SF Project No. 2066902 June 4, 2021
Fit-Up Administrative Headquarters
Suite 440E &455E Capital Gallery East Tower

Product Data for Basis of Design Only

Architecture Product Data
Electrical Product Data
Fire Alarm and Sprinkler Product Data
Mechanical Product Data
Plumbing Product Data
Security Product Data
Telecommunications Product Data

SF Project No. 2066902 June 4, 2021
Fit-Up Administrative Headquarters
Suite 440E &455E Capital Gallery East Tower

Architecture Product Data for Basis of Design Only

CALLA® High CAC

Square Lay-in & Tegular
smooth texture

TOTAL ACOUSTICS®
Sound Absorption (NRC)
+ Sound Blocking (CAC)

SUSTAIN®
High Performance
Sustainable
Ceiling Systems

24/7 DEFEND™
Solutions for Healthier,
Safer Spaces

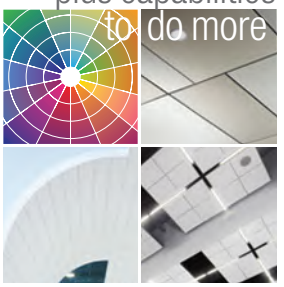
CONTAIN CLEAN PROTECT

▲ Calla® High CAC Square Tegular panels with Suprafine® 9/16" suspension system

CAD/Revit® drawings at:
armstrongceilings.com/cadrevit

DESIGNFlex®
A New World of Choice
for Ceiling Systems

plus capabilities to do more



armstrongceilings.com/capabilities
See more photos at:
armstrongceilings.com/photogallery

Smooth, drywall-like finish with the highest levels of sound blocking available to address speech privacy. Offers both Sustain® and Total Acoustics® panel performance for flexible spaces.

KEY SELECTION ATTRIBUTES

- DESIGNFlex® options include made-to-order sizes and colors available to ship in 3 weeks
- Get total noise control and floor plan versatility with Total Acoustics® ceiling panels: NRC + CAC = Total Acoustics Performance
- Calla® High CAC panels are part of the Sustain® portfolio and meet the most stringent sustainability compliance standards today
- Excellent combination of acoustical performance with exceptional sound blocking; NRC 0.80, CAC 40, and AC 170
- CleanAssure™ family of products – includes disinfectable panels, suspension systems, and trim
- Mold- and mildew-resistant surface
- Washable, Impact-resistant, Scratch-resistant, Soil-resistant
- USDA-Certified Biobased Product – 91%
- Compatible with the TechZone® Ceiling Systems
- Product can be recycled through the Armstrong Ceilings Recycling Program
- 30-Year Limited System Warranty against visible sag, mold, and mildew

TYPICAL APPLICATIONS

- Offices – closed spaces for privacy and confidentiality; open spaces for focus, collaboration, and teaming
- Healthcare – assists in addressing HIPAA, HCAHPS, and FGI acoustical requirements
- Classrooms
- Corridors
- Lobbies/reception areas

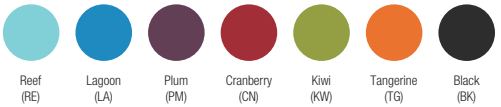
COLORS

Due to printing limitations, shade may vary from actual product.

White (WH) | Black (BK) | Available in any color!

These colors are pre-qualified to meet Sustain® portfolio requirements.

White (WH) | Shell (SH) | Pale Lemon (LM) | Pecan (PC) | Sky (SK) | Moss (MS) | Stone (SE)



Reef (RE) | Lagoon (LA) | Plum (PM) | Cranberry (CN) | Kiwi (KW) | Tangerine (TG) | Black (BK)

Other made-to-order colors must be evaluated if sustainability criteria is required. Lead time will increase.

DETAILS

1. Calla® High CAC Square Tegular
2. Calla High CAC Square Lay-in
3. Calla High CAC Square Tegular with Suprafine® 9/16" suspension system

TechLine 877 276-7876
armstrongceilings.com/calla

Armstrong® CEILING & WALL SOLUTIONS

CALLA® High CAC

Square Lay-in & Tegular
smooth texture

USDA CERTIFIED BIOBASED PRODUCT PRODUCT 91%

SUSTAIN® High Performance Sustainable Ceiling Systems

Declare.

GREENGUARD Gold Certified (details below)

LEED® | WELL™ | LBC

76% RECYCLED CONTENT

Calculate sustainability with GreenGenie™ armstrongceilings.com/greengenie

energy management · construction waste mgmt · regional materials · design for flexibility · EPD · recyclable/ extended producer resp. · biobased materials · recycled content · sourcing of raw materials · material ingredient reporting · low emitting/ materials · lighting quality · acoustics

▲ LOCATION DEPENDENT

VISUAL SELECTION

PERFORMANCE SELECTION

Dots represent high level of performance.

$$$$

armstrongceilings.com/catdwgs	Susp. Dwg.	Item No.	Dimensions (Inches)	UL Classified Acoustics NRC + CAC =	Total Acoustics[1]	PrivAssure[2]	Articulation Class AC	Fire Performance	Light Reflect*	Bio-Block Anti-Mold/ Mildew	Humi-Guard+ Sag Resistant	Certified Low VOC Emissions	CleanAssure™ Disinfectable Panels Fog	DURABILITY Wash*	Impact	Scratch*	Soil	Recycle Program	30-Yr Warranty
CALLA® High CAC 15/16" Square Lay-in	1	8805	24 x 24 x 1"	0.80 • 40 •	BEST	N/A	170 •	Class A	0.85 •	•	•	•	•	•	•	•	•	•	•
		8808	24 x 48 x 1"	0.80 • 40 •	BEST	N/A	170 •	Class A	0.85 •	•	•	•	•	•	•	•	•	•	•
		8811	24 x 60 x 1"	0.80 • 40 •	BEST	N/A	170 •	Class A	0.85 •	•	•	•	•	•	•	•	•	•	•
		8814	24 x 72 x 1"	0.80 • 40 •	BEST	N/A	170 •	Class A	0.85 •	•	•	•	•	•	•	•	•	•	•
		8817	30 x 30 x 1"	0.80 • 40 •	BEST	N/A	170 •	Class A	0.85 •	•	•	•	•	•	•	•	•	•	•
15/16" Square Tegular	8	8806	24 x 24 x 1"	0.80 • 40 •	BEST	N/A	170 •	Class A	0.85 •	•	•	•	•	•	•	•	•	•	•
		8809	24 x 48 x 1"	0.80 • 40 •	BEST	N/A	170 •	Class A	0.85 •	•	•	•	•	•	•	•	•	•	•
		8812	24 x 60 x 1"	0.80 • 40 •	BEST	N/A	170 •	Class A	0.85 •	•	•	•	•	•	•	•	•	•	•
		8815	24 x 72 x 1"	0.80 • 40 •	BEST	N/A	170 •	Class A	0.85 •	•	•	•	•	•	•	•	•	•	•
		8818	30 x 30 x 1"	0.80 • 40 •	BEST	N/A	170 •	Class A	0.85 •	•	•	•	•	•	•	•	•	•	•
9/16" Square Tegular	26,43, 47, 51, 55	8807	24 x 24 x 1"	0.80 • 40 •	BEST	N/A	170 •	Class A	0.85 •	•	•	•	•	•	•	•	•	•	•
		8810	24 x 48 x 1"	0.80 • 40 •	BEST	N/A	170 •	Class A	0.85 •	•	•	•	•	•	•	•	•	•	•
		8813	24 x 60 x 1"	0.80 • 40 •	BEST	N/A	170 •	Class A	0.85 •	•	•	•	•	•	•	•	•	•	•
		8816	24 x 72 x 1"	0.80 • 40 •	BEST	N/A	170 •	Class A	0.85 •	•	•	•	•	•	•	•	•	•	•
		8819	30 x 30 x 1"	0.80 • 40 •	BEST	N/A	170 •	Class A	0.85 •	•	•	•	•	•	•	•	•	•	•
1" Thick – 15/16" Square Lay-in & Square Tegular																			
Made-to-Order Sizes		Width	Length	N/A	N/A	N/A	N/A	–	Class A	0.85 •	•	•	•	•	•	•	•	•	•	•
		4" – 11-1/2"	12" – 72"																
		12" – 35-1/2"	4" – 72"																
		36" – 48"	4" – 30"																

1 Ctn Min FASTSIZE 3 WEEKS order to ship

Visit the product page online and see "Configure an Item" to verify capabilities.
Questions? email Techline@armstrongceilings.com

[1] Total Acoustics® ceiling panels have an ideal combination of sound absorption and sound blocking in one product.
GOOD (NRC 0.60-0.65; CAC 35+)
BETTER (NRC 0.70-0.75; CAC 35+)
BEST (NRC 0.80+; CAC 35+)

* Advertised values for light reflectance, wash and scratch resistance are applicable to white tiles only

SUSPENSION SYSTEMS

15/16" Prelude® XL®

9/16" Silhouette® XL® 1/4" Reveal · Silhouette XL 1/8" Reveal · Suprafine® · Interlude® XL® HRC

PHYSICAL DATA

Material
Wet-formed mineral fiber with acoustically transparent membrane

Surface Finish
Acoustically transparent membrane with factory-applied latex paint

Fire Performance
Class A: ASTM E84 and CAN/ULC S102 surface burning characteristics. Flame Spread Index of 25 or less. Smoke Developed Index of 50 or less (UL labeled).

Design Considerations
Combining materials with different run dates may result in shade variations. Order attic stock for any anticipated future needs.

ASTM E1264 Classification
Type IV, Form 2, Pattern E; Fire Class A

Humidity/Sag Resistance
HumiGuard® Plus ceiling panels are recommended for areas subject to high humidity, up to, but not including, standing water and outdoor applications.

Anti-Mold/Mildew
Ceiling tiles with BioBlock® performance resist the growth of mold and mildew on the tile surface.

VOC Emissions
GREENGUARD Gold Certified
Third-party certified compliant with California Department of Public Health CDPH/EHLB/Standard Method Version 1.2, 2017. This standard is the guideline for low emissions in LEED®, WELL Building Standard™, Living Building Challenge® (LBC), CalGreen Title 24, ANSI/ASHRAE/USGBC/IES Standard 189; ANSI/GBI Green Building Assessment Protocol.

PRODUCT CERTIFIED FOR LOW CHEMICAL EMISSIONS UL.COM/GG UL 2818

GREENGUARD GOLD

High Recycled Content
Classified as containing greater than 50% total recycled content. Total recycled content based on product composition of post-consumer and pre-consumer (post-industrial) recycled content per FTC guidelines.

Insulation Value
R Factor – 2.9 (BTU units); R Factor – 0.445 (Watts units)

Cleaning and Disinfecting
Cleaning and CDC recommended disinfecting options available on armstrongceilings.com/cleaning

30-Year Performance Guarantee & Warranty
When installed with Armstrong® Suspension System. Details at armstrongceilings.com/warranty

Weight; Square Feet/Carton
8805, 8806, 8807 – 1.0 lbs/SF; 40 SF/ctn
8808, 8809, 8810 – 1.0 lbs/SF; 48 SF/ctn
8817, 8818, 8819 – 1.0 lbs/SF; 50 SF/ctn
8814, 8815, 8816 – 1.0 lbs/SF; 72 SF/ctn
8811, 8812, 8813 – 1.0 lbs/SF; 80 SF/ctn

Minimum Order Quantity
1 carton

TechLine / 1 877 276-7876
armstrongceilings.com/calla

BPCS-5936-121

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Armstrong® CEILING & WALL SOLUTIONS

MINERAL FIBER – Standard

SILHOUETTE® XL® 1/8" Reveal
9/16" Slotted Tee System

SUSTAIN™ High Performance Sustainable Ceiling Systems

24/7 DEFEND™ Solutions for Healthier, Safer Spaces

Declare. CONTAIN CLEAN PROTECT

UP TO 30% RECYCLED CONTENT

Calculate LEED contribution at armstrongceilings.com/greengenie

LEED®: energy management ✓, construction waste mgmt ✓, regional materials ✓, design for flexibility ✓, EPD ✓, recyclable/extended producer resp., biobased materials, recycled content ✓, sourcing of raw materials, material ingredient reporting, low emitting/materials, lighting quality, acoustics

▲ LOCATION DEPENDENT

KEY SELECTION ATTRIBUTES

- Seismic Rx® Suspension System saves time and money; offer an ICC-ES approach to installations (ESR-1308)
- Silhouette is part of the Sustain™ portfolio and meets the most stringent sustainability compliance standards today
- Hot dipped galvanized coating inhibits red rusting better than electrogalvanized or painted systems
- Some items available in metric sizes
- Rotary-stitched during manufacture for additional torsional strength and extra stability during installation; maintains size and shape of reveal when cutting perimeter cross tees

new

- CleanAssure™ family of products – includes disinfectable panels, suspension systems, and trim (Fog, Spray, and Wipe)
- XL² staked-on end detail provides secure locked connection
- 10-Year Limited System Warranty; 30-Year Limited Ceiling Systems Warranty when used with HumiGuard® Plus products

10-YEAR Availability

- Made-to-Order main beams and cross tees can be ordered for your project needs in one carton minimums

Blizzard White and Charcoal Black powder-coated finish coordinates with Calla®, Optima®, Ultima® and Lyra® ceiling panels for a clean, seamless, monolithic installed visual.

Linear lighting integration is easy with made-to-order main beam-to-cross tee adapters, rout spacing, miter spacing, and short cross tees (3" to 6" lengths).

VISUAL SELECTION

Item No.	Face	Profile	Description	Rout Spacing	Notching	Dimensions (Inches)	Hanger Spacing* Lbs./Lin. Ft. 4 Ft.	5 Ft.	PERFORMANCE Fire Guard™	Seismic Category DEF	PACKAGING Pcs./ Ctn.	Lin.Ft./ Ctn.
Silhouette XL – 1/8" Reveal									Dots represent high level of performance.			
☐ **76018**_ _❖	9/16"		12' HD Main Beam – Notched 24" O.C.	24" O.C.		144 x 9/16 x 1-3/4"	16.35	7.80	–	•	20	240
☐ **76128**_ _❖	9/16"		12' HD Main Beam – Unnotched	–		144 x 9/16 x 1-3/4"	16.35	7.80	–	•	20	240
☐ **76008**_ _❖	9/16"		12' ID Main Beam – Notched 24" O.C.	24" O.C.		144 x 9/16 x 1-3/4"	13.10	6.61	–	–	20	240
☐ **76028**_ _❖	9/16"		10' ID Main Beam – Notched 24" O.C.	24" O.C.		120 x 9/16 x 1-3/4"	13.10	6.61	–	–	20	200
☐ **76038**_ _❖	9/16"		12' ID Main Beam – Notched 48" O.C.	48" O.C.		144 x 9/16 x 1-3/4"	13.10	6.61	–	–	20	240
☐ **76068**_ _❖	9/16"		10' ID Main Beam – Notched 30" O.C.	30" O.C.		120 x 9/16 x 1-3/4"	13.10	6.61	–	–	20	200
☐ **XL76808**_ _❖	9/16"		8' Cross Tee – Unnotched	–		96 x 9/16 x 1-3/4"	12.59**	–	–	•	20	160
☐ **XL76908**_ _❖	9/16"		6' Cross Tee – Unnotched	–		72 x 9/16 x 1-3/4"	12.59**	–	–	•	20	120
☐ **XL76508**_ _❖	9/16"		5' Cross Tee – Unnotched	–		60 x 9/16 x 1-3/4"	–	6.09	–	•	30	150
☐ **XL76558**_ _❖	9/16"		5' Cross Tee – Center-notched, both sides	–		60 x 9/16 x 1-3/4"	–	5.71	–	•	30	150
☐ **XL76408**_ _❖	9/16"		4' Cross Tee – Unnotched	–		48 x 9/16 x 1-3/4"	14.11	–	–	•	60	240
☐ **XL76458**_ _❖	9/16"		4' Cross Tee – Center-notched, both sides	–		48 x 9/16 x 1-3/4"	12.60	–	–	•	60	240
☐ **XL76468**_ _❖	9/16"		4' Cross Tee – Center-notched, one side	–		48 x 9/16 x 1-3/4"	13.01	–	–	•	60	240
☐ **XL76708**_ _❖	9/16"		30" Cross Tee – Unnotched	–		30 x 9/16 x 1-3/4"	47.76	–	–	•	60	150
☐ **XL76208**_ _❖	9/16"		2' Cross Tee – Unnotched	–		24 x 9/16 x 1-3/4"	69.69	–	–	•	60	120
☐ **XL76108**_ _❖	9/16"		1' Cross Tee – Unnotched	–		12 x 9/16 x 1-3/4"	69.69	–	–	•	120	120
☐ **XL76048**_ _❖	9/16"		4" Cross Tee – Unnotched	–		4 x 9/16 x 1-3/4"	–	–	–	•	60	20

Size Capabilities		Main Beams Length	Cross Tees Length	Varies	Varies
9/16"	1 CTN MIN Made-to-Order Sizes or Colors (2 Wks)	36" – 144" Rout spacing 3" from ends, 6" thereafter **NOTE: Up to 6 Weeks for Color & Size Combinations**	6" – 144"		

ASTM Class
HD - Heavy-duty
ID - Intermediate-duty
LD - Light-duty

Made-to-Order main beams and cross tees can be ordered with special sizes, rout spacing, and colors for your project needs in one carton minimums.

SILHOUETTE® XL®
1/8" Reveal
9/16" Slotted Tee System

SILHOUETTE XL – 1/8" REVEAL PAINTED GRID TO MATCH AXIOM® TRIM

VISUAL SELECTION | **PERFORMANCE** | **PACKAGING**

Item No.	Face Profile	Description	Rout Spacing	Notching	Dimensions (Inches)	Hanger Spacing* Lbs./Lin. Ft. 4 Ft.	5 Ft.	Seismic Category Fire Guard™ DEF (Dots represent high level of performance.)		Pcs./ Ctn.	Lin.Ft./ Ctn.
360° Painted – Powder Coated Paint – (made to order)											
☐ **AX76003XX**	9/16"	12' HD Main Beam – Notched 24" O.C.	12" O.C.		144 x 9/16 x 1-3/4 x 1/4"	13.10	6.61	–	–	20	240
☐ **AX76013XX**	9/16"	12' HD Main Beam – Notched 24" O.C.	12" O.C.		144 x 9/16 x 1-3/4 x 1/4"	16.35	7.80	–	–	20	240
☐ **AX76103XX**	9/16"	1' Cross Tee – Unnotched	–		12 x 9/16 x 1-3/4 x 1/4"	69.69	71.66	–	–	120	120
☐ **AX76203XX**	9/16"	2' Cross Tee – Unnotched	–		24 x 9/16 x 1-3/4 x 1/4"	69.69	71.66 @ 2'	–	–	60	120
☐ **AX76703XX**	9/16"	30" Cross Tee – Unnotched	–		30 x 9/16 x 1-3/4 x 1/4"	39.86 @ 2.5'	–	–	–	60	150
☐ **AX76453XX**	9/16"	4' Cross Tee – Center Notched Both Sides	–		48 x 9/16 x 1-3/4 x 1/4"	12.85	–	–	–	60	240
☐ **AX76503XX**	9/16"	5' Cross Tee – Unnotched	–		60 x 9/16 x 1-3/4 x 1/4"	–	6.09	–	–	30	150

VISUAL SELECTION | **PERFORMANCE** | **PACKAGING**

Item No.	Description	Length	(A) Flange	(B) Flange	(C) Flange	Pcs./ Ctn.	Lin. Ft./ Ctn.
Suggested Wall Moldings and Shadow Moldings Additional molding options available. See armstrongceilings.com/suspensionsystems (search: accessories and moldings)							
☐ **7804_ _** ❖	12' Hemmed Angle Molding	144"	9/16"	7/8"	–	30	360
☐ **7873_ _** ❖	10' Shadow Molding	120"	9/16"	15/16"	3/8"	30	300
☐ **7878_ _** ❖***	10' Seismic Shadow Molding	120"	15/16"	15/16"	3/8"	30	300

* Simple Span
** Wire at 4'
*** Suitable for Category D, E, F Seismic Installation with BERC2 clip
❖ Items available in Blizzard White powder-coated finish
When specifying or ordering items with a color or finish, add the two-letter suffix to the end of the item number (e.g.,. 7804ZW – Blizzard White)

MAXIMUM FIXTURE WEIGHT

Configuration A	Configuration B	Item No.	Fixture A	Fixture B	Planning Module A	Planning Module B	Hanger Spacing A	Hanger Spacing B	Maximum Weight A	Maximum Weight B
Main Beam to Main Beam – Drawing Key: Main beam (↑) Cross tee (┄) Hanger wire (✦)										
		76008	24" x 48"	24" x 48"	48" x 48"	48" x 48"	48"	48"	73.0 lbs.	73.0 lbs.
		76018	24" x 48"	24" x 48"	48" x 48"	48" x 48"	48"	48"	76.0 lbs.	76.0 lbs.
			12" x 48"	12" x 48"	48" x 48"	48" x 48"	48"	48"	73.0 lbs.	58.0 lbs.
			12" x 48"	12" x 48"	48" x 48"	48" x 48"	48"	48"	76.0 lbs.	76.0 lbs.

Main beams tested as follows: 76008/814042 tested at 13.1 lbs./lin. ft. to 1/360 of 4' span; 76018 tested at 16.35 lbs./lin. ft. to 1/360 of 4' span.

Cross Tee to Cross Tee – Drawing Key: Main beam (↑) Cross tee (┄) Hanger wire (✦)

		XL76458	24" x 48"	24" x 24"	48" x 48"	48" x 48"	48"	48"	59.0 lbs.	41.0 lbs.
		XL76468	12" x 48"	24" x 24"	48" x 48"	48" x 48"	48"	48"	59.0 lbs.	41.0 lbs.

Cross tees tested as follows: XL76458/813042 at 12.0 lbs./lin. ft. to 1/360 of 4' span.

Fixtures weighing more than 56 lbs. should be independently supported. Fixture weight is based on single fixture only. For end-to-end fixtures or other configurations not shown, consult your Armstrong representative.
NOTE: The above data is based on 48" hanger wire spacing, board weight of 1 lb./SF, maximum deflection of tees not to exceed 1/360 of the span, and suspension system installed in accordance with ASTM C636.

SILHOUETTE® XL®
1/8" Reveal
9/16" Slotted Tee System

COLOR AND FINISH SELECTION

Standard

White (WH)

Powder-coated Finish❖

Charcoal Black (ZB)

Blizzard White (ZW)

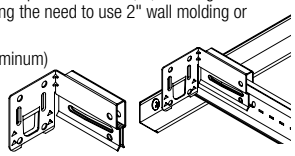
Available in any color!

❖ Items available in powder-coated finish

ACCESSORIES

BERC2 – 2" Beam End Retaining Clip – Allows you to create a code compliant Seismic D, E, F ceiling installation while eliminating the need to use 2" wall molding or spreader bars.

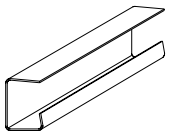
ALBERC2 (aluminum)



☐ **BERC2** (Steel) – 200 pcs
☐ **FZBERC2** (Steel) – 50 pcs

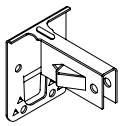
☐ **ALBERC2** (Aluminum) – 200 pcs
☐ **FZALBERC2** (Aluminum) – 50 pcs

MCC8 – Silhouette 1/8" Reveal Miter Closure Clip – Eliminates main beam and cross tee miters.



☐ **MCC8** – 200 pcs
☐ **FZMCC8** – 50 pcs

GCWA – Grip Clip Wall Attachment – Joins main beam or cross tee to wall molding via locking barbs without pop rivets or screws.



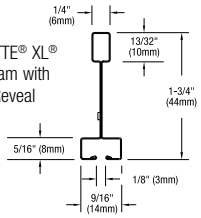
☐ **GCWA** – 250 pcs
☐ **FZGCWA** – 50 pcs

DETAILS

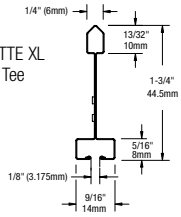
SILHOUETTE XL Main Beam

SILHOUETTE XL Cross Tee

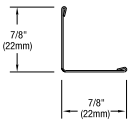
SILHOUETTE® XL® Main Beam with 1/8" Reveal



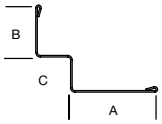
SILHOUETTE XL Cross Tee



7/8" Hemmed Angle Molding



Shadow Molding



SEISMIC PERFORMANCE

Main Beams
76018, 76128

Minimum Lbs. To Pull Out Compression/Tension
392.9, 340.0

Cross Tees
XL76808, XL76908, XL76508, XL76558, XL76408, XL76458, XL76468, XL76708, XL76208, XL76108

Minimum Lbs. To Pull Out Compression/Tension
299.5

ICC Reports
For areas under ICC jurisdiction, see ICC evaluation report number ESR-1308 for allowable values and/or conditions of use concerning the suspension system components listed on this page. The report is subject to reexamination, revisions, and possible cancellation.

To derive maximum lbs/sf, divide the on-center spacing of the component into the lbs/lf given in the load test data table.

PHYSICAL DATA

Material
Hot dipped galvanized steel

Surface Finish
Baked polyester paint or powder-coated paint

Manufactured and tested in accordance with ASTM C635

Face Dimension
9/16"

Profile
Bolt-slot

Cross Tee/Main Beam Interface
Mitered

End Detail
Main Beam: Coupling

Cross Tee: Staked-on clip

Duty Classification
Intermediate or Heavy-duty

Cleaning & Disinfecting
Cleaning and CDC approved disinfecting options available on armstrongceilings.com/cleaning)

TechLine / 1 877 276-7876
armstrongceilings.com/suspensionsystems
(search: silhouette)
BPCS-3078-321

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Armstrong® CEILING SOLUTIONS

ArmstrongFlooring™

VINYL COMPOSITION TILE (VCT)

Standard Excelon® Imperial® Texture

Product Information

Construction - Vinyl Composition Tile

International Specifications - ASTM F1066 - Class 2 Through Pattern, ISO 10595, Type II

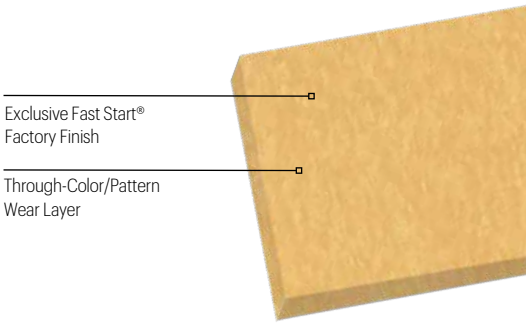
Overall/Wear Layer Thickness - 1/8" (3.2 mm), 3/32" (2.4 mm)+

Factory Finish - Fast Start®

Installation - S-515 High Moisture, S-525, S-700, S-750, S-240 or Flip® Spray Adhesive

Maintenance Options - Polish

+1/8" and 3/32" sizes are stocked for these colors: 51830, 51836, 51839, 51858, 51899 All other colors are stocked in 1/8" size; 3/32" is available on a special order basis, minimum order quantity of 45,000 sq ft² (4,181 m²).



Packaging

Size	Tile per Carton/Coverage	Shipping Weight per Carton
12" x 12" (305 mm x 305 mm)	45 - 45 ft² (4.18 m²)	1/8" - 63 lbs./carton (28.6 kg) 3/22" - 48 lbs./carton (21.7 kg)

Testing

Performance	Test Method	Requirement	Performance vs. Requirement
Thickness	ASTM F386	Nominal ± 0.005"	Meets
Size	ASTM F2055	± 0.016" per linear foot	Meets
Squareness	ASTM F2055	0.010" max	Meets
Indentation – One Minute	ASTM F1914	≥ 0.006" to ≤ 0.015"	Meets
Indentation @ 115°F	ASTM F1914	< 0.032"	Meets
Impact	ASTM F1265	No cracks beyond limit	Meets
Deflection	ASTM F1304	1.0" minimum	Meets
Dimensional Stability	ASTM F2199	≤ 0.024" per linear foot	Meets
Chemical Resistance	ASTM F925	No more than slight change in surface dulling, attack or staining	Meets
Resistance to Heat	ASTM F1514	ΔE not greater than 8.0	Meets
Additional Testing			
Static Load Resistance	ASTM F970*	≤ 0.005"	2000 psi
Fire Test Data – Flame Spread	ASTM E648	0.45 W/cm² or more Class 1	Meets
Fire Test Data – Smoke Evolution	ASTM E662	450 or less	Meets
Fire Test Data – Canada	CAN\ULC S102.2	Use dependent	Flame Spread - 0 Smoke Developed - 30
ADA Standards for Accessible Design	Chapter 3 Section 302.1	Floor surfaces shall be stable, firm and slip-resistant	Meets
Static Coefficient of Friction**	ASTM D 2047/UL 410	≥ 0.5	Meets

Maritime Usage

IMO Resolution A653 (16) Surface Flammability IMO MSC 61(67) Annex 1 Part 5 and Annex 2 Smoke and Toxicity IMO MSC 61(67) Annex 1 Part 2 and Annex 2	 Passes Passes
Safety Of Life at Sea (SOLAS)	Compliant
United States Coast Guard	Approved

ArmstrongFlooring™

VINYL COMPOSITION TILE (VCT) — Standard Excelon® Imperial® Texture

Sustainability

WELL v1 Feature		Imperial Texture	Contribution
Air	Feature 04 - VOC Reduction	✓	Tested and third party certified by FloorScore as complying with CDPH v1.2
	Feature 11 - Fundamental Material Safety	✓	Product is free of asbestos and added lead (Part 1)
	Feature 25 - Toxic Material Reduction	✓	Free of flame retardants (Part 2)
Mind	Feature 97 - Material Transparency	✓	Readily available Health Product Declaration (HPD) to 1000 ppm
	Feature 88 (Part 2) Biophilia I - Qualitative	✓	Products available that incorporate nature patterns
	Feature 99 - Beauty and Design II	✓	Patterns and colors to aid in wayfinding and spatial familiarity (Part 3)

WELL v2 Feature		Imperial Texture	Contribution
Air	Feature X12 - Short Term Emission Control	✓	Adhesives associated with product are tested and third party certified by FloorScore as complying with CDPH v1.2
	Feature X11 Long-Term Emission Control	✓	Flooring is tested and third party certified by FloorScore as complying with CDPH v1.2
	Feature X01 Fundamental Material Precautions	✓	Product is free of asbestos
Materials	Feature X10 Volatile Organic Compound	✓	Free of flame retardants (Part 2)
	Feature X14 Material Transparency	✓	Readily available Health Product Declaration (HPD) to 1000 ppm
Mind	Feature M02 Access to Nature	✓	Products available that incorporate nature patterns
Community	Feature C13 (Part 2) Accessibility and Universal Design	✓	Patterns and colors to aid in wayfinding and spatial familiarity

LEED™ v4.1	Imperial Texture
BPDO - EPD	Product Specific certified by ASTM International
BPDO - Material Ingredient	HPD
BPDO - Sourcing	Recycled Content – 25% Total (5% Post-Consumer and 20% Pre-Consumer) Extended Producer Responsibility – On&On™ Recycling Program
Location of Manufacturer	USA
Low Emitting Flooring	Tested and third party certified by FloorScore as complying with CDPH v1.2
Low Emitting Adhesives	Tested and compliant to CDPH v1.2; Methylene Chloride and Perchloroethylene not intentionally added; FloorScore Certified
SCAQMD #1168 Compliant. Adhesives meet >50 g/L requirement	S-515 Exceeds – 0 g/L S-525 Exceeds – 16 g/L S-700 Exceeds – 0 g/L S-750 Exceeds – 5 g/L S-240 Exceeds – 10 g/L Flip® Exceeds – 0 g/L

Limited Warranty

5-year Commercial Warranty when installed in strict accordance with the detailed instructions.

Visit ArmstrongFlooring.com
for complete Product, Technical, Adhesives, Installation & Maintenance recommendations.

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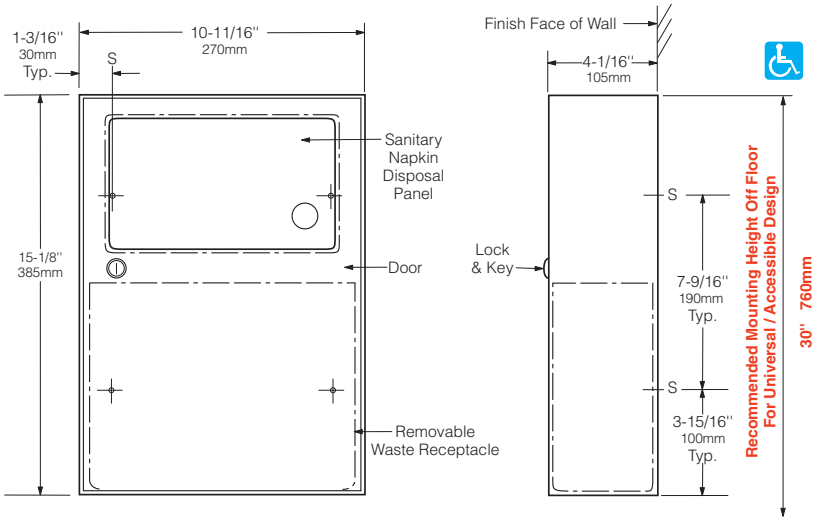
*Testing at loads above 125 psi is outside the scope of the test method. Since testing is conducted on uninstalled flooring, results do not consider the performance of the adhesive, underlayment, or subfloor. These test results are not an indicator of the installed flooring system performance. **Using the James Machine as described in D2047 and as directed in UL 410 for floor covering materials (FCM) using a leather foot under dry conditions. The application of site-applied floor sealers, polishes and other types of finishes routinely used to maintain resilient flooring materials will change the walking surface and consequently the SCOF value.

BOBRICK

Technical Data

SURFACE-MOUNTED SANITARY NAPKIN DISPOSAL

B-254



MATERIALS:

Cabinet — 18-8, type-304, heavy-gauge stainless steel. All-welded construction. Exposed surfaces have satin finish.

Door — 18-8, type-304, 22-gauge (0.8mm) stainless steel with satin finish. Secured to cabinet with a full-length stainless steel piano-hinge. Equipped with a tumbler lock keyed like other Bobrick washroom accessories.

Disposal Panels (2) — 18-8, type-304, 22-gauge (0.8mm) stainless steel with satin finish. Bottom edges hemmed for safety. Secured to door and permanent panel with spring-loaded, full-length stainless steel piano-hinge. Equipped with international graphic symbol identifying sanitary napkin disposal.

Waste Receptacle — Leak-proof, rigid molded polyethylene. Removable for servicing. Capacity: 1.2-gal. (4.6-L).

OPERATION:

Unit is equipped with a self-closing panel covering each disposal opening. Napkin disposal is emptied by opening door with furnished key and removing waste receptacle.

INSTALLATION:

For partitions with particle-board or other solid core, secure with four #8 x 1-1/4" (4.2 x 32mm) sheet=metal screws (not furnished), or provide through-bolts, nuts, and washers.

For hollow-core metal partitions, provide solid backing into which sheet-metal screws can be secured. If two units are installed back-to-back, then provide threaded sleeves and machine screws for the full thickness of partition.

For plaster or dry wall construction, provide concealed backing to comply with local building coeds, then secure unit with #8 x 1-1/4" (4.2 x 32mm) sheet-metal screws.

For other wall surfaces, provide fiber plugs or expansion shields for use with #8 x 1-1/4" (4.2 x 32mm) sheet-metal screws, or provide 3/16" (5mm) toggle bolts or expansion bolts.

SPECIFICATION:

Surface-mounted sanitary napkin disposal shall be type-304 stainless steel with all-welded construction; exposed surfaces shall have satin finish. Door shall be secured to cabinet with a full-length stainless steel piano-hinge and equipped with a tumbler lock keyed like other Bobrick washroom accessories. Unit shall have a self-closing panel covering each disposal opening. Panel shall have bottom edge hemmed for safety, be secured to door with spring-loaded, full-length stainless steel piano-hinge, and equipped with international graphic symbols identifying sanitary napkin disposal. Unit shall be furnished with a removable, leak-proof molded polyethylene receptacle. Receptacle shall have a capacity of 1.2-gal. (4.6-L).

Surface-Mounted Sanitary Napkin Disposal shall be Model B-254 of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

The illustrations and descriptions herein are applicable to production as of the date of this Technical Data Sheet.
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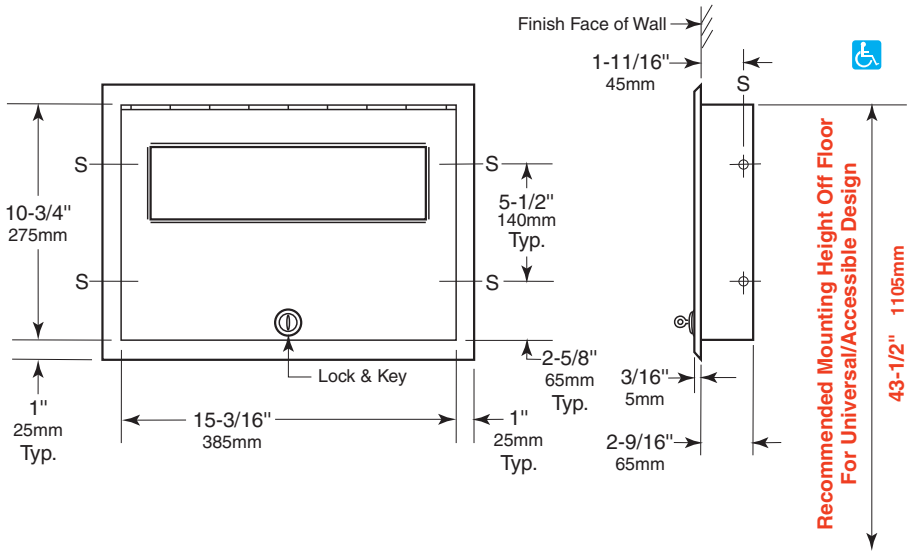
BOBRICK

Technical Data

RECESSED TOILET-SEAT-COVER DISPENSER

B-301



Rough Wall Opening
15-5/8" (395mm) wide
11-1/4" (285mm) high
2-5/8" (67mm) minimum
recessed depth

MATERIALS:

Cabinet — 18-8, type-304, heavy-gauge stainless steel. All-welded construction.

Flange — 18-8, type-304, 22-gauge (0.8mm) stainless steel with satin finish. Drawn and beveled, one-piece, seamless construction.

Door — 18-8, type-304, 22-gauge (0.8mm) stainless steel with satin finish. Secured to cabinet with a full-length, stainless steel piano-hinge. Beveled opening. Equipped with a tumbler lock keyed like other Bobrick washroom accessories.

OPERATION:

Dispenses single- or half-fold paper toilet seat covers. To fill dispenser, door unlocks with key provided. Capacity: 500 toilet seat covers.

INSTALLATION:

Provide framed rough wall opening 15-5/8" wide x 11-1/4" high (395 x 285mm). Minimum recessed depth required from finish face of wall is 2-5/8" (67mm). Allow clearance for construction features that may protrude into rough wall opening from opposite wall. Coordinate with mechanical engineer to avoid pipes, vents, and conduits in wall. Mount cabinet with shims between framing and cabinet at all points indicated by an *S*, then secure unit with four #8 x 1-1/4" (4.2 x 32mm) sheet-metal screws (not furnished).

SPECIFICATION:

Recessed toilet-seat-cover dispenser shall be type-304 stainless steel with all-welded construction; exposed surfaces shall have satin finish. Flange shall be drawn and beveled, one-piece, seamless construction. Door shall be secured to cabinet with a full-length, stainless steel piano-hinge and equipped with a tumbler lock keyed like other Bobrick washroom accessories. Dispenser shall have a capacity of 500 paper toilet seat covers.

Recessed Toilet-Seat-Cover Dispenser shall be Model B-301 of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

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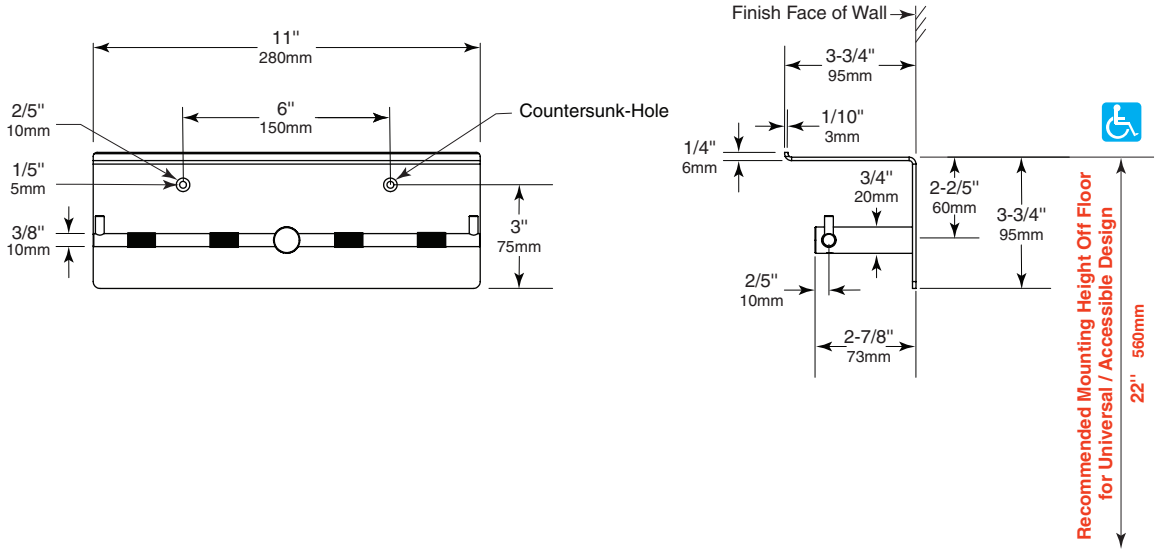
BOBRICK

Technical Data

SURFACE-MOUNTED TOILET TISSUE DISPENSER AND UTILITY SHELF

B-540



MATERIALS:

Shelf / Wall Plate — 18-8, Type-304, 14-gauge (2.5mm) stainless steel with satin finish. 1/4" (6mm) upward return edge at the front.

Post — 18-8, Type-304, 3/4" (19mm) diameter, solid stainless steel rod. Post is securely welded to the Wall Plate.

Dispenser Bar — 18-8, Type-304, 3/8" (9.5mm) diameter, solid stainless steel rod. Secured to Post with a concealed set screw.

Retaining Pins (2) — 18-8, Type-304, 1/4" (6.4mm) diameter, solid stainless steel rod press fit and secured into Dispenser Bar.

OPERATION:

Unit holds two standard-core toilet tissue rolls up to 4-1/4" (110mm) diameter (500 sheets). Item complies with one-hand-operation and continuous-paperflow-requirement of ADA. *Designer's Note:* It is recommended that one full toilet tissue roll remain wrapped or taped until the other roll has been depleted to avoid wasting the ends of both rolls.

INSTALLATION:

For plaster or dry wall construction, provide concealed backing to comply with local building codes, then secure unit with sheet-metal screws (not furnished). For other wall surfaces, provide fiber plugs or expansion shields for use with sheet-metal screws (not furnished), or provide 1/8" (3mm)toggle bolts or expansion bolts.

For partitions with particle-board or other solid core, secure with sheet-metal screws (not furnished), or provide through-bolts, nuts, and washers. For hollow-core metal partitions, provide solid backing into which the sheet-metal screws (not furnished) can be secured.

SPECIFICATION:

Surface-mounted toilet tissue dispenser and utility shelf shall be Type-304, 14 gauge stainless steel with satin finish. Shelf shall have 1/4" (6mm) upward return front edge. Toilet Tissue Dispenser shall have 3/4" (19mm) diameter Post. Dispenser bar shall be 3/8" (9.5mm) diameter, secured to Post with a concealed set screw. Retaining pin shall be 1/4" (6.4mm) diameter and pressed into Dispenser bar. Wall Plate equipped with two screw holes for attachment. Post and Wall Plate are to be securely welded as one piece. Dispenser Bar shall hold standard-core toilet tissue rolls up to 4-1/4" (110mm) diameter (500 sheets).

Surface-Mounted Toilet Tissue Dispenser And Utility Shelf shall be Model B-540 of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

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BOBRICK

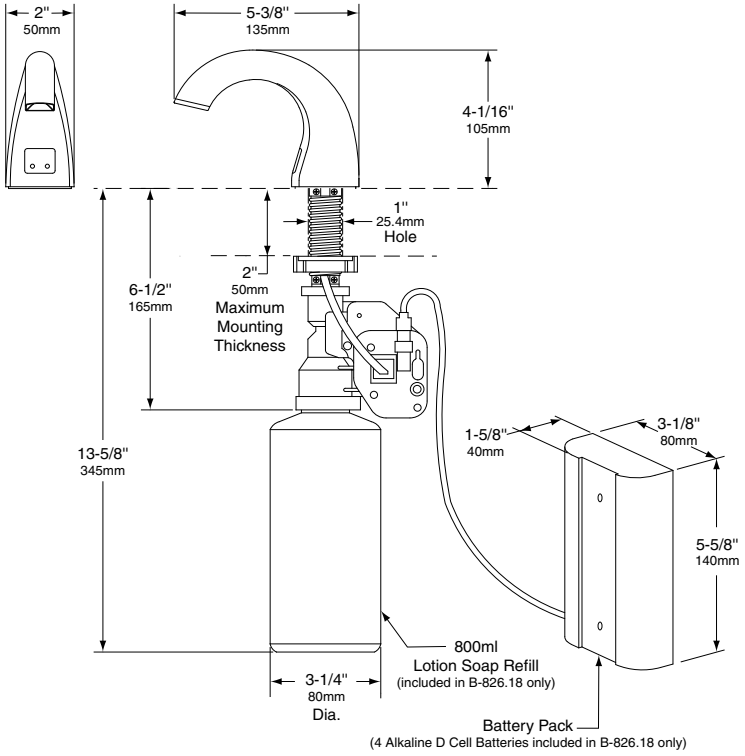
Technical Data

AUTOMATIC LAVATORY-MOUNTED SOAP DISPENSER

B-826
B-826.18

Specify Model Required:

- ❑ Model B-826 Automatic Lavatory-Mounted Soap Dispenser
- ❑ Model B-826.18 Starter Kit. Includes B-826 Soap Dispenser, an 800ml lotion soap refill, 4 Alkaline D Cell Batteries



MATERIALS:

Spout Cover Assembly — Bright Polished chrome plated plastic with LED light indicators. Red blinking LED indicates soap level is low, Yellow blinking LED indicates battery life is low. Equipped with integral plastic shank.

Motor Assembly — Water resistant, plastic construction, fits onto bottom of shank and top of soap refill.

Battery Pack — Water resistant, plastic material, holds 4 Alkaline "D" Cell Batteries. Batteries are included in Model B-826.18 Starter Kit only. Average battery life is 100 soap refills or 2 years.

Soap Refill — OneShot® Soap Refill. Translucent, shatter-resistant polyethylene bottle. Includes new supply tube and pump mechanism in each refill. Soap refill available in 27-fl oz (800ml) and 54-fl oz (1600ml) capacities. One 27-fl oz (800ml) bottle of Lotion Hand Soap with Moisturizers is included in Model B-826.18 only. OneShot® is a registered trademark of Technical Concepts, LLC.

Optional Spacer — Plastic spacer is included for mounting dispenser when sink rim is ¾" (19mm) high or greater.

OPERATION:

Place hand under soap spout for approximately 2 seconds. Spout will dispense controlled amount (0.8ml) of Lotion Hand Soap with Moisturizers, Antibacterial Hand Soap or Lotion Hand Soap. 27-fl oz (800ml) soap refill provides 1000 hand washes, the 54 fl oz (1600ml) soap refill provides 2000 hand washes. Motor assembly is preset for 27-fl oz (800ml) soap refill (if 54-fl oz (1600ml) is used, a switch under the rubber plug next to red reset button must be moved to 2K). Once a new soap refill is connected, pressing the red reset button automatically resets the low soap indicator LED and primes the new soap refill.

continued . . .

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INSTALLATION:

Unit is designed for installation in 1" (25mm) diameter hole in porcelain-enameled steel, cast iron or vitreous-china lavatories, as well as in countertops adjacent to lavatories. Unit may be mounted in unused faucet hole or through special hole requisitioned when lavatory is ordered from manufacturer (specify punching location). Shank accommodates maximum 2" (50mm) mounting thickness. Clearance required for soap refill bottle and motor housing is 5" (125mm) for the 27-fl oz (800ml) soap refill and 5-½" (140mm) diameter for 54-fl oz (1600ml) soap refill and 11-5/8" (295mm) minimum depth for height of 27 fl-oz. of soap refill bottle and motor housing and 13-5/8" (345mm) minimum depth for height of 5-fl oz. (1600ml) soap refill bottle and motor housing. Place 4 "D" Cell Batteries (included in Model B-826.18 only) into battery pack. An optional single 6V AC adapter to replace the battery pack is available, order Part No. 826-20.

	27-fl oz. 800ml	54-fl oz. 1600ml
Diameter of Bottle and Motor	5" 125mm	5-1/2" 140mm
Clearance Below Counter	11-5/8" 295mm	13-5/8" 345mm

SPECIFICATION:

Automatic Lavatory-Mounted Soap Dispenser shall dispense controlled amount (0.8ml) of Lotion Hand Soap with Moisturizers, Antibacterial Hand Soap or Lotion Hand Soap. Spout cover assembly to be Bright Polished chrome plated plastic. Meets Barrier-Free accessibility standards. Unit shall have blinking LED indicators to show low soap level and low battery life. Shank shall accommodate mounting thicknesses up to 2" (50mm). Translucent, shatter-resistant polyethylene soap refill (800ml soap refill included in model B-826.18 only) shall have capacities of 27-fl oz (800ml) or 54-fl oz (1600ml).

Automatic Lavatory-Mounted Soap Dispenser shall be Model B-826 of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

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BOBRICK

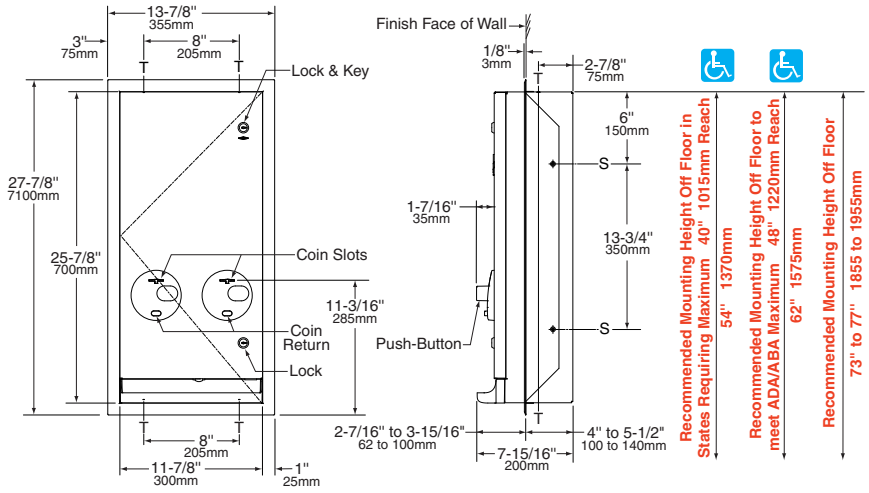
Technical Data

ClassicSeries® RECESSED OR SEMI-RECESSED NAPKIN/TAMPON VENDOR

B-3706 SERIES

Specify Model Required:

- ❑ B-3706 25 Recessed or Semi-Recessed 25¢ single-coin operation
- ❑ B-3706C Recessed or Semi-Recessed Free no-coin operation
- ❑ B-3706T Token operation



Rough Wall Opening
12-1/2" (320mm) wide
26-3/8" (670mm) high
4" to 5-1/2"
(100 to 140mm) minimum
recessed depth

Token — Part.-No. 3706-405 - qty of 100 Tokens (measurement: .900" diameter, .067" thickness), qty of 100 Tokens are available as part of the unit and are also available as spare part (qty of 100 pcs).

MATERIALS:

Cabinet — 18-8, Type-304, 18-gauge (1.2mm) stainless steel. All-welded construction.

Flange — 18-8, Type-304, 22-gauge (0.8mm) stainless steel with satin finish. Drawn and beveled, one-piece, seamless construction. Adjustable escutcheon-type flange permits semi- or fully-recessed installation.

Door — 18-8, Type-304, 18-gauge (1.2mm) stainless steel with satin finish. Door has three 90° return edges and hemmed bottom edge. Secured to cabinet with a concealed full-length stainless steel piano-hinge. Equipped with two tumbler locks keyed like other Bobrick washroom accessories. Door has no brand-name advertising for products dispensed. Graphic symbols identify products dispensed and coin denomination.

Coin Mechanisms (2) — Impact-Resistant PC-ABS Push Buttons. Coin mechanisms can be converted in the field to any standard coin denomination without having to buy new coin mechanisms (Free, 25¢ or Token) order Part No. 3706-250 for Free Vend Conversion Kit. Accepts one quarter (U. S. or Canadian) as designated by factory setting. Coin Box is equipped with tumbler lock that opens with different key than furnished for door locks.

Coin Return Push-Button (2) — Impact-Resistant PC-ABS Push-Button cancels selection and returns coin into product tray.

Product Tray — Impact-Resistant PC-ABS, provides convenient access to dispensed product.

continued . . .

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OPERATION:

After coin is inserted in dispensing mechanism of patron's choice, pushing button dispenses boxed sanitary napkin or tampon tube. Mechanical operations; no batteries or electricity required. Coin slot of each dispensing mechanism is identified by a graphic symbol. Capacity: 20 sanitary napkins and 30 tampons. Coin slots are automatically blocked with a red indicator when supply is depleted. Coin Return Push-Button cancels the selection and returns coin into product tray. Wrong coins (penny, nickel, dime) by-pass mechanisms and drop into product tray. Vendor dispenses sanitary napkin packages measuring 2-7/8" x 3/4" x 4-1/8" to 3-1/8" x 1-1/8" x 4-3/8" (73 x 19 x 105mm to 80 x 29 x 111mm) and tampon tubes measuring 4-5/8" long x 9/16" diameter minimum to 5-1/8" long x 3/4" diameter maximum (118 x 14 to 130 x 19mm).

INSTALLATION:

Provide framed rough wall opening 12-1/2" wide x 26-3/8" high (320 x 670mm). Minimum recessed depth required to finish face of wall for fully recessed installation is 5-1/2" (140mm); for semi-recessed installation the minimum depth required is 4" (100mm). Allow clearance for construction features that may protrude into opening from opposite wall. Coordinate with mechanical engineer to avoid pipes, vents, and conduits. If unit projects above top of wainscot, provide aluminum channel or other filler to eliminate gap between flange and finish face of wall. Mount flange in rough wall depth with four flat-head sheet-metal screws, not furnished by manufacturer, at points indicated by an *S.* Insert cabinet into flange to wall depth available, then secure unit with four sheet-metal screws, (not furnished), at points indicated by a *T.*

SPECIFICATION:

Recessed or Semi-Recessed napkin/tampon vendor shall combine two dispensing mechanisms in one cabinet to provide sanitary napkins and tampons at user's option. Mechanical operations; no batteries or electricity required. Dispensing mechanisms shall be pre-set at factory for _____ (insert one: Free, 25¢ or Token) operation, but shall be convertible in the field to allow the change of coin denomination without removing unit from wall. Door shall be furnished with graphics indicating specified coin denomination. Unit shall be Type-304 stainless steel with all-welded construction; exposed surfaces shall have #4 satin finish. Adjustable escutcheon type flange shall permit semi- or fully recessed installation. Door shall be 18 gauge (1.2mm); have three 90° return edges and bottom edge hemmed; be secured to cabinet with a concealed, full-length stainless steel piano hinge; and equipped with two tumbler locks keyed like other Bobrick washroom accessories. Vendor product selection and coin return pushbutton-operation shall be certified ADA-ABA, ICC/ANSI A117.1 complaint by third party (certification available on request) for operation with one hand with less than 5 pounds of force (22.2 N) without tight grasping, pinching or twisting of the wrist. Push-Button coin return shall cancel selection and return coin into product tray. Wrong coins (penny, nickel, dime) shall by-pass mechanisms and drop into product tray. Product tray shall be impact-resistant PC-ABS plastic and provide easy access to dispensed product. Coin Box shall be equipped with a tumbler lock that is keyed differently than door locks. Unit shall not carry brand-name advertising.

Recessed or Semi-Recessed Napkin/Tampon Vendor shall be Model _____ (insert model number) of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

The illustrations and descriptions herein are applicable to production as of the date of this Technical Data Sheet.
The manufacturer reserves the right to, and does from time to time, make changes and improvements in designs and dimensions.
3706-200 r6/22/18 Printed in U.S.A.
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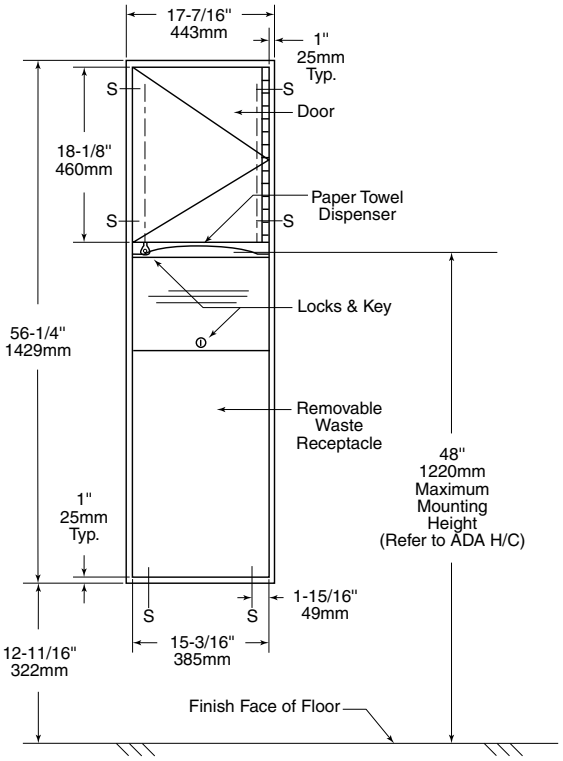
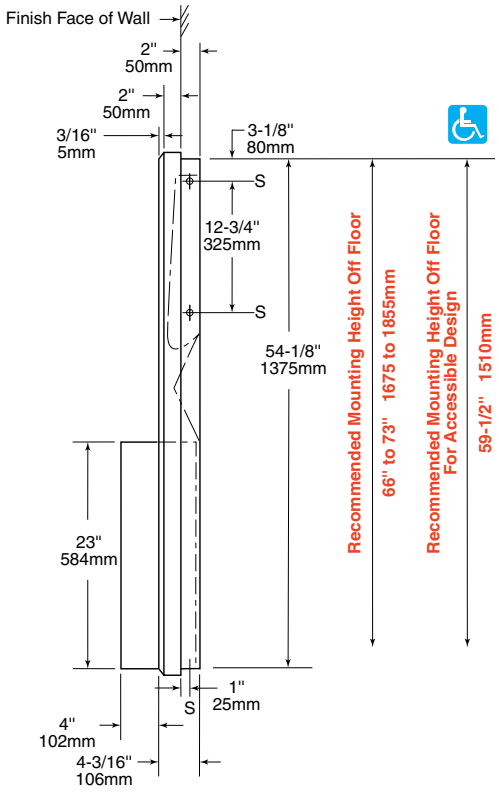
BOBRICK

Technical Data

ClassicSeries® SEMI-RECESSED CONVERTIBLE PAPER TOWEL DISPENSER AND WASTE RECEPTACLE

B-3942





Rough Wall Opening
16" (406mm) wide
54-3/4" (1390mm) high
2-1/4" (57mm) minimum recessed depth

MATERIALS:

Cabinet — 18-8, Type-304, heavy-gauge stainless steel. Welded construction. Exposed surfaces have satin-finish.

Flange — 18-8, Type-304, 22-gauge (0.8mm) stainless steel with satin-finish. Drawn and beveled, one-piece, seamless construction.

Skirt — 18-8, Type-304, 22-gauge (0.8mm) stainless steel with satin-finish.

Door — 18-8, Type-304, 22-gauge (0.8mm) stainless steel with satin-finish. Double-pan-back construction. Secured to cabinet with a full-length stainless steel piano-hinge. Equipped with a semi-concealed tumbler lock keyed like other Bobrick washroom accessories.

Paper Towel Dispenser — 18-8, Type-304, 22-gauge (0.8mm) stainless steel with satin finish. Rounded towel tray has hemmed opening to dispense paper towels without tearing. Capacity: 600 C-fold or 800 multifold paper towels.

Waste Receptacle — 18-8, Type-304, 22-gauge (0.8mm) stainless steel with satin finish. Front and sides of bottom and all top edges are hemmed for safe handling. Secured to cabinet with a tumbler lock keyed like other Bobrick washroom accessories. Capacity: 12-gal. (45.5-L).

continued . . .

The illustrations and descriptions herein are applicable to production as of the date of this Technical Data Sheet.
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OPERATION:

Paper towel dispenser accommodates C-fold or multifold paper towels without adjustment or use of adapters. To adapt to changing needs of washrooms, this unit is field convertible with the Universal, Touch-Free Roll Towel Dispenser or Universal, Automatic Roll Towel Dispenser. To order convertible modules, reference part numbers below under Options.

To empty waste receptacle, unlock with key provided.

NOTE: To accommodate disposable trash liners, order LinerMate®, sold as an optional accessory item. LinerMate eliminates unsightly trash liner overhang and facilitates installation and removal of disposable trash liners in the 12-gallon waste receptacle.

TowelMate® available as an optional accessory allows paper towels to dispense one at time without bulging or sagging, or falling through the towel tray opening. The 90 degree return on the towel guide prevents papers from falling forward and out when door is opened for servicing. TowelMate fits Gamco and most other manufacturers' similar models.

Options:

- Universal Touch-Free Roll Towel Dispenser Module convertible in field: order Bobrick Part No. 3961-50.
- Automatic, Universal Roll Towel Dispenser Module convertible in field: order Bobrick Part No. 3974-250.
- 18-gallon Waste Receptacle: order Bobrick Part No. 368-60.
- Reusable Vinyl Liner: order Bobrick Part No. 368-16.
- LinerMate for 12-gal waste only: order Bobrick Part No. 3944-134.
- TowelMate accessory: order Bobrick Part No. 3944-130.

INSTALLATION:

Provide framed rough wall opening 16" wide x 54-3/4" high (406 x 1390mm). Minimum recessed depth required to finish face of wall is 2" (51mm). Allow clearance for construction features that may protrude into rough wall opening from opposite wall. Coordinate with mechanical engineer to avoid pipes, vents, and conduits. If unit projects above top of wainscot, provide aluminum channel or other filler to eliminate gap between skirt and finish face of wall. Mount unit in wall opening with shims between framing and cabinet at all points indicated by an *S*, then secure unit with #8 x 1-1/4" (4.2 x 32mm) sheet-metal screws (not furnished).

SPECIFICATION:

Semi-recessed convertible paper towel dispenser and waste receptacle shall be Type-304 stainless steel with welded construction; exposed surfaces shall have satin finish. Flange shall be drawn and beveled, one-piece, seamless construction. Door shall be secured to cabinet with a full-length stainless steel piano-hinge and equipped with a semi-concealed tumbler lock keyed like other Bobrick washroom accessories. Paper towel dispenser shall dispense 600 C-fold or 800 multifold paper towels. Removable waste receptacle shall be secured to cabinet with a tumbler lock, have front and side edges of bottom and all top edges hemmed for safe handling, and shall have a minimum capacity of 12-gal. (45.5-L).

Semi-Recessed Convertible Paper Towel Dispenser And Waste Receptacle shall be Model B-3942 of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

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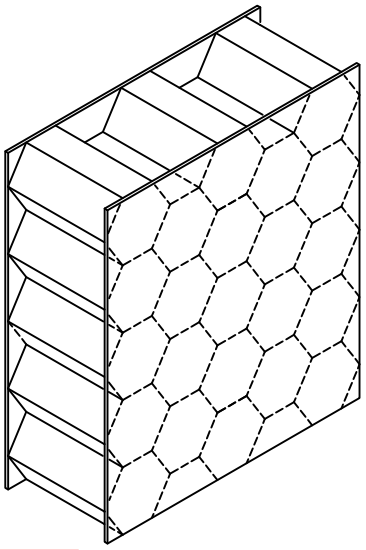
1-3/4" REGENT (RI) HONEYCOMB CORE DOORS

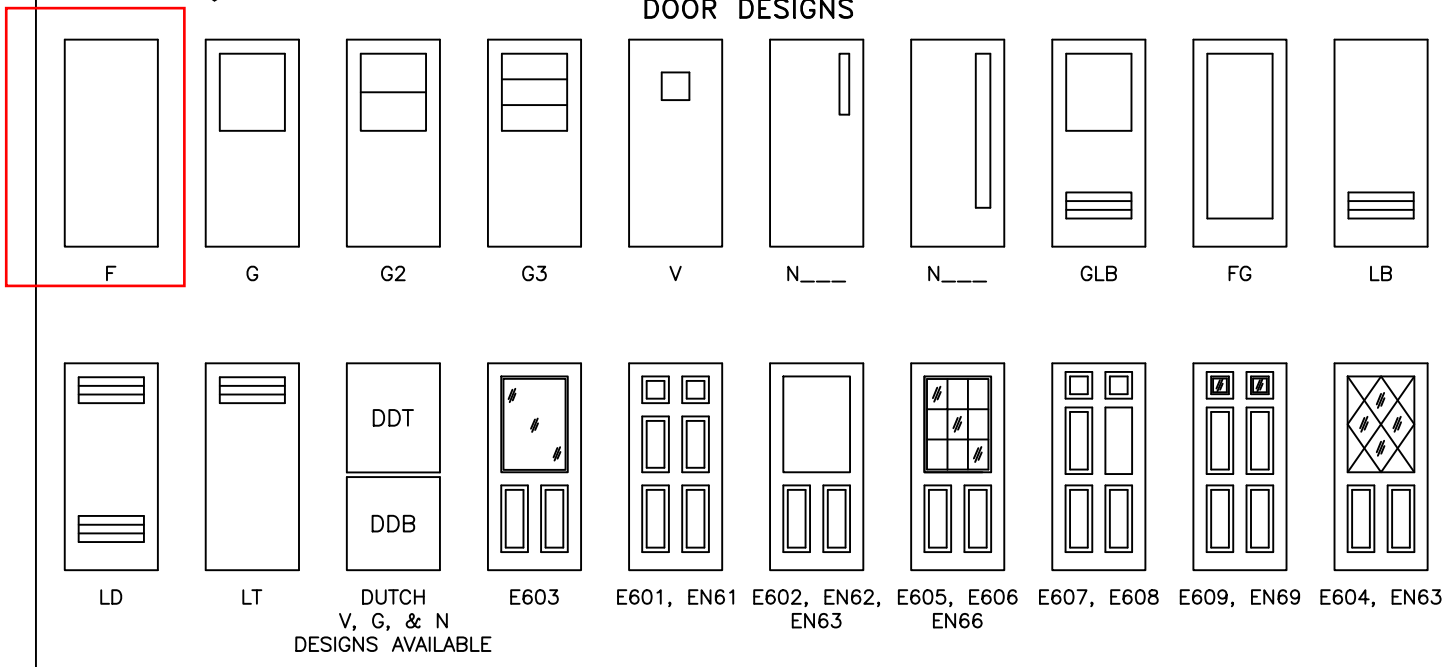
FLUSH AND EMBOSSED PANEL STEEL DOORS
BEVELED LOCK EDGE, HANDED



Kraft fiber honeycomb slab, bonded to the inside of both face sheets with a water resistant, contact adhesive.

Suggested Use:
Interior or Exterior ...
Office, Motel/Hotel, Apartment, Urban Renewal, Health Care, Institutional, Mercantile, Public Utility, Factory, or Warehouse.

DOOR DESIGNS

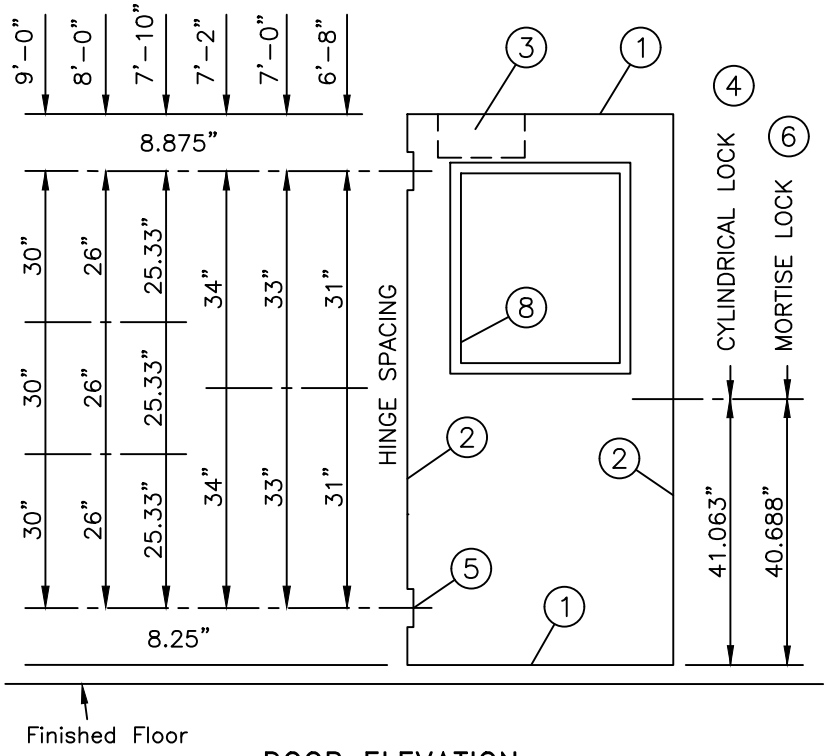


EMBOSSED 6 PANEL ORDER CODES AND DOOR WIDTHS	
2'6", 2'8" NARROW 6 PANEL	2'8", 3'0" STD. 6 PANEL
EN61	E603
EN62	E601
EN63	E602
EN66	E605
E607	E606
E608	E607
EN69	E608
EN63	E609
E603	E604

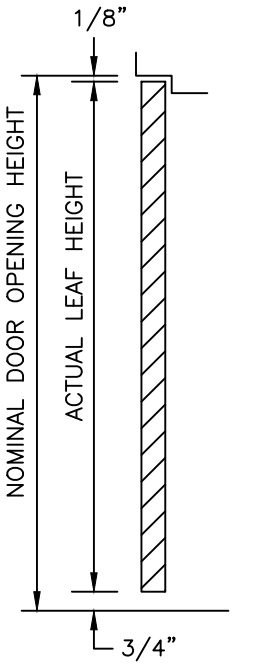
6 PANEL	
MAX. SIZE	3'0"x7'0"
MIN. SIZE	2'6"x6'8"

ALL 6 PANEL EMBOSSED DESIGNS WILL BE CENTER EDGE SEAM CONSTRUCTION.

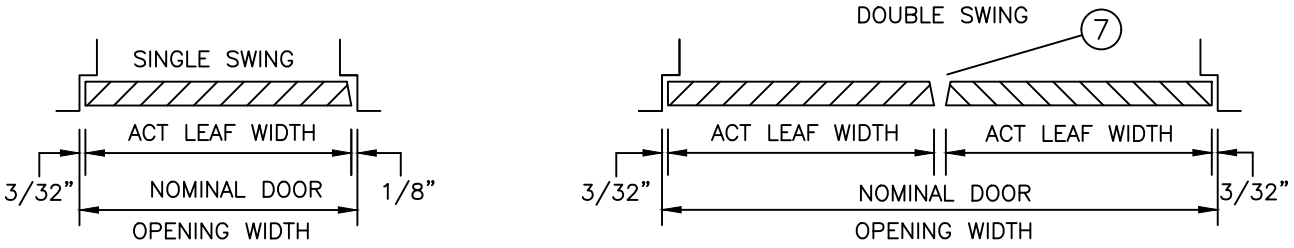
Hardware locations shown match Ceco standard frames.



DOOR ELEVATION



VERTICAL SECTION



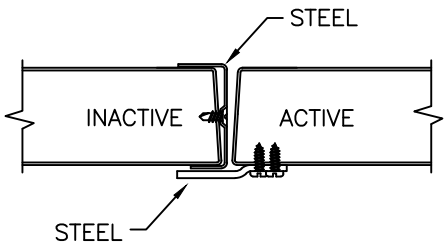
HORIZONTAL SECTIONS

(Conversion: 1" = 25.4 mm, e.g., 1-3/4" = 44.45 mm)

OVERLAPPING ASTRAGAL 7

4441

FOR 1-3/4" THICK DOORS

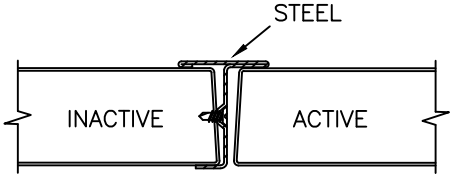


LISTED

OVERLAPPING ASTRAGAL

4471

FOR 1-3/4" THICK DOORS



LISTED

CecoDoor

TECH-DATA

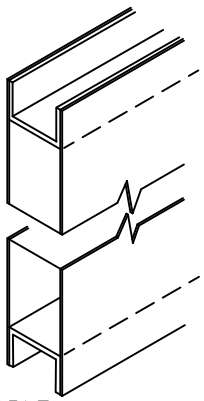
D1-3

16 GAGE STEEL END CHANNELS

1

WELDED TO BOTH FACE SHEETS

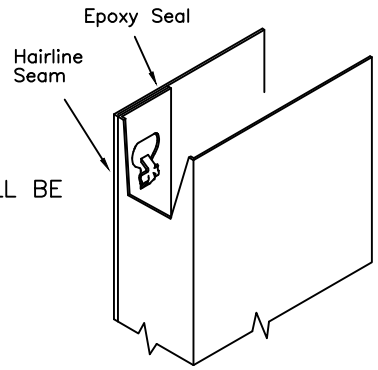
INVERTED TOP AND BOTTOM



OPTIONAL TOP AND BOTTOM CAPS ARE AVAILABLE

VERTICAL EDGES

2



MECHANICALLY INTERLOCKED HEMMED EDGES

14 GAGE DOORS WILL BE CENTER EDGE SEAM CONSTRUCTION

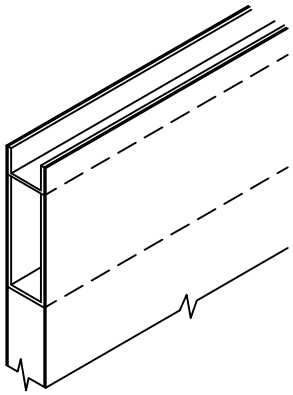
OPTIONAL: SEAMLESS (WELDED OR BODY FILLER)

ALL 6 PANEL EMBOSSED DESIGNS WILL BE CENTER EDGE SEAM CONSTRUCTION.

CLOSER REINFORCEMENT (OPTIONAL)

3

14 GAGE STEEL CHANNEL 20" LONG



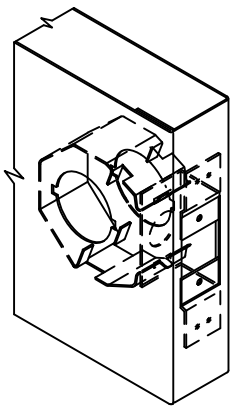
LOCK PREPARATION GOV. 160/161 CYLINDRICAL TYPE

4

(LC1)

(ANSI A115.2)

2-3/4" BACKSET



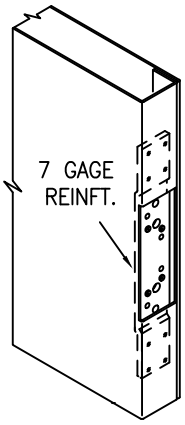
LOCK EDGE IS BEVELED 1/8" in 2" (1:16)

HINGE PREPARATION

5

4-1/2 OR 5 IN. HIGH, STANDARD OR HEAVY WEIGHT, FULL MORTISE HINGES

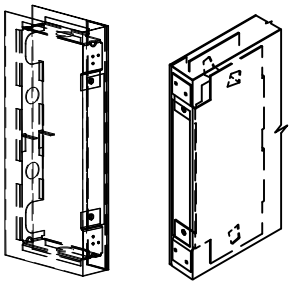
HINGE EDGE IS HANDED AND NOT BEVELED.



ANSI A156.7 TEMPLATE

LOCK PREPARATION GOV. 86, ANSI/BHMA A115.1 MORTISE TYPE

6



(LM0)

NOTE: EITHER OF THE LOCK REINFORCEMENTS/ GUARDS SHOWN MAY BE INSTALLED WITH ANY MORTISE LOCK PREPARATION.

VERTICAL EDGES

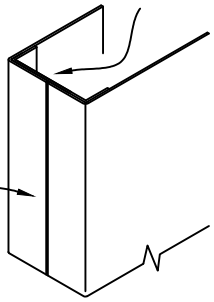
2

ALL 6 PANEL DESIGNS ARE CENTER EDGE SEAM CONSTRUCTION

14 GAGE WILL BE CENTER EDGE SEAM CONSTRUCTION

WELD SEAMLESS AND BODY FILLER SEAMLESS IS OPTIONAL

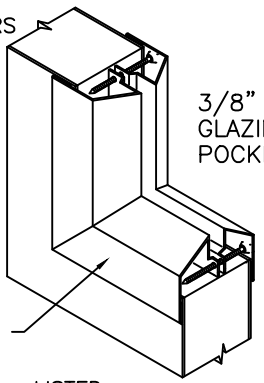
16 GAGE FULL HEIGHT CHANNEL



GLAZING TRIM SlimTrim

8

FOR ALL FIRE DOORS



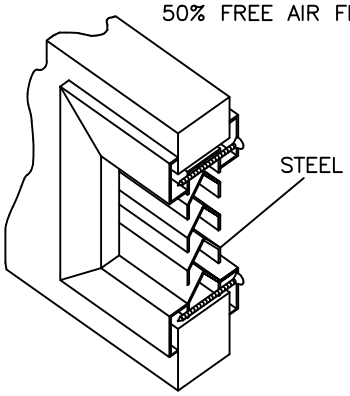
LISTED

FIXED SLAT TYPE LOUVER 4634

9

FOR 1-3/4" THICK DOORS

50% FREE AIR FLOW



07/14/20

CecoDoor

ASSA ABLOY

Experience a safer and more open world

(Conversion: 1" = 25.4 mm, e.g., 1-3/4" = 44.45 mm)

BACK TO TOP

PRODUCT SPECIFICATIONS:

1-3/4" Thick steel doors shall be as manufactured by Ceco Door Products. Doors shall conform to the Steel Door Institute guide specification, ANSI A250.8; see chart below for performance classifications.

REGENT doors are made full-flush or (optional) seamless style. Face sheets are commercial quality cold rolled steel conforming to ASTM A1008 ...or (optional) hot-dipped galvannealed or galvanized steel conforming to ASTM A924 and A653 -- see chart below.

Regent full-flush doors have mechanically interlocked, hemmed, hairline seams on vertical edges and have no visible seams on faces. Embossed 6 panel doors will have center edge seam construction. Doors specified "seamless" have no visible seams on faces or vertical edges (S.D.I. Model 2). A one piece, kraft honeycomb core is securely bonded to both face sheets under pressure with contact adhesive. The top and bottom door edges are closed with 16 gage steel channels welded to both face sheets.

Hardware Provisions: Hinge preparations are handed. Hinge edges are mortised for 4-1/2" or 5" high, standard and heavy weight hinges (specify which). 7 gage steel hinge reinforcements are welded inside the door edge and are drilled and tapped for fasteners in accordance with ANSI A156.7. The lock edge has a standard bevel (1:16) and is prepared for Gov. series 86, 160/161, or 90 locks in accordance with ANSI A115 (specify which). Optional closer reinforcement is a 14 gage steel channel.

Paint: 1-3/4" steel doors shall be provided with one coat of oven-cured neutral color primer paint. Primer coat shall conform with ANSI A250.10. The primer coat is a preparatory base for necessary finish painting. "Colorstyle" finish coat is also available from a selection of standard colors (optional). Colorstyle finish is electrostatically applied, oven-cured urethane enamel, and shall conform to ANSI A250.3. For accurate color selectors ask for a Ceco Colorstyle chart.

STANDARD SIZES NOMINAL DOOR OPENING

WIDTH		HEIGHT
SINGLE	DOUBLE	
2'–0"	4'–0"	
2'–4"	4'–8"	
2'–6"	5'–0"	6'–8"
2'–8"	5'–4"	7'–0"
2'–10"	5'–8"	7'–2"
3'–0"	6'–0"	7'–10"
3'–4"	6'–8"	8'–0"
3'–6"	7'–0"	9'–0"
3'–8"	7'–4"	
3'–10"	7'–8"	
4'–0"	8'–0"	

FIRE DOORS

LABELING AGENCIES:

- UNDERWRITERS LABORATORY
- WARNOCK HERSEY
- FACTORY MUTUAL

TEST: UL10C, UL10B, UL1784, & NFPA 252

- RATING: 20 MIN, 3/4 HR, 1 HR, 1–1/2 HR, OR 3 HR
- MAX. SIZE: 4'0" x 9'0" SINGLE 8'0" x 9'0" PAIR
- DESIGNS: F, FG, G, N, & V

Not all ratings are available in all sizes, designs and materials.

MATERIAL

DOOR FACE SHEETS	LEVEL	C.R.	GALV		RECOMMENDED DOOR FRAME MATERIAL
			A60	G90	
20 Gage Steel (4080 max.)	Standard Duty	N/A	STD	N/A	16 Gage Steel
18 Gage Steel	Heavy Duty	STD	OPT	OPT	16 Gage Steel
16 Gage Steel	Extra Heavy Duty	STD	OPT	OPT	16 or 14 Gage Steel
14 Gage Steel	Maximum Duty	STD	OPT	OPT	14 or 12 Gage Steel

PERFORMANCE

Sound Transmission Class:	STC 32 (F Design, 18 Gage Face Sheets, ASTM E90 & E413 [Fully Operable])
Physical Endurance /Level:	Meets ANSI A250.4 Performance Test, 20 GAGE: Level B (500,000 Cycles); 18 and 16 Gage: Level A (1,000,000 Cycles)

(Conversion: 1" = 25.4 mm, e.g., 1–3/4" = 44.45 mm)

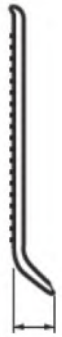
ROPPE.
Proven. Flooring. Experiences.

Pinnacle 4" Cove Wall Base

PRODUCT SUBMITTAL

Nominal Dimensions	4” (101.6 mm) x 48” (1.22 m) x 1/8” (3.2 mm) 4” (101.6 mm) x 120’ (36.58 m) x 1/8” (3.2 mm)
ASTM F1861 - Resilient Wall Base	Type TS, Group 1, Styles B
ASTM E648 (NFPA 253) - Critical Radiant Flux	Class 1, ≥ 0.45 W/cm2
ASTM E662 (NFPA 258) - Smoke Density	Passes, ≤ 450
ASTM E84 - Flammability	Class B
CAN/ULC-S102.2 - Surface Burning	50 Flame Spread Rating 175 Smoke Developed Classification
ASTM F925 - Chemical Resistance	Excellent with chemicals listed in standard, Additional chemicals available via chart
Acclimation Time	48 Hours, see installation instructions for details
Service & Storage Temperature	65° - 85° F, see installation instructions for details
Sustainability Information	Contributes to LEED v4/4.1 Meets CA 01350 Requirements FloorScore Certification* NSF/ANSI 332 Certified Platinum* HPD Available*
Warranty	5 Year Commercial, see warranty document for details
Recommended Adhesives	Excelsior WB-600, Wall Base Adhesive Excelsior C-630, Contact Adhesive
Technical Support	solutions@rhctechnical.com
Product Support	sales@roppe.com
Technical Documentation	www.roppe.com

**certificate or document available on website*



Standard
Toe Base 5/8"

Attach color submittal sample here

Ceiling-Hung Restroom Partitions
Powder Coated — Series 600

This style is mounted to the ceiling and is recommended where complete floor access is desired. This system requires pre-installed structural ceiling support and is not recommended for ceiling heights over 8'.

Construction

Doors, panels and pilasters consist of two sheet metal faces insulated with a moisture resistant honeycomb core that is adhered to the inner surface and set under pressure to cure. All are manufactured from galvannealed steel which is cleaned and finished with electrostatic high-grade powder coating and oven cured to provide a mar-resistant finish. Mills offers 15 standard colors.

Permaseal™ Edge

Mills is the only manufacturer to offer the Permaseal Edge. Edges are formed to interlock together to provide a tight fit without crown molding.

Panels

Panels are 1" thick, constructed from 22 gauge galvannealed steel. Corners are welded underneath a clip that is affixed to all corners.

Doors

Doors are 1" thick, constructed from 22 gauge galvannealed steel. Corners are welded underneath a clip that is affixed to all corners. Each door includes internal 16 and 14 gauge welded reinforcements at the top and bottom hinge locations with a factory installed concealed true gravity cam. The closing position of each hinge is fully adjustable. A pre-punched hole permits field installation of the ADA-compliant concealed slide latch.

Pilasters

Pilasters are 1¼" thick, constructed from 18 gauge galvannealed steel. The ceiling end of the pilaster shall be provided with an integrally welded 12 gauge leveling bar. Pilasters shall be attached to the ceiling using ⅜"-16 threaded rod(s), hex nuts and washers (included or shipped in advance upon request). Structural support and drilling provided by others.

Hardware

Mills standard hardware is constructed from heavy-duty grade chromed Zamac. Compartments are provided with all hardware and zinc-plated torx-head fasteners to complete installation for applications with masonry block walls.

Door Hardware

Wraparound hinges are thru-bolted to the pilasters and the surface-mounted slide latch includes an emergency egress feature. The slide latch does not require a twisting motion and complies with all Federal ADA guidelines. The strike/keeper is wraparound and thru-bolted. Doors 32" wide or less are provided with a combination coat hook/bumper. Doors 34" wide or 36" wide are provided with an individual coat hook, door bumper and door pulls. Torx-head fasteners are supplied with all hardware.

Brackets

Stirrup-type, single-ear, double-ear and U-brackets are provided with Phillips-head fasteners.

Shoes

Shoes are 1-piece, 4" high, 304 series stainless steel with #4 satin brushed finish and are secured to the inside face of the pilaster with Torx-head fasteners.

Series 600

Standard Selections (Must select one from each category)

Colors

◯ Adaptive Shade	◯ Carnival Red	◯ Polo Green
◯ Almond	◯ Cyberspace	◯ Royal Blue
◯ Black	◯ Dove Gray	◯ Toffee
◯ Buff	◯ Dusk Gray	◯ Warm Gray
◯ Burgundy	◯ Glacier Blue	◯ White

Door Hardware

- ◯ Zamac Surface-Mounted Slide Latch and Keeper
- ◯ Stainless Steel Surface-Mounted Slide Latch and Keeper

Hinges

- ◯ Chromed Zamac Wraparound Gravity Hinge (STD)
- ◯ Stainless Steel Wraparound Gravity Hinge
- ◯ Continuous Aluminum Spring-Loaded Hinge
- ◯ Continuous Stainless Steel Spring-Loaded Hinge

Brackets

- ◯ Chromed Zamac Stirrup Brackets (STD)
- ◯ Stainless Steel Stirrup Brackets
- ◯ Continuous Stainless Steel Brackets
- ◯ Continuous Aluminum Brackets

Corners

- ◯ Clipped Corners (STD)
- ◯ Welded Corners/Ground Smooth

Optional Selections

Miscellaneous

- ◯ Grab Bar Reinforcements
- ◯ Cutouts

GREENGUARD GOLD
PRODUCT CERTIFIED FOR LOW CHEMICAL EMISSIONS
UL.COM/GG
UL 2818

Verify all rough-in dimensions prior to installation.

Consult local and national codes:. Conformity and compliance to local and national codes is the responsibility of the installer.

This information is subject to change without notice.

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P.O. Box 309, Menomonee Falls, WI 53052-0309
800 BRADLEY (800 272 3539) +1 262 251 6000
bradleycorp.com

OSHKOSH
Door Company
Right product. Right place. Right time.

GFREM
5-Ply Mineral Core
No Added Urea Formaldehyde (NAUF)

Standard Duty* *(unblocked)*	* Heavy Duty or Extra Heavy Duty with Blocking
Industry Performance Standards	WDMA IS.1.A13 & AWS Edition 2 (rev. 2019), (WI)NAAWS 3.1
Thickness	1-¾"
Maximum Sizes	Single 4^0 x 9^0 Pairs 8^0 x 8^0 regular (6^0 X 9^0 w/ cvr regular) 8° x 8° DE
Core	Non-combustible, asbestos free, (45 pcf density) NAUF mineral core
Stiles	Matching veneer, HPL or PVC over composite fire rated mineral
Rails	Composite fire rated mineral, optional oversized rails available
Faces	Domestic & exotic veneer species, medium density overlay or HPL
Crossband	Engineered wood product
Core Assembly	Stiles & rails securely bonded to core
Face Assembly Adhesive	Faces & crossbands hot-pressed to core with Type I glue
Warranty	Interior Use—Life of installation High Gloss Finish/ Exterior Use—No Warranty *See complete warranty for details.
Labeling	45, 60, & 90 Minute Rating in singles and pairs. Subject to ASTM E-152 and Intertek Testing Services (Warnock Hersey) Negative or Positive Pressure
Special Details	Machining for template hardware, 24" x 40" max light size (30" x 70" max at 45 min), louvers, special blocking & applied moldings. Refer to specific technical sheets for details and limitations.
Factory Finish	WDMA TR-8/AWS System 9 (UV Cured Acrylated Polyurethane) • Clear • Standard color selections • Custom color matching available • Priming for field painting
Sustainability	• Leed v3 Credit: EQ 4.4 Low emitting materials • Leed v4 Credit: MR: EPD, Sourcing of raw materials, EQ: low emitting materials • CARB (California Air Resources Board) Compliant • TSCA Title VI Compliant • Greenguard & Greenguard Gold Certification

Oshkosh Door Company reserves the right to change design and/or details of its products without notice.

GRAINGER APPROVED GRAINGERCHOICE

Cabinet Pull, Oval Shape, Stainless Steel

Item #**451J55** Mfr. Model #**45-430SS**

UNSPSC #**31162801** Catalog Page #**N/A**

Country of Origin USA. Country of Origin is subject to change.

Web Price

$8.26 / each

Qty 1

Add to Cart

Shipping Pickup

Availability

Expected to arrive **Mon. Jun 07.**

Ship to **21204** | Change

Shipping Weight **0.37 lbs**

Ship Availability Terms

Add to List

Technical Specs

Item	Cabinet Pull
Shape	Oval
Material	Stainless Steel
Finish	Unfinished

Projection	1 1/4 in
Diameter	31/64 in
Screw Size	#8 - 32, 1 in
Hardware	Included

SF Project No. 2066902
Fit-Up Administrative Headquarters Suite 440E &455E
Capital Gallery East Tower

Electrical Product Data for Basis of Design Only

Columbia LIGHTING

DATE: LOCATION:

TYPE: A1 PROJECT:

CATALOG #:

LCAT24

2' × 4' LED CONTEMPORARY ARCHITECTURAL TROFFER

FEATURES

- High efficiency acrylic center lens features linear prisms for high performance without pixelation
- Appropriate for offices, schools, medical, and public spaces
- High performance reflector with matte white paint standard
- HE lumen packages available
- LED modules and electrical accessible from below
- Optional architecturally styled integration of daylight and occupancy sensor(s)
- QR code traceability
- Compatible with Dual-Lite inverters

Built to UL 924 Standards

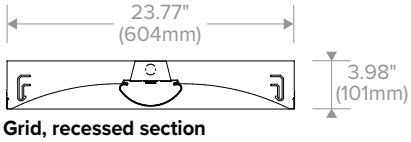
Chicago Plenum

BUY AMERICAN SOLUTIONS

See Certification Specifications

RELATED PRODUCTS

LCAT12 LCAT14 LCAT22



Grid, recessed section

CONTROL TECHNOLOGY

SpectraSync Color Tuning Technology NX DISTRIBUTED INTELLIGENCE SPECTRASAFE

SPECIFICATIONS

CONSTRUCTION

- Luminaire housing, reflectors and end caps are die-formed code-gauge cold-rolled steel
- High transmission extruded acrylic enclosed lens features linear prisms with custom frost for high efficacy without pixelation
- All reflective surfaces are finished after fabrication with unique formula high-reflectivity matte white paint for soft, uniform indirect illumination

OPTICS

- Removable lens for easy access to LED module and electrical components

INSTALLATION

- An access plate is furnished with each luminaire for fast wiring access without the necessity to open the fixture or wireway
- Luminaire fits recessed exposed Grid ceilings (G); four integral NEC compliant T-bar clips are standard
- Can be placed in Slot Grid (SG) style ceiling with regress ⅜" above ceiling plane
- A Flange Kit (FK) accessory is available for recessed hard ceiling applications
- Surface Mount (SM) option allows placement below ceiling plane
- Cable Mount (CM) option allows suspension below ceiling plane

ELECTRICAL

- 60,000 hour LEDs at L80 for reduced maintenance

ELECTRICAL (CONTINUED)

- 83 CRI standard or optional 90 CRI for color sensitive applications

CONTROLS

- Optional SpectraSync™ offers two modes of Tunable White solutions and integrates seamlessly into a variety of control systems
- NX Distributed Intelligence™ provides options for standalone and networked integrated sensor with wired or wireless connectivity for NX system deployments

TECHNOLOGY

- SpectraSAFE™ is a scalable, cloud-enabled and lighting-based wireless video security solution for interior commercial and industrial applications

CERTIFICATIONS

- IC label is standard for recessed products. Note that IC label is void if product is installed on site with a combination of both battery pack plus through wiring or for air return fixtures
- All luminaires are built to UL1598 and 2108 standards, and bear appropriate cCSAus labels
- CSA certified to UL 924 standards with battery pack or DTS (Dimming Bypass Module) options
- Damp Location label standard
- Adheres to LM79, LM80, and TM21 industry standards

CERTIFICATIONS (CONTINUED)

- DLC® (DesignLights Consortium) Qualified, with some Premium Qualified configurations. Please refer to the DLC website for specific product qualifications at www.designlights.org
- NX is available in U.S., Canada and Mexico. For other locations consult factory
- The DTS, Dimming Bypass Module, is for emergency circuit control loads including sensors and wireless systems CSA certified to UL 924. See page 8 for wiring diagram. Link to Dimming Bypass Module Specification sheet
- This product qualifies as a "designated country construction material" per FAR 52.225-11 Buy American-Construction Materials under Trade Agreements effective 04/03/2020. See Buy American Solutions

WARRANTY

- 5 year warranty
- See HLI Standard Warranty for additional information

KEY DATA	
Lumen Range	2142–9304
Wattage Range	19–75
Efficacy Range (LPW)	92–141
Reported Life (Hours)	L80/60,000

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HUBBELL Lighting

Columbia LIGHTING

DATE: | LOCATION:

TYPE: A1 | PROJECT:

CATALOG #:

LCAT24

2' × 4' LED CONTEMPORARY ARCHITECTURAL TROFFER

ORDERING GUIDE

Example: LCAT24–35MLG–ESDU

CATALOG #

LCAT24 –

Model	CRI	Color Temp	Delivered Lumens [3]	Ceiling Type
LCAT24 2' x 4' LED Contemporary Architectural Troffer	**Blank** >80 **9** >90 [1]	**30** 3000K **35** 3500K **40** 4000K **50** 5000K **2750T** 2700K–5000K SpectraSync™ Tunable White [2] **2765T** 2700K–6500K SpectraSync™ Tunable White [2]	**XW** 2341–2524 **XWHE** 2458–2650 **VW** 3124–3558 **VWHE** 3310–3770 **MW** 3363–3831 **MWHE** 3717–4234 **LW** 4268–4861 **ML** 4771–5434 **HL** 5443–6200 **VL** 6999–7972 **XL** 8168–9304	**G** Grid Lay-in [4] **SM** Surface Mount [5,12] **CM** Cable Suspended Mount [5,6]

–

Shielding	Air Function
Blank Curve **R** Rectangular	**Blank** Static **A** Air Return Side Slots

–

Driver	
E	Fixed Output
ED	0–10V Dimming
ED1	0–10V 1% Dimming
EDD	0–10V Dim-to-Dark
ESD	Step Dimming [7,9,13]
LUTH	Hi-lume 1% EcoSystem LED driver with Soft-on, Fade-to-Black dimming technology [7,9,13]
LUT5	5-Series EcoSystem LED driver [7,9,13]
DALIP	DALI Power Bus [9,16]

–

Voltage	
U	120–277V
347	347V [14]

Options	
ELL14	Emergency Battery Pack Installed, 1400 Lumens [8,9]
ELL14ST	Emergency Battery Pack, 1400 Lumens, Self Test [8,9]
ELL14H2	Emergency Battery Pack, 2-Hour Run Time [8,9]
DTS	Dimming Bypass Module [9,10]
C388	3-wire Flex [15]
C488	4-wire Flex [15]
C588	5-wire Flex [15]
GLR	Fast Blow Fuse
EOR	End of Row (SM and CM only. Provides end wiring access for continuous row mounting.) [5]
INT	Intermediate (SM and CM only. Provides ends with wiring access for continuous row mounting.) [5]
CP	Chicago Plenum
SAF	SpectraSAFE™ Integrated Surveillance Lighting System [11]

Control Options	
NX Standalone	
NXS	NX, PIR BT Occupancy/Daylight Sensor, Slide Mount [13,14]
NX Networked – Wired	
NXE	NX, Dual SmartPORTs [13,14]
NXES	NX, PIR BT Occupancy/Daylight Sensor, Slide Mount, Dual SmartPORTs [13,14]
NX Networked – Wireless	
NXSW	NX Wireless, PIR BT Occupancy/Daylight Sensor [12,13,14]
NXWE	NX Wireless Enabled [12,13,14]
NX Networked – Wired/Wireless Hybrid	
NXSWD	NX Wireless, PIR BT Occupancy/Daylight Sensor, Dual SmartPORTs [13,14]
NXWD	NX Wireless, Dual SmartPORTs [13,14]
Third-Party Control Options	
ODPG	Occupancy and Daylight Sensors w/ Grouping, Philips SNS200 [9,16,20]
LV	Lutron Vive Attached FCJS POWPAK Fixture Control (RF only for 0–10V drivers) [9,17,18,19,20]
LVR	Lutron Vive Integral Fixture Control DFCSJ-OEM-RF (RF only) [9,16,18,20]
LVS	Lutron Vive Integral Fixture Control DFCSJ-OEM-OCC (RF with daylight and occupancy sensing) [9,16,18,20]
ZRE	ControlScope® compatible [9,20,21]

Accessories

- ☐ **FK24** 2' × 4' Single Flange Kit (Shipped separately)
- ☐ **CM48Y2SC3F-KIT** 48" Cable Mount Kit for 2' wide Cable Mount fixtures, 3-wire

Notes:

1 Not available with HE lumen output
2 Available with ED driver and 80 CRI only. Not available with HE, VL or XL lumen outputs
3 High efficacy versions designated with "HE"
4 For drywall, order G with Flange Kit Accessory
5 Not available with Air Return (A) air function
6 Order hanger accessories separately
7 Limitations apply based on lumen packages (see Product Exceptions & Details)
8 For compatibility with Dual-Lite LiteGear® inverters, contact Hubbell Lighting Representative
9 Not available in 347V
10 For emergency circuit control loads including sensors and wireless systems CSA certified to UL 924. Only available with 0–10V drivers. Universal voltage only. See page 8 for wiring diagram
11 SpectraSync+NX+SAF can not be configured. Only available with NXE, NXWE or NXWD. Not available in 347V

NX In-Fixture Control Options:

12 NXSW, NXWE, NXSWD and NXWD cannot be used with surface mount versions
13 NX is not available with ESD, LUTH, LUT5 or DALIP driver options
14 NX combined with Spectrasync is not available in 347V
15 For NX control and Flex Wire together, consult factory

Third-Party Control Options:

16 LVS, LVR and ODPG only available with DALIP driver option
17 Only available with ED driver option
18 VIVE is a trademark of Lutron Electronics Co., Inc
19 Installations controlled solely by the Lutron Pico controller require accessing the LV (Lutron FCJS) module for commissioning after the circuit has been energized
20 Not available with SpectraSync (2750T or 2765T)
21 Registered trademark of Daintree Networks, used by permission

For questions about configuration options, contact Hubbell Representative

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HUBBELL Lighting

Columbia LIGHTING

DATE: LOCATION:

TYPE: A1 PROJECT:

CATALOG #:

LCAT24

2' × 4' LED CONTEMPORARY ARCHITECTURAL TROFFER

PRODUCT EXCEPTIONS & DETAILS

Driver options listed below are available for the outputs as shown.

DRIVER AVAILABILITY TABLE											
	XW	XWHE	VW	VWHE	MW	MWHE	LW	ML	HL	VL	XL
E	X	X	X	X	X	X	X	X	X	X	X
ED	X	X	X	X	X	X	X	X	X	X	X
ED1	X	X	X	X	X	X	X	X	X	X	X
EDD			X		X		X	X	X		
ESD						X	X	X	X	X	X
LUT5	X		X		X		X	X	X		
LUTH	X		X		X		X	X	X		
DALIP			X	X	X	X	X	X	X	X	X
347	X		X		X		X	X	X		X

CONTROLS

NX Distributed Intelligence™ Lighting Controls:

Supports both indoor and outdoor applications in a variety of deployment options- wired, wireless, hybrid.
Integrates with and enables a wide array of luminaires including those with SpectraSync™ Color Tuning Technology.

NX DISTRIBUTED™ INTELLIGENCE

NX INTEGRATED CONTROLS REFERENCE								
NX Option	Sensor	Networkable	Scheduling	Occupancy	Daylight Harvesting	0–10V Dimming	On/off Control	Bluetooth® App Programming
NX Standalone								
NXS	NXSMP-SMI	No	Yes	Yes	Yes	Yes	Yes	Yes
NX Networked – Wired								
NXE	N/A	Yes	Yes	No	No	Yes	Yes	Requires NXBTC/R[1]
NXES	NXSMP-SMI	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NX Networked – Wireless								
NXSW	NXSMP-SMI	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NXWE	N/A	Yes	Yes	No	No	Yes	Yes	No[2]
NX Networked – Wired/Wireless								
NXSWD	NXSMP-SMI	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NXWD	N/A	Yes	Yes	No	No	Yes	Yes	Requires NXBTC/R[1,2]

1 NXBTC/R needs to be plugged into an available NX SmartPORT™ on the fixture network

2 To program NXWE option, need to consult factory. If connected to an area controller, programming can be done from that

Philips EasySense Controls ODPG Sensor:

- Occupancy sensing, daylight harvesting, task tuning and grouping in one device
- Standalone control or grouping to wireless switches[1]
- Uses Philips field apps for on site commissioning[2,3]
- Ability to create scenes for various room configurations
- Cost-effective solution for energy-savings and code-compliancy strategies
- DLC® Qualified: Listed on the QPL for Networked Lighting Controls. Please refer to the DLC website for specific product qualifications at www.designlights.org

1 Wireless switches only compatible with ODPG Philips EasySense

2 See link to Philips commssioning

3 Requires android device or IR dongle. See links for phone compatiblity and IR dongle

Wireless Switch Accessories[1]

☐ PESR-WH EasySense compatible wireless single rocker switch, white

☐ PEDR-WH EasySense compatible wireless dual rocker switch, white

NX Design & Application Guide

NX Brochure

Philips SNS200

EasySense Design-in Guide

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HUBBELL Lighting

LCAT24

2' × 4' LED CONTEMPORARY ARCHITECTURAL TROFFER

CONTROLS (CONTINUED)

SpectraSAFE™ Integrated Surveillance Lighting System

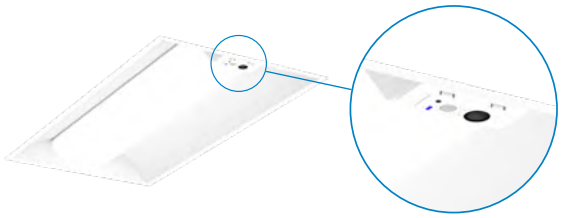
SPECTRASAFE

Technical Features

- High resolution 1080p full HD camera
- 2.8mm lens / 140° field of view
- IR emitter for low / no-light conditions
- Multiple wiring configurations available
- Supports 2-way audio communication
- Supports 2.4GHz WPA-PSK/WPA2-PSK Wi-Fi
- Data encrypted using AES 256 standard
- Low power consumption (2-5W)
- Transmissions secured using Open TLS / SSL

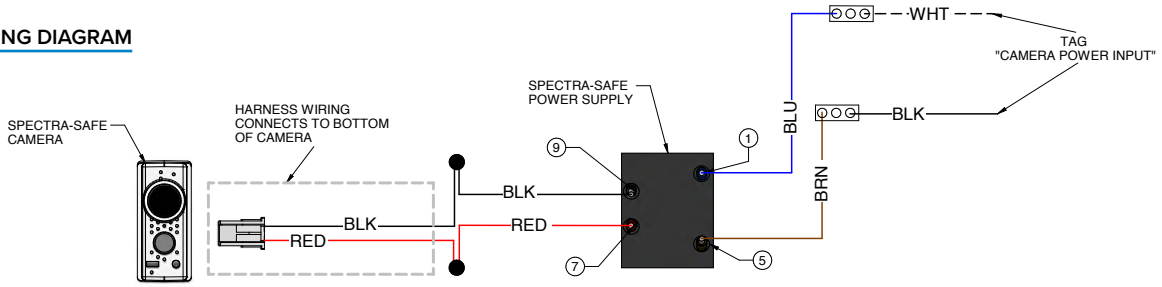
Software & Support

- Free Android, iOS and web-based app
- Versatile and supports multiple applications
- Multi-tenant web-based camera application
- Phone and in-app chat technical support
- Scalable cloud services and video storage
- Supported by a 5-year warranty



SPECTRASAFE WIRING DIAGRAM

Power Supply Pin Connections	
Pin#	Single
1	VAC in (N)
5	VAC in (L)
7	+Vout
9	-Vout



SpectraSync™ Color Tuning Technology:

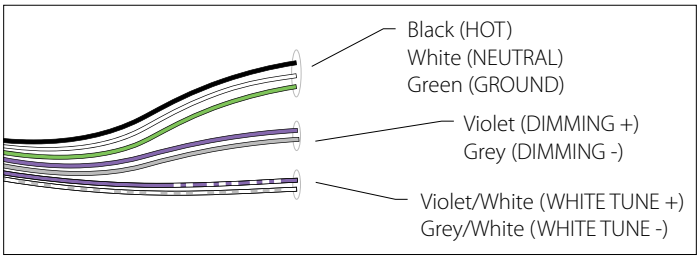
Control your space based on the needs of the application, specific activities throughout the day and preferences of the occupants with distinct SpectraSync™ Color Tuning Technologies.

SpectraSync Color Tuning Technology

SPECTRASYNC COLOR TUNING TECHNOLOGY		
Mode	Kelvin Range	Description
Tunable White	2700K–5000K 2700K–6500K	Offers users the ability to tailor CCT to their personal preference, enhancing task visibility, material and colors or the aesthetics of the space

SpectraSync Tunable White

Available in two options: 2750T (2700K–5000K) or 2765T (2700K–6500K). Requires two 0–10V controllers, one for intensity and one for CCT. Minimum 5% dimming.

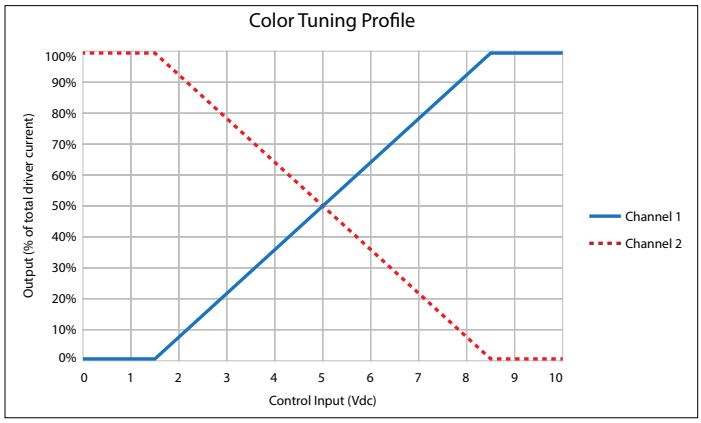


SpectraSync Tunable White luminaires are provided with two 0–10V circuits. The violet and grey circuit is for wiring to any qualified 0–10V controller for dimming. The violet/white and grey/white circuit is for wiring to any qualified 0–10V controller for Tunable White CCT control.

Controller Manufacturer Data

SpectraSync Tunable White was designed to be used with sinking style dimmers (provided by others) and is compatible with:

- Hubbell Control Solutions (HCS): NX Distributed Intelligence™ Room Controllers (NXRC) and In-fixture Controllers (NXFM)
- Lutron: DVTV, DVSTV, and NFTV dimmers
- Wattstopper: ADF120277 and CD4BL (Titan) dimmers



To enable scheduling and for use with NX wall control preset stations please refer to Hubbell Control Solutions NX SpectraSync technical sheet.

SpectraSAFE Brochure
SpectraSync
NX Solutions Guide

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HUBBELL Lighting

Columbia LIGHTING

LCAT24

2' × 4' LED CONTEMPORARY ARCHITECTURAL TROFFER

DELIVERED LUMENS, SPECTRASYNC™

SpectraSync™ Color Tuning Technology

Shielding	Lumen Output	Watts	2700		3000		3500		4000		5000		6500	
			Lumens	LPW	Lumens	LPW	Lumens	LPW	Lumens	LPW	Lumens	LPW	Lumens	LPW
Curve	XW	19	2240	117	2341	123	2383	125	2414	126	2493	131	2456	129
	VW	28	2990	108	3124	113	3180	115	3221	117	3327	121	3277	119
	MW	30	3218	107	3363	111	3424	113	3467	115	3582	119	3528	117
	LW	36	4084	113	4268	118	4345	120	4400	122	4545	126	4477	124
	ML	39	4566	118	4771	123	4857	125	4919	127	5081	131	5005	129
	HL	44	5209	118	5443	124	5541	126	5612	128	5797	132	5710	130
Rectangle	XW	20	2489	123	2601	128	2648	130	2682	132	2770	136	2728	134
	VW	28	3085	109	3224	114	3282	116	3324	118	3434	122	3382	120
	MW	30	3323	110	3472	115	3534	117	3580	119	3698	122	3642	121
	LW	36	4230	117	4420	122	4500	125	4557	126	4707	130	4637	128
	ML	39	4711	121	4923	127	5012	129	5076	131	5243	135	5164	133
	HL	43	5295	123	5533	128	5633	131	5705	132	5893	137	5804	135

DELIVERED LUMENS

Product Availability 80 CRI				
Lumen Package	Shielding	Lumens	Input Watts	LPW
LCAT24-30XW	Curve	2341	19	123
LCAT24-30XWx-R	Rectangle	2601	20	128
LCAT24-30XWHE	Curve	2458	19	129
LCAT24-30XWHEx-R	Rectangle	2555	20	128
LCAT24-35XW	Curve	2424	19	127
LCAT24-35XWx-R	Rectangle	2690	20	133
LCAT24-35XWHE	Curve	2542	19	134
LCAT24-35XWHEx-R	Rectangle	2642	20	132
LCAT24-40XW	Curve	2458	19	129
LCAT24-40XWx-R	Rectangle	2732	20	135
LCAT24-40XWHE	Curve	2581	19	136
LCAT24-40XWHxE-R	Rectangle	2683	20	134
LCAT24-50XW	Curve	2524	19	132
LCAT24-50XWx-R	Rectangle	2805	20	138
LCAT24-50XWHE	Curve	2650	19	139
LCAT24-50XWHEx-R	Rectangle	2754	20	138
LCAT24-30VW	Curve	3124	28	113
LCAT24-30VWx-R	Rectangle	3224	28	114
LCAT24-30VWHE	Curve	3310	27	123
LCAT24-30VWHEx-R	Rectangle	3280	26	126
LCAT24-35VW	Curve	3217	28	117
LCAT24-35VWx-R	Rectangle	3334	28	118
LCAT24-35VWHE	Curve	3409	27	126
LCAT24-35VWHEx-R	Rectangle	3391	26	130
LCAT24-40VW	Curve	3267	28	118
LCAT24-40VWx-R	Rectangle	3386	28	120
LCAT24-40VWHE	Curve	3462	27	128
LCAT24-40VWHE-R	Rectangle	3443	26	132
LCAT24-50VW	Curve	3558	28	129
LCAT24-50VW-R	Rectangle	3476	28	123
LCAT24-50VWHE	Curve	3770	27	140
LCAT24-50VWHE-R	Rectangle	3535	26	136

Product Availability 90 CRI				
Lumen Package	Shielding	Lumens	Input Watts	LPW
LCAT24-930XW	Curve	2142	20	106
LCAT24-930XWx-R	Rectangle	2212	20	109
–	–	–	–	–
–	–	–	–	–
LCAT24-935XW	Curve	2187	20	108
LCAT24-935XWx-R	Rectangle	2259	20	111
–	–	–	–	–
–	–	–	–	–
LCAT24-940XW	Curve	2234	20	110
LCAT24-940XWx-R	Rectangle	2308	20	114
–	–	–	–	–
–	–	–	–	–
LCAT24-950XW	Curve	2380	20.3	117
LCAT24-950XWx-R	Rectangle	2458	20.3	121
–	–	–	–	–
–	–	–	–	–
LCAT24-930VW	Curve	2655	28	96
LCAT24-930VWx-R	Rectangle	2740	28	97
–	–	–	–	–
–	–	–	–	–
LCAT24-935VW	Curve	2717	28	98
LCAT24-935VWx-R	Rectangle	2799	28	99
–	–	–	–	–
–	–	–	–	–
LCAT24-940VW	Curve	2780	28	101
LCAT24-940VWx-R	Rectangle	2859	28	101
–	–	–	–	–
–	–	–	–	–
LCAT24-950VW	Curve	2936	28	106
LCAT24-950VWx-R	Rectangle	3045	28	108
–	–	–	–	–
–	–	–	–	–

(Tables continue on next page.)

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HUBBELL Lighting

LCAT24

2' × 4' LED CONTEMPORARY ARCHITECTURAL TROFFER

DELIVERED LUMENS, CONT'D

Product Availability 80 CRI				
Lumen Package	Shielding	Lumens	Input Watts	LPW
LCAT24-30MW	Curve	3363	30	111
LCAT24-30MWx-R	Rectangle	3472	30	115
LCAT24-30MWHE	Curve	3717	31	120
LCAT24-30MWHE-R	Rectangle	3660	29	126
LCAT24-35MW	Curve	3464	30	115
LCAT24-35MWx-R	Rectangle	3590	30	119
LCAT24-35MWHE	Curve	3829	31	124
LCAT24-35MWHE-R	Rectangle	3785	29	131
LCAT24-40MW	Curve	3518	30	116
LCAT24-40MWx-R	Rectangle	3646	30	121
LCAT24-40MWHE	Curve	3888	31	125
LCAT24-40MWHE-R	Rectangle	3843	29	133
LCAT24-50MW	Curve	3831	30	127
LCAT24-50MWx-R	Rectangle	3744	30	124
LCAT24-50MWHE	Curve	4234	31	137
LCAT24-50MWHEx-R	Rectangle	3946	29	136
LCAT24-30LW	Curve	4268	36	118
LCAT24-30LWx-R	Rectangle	4420	36	122
LCAT24-35LW	Curve	4396	36	122
LCAT24-35LWx-R	Rectangle	4570	36	127
LCAT24-40LW	Curve	4465	36	124
LCAT24-40LWx-R	Rectangle	4642	36	129
LCAT24-50LW	Curve	4861	36	135
LCAT24-50LWx-R	Rectangle	4766	36	132
LCAT24-30ML	Curve	4771	39	123
LCAT24-30MLx-R	Rectangle	4923	39	127
LCAT24-35ML	Curve	4914	39	127
LCAT24-35MLx-R	Rectangle	5091	39	131
LCAT24-40ML	Curve	4990	39	129
LCAT24-40MLx-R	Rectangle	5170	39	133
LCAT24-50ML	Curve	5434	39	140
LCAT24-50MLx-R	Rectangle	5308	39	137
LCAT24-30HL	Curve	5443	44	124
LCAT24-30HLx-R	Rectangle	5533	43	128
LCAT24-35HL	Curve	5606	44	127
LCAT24-35HLx-R	Rectangle	5721	43	133
LCAT24-40HL	Curve	5694	44	129
LCAT24-40HLx-R	Rectangle	5810	43	135
LCAT24-50HL	Curve	6200	44	141
LCAT24-50HLx-R	Rectangle	5966	43	138
LCAT24-30VL	Curve	6999	59	119
LCAT24-30VLx-R	Rectangle	6952	58	121
LCAT24-35VL	Curve	7209	59	122
LCAT24-35VLx-R	Rectangle	7189	58	125
LCAT24-40VL	Curve	7321	59	124
LCAT24-40VLx-R	Rectangle	7301	58	127
LCAT24-50VL	Curve	7972	59	135
LCAT24-50VLx-R	Rectangle	7496	58	130
LCAT24-30XL	Curve	8168	74	111
LCAT24-30XLx-R	Rectangle	8112	75	109
LCAT24-35XL	Curve	8412	74	114
LCAT24-35XLx-R	Rectangle	8388	75	112
LCAT24-40XL	Curve	8547	74	116
LCAT24-40XLx-R	Rectangle	8519	75	114
LCAT24-50XL	Curve	9304	74	126
LCAT24-50XLx-R	Rectangle	8747	75	117

Product Availability 90 CRI				
Lumen Package	Shielding	Lumens	Input Watts	LPW
LCAT24-930MW	Curve	2859	30	95
LCAT24-930MWx-R	Rectangle	2953	30	98
–	–	–	–	–
–	–	–	–	–
LCAT24-935MW	Curve	2926	30	97
LCAT24-935MWx-R	Rectangle	3015	30	100
–	–	–	–	–
–	–	–	–	–
LCAT24-940MW	Curve	2993	30	99
LCAT24-940MWx-R	Rectangle	3080	30	102
–	–	–	–	–
–	–	–	–	–
LCAT24-950MW	Curve	3161	30	105
LCAT24-950MWx-R	Rectangle	3280	30	109
–	–	–	–	–
–	–	–	–	–
LCAT24-930LW	Curve	3628	36	100
LCAT24-930LWx-R	Rectangle	3759	36	104
LCAT24-935LW	Curve	3713	36	103
LCAT24-935LWx-R	Rectangle	3838	36	106
LCAT24-940LW	Curve	3798	36	105
LCAT24-940LWx-R	Rectangle	3920	36	109
LCAT24-950LW	Curve	4012	36	111
LCAT24-950LWx-R	Rectangle	4175	36	116
LCAT24-930ML	Curve	4055	39	105
LCAT24-930MLx-R	Rectangle	4186	39	108
LCAT24-935ML	Curve	4150	39	107
LCAT24-935MLx-R	Rectangle	4274	39	110
LCAT24-940ML	Curve	4246	39	109
LCAT24-940MLx-R	Rectangle	4366	39	113
LCAT24-950ML	Curve	4484	39	116
LCAT24-950MLx-R	Rectangle	4651	39	120
LCAT24-930HL	Curve	4810	43	112
LCAT24-930HLx-R	Rectangle	4704	43	109
LCAT24-935HL	Curve	4913	43	114
LCAT24-935HLx-R	Rectangle	4803	43	111
LCAT24-940HL	Curve	5019	43	116
LCAT24-940HLx-R	Rectangle	4907	43	114
LCAT24-950HL	Curve	5346	43	124
LCAT24-950HLx-R	Rectangle	5227	43	121
LCAT24-930VL	Curve	5883	58	102
LCAT24-930VLx-R	Rectangle	5912	58	103
LCAT24-935VL	Curve	6007	58	104
LCAT24-935VLx-R	Rectangle	6036	58	105
LCAT24-940VL	Curve	6136	58	107
LCAT24-940VLx-R	Rectangle	6166	58	107
LCAT24-950VL	Curve	6537	58	114
LCAT24-950VLx-R	Rectangle	6568	58	114
LCAT24-930XL	Curve	7058	75	95
LCAT24-930XLx-R	Rectangle	6895	75	92
LCAT24-935XL	Curve	7207	75	97
LCAT24-935XLx-R	Rectangle	7043	75	94
LCAT24-940XL	Curve	7362	75	99
LCAT24-940XLx-R	Rectangle	7194	75	96
LCAT24-950XL	Curve	7842	75	105
LCAT24-950XLx-R	Rectangle	7664	75	103

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LCAT24

2' × 4' LED CONTEMPORARY ARCHITECTURAL TROFFER

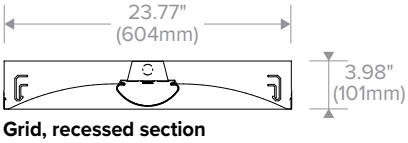
DATE: | LOCATION:

TYPE: A1 | PROJECT:

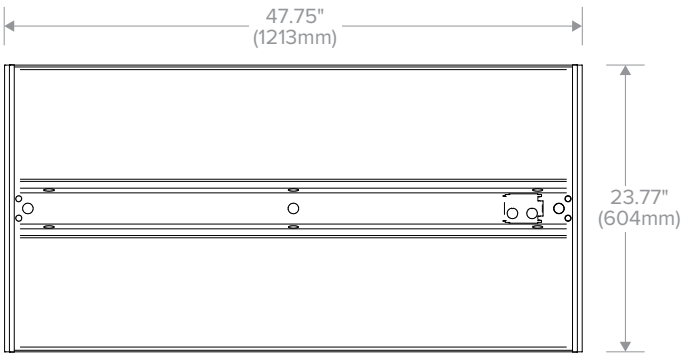
CATALOG #:

DIMENSIONS

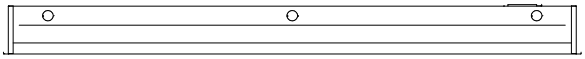
GRID



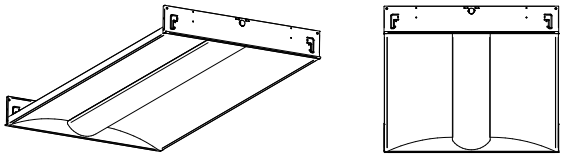
Grid, recessed section



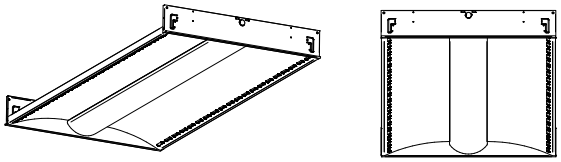
Grid, back of housing



GRID, STATIC

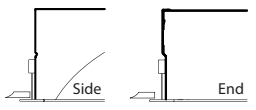


GRID, AIR RETURN



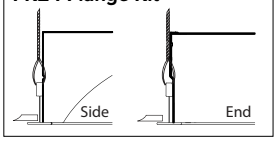
CEILING COMPATIBILITY

Type G



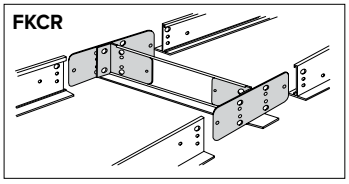
For lay-in installation in exposed grid ceilings. Maximum tee widths of 1" and maximum tee heights of 2" allowed.

FK24 Flange Kit



For hard ceiling applications, order FK24 flange kit. Flange kit wires directly into concealed ceiling opening for a clean, finished appearance.

FKCR

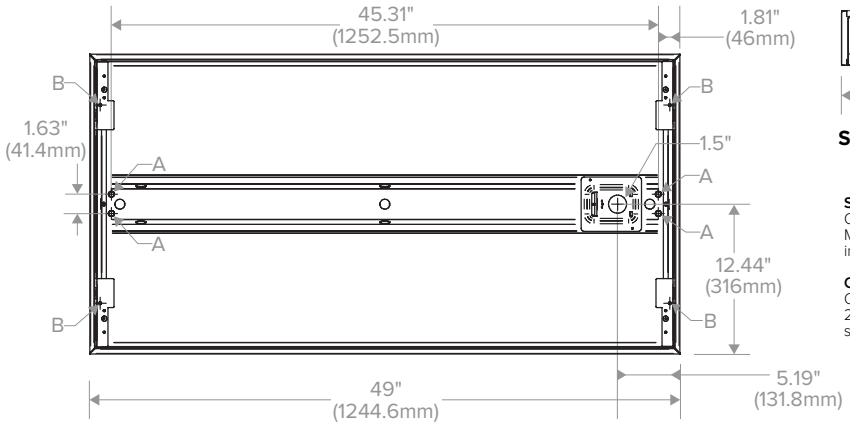


For flanged fixtures in row configurations, the FKCR adapter bracket kit is required in addition to the FK24 kit. Order one less FKCR than the total number of fixtures in row. (Example: Row of two, order (2) FK24 & (1) FKCR)

Row cut out dimensions using FK24s & FKCR adapters: Width 24⅜", Length [48" × (# in row)] + ⅜". Example: (48" × 2) + ⅜" = 96⅜"

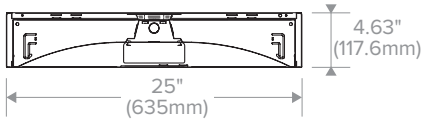
Flange kit cut out dimension for single unit only: 24⅜" × 48⅜"

SURFACE MOUNT OR CABLE MOUNT, STATIC ONLY



Surface Mount (SM) and Cable Mount (CM), back of housing

* For Cable Mount a 2" x 3" access plate with (4) **⅞"** KOs provided in place of Mounting Collar shown.



Surface section (SM)

Surface Mount:
Order SM ceiling type. Mounting collar required for surface mounting. (4) Mounting knock-outs, ⅜", provided in center channel as indicated at left, marked A.

Cable Mount:
Order CM ceiling type. Use CM48Y2SC3F-KIT 48" Cable Mount Kit for 2' wide CM trim fixtures. Mounting holes are provided in diagonal straps shown at left, marked B.

NOTE: All dimensions are in inches; dimensions and specifications are subject to change without notice. Please consult factory or check sample for verification.

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HUBBELL Lighting

Columbia LIGHTING

LCAT24

2' × 4' LED CONTEMPORARY ARCHITECTURAL TROFFER

DATE: | LOCATION:

TYPE: A1 | PROJECT:

CATALOG #:

PHOTOMETRY

LCAT24-35LWG-EU

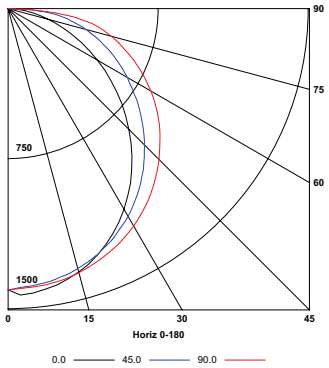
LUMINAIRE DATA

Test No.	**16519**
Description	**2' x 4' LED architectural troffer with frosted linear prismed lens**
Delivered Lumens	**4396**
Watts	**36.10**
Efficacy	**122**
Mounting	**Recessed**
Spacing Criterion	**0° = 1.22 90° = 1.32**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
0–30	1098	25
0–40	1804	41
0–60	3240	73.7
0–90	4396	100
0–180	4396	100

POLAR GRAPH



LCAT24-35MLG-EU

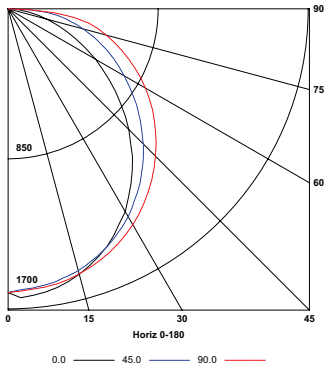
LUMINAIRE DATA

Test No.	**16522**
Description	**2' x 4' LED architectural troffer with frosted linear prismed lens**
Delivered Lumens	**4914**
Watts	**38.80**
Efficacy	**127**
Mounting	**Recessed**
Spacing Criterion	**0° = 1.22 90° = 1.30**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
0–30	1250	25.4
0–40	2049	41.7
0–60	3648	74.2
0–90	4914	100
0–180	4914	100

POLAR GRAPH



LCAT24-35HLG-EU

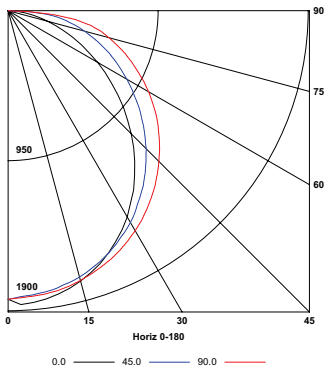
LUMINAIRE DATA

Test No.	**16525**
Description	**2' x 4' LED architectural troffer with frosted linear prismed lens**
Delivered Lumens	**5607**
Watts	**44.00**
Efficacy	**127**
Mounting	**Recessed**
Spacing Criterion	**0° = 1.22 90° = 1.31**

ZONAL LUMEN SUMMARY

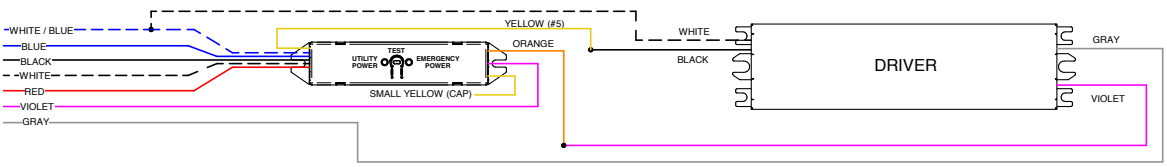
Zone	Lumens	% Luminaire
0–30	1422	25.4
0–40	2333	41.6
0–60	4161	74.2
0–90	5607	100
0–180	5607	100

POLAR GRAPH



ADDITIONAL INFORMATION

DTS WIRING DIAGRAM (0–10V DIMMING DRIVER SHOWN)



WHITE/BLUE	Emergency Neutral
BLUE	Emergency Line
BLACK	Utility Line (Unswitched Hot)
WHITE	Utility Neutral
RED	Switched Hot
VIOLET	Dimming
GRAY	Dimming

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HUBBELL Lighting

Columbia LIGHTING

DATE: | LOCATION:

TYPE: A2 | PROJECT:

CATALOG #:

LCAT22

2' × 2' LED CONTEMPORARY ARCHITECTURAL TROFFER

FEATURES

- High efficiency acrylic center lens features linear prisms for high performance without pixelation
- Appropriate for offices, schools, medical, and public spaces
- High performance reflector with matte white paint standard
- HE lumen packages available
- LED modules and electrical accessible from below
- Optional architecturally styled integration of daylight and occupancy sensor(s)
- QR code traceability
- Compatible with Dual-Lite inverters

Built to UL 924 Standards

Chicago Plenum

BUY AMERICAN SOLUTIONS

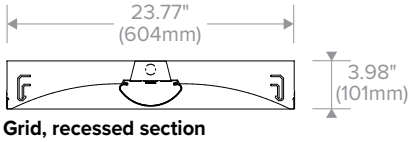
See Certification Specifications

RELATED PRODUCTS

LCAT12 LCAT14 LCAT24

CONTROL TECHNOLOGY

SpectraSync Color Tuning Technology | NX DISTRIBUTED INTELLIGENCE | SPECTRASAFE



Grid, recessed section

SPECIFICATIONS

CONSTRUCTION

- Luminaire housing, reflectors and end caps are die-formed code-gauge cold-rolled steel
- High transmission extruded acrylic enclosed lens features linear prisms with custom frost for high efficacy without pixelation
- All reflective surfaces are finished after fabrication with unique formula high-reflectivity matte white paint for soft, uniform indirect illumination

OPTICS

- Removable lens for easy access to LED module and electrical components

INSTALLATION

- An access plate is furnished with each luminaire for fast wiring access without the necessity to open the fixture or wireway
- Luminaire fits recessed exposed Grid ceilings (G); four integral NEC compliant T-bar clips are standard
- Can be placed in Slot Grid (SG) style ceiling with regress ⅜" above ceiling plane
- A Flange Kit (FK) accessory is available for recessed hard ceiling applications
- Surface Mount (SM) option allows placement below ceiling plane
- Cable Mount (CM) option allows suspension below ceiling plane

ELECTRICAL

- 60,000 hour LEDs at L80 for reduced maintenance

ELECTRICAL (CONTINUED)

- 83 CRI standard or optional 90 CRI for color sensitive applications

CONTROLS

- Optional SpectraSync™ offers two modes of Tunable White solutions and integrates seamlessly into a variety of control systems
- NX Distributed Intelligence™ provides options for standalone and networked integrated sensor with wired or wireless connectivity for NX system deployments

TECHNOLOGY

- SpectraSAFE™ is a scalable, cloud-enabled and lighting-based wireless video security solution for interior commercial and industrial applications

CERTIFICATIONS

- IC label is standard for recessed products. Note that IC label is void if product is installed on site with a combination of both battery pack plus through wiring or for air return fixtures
- All luminaires are built to UL1598 and 2108 standards, and bear appropriate cCSAus labels
- CSA certified to UL 924 standards with battery pack or DTS (Dimming Bypass Module) options
- Damp Location label standard
- Adheres to LM79, LM80, and TM21 industry standards

CERTIFICATIONS (CONTINUED)

- DLC® (DesignLights Consortium) Qualified, with some Premium Qualified configurations. Please refer to the DLC website for specific product qualifications at www.designlights.org
- NX is available in U.S., Canada and Mexico. For other locations consult factory
- The DTS, Dimming Bypass Module, is for emergency circuit control loads including sensors and wireless systems CSA certified to UL 924. See page 8 for wiring diagram. Link to Dimming Bypass Module Specification sheet
- This product qualifies as a "designated country construction material" per FAR 52.225-11 Buy American-Construction Materials under Trade Agreements effective 04/03/2020. See Buy American Solutions

WARRANTY

- 5 year warranty
- See HLI Standard Warranty for additional information

KEY DATA	
Lumen Range	1313–4863
Wattage Range	13–40
Efficacy Range (LPW)	93–139
Reported Life (Hours)	L80/60,000

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HUBBELL Lighting

Columbia LIGHTING

DATE: | LOCATION:

TYPE: A2 | PROJECT:

CATALOG #:

LCAT22

2' × 2' LED CONTEMPORARY ARCHITECTURAL TROFFER

ORDERING GUIDE

Example: LCAT22–35MLG–ESDU

CATALOG # LCAT22 –

Model	CRI	Color Temp	Delivered Lumens[3]	Ceiling Type	Shielding	Air Function	Driver
LCAT22 2' x 2' LED Contemporary Architectural Troffer	**Blank** >80 **9** >90[1]	**30** 3000K **35** 3500K **40** 4000K **50** 5000K **2750T** 2700K–5000K SpectraSync™ Tunable White[2] **2765T** 2700K–6500K SpectraSync™ Tunable White[2]	**VW** 1313–1785 **VWHE** 1530–1743 **MW** 1714–2334 **MWHE** 2010–2289 **LW** 2263–3063 **ML** 2778–3781 **MLHE** 3293–3751 **HL** 3012–4099 **HLHE** 3616–3769 **VL** 3767–4863 **VLHE** 4257–4649	**G** Grid Lay-in[4] **SM** Surface Mount[5,12] **CM** Cable Suspended Mount[5,6]	**Blank** Curve **R** Rectangular	**Blank** Static **A** Air Return Side Slots	**E** Fixed Output **ED** 0–10V Dimming **ED1** 0–10V 1% Dimming **EDD** 0–10V Dim-to-Dark **ESD** Step Dimming[7,9,13] **LUTH** Hi-lume 1% EcoSystem LED driver with Soft-on, Fade-to-Black dimming technology[7,9,13] **LUT5** 5-Series EcoSystem LED driver[7,9,13] **DALIP** DALI Power Bus[9,16]

–

Voltage	Options	Control Options
U 120–277V **347** 347V[14]	**ELL14** Emergency Battery Pack Installed, 1400 Lumens[8,9] **ELL14ST** Emergency Battery Pack, 1400 Lumens, Self Test[8,9] **ELL14H2** Emergency Battery Pack, 2-Hour Run Time[8,9] **DTS** Dimming Bypass Module[9,10] **C388** 3-wire Flex[15] **C488** 4-wire Flex[15] **C588** 5-wire Flex[15] **GLR** Fast Blow Fuse **EOR** End of Row (SM and CM only. Provides end wiring access for continuous row mounting.)[5] **INT** Intermediate (SM and CM only. Provides ends with wiring access for continuous row mounting.)[5] **CP** Chicago Plenum **SAF** SpectraSAFE™ Integrated Surveillance Lighting System[11]	**NX Standalone** **NXS** NX, PIR BT Occupancy/Daylight Sensor, Slide Mount[13,14] **NX Networked – Wired** **NXE** NX, Dual SmartPORTs[13,14] **NXES** NX, PIR BT Occupancy/Daylight Sensor, Slide Mount, Dual SmartPORTs[13,14] **NX Networked – Wireless** **NXSW** NX Wireless, PIR BT Occupancy/Daylight Sensor[12,13,14] **NXWE** NX Wireless Enabled[12,13,14] **NX Networked – Wired/Wireless Hybrid** **NXSWD** NX Wireless, PIR BT Occupancy/Daylight Sensor, Dual SmartPORTs[13,14] **NXWD** NX Wireless, Dual SmartPORTs[13,14] **Third-Party Control Options** **ODPG** Occupancy and Daylight Sensors w/ Grouping, Philips SNS200[9,16,20] **LV** Lutron Vive Attached FCJS POWPAK Fixture Control (RF only for 0–10V drivers)[9,17,18,19,20] **LVR** Lutron Vive Integral Fixture Control DFCSJ-OEM-RF (RF only)[9,16,18,20] **LVS** Lutron Vive Integral Fixture Control DFCSJ-OEM-OCC (RF with daylight and occupancy sensing)[9,16,18,20] **ZRE** ControlScope® compatible[9,20,21]

Accessories

- ☐ **FK22** 2' × 2' Single Flange Kit (Shipped separately)
- ☐ **CM48Y2SC3F-KIT** 48" Cable Mount Kit for 2' wide Cable Mount fixtures, 3-wire

Notes:

1 Not available with HE lumen output
2 Available with ED driver and 80 CRI only. Not available with HE or VL lumen outputs
3 High efficacy versions designated with "HE"
4 For drywall, order G with Flange Kit Accessory
5 Not available with Air Return (A) air function
6 Order hanger accessories separately
7 Limitations apply based on lumen packages (see Product Exceptions & Details)
8 For compatibility with Dual-Lite LiteGear® inverters, contact Hubbell Lighting Representative
9 Not available in 347V
10 For emergency circuit control loads including sensors and wireless systems CSA certified to UL 924. Only available with 0–10V drivers. Universal voltage only. See page 8 for wiring diagram
11 SpectraSync+NX+SAF can not be configured. Only available with NXE, NXWE or NXWD. Not available in 347V

NX In-Fixture Control Options:

12 NXSW, NXWE, NXSWD and NXWD cannot be used with surface mount versions
13 NX is not available with ESD, LUTH, LUT5 or DALIP driver options
14 NX combined with Spectrasync is not available in 347V
15 For NX control and Flex Wire together, consult factory

Third-Party Control Options

16 LVS, LVR and ODPG only available with DALIP driver option
17 Only available with ED driver option
18 VIVE is a trademark of Lutron Electronics Co., Inc
19 Installations controlled solely by the Lutron Pico controller require accessing the LV (Lutron FCJS) module for commissioning after the circuit has been energized
20 Not available with SpectraSync (2750T or 2765T)
21 Registered trademark of Daintree Networks, used by permission

For questions about configuration options, contact Hubbell Representative

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HUBBELL Lighting

Columbia LIGHTING

DATE: LOCATION:

TYPE: A2 PROJECT:

CATALOG #:

LCAT22

2' × 2' LED CONTEMPORARY ARCHITECTURAL TROFFER

PRODUCT EXCEPTIONS & DETAILS

Driver options listed below are available for the outputs as shown.

DRIVER AVAILABILITY TABLE											
	VW	VWHE	MW	MWHE	LW	ML	MLHE	HL	HLHE	VL	VLHE
E	X	X	X	X	X	X	X	X	X	X	X
ED	X	X	X	X	X	X	X	X	X	X	X
ED1	X	X	X	X	X	X	X	X	X	X	X
EDD			X		X	X		X			
ESD					X	X		X		X	
LUT5			X		X	X					
LUTH			X		X	X					
DALIP					X	X	X	X	X	X	X
347	X		X		X	X		X		X	

CONTROLS

NX Distributed Intelligence™ Lighting Controls:

Supports both indoor and outdoor applications in a variety of deployment options- wired, wireless, hybrid.
Integrates with and enables a wide array of luminaires including those with SpectraSync™ Color Tuning Technology.

NX DISTRIBUTED™ INTELLIGENCE

NX INTEGRATED CONTROLS REFERENCE								
NX Option	Sensor	Networkable	Scheduling	Occupancy	Daylight Harvesting	0–10V Dimming	On/off Control	Bluetooth® App Programming
NX Standalone								
NXS	NXSMP-SMI	No	Yes	Yes	Yes	Yes	Yes	Yes
NX Networked – Wired								
NXE	N/A	Yes	Yes	No	No	Yes	Yes	Requires NXBTC/R[1]
NXES	NXSMP-SMI	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NX Networked – Wireless								
NXSW	NXSMP-SMI	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NXWE	N/A	Yes	Yes	No	No	Yes	Yes	No[2]
NX Networked – Wired/Wireless								
NXSWD	NXSMP-SMI	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NXWD	N/A	Yes	Yes	No	No	Yes	Yes	Requires NXBTC/R[1,2]

1 NXBTC/R needs to be plugged into an available NX SmartPORT™ on the fixture network

2 To program NXWE option, need to consult factory. If connected to an area controller, programming can be done from that

Philips EasySense Controls ODPG Sensor:

- Occupancy sensing, daylight harvesting, task tuning and grouping in one device
- Standalone control or grouping to wireless switches[1]
- Uses Philips field apps for on site commissioning[2,3]
- Ability to create scenes for various room configurations
- Cost-effective solution for energy-savings and code-compliancy strategies
- DLC® Qualified: Listed on the QPL for Networked Lighting Controls. Please refer to the DLC website for specific product qualifications at www.designlights.org

1 Wireless switches only compatible with ODPG Philips EasySense

2 See link to Philips commssioning

3 Requires android device or IR dongle. See links for phone compatiblity and IR dongle

Wireless Switch Accessories[1]

☐ PESR-WH EasySense compatible wireless single rocker switch, white

☐ PEDR-WH EasySense compatible wireless dual rocker switch, white

NX Design & Application Guide

NX Brochure

Philips SNS200

EasySense Design-in Guide

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HUBBELL Lighting

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LCAT22

2' × 2' LED CONTEMPORARY ARCHITECTURAL TROFFER

DATE: | LOCATION:

TYPE: A2 | PROJECT:

CATALOG #:

CONTROLS (CONTINUED)

SpectraSAFE™ Integrated Surveillance Lighting System

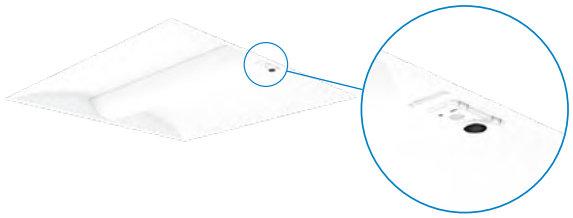
SPECTRASAFE

Technical Features

- High resolution 1080p full HD camera
- 2.8mm lens / 140° field of view
- IR emitter for low / no-light conditions
- Multiple wiring configurations available
- Supports 2-way audio communication
- Supports 2.4GHz WPA-PSK/WPA2-PSK Wi-Fi
- Data encrypted using AES 256 standard
- Low power consumption (2-5W)
- Transmissions secured using Open TLS / SSL

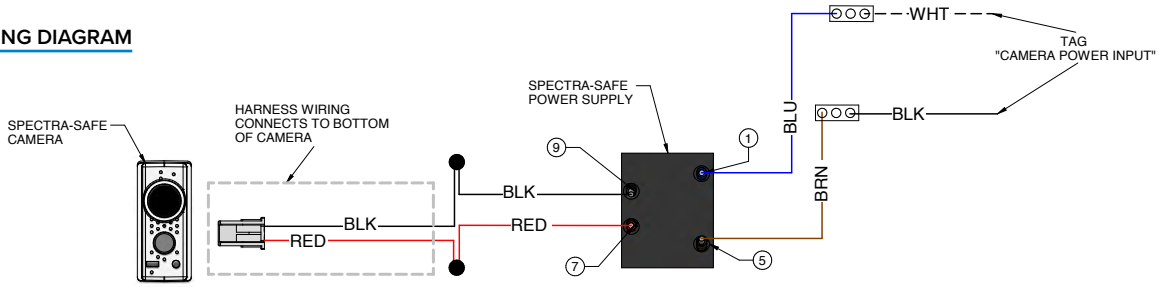
Software & Support

- Free Android, iOS and web-based app
- Versatile and supports multiple applications
- Multi-tenant web-based camera application
- Phone and in-app chat technical support
- Scalable cloud services and video storage
- Supported by a 5-year warranty



SPECTRASAFE WIRING DIAGRAM

Power Supply Pin Connections	
Pin#	Single
1	VAC in (N)
5	VAC in (L)
7	+Vout
9	-Vout



SpectraSync™ Color Tuning Technology:

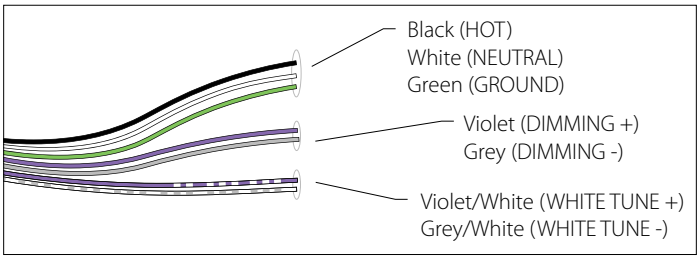
Control your space based on the needs of the application, specific activities throughout the day and preferences of the occupants with distinct SpectraSync™ Color Tuning Technologies.

SpectraSync Color Tuning Technology

SPECTRASYNC COLOR TUNING TECHNOLOGY		
Mode	Kelvin Range	Description
Tunable White	2700K–5000K 2700K–6500K	Offers users the ability to tailor CCT to their personal preference, enhancing task visibility, material and colors or the aesthetics of the space

SpectraSync Tunable White

Available in two options: 2750T (2700K–5000K) or 2765T (2700K–6500K). Requires two 0–10V controllers, one for intensity and one for CCT. Minimum 5% dimming.

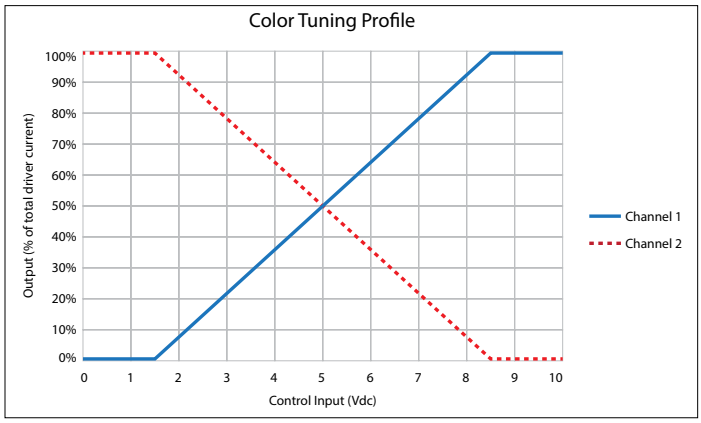


SpectraSync Tunable White luminaires are provided with two 0–10V circuits. The violet and grey circuit is for wiring to any qualified 0–10V controller for dimming. The violet/white and grey/white circuit is for wiring to any qualified 0–10V controller for Tunable White CCT control.

Controller Manufacturer Data

SpectraSync Tunable White was designed to be used with sinking style dimmers (provided by others) and is compatible with:

- Hubbell Control Solutions (HCS): NX Distributed Intelligence™ Room Controllers (NXRC) and In-fixture Controllers (NXFM)
- Lutron: DVTV, DVSTV, and NFTV dimmers
- Wattstopper: ADF120277 and CD4BL (Titan) dimmers



To enable scheduling and for use with NX wall control preset stations please refer to Hubbell Control Solutions NX SpectraSync technical sheet.

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HUBBELL Lighting

Columbia LIGHTING

LCAT22

2' × 2' LED CONTEMPORARY ARCHITECTURAL TROFFER

DELIVERED LUMENS, SPECTRASYNC™

SpectraSync™ Color Tuning Technology

Shielding	Lumen Output	Watts	2700		3000		3500		4000		5000		6500	
			Lumens	LPW	Lumens	LPW	Lumens	LPW	Lumens	LPW	Lumens	LPW	Lumens	LPW
Curve	VW	14	1500	110	1567	115	1595	117	1616	119	1669	123	1644	121
	MW	18	1961	109	2049	114	2086	116	2113	117	2182	121	2149	119
	LW	23	2582	114	2698	119	2747	122	2782	123	2873	127	2830	125
	ML	29	3177	111	3320	116	3380	118	3423	119	3536	123	3483	121
	HL	32	3444	108	3599	113	3664	115	3711	117	3833	121	3775	119
Rectangle	VW	13	1479	110	1545	115	1573	117	1593	119	1645	123	1621	121
	MW	18	1930	109	2017	114	2053	116	2080	117	2148	121	2116	120
	LW	23	2547	113	2661	118	2709	120	2743	121	2834	125	2791	124
	ML	29	3127	109	3267	114	3326	116	3368	117	3479	121	3427	119
	HL	32	3391	107	3543	112	3607	114	3653	116	3773	119	3717	118

DELIVERED LUMENS

Product Availability 80 CRI				
Lumen Package	Shielding	Lumens	Input Watts	LPW
LCAT22-30VW	Curve	1567	14	115
LCAT22-30VWx-R	Rectangle	1545	13	115
LCAT22-30VWHE	Curve	1530	13	121
LCAT22-35VW	Curve	1614	14	119
LCAT22-35VWx-R	Rectangle	1597	13	119
LCAT22-35VWHE	Curve	1576	13	125
LCAT22-40VW	Curve	1639	14	121
LCAT22-40VWx-R	Rectangle	1623	13	121
LCAT22-40VWHE	Curve	1600	13	127
LCAT22-50VW	Curve	1785	14	131
LCAT22-50VWx-R	Rectangle	1666	13	124
LCAT22-50VWHE	Curve	1743	13	138
LCAT22-30MW	Curve	2049	18	114
LCAT22-30MWx-R	Rectangle	2017	18	114
LCAT22-30MWHE	Curve	2010	17	122
LCAT22-35MW	Curve	2110	18	117
LCAT22-35MWx-R	Rectangle	2085	18	118
LCAT22-35MWHE	Curve	2070	17	125
LCAT22-40MW	Curve	2143	18	119
LCAT22-40MWx-R	Rectangle	2118	18	120
LCAT22-40MWHE	Curve	2102	17	127
LCAT22-50MW	Curve	2334	18	130
LCAT22-50MWx-R	Rectangle	2174	18	123
LCAT22-50MWHE	Curve	2289	17	139
LCAT22-30LW	Curve	2689	23	119
LCAT22-30LWx-R	Rectangle	2661	23	118
LCAT22-35LW	Curve	2770	23	123
LCAT22-35LWx-R	Rectangle	2752	23	122
LCAT22-40LW	Curve	2813	23	124
LCAT22-40LWx-R	Rectangle	2795	23	124
LCAT22-50LW	Curve	3063	23	136
LCAT22-50LWx-R	Rectangle	2870	23	127

Product Availability 90 CRI				
Lumen Package	Shielding	Lumens	Input Watts	LPW
LCAT22-930VW	Curve	1342	13	100
LCAT22-930VWx-R	Rectangle	1313	13	98
–	–	–	–	–
LCAT22-935VW	Curve	1371	13	102
LCAT22-935VWx-R	Rectangle	1341	13	100
–	–	–	–	–
LCAT22-940VW	Curve	1400	13	104
LCAT22-940VWx-R	Rectangle	1370	13	102
–	–	–	–	–
LCAT22-950VW	Curve	1492	13	111
LCAT22-950VWx-R	Rectangle	1459	13	109
–	–	–	–	–
LCAT22-930MW	Curve	1744	17.7	99
LCAT22-930MWx-R	Rectangle	1714	17.7	97
–	–	–	–	–
LCAT22-935MW	Curve	1781	18	101
LCAT22-935MWx-R	Rectangle	1750	18	99
–	–	–	–	–
LCAT22-940MW	Curve	1819	18	103
LCAT22-940MWx-R	Rectangle	1788	18	101
–	–	–	–	–
LCAT22-950MW	Curve	1938	18	109
LCAT22-950MWx-R	Rectangle	1905	18	108
–	–	–	–	–
LCAT22-930LW	Curve	2286	23	101
LCAT22-930LWx-R	Rectangle	2263	23	100
LCAT22-935LW	Curve	2339	23	103
LCAT22-935LWx-R	Rectangle	2311	23	102
LCAT22-940LW	Curve	2393	23	106
LCAT22-940LWx-R	Rectangle	2361	23	104
LCAT22-950LW	Curve	2527	23	112
LCAT22-950LWx-R	Rectangle	2515	23	111

(Tables continue on next page.)

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HUBBELL Lighting

LCAT22

2' × 2' LED CONTEMPORARY ARCHITECTURAL TROFFER

DELIVERED LUMENS, CONT'D

Product Availability 80 CRI				
Lumen Package	Shielding	Lumens	Input Watts	LPW
LCAT22-30ML	Curve	3320	29	116
LCAT22-30MLx-R	Rectangle	3267	29	114
LCAT22-30MLHE	Curve	3293	28	119
LCAT22-35ML	Curve	3420	29	119
LCAT22-35MLx-R	Rectangle	3378	29	118
LCAT22-35MLHE	Curve	3392	28	123
LCAT22-40ML	Curve	3473	29	121
LCAT22-40MLx-R	Rectangle	3431	29	120
LCAT22-40MLHE	Curve	3442	28	125
LCAT22-50ML	Curve	3781	29	132
LCAT22-50MLx-R	Rectangle	3522	29	123
LCAT22-50MLHE	Curve	3751	28	136
LCAT22-30HL	Curve	3599	32	113
LCAT22-30HLx-R	Rectangle	3543	32	112
LCAT22-30HLHE	Curve	3497	28	126
LCAT22-35HL	Curve	3707	32	117
LCAT22-35HLx-R	Rectangle	3664	32	116
LCAT22-35HLHE	Curve	3616	28	130
LCAT22-40HL	Curve	3764	32	118
LCAT22-40HLx-R	Rectangle	3721	32	118
LCAT22-40HLHE	Curve	3671	28	132
LCAT22-50HL	Curve	4099	32	129
LCAT22-50HLx-R	Rectangle	3820	32	121
LCAT22-50HLHE	Curve	3769	28	136
LCAT22-30VL	Curve	4270	39	111
LCAT22-30VLx-R	Rectangle	4432	40	110
LCAT22-30VLHE	Curve	4257	35	123
LCAT22-35VL	Curve	4398	39	114
LCAT22-35VLx-R	Rectangle	4583	40	113
LCAT22-35VLHE	Curve	4401	35	127
LCAT22-40VL	Curve	4466	39	116
LCAT22-40VLx-R	Rectangle	4655	40	115
LCAT22-40VLHE	Curve	4470	35	129
LCAT22-50VL	Curve	4863	39	126
LCAT22-50VLx-R	Rectangle	4779	40	118
LCAT22-50VLHE	Curve	4649	35	134

Product Availability 90 CRI				
Lumen Package	Shielding	Lumens	Input Watts	LPW
LCAT22-930ML	Curve	2821	29	98
LCAT22-930MLx-R	Rectangle	2778	29	97
–	–	–	–	–
LCAT22-935ML	Curve	2888	29	101
LCAT22-935MLx-R	Rectangle	2836	29	99
–	–	–	–	–
LCAT22-940ML	Curve	2954	29	103
LCAT22-940MLx-R	Rectangle	2897	29	101
–	–	–	–	–
LCAT22-950ML	Curve	3121	29	109
LCAT22-950MLx-R	Rectangle	3086	29	108
–	–	–	–	–
LCAT22-930HL	Curve	3123	32	98
LCAT22-930HLx-R	Rectangle	3012	32	95
–	–	–	–	–
LCAT22-935HL	Curve	3190	32	100
LCAT22-935HLx-R	Rectangle	3076	32	97
–	–	–	–	–
LCAT22-940HL	Curve	3259	32	102
LCAT22-940HLx-R	Rectangle	3142	32	99
–	–	–	–	–
LCAT22-950HL	Curve	3471	32	109
LCAT22-950HLx-R	Rectangle	3347	32	106
–	–	–	–	–
LCAT22-930VL	Curve	4289	39	110
LCAT22-930VLx-R	Rectangle	3767	40	93
–	–	–	–	–
LCAT22-935VL	Curve	4381	39	113
LCAT22-935VLx-R	Rectangle	3848	40	95
–	–	–	–	–
LCAT22-940VL	Curve	4476	39	115
LCAT22-940VLx-R	Rectangle	3930	40	97
–	–	–	–	–
LCAT22-950VL	Curve	4767	39	123
LCAT22-950VLx-R	Rectangle	4187	40	104
–	–	–	–	–

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HUBBELL Lighting

Columbia LIGHTING

LCAT22

2' × 2' LED CONTEMPORARY ARCHITECTURAL TROFFER

DATE: | LOCATION:

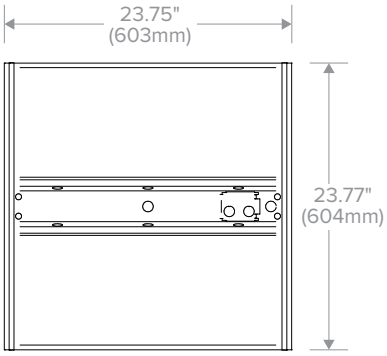
TYPE: A2 | PROJECT:

CATALOG #:

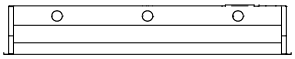
DIMENSIONS

GRID

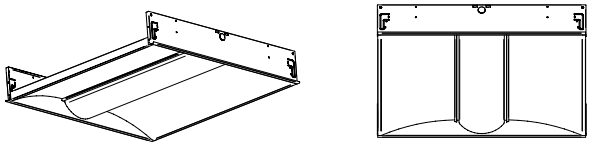
Grid, recessed section



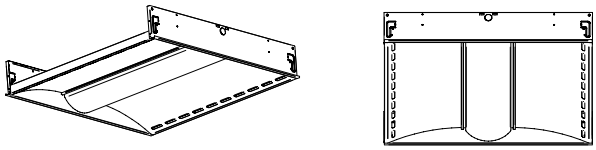
Grid, back of housing



GRID, STATIC

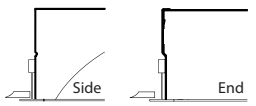


GRID, AIR RETURN



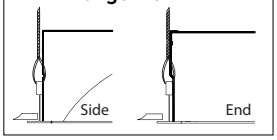
CEILING COMPATIBILITY

Type G



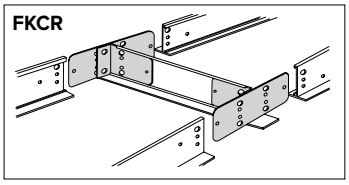
For lay-in installation in exposed grid ceilings. Maximum tee widths of 1" and maximum tee heights of 2" allowed.

FK22 Flange Kit



For hard ceiling applications, order FK22 flange kit. Flange kit wires directly into concealed ceiling opening for a clean, finished appearance.

FKCR

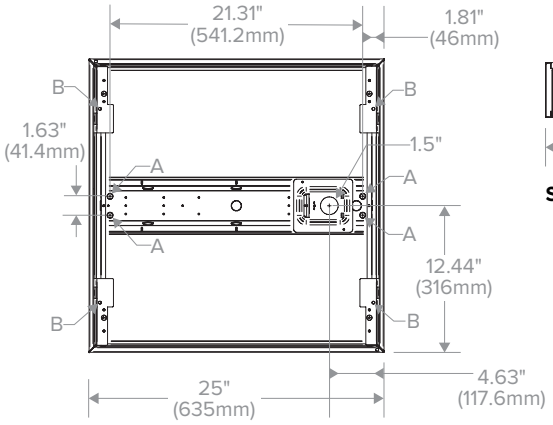


For flanged fixtures in row configurations, the FKCR adapter bracket kit is required in addition to the FK22 kit. Order one less FKCR than the total number of fixtures in row. (Example: Row of two, order (2) FK22 & (1) FKCR)

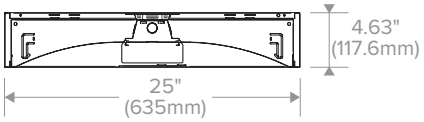
Row cut out dimensions using FK22s & FKCR adapters: Width 24⅜", Length [24" × (# in row)] + ⅜". Example: (24" × 2) + ⅜" = 48⅜"

Flange kit cut out dimension for single unit only: 24⅜" × 24⅜"

SURFACE MOUNT OR CABLE MOUNT, STATIC ONLY



Surface Mount (SM) and Cable Mount (CM), back of housing



Surface section (SM)

Surface Mount:
Order SM ceiling type. Mounting collar required for surface mounting. (4) Mounting knock-outs, 3⁄8", provided in center channel as indicated at left, marked A.

Cable Mount:
Order CM ceiling type. Use CM48Y2SC3F-KIT 48" Cable Mount Kit for 2' wide CM trim fixtures. Mounting holes are provided in diagonal straps shown at left, marked B.

* For Cable Mount a 2" x 3" access plate with (4) **⅞"** KOs provided in place of Mounting Collar shown.

NOTE: All dimensions are in inches; dimensions and specifications are subject to change without notice. Please consult factory or check sample for verification.

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HUBBELL Lighting

Columbia LIGHTING

DATE: | LOCATION:

TYPE: A2 | PROJECT:

CATALOG #:

LCAT22

2' × 2' LED CONTEMPORARY ARCHITECTURAL TROFFER

PHOTOMETRY

LCAT22-35LWG-EU

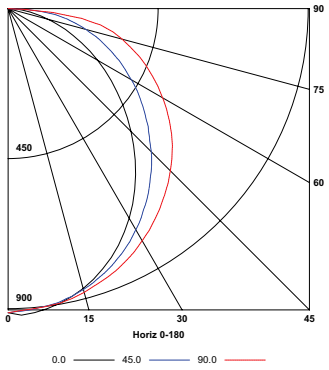
LUMINAIRE DATA

Test No.	**16540**
Description	**2' x 2' LED architectural troffer with frosted linear prismed lens**
Delivered Lumens	**2769**
Watts	**22.60**
Efficacy	**123**
Mounting	**Recessed**
Spacing Criterion	**0° = 1.19 90° = 1.31**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
0–30	705	25.5
0–40	1154	41.7
0–60	2056	74.3
0–90	2769	100
0–180	2769	100

POLAR GRAPH



LCAT22-35MLG-EU

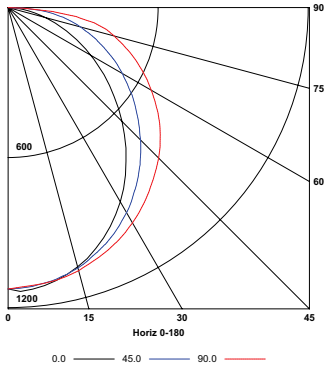
LUMINAIRE DATA

Test No.	**16543**
Description	**2' x 2' LED architectural troffer with frosted linear prismed lens**
Delivered Lumens	**3420**
Watts	**28.70**
Efficacy	**119**
Mounting	**Recessed**
Spacing Criterion	**0° = 1.19 90° = 1.31**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
0–30	871	25.5
0–40	1424	41.7
0–60	2539	74.2
0–90	3420	100
0–180	3420	100

POLAR GRAPH



LCAT22-35HLG-EU

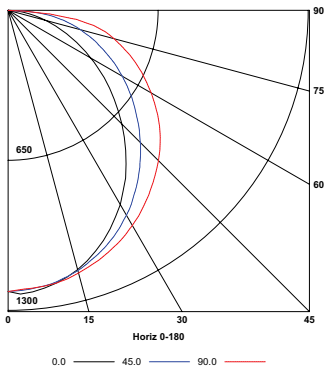
LUMINAIRE DATA

Test No.	**16546**
Description	**2' x 2' LED architectural troffer with frosted linear prismed lens**
Delivered Lumens	**3707**
Watts	**31.80**
Efficacy	**117**
Mounting	**Recessed**
Spacing Criterion	**0° = 1.19 90° = 1.31**

ZONAL LUMEN SUMMARY

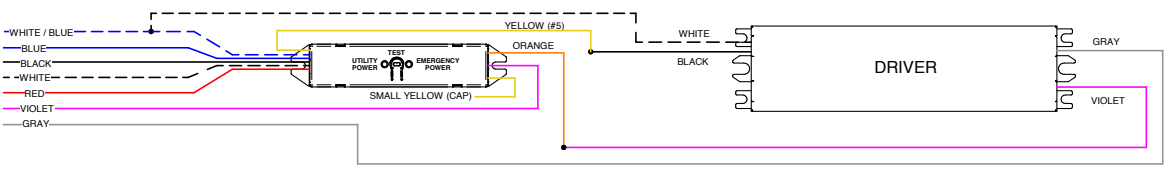
Zone	Lumens	% Luminaire
0–30	943	25.4
0–40	1543	41.6
0–60	2751	74.2
0–90	3707	100
0–180	3707	100

POLAR GRAPH



ADDITIONAL INFORMATION

DTS WIRING DIAGRAM (0–10V DIMMING DRIVER SHOWN)



WHITE/BLUE	Emergency Neutral
BLUE	Emergency Line
BLACK	Utility Line (Unswitched Hot)
WHITE	Utility Neutral
RED	Switched Hot
VIOLET	Dimming
GRAY	Dimming

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HUBBELL Lighting

prescolite

DATE: LOCATION:

TYPE: D1 PROJECT:

CATALOG #:

LTR-6RD

LITEISTRY 6" ROUND DOWNLIGHT

LITEISTRY

FEATURES

- 6" architectural LED downlight delivering 600 – 9000 lm
- Four beam distributions from 0.3 to 1.1 Spacing Criteria
- Quiet reflector appearance with superior 50° optical cutoff
- 2700K – 5000K, 80+ and 90+ CRI options
- Available for New Construction (non-IC), Retrofit (non-IC), IC and Chicago Plenum applications
- Variety of dimming protocol options including 0–10V, DALI, DMX, Lutron Forward Phase, and EcoSystem
- NX Distributed Intelligence™ wired and wireless controls capability available

WET LOCATION

C SA US

ENERGY STAR

BUY AMERICAN SOLUTIONS

See Certification Specifications

RELATED PRODUCTS

- 3" LITEISTRY Family
- 4" LITEISTRY Family
- 6" LITEISTRY Family

CONTROL TECHNOLOGY

NX DISTRIBUTED INTELLIGENCE

SPECIFICATIONS

CONSTRUCTION

- Standard Non-IC. Chicago Plenum, IC and Retrofit options
- New Construction: Painted black durable steel platform with pre-installed bar hangers
- Retrofit: Die cast aluminum mounting ring with 5-axis adjustable junction box
- Retrofit housing allows below ceiling installation without removing existing fixture
- Pre-wired junction box with snap-on covers for easy access
- Snap-in connection from driver compartment allows easy installation
- Light Engine connections use plenum rated (CMP) cable

OPTICS

- Visually pleasing 50° cutoff to source and source image
- The light distribution is free of distracting bright spots or pixelation and the perimeter has a smooth transition
- Optical grade silicone lens integral to light engine
- High purity spun aluminum reflector, self-flanged
- Flush Mount flange option with mud-in ring available
- Large selection of anodized finishes and colors
- Painted cones and flange options available

ELECTRICAL

- Chip-on-board LED with 2 SDCM
- Multiple CCTs, 80+ or 90+ CRI
- Long LED life: L90 at >55,000 hours (TM-21)
- Universal voltage 120V–277V driver, 347V optional
- UL Class 2, inherent short circuit and overload protection, RoHS compliant
- Flicker free 0-10V dimming with 1% or <1% performance
- DALI, DMX, and Lutron Forward Phase and EcoSystem options
- NX or Lutron Vive control options available
- Integral and remote controller and battery pack options available
- Refer to additional spec sheets for information on SpectraSync™ Tunable White or Dim-to-Warm or PowerHUBB™ PoE enabled solutions

INSTALLATION

- Accommodates ceiling thickness up to 2" (SL, ML, HL); up to 1.25" (VL, XL)
- Universal adjustable mounting brackets also accept 0.5" EMT conduit or 1.5" or 0.75" lathing channel (by others) or Prescolite accessory bar hangers (B24 or B6).
- Light Engine/Driver fully serviceable from above or below the ceiling

CERTIFICATIONS

- cCSAus certified to UL 1598
- For ≥70L: Marked spacing required 36" fixture center to center; 36" fixture center to building member; 0.5" above fixture
- Suitable for wet locations, covered ceiling. EM/ EMR: Suitable for damp locations.
- EM/EMR: Certified under UL 924 standard for emergency lighting and power equipment
- Approved for 8 (4 in/4 out) No. 12AWG conductors rated for 90°C through wiring
- ENERGY STAR® certified models available (See list and additional information on page 8)
- This product qualifies as a "designated country construction material" per FAR 52.225-11 Buy American-Construction. Materials under Trade Agreements effective 6/6/2020. See Buy American Solutions.

WARRANTY

- 5 year warranty
- See HLI Standard Warranty for additional information

KEY DATA	
Lumen Range	600-9000
Wattage Range	8-99
Efficacy Range (LPW)	94-104*
Reported Life (Hours)	L90 / >55,000
Input Current (mA)	65-825 (120V)

*Based on Specular, 35K, 80 CRI

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HUBBELL Lighting

prescolite

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

LTR-6RD

LITEISTRY 6" ROUND DOWNLIGHT

ORDERING GUIDE

Example: LTR–6RD–H–SL10L–DM1–LTR–6RD–T–SL35K8MD–S

CATALOG #

HOUSING

LTR-6RD-H –

Aperture/Shape/Function	
LTR-6RD-H	6" Round Downlight New Construction Housing
LTR-6RD-RFH	6" Round Downlight Retrofit Housing [1, 7]
LTR-6RD-RFHW	6" Round Downlight Retrofit Housing (for Wide Diameter) [1, 7]

Lumen Package		Lumen Output	
SL	Standard Lumen	**06L**	600
		10L	1000
		15L	1500
ML	Medium Lumen	**20L**	2000
		25L	2500
		30L	3000
HL	High Lumen	**35L**	3500
		40L	4000
		45L	4500
VL	Very High Lumen	**50L**	5000
		55L	5500
		60L	6000
XL	Extra high Lumen [15]	**70L**	7000
		80L	8000
		90L	9000

Driver Options	
DM1	0-10V Dimming to 1% [13]
DM01	0-10V Dimming to < 1% [3]
DMX	DMX with RDM dimming to < 0.1% [3]
DALI	DALI Dimming to 1% [3]
2DM	Lutron Hi-Lume 2-wire Dimming to 1% (120V Forward Phase only) [3]
EDM	Lutron Hi-Lume EcoSystem Dimming to 1% [3]

Control Options	
NXE	NX Enabled, Dual SmartPorts [4]
NXWE	NX Wireless Enabled [4]
NXWD	NX Wireless Enabled, Dual SmartPorts [4]
LV	Lutron Vive Enabled, 0-10V (requires 0-10V driver)
LVE	Lutron Vive Enabled, EcoSystem, (requires EDM)

Voltage	
Standard 120-277V	
34	347V [8]

Housing Options	
CP	Chicago Plenum [9, 11]
IC	IC rated [10, 11]
EM	Emergency Battery Pack with integral test switch and indicator light [11]
EMR	Emergency Battery Pack with remote test switch and indicator light [11]
DTS	Device Transfer Switch with Dimming Bypass [11, 16]
GTD	Generator Transfer Device [11]
F	Fuse [11]

TRIM

LTR-6RD-T –

Aperture/Shape/Function	
LTR-6RD-T	6" Round Downlight Light Engine/Trim Assembly

Lumen Package	
SL	Standard Lumen
ML	Medium Lumen
HL	High Lumen
VL	Very High Lumen
XL	Extra High Lumen [15]

CCT	
27K	2700K
30K	3000K
35K	3500K
40K	4000K
50K	5000K [2]

CRI	
8	80+CRI
9	90+CRI

Distribution	
NR	Narrow (0.3 SC/18°)
MD	Medium (0.6 SC/37°)
WD	Wide (0.9 SC/59°)
XW	Extra Wide (1.1 SC/76°)

TRIM CONTINUED

–

Reflector Finish	
Finish not applicable with painted reflectors (WC or BC)	
S	Specular
SS	Semi-Specular
MFC	American Matte™
VS	Softglow®
VSS	SoftSheen™

Reflector Color	
Standard Clear	
CG	Champagne Gold
BL	Black
LW	Light Wheat
PW	Pewter
WC	Painted White Cone and Flange
BC	Painted Black Cone and Flange

Flange Color Options	
Standard matches reflector color	
WT	White Flange [5]
BT	Black Flange [5]

Lower Trim Options	
EM	Pre-punched reflector for EM integral test switch and indicator
FM	Flush Mount Mud-in Ring [12]
WF	Wide Flange

Reflector Options	
AM	Antimicrobial Coating [6]

Accessories		
☐	**B24**	Set of two (2) 24" bar hangers for T-bar ceilings [14]
☐	**B6**	Set of two bar hangers for ceiling joist up to 24" centers [14]
☐	**FMR6-R**	Flush Mount Mud-In Ring, 6" Round
☐	**LiteGear**	LiteGear® Inverter, 125VA-250VA
☐	**LPS Series**	LightPower Micro-Inverter, 20VA-55VA
☐	**MOR6-R-WH**	Metal Oversized Ring, 6" Round, White (10" outside diameter)
☐	**MOR6-R-BL**	Metal Oversized Ring, 6" Round, Black (10" outside diameter)
☐	**LTR-SCA6-__**	Sloped Ceiling Adapter, 6", White [17]

Notes:

1 RFH and RFHW available up to 30L; not available with Controls or Housing options.
2 5000K available in 80+ CRI only.
3 2DM, EDM, DMX available in 10L-35L. DM01, DALI not available on >55L.
4 NX requires DM1 driver option, not available on >60L.
5 WT not needed for WC, BT not needed for BC.
6 AM available with WC or Specular Clear (S or SWT). Consult factory for other colors.
7 See line art for compatibility with existing aperture diameters.
8 347V requires DM1 driver option; available 10L - 60L not available with Controls, F, GTD, DTS, EM, EMR.
9 CP available up to 20L; not available with DMX, Controls, or EMR options.
10 IC available up to 20L; not available with Controls options.
11 Housing options (except Fuse) not available in combination.
12 Flush Mount Flange (FM) requires FMR accessory (sold separately).
13 DM1 on >60L is 0-10V to 5% dimming.
14 Not for use with Retroft housings (RFH/RFHW)
15 XL (70L-90L) require marked spacing. See line art for more details.
16 DTS available with DM1, DM01, DALI, or EDM; not available with LVE.
17 Specify slope angle 5°-35° in 5° increments. Not available with RFH/RFHW, EM, WF, or FM options.

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LTR-6RD

LITEISTRY 6" ROUND DOWNLIGHT

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

CONTROLS

NX Distributed Intelligence™ Lighting Controls:

Supports applications in a variety of deployment options- wired, wireless, hybrid. Integrates with and enables a wide array of luminaires including those with SpectraSync™ Color Tuning Technology.

NX DISTRIBUTED™ INTELLIGENCE

NX INTEGRATED CONTROLS REFERENCE								
NX Option	Sensor	Networkable	Scheduling	Occupancy	Daylight Harvesting	0–10V Dimming	On/off Control	Bluetooth® App Programming
NX Networked – Wired								
NXE	N/A	Yes	Yes	No	No	Yes	Yes	Requires NXBTC/R[1]
NX Networked – Wireless								
NXWE[2]	N/A	Yes	Yes	No	No	Yes	Yes	No[3]
NX Networked – Wired/Wireless								
NXWD	N/A	Yes	Yes	No	No	Yes	Yes	Requires NXBTC/R[1,3]

1 NXBTC/R needs to be plugged into an available NX SmartPort™ on the fixture network

2 Programming via App requires factory assistance

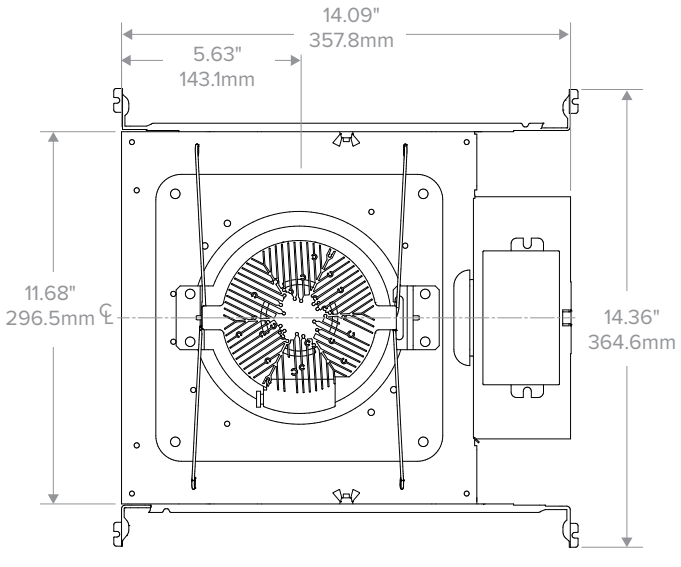
3 To program NXWE option, need to consult factory. If connected to an area controller, programming can be done from that

DIMENSIONS

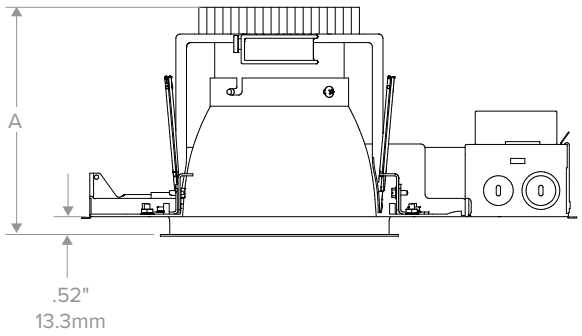
Lumen Package	"A"
06L-15L	5.90" (149.9mm)
20L-30L	6.68" (169.7mm)
35L-40L	7.86" (199.6mm)
50L-60L	9.04" (229.6mm)

Dimensional Data		
Aperture		5.75" (146.1mm)
Flange:	Standard	7.00" (177.8mm)
	Flush Mount	6.54" (166.0mm)
Ceiling Cutout:	Standard	6.50" (165.1mm)
	Flush Mount	6.75" (171.5mm)
Ceiling Thickness:	Standard or w/SCA 5-20° slope	0.50" to 2.00" (12.7mm to 50.8mm)
	With SCA 25-35° slope	0.50" to 1.75" (12.7mm to 44.6mm)

SCA Sloped Ceiling Adapter accessory available, see LTR-SCA specification sheet and installation instructions for dimensional data and other details.



Top View



LTR-6RD-H (06L - 60L) New Construction

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LTR-6RD

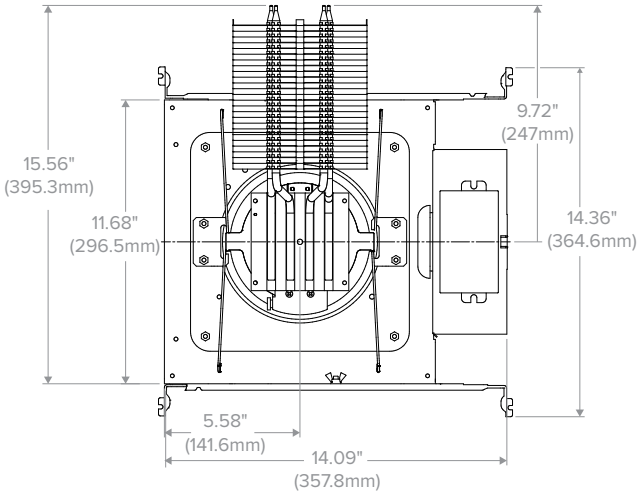
LITEISTRY 6" ROUND DOWNLIGHT

DATE: LOCATION:

TYPE: PROJECT:

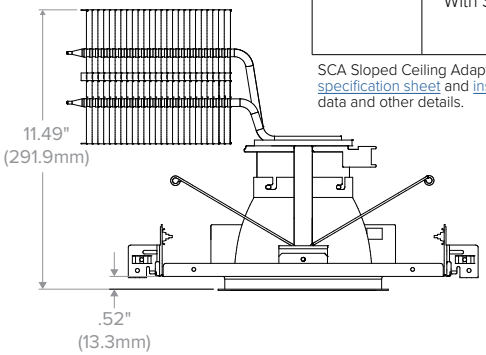
CATALOG #:

DIMENSIONS CONTINUED



Top View

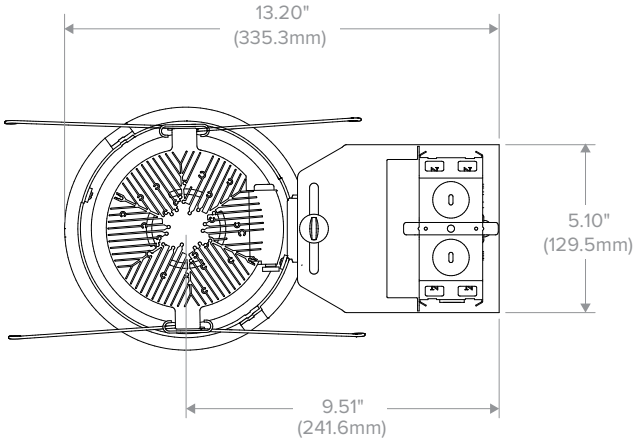
Marked spacing required:
36" fixture center to center;
36" center to building member;
0.50" above fixture

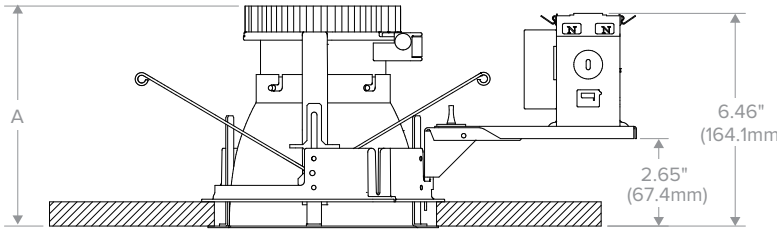


Dimensional Data		
Aperture		5.75" (146.1mm)
Flange:	Standard	7.00" (177.8mm)
	Flush Mount	6.54" (166.0mm)
Ceiling Cutout:	Standard	6.50" (165.1mm)
	Flush Mount	6.75" (171.5mm)
Ceiling Thickness:	Standard or w/SCA 5-20° slope	0.50" to 2.00" (12.7mm to 50.8mm)
	With SCA 25-35° slope	0.50" to 1.75" (12.7mm to 44.6mm)

SCA Sloped Ceiling Adapter accessory available, see LTR-SCA specification sheet and installation instructions for dimensional data and other details.

LTR-6RD-H (70L - 90L) New Construction





Housing Compatibility Guide			
Existing Frame Opening**		Use Housing	Use Flange Option
MIN	MAX		
6.25" (156.3mm)	6.50" (165.1mm)	-RFH	(Standard)
6.63" (168.4mm)	6.88" (172mm)	-RFHW	WF

**Measure the existing plaster frame opening at its narrowest point

Dimensional Data		
Aperture		5.75" (146.1mm)
Flange:	Standard	7.00" (177.8mm)
	Flush Mount	6.54" (166.0mm)
	Wide (WF)	7.75" (196.9mm)
Ceiling Cutout:	Standard	6.50" (165.1mm)
	Flush Mount	6.75" (171.5mm)
Ceiling Thickness:		0.50" to 2.00" (12.7mm to 50.8mm)

Lumen Package	"A"
06L-15L	5.90" (149.9mm)
20L-30L	6.68" (169.7mm)

LTR-6RD-RFH/-RFHW

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LTR-6RD

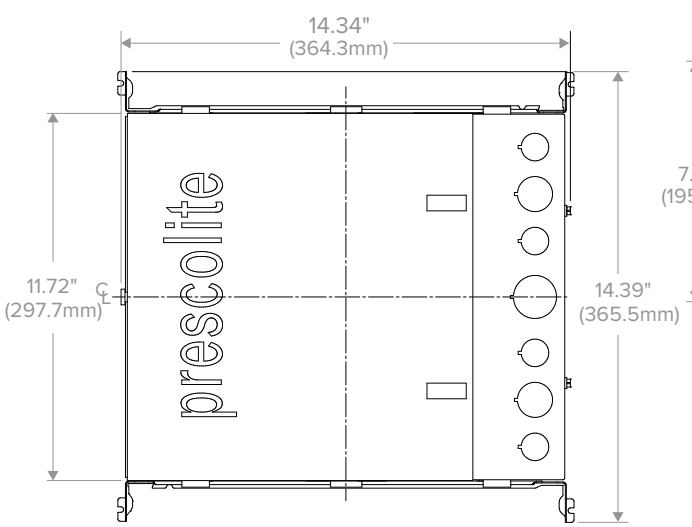
LITEISTRY 6" ROUND DOWNLIGHT

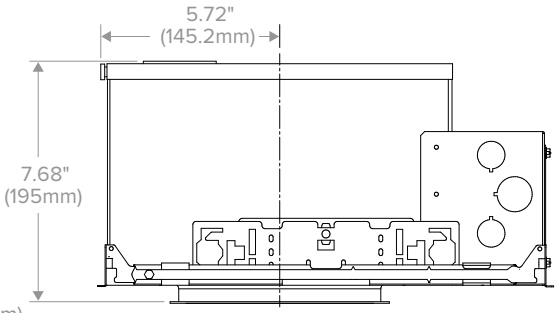
DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

DIMENSIONS CONTINUED





LTR-6RD-IC

Dimensional Data		
Aperture		5.75" (146.1mm)
Flange:	Standard	7.00" (177.8mm)
	Flush Mount	6.54" (166.0mm)
Ceiling Cutout:	Standard	6.50" (165.1mm)
	Flush Mount	6.75" (171.5mm)
Ceiling Thickness:	Standard or w/SCA 5-20° slope	0.50" to 2.00"
	With SCA 25-35° slope	0.50" to 1.75" (12.7mm to 44.6mm)

SCA Sloped Ceiling Adapter accessory available, see LTR-SCA specification sheet and installation instructions for dimensional data and other details.

PHOTOMETRY

LTR-6RD-H-ML20L-DM1 / LTR-6RD-T-ML35K8NRS

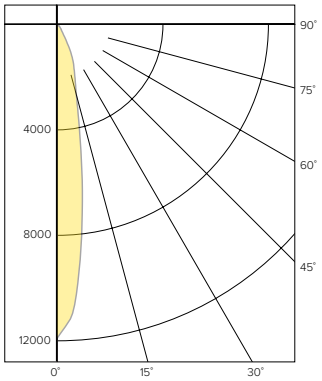
LUMINAIRE DATA

Test No.	**19.00588**
Description	**2000 lm, Narrow, 3500K, 80 CRI**
Delivered Lumens	**2355**
Watts	**22.6W**
Efficacy	**104.0**
Mounting	**Recessed**
Spacing Criterion	**0.3**
Beam Angle (FWHM)	**18**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
0-40	2290	97.2
0-60	2355	100.0
0-90	2355	100.0
0-180	2355	100.0

POLAR GRAPH



CANDELA DISTRIBUTION

Degree	Candela
0	11881
5	9399
15	2776
25	1236
35	255
45	74
55	0
65	0
75	0
85	0
90	0

LUMINANCE DATA*

Vertical Angle	Average
45°	6247
55°	0
65°	0
75°	0
85°	0

*Candela/Square Meter

IES FILE

LTR-6RD-H-ML20L-DM1 / LTR-6RD-T-ML35K8MDS

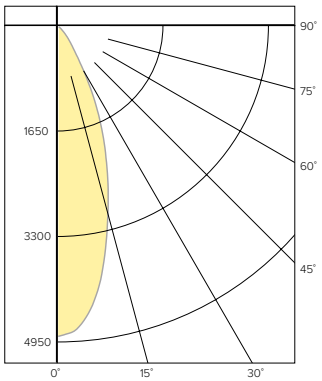
LUMINAIRE DATA

Test No.	**19.00587**
Description	**2000 lm, Medium, 3500K, 80 CRI**
Delivered Lumens	**2265**
Watts	**22.6W**
Efficacy	**100.0**
Mounting	**Recessed**
Spacing Criterion	**0.6**
Beam Angle (FWHM)	**37**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
0-40	2171	95.9
0-60	2262	99.9
0-90	2265	100.0
0-180	2265	100.0

POLAR GRAPH



CANDELA DISTRIBUTION

Degree	Candela
0	4851
5	4619
15	3007
25	1450
35	386
45	99
55	6
65	2
75	1
85	0
90	0

LUMINANCE DATA*

Vertical Angle	Average
45°	8357
55°	624
65°	282
75°	231
85°	0

*Candela/Square Meter

IES FILE

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HUBBELL Lighting

prescolite

LTR-6RD

LITEISTRY 6" ROUND DOWNLIGHT

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

PHOTOMETRY CONTINUED

LTR-6RD-H-ML20L-DM1 / LTR-6RD-T-ML35K8WDS

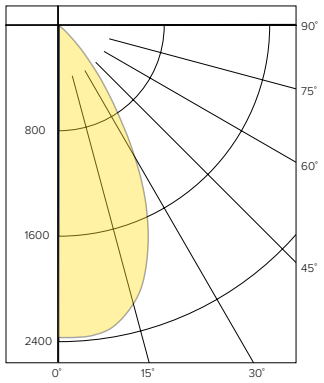
LUMINAIRE DATA

Test No.	**19.00585**
Description	**2000 lm, Wide, 3500K, 80 CRI**
Delivered Lumens	**2180**
Watts	**22.6W**
Efficacy	**96.1**
Mounting	**Recessed**
Spacing Criterion	**0.9**
Beam Angle (FWHM)	**59**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
0-40	2014	92.4
0-60	2176	99.8
0-90	2180	100.0
0-180	2180	100.0

POLAR GRAPH



CANDELA DISTRIBUTION

Degree	Candela
0	2368
5	2371
15	2189
25	1591
35	726
45	177
55	10
65	3
75	1
85	0
90	0

LUMINANCE DATA*

Vertical Angle	Average
45°	14942
55°	1041
65°	424
75°	231
85°	0

*Candela/Square Meter

IES FILE

LTR-6RD-H-ML20L-DM1 / LTR-6RD-T-ML35K8XWS

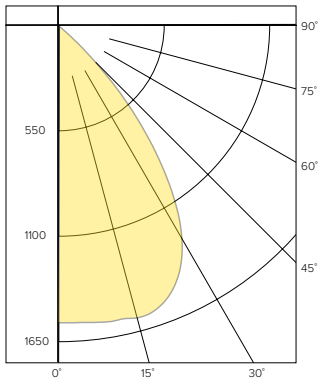
LUMINAIRE DATA

Test No.	**19.00586**
Description	**2000 lm, Extra Wide, 3500K, 80 CRI**
Delivered Lumens	**2139**
Watts	**22.7W**
Efficacy	**94.4**
Mounting	**Recessed**
Spacing Criterion	**1.1**
Beam Angle (FWHM)	**76**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
0-40	1875	87.7
0-60	2134	99.8
0-90	2139	100.0
0-180	2139	100.0

POLAR GRAPH



CANDELA DISTRIBUTION

Degree	Candela
0	1547
5	1552
15	1576
25	1461
35	1007
45	301
55	9
65	3
75	1
85	0
90	0

LUMINANCE DATA*

Vertical Angle	Average
45°	25409
55°	937
65°	424
75°	231
85°	0

*Candela/Square Meter

IES FILE

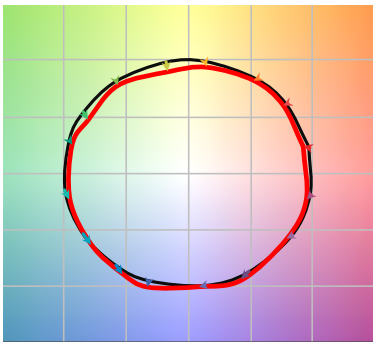
LUMEN MULTIPLIER

Option	27K8	30K8	35K8	40K8	50K8	27K9	30K9	35K9	40K9
Multiplier	0.94	0.98	1.00	1.01	1.02	0.81	0.84	0.85	0.85

Photometrics are published below at a nominal 3500 Kelvin, 80+ CRI. This table may be used to approximate the lumen values at different Kelvin temperatures. Power consumption would stay the same.

TM-30 DATA

COLOR VECTOR GRAPHIC 3500K, 90 CRI



Reference Illuminant — Test Source

COLOR DISTORTION GRAPHIC 3500K, 90 CRI

TEST RESULTS - 3500K		
Value	80+ CRI	90+ CRI
R_f	84	88
R_g	95	95
CCT (K)	3411	3419
D_{UV}	0.0015	0.0042
x	0.4120	0.4147
y	0.3974	0.4052
CIE R_a	84	93
CIE R_9	11	62

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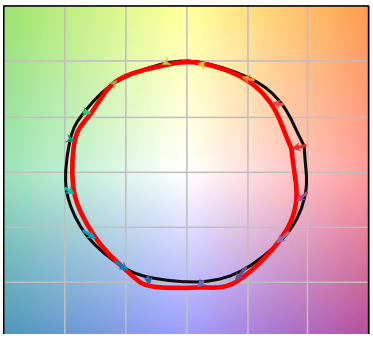
LTR-6RD

LITEISTRY 6" ROUND DOWNLIGHT

TM-30 DATA CONTINUED

COLOR VECTOR GRAPHIC
3500K, 80 CRI



Reference Illuminant — Test Source

COLOR DISTORTION GRAPHIC
3500K, 80 CRI

ELECTRICAL DATA

DRIVER DATA		
Input Voltage	120-277 V	347 V
Input Frequency	50/60 Hz	50/60 Hz
Power Factor	≥0.90	≥0.90
THD	<20%	<20%
EMI Filtering (FCC 47 CFR Part 15)	Class A	Class A

* Values for DM1 option shown, values for other dimming options may vary.

WATTAGE DATA		
Lumen Output	Nominal Lumens	WATTAGE
06L	600	8
10L	1000	12
15L	1500	19
20L	2000	23
25L	2500	28
30L	3000	35
35L	3500	43
40L	4000	52
45L	4500	55
50L	5000	49
55L	5500	54
60L	6000	61
70L	7000	72
80L	8000	85
90L	9000	99

* Wattage may vary based on configuration and options selected

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HUBBELL Lighting

LTR-6RD

LITEISTRY 6" ROUND DOWNLIGHT

ADDITIONAL INFORMATION

DIMMING COMPATIBILITY CHART		
Dimming Driver	**Manufacturer**	**Web Link**
DM1 /DM01	Lutron DVTV	http://bit.ly/11jSvZg
DM1	Leviton AWRMG-7xx, AWSMG-7xx, AWSMT-7xx	http://bit.ly/1BJn2R9
EDM	Lutron	http://bit.ly/1vtjHAl
2DM	Lutron	http://bit.ly/1S4WjXK

DMX

See instruction sheet on www.prescolite.com for connection & installation information.

Central Inverters

For full fixture output in back-up mode, we recommend you visit www.dual-lite.com for your Central Lighting Inverter options. Please contact your local Hubbell representative for any assistance with proper sizing and loading of your inverter selection. Central lighting inverters must be ordered separately.
LiteGear: www.dual-lite.com/products/litegear_lg_series
LPS Series: www.dual-lite.com/products/lps

ENERGY STAR®

For a list of certified models, click on the ENERGY STAR® MODELS link or visit www.energystar.gov.

ENERGY STAR MODELS

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LITECONTROL
making light work™

4L-R-D L1

MOD™ 4 LED Recessed Direct

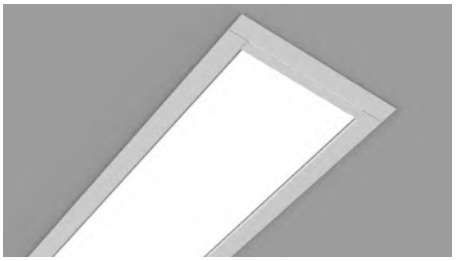
Fixture Type:

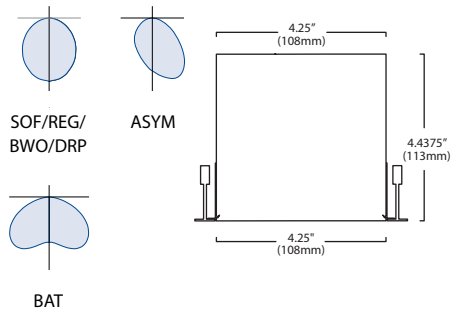
Project Name:

Ordering Guide

Feature	Code	Options	Description
Series		4L	MOD
Ceiling Type*		DW PT LG NG SS	Drywall Drywall with plaster trim (trimless finish) 15/16 Grid 9/16 Grid 9/16 Screw Slot *Ceiling Type cannot be retrofitted in the field
Fixture distribution		D AD	Direct Asymmetric Direct
Row length (in feet)		___'	Enter in foot increments. Note fixture lengths below.
Row length adder (in inches)		.3 .6 .9	Row length +3" Row length +6" Row length +9" *Excludes Individual Grid Mounts
Max length in row		02 03 04 05 06 08	2', 609mm 3', 914mm 4', 1219mm 5', 1524mm 6', 1829mm 8', 2438mm
Downlight diffuser		SOF REG BWO ASYM BAT DRP	Soft Diffuse Lens Regressed Diffuse Lens* Blade Baffle with Overlay* Asymmetric Diffuser Lens*/** Batwing Lens Drop Lens*+ *Not available with Patterns **Must be ordered with AD
Finish/Color		C1 C2 C3 C4 C5 C6 CC	Matte White (Default) Textured Matte White Light Silver Machined Aluminum Carbon Black Textured Camera Black Custom Color
Color temperature		27K 30K 35K 40K 50K 27K9 30K9 35K9 40K9 50K9 2230TD 2750T 2765T	2700K+ 3000K 3500K 4000K 5000K+ 2700K, 90 CRI+ 3000K, 90 CRI 3500K, 90 CRI 4000K, 90 CRI 5000K, 90 CRI+ 2200K-3000K SpectraSync™ Dim-to-Warm* 2700K-5000K SpectraSync™ Tunable White* 2700K-6500K SpectraSync™ Tunable White* *Must be ordered with D05 Driver option; excludes 2' lengths and patterns
Direct output/ft *(specifiable in 50 lumens/ft increments)*		D030 D125	300 (not available in 2') 1250

+ Additional lead time may be applicable. Contact factory.





Key Features

- Variable Intensity technology provides specifiable lumen output/wattage
- End cap design eliminates visible diffuser seams/gaps
- 2 SDCM color variation

Performance

Nomenclature	Lumens/ft	W/ft	Efficacy
D030	300	2.6	118
D035	350	3.0	118
D040	400	3.4	118
D045	450	3.8	118
D050	500	4.2	118
D055	550	4.7	117
D060	600	4.8	117
D065	650	5.6	116
D070	700	6.1	116
D075	750	6.5	115
D080	800	7.0	115
D085	850	7.5	113
D090	900	7.9	113
D095	950	8.5	112
D100	1000	9.0	112
D105	1050	9.4	111
D110	1100	10.0	110

(wattage may vary up to 5% from published)

Quick Find litecontrol.com **4L-R-D**

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HUBBELL Lighting

Ordering Guide (continued)

Driver		NDM	Non Dimming
		D05	5% Dimming, 0-10V*
		D01	1% Dimming, 0-10V
		DS1	Soft-Start 1% Dimming, 0-10V
		D00	Dim-to-off (1%), 0-10V
		DS0	Soft-Start Dim-to-off (1%), 0-10V
		LEC	Hi-lume 1% EcoSystem LED driver
		DALI	DALI+
		DALIP	Powered DALI (2.0)+
			*Must be ordered with 2230TD, 2750T or 2765T Option
Circuiting		1C	1 Circuit
Voltage		UNV	Universal Voltage (120V through 277V)
		347	347 Volt*+
			*Excludes Emergency Battery Pack 'EF' Option. Excludes DALI, DALIP and Lutron (LEC) Dimming Drivers

Optional Features	Code	Options	Description
Nightlight		NL	Nightlight Circuit Required. Enter quantity. 2NL = 2 nightlight circuits/row
Emergency		EF	10W Emergency Battery Backup Enter quantity. 2EF = 2 Emergency batteries/row. See Details for restrictions.
Thru-wiring		W1	No Thru Wire
		W2	Provide Normal and Emergency/Nightlight Thru Wiring*
		W3	Provide Normal Thru Wiring Only
			*Only applicable when specified with Emergency/Nightlight
Patterns+*		C90L	Illuminated 90° corner
		C120L	Illuminated 120° corner
		C135L	Illuminated 135° corner
			*Contact Factory for pattern configurations. Approval drawings required. See page 5.
Chicago Environmental Air Modification		CCEA	Chicago Environmental Air Modification

Control Options	Code	Options	Description
NX*+		NXE	NX Enabled, Dual SmartPorts
		NXWE	NX Wireless Enabled
		NXES	NX Enabled, Dual SmartPorts, PIR Occupancy Sensor, Dimming Daylight Harvesting
		NXS	NX, PIR Occupancy Sensor, Dimming Daylight Harvesting (standalone)
		NXSW	NX Wireless, PIR Occupancy Sensor, Dimming Daylight Harvesting
		NXWD	NX Wireless Enabled, Dual SmartPORTs
		NXSWD	NX Wireless, PIR Occupancy Sensor, Dimming Daylight Harvesting, Dual SmartPORTs
			*Not available for row mounting; Only available with 0-10V Driver options; Contact factory for Length restrictions
Sensors+		SD1	Daylight Sensor Required. Enter quantity 2SD1=2 daylight sensors/row
		SO1	Occupancy Sensor Required. Enter quanity. 2SO1= 2 occupancy sensors/row
		SZ1	Zigbee Radio Module Required. Enter quantity. 2SZ1=2 radio modules/row Radio controls up to 10 drivers. Must be ordered with D00.

+ Additional lead time may be applicable. Contact factory.

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Output Restrictions

Driver options listed below are not available for the output and length as shown

Restrictions-Direct		Output
		300
Length (feet)	2	Not Available

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HUBBELL Lighting

4L-R-D

MOD™ 4 LED Recessed Direct

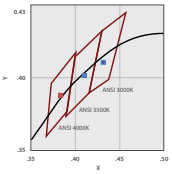
Details

Construction:
Die-formed and welded steel. Wiring knockouts in top.
End caps- Die formed steel. Install from below via magnetic interface.
Overlaps diffuser at each fixture end to eliminate gaps/LED visibility.

Downlight diffuser:
SOF-Soft diffuse acrylic lens.
REG- ½" regressed softglo lens with painted steel inserts. Output multiplier (.77).
BWO- White blade baffle with softglo lens overlay. Output multiplier (.70).
ASYM- Highly transmissive diffuse acrylic lens with linear prisms.
BAT- Highly transmissive diffuse acrylic lens with linear prisms.
DRP- ½" protruding soft diffuse lens.
Please see the installation instruction sheets for more details.

Finish/Color:
Visit www.litecontrol.com/finishes for details.

CCT:
27K-2700K output multiplier (0.95)
30K-3000K output multiplier (0.98)
35K-3500K output multiplier (1.00)*
40K-4000K output multiplier (1.03)
50K-5000K output multiplier (1.05)
27K9-2700K 90 CRI output multiplier (0.83)
30K9-3000K 90 CRI output multiplier (0.85)
35K9-3500K 90 CRI output multiplier (0.88)
40K9-4000K 90 CRI output multiplier (0.90)
50K9-5000K 90 CRI output multiplier (0.93)
*Scale all values from 35K



Color Variation:
2 step MacAdam ellipse

Output (VI technology):
Variable Intensity (VI) technology allows precise specification of fixture output/wattage. Fixture will be programmed and labeled to specification. Specify each in 50 lumen increments/ft within the below range:

	Lumens/ft	Nomenclature
Direct		
Min:	300	D030
Max:	1250	D125

Field Accessibility:
LED boards and drivers can be accessed and removed from fixture, while installed. LED boards can be replaced either individually or as part of 2' module.

Circuiting:
1C (1 Circuit) Fixture wired for a single circuit.

Emergency:
EF - 10W battery powered driver.
Provides a minimum of 90 minutes of emergency lighting.
Inverter-Compatible. Provided by others.
Available in 4'+ fixtures.

Driver:

NDM:	Non-dimming. Fixture will be wired for fixed light output.
D05:	Osram 100%-5% dimming range, Fixture will be wired for low voltage 0-10V dimming control. Only applicable if either 2230TD, 2750T or 2765T is selected.
D01:	100%-1% dimming range. Fixture will be wired for low voltage 0-10V dimming control.
DS1:	Soft-Start 100%-1% dimming range. Fixture will be wired for low voltage 0-10V dimming control.
D00:	Dim-to-off 100%-1% Dimming range. Fixture will be wired for low voltage 0-10V dimming control.
DS0:	Soft-Start Dim-to-off 100%-1% dimming range. Fixture will be wired for low voltage 0-10V dimming control.
LEC:	Hi-Lume 1% EcoSystem LED Driver with Soft-on, Fade-to-Black dimming technology.
DALI:	DALI compatible.
DALIP:	Self-Powered DALI bus (e.g. DEXAL)

*See driver limitations in Output Restrictions above.

Nightlight:
See separate LC-Nightlight spec sheet for additional details.

NX Distributed Intelligence: NX DISTRIBUTED INTELLIGENCE™
Supports indoor and outdoor applications, wired, wireless and hybrid networked NX lighting control deployments and enables emerging applications such as Hubbell Lighting's SpectraSync™ color tuning technology.
See separate NX™ Application Guide for additional details.
See Hubbell Controls Solution NX Brochure.

Sensors:

SD1:	Daylight sensor(Wattstopper part #FD301). Installs between diffusers.
SO1:	Occupancy sensor(Wattstopper FS-305 with FS-L6 lens). Installs between difffusers.
SZ1:	Zigbee radio module(Osram Sylvania part #ZBHA-CLM-DIM). Installs in knockout.
NX:	NX Sensors installs between diffusers.

See separate Control Options Guide for additional details.

SpectraSync™ Color Tuning Technology: SpectraSync™ Color Tuning Technology
Control your space based on the needs of the application, specific activities throughout the day and preferences of the occupants with two distinct SpectraSync™ Color Tuning Technology.

Dim to Warm:	Dim to Warm mimics the familiar warming effect that occurs with traditional incandescent sources as they are dimmed. (Available with 2200K-3000K).
Tunable White:	Tunable White offers users the ability to tailor CCT to their personal preference, enhancing task visibility, material and colors or the aesthetics of the space. (Available with 2700K-5000K or 2700K-6500K).

See separate SpectraSync™ Tech Sheet for additional details.
See separate NX™ Solutions Guide for additional details.

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4L-R-D

MOD™ 4 LED Recessed Direct

Details (continued)

Patterns:
90°, 120°, 135° illuminated corners available. One piece construction, ready to install, with diffusers that match adjoining fixtures. Corner system connectors must be used to form patterns. The length of each outside or inside lighted corner is 12".

Rated Life (LED Board):
Tested in accordance to LM79-2008 & derived from EPA TM-21 calculator
L70: 280,000 (calculated per TM-21 extrapolated curve)
L70: >61,000 (reported per TM-21/LM80 6x's limitation)
L90: 72,000 (calculated per TM-21 extrapolated curve)
L90: >61,000 (reported per TM-21/LM80 6x's limitation)

Thru wiring:
See separate LC-Thruwire spec sheet for additional details.

Fixture Mounting:
PT: Continuous spackle trim with beaded edge welded to housing. Spackle trim allows plaster coat up to fixture edge for clean ceiling appearance.
LG/NG/SS: Side rails provide continuous mounting, lateral spacing between T-bars and allows clearance for T-bar supporting wire. For Tegular grid mount, fixture will sit level with the T-bar.
DW: Side rails allow installation into drywall slot. Visible flange is located on all 4 sides of fixture

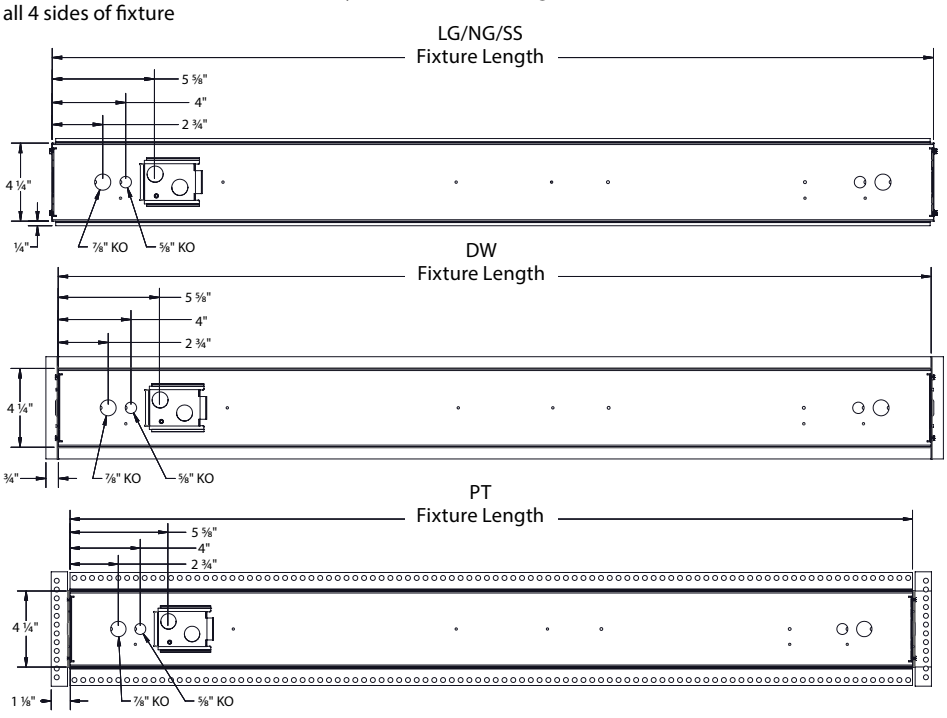
Rated Life (Driver):
Standard = 100,000 hours
Lutron = 50,000 hours

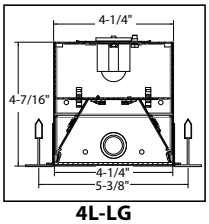
Fixture weight:
3 lbs/ft.

Ratings:
CSA listed for damp locations. IBEW. AF of L. UL924. IC Rated.
This product qualifies as a "designated country construction material" per FAR 52.225-11 Buy American-Construction. Materials under Trade Agreements effective 8/14/2020.
See Buy American Act Solutions. Contact factory forconfigurations including SpectraSync, Emergency Battery, NX, or sensors.

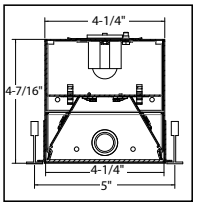
BUY AMERICAN SOLUTIONS
See Certification Specifications

Warranty:
5 years. See www.litecontrol.com for details.

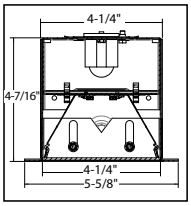




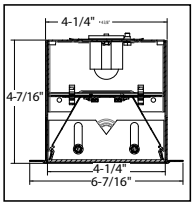
4L-LG



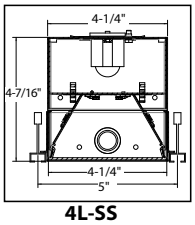
4L-NG



4L-DW



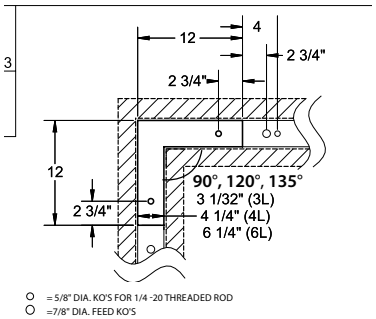
4L-PT



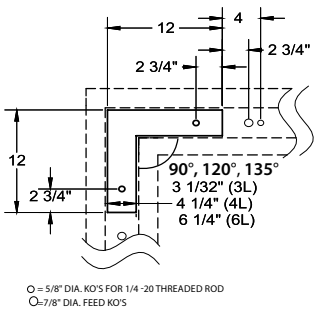
4L-SS

Patterns:

Drywall



Grid



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4L-R-D

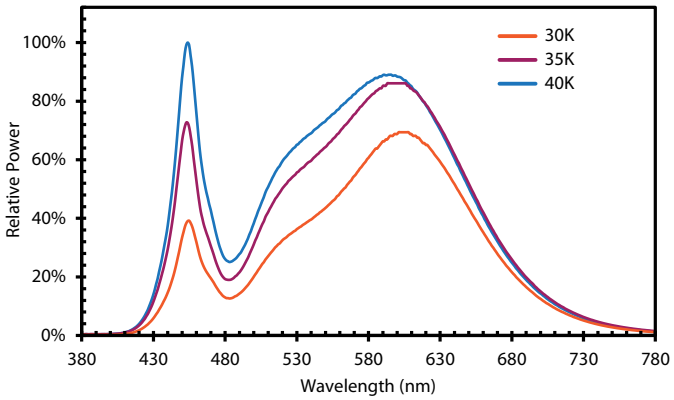
MOD™ 4 LED Recessed Direct

Details (continued)

Color Characteristics:

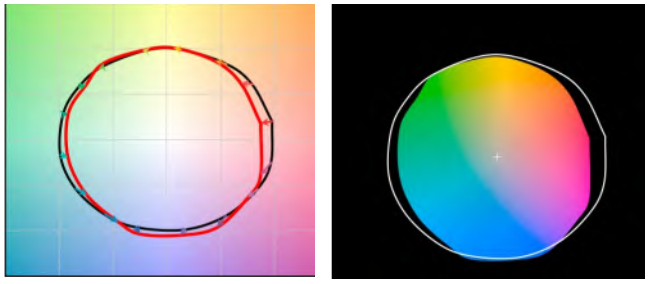
Value	Ordering Code		
	30K	35K	40K
Rf	83	82	82
Rg	96	96	96
CCT (K)	3009	3494	3975
Duv	-0.0009	-0.0004	-0.0003
x	0.435	0.4052	0.3814
y	0.4012	0.3898	0.3768
CIE Ra	83	83	84

Spectral Distribution:

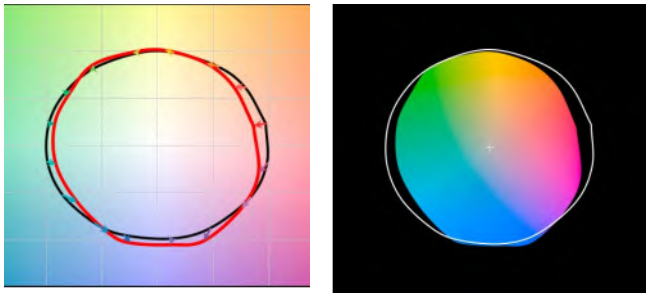


Color Vector Graphic:

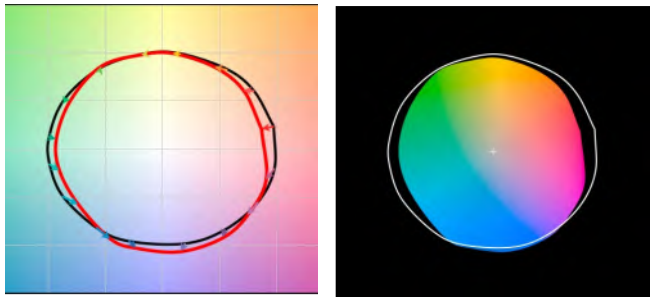
30K:



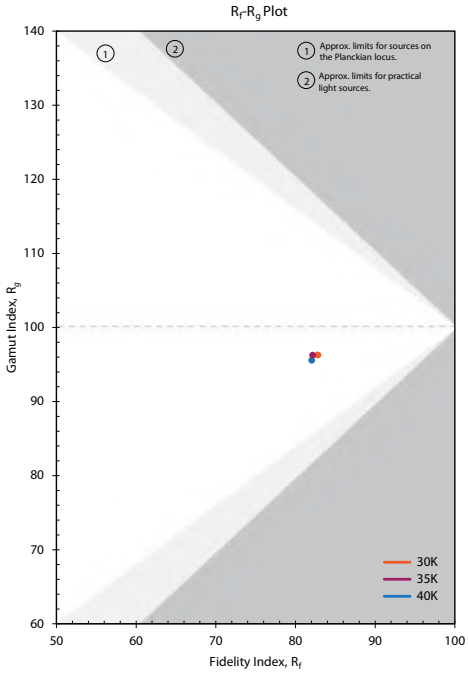
35K:



40K:



Color Gamut/Fidelity Plot



CRI:
80 minimum

CCT	CRI	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
30K	83	82	91	97	81	82	89	84	62	13	79	79	69	84	99
35K	83	81	89	95	81	81	85	86	65	13	73	79	62	83	97
40K	84	82	90	94	82	82	85	87	68	17	74	80	60	84	97

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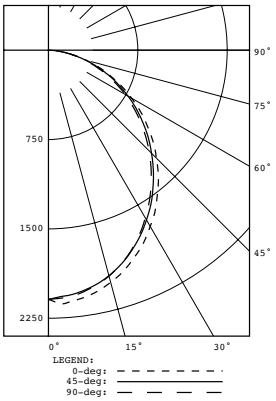
4L-R-D

MOD™ 4 LED Recessed Direct

Photometry

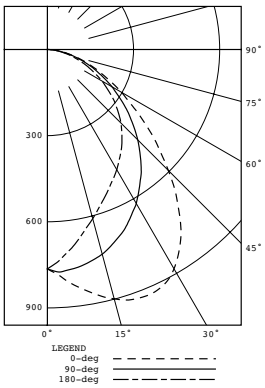
Fixture: 4L-R-D-XX-XX-SOF-CX-35K-D100
CCT: 3500K
Output: D100
Nominal lumens: 1000 lumens/ft
Efficacy: 112 lm/W
Test report: 4L-R-D-04-SOF-X-CX-35K-D100.IES



Zonal Lumens

Zone	Lumens	Lamp %
0-40	1885.8	47.1%
0-60	3214.6	80.4%
0-90	4000.1	100.0%
90-180	0.0	0.0%
0-180	4000.1	100.0%

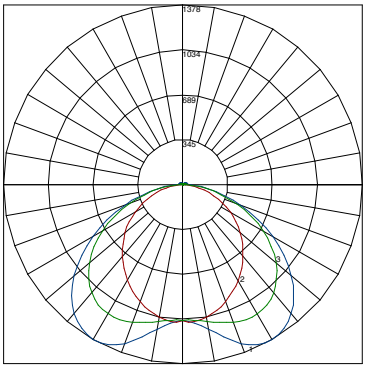
Fixture: 4L-R-AD-XX-XX-ASYM-CX-35K-D050
CCT: 3500K
Output: D050
Nominal lumens: 500 lumens/ft
Efficacy: 124 lm/W
Test report: 4L-R-AD-XX-XX-ASYM-CX-35K-D050.IES



Zonal Lumens

Zone	Lumens	Lamp %
0-40	982	48.7%
0-60	1658	82.3%
0-90	2016	100.0%
90-180	0	0.0%
0-180	2016	100.0%

Fixture: 4L-X-D-04-BAT-CX-35K-D100
CCT: 3500K
Output: D100
Nominal lumens: 1000 lumens/ft
Efficacy: 111 lm/W
Test report: 4L-X-D-04-BAT-CX-35K-D100.IES



Legend:
0-deg: Blue
45-deg: Green
90-deg: Red

Zonal Lumens

Zone	Lumens	Lamp %
0-40	1625.84	40.64
0-60	3056.77	76.42
0-90	3948.2	98.70
90-180	51.97	1.30
0-180	4000.17	100.00

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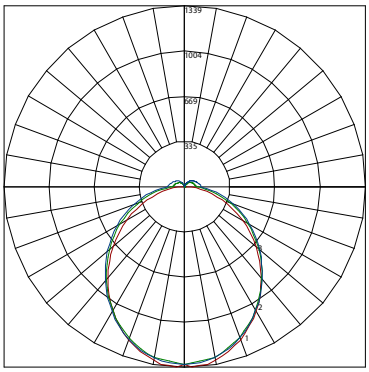
Photometry (continued)

Fixture: 4L-X-D-04-DRP-CX-35K-D100
CCT: 3500K
Output: D100
Nominal lumens: 1000 lumens/ft
Efficacy: 110 lm/W
Test report: 4L-X-D-04-DRP-CX-35K-D100.IES



Legend:
0-deg: Blue
45-deg: Green
90-deg: Red

Zonal Lumens

Zone	Lumens	Lamp %
0-40	1613.08	40.60
0-60	2797.69	70.50
0-90	3677.99	92.70
90-180	291.34	7.30
0-180	3969.32	100.00

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HUBBELL Lighting

LITECONTROL
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4L-R-D L1

MOD™ 4 LED Recessed Direct

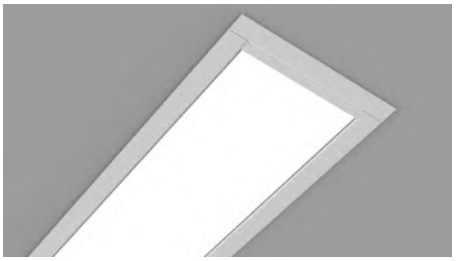
Fixture Type:

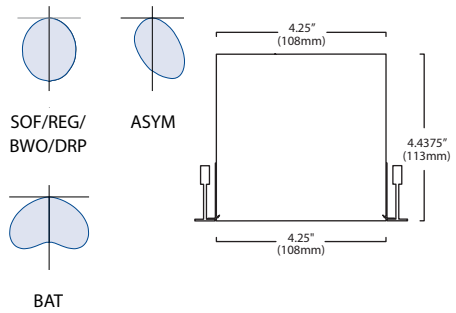
Project Name:

Ordering Guide

Feature	Code	Options	Description
Series		4L	MOD
Ceiling Type*		DW	Drywall
		PT	Drywall with plaster trim (trimless finish)
		LG	15/16 Grid
		NG	9/16 Grid
		SS	9/16 Screw Slot
			*Ceiling Type cannot be retrofitted in the field
Fixture distribution		D	Direct
		AD	Asymmetric Direct
Row length (in feet)		___'	Enter in foot increments. Note fixture lengths below.
Row length adder (in inches)		.3	Row length +3"
		.6	Row length +6"
		.9	Row length +9"
			*Excludes Individual Grid Mounts
Max length in row		02	2', 609mm
		03	3', 914mm
		04	4', 1219mm
		05	5', 1524mm
		06	6', 1829mm
		08	8', 2438mm
Downlight diffuser		SOF	Soft Diffuse Lens
		REG	Regressed Diffuse Lens*
		BWO	Blade Baffle with Overlay*
		ASYM	Asymmetric Diffuser Lens*/**
		BAT	Batwing Lens
		DRP	Drop Lens*+
			*Not available with Patterns
			**Must be ordered with AD
Finish/Color		C1	Matte White (Default)
		C2	Textured Matte White
		C3	Light Silver
		C4	Machined Aluminum
		C5	Carbon Black
		C6	Textured Camera Black
		CC	Custom Color
Color temperature		27K	2700K+
		30K	3000K
		35K	3500K
		40K	4000K
		50K	5000K+
		27K9	2700K, 90 CRI+
		30K9	3000K, 90 CRI
		35K9	3500K, 90 CRI
		40K9	4000K, 90 CRI
		50K9	5000K, 90 CRI+
		2230TD	2200K-3000K SpectraSync™ Dim-to-Warm*
		2750T	2700K-5000K SpectraSync™ Tunable White*
		2765T	2700K-6500K SpectraSync™ Tunable White*
			*Must be ordered with D05 Driver option; excludes 2' lengths and patterns
Direct output/ft *(specifiable in 50 lumens/ft increments)*		D030	300 (not available in 2')
		D125	1250

+ Additional lead time may be applicable. Contact factory.





Key Features

- Variable Intensity technology provides specifiable lumen output/wattage
- End cap design eliminates visible diffuser seams/gaps
- 2 SDCM color variation

Performance

Nomenclature	Lumens/ft	W/ft	Efficacy
D030	300	2.6	118
D035	350	3.0	118
D040	400	3.4	118
D045	450	3.8	118
D050	500	4.2	118
D055	550	4.7	117
D060	600	4.8	117
D065	650	5.6	116
D070	700	6.1	116
D075	750	6.5	115
D080	800	7.0	115
D085	850	7.5	113
D090	900	7.9	113
D095	950	8.5	112
D100	1000	9.0	112
D105	1050	9.4	111
D110	1100	10.0	110

(wattage may vary up to 5% from published)

Quick Find litecontrol.com **4L-R-D**

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HUBBELL Lighting

Ordering Guide (continued)

Driver		NDM	Non Dimming
		D05	5% Dimming, 0-10V*
		D01	1% Dimming, 0-10V
		DS1	Soft-Start 1% Dimming, 0-10V
		D00	Dim-to-off (1%), 0-10V
		DS0	Soft-Start Dim-to-off (1%), 0-10V
		LEC	Hi-lume 1% EcoSystem LED driver
		DALI	DALI+
		DALIP	Powered DALI (2.0)+
			*Must be ordered with 2230TD, 2750T or 2765T Option
Circuiting		1C	1 Circuit
Voltage		UNV	Universal Voltage (120V through 277V)
		347	347 Volt*+
			*Excludes Emergency Battery Pack 'EF' Option. Excludes DALI, DALIP and Lutron (LEC) Dimming Drivers

Optional Features	Code	Options	Description
Nightlight		NL	Nightlight Circuit Required. Enter quantity. 2NL = 2 nightlight circuits/row
Emergency		EF	10W Emergency Battery Backup Enter quantity. 2EF = 2 Emergency batteries/row. See Details for restrictions.
Thru-wiring		W1	No Thru Wire
		W2	Provide Normal and Emergency/Nightlight Thru Wiring*
		W3	Provide Normal Thru Wiring Only
			*Only applicable when specified with Emergency/Nightlight
Patterns+*		C90L	Illuminated 90° corner
		C120L	Illuminated 120° corner
		C135L	Illuminated 135° corner
			*Contact Factory for pattern configurations. Approval drawings required. See page 5.
Chicago Environmental Air Modification		CCEA	Chicago Environmental Air Modification

Control Options	Code	Options	Description
NX*+		NXE	NX Enabled, Dual SmartPorts
		NXWE	NX Wireless Enabled
		NXES	NX Enabled, Dual SmartPorts, PIR Occupancy Sensor, Dimming Daylight Harvesting
		NXS	NX, PIR Occupancy Sensor, Dimming Daylight Harvesting (standalone)
		NXSW	NX Wireless, PIR Occupancy Sensor, Dimming Daylight Harvesting
		NXWD	NX Wireless Enabled, Dual SmartPORTs
		NXSWD	NX Wireless, PIR Occupancy Sensor, Dimming Daylight Harvesting, Dual SmartPORTs
			*Not available for row mounting; Only available with 0-10V Driver options; Contact factory for Length restrictions
Sensors+		SD1	Daylight Sensor Required. Enter quantity 2SD1=2 daylight sensors/row
		SO1	Occupancy Sensor Required. Enter quanity. 2SO1= 2 occupancy sensors/row
		SZ1	Zigbee Radio Module Required. Enter quantity. 2SZ1=2 radio modules/row Radio controls up to 10 drivers. Must be ordered with D00.

+ Additional lead time may be applicable. Contact factory.

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Output Restrictions

Driver options listed below are not available for the output and length as shown

Restrictions-Direct		Output
		300
Length (feet)	2	Not Available

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HUBBELL Lighting

4L-R-D

MOD™ 4 LED Recessed Direct

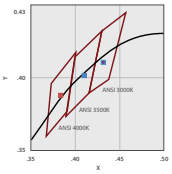
Details

Construction:
Die-formed and welded steel. Wiring knockouts in top.
End caps- Die formed steel. Install from below via magnetic interface.
Overlaps diffuser at each fixture end to eliminate gaps/LED visibility.

Downlight diffuser:
SOF-Soft diffuse acrylic lens.
REG- ½" regressed softglo lens with painted steel inserts. Output multiplier (.77).
BWO- White blade baffle with softglo lens overlay. Output multiplier (.70).
ASYM- Highly transmissive diffuse acrylic lens with linear prisms.
BAT- Highly transmissive diffuse acrylic lens with linear prisms.
DRP- ½" protruding soft diffuse lens.
Please see the installation instruction sheets for more details.

Finish/Color:
Visit www.litecontrol.com/finishes for details.

CCT:
27K-2700K output multiplier (0.95)
30K-3000K output multiplier (0.98)
35K-3500K output multiplier (1.00)*
40K-4000K output multiplier (1.03)
50K-5000K output multiplier (1.05)
27K9-2700K 90 CRI output multiplier (0.83)
30K9-3000K 90 CRI output multiplier (0.85)
35K9-3500K 90 CRI output multiplier (0.88)
40K9-4000K 90 CRI output multiplier (0.90)
50K9-5000K 90 CRI output multiplier (0.93)
*Scale all values from 35K



Color Variation:
2 step MacAdam ellipse

Output (VI technology):
Variable Intensity (VI) technology allows precise specification of fixture output/wattage. Fixture will be programmed and labeled to specification. Specify each in 50 lumen increments/ft within the below range:

	Lumens/ft	Nomenclature
Direct		
Min:	300	D030
Max:	1250	D125

Field Accessibility:
LED boards and drivers can be accessed and removed from fixture, while installed. LED boards can be replaced either individually or as part of 2' module.

Circuiting:
1C (1 Circuit) Fixture wired for a single circuit.

Emergency:
EF - 10W battery powered driver.
Provides a minimum of 90 minutes of emergency lighting.
Inverter-Compatible. Provided by others.
Available in 4'+ fixtures.

Driver:

NDM:	Non-dimming. Fixture will be wired for fixed light output.
D05:	Osram 100%-5% dimming range, Fixture will be wired for low voltage 0-10V dimming control. Only applicable if either 2230TD, 2750T or 2765T is selected.
D01:	100%-1% dimming range. Fixture will be wired for low voltage 0-10V dimming control.
DS1:	Soft-Start 100%-1% dimming range. Fixture will be wired for low voltage 0-10V dimming control.
D00:	Dim-to-off 100%-1% Dimming range. Fixture will be wired for low voltage 0-10V dimming control.
DS0:	Soft-Start Dim-to-off 100%-1% dimming range. Fixture will be wired for low voltage 0-10V dimming control.
LEC:	Hi-Lume 1% EcoSystem LED Driver with Soft-on, Fade-to-Black dimming technology.
DALI:	DALI compatible.
DALIP:	Self-Powered DALI bus (e.g. DEXAL)

*See driver limitations in Output Restrictions above.

Nightlight:
See separate LC-Nightlight spec sheet for additional details.

NX Distributed Intelligence: NX DISTRIBUTED INTELLIGENCE™
Supports indoor and outdoor applications, wired, wireless and hybrid networked NX lighting control deployments and enables emerging applications such as Hubbell Lighting's SpectraSync™ color tuning technology.
See separate NX™ Application Guide for additional details.
See Hubbell Controls Solution NX Brochure.

Sensors:

SD1:	Daylight sensor(Wattstopper part #FD301). Installs between diffusers.
SO1:	Occupancy sensor(Wattstopper FS-305 with FS-L6 lens). Installs between difffusers.
SZ1:	Zigbee radio module(Osram Sylvania part #ZBHA-CLM-DIM). Installs in knockout.
NX:	NX Sensors installs between diffusers.

See separate Control Options Guide for additional details.

SpectraSync™ Color Tuning Technology: SpectraSync™ Color Tuning Technology
Control your space based on the needs of the application, specific activities throughout the day and preferences of the occupants with two distinct SpectraSync™ Color Tuning Technology.

Dim to Warm:	Dim to Warm mimics the familiar warming effect that occurs with traditional incandescent sources as they are dimmed. (Available with 2200K-3000K).
Tunable White:	Tunable White offers users the ability to tailor CCT to their personal preference, enhancing task visibility, material and colors or the aesthetics of the space. (Available with 2700K-5000K or 2700K-6500K).

See separate SpectraSync™ Tech Sheet for additional details.
See separate NX™ Solutions Guide for additional details.

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4L-R-D

MOD™ 4 LED Recessed Direct

Details (continued)

Patterns:
90°, 120°, 135° illuminated corners available. One piece construction, ready to install, with diffusers that match adjoining fixtures. Corner system connectors must be used to form patterns. The length of each outside or inside lighted corner is 12".

Rated Life (LED Board):
Tested in accordance to LM79-2008 & derived from EPA TM-21 calculator
L70: 280,000 (calculated per TM-21 extrapolated curve)
L70: >61,000 (reported per TM-21/LM80 6x's limitation)
L90: 72,000 (calculated per TM-21 extrapolated curve)
L90: >61,000 (reported per TM-21/LM80 6x's limitation)

Thru wiring:
See separate LC-Thruwire spec sheet for additional details.

Fixture Mounting:
PT: Continuous spackle trim with beaded edge welded to housing. Spackle trim allows plaster coat up to fixture edge for clean ceiling appearance.
LG/NG/SS: Side rails provide continuous mounting, lateral spacing between T-bars and allows clearance for T-bar supporting wire. For Tegular grid mount, fixture will sit level with the T-bar.
DW: Side rails allow installation into drywall slot. Visible flange is located on all 4 sides of fixture

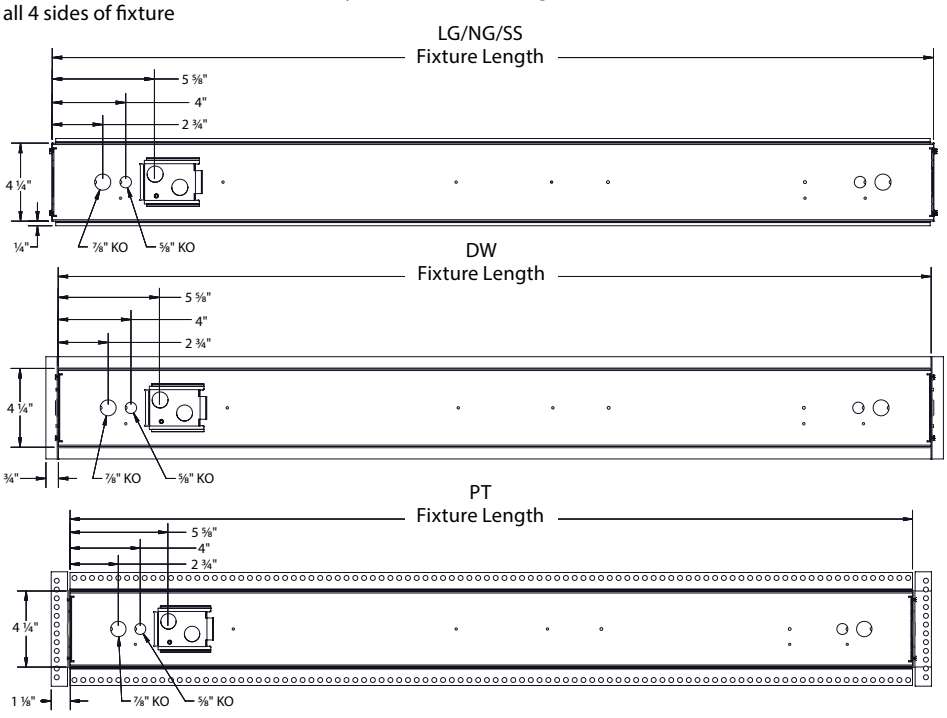
Rated Life (Driver):
Standard = 100,000 hours
Lutron = 50,000 hours

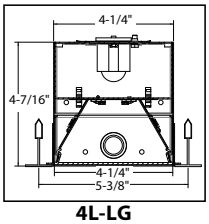
Fixture weight:
3 lbs/ft.

Ratings:
CSA listed for damp locations. IBEW. AF of L. UL924. IC Rated.
This product qualifies as a "designated country construction material" per FAR 52.225-11 Buy American-Construction. Materials under Trade Agreements effective 8/14/2020.
See Buy American Act Solutions. Contact factory forconfigurations including SpectraSync, Emergency Battery, NX, or sensors.

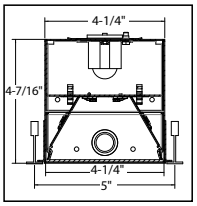
BUY AMERICAN SOLUTIONS
See Certification Specifications

Warranty:
5 years. See www.litecontrol.com for details.

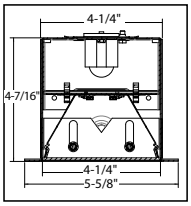




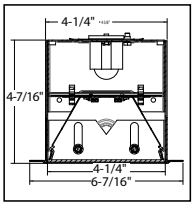
4L-LG



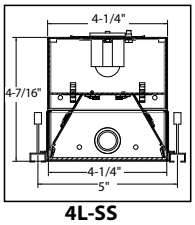
4L-NG



4L-DW



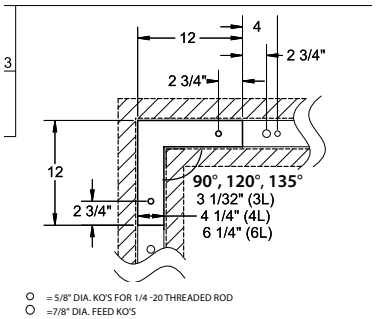
4L-PT



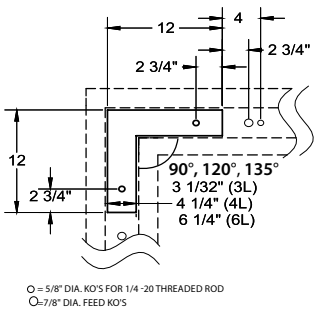
4L-SS

Patterns:

Drywall



Grid



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4L-R-D

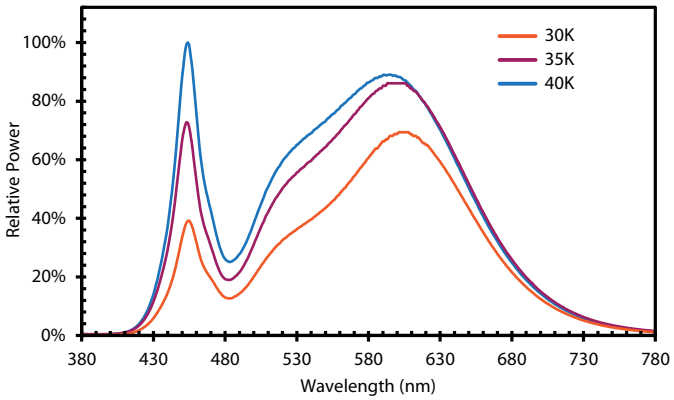
MOD™ 4 LED Recessed Direct

Details (continued)

Color Characteristics:

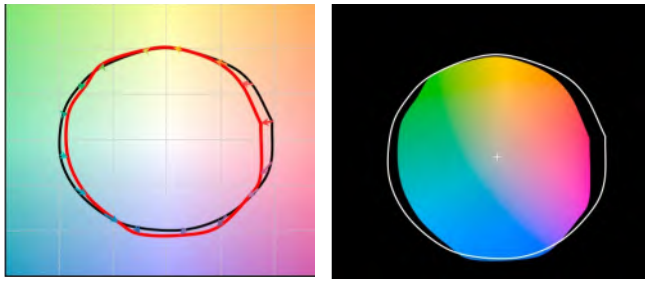
Value	Ordering Code		
	30K	35K	40K
Rf	83	82	82
Rg	96	96	96
CCT (K)	3009	3494	3975
Duv	-0.0009	-0.0004	-0.0003
x	0.435	0.4052	0.3814
y	0.4012	0.3898	0.3768
CIE Ra	83	83	84

Spectral Distribution:

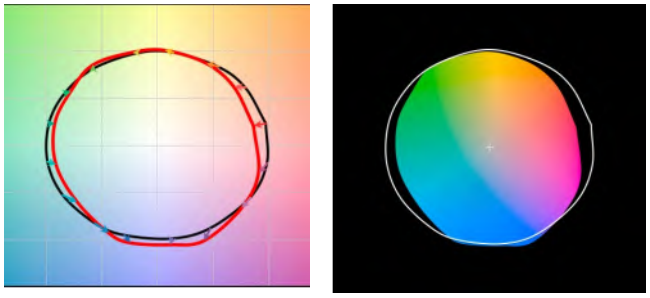


Color Vector Graphic:

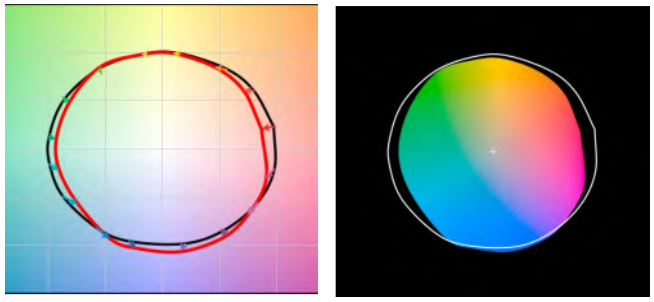
30K:



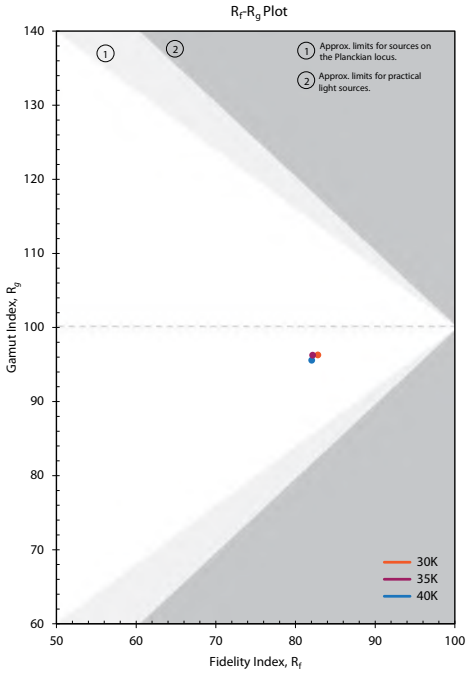
35K:



40K:



Color Gamut/Fidelity Plot



CRI:
80 minimum

CCT	CRI	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
30K	83	82	91	97	81	82	89	84	62	13	79	79	69	84	99
35K	83	81	89	95	81	81	85	86	65	13	73	79	62	83	97
40K	84	82	90	94	82	82	85	87	68	17	74	80	60	84	97

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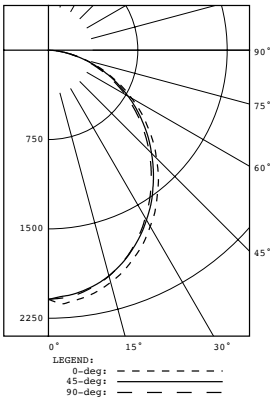
4L-R-D

MOD™ 4 LED Recessed Direct

Photometry

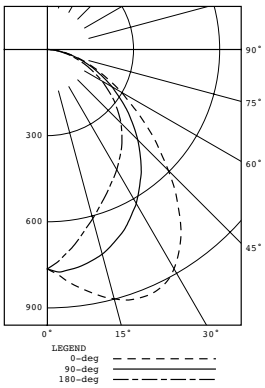
Fixture: 4L-R-D-XX-XX-SOF-CX-35K-D100
CCT: 3500K
Output: D100
Nominal lumens: 1000 lumens/ft
Efficacy: 112 lm/W
Test report: 4L-R-D-04-SOF-X-CX-35K-D100.IES



Zonal Lumens

Zone	Lumens	Lamp %
0-40	1885.8	47.1%
0-60	3214.6	80.4%
0-90	4000.1	100.0%
90-180	0.0	0.0%
0-180	4000.1	100.0%

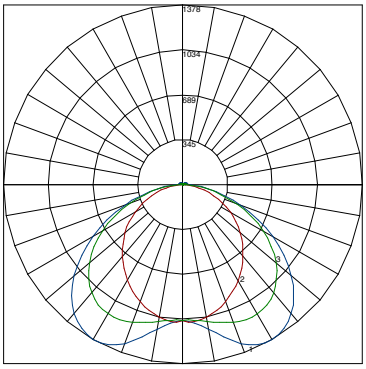
Fixture: 4L-R-AD-XX-XX-ASYM-CX-35K-D050
CCT: 3500K
Output: D050
Nominal lumens: 500 lumens/ft
Efficacy: 124 lm/W
Test report: 4L-R-AD-XX-XX-ASYM-CX-35K-D050.IES



Zonal Lumens

Zone	Lumens	Lamp %
0-40	982	48.7%
0-60	1658	82.3%
0-90	2016	100.0%
90-180	0	0.0%
0-180	2016	100.0%

Fixture: 4L-X-D-04-BAT-CX-35K-D100
CCT: 3500K
Output: D100
Nominal lumens: 1000 lumens/ft
Efficacy: 111 lm/W
Test report: 4L-X-D-04-BAT-CX-35K-D100.IES



Legend:
0-deg: Blue
45-deg: Green
90-deg: Red

Zonal Lumens

Zone	Lumens	Lamp %
0-40	1625.84	40.64
0-60	3056.77	76.42
0-90	3948.2	98.70
90-180	51.97	1.30
0-180	4000.17	100.00

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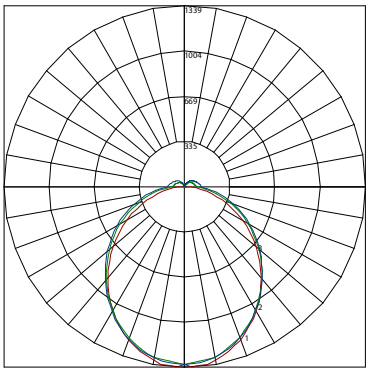
Photometry (continued)

Fixture: 4L-X-D-04-DRP-CX-35K-D100
CCT: 3500K
Output: D100
Nominal lumens: 1000 lumens/ft
Efficacy: 110 lm/W
Test report: 4L-X-D-04-DRP-CX-35K-D100.IES



Legend:
0-deg: Blue
45-deg: Green
90-deg: Red

Zonal Lumens

Zone	Lumens	Lamp %
0-40	1613.08	40.60
0-60	2797.69	70.50
0-90	3677.99	92.70
90-180	291.34	7.30
0-180	3969.32	100.00

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HUBBELL Lighting

LITHONIA LIGHTING®

Catalog Number	
Notes	
Type	X1

FEATURES & SPECIFICATIONS

INTENDED USE — Suitable for applications requiring attractive edge-lit exit signage, universal installation and low energy consumption.

CONSTRUCTION — Extruded brushed aluminum finish.

Clear acrylic panels- letters measure 6" high with 3/4" stroke, with 100 ft viewing distance rating, based upon UL 924 standard.

For single-face clear panels, EXIT is seen as a reversed image from the back.

OPTICS — LEDs mounted on printed circuit board. The typical life of the exit LED lamp is 10 years.

Low energy consumption – less than 3 watts for AC only and less than 5 watts for battery back-up.

ELECTRICAL — Dual voltage input capacity (120/277V).

Battery: (EL Option) – Sealed, maintenance free nickel-cadmium battery delivers 90 minutes capacity to emergency lamps. Test switch provides manual activation of 30-second diagnostic testing for on-demand visual inspection.

Self-diagnostic testing (EL Option Only) for 30 seconds every 30 days and 90 minutes annually. Diagnostic evaluation of LED light source, AC to DC transfer, charging and battery condition.

INSTALLATION — EDG – Universal surface (top, end or back) mounting. Canopy provided.

EDGR – Recessed mounting. Bar hanger and brackets provided for both new or restricted ceiling access installation applications. Back wall mount (WM) option.

Universal directional indicators. Field selected and attached.

LISTINGS — UL damp location listed 32°-122°F (0°-50°C) standard. Meets UL924, NFPA 101 (current Life Safety Code), NEC and OSHA illumination standards.

WARRANTY — 3-year limited warranty. Complete warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

NOTE: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25°C.

Specifications subject to change without notice.

EDG (surface mount)

EDGR (recessed mount)

LED Edge-Lit Exits

EDG
EDGR

LED Lamps

LED

Specifications

EDG (End Mount)
Length: 13-5/8 (34.6)
Depth: 5-1/2(14.0)
Height: 11-1/8 (28.3)
Shipping Weight : 4 lbs (1.8 kgs)

EDG (Top Mount)
Length: 13 (33.0)
Depth: 4-5/16 (11.0)
Height: 11-3/4 (29.8)
Shipping Weight : 4 lbs (1.8 kgs)

EDG (Back Mount)
Length: 13 (33.0)
Depth: 3 (7.6)
Height: 11-1/8 (28.3)
Shipping Weight : 4 lbs (1.8 kgs)

EDGR
Length: 13 (33.0)
Depth: 1-3/4 (4.4)
Height: 8 (20.3)
Shipping Weight : 6.8 lbs (3.1 kgs)
Shipping Weight (WM option) : 8.1 lbs (3.7 kgs)

All dimensions are inches (centimeters) unless otherwise noted.

ORDERING INFORMATION

For shortest lead times, configure products using **bolded options**.

Example: EDG 1 R EL

EDG	-	1 OR 2	G OR GMR	-	-
Family	**Housing color**	**Number of faces**	**Letter color**	**Operations**	**Options**
EDG Surface mount LED edge-lit exit	**(blank)** Brushed aluminum	**1** Single face	**R** Red on clear (single face only)[1]	**(blank)** AC only	**(blank)** None
EDGR Recessed LED edge-lit exit	W White	**2** Double face	**G** Green on clear (single face only)[1]	**EL** Nickel-cadmium battery	WM Recessed wall mount[6]
			RMR Red on mirror[2]	X2 Provides primary and secondary AC input[4]	
			GMR Green on mirror[2]	SD Self-diagnostics[5]	
			RW Red on white[3]		
			GW Green on white[3]		

-
Accessories: Order as separate item.
ELA US12 12" stem kit with brushed aluminum canopy[7]
ELA W US12 12" stem kit with white canopy[7]

Notes

1 For single-face clear panels, EXIT is seen as a reversed image from the back.
2 Available with single and double face.
3 White panel standard for double and single face. Only available with white housing.
4 Not available with EL and SD options.
5 Available with EL option only.
6 Available on EDGR single face only
7 See spec sheet ELA-StemKits. Only available for EDG.

EDG-EDGR LED, Surface and Recessed Mount Edge-Lit Exits

SPECIFICATIONS

ELECTRICAL						
Primary Circuit						
Type	**Typical LED life[1]**	**Supply voltage**	**EDG**		**EDGR**	
			Input Watts	**Max amps.**	**Input Watts**	**Max amps.**
Red LED AC only	10 years	120	2.5	0.020	3.8	0.030
		277	2.8	0.010	4.5	0.014
Green LED AC only	10 years	120	2.2	0.020	3.8	0.030
		277	2.2	0.010	4.5	0.020
Red LED emergency	10 years	120	3.0	0.030	3.8	0.031
		277	3.1	0.010	4.5	0.015
Green LED emergency	10 years	120	2.6	0.020	3.8	0.031
		277	2.8	0.010	4.5	0.020

BATTERY (EL option)			
Sealed Nickel-Cadmium			
Shelf life[2]	Typical life[2]	Maintenance[3]	Optimum temperature[4]
3 years	7-9 years	none	32-122°F (0-50°C)

Notes

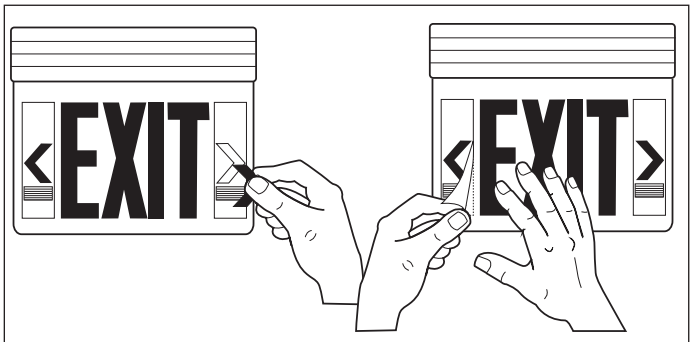
1 Based on continuous operation. The typical life of the exit LED lamp is 10 years.

2 At 77°F (25°C).

3 All life safety equipment, including emergency lighting for path of egress must be maintained, serviced, and tested in accordance with all National Fire Protection Association (NFPA) and local codes. Failure to perform the required maintenance, service, or testing could jeopardize the safety of occupants and will void all warranties.

4 Optimum ambient temperature range where unit will provide capacity for 90 minutes. Higher and lower temperatures affect life and capacity. Consult factory for detailed information.

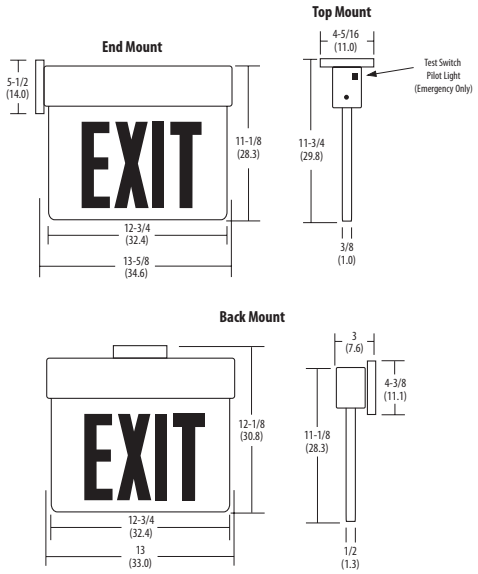
KEY FEATURES



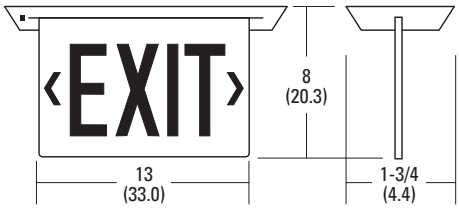
Universal chevron indicators for field selection/installation.

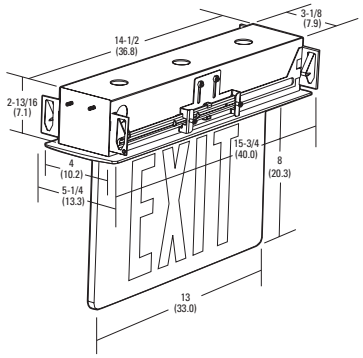
MOUNTING

EDG

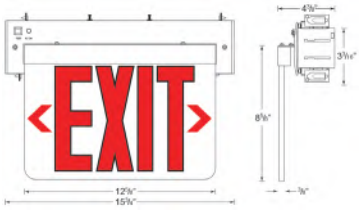


EDGR





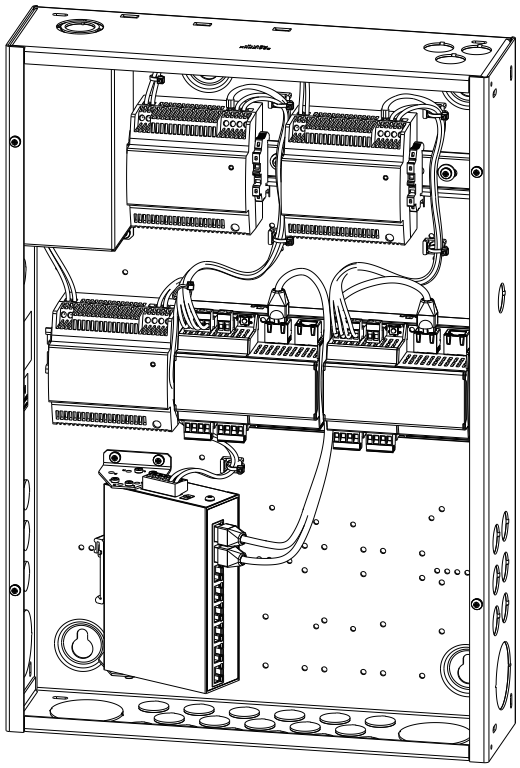
EDGR WM option



EMERGENCY: One Lithonia Way Conyers, GA 30012 Phone: 800-334-8694 Fax: 770-981-8141 www.lithonia.com © 2003-2013 Acuity Brands Lighting, Inc. All rights reserved. Rev. 04/16/15

Athena Light Management Hub (QP5)

The Athena Light Management Hub (QP5) connects Lutron QS devices to your Athena lighting and shading control system.



QP5-4L-POE shown

Features

- Designed to control, manage, and monitor Lutron Energi Savr Node units, QS and Pico wallstations, Contract Roller QS shades and QS drapery systems.
- The Athena system brings switching, dimming, motorized window shades, digital ballasts, digital LED drivers, and smart sensors together under one software tool.
- QS link wiring can be T-tapped or daisy-chained.

QP5 Hub Capabilities

- Supports up to two Athena Edge processors with up to two links each that can be individually configured to communicate with:
  – Lutron QS devices
- Includes 8-port Ethernet unmanaged PoE switch to easily connect processors and power a Lutron Athena Clear Connect Gateway–Type X.
- Q-POE-PNL can be used to connect a Lutron Athena Clear Connect Gateway–Type X to the processor hub when the wiring distance exceeds 328 ft (100 m).
- Supports both astronomic and time-of-day events to automatically control the lights and shades/draperies in the system.

Athena Hubs Available:

QP5-1L-POE – 1 Link Athena hub*
QP5-2L-POE – 2 Link Athena hub
QP5-4L-POE – 4 Link Athena hub

Athena Hub Accessory:

Q-POE-PNL – Ethernet range extender, no configurable link. Does not include an Athena Edge processor or respective software features and functionality.

* 1L hub link capability differs from 2L and 4L hubs. See Specifications page.

** Pico wireless controls, QS keypads, IR

Configurable Link/Switchleg Capabilities

	Limitations per Processor		
Model	Number of Processors per Panel	Number of QS Links	Number of Ethernet Ports
QP-5-1L-POE	(1) 1-link	1	2
QP-5-2L-POE	(1) 2-link	2	2
QP-5-4L-POE	(2) 2-link	2	2

	Limitations per QS Link					
Model	QS Device Count	Wall Controls**	Occupancy Sensor Count	Daylight Sensor Count	Switchleg Count	DMX Interface Limit
QP-5-1L-POE	25	50	50	50	256	8
QP-5-2L-POE	99	100	100	100	512	16
QP-5-4L-POE	99	100	100	100	512	16

Job Name:	Model Numbers:	
Job Number:		

Specifications

Regulatory Approvals

- cULus® Listed (Reference: UL® File E42071)
- CE
- Complies with requirements for use in other spaces used for environmental air (plenums) per NEC® 2014 300.22(C)(3)
- Meets the Canadian National Building Code plenum requirements for a concealed space used as a plenum within a floor or roof assembly

Power

- Input voltage: 100–277 V~ 50/60 Hz, normal feed*
- Input Current:
  - QP5-1L-POE/QP5-2L-POE:
    - 2.4 A (100 V~)
    - 2 A (120 V~)
    - 1.4 A (230 V~)
    - 1 A (277 V~)
  - QP5-4L-POE:
    - 3.6 A (100 V~)
    - 3 A (120 V~)
    - 2.1 A (230 V~)
    - 1.5 A (277 V~)
  - Q-POE-PNL:
    - 1.2 A (100 V~)
    - 1 A (120 V~)
    - 0.7 A (230 V~)
    - 0.5 A (277 V~)
- Output: Edge Processor: 24 V⎓ 1 A per link
  Ethernet PoE Switch: 60 W total, 30 W max per port
- Power Dissipation (max):
  - QP5-1L-POE/QP5-2L-POE: 85 BTUs/hr
  - QP5-4L-POE: 125 BTUs/hr
  - Q-POE-PNL: 45 BTUs/hr

* If the QP5 panel's PoE switch is powering a Q-RF that is controlling one or more designated Ketra emergency fixtures, power for the QP5 must be supplied via normal-only feed and not using an uninterruptible power supply or generator.

Physical Design

- Enclosure: NEMA Type 1, IP-20 protection
  16 U.S. gauge steel
- Enclosure: W: 14.39 in (365 mm)
  H: 21.00 in (533 mm)
  D: 4.09 in (104 mm)
- Enclosure with Cover: W: 15.39 in (291 mm)
  H: 21.50 in (546 mm)
  D: 4.14 in (105 mm)
- Weight: 25 lb (11.3 kg) (without packaging)

Mounting

- Surface-mount only

Environment

- For indoor use only
- 32 °F to 104 °F (0 °C to 40 °C)
- Relative humidity less than 90% non-condensing

Ethernet Port Connections

- Each hub comes with an 8-port unmanaged PoE switch.
- Ports on the switch must only be used for:
  - Processors (inside the hub)
  - Athena Clear Connect Gateway-Type X
  - Connections to other hubs (QP5 or QP6)
  - Connections to network
  - Do not use unused ports to connect any other Ethernet connections or PoE equipment other then specified above

Example: QP5-4L-POE has:
8 total ports
– 2 (1 port used per processor)
6 available to connect to other devices

Internet Connection

- Providing the Athena hub with an internet connection is highly recommended. This connection is outbound from the Athena processor to the cloud (see the Athena IT Guide at www.lutron.com/AthenaITGuide for details). Having this connection provides for automated firmware updates as well as remote access, diagnostics, and service (some features may only be available after system startup).

Job Name:	Model Numbers:	
Job Number:		

Athena Security Statement

Lutron takes cybersecurity very seriously. We actively monitor the threat landscape and take a proactive approach to security and privacy, continuously working to update and enhance our systems and processes.

At Lutron, we call our approach to cybersecurity **"Secure Lifecycle"**, and we would like to present the following steps we take to protect your security and privacy:

- **Security by Design.** When building a new system, Lutron utilizes a dedicated security team to ensure best practices are implemented. Security is built in. It is not an afterthought or an add-on.
- **Third-Party Validation.** Security is complicated. Lutron has a dedicated team of internal experts, but we also leverage external experts to double-check our work, and to make security recommendations.
- **Continuous Monitoring and Improvements.** Security is a constantly moving target. Lutron uses a dedicated security team to continuously monitor for potential threats and, when needed, send out security patches to update installed systems.
- **Ongoing Support.** Lutron has the resources you need to answer questions about security when they arise

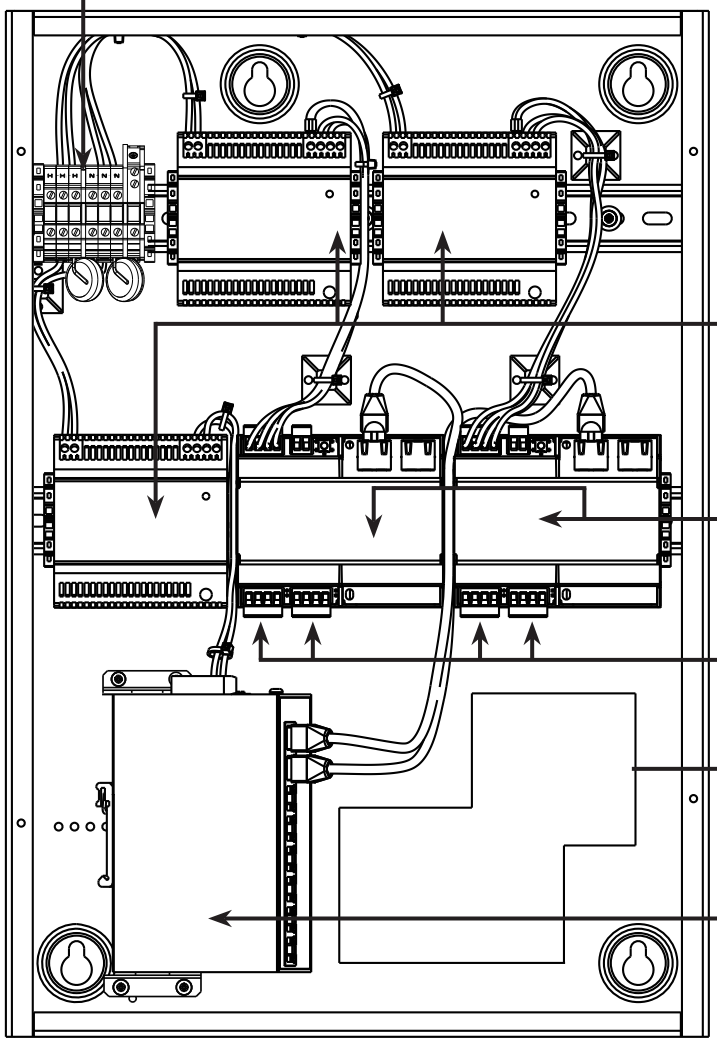
We incorporate a variety of security features into our product designs. These features include recommendations from the National Institute of Standards and Technology (NIST) among others, and they are aimed at meeting our secure lifecycle protections. While we do not publish a comprehensive list of our security features, the following list is a small example of some of the techniques employed in our system designs for Athena Processors, Light Management Hubs, Clear Connect – Type X Gateway devices and associated services (such as mobile applications and cloud resources):

1. Secure and authenticated remote access with unique keys for every Athena system
2. A secure hardware element ("chip") on all Athena processors and Clear Connect – Type X Gateway to guard the keys used for secure communication and authentication
3. Enforcing industry-standard encrypted communication and techniques for our integration protocols to the highest extent possible. Any integrated third-party components or systems should be evaluated independently.
4. Secure commissioning – all communication between the system programming software tool/app and the processors is encrypted and authenticated. Programming a system requires permission to access that system.
5. Security updates are pushed out automatically to the lighting system for urgent security patches. Lutron is committed to one year of security support from system start-up date.
6. Use of industry-standard techniques for cloud-based integrations, such as OAuth2.0
7. Signed processor firmware to ensure a firmware update is authentically from Lutron.

If you have additional questions or would like to make a vulnerability disclosure to Lutron, please contact Lutron's 24/7 Technical support Line at 1.844.LUTRON1 or email us at support@lutron.com.

Job Name:	Model Numbers:	
Job Number:		

Hub Overview

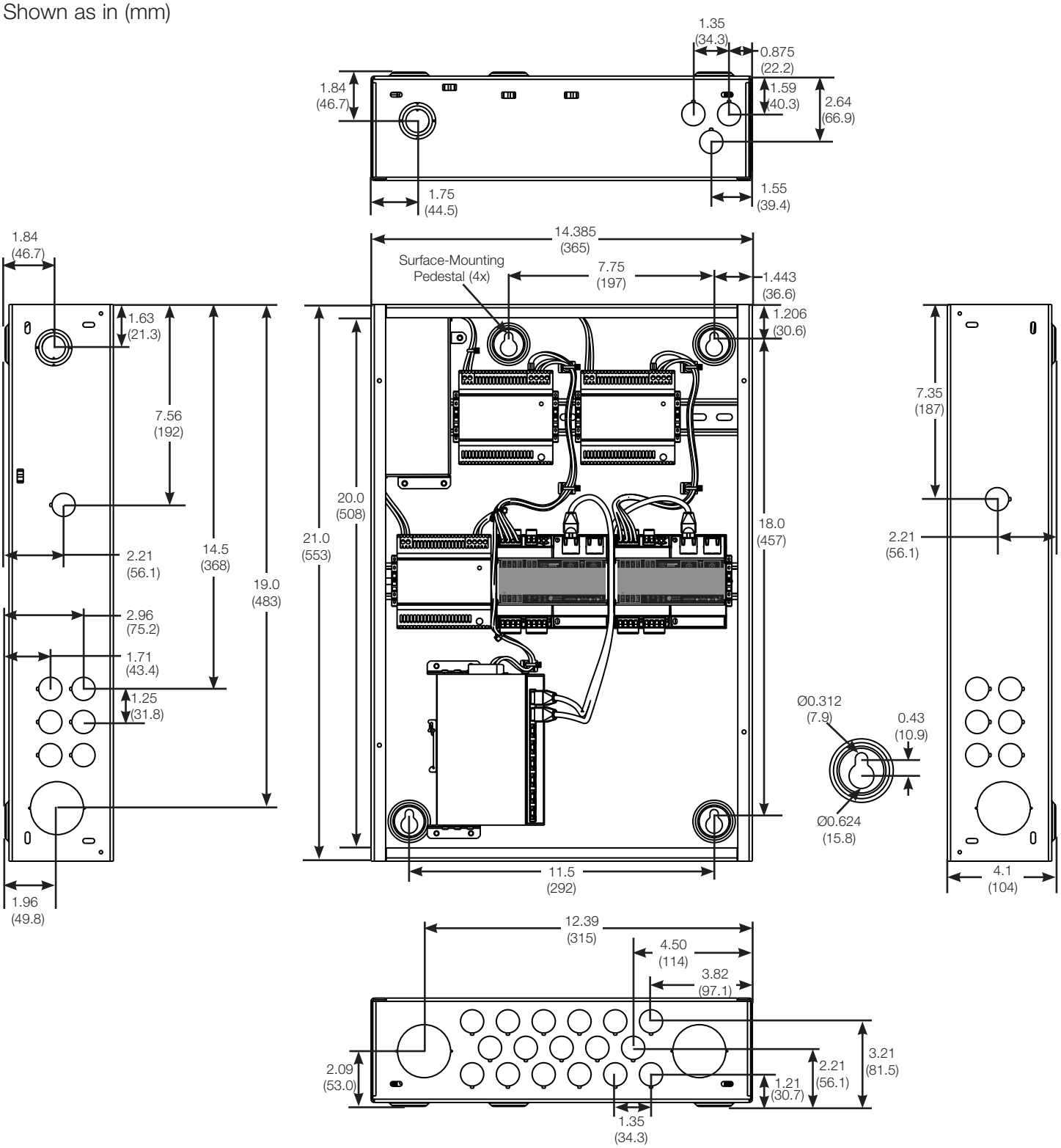


QP5-4L-POE shown

Job Name:	Model Numbers:	
Job Number:		

Dimensions

Shown as in (mm)



QP5-4L-POE shown

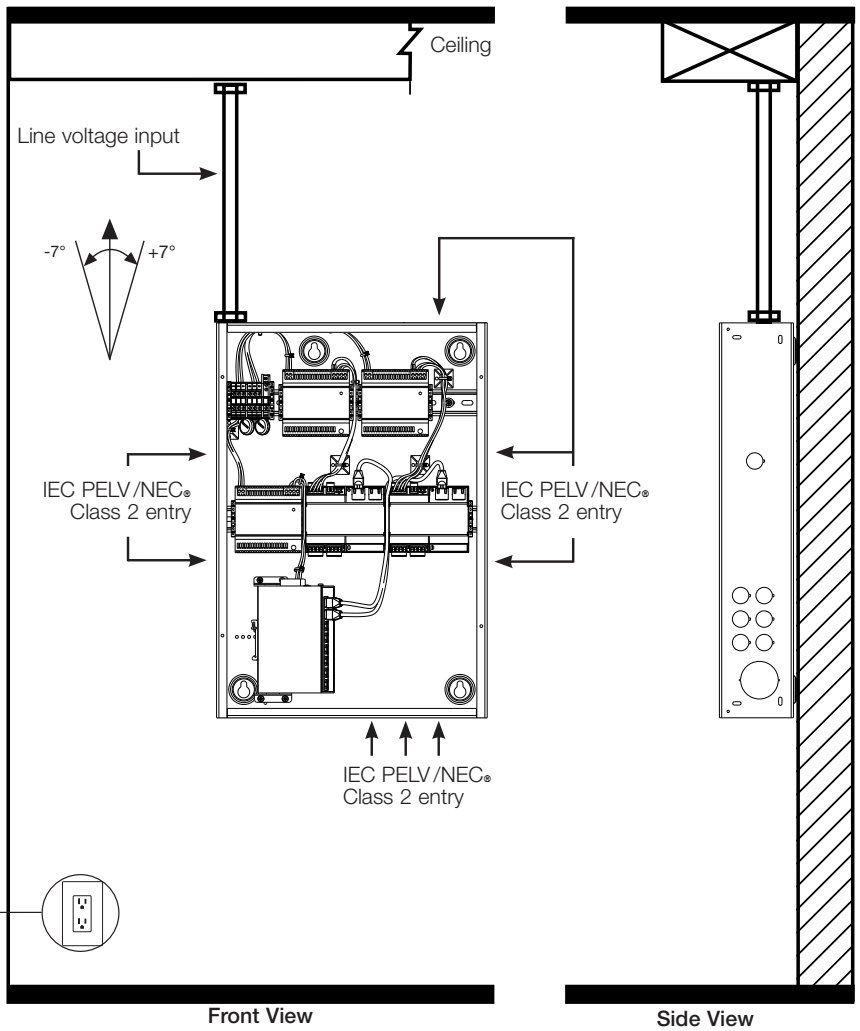
Job Name:	Model Numbers:	
Job Number:		

Mounting and Conduit Entry

- Surface-mount indoors.
- Hub generates heat. Mount only where temperature will be 32 ˚F to 104 ˚F (0 ˚C to 40 ˚C).
- This equipment is air-cooled. Do not block vents or warranty will be void. A minimum of 12 in (305 mm) of unobstructed space is required in front of and below the hub for ventilation.
- Water damages equipment. Mount in a location where the hub and processors will not get wet.
- Mount in an accessible and serviceable location.
- Mount within 7˚ of true vertical.
- An outlet is recommended to be installed within 6 ft (1.8 m) of the hub for servicing. Outlet should not be on the same circuit as the hub.
- Reinforce wall structure for weight and local codes.

Hub	Weight (without packaging)
All models	25 lb (11.3 kg)

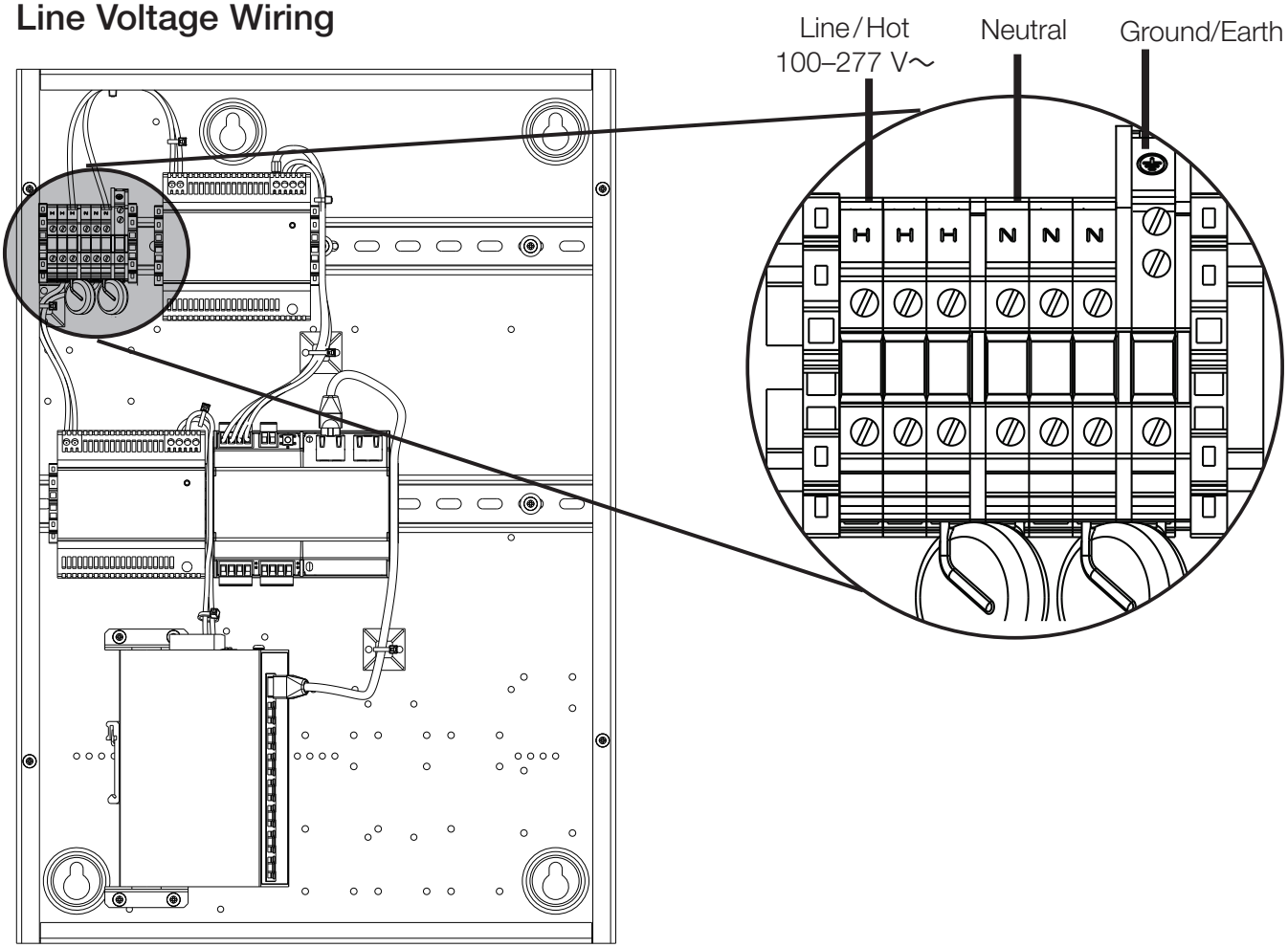
- Mount hub so line (mains) voltage is at least 6 ft (1.8 m) from sound or sensitive electronic equipment.
- A Light Management Hub (QP5) may be mounted above, below, or beside other Light Management Hubs (QP5 or QP6). Maintain at least 5 in (127 mm) of spacing between installed hub and other equipment, and follow the NEC® guidelines.



Note: An outlet is recommended to be installed within 6 ft (1.8 m) of the hub. Outlet should not be on the same circuit as the hub. **Recommended for system start-up.**

Job Name:	Model Numbers:	
Job Number:		

Line Voltage Wiring



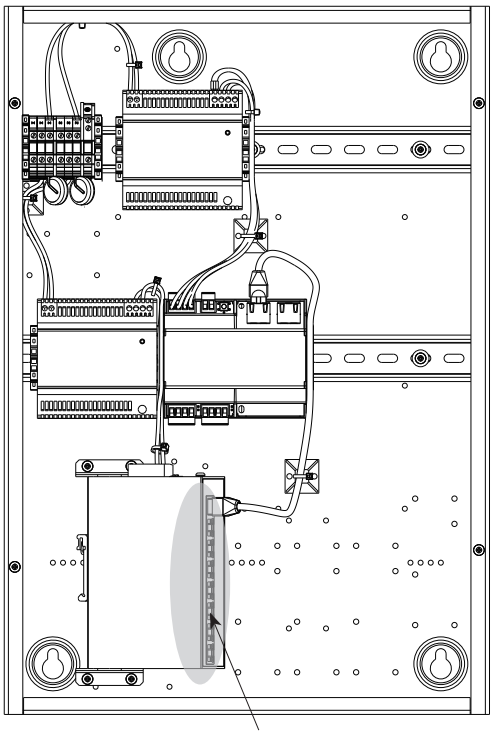
QP5-2L-POE shown

Notes

- Line voltage must enter hub in top left corner as shown above
- Lutron requires a 100–277 V~ normal feed. See Lutron Application Note 106 (P/N048106) at www.lutron.com for information on emergency lighting applications. Athena hubs and network switches providing power to Clear Connect Type X Gateways MUST be powered with normal power if Ketra loads are used for emergency lighting
- Lutron recommends no more than four Light Management Hubs are powered by a dedicated single derated 20 A circuit
- Run wiring so line (mains) Class 1 voltage is separate from IEC PELV/NEC® Class 2 wiring

Job Name:	Model Numbers:	
Job Number:		

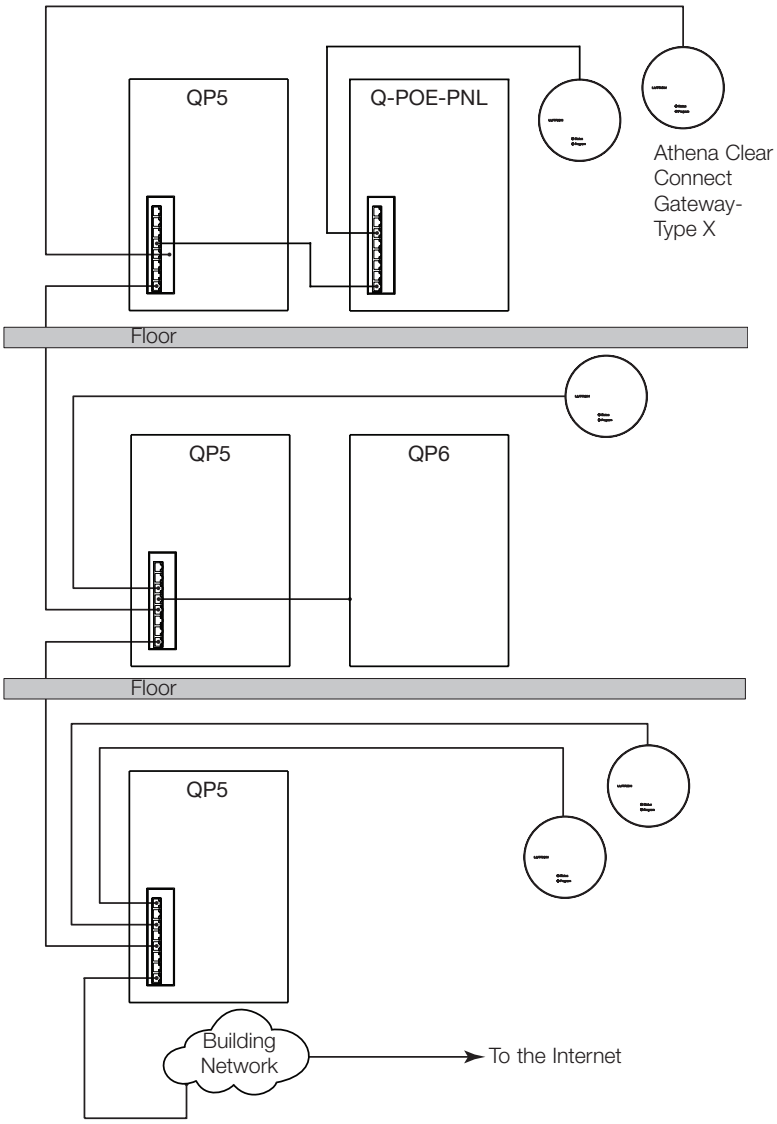
Athena Hub Ethernet Link Wiring



Notes

- Use Cat5e minimum cable for all connections between hubs and a Athena Clear Connect Gateway-Type X.
- The wiring between hubs and gateways is considered PELV/NEC® Class 2; do not run in the same conduit as line (mains) voltage wiring.
- Processors cannot be daisy-chained. Each must be connected to the internal Ethernet switch. The second Ethernet connection is used for service or diagnostics only.
- All system Ethernet wiring must comply with IEEE 802.3 standards.
- Wiring distance for any single "wire segment" is 328 ft (100 m) max; this applies for any Ethernet connections between hubs or to a Athena Clear Connect Gateway-Type X. Use Lutron's Q-POE-PNL or unmanaged Ethernet switches for longer distances.
- For more information about connecting a Athena system to a corporate or building-wide network, please refer to the Athena IT Guide (P/N 040453) at www.lutron.com/AthenaITguide

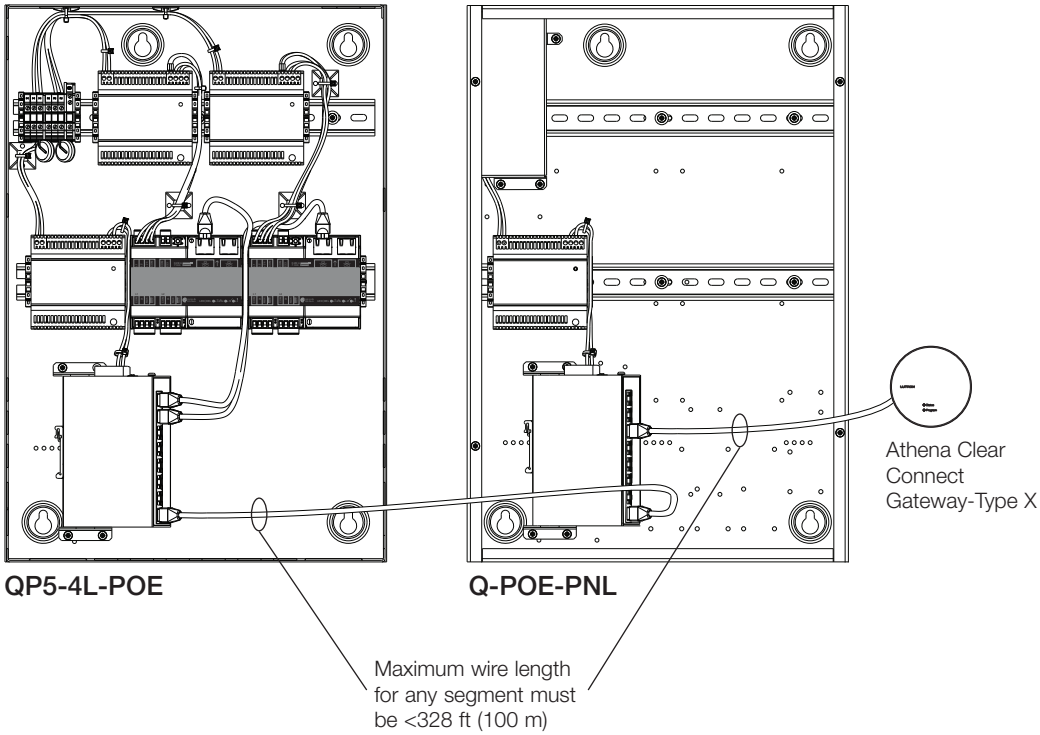
Typical System Ethernet Wiring Riser Diagram



Note: Refer to the IT Guide at www.lutron.com/AthenaITguide for more information for managed switch configuration requirements.

Job Name:	Model Numbers:	
Job Number:		

Q-POE-PNL Wiring

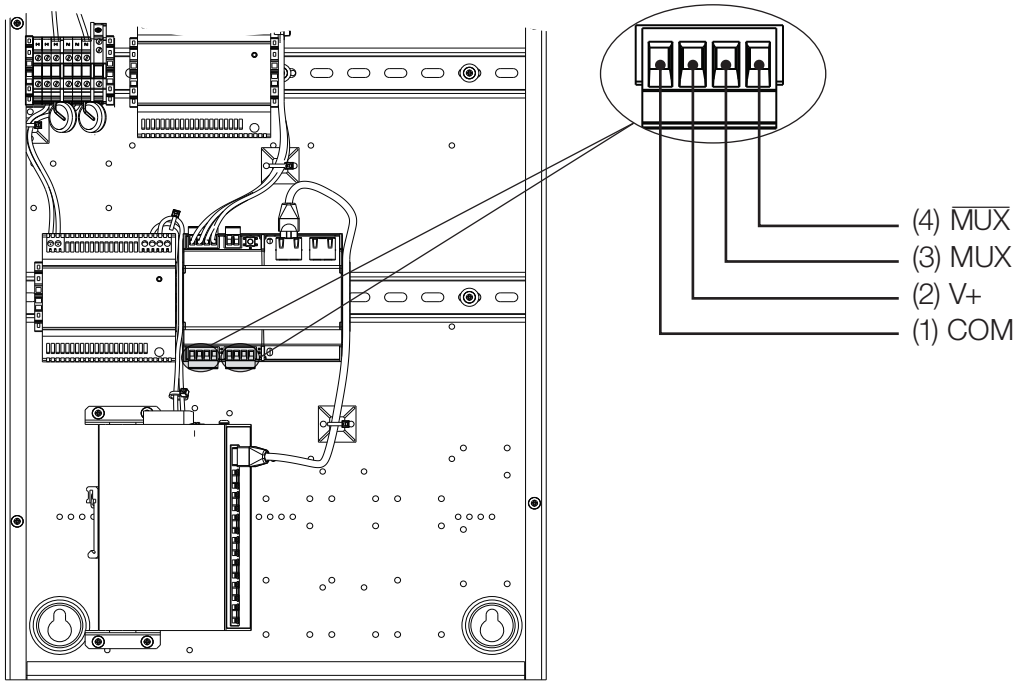


Notes

- For distances >328 ft (100 m) use a Lutron Q-POE-PNL or either a IEEE 802.3af-2003 or 802.3at-2009 compliant PoE extender (not by Lutron) or a PoE unmanaged Ethernet switch (not by Lutron).
- One Q-POE-PNL is required for every additional 328 ft (100 m).
- All connections between PoE switch and the Type X gateways should be Cat5e minimum.

Job Name:	Model Numbers:	
Job Number:		

Configurable Link Wiring: QS Link



QP5-2L-POE shown

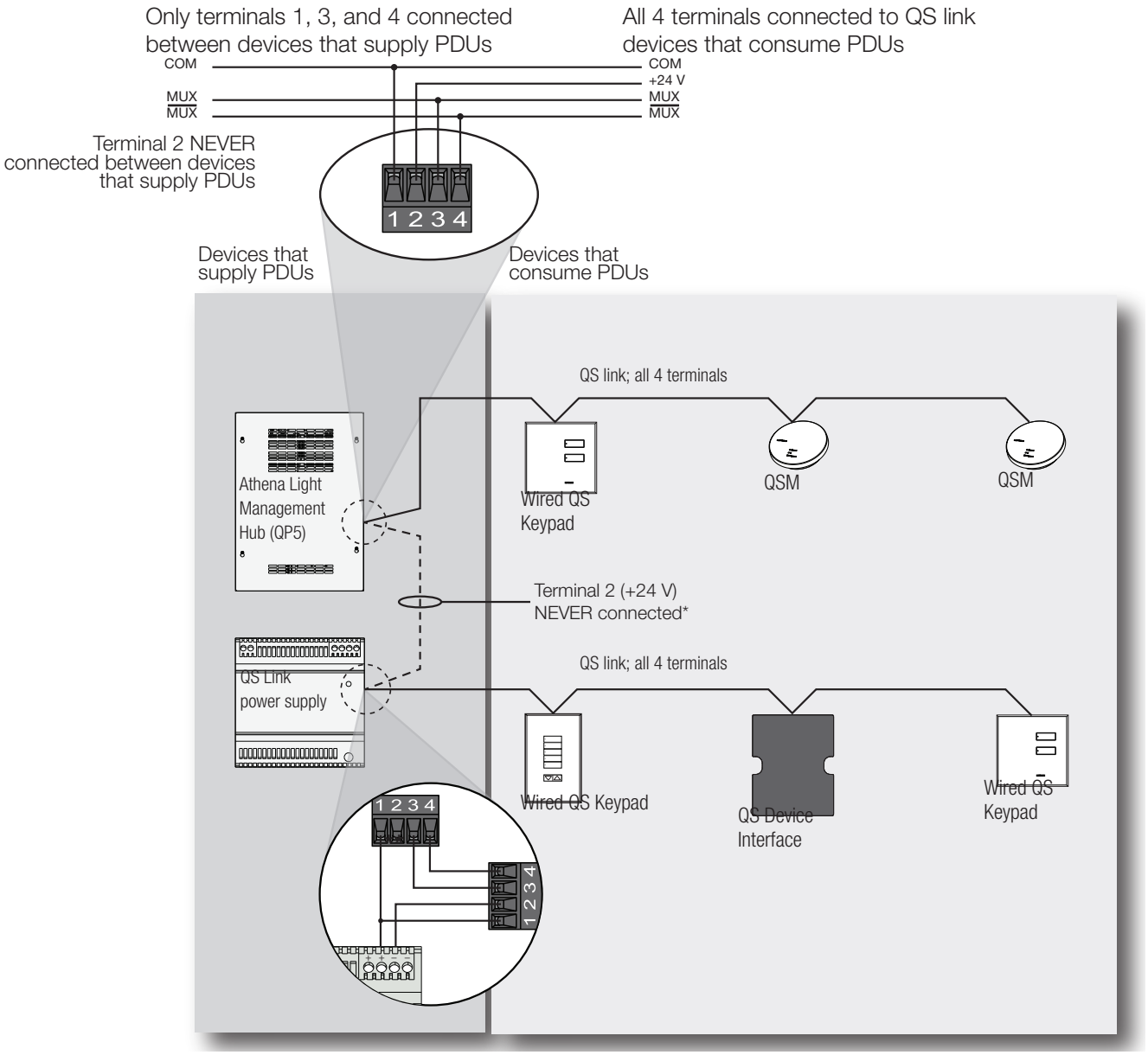
Maximum Link Length	Wire Gauge	Available from Lutron in one cable	Alternate Wiring
500 ft (152 m)	Power (terminals 1 and 2) 1 pair 18 AWG (1.0 mm²) Data (terminals 3 and 4) 1 pair 22 AWG (0.5 mm²) twisted and shielded	GRX-CBL-346S GRX-PCBL-346S	Power Connections: use two 18 AWG (1.0 mm²) stranded conductors Data connections: use Belden Cable #9461 (two 22 AWG (0.5 mm²) twisted shielded pair)
2000 ft (609 m)	Power (terminals 1 and 2) 1 pair 12 AWG (4.0 mm²) Data (terminals 3 and 4) 1 pair 22 AWG (0.5 mm²) twisted and shielded	GRX-CBL-46L GRX-PCBL-46L	Power Connections: use two 12 AWG (4.0 mm²) stranded conductors Data connections: use Belden Cable #9461 (two 22 AWG (0.5 mm²) twisted shielded pair)

Notes

- Link communication uses IEC PELV/NEC® Class 2 low-voltage wiring.
- Follow all local and national electrical codes when installing IEC PELV/NEC® Class 2 wiring with line voltage/mains wiring.
- Terminals will accept:
  – One 22 AWG to 12 AWG (0.5 mm² to 2.5 mm²) wire
  – Up to two 18 AWG (1.0 mm²) wires
- The total wire length of a link must not exceed 2000 ft (609 m).
- The Athena Light Management Hub provides 33 power draw units (PDUs) on each QS Link. For more information, see “Power Draw Units on the QS Link” (Lutron P/N 369405) at www.lutron.com
- QS Link Wiring can be T-tapped or daisy-chained.
- Shield wire will not land on the processor, it should be isolated from ground and all other connections.

Job Name:	Model Numbers:	
Job Number:		

Configurable Link Wiring: QS Link *(continued)*



QS Link Wiring Rules

* Terminal 2 (+24 V) should NEVER be connected between devices that supply PDUs.

** For QS Link power supply wiring connection details, refer to the installation instructions for the specific power supply model being used.

Job Name:	Model Numbers:	
Job Number:		

Software

OpenADR Compliant

- OpenADR 2.0b compliant when used with LUT-Q-OPNADR-CPN8064

iOS Control Application

- The Athena system can have up to 10 simultaneously connected mobile app clients
- Compatible with Lutron App
- Requires iOS 13 or newer

Scheduling

- Events can be scheduled to occur at fixed times or relative to sunrise/sunset and can be programmed to occur once or to be reoccurring

User Access

- Username and password required for user access

Load Shed/Demand Response

- Participate in load shed/demand response programs offered by local utility companies
- Apply a load shed reduction to the system, thereby reducing the building's lighting power usage

Lighting Control

- Monitor current status of areas, scenes, and zones
- Activate lighting scenes
- Adjust lighting zone levels
- Modify lighting zone levels in area scenes
- Control the intensity and color of Ketra fixtures
- Adjust saturated color and vibrancy of Ketra fixtures

QS Shade Control

- Monitor current status of shade groups and drives
- Activate shade presets
- Adjust shade levels

Job Name:	Model Numbers:	
Job Number:		

Compatible Models

Load controls
– QSN-*
– QSE-CI-DMX

Wall controls
– PJ2-*
– PJN-*
– PX-*
– QSWA-*
– QSWAS-*
– QSWE-*
– QSWS2-*
– QSWS2-KS-*
– QWP-*

Shades
– Contract Roller Shades
– Sivoia QS Shades

Sensors
– GRX-IRPS
– EC-DIR*
– GRX-CES*
– LOS-*
– LRF2-OCR2B*
– LRF2-DCRB*
– LUT-WS*
– QSM2-*

Accessories
– LUT-19AV-1U
– LUT-5x10-ENC
– LFG*
– LTR-*
– LPFP-*
– L-PED*
– PICO-*

Power Interfaces
– TVI-LMF-2A
– C5-*
– PHPM-*
– GRX-TVI

Integration Interfaces
– LUT-Q-OPNADR-CPN8064
– QSE-CI-NWK-E
– QSE-IO
– QSE-CI-WCI

Emergency
– LUT-ELI-3PH (for QSN-* load control panels)
– LUT-SHUNT-A-TD (for Ketra loads)

Power Supplies
– QSPS-*

Cable
– QS-CBL-*
– GRX-CBL-*
– GRX-PCBL-*

* Designates additional model number characters that may vary depending on the specific model chosen.

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All other product names, logos, and brands are property of their respective owners.

Job Name:	Model Numbers:	
Job Number:		

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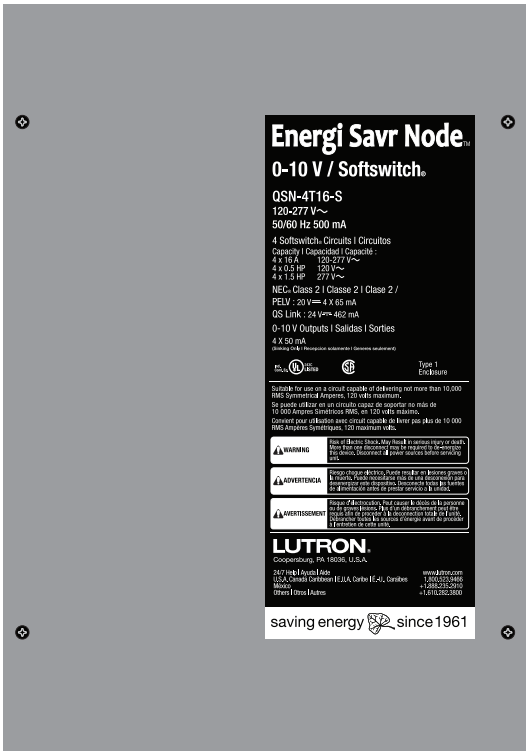
Energi Savr Node for 0–10 V⎓
Energi Savr Node with Softswitch

The Energi Savr Node (ESN) family is a group of modular products for the control of lighting and other loads. This document describes the following products:

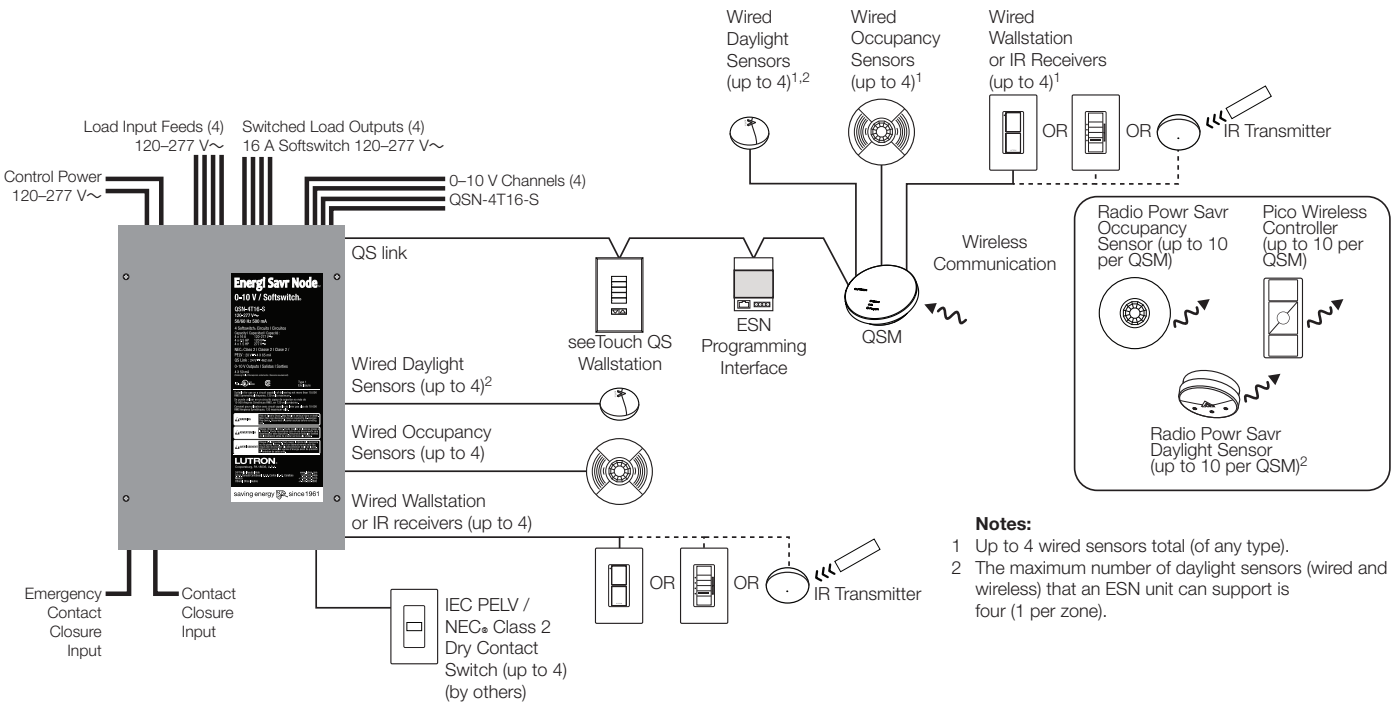
- ESN unit for 0–10 V⎓ (models QSN-4T16-S — 0–10 V⎓ Control/Softswitch)
- Softswitch ESN unit (models QSN-4S16-S — Softswitch)



Features

- Default configuration requires no commissioning.
- Programming using integral interface on the ESN unit.
- Four occupancy sensor inputs for automated control of lights in 4 zones.
- Four daylight sensor inputs automatically adjust light levels based on the amount of natural light entering through the windows.
- Four IR receiver inputs for personal control.
- Four inputs for IEC PELV/NEC® Class 2 dry contact switches.
- Includes QS control link for seamless integration of lights, control stations, and QS sensor modules.
- Softswitch technology yields 1,000,000 cycle relay lifetime.
- Contact Lutron for compatibility with Quantum system.

System Example



Notes:
1 Up to 4 wired sensors total (of any type).
2 The maximum number of daylight sensors (wired and wireless) that an ESN unit can support is four (1 per zone).

LUTRON SPECIFICATION SUBMITTAL Page 1

Job Name:	Model Numbers:	
Job Number:		

Specifications

Regulatory Approvals

- UL Listed
- CSA
- NOM
- Lutron Quality Systems registered to ISO 9001:2015
- Complies with requirements for use in other spaces used for environmental air (plenums) per NEC® 2014 300.22(C)(3)
- Meets the Canadian National Building Code plenum requirements for a concealed space used as a plenum within a floor or roof assembly
- For commercial use, Class A only

Power

- Control Power: 120 V~; 220–240 V~; 277 V~ 50/60 Hz
- Lightning strike protection meets ANSI/IEEE standard 62.41-1991. Can withstand voltage surges of up to 6,000 V~ and current surges of up to 3,000 A
- Current draw: 0.5 A max
- 10-year power failure memory: restores lighting to levels prior to power interruption
- Latching relays keep previously illuminated zones on when control power feed is lost

Environment

- Ambient Temperature Operating Range: 32 °F to 104 °F (0 °C to 40 °C)
- Relative humidity: less than 90% non-condensing
- For indoor use only
- Thermal dissipation: 40 BTU/hr

Terminal Wiring

- Control Power Wiring: 14 AWG to 12 AWG (2.5 mm^2 to 4.0 mm^2)
- Load Wiring: 14 AWG to 12 AWG (2.5 mm^2 to 4.0 mm^2)
- 0–10 V⎓ Wiring: 20 AWG to 12 AWG (0.5 mm^2 to 4.0 mm^2)
- Input Group Wiring: 20 AWG to 12 AWG (0.5 mm^2 to 4.0 mm^2) — maximum wire run length to each input not to exceed 150 ft (46 m)
- QS Link Wiring: 22 AWG to 12 AWG (0.5 mm^2 to 4.0 mm^2)
- Contact Closure Wiring: 20 AWG to 12 AWG (0.5 mm^2 to 4.0 mm^2)

Physical Design and Mounting

- NEMA Type 1, IP-20 protection
- Surface mount

Load Types (relay ratings)

- 16 A Tungsten, 120 to 277 V~
- 16 A AC General Use, 120 to 277 V~
- 16 A Electric Discharge Lamp (ballast), 120 to 277 V~
- 16 A Inductive, 120 to 277 V~
- 0.5 HP, 120 V~
- 1.5 HP, 220 to 277 V~
- Works with all ballasts and drivers that provide a current source that is compliant to IEC 60629 Annex E.2, and whose inrush current does not exceed NEMA410 standards for electronic ballast/driver

Input Default Associations

	Inputs/Outputs	Zone 1	Zone 2	Zone 3	Zone 4
Group 1	Occ	X			
	Photo	X			
	IR	X			
	Switch	X			
Group 2	Occ		X		
	Photo		X		
	IR		X		
	Switch		X		
Group 3	Occ			X	
	Photo			X	
	IR			X	
	Switch			X	
Group 4	Occ				X
	Photo				X
	IR				X
	Switch				X
	CCI	X	X	X	X
	Emergency CCI	X	X	X	X

Softswitch: 120 V~ to 277 V~

- Softswitch relay is rated for 16 A continuous use per channel, which is the maximum continuous load for a 20 A Overcurrent Protection Device (Branch Breaker).
- Patented Softswitch circuit eliminates arcing at mechanical contacts when loads are switched. Extends relay life to an average of 1,000,000 cycles (on/off) for resistive, capacitive, or inductive sources.
- Relay is mechanically held.

Job Name:	Model Numbers:	
Job Number:		

Specifications *(continued)*

0–10 V⎓ Product Ratings (QSN-4T16-S)

- Each output sinks up to 50 mA maximum.
- Each output sinks current only (load device must provide 10 V⎓ supply).
- Provides an IEC PELV/NEC® Class 2 isolated 0–10 V⎓ output signal that conforms to IEC 60929.

Occupancy Sensors

- Up to 16 occupancy sensors can be programmed to the ESN device.
- Manual Programming: up to 4 occupancy sensors wired directly to the ESN device, up to 4 occupancy sensors wired to a QS Sensor Module (QSM), and up to 10 wireless occupancy sensors through the same QSM; the total programmed to the ESN device cannot exceed 16.
- HHD (*iPod*/*iPhone*) Programming: up to 16 occupancy sensors from any source (wired directly to the ESN device, wired to any other ESN device, or wired/wireless from any QSM on the QS link); the total programmed to the ESN device cannot exceed 16.
- Use Lutron occupancy sensors to control one or more zones.
- Use Lutron occupancy sensors in vacancy mode to automatically turn the lights off in an area after it becomes vacant.
- Each zone can be programmed to automatically turn the lights on when occupied and turn the lights off when vacant.
- Each wired occupancy input can power one Lutron occupancy sensor.
- Each occupied scene and unoccupied scene can be programmed independently.
- Lutron occupancy sensors can be programmed to automatically turn the lights on in area when it becomes occupied and turn the lights off in an area after it becomes vacant.
- Each of the four occupancy inputs can power one Lutron occupant sensor.
- Each area's occupied scene and unoccupied scene can be programmed independently.
- Occupancy sensor must provide a dry contact closure or solid-state output.
- Additional occupancy sensors can be used with the ESN device. Refer to the "Programming Options and Features" table for system rules.

seeTouch QS Controls

- seeTouch QS wallstations can be configured to control ESN unit scenes or zones.
- In zone toggle mode, zone buttons can be assigned to one or more zones on any ESN unit connected to the QS Link.
- In scene mode, wallstations can be assigned to one or more ESN units connected to the QS Link.
- LED indicator displays zone or scene status.

Table 1: seeTouch QS Wallstation Configurations

	# Buttons				
Wallstation Function	**1**	**2**	**3**	**5**	**7**
Zone Toggle	✓	✓	✓	✓	✓
Scene	1, Off (toggle)	1, Off	1, 2 Off	1-4, Off	N/A

IR Wallstation or Receiver Input

- Four inputs for IR receivers or wallstations for control of lighting zones can be connected directly to the ESN unit.
- Use Lutron CC-4BRL-WH wallstations to control one or more zones.
- Use Lutron EC-DIR-WH ceiling-mount sensors to control one or more zones.
- Up to four additional wired wallstations or IR receivers can be assigned when associated with a QSM.
- Associate additional QSMs and sensors/controls with ESN unit when programming with an *Apple iPod touch* or *iPhone*. Refer to "Programming Options" section for details.

Specifications (continued)

Daylight Sensors

- Lutron daylight sensors allow daylight harvesting with programmable effect on light output.
- Four daylight sensors can be connected directly to the ESN unit.
- Use Lutron EC-DIR-WH sensors to control one or more zones.
- Alternatively, up to four sensors (Lutron Wired Daylight Sensors or Radio Powr Savr Daylight Sensors) can be assigned when associated with a QSM.
- The maximum number of Lutron daylight sensors (wired or wireless), either wired directly to the unit or indirectly (associated with a QSM) cannot exceed four.
- Associate additional QSMs and sensors/controls with ESN unit when programming with an *Apple iPod touch* or *iPhone*. Refer to "Programming Options" section for details.

Contact Closure Input (CCI)

Default behavior:

- Activate scenes using momentary or maintained closures from an external device such as a timeclock.
- Start or stop Afterhours Mode using a maintained closure.
- The attached device must provide a dry contact closure or solid-state output.
- Configurable for Normally-Open (NO) or Normally-Closed (NC) operation.
- Input is miswire-protected up to 36 V⎓.

Emergency Contact Closure Input

- By default, contact closure input from Lutron Emergency Lighting Interface (LUT-ELI-3PH), security, or fire alarm systems turns all zones on to full output when emergency state is detected.
- Emergency contact closure input is normally closed (NC). The ESN unit is shipped with a jumper pre-installed.
- Response of each zone is configurable.
- Attached devices, by default, will go to maximum output and ignore control inputs.
- No operations will be allowed until emergency signal is cleared.
- The attached device must provide a dry contact closure or solid-state output.
- Input is miswire-protected up to 36 V⎓.
- Emergency CCI cannot control other ESN units.

Functionality with GRAFIK Eye QS

- ESN unit follows GRAFIK Eye QS scene activations when associated with the GRAFIK Eye QS.
- ESN unit responds to commands initiated by the GRAFIK Eye QS astronomic time clock when associated with the GRAFIK Eye QS.
- ESN unit operates in afterhours mode when associated with a GRAFIK Eye QS that is in afterhours mode.

Functionality with QSE-IO

- ESN unit responds to scene commands initiated by the QSE-IO, if the QSE-IO DIP switches have been set to either scene selection mode, zone toggle mode, partition mode, or occupancy sensor mode.

Functionality with QSE-CI-NWK-E

- Integrate ESN unit with touchscreens, PCs, A/V systems, or other digital systems and devices.
- Recall scenes and set/adjust zone levels.

Specifications (continued)

IEC PELV/NEC® Class 2 Dry Contact Switches

- Four inputs for IEC PELV/NEC® Class 2 dry contact switches can be assigned to turn on and off one or more zones.
- Configure for momentary or maintained operation.

QS Link Limits

- Each ESN unit can provide up to 14 Power Draw Units (PDUs) for other QS devices. Refer to the QS Link Power Draw Unit specification submittal (Lutron P/N 369405) for more information concerning PDUs.
- The QS Link can have up to 100 devices and 100 zones.
- Each ESN unit counts as 1 device towards the 100 device limit.
- Each ESN unit counts as 4 zones towards the 100 zone limit.

QSM (QS Sensor Module)

- Use the QSM to integrate Radio Powr Savr Occupancy sensors, Radio Powr Savr Daylight sensors, and Pico Wireless Controllers to control zones on the ESN unit.
- Associate 1 QSM per ESN unit with manual programming.
- Associate multiple QSMs per ESN unit with *Apple iPod touch* or *iPhone* programming (requires QSE-CI-AP-D and Wi-Fi router). See "Programming Options" for details.
- Assign up to 10 Radio Powr Savr Occupancy sensors per ESN unit via QSM.
- Assign up to 4 Radio Powr Savr Daylight sensors per ESN unit via QSM.
- Assign up to 10 Pico Wireless Controllers per ESN unit via QSM.
- The sensors and Pico Wireless Controllers associated with the QSM should be mounted within 60 ft (18 m) line of sight, or 30 ft (9 m) through walls, of the QSM.
- Wire and power up to 4 wired sensors per QSM
  – Daylight Sensors
  – Occupancy Sensors
  – Infrared (IR) Receivers or Wallstations
- Refer to QSM Specification Submittal for more information.

Job Name:	Model Numbers:	
Job Number:		

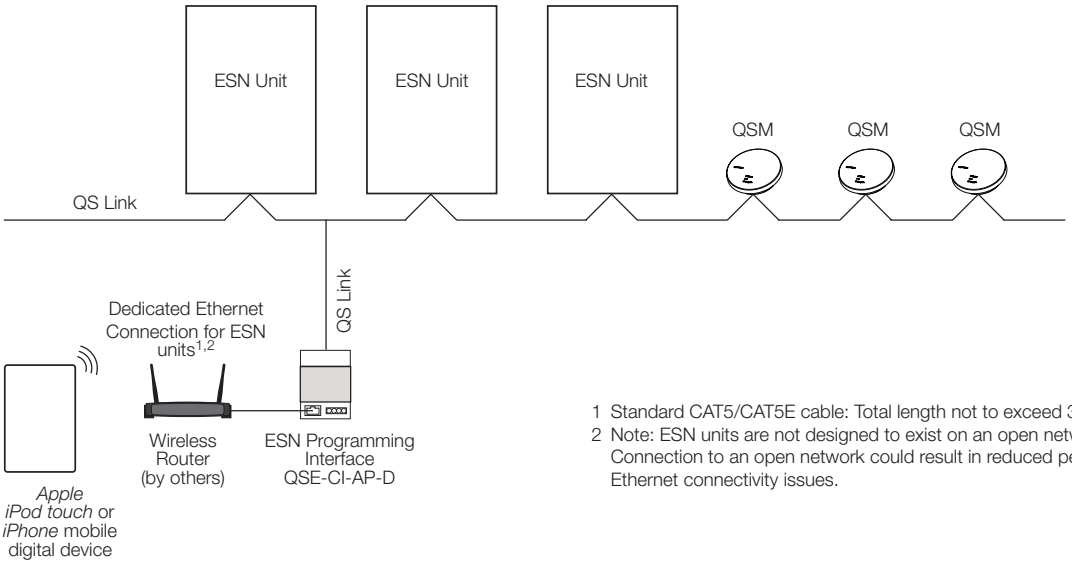
Programming Options

Manual Programming:

- Use buttons on the front of the ESN unit.
- Use manual programming in installations with only one ESN unit and with one QSM or fewer on the QS link.

HHD Programming

- Requires ESN Programming Interface (QSE-CI-AP-D).
- Requires *Apple iPod touch* or *iPhone* mobile digital device.
- Use the intuitive programming application for the *Apple iPod touch* or *iPhone* to program systems with multiple ESN units and QSMs in the QS link.
- Wireless router only required for programming with an *Apple iPod touch* or *iPhone*.



1 Standard CAT5/CAT5E cable: Total length not to exceed 300 ft (100 m)
2 Note: ESN units are not designed to exist on an open network. Connection to an open network could result in reduced performance and Ethernet connectivity issues.

- Wireless router may be removed for normal operation.
- Ethernet connection may be made via an ESN Programming Interface (QSE-CI-AP-D) or an ESN QS unit with integral Ethernet jack.
- Lutron recommends that an ESN Programming Interface (or ESN QS unit with Ethernet jack) be wired to an Ethernet jack in the space for ease of access and proximity to power for the wireless router.
- Works with any standard wireless router that supports multicast packets.
- *Apple iPod touch* or *iPhone* can program all ESN QS units connected to an ESN Programming Interface via the QS Link (except when part of a Quantum system).
- ESN app is required and is available from the *Apple App Store Store* online marketplace.

Job Name:	Model Numbers:	
Job Number:		

Programming Options and Features

	Manual Programming	HHD Programming: • Requires ESN Programming Interface QSE-CI-AP-D • Requires *Apple iPod touch* or *iPhone* mobile digital device
ESN units connected to 1 QS Link	Not more than 1	Multiple—100 QS devices and 100 zone limits apply
QSMs connected to 1 QS link	Not more than 1	Multiple—100 QS devices limit applies

Wired Occupancy Sensors

System Limits	4 connected directly to ESN unit Up to 4 wired to QSM	Up to 100 total occupancy sensors per QS link (wired + wireless)
Can be assigned to…	Any zone(s) on the ESN unit	Zones on ESN unit or share to other ESN units on same QS link
Occupancy Dependency Supported	No	Yes

Wireless Occupancy Sensors

System Limits	Associate 10 occupancy sensors to QSM to control zones on the ESN unit	Up to 100 total occupancy sensors per QS link (wired + wireless)
Can be assigned to…	Any zone(s) on the ESN unit	Zones on ESN unit or share to other ESN units on same QS link
Occupancy Dependency Supported	No	Yes

Wired Daylight Sensors

System Limits	Maximum of 1 daylight sensor per zone 4 connect directly to the ESN unit Additional daylight sensors can connect to the QSM	Maximum of 2 daylight sensors per zone Up to 100 total daylight sensors per QS link (wired + wireless)
Can be assigned to…	Any zone(s) on the ESN unit	Zones on ESN unit or share to other ESN units on same QS link
Disable daylighting in Scenes	No	Yes

Wireless Daylight Sensors

System Limits	Maximum of 1 daylight sensor per zone Associate wireless daylight sensors to the QSM	Maximum of 2 daylight sensors per zone Associate up to 10 wireless daylight sensors per QSM Up to 100 total daylight sensors per QS link (wired + wireless)
Can be assigned to…	Any zone(s) on the ESN unit	Zones on ESN unit or share to other ESN units on same QS link
Disable daylighting in Scenes	No	Yes

Job Name:	Model Numbers:	
Job Number:		

Programming Options and Features *(continued)*

	Manual Programming	HHD Programming: • Requires ESN Programming Interface QSE-CI-AP-D • Requires *Apple iPod touch* or *iPhone* mobile digital device
Pico Wireless Controllers		
System Limits	Associate 10 Pico wireless controllers to QSM to control zones on the ESN unit	Up to 100 total controls per QS link (wired wallstations, Pico wireless controllers, IR receivers)
Can be assigned to…	Any zone on the local ESN unit	Zones on ESN unit or share to other ESN units on same QS link
IR Receivers and Wallstations		
System Limits	4 connect directly to the ESN unit Up to 4 wired to the QSM	Up to 100 total controls per QS link (wired wallstations, Pico wireless controllers, IR receivers)
Can be assigned to…	Any zone on the local ESN unit	Zones on ESN unit or share to other ESN units on same QS link
NEC® dry contact Switches Inputs		
Can be assigned to…	Any zone(s) on the connected ESN	Any zone(s) on the connected ESN
Contact Closure Input		
Can be assigned to…	Any zone(s) on the ESN unit	Any or all local ESN unit zones
Functions	• Sweep to off • Enable/disable afterhours • Turn on to preset and turn off	• Sweep to off • Enable/disable afterhours • Turn on to preset and turn off
Afterhours Configuration	afterhours timeout – 15 minutes blink-warn timeout – 5 minutes	Afterhours timeout and blink-warn timeouts are configurable
Emergency Contact Closure Input		
Can be assigned to…	Any zone(s) on the ESN unit	Any or all local ESN zones
Emergency Light level	Configurable	Configurable

Job Name:	Model Numbers:	
Job Number:		

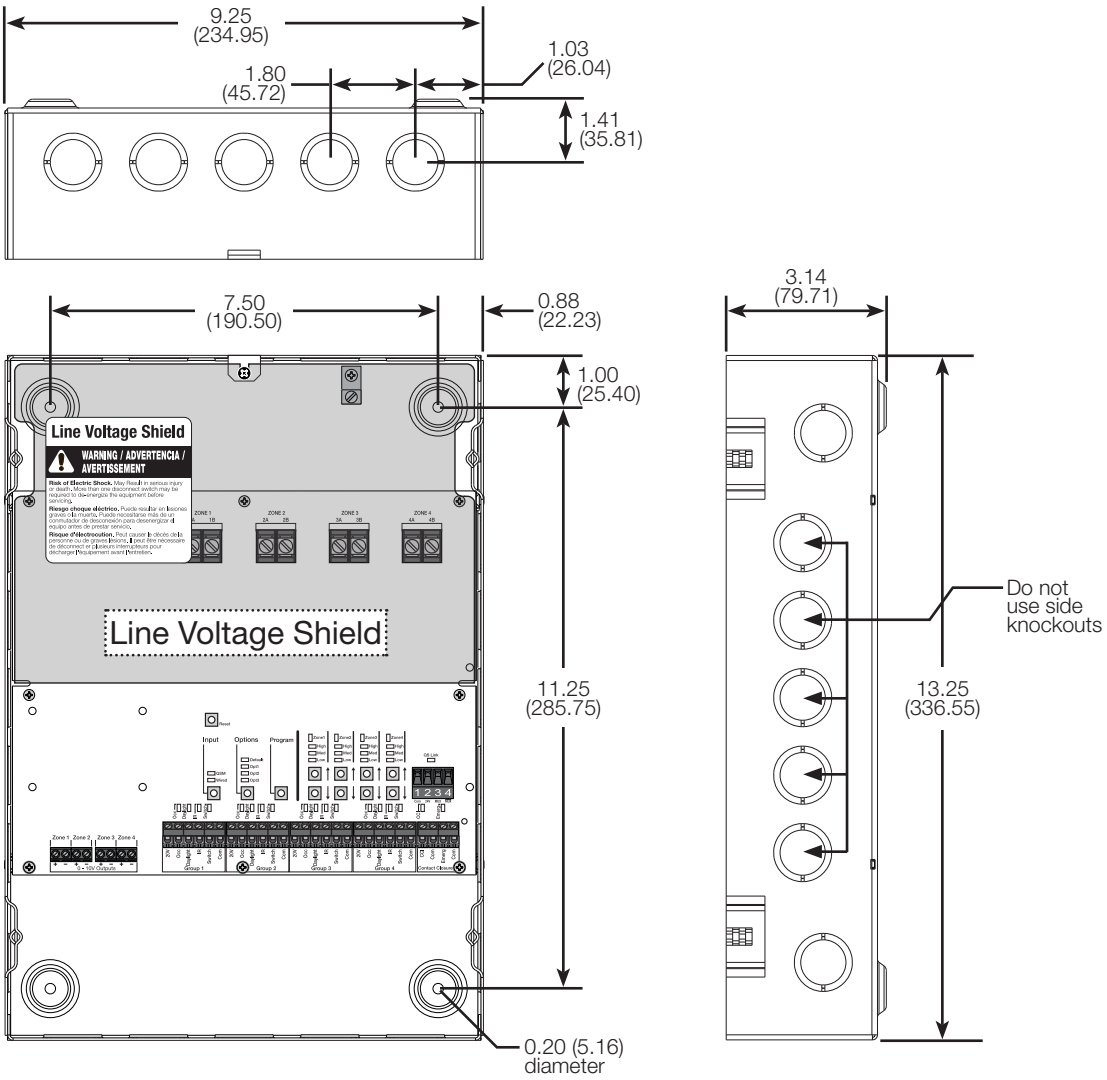
Programming Options and Features *(continued)*

	Manual Programming	HHD Programming: • Requires ESN Programming Interface QSE-CI-AP-D • Requires *Apple iPod touch* or *iPhone* mobile digital device
seeTouch QS wallstations		
Scene Keypads assigned to…	Any zone(s) on the ESN unit	Any zone(s) on one or more ESN units on the QS link
Scene + off keypads assigned to…	Any zone(s) on the ESN unit	Any zone(s) on one or more ESN units on the QS link
Zone toggle keypad buttons assigned to…	Any zone(s) on the ESN unit	Any zone(s) on on or more ESN units on the link
Change Keypad to Scene or Zone	Yes	Yes
Changing keypads to shade, panic, fine tune	No	Yes
Zone Configuration Parameters		
Load type	0-10, 10-0, or switched	0-10, 10-0, or switched
High-end trim	Adjustable	Adjustable
Low-end trim	Adjustable	Adjustable
Absolute minimum level	Adjustable	Adjustable
Scenes		
Available scenes	Scenes 1-16	Scenes 1-16
GRAFIK Eye QS	N/A	Share scenes, timeclock events, or afterhours events to ESN units on QS Link
QSE-IO	Scene, zone toggle, occupancy	Scene, zone toggle, occupancy
QSE-CI-NWK-E	Yes	Yes

Job Name:	Model Numbers:	
Job Number:		

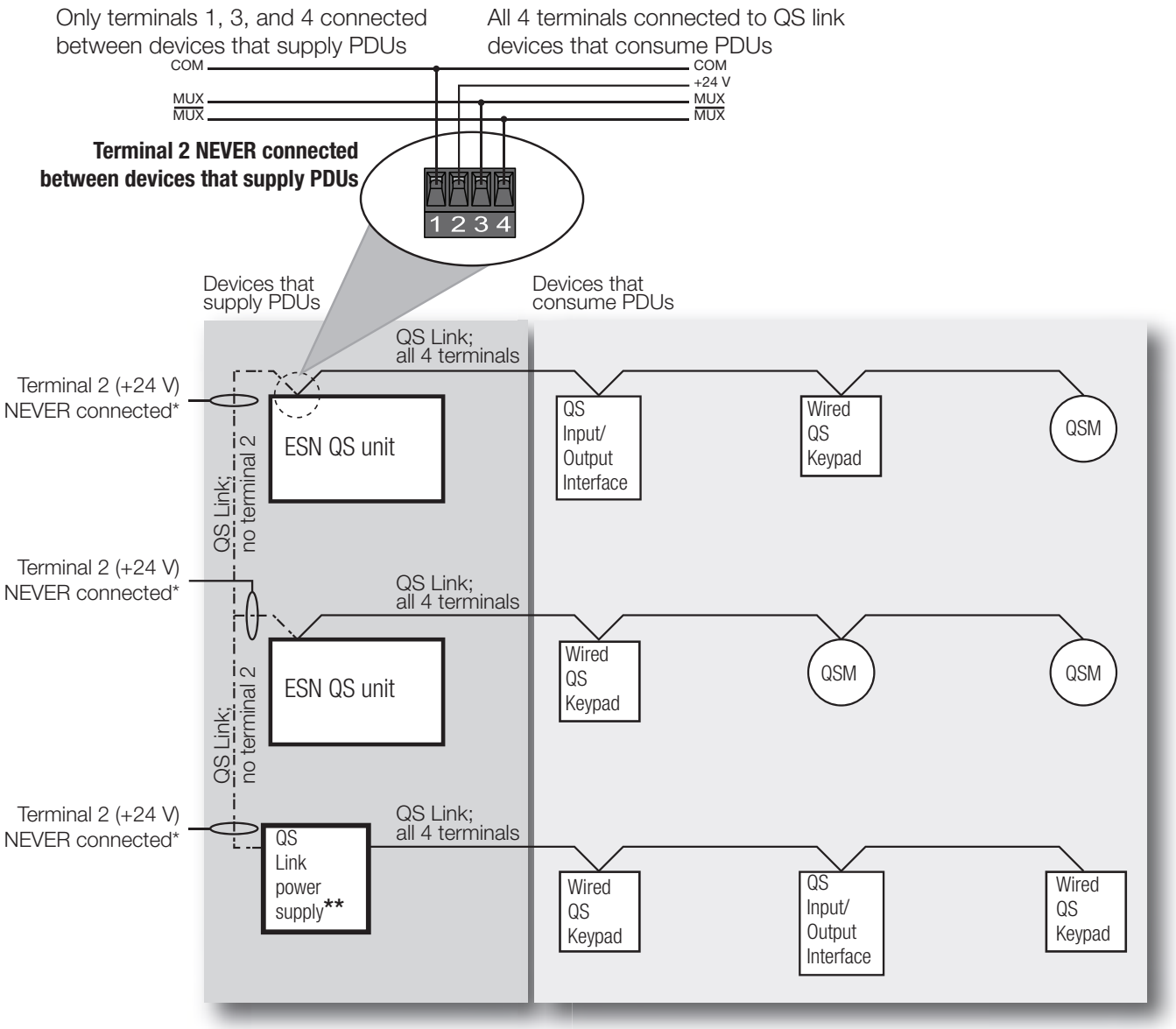
Mechanical Dimensions

All dimensions shown as in (mm)



Job Name:	Model Numbers:	
Job Number:		

Wiring: QS Link



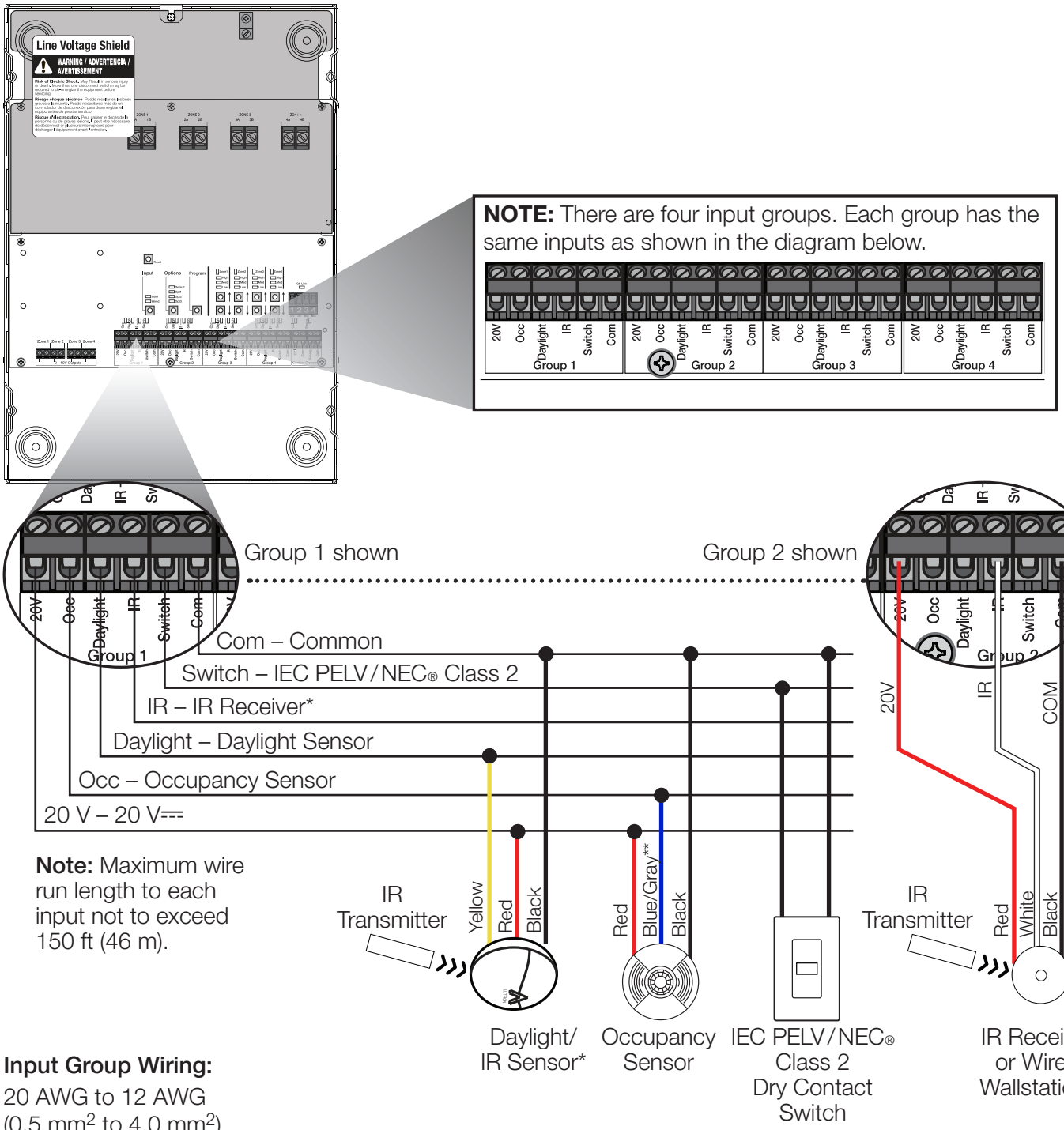
QS Link Wiring Rules

* Terminal 2 (+24 V) should NEVER be connected between devices that supply PDUs.

** For QS Link power supply wiring connection details, refer to the installation instructions for the specific power supply model being used.

Job Name:	Model Numbers:	
Job Number:		

Wiring: IEC PELV/NEC® Class 2 Inputs



Input Group Wiring:

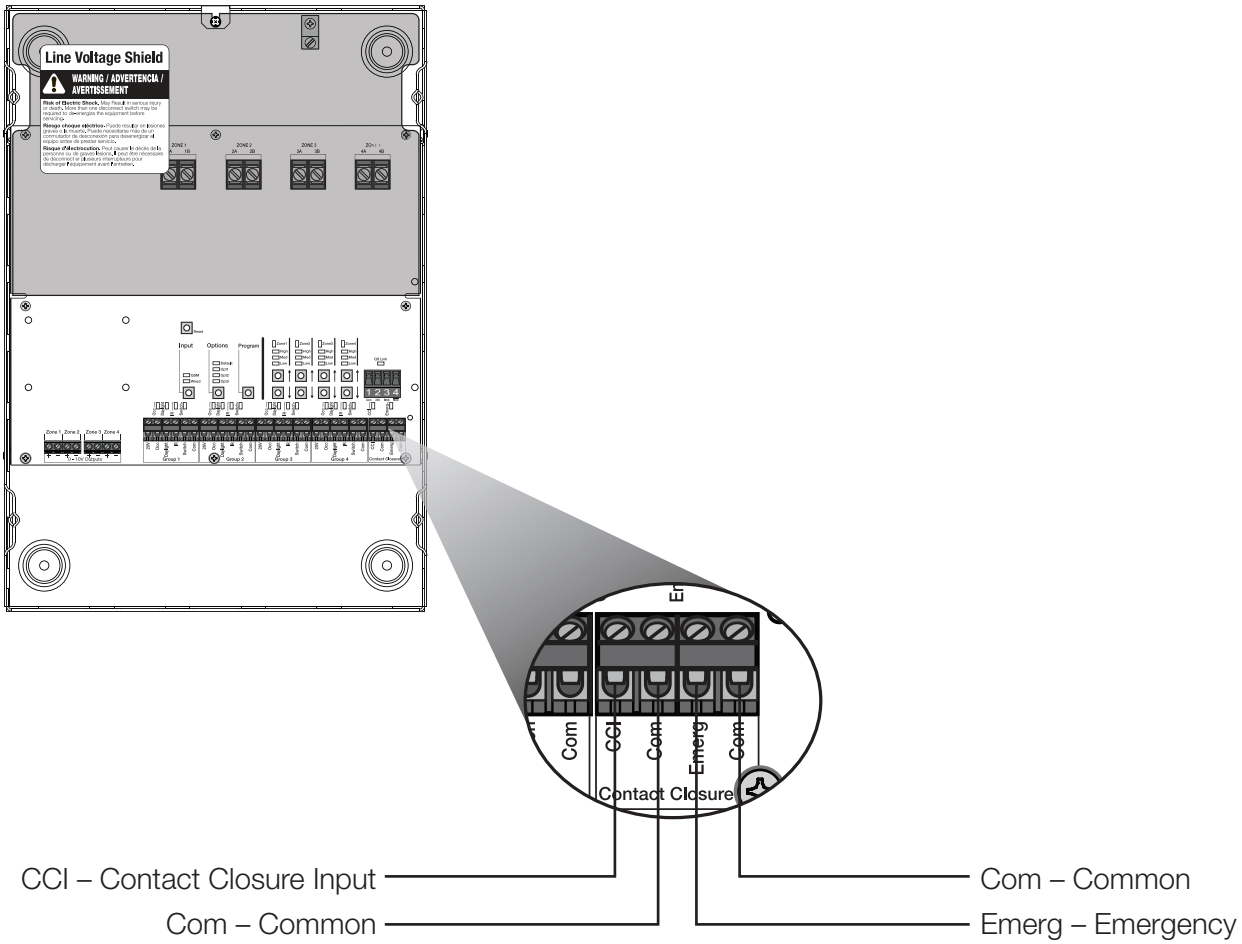
- 20 AWG to 12 AWG (0.5 mm^2 to 4.0 mm^2)
- Strip length: 1/4 in (6 mm)
- Torque: 5 in•lb (0.5 N•m)

* **Note:** Only one IR device may be connected per input. If the IR signal from a daylight sensor is connected, a wall control may not be connected to the same input, and vice-versa.

**Connect the gray wire on -R model occupancy sensors.

Job Name:	Model Numbers:	
Job Number:		

Wiring: Contact Closure Inputs (CCI and Emerg)

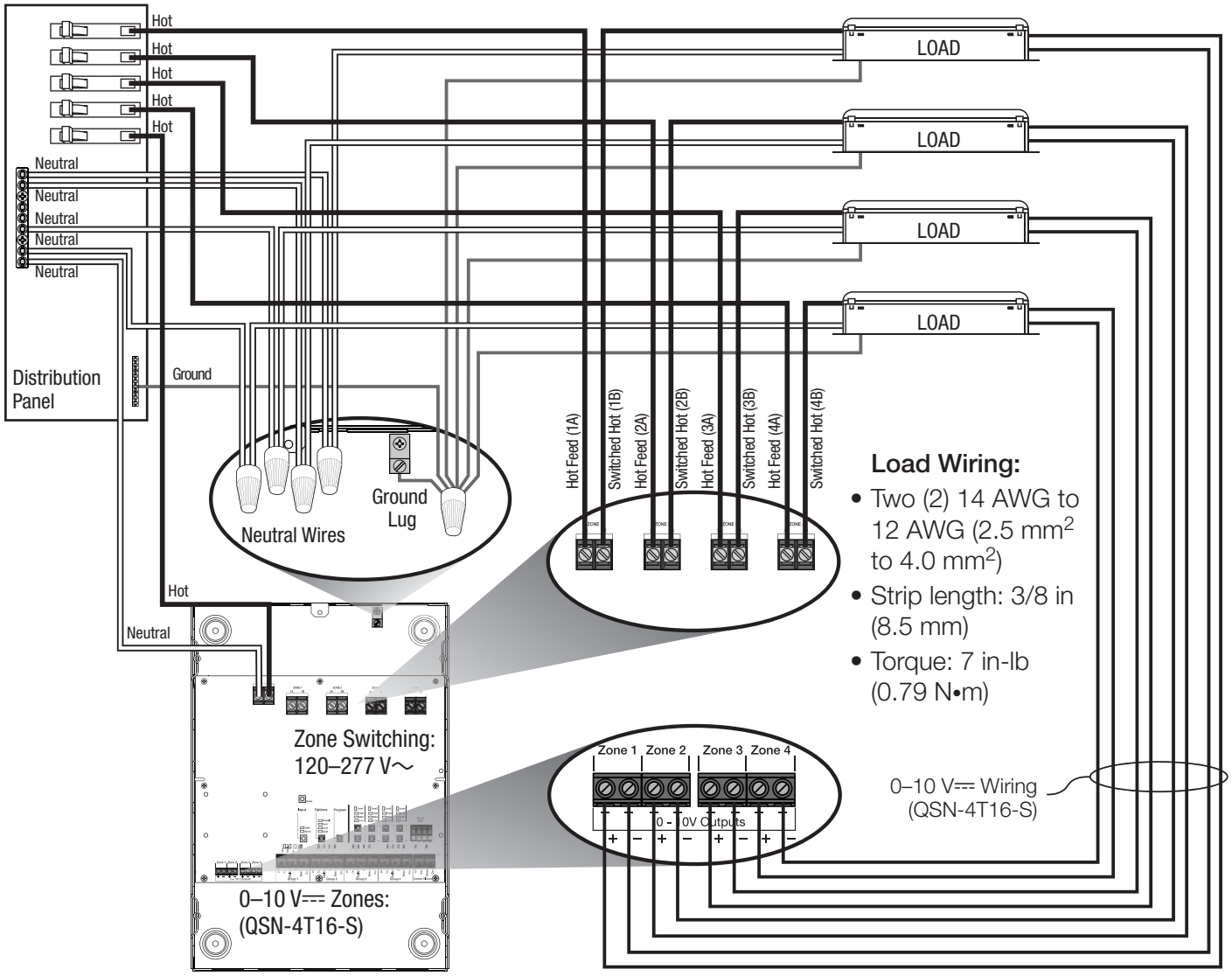


Contact Closure Wiring:

- 20 AWG to 12 AWG (0.5 mm^2 to 4.0 mm^2)
- Strip length: 1/4 in (6 mm)
- Torque: 5 in•lb (0.5 N•m)

Job Name:	Model Numbers:	
Job Number:		

Wiring Diagram: Example A – 4 circuits, multiple feeds

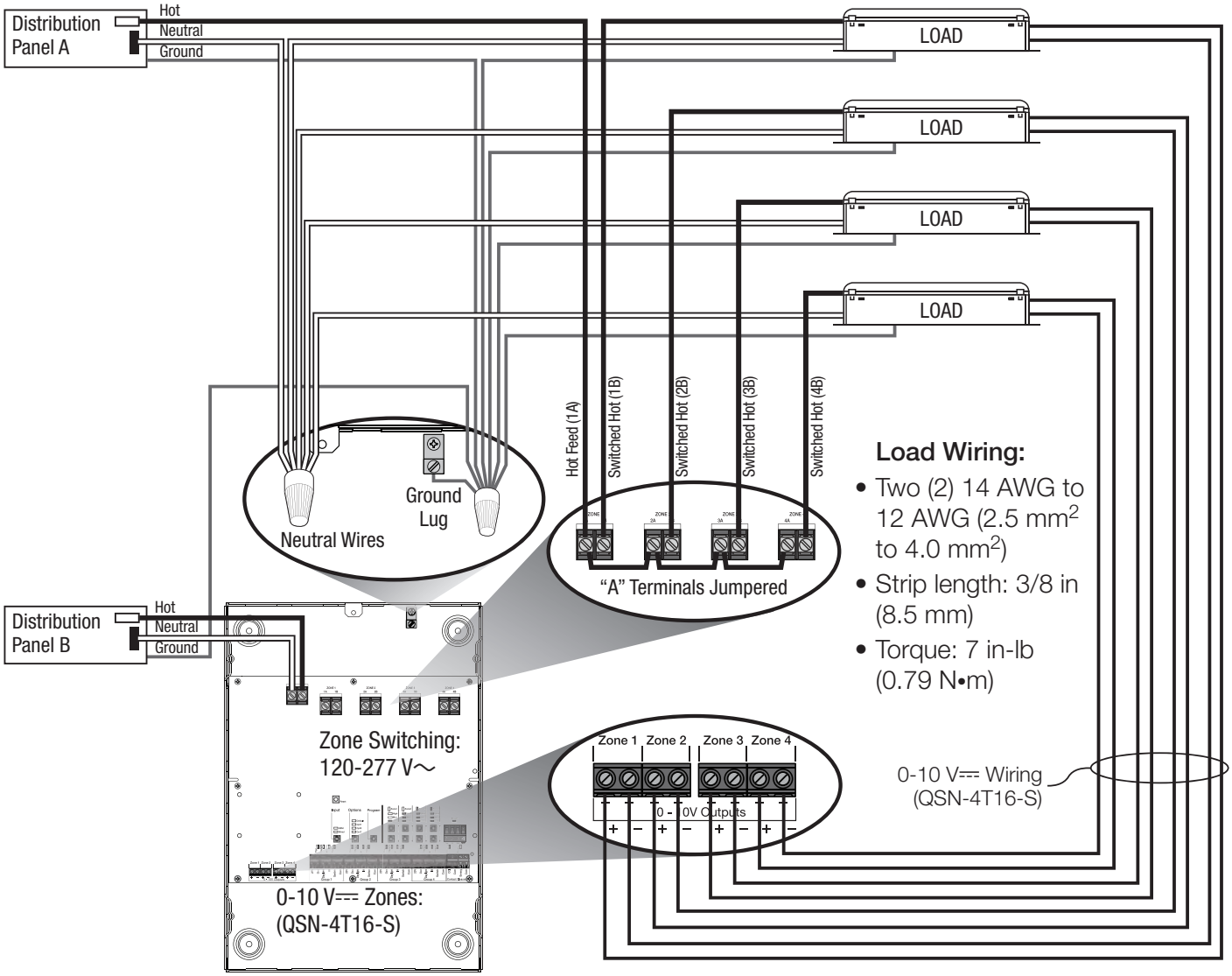


0-10 V⎓ Wiring (QSN-4T16-S)

- 20 AWG to 12 AWG (0.5 mm² to 4.0 mm²)
- Strip length: 1/4 in (6 mm)
- Torque: 5 in-lb (0.5 N•m)
- 0-10 V⎓ control wires for zones 1-4 can be installed using NEC® Class 1 or Class 2 wiring methods.
- 0-10 V⎓ zones 1-4 are not isolated from each other.
- Negative (–) terminals are not internally connected to each other - both positive (+) and negative (–) connections must be made.
- Follow all national and local codes for separation requirements.
- If any pair of 0-10 V⎓ control wires are installed using NEC® Class 1 wiring methods, then these wires must be physically separated from all other Class 2 wiring in the Energi Savr Node in accordance with NEC® guidance on separation of Class 1 and 2 wires.
- If one pair of 0-10 V⎓ control wires are wired using NEC® Class 1 wiring methods, then all pairs of 0-10 V⎓ control wires must be installed using NEC® Class 1 wiring methods.

Job Name:	Model Numbers:	
Job Number:		

Wiring Diagram: Example B – 4 circuits, single feed



0-10 V Wiring (QSN-4T16-S)

- 20 AWG to 12 AWG (0.5 mm² to 4.0 mm²)
- Strip length: 1/4 in (6 mm)
- Torque: 5 in-lb (0.5 N•m)
- Connect only IEC PELV/NEC® Class 2 circuits or connect only non-IEC PELV/NEC® Class 2 circuits to 0-10 V⎓ zones 1-4.
- 0-10 V⎓ zones 1-4 are not isolated from each other.
- Negative (–) terminals are not internally connected to each other - both positive (+) and negative (–) connections must be made.
- Follow all national and local codes for separation requirements.

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Job Name:	Model Numbers:	
Job Number:		

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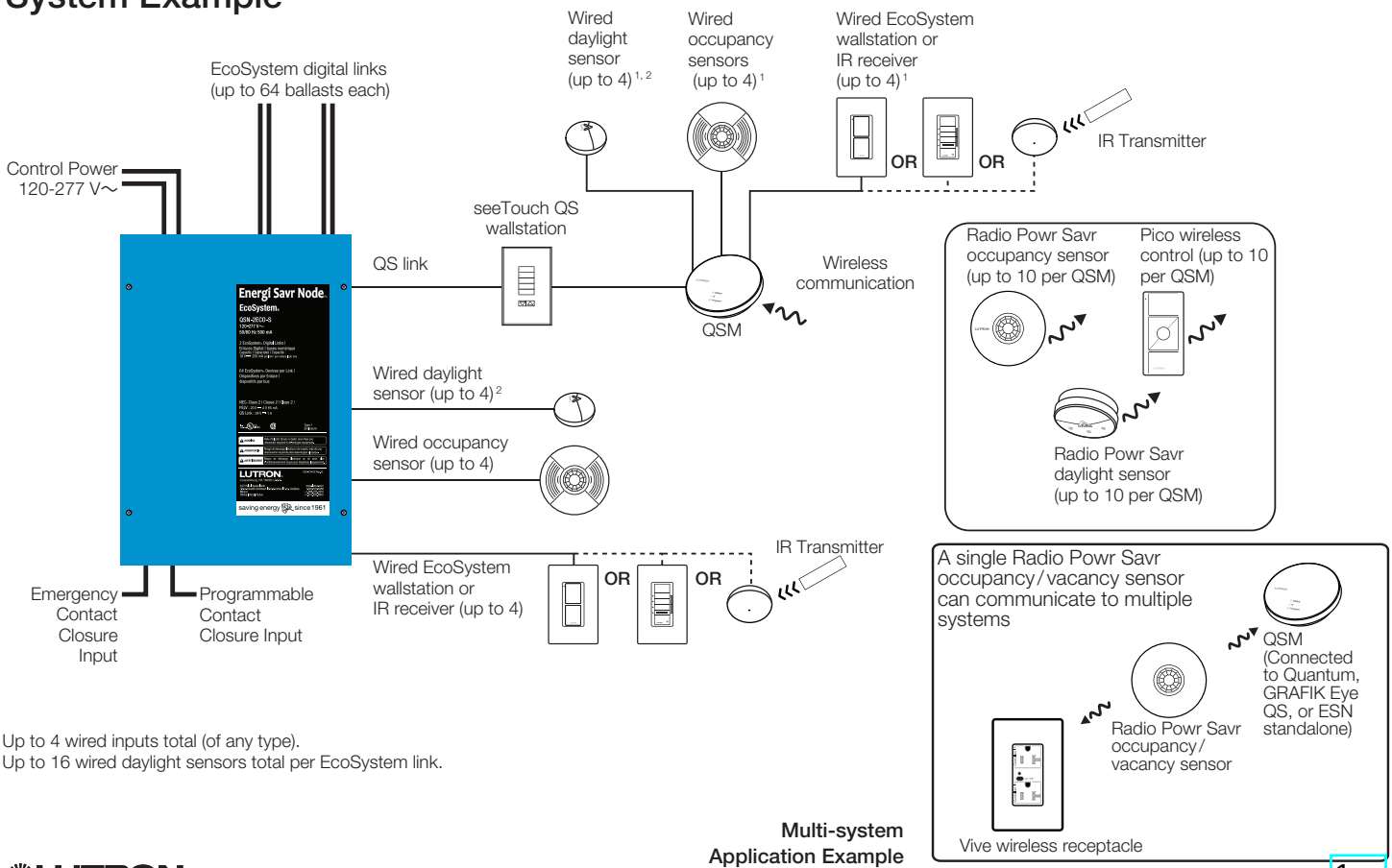
QS Sensor Module

The QS Sensor Module (QSM) is a ceiling-mounted device that integrates Lutron wireless and wired sensors and controls through the QS communication link to Energi Savr Node (ESN) units, GRAFIK Eye QS control units, Quantum systems, myRoom control modules, and Sivoia QS shades/draperies.

Features

- Uses Clear Connect RF technology for communication with Radio Powr Savr sensors and Pico wireless controls.
- QSM connects to four Lutron wired sensors or controls—sensors, EcoSystem infrared (IR) receivers, or EcoSystem wallstations. Does not apply to wireless only models.
- Powered by the QS link—no line voltage connections are required.
- Contact Lutron for compatibility details with the Quantum system.
- Compatible with the entire ESN product family:
  - — Allows Lutron wired sensors, EcoSystem wallstations, EcoSystem IR receivers, Pico wireless controls, and Radio Powr Savr sensors to control ESN units.
- Compatible with myRoom power modules.
  - — Allows Lutron wired and wireless occupancy/vacancy sensors to control power modules.
  - — Allows Pico wireless controls to control power modules.
- Compatible with GRAFIK Eye QS control units.
  - — GRAFIK Eye QS control unit models starting with QSGR.
  - — Allows Lutron wired or Radio Powr Savr wireless sensors linked to a QSM to control the GRAFIK Eye QS control unit.
  - — Contact Lutron for compatibility with Pico wireless controls, EcoSystem wallstations, and EcoSystem infrared (IR) receivers.
- Compatible with Sivoia QS shades/draperies.
  - — Allows Pico wireless controls to control Sivoia QS shades/draperies (QSM models with wireless inputs only).

System Example



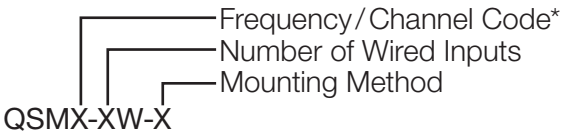
[1] Up to 4 wired inputs total (of any type).
[2] Up to 16 wired daylight sensors total per EcoSystem link.

Multi-system Application Example

LUTRON SPECIFICATION SUBMITTAL

Job Name:	Model Numbers:	
Job Number:		

Models



Frequency/Channel Code*

2—431.5 - 436.6 MHz U.S.A., Canada, and Mexico
3—868.1 - 869.8 MHz European Union and United Arab Emirates
4—868.1 - 868.5 MHz Singapore and China
5—865.5 - 866.5 MHz India
7—433.0 - 434.7 MHz Hong Kong
X—No RF

*Contact Lutron for frequency/channel code compatibility with your particular geographic region if it is not indicated above.

Number of Wired Inputs

4—4
X—None

Mounting Method

C—Ceiling Mount
J—Junction Box Ceiling Mount

Availability/Compatibility

Refer to the chart below to determine QSM model availability and compatibility with different sensor models.

	Radio Powr Savr Sensors		
QSM Models	Occupancy/Vacancy***	Daylight**	Pico Wireless Controls
QSM2-4W-C, QSM2-XW-C, QSM2-4W-J, QSM2-XW-J	LRF2-OCRB-P, LRF2-OHLB-P, LRF2-OKLB-P, LRF2-OWLB-P, LRF2-VHLB-P, LRF2-VKLB-P, LRF2-VWLB-P, LRF2-OCR2B-WH, LRF2-VCR2B-WH	LRF2-DCRB	MRF2-3BRL, MRF2-3B, MRF2-2BRL, MRF2-2B, QSR4P-3R, PJ-2B-Gxx-xxx, PJ-2BRL-Gxx-xxx, PJ-3B-Gxx-xxx, PJ-3BRL-Gx-xxx, PJ2-2B-Gxx-xxx, PJ2-2BRL-Gxx-xxx, PJ2-3B-Gxx-xxx, PJ2-3BRL-Gx-xxx, PJ2-4B-Gxx-xxxx
QSM3-4W-C, QSM3-XW-C	LRF3-OCRB-P	LRF3-DCRB	QSRKP-2, QSRKP-2R, QSRKP-3R
QSM4-4W-C, QSM4-XW-C	LRF4-OCRB-P	LRF4-DCRB	QSRMP-2, QSRMP-2R, QSRMP-3R
QSM5-XW-C	LRF5-OCRB-P	LRF5-DCRB	QSRNP-2, QSRNP-2R, QSRNP-3, QSRNP-3R
QSM7-4W-C, QSM7-XW-C	LRF7-OCR2B-P	LRF7-DCRB	QSRQP-2, QSRQP-2R, QSRQP-3, QSRQP-3R
QSMX-4W-C	N/A	N/A	N/A

** Daylight sensors cannot be used as part of myRoom solutions.
***Low light occupancy mode is incompatible with QSM models.

Job Name:	Model Numbers:	
Job Number:		

Specifications

QS Sensor Module (QSM)

Power

- 24–36 V⎓
- Maximum current draw:
  - 400 mA (models with wired input)
  - 100 mA (models without wired input)
- Power Draw Units (PDU): Refer to the QS Link Power Draw Units specification submittal (P/N 369405) for information concerning PDUs on the QS link. Use only Lutron approved power sources.
- 10-year power failure memory: restores settings and programming after power interruption.

Regulatory

- Lutron quality systems registered to ISO 9001.
- RoHS compliant
- Wireless receiver (Rx) device. Product has no wireless transmit functionality.

QSM2 –

- cUL US Listed (U.S.A. and Canada)
- FCC Compliant. Complies with the limits for a Class B digital device, persuant to Part 15 of the FCC Rules (U.S.A.).
- IC Certified. (Canada)
- SCT Certified (Mexico)

QSM3 –

- CE Marked (European Union)

QSM5 –

- WPC Type Approved (India)

QSM7 –

- FCC Compliant. Complies with the limits for a Class B digital device, persuant to Part 15 of the FCC Rules (U.S.A.).

Environment

- Ambient Temperature Operating Range: 32 °F to 104 °F (0 °C to 40 °C).
- Relative humidity: less than 90% non-condensing.
- For indoor use only.

Terminals

- Input wiring: 22 AWG to 12 AWG (0.5 mm^2 to 4.0 mm^2)
- QS link wiring: 22 AWG to 12 AWG (0.5 mm^2 to 4.0 mm^2)

Mounting

- QSM units should be mounted in the middle of non-metal ceiling tile or drywall, visible from inside the space.
- Installation near metal other than a junction box may reduce RF range.

Wireless Communication (models with wireless inputs only)

- RF Range: 60 ft (18 m) line of sight or 30 ft (9 m) through typical construction materials.
- To ensure optimal wireless range, install the QSM in the ceiling in a visible position from inside the space.
- Radio Powr Savr occupancy/vacancy sensor (up to 10)
- Radio Powr Savr daylight sensor (up to 10)
- Pico wireless control (up to 10)

Wired Inputs

- There are 4 universal wired inputs. Each input can accept one of the following:
  - EcoSystem wallstation (CC- series)
  - Occupancy sensor (LOS- series)
  - Daylight sensor (EC-DIR- series)
  - EcoSystem IR receiver (EC-IR or EC-DIR- series)
  - Wired Pico control (PX- series)
- Use of both the infrared receiver and daylight sensor on the EC-DIR- series sensors is considered two wired inputs on a QSM
- Maximum wiring distance = 150 ft (46 m)
- Only wired (LOS- series) and wireless occupancy/vacancy sensors may be used in myRoom; no Ecosystem wallstations, daylight sensors, Ecosystem IR receivers or wired Pico controls

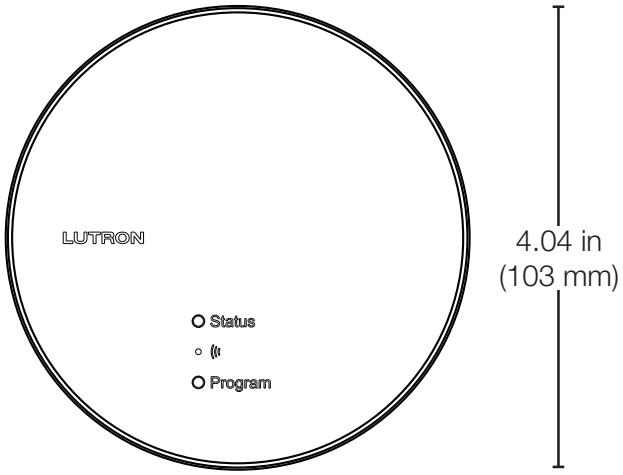
QS Link Limits

- The QS link can have up to 100 devices.
- Each QSM counts as 1 device towards the 100 device limit.
- Each QSM draws 3 Power Draw Units (PDUs) on the QS link.
- Wired sensors add to the PDU draw of a QSM. Refer to the QS Link Power Draw Units specification submittal (P/N 369405) for information concerning PDUs.
- QS link maximum wire run length is 2000 ft (610 m).
- See the commercial system rules spec (P/N 369821) for system specific limitations.

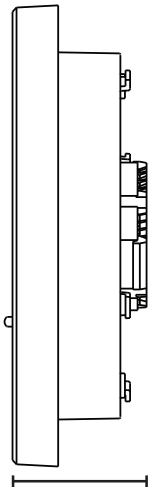
Job Name:	Model Numbers:	
Job Number:		

Mechanical Dimensions (All Models)

Front View

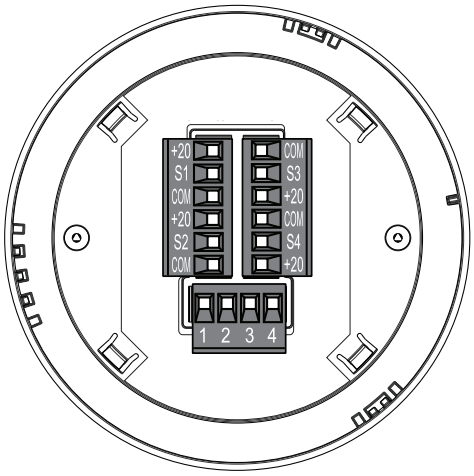


Side View

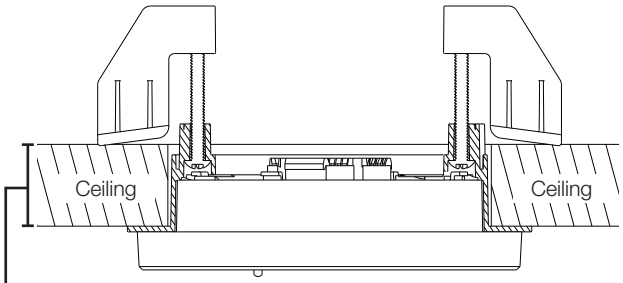


Back View

(QSM2-4W-C shown)

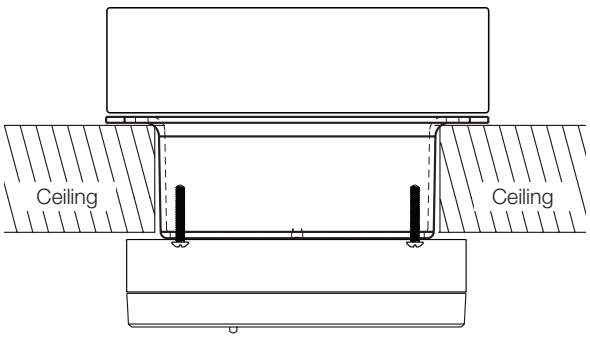


Mounted (-C Models)

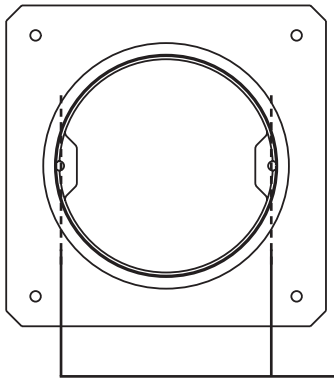


Ceiling thickness range for -C models
Minimum 0.30 in (8 mm)
to
Maximum 1.20 in (30 mm)

Mounted (-J Models)



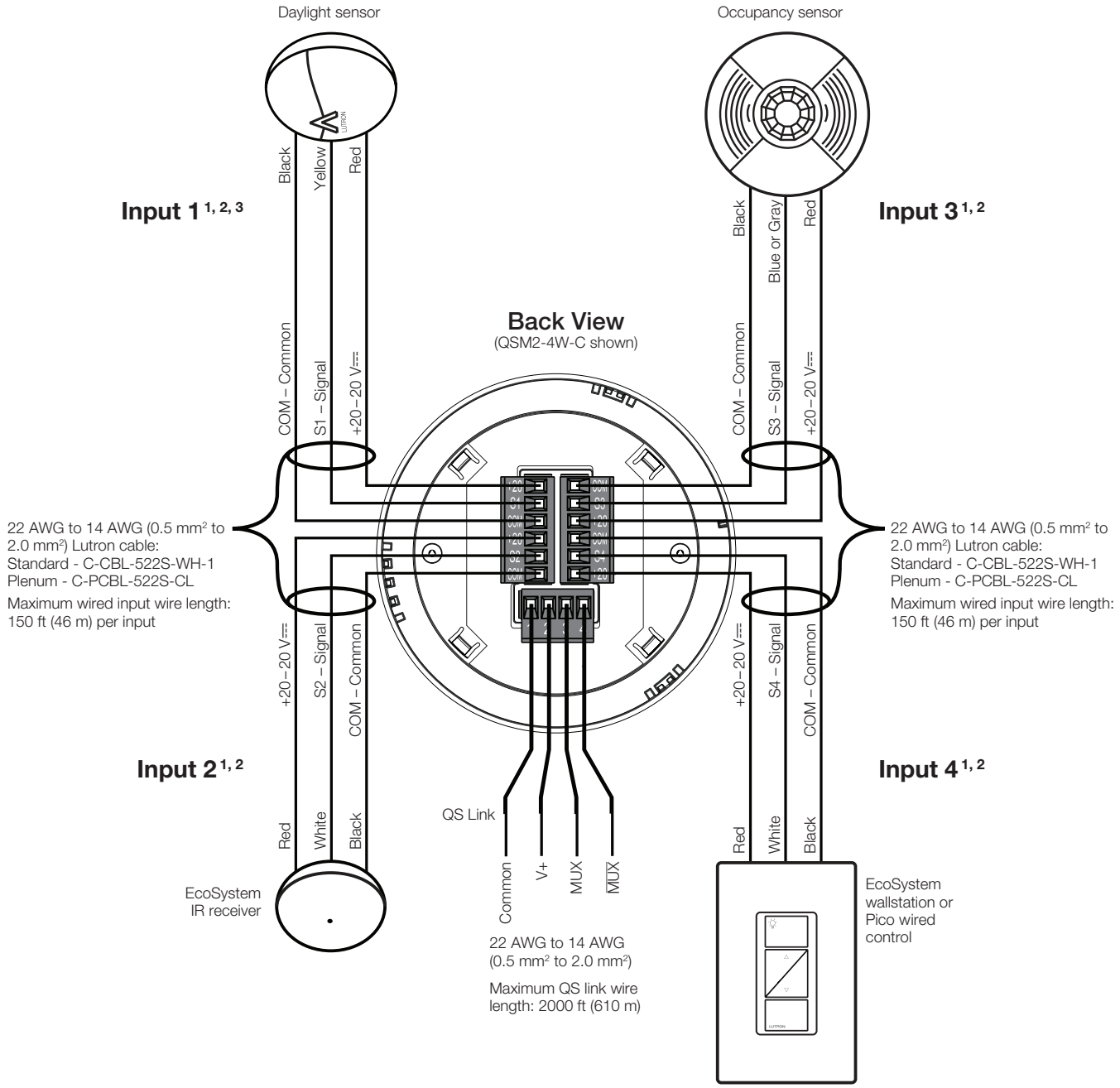
Use appropriate mud ring for ceiling tile thickness. Do not allow the tile to carry the weight of the junction box.



Use mud ring with hole spacing shown below. Mud ring not included with any QSM models.

Job Name:	Model Numbers:	
Job Number:		

Wiring: QS Link and Wired Inputs[1]

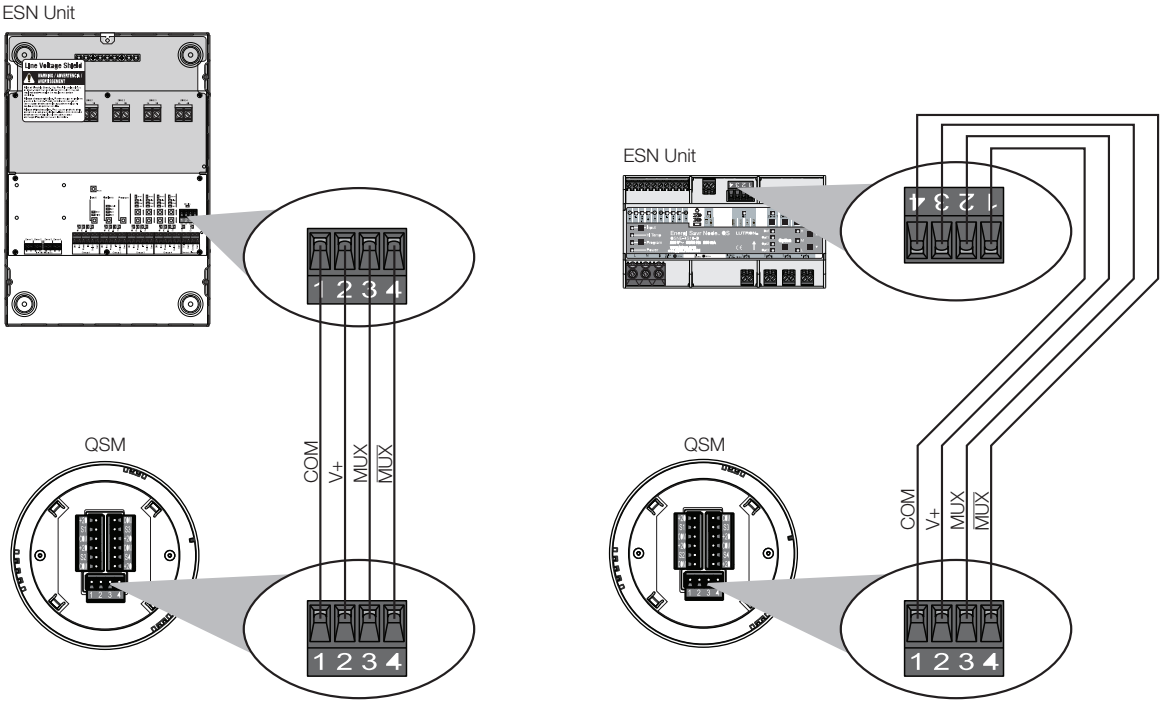


[1] Only on QSM models with wired inputs.
[2] For reference only. Each input is universal and can accept any of the inputs shown above.
[3] Only daylight sensor signal connected to QSM shown above. Use of IR signal counts as an additional input on the QSM.

Job Name:	Model Numbers:	
Job Number:		

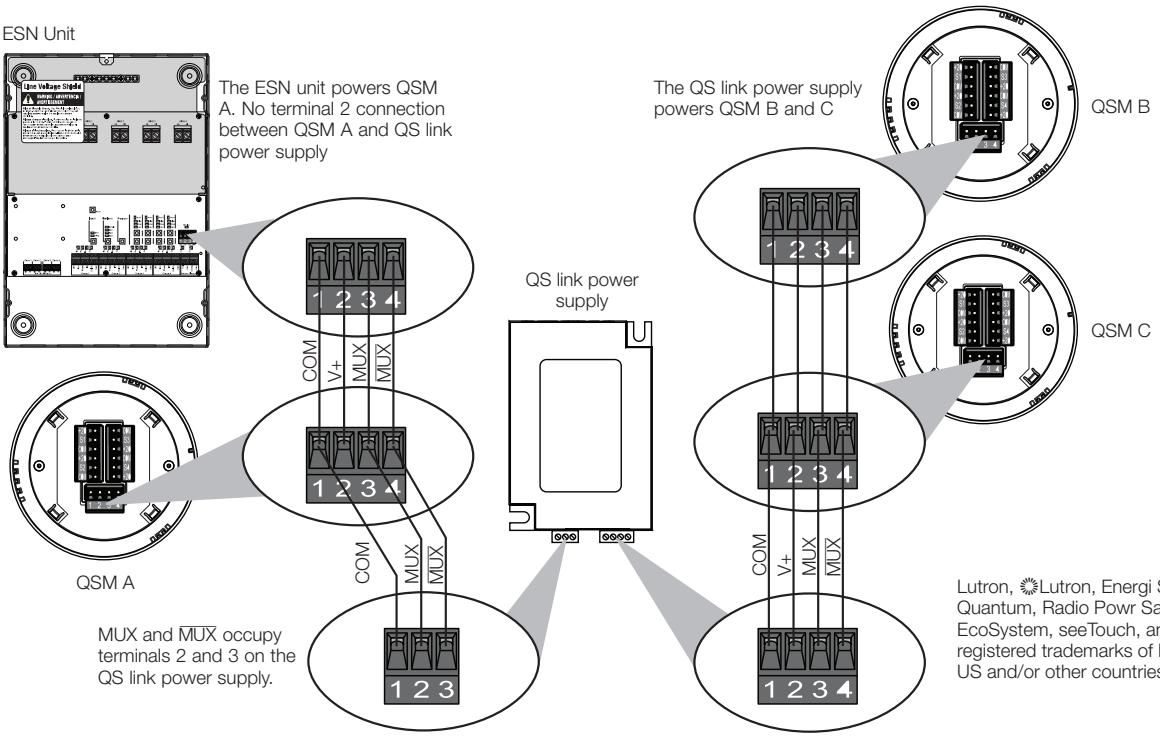
Wiring: Device Power

Single QSM Powered by an ESN Unit



Multiple QSMs Powered by an ESN Unit and a QS Link Power Supply

A QS link power supply may be necessary if PDUs required by QSMs exceed available PDUs from the device supplying power.



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Job Name:	Model Numbers:	
Job Number:		

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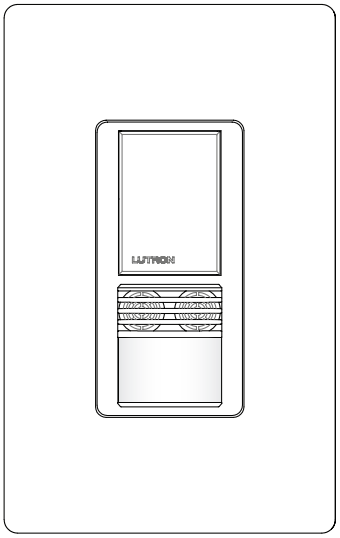
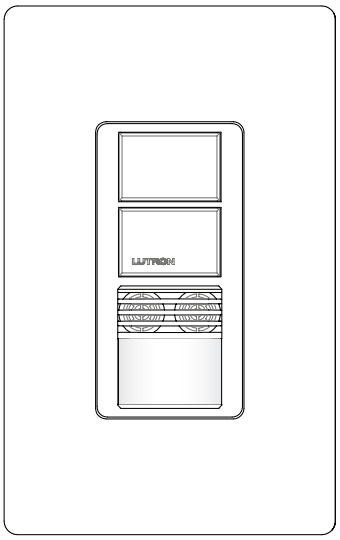
Maestro Dual Technology Sensor Switch

The Maestro dual technology (dual tech) occupancy sensor switch applies our exclusive XCT Technology to the ultrasonic as well as the passive infrared technology in this sensor to create a product that can detect very fine motion, such as typing. This product also includes all of the great features found in the rest of the Maestro sensor family, including: adaptive relay switching, smart ambient light detection, and simple button presses for changing settings. The Maestro dual tech occupancy sensor switch is available in single-circuit and dual-circuit versions.

The single-circuit versions (MS-A102, MS-B102) can be used to meet many of the Title 20/24, ASHRAE 90.1, and IECC code requirements such as “automatic shutoff”. The dual-circuit versions (MS-A202, MS-B202) can be used to meet many of the Title 20/24, ASHRAE 90.1, and IECC code requirements such as “automatic shutoff” and “multi-level lighting control”. To find some examples of code-specific applications, visit www.lutron.com/energycodes



MS-A102-XX (Occupancy model)
MS-A102-V-XX (Vacancy model)
MS-B102-XX (Occupancy model)
MS-B102-V-XX (Vacancy model)



MS-A202-XX (Occupancy model)
MS-B202-XX (Occupancy model)

Features

- XCT Technology for major, minor, fine, and very fine motion detection
- 180° sensor field-of-view
- Tamper-resistant PIR lens
- Up to 900 ft^2 (81 m^2) major motion coverage and 400 ft^2 (36 m^2) minor motion coverage
- Two Ambient Light Detect (ALD) options:
  - – Learning ALD Mode:
    Uses adaptive algorithm.
    Sensor learns user’s preferred light level over time.
  - – Fixed ALD mode:
    Four selectable light level thresholds: Hi, Med, Low, Min
- Occupancy models (MS-A102-XX, MS-B102-XX, MS-A202-XX, MS-B202-XX) can be set to Auto-ON/Auto-OFF or Manual-ON/Auto-OFF per circuit
- Dual-circuit model (MS-A202) meet Title 24 requirements for multi-level lighting control.
- Single-circuit “Vacancy” model (MS-A102-V-XX, MS-B102-V-XX) available to meet Title 24/Title 20 requirements for vacancy sensors.
- Adjustable timeout for each circuit (1, 5, 15, or 30 minutes)
- Sensitivity adjustment
  - PIR (Hi, Med, Low, Min)
  - Ultrasonic (Hi, Med, Low, Off)
- Switches all lighting loads: incandescent, halogen, ELV, MLV, CFL, LED, magnetic fluorescent, electronic fluorescent
- Switches fan loads at 120 V~
- MS-B102, MS-B102-V work with Maestro accessory switches in multi-location applications
- MS-A models DO NOT require neutral wiring, while the MS-B models DO require neutral wiring.

Notes:

- “XX” in the model number represents color/finish code. See **Colors and Finishes** at end of document.
- Wallplate not included.
- For TAA compliant models, add “W” before “MS” when ordering. Available in gloss colors only. For other BAA/TAA compliant products, please visit our website at www.lutron.com/BAA and select “download BAA product list”.

LUTRON SPECIFICATION SUBMITTAL Page 1

Job Name:	Model Numbers:	
Job Number:		

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Specifications

Regulatory Approvals

- UL® Listed to U.S. and Canadian safety requirements
- NOM certified
- Title 20/24 certified lighting control device
  – Complies with Title 20 and Title 24 section 110.9

Power/Load Control

- 120–277 V~ 50/60 Hz

Key Design Features

- Dual Sensing Technology
- Switches all lighting loads
- 6 A of lighting load per circuit at 120–277 V~
- 4.4 A (1/6 HP) of fan load per circuit at 120 V~
- Crush/tamper resistant lens
- Smart Ambient Light Detection (ALD)
- Fixed Ambient Light Detection
- Adaptive zero-cross switching algorithm for extended relay life (patent pending)
- XCT Technology for major, minor, fine, and very fine motion detection
- Programmable circuit swapping eliminates need for rewiring to reassign circuits after installation of a dual-circuit product. (patent pending)
- Product ground current does not exceed 0.5 mA

Environment

- Ambient operating temperature: 32 °F to 104 °F (0 °C to 40 °C), 0%–90% humidity, non-condensing. Indoor use only.

Warranty

- 5-Year Limited Warranty. For additional Warranty information, please visit www.lutron.com/TechnicalDocumentLibrary/Sensor_Warranty.pdf

Sensor Detection

Lutron dual tech sensors operate by triggering initial occupancy using PIR technology, and maintain occupancy using both ultrasonic and PIR technology.

Advanced Features

Switching

- Adaptive zero-cross switching—maximizes relay life by switching at the point of minimum energy on the AC power curve (patent pending). Actively adapts to variations in relay timing.

Additional Information on Sensors

- For single-circuit PIR Maestro occupancy sensor switch models, please see Lutron P/N 369666
- For Maestro occupancy sensor C•L dimmer models, please see Lutron P/N 369748
- For dual-circuit PIR Maestro occupancy sensor switch, please see Lutron P/N 369758
- For more information, please see www.lutron.com/occvacsensors
- Lutron Customer Support: 1.844.LUTRON1

Job Name:	Model Numbers:	
Job Number:		

Custom Settings

Default settings shown in bold

- Timeout

- 30 min
- **15 min**
- 5 min
- 1 min

Mode **- Sensor Modes**

Lights automatically turn off in all sensor modes

- **Occ -Occupancy mode (No ALD)** [1,2,3]
- Lrn - Occupancy with learning ALD mode
- Fixd - Occupancy with fixed ALD mode
- Vac - Vacancy mode (No ALD) [2,3]

1 MS-A102-XX, MS-B102-XX default is Occ
2 MS-A102-V-XX, MS-B102-V-XX is locked as Vac
3 MS-A202-XX, MS-B202-XX defaults are: Circuit 1 - Occ, Circuit 2 - Vac

- Ultrasonic Sensitivity

- High
- **Med**
- Low
- Off

PIR **- Passive Infrared Sensitivity**

- **High**
- Med
- Low
- Min

Additional Settings

Fixed ALD Light Level

- Hi
- Med
- **Low***
- Min

* "Low" is the default setting for any sensor that is set by the user to: Occupancy with fixed ALD mode

Off-While-Occupied

- **Enabled**
- Disabled

Walk-Thru Mode

- Enabled
- **Disabled**

Custom Settings - Details

Ambient Light Detection (ALD) mode

Lights turn on only when natural light in the room is below the set threshold.

– Learning: The ambient light threshold adjusts to the user's preference via manual interaction with the sensor switch.

– Fixed: Choose a fixed ALD light level from four pre-set options:
High, Medium, Low, and Minimum

Manual Off-While-Occupied Options

ENABLED (default setting)

– When the sensor switch is manually turned off, the sensor switch will not turn the lights back on automatically while the room is occupied.

– Once the room is vacated, the Auto-On feature returns to normal operation after the timeout period has expired.

– This may be the preference in conference rooms or classrooms while viewing presentations. This feature requires motions to keep the lights off.

DISABLED

– When the sensor switch is manually turned off, the Auto-On feature will return to normal operation after 25 seconds.

– This may be the preference in a restroom if the user always wants the lights to turn on upon entering and the lights to turn off when the room is vacant.

Walk-Thru Mode

ENABLED [1]

– If motion is not detected within 3 minutes after initial occupancy, the lights will turn off after 3 minutes, instead of the current timeout.

– This setting may be the preference in commercial applications where personnel may briefly trigger sensors during non-working hours.

DISABLED (default setting)

– When motion is detected, the lights will ALWAYS remain on for the entire timeout duration, regardless of the duration of occupancy detection.

1 1 minute timeout would be overridden if walk-thru mode is also ENABLED

Job Name:	Model Numbers:	
Job Number:		

Load Type and Capacity

Control	Neutral Connection Required	Vacancy Only	Number of Circuits	TAA Compliant	Voltage/Load Type/Maximum Load (Anywhere in Gang) [1]	Minimum Load	3-Way with Mechanical Switch	Multi-Location with Accessory Switch
MS-A102			1		120 – 277 V~ Lighting 6 A [2] 120 V~ Fan 4.4 A (1/6 HP) [3]	0 A		
MS-A102-V		✓	1			0 A		
MS-A202			2			0 A		
MS-B102	✓		1			0 A	✓	✓
MS-B102-V	✓	✓	1			0 A	✓	✓
MS-B202	✓		2			0 A	✓	
WMS-A102			1	✓		0 A		
WMS-A102-V		✓	1	✓		0 A		
WMS-A202			2	✓		0 A		
WMS-B102	✓		1	✓		0 A	✓	✓
WMS-B102-V	✓	✓	1	✓		0 A	✓	✓
WMS-B202	✓		2	✓		0 A	✓	

1 Ratings shown are per circuit.

2 Sensor switch load type: Designed for use with permanently installed incandescent, halogen, MLV, ELV, CFL, LED, magnetic fluorescent, and electronic fluorescent lighting loads.

3 When controlling light and fan loads simultaneously on a single-circuit, maximum load capacity per circuit is 4.4 A at 120 V~.

- Ground or neutral is required for product to function. If neither wire is present, consult a licensed electrician.
- For models MS-A102 and MS-A202, connect green-sleeved wire to ground only in retrofit and replacement applications. When neutral connection is available, remove green sleeve and connect the white wire to neutral.

Sensor switch placement

- The sensor switch performs better with an unobstructed view of room occupants.
- Hot objects and moving air currents can affect the performance of the sensor switch. The sensor switch performs best when located 6 ft (1.8 m) or more away from hot objects or moving air currents.
- The PIR performance depends on a temperature differential between the ambient room temperature and that of room occupants. Warmer rooms may reduce the ability of the sensor switch to detect occupants.
- The ultrasonic performance can be affected by air currents and moving objects. Consider the effects of fans, HVAC vents, open windows, or moving objects when installing the sensor switch.
- If the sensor sees a specific area that is not desired (e.g., hallway), Lutron offers a lens mask kit (Lutron P/N 50013614) that can be ordered through Customer Support (1.844.LUTRON1). Alternatively, selectively placing opaque tape (e.g., painter's tape, electrical tape, masking tape) over certain parts of the lens can limit it's field of vision to block undesired detection areas. Masking the lens may effect ALD performance, but DOES NOT block ultrasonic frequencies.

Definitions

Major motion: movement of a person entering or passing through an area.

Minor motion: movement of a person occupying an area and engaging in small activities (e.g., reaching for a telephone, turning the pages of a book, opening a file folder, picking up a coffee cup).

Fine Motion: movement of a person occupying an area and engaging in very small activities (e.g., reading a magazine).

Very Fine Motion: movement of a person occupying an area and engaging in very small activities (e.g., typing on a keyboard).

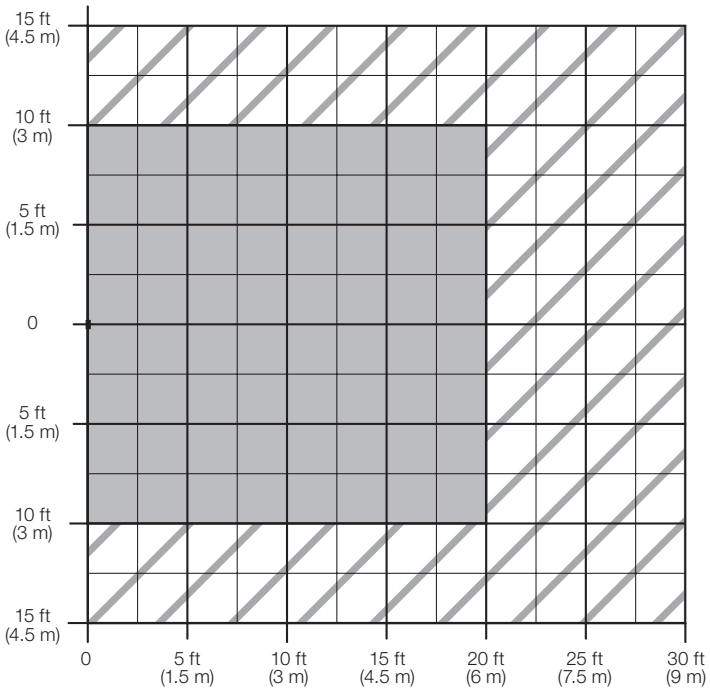
Job Name:	Model Numbers:	
Job Number:		

Sensor switch placement *(continued)*

NEMA WD7 Coverage

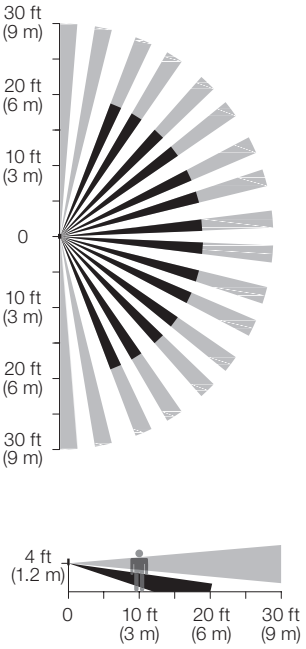
Major motion coverage: 900 ft² (81 m²)

Minor motion coverage: 400 ft² (36 m²)

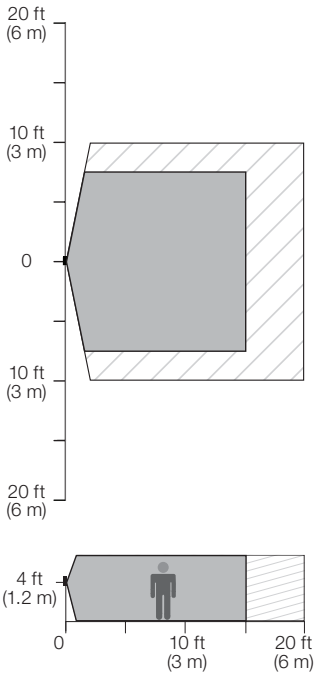


Test Room Dimensions: 37 ft x 38 ft (11.28 m x 11.6 m)
Test Floor Surface Material: Carpet
Sensor Coverage Angle: 180 °
Major motion coverage: Initial trigger motion detection
Minor motion coverage: Maintained motion detection

Passive Infrared Beam Diagram
(For Reference Only)



Ultrasonic Coverage
(For Reference Only)



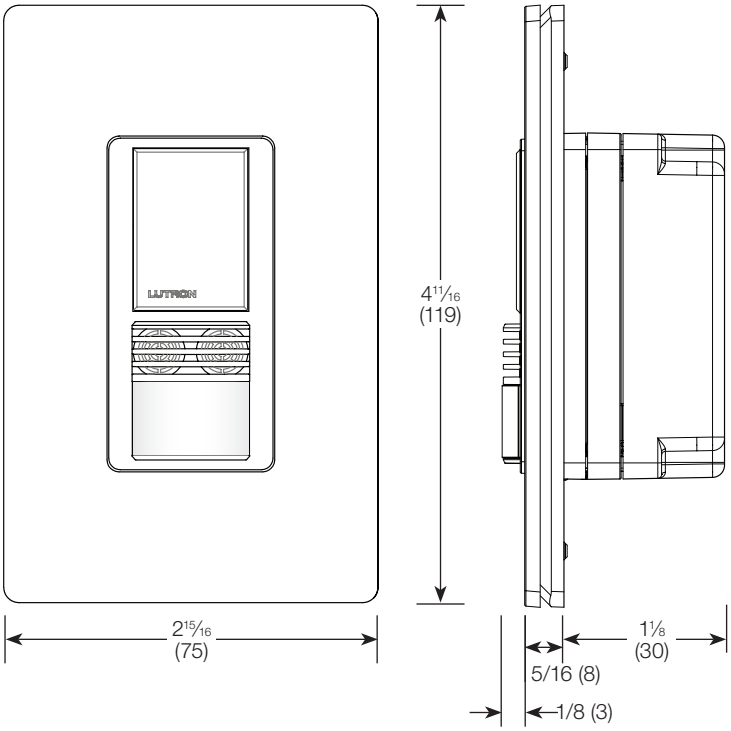
Ultrasonic Frequency: 40 kHz

Job Name:	Model Numbers:	
Job Number:		

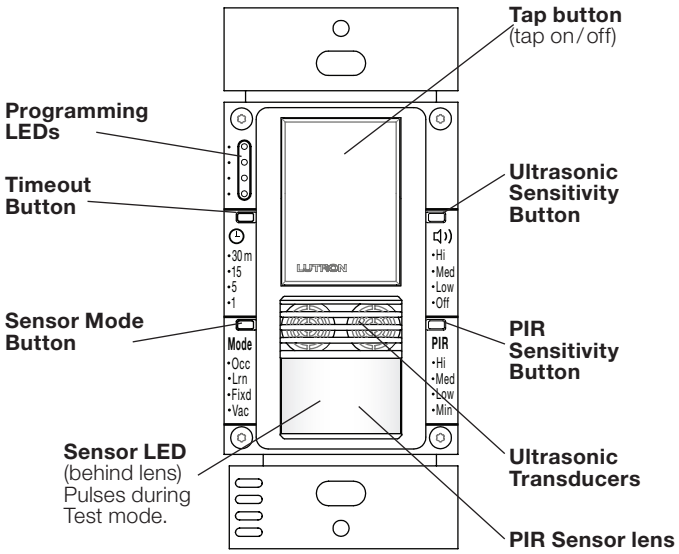
Dimensions - single-circuit
MS-A102, MS-A102-V, MS-B102, MS-B102-V

Measurements shown as: in (mm).

Front View **Side View**

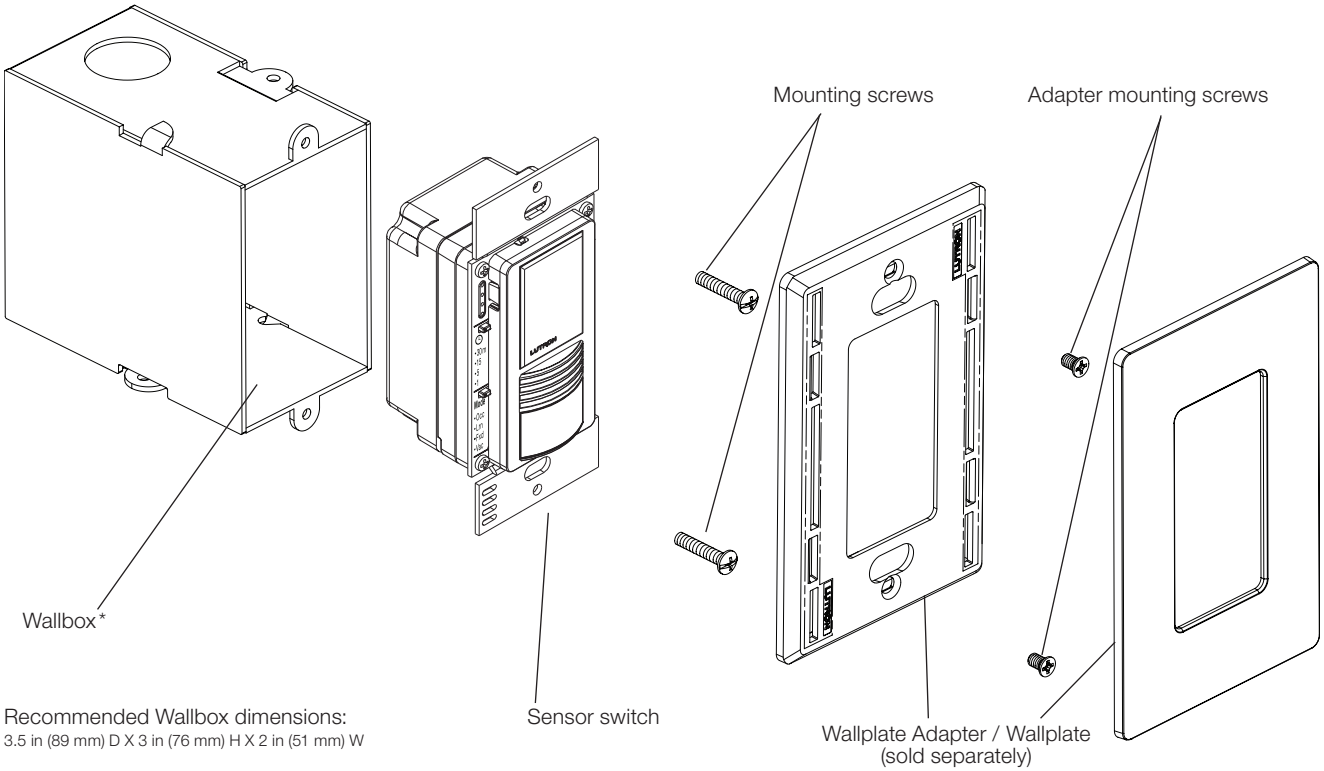


Operation



Job Name:	Model Numbers:	
Job Number:		

Mounting



* Recommended Wallbox dimensions:
3.5 in (89 mm) D X 3 in (76 mm) H X 2 in (51 mm) W

Job Name:	Model Numbers:	
Job Number:		

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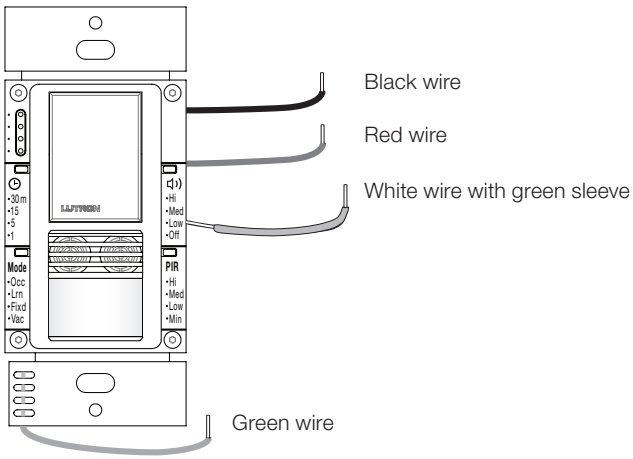
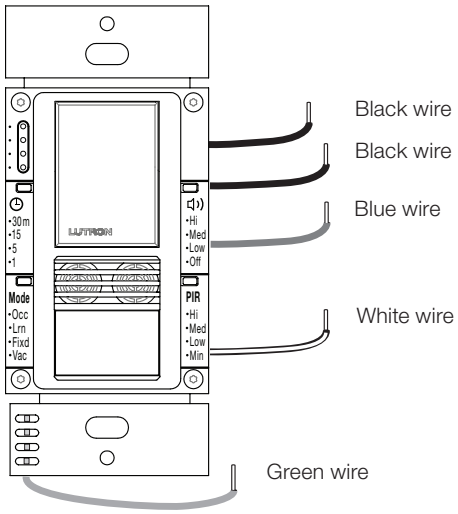
Wiring Installations with the Maestro Dual Technology Sensor Switch A102

In order to function, the dual technology sensor switch must have a ground or neutral wire connected. Connect green-sleeved wire to ground only in retrofit and replacement applications. When a neutral connection is available, remove green sleeve and connect white wire to neutral. Before installing wallplate, program all desired settings.



Wiring Installations with the Maestro Dual Technology Sensor Switch B102

Before installing wallplate, program all desired settings.

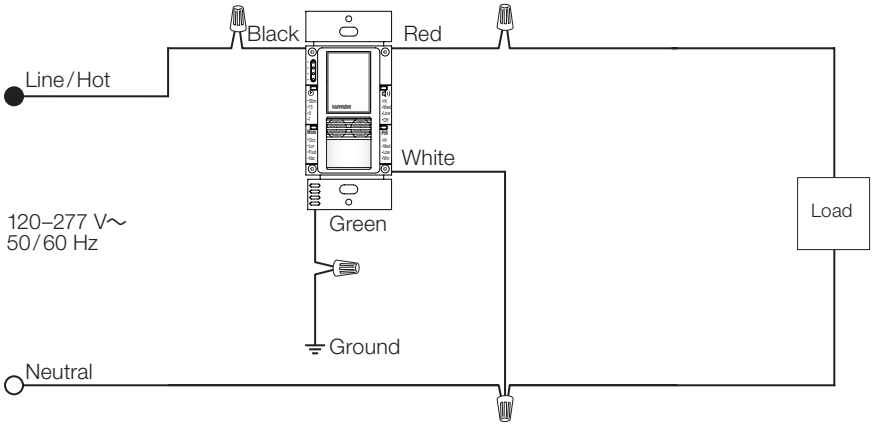


Job Name:	Model Numbers:	
Job Number:		

Wiring Diagrams - Single-Circuit

Wiring Diagram 1

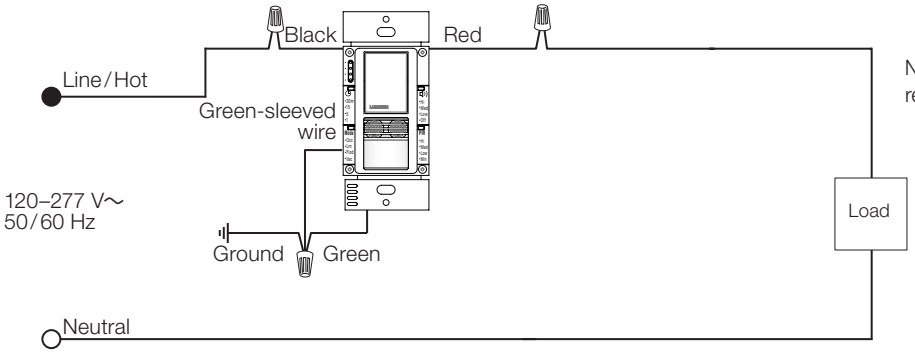
Single pole wiring - single-circuit (MS-A102, MS-A102-V) with neutral



Note: When a neutral connection is available, remove green sleeve and connect the white wire to neutral

Wiring Diagram 2

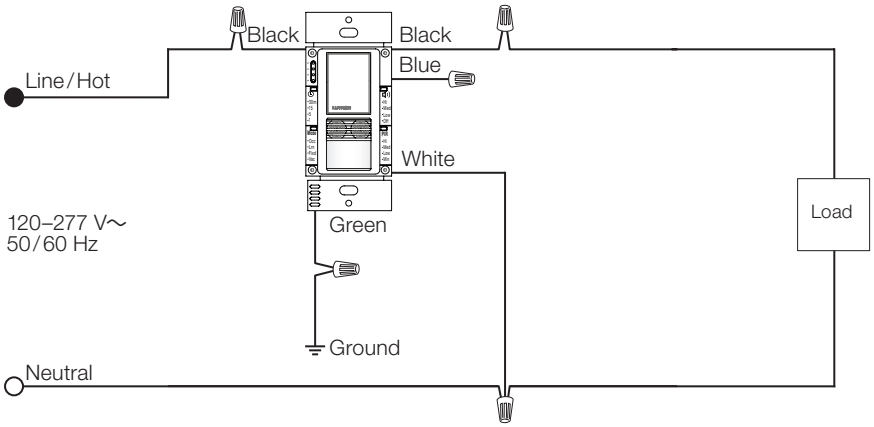
Single pole wiring - single-circuit (MS-A102, MS-A102-V) without neutral



Note: Connect green-sleeved wire to ground only in retrofit and replacement applications.

Wiring Diagram 3

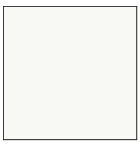
Single pole wiring - single-circuit (MS-B102, MS-B102-V)

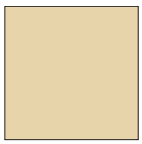


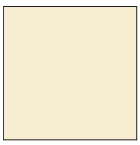
continued on next page...

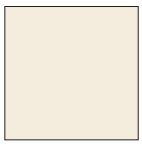
Colors and Finishes

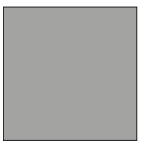
Gloss Finishes


White
WH


Ivory
IV


Almond
AL

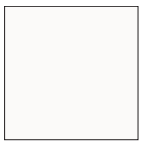

Light Almond
LA


Gray
GR

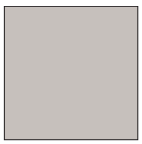
Brown
BR

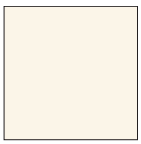
Black
BL

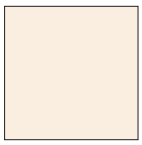
Satin Finishes

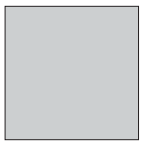

Snow
SW

Midnight
MN


Taupe
TP


Biscuit
BI


Eggshell
ES


Palladium
PD

Hot
HT

Merlot
MR

Plum
PL

Sienna
SI

Terracotta
TC

Bluestone
BG

Greenbriar
GB

Goldstone
GS

Mocha Stone
MS

Stone
ST

Desert Stone
DS

Limestone
LS

- Due to printing limitations, colors and finishes shown cannot be guaranteed to match actual product colors perfectly.
- Color chip keychains are available for more precise color matching:
  Gloss Finishes: DG-CK-1
  Satin Finishes: SC-CK-1

For the latest color offerings please see our website:
http://www.lutron.com/satincolors

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Job Name:	Model Numbers:	
Job Number:		

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Pico Wired Control

The Pico wired control works with compatible Lutron systems to control a light or group of lights. The Pico wired control is easily wired to the system via IEC PELV / NEC® Class 2 wiring.

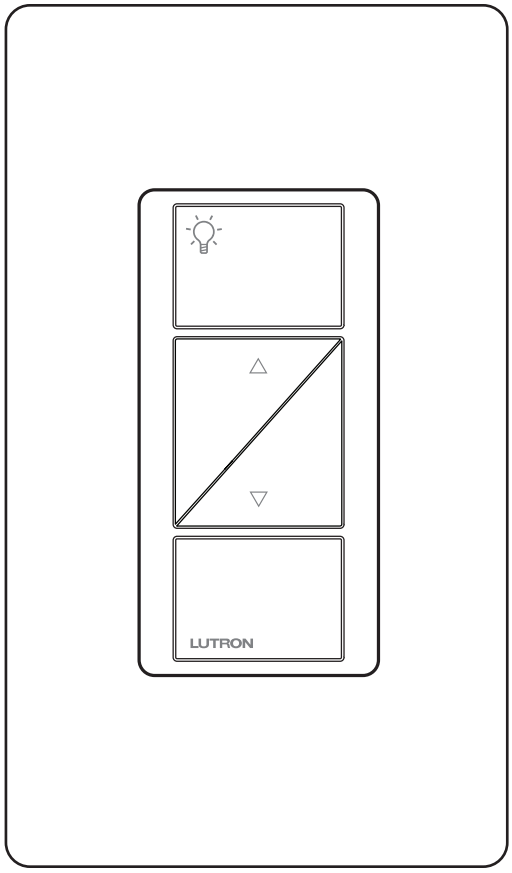
Features

- Provides control for the following Lutron products that incorporate a wired IR input:
  - Energi Savr Node units
  - QS sensor modules
  - EcoSystem ballasts or ballast modules
- Mounts easily in any single-gang wallbox (sold separately)
- Fits designer style Claro wallplates (sold separately)
- Allows users to:
  - Turn On/Off individual fixture or group of fixtures
  - Raise/Lower light levels *(-2BRL and -3BRL)*
  - Recall favorite light levels *(-3B and -3BRL)*
- IEC PELV/NEC® Class 2 wiring

Model Numbers

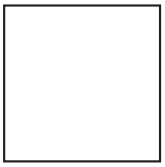
PX-2B-GXX*-I01	2 Buttons
PX-2BRL-GXX*-I01	2 Buttons with Raise/Lower
PX-3B-GXX*-I01	3 Buttons (including Preset)
PX-3BRL-GXX*-I01	3 Buttons (including Preset) with Raise/Lower

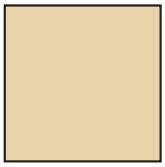
* "XX" in the model number represents color code.



PX-2BRL-GWH-I01
Shown actual size with Claro wallplate
(sold separately)

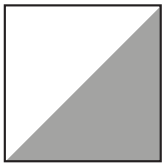
Color and Finishes

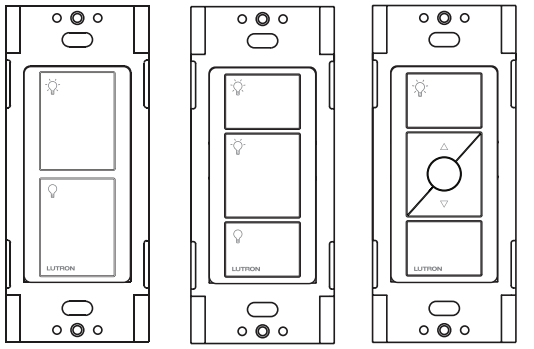

White
WH


Ivory
IV

Light Almond
LA

Black
BL


White/Gray
WG



PX-2B-GWH-I01 **PX-3B-GWH-I01** **PX-3BRL-GWH-I01**
Models shown in White (WH)

Notes:

- All models available in gloss finish only.
- For White/Gray (WG), top and raise buttons are white; preset, lower, and bottom buttons are gray.

LUTRON SPECIFICATION SUBMITTAL

Job Name:	Model Numbers:	
Job Number:		

Specifications

Regulatory

- Designed for IEC PELV/NEC® Class 2 operation only
- Complies with requirements of NFPA 70, of the National Electrical Code® IEC PELV/NEC® Class 2 device wiring
- Install according to all applicable national and local wiring regulations
- For regions requiring UL® listing on low-voltage devices, install in a fully enclosed wallbox. Low- voltage wallboxes are acceptible for regions that do not require UL® listing on low-voltage devices

Power

- Do not exceed 35 V⎓
- Operating Voltage: 20 V⎓ (IEC PELV/NEC® Class 2)
- Current Draw: 20 mA maximum

System Communication and Capacity

- Total wire length from control to device must not exceed 500 ft (152 m)
- Not a wireless device

Mounting

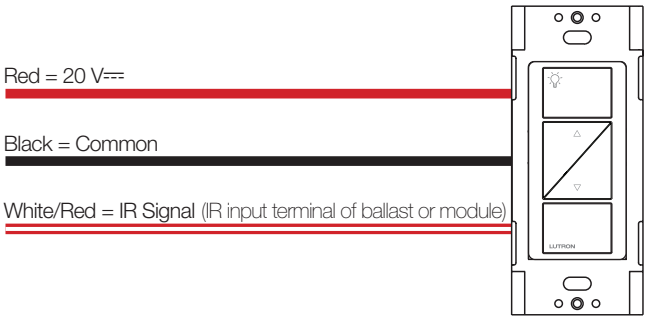
- Mounts easily in any single-gang wallbox (not included)
- Lutron suggests using Lutron Claro wallplates to ensure proper compatibility. Wallplates sold serparately. Pico wired controls may not be compatible with non-Lutron wallplates, test fit non-Lutron parts before use.

Environment

- Temperature: 32 ºF to 104 ºF (0 °C to 40 °C)
- Relative Humidity: Less than 90% non-condensing

Wiring

- Pico wired control does not receive IR input from hand-held transmitters
- Pico wired control does not connect to QS Link
- A Pico wired control can only be wired to a single control module or a single sensor interface
- Each input on a control module or sensor interface can be connected to only one control or one input device



NOTE: The red stripe on this wire may be absent in older products or in retrofit applications.

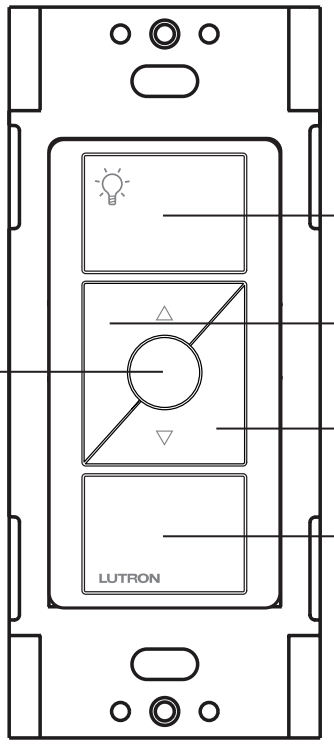
Warranty

1-year limited warranty
For additional Warranty information, please visit www.lutron.com/TechnicalDocumentLibrary/369-119_Wallbox_Warranty.pdf

Job Name:	Model Numbers:	
Job Number:		

Operation

The basic functionality of the Pico wired control is detailed below. For specific system performance, reference system documentation at www.lutron.com, or contact your Lutron representative.



Top Button
Lights brighten to full intensity.

Preset Button
(3B & 3BRL models only)

Tap once:
Lights go to preset levels.

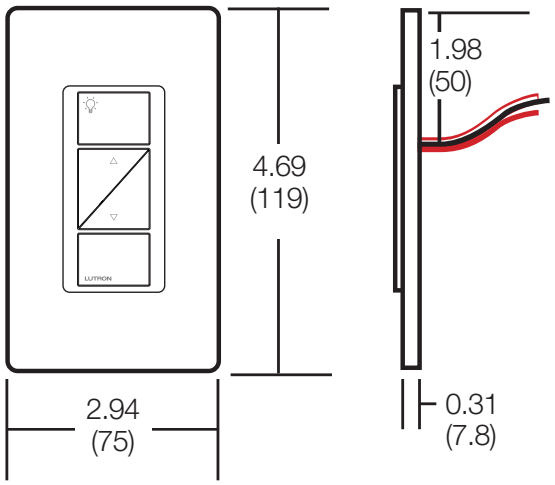
Raise Button (2BRL & 3BRL models only)
Lights increase in intensity.

Lower Button (2BRL & 3BRL models only)
Lights decrease in intensity.

Bottom Button
Lights dim to off.

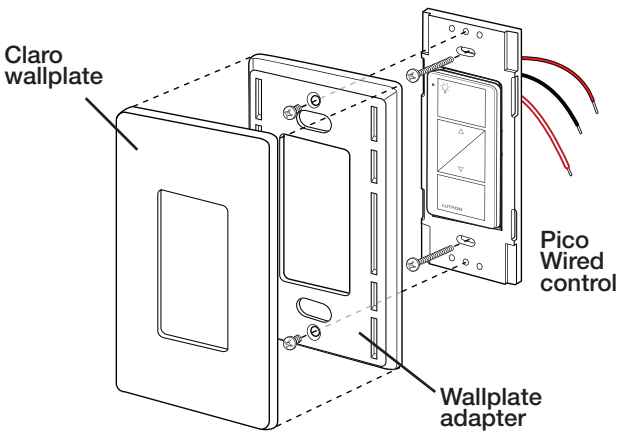
Dimensions

Measurements shown as: in (mm)



Mounting

Wallplate and wallplate adapter sold separately.



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Job Name:	Model Numbers:	
Job Number:		

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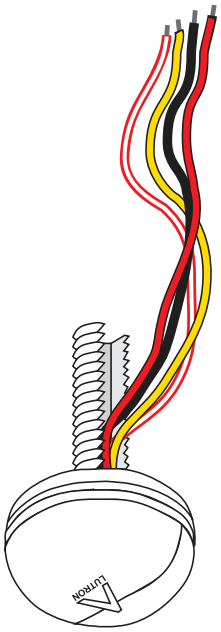
Wired Daylight Sensor with Infrared Receiver

This daylight sensor is designed specifically to work with Lutron ballasts, control modules, and sensor interfaces to implement daylight harvesting. To maintain a specific light level in the space, it allows the control system to automatically dim the lights when the available daylight is high and brighten the lights when the available daylight is low. An integrated infrared (IR) receiver resides within the sensor to allow access to the system for advanced programming and personal control.



Features

- Mounts easily on any ceiling tile or fixture.
- Threaded mounting stud may be shortened for applications with limited fixture height.
- Calibrated for daylight sensitivity through the lighting control system to which it is attached.
- Receives IR signals and transfers them to a digital ballast, control module, or sensor interface.
- The infrared receiver receives IR programming signals from up to 8.2 ft (2.5 m) away.
- Constructed of flame-retardant material.
- Meets IEC 801-2. Tested to withstand 15 kV electrostatic discharge without damage.
- LED indicates programming mode.
- Sensor wire insulation is rated to 600 V, suitable for fixture installation.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Standards

- Designed for SELV/PELV/NEC® Class 2 operation only. Voltages do not exceed 35 V⎓.
- Designed to give a linear response to changes in viewed light level.
- For use with Lutron products only.
- cULus Listed
- CE compliant

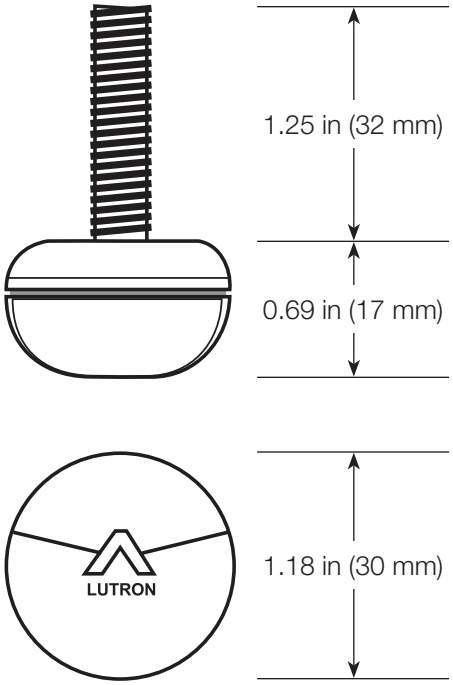
Power

- Operating Voltage: SELV/PELV/NEC® Class 2, 20 V⎓
- Analog Signal: 5 mA
- IR Output: 0–20 V⎓

Environment

- Temperature: 32 ˚F to 113 ˚F (0 ˚C to 45 ˚C).
- Relative Humidity: Maximum 90%, non-condensing.

Dimensions



- Sensor lead length = 4 in (100 mm) minimum beyond threaded stud.
- Total wire length from sensor to device must not exceed 150 ft (45.7 m).
- Threaded stud diameter = 3/8 in (9.5 mm) maximum.
- Use 3/8-16 nut (provided) for mounting.

Job Name:	Model Numbers:	
Job Number:		

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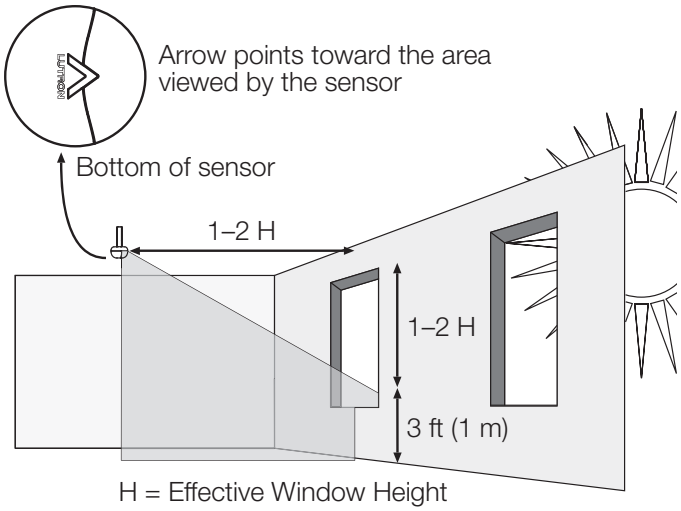
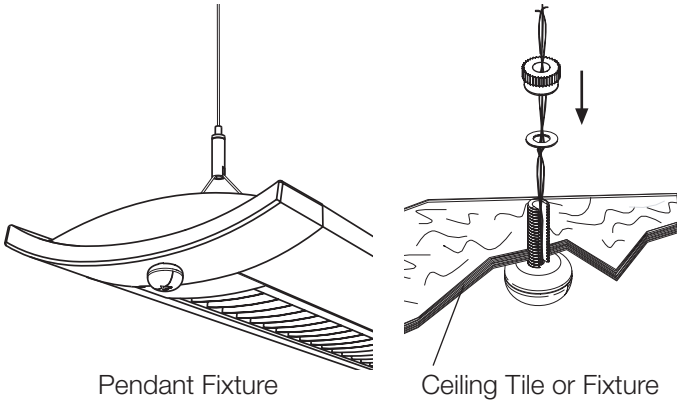
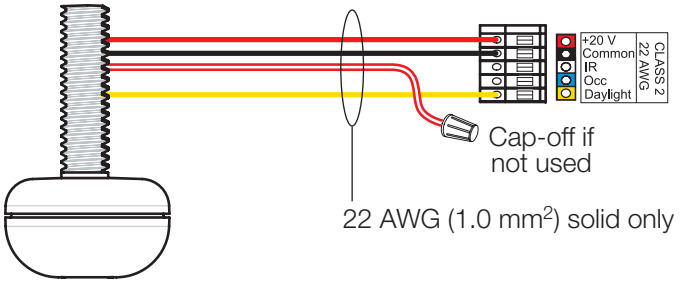
Mounting and Wiring







Wired Daylight Sensor with IR receiver

* The red stripe on this wire may be absent in older products or in retrofit applications.

Installing

Determine the Proper Location of the Daylight Sensor Using the Adjacent Diagram.

- The arrow on the daylight sensor points toward the area viewed by the sensor.
- The effective window height (H) starts 3 ft (1 m) up from the floor or at the window sill, whichever is higher, and ends at the top of the window.
- Place the daylight sensor so its viewing area is centered upon the nearest window at a distance of between 1–2 H from the window.
- Ensure that the view of the daylight sensor is not obstructed.
- Do not position the daylight sensor in the well of a skylight or above indirect lighting fixtures.

Mounting the Daylight Sensor

- Drill a 3/8 in (10 mm) diameter hole in the ceiling tile or pendant fixture.
- Thread the wires through the hole.
- Install the daylight sensor into the hole.
- Secure the daylight sensor with the mounting hardware provided (hand tighten only).

Note: If the stem of the daylight sensor must be shortened because of its location (e.g., in a pendant fixture), this should be done prior to wiring.

Wiring to a Sensor Input

- Connect the sensor wires as described:

Wire	Terminal
Red	20 V⎓
Black	Common
Yellow	Daylight Signal
White/Red*	IR Signal (cap if not used)

- Make sure that the supply breaker to the control system is OFF.
- Use only 22 AWG (1.0 mm²) solid wire.
- If IR output is not required, the white/red* wire should be terminated.
- A sensor can be wired only to a single control module or sensor interface.
- Each input on a control module or sensor interface can have only one daylight sensor connected to it.

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Job Name:	Model Numbers:	
Job Number:		

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Dual Technology Ceiling Mount Sensor

The LOS-CDT Series dual technology ceiling-mount sensors can integrate into Lutron® systems or function as stand-alone controls using a Lutron® power pack. The technology eliminates manual sensitivity and timer adjustments during installation and over the life of the product.

Features

- Intelligent, continually adapting sensor
- Ultrasonic (US) combined with Passive Infrared (PIR) sensing provide high sensitivity, high noise immunity, and excellent false tripping immunity
- Suited for complex environments that are difficult to control with single-technology sensors
- Snap-locks to ceiling-mounted cover plate
- Non-Volatile Memory: settings saved in protected memory are not lost during power outages
- 500 ft² to 2000 ft² (46 m² to 186 m²) coverage when mounted on an 8 ft to 12 ft (2.4 m to 3.7 m) ceiling
- Affords choice of turning lights off or dimming to a preset level in the unoccupied state when integrated with a Lutron® system.

Models Available

Model	Color	Coverage	Field of View
LOS-CDT-500-WH	White	500 ft² (46 m²)	180°
LOS-CDT-500R-WH	White	500 ft² (46 m²)	180°
LOS-CDT-1000-WH	White	1000 ft² (93 m²)	180°
LOS-CDT-1000R-WH	White	1000 ft² (93 m²)	180°
LOS-CDT-2000-WH	White	2000 ft² (186 m²)	360°
LOS-CDT-2000R-WH	White	2000 ft² (186 m²)	360°

Self-Adaptive Feature

The LOS-CDT Series sensors combine both Ultrasonic (US) motion detection for maximum sensitivity and Passive Infrared (PIR) motion detection for false triggering immunity. The self-adapting internal microprocessor analyzes the composite sum of both signals to eliminate time-consuming adjustments and callbacks found in non-intelligent sensors.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Regulatory Approvals

- UL® and cUL® listed

Power

- Operating voltage: 20 – 24 V⎓, IEC PELV/NEC® Class 2
- Operating current: 33 mA nominal
- Control output: 20 – 24 V⎓ active high logic control signal with short-circuit protection, open collector when unoccupied

Environment

- Temperature: 32 °F to 104 °F (0 °C to 40 °C)
- Relative humidity: less than 95%, non-condensing
- For indoor use only

Timer Adjustment

- Automatic mode: Continually adapting sensor automatically adjusts settings to the space
- Manual mode: 8 to 30 minutes
- Test mode: 8 seconds

LED Lamp

- Red: infrared motion detected
- Green: ultrasonic motion detected

Housing

- Rugged, high-impact, injection-molded plastic
- Color-coded leads 6 in (15 cm)

Adaptive Functions

- Installation: 60 minutes
- Learning: 4 weeks for response to error conditions, air current adaptation, and timer optimization
- Post-learning occupancy periods
  - —24 hour circadian occupancy periods learned
  - —Weekly occupancy periods learned
- Adjustments in post-learning period
  - —Generally occupied periods (threshold = high-sensitivity mode)
  - —Generally unoccupied periods (threshold = miser mode)

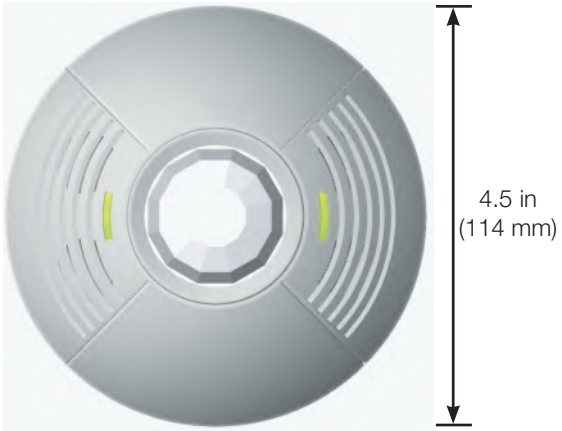
Contact Rating (R Models only)

- SPDT 500 mA rated at 24 V⎓ isolated relay

Photo Cell (R Models only)

- Prevents light from turning on when there is sufficient natural light
- Sensitivity: 0 lx to 1000 lx adjustable

Dimensions



Front View

Side View

Job Name:	Model Numbers:	
Job Number:		

Wiring: System Control

Power packs may be required when interfaced to Lutron® lighting control systems. If more than 1 occupancy sensor is connected to the same input, a power pack is required. A maximum of 3 occupancy sensors can be connected to the same input. If more than 3 sensors are required per input, use one of the following models: LOS-CDT-500R-WH, LOS-CDT-1000R-WH, or LOS-CDT-2000R-WH.

Power Supply Options

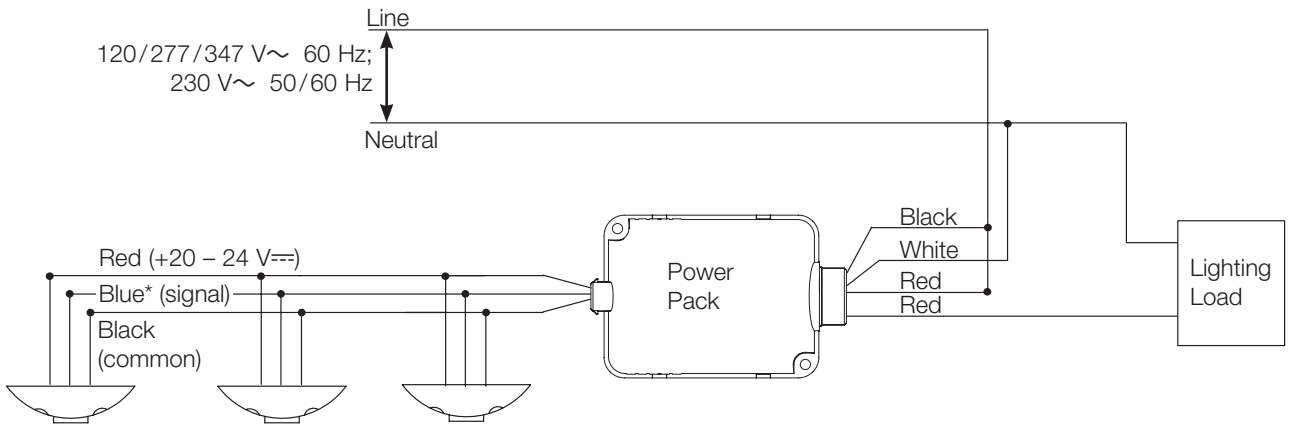
Lutron® Lighting Control System	Power Pack Required?
Digital microWATT™	No
EcoSystem®	No
Energi Savr Node™	No*
GRAFIK 5000™/6000®/7000™	No, when used with seeTouch® wallstations with occupancy sensor connections.
GRAFIK Eye® 3000/4000	Yes
GRAFIK Eye® QS	No*
HomeWorks®	Yes
HomeWorks® QS	No*
LCP128™	No, when used with seeTouch® wallstations with occupancy sensor connections.
microWATT®	No
Quantum®	No*
RadioRA®	Yes
RadioRA® 2	Yes
Softswitch128®	No, when used with seeTouch® wallstations with occupancy sensor connections.

* Some system components do not supply external power for occupancy sensors. Refer to individual product specifications for more information.

Job Name:	Model Numbers:	
Job Number:		

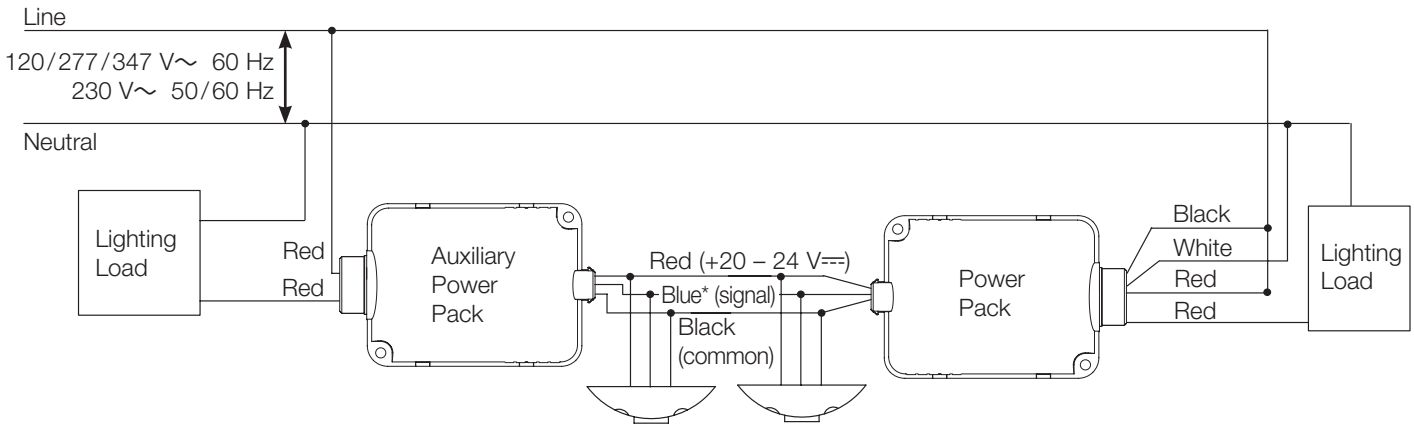
Wiring: Stand-Alone Control

1 to 3 Sensors with Power Pack



NOTE: Maximum 3 occupancy sensors.

Switching Multiple Loads with Auxiliary Power Packs



NOTE: Maximum of 3 devices total (occupancy sensors and auxiliary power packs) can be connected to a power pack.

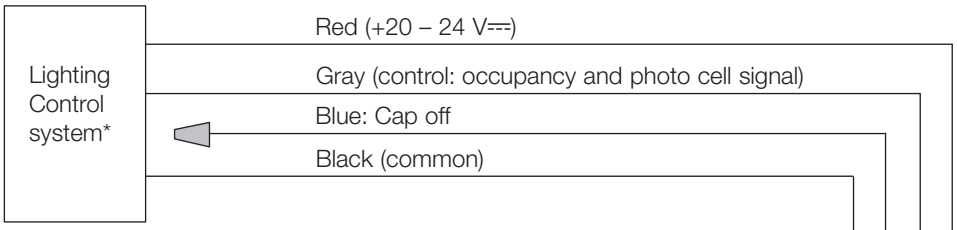
*Use gray wire for LOS-CDT-500R-WH, LOS-CDT-1000R-WH, and LOS-CDT-2000R-WH.

Job Name:	Model Numbers:	
Job Number:		

Wiring

Relay Model Option

LOS-CDT-500R-WH, LOS-CDT-1000R-WH, and LOS-CDT-2000R-WH only

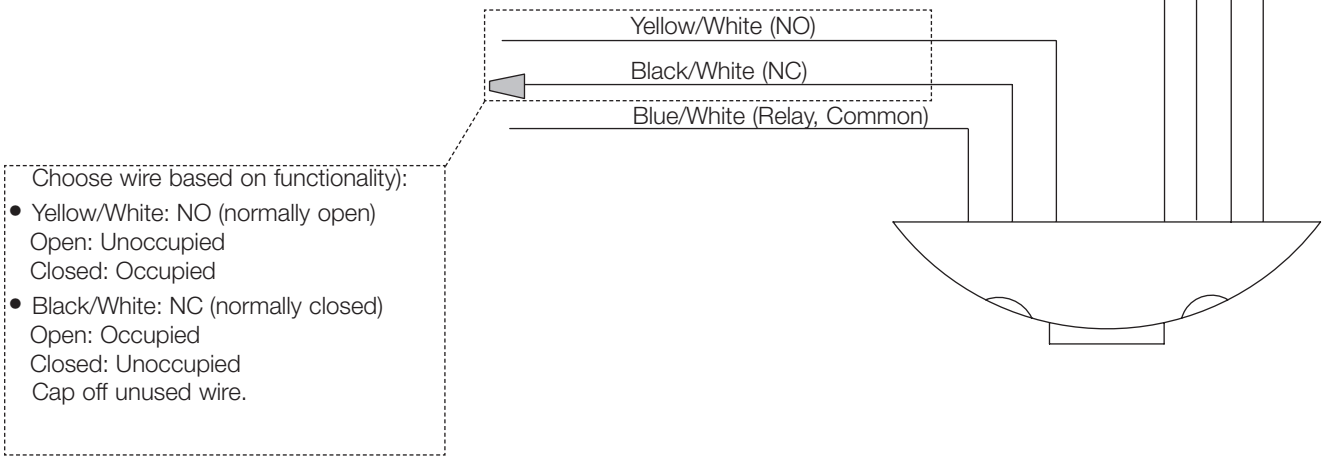


Gray wire logic with photo cell active:

Room First Occupied	
Light level	Lights
Below set value	Turn on
Above set value	Remain off

During Occupancy	
Light level	Lights
Falls below set value	Turn on
Moves above set value	Remain on

*May require power pack



Job Name:	Model Numbers:	
Job Number:		

Installation

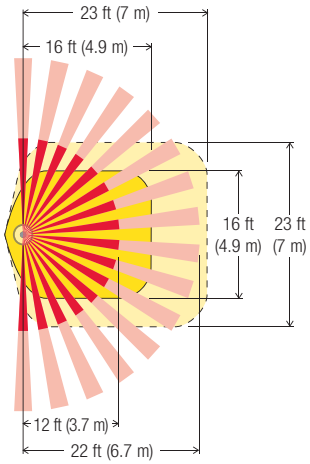
Sensor Setup

- Sensor setup is available as a service by Lutron. For more information see the **Sensor Layout and Tuning** service document (Lutron® P/N 3601235).

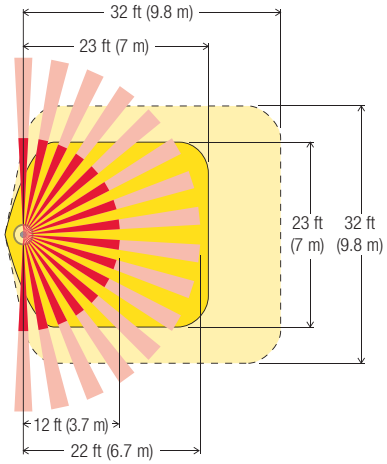
Sensor Placement

- Mount the sensor so the grilles face the open portion of the room and are not facing a nearby wall, window, or other obstructing object.
- Do not place sensor within 6 ft (1.8 m) of air vents, air handlers, windows, fans, etc., as this may cause false triggering.
- If installing a 180° occupancy sensor (500 and 1000 models), place the sensor on the same wall as the doorway so that traffic in a hallway will not affect the sensor; otherwise, place in center of room.
- Closely follow the diagrams shown concerning major and minor motion coverage. The sensor can detect major motion (e.g. person taking a half-step) at a greater distance than it can detect minor motion (e.g. writing at a desk or reading a book).
- Decrease total coverage area by 15% for “soft” rooms (e.g. heavy draperies or thick carpeting).

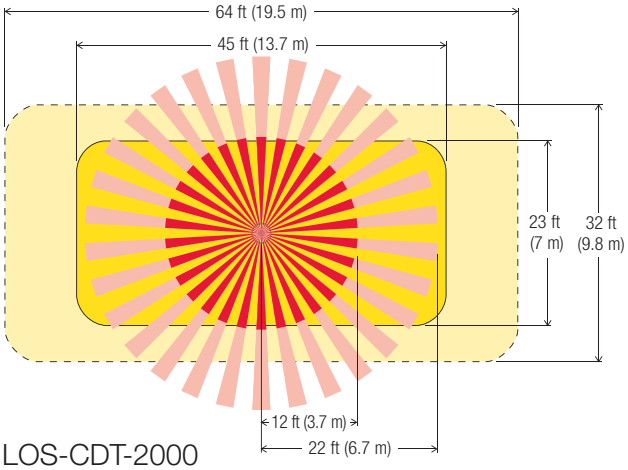
Range Diagrams



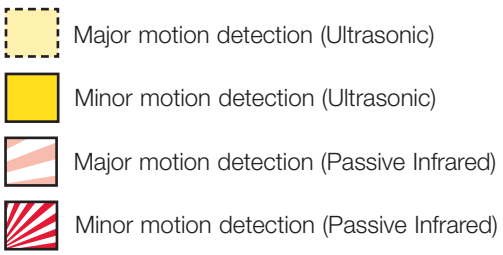
LOS-CDT-500



LOS-CDT-1000



LOS-CDT-2000

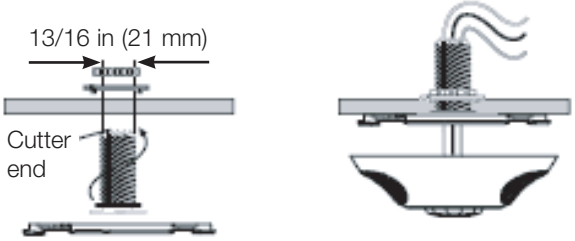


Job Name:	Model Numbers:	
Job Number:		

Mounting

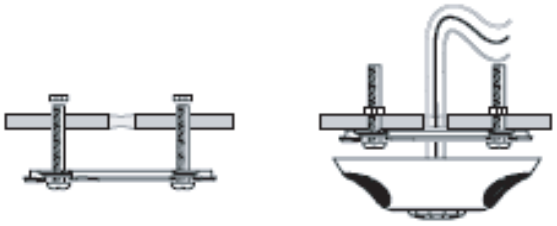
Normal Mounting

Twist and lock threaded mounting post onto cover plate. Drill through ceiling tile with assembly, using cutter end of the threaded mounting post. Secure with washer and nut.

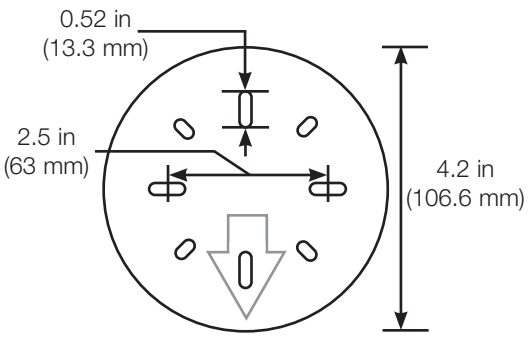


Mounting to Non-Standard Ceiling or Fixture

Mount twist-lock cover plate using mounting screws, nuts, and washers (included). Drill/punch wire routing hole through ceiling tile at center of cover plate.



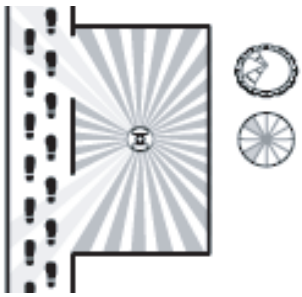
Mounting Plate Dimensions



Wire Lengths

Number of Sensors	1	2	3	1	2	1
Number of Auxiliary Power Packs	0	0	0	1	1	2
22 AWG	750 ft	375 ft	250 ft	375 ft	250 ft	250 ft
0.5 mm^2	365 m	180 m	120 m	90 m	120 m	120 m
20 AWG	1200 ft	600 ft	400 ft	600 ft	400 ft	400 ft
0.75 mm^2	730 m	365 m	240 m	365 m	240 m	365 m
18 AWG	2400 ft	1200 ft	800 ft	1200 ft	800 ft	800 ft

Using the Infrared Mask



Center Ceiling Mount
(Mask blocks sensor seeing out doorway into hall)

Corner Ceiling Mount
(No mask needed)

Typical Mask Patterns

Conference Room Mask

180° Mask

Full Mask

Rectangular Areas

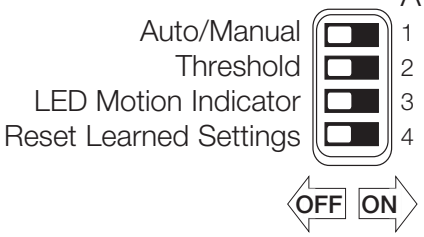
Over the Door

Specific Areas You Wish to Mask

Job Name:	Model Numbers:	
Job Number:		

Sensor Adjustments

Override Settings



A	Off (Default)	On
1 Auto/Manual	Automatic (Normal)	Manual on/off (Override)
2 Threshold	Auto Threshold Adjustment	High Sensitivity (Low turn-on threshold)
3 LED Motion Indicator	Lights indicate motion	Disable LED Indicator
4 Reset Learned Settings	Retain Settings (Normal)	Erase all learned settings; Restart Learning (Toggle On)

B	Off (Default)	On
1 Strong Airflow Compensation	Disable Compensation (Normal)	Enable Compensation
2 Over Doorway Installation	No (Normal)	Yes (Use increased turn-on threshold)
3 Timer Adjust	Adjust Timer Automatically	Use Manual Setting (No adjustment)
4 Auto Sensitivity	Adjust Sensitivity Automatically	Adjust Sensitivity Manually

Timer Test Mode

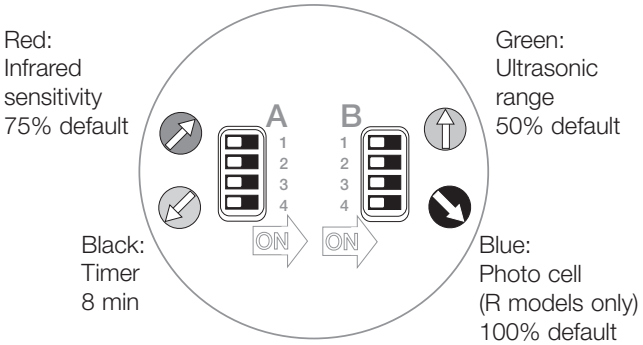
1. Remove the retainer cover.
2. Rotate the black timer adjustment knob to about midway (12 o'clock).
3. Return setting to minimum setting (full CCW).

Factory Settings | 12 o'clock | Full CCW

NOTE: The timer will remain in the 8 second test mode for 1 hour, then automatically reset to 8 minutes.

4. To manually take the timer out of the 8 second test mode, turn the timer adjustment approximately 1/16 in (1.5 mm) clockwise to make the setting slightly above minimum (just above the 8 minute setting).

Factory Settings



Continued on next page...

Job Name:	Model Numbers:	
Job Number:		

Sensor Adjustments *(continued)*

Adjusting the "Lights Not On" Level

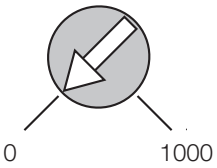
LOS-CDT-500R-WH, LOS-CDT-1000R-WH, and LOS-CDT-2000R-WH only

1. Place timer in Test Mode (see page 8).
2. Set photo cell to maximum. Turn the blue knob full clockwise (lights on no matter how bright the natural light is), then about 30° counterclockwise.
3. Check for Lights-Out. Move from underneath the sensor, and remain still until the lights turn off. Move around normally to turn the light on.
4. Adjust to desired level. If lights remain off, adjust the blue knob another 30° counterclockwise and repeat step 3 until the lights turn on.

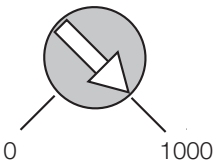
NOTE: Set blue knob to 100% to disable photo cell functionality and leave secondary dry contact closure output functionality intact.

Control Settings (Blue Knob)

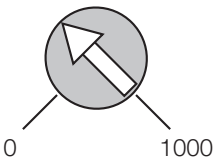
LOS-CDT-500R-WH, LOS-CDT-1000R-WH, and LOS-CDT-2000R-WH only



Minimum (low):
Lights will never come on, even though room is occupied.



Maximum (high):
Photo cell has no effect on operation (factory setting).



Normal:
200 lx to 600 lx is normal range.

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PP and UPP Series Power Packs

PP and UPP[1] Series Power Packs provide both the 24 V⎓ power supply to operate Lutron wired occupancy sensors, as well as the 16 A line-voltage relay to control the load, in one compact housing. The unit can be mounted inside a ballast enclosure or inside/outside a junction box.

The manual-ON Power Pack (-DV-M) is used to provide a vacancy-only solution (not configurable for occupancy behavior) when paired with Lutron wired occupancy sensors. A low-voltage momentary switch should be used to manually turn ON the load while the sensor automatically shuts the load OFF when unoccupied. Pressing the momentary switch can also turn the load OFF.

The auxiliary Power Pack (-SH) must be used in conjunction with at least one line-voltage Power Pack and one Lutron wired occupancy sensor to switch additional loads.

(-DV)
(-DV-M [vacancy ONLY])
(-347H)

(-SH)

Features

- High-impact UL94 flammability-rated plastic case construction
- Relay: Class B 266 °F (130 °C) insulating material; silver alloy contacts
- Power Pack units (PP-DV/UPP-DV, PP-347H, PP-DV-M/UPP-DV-M) power up to 3 total devices. PP-SH/UPP-SH counts as 1 device, each occupancy sensor counts as 1 device.
- For indoor use only, 32 °F to 104 °F (0 °C to 40 °C), 0% to 90% humidity, non-condensing

Model	Power Input	Relay Contact Rating	Control Input	IEC PELV/ NEC® Class 2 Output
PP-DV **UPP-DV** **PP-DV-M (vacancy ONLY)** **UPP-DV-M (vacancy ONLY)**	120-277 V∼ 50/60 Hz 6.5 W	• 120-277 V∼ 16 A; All lighting loads[2] • 120-277 V∼ 1 HP Motor Load	24 V⎓ 5 mA	24 V⎓ 150 mA up to 3 Devices[3]
PP-347H	347 V∼ 60 Hz 6.5 W	• 347 V∼ 15 A Ballast	24 V⎓ 5 mA	24 V⎓ 100 mA up to 3 Devices[3]
PP-SH **UPP-SH**	24 V⎓ (At least one line-voltage Power Pack must be used)	• 120-277 V∼ 16 A; All lighting loads[2] • 120-277 V∼ 1 HP Motor Load • 347 V∼ 15 A Ballast	24 V⎓ 5 mA	N/A

[1] "U" denotes BAA compliance
[2] Lighting loads include (but are not limited to): Incandescent, MLV, ELV, Resistive, Inductive
[3] PP-SH/UPP-SH counts as 1 device and each occupancy sensor counts as 1 device

Job Name:	Model Numbers:	
Job Number:		

Specifications

Regulatory Approvals

- UL® and cUL® Listed
- Complies with requirements for use in other spaces used for environmental air (plenums) per NEC® 2014 300.22(C)(3)

Power / Performance

- PP-DV, UPP-DV, PP-DV-M, UPP-DV-M: 120-277 V~ 50/60 Hz
- PP-347H: 347 V~ 60 Hz only

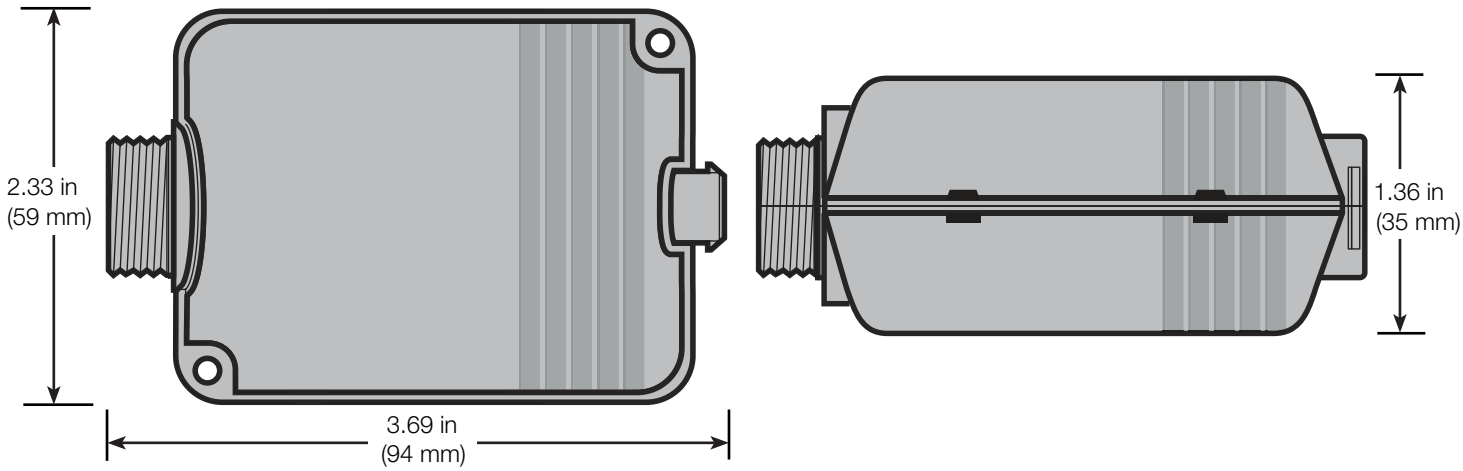
Wiring

- 7 in (178 mm) wire leads, 18 AWG (0.75 mm^2) input; 7 in (178 mm) leads, 16 AWG (1.5 mm^2) contacts.

Mounting

- Fits inside standard 4 in x 4 in (102 mm x 102 mm) junction box or standard fluorescent fixture ballast cavity
- Mount with 6/32 in (5 mm) x 1¼ in (32 mm) pan head screws
- Mounts inside junction box through knockout, with 1/2 in (13 mm) Electrical Metallic Tubing (EMT) threaded nipple. Recommended volume is 30 in^3 (762 mm^3).

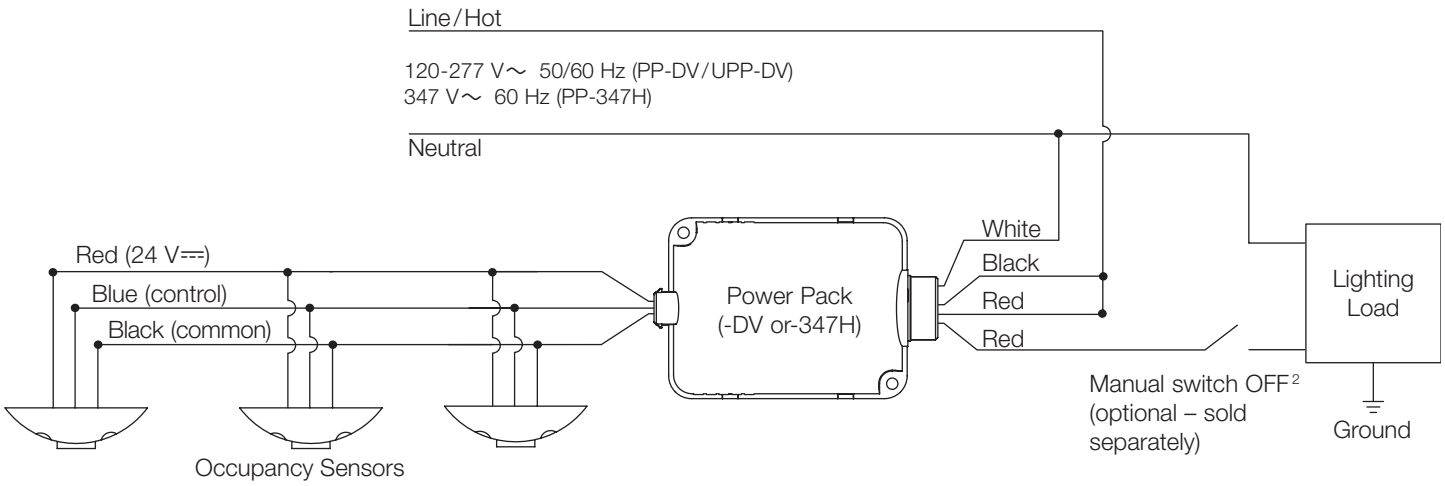
Dimensions



Job Name:	Model Numbers:	
Job Number:		

Wiring

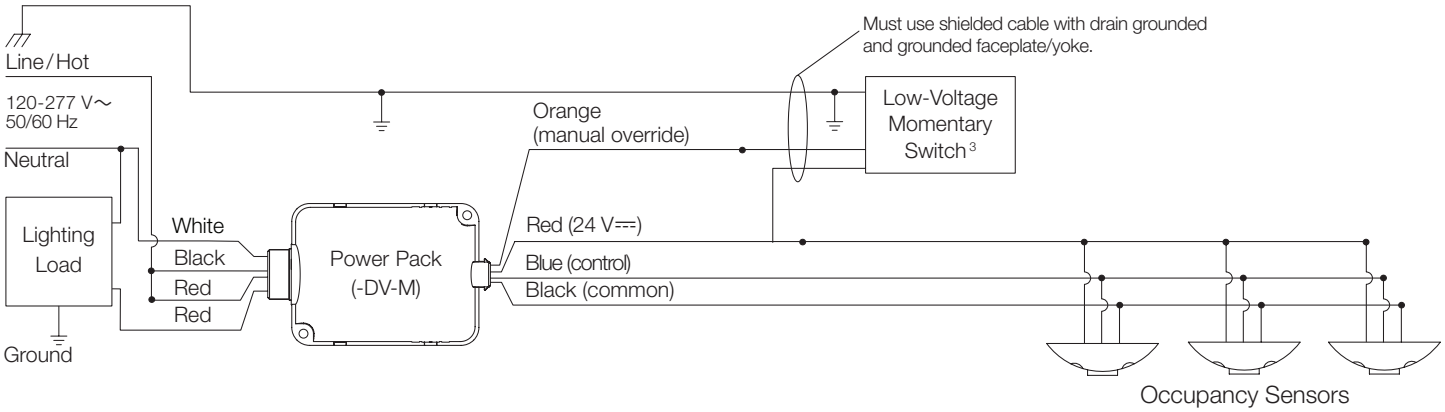
3 Sensors with Power Pack (PP-DV, UPP-DV or PP-347H)[1]



[1] Maximum 3 occupancy sensors can be used with PP-DV/UPP-DV or PP-347H.

[2] When lights are manually turned off, switch must be returned back to the on position for occupancy sensors to function as set.

3 Sensors with Power Pack - Vacancy-Only Solution (PP-DV-M, UPP-DV-M)[1,2]



[1] Maximum 3 devices (excluding low-voltage momentary switches) can be used with PP-DV-M/UPP-DV-M. Each PP-SH/UPP-SH counts as one device, each occupancy sensor counts as one device.

[2] The PP-DV-M cannot be used for occupancy functionality. It is a vacancy ONLY solution. For occupancy functionality, use the PP-DV.

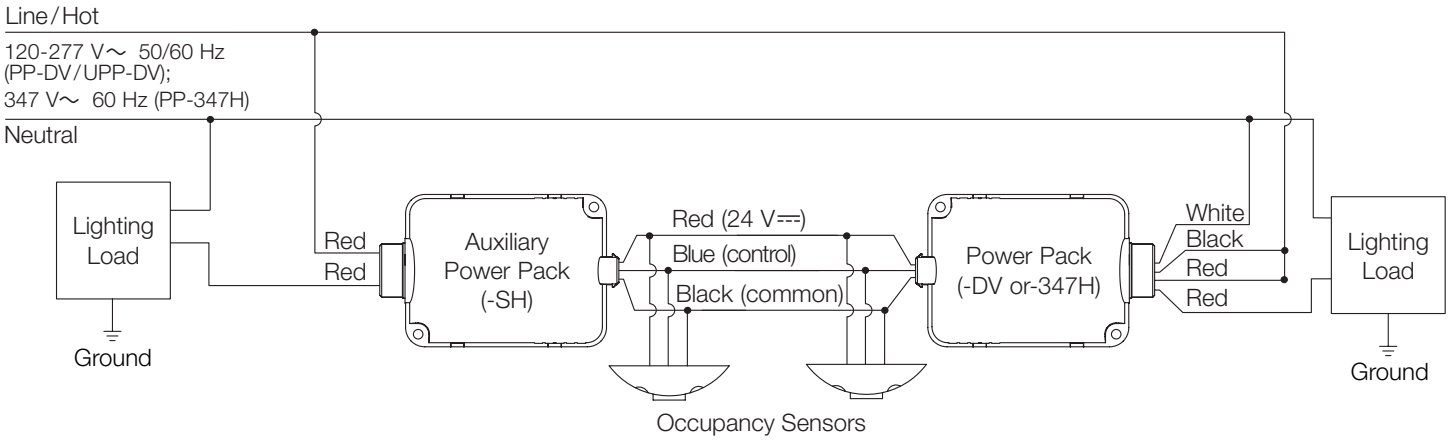
[3] NTRCS-1 (Nova T☆ momentary switch) or any low voltage momentary switch rated for at least 24 V⎓, 100 mA.

continued on next page...

Job Name:	Model Numbers:	
Job Number:		

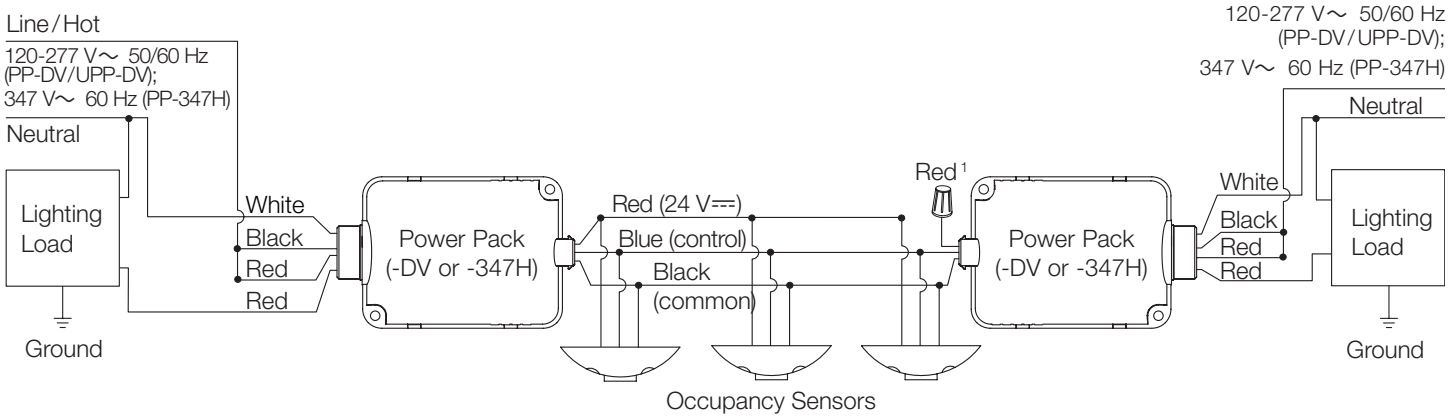
Wiring *(continued)*

Switching Multiple Loads with 1 Power Pack and 1 Auxiliary Power Pack[1]



[1] Maximum of 3 devices can be used with PP-DV, UPP-DV, or PP-347H. Each PP-SH/UPP-SH counts as one device, each occupancy sensor counts as one device.

Switching Multiple Loads with 2 Power Packs (PP-DV/UPP-DV)



[1] Only 1 Power Pack (PP-DV/UPP-DV) should power the occupancy senors. This 24 V⎓ output is left disconnected.

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NEC is a registered trademark of National Fire Protection Association, Quincy, Massachusetts.
UL is a trademark of UL LLC.

Job Name:	Model Numbers:	
Job Number:		

Commercial grade straight blade duplex receptacles

Project Name:	Prepared By:
Project Number:	Date:
Catalog Number:	Type:

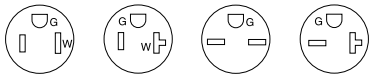
BR15

CR20

1877

Description

2-Pole, 3-Wire Grounding
15A 125V/AC; 15A 250V/AC
20A 125V/AC; 20A 250V/AC
NEMA 5-15, 5-20, 6-15, 6-20



5-15R **5-20R** **6-15R** **6-20R**

Design features

- Galvanized steel, wrap-around yoke mounting strap for superior assembly security; extra length/width helps reach large panel cutouts for Code Compliance
- Automatic grounding system eliminates need for bonding jumper in grounded metal enclosure, provides redundant measure of ground continuity where jumper used
- Screw-Catch feature on duplex devices speeds mounting of wallplates
- Tamper Resistant receptacles provide compliance with 2014 NEC® Article 406.12 that states that all 15A & 20A, 125V receptacles installed in dwelling units must be tamper resistant

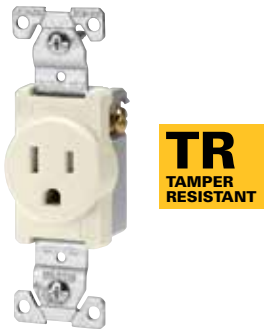
Table 1. Commercial Grade Receptacles

Catalog No.	Description	Amps	Volts	Color Suffix
☐ BR15__	NEMA 5-15R Duplex Receptacle, Back & Side Wire	15	125	A, B, BK, GY, LA, V, W
☐ CR15__	NEMA 5-15R Duplex Receptacle, Side Wire	15	125	A, B, BK, GY, LA, V, W
☐ 817__	NEMA 5-15R Single Receptacle, Side Wire	15	125	B, BK, LA, V, W
☐ BR20__	NEMA 5-20R Duplex Receptacle, Back & Side Wire	20	125	A, B, BK, GY, LA, RD, V, W
☐ CR20__	NEMA 5-20R Duplex Receptacle, Side Wire	20	125	A, B, BK, GY, LA, V, W
☐ 1877__	NEMA 5-20R Single Receptacle, Side Wire	20	125	A, B, BK, LA, V, W
☐ 826__	NEMA 6-15R Duplex Receptacle, Side Wire	15	250	B, V, W
☐ 816__	NEMA 6-15R Single Receptacle, Side Wire	15	250	B, V, W
☐ 815__	NEMA 6-20R Duplex Receptacle, Side Wire	20	250	B, V, W
☐ 1876__	NEMA 6-20R Single Receptacle, Side Wire	20	250	A, B, BK, LA, V, W

Compliances, specifications and availability are subject to change without notice.

Powering Business Worldwide

Project Name:	Prepared By:
Project Number:	Date:
Catalog Number:	Type:



TR817

Table 2. Dual Voltage Commercial Grade Receptacles, Side Wire

Catalog No.	Description	Amps	Volts	Color
☐ 829V	NEMA 5-15R/6-15R Dual Voltage Duplex Receptacle, Side Wire	15	125/250	V

Table 3. Commercial Grade Tamper Resistant Receptacles

Catalog No.	Description	Amps	Volts	Color Suffix
☐ TRBR15__	NEMA 5-15R Tamper Resistant Duplex Receptacle, Back & Side Wire	15	125	A, B, BK, GY, LA, V, W
☐ TRCR15__	NEMA 5-15R Tamper Resistant Duplex Receptacle, Side Wire	15	125	A, B, BK, GY, LA, V, W
☐ TR817__	NEMA 5-15R Single Receptacle, Side Wire	15	125	A, B, BK, LA, V, W
☐ TRBR20__	NEMA 5-20R Tamper Resistant Duplex Receptacle, Back & Side Wire	20	125	A, B, BK, GY, LA, RD, V, W
☐ TRCR20__	NEMA 5-20R Tamper Resistant Duplex Receptacle, Side Wire	20	125	A, B, BK, GY, LA, V, W
☐ TR1877__	NEMA 5-20 Single Receptacle, Side Wire	20	125	A, B, BK, LA, V, W

Compliances, specifications and availability are subject to change without notice.

Project Name:	Prepared By:
Project Number:	Date:
Catalog Number:	Type:

Applications

Commercial grade duplex receptacles are challenged on a daily basis to provide a consistent, reliable means of connectivity in a wide variety of environments. The applications vary greatly by environment, and provide challenges from impact and chemical resistance to environmental extremes such as heat and moisture. The breadth of the Arrow Hart Straight Blade Receptacle line provides solutions for all environments and applications.

Table 4. Specifications

Catalog No.	BR15, BR20, Series	CR15, CR20 Series	815, 826 Series
Device Type	**Straight Blade Duplex Receptacles, BR Series**	**Straight Blade Duplex Receptacles, CR Series**	**Straight Blade Duplex Receptacles**
Wiring Type	Back & side wire	Side wire	Side wire
Testing & Code Compliance	• cULus Listed to UL 498, file no. E15058 • CSA Certified to C22.2, no. 42, file no. 6914, class 6233-01 • UL verified to Federal Spec. WC-596G • NOM certified	• cULus Listed to UL 498, file no. E15058 • UL verified to Federal Spec. WC-596G • NOM certified	• cULus Listed to UL 498, file no. E15058 • UL verified to Federal Spec. WC-596G • NOM certified
Environmental Specifications	**Flammability:** Meets UL 94 requirements; V2 rated **Temperature Rating:** -20ºC to 60ºC (-4ºF to 140ºF)	**Flammability:** Meets UL 94 requirements; V2 rated **Temperature Rating:** -20ºC to 60ºC (-4ºF to 140ºF)	**Flammability:** Meets UL 94 requirements; V2 rated **Temperature Rating:** -20ºC to 60ºC (-4ºF to 140ºF)
Electrical Specifications	**Dielectric Voltage:** Withstands 2000V per UL 498 **Current Interrupting:** Yes, at full-rated current **Temperature Rise:** Max. 30ºC (86°F) after 100 cycles of overload @ 150% of rated current (DC)	**Dielectric Voltage:** Withstands 2000V per UL 498 **Current Interrupting:** Yes, at full-rated current **Temperature Rise:** Max. 30ºC (86°F) after 100 cycles of overload @ 150% of rated current (DC)	**Dielectric Voltage:** Withstands 2000V per UL 498 **Current Interrupting:** Yes, at full-rated current **Temperature Rise:** Max. 30ºC (86°F) after 100 cycles of overload WW@ 150% of rated current (DC)
Mechanical Specifications	**Terminal Accommodation:** #14 - 10 AWG **Voltage Ratings:** Permanently marked on device	**Terminal Accommodation:** #14 - 10 AWG **Voltage Ratings:** Permanently marked on device	**Terminal Accommodation:** #14 - 10 AWG **Voltage Ratings:** Permanently marked on device

Table 5. Materials

Catalog No.	BR15, BR20, Series	CR15, CR20 Series	815, 826 Series
Top Housing	Nylon	PVC	PC
Bottom Housing	PVC	PVC	PC
Strap	0.046" thick galvinated steel	0.040" thick galvinated steel	0.040" thick galvinated steel
Ground Contact	0.030" thick brass	0.030" thick brass	0.030" thick brass
Auto Ground	Phosphor bronze staple	Phosphor bronze staple	Phosphor bronze staple
Line Contacts	.030" thick 3-leaf brass	.030" thick 3-leaf neutral/2-leaf hot brass	.030" thick 3-leaf brass
Terminal Screws	#8-32 Steel brass plated hot	#8-32 Steel brass plated hot	#8-32 Steel brass plated hot
Ground Screw	#8-32 Steel (Green)	#8-32 Steel (Green)	#8-32 Steel (Green)
Tamper Resistant Shutters	N/A	N/A	N/A

Project Name:	Prepared By:
Project Number:	Date:
Catalog Number:	Type:

Table 6. Specifications

Catalog No.	829 Series	817, 1877 Series	816, 1876 Series
Device Type	**Straight Blade Dual Voltage Duplex Receptacles**	**Straight Blade Single Receptacles**	**Straight Blade Single Receptacles**
Wiring Type	Side wire	Side wire	Side wire
Testing & Code Compliance	• UL Listed to UL 498, file no. E15058 • CSA Certified to C22.2, no. 42, file no. 6914, class 6233-01 • NOM certified	• UL Listed to UL 498, file no. E15058 • CSA Certified to C22.2, no. 42, file no. 6914, class 6233-01 • NOM certified	• cULus Listed to UL 498, file no. E15058 • NOM certified
Environmental Specifications	**Flammability:** Meets UL 94 requirements; V2 rated **Temperature Rating:** -20ºC to 60ºC (-4ºF to 140ºF)	**Flammability:** Meets UL 94 requirements; V2 rated **Temperature Rating:** -20ºC to 60ºC (-4ºF to 140ºF)	**Flammability:** Meets UL 94 requirements; V2 rated **Temperature Rating:** -20ºC to 60ºC (-4ºF to 140ºF)
Electrical Specifications	**Dielectric Voltage:** Withstands 2000V per UL 498 **Current Interrupting:** Yes, at full-rated current **Temperature Rise:** Max. 30ºC (86°F) after 100 cycles of overload @ 150% of rated current (DC)	**Dielectric Voltage:** Withstands 2000V per UL 498 **Current Interrupting:** Yes, at full-rated current **Temperature Rise:** Max. 30ºC (86°F) after 100 cycles of overload @ 150% of rated current (DC)	**Dielectric Voltage:** Withstands 2000V per UL 498 **Current Interrupting:** Yes, at full-rated current **Temperature Rise:** Max. 30ºC (86°F) after 100 cycles of overload WW@ 150% of rated current (DC)
Mechanical Specifications	**Terminal Accommodation:** #14 - 10 AWG **Voltage Ratings:** Permanently marked on device	**Terminal Accommodation:** #14 - 10 AWG **Voltage Ratings:** Permanently marked on device	**Terminal Accommodation:** #14 - 10 AWG **Voltage Ratings:** Permanently marked on device

Table 7. Materials

Catalog No.	829 Series	817, 1877 Series	816, 1876 Series
Top Housing	PC	PVC	Nylon
Bottom Housing	PC	PVC	PVC
Strap	0.040" thick galvinated steel	0.040" thick galvinated steel	0.040" thick galvinated steel
Ground Contact	0.030" thick brass	0.030" thick brass	0.030" thick brass
Auto Ground	Phosphor bronze staple	N/A	N/A
Line Contacts	.030" thick 3-leaf neutral/2-leaf hot brass	.030" thick 3-leaf brass	.030" thick 3-leaf brass
Terminal Screws	#8-32 Steel brass plated hot	#8-32 Steel brass plated hot	#8-32 Steel brass plated hot
Ground Screw	#8-32 Steel (Green)	#8-32 Steel (Green)	#8-32 Steel (Green)
Tamper Resistant Shutters	N/A	N/A	N/A

Project Name:	Prepared By:
Project Number:	Date:
Catalog Number:	Type:

Table 8. Specifications

Catalog No.	TRBR15, TRCR15, TRBR20, TRCR20 Series	TR817, TR1877 Series
Device Type	**Tamper Resistant Straight Blade Duplex Receptacles**	**Tamper Resistant Straight Blade Single Receptacles**
Wiring Type	Back & side wire (TRCR side wire only)	Side wire
Testing & Code Compliance	• cULus Listed to UL 498, file no. E15058 • UL verified to Federal Spec. WC-596G (TRBR only) • NOM certified	• cULus Listed to UL 498, file no. E15058 • NOM certified
Environmental Specifications	**Flammability:** Meets UL 94 requirements; V2 rated **Temperature Rating:** -20ºC to 60ºC (-4ºF to 140ºF)	**Flammability:** Meets UL 94 requirements; V2 rated **Temperature Rating:** -20ºC to 60ºC (-4ºF to 140ºF)
Electrical Specifications	**Dielectric Voltage:** Withstands 2000V per UL 498 **Current Interrupting:** Yes, at full-rated current **Temperature Rise:** Max. 30ºC (86°F) after 100 cycles of overload @ 150% of rated current (DC)	**Dielectric Voltage:** Withstands 2000V per UL 498 **Current Interrupting:** Yes, at full-rated current **Temperature Rise:** Max. 30ºC (86°F) after 100 cycles of overload @ 150% of rated current (DC)
Mechanical Specifications	**Terminal Accommodation:** #14 - 10 AWG **Voltage Ratings:** Permanently marked on device	**Terminal Accommodation:** #14 - 10 AWG **Voltage Ratings:** Permanently marked on device

Table 9. Materials

Catalog No.	TRBR15, TRCR15, TRBR20, TRCR20 Series	TR817, TR1877 Series
Top Housing	PVC	PVC
Bottom Housing	PVC	PVC
Strap	0.040" thick galvinated steel	0.040" thick galvinated steel
Ground Contact	0.030" thick brass	0.030" thick brass
Auto Ground	Phosphor bronze staple	Phosphor bronze staple
Line Contacts	.030" thick 3-leaf neutral/2-leaf hot brass	.030" thick 3-leaf brass
Terminal Screws	#8-32 Steel brass plated hot	#8-32 Steel brass plated hot
Ground Screw	#8-32 Steel (Green)	#8-32 Steel (Green)
Tamper Resistant Shutters	Reliable Delrin® shutter assembly	Reliable Delrin® shutter assembly

Table 10. Color Ordering Information

For ordering devices, include Cat. No. followed by the color code: A (Almond), B (Brown), BK (Black), GY (Gray) LA (Light Almond), RD (Red), V (Ivory), W (White)

A	B	BK	GY	LA	RD	V	W
Almond	Brown	Black	Gray	Lt. Almond	Red	Ivory	White

Project Name:	Prepared By:
Project Number:	Date:
Catalog Number:	Type:

Product Dimensions

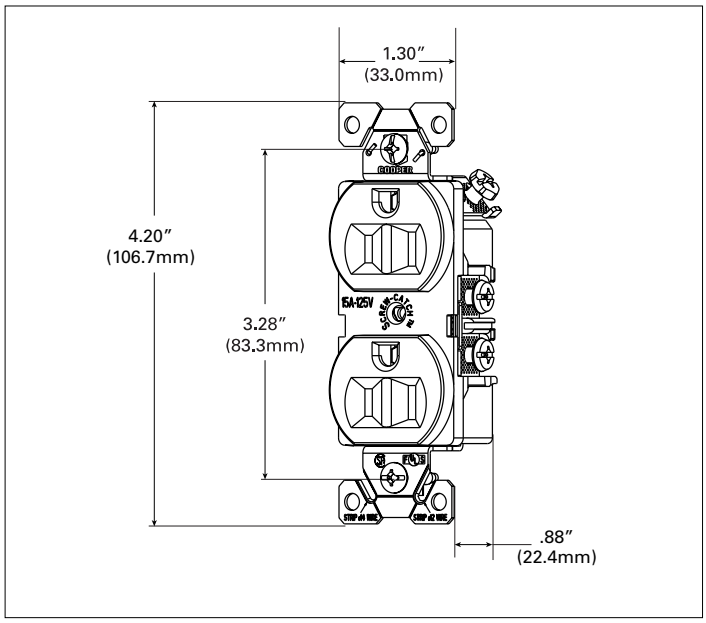


Figure 1. BR15 Line Art with Dimensions

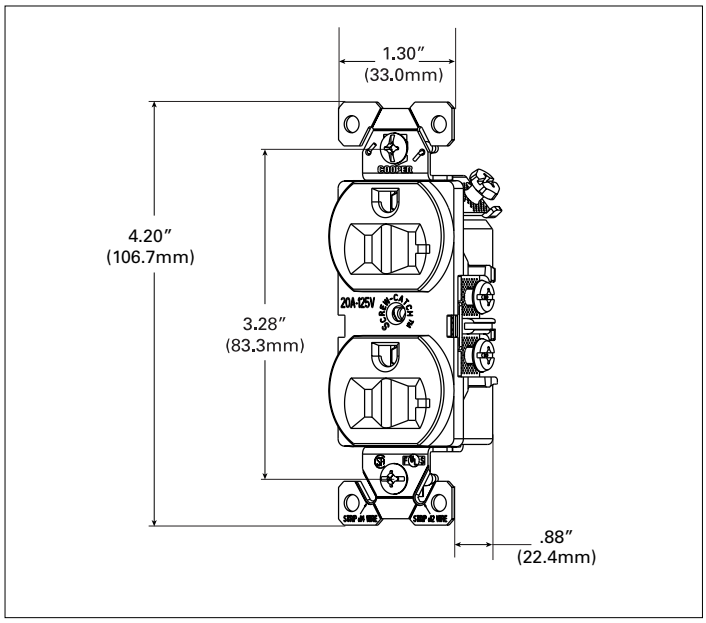


Figure 2. BR20 Line Art with Dimensions

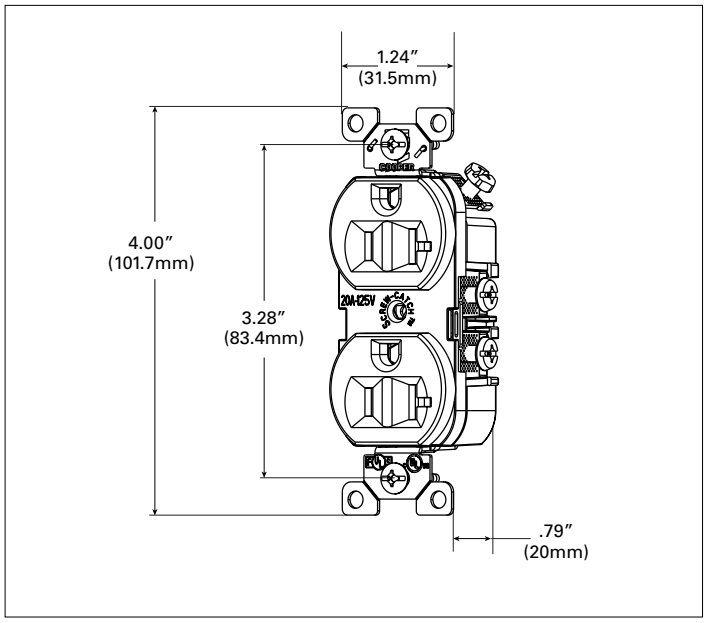


Figure 3. CR20 Line Art with Dimensions

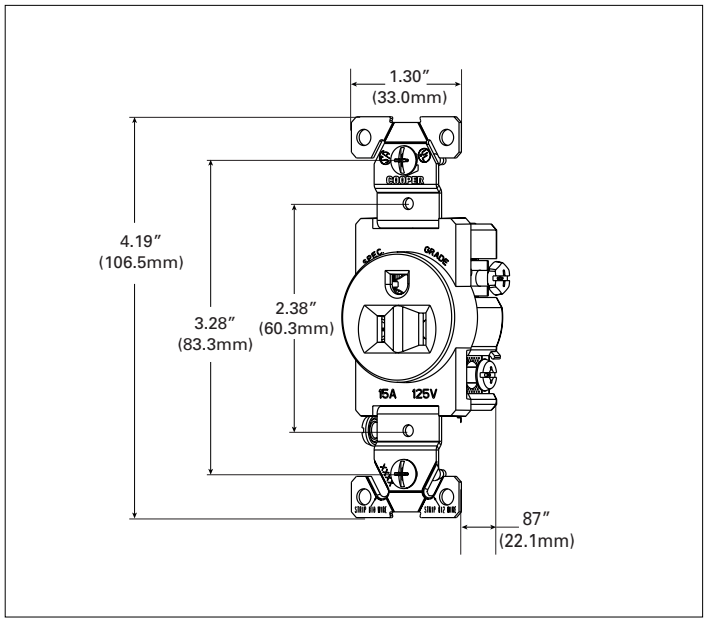


Figure 4. 817 Line Art with Dimensions

Project Name:	Prepared By:
Project Number:	Date:
Catalog Number:	Type:

Product Dimensions

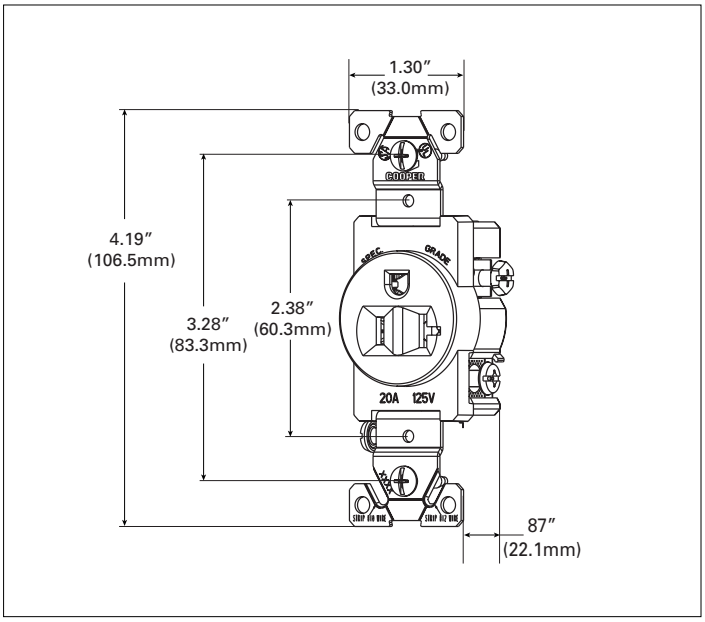


Figure 5. 1877 Line Art with Dimensions

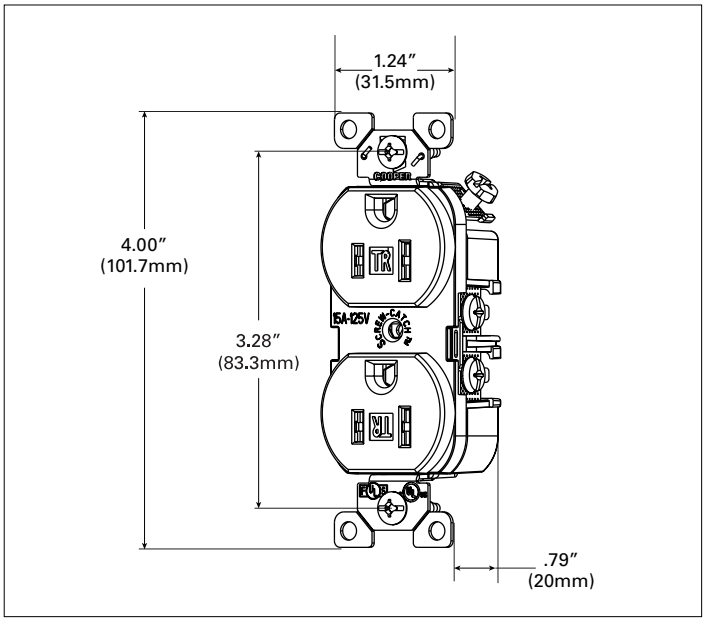


Figure 6. TRBR15 Line Art with Dimensions

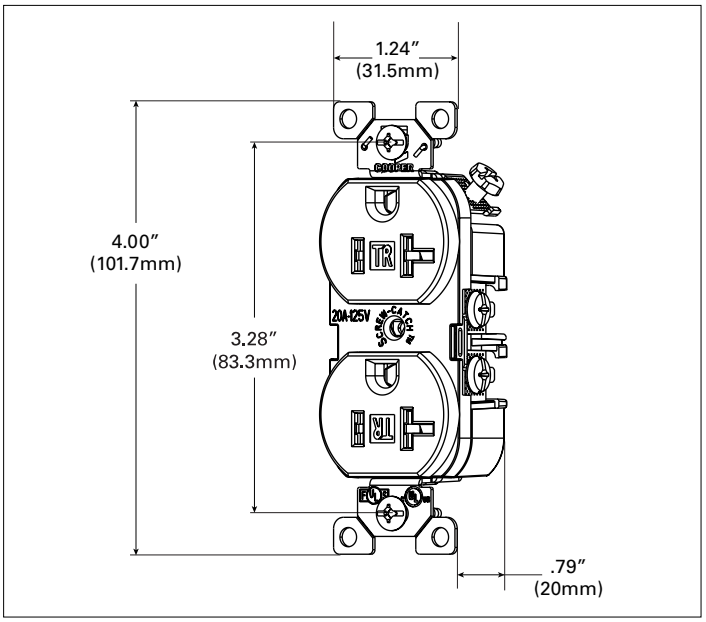


Figure 7. TRBR20 Line Art with Dimensions

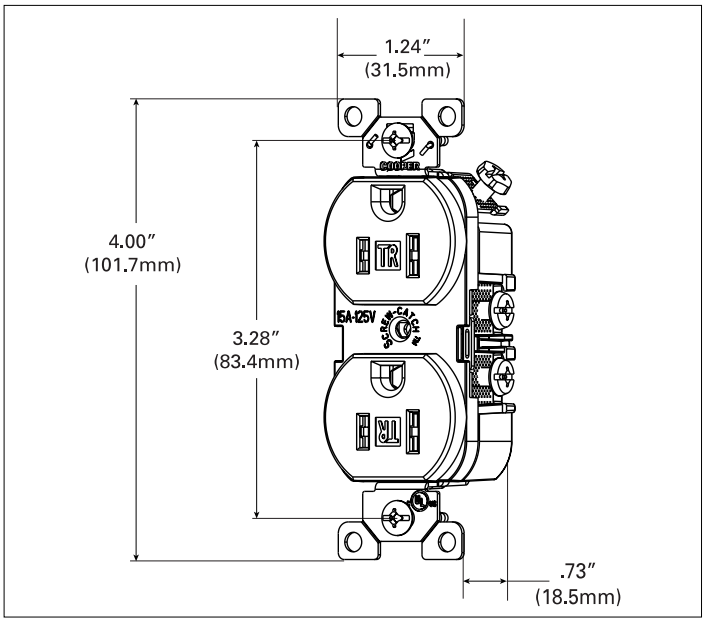


Figure 8. TRCR15 Line Art with Dimensions

Project Name:	Prepared By:
Project Number:	Date:
Catalog Number:	Type:

Product Dimensions

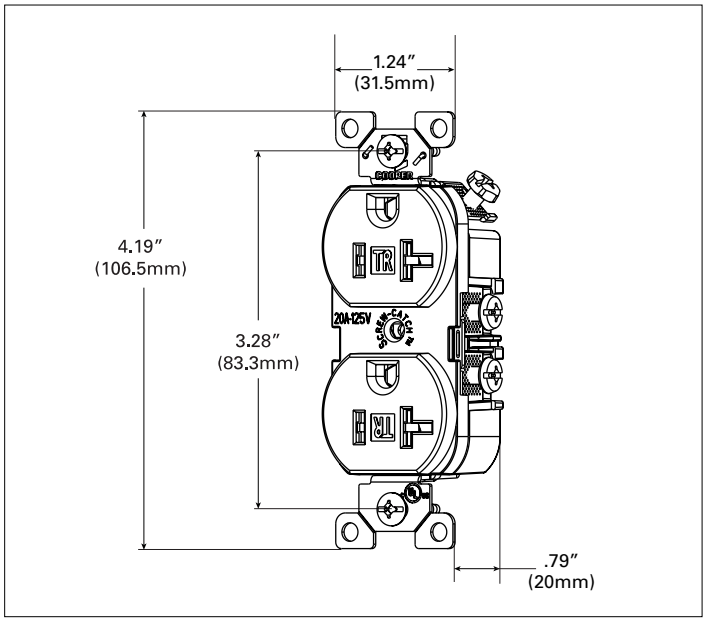


Figure 9. TRCR20 Line Art with Dimensions

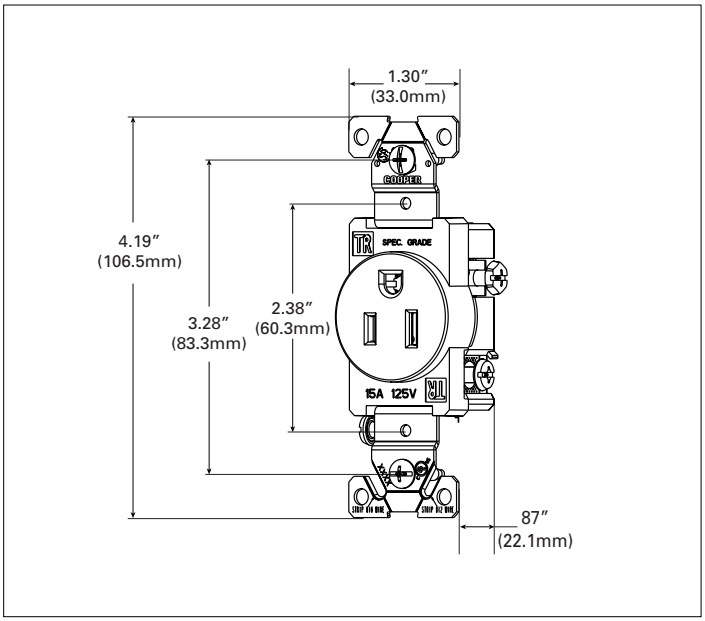


Figure 10. TR817 Line Art with Dimensions

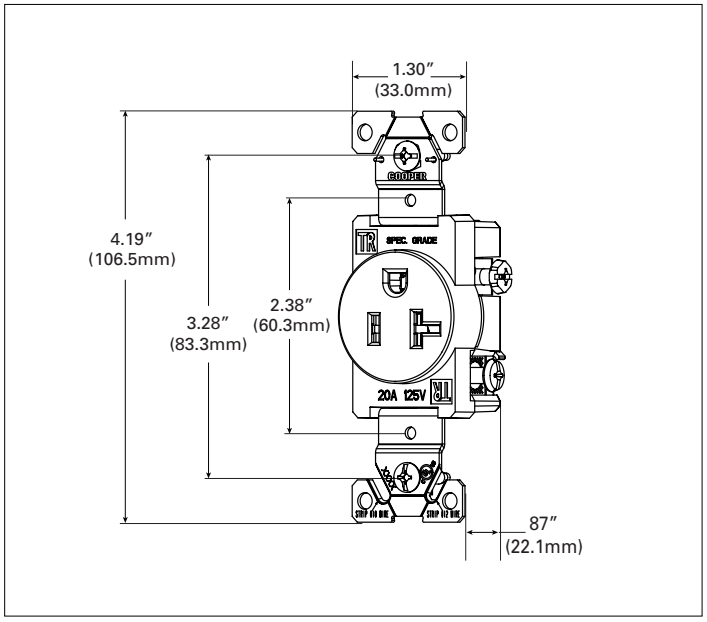


Figure 11. TR1877 Line Art with Dimensions

Compliances, specifications and availability are subject to change without notice.

Project Name:	Prepared By:
Project Number:	Date:
Catalog Number:	Type:

Certifications & compliances

Catalog No.	cULus	UL	Fed Spec	NAFTA	CSA	NOM 426	Arrowlink	Build-To-Spec	ROHS
BR15	•	•	•	•	•	•	•	•	•
CR15	•		•			•		•	•
817		•		•	•	•		•	•
BR20	•	•	•	•	•	•	•	•	•
CR20	•		•			•		•	•
1877		•		•	•	•		•	•
826	•		•			•			•
816	•			•		•		•	•
815	•	•	•		•	•			•
1876	•			•		•		•	•
829		•	•		•	•			•
TRBR15	•		•			•	•	•	•
TRCR15	•					•			•
TR817	•			•		•		•	•
TRBR20	•		•			•	•	•	•
TRCR20	•					•			•
TR1877	•					•		•	•

KEY: cULus · UL · Fed Spec · NAFTA · CSA · NOM 426 · Arrowlink · Build-To-Spec · ROHS

Parts are manufactured and designed in accordance with article 4 of the European Union's RoHS2 directive 2011/65/EU

Build-To-Spec Customizable Devices

Compliances, specifications and availability are subject to change without notice.

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Panelboards and Lighting Controls

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Product Selection Guide

Product Types

Type PRL1a

Bolt-on Circuit Breakers 240Vac Maximum

Main Lugs Only
600 amperes maximum.

Main Circuit Breaker
400 amperes maximum.

Branch Circuit Breakers
100 amperes maximum.
(1 pole and 3 pole)
125 amperes maximum.
(2 pole)

Type PRL2a

Bolt-on Circuit Breakers 240V, 480Y/277V or 600Y/347Vac; 125/250Vdc Maximum

Main Lugs Only
600 amperes maximum.

Main Circuit Breaker
400 amperes maximum.

Branch Circuit Breakers
100 amperes maximum,
1-, 2- and 3-pole.

Type PRL3a

Bolt-on Circuit Breakers 240V, 480V or 600Vac; 250Vdc Maximum

Main Lugs Only
600 amperes maximum.

Main Circuit Breaker
600 amperes maximum.

Branch Circuit Breakers
225 amperes maximum,
1-, 2- and 3-pole.

Type PRL4

Circuit Breakers or Fusible Switches 240V, 480V or 600Vac; 250Vdc Maximum

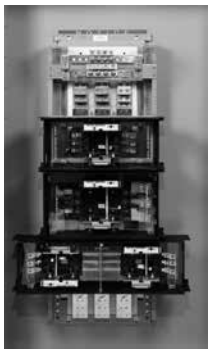
Main Lugs Only
1200 amperes maximum.

Main Circuit Breaker
1200 amperes maximum.

Main Fusible Switch
1200 amperes maximum.

Branch Circuit Breakers
1200 amperes maximum
1-, 2- and 3-pole.

Branch Fusible Switches
1200 amperes maximum,
2- and 3-pole.



PRL4D

Draw-out Circuit Breakers 240V, 480V or 60Vac; 250Vdc Maximum

Main Lugs Only
1200 amperes maximum.

Branch Circuit Breakers
600 amperes maximum.
3-pole

Type PRL1a-LX Column Type

Bolt-on Circuit Breakers 240Vac Maximum

Main Lugs Only
225 amperes maximum.

Main Circuit Breaker
225 amperes maximum.

Branch Circuit Breakers
100 amperes maximum
1-, 2- and 3-pole.

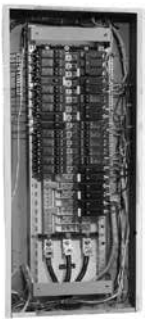
Type PRL2a-LX Column Type

Bolt-on Circuit Breakers 240 V or 600Y/347Vac; 125/250Vdc Maximum

Main Lugs Only
225 amperes maximum.

Main Circuit Breaker
225 amperes maximum.

Branch Circuit Breakers
100 amperes maximum
1-, 2- and 3-pole.



Retrofit Panelboard PRL-1R

Bolt-on Circuit Breakers 240Vac Maximum

Main Lugs Only
400 amperes maximum.

Main Circuit Breaker
225 amperes maximum.

Branch Circuit Breakers
100 amperes maximum,
1-, 2- and 3-pole.

Retrofit Panelboard PRL-2R

Bolt-on Circuit Breakers 600Y/347Vac Maximum

Main Lugs Only
400 amperes maximum.

Main Circuit Breaker
225 amperes maximum.

Branch Circuit Breakers
100 amperes maximum,
1-, 2 and 3-pole.

Retrofit Panelboard PRL4R

Bolt-on Circuit Breakers 600Y/34Vac Maximum

Main Lugs Only
1200 amperes maximum.

Main Circuit Breaker
1200 amperes maximum.

Branch Circuit Breakers
1200 amperes maximum,
1, 2 and 3-poles.

Pow-R-Command Lighting Control

Bolt-on Circuit Breakers 240V or 480Y/277Vac

Main Lugs Only
400 amperes maximum.

Main Circuit Breaker
400 amperes maximum.

Branch Circuit Breakers
225 amperes maximum,
1, 2 and 3-poles.

Integral Power Switching Controls.

Type PRL1a Panelboard

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Product Description

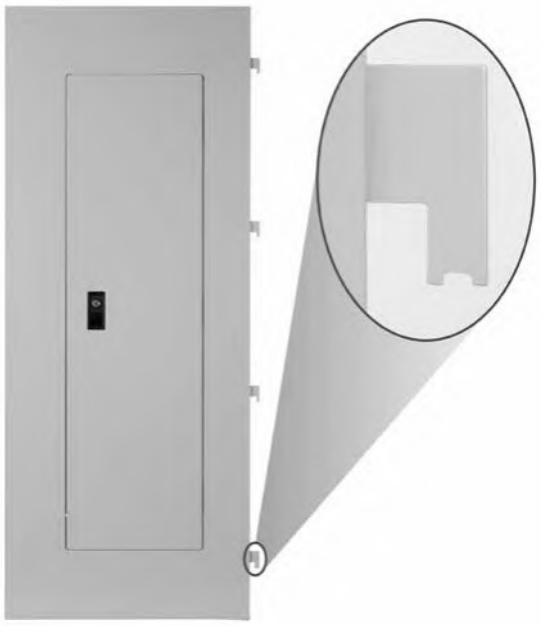
Eaton's new EZ box and EZ trim represents the first significant change in panelboard box and trim designs in more than a half-century. The EZ box and EZ trim have been designed for faster, more secure and safer installations. The new EZ box and EZ trim are provided standard for Pow-R-Line 1a and Pow-R-Line 2a lighting panel- boards, as well as our Pow-R-Line 3a mid-range panelboard.

Flange Detail

Features

- Virtually eliminates sharp edges.
- Trim installs in seconds rather than minutes.
- Door-in-door is standard.
- Ability to adjust flush box to wall irregularities.
- Trim installs without the need for tools.
- No exposed hardware (because there is none).
- Multipoint door latch over breakers.

The EZ box flanges are bent and painted, which virtually eliminates the sharp edges associated with traditional boxes. Additionally, all steel panelboard chassis parts are painted. This significantly reduces potential injury for material handlers and install-ers. Each flange is adjustable outward up to 3/4 inch. This feature allows the installer to adjust flush box applications to be level and flat with the finished wall after the wall material is installed to help correct wall irregularities. The new box flange also provides the means for attaching the EZ trim.



Stand-alone Trim and Bottom Flange Hanger with Notch

Corner Flange Detail

Fast Installation

The EZ trim incorporates a patent pending, ground breaking design that installs in seconds, rather than minutes. The standard trim features include door-in-door construction; no exposed hardware and no tools are required for installation.

Each EZ trim includes hangers attached on the right side. The bottom trim hanger has a notch in its base. To install, the bottom hanger is inserted into the bottom right side box flange opening, resting the notch on the flange.

Trim Hanger Inserted Into Box Flange

The balance of the hangers should be aligned with the other flange openings and pushed in. When all hangers are in the box flange, the trim should be lifted up slightly to clear the notch on the bottom hanger as the trim is self-supported on the EZ box.

The installation is completed by swinging the trim to the closed position, then lifting and pushing slightly to the right. The trim will drop into place totally secured. The multi-point catches on the left side of the trim will lock into the left side box flange openings.

To prevent the trim from being removed by non-authorized persons, a unique sliding means automatically latches in place when the trim door is closed. Along with a new lock, the EZ trim offers a high degree of door security.

Standards and Certifications

When used with Eaton's panelboard chassis, EZ boxes and EZ trims meet the following applicable industry standards.

- CSA C22.2#29 approved.
- Canadian Electrical Code

Trim Hanging on Surface Mounted Box

1

Pow-R-Line C Panelboards

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Product Description

Lighting and Distribution Panelboards

Assembled panelboards are designed for sequence phase connection of branch circuit devices. This allows complete flexibility of circuit arrangement (1-, 2- or 3-poles) to allow balance of the electrical load on each phase.

Sturdy, rigid chassis assembly assures accurate alignment of interior with panel front; prevents flexing and minimizes possibility of loosening or damage to current carrying parts during and after installation.

Four-point in-and-out adjustment of panel interior is provided to meet critical depth dimensions on flush installations. This compensates for possible misalignment of box at installation.

Main lugs are mechanical solderless type and approved for copper or aluminum conductors.

Enclosures

Boxes are code-gauge galvanized steel.

Standard panelboard cabinets are designed for indoor use. Alternate types are available for indoor and special purpose applications.

All enclosures are furnished in accordance with Canadian Standards Association and include wiring gutters with proper wire bending space. Special cabinets can be provided at an additional charge.

The box dimensions shown are inside dimensions. For outside dimensions, add 1/4-inch (6.4 mm).

Standard panelboard boxes are supplied without knockouts (blank endwalls).

Fronts

Fronts (trims) for all panelboards are made of code-gauge steel and have a high durability ASA-61 light gray finish applied by a baked-on polyester powder coating paint system.

The fronts for lighting and appliance branch circuit panelboards and small power distribution panelboards include a door with rounded corners and concealed hinges. A flush-type latch and lock assembly is included. All locks are keyed alike. These trims are available in both surface and flush mounted designs.

EZ Trim features standard door-in-door with no exposed hardware or sharp edges (no tools are required for installation)

The three-piece trim for larger power distribution panelboards provides for easy handling and installation

Fronts for power distribution panelboards utilize a unique breaker front cover design in which each device has a dedicated bolt-on steel cover. The individual covers form a single deadfront for the panelboard that is used in conjunction with two wiring gutter covers to complete the trim. A door is not finished as part of the standard oering on these panelboards but can be provided, for an additional charge, using a deeper than standard box.

Application Description

Panelboard Selection Factors

In selecting a panelboard, the following factors must be considered:

- Service (voltage and frequency)
- Interrupting capacity (fully or series rated)
- Ampere rating of main
- Ampere ratings of branches
- Environment

Panelboard Short Circuit Rating

The short circuit rating of Eaton's assembled panelboards are test verified by, and listed with Canadian Standards Association. Generally, these ratings are that of the lowest interrupting rated device in the panel.

Certain exceptions to this rule exist where branch devices have been CSA tested in combination with specific main devices having a higher interrupting rating. Where these defined main devices and branch breaker combinations are utilized, the Series Short Circuit Rating of the assembled panelboard will be the same as the tested rating of the approved rated main device in series with the branches. Available main and branch breaker combinations are tabulated starting on **Page 1-10.** All combinations shown are CSA certified.

These series ratings apply to panels having main devices, or main lug only panelboards fed remotely by the device listed in the series ratings chart as the main, for which CSA tests were conducted.

Standard Entrance Equipment

Standard main breaker panelboards may be configured to meet CSA Service Entrance requirements. This option must be added to the List Price and specified at order entry.

Service entrance rated panelboards require a number of additions:

- CSA service entrance label
- Barrier around the main breaker
- Ground lug inside the service entrance barrier
- A neutral lug inside the service entrance barrier that extends outside to panelboard's box

Service entrance panelboards must be identified during order entry.

Multi-Section Panelboards

Separate fronts for each box are standard. Where the required number of branch circuit devices exceeds the available space in any single panelboard, multiple-section assemblies may be provided. These assemblies consist of two or more close-coupled enclosures with provisions for interconnecting power cables or bus.

Interconnecting Multi-Section Panelboards

When a panelboard, for connection to one feeder, must be furnished in more than one section (Box), each section must be furnished with main bus and terminals of the same rating, unless a main overcurrent device is provided in each section.

Subfeed or throughfeed provision must also be included (and priced) to provide connection capability to the second section.

Note: Subfeed or throughfeed lugs cannot be used on any panelboard that is not protected by a single main overcurrent device either in the panelboard or immediately upstream.

1

Sub-Feed Lugs

Sub-feed lugs **(see Figure 1-1)** are one means of interconnecting multi-section panels. The subfeed (second set of) lugs are mounted directly beside the main lugs. These are required in each section except the last panel in the lineup. The feeder cables are brought into the wiring gutter of the first section and connected to the main lugs. Another set of the same size cables are connected to the subfeed lugs (Section 1) and are carried over to the main lugs of the adjacent panel. Cross connection cables are not furnished by Eaton. Subfeed lugs are only available on main lug only panels.

In situations requiring large numbers of overcurrent protective devices, or when site conditions demand panelboards may be supplied in multiple sections.

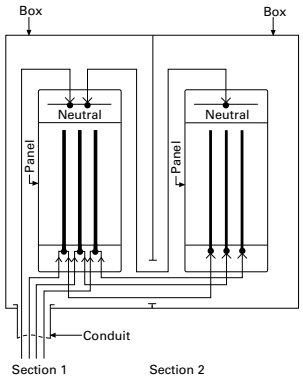


Figure 1.1. Sub-Feed Lugs

Through-Feed Lugs

Through-feed lugs **(see Figure 1-2)** are another method to interconnect multi-section panelboards. The incoming feeder cables are connected to the main lugs or main breaker at the bottom of panel (Section 1). Another set of lugs (through-feed) are located at the opposite end of the main bus. The interconnecting cables are connected to the through-feed lugs in Section 1 and are carried over to the main lugs in Section 2. The connection arrangement could be reversed, i.e., main lugs at top; through-feed lugs at bottom end of panel. Cross cables are not furnished by Eaton.

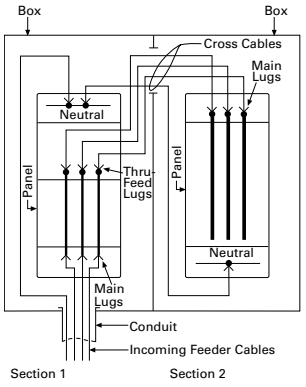
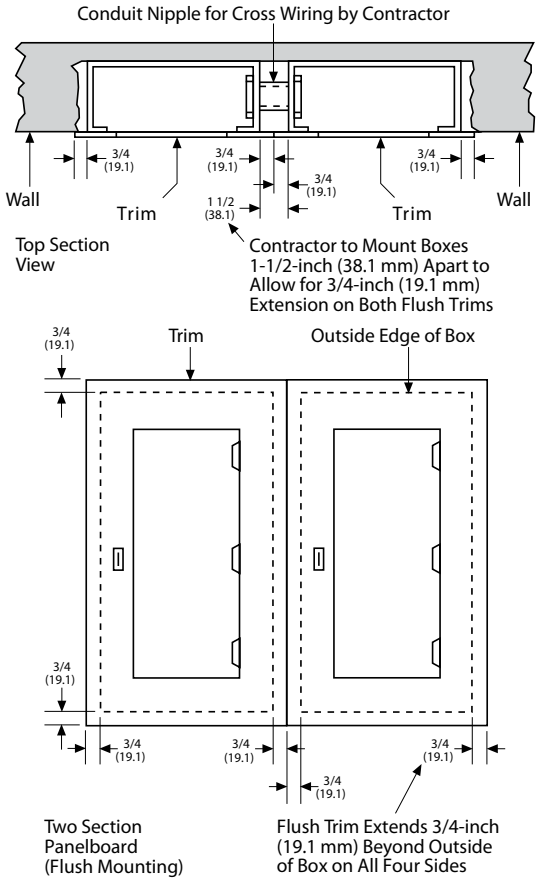


Figure 1.2. Through-Feed Lugs

Multiple Section Panelboard — Flush Mounted

Shown below **(see Figure 1.3**) is the standard method for flush mounting multiple section lighting and distribution panelboards using standard flush trims.



Special Conditions

Standard panelboards, assembled with standard components, are adequate for most applications. However, special consideration should be given to those required for application under special conditions such as:

- Excessive vibration or shock
- Frequencies above 60 cycles
- Altitudes above 6600 feet (2011.7 m)
- Damp environment (possible fungus growth)
- Compliance with federal, state, provincial and municipal electrical codes and standards

Seismic Considerations

Eaton panelboards are seismic qualified at the highest possible level, Seismic Zone 4, and have been tested in accordance with ANSI C37.81. This standard quantifies actual earthquake conditions, as well as equipment seismic capability.

Harmonic Currents

Standard panelboard neutrals are rated or 100% of the panelboard current. However, since harmonic currents can cause overheated neutrals, an option is provided for neutrals to be rated at 200% (1200 ampere maximum neutral for 600 ampere main bus) of the panelboard phase current.

Panelboards with the 200% rated neutral are CSA certified as suitable for use with non-linear loads.

Prior to specifying the 200% rated neutral, Eaton recommends a harmonic survey be conducted of the distribution system, be it new or existing.

Transient Voltage Surge Suppression

The quality of power feeding sensitive electronic loads is critical to the reliable operation of any facility. In modern offices, hospitals, and manufacturing facilities, the most frequent causes of microprocessor-based equipment downtime and damage are voltage transients and electrical noise.

Electrical loads and microprocessor-based equipment are highly susceptible to both high and low energy transients. High energy transients include lightning induced surges and power company switching. These high energy transients can destroy components instantly.

More frequently the electrical system experiences low energy transients and high frequency noise.

The effects of continual low energy transients and high frequency noise can cause erratic equipment performance or sudden failure of electronic circuit board components.

Eaton can provide protective and diagnostic systems integral to panelboards. The surge protection device (SPD) is integrated into the panelboards using a “zero lead length” direct bus bar connection.

The Surge Protection Device (SPD) provides Transient Voltage Surge Suppression (TVSS) and active hybrid filtering. The SPD protects sensitive electronic equipment from the damaging effects of high and low energy transients, as well as high frequency noise.

Pow-R-Line 4

Standards and Certifications

All Eaton panelboards are designed to meet the following applicable industry standards, except where noted:

- Canadian Standards Association
- C22.2 No. 29
- Canadian Electrical Code

Box Sizing and Selection

Assembled Circuit Breaker Panelboards

Box size and box and trim catalogue numbers for all standard panelboard types are found in **Table 2-10** and **2-11**.

Instructions:

1. Select the rating and types of main required from Tables.
2. Count the total number of branch circuit poles, including spaces, required in the panelboard. Do not count main breaker poles. Convert 2- or 3-pole branch breaker to single-poles, i.e., 3-pole breaker, count as 3 poles. (140 amps per connector maximum).
3. Using the correct table, type of mains and ampere rating per step 1 above, find total on the table, use the next higher number.
4. Read box size, box and trim catalogue numbers across columns to the right. On trim catalogue numbers, specify surface or flush mounting on the order.

Cabinets

Fronts are code-gauge steel, ASA-61 light gray painted finish.

Boxes are code-gauge galvanized steel without knockouts. Standard depth is 5-3/4 inches (146.1 mm). Standard width is 20 inches (508.0 mm).

Top and Bottom Gutters

5-1/2 inches (139.7 mm) minimum.

Table 2.10 PRL2a Panelboard Sizing

Main Lugs Only or Main Lugs with Sub-Feed Lugs

Main Ampere Rating	Number of Branch Circuit Poles	Box Dimensions (Inches) H	W	D	Box Catalogue Number	Trim Catalogue Number
100 Amp Main Lugs	18, 24, 30	30	20	5-3/4	**EZB2030RC**	**EZT2030 S or F**
	42	36	20	5-3/4	**EZB2036RC**	**EZT2036 S or F**
225 Amp Main Lugs	18	30	20	5-3/4	**EZB2030RC**	**EZT2030 S or F**
	24, 30	36	20	5-3/4	**EZB2036RC**	**EZT2036 S or F**
	42	42	20	5-3/4	**EZB2042RC**	**EZT2042 S or F**
	60	54	20	5-3/4	**EZB2054RC**	**EZT2054 S or F**
	72	60	20	5-3/4	**EZB2060RC**	**EZT2060 S or F**
	84	72	20	5-3/4	**EZB2072RC**	**EZT2072 S or F**
400/600 Amp Main Lugs	24	42	20	5-3/4	**EZB2042RC**	**EZT2042 S or F**
	30	48	20	5-3/4	**EZB2048RC**	**EZT2048 S or F**
	42	54	20	5-3/4	**EZB2054RC**	**EZT2054 S or F**
	60	60	20	5-3/4	**EZB2060RC**	**EZT2060 S or F**
	72, 84	72, 90	20	5-3/4	**EZB2072RC**	**EZT2072 S or F**
Main Lugs with Through-Feed Lugs						
100 Amp Main Lugs	18, 24, 30	30	20	5-3/4	**EZB2030RC**	**EZT2030 S or F**
	42	36	20	5-3/4	**EZB2036RC**	**EZT2036 S or F**
225 Amp Main Lugs	18, 24	36	20	5-3/4	**EZB2036RC**	**EZT2036 S or F**
	30	42	20	5-3/4	**EZB2042RC**	**EZT2042 S or F**
	42	48	20	5-3/4	**EZB2048RC**	**EZT2048 S or F**
	60	60	20	5-3/4	**EZB2060RC**	**EZT2060 S or F**
	72	72	20	5-3/4	**EZB2072RC**	**EZT2072 S or F**
400/600 Amp Main Lugs	24	48	20	5-3/4	**EZB2048RC**	**EZT2048 S or F**
	30	54	20	5-3/4	**EZB2054RC**	**EZT2054 S or F**
	42	60	20	5-3/4	**EZB2060RC**	**EZT2060 S or F**
	60, 72	72	20	5-3/4	**EZB2072RC**	**EZT2072 S or F**

Note: Depending on the panel configuration, 72/84 cct interiors fit into a 90" H box.

Box Sizing and Selection Cont'd

Table 2.11 PRL2a Panelboard Sizing

Ampere Rating	Main Breaker Types	Number Branch Circuit Poles	Box Dimensions (Inches) H	W	D	Box Catalogue Number	Trim Catalogue Number
100	GBH, GHB (Horizontal)	15, 21, 27	30	20	5.75	**EZB2030RC**	**EZT2030 S or F**
100/225	FDB, FD, HFD, FDC EHD① (Vertical)	18, 24	36	20	5.75	**EZB2036RC**	**EZT2036 S or F**
		30	42	20	5.75	**EZB2042RC**	**EZT2042 S or F**
		42	48	20	5.75	**EZB2048RC**	**EZT2048 S or F**
		60	60	20	5.75	**EZB2060RC**	**EZT2060 S or F**
		72, 84	72	20	5.75	**EZB2072RC**	**EZT2072 S or F**
400	KD	24	48	20	5.75	**EZB2048RC**	**EZT2048 S or F**
	HKD	30	54	20	5.75	**EZB2054RC**	**EZT2054 S or F**
	KDC	42	60	20	5.75	**EZB2060RC**	**EZT2060 S or F**
	(Vertical)	60, 72	72	20	5.75	**EZB2072RC**	**EZT2072 S or F**
Main Breaker with Through-Feed Lugs							
100	GBH, GHB①	15, 21, 27	30	20	5.75	**EZB2030RC**	**EZT2030 S or F**
100/225	FDB, FD	18, 24	36	20	5.75	**EZB2036RC**	**EZT2036 S or F**
	HFD, FDC	30	42	20	5.75	**EZB2042RC**	**EZT2042 S or F**
	EHD①	42	54	20	5.75	**EZB2054RC**	**EZT2054 S or F**
	(Vertical)	60	60	20	5.75	**EZB2060RC**	**EZT2060 S or F**
		72	72	20	5.75	**EZB2072RC**	**EZT2072 S or F**
400	KD	24	60	20	5.75	**EZB2060RC**	**EZT2060 S or F**
	HKD, KDC	30	72	20	5.75	**EZB2072RC**	**EZT2072 S or F**
	(Vertical)	42	72	20	5.75	**EZB2072RC**	**EZT2072 S or F**

1. ① In a Sub-Feed configuration, maximum incoming and outgoing cables are 1 per phase 4/0.

2. Through-Feed lugs are recommended for 400A applications.

3. Depending on the panel configuration, 72/84 cct interiors fit into a 90" H box.

Table 2.12 Metric box dimensions:

Box Catalogue Number	Height	Width	Depth
EZB2030RC	762	508.0	146
EZB2036RC	914	508.0	146
EZB2042RC	1067	508.0	146
EZB2048RC	1219	508.0	146
EZB2054RC	1372	508.0	146
EZB2060RC	1524	508.0	146
EZB2072RC	1828	508.0	146
EZB2090RC	2286	508.0	146

Type DT-3

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Accessories	**V2-T2-28**
Technical Data and Specifications	**V2-T2-28**

Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Types DS-3, DT-3

- Ventilated, NEMA 2 enclosure standard
- Suitable for indoor applications, outdoors when weathershields are also installed
- Upright mounting only
- 220°C insulation system
- 150°C rise standard; 115°C or 80°C rise optional
- Available in single-phase ratings 15–167 kVA, 600 volts primary (DS-3)
- Available in three-phase ratings 15–1500 kVA and up to 600 volts primary (DT-3)

Application Description

DOE 2016 compliant energy-efficient transformers are specifically designed to meet the energy efficiency standards set forth in "CFR Title 10 Chapter II Part 431, Appendix A of Subpart K 2016". Surveys have shown that the average loading of low-voltage dry-type distribution transformers, over a 24-hour period, is approximately 35%. DOE 2016 compliant transformers are optimized to offer maximum efficiency at 35% of nameplate rating.

The range of products covered by DOE 2016 is:

DOE 2016 Product Range

Rating	Voltage Class	Voltage
	Primary voltage	34.5 kV and below
	Secondary voltage	600V and below
Low-Voltage Dry-Type Rating	Single-phase	10–833 kVA
	Three-phase	15–2500 kVA
Liquid Rating	Single-phase	10–833 kVA
	Three-phase	15–2500 kVA

Transformers that are currently specifically excluded from the scope of CFR Title 10 Chapter II Part 431, Appendix A of Subpart K 2016 include:

- Liquid-filled transformers below 10 kVA
- Low-voltage dry-type transformers below 15 kVA
- AC and DC drives transformers
- Rectifier transformers designed for high harmonics
- Autotransformers
- Non-distribution transformers, such as UPS transformers
- Special impedance or regulation transformers
- Regulating transformers
- Sealed and non-ventilated transformers
- Machine tool transformers
- Welding transformers
- Transformers with tap ranges greater than 15%
- Transformers with a frequency other than 60 Hz
- Grounding transformers
- Testing transformers

Efficiency levels set forth in DOE 2016.

DOE 2016 Efficiency Levels

Low-Voltage Dry-Type Distribution Transformers (600V and below)

Single-Phase		Three-Phase	
kVA	**Efficiency**	**kVA**	**Efficiency**
15	97.70	15	97.89
25	98.00	30	98.23
37.5	98.20	45	98.40
50	98.30	75	98.60
75	98.50	112.5	98.74
100	98.60	150	98.83
167	98.70	225	98.94
250	98.80	300	99.02
333	98.90	500	99.14
—	—	750	99.23
—	—	1000	99.28

Features, Benefits and Functions

- 60 Hz operation (except as noted)
- Short-term overload capability as required by ANSI
- Meet NEMA ST-20 sound levels
- Transformer core and coil covered with a fungus-resistant varnish to seal out moisture and other contaminants, and prevent the growth of fungus
- The core and coil assembly is grounded to the transformer enclosure by means of a visible flexible copper ground strap. The copper ground strap is sized per the NEC to be a grounding conductor. Three-phase DOE 2016 efficient transformers are provided with a bonding ground bar attached to the bottom panel for compliance with NEC 450.10(A)
- Transformers manufactured in enclosures 939, 940, 942, 943, 944 and 945 are UL Listed to be installed indoors (without weathershields) with just 2 inches of clearance on the sides and behind the transformer
- Double neutral
- Meet federal energy efficiency requirements for low-voltage dry-type distribution transformers effective as of January 1, 2016
- cUL Energy Verified in accordance with energy standards: CFR Title 10 Chapter II Part 431, Appendix A of Subpart K and CSA C802.2-12 Update No. 1 May 2013 by Underwriters Laboratories Inc.

Standards and Certifications

- UL® listed

Listed

Energy Verified

Industry Standards

All Eaton low-voltage dry-type distribution transformers are built and tested in accordance with applicable NEMA, ANSI and IEEE Standards. All 600 volt class transformers are UL listed unless otherwise noted.

Seismically Qualified

Eaton manufactured low-voltage dry-type distribution transformers are seismically qualified and exceed requirements of the Uniform Building Code (UBC), International Building Code (IBC) and California Code Title 24.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient— Copper Windings

480 Delta Volts to 208Y/120 Volts

kVA	Temperature Rise °C	Frame	Wiring Diagram	Weight Lb (kg) ①	Type 3R WS Kit	Wallmount Bracket	Catalog Number
15	150	FR939	280B	250 (114)	WS57	WMB05	**V48M28T1516CU**
30		FR940		415 (188)	WS58	WMB05	**V48M28T3016CU**
45		FR940		478 (217)	WS58	WMB05	**V48M28T4516CU**
75		FR942		676 (307)	WS59	WMB04	**V48M28T7516CU**
112.5		FR943		1263 (573)	WS60	WMB04	**V48M28T1216CU**
150		FR943		1410 (640)	WS60	WMB04	**V48M28T4916CU**
225		FR944		1883 (855)	WS61	—	**V48M28T2216CU**
300		FR945		2485 (1128)	WS62	—	**V48M28T3316CU**
500		Contact local Eaton representative					**V48M28T5516CU**
750							**V48D28T7716CU**
1000							**V48D28T1116CU**
15	115	FR939	280B	241 (109)	WS57	WMB05	**V48M28F1516CU**
30		FR940		433 (197)	WS58	WMB05	**V48M28F3016CU**
45		FR940		471 (214)	WS58	WMB05	**V48M28F4516CU**
75		FR942		665 (302)	WS59	WMB04	**V48M28F7516CU**
112.5		FR943		1271 (577)	WS60	WMB04	**V48M28F1216CU**
150		FR943		1422 (646)	WS60	WMB04	**V48M28F4916CU**
225		FR944		2082 (945)	WS61	—	**V48M28F2216CU**
300		FR945		2568 (1166)	WS62	—	**V48M28F3316CU**
500		Contact local Eaton representative					**V48M28F5516CU**
15	80	FR939	280B	239 (109)	WS57	WMB05	**V48M28B1516CU**
30		FR940		466 (212)	WS58	WMB05	**V48M28B3016CU**
45		FR942		667 (303)	WS58	WMB05	**V48M28B4516CU**
75		FR943		1147 (521)	WS59	WMB04	**V48M28B7516CU**
112.5		FR943		1385 (629)	WS60	WMB04	**V48M28B1216CU**
150		FR944		1895 (860)	WS60	WMB04	**V48M28B4916CU**
225		FR945		2385 (1083)	WS61	—	**V48M28B2216CU**
300		Contact local Eaton representative					**V48M28B3316CU**
500							**V48M28B5516CU**

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog.
For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.
Frame drawings/dimensions information begins on **Page V2-T2-204**.

SF Project No. 2066902 June 4, 2021
Fit-Up Administrative Headquarters Suite 440E &455E
Capital Gallery East Tower

Fire Alarm and Sprinkler Product Data for Basis of Design Only

NOTIFIER® by Honeywell

DAA2 Series Digital Audio Amplifiers

General

The DAA2 Series amplifiers are multi-featured amplifiers with digital audio functionality. Each DAA2 is capable of accessing and processing one of up to eight audio channels on the DVC audio loop, amplifying the signal, and distributing it via four Class B, two Class A outputs, or four Class A outputs in DAA2 amplifiers with a DCADC Class A expander. A DAA2-50 or DAA2-75 series amplifier is capable of mounting an optional BDA Digital amplifier, which can be used to provide one-to-one amplifier backup, or to support two-channel operation, or increased output wattage to 100W (100W option applies to DAA2-50 series only, other rules apply).

The DAA2 has two wire digital audio ports to connect to wire DAL (digital audio loop) segments. Either or both ports may be converted to fiber using fiber option modules.

Up to 32 devices, such as DAA2 amplifiers, can be connected to the DAL on one DVC Digital Voice Command unit. DAA2 amplifiers may be mixed with DAX and DAA series amplifiers on the same DAL.

An optional Firefighter telephone riser on the DAA2 supports local and network FFT communications. A DAA2 also supports use of an RM-1 remote microphone.

DAA2 amplifiers can store backup alarm and trouble messages, and provide an adjustable background music input.

Features

- Listed to UL Standard 864, 9th edition
- 50 W total output power at 25 VRMS (all DAA2-5025 models) or 70 VRMS (all DAA2-5070 models)
- 75 W total output power at 25 VRMS (all DAA2-7525 models)
- Supports two Class A high-level audio outputs, or four Class A outputs in DAA2 amplifiers with a DCADC Class A expander, or four Class B outputs
- Optional BDA amplifiers support alternative configurations
- Backup amplifier - supports one-to-one backup (all DAA2 models)
- Primary amplifier - supports two-channel operation (all DAA2 models)
- Primary amplifier - increase power up to 100W, one- or two-channel operation. (DAA2-50 series only, configuration rules apply.)
- Supports one-to-many amplifier backup applications using the same model DAA2
- Firefighter telephone riser supports 7 active firefighter telephones. System Release 3.0 and higher supports optional configurations: direct connection for up to 7 firefighter telephones, or connection to multiple FTM-1 modules
- Remote microphone paging option with RM-1
- Audio output activation via network control-by-event equations resident within the DVC
- Two wire digital audio ports that can be converted to fiber using fiber option modules. Support Style 4 or 7 configurations
- Auxiliary input for 1 VRMS, to be used for background music input, an interface with a telephone paging source, or other compatible audio sources. Audio levels can be adjusted by end user. Optional supervision through programming
- Isolated alarm bus input, to be used for backup activation of alarm messages when normal digital communication is lost
- Programmable through VeriFire® Tools

- Up to 106 seconds of backup digital message storage for use in the event of communication loss (from the VeriFire Tools message library, or created by the installer)
- Battery charger disable provides battery sharing option for up to four DAA2s
- Disconnect of deeply-discharged battery (low battery disconnect)

Installation

The DAA2 arrives from the factory already installed on its chassis. The DAA2 mounts in one row of any EQ or CAB-4 Series cabinet: The CAB-4 row can be covered using a DP- 1B dress panel, ordered separately.

One or two fiber option modules will plug directly onto a DAA2 for simple installation. A BDA backup amplifier mounts directly onto a DAA2.

Batteries for the DAA2 may be installed in any of the following configurations:

- In a CHS-BH1 optional battery chassis. The CHS-BH1 battery chassis will hold two 12.0 AH batteries, and mounts on the left side of the DAA2 chassis, so that the DAA2 and batteries are contained in a single cabinet tier. (This option is not available in DAA2 amplifiers with a DCADC Class A expander).
- In the battery row (bottom) of the CAB-4 Series cabinet, or in the bottom row of an EQ Series cabinet.
- In a cabinet adjacent to the cabinet that holds the DAA2, with connections in conduit. External battery charging is supported.

Standards and Codes

The DAA2 Series Digital Audio Amplifiers comply with the following standards:

- NFPA 72 2007 National Fire Alarm Code
- Underwriter Laboratories Standard UL 864
- Underwriter Laboratories of Canada (ULC) ULC-S527-11 Standard of Control Units for Fire Alarm Systems
- Part 15 Class A conducted and radiated emissions as required by the FCC
- IBC 2012, IBC 2009, IBC 2006, IBC 2003, IBC 2000 (Seismic).
- CBC 2007 (Seismic)

Listings and Approvals

These listings and approvals apply to the basic DAA2 Series Digital Audio Amplifiers. In some cases, certain modules may not be listed by certain agencies, or listing may be in process. Contact NOTIFIER for latest listing status.

- UL Listed: S635
- ULC Listed: S635
- CSFM: 7165-0028:0243 (NFS2-640/NFS-320), 7165-0028:0224 (NFS2-3030)
- Fire Dept. of New York: COA#6287A (NFS2-640/NFS-320), COA#6306A (NFS2-3030)
- FM approved

Product Line Information

50 WATT DAA2 AMPLIFIERS

Shipped mounted to the chassis.

DAA2-5025: 120 VAC Digital Audio Amplifier (50 W, 25 VRMS)

DAA2-5025-CLA: 120 VAC Digital Audio Amplifier (50 W, 25 VRMS) with DCADC Class A expander

DAA2-5070: 120 VAC Digital Audio Amplifier (50 W, 70 VRMS)

DAA2-5070-CLA: 120 VAC Digital Audio Amplifier (50 W, 70 VRMS) with DCADC Class A expander

DAA2-5025E: 220-240 VAC Digital Audio Amplifier (50 W, 25 VRMS)

DAA2-5025E-CLA: 220-240 VAC Digital Audio Amplifier (50 W, 25 VRMS) with DCADC Class A expander

DAA2-5070E: 220-240 VAC Digital Audio Amplifier (50 W, 70 VRMS)

DAA2-5070E-CLA: 220-240 VAC Digital Audio Amplifier (50 W, 70 VRMS) with DCADC Class A expander

75 WATT DAA2 AMPLIFIERS

Shipped mounted to the chassis.

DAA2-7525: 120 VAC Digital Audio Amplifier (75 W, 25 VRMS)

DAA2-7525-CLA: 120 VAC Digital Audio Amplifier (75 W, 25 VRMS) with DCADC Class A expander

DAA2-7525E: 220-240 VAC Digital Audio Amplifier (75 W, 25 VRMS)

DAA2-7525E-CLA: 220-240 VAC Digital Audio Amplifier (75 W, 25 VRMS) with DCADC Class A expander

BDA BACKUP DIGITAL AMPLIFIERS

BDA-25V: Backup Digital Amplifier (25 VRMS), switch settings for 75, 50, and 35 W operation. Provides a second audio channel when programmed as a primary amplifier.

BDA-70V: Backup Digital Amplifier (70 VRMS), switch settings for 50 and 35 W operation. Provides a second audio channel when programmed as a primary amplifier.

FIBER OPTION MODULES

DS-FM: Fiber option module for multi-mode fiber. Converts a wire DAP (digital audio port) to a multi-mode fiber port.

DS-SFM: Fiber option module for single-mode fiber. Converts a wire DAP (digital audio port) to a single-mode fiber port.

DS-RFM: Fiber option module for multi-mode fiber. Used exclusively for compatibility with multi-mode fiber DVC or DAA.

ACCESSORIES

CHS-BH1: Battery chassis. Holds two 12.0 AH batteries. Mounts on the left side of the DAA2 chassis.

DP-1B: Dress panel: covers one tier of CAB-4 Series cabinet. ACT-25, ACT-70: Audio-coupling transformers. Used with AA-30 or DAA2-series amplifiers to drive thousands of amplifiers in large system applications.

SEISKIT-DAA: Seismic kit for DAA, DAA2, and DAX series amplifiers. Required when using CHS-BH1 chassis. Includes battery bracket for two 12AH Power Sonic batteries. See document 53851.

Specifications

CPS-24 POWER SUPPLY BOARD

AC Power (TB1):

- Models using 120 VAC, 60 Hz input:
  - – DAA2-5025/DAA2-5025-CLA - 4.68A max.
  - – DAA2-5070/DAA2-5070-CLA - 4.69A max.
  - – DAA2-7525/DAA2-7525-CLA - 4.68A max.
- "E" version models using 220-240 VAC 60 Hz input:
  - – DAA2-5025E/DAA2-5025E-CLA - 2.68A max.
  - – DAA2-5070E/DAA2-5070E-CLA - 2.68A max.
  - – DAA2-7525E/DAA2-7525E-CLA - 2.68A max.

Recommended Wiring: 12 to 14 AWG (1.6 mm O.D.) with 600 VAC insulation.

Shipping Weight: 13 lb (5.9 kg).

Secondary Power 5V and 24V AUX Outputs (TB2):

24 V AUX: Power-limited, 24V @ 0.5A, utilizes wire sizes 12-18 AWG (3.31 mm^2 - 2.08 mm2.

5 V: Future Use.

Battery Connections: Supplied cable connections to batteries.

Battery Charger: Current-limited sealed lead acid battery charger which charges two 12 volt batteries in series, up to 200 AH:

	Charge 7 AH to 26 AH Batteries	Charge 26 AH to < 50 AH Batteries	Charge 50 AH to 200 AH Batteries
DAA2-5025 DAA2-5025-CLA DAA2-5070 DAA2-5070-CLA	Yes	Yes	Yes
DAA2-7525 DAA2-7525-CLA	Yes	Yes	No
DAA2-5025/ DAA2-5025-CLA or DAA-5070/ DAA-5070-CLA w/ BDA in Group 2 of *VeriFire®Tools*	No	No	No

DAA2 BOARDS

Digital Audio Ports, wire media, A and B (TB2, TB3): Maximum distance per segment is 1900 feet (579.12 m) on Belden 5320UJ (18AWG, TP) FPL cable: 18 AWG (0.821 mm2) twisted-pair, unshielded, power-limited. For approved cable types, see wiring documentation, P/N 52916ADD: C Approved Wire Cables for Digital Audio Loops.

Digital Audio Ports, fiber media, fiber option modules: Digital audio loop connectors support single- and multi-mode fiber with the use of fiber option modules. Refer to the Fiber Option Module datasheet for fiber specifications.

Alarm Bus: Power-limited, supervised by source. Recommended wiring: 14-18 AWG twisted-pair. Requires 16VDC minimum @ 20mA across the terminals to activate. Nominal 24VDC.

Remote Microphone Interface: RMI power: +24VDC, power-limited @ 100mA. Supervised. Recommended wiring: 14-18 AWG twisted-pair, Max. 14 AWG. Nominal AC signal strength 2.5VRMS, 3VRMS Max. Maximum distance between remote microphone and DAA2: 100 ft (304.8 m).

FFT Riser: Power-limited output, supervised. Class A or Class B operation. Class B 2-wire connections require a 3.9k ohm 1/2 watt resistor (P/N R-3.9K). Max. wiring resistance (including individual telephone zone to last handset) permitted is 50 ohms, 10,000 ft (3048 m) max. wiring distance at 14 AWG to last handset.

Auxiliary Input: Signal strength from low-level analog audio input (such as background music or telephone paging): 1Vp-p max. Optional supervision through programming. Recommended wiring: 14-18 AWG, twisted-pair. Auxiliary input source must be within 25 ft. (7.6 m) of the DAA2, and within the same room.

Speaker circuits: Power-limited outputs (exception: a DAA2-5070 speaker circuit used with any Canadian Room Isolator module is non-power limited. Speaker circuit 1 (TB10) cannot be used.). Supervision determined by programming. DAA2-5025/70, Each circuit rated up to 50 watts*. DAA2-7525, each circuit rated up to 75 watts*. Recommended wiring: 12-18 AWG twisted-pair (shielded recommended). Class B or Class A: Class B requires 20k end-of-line resistors (included, P/N ELR-20K). Class A requires 10k end-of-line resistors (included, P/N R-10K) on the return.

*Total wattage may vary per configuration.

Backup: High-level audio input: 25VRMS (DAA2-5025 and DAA2-7525). 70 VRMS (DAA2-5070). Recommended wiring: 14-18 AWG. Not supervised when inactive. Supervised by backup source when active. Must be in same room or enclosure.

ISO 9001 CERTIFIED
ENGINEERING & MANUFACTURING QUALITY SYSTEMS

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We try to keep our product information up-to-date and accurate.
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Country of Origin: USA

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NOTIFIER® by Honeywell

EQ Cabinet

ONYX® Series Equipment Backboxes with Ventilated Locking Doors

NOTIFIER® by Honeywell

Peripheral Devices

General

EQ Series cabinets provide an effective solution for applications that require distributed components such as power supplies, amplifiers, and multiple I/O modules. The EQ Series provides superior ventilation for devices such as amplifiers and field power supplies, ample room for wire or fiber-optic media between each row, and a space efficient package that allows for the consolidation of multiple system components in a single enclosure.

Equipment cabinets use a perforated blank door for enhanced ventilation, and do not support the mounting of backbox mounted dress plates. Therefore these cabinets are not appropriate for equipment that would be normally accessed by a system operator such as control equipment, annunciators, or remote microphones.

EQ cabinets share the same external dimensions as the familiar CAB-4 Series cabinets. EQ Series cabinets differ in that they do not include a separate battery row. See illustrations below for examples of EQ cabinet row spacing.

Specifications

- Equipment cabinets are fabricated from 16-gauge steel. The cabinet assembly consists of two basic parts: a backbox and a locking door. Cabinets are available in black and red.
- The key-locked door is provided with a pin-type hinge, two keys and the necessary hardware to mount the door to the backbox.
- The backbox has been engineered to provide ease-of-entry for the installer. Knockouts are positioned at numerous points to aid the installer in bringing a conduit into the enclosure with a minimum of hardship.
- Right- or left-hand hinges, selectable in the field. Door opens 180°.
- Cabinets are arranged in 3 standard sizes, B (two tiers) through D (four tiers). See Ordering Information.
- Trim ring options are available for semi-flush mounting.

Equipment Compatible for Use in EQ Series Cabinets

- DAA2 Series Amplifiers
- DAX Series Amplifiers
- DS-DB Digital Series Distribution Board
- DS-AMP Digital Series Amplifier
- DAA-50 Series Amplifiers
- DAA-75 Series Amplifiers
- AA-30(E) Audio Amplifiers
- AA-100(E) Audio Amplifiers
- AA-120(E) Audio Amplifiers
- ACPS-610(E) Power Supply
- AMPS-24(E) Power Supply
- HPFF8CM(E) Power Supply
- HPFF12CM(E) Power Supply
- XP6-C Modules

EQCab.jpg

- XP6-MA Modules
- XP6-R Modules
- XP10-MA Modules

Agency Listings and Approvals

These listings and approvals below apply to the EQ cabinet. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be process. Consult factory for latest listing status.

- **UL Listed:** S635.
- **ULC Listed:** S635.
- **CSFM:** 7165-0028:0243 (NFS2-640), 7165-0028:0224 (NFS2-3030).
- **FDNY:** COA#6121 (NFS2-640), COA#6114 (NFS2-3030), COA#6073.

Ordering Information

A complete cabinet assembly consists of a door, a backbox, and an optional semi-flush trim ring. For each cabinet required, order one "EQDR" door and one "EQBB" backbox.

The optional trim ring is an attractive “picture-frame” style black metal ring.

“B” SIZE CABINET (TWO TIERS)

EQDR-B4: Door assembly, vented door, two tiers, black. (For red, order EQDR-B4R.)

EQBB-B4: Backbox assembly, two tiers, black. (For red, order EQBB-B4R.)

TR-B4: Semi-flush-mount trim ring, two tiers.

“C” SIZE CABINET (THREE TIERS)

EQDR-C4: Door assembly, vented door, three tiers, black. (For red, order EQDR-C4R.)

EQBB-C4: Backbox assembly, three tiers, black. (For red, order EQBB-C4R.)

TR-C4: Semi-flush-mount trim ring, three tiers.

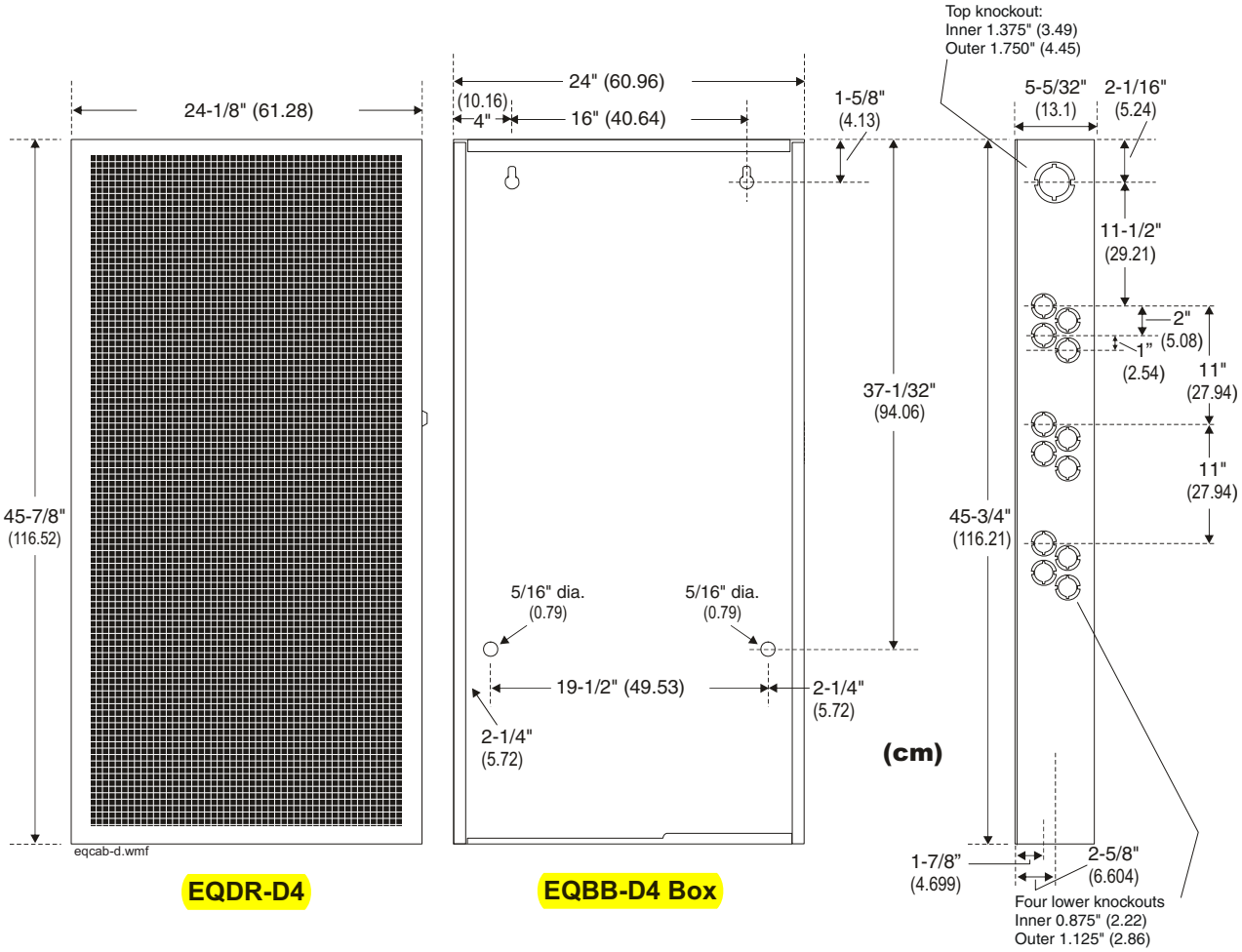
“D” SIZE CABINET (FOUR TIERS)

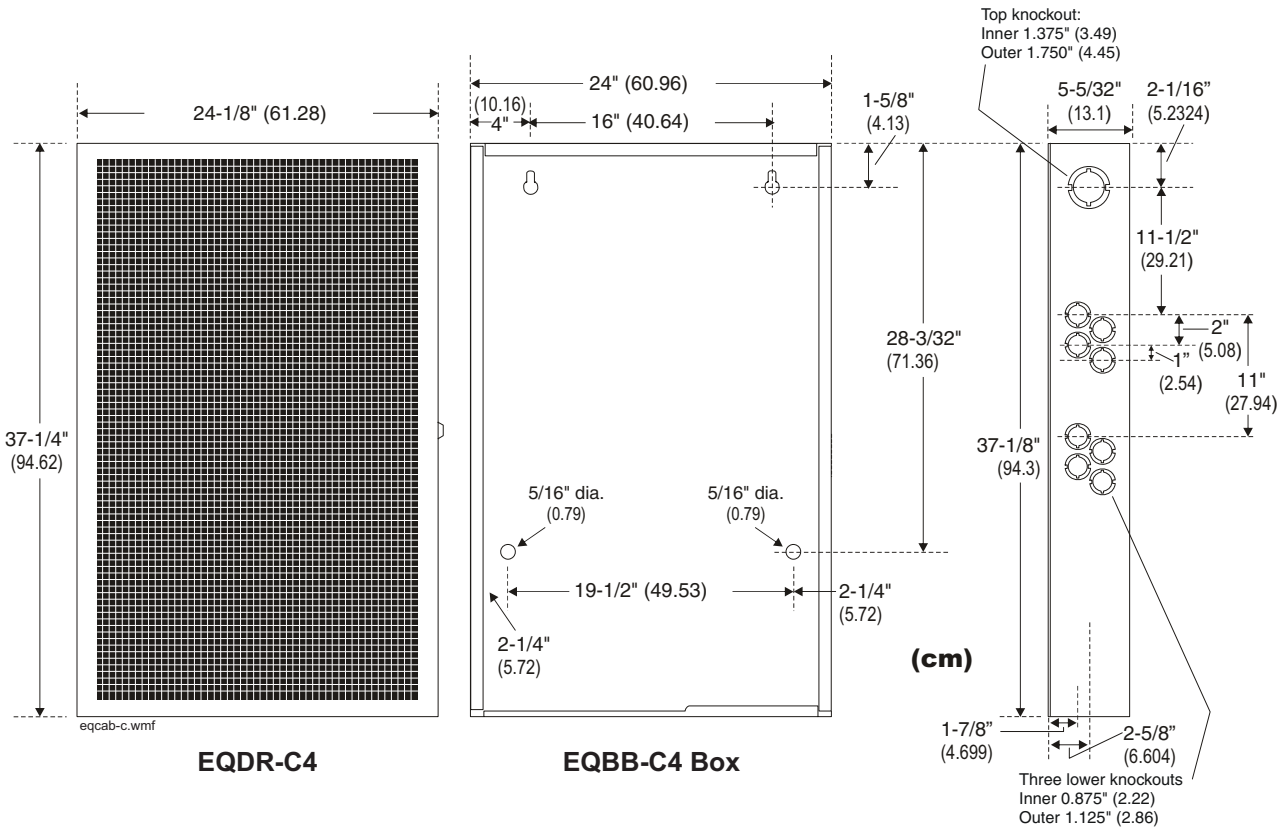
EQDR-D4: Door assembly, vented door, four tiers, black. (For red, order EQDR-D4R.)

EQBB-D4: Backbox assembly, four tiers, black. (For red, order EQBB-D4R.)

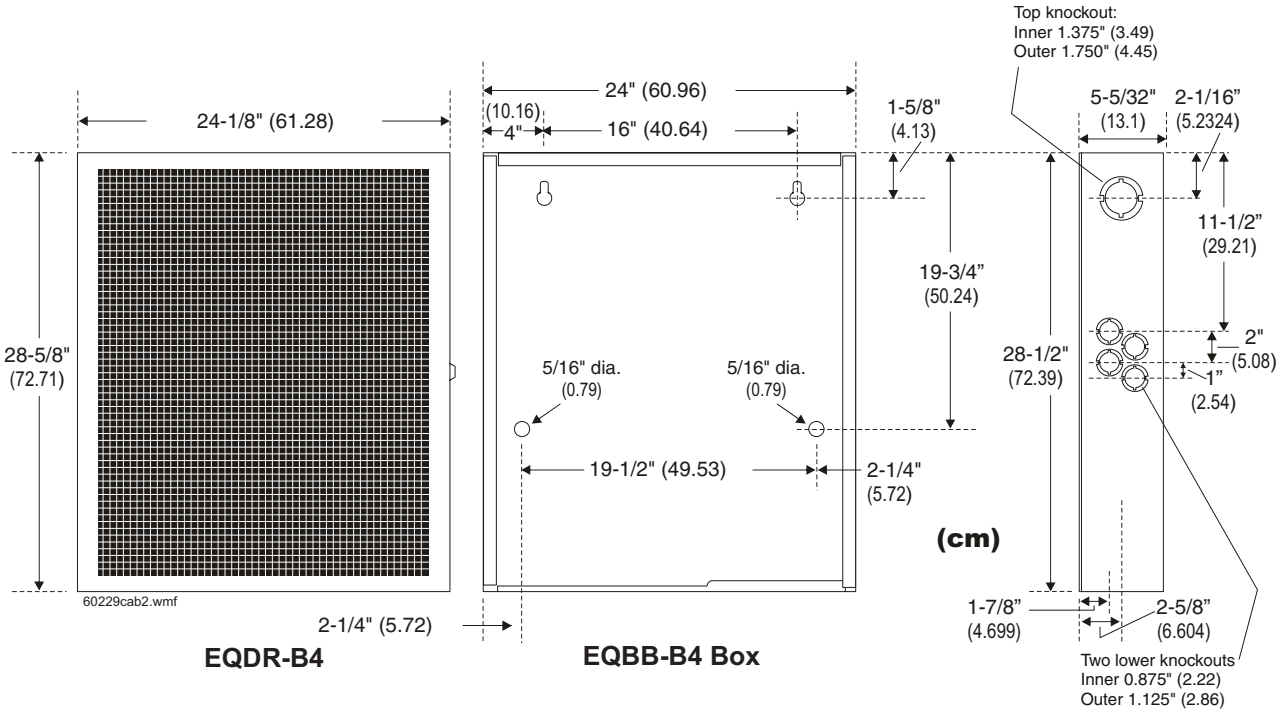
TR-D4: Semi-flush-mount trim ring, four tiers.

CABINET DRAWINGS AND FEATURES

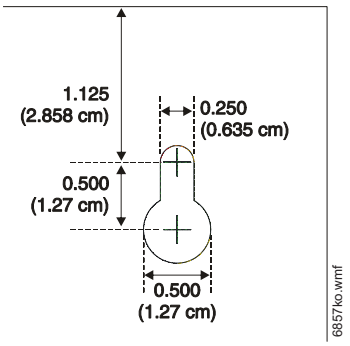




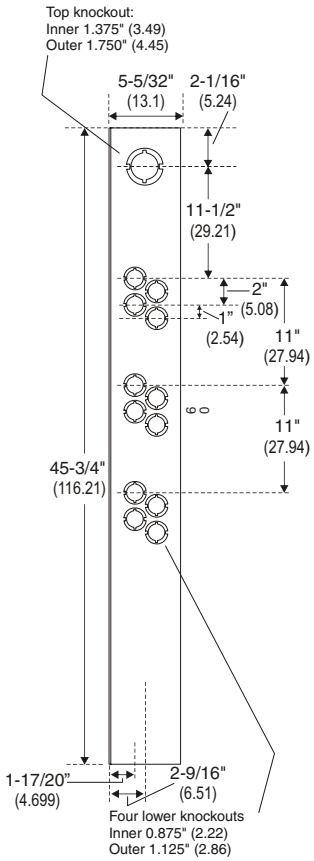
EQDR-C4 **EQBB-C4 Box**



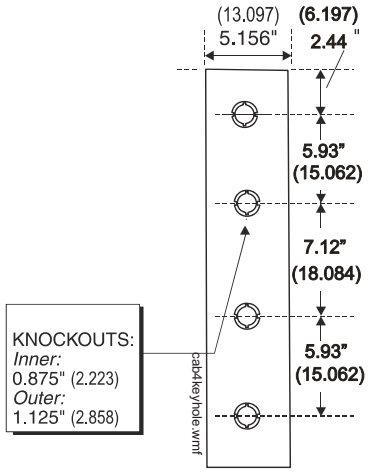
EQDR-B4 **EQBB-B4 Box**



Mounting Hole



Side View of Backbox (EQBB-D4)



Top View of Backbox

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QUALITY SYSTEMS

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Made in the U.S. A.

For more information, contact Notifier. Phone: (203) 484-7161, FAX: (203) 484-7118.
www.notifier.com

PSE-6/PSE-10 Series 6/10 Amp, 24 Volt Power Supply Expanders

General

The PS Series is a remote power supply line from NOTIFIER. The PSE-6(C)(E) is a 6 amp and the PSE-10(C)(E) is a 10 amp, remote power supply with battery charger that may be connected to any 12 or 24 volt fire alarm control panel (FACP) or used as a standalone power supply. The PS Series provides 24 VDC power for NACs (notification appliance circuits) configured as either Class B or Class A (requires the ZNAC-PS option card) with multiple sync protocol options. The PS Series also provides auxiliary power, constant or resettable, suited for detectors, annunciators, door holders, and other fire alarm system peripherals. The PS Series cabinet can hold two 7 AH or 18 AH batteries and can charge up to 33 AH batteries in a separate cabinet. The PSE-6E and PSE-10E are models rated for 240V operation.

Features

- Up to five (6 amp model) or seven (10 amp model) independently-configurable, power-limited output circuits for:
  - Class B and/or Class A NACs
  - Class B and/or Class A resettable or non-resettable 24V auxiliary power
  - door holder power
- Converts from Class B to Class A wiring without losing any outputs using the ZNAC-PS converter card (sold separately)
- Optimal for powering four-wire smoke detectors, annunciators, and other system peripherals requiring regulated power
- Configurable for ANSI® Temporal 3 or Temporal 4 coded output
- UL-Listed NAC synchronization using System Sensor®, Wheelock®, Gentex®, or AMSECO® appliances
- Synchronization can be triggered from FACP NAC/remote sync outputs, cascaded power supply, or a control module, single or multi, which may be housed within the power supply cabinet
- Ability to cascade up to four power supplies
- Two (6 amp model) or three (10 amp model) fully-isolated input/control circuits which can be programmed to any output
- Two Form C normally-closed trouble relays for AC Trouble and General Trouble, Ground Fault relay available on Canadian models only
- 6 or 10 amp full load output, respectively, with 3 A maximum/circuit
- Individual NAC power and trouble LEDs for diagnostic efficiency
- Trouble history modes for diagnostic support
- Wide range end-of-line supervision value (normal: 2K-27K ohms)
- Selectable earth fault detection (enable or disable)
- AC trouble report delay timer
- Completely configurable via onboard DIP switches, no extra software required
- Self-contained in compact, locking cabinet constructed of heavy gauge steel with a corrosion-resistant powder coat chip and scratch-resistant finish
- Cabinet designed with ten double knockouts and a removable door for ease of installation and wiring
- Includes integral battery charger capable of charging up to 33 AH batteries
- Cabinet can house two 7 AH or 18 AH batteries
- Battery charger may be disabled via DIP switch for applications requiring larger batteries and external battery charger

- Removable terminal blocks accommodate up to 12 AWG (3.1mm^2) wire
- Works with any UL 864 FACP which utilizes an industry-standard reverse-polarity notification circuit
- Optional devices include addressable control, monitor, and relay modules and power-supervision relay (EOLR-1)

Standards and Codes

The PSE Series comply with the following standards:

- **NFPA 72** National Fire Alarm Code
- **UL 864** Standard for Control Units for Fire Alarm Systems (NAC expander mode), 10th Edition
- **UL 1481** Power Supplies for Fire Alarm Systems
- **IBC 2009** (when using SEISKIT-MULTI-1)
- **CBC 2007** (when using SEISKIT-MULTI-1)

Agency Listings and Approvals

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

- **UL Listed:** S635, S674
- **ULC Listed:** S635 (PSE-6/10C)
- **CSFM Approved:** 7315-0028:0513
- **FDNY Approved**
- **FM Approved**

Primary (AC) Power:

- **PSE-6(C):** 120 VAC, 50/60 Hz, 5.0A maximum
- **PSE-10(C):** 120VAC, 50/60 Hz, 6.2 A maximum
- **PSE-6E:** 240 VAC, 50/60 Hz, 2.7A maximum
- **PSE-10E:** 240 VAC, 50/60 Hz, 3.5A maximum
- **Wire Size:** #12-14 AWG with 600 V insulation

Command Input Circuit:

- **Trigger Input Voltage:** 9 to 32 VDC
- **Trigger Current:** 2.0 mA (16 - 32 V); Per Input: 1.0 mA (9 - 16 V)

Trouble Contact Rating: 4 A at 24 VDC

Output Circuits:

- 24 VDC filtered, regulated
- PSE-6: TB8-TB9 – 1A Regulated, 3A special applications; TB10-TB12 – 0.3A Regulated, 3A special applications
- PSE-10: TB8-TB11 – 1.5A Regulated, 3A special applications; TB12-TB14 – 0.3A Regulated, 3A special applications
- 6.0 A (PSE-6) or 10.0 A (PSE-10) maximum total continuous current for all outputs

Secondary Power (Battery) Charging Circuit:

- Supports lead-acid batteries only
- Float-charge voltage: 27.6 VDC
- Maximum current charge: 1.5 A
- Maximum battery capacity: 18 AH (inside cabinet)
- Maximum battery charging capacity: 33 AH (external cabinet)

Physical:

- **Dimensions:** 20.0”H x 14.5”W x 3.5”D (cm: 50.8H x 36.83W x 8.9D)
- **Weight:** with two 7Ah batteries is 24 pounds (10.9 kg), with two 18 AH batteries is 39 pounds (17.7 kg)

Ordering Information

PSE-6: 6.0 A, 120 VAC remote charger power supply in a lockable, metal enclosure

PSE-6C: Same as above, ULC-listed model

PSE-6R: Same as PSE-6 with red enclosure

PSE-6E: 6.0 A, 240 VAC remote charger power supply in a lockable, metal enclosure

PSE-10: 10.0 A, 120 VAC remote charger power supply in a lockable, metal enclosure

PSE-10C: Same as above, ULC-listed model

PSE-10R: Same as PSE-10 with red enclosure

PSE-10E: 10.0 A, 240 VAC remote charger power supply in a lockable, metal enclosure

ZNAC-PS: Optional Class A output converter module

FCM-1: Addressable Control Module for one Class B or Class A zone of supervised, polarized Notification Appliances. Notification Appliance Circuit option requires external 24 VDC to power notification appliances.

FRM-1: Addressable relay module containing two isolated sets of Form-C contacts, which operate as a DPDT switch

FMM-1: Addressable Monitor Module for one zone of normally open dry-contact initiating devices. Includes plastic cover plate and end-of-line resistor. Module may be configured for either a Class B or Class A IDC.

FDM-1: Dual Monitor Module. Same as FMM-1 except it provides two inputs for Class B wiring only

FDRM-1: Provides two monitored inputs and two Form-C relays. Functions in Class B wiring only.

XP6-C: Six-circuit supervised control module

XP6-R: Six Form-C relay control module

EOLR-1: 12/24 VDC end-of-line relay for monitoring four-wire smoke detector power

BAT-1270: Battery, 12 volt, 7.0 AH (two required, see BAT Series data sheet DN-6933).

BAT-12180: Battery, 12 volt, 18AH

BAT-12330: Battery, 12 volt, 33AH

SEISKIT-MULTI-1: Seismic kit for the FL-PSE Series. Includes bracket and hardware for two 7AH or two 18AH batteries.

ISO 9001 CERTIFIED ENGINEERING & MANUFACTURING QUALITY SYSTEMS

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We try to keep our product information up-to-date and accurate.
We cannot cover all specific applications or anticipate all requirements.
All specifications are subject to change without notice.

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Country of Origin: USA

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NOTIFIER® by Honeywell

FCM-1(A) & FRM-1(A) Series

Control and Relay Modules

NOTIFIER® by Honeywell

Intelligent / Addressable Devices

General

FCM-1(A) Control Module: The FCM-1(A) Addressable Control Module provides Notifier intelligent fire alarm control panels a circuit for Notification Appliances (horns, strobes, speakers, etc.). Addressability allows the FCM-1(A) to be activated, either manually or through panel programming, on a select (zone or area of coverage) basis.

FRM-1(A) Relay Module: The FRM-1(A) Addressable Relay Module provides the system with a dry-contact output for activating a variety of auxiliary devices, such as fans, dampers, control equipment, etc. Addressability allows the dry contact to be activated, either manually or through panel programming, on a select basis.

FlashScan® (U.S. Patent 5,539,389) is a communication protocol developed by NOTIFIER Engineering that greatly enhances the speed of communication between analog intelligent devices. Intelligent devices communicate in a grouped fashion. If one of the devices within the group has new information, the panel CPU stops the group poll and concentrates on single points. The net effect is response speed greater than five times that of other designs.

FCM-1(A)

Features

- Built-in type identification automatically identifies these devices to the control panel.
- Internal circuitry and relay powered directly by two-wire SLC loop. The FCM-1(A) module requires power (for horns, strobes, etc.), or audio (for speakers).
- Integral LED “blinks” green each time a communication is received from the control panel and turns on in steady red when activated.
- LED blink may be deselected globally (affects all devices).
- High noise immunity (EMF/RFI).
- The FCM-1(A) may be used to switch 24-volt NAC power, audio (up to 70.7 Vrms).
- Wide viewing angle of LED.
- SEMS screws with clamping plates for wiring ease.
- Direct-dial entry of address 01– 159 for FlashScan loops, 01 – 99 for CLIP mode loops.
- Speaker, and audible/visual applications may be wired for Class B or A (Style Y or Z).

Applications

The FCM-1(A) is used to switch 24 VDC audible/visual power, high-level audio (speakers). The FRM-1(A) may be programmed to operate dry contacts for applications such as door holders or Air Handling Unit shutdown, and to reset four-wire smoke detector power.

NOTE: *Refer to the SLC Manual (PN 51253) for details regarding releasing applications with the FCM-1(A). Refer to the FCM-1-REL datasheet (DN-60390) for new FlashScan® releasing applications.*

Construction

- The face plate is made of off-white heat-resistant plastic.
- Controls include two rotary switches for direct-dial entry of address (01-159).
- The FCM-1(A) is configured for a single Class B (Style Y) or Class A (Style Z) Notification Appliance Circuit.
- The FRM-1(A) provides two Form-C dry contacts that switch together.

Operation

Each FCM-1(A) or FRM-1(A) uses one of 159 possible module addresses on a SLC loop (99 on CLIP loops). It responds to regular polls from the control panel and reports its type and status, including the open/normal/short status of its Notification Appliance Circuit (NAC). The LED blinks with each poll received. On command, it activates its internal relay. The FCM-1(A) supervises Class B (Style Y) or Class A (Style Z) notification or control circuits.

Upon code command from the panel, the FCM-1(A) will disconnect the supervision and connect the external power supply in the proper polarity across the load device. The disconnection of the supervision provides a positive indication to the panel that the control relay actually turned ON. The external power supply is always relay isolated from the communication loop so that a trouble condition on the external power supply will never interfere with the rest of the system.

Rotary switches set a unique address for each module. The address may be set before or after mounting. The built-in TYPE CODE (not settable) will identify the module to the control panel, so as to differentiate between a module and a sensor address.

Specifications for FCM-1(A)

Normal operating voltage: 15 to 32 VDC.

Maximum current draw: 6.5 mA (LED on).

Average operating current: 350 µA direct poll, 375 µA group poll with LED flashing, 485 µA Max. (LED flashing, NAC shorted.)

Maximum NAC Line Loss: 4 VDC.

External supply voltage (between Terminals T10 and T11): Maximum (NAC): Regulated 24 VDC; Maximum (Speakers): 70.7 V RMS, 50W.

Drain on external supply: 1.7 mA maximum using 24 VDC supply; 2.2 mA Maximum using 80 VRMS supply.

Max NAC Current Ratings: For class B wiring system, the current rating is 3A; For class A wiring system, the current rating is 2A.

Temperature range: 32°F to 120°F (0°C to 49°C).

Humidity range: 10% to 93% non-condensing.

Dimensions: 4.5" (114.3 mm) high x 4" (101.6 mm) wide x 1.25" (31.75 mm) deep. Mounts to a 4" (101.6 mm) square x 2.125" (53.975 mm) deep box.

Accessories: SMB500 Electrical Box; CB500 Barrier

Specifications for FRM-1(A)

Normal operating voltage: 15 to 32 VDC.

Maximum current draw: 6.5 mA (LED on).

Average operating current: 230 µA direct poll; 255 µA group poll.

EOL resistance: not used.

Temperature range: 32°F to 120°F (0°C to 49°C).

Humidity range: 10% to 93% non-condensing.

Dimensions: 4.5" (114.3 mm) high x 4" (101.6 mm) wide x 1.25" (31.75 mm) deep. Mounts to a 4" (101.6 mm) square x 2.125" (53.975 mm) deep box.

Accessories: SMB500 Electrical Box; CB500 Barrier

Agency Listings and Approvals

In some cases, certain modules may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

- **UL:** S635
- **ULC:** S3705 (A version only)
- **FM Approved**
- **CSFM:** 7300-0028:0219
- **MEA:** 14-00-E
- **FDNY:** COA #6067, #6065

Contact Ratings for FRM-1(A)

Current Rating	Maximum Voltage	Load Description	Application
3 A	30 VDC	Resistive	Non-Coded
2 A	30 VDC	Resistive	Coded
.9 A	110 VDC	Resistive	Non-Coded
.9 A	125 VDC	Resistive	Non-Coded
.5 A	30 VDC	Inductive (L/R=5ms)	Coded
1 A	30 VDC	Inductive (L/R=2ms)	Coded
.3 A	125 VAC	Inductive (PF=0.35)	Non-Coded
1.5 A	25 VAC	Inductive (PF=0.35)	Non-Coded
.7 A	70.7 VAC	Inductive (PF=0.35)	Non-Coded
2 A	25 VAC	Inductive (PF=0.35)	Non-Coded

NOTE: *Maximum (Speakers): 70.7 V RMS, 50 W*

Product Line Information

NOTE: *"A" suffix indicates ULC Listed model.*

FCM-1(A): Intelligent Addressable Control Module.

FRM-1(A): Intelligent Addressable Relay Module.

A2143-20: Capacitor, required for Class A (Style Z) operation of speakers.

SMB500: Optional Surface-Mount Backbox.

CB500: Control Module Barrier — required by UL for separating power-limited and non-power limited wiring in the same junction box as FCM-1(A).

NOTE: *For installation instructions, see the following documents:*

- *FCM-1(A) Installation document I56-1169.*
- *FRM-1(A) Installation document I56-3502.*
- *Notifier SLC Wiring Manual, document 51253.*

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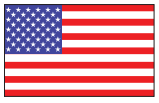


Made in the U.S. A.

For more information, contact Notifier. Phone: (203) 484-7161, FAX: (203) 484-7118.
www.notifier.com

BAT Series Batteries

Sealed Lead-Acid

NOTIFIER® by Honeywell

Power Supplies

General

BAT Series Batteries are Power-Sonic brand batteries. BAT Series (or Power-Sonic brand) batteries are recommended for secondary power or backup power for all NOTIFIER fire alarm control equipment.

Features

- Provide secondary power for control panels.
- Sealed and maintenance-free.
- Overcharge protected.
- Easy handling with leak-proof construction.
- Ruggedly constructed, high-impact case (ABS).
- Long service life.
- Compact design.

Agency Listings and Approvals

The listings and approvals below apply to BAT Series Batteries. In some cases, certain modules may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

- **UL Recognized Components**: MH20845 *(Power-Sonic).*

6933cov.jpg

Ordering Information

BAT-1250-BP: 10-unit bulk pack of BAT-1250 (12 V 5 AH).

BAT-1270-BP: 5-unit bulk pack of BAT-1270 (12 V 7 AH).

BAT-12120-BP: 4-unit bulk pack of BAT-12120 (12V 12 AH).

BAT-12180-BP: 2-unit bulk pack of BAT-12180 (12 V 18 AH).

BAT-12260-BP: 2-unit bulk pack of BAT-12260 (12 V 26 AH).

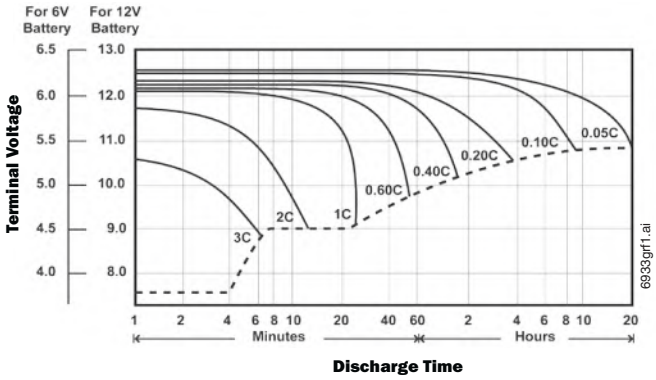
BAT-12550: single battery (12 V 55 AH).

BAT-121000: single battery (12 V 100 AH).

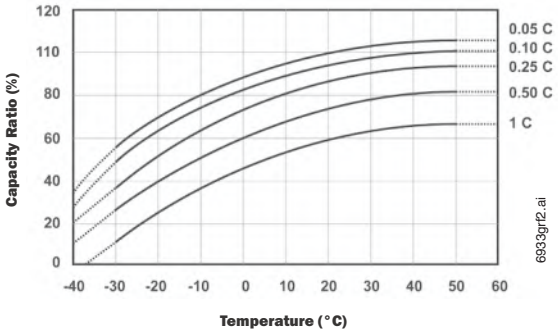
Part Number Reference & Specifications

Part Number	Power-Sonic Part Number	Battery Description			DIMENSIONS									
		Nominal Voltage V	Nominal Capacity @ 20 hr. rate A.H.		Width		Depth		Height		Height over terminal		Weight	
					in.	mm	in.	mm	in.	mm	in.	mm	lb.	kg.
BAT-1250	PS-1250	12	5	sealed	3.54	90	2.76	70	3.98	101	4.21	107	3.50	1.59
BAT-1270	PS-1270	12	7	sealed	5.95	151	2.56	65	3.7	94	3.86	98	4.8	2.18
BAT-12120	PS-12120	12	12	sealed	5.95	151	3.86	98	3.7	94	3.94	100	7.92	3.59
BAT-12180	PS-12180	12	18	sealed	7.13	181	3.00	76	6.59	167	6.59	167	12.6	5.72
BAT-12260	PS-12260	12	26	sealed	6.5	167	6.97	177	4.92	125	4.92	125	17	7.71
BAT-12550	PS-12550	12	55	sealed	9.04	230	5.45	138	8.15	207	8.98	228	36	16.33
BAT-121000	PS-121000	12	100	sealed	12	305	6.6	168	8.15	207	8.98	228	68	30.84

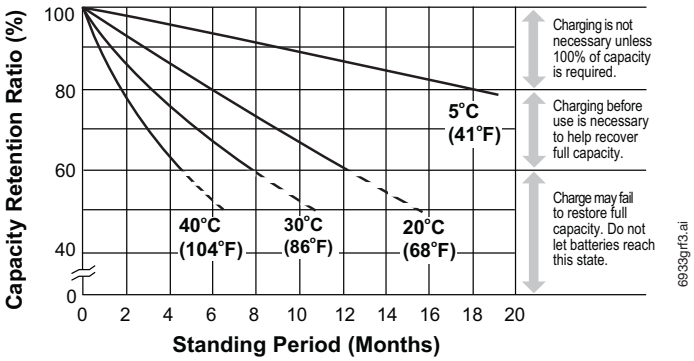
Discharge Characteristic Curves at 20°C (68°F)



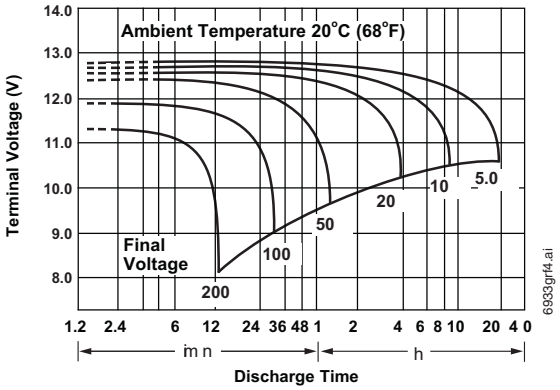
Effect of Temperature on Capacity



PS-121000 Shelf-Life and Storage



PS-121000 Discharge Characteristics



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NOTIFIER® by Honeywell

FSP-951 Series Addressable Photoelectric Smoke Detectors

The NOTIFIER® FSP-951 Series intelligent plug-in smoke detectors are designed for both performance and aesthetics, and are direct replacements for the FSP-851 Series. A new modern, sleek, contemporary design and enhanced optical sensing chamber is engineered to sense smoke produced by a wide range of combustion sources in accordance with more stringent code standards.

The FSP-951 Series detector sensitivity can be programmed in the control panel software. Sensitivity is continuously monitored and reported to the panel. Point ID capability allows each detector's address to be set with rotary, decimal address switches, providing exact detector location for selective maintenance when chamber contamination reaches an unacceptable level. Dual electronic thermistors add 135°F (57°C) fixed temperature thermal sensing on the FSP-951T. The FSP-951R is a remote test capable detector for use with DNR Series duct detector housings. FSP-951 series detectors are available for both FlashScan® and CLIP applications as designated.

Features

SLC LOOP:

- Two-wire SLC loop connection
- Unit uses base for wiring
- Compatible with FlashScan® and CLIP protocol systems
- Stable communication technique with noise immunity

ADDRESSING:

- Addressable by device
- Rotary, decimal addressing
  (Refer to the *NOTIFIER panel manuals* for device capacity.)

ARCHITECTURE:

- Sleek, low-profile, stylish design
- Unique single-source design to respond quickly and dependably to a broad range of fires
- Integral communications and built-in device-type identification
- Built-in tamper resistant feature
- Remote test feature from the panel
- Walk test with address display (an address on 121 will blink the detector LED: 12-[pause]-1*(FlashScan systems only)*
- Built-in functional test switch activated by external magnet
- Removable cover and insect-resistant screen for simple field cleaning
- Expanded color options

OPERATION:

- Designed to meet UL 268 7th Edition
- Factory preset at 1.5% nominal sensitivity for panel alarm threshold level
- LED "blinks" when the unit is polled (communicating with the fire panel) and latches in alarm.
- Low standby current

MECHANICALS:

- Sealed against back pressure
- SEMS screws for wiring of the separate base
- Designed for direct-surface or electrical-box mounting
- Plugs into separate base for ease of installation and maintenance
- Separate base allows interchange of photoelectric, ionization and thermal sensors

OPTIONS:

- Optional relay, isolator, and sounder bases

Installation

FSP-951 Series plug-in intelligent smoke detectors use a detachable base to simplify installation, service and maintenance. Installation instructions are shipped with each detector.

Mount detector base (all base types) on an electrical backbox which is at least 1.5" (3.81 cm) deep. For a chart of compatible junction boxes, see *DN-60054.*

NOTE: *Because of the inherent supervision provided by the SLC loop, end-of-line resistors are not required. Wiring "T-taps" or branches are permitted for Class "B" wiring only.*
When using relay or sounder bases, consult the ISO-X(A) installation sheet I56-1380 for device limitations between isolator modules and isolator bases.

Construction

These detectors are constructed of fire-resistant plastic. The FSP-951 Series plug-in intelligent smoke detectors are designed to commercial standards and offer an attractive appearance.

Operation

Each FSP-951 Series detector uses one of the panel's addresses (total limit is panel dependent) on the NOTIFIER Signaling Line Circuit (SLC). It responds to regular polls from the control panel and reports its type and the status. If it receives a test command from the panel (or a local magnet test), it stimulates its electronics and reports an alarm. It blinks its LEDs when polled and turns the LEDs on when commanded by the panel. The FSP-951 Series offers features and performance that represent the latest in smoke detector technology.

Product Line Information

NOTE: *"-IV" suffix indicates CLIP and FlashScan device.*

FSP-951: White, low-profile intelligent photoelectric sensor, FlashScan only

FSP-951A: Same as FSP-951 but with ULC listing

FSP-951-IV: Ivory, low-profile intelligent photoelectric sensor

FSP-951A-IV: Same as FSP-951-IV but with ULC listing

FSP-951T: White, same as FSP-951 but includes a built-in 135°F (57°C) fixed-temperature thermal device, FlashScan only

FSP-951TA: Same as FSP-951T but with ULC listing

FSP-951T-IV: Ivory, same as FSP-951T but includes a built-in 135°F (57°C) fixed-temperature thermal device

FSP-951TA-IV: Same as FSP-951T-IV but with ULC listing

FSP-951R: White, low-profile intelligent photoelectric sensor, remote test capable, for use with DNR/DNRW, FlashScan only

FSP-951RA: Same as FSP-951R but with ULC listing, for use with DNRA

FSP-951R-IV: Ivory, low-profile intelligent photoelectric sensor, remote test capable, for use with DNR/DNRW

FSP-951RA-IV: Same as FSP-951R-IV but with ULC listing, for use with DNRA

INTELLIGENT BASES

NOTE: *For details on intelligent bases, see DN-60981.*

B300-6: White, 6" base, standard flanged low-profile mounting base *(CSFM: 7300-1653:0109)*

B300-6-IV: Ivory,6" base, standard flanged low-profile mounting base *(CSFM: 7300-1653:0109)*

B300A-6: Same as B300-6, ULC listed

B300A-6-IV: Ivory, 6" standard flanged low-profile mounting base, ULC listed

B300-6-BP: Bulk pack of B300-6, package contains 10

B501-WHITE: White, 4" standard European flangeless mounting base. UL/ULC listed *(CSFM: 7300-1653:0109)*

B501-BL: Black, 4" standard European flangeless mounting base. UL/ULC listed *(CSFM: 7300-1653:0109)*

B501-IV: Ivory color, 4" standard European flangeless mounting base. UL/ULC listed *(CSFM: 7300-1653:0109)*

B501-WHITE-BP: Bulk pack of B501-WHITE contains 10

B224RB-WH: White, relay base (*CSFM: 7300-1653:0216)*

B224RB-IV: Ivory, relay base (*CSFM: 7300-1653:0216)*

B224RBA-WH: White, relay base, ULC listing

B224RBA-IV: Ivory, relay base, ULC listing

B224BI-WH: White, isolator detector base (CSFM: 7300-1653:0216)

B224BI-IV: Ivory isolator detector base (CSFM: 7300-1653:0216)

B224BIA-WH: White, isolator detector base, ULC listing

B224BIA-IV: Ivory isolator detector base, ULC listing

B200S-WH: White, Intelligent addressable sounder base capable of producing sound output in high or low volume with ANSI Temporal 3, ANSI Temporal 4, continuous tone, marching tone, and custom tone. Uses FlashScan protocol. *(CSFM: 7300-1653:0213)*

B200S-IV: Ivory, Intelligent addressable sounder base capable of producing sound output in high or low volume with ANSI Temporal 3, ANSI Temporal 4, continuous tone, marching tone, and custom tone. Uses FlashScan protocol. *(CSFM: 7300-1653:0213)*

B200SA-WH: Same as B200S-WH, ULC listing

B200SA-IV: Same as B200S-IV, ULC listing

B200SCOA-WH: White, Intelligent, programmable sounder base in English/French (required in Canada for ULC applications with CO Series detector applications

B200SCOA-IV: Ivory Intelligent, programmable sounder base in English/French (required in Canada for ULC applications with CO Series detector applications, ULC listing

B200S-LF-WH: White, Low Frequency Intelligent, programmable sounder base. Produces a fundamental frequency of 520 Hz +/- 10% with a square wave or its equivalent; designed to meet the NFPA 72 sleeping space requirement. (*CSFM: 7300-1653:0238)*

B200S-LF-IV: Ivory, Low Frequency Intelligent, programmable sounder base. Produces a fundamental frequency of 520 Hz +/- 10% with a square wave or its equivalent; designed to meet the NFPA 72 sleeping space requirement. (*CSFM: 7300-1653:0238)*

B200SR-WH: White, Intelligent sounder base capable of producing sound output with ANSI Temporal 3 or continuous tone. Intended for retrofit applications. *(CSFM: 7300-1653:0213)*

B200SR-IV: Ivory, Intelligent sounder base capable of producing sound output with ANSI Temporal 3 or continuous tone. Intended for retrofit applications. *(CSFM: 7300-1653:0213)*

B200SRA-WH: Same as B200SR-WH with, ULC listing

B200SRA-IV: Same as B200SR-IV in Ivory color, ULC listing

B200SR-LF-WH: White, Low Frequency Intelligent, programmable sounder base. Produces a fundamental frequency of 520 Hz +/- 10% with a square wave or its equivalent; designed to meet the NFPA 72 sleeping space requirement. Intended for retrofit applications. (*CSFM: 7300-1653:0238)*

B200SR-LF-IV: Ivory, Low Frequency Intelligent, programmable sounder base. Produces a fundamental frequency of 520 Hz +/- 10% with a square wave or its equivalent; designed to meet the NFPA 72 sleeping space requirement. Intended for retrofit applications. (*CSFM: 7300-1653:0238)*

MOUNTING KITS AND ACCESSORIES

TR300: White, replacement flange for B210LP(A) base

TR300-IV: Ivory, replacement flange for B210LP(A) base

RA100Z(A): Remote LED annunciator. 3-32 VDC. Mounts to a U.S. single-gang electrical box. For use with B501(A) and B300-6(A).

M02-04-00: Test magnet

M02-09-00: Test magnet with telescoping handle

CK300: Color Kit (includes cover and trim ring), white, 10-pack

CK300-IV: Color Kit (includes cover and trim ring), ivory, 10-pack

CK300-BL: Color Kit (includes cover and trim ring), black, 10-pack

Sensitivity:

- UL Applications: 0.5% to 4.0% per foot obscuration.
- ULC Applications: 0.5% to 3.5% per foot obscuration

Size: 2.0" (51mm) high; base determines diameter

  – **B300-6 series:** 6.1" (15.6 cm) diameter

  – **B501 series:** 4" (10.2 cm) diameter

For a complete list of detector bases see DN-60981

Shipping weight: 3.4 oz. (95 g)

Operating temperature range:

- FSP-951 Series: 32°F to 122°F (0°C to 50°C)
- FSP-951T Series: 32°F to 100°F(0°C to 38°C)
- FSP-951R Series installed in DNR/DNRA/DNRW, -4°F to 158°F (-20°C to 70°C)

UL/ULC Listed Velocity Range: 0-4000 ft/min. (1219.2 m/min.), suitable for installation in ducts

Relative humidity: 10% – 93% non-condensing

Thermal ratings: fixed-temperature set point 135°F (57°C), rate-of-rise detection 15°F (8.3°C) per minute, high temperature heat 190°F (88°C)

ELECTRICAL SPECIFICATIONS

Voltage range: 15 - 32 volts DC peak

Standby current (max. avg.): 200µA @ 24 VDC (one communication every 5 seconds with LED enabled)

Max current: 4.5 mA @ 24 VDC (“ON”)

DETECTOR SPACING AND APPLICATIONS

NOTIFIER recommends spacing detectors in compliance with NFPA 72. In low airflow applications with smooth ceiling, space detectors 30 feet (9.1m). For specific information regarding detector spacing, placement, and special applications refer to NFPA 72. A *System Smoke Detector Application Guide*, document SPAG91, is available at **www.systemsensor.com.**

Listings and Approvals

Listings and approvals below apply to the FSP-951 Series detectors. In some cases, certain modules may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

- UL/ULC Listing: S1115
- FM Approved
- CSFM: 7272-0028:0503

NOTIFIER
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Northford, CT 06472
203.484.7161
www.notifier.com

ISO 9001 CERTIFIED
ENGINEERING & MANUFACTURING QUALITY SYSTEMS

This document is not intended to be used for installation purposes.
We try to keep our product information up-to-date and accurate.
We cannot cover all specific applications or anticipate all requirements.
All specifications are subject to change without notice.

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Country of Origin: Mexico

NOTIFIER® by Honeywell

Technical Data TD450023EN

Effective April 2018
Supersedes January 2016

Wheelock E50 & E60 Speakers & Speaker Strobes

Description

The Wheelock E50 Wall and E60 Ceiling Speakers and Speaker Strobes are designed for high efficiency sound output for indoor applications. The E product line features intelligible communications with crisp, clear voice messages and tone signaling, ideal for mass notification and voice evacuation.

Providing a sleek aesthetic appearance, the wall and ceiling appliances feature dual voltage (25/70 VRMS) capability and field-selectable taps from 1/8 to 2 watts. For faster and easier installation, the low profile design incorporates a speaker mounting plate, and each model has a built-in level adjustment feature and snap-on cover with no visible mounting screws.

For visible signaling to meet the hearing impaired, the E Speaker Strobe models incorporate the low current draw of the RSS Strobes.

Strobe options for wall mount models include Wheelock patented MCW multi-candela strobe with field selectable candela settings of 15/30/75/110cd or the high intensity MCWH strobe with field selectable 135/185cd.

Ceiling mount models are available in Wheelock patented MCC multi-candela ceiling strobe with field selectable intensities of 15/30/75/95cd or the high intensity MCCH strobe with field selectable 115/177cd.

The strobe portion of all E Speaker Strobes may be synchronized when used in conjunction with the Wheelock DSM Sync Modules, Wheelock Power Supplies or other manufacturers panels incorporating the Wheelock Patented Sync Protocol. Wheelock synchronized strobes offer an easy way to comply with ADA recommendations concerning photosensitive epilepsy.

E Speaker Strobes are UL Listed for indoor use under Standard 1971 (Signaling Devices for the Hearing-Impaired) and Standard 1480 (Speaker Appliances). All inputs employ IN/OUT wiring terminals for fast installation using #12 to #18 AWG wiring.

Color options for the E Speakers and Speaker Strobes are red and white.

Powering Business Worldwide

Features

- Intelligible Communications
  - Efficient design for high intelligibility at minimum wattage across a frequency range of 400 to 4000 HZ
- Field Selectable Settings
  - Wall mount models are available with Field Selectable Candela Settings of 15/30/75/110cd or 135/185cd (Multi-Candela models)
  - Ceiling mount models are available with field selectable candela settings of 15/30/75/95cd or 115/177cd (Multi-candela models)
- Field Selectable Taps
  - 1/8 watt up to 2 watts
  - 25 or 70 VRMS operation
- Easy-to-Install
  - Low profile design incorporates speaker mounting plate for faster and easier installation
  - Snap on grille cover with no visible mounting screws
  - Quick installation with IN/OUT screw terminals using #12 to #18 AWG wires
  - 4" square backbox prevents wire damage
  - E50- No extension ring required
  - E60- Optional Extender (E60 Ext) is available for mounting to 4" square backboxes
- Strobe Synchronization Components
  - Meet synchronizing standards with Wheelock's DSM Sync Modules, Power Supplies or SAFEPATH products
- Compliance
  - UL 1971, UL 1480
  - California State Fire Marshal (CSFM)
  - ADA/NFPA/ANSI/OSHA
  - FCC Part 15, ICES

Note: Please read these specifications and associated installation instructions, before using, specifying, or installing this product. Visit Eaton.com/massnotification for current installation instructions.

Drawings

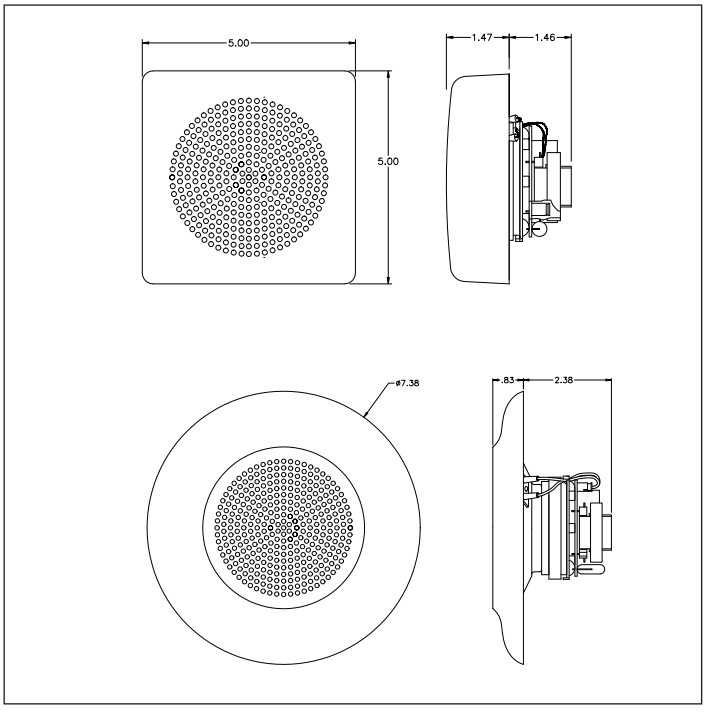

Figure 1. E50 (top) and E60 (bottom) Speakers - Front & Side Views

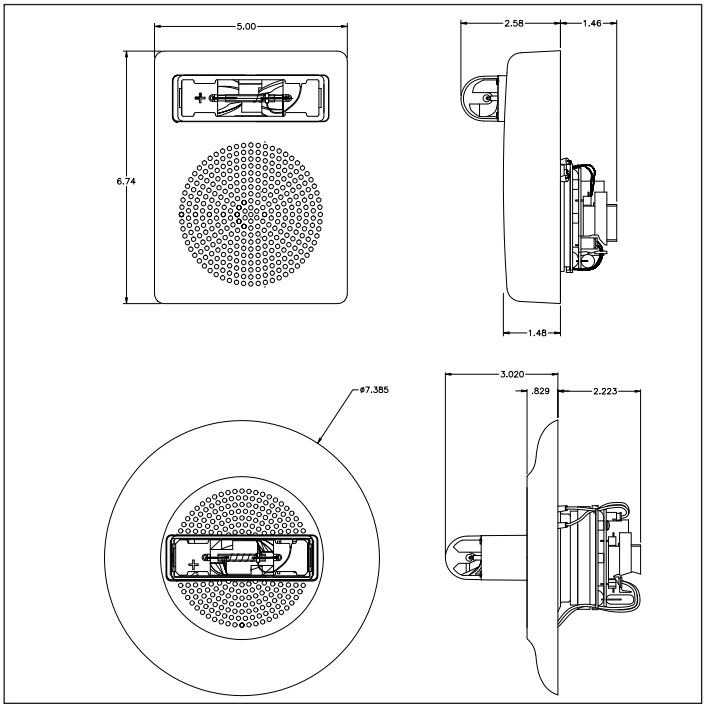

Figure 2. E50 (top) and E60 (bottom) Speaker Strobes - Front & Side Views

General Notes

- Strobes are designed to flash at 1 flash per second minimum over their "Regulated Voltage Range." Note that NFPA-72 specifies a flash rate of 1 to 2 flashes per second and ADA Guidelines specify a flash rate of 1 to 3 flashes per second.
- All candela ratings represent minimum effective Strobe intensity based on UL 1971.

Table 1. Maximum RMS Current

		UL Max Current ①								
		24MCW/24MCC 241575W				24MCWH/24MCCH				
Model	Regulated Voltage Range VDC	15	30	75	95	110	115	135	177	185
E50	16.0-33.0	0.060	0.092	0.165		0.220		0.300		0.420
E60	16.0-33.0	0.065	0.105	0.189	0.249		0.300		0.420	

Table 2. UL Listed Models and Ratings

	UL Reverberant dBA at 10 Feet ②				
Model	1/8 watts ③	1/4 watts	1/2 watts	1 watts	2 watts
E50 Speaker Strobe	77	79.5	82.5	85	88
E60 Speaker	77	79.5	82.5	85	88
E60 Speaker Strobe	77	79.5	82.5	85	88

Table 3. Specification & Ordering Information

Model	Order #	Strobe Candela	Red	White	Lettering	Wall	Ceiling	Mounting Options	Sync w/ DSM or Wheelock Power Supplies
Speakers									
E50-R	0222		X		No Lettering	X	X	E,O,P,Q,R,U,Y,A	
E50-W	0223			X	No Lettering	X	X	E,O,P,Q,R,U,Y,A	
E60-R	3746		X		No Lettering		X	Q,U	
E60-W	3745			X	No Lettering		X	Q,U	
Speaker Strobes									
E50-24MCW-FR	0092	15/30/75/110	X		FIRE	X		E, BB	X
E50-24MCW-FW	0093	15/30/75/110		X	FIRE	X		E, BB	X
E50-24MCWH-FR	0094	135/185	X		FIRE	X		E, BB	X
E50-24MCWH-FW	0097	135/185		X	FIRE	X		E, BB	X
E60-24MCC-FR	3748	15/30/75/95	X		FIRE		X	Q,U,V	X
E60-24MCC-FW	3747	15/30/75/95		X	FIRE		X	Q,U,V	X
E60-24MCCH-FR	3750	115/177	X		FIRE		X	Q,U,V	X
E60-24MCCH-FW	3749	115/177		X	FIRE		X	Q,U,V	X
Extender Ring									
E60EXT-R ④	3578		X						
E60EXT-W ④	3757			X					

Table 4. Specifications

Physical	
Material	Red or white textured UV stabilized, colored impregnated engineered plastic. Exceeds 94V-0 UL flammability rating
Weight	E50 Speaker: 1.5 lbs (0.68 kg); E50 Speaker Strobe 1.6 lbs (0.73 kg); E60 Speaker: 1.6 lbs (0.73 kg); E60 Speaker Strobe 1.7 lbs (0.77 kg);
Dimensions	E50 Speaker: 5" W x 5" H x 1.7"D; E50 Speaker Strobe: 5" W x 6.74" H x 2.58"D; E60 Speaker: 7.38" Diameter x .83" D; E60 Speaker Strobe: 7.38" Diameter x 3.02" D
Operating Temperature	Indoor: 33.8°F to 120.2°F (0°C to 49°C) and maximum humidity of 93%
Lens (material type)	GE Lexan 943 A
Mounting & Wire Connections	
Mounting (indoor only)	4" square backbox prevents wire damage; Series E50 No extension ring required; Series E60 Optional Extender (E60 Ext) is available for mounting to 4" square backboxes, E50 SSB, E50 SB for surface mount of E50
Wire Connections	#12 through #18 AWG
Power & General	
Operating voltage	25/70 VRMS
Strobe Output Rating	UL 1971
Strobe Flash Rate	Strobes are designed to flash at 1 flash per second
Synchronization Models	Strobes can be synchronized with Wheelock's DSM Sync Modules, Power Supplies or SAFEPATH products, using Wheelock patented sync protocol
Frequency Range	400 Hz to 4000 Hz

① RMS current ratings are per UL maximum RMS method. UL max current rating is the maximum RMS current within the listed voltage range (16-33v for 24v units). For strobes the UL max current is usually at the minimum listed voltage (16v for 24v units). For audibles the max current is usually at the maximum listed voltage (33v for 24v units). For unfiltered FWR ratings, see installation instructions.

b dBA ratings are based on testing under UL Standard 1480.
c 1/8 watt tap is for private mode only.
d E60 EXT is an attractive extender ring that mounts behind the speaker to permit mounting to a 4" square x 2 1/8" deep electrical box without need for an extension ring on the box.

Architects and Engineers Specifications

Wheelock E50- The speaker appliances shall be Wheelock E50 Speakers, and the Speaker Strobe appliances shall be Wheelock E50 Speaker Strobes or approved equals. The speakers shall be UL Listed under UL 1480 for Fire Protective Service and speakers equipped with strobes shall be listed under UL 1971 for Emergency Devices for the Hearing-Impaired. In addition, the strobes shall be certified to meet the requirements of FCC Part 15, Class A.

All speakers shall be designed for a field selectable input of either 25 or 70 VRMS, with selectable power taps from 1/8 watt to 2 watts. All models shall have listed sound output of up to 87 dBA at 10 feet and a listed frequency response of 400 to 4000 Hz. The speaker shall incorporate a sealed back construction. All inputs shall employ terminals that accept #12 to #18 AWG wire sizes. The strobe portion of the appliance shall produce a flash rate of one (1) flash per second over the Regulated Voltage Range and shall be of low current design. Where Multi-Candela Speaker Strobes are specified, the strobe intensity shall have field selectable settings and shall be rated per UL 1971 at 15/30/75/110cd or 135/185cd for wall mounting. The selector switch for selecting the candela shall be tamper resistant.

When synchronization is required,the strobe portion of the appliance shall be compatible with the Wheelock's DSM sync modules or Wheelock Power Supplies with built-in Patented Sync Protocol. The strobes shall not drift out of synchronization at any time during operation. If the sync module or Power Supply fails to operate, (i.e., contacts remain closed), the strobe shall revert to a non-synchronized flash rate.

The speaker and speaker strobe appliances shall be designed for indoor flush mounting to 4" x 2-1/8" electrical boxes without need for an extension ring or surface mounting to Wheelock's E50SB or E50SSB surface boxes. The speaker and speaker strobe shall incorporate a speaker mounting plate with a snap-on grille cover. The finish of the Series E50 speakers and speakers strobes shall be white or red.

UL 1971, UL 1480, CSFM, FCC.

Wheelock E60 - The speaker appliances shall be Wheelock E60 Speakers, and the Speaker Strobe appliances shall be Wheelock Series E60 Speaker Strobes or approved equals. The speakers shall be UL Listed under UL 1480 for Fire Protective Service and speakers equipped with strobes shall be listed under UL 1971 for Emergency Devices for the Hearing-Impaired. In addition, the strobes shall be certified to meet the requirements of FCC Part 15, Class A.

All speakers shall be designed for a field selectable input of either 25 or 70 VRMS, with selectable power taps from 1/8 watt to 2 watts. All models shall have listed sound output of up to 87 dB at 10 feet and a listed frequency response of 400 to 4000 Hz. The speaker shall also incorporate a sealed back construction. All inputs shall employ terminals that accept #12 to #18 AWG wire sizes. The strobe portion of the appliance shall produce a flash rate of one (1) flash per second over the Regulated Voltage Range. The strobe shall be of low current design. Where Multi-Candela Speaker Strobes are specified, the strobe intensity shall have field selectable settings and shall be rated per UL 1971 15/30/75/95cd or 115/177cd for ceiling mount. The selector switch for selecting the candela shall be tamper resistant. When synchronization is required, the strobe portion of the appliance shall be compatible with Wheelock DSM sync modules or the Wheelock Power Supplies with built-in Patented Sync Protocol. The strobes shall not drift out of synchronization at any time during operation. If the sync module or Power Supply fails to operate, (i.e., contacts remain closed), the strobe shall revert to a non-synchronized flash rate.

The speaker and speaker strobe appliances shall be designed for indoor flush mounting. The speaker and speaker strobe shall incorporate a speaker mounting plate with a snap-on grille cover with no visible screws for a level, aesthetic finish and shall mount to standard electrical hardware. The finish of the Series E60 Speakers and Speaker Strobes shall be white or red. All speaker and speaker strobe appliances shall be backward compatible.

UL 1971, UL 1480, CSFM, FCC.

Note: Due to continuous development of our products, specifications and offerings are subject to change without notice in accordance with Cooper Wheelock Inc., dba Eaton standard terms and conditions.

NEMA Member

WE ENCOURAGE AND SUPPORT NICET CERTIFICATION
3 YEAR WARRANTY

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April 2018

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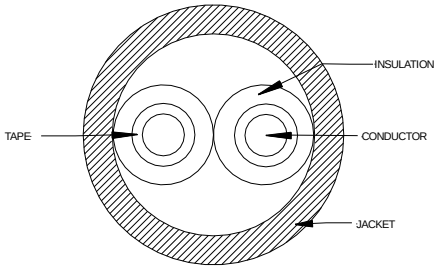
Powering Business Worldwide

VITALink®
18 AWG Solid 2/C Non-Shielded Circuit Integrity Cable



1. Construction:

1.1. Conductors: 18 AWG (0.82 mm^2) Solid Bare Copper, 0.0403" (1.02 mm) Nominal Diameter
1.2. Tape: Flame Retardant Tape
1.3. Insulation: Low Smoke Zero Halogen Thermoset Fire-Roc® 0.118" (3 mm) Nominal Diameter & 0.029" (0.73 mm) Nominal Wall Thickness
1.4. Color Code: Red, Black
1.5. Assembly: Cable (2) Conductors 4.25" (108 mm) Nominal LHL
1.6. Jacket: Non-Halogen Flame Retardant Polyolefin Compound, Nominal Overall Diameter 0.305" (7.74 mm), Nominal Wall Thickness 0.034" (0.86 mm)
Color: RED
1.7. **Jacket Print:**
COMTRAN LSZH VITALink® FPLR-CI-ST1 CMR-CI-LS CL3R-CI-ST1 2/C 18AWG 105C SUN RES WET or FAS105 LL14444 FRR-2HR FHIT.40A/FHIT7.40A UL2196/ULC S139 MAX VOLTAGE 72V PN36337 --- NYC APPROVED (MMYY) 000002 (01-12345)

NOTE: MMYY is 4 Digit Month/Year
Sequential Footage Markings Every Two Feet (01-12345)- Traceability Marking

2. Compliance:

2.1. (UL) Listed Type FPLR-CI-ST1
2.2. (UL) Listed Type CMR-CI-LS
2.3. (UL) Listed CL3R-CI-ST1
2.4. CSA Listed FAS 105
2.5. UL Subject 1424 Power Limited Fire Alarm Circuits; 300V/105°C Classified
2.6. UL Subject 13 Power Limited Circuit Cables; 300V/105°C Classified
2.7. UL Subject 444 Communications Cable; 300V/105°C Classified
2.8. ANSI/UL 2196 2-Hour Fire Rating for use in FHIT System 40A
2.9. CAN/ULC-S139 2-Hour Fire Rating with Hose Stream for use in FHIT7 System 40A
2.10. NFPA 70 & 72
2.11. NFPA 130
2.12. NFPA 502
2.13. California State Fire Marshal Approved
2.14. NYC Electrical Advisory Board #54502, April 2017
2.15. RoHS Compliant

3. Physical Characteristics:

3.1. Nominal Weight per 1000 FT: 41 Lbs. (18.5 kg)
3.2. Min Bend Radius: 2" (50.8 mm)
3.3. Maximum Pull Tension – Straight runs: 26 Lbs. /ft. (11.7 kg/Ft.)

4. Electrical Characteristics:

4.1. Nominal Conductor DCR @ 68F (20 ºC): 6.51 Ω / 1000 Ft.
4.2. Nominal Capacitance C-C: 13 pF/Ft.

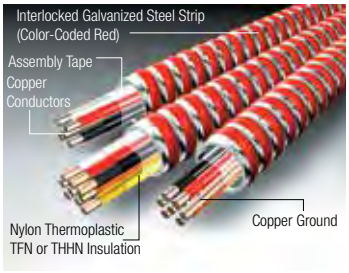
TITLE:	DESCRIPTION:	COMTRAN 330A Turner Street South Attleboro, MA 02703 Phone: 508-399-7004 Fax: 508-399-8839	COMTRAN Innovative Systems. Engineered Solutions. A Marmon Wire & Cable/Berkshire Hathaway Company
DS36337	18 AWG Solid 2 Conductor VITALink® Non-shielded Circuit Integrity Cable		

Rev	Date	Detail	Eng.	App.	
12	05/12/20	Update legend per UL update	PB	KB	ECN 20-042
11	01/09/20	Update Capacitance per physical test.	PB	WC	
10	07/09/19	Change legend per UL update; add electrical data	PB	WC	ECN 19-071
09	02/27/19	Add regulatory approvals	PB	WC	
08	01/29/19	Change logo and basic corrections	SM	WC	

Comtran reserves the right to change the information above without prior notification. Comtran assumes no risk, and is not liable for direct or indirect, or consequential damages, resulting from the use of this document

Fire Alarm® Control Cable – Type MC – Dual Rated Type MC/FPLP

Plenum Rated Technical Specifications



Armor
Interlocked Galvanized Steel Strip (Painted Red)

Conductors
Solid Copper

Conductor Insulation
TFN 18 & 16 AWG and/or THHN 14 & 12 AWG

Assembly
Polyester Assembly Tape; Twisted Shielded: Laminated Aluminum/Mylar® Shield with Tinned Copper Drain Wire

Maximum Temperature Rating
FPLP: 105°C (Dry)
MC: 90°C (Dry)

Grounding
One or More Grounding Conductors May Be Bare or Insulated Green, See Chart Below

Neutral Conductor
White (Where Applicable)

Maximum Voltage Rating
300V (FPLP)
600V (MC)

References & Ratings
- UL 66, 83, 1424, 1479, 1569, 1581, 2556, File Reference E80042
- NEC® 300.22(C), 392, 330, 430.2, 501, 502, 503, 530, 504, 505, 518, 530, 645, 725, 760, 760.154(A)
- Cable Tray Rated, install per NEC®
- Federal Specification A-A-59544 (formerly J-C-30B)
- UL Classified 1, 2, and 3 hour through (Fire) penetration product, R14141
- NFPA 262 (formerly UL 910) Plenum Rated - Type FPLP
- Made in USA of US and/or imported materials

Product Code		Trade Size	Grounding Conductor AWG	Approx. Weight/ 1,000ft (lbs)	Approx. Armor O.D. (In)
250' Coil	1000' Reel				
Solid TFN					
1801R42-00	1801R60-00	18-2 Solid (Black, White)	18 bare	110	0.470
1803R42-00	1803R60-00	18-4 Solid (Black, White, Red, Blue)	18 bare	130	0.430
1805R42-00	1805R60-00	18-6 Solid (Black, White, Red, Blue, Yellow, Orange)	18 bare	170	0.490
1810R42-00	1810R60-00	16-2 Solid (Black, White)	16 bare	120	0.470
1813R42-00	1813R60-00	16-4 Solid (Black, White, Red, Blue)	16 bare	147	0.491
Solid THHN					
1834R42-00	1834R60-00	14-2 Solid (Black, White)	14 Solid (Green)	142	0.471
1837R42-00	1837R60-00	14-4 Solid (Black, White, Red, Blue)	14 Solid (Green)	192	0.529
1835R42-00	1835R60-00	12-2 Solid (Black, White)	12 Solid (Green)	177	0.514
1840R42-00	1840R60-00	12-4 Solid (Black, White, Red, Blue)	12 Solid (Green)	249	0.584
Twisted Shielded Pairs					
1895R42-05	1895R60-05	16-2 Solid (1 TSP) (Blue, White) †	16 Solid (Green)	147	0.526
1895R42-06	1895R60-06	16-2 Solid (1 TSP) (Black, Red) †	16 Solid (Green)	147	0.526
4901R42-00	4901R60-00	16-2 Solid (1 TSP) (Black, White) & un-shielded 12-2 Solid (Black, Red) †	12 Solid (Green)	236	0.606
1828R42-00	1828R60-00	14-2 Solid (1 TSP) (Black, White) †	14 Solid (Green)	217	0.565
1828R42-05	1828R60-05	14-2 Solid (1 TSP) (Blue, White) †	14 Solid (Green)	217	0.565
1881R42-00	1881R60-00	14-4 Solid (2 TSP) (Black, Red) (Blue, White) †	14 Solid (Green)	255	0.690
Specialty Colors					
1828R42-05	1828R60-05	14-2 Solid (1TSP) (Blue, White) †	14 Solid (Green)	217	0.565
1834R42-05	1834R60-05	14-2 Solid (Blue, White)	14 Solid (Green)	195	0.627
1834R42-06	1834R60-06	14-2 Solid (Black, Red)	14 Solid (Green)	195	0.627
1834R42-23	1834R60-23	14-2 Solid (Orange, Yellow)	14 Solid (Green)	195	0.627
1834R42-37	1834R60-37	14-2 Solid (Brown, Purple)	14 Solid (Green)	195	0.627
1834R42-44	1834R60-44	14-2 Solid (Gray, Gray*)	14 Solid (Green)	195	0.627
1835R42-05	1835R60-05	12-2 Solid (Blue, White)	12 Solid (Green)	177	0.514
1837R42-05	1837R60-05	14-4 Solid (Blue, Blue*, White, White*)	14 Solid (Green)	192	0.529
1837R42-06	1837R60-06	14-4 Solid (Black, Black*, Red, Red*)	14 Solid (Green)	192	0.529
1895R42-06	1895R60-06	16-2 Solid (1 TSP) (Black, Red) †	16 Solid (Green)	147	0.526

SIGNALING LINE, AND SPEAKER CIRCUITS

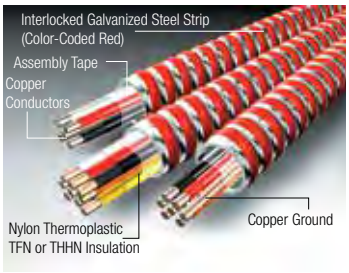
STROBE CIRCUITS

CONTROL AND INTERFACED CIRCUITS

NOTE: All dimensions and weights are subject to normal manufacturing tolerances.
* One conductor insulation has identifying stripe
† All drain wires are 18AWG Tinned Copper in TSP construction
Mylar is a Registered trademark of DuPont

For the electrical properties of Fire Alarm® Control Cable and twists per foot information, see page 30.

Fire Alarm® Control Cable Performance Charts



Conductor Size AWG	XL, Reactance[1]	Rac, Resistance, 75°C[2]	Z, Effective[3] Impedance
Electrical Properties (ohms to neutral per 1000 feet)			
18	0.047	7.77	6.24
16	0.043	4.89	3.93
14	0.042	3.07	2.48
12	0.04	1.93	1.57

[1] In Steel Armor
[2] To correct for 90°C, multiply by 1.048
[3] Effective Impedance is defined as R cos (Theta) + X sin (Theta) where Theta is the power factor angle of the circuit. Effective impedance values shown in the table above are valid at 80% power factor.

Conductor Size AWG	Twisted Pair[1]	Twisted Shielded Pair[2]
Mutual Capacitance (pico farads per foot)		
18	30	47.3
16	33.5	54.8
14	36.3	60.7
12	38.8	66.4

[1] In Steel Armor
[2] To correct for 90°C, multiply by 1.048
[3] Effective Impedance is defined as R cos (Theta) + X sin (Theta) where Theta is the power factor angle of the circuit. Effective impedance values shown in the table above are valid at 80% power factor.

Inductance (L) to neutral, per 1000 feet is typically 0.0002mH for sizes 18 AWG through 250 kcmil

= 0.1404 Log10(GMD/GMR) x 10-3 Henrys to neutral per 1000 feet]

Size	Total Number of Conductors Including Ground	Conductor Diameter	Length of Lay	Twists per Foot
Twists per Foot				
18	2	0.08	2.4	5
18	3	0.08	2.8	4.3
18	4	0.08	3.2	3.8
18	5	0.08	3.3	3.7
16	2	0.09	2.7	4.4
16	3	0.09	3.2	3.8
16	4	0.09	3.6	3.3
16	5	0.09	3.7	3.3
14	2	0.105	3.15	3.8
14	3	0.105	3.7	3.3
14	4	0.105	4.2	2.9
14	5	0.105	4.3	2.8
12	2	0.125	3.75	3.2
12	3	0.125	4.4	2.7
12	4	0.125	5	2.4
12	5	0.125	5.1	2.4

Power Limited Fire Alarm Circuit Cable – Type FPLP

Plenum Rated Technical Specifications

Armor
Interlocked Galvanized Steel Strip (Red-Striped)

Conductors
Solid Copper

Conductor Insulation
TFN 18 & 16 AWG and/or THHN 14 & 12 AWG

Assembly
Polyester Assembly Tape; Twisted Shielded: Laminated Aluminum/Mylar® Shield with Tinned Copper Drain Wire

Maximum Temperature Rating
FPLP: 105°C (Dry)

Neutral Conductor
White (Where Applicable)

References & Ratings
- UL 66, 83, 1424, 1479, 1581, 2556, File Reference E83514
- NEC® 300.22(C), 392, 330, 430.2, 501, 502, 503, 530, 504, 505, 518, 530, 645, 725, 760, 760.154(A)
- Cable Tray Rated, install per NEC®
- Federal Specification A-A-59544 (formerly J-C-30B)
- UL Classified 1, 2, and 3 hour through (Fire) penetration product, R14141
- NFPA 262 (formerly UL 910) Plenum Rated - Type FPLP
- Made in USA of US and/or imported materials

Product Code		Trade Size	Approx. Weight/ 1,000ft (lbs)	Approx. Armor O.D. (In)
250' Coil	1000' Reel			
Metal Sheathed Type FPLP Cable				
1850R42-00	1850R60-00	18-2 Solid (1 TSP) (Black, White) †	111	0.470
1827R42-00	1827R60-00	18-2 Solid (1 TSP) (Black, Red) & 14-2 Solid (1 TSP) (Black, White) †	204	0.637
1860R42-00	1860R60-00	16-2 Solid (1 TSP) (Black, White) †	118	0.470
1843R42-00	1843R60-00	16-4 Solid (2 TSP) (Black, White) (Red, Blue) †	195	0.627

NOTE: All dimensions and weights are subject to normal manufacturing tolerances.
* One conductor insulation has identifying stripe
† All drain wires are 18AWG Tinned Copper in TSP construction
Mylar is a Registered trademark of DuPont

For the electrical properties of Fire Alarm® Control Cable and twists per foot information, see page 30.

Series TY-FRB, 5.6 K-factor Upright, Pendent, and Recessed Pendent Sprinklers Quick Response, Standard Coverage

General Description

The TYCO Series TY-FRB, 5.6 K-factor, Upright (TY313) and Pendent (TY323) Sprinklers described in this data sheet are quick response, standard coverage, decorative 3 mm glass bulb-type spray sprinklers designed for use in light or ordinary hazard, commercial occupancies such as banks, hotels, and shopping malls.

The recessed version of the Series TY-FRB Pendent Sprinkler, where applicable, is intended for use in areas with a finished ceiling. This recessed pendent sprinkler uses one of the following:

- A two-piece Style 15 Recessed Escutcheon with recessed adjustment up to 5/8 in. (15,9 mm) from the flush pendent position.
- A two-piece Style 20 Recessed Escutcheon with recessed adjustment up to 1/2 in. (12,7 mm) from the flush pendent position.

The adjustment provided by the Recessed Escutcheon reduces the accuracy to which the fixed pipe drops to the sprinklers must be cut.

Intermediate level versions of Series TY-FRB Sprinklers are described in Technical Data Sheet TFP357. Sprinkler guards and shields are described in Technical Data Sheet TFP780.

IMPORTANT

Refer to Technical Data Sheet TFP2300 for warnings pertaining to regulatory and health information.

Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.

NOTICE

The TYCO Series TY-FRB Sprinklers described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of these devices.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. Contact the installing contractor or product manufacturer with any questions.

Sprinkler Identification Number (SIN)

TY313 . . . . Upright 5.6K, 1/2 in. NPT
TY323 . . . .Pendent 5.6K, 1/2 in. NPT

Technical Data

Approvals
Refer to Table A

Maximum Working Pressure
175 psi (12.1 bar)
250 psi (17.2 bar)*

* The maximum working pressure of 250 psi (17.2 bar) only applies to the listing by Underwriters Laboratories, Inc. (UL).

Discharge Coefficient
K=5.6 GPM/psi$^{1/2}$ (80,6 LPM/bar$^{1/2}$)

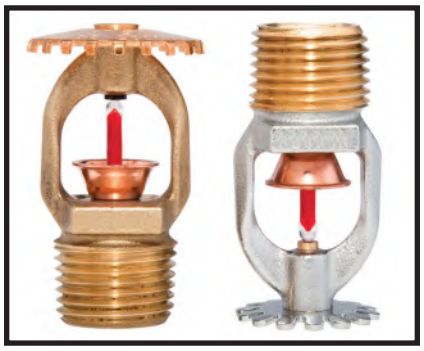
Temperature Rating
Refer to Table A

Finishes
Sprinkler: Refer to Table B

Recessed Escutcheon: White Coated, Black Coated, Chrome Plated, or Brass Plated

Physical Characteristics

Frame	Bronze
Button	Brass/Copper
Sealing Assembly	Stainless Steel w/TEFLON
Bulb	Glass
Compression Screw	Bronze
Deflector	Bronze



Operation

The glass bulb contains a fluid which expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb, allowing the sprinkler to activate and water to flow.

Design Criteria

The TYCO Series TY-FRB, 5.6 K-factor, Upright (TY313) and Pendent (TY323) Sprinklers are intended for fire protection systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency (such as, UL Listing is based on the requirements of NFPA 13, and FM Approval is based on the requirements of FM's Loss Prevention Data Sheets). Only the Style 15 or Style 20 Recessed Escutcheon is to be used for recessed pendent installations.

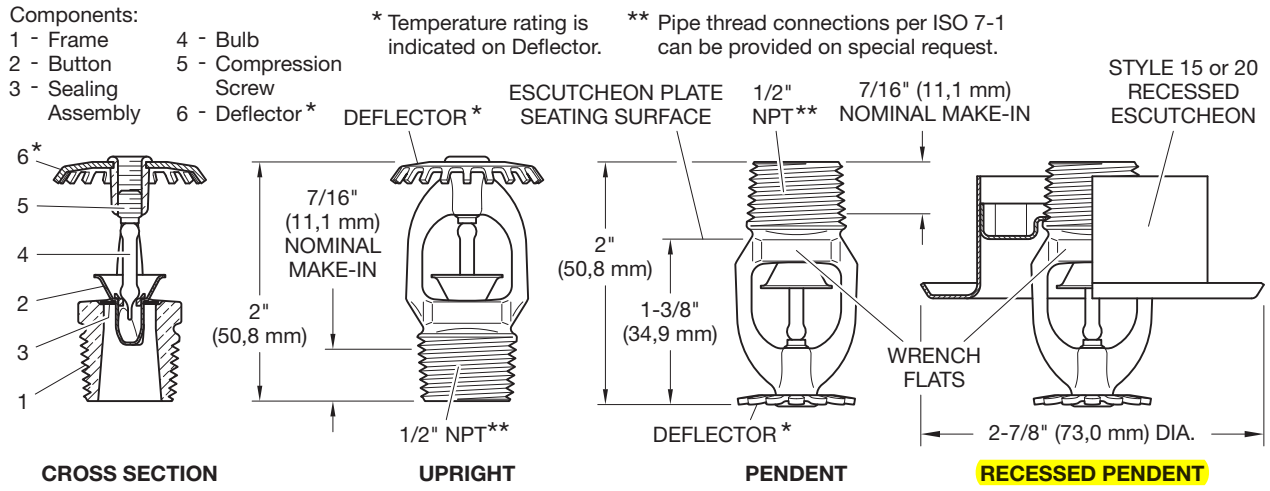


FIGURE 1
SERIES TY-FRB UPRIGHT (TY313) AND PENDENT (TY323) SPRINKLERS
5.6 K-FACTOR, 1/2 INCH NPT, QUICK RESPONSE

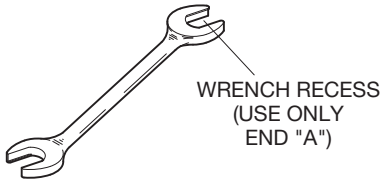


FIGURE 2
W-TYPE 6
SPRINKLER WRENCH

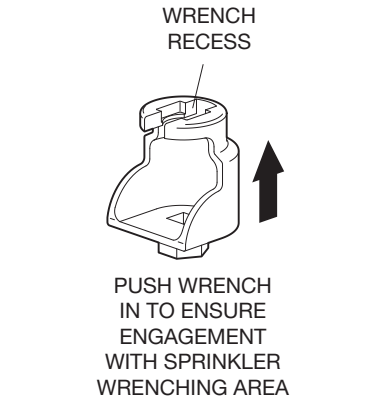


FIGURE 3
W-TYPE 7 RECESSED
SPRINKLER WRENCH

Installation

The TYCO Series TY-FRB, 5.6 K-factor, Upright (TY313) and Pendent (TY323) Sprinklers must be installed in accordance with this section.

General Instructions
Do not install any bulb-type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 in. (1,6 mm) for the 135°F (57°C) and 3/32 in. (2,4 mm) for the 286°F (141°C) temperature ratings.

A leak-tight 1/2 in. NPT sprinkler joint should be obtained by applying a minimum to maximum torque of 7 to 14 lb-ft (9,5 to 19,0 N·m). Higher levels of torque can distort the sprinkler Inlet with consequent leakage or impairment of the sprinkler.

Do not attempt to compensate for insufficient adjustment in the Escutcheon Plate by under- or over-tightening the sprinkler. Re-adjust the position of the sprinkler fitting to suit.

Upright and Pendent Sprinklers
The Series TY-FRB Upright and Pendent Sprinklers must be installed in accordance with the following instructions.

Step 1. Install Pendent sprinklers in the pendent position. Install upright sprinklers in the upright position.

Step 2. With pipe-thread sealant applied to the pipe threads, hand-tighten the sprinkler into the sprinkler fitting.

Step 3. Tighten the sprinkler into the sprinkler fitting using only the W-Type 6 Sprinkler Wrench (Figure 2). With reference to Figure 1, apply the W-Type 6 Sprinkler Wrench to the wrench flats. Torque sprinklers 7 to 14 lb-ft (9,5 to 19,0 N·m).

Recessed Pendent Sprinklers
The Series TY-FRB Recessed Pendent Sprinklers must be installed in accordance with the following instructions.

Step A. After installing the Style 15 or Style 20 Mounting Plate over the sprinkler threads, and with pipe-thread sealant applied to the pipe threads, hand-tighten the sprinkler into the sprinkler fitting.

Step B. Tighten the sprinkler into the sprinkler fitting using only the W-Type 7 Recessed Sprinkler Wrench (Figure 3). With reference to Figure 1, apply the W-Type 7 Recessed Sprinkler Wrench to the sprinkler wrench flats. Torque sprinklers 7 to 14 lb-ft (9,5 to 19,0 N·m).

Step C. After ceiling installation and finishing, slide on the Style 15 or Style 20 Closure over the Series TY-FRB Sprinkler and push the Closure over the Mounting Plate until its flange comes in contact with the ceiling.

Care and Maintenance

The TYCO Series TY-FRB, 5.6 K-factor, Upright (TY313) and Pendent (TY323) Sprinklers must be maintained and serviced in accordance with this section.

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, obtain permission to shut down the affected fire protection systems from the proper authorities and notify all personnel who may be affected by this action.

Absence of the outer piece of an escutcheon, which is used to cover a clearance hole, can delay sprinkler operation in a fire situation.

The owner must assure that the sprinklers are not used for hanging any objects and that the sprinklers are only cleaned by means of gently dusting with a feather duster; otherwise, non-operation in the event of a fire or inadvertent operation may result.

Sprinklers which are found to be leaking or exhibiting visible signs of corrosion must be replaced.

Automatic sprinklers must never be painted, plated, coated, or otherwise altered after leaving the factory. Modified sprinklers must be replaced. Sprinklers that have been exposed to corrosive products of combustion, but have not operated, should be replaced if they cannot be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

Care must be exercised to avoid damage to the sprinklers before, during, and after installation. Sprinklers damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. (Ref. Installation Section.)

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any other authorities having jurisdiction. Contact the installing contractor or product manufacturer with any questions.

Automatic sprinkler systems are recommended to be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

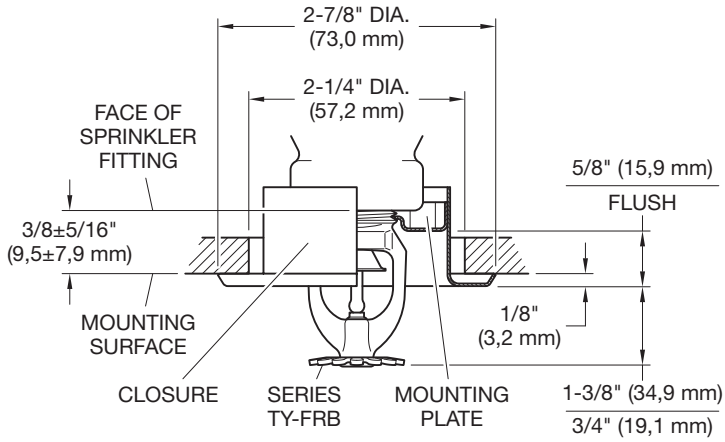


FIGURE 4
SERIES TY-FRB RECESSED PENDENT SPRINKLER ASSEMBLY (TY323) WITH TWO PIECE 5/8 INCH TOTAL ADJUSTMENT STYLE 15 RECESSED ESCUTCHEON

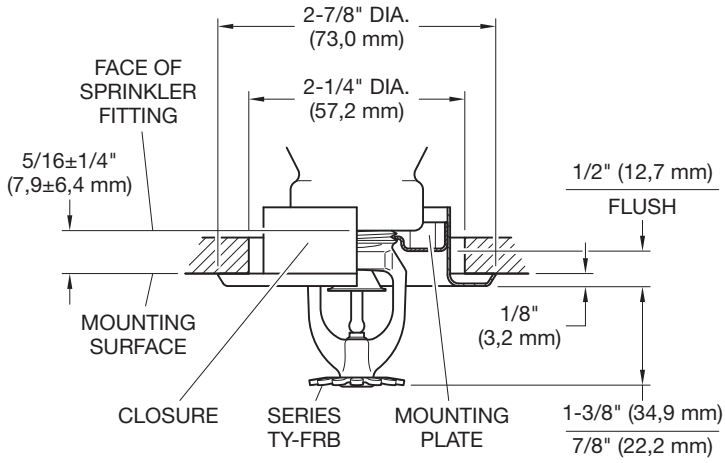


FIGURE 5
SERIES TY-FRB RECESSED PENDENT SPRINKLER ASSEMBLY (TY323) WITH TWO PIECE 1/2 INCH TOTAL ADJUSTMENT STYLE 20 RECESSED ESCUTCHEON

Limited Warranty

For warranty terms and conditions, visit www.tyco-fire.com.

Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name and Part Number (P/N).

Sprinkler Assemblies with NPT Thread Connections
Specify: Series TY-FRB Upright or Pendent (specify) Sprinkler, SIN (specify), K=5.6, Quick Response, (specify) temperature rating, (specify) finish, P/N (specify, refer to Table A).

Recessed Escutcheon
Specify: Style 15 Recessed Escutcheon with (specify*) finish, P/N (specify*)

Specify: Style 20 Recessed Escutcheon with (specify*) finish, P/N (specify*)

* Refer to Technical Data Sheet TFP770

Sprinkler Wrench
Specify: W-Type 6 Sprinkler Wrench, P/N 56-000-6-387

Specify: W-Type 7 Sprinkler Wrench, P/N 56-850-4-001

K FACTOR	TYPE	TEMPERATURE	SPRINKLER FINISH (See Note 7) BULB LIQUID COLOR	NATURAL BRASS	CHROME PLATED	POLYESTER[c]
5.6 1/2 in. NPT	UPRIGHT (TY313) and PENDENT (TY323)	135°F (57°C)	Orange	1, 2, 3, 4, 5, 6		
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
		200°F (93°C)	Green			
		286°F (141°C)	Blue			
	RECESSED PENDENT (TY323) Figures 4[a] and 5[b]	135°F (57°C)	Orange	1, 2, 3, 4		
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
		200°F (93°C)	Green			

Notes:
1. Listed by Underwriters Laboratories, Inc., (UL) as Quick Response Sprinklers.
2. Listed by Underwriters Laboratories, Inc., for use in Canada (C-UL) as Quick Response Sprinklers.
3. Approved by Factory Mutual Research Corporation (FM) as Quick Response Sprinklers.
4. Approved by the City of New York under MEA 354-01-E.
5. VdS Approved (For details, contact Johnson Controls, Enschede, Netherlands, Tel. 31-53-428-4444/Fax 31-54-428-3377.)
6. Approved by the Loss Prevention Certification Board (LPCB Ref. No. 094a/06) as Quick Response Sprinklers.
7. Where Polyester Coated Sprinklers are noted to be UL and C-UL Listed, the sprinklers are UL and C-UL Listed as Corrosion-Resistant Sprinklers.

a. Installed with Style 15 (1/2 in. NPT) 5/8 in. Total Adjustment Recessed Escutcheon, as applicable.
b. Installed with Style 20 (1/2 in. NPT) 1/2 in. Total Adjustment Recessed Escutcheon, as applicable.
c. Frame and Deflector only. Listings and approvals apply to color (Special Order).

TABLE A
LABORATORY LISTINGS AND APPROVALS FOR
5.6 K-FACTOR SPRINKLERS

P/N[a] 77 – XXX – X – XXX

		SIN
370	5.6K UPRIGHT (1/2 in.NPT)	TY313
371	5.6K PENDENT (1/2 in.NPT)	TY323

Notes:
a. Use suffix "I" for ISO 7-1 connection; for example, 77-370-4-175-I

	SPRINKLER FINISH
1	NATURAL BRASS
3	PURE WHITE (RAL9010)[a] POLYESTER
4	SIGNAL WHITE (RAL9003) POLYESTER
5	JET BLACK (RAL9005) POLYESTER
9	CHROME PLATED

Notes:
a. Eastern Hemisphere sales only

	TEMPERATURE RATINGS
135	135°F (57°C)
155	155°F (68°C)
175	175°F (79°C)
200	200°F (93°C)
286	286°F (141°C)

TABLE B
SERIES TY-FRB UPRIGHT AND PENDENT SPRINKLERS
PART NUMBER SELECTION

1400 Pennbrook Parkway, Lansdale, PA 19446 | Telephone +1-215-362-0700

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TEFLON is a registered trademark of DuPont

Johnson Controls

SF Project No. 2066902 June 4, 2021
Fit-Up Administrative Headquarters
Suite 440E &455E Capital Gallery East Tower

Mechanical Product Data for Basis of Design Only

Performance Data

Model: **TC-024**

Tag/Reference #: **WSHP Selection /**

Qty: **1**

General Information

Unit Configuration:	**Horizontal**	
Operating Weight:	**174**	lbs.
Unit Length/Width/Height:	**43.1/20.1/18.3**	inches

Systems Information

Fluid Flow:	**5.85**	GPM	Altitude:	**0**	Feet
Fluid Type:	**Water**		Antifreeze Percent:	**0**	%

Entering Conditions

	Cooling		Heating	
Entering Air Dry Bulb:	**75.0**	°F	**68.0**	°F
Entering Air Wet Bulb:	**63.0**	°F		
Entering Water/Fluid:	**85.0**	°F	**70.0**	°F
Fan Speed:	**MED**		**MED**	

Unit Performance

	Cooling		Heating		
Air Flow:	**874**	CFM	**874**		CFM
Total Capacity:	**22.8**	MBH	**30.8**		MBH
Sensible Capacity:	**18.7**	MBH			
Heat of Rejection:	**29.3**	MBH			
Heat of Absorption:			**24.5**		MBH
Leaving Air Dry Bulb:	**55.2**	°F	**100.6**		°F
Leaving Air Wet Bulb:	**50.1**	°F			
Leaving Fluid Temp:	**95.0**	°F	**61.6**		°F
Fluid Pressure Drop:	**10.6**	ft. H2O	**11.5**		ft. H2O
Input Power:	**1.9**	kW	**1.9**		kW
Efficiency:	**11.8**	EER	**4.9**	**0.0**	COP

Unit Electrical Data

	Unit Amps - FLA	Min. Cir. Amps - MCA	Max. Fuse Size - MFS
265/60/1	**10.8**	**13.2**	**20**

Fan Performance

External Duct Static:	**0.3**	in. H2O

Motor / Compressor Data

	Qty	FLA (ea.)	RLA (ea.)	LRA (ea.)
Fan Motor	**1**	**1.20**		
Compressor	**1**		**9.60**	**54.00**

Selected Options

Straight Discharge, PSC Motor

Right Return

CXM Controls

Uncoated Air Coil, Copper Water Coil

SF Project No. 2066902 June 4, 2021
Fit-Up Administrative Headquarters Suite 440E &455E
Capital Gallery East Tower

Plumbing Product Data for Basis of Design Only

CODE NUMBER

3250289

DESCRIPTION

1.28 gpf, Polished Chrome Finish, Fixture Connection Top Spud, Single Flush, Battery, G2 Exposed Sensor Water Closet Flushometer.

DETAILS

- Flush Volume: 1.28 gpf (4.8 Lpf)
- Finish: Polished Chrome (CP)
- Power Type: Battery ()
- Battery Life: 6 years
- Valve: Diaphragm
- Valve Body Material: Semi-red Brass
- Fixture Type: Water Closet
- Fixture Connection: Top Spud
- Rough-In Dimension: 11 ½" (292mm)
- Spud Coupling: 1 ½" (38mm)
- Supply Pipe: 1" (25mm)

FEATURES

- Sweat Solder Adapter with Cover Tube and Cast Set Screw Wall Flange
- Handle Packing, Main Seat, Stop Seat and Vacuum Breaker Molded from PERMEX® Rubber Compound for Chloramine resistance
- User friendly three (3) second Flush Delay
- “Low Battery” Flashing LED
- Fixed Metering Bypass and No External Volume Adjustment to Ensure Water Conservation
- Flex Tube Diaphragm designed for improved life and reduced maintenance
- Engineered Metal Cover with replaceable Lens Window
- Four (4) Size AA alkaline Batteries included
- Courtesy Flush® Override Button
- 1" I.P.S. Screwdriver Bak-Chek® Angle Stop with Vandal Resistant Stop Cap
- Infrared Sensor with Multiple-focused, Lobular Sensing Fields for high and low target detection
- PERMEX® Synthetic Rubber Diaphragm with Dual Filtered Fixed Bypass
- WaterSense compliant when used with a 1.28 gpf WaterSense fixture

VIDEOS

PVD Special Finishes

COMPLIANCES & CERTIFICATIONS

(ADA Compliant, BAA Compliant, BREEAM Materials Credit, BREEAM Water Credit, Carbon Neutral, cUPC Certified, cUPC Green Certified, EPD, Green Globes Materials & Resources Credit, Green Globes Water Credit, HPD, LEED Materials & Resources EPD Credit, LEED Materials & Resources HPD Credit, LEED V4 Water Efficiency Credit, Satisfies LEED Credits, WaterSense Listed, WELL Building Standards)

RECOMMENDED SPECIFICATION

Valve Body, Cover, Tailpiece and Control Stop shall be in conformance with ASTM Alloy Classification for Semi- Red Brass. Valve shall be in compliance with the applicable sections of ASSE 1037 and ANSI/ASME 112.19.2.

ELECTRICAL SPECIFICATIONS

- Battery Life: 6 years

VALVE OPERATING PRESSURE (FLOWING)

15–80 PSI (103–552 kPa). Specific fixtures may require greater minimum flowing pressure - consult manufacturer requirements.

DOWNLOADS

- Optima Plus Valve Installation Instructions
- G2 Repair and Maintenance Guide
- Control Stop Repair and Maintenance Guide
- Flush Connections Flanges Repair and Maintenance Guide
- Tail Piece Repair and Maintenance Guide
- Additional Downloads

NOTES

All information contained within this document subject to

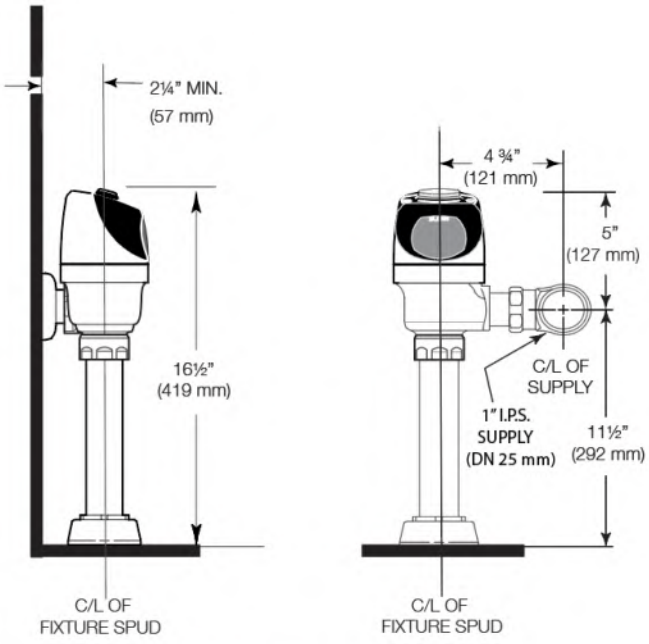
change without notice.

Looking for other variations of the G2 8111 product? View the general spec sheet with all options.

Find a compatible urinal for this flushometer.
Find a compatible water closet for this flushometer.

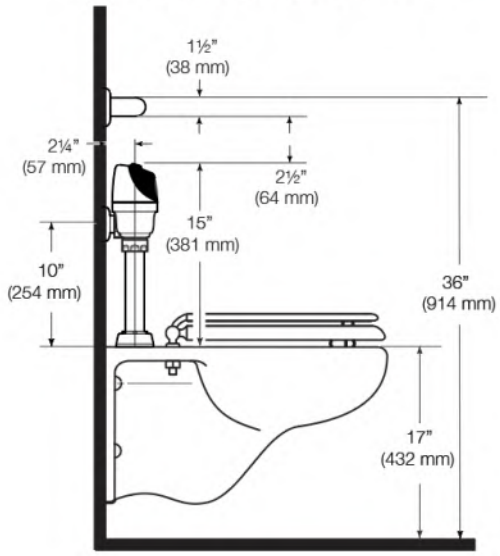
WaterSense compliant when used with a 1.28 gpf (4.8 Lpf) WaterSense fixture

ROUGH-IN



WHEN INSTALLING IN A HANDICAP STALL:
Per the ADA Guildlines (section 604.9.4) it is recommended that the grab bars be split or shifted to the wide side of the stall. If grab bars must be present over the valve, use the alternate ADA installation as shown to the right.

ALTERNATE ADA INSTALLATION
Lower water supply rough-in to 10" (254 mm) and mount grab bar at the 36" (914 mm) maximum allowed height (top of grab bar at 36").



Sloan 10500 Seymour Ave, Franklin Park, IL 60131
Phone: 800.982.5839 • Fax: 800.447.8329 • sloan.com

P-1/P-1A

BEMIS COMMERCIAL

COMMERCIAL HEAVY-DUTY PLASTIC TOILET SEAT

MODEL # 2155CT/2155SSCT

COLOR # _____

DESCRIPTION:

Open front less cover, elongated, heavy-duty, injection molded solid plastic toilet seat. Features four molded-in bumpers, non self sustaining (2155CT) or self-sustaining (2155SSCT) check hinges with non-corrosive 300 Series stainless steel posts and pintles and STA-TITE® Commercial Fastening System™. Seat contains DuraGuard® Antimicrobial* Built-In Seat Protection™. This seat complies with IAPMO/ANSI Z124.5-2013 Plastic Toilet Seats as a class Commercial Heavy Duty

* DuraGuard® Antimicrobial does not protect users against bacteria, viruses, or other disease organisms. Always clean and wash this product thoroughly before and after each use.

SPECIFICATIONS:

Size:	Elongated
Material:	Plastic
Style:	Open Front less Cover
Bumpers:	Four
Hinges:	Plastic Non Self-Sustaining (2155CT) or Self-Sustaining (2155SSCT) with 300 Series Stainless Steel Posts and Pintles
Fastening System:	STA-TITE® Commercial Fastening System™

PLASTIC HINGES WITH STAINLESS STEEL POSTS AND PINTLES

STA-TITE® COMMERCIAL FASTENING SYSTEM™

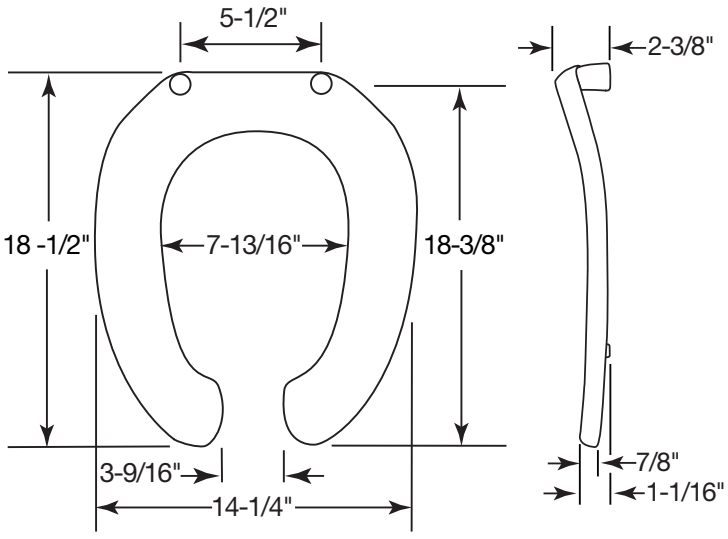
FEATURES:

STA-TITE® Commercial Fastening System™

DuraGuard® Antimicrobial Built-In Seat Protection™

Non-Corrosive 300 Series Stainless Steel Posts and Pintles

DIMENSIONS:



Proudly Made in the USA

Bemis Manufacturing Co., Sheboygan Falls, WI 53085
www.ToiletSeats.com
Phone: 800-558-7651 Fax: 800-292-3647

P-1/P-1A

AFWALL® MILLENIUM™ FloWise® 1.28 GPF FLUSHOMETER TOILET SYSTEM

with EVERCLEAN® MANUAL FLUSH VALVE

BARRIER FREE

AFWALL® MILLENIUM™ FloWise® 1.28 GPF FLUSHOMETER TOILET SYSTEM with EVERCLEAN®

❑ **2856.128** 1.28 gpf Exposed Top Spud Bowl and Manual Flush Valve

BOWL:
- Wall-mount elongated flushometer valve toilet
- Vitreous china
- High Efficiency. Operates in the range of 1.1 gpf to 1.6 gpf (4.2 Lpf to 6.0 Lpf)
- Permanent EverClean® surface inhibits the growth of stain- and odor-causing bacteria, mold, and mildew on the surface
- Condensation channel
- Direct-fed siphon jet action
- 1-1/2" inlet spud
- Fully-glazed 2-1/8" trapway
- 10" x 12" water surface area
- 100% factory flush tested
- Bolt caps and seat not included
- Model 3351.101

MANUAL FLUSH VALVE:
- Manual Piston-Type Water Closet Flush Valve for floor-mounted or wall-hung 1-1/2" top spud bowls
- Self-cleaning brass piston with integral wiper spring prevents clogging and reduces maintenance
- Piston operation delivers superior flush accuracy and repeatability
- Piston valve remains closed and does not need to be reset after loss of water pressure
- ADA compliant non-hold open handle provides automatic shut-off after every flush
- Positive seal ensures leak-free performance
- No external volume adjustment
- Durable chrome-plated cast brass construction is ideal for commercial applications
- Chloramine-resistant EPDM seals
- Adjustable tailpiece for rough-in flexibility
- Can be installed left or right handed
- Model 6047.121.002

Includes:
- 047007-0070A Inlet spud (furnished with bowl)
- 1" I.P.S. angle stop with back-flow prevention and vandal-resistant cap
- Sweat solder kit including cover tube and wall flange
- High back pressure vacuum breaker with down tube
- Spud coupling & flange for 1-1/2" top spud

To Be Specified:
- ❑ Color: ❑ White
- ❑ Seat: 5901.100 American Standard Seat
- ❑ 5901.110 American Standard Seat with EverClean®
- ❑ Alternate Seat: 5905.100 Heavy Duty American Standard Seat
- ❑ 5905.110 Heavy Duty American Standard Seat with EverClean
- ❑ Carrier Fitting (by others):

SEE REVERSE FOR ROUGHING-IN DIMENSIONS

High-Efficiency Toilet Systems:
- 20% water savings when compared to a 1.6 gpf toilet system

System MaP* Score:
- 1,000 grams of miso @ 1.28 gpf

* Maximum Performance (MaP) testing performed by IAPMO R&T Lab. MaP Report conducted by Veritec Consulting, Inc. and Koeller and Company.

Operating Pressure:
25 psi (flowing) - 80 psi (static)

Flow Requirement:
25gpm (94.6 L/min.)

Nominal Fixture Dimensions:
660 x 356 x 381mm (26" x 14" x 15")

EVERCLEAN® Surface

WATER EFFICIENT PRODUCT

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AFWALL® MILLENIUM™ FloWise® 1.28 GPF FLUSHOMETER TOILET SYSTEM

with EVERCLEAN®
MANUAL FLUSH VALVE

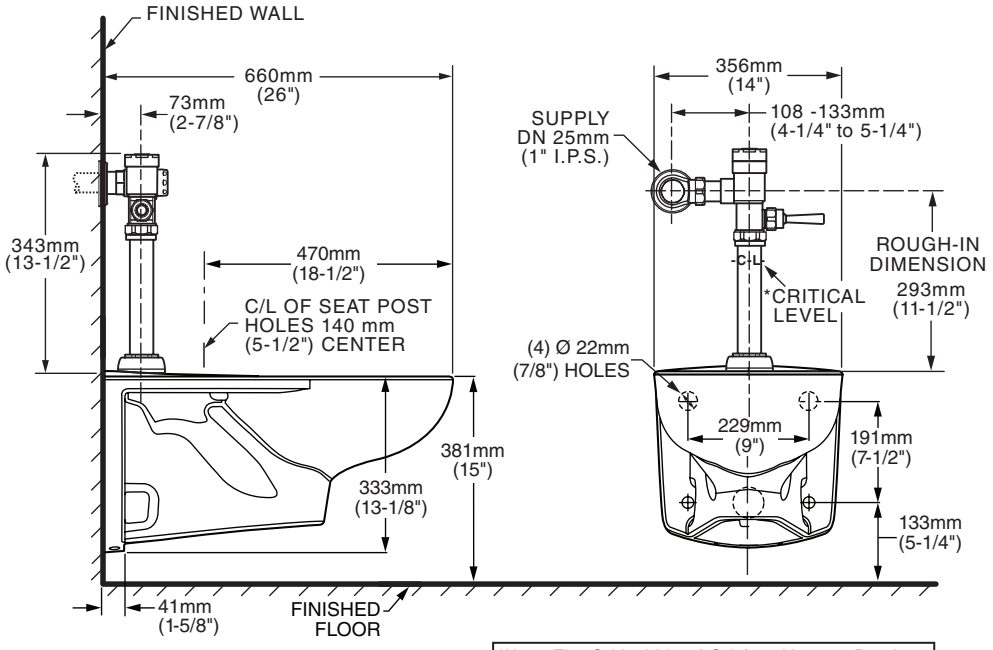
BARRIER FREE

Fixture Compliance Certifications - Meets or Exceeds the Following Specifications:

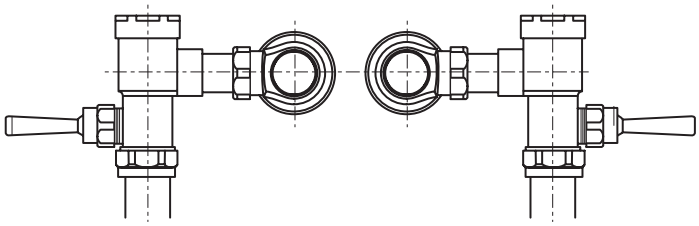
- ASME A112.19.2-2008 / CSA B45.1-08 for Vitreous China Fixtures

Valve Listings:

- ASSE 1037
- ANSI/ASME A112.19.2
- ADA Compliant



*Note: The Critical Line (-C-L-) on Vacuum Breaker must typically be a minimum of 6" (152mm) above fixture. Consult Codes for details.



VALVE LEFT or RIGHT HAND INSTALLATION

MEETS THE AMERICANS WITH DISABILITIES ACT GUIDELINES AND ANSI A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES - CHECK LOCAL CODES.

- When installed so that top of seat is 432 to 483mm (17" to 19") from the finished floor.

NOTES:
WASTE OUTLET SEAL RING MUST BE NEOPRENE OR GRAPHITE-FELT (WAX RING NOT RECOMMENDED).
SUGGESTED 2mm (1/16) CLEARANCE BETWEEN FACE OF WALL AND BACK OF BOWL.
TO COMPLY WITH AREA CODE GOVERNING THE HEIGHT OF VACUUM BREAKER ON THE FLUSHOMETER VALVE, THE PLUMBER MUST VERIFY DIMENSIONS SHOWN FOR SUPPLY ROUGHING.
CARRIER FITTING AS REQUIRED TO BE FURNISHED BY OTHERS.
PROVIDE SUITABLE REINFORCEMENT FOR ALL WALL SUPPORT.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.19.2.
These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages

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P-1A

SMITH® JAY R. SMITH MFG. CO.®
DIVISION OF SMITH INDUSTRIES, INC.
POST OFFICE BOX 3237
MONTGOMERY, ALABAMA 36109-0237 (USA)
TEL: 334-277-8520 FAX: 334-272-7396 www.jrsmith.com
CUSTOMER DRIVEN
MEMBER OF:

LOCATION

ADJUSTABLE FIXTURE SUPPORTS

FOR SIPHON JET WATER CLOSETS SHALLOW ROUGH-IN TYPE

HORIZONTAL FITTINGS

SINGLE

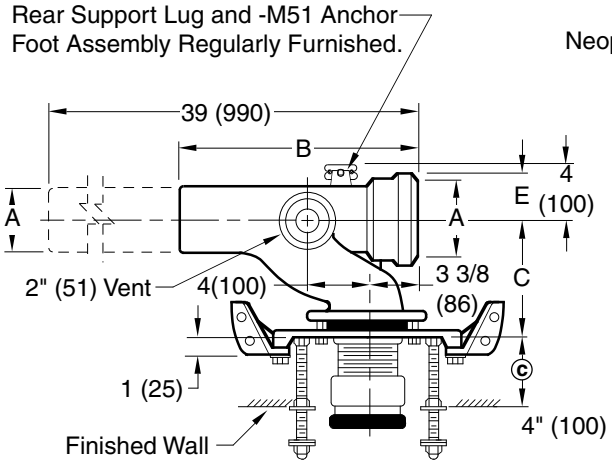


Fig. 0210R
Top View

DOUBLE

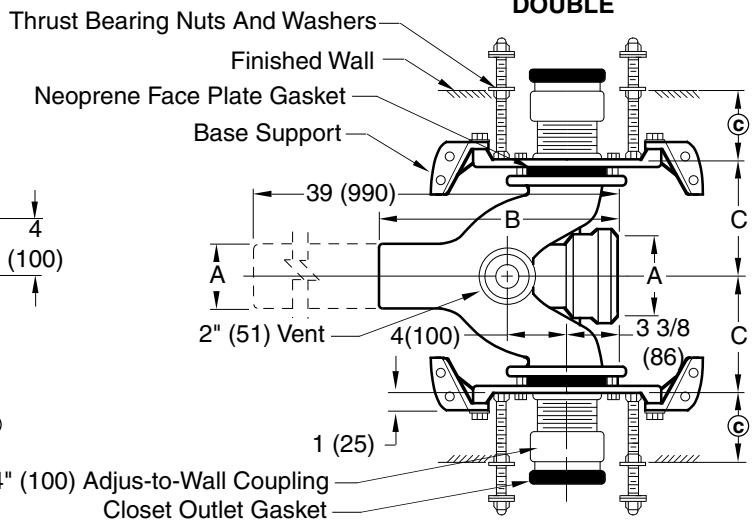
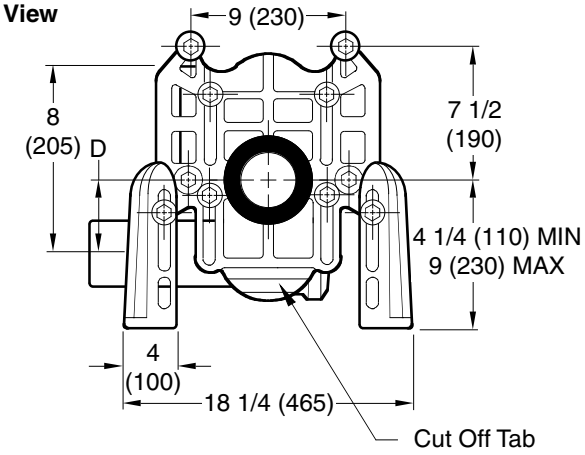


Fig. 0210D
Top View

NOTE: Base support must be securely anchored to floor (with four 1/2" (13) bolts provided by contractor).



Front View

The water closet gasket regularly furnished is made of molded neoprene and designed to fit water closet outlet dimensions and configurations shown in ANSI Standard A112.19.2M-1995, Figure 13B. If gasket is not found to be compatible to fixture due to nonconformance of said fixture to ANSI A112.19.2M, then fixture manufacturer shall be consulted for a suitable gasket recommendation. Jay R. Smith assumes no liability for connections to fixtures which do not conform to these standards.

- [ ] Fig. 0210L . . . CAULK Left Hand
- [ ] Fig. 0210R . . . CAULK Right Hand
- [ ] Fig. 0210D . . . CAULK Double
- [ ] Fig. 0220L . . . CAULK Left Hand Long Barrel
- [ ] Fig. 0220R . . . CAULK Right Hand Long Barrel
- [ ] Fig. 0220D . . . CAULK Double Long Barrel

A SIZE	B	C	D MIN	D MAX	E
4 (100)	16 (405)	7 (180)	5/8 (16)	3 3/8 (86)	3 (76)
5 (125)	15 1/2 (395)	9 (230)	5/8 (16)	3 3/8 (86)	3 1/2 (89)

ⓒ dimension = 4" (100) (regularly furnished) consisting of nipple and Adjus-to-Wall coupling permitting adjustment from 3" (76) min. to 4" (100) max.

NOTE: Dimensions shown in parentheses are in millimeters.

REV.	DATE	DESCRIPTION	BY	CKD. BY
H	10/09/99	Deleted Note	JJ	BS
G	7-1-98	Submittal Update	ASL	BS
F	1-23-98	Chg'd Callout	EMB	BS
E	3-15-96	Added Millimeters	EMB	BS

WEIGHT POUNDS

VOLUME CUBIC FEET

FIGURE NUMBER
0210,0220

H | DRAWING NUMBER S0210 | SIZE A | SCALE: NONE | DATE: 2-28-86 | APPROVED BY: | CHECKED BY: CR | DRAWN BY: CM | 0210,0220 | FIGURE NUMBER

DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCE AND CHANGE WITHOUT NOTICE
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SMITH® JAY R. SMITH MFG. CO.®
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CUSTOMER DRIVEN
MEMBER OF:

LOCATION

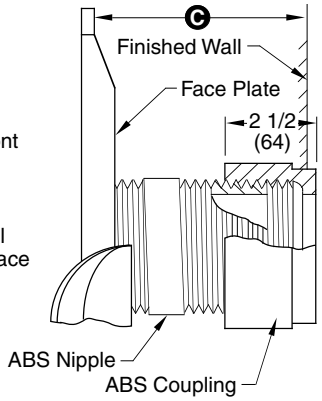
MODIFICATIONS & VARIATIONS

Ⓒ DIMENSION - ADJUS-TO-WALL TYPE OUTLET CONNECTION

The Smith Adjus-to-Wall outlet connection provides adjustment at the face of the wall at the time the fixture is set; thus, compensating for wall construction variations. The Ⓒ dimension is measured from the front of the face plate to the finished wall. To properly determine the length of nipple required, deduct 1" (25) from the Ⓒ dimension. When the Ⓒ dimension exceeds 7" (180), the -M40 Wide Pipe Chase Support is recommeded. The Adjus-to-Wall coupling will provide 1/2" (13) horizontal adjustment in either direction with the coupling extended 5/16" (8) past face of the finished wall.

Ⓒ dimension = 4" (100) (regularly furnished) consisting of nipple and adjus-to-wall coupling permitting adjustment from 3" (76) min. to 4" (100) max.

*ABS (Regularly Furnished) other length PVC.



NIPPLE LENGTHS AVAILABLE

LENGTH	MIN Ⓒ	MAX
2 1/2 (64)	2 1/4 (57)	3 1/4 (83)
*3 1/4 (83)	3 (76)	4 (100)
*8 1/4 (210)	8 (205)	9 (230)
10 (255)	9 3/4 (250)	10 3/4 (275)
12 (305)	11 3/4 (300)	12 3/4 (325)
15 (380)	14 3/4 (376)	15 3/4 (400)
18 (455)	17 3/4 (450)	18 3/4 (475)

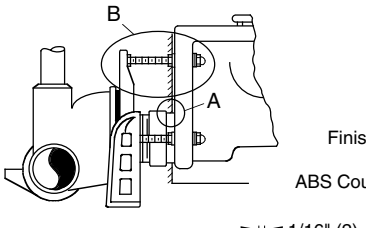
NOTE: When nipple lengths between 3 1/4" (83) and 8 1/4" (210) are specified, the 8 1/4" (210) nipple will be supplied. Nipple must be cut to specified length by others.

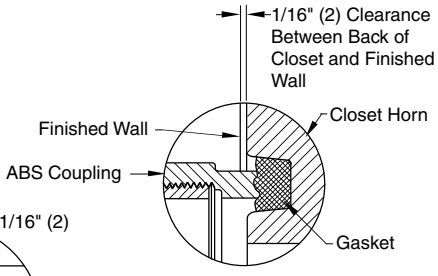
RECOMMENDED SETTING OF CLOSET OUTLET CONNECTION AND FIXTURE STUDS

Manufacturers have slight differences in the depth of the closet horn and flange thickness of their closets. Usually the fixture support closet connection should extend 5/16" (8) beyond face of finished wall (Dimension "R") and the fixture studs 2 1/4" (57) (Dimension "X"). For exact dimensions please use the formulas below.

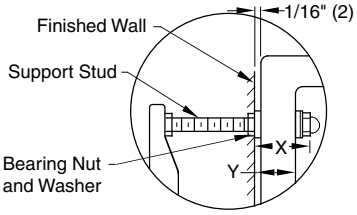
DETAIL A Formula for "R" is: S +1/16" (2) - D = R.
S = Depth of closet horn
1/16" (2) = Distance closet is to set away from finished wall.
D =1/2" (13) for felt gasket and 3/8" (10) for neoprene gasket.
R = Distance coupling should extend beyond finished wall.
NOTE: When the fixture is installed, closet gasket must be compressed sufficiently to assure a gas and water-tight seal.

DETAIL B Formula for "X" is: Y + 1/16" (2) + 9/16" (14) = X.
Y = Thickness of closet wall flange.
1/16" (2) = Distance closet is to set away from finished wall.
X = Distance supporting stud should extend beyond finished wall.
NOTE: Bearing nuts and washers must be set to take full loading from the fixture allowing 1/16" (2) clearance between fixture and wall.



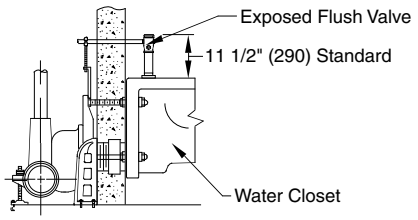


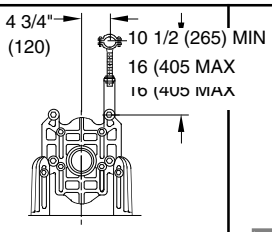
DETAIL A



DETAIL B

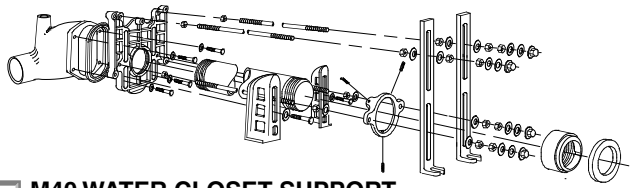
NOTE: Dimensions shown in parentheses are in millimeters.



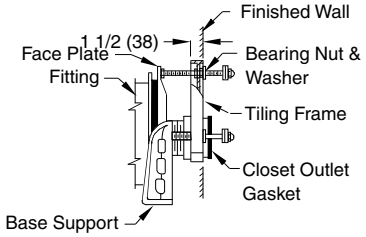


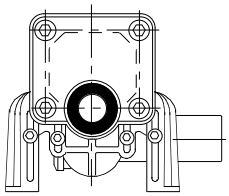
Provides support and alignment for the supply pipe to an exposed flush valve; must be specified for either 1" (25) copper tube or 1" (25) iron pipe.

SUFFIX -M12 EXPOSED FLUSH VALVE SUPPLY SUPPORT



-M40 WATER CLOSET SUPPORT FOR WIDE PIPE CHASE (USE WHEN Ⓒ DIMENSION EXCEEDS 7" (180))

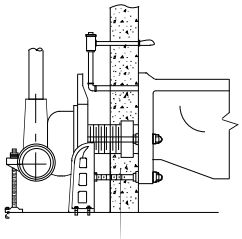




SUFFIX -M13 TILING FRAME - POLYSTYRENE

CONCEALED FLUSH VALVES

A concealed flush valve when used with a blowout water closet support will not clear the face plate. Therefore 4 1/2" (115) to 6 1/2" (165) is required from back of wall to face plate to permit the installation of the concealed flush valve piping.



REV.	DATE	DESCRIPTION	BY	CKD. BY
C	12-10-03	Revised Notes	RN	CL
B	6-1-95	Added Millimeters	EMB	BS
A	7-1-93	Submittal Update	EMB	BS

WEIGHT POUNDS | VOLUME CUBIC FEET

FIGURE NUMBER
0200/0300 Series Back Sheet

C | DRAWING NUMBER S0200BS | SIZE A | SCALE: NONE | DATE: 2-28-86 | APPROVED BY: JD | CHECKED BY: CR | DRAWN BY: VGD | FIGURE NUMBER 0200/0300 Series Back Sheet

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P-2/P-2A Flushometer

ECOS® SENSOR FLUSHOMETER

ECOS 8186-0.125-L/OR

CODE NUMBER

3370425

DESCRIPTION

0.125 gpf, Polished Chrome Finish, Fixture Connection Top Spud, Single Flush, Less Override, Battery, ECOS® Exposed Sensor Urinal Flushometer.

DETAILS

- Flush Volume: 0.125 gpf (0.5 Lpf)
- Finish: Polished Chrome (CP)
- Power Type: Battery ()
- Battery Life: 6 years
- Valve: Diaphragm
- Valve Body Material: Semi-red Brass
- Fixture Type: Urinal
- Fixture Connection: Top Spud
- Rough-In Dimension: 11 ½" (292mm)
- Spud Coupling: ¾" (19mm)
- Supply Pipe: ¾" (19mm)
- Override: Less (L/OR)

FEATURES

- Synthetic rubber seals for chloramine resistance
- “Low Battery” Flashing LED
- Sweat solder adapter with cover tube and cast wall flange with set screw
- Flex Tube Diaphragm designed for improved life and reduced maintenance
- Stop Seat and Vacuum Breaker Molded from PERMEX® Rubber Compound for Chloramine resistance
- Infrared Sensor with Multiple-focused, Lobular Sensing Fields for high and low target detection
- Fixed Metering Bypass and No External Volume Adjustment to Ensure Water Conservation
- Engineered Metal Cover with replaceable Lens Window
- Four (4) Size AA alkaline Batteries included
- Courtesy Flush® Override Button (optional)
- ADA Compliant Sloan ECOS® Battery powered Infrared Sensor for automatic “No Hands” operation
- 3/4” IPS screwdriver Bak-Chek® angle stop with vandal resistant stop cap

PERMEX® Synthetic Rubber Diaphragm with Dual Filtered Fixed Bypass

VIDEOS

PVD Special Finishes

Variation Not Shown: Brushed Nickel

COMPLIANCES & CERTIFICATIONS

(ADA Compliant, BAA Compliant, BREEAM Materials Credit, BREEAM Water Credit, Carbon Neutral, cUPC Certified, cUPC Green Certified, EPD, Green Globes Materials & Resources Credit, Green Globes Water Credit, HPD, LEED Materials & Resources EPD Credit, LEED Materials & Resources HPD Credit, LEED V4 Water Efficiency Credit, Satisfies LEED Credits, WaterSense Listed, WELL Building Standards)

RECOMMENDED SPECIFICATION

Valve Body, Cover, Tailpiece and Control Stop shall be in conformance with ASTM Alloy Classification for Semi- Red Brass. Valve shall be in compliance with the applicable sections of ASSE 1037 and ANSI/ASME 112.19.2.

ELECTRICAL SPECIFICATIONS

- Battery Life: 6 years

VALVE OPERATING PRESSURE (FLOWING)

15–80 PSI (103–552 kPa). Specific fixtures may require greater minimum flowing pressure - consult manufacturer requirements.

DOWNLOADS

- Sloan ECOS Valve Installation Instructions
- Sloan Ecos Valve (Spanish) Installation Instructions
- Control Stop Repair and Maintenance Guide
- Flush Connections Flanges Repair and Maintenance Guide
- Tail Piece Repair and Maintenance Guide
- ECOS Repair and Maintenance Guide
- Flushometer Pressure gauges

Sloan 10500 Seymour Ave, Franklin Park, IL 60131
Phone: 800.982.5839 • Fax: 800.447.8329 • sloan.com

- Additional Downloads

NOTES

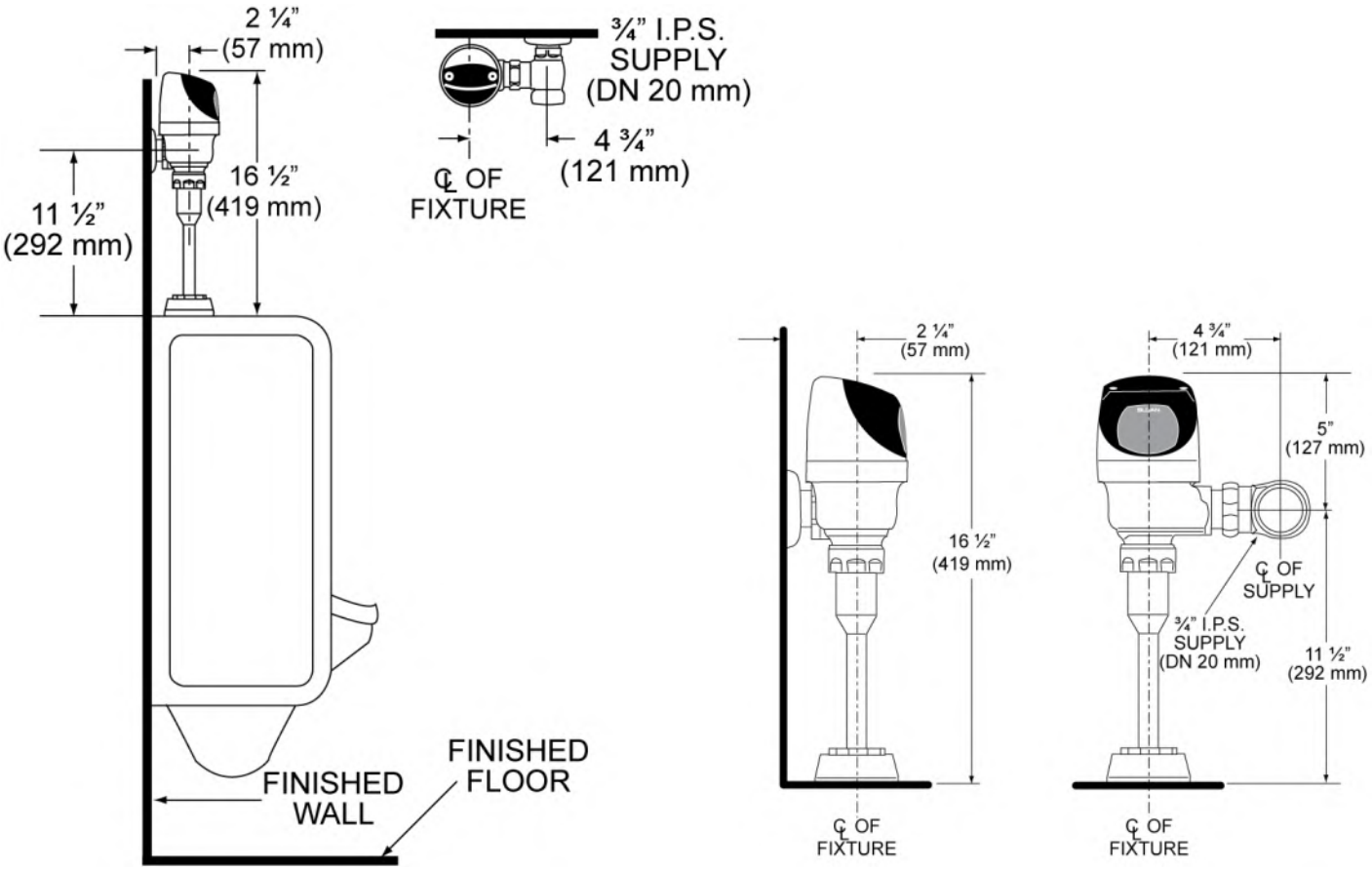
All information contained within this document subject to change without notice.

Looking for other variations of the ECOS 8186 product? View the general spec sheet with all options.

Find a compatible urinal for this flushometer.
Find a compatible water closet for this flushometer.

WaterSense compliant when used with a WaterSense compliant fixture

ROUGH-IN



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Phone: 800.982.5839 • Fax: 800.447.8329 • sloan.com

American Standard

BARRIER FREE

WASHBROOK® FloWise® UNIVERSAL URINAL
VITREOUS CHINA

WASHBROOK® FloWise® UNIVERSAL URINAL

- Vitreous china
- Ultra High Efficiency, Low Consumption. Operates in the range of 0.125gpf to 1.0gpf (0.5 Lpf to 3.8 Lpf)
- Flushing rim
- Elongated 14" rim from finished wall
- Washout flush action
- Extended sides for privacy
- 3/4" inlet spud
- Outlet connection threaded 2" inside (NPTF)
- 2 wall hangers
- Fixture only
- Strainer included
- Meets ASME flush requirements at 0.125 to 1.0 gpf

❏ **6590.001** Universal Top spud
❏ **6515.001** Universal Back spud

Nominal Dimensions:
360 x 480 x 664mm
(14-1/8" x 18-7/8" x 26-1/8")

Recommended working pressure – between 20 psi at valve when flushing and 80 psi static

Compliance Certifications -
Meets or Exceeds the Following Specifications:
- ASME A112.19.2-2008/CSA B45.1-08 for Vitreous China Fixtures

SEE REVERSE FOR ROUGHING-IN DIMENSIONS

To Be Specified:
❏ Color: ❏ White
❏ Flush Valve:

1.0 gpf Flush Valve: Sensor-Operated:
- ❏ American Standard Selectronic® #6063.101.002 DC Power (Top Spud)
- ❏ American Standard Selectronic® #6062.101.002 AC Power (Back Spud)

1.0 gpf Flush Valve: Manual-Operated:
- ❏ American Standard # 6045.101.002

0.5 gpf Flush Valve: Sensor-Operated:
- ❏ American Standard Selectronic® #6063.051.002 DC Power (Top Spud)
- ❏ American Standard Selectronic® #6062.051.002 AC Power (Back Spud)

0.5 gpf Flush Valve: Manual-Operated:
- ❏ American Standard #6045.051.002

0.125 gpf Flush Valve: Sensor-Operated:
- ❏ American Standard Selectronic® #6063.013.002 DC Power (Top Spud)
- ❏ American Standard Selectronic® #6062.013.002 AC Power (Back Spud)

0.125 gpf Flush Valve: Manual-Operated:
- ❏ American Standard #6045.013.002

WaterSense Meets EPA Criteria
Certified by IAPMO R&T
When used with 0.125 gpf or 0.5 gpf urinal flush valves

© 2015 AS America Inc.

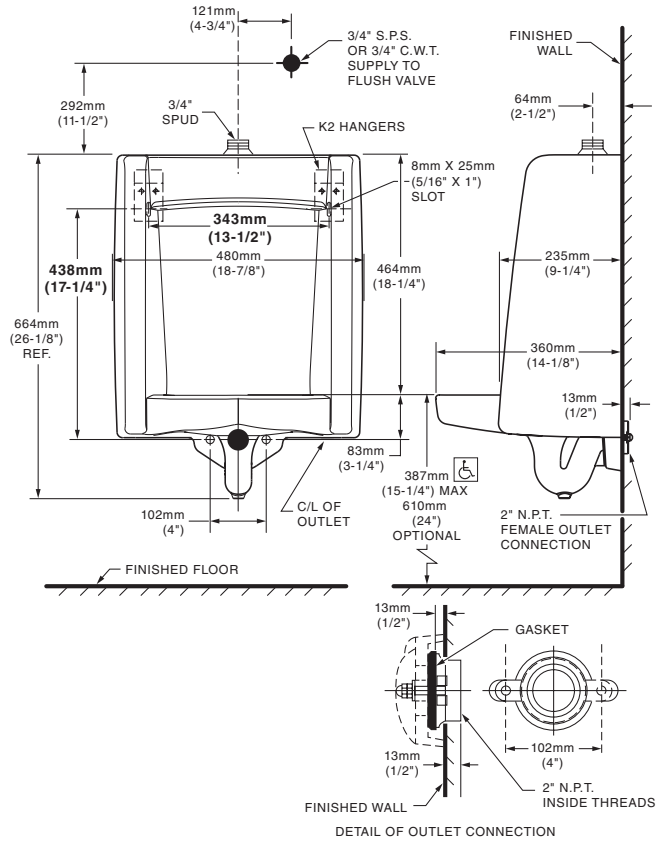
American Standard

BARRIER FREE

WASHBROOK® FloWise® UNIVERSAL URINAL

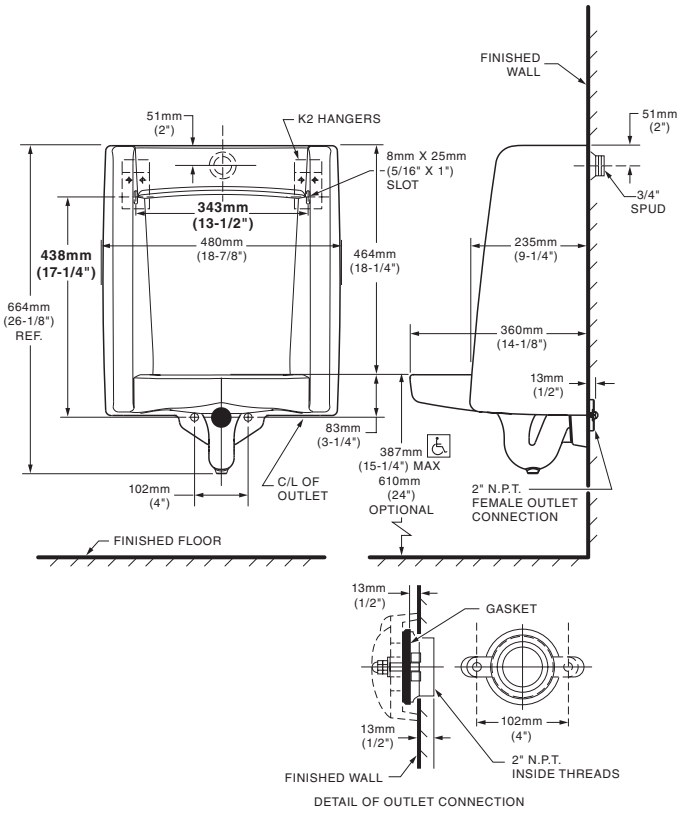
VITREOUS CHINA

6590.001 TOP SPUD



DETAIL OF OUTLET CONNECTION

6515.001 BACK SPUD



DETAIL OF OUTLET CONNECTION

MEETS THE AMERICANS WITH DISABILITIES ACT GUIDELINES AND ANSI A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES - CHECK LOCAL CODES.

- When installed so top of rim is 387mm (15-1/4") from finished floor.

NOTES:
FLUSH VALVE NOT INCLUDED AND MUST BE ORDERED SEPARATELY.
PROVIDE SUITABLE REINFORCEMENT FOR ALL WALL SUPPORTS.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.19.2. These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.

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Touchless Faucets
116.606.AB.1

P-3 Faucet

CHICAGO FAUCETS
Geberit Group

Product Type

Touch-free, programmable faucet with above-deck electronics

Features & Specifications

- Single hole
- Vandal Proof Pressure compensating Econo-Flo™ non-aerating laminar spray 0.5 GPM
- E-Tronic® 40 module kit
- ECAST® design provides durable cast brass construction with total lead content equal to or less than 0.25% by weighted average
- Complies with the requirements of the Buy American Act of 1933.
- CFNow! Item Ships in 3 Days

Performance Specification

- Rated Operating Pressure: 20-125 PSI
- Rated Operating Temperature: 40-140°F

Warranty

- 3-Year Limited Electronics and Solenoid Warranty
- 5-Year Limited Faucet Warranty
- 1-Year Limited Finish Warranty
- 5-Year Limited Mechanical Warranty

Codes & Standards

- ASME A112.18.1/CSA B125.1
- ADA ANSI/ICC A117.1
- Complies with CALGreen requirements
- NSF/ANSI 372 Low Lead Content
- NSF/ANSI 61, Section 9

Job Name _____

Item Number _____

Section/Tag _____

Model Specified _____

Architect _____

Engineer _____

Contractor _____

[ ] Submitted as Shown [ ] Submitted with Variations

Date _____

ECAST

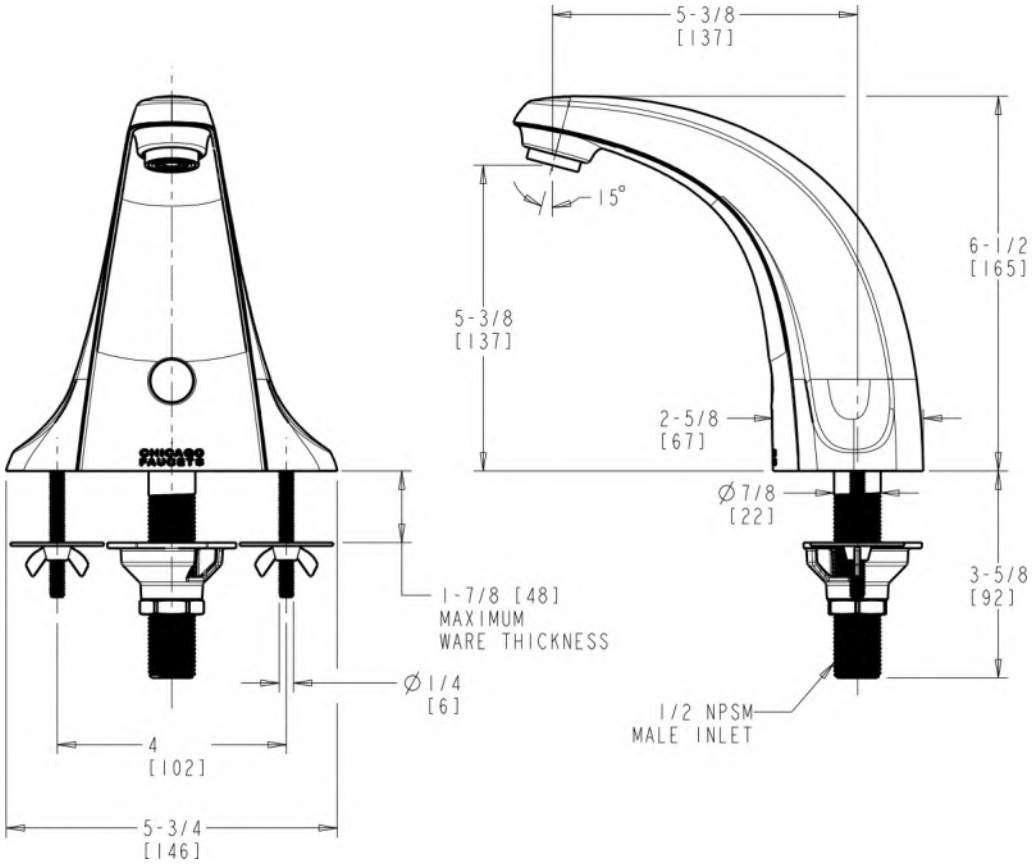
ECAST products are intended for installation where state laws and local codes mandate lead content levels or in any location where lead content is a concern.

2100 South Clearwater Drive
Des Plaines, IL
P: 847/803-5000
F: 847/803-5454
Technical: 800/TEC-TRUE
www.chicagofaucets.com

116.606.AB.1

Architect/Engineer Specification

Chicago Faucets No. 116.606.AB.1, E-Tronic™ 40 electronic faucet with dual-beam infrared sensor. Traditional-style spout, chrome plated. Single-hole deck mount. 0.5 GPM (1.9 L/min) vandal-proof, pressure compensating, Econo-Flo, non-aerating spray. Single supply for tempered water. 6-volt lithium CRP2 battery included. Multiple field-adjustable modes and ranges. Compatible with Chicago Faucets Commander™ handheld programming unit. Compliant to CALGreen standard: .2 gallons per cycle maximum when used with supplied E2805 outlet. ECAST® construction with less than 0.25% lead content by weighted average. CALGreen compliant. This product meets ADA ANSI/ICC A117.1 requirements and is tested and certified to industry standards: ASME A112.18.1/CSA B125.1, Certified to NSF/ANSI 61, Section 9 by CSA, California Health and Safety Code 116875 (AB1953-2006), Vermont Bill S.152, NSF/ANSI 372 Low Lead Content, and California Green Building Standards Code (CALGreen).



Operation and Maintenance

Installation should be in accordance with local plumbing codes. Flush all pipes thoroughly before installation. After installation, remove spout outlet or flow control and flush faucet thoroughly to clear any debris. Care should be taken when cleaning the product. Do not use abrasive cleaners, chemicals or solvents as they can result in surface damage. Use mild soap and warm water for cleaning and protecting the life of Chicago Faucet products. For specific operation and maintenance refer to the installation instructions and repair parts documents that are located at www.chicagofaucets.com.

Chicago Faucets, member of the Geberit Group, is the leading brand of commercial faucets and fittings in the United States, offering a complete range of products for schools, laboratories, hospitals, office buildings, food service, airports and sport facilities. Call 1.800.TECTRUE or 1.847.803.5000 Option 1 for installation or other technical assistance.

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Des Plaines, IL
P: 847/803-5000
F: 847/803-5454
Technical: 800/TEC-TRUE
www.chicagofaucets.com

Product Specification

Job Name _____

Job Location _____

Engineer _____

Approval _____

Contractor _____

Approval _____

Contractor's P.O. No. _____

Representative _____

LEAD FREE*

Series LFe480 and LFG480

Lavatory Tempering Valve

LFe480-00

LFe480-10

LFe480-50

Advanced Thermal Actuation

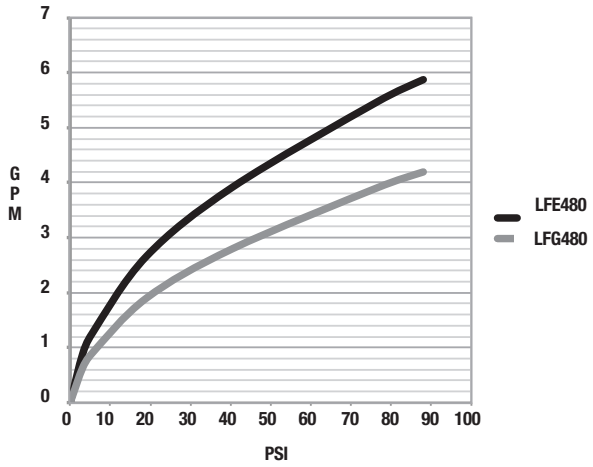
Features

- Adjustable temperature selection with locknut to prevent tampering
- Advanced thermal actuator improves performance
- Temperature controls to ASSE 1070, down to 0.5 gpm for LFe480 & 0.25 gpm for LFG480
- Lead Free* brass body for durability & to comply with Lead Free* installation requirements
- Corrosion resistant internal components for extended life
- Integral checks with screens prevents cross flow and filter out debris
- Factory set to 105°F (41°C)

Specifications

Connections	See ordering code
Maximum Operating Pressure	125 psi (861 kPa)
Maximum Hot Water Temperature	180°F (82°C)
Minimum Hot Water Supply Temperature	5°F (3°C) above set point+
Hot Water Inlet Temperature Range	120 – 180°F (49 – 82°C)
Cold Water Inlet Temperature Range	40 – 80°F (4 – 27°C)
Temperature Adjustment Range	80 – 120°F (27 – 49°C)
Minimum Flow	
LFe480	0.5 gpm (1.9 lpm)
LFG480	0.25 gpm (1.0 lpm)
Listing	ASSE 1070, IAPMO cUPC, NSF61-G
Approval	CSA B125.3

Flow Capacity



NOTICE

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

*** The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.**

+ With Equal Pressure

Powers product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Powers Technical Service. Powers reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Powers products previously or subsequently sold.

POWERS™

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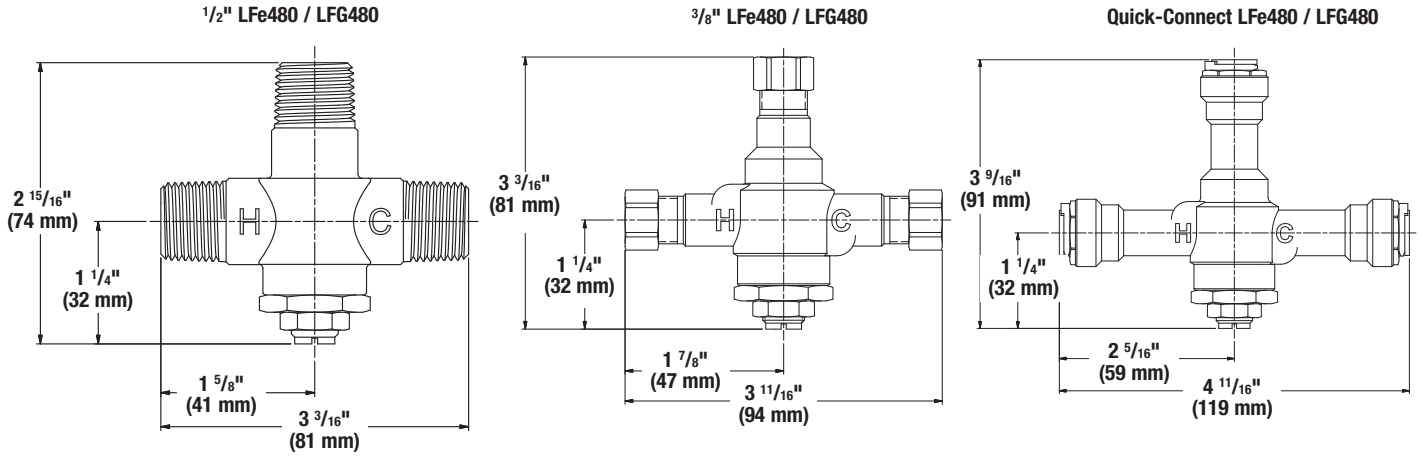
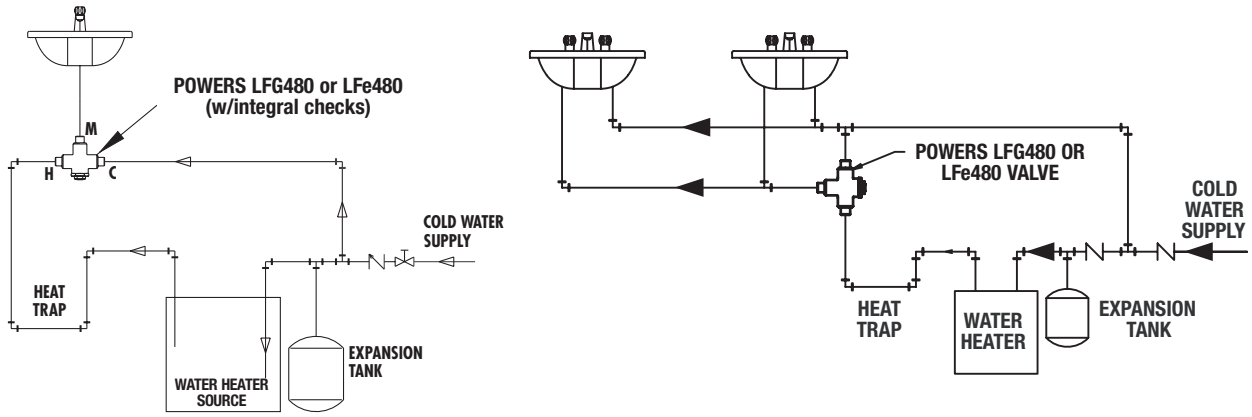
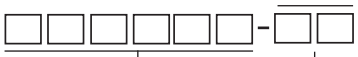
Dimensions



Piping Diagram



Ordering Code



	Order Code
0.25 gpm minimum flow	LFG480
0.50 gpm minimum flow	LFE480
½" NPT Rough Bronze Finish	00
½" NPT Chrome Plated Finish	01
⅜" Compression Rough Bronze Finish	10
⅜" Compression Chrome Plated Finish	11
⅜" Quick-Connect Rough Bronze Finish	50
⅜" Quick-Connect Chrome Plated Finish	51

Typical Specification

Lavatory tempering valve shall be ASSE 1070 and cUPC listed. All internal components shall be from corrosion resistant material. The valve must control each performance standard down to 0.25 gpm (1.00 lpm) for LFG480 and 0.5 gpm (1.90 lpm) for LFe480.

Capacity of the valve must be 3 gpm (11 lpm) @ 45psi differential or 4 gpm (15 lpm) @ 45psi differential. Thermostatic lavatory tempering valve shall be constructed using Lead Free* brass material which shall comply with state codes and standards, where applicable requiring reduced lead content. Control temperature must be adjustable between 80–120° F (32–43°C) with a locking nut to prevent unauthorized or accidental adjustment. The valve shall contain integral checks to prevent cross flow and inlet screens to filter debris. The valve shall be a Powers Series LFe480 or LFG480.

POWERS™

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Canada: Tel: (905) 332-4090 • Fax: (905) 332-7068 • PowersControls.ca
Latin America: Tel: (52) 81-1001-8600 • PowersControls.com

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McGuire Manufacturing Co., Inc.
60 Grandview Court
P.O. Box 746 • Cheshire, CT 06410
203-699-1801 • Fax: 203-699-1813
www.mcguiremfg.com

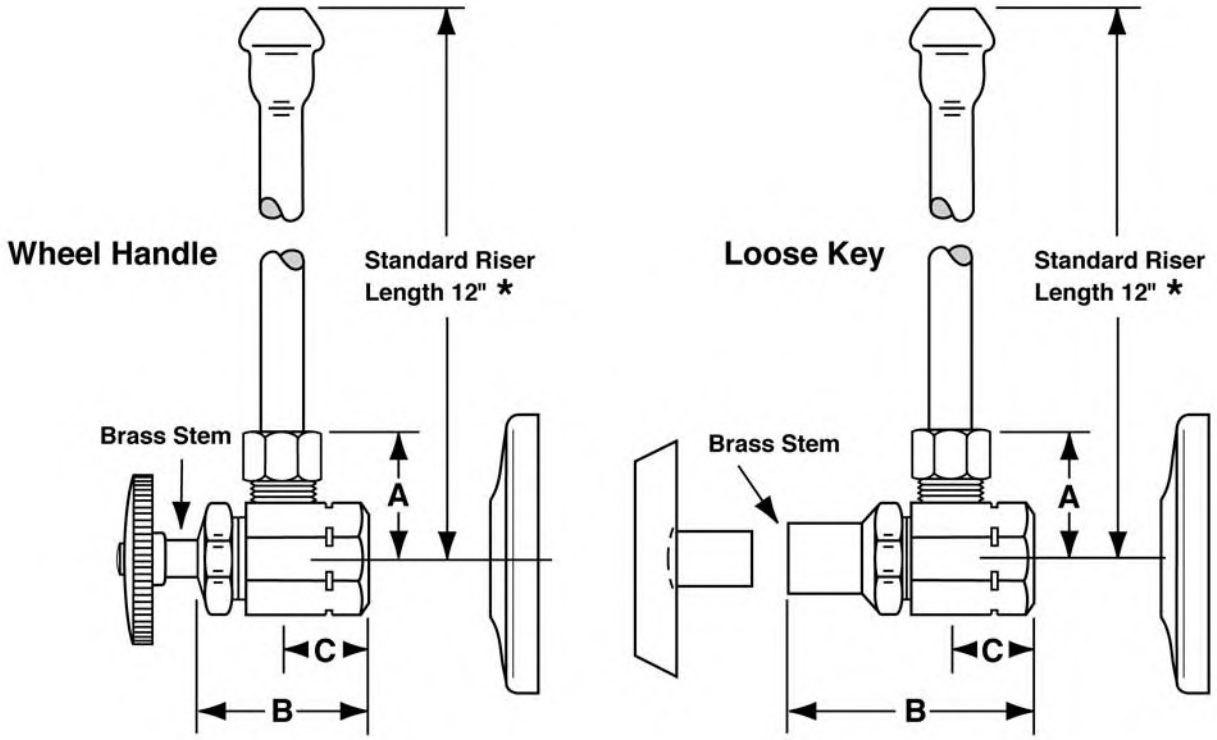
PRODUCT SPECIFICATION

Part No.

LF2165, LF2165LK, LF2167, LF2167LK

Lavatory Supply 1/2" I.P.S. x O.D.

Job Name: _____ **Submittal Number:** _____



NO.	DESCRIPTION	ROUGHING MEASUREMENTS		
		A	B	C
LF2165	1/2" I.P.S. x 3/8" O.D.	1-3/16"	1-1/2"	3/4"
LF2165LK	1/2" I.P.S. x 3/8" O.D.	1-3/16"	2-1/4"	3/4"
LF2167	1/2" I.P.S. x 1/2" O.D.	1-3/16"	1-1/2"	3/4"
LF2167LK	1/2" I.P.S. x 1/2" O.D.	1-3/16"	2-1/4"	3/4"

P-3/P-3A

LOW-LEAD UPC

LK designates Loose Key

* See options and accessories section for details on product variations.

Specifications:

Supply kit shall include lead free chrome plated brass supply stop valves with full turn brass stem, no plastic, (12, 15, 20) inch chrome plated risers and (shallow, deep, bell) (steel, brass) or (forged brass with set screw) flange. Inlet shall be (3/8, 1/2) inch (IPS, compression). Outlet shall be (3/8, 1/2) inch compression. Supply kit shall be McGuire _____. Supply kit shall be certified by recognized authority and bear manufacturer and testing mark.

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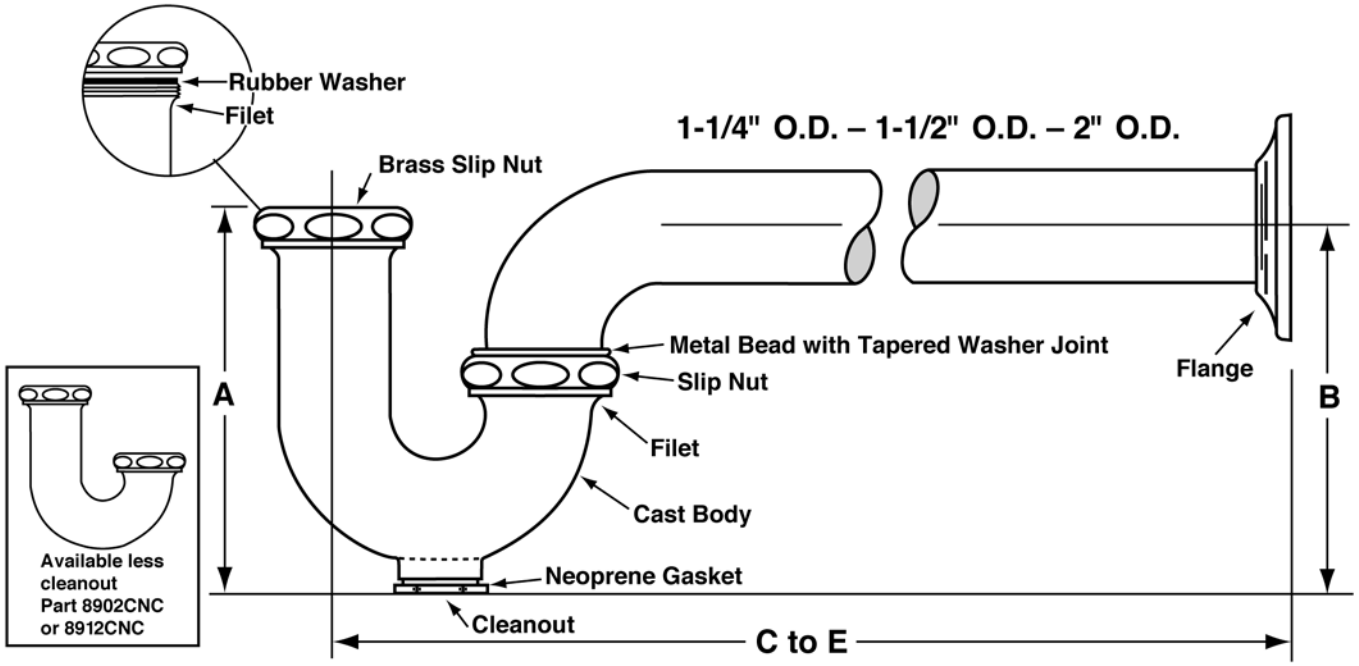
McGuire Manufacturing Co., Inc.
60 Grandview Court
P.O. Box 746 • Cheshire, CT 06410
203-699-1801 • Fax: 203-699-1813
www.mcguiremfg.com

PRODUCT SPECIFICATION

Part No.
8872, 8902, 8902CNC, 8912, 8912CNC, 8903, 8904

Cast Body P-Trap With or Without Cleanout

Job Name: _____ **Submittal Number:** _____



PROFESSIONAL LINE

ROUGHING MEASUREMENTS					
NO.	TRAP DIMENSIONS		A	B	C to E
	INLET	OUTLET			
8872	1-1/4"	1-1/4"	5"	4-1/2"	11"
8902	1-1/4"	1-1/2"	5"	4-1/2"	12"
8902CNC	1-1/4"	1-1/2"	4-5/8"	4-1/8"	12"
8912	1-1/2"	1-1/2"	5"	4-1/2"	12"
8912CNC	1-1/2"	1-1/2"	4-5/8"	4-1/8"	12"
8903	1-1/2"	2"	5"	6"	13"
8904	2"	2"	5"	6"	13"

FED SPEC W.W.P. 541
CAST BRASS P TRAP
MINIMUM SEAL 2"

See options and accessories section for details on product variations.

ASME A112.18.1-2005/CSA

Specifications:

P-Trap shall be chrome plated cast brass body (with, without) cleanout, with 17 gauge seamless tubular wall bend, cast brass slip nuts. Reducing washers shall be used with reducing cast brass nut. With (shallow, deep, bell) (steel, brass) or (forged brass with set screw) flange. P-Trap shall be McGuire "Classic" Professional Line (8872C, 8902C, 8912C, 8903, 8904). Trap shall be certified by CSA or other recognized testing authority. P-Trap shall bear manufacturer and testing mark.

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American Standard
Style That Works Better

BARRIER FREE

OVALYN UNIVERSAL ACCESS™ UNDERCOUNTER SINK

VITREOUS CHINA

OVALYN UNIVERSAL ACCESS™ SINK

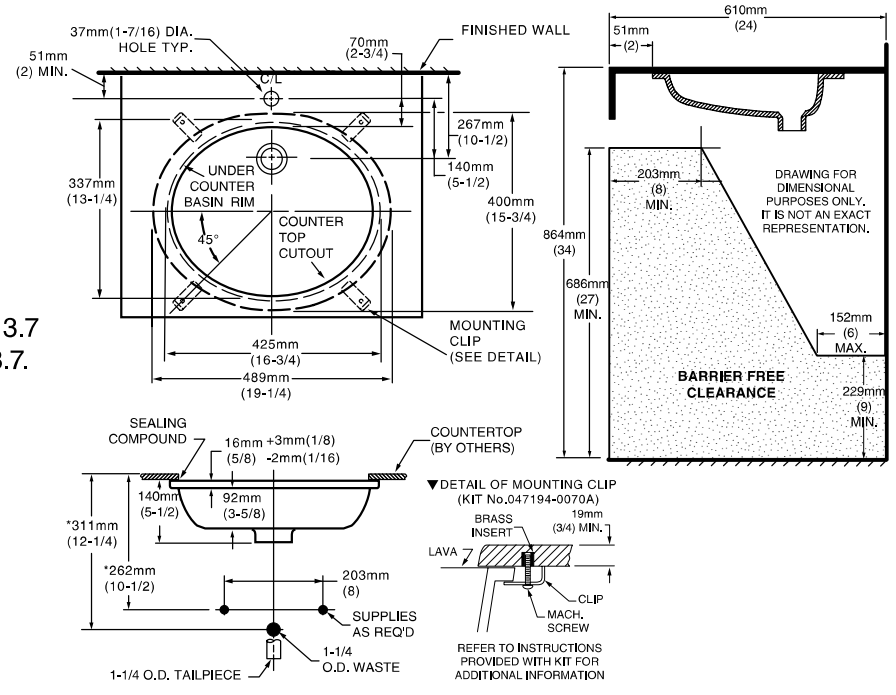
- Made from vitreous china
- Unglazed rim for under counter mount
- Rear overflow
- Supplied with mounting kit (047194-0070A) and template

❑ **9482.000**

Nominal Dimensions:
489 x 400mm
(19-1/4" x 15-3/4")

Bowl sizes:
425mm (16-3/4") wide
337mm (13-1/4") front to back
140mm (5-1/2") deep
102mm (4") bowl depth

Compliance Certifications - Meets or Exceeds the Following Specifications:
- ASME A112.19.2M for Vitreous China Fixtures
- CAN/CSA B45 series
- 1995 National Building Code, section 3.7 and CAN/CSA-B651-M90 and OBC 3.7.



To Be Specified:
- ❑ Color: ❑ White ❑ Bone ❑ Linen ❑ Silver ❑ Fawn Beige ❑ Black
- ❑ Faucet*:
- ❑ Faucet Finish:
- ❑ Supplies:
- ❑ 1-1/4" Trap:

* See faucet section for additional models available

For Universal Design Options, top of counter may be mounted at 813mm (32") minimum from finished floor to meet ADA and ANSI A117.1 requirements. A 838mm (33") minimum mounting height is required for Ontario. Check local codes for heights and faucet handles requirements.

MEETS THE AMERICANS WITH DISABILITIES ACT GUIDELINES AND ANSI A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES - CHECK LOCAL CODES.
Countertop 864mm (34") from finished floor. Lavatory installed 51mm (2") MIN. from front edge of countertop. Countertop thickness to be 25mm (1") maximum.

NOTES:
* DIMENSIONS SHOWN FOR LOCATION OF SUPPLIED AND "P" TRAP ARE SUGGESTED.
▼ UNDERCOUNTER MOUNTING KIT SUPPLIED WITH BASIN.
FITTINGS NOT INCLUDED WITH FIXTURE AND MUST BE ORDERED SEPARATELY.
USE ENCLOSED TEMPLATE FOR COUNTERTOP CUTOUT
SEALING COMPOUND SUPPLIED BY OTHERS.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.19.2. These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.

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MECHANICAL FAUCETS

P-4 Faucet

1100-GN8AE35-317AB

Manual Faucets

Product Type

Deck Mounted 8" Fixed Centers Hot and Cold Water Sink Faucet

Features & Specifications

- 8" Fixed Centers
- 1.5 GPM (5.7 L/min) Aerator
- 4" Vandal Proof Wristblade
- Quaturn
- 1/2" NPSM Supply Inlets and Coupling Nut for 3/8" or 1/2" Flexible Riser
- ECAST® design provides durable construction with total lead content equal to or less than 0.25% by weighted average
- CFNow! Item Ships in 3 Days

Performance Specification

- Rated Operating Pressure: 20-125 PSI
- Rated Operating Temperature: 40-140ºF

Warranty

- Lifetime Limited Faucet Warranty
- 5-Year Limited Cartridge Warranty
- 1-Year Limited Finish Warranty

Codes & Standards

- ASME A112.18.1/CSA B125.1
- Certified to NSF/ANSI 61, Section 9 by CSA
- California Health and Safety Code 116875 (AB1953-2006)
- Vermont Bill S.152
- NSF/ANSI 372 Low Lead Content
- ADA ANSI/ICC A117.1
- CALGreen

Job Name _____

Item Number _____

Section/Tag _____

Model Specified _____

Architect _____

Engineer _____

Contractor _____

[ ] Submitted as Shown [ ] Submitted with Variations

Date _____

ECAST

ECAST products are intended for installation where state laws and local codes mandate lead content levels or in any location where lead content is a concern.

2100 South Clearwater Drive
Des Plaines, IL
P: 847/803-5000
F: 847/803-5454
Technical: 800/TEC-TRUE
www.chicagofaucets.com

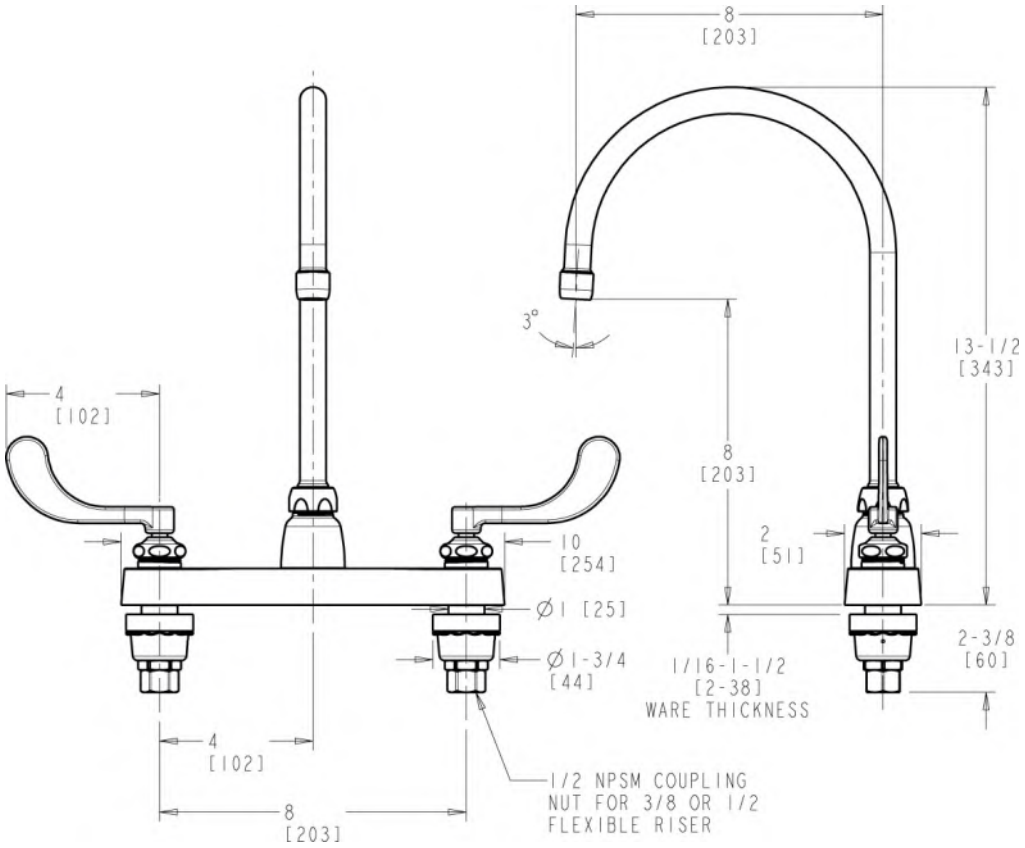
1100-GN8AE35-317AB

P-4 Faucet

Manual Faucets

Architect/Engineer Specification

Chicago Faucets No. 1100-GN8AE35-317AB, Sink Faucet for hot and cold water, deck-mounted with 8" fixed centers, chrome plated. Rigid/swing gooseneck spout, 8" center-to-center. 1.5 GPM (5.7 L/min) pressure compensating Softflo aerator. 4" metal, vandal-proof, wristblade handles with sixteen-point, tapered broach and secured blue and red index buttons. Quaturn™ rebuildable compression cartridge, opens and closes 90°, closes with water pressure, features square, tapered stem. 1/2" NPSM supply inlets and coupling nut for 3/8" or 1/2" flexible riser. Mounting hardware included. ECAST® construction with less than 0.25% lead content by weighted average. CALGreen compliant. This product meets ADA ANSI/ICC A117.1 requirements and is tested and certified to industry standards: ASME A112.18.1/CSA B125.1, Certified to NSF/ANSI 61, Section 9 by CSA, California Health and Safety Code 116875 (AB1953-2006), Vermont Bill S.152, NSF/ANSI 372 Low Lead Content, and California Green Building Standards Code (CALGreen).



Operation and Maintenance

Installation should be in accordance with local plumbing codes. Flush all pipes thoroughly before installation. After installation, remove spout outlet or flow control and flush faucet thoroughly to clear any debris. Care should be taken when cleaning the product. Do not use abrasive cleaners, chemicals or solvents as they can result in surface damage. Use mild soap and warm water for cleaning and protecting the life of Chicago Faucet products. For specific operation and maintenance refer to the installation instructions and repair parts documents that are located at www.chicagofaucets.com.

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Des Plaines, IL
P: 847/803-5000
F: 847/803-5454
Technical: 800/TEC-TRUE
www.chicagofaucets.com

Product Specification

Job Name _____ Contractor _____

Job Location _____ Approval _____

Engineer _____ Contractor's P.O. No. _____

Approval _____ Representative _____

LEAD FREE*

Series LFe480 and LFG480

Lavatory Tempering Valve

LFe480-00

LFe480-10

LFe480-50

Advanced Thermal Actuation

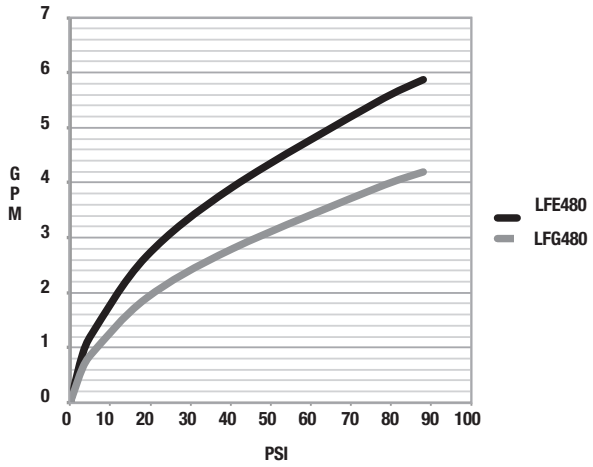
Features

- Adjustable temperature selection with locknut to prevent tampering
- Advanced thermal actuator improves performance
- Temperature controls to ASSE 1070, down to 0.5 gpm for LFe480 & 0.25 gpm for LFG480
- Lead Free* brass body for durability & to comply with Lead Free* installation requirements
- Corrosion resistant internal components for extended life
- Integral checks with screens prevents cross flow and filter out debris
- Factory set to 105°F (41°C)

Specifications

Connections	See ordering code
Maximum Operating Pressure	125 psi (861 kPa)
Maximum Hot Water Temperature	180°F (82°C)
Minimum Hot Water Supply Temperature	5°F (3°C) above set point+
Hot Water Inlet Temperature Range	120 – 180°F (49 – 82°C)
Cold Water Inlet Temperature Range	40 – 80°F (4 – 27°C)
Temperature Adjustment Range	80 – 120°F (27 – 49°C)
Minimum Flow	
LFe480	0.5 gpm (1.9 lpm)
LFG480	0.25 gpm (1.0 lpm)
Listing	ASSE 1070, IAPMO cUPC, NSF61-G
Approval	CSA B125.3

Flow Capacity



NOTICE

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

*** The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.**

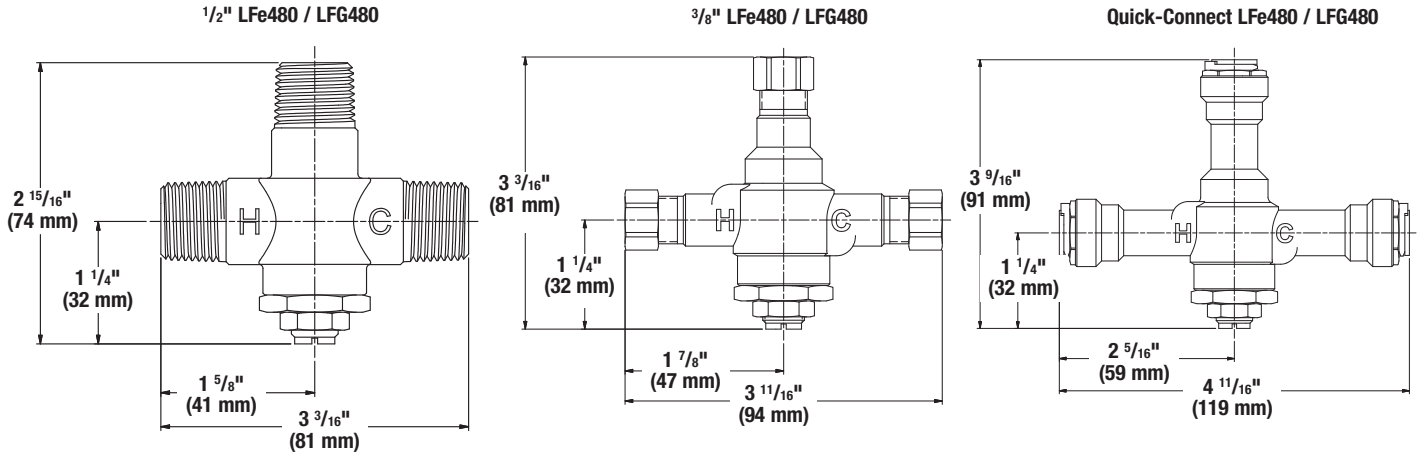
+ With Equal Pressure

Powers product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Powers Technical Service. Powers reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Powers products previously or subsequently sold.

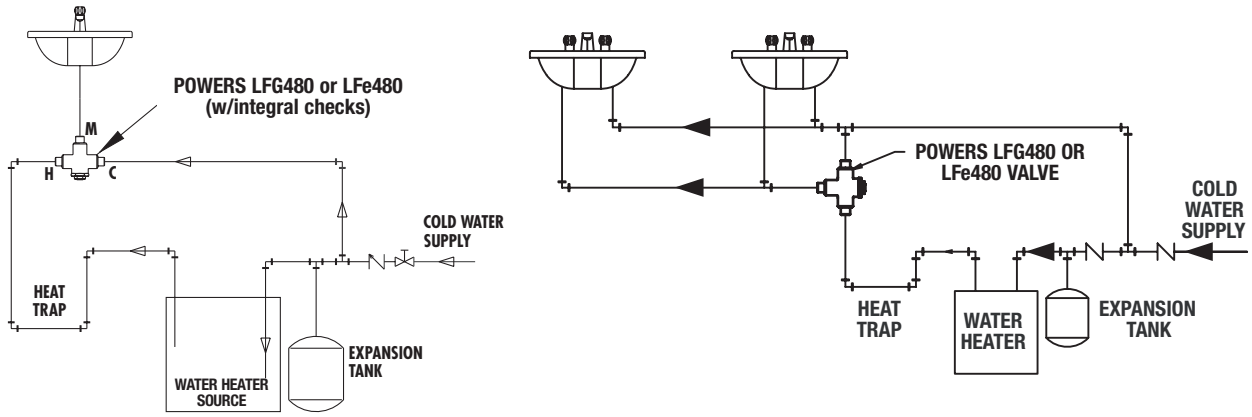
POWERS™

A WATTS Brand

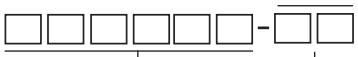
Dimensions



Piping Diagram



Ordering Code



Order Code

0.25 gpm minimum flow	LFG480
0.50 gpm minimum flow	LFE480
½" NPT Rough Bronze Finish	00
½" NPT Chrome Plated Finish	01
⅜" Compression Rough Bronze Finish	10
⅜" Compression Chrome Plated Finish	11
⅜" Quick-Connect Rough Bronze Finish	50
⅜" Quick-Connect Chrome Plated Finish	51

Typical Specification

Lavatory tempering valve shall be ASSE 1070 and cUPC listed. All internal components shall be from corrosion resistant material. The valve must control each performance standard down to 0.25 gpm (1.00 lpm) for LFG480 and 0.5 gpm (1.90 lpm) for LFe480.

Capacity of the valve must be 3 gpm (11 lpm) @ 45psi differential or 4 gpm (15 lpm) @ 45psi differential. Thermostatic lavatory tempering valve shall be constructed using Lead Free* brass material which shall comply with state codes and standards, where applicable requiring reduced lead content. Control temperature must be adjustable between 80–120° F (32–43°C) with a locking nut to prevent unauthorized or accidental adjustment. The valve shall contain integral checks to prevent cross flow and inlet screens to filter debris. The valve shall be a Powers Series LFe480 or LFG480.

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A WATTS Brand

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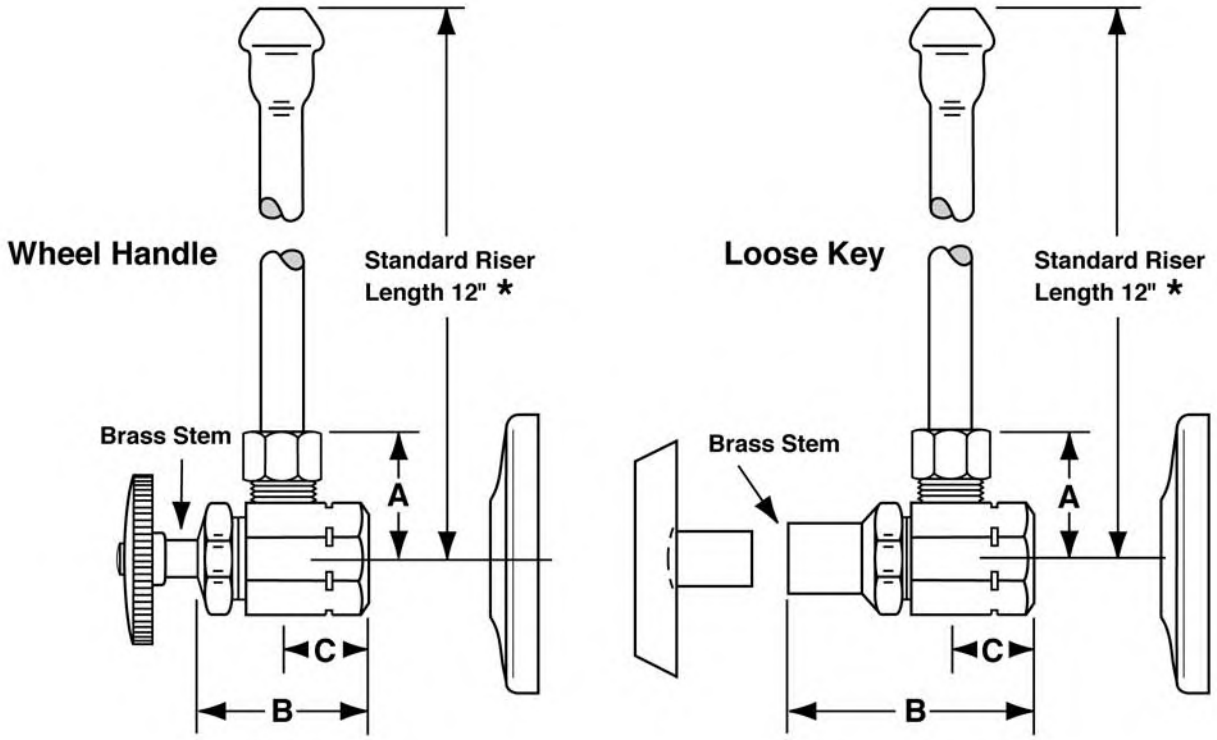
60 Grandview Court
P.O. Box 746 • Cheshire, CT 06410
203-699-1801 • Fax: 203-699-1813
www.mcguiremfg.com

PRODUCT SPECIFICATION

Part No.
LF2165, LF2165LK, LF2167, LF2167LK

Lavatory Supply 1/2" I.P.S. x O.D.

Job Name: _____ **Submittal Number:** _____



NO.	DESCRIPTION	ROUGHING MEASUREMENTS		
		A	B	C
LF2165	1/2" I.P.S. x 3/8" O.D.	1-3/16"	1-1/2"	3/4"
LF2165LK	1/2" I.P.S. x 3/8" O.D.	1-3/16"	2-1/4"	3/4"
LF2167	1/2" I.P.S. x 1/2" O.D.	1-3/16"	1-1/2"	3/4"
LF2167LK	1/2" I.P.S. x 1/2" O.D.	1-3/16"	2-1/4"	3/4"

P-4

LOW-LEAD UPC

LK designates Loose Key

* See options and accessories section for details on product variations.

Specifications:

Supply kit shall include lead free chrome plated brass supply stop valves with full turn brass stem, no plastic, (12, 15, 20) inch chrome plated risers and (shallow, deep, bell) (steel, brass) or (forged brass with set screw) flange. Inlet shall be (3/8, 1/2) inch (IPS, compression). Outlet shall be (3/8, 1/2) inch compression. Supply kit shall be McGuire _____. Supply kit shall be certified by recognized authority and bear manufacturer and testing mark.

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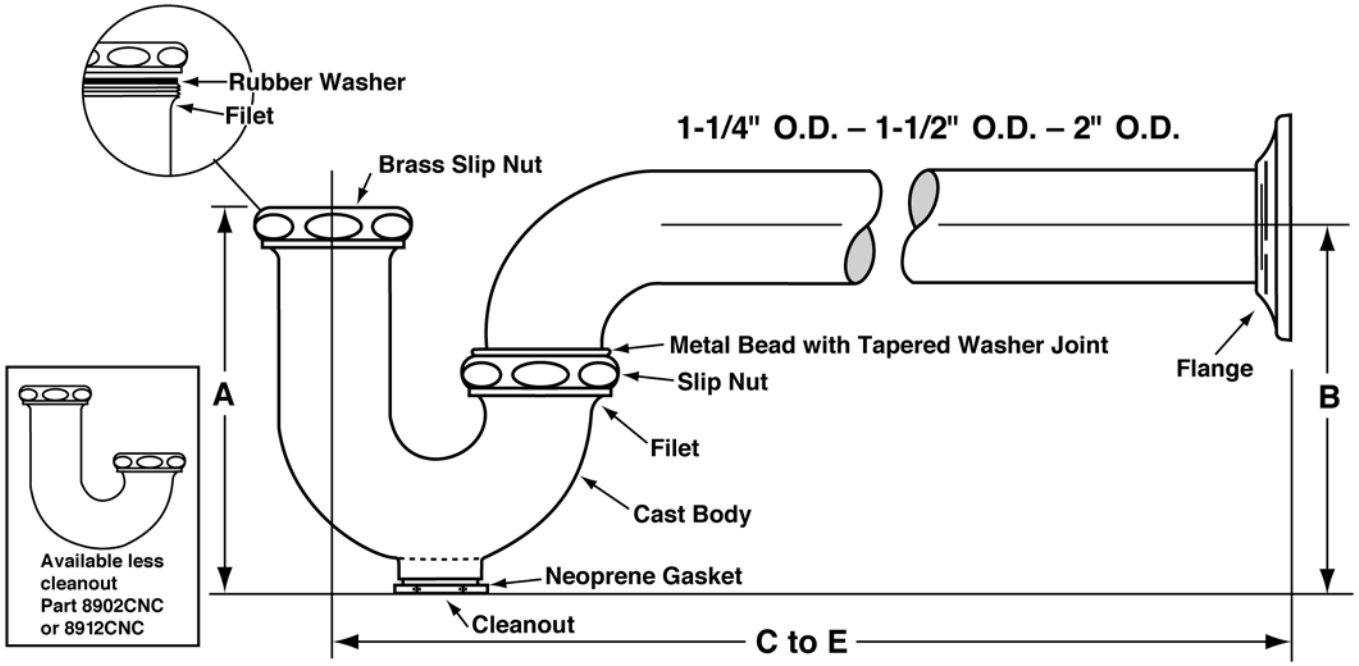
McGuire Manufacturing Co., Inc.
60 Grandview Court
P.O. Box 746 • Cheshire, CT 06410
203-699-1801 • Fax: 203-699-1813
www.mcguiremfg.com

PRODUCT SPECIFICATION

Part No.
8872, 8902, 8902CNC, 8912, 8912CNC, 8903, 8904

Cast Body P-Trap With or Without Cleanout

Job Name: _____ **Submittal Number:** _____



PROFESSIONAL LINE

ROUGHING MEASUREMENTS					
NO.	TRAP DIMENSIONS		A	B	C to E
	INLET	OUTLET			
8872	1-1/4"	1-1/4"	5"	4-1/2"	11"
8902	1-1/4"	1-1/2"	5"	4-1/2"	12"
8902CNC	1-1/4"	1-1/2"	4-5/8"	4-1/8"	12"
8912	1-1/2"	1-1/2"	5"	4-1/2"	12"
8912CNC	1-1/2"	1-1/2"	4-5/8"	4-1/8"	12"
8903	1-1/2"	2"	5"	6"	13"
8904	2"	2"	5"	6"	13"

FED SPEC W.W.P. 541
CAST BRASS P TRAP
MINIMUM SEAL 2"

See options and accessories section for details on product variations.

ASME A112.18.1-2005/CSA

Specifications:

P-Trap shall be chrome plated cast brass body (with, without) cleanout, with 17 gauge seamless tubular wall bend, cast brass slip nuts. Reducing washers shall be used with reducing cast brass nut. With (shallow, deep, bell) (steel, brass) or (forged brass with set screw) flange. P-Trap shall be McGuire "Classic" Professional Line (8872C, 8902C, 8912C, 8903, 8904). Trap shall be certified by CSA or other recognized testing authority. P-Trap shall bear manufacturer and testing mark.

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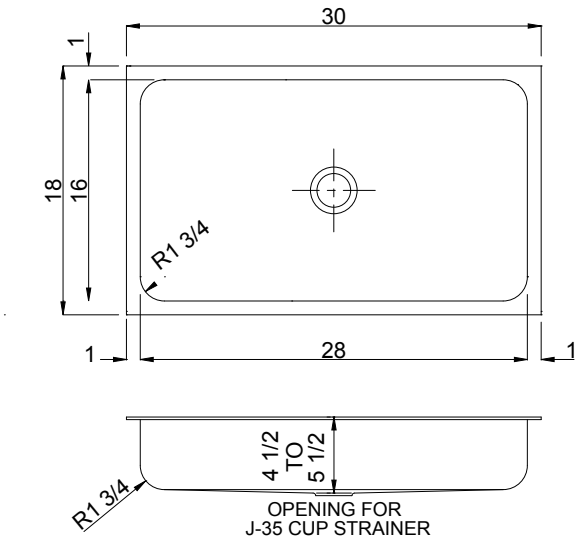
US-ADA-1830-A - 18 GA.

UNDERMOUNT GROUP

ADA COMPLIANT
SINGLE COMPARTMENT

SUBMITTAL DATA



ADA COMPLIANT

SPECIFICATION

Seamless die-drawn construction of 18 gauge, type 304, 18-8 stainless steel. Interior and top surfaces polished to a non-porous Hand-Blended Just Finish with highlighted bowl rim. Smooth, fully coated underside insulates for sound and reduces condensation. Certified to ASME A112.19.3/CSA B45.4, Canadian Standards Association (CSA), Uniform Plumbing Code (UPC), International Plumbing Code (IPC). Drain punched for J-35 drain.

10.36 Gallon Capacity*

Capacity Matters
Max ID sizing with straight sided bowl configuration (non tapered sides). Tight corner radius design.

**Capacity is based on 5-1/2" Depths*

To Be Specified:			
DRAIN LOCATION:			
☐ CENTER (SHOWN)		☐ LEFT REAR	
☐ RIGHT REAR		☐ CENTER REAR	
LOCATIONS MUST BE A MINIMUM OF 4 1/2" FROM THE BOWL WALL.			
DEPTH* - MUST BE SPECIFIED:			
☐ 4 1/2" DEEP	☐ 5" DEEP	☐ 5-1/2" DEEP	

* The thickness of the surface material these sinks are mounted under may affect the maximum depth that can be used while maintaining deck height and knee clearances.

APPROVED FOR MANUFACTURING

MODEL NO.: **US-ADA-1830-A** QTY: _____

JOB NAME: _____

TAG/ITEM: _____

CUSTOMER: _____

SIGNATURE: _____

MADE IN U.S.A.

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SF Project No. 2066902 June 4, 2021
Fit-Up Administrative Headquarters
Suite 440E &455E Capital Gallery East Tower

Security Product Data for Basis of Design Only

Smart-UPS 120 V

Advanced line interactive power protection for servers and network equipment

The world's most popular network and server UPS

The award-winning Smart-UPS™ unit from APC™ by Schneider Electric™ is the most popular UPS in the world for servers, storage, and networks. Trusted to protect critical data and equipment from power problems, the UPS supplies clean and reliable network-grade power. In addition to Legendary Reliability and manageability, Smart-UPS units have extremely high efficiency at low, medium, and high load levels, making them ideal for today's multi-core or virtualized servers that have varying load consumption. Available in a variety of form factors (tower, rack-mount, rack/tower convertible), there is a model for every application and budget.

Intelligent and efficient network power protection from entry level to scaleable runtime. Ideal for servers, point-of-sale, routers, switches, hubs, and other network devices.

- Reliable
- Intelligent
- Efficient
- Manageable

APC by Schneider Electric

Smart-UPS Tower and Rack-mount 750 – 3,000 VA

Application-optimized standard models, ideal for servers, storage, point-of-sale, and other network devices

[SMT1500RM1U]

[SMT1500RM2U]

[SMT750]

[SMT1500RM2U]

[SMT750]

Standard Features

High-efficiency Green Mode:
Optimum efficiency which saves utility and cooling costs

Emergency Power Off (EPO):
Provides for remote UPS shut-off in the event of a fire or other emergency (2,200 VA and above)

Alphanumeric LCD Display:
Intuitive interface provides detailed and accurate information with ability to configure locally

Battery Disconnect:
Convenient way to disconnect battery for transport

Network-grade Power:
Provides most stable power conditions by filtering noise, automatic voltage regulation (AVR), and surge protection

Communication Ports:
Serial, USB, and SmartSlot™ for accessory cards

Advanced Battery Management:
Temperature-compensated charging extends life and advanced algorithms recommend replacement date

Smart-UPS Extended Run 750 – 3,000 VA

Convertible extended run models ideal for
critical servers and voice/data switches

[SMX3000LV]

[SMX1500RM2U]

[SMX1500RM2UNC]

[SMX3000RMLV2U]

Additional Features

Slim 2U Rack/Tower and 4U Short Depth Convertible Forms:

Display rotates easily for use in or out of a rack

High-frequency Design:

Reduces size of (or eliminates) bulky transformers making installation even easier

Low-voltage Models:

(2 – 3 kVA)
Configurable output from 100 V – 127 V on low-voltage models

Models Available with Pre-installed Network Cards:

Models with “NC” suffix have pre-installed AP9631 network cards with environmental monitoring

Smart External Battery Connector:

Accepts external batteries and increases runtime automatically to increase availability

Switched Outlet Groups:

Reboot hung devices, shed non-critical loads to conserve runtime, and sequence start-up/turn off

Smart-UPS Display

Intuitive, easy-to-use LCD interface

Standard Features

LCD Display Screen
Clear, consistent, and detailed information in your choice of basic or advanced menus

Power Status:
- Operating mode and efficiency
- Load VA/Watts/Amps
- Input/Output voltage and frequency
- Battery capacity and runtime
- Energy meter and more

Control:
UPS and outlet group settings

Configuration:
- Language
- Power quality settings
- Alarm, delay, and threshold settings

Test and Diagnostics:
Initiate battery and runtime calibration tests

Logs:
See explanation of last 10 transfers and faults

About:
UPS and replacement battery part numbers, serial numbers, battery install, and suggested replacement dates

About:
UPS and replacement battery part numbers, serial numbers, battery install, and suggested replacement dates

Quick Status Indicators
Online, on battery, fault, and replace battery LEDs for quick status identification

Escape:
Exits to the previous menu or screen

Return:
Used to enter or confirm settings

Navigation Arrows:
Allow for quick adjustment of settings

Product Services and Accessories

Schneider Electric Critical Power & Cooling Services (CPCS) provides the highest quality services and solutions by trained and trusted professionals. Our world-class services offer a smart way to build, operate, and maintain your critical applications, ensuring the right people, in the right place, at the right time.

Management Cards

AP9630: UPS Network Management Card

AP9631: UPS Network Management Card with Environmental Monitoring

AP9620: Legacy Communications SmartSlot Card

Battery Packs

SMX48RMBP2U: APC Smart-UPS 48 V External Battery Pack Rack/Tower

SMX120RMBP2U: APC Smart-UPS 120 V External Battery Pack Rack/Tower

Additional Accessories

AP9625: APC Smart-UPS Two-post Rail Kit

SMX039-2: APC Smart-UPS 48V Battery Extension Cable

SMX040: APC Smart-UPS 120V Battery Extension Cable

Service Bypass Panels

SBP1500RM: APC Service Bypass PDU, 120 V; 15 AMP W/ (8) NEMA 5-15R

SBP3000RM: APC Service Bypass PDU, 120 V; 30 AMP W/ (4) NEMA 5-20R and (1) L5-30R

SBP3000: APC Service Bypass Panel- 100 – 240 V; 30 A; BBM; Hard-wire Input/Output

SBP3000RMHW: APC Service Bypass Panel- 100 – 240 V; 30 A; BBM; Hard-wire Input/Output

AP9631

SBP3000RM

Standard Tower models

Product feature	SMT750	SMT1000	SMT1500	SMT2200	SMT3000
Output					
Power capacity	500 W/750 VA	700 W/1,000 VA	1,000 W/1,440 VA	1,980 W/2,200 VA	2,700 W/3,000 VA
Nominal output voltage	120 V				
Output frequency	57 – 63 Hz				
Waveform type	Sine wave				
Output connections (NEMA)	(6) 5-15R	(8) 5-15R		(8) 5-15R (2) 5-20R	
Switched outlet groups	-	1			
Input					
Nominal input voltage	120 V				
Input voltage range for main operations (Max adjustable range)	82 – 144 V (75 – 154 V)				
Input frequency	50/60 Hz +/- 3 Hz (auto sensing)				
Input connection	5-15P, 6 ft. cord			5-20P	L5-30P
Batteries and runtime					
Battery type	Maintenance-free sealed lead-acid battery with suspended electrolyte; leak proof				
Replacement battery	RBC48	RBC6	RBC7	RBC55	
Runtime estimates					
200 W	:22	:45	1:24	2:17	2:29
500 W	:05	:10	:23	:51	:55
700 W		:06	:12	:34	:37
1,000 W			:07	:21	:23
1,400 W				:13	:14
1,600 W				:10	:12
Full load	:05	:06	:07	:07	:06
Communication and management					
Interface ports	Serial (RJ45), USB, and SmartSlot				
Control panel and audible alarms	Alpha-numeric LCD display with LED status indicators; alarm on battery, distinctive low battery alarm and configurable delays				
Emergency power off (EPO)	Optional			Yes	
Surge protection and filtering					
Surge energy rating	459 J	480 J			
Filtering meets	Full-time multi-pole noise filtering: 0.3% IEEE surge let-through, zero clamping response time, meets UL 1449				
Physical					
Maximum height (inches)	6.2	8.5	8.5	17.0	17.0
Maximum width (inches)	5.4	6.7	6.7	7.7	7.7
Maximum depth (inches)	14.1	17.3	17.3	21.5	21.5
Net weight (pounds)	29	42	53	112	116
Conformance					
Regulatory	UL 1778, CSA				
Warranty and equipment protection policy	3-year electronics, 2-years battery, and $150,000 lifetime EPP				

Standard Rack-mount models

Product feature	SMT750RM2U	SMT1000RM2U	SMT1500RM1U	SMT1500RM2U	SMT2200RM2U	SMT3000RM2U
Output						
Power capacity	500 W/750 VA	700 W/1,000 VA	1,000 W/1,440 VA	1,000 W/1,440 VA	1,980 W/2,200 VA	2,700 W/3,000 VA
Nominal output voltage	120 V					
Output frequency	57 – 63 Hz					
Waveform type	Sine wave					
Output connections (NEMA)	(6) 5-15R	(6) 5-15R	(4) 5-15R	(6) 5-15R	(6) 5-15R (2) 5-20R	
Switched outlet groups	1					
Input						
Nominal input voltage	120 V					
Input voltage range for main operations (Max adjustable range)	82 – 144 V (75 – 154 V)					
Input frequency	50/60 Hz +/- 3 Hz (auto sensing)					
Input connection (NEMA, 8 ft. cord)	5-15P				5-20P	L5-30P
Batteries and runtime						
Battery type	Maintenance-free sealed lead-acid battery with suspended electrolyte; leak proof					
Replacement battery	APCRBC123	APCRBC132	APCRBC88	APCRBC133	RBC43	
Runtime estimates						
200 W	:24	1:10	1:32	:27	1:24	1:26
500 W	:05	:17	:26	:12	:35	:38
600 W		:12	:19	:09	:28	:31
700 W		:09	:14	:07	:24	:26
1,000 W			:07	:04	:15	:17
1,400 W					:09	:11
1,600 W					:07	:09
Full load	:06	:09	:07	:04	:05	:03
Communication and management						
Interface ports	Serial (RJ45), USB, and SmartSlot					
Control panel and audible alarms	Alpha-numeric LCD display with LED status indicators; alarm on battery, distinctive low-battery alarm and configurable delays					
Emergency power off (EPO)	Optional				Yes	
Surge protection and filtering						
Surge energy rating	459 J		540 J	459 J	480 J	
Filtering meets	Full-time multi-pole noise filtering: 0.3% IEEE surge let-through, zero clamping response time, meets UL 1449					
Physical						
Maximum height (inches)	3.5	3.5	1.75 (1U)	3.5	3.5	3.5
Maximum width (inches)	17.0	17.0	17.0	17.0	19.0	19.0
Maximum depth (inches)	16.0	18.0	26.0	18.0	26.0	26.0
Net weight (pounds)	38.0	62.0	53	63.0	96.0	96.0
Conformance						
Regulatory	UL 1778, CSA					
Warranty and equipment protection policy	3-year electronics, 2-years battery, and $150,000 lifetime EPP					

Extended Run Rack/Tower Convertible 2U models

Product feature	SMX750	SMX1000	SMX1500RM2U*	SMX2000RMLV2U*	SMX2200RMLV2U	SMX3000RMLV2U*
Output						
Power capacity	600 W/750 VA	800 W/1,000 VA	1,200 W/1,440 VA	1,800 W/2,000 VA	1,980 W/2,200 VA	2,700 W/3,000 VA
Nominal output voltage	120 V			100/110/120/127 V		
Output frequency	57 – 63 Hz					
Waveform type	Sine wave					
Output connections (NEMA)	(8) 5-15R			(3) 5-15R (3) 5-20R (1) L5-20R	(6) 5-15R (2) 5-20R	(3) 5-15R (3) 5-20R (1) L5-30R
Switched outlet groups	1	2	3			
Input						
Nominal input voltage	120 V			100 – 127 V		
Input voltage range for main operations (Max adjustable range)	82 – 143 V (75 – 153 V)			70 – 153 V		
Input frequency	50/60 Hz +/- 3 Hz (auto sensing)					
Input connection (NEMA)	5 - 15P 8 ft. cord			5-20P	L5-30P	
Batteries and runtime						
Battery type	Maintenance-free sealed lead-acid battery with suspended electrolyte; leak proof					
Replacement battery (UPS)	APCRBC116		APCRBC115	APCRBC117		
External Battery Pack	SMX48RMBP2U			SMX120RMBP2U		
Replacement battery (XBP)	APCRBC115			APCRBC118		
Typical back up time at other load conditions, and with external battery packs	Please refer to www.apc.com for runtime charts					
Communication and management						
Interface ports	Serial (RJ45), USB and Smartslot (Note: models denoted with asterisk * are also available in “NC” version with pre-installed AP9631 network management card.)					
Control panel and alarms	Alphanumeric LCD display with LED status indicators; alarm on battery, distinctive low battery alarm, and configurable delays					
Emergency power off (EPO)	Yes					
Surge protection						
Surge energy rating	540 J					
Filtering	Full-time multi-pole noise filtering: 0.3% IEEE surge let-through, zero clamping response time, meets UL 1449					
Physical						
Maximum height (inches)	3.5 (2U)					
Maximum width (inches)	17					
Maximum depth (inches)	19			6		
Net weight (pounds)	49	50	55	85		
Conformance						
Regulatory	UL 1778, CSA					
Warranty and equipment protection policy	3-years electronics, 2-years battery, and $150,000 lifetime EPP					

Extended Run Rack/Tower Convertible 4U Short Depth models

Product feature	SMX2000LV*	SMX3000LV*	SMX3000HVT
Output			
Power capacity	1,800 W/2,000 VA	2,700 W/3,000 VA	2,700 W/3,000 VA
Nominal output voltage	120 V (user selectable 100 – 127 V)		208 V
Output frequency	57 – 63 Hz		
Waveform type	Sine wave		
Output connections (NEMA)	(6) 5-15R (3) 5-20R (1) L5-20R	(6) 5-15R (3) 5-20R (1) L5-30R	(2) L6-20R (4) IEC 320 C13 (2) IEC 320 C19
Switched outlet groups	3		
Input			
Nominal input voltage	120 V (user selectable 100 – 127 V)		208 V
Input voltage range for main operations (Max adjustable range)	70 – 153 V		
Input frequency	50/60 Hz +/- 3 Hz (auto sensing)		
Input connection (NEMA)	5-20P, 8 ft. cord	L5-30P, 8 ft. cord	L6-20P, 8 ft. cord
Batteries and runtime			
Battery type	Maintenance-free sealed lead-acid battery with suspended electrolyte; leak proof		
Replacement battery (UPS)	APCRBC143		
External Battery Pack	SMX120BP		
Replacement battery (XBP)	APCRBC143		
Typical back up time at other load conditions, and with external battery packs	Please refer to www.apc.com for runtime charts		
Communication and management			
Interface ports	Serial (RJ45), USB and SmartSlot (Note: models denoted with asterisk * are also available in “NC” version with pre-installed AP9631 network management card.)		
Control panel and alarms	Alphanumeric LCD display with LED status indicators; alarm on battery, distinctive low battery alarm, and configurable delays		
Emergency power off (EPO)	Yes		
Surge protection			
Surge energy rating	540 J		
Filtering	Full-time multi-pole noise filtering: 0.3% IEEE surge let-through, zero clamping response time, meets UL 1449		
Physical			
Maximum height (inches)	17		
Maximum width (inches)	7.0 (4U)		
Maximum depth (inches)	19		
Net weight (pounds)	85		
Conformance			
Regulatory	UL 1778, CSA		
Warranty and equipment protection policy	3-years electronics, 2-years battery, and $150,000 lifetime EPP		

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TS-14
Request to Exit Station with Pneumatic Timer

TS-14

The TS-14 request to exit station with pneumatic timer and push button, provides a convenient way to keep the door unlocked for a specified amount of time, allowing for easy entry or egress. The door will relock when the relay time has expired.

Features

Standard Features

- Switch mounted on single gang wall plate with 430 stainless steel finish
- 1-1/2" green mushroom push button
- Plate screened "PUSH TO EXIT" for easy to follow egress instructions
- Pneumatic time delay is adjustable 2 to 60 seconds
- Does not require external power for operation
- Timer life: up to 1 million operations

Options

- **TS-14R** with red mushroom push button
- **TS-14N** with switch mounted on narrow 1-3/4" wall plate with 302 stainless steel finish
- **TS-14NR** mounted on narrow wall plate with red push button
- **TS-14302** mounted on weather resistant plate with 302 stainless steel finish
- Finishes: multiple plate finishes available
- Custom screening available

Specifications

Certifications & Listings

- UL 294 listed

Electrical

- One N/O and one N/C contact pair
- Contacts rated 10A at 120 VDC
- Switch depth behind plate: 2-1/4"
- Switch time repeatable +/- 10%
- Switch terminated with 10" colored leads

Operating Temperature

- +15 to 120F (-9 to 49C)

www.alarmcontrols.com | 800.645.5538
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Fiber*Express* Distribution Cables (continued)

Tight Buffer — Indoor/Outdoor Riser, Plenum & LSZH Rated

Indoor/Outdoor Specifications

- Environmental Protection
  - UV Resistant Jacket
  - Moisture Resistant Jacket
  - Fungus Resistant Jacket
  - Water Blocking Aramid
  - Water Blocking Tape

Additional Options

- MSHA (Mining) Approvals

Indoor/Outdoor Specifications

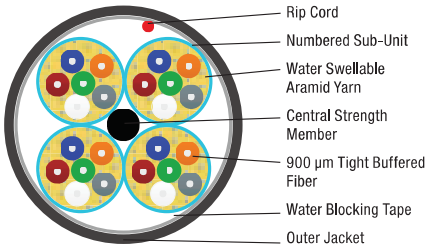
Bend Radius (vs. Cable OD)

Installation	20 x OD
Operation	10 x OD

Temperature Range

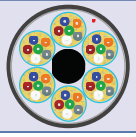
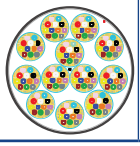
Storage	-40°C to 70°C (-40 to 158°F)
Installation	-20 to 70°C (-4 to 158°F)
Operation	-40 to 70°C (-40 to 158°F)

Legend



Compliance

- TIA/EIA-568-C.3
- ISO/IEC 11801, 2nd Edition
- Telcordia GR-20-CORE
- RoHS II 2011/65/EU
- REACH EC1907-2006
- NEC/CEC OFNR/OFN FT.4 (RISER - PVC)
- NEC/CEC OFNR/OFN FT.4 (LSZH - FRPE)
- NEC/CEC OFNP/OFN FT.6 (PLENUM - PVC or PVDF)
- ICEA S-104-696

Description	Construction	Fiber Count	Fiber	Sub-Unit OD	Cable OD		Weight		Tensile Strength			
									Operation		Installation	
				mm	mm	in.	Kg/km	lb/1000 ft.	N	lbs-f	N	lbs-f
Non-Unitized		2	900 µm TB	N/A	4.8	0.19	22	15	222	50	556	125
		4	900 µm TB	N/A	4.8	0.19	25	17	222	50	556	125
		6					31	21				
		8			5.8	0.23	36	24	334	75	667	150
		10					39	26				
		12					43	29				
		16			8.8	0.35	64	43	556	125	1112	250
		24					80	54				
Unitized 6-Fiber Sub-Units		24	900 µm TB	4.5	13.1	0.52	145	97	1001	225	2002	450
		36			16.0	0.63	221	148	1668	375	3336	750
Unitized 12-Fiber Sub-Units		36	900 µm TB	5.5	14.1	0.56	162	109	1001	225	2002	450
		48			15.5	0.61	207	139	1423	320	2847	640
		72			19.0	0.75	321	216	2002	450	4226	950
		96			22.8	0.90	536	360	2780	625	5560	1250
		144			25.4	1.00	602	404	4226	950	8452	1900

Above specifications provide a general representation for the product family. Improved specifications may exist for Riser, Plenum or LSZH constructions. Consult individual technical data sheets for exact specifications.

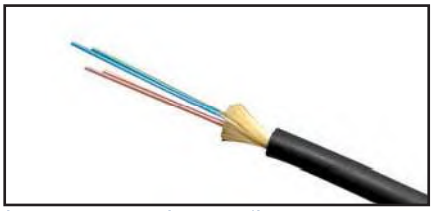
Fiber*Express* Distribution Cables (continued)

Tight Buffer — Indoor/Outdoor Riser, Plenum & LSZH Rated

Standard Indoor/Outdoor Configurations

Fiber Count	Belden Part Number			
	OM1 Black	OM3 Black	OM4 Black	OS2 Black
Non-Unitized - Riser/LSZH				
2	FD1D002L9	FD3D002L9	FD4D002L9	FDSD002L9
6	FD1D006L9	FD3D006L9	FD4D006L9	FDSD006L9
12	FD1D012L9	FD3D012L9	FD4D012L9	FDSD012L9
24	FD1D024L9	FD3D024L9	FD4D024L9	FDSD024L9
Non-Unitized - Riser				
2	FD1D002R9	FD3D002R9	FD4D002R9	FDSD002R9
6	FD1D006R9	FD3D006R9	FD4D006R9	FDSD006R9
12	FD1D012R9	FD3D012R9	FD4D012R9	FDSD012R9
24	FD1D024R9	FD3D024R9	FD4D024R9	FDSD024R9
Non-Unitized Plenum				
2	FD1D002P9	FD3D002P9	FD4D002P9	FDSD002P9
6	FD1D006P9	FD3D006P9	FD4D006P9	FDSD006P9
12	FD1D012P9	FD3D012P9	FD4D012P9	FDSD012P9
24	FD1D024P9	FD3D024P9	FD4D024P9	FDSD024P9
Unitized 6-Fiber Sub-Units - Riser				
24	FD1D024RJ	FD3D024RJ	FD4D024RJ	FDSD024RJ
Unitized 6-Fiber Sub-Units - Plenum				
24	FD1D024PJ	FD3D024PJ	FD4D024PJ	FDSD024PJ
Unitized 12-Fiber Sub-Units - Riser/LSZH				
48	FD1D048LK	FD3D048LK	FD4D048LK	FDSD048LK
72	FD1D072LK	FD3D072LK	FD4D072LK	FDSD072LK
96	FD1D096LK	FD3D096LK	FD4D096LK	FDSD096LK
144	FD1D144LK	FD3D144LK	FD4D144LK	FDSD144LK
Unitized 12-Fiber Sub-Units - Plenum				
48	FD1D048PK	FD3D048PK	FD4D048PK	FDSD048PK
72	FD1D072PK	FD3D072PK	FD4D072PK	FDSD072PK
96	FD1D096PK	FD3D096PK	FD4D096PK	FDSD096PK
144	FD1D144PK	FD3D144PK	FD4D144PK	FDSD144PK

For an exhaustive selection contact Belden customer service or your local Belden Representative for more details.



Optical Fiber Distribution Cable, Indoor/Outdoor

Cisco Catalyst 9300 Series Switches

Built for Security, IoT, Mobility, and Cloud

The Cisco® Catalyst® 9300 Series Switches are Cisco's lead stackable enterprise switching platform built for security, IoT, mobility, and cloud. They are the next generation of the industry's most widely deployed switching platform. The Catalyst 9300 Series switches form the foundational building block for Software-Defined Access (SD-Access), Cisco's lead enterprise architecture. At 480 Gbps, they are the industry's highest-density stacking bandwidth solution with the most flexible uplink architecture. The Catalyst 9300 Series is the first optimized platform for high-density 802.11ac Wave2. It sets new maximums for network scale. These switches are also ready for the future, with an x86 CPU architecture and more memory, enabling them to host containers and run third-party applications and scripts natively within the switch.

The Catalyst 9300 Series is designed for Cisco StackWise® technology, providing flexible deployment with support for nonstop forwarding with stateful switchover (NSF/SSO), for the most resilient architecture in a stackable (sub-50-ms) solution. The highly resilient and efficient power architecture features Cisco StackPower®, which delivers high-density Cisco Universal Power Over Ethernet (Cisco UPOE®) and Power over Ethernet Plus (PoE+) ports. The switches are based on the Cisco Unified Access™ Data Plane 2.0 (UADP) 2.0 architecture which not only protects your investment but also allows a larger scale and higher throughput. A modern operating system, Cisco IOS XE with programmability offers advanced security capabilities and Internet of Things (IoT) convergence.

The Foundation of Software-Defined Access

Advanced persistent security threats. The exponential growth of Internet of Things (IoT) devices. Mobility everywhere. Cloud adoption. All of these require a network fabric that integrates advanced hardware and software innovations to automate, secure, and simplify customer networks. The goal of this network fabric is to enable customer revenue growth by accelerating the rollout of business services.

The Cisco Digital Network Architecture (Cisco DNA™) with SD-Access is the network fabric that powers business. It is an open and extensible, software-driven architecture that accelerates and simplifies your enterprise network operations. The programmable architecture frees your IT staff from time-consuming, repetitive network configuration tasks so they can focus instead on innovation that positively transforms your business. SD-Access enables policy-based automation from edge to cloud with foundational capabilities. These include:

- Simplified device deployment
- Unified management of wired and wireless networks
- Network virtualization and segmentation
- Group-based policies
- Context-based analytics

Cisco ONE Software

Cisco ONE™ Software offers a valuable and flexible way to buy software for the access, WAN, and data center domains. At each stage in the product lifecycle, Cisco ONE Software helps make buying, managing, and upgrading your network and infrastructure software easier. Cisco ONE Software provides:

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- Flexible licensing models to smoothly distribute customers' software spending over time
- Investment protection for software purchases through software services–enabled license portability
- Access to updates, upgrades, and new technology from Cisco through Cisco® Software Support Services (SWSS)
- Lower cost of entry with the new Cisco ONE Subscription for Switching model

Cisco ONE for Access lets you manage your entire switching structure as a single, converged component. With one management system and one policy for wired and wireless networks, it offers an efficient way to provide more secure access.

Product Overview: Features

Product Highlights

- Highest wireless scale with Wave 2 access points supported on a single switch with select models
- UADP 2.0 Application-Specific Integrated Circuit (ASIC) with programmable pipeline and microengine capabilities, along with template-based, configurable allocation of Layer 2 and Layer 3 forwarding, access control lists (ACLs), and quality of service (QoS) entries
- Intel® x86 CPU complex with 8-GB memory, and 16 GB of flash and external USB 3.0 SSD pluggable storage slot to host containers
- USB 2.0 slot to load system images and set configurations
- Up to 480 Gbps of local stackable switching bandwidth
- Flexible and dense uplink offerings with 1G, Multigigabit, 10G, and 40G, with platform readiness for 25G
- Flexible downlink options with 1G and Multigigabit links
- Leading PoE capabilities with up to 384 ports of PoE per stack, 60W Cisco UPOE, and PoE+
- Intelligent Power Management with Cisco StackPower technology, providing power stacking among members for power redundancy
- Line-rate, hardware-based Flexible NetFlow (FNF), delivering flow collection of up to 64,000 flows
- IPv6 support in hardware, providing wire-rate forwarding for IPv6 networks
- Dual-stack support for IPv4/IPv6 and dynamic hardware forwarding table allocations, for ease of IPv4-to-IPv6 migration
- Cisco IOS XE, a modern operating system for the enterprise with support for model-driven programmability including NETCONF, RESTCONF, YANG, on-box Python scripting, streaming telemetry, container-based application hosting, and patching for critical bug fixes. The OS also has built-in defenses to protect against runtime attacks
- **SD-Access:** The Cisco Catalyst 9300 Series Switches form the foundational building block for SD-Access, Cisco's lead enterprise architecture:
  - Policy-based automation from edge to cloud
  - Simplified segmentation and micro-segmentation, with predictable performance and scalability
  - Automation through the Cisco Application Policy Infrastructure Controller Enterprise Module (APIC-EM)
  - Policy handled through the Cisco Identity Services Engine (ISE)
  - Network assurance provided through the Network Data Platform
  - Faster launch of new business services and significantly improved issue resolution time

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- Plug and Play (PnP) enabled: A simple, secure, unified, and integrated offering to ease new branch or campus device rollouts or updates to an existing network
- **Advanced security:**
  - Encrypted Traffic Analytics (ETA): You benefit from the power of machine learning to identify and take actions toward threats or anomalies in your network, including malware detection in encrypted traffic (without decryption) and distributed anomaly detection
  - Support for AES-256 with the powerful MACsec 256-bit encryption algorithm available on all models
  - Trustworthy systems: Hardware anchored Secure Boot and Secure Unique Device Identification (SUDI) support for Plug and Play, to verify the identity of the hardware and software

Platform Details

Switch Models and Configurations

The Cisco Catalyst 9300 Series is made up of seven different switch models. Any of the models can be used together in a stack of up to eight units.

Figure 1. Cisco Catalyst 9300 Series Switches

Table 1 lists port scale and power details for the Cisco Catalyst 9300 Series models.

Table 1. Cisco Catalyst 9300 Series Switch Configurations

Model	Total 10/100/1000 or Multigigabit copper ports	Default AC power supply	Available PoE power	Cisco StackWise-480	Cisco StackPower
C9300-24T	24	350W AC		Yes	Yes
C9300-48T	48	350W AC		Yes	Yes
C9300-24P	24 POE+	715W AC	445W	Yes	Yes
C9300-48P	48 POE+	715W AC	437W	Yes	Yes
C9300-24U	24 Cisco UPOE	1100W AC	830W	Yes	Yes
C9300-48U	48 Cisco UPOE	1100W AC	822W	Yes	Yes
C9300-24UX	24 Multigigabit Cisco UPOE (100 Mbps or 1, 2.5, 5, or 10 Gbps)	1100W AC	560W	Yes	Yes
C9300-48UXM	48x 2.5G ports (12 mGig – 1/2.5/5/10G)	1100W AC	490W	Yes	Yes

Network Modules

The Cisco Catalyst 9300 Series Switches support optional network modules for uplink ports. The default switch configuration does not include the network module. When you purchase the switch, you can choose from the network modules described in Table 2.

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Figure 2. Cisco Catalyst 9300 Series Network Modules

Table 2. Network Module Numbers and Descriptions

Network module	Description
C9300-NM-4G	9300 Series 4x 1G Network Module
C9300-NM-8X	9300 Series 8x 10G Network Module
C9300-NM-2Q	9300 Series 2x 40G Network Module

Please note: Existing 3850 network modules are also supported in the Cisco Catalyst 9300 Series platforms.

For additional details, please read our FAQs:
https://www.cisco.com/c/dam/en/us/products/collateral/switches/catalyst-9300-series-switches/nb-09-cat-9k-faq-cte-en.pdf

Power Supplies

The Cisco Catalyst 9300 Series Switches support dual redundant power supplies. The switches ship with one power supply by default, and the second power supply can be purchased when the switch is ordered or at a later time. If only one power supply is installed, it should always be in power supply bay #1. The switches also ship with three field-replaceable fans.

Figure 3. Cisco Catalyst 9300 Series Dual Redundant Power Supplies

Table 3 lists the different power supplies available in these switches and available PoE power.

Table 3. Power Supply Models

Models	Default power supply	Available PoE power
24-port data switch	PWR-C1-350WAC	–
48-port data switch	PWR-C1-350WAC	
24-port PoE+ switch	PWR-C1-715WAC	445W
48-port PoE+ switch	PWR-C1-715WAC	437W

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Models	Default power supply	Available PoE power
24-port Cisco UPOE switch	PWR-C1-1100WAC	830W
48-port Cisco UPOE switch	PWR-C1-1100WAC	822W
24-port Multigigabit Cisco UPOE switch	PWR-C1-1100WAC	560W – Support in Cisco IOS XE 16.6
48-port 2.5G (12 mGig – 1/2.5/5/10G)	PWR-C1-1100WAC	490W

Performance and Scalability

Performance and scalability metrics for the Catalyst 9300 Series are provided in Table 4.

Table 4. Performance Specifications

Description	Performance
Switching capacity	208 Gbps on 24-port Gigabit Ethernet model 256 Gbps on 48-port Gigabit Ethernet model 640 Gbps on 24-port Multigigabit Ethernet model 580 Gbps on 48-port 2.5G (12 mGig) Ethernet model
Stacking bandwidth	480 Gbps
Total number of MAC addresses	32,000
Total number of IPv4 routes (ARP plus learned routes)	32,000 (24,000 direct routes and 8000 indirect routes)
IPv4 routing entries	32,000
IPv6 routing entries	16,000
Multicast routing scale	8000
QoS scale entries	5120
ACL scale entries	5120
Packet buffer per SKU	16 MB buffer for 24- or 48-port Gigabit Ethernet models 32 MB buffer for 24-port Multigigabit
FNF entries	64,000 flow on 24- and 48-port Gigabit Ethernet models 128,000 flows on 24-port Multigigabit
DRAM	8 GB
Flash	16 GB
VLAN IDs	4000
Total Switched Virtual Interfaces (SVIs)	2000
Jumbo frames	9198 bytes
Total routed ports per 9300 Series stack	208
Wireless	
Wireless bandwidth per switch	Up to 96 Gbps on 48-port Gigabit Ethernet model Up to 48 Gbps on 24-port Gigabit Ethernet model
Forwarding rate of switch models (with 2x 40 Gigabit Ethernet uplinks for 24-port models and 48-port models)	
Model	**Forwarding rate**
C9300-24T	154.76 Mpps
C9300-24P	154.76 Mpps
C9300-24U	154.76 Mpps
C9300-48T	190.48 Mpps
C9300-48P	190.48 Mpps
C9300-48U	190.48 Mpps
C9300-24UX	476.19 Mpps
C9300-48UXM	431.54 Mpps

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Description	Performance
Forwarding rate for both IPv4 and IPv6	

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SD-Access Architecture

What if you could give time back to IT? Provide network access in minutes for any user or device to any application – without compromise? SD-Access is industry's first policy-based automation from network edge to cloud. Your foundation for your digital network, Cisco® Software-Defined Access (SD-Access). Built on the principles of the Cisco Digital Network Architecture (Cisco DNA™), SD-Access provides end-to-end segmentation to keep user, device and application traffic separate without a redesign of the network. It automates user access policy so organizations can make sure the right policies are set for any user or device with any application across the network. This is accomplished with a single network fabric across LAN and WLAN which creates a consistent user experience anywhere without compromising on security.

There are many challenges today in managing the network to drive business outcomes. These limitations are due to manual configuration and fragmented tool offerings. SD-Access provides:

- A transformational management solution that reduces operational expenses and enhances business agility
- Consistent management of wired and wireless network provisioning and policy
- Automated network segmentation and group-based policy
- Contextual insights for fast issue resolution and capacity planning
- Open and programmable interfaces for integration with third-party solutions

For an overview of key use-cases SD-Access addresses, refer to SD-Access Solution Overview.

Platform Benefits

Cisco IOS XE opens a completely new paradigm in network configuration, operation, and monitoring through network automation. Cisco's automation solution is open, standards-based, and extensible across the entire lifecycle of a network device. The various automation mechanisms are outlined below.

- **Automated device provisioning** is the ability to automate the process of upgrading software images and installing configuration files on Cisco Catalyst switches when they are being deployed in the network for the first time. Cisco provides both turnkey solutions such as Plug and Play and off-the-shelf tools such as Zero-Touch Provisioning (ZTP) and Preboot Execution Environment (PXE) that enable an effortless and automated deployment.
- **API-driven configuration** is available with modern network switches such as the Cisco Catalyst 9300 Series. It supports a wide range of automation features and provides robust open APIs over NETCONF using YANG data models for external tools, both off-the-shelf and custom built, to automatically provision network resources.
- **Granular visibility** enables model-driven telemetry to stream data from a switch to a destination. The data to be streamed is identified through subscription to a data set in a YANG model. The subscribed data set is streamed to the destination at specified intervals. Additionally, Cisco IOS XE enables the push model. It provides near-real-time monitoring of the network, leading to quick detection and rectification of failures.
- **Seamless software upgrades and patching** supports OS resilience. Cisco IOS XE supports patching, which provides fixes for critical bugs and security vulnerabilities between regular maintenance releases. This support lets you add patches without having to wait for the next maintenance release.

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Security

- **Encrypted Traffic Analytics (ETA)** is a unique capability for identifying malware in encrypted traffic coming from the access layer. Since more and more traffic is becoming encrypted, the visibility this feature affords for threat detection is critical for keeping your network secure at different layers.
- **AES-256 MACsec encryption** is the IEEE 802.1AE standard for authenticating and encrypting packets between switches. The Catalyst 9300 Series switches support 256-bit and 128-bit Advanced Encryption Standard (AES) on all ports at all speeds, providing the most secure link encryption.
- **Trustworthy systems built with Cisco Trust Anchor Technologies** provide a highly secure foundation for Cisco products. With The Catalyst 9300 Series, these technologies enable hardware and software authenticity assurance for supply chain trust and strong mitigation against man-in-the-middle attacks that compromise software and firmware. Trust Anchor capabilities include:
  - **Image signing:** Cryptographically signed images provide assurance that the firmware, BIOS, and other software are authentic and unmodified. As the system boots, the system's software signatures are checked for integrity.
  - **Secure Boot:** Cisco Secure Boot technology anchors the boot sequence chain of trust to immutable hardware, mitigating threats against a system's foundational state and the software that is to be loaded, regardless of a user's privilege level. It provides layered protection against the persistence of illicitly modified firmware.
  - **Cisco Trust Anchor module:** A tamper-resistant, strong cryptographic, single-chip solution provides hardware authenticity assurance to uniquely identify the product so that its origin can be confirmed to Cisco. This provides assurance that the product is genuine.

Resiliency and High Availability

- **StackWise-480:** The Catalyst 9300 Series supports the industry's highest back-panel stacking bandwidth solution (480 Gbps) with StackWise-480.
- **Cisco StackPower:** Cisco StackPower is an innovative power interconnect system that allows the power supplies in a stack to be shared as a common resource among all the switches. This allows you to simply add one extra power supply in any switch of the stack and either provide power redundancy for any of the stack members or simply add more power to the shared pool.

Figure 4. Cisco Catalyst 9300 Series StackPower

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- **High availability:** The Catalyst 9300 Series supports high-availability features, including the following:
  - Cross-stack EtherChannel provides the ability to configure Cisco EtherChannel technology across different members of the stack for high resiliency.
  - IEEE 802.1s Multiple Spanning Tree Protocol (MSTP) provides rapid spanning tree convergence independent of spanning tree timers and also offers the benefit of Layer 2 load balancing and distributed processing.
  - Per-VLAN Rapid Spanning Tree (PVRST+) allows rapid spanning tree (IEEE 802.1w) reconvergence on a per-VLAN spanning tree basis, providing simpler configuration than MSTP. In both MSTP and PVRST+ modes, stacked units behave as a single spanning tree node.
  - Switch-port auto-recovery ("err-disable" recovery) automatically attempts to reactivate a link that is disabled because of a network error.
  - The Catalyst 9300 Series platform delivers the best NSF/SSO resiliency architecture in a stackable solution with sub-50-ms failover.

Flexible NetFlow

- **Flexible NetFlow (FNF):** Cisco IOS® Software FNF is the next generation in flow visibility technology. It enables optimization of the network infrastructure, reduces operation costs, and improves capacity planning and security incident detection with increased flexibility and scalability. The Catalyst 9300 Series is capable of up to 64,000 flow entries on 48-port and 24 port models and up to 128,000 flow entries on mGig models.

Application Visibility and Control

- **NBAR2:** Next-Generation Network-Based Application Recognition (NBAR2) enables advanced application classification techniques, accuracy with up to 1400 predefined and well-known application signatures and up to 150 encrypted applications on the Cisco Catalyst 9000 Series. The most popular applications included are Skype, Office 365, Microsoft Lync, Cisco WebEx®, and Facebook, among many others that are predefined and easy to configure. NBAR2 provides the network administrator with an important tool to identify, control, and monitor end-user application usage while helping ensure a quality user experience and securing the network from malicious attacks. NBAR2 leverages FNF to report application performance and activities within the network to any supported NetFlow collector, such as Cisco Prime®, Cisco Stealthwatch®, or any compliant third-party tool.

QoS

- **Superior QoS:** The Cisco Catalyst 9300 Series offers Gigabit Ethernet speeds with intelligent services that keep traffic flowing smoothly, even at 10 times the normal network speed. Industry-leading mechanisms for cross-stack marking, classification, and scheduling deliver superior performance for data, voice, and video traffic at wire speed. Superior QoS includes granular wireless bandwidth management and fair sharing, 802.1p Class of Service (CoS) and Differentiated Services Code Point (DSCP) field classification, Shaped Round Robin (SRR) scheduling, Committed Information Rate (CIR), and eight egress queues per port.

Service Discovery

- **Multicast DNS (mDNS) gateway:** This service discovery gateway capability facilitates sharing of services advertised using the Apple mDNS (Bonjour) protocol, such as printers, Apple TVs, and file services across the network. Additionally, the administrator can create policies defining which services can be seen and accessed by the users in the network. This capability facilitates a Bring-Your-Own-Device (BYOD) rollout.

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Smart Operation

- **Bluetooth ready:** The Catalyst 9300 Series has hardware support to connect a Bluetooth dongle to your switch, enabling you to use this wireless interface as an IP management port interface. The port can be used for configuration and troubleshooting using WebUI or the Command-Line Interface (CLI), and to transfer images and configurations.
- **WebUI:** WebUI is an embedded GUI-based device-management tool that provides the ability to provision the device, to simplify device deployment and manageability, and to enhance the user experience. It comes with the default image, so there is no need to enable anything or install any license on the device. You can use WebUI to build configurations, and to monitor and troubleshoot the device without having CLI expertise.
- **Efficient switch operation:** Cisco Catalyst 9300 Series Switches provide optimum power saving with Energy Efficient Ethernet (EEE) on the RJ-45 ports and low-power operations for industry best-in-class power management and power consumption capabilities. The ports support reduced power modes so that ports not in use can move into a lower power utilization state. Other efficient switch operation features are as follows:
  - Per-port power consumption command allows customers to specify a maximum power setting on an individual port.
  - Per-port PoE power sensing measures actual power being drawn, enabling more intelligent control of powered devices. The PoE MIB provides proactive visibility into power usage and allows you to set different power-level thresholds.
- **RFID tags:** The Catalyst 9300 Series switches have an embedded RFID tag that facilitates easy asset and inventory management using commercial RFID readers.
- **Blue beacon:** The Catalyst 9300 Series switches support a blue beacon LED for easy identification of the switch being accessed.

High-Performance IP Routing

The Cisco Express Forwarding hardware routing architecture delivers extremely high-performance IP routing in Cisco Catalyst 9300 Series Switches, based on:

- IP unicast routing protocols (including static, Routing Information Protocol Version 1 [RIPv1], RIPv2, RIPng, and Open Shortest Path First [OSPF], Routed Access) are supported for small network routing applications with the Network Essentials stack. Equal-cost routing facilitates Layer 3 load balancing and redundancy across the stack.
- Advanced IP unicast routing protocols (including Full [OSPF], Enhanced Interior Gateway Routing Protocol [EIGRP], Border Gateway Protocol Version 4 [BGPv4], and Intermediate System-to-Intermediate System Version 4 [IS-ISv4]) are supported for load balancing and for constructing scalable LANs. IPv6 routing (using OSPFv3 and EIGRPv6) is supported in hardware for maximum performance.
- Protocol-Independent Multicast (PIM) for IP multicast routing is supported, including PIM sparse mode (PIM SM), and Source-Specific Multicast (SSM).
- IPv6 addressing is supported on interfaces with appropriate show commands for monitoring and troubleshooting.

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Multigigabit Ethernet technology: Cisco Multigigabit Ethernet technology allows you to achieve bandwidth speeds from 1 Gbps to 10 Gbps over traditional Category 5e cabling or above. This technology addresses the need for exponential increases in bandwidth with the enormous growth of 802.11ac and new wireless applications without having to replace current cabling infrastructure.

Power Over Ethernet Leadership

Cisco Universal Power over Ethernet (Cisco UPOE): PoE removes the need for wall sockets to power each PoE-enabled device and eliminates the cost of additional electrical cabling and circuits that would otherwise be necessary in IP phone and WLAN deployments. Cisco UPOE extends the IEEE PoE+ standard to double the power per port to 60 watts. This facilitates delivery of network power to a broad range of devices requiring higher power, including virtual desktop terminals, IP turrets, compact switches, building management gateways, LED lights, wireless access points, and IP phones. The Catalyst 9300 Series supports Cisco UPOE, PoE+ and PoE, thereby addressing the largest range of network power needs.

Tables 5 and 6 show the power supply combinations required for different PoE needs.

Table 5. Power Supply Requirements

	24-port PoE switch	48-port PoE switch
PoE on all ports (15.4W per port)	1 PWR-C1-715WAC	1 PWR-C1-1100WAC or 2 PWR-C1-715WAC
PoE+ on all ports (30W per port)	1 PWR-C1-1100WAC or 2 PWR-C1-715WAC	2 PWR-C1-1100WAC or 1 PWR-C1-1100WAC and 1 PWR-C1-715WAC

Power Supply Requirements for Cisco UPOE

	24-port Cisco UPOE switch	48-port Cisco UPOE switch	24-port Multigigabit Cisco UPOE switch
Cisco UPOE (60W per port) on all ports (24-port switch) or up to 30 ports (48-port switch)	1 PWR-C1-1100WAC and 1 PWR-C1-715WAC	2 PWR-C1-1100WAC	2 PWR-C1-1100WAC

- **Perpetual PoE:** With Perpetual PoE, the PoE power is maintained during a switch reload. This is important for IoT endpoints such as PoE-powered lights, so that there is no disruption during switch reboot.
- **Fast PoE:** When power is restored to a switch, PoE starts delivering power to endpoints without waiting for the operating system to fully load, thereby speeding up the time for the endpoint to start up.

Software Requirements

Cisco ONE Software for Access Switching **is available for the Cisco Catalyst 9300.**

Cisco ONE Software for Access Switching offers comprehensive solutions for the enterprise campus and branch offices. Cisco ONE for Access Switching introduces a simpler and more economical way to deploy access, aggregation, and core switches across enterprise campus and branch locations.

The Cisco ONE Subscription for Switching offer delivers an unbound network on an open and extensible architecture to help you navigate the digital journey. This subscription offer simplifies the buying process and includes lower initiation costs and flexible terms. It includes: Cisco ONE Advantage with full Cisco Digital Network Architecture (DNA) capabilities and Cisco Software-Defined Access (SD-Access).

For ordering information for Cisco ONE Software for the Cisco Catalyst 9300, go to https://www.cisco.com/c/en/us/products/software/one-access/switching-part-numbers.html.

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Cisco Catalyst 9300 Series Switches run on Cisco IOS XE 16.5.1a release or later. This software release includes all the features listed earlier in the Platform Benefits section.

Packaging

The Cisco Catalyst 9000 family of switches introduces a new and simplified licensing package in the form of base and add-on licenses.

- **The base licensing** package includes the Network Essentials and Network Advantage licensing options that are tied to the hardware. Between them, the base licensing packages cover switching fundamentals, management automation, troubleshooting, and advanced switching features.
- **The add-on licensing** package includes the Cisco DNA Essentials and Cisco DNA Advantage options. In addition to on-box capabilities, the features available with this package provide Cisco innovations on the switch, as well as on Cisco DNA Center, in the APIC-EM.

License consumption is easily determined by the package itself. While base licenses are always permanent and without an expiration date, add-on licenses have to be purchased for a 3-, 5-, or 7-year term (and hence are also known as term-based licenses). Table 7 shows the combinations of base and add-on licenses that must be purchased.

Licensing Combinations

	Cisco DNA Essentials	Cisco DNA Advantage
Network Essentials	Yes	No
Network Advantage	No	Yes

Ordering and managing licenses with Smart Accounts: Creating Smart Accounts by using the Cisco Smart Software Manager (SSM) enables you to order devices and licensing packages and also manage your software licenses from a centralized website. You can set up Cisco SSM to receive daily email alerts and to be notified of expiring add-on licenses that you want to renew.

You must order an add-on license in order to purchase a switch. When the license term expires, you can either renew the add-on license to continue using it or deactivate the add-on license and then reload the switch to continue operating with the base license capabilities.

Both the base and add-on licenses are also available for a 90-day evaluation period. An evaluation license is activated temporarily, without purchase. An expired evaluation license cannot be reactivated after reload.

Note: It is not required to deploy Cisco DNA Center just to use one of the above packages.

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Table 6 shows the features included in the Essentials and Advantage packages.

Table 6. Essentials and Advantage Package Features

Features	Network Essentials	Network Advantage	Cisco DNA Essentials	Cisco DNA Advantage	Cisco ONE Advantage
Switch features					
Switch fundamentals Spanning Tree Protocol (STP), Rapid STP (RSTP), VLAN Trunking Protocol (VTP), trunking, Private VLAN (PVLAN), dynamic voice VLAN, IPv6, PnP, Cisco Discovery Protocol, 802.1Q tunneling (Q-in-Q), Routed Access – OSPF and RIP, Policy-Based Routing (PBR), Virtual Router Redundancy Protocol (VRRP), Internet Group Management Protocol (IGMP), PIM Stub, Weighted Random Early Detection (WRED), First Hop Security (FHS), 802.1X, MACsec-128, Control Plane Policing (CoPP), Cisco TrustSec® SGT Exchange Protocol (SXP), IP SLA Responder, SSO, EIGRP Stub, Microflow Policing, Class-Based Weighted Fair Queuing (CBWFQ), hierarchical QoS (H-QoS), Application Reporting, Syslog, SNMP	✓	✓	✗	✗	✗
Advanced switch capabilities and scale BGP, EIGRP, Hot Standby Router Protocol (HSRP), IS-IS, Bootstrap Router (BSR), Multicast Source Discovery Protocol (MSDP), Bidirectional PIM (PIM-BIDIR), Label Switched Multicast (LSM), IP SLA, Full OSPF	✗	✓	✗	✗	✗
Network segmentation VPN Routing and Forwarding (VRF), Virtual Extensible LAN (VXLAN), Cisco Locator/ID Separation Protocol (LISP), Cisco TrustSec, SD-Wireless, Multiprotocol Label Switching (MPLS), Layer 3 VPN (L3VPN), Multicast VPN (mVPN)	✗	✓	✗	✗	✗
Optimized network deployments mDNS gateway	✗	✗	✗	✓	✓
Automation Netconf/YANG, PnP Agent, ZTP/Open PnP	✓	✓	✗	✗	✗
Advanced automation Containers, Python, Cisco IOS Embedded Event Manager (EEM), Autonomic Networking Infrastructure	✗	✗	✓	✓	✓
Telemetry and visibility Streaming telemetry, sampled NetFlow, Switched Port Analyzer (SPAN), Remote SPAN (RSPAN)	✓	✓	✗	✗	✗
Advanced telemetry and visibility Flexible NetFlow, Wireshark	✗	✗	✓	✓	✓
Optimized telemetry a visibility Encapsulated Remote SPAN (ERSPAN), Application Visibility and Control (AVC), NBAR2	✗	✗	✗	✓	✓
High availability and resiliency NSF, Graceful Insertion and Removal (GIR)	✗	✓	✗	✗	✗
High availability and resiliency Patching	✗	✓ (CLI)	✗	✓	✓
Security MACsec-256	✗	✓	✗	✗	✗
Advanced security Encrypted Traffic Analytics (ETA)	✗	✗	✗	✓	✓
Cisco DNA Center Features					
Day 0 network bring-up automation Cisco Network Plug-n-Play application, network settings, device credentials	✗	✗	✓	✓	✓
Element management Discovery, inventory, topology, software image, licensing, and configuration management	✗	✗	✓	✓	✓
Element management Patching	✗	✗	✗	✓	✓

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Features	Network Essentials	Network Advantage	Cisco DNA Essentials	Cisco DNA Advantage	Cisco ONE Advantage
Network monitoring Product Security Incident Response Team (PSIRT) compliance, end-of-life/end-of-sale reporting, telemetry quotient, client 360, device 360, top talkers/ NetFlow/streaming telemetry collection and correlation	✗	✗	✓	✓	✓
Static QoS configuration and monitoring EasyQoS application	✗	✗	✓	✓	✓
Policy-based automation SD-Access, group-based policy for access, app prioritization, monitoring, and path selection; SD-Access with Integrated Wireless	✗	✗	✗	✓	✓
Network assurance and analytics Insights driven from analytics and machine learning for the network, clients and applications that cover onboarding, connectivity, and performance	✗	✗	✗	✓	✓
Security analytics and endpoint profiling					
Advanced security analytics (Visibilty and threat detection across the network with Stealthwatch*) *Flow collector and management licenses included	✗	✗	✗	✗	✓
Endpoint based policy (Granular SD-Access with endpoint profiling from ISE)	✗	✗	✗	✗	✓

Dimensions, Weight, Acoustic, Mean Time Between Failures

Table 7 shows the dimensions, weights, acoustic and mean time between failures of all models of 9300 Series switches.

Table 7. Model Dimensions, Weight, and Mean Time Between Failures Metrics

	Dimensions (H x W x D)	
Model	**Inches**	**Centimeters**
C9300-24T	1.73 x 17.5 x 17.5	4.4 x 44.5 x 44.5
C9300-24P	1.73 x 17.5 x 17.5	4.4 x 44.5 x 44.5
C9300-24U	1.73 x 17.5 x 17.5	4.4 x 44.5 x 44.5
C9300-24UX	1.73 x 17.5 x 18.5	4.4 x 44.5 x 47.0`
C9300-48T	1.73 x 17.5 x 17.5	4.4 x 44.5 x 44.5
C9300-48P	1.73 x 17.5 x 17.5	4.4 x 44.5 x 44.5
C9300-48U	1.73 x 17.5 x 17.5	4.4 x 44.5 x 44.5
C9300-48UXM	1.73 x 17.5 x 18.5	4.4 x 44.5 x 47.0
	Weight	
Model	**Pounds**	**Kilograms**
C9300-24T	16.03	7.27
C9300-24P	16.33	7.4
C9300-24U	16.63	7.54
C9300-24UX	18.18	8.25
C9300-48T	16.43	7.45
C9300-48P	16.73	7.59
C9300-48U	17.03	7.72
C9300-48UXM	20.50	9.34
Mean time between failures (hours)		
C9300-24T	314,790	

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	Dimensions (H x W x D)	
C9300-24P	299,000	
C9300-24U	238,410	
C9300-24UX	214,760	
C9300-48T	305,870	
C9300-48P	277,770	
C9300-48U	227,410	
C9300-48UXM	202,160	
Environmental Ranges		
Acoustic noise **Measured per ISO 7779 and declared per ISO 9296** **Bystander positions operating to an ambient temperature of 25°C**	With AC power supply (with 24 PoE+ ports loaded): • LpA: 45dB typical, 48 dB max • LwA: 5.6B typical, 5.9B max Typical: Noise emission for a typical configuration Maximum: Statistical maximum to account for variation in production	

Connectors

Table 8 shows the supported connectors for the Cisco Catalyst 9300 Series.

Table 8. Connectors

Connectors and cabling	• 1000BASE-T ports: RJ-45 connectors, 4-pair Cat 5E UTP cabling • Multigigabit-T ports: RJ-45 connectors, 4-pair Cat 5E, Cat 6, Cat 6A UTP cabling • 1000BASE-T SFP-based ports: RJ-45 connectors, 4-pair Cat 5E UTP cabling • 100BASE-FX, 1000BASE-SX, -LX/LH, -ZX, -BX10, dense wavelength-division multiplexing (DWDM) and Coarse Wavelength-Division Multiplexing (CWDM) SFP transceivers: LC fiber connectors (single-mode or multimode fiber) • 10GBASE-SR, LR, LRM, ER, ZR, DWDM SFP+ transceivers: LC fiber connectors (single-mode or multimode fiber) • QSFP • SFP+ connector • Cisco StackWise-480 stacking ports: copper-based Cisco StackWise cabling • Cisco StackPower: Cisco proprietary power stacking cables • Ethernet management port: RJ-45 connectors, 4-pair Cat 5 UTP cabling • Management console port: RJ-45-to-DB9 cable for PC connections
Power connectors	• Customers can provide power to a switch by using either the internal power or Cisco StackPower from another member in the power stack. The connectors are located at the back of the switch. • Internal power supply connector: The internal power supply is an auto-ranging unit. It supports input voltages between 100 and 240 VAC. Use the supplied AC power cord to connect the AC power connector to an AC power outlet.

For the latest Cisco transceiver module compatibility information, refer to https://www.cisco.com/c/en/us/support/interfaces-modules/transceiver-modules/products-device-support-tables-list.html.

Management and Standards Support

Table 9 shows management and standards support for the Cisco Catalyst 9300 Series.

Table 9. Management and Standards Support*

Description	Specification	
Management	BRIDGE-MIB	CISCO-SNMP-TARGET-EXT-MIB
	CISCO-AUTH-FRAMEWORK-MIB	CISCO-STACKMAKER-MIB
	CISCO-BGP4-MIB, BGP4-MIB	CISCO-MEMORY-POOL-MIB
	CISCO-BRIDGE-EXT-MIB	CISCO-STP-EXTENSIONS-MIB
	CISCO-BULK-FILE-MIB	CISCO-SYSLOG-MIB

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Description	Specification	
	CISCO-CABLE-DIAG-MIB	CISCO-TCP-MIB
	CISCO-CALLHOME-MIB	CISCO-UDLDP-MIB
	CISCO-CEF-MIB	CISCO-VLAN-IFTABLE-RELATIONSHIP-MIB
	CISCO-CIRCUIT-INTERFACE-MIB	CISCO-VLAN-MEMBERSHIP-MIB
	CISCO-ENTITY-VENDORTYPE-OID-MIB	CISCO-VTP-MIB
	CISCO-CONTEXT-MAPPING-MIB	EtherLike-MIB
	CISCO-DEVICE-LOCATION-MIB	HC-RMON-MIB
	CISCO-DHCP-SNOOPING-MIB	IEEE8021-PAE-MIB
	CISCO-EIGRP-MIB	IEEE8023-LAG-MIB
	CISCO-EMBEDDED-EVENT-MGR-MIB	IF-MIB
	CISCO-ENTITY-FRU-CONTROL-MIB	IGMP-MIB
	CISCO-ENTITY-SENSOR-MIB	IGMP-STD-MIB
	ENTITY-MIB	IP-FORWARD-MIB
	CISCO-ERR-DISABLE-MIB	IP-MIB
	CISCO-CONFIG-COPY-MIB	IPMROUTE-STD-MIB
	CISCO-FLOW-MONITOR-MIB	LLDP-EXT-MED-MIB
	CISCO-FTP-CLIENT-MIB	LLDP-MIB
	CISCO-HSRP-EXT-MIB	NOTIFICATION-LOG-MIB
	CISCO-HSRP-MIB	OLD-CISCO-MEMORY-MIB
	CISCO-IETF-ISIS-MIB	CISCO-CDP-MIB
	CISCO-IF-EXTENSION-MIB	POWER-ETHERNET-MIB
	CISCO-IGMP-FILTER-MIB	RMON2-MIB
	CISCO-CONFIG-MAN-MIB	RMON-MIB
	CISCO-IP-CBR-METRICS-MIB	SNMP-COMMUNITY-MIB
	CISCO-IPMROUTE-MIB	SNMP-FRAMEWORK-MIB
	CISCO-IP-STAT-MIB	SNMP-MPD-MIB
	CISCO-IP-URPF-MIB	SNMP-NOTIFICATION-MIB
	CISCO-L2L3-INTERFACE-CONFIG-MIB	SNMP-PROXY-MIB
	CISCO-LAG-MIB	SNMP-TARGET-MIB
	CISCO-LICENSE-MGMT-MIB	SNMP-USM-MIB
	CISCO-MAC-AUTH-BYPASS-MIB	SNMPv2-MIB
	CISCO-MAC-NOTIFICATION-MIB	SNMP-VIEW-BASED-ACM-MIB
	CISCO-MDI-METRICS-MIB	TCP-MIB
	CISCO-FLASH-MIB	UDP-MIB
	CISCO-OSPF-MIB	CISCO-IMAGE-MIB
	CISCO-OSPF-TRAP-MIB	CISCO-STACKWISE-MIB
	CISCO-PAE-MIB	
	CISCO-PAGP-MIB	
	CISCO-PIM-MIB	
	CISCO-PING-MIB	
	CISCO-PORT-QOS-MIB	
	CISCO-PORT-SECURITY-MIB	
	CISCO-PORT-STORM-CONTROL-MIB	
	CISCO-POWER-ETHERNET-EXT-MIB	
	CISCO-PRIVATE-VLAN-MIB	
	CISCO-PROCESS-MIB	
	CISCO-PRODUCTS-MIB	
	CISCO-RF-MIB	
	CISCO-RTP-METRICS-MIB	
	CISCO-RTTMON-MIB	
	CISCO-SMART-INSTALL-MIB	
Standards	EEE 802.1s	RMON I and II standards
	IEEE 802.1w	SNMPv1, v2c, and v3
	IEEE 802.1x	
	IEEE 802.1x-Rev	

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Description	Specification	
	IEEE 802.3ad IEEE 802.3af IEEE 802.3at IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX, and 1000BASE-T ports IEEE 802.1D Spanning Tree Protocol IEEE 802.1p CoS prioritization IEEE 802.1Q VLAN IEEE 802.3 10BASE-T specification IEEE 802.3u 100BASE-TX specification IEEE 802.3ab 1000BASE-T specification IEEE 802.3z 1000BASE-X specification IEEE 802.3bz 10G BASE-T specification	

Power Supply Specifications

Table 10 lists the power specifications for the Cisco Catalyst 9300 Series based on the kind of power supply used.

Table 10. Power Specifications

Description	Specification		
	PWR-C1-1100WAC	**PWR-C1-715WAC**	**PWR-C1-350WAC**
Power supply rated maximum	1100W	715W	350W
Total output BTU (note: 1000 BTU/hr = 293W)	3793 BTU/hr, 1100W	2465 BTU/hr, 715W	1207BTU/hr, 350W
Input-voltage range and frequency	115V to 240 VAC, 50 to 60 Hz	100 to 240 VAC, 50 to 60 Hz	100 to 240 VAC, 50 to 60 Hz
Input current	12-6A	10-5A	4-2A
Output ratings	-56V at 19.64A	-56V at 12.8A	-56V at 6.25A
Output holdup time	10 ms minimum at 102.5VAC	16.7 ms minimum at 100VAC	16.7 ms minimum at 100VAC
Power-supply input receptacles	IEC 320-C16 (IEC60320-C16)	IEC 320-C16 (IEC60320-C16)	IEC 320-C16 (IEC60320-C16)
Power cord rating	13A	13A	10A
Physical specifications	(H x W x D): 1.58 x 3.25 s 13.7 in Weight: 3 lb (1.4 kg)	(H x W x D): 1.58 x 3.25 x 12.20 in Weight: 2.8 lb (1.3 kg)	(H x W x D): 1.58 x 3.25 x 12.20 in Weight: 2.6 lb (1.2 kg)
Operating temperature	23° to 113°F (-5° to 45°C)		
Storage temperature	-40° to 158°F (-40° to 70°C)		
Relative humidity operating and non-operating noncondensing	5% to 90% noncondensing		
Altitude	10,000 ft. (3000 meters), up to 45°C		
Mean Time Between Failures (MTBF)	C9300-48UXM: 209,430 C9300-24UX: 223,480 C9300-24T: 314,790 C9300-48T: 305,870 C9300-24P: 299,000 C9300-48P: 277,770 C9300-24U: 238,410 C9300-48U: 227,410		
EMI and EMC compliance	FCC Part 15 (CFR 47) Class A ICES-003 Class A EN 55022 Class A CISPR 22 Class A		

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Description	Specification
	AS/NZS 3548 Class A BSMI Class A (AC input models only) VCCI Class A EN 55024, EN300386, EN 50082-1, EN 61000-3-2, EN 61000-3-3 EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN 61000-6-1
Safety compliance	UL 60950-1, CAN/CSA-C22.2 No. 60950-1, EN 60950-1, IEC 60950-1, CCC, CE Marking
LED indicators	“AC OK”: Input power to the power supply is OK “PS OK”: Output power from the power supply is OK

Power Consumption of Standalone 9300 Series Switches

Table 11 shows the power consumption of standalone Cisco Catalyst 9300 Series Switches based on Alliance for Telecommunications Industry Solutions (ATIS) testing using Internet Mix (IMIX) distribution stream traffic, with input voltage of 115VAC at 60 Hz and no PoE loading. The values given are the maximum possible power consumption numbers under the respective test scenarios.

Table 11. Power Consumption of Standalone 9300 Series Switches

				Measured P(W)															
				Half Port Traffic					Full Port Traffic					Weighted Average Pw	No Link	PoE Test (No Traffic)			
SKU	FEP	Uplink	Input	0.01% / EEE	10%	30%	50%	100%	0.01% / EEE	10%	30%	50%	100%			25%	50%	90%	100%
C9300-24T	350W	Not Installed	115Vac	77.7	86.1	89.1	89.5	89.7	77.5	91.0	91.7	91.9	92.5	89.8	78.1				
			230Vac	77.4	85.4	88.5	88.7	88.8	77.0	89.8	90.7	90.9	91.3	88.7	77.7				
		NM-4-1G	115Vac	82.5	88.4	92.1	93.3	94.1	85.9	96.0	98.9	99.7	100.0	95.4	81.2				
			230Vac	81.8	87.6	90.4	92.0	92.9	84.9	94.2	96.9	97.9	98.3	93.7	80.5				
		NM-4-10G	115Vac	86.4	96.3	98.0	98.2	98.7	90.2	103.7	104.5	104.9	105.9	102.6	87.0				
			230Vac	85.4	95.1	96.6	96.8	97.3	89.1	102.1	102.9	103.3	104.2	101.0	86.0				
		NM-2-40G	115Vac	84.0	94.7	95.7	95.9	96.1	87.1	101.1	101.7	102.1	103.0	99.9	83.9				
			230Vac	83.2	93.6	94.4	94.6	95.1	86.2	99.2	100.1	100.5	101.4	98.1	83.2				
		NM-8-10G	115Vac	86.3	95.6	97.5	97.8	98.2	90.7	103.9	104.7	105.1	106.1	102.8	85.0				
			230Vac	85.4	94.5	96.2	96.4	97.0	89.7	102.2	103.2	103.6	104.5	101.2	84.3				
C9300-24P	715W	Not Installed	115Vac	82.6	91.0	93.4	93.7	93.9	82.0	94.8	95.9	96.1	96.6	93.7	82.9	202.3	325.8	527.5	579.0
			230Vac	81.6	89.8	92.2	92.4	92.6	81.7	93.7	94.6	94.7	95.2	92.6	82.3	199.0	318.2	510.6	559.9
		NM-4-1G	115Vac	87.5	93.0	96.5	97.7	98.5	89.8	99.5	102.4	103.0	103.4	98.9	85.4	211.4	334.5	537.8	585.7
			230Vac	86.1	91.3	94.4	95.8	96.6	88.9	98.5	101.5	101.9	102.4	97.9	84.6	207.9	328.0	520.3	568.2
		NM-4-10G	115Vac	90.4	100.4	101.6	101.9	102.3	94.1	106.8	107.8	108.2	109.1	105.7	90.8	214.9	337.9	539.4	590.8
			230Vac	89.4	99.1	100.3	100.5	100.7	92.8	106.1	106.5	106.9	107.8	104.9	89.6	211.0	329.7	522.2	571.0
		NM-2-40G	115Vac	88.1	98.6	99.5	99.6	99.9	91.1	104.4	105.2	105.6	106.5	103.3	88.4	212.2	335.2	536.2	586.5
			230Vac	87.1	97.2	98.1	98.3	98.8	90.0	103.3	103.9	104.3	105.2	102.1	87.5	208.0	326.8	519.3	567.6
		NM-8-10G	115Vac	90.0	99.4	101.0	101.2	101.6	94.2	107.1	107.9	108.3	109.2	106.0	88.7	215.3	339.6	541.4	591.3
			230Vac	89.0	97.9	99.8	100.0	100.5	93.1	105.8	106.7	107.1	108.1	104.8	87.8	211.7	331.9	524.2	572.3
C9300-24U	1100W	Not Installed	115Vac	87.4	95.9	99.0	99.2	99.4	87.0	100.8	101.5	101.8	102.3	99.6	87.8	313.7	547.9	940.3	1041.4
			230Vac	85.9	94.7	97.3	97.6	97.8	85.5	98.0	99.6	99.8	100.3	96.9	86.4	306.2	529.1	895.6	988.7
		NM-4-1G	115Vac	92.2	97.8	101.2	102.7	103.6	95.4	105.2	108.3	109.0	109.4	104.6	94.4	321.0	554.0	943.5	1045.5
			230Vac	90.6	96.1	99.4	100.9	101.7	93.7	103.4	106.4	107.2	107.6	102.8	93.2	313.5	536.6	901.5	994.6

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				Measured P(W)															
				Half Port Traffic					Full Port Traffic					Weighted Average Pw	No Link	PoE Test (No Traffic)			
SKU	FEP	Uplink	Input	0.01% / EEE	10%	30%	50%	100%	0.01% / EEE	10%	30%	50%	100%			25%	50%	90%	100%
		NM-4-10G	115Vac	96.0	106.2	107.6	107.8	108.4	99.7	113.4	114.2	114.6	115.6	112.3	96.1	325.7	559.0	950.6	1053.0
			230Vac	94.3	104.5	105.8	106.1	106.6	97.9	112.1	112.8	113.2	114.0	110.8	94.4	318.3	541.9	906.2	997.8
		NM-2-40G	115Vac	93.4	103.9	104.8	105.0	105.5	96.5	110.4	111.3	111.5	112.4	109.2	93.4	323.2	555.8	946.7	1048.6
			230Vac	91.8	102.0	103.0	103.3	103.7	94.8	108.7	109.4	109.8	110.6	107.5	91.8	314.9	538.4	902.2	994.5
		NM-8-10G	115Vac	95.8	105.4	107.3	107.6	108.1	100.2	114.0	114.8	115.2	116.2	112.8	94.4	324.4	557.7	946.6	1049.0
			230Vac	94.0	103.0	105.1	105.4	106.0	98.4	112.0	113.1	113.5	114.5	110.9	93.2	317.8	541.8	907.7	999.1

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				Measured P(W)															
				Half Port Traffic					Full Port Traffic					Weighted Average Pw	No Link	PoE Test (No Traffic)			
SKU	FEP	Uplink	Input	0.01% / EEE	10%	30%	50%	100%	0.01% / EEE	10%	30%	50%	100%			25%	50%	90%	100%
C9300-48T	350W	Not Installed	115Vac	81.5	94.9	95.7	95.9	96.4	80.8	98.6	100.2	101.3	102.3	97.2	82.2				
			230Vac	80.5	93.7	94.6	94.8	95.3	80.1	97.3	99.5	99.9	100.8	96.0	81.5				
		NM-4-1G	115Vac	86.4	94.9	97.8	99.4	100.4	89.3	104.6	107.6	108.6	108.9	103.5	85.7				
			230Vac	85.3	93.8	96.6	98.4	99.1	88.2	103.4	106.2	106.9	107.2	102.3	84.8				
		NM-4-10G	115Vac	89.6	103.4	104.2	104.6	105.4	93.0	112.7	113.5	114.1	115.7	111.0	90.6				
			230Vac	89.0	102.0	102.8	103.1	103.9	91.9	111.0	111.8	112.4	114.0	109.4	89.3				
		NM-2-40G	115Vac	88.3	102.4	102.9	103.3	104.2	91.0	110.5	111.3	112.1	113.9	108.9	88.6				
			230Vac	87.3	100.9	101.4	101.8	102.7	89.9	108.8	109.6	110.3	112.1	107.2	87.6				
		NM-8-10G	115Vac	92.1	105.2	106.1	106.5	107.4	98.6	117.6	118.4	119.1	120.9	116.0	91.0				
			230Vac	91.1	103.9	104.7	105.1	106.0	97.3	115.8	116.6	117.3	119.0	114.3	90.0				
C9300-48P	715W	Not Installed	115Vac	90.5	103.2	104.5	104.7	105.2	89.9	104.9	107.8	109.2	110.2	103.9	91.3	206.1	324.1	514.4	563.2
			230Vac	89.4	102.2	103.4	103.6	104.1	88.9	103.7	106.9	108.4	109.3	102.7	89.9	202.9	316.9	500.6	547.5
		NM-4-1G	115Vac	95.3	103.5	106.2	108.1	108.8	98.0	112.1	114.9	115.9	116.2	111.1	94.3	215.0	332.6	523.4	572.1
			230Vac	94.0	102.2	105.2	106.9	107.8	96.4	111.3	114.1	115.2	115.5	110.2	93.1	211.2	324.8	509.3	555.8
		NM-4-10G	115Vac	98.7	111.5	112.3	112.7	113.5	101.5	119.7	120.5	121.2	122.8	118.2	99.2	219.1	336.5	528.8	576.6
			230Vac	97.1	110.7	111.5	111.9	112.7	100.6	119.2	120.0	120.7	122.3	117.6	97.9	215.5	329.5	514.2	560.5
		NM-2-40G	115Vac	96.9	110.1	110.7	111.0	111.9	99.3	118.2	119.0	119.7	121.5	116.7	97.6	217.4	335.4	527.4	577.8
			230Vac	95.6	109.2	109.7	110.1	111.0	98.1	117.5	118.2	119.0	120.6	115.8	96.0	213.0	326.9	511.9	558.8
		NM-8-10G	115Vac	100.5	113.4	114.2	114.6	115.5	106.4	124.5	125.4	126.1	128.0	123.0	99.5	215.1	334.7	520.8	568.8
			230Vac	99.4	112.8	113.5	113.9	114.9	105.3	124.0	124.9	125.6	127.4	122.5	98.4	212.3	327.4	507.4	553.1
C9300-48U	1100W	Not Installed	115Vac	96.0	110.2	110.9	111.2	111.7	95.6	112.5	114.3	115.9	116.9	111.3	97.0	315.1	544.0	925.9	1023.0
			230Vac	94.8	108.5	109.2	109.4	109.9	94.2	110.0	112.5	114.1	115.0	108.9	95.6	308.6	529.4	889.9	978.8
		NM-4-1G	115Vac	97.4	105.8	109.0	110.7	111.0	99.9	115.1	117.8	118.9	119.2	114.0	96.4	319.2	547.3	928.0	1026.3
			230Vac	95.4	103.9	107.4	108.7	110.0	98.8	113.4	116.2	117.0	117.4	112.4	94.9	314.3	535.6	896.0	984.3
		NM-4-10G	115Vac	104.4	118.5	119.0	119.5	120.1	107.4	126.8	127.6	128.3	130.0	125.2	104.9	326.2	556.0	938.6	1035.6
			230Vac	102.8	116.0	117.1	117.5	118.2	106.4	124.8	125.5	126.2	127.7	123.2	103.6	320.4	541.4	903.0	991.6
		NM-2-40G	115Vac	102.9	117.2	117.6	118.0	119.0	104.8	123.8	124.6	125.3	127.0	122.2	102.5	324.1	552.4	934.4	1032.6
			230Vac	101.2	114.9	115.5	115.9	117.0	103.9	123.0	123.7	124.4	126.1	121.4	101.7	316.9	537.9	898.2	988.3
		NM-8-10G	115Vac	106.7	120.4	121.1	121.5	122.3	112.7	131.5	132.4	133.0	134.8	130.0	105.7	330.0	563.7	941.8	1043.4
			230Vac	105.0	118.5	119.2	119.6	120.2	110.9	129.4	130.2	131.0	132.6	127.9	104.1	324.5	549.0	908.0	998.9
C9300-24XU	1100W	NM-8-10G	115Vac	188.0	195.7	196.8	197.4	198.9	208.8	224.6	227.0	228.6	232.0	223.8	168.6	364.2	521.6	784.3	851.4
			230Vac	184.4	192.2	192.9	193.5	195.1	204.6	220.0	222.0	223.5	226.9	219.2	165.3	354.2	505.0	749.7	810.6

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Safety and Compliance

Table 12 lists the safety and compliance information for the Cisco Catalyst 9300 Series.

Table 12. Safety and Compliance Information

Description	Specification
Safety certifications	• UL 60950-1 • CAN/CSA-C222.2 No. 60950-1 • EN 60950-1 • IEC 60950-1 • AS/NZS 60950.1 • IEEE 802.3
Electromagnetic emissions certifications	• 47 CFR Part 15 • CISPR22 Class A • EN 300 386 V1.6.1 • EN 55022 Class A • EN 55032 Class A • CISPR 32 Class A • EN61000-3-2 • EN61000-3-3 • ICES-003 Class A • TCVN 7189 Class A • V-3 Class A • CISPR24 • EN 300 386 • EN55024 • TCVN 7317
Environmental	Reduction of Hazardous Substances (ROHS) 5

Cisco Enhanced Limited Lifetime Hardware Warranty

The Cisco Catalyst 9300 Series Switches come with a Cisco Enhanced Limited Lifetime Warranty (E-LLW) that includes Next-Business-Day (NBD) delivery of replacement hardware where available and 90 days of 8x5 Cisco Technical Assistance Center (TAC) support.

Your formal warranty statement, including the warranty applicable to Cisco software, appears in the information packet that accompanies your Cisco product. We encourage you to review the warranty statement shipped with your specific product carefully before use.

Cisco reserves the right to refund the purchase price as its exclusive warranty remedy.

For further information about warranty terms, visit https://www.cisco.com/go/warranty. Table 13 provides information about the E-LLW.

Table 13. E-LLW Details

	Cisco E-LLW
Devices covered	Applies to Cisco Catalyst 9300 Series Switches.
Warranty duration	As long as the original customer owns the product.
End-of-life policy	In the event of discontinuance of product manufacture, Cisco warranty support is limited to 5 years from the announcement of discontinuance.
Hardware replacement	Cisco or its service center will use commercially reasonable efforts to ship a replacement for NBD delivery, where available. Otherwise, a replacement will be shipped within 10 working days after receipt of the Return Materials Authorization (RMA) request. Actual delivery times might vary depending on customer location.

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	Cisco E-LLW
Effective date	Hardware warranty commences from the date of shipment to customer (and in case of resale by a Cisco reseller, not more than 90 days after original shipment by Cisco).
TAC support	Cisco will provide during business hours, 8 hours per day, 5 days per week, basic configuration, diagnosis, and troubleshooting of device-level problems for up to a 90-day period from the date of shipment of the originally purchased Cisco Catalyst 9300 Series product. This support does not include solution or network-level support beyond the specific device under consideration.
Cisco.com access	Warranty allows guest access only to Cisco.com.

Cisco Services For Next-Generation Cisco Catalyst Fixed Switches

Achieve infrastructure excellence faster and with less risk. Cisco Catalyst 9K Services provide expert guidance to help you successfully deploy, manage and support the new Catalyst 9K Series Switches. With unmatched networking expertise, best practices and innovative tools, we can help you reduce overall upgrade, refresh, and migration costs as you introduce new hardware, software and protocols into the network. Offering a comprehensive lifecycle of services – from implementation, optimization, technical and managed services – Cisco experts help you minimize disruption and achieve operational excellence to extract maximum value from your DNA-ready infrastructure.

Learn more about Cisco Services for Enterprise Networks

Software Policy for Cisco Catalyst 9300 Series Switches

Software Policy For Network Stack Components

Customers with the Network Essential Stack and Network Advantage Stack software feature sets are provided with maintenance updates and bug fixes designed to maintain compliance of the software. This includes compliance with published specifications, release notes, and industry standards as long as the original end user continues to own or use the product or up to one year from the end-of-sale date for the product, whichever occurs earlier.

Cisco Embedded Support for Cisco DNA Term Components

Cisco Embedded Support delivers the right support for Cisco software products and suites. It will keep your business applications performing as expected and protect your investment. Cisco Embedded Support for the DNA Essentials and DNA Advantage term components is included. Cisco Embedded Support provides access to TAC support, major software updates, maintenance and minor software releases, and the Cisco Embedded Support site, for increased productivity with anytime access.

Ordering Information

Table 16 lists ordering information for the Cisco Catalyst 9300 Series. To place an order, visit the Cisco Ordering home page at https://www.cisco.com/en/US/ordering/or13/or8/order_customer_help_how_to_order_listing.html.

Table 14. Ordering Information

Switches	
Product Number	**Product Description**
C9300-24T-E	Catalyst 9300 24-port data only, Network Essentials
C9300-24T-A	Catalyst 9300 24-port data only, Network Advantage
C9300-24P-E	Catalyst 9300 24-port PoE+, Network Essentials
C9300-24P-A	Catalyst 9300 24-port PoE+, Network Advantage
C9300-24U-E	Catalyst 9300 24-port UPOE, Network Essentials
C9300-24U-A	Catalyst 9300 24-port UPOE, Network Advantage

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Switches	
C9300-24UX-E	Catalyst 9300 24-port mGig UPOE, Network Essentials
C9300-24UX-A	Catalyst 9300 24-port mGig UPOE, Network Advantage
C9300-48T-E	Catalyst 9300 48-port data only, Network Essentials
C9300-48T-A	Catalyst 9300 48-port data only, Network Advantage
C9300-48P-E	Catalyst 9300 48-port PoE+, Network Essentials
C9300-48P-A	Catalyst 9300 48-port PoE+, Network Advantage
C9300-48U-E	Catalyst 9300 48-port UPOE, Network Essentials
C9300-48U-A	Catalyst 9300 48-port UPOE, Network Advantage
C9300-48UXM-E	Catalyst 9300 48-port 2.5G (12 mGig) UPOE, Network Essentials
C9300-48UXM-A	Catalyst 9300 48-port 2.5G (12 mGig) UPOE, Network Advantage
Network modules	
Product Number	**Product Description**
C9300-NM-4G	Catalyst 9300 4 x 1GE Network Module
C9300-NM-4G=	Catalyst 9300 4 x 1GE Network Module, spare
C9300-NM-8X	Catalyst 9300 8 x 10GE Network Module
C9300-NM-8X=	Catalyst 9300 8 x 10GE Network Module, spare
C9300-NM-2Q	Catalyst 9300 2 x 40GE Network Module
C9300-NM-2Q=	Catalyst 9300 2 x 40GE Network Module, spare
C9300-NM-4M	Catalyst 9300 4 x MGig Network Module
C9300-NM-4M=	Catalyst 9300 4 x MGig Network Module, spare
Stacking cables	
Product Number	**Product Description**
STACK-T1-50CM	50CM Type 3 Stacking Cable
STACK-T1-50CM=	50CM Type 3 Stacking Cable, spare
STACK-T1-1M	1M Type 3 Stacking Cable
STACK-T1-1M=	1M Type 3 Stacking Cable, spare
STACK-T1-3M	3M Type 3 Stacking Cable
STACK-T1-3M=	3M Type 3 Stacking Cable, spare
Software licenses	
Product Number	**Product Description**
C1A1TCAT93001*	C9300 C1 Advantage Term, 24-Port: Includes Term Licenses for DNA Advantage, 25 ISE Base & 25 ISE Plus Endpoints, 25 Stealthwatch Flows (including Virtual Flow Collector & Management Console). Requires separate purchase of ISE appliance/ISE VM and DNA Center appliance
C1A1TCAT93001-3Y	C9300 C1 Advantage, 24-port, 3Y Term – DNA, 25 ISE PLS and ISE BASE, 25 SWATCH
C1A1TCAT93001-5Y	C9300 C1 Advantage, 24-port, 5Y Term – DNA, 25 ISE PLS and ISE BASE, 25 SWATCH
C1A1TCAT93001-7Y	C9300 C1 Advantage, 24-port, 7Y Term – DNA, 25 ISE PLS and ISE BASE, 25 SWATCH
C1A1TCAT93002*	C9300 C1 Advantage Term, 48-Port: Includes Term Licenses for DNA Advantage, 25 ISE Base & 25 ISE Plus Endpoints, 25 Stealthwatch Flows (including Virtual Flow Collector & Management Console). Requires separate purchase of ISE appliance/ISE VM and DNA Center appliance
C1A1TCAT93002-3Y	C9300 C1 Advantage, 48-port, 3Y Term – DNA, 25 ISE PLS and ISE BASE, 25 SWATCH
C1A1TCAT93002-5Y	C9300 C1 Advantage, 48-port, 5Y Term – DNA, 25 ISE PLS and ISE BASE, 25 SWATCH
C1A1TCAT93002-7Y	C9300 C1 Advantage, 48-port, 7Y Term – DNA, 25 ISE PLS and ISE BASE, 25 SWATCH
C1AA1TCAT93001	C9300 C1 Advantage Add-On Term: Includes Term Licenses for 25 ISE Base & 25 ISE Plus Endpoints, 25 Stealthwatch Flows (including Virtual Flow Collector & Management Console). Requires separate purchase of ISE appliance/ISE VM and DNA Center appliance.
C1AA1TCAT93001-3Y	C9300 C1 Advantage Add-on 3Y Term - 25 ISE PLS and ISE BASE, 25 SWATCH

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Switches	
C1AA1TCAT93001-5Y	C9300 C1 Advantage Add-on 5Y Term - 25 ISE PLS and ISE BASE, 25 SWATCH
C1AA1TCAT93001-7Y	C9300 C1 Advantage Add-on 7Y Term - 25 ISE PLS and ISE BASE, 25 SWATCH
C9300-DNA-E-24-3Y	C9300 DNA Essentials, 24-port, 3 Year Term license
C9300-DNA-E-24-5Y	C9300 DNA Essentials, 24-port, 5 Year Term license
C9300-DNA-E-24-7Y	C9300 DNA Essentials, 24-port, 7 Year Term license
C9300-DNA-A-24-3Y	C9300 DNA Advantage, 24-port, 3 Year Term license
C9300-DNA-A-24-5Y	C9300 DNA Advantage, 24-port, 5 Year Term license
C9300-DNA-A-24-7Y	C9300 DNA Advantage, 24-port, 7 Year Term license
C9300-DNA-E-48-3Y	C9300 DNA Essentials, 48-port, 3 Year Term license
C9300-DNA-E-48-5Y	C9300 DNA Essentials, 48-port, 5 Year Term license
C9300-DNA-E-48-7Y	C9300 DNA Essentials, 48-port, 7 Year Term license
C9300-DNA-A-48-3Y	C9300 DNA Advantage, 48-port, 3 Year Term license
C9300-DNA-A-48-5Y	C9300 DNA Advantage, 48-port, 5 Year Term license
C9300-DNA-A-48-7Y	C9300 DNA Advantage, 48-port, 7 Year Term license
C9300-LIC=	Electronic SW License for C9300 Switches
Power supplies	
Product Number	**Product Description**
PWR-C1-350WAC=	350WAC power supply spare
PWR-C1-715WAC=	715WAC power supply spare
PWR-C1-1100WAC=	1100WAC power supply spare
Cisco StackWise-480 and StackPower cables	
STACK-T1-50CM=	Cisco StackWise-480 50cm stacking cable spare
STACK-T1-1M=	Cisco StackWise-480 1m stacking cable spare
STACK-T1-3M=	Cisco StackWise-480 3m stacking cable spare
CAB-SPWR-30CM=	Cisco Catalyst 3850 StackPower cable 30cm spare
CAB-SPWR-150CM=	Cisco Catalyst 3850 StackPower cable 150cm spare
Spare power cords	
CAB-TA-NA=	AC power cord for Cisco Catalyst (North America)
CAB-TA-AP=	AC power cord for Cisco Catalyst (Australia)
CAB-TA-AR=	AC power cord for Cisco Catalyst (Argentina)
CAB-TA-SW=	AC power cord for Cisco Catalyst (Switzerland)
CAB-TA-UK=	AC power cord for Cisco Catalyst (United Kingdom)
CAB-TA-JP=	AC power cord for Cisco Catalyst (Japan)
CAB-TA-250VAC-JP=	Japan 250VAC power cord for Cisco Catalyst (Japan)
CAB-TA-EU=	AC power cord for Cisco Catalyst (Europe)
CAB-TA-IT=	AC power cord for Cisco Catalyst (Italy)
CAB-TA-IN=	AC power cord for Cisco Catalyst (India)
CAB-TA-CN=	AC power cord for Cisco Catalyst (China)
CAB-TA-DN=	AC power cord for Cisco Catalyst (Denmark)
CAB-TA-IS=	AC power cord for Cisco Catalyst (Israel)
CAB-ACBZ-12A=	AC power cord for Cisco Catalyst (Brazil), 12A/125V BR-3-20 plug up to 12A
CAB-ACBZ-10A=	AC power cord for Cisco Catalyst (Brazil), 10A/250V BR-3-10 plug up to 10A
CAB-C15-CBN	Cabinet jumper power cord, 250VAC 13A, C14-C15 connectors

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Optics online reference

The Cisco Catalyst 9300 Series supports a wide range of optics. Because the list of supported optics is updated on a regular basis, consult the tables available here for the latest QSFP+, SFP+, and SFP compatibility information: https://www.cisco.com/en/US/products/hw/modules/ps5455/products_device_support_tables_list.html.

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Cisco 10GBASE SFP+ Modules

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A broad range of industry-compliant SFP+ modules for 10 Gigabit Ethernet deployments in diverse networking environments.

Product overview

The Cisco® 10GBASE SFP+ modules (Figure 1) give you a wide variety of 10 Gigabit Ethernet connectivity options for data center, enterprise wiring closet, and service provider transport applications.

Figure 1.
Cisco 10GBASE SFP+ modules

Features and benefits

Cisco SFP+ modules offer the following features and benefits.

- Industry's smallest 10G form factor for greatest density per chassis
- Hot-swappable input/output device that plugs into an Ethernet SFP+ port of a Cisco switch (no need to power down if installing or replacing)
- Supports "pay-as-you-populate" model for investment protection and ease of technology migration
- Digital optical monitoring capability for strong diagnostic capabilities
- Optical interoperability with 10GBASE XENPAK, 10GBASE X2, and 10GBASE XFP interfaces on the same link
- Cisco quality Identification (ID) feature enables a Cisco platform to identify whether the module is certified and tested by Cisco

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Cisco SFP-10G-T-X module

The Cisco 10GBASE-T module (Figure 2) offers connectivity options at the following data rates: 100M/1G/10Gbps. It has the SFP+ form factor and an RJ-45 interface so that CAT5e/CAT6A/CAT7 cables can be used to connect to end points with embedded 10GBASE-T ports. They are suitable for distances up to 30 meters and offers a cost-effective way to connect within racks and across adjacent racks.

Figure 2.
Cisco SFP+ 10GBASE-T module with RJ-45 connector

Table 1, details the specifications for the SFP-10G-T-X module, including cable type, distance, and data rates supported.

Table 1. SFP-10G-T-X cabling specifications

Cisco PIDs	Speeds	Cable Type	Distance	Max. Power Consumption (W)
SFP-10G-T-X	10Gbps	Cat6A/Cat7 or better	Up to 30 meters	2.5W
SFP-10G-T-X	100M/1Gbps	Cat5e/Cat6A/Cat7 or better	Up to 100 meters	1.0W

Cisco SFP-10G-SR-S module (S-Class)

The Cisco 10GBASE-SR module supports a link length of 26 meters on standard Fiber Distributed Data Interface (FDDI)-grade Multimode Fiber (MMF). Using 2000 MHz*km MMF (OM3), up to 300-meter link lengths are possible. Using 4700 MHz*km MMF (OM4), up to 400 meter link lengths are possible. SFP-10G-SR-S does not support FCoE.

Cisco SFP-10G-SR module

The Cisco 10GBASE-SR Module supports a link length of 26m on standard Fiber Distributed Data Interface (FDDI)-grade Multimode Fiber (MMF). Using 2000MHz*km MMF (OM3), up to 300m link lengths are possible. Using 4700MHz*km MMF (OM4), up to 400m link lengths are possible.

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Cisco SFP-10G-SR-X module

The Cisco SFP-10G-SR-X is a multirate* 10GBASE-SR, 10GBASE-SW and OTU2/OTU2e module for extended operating temperature range. It supports a link length of 26m on standard Fiber Distributed Data Interface (FDDI)-grade Multimode Fiber (MMF). Using 2000MHz*km MMF (OM3), up to 300m link lengths are possible. Using 4700MHz*km MMF (OM4), up to 400m link lengths are possible.

* Except for version 1, which supports only 10GBASE-SR.

Cisco SFP-10G-LRM module

The Cisco 10GBASE-LRM Module supports link lengths of 220m on standard Fiber Distributed Data Interface (FDDI) grade Multimode Fiber (MMF). To make sure that specifications are met over FDDI-grade, OM1 and OM2 fibers, the transmitter should be coupled through a mode conditioning patch cord. No mode conditioning patch cord is required for applications over OM3 or OM4. For additional information on mode conditioning patch cord requirements please see:
https://www.cisco.com/en/US/prod/collateral/modules/ps5455/product_bulletin_c25-530836.html.

The Cisco 10GBASE-LRM Module also supports link lengths of 300m on standard Single-Mode Fiber (SMF, G.652).

Cisco FET-10G module

The Cisco FET-10G Fabric Extender Transceiver supports link lengths up to 100m on laser-optimized OM3 or OM4 multimode fiber. It is supported on fabric links from a Nexus 2000 to a Cisco parent switch only. Note this product is not orderable individually. For more information refer to Nexus 2000 datasheet:
https://www.cisco.com/en/US/prod/collateral/switches/ps9441/ps10110/data_sheet_c78-507093.html.

Cisco SFP-10G-LR-S module (S-Class)

The Cisco 10GBASE-LR module supports a link length of 10 kilometers on standard Single-Mode Fiber (SMF) (G.652). SFP-10G-LR-S does not support FCoE.

Cisco SFP-10G-LR module

The Cisco 10GBASE-LR Module supports a link length of 10 kilometers on standard Single-Mode Fiber (SMF, G.652).

Cisco SFP-10G-LR-X module

The Cisco SFP-10G-LR-X is a multirate 10GBASE-LR, 10GBASE-LW, and OTU2/OTU2e module for extended operating temperature range. It supports a link length of 10 kilometers on standard Single-Mode Fiber (SMF, G.652).

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Cisco SFP-10G-LR10-I module

The Cisco SFP-10G-LR10-I supports a link length of 10 kilometers on standard Single-Mode Fiber (SMF, G.652). The SFP-10G-LR10-I is for industrial operating temperature range. The SFP-10G-LR10-I also supports CPRI datrates options 3, 4, 5, 6, 7, 7a, 8.

Cisco SFP-10G-BXD-I and SFP-10G-BXU-I for 10Km (single-fiber bidirectional applications)

The Cisco SFP-10G-BXD-I and SFP-10G-BXU-I SFPs operate on a single strand of standard SMF.

A SFP-10G-BXD-I device is always connected to a SFP-10G-BXU-I device with a single strand of standard SMF with an operating transmission range up to 10 km.

The communication over a single strand of fiber is achieved by separating the transmission wavelength of the two devices, as depicted in Figure 3. SFP-10G-BXD-I transmits a 1330-nm channel and receives a 1270-nm signal, whereas SFP-10G-BXU-I transmits at a 1270-nm wavelength and receives a 1330-nm signal. Note in Figure 3 the presence of a Wavelength-Division Multiplexing (WDM) splitter integrated into the SFP to split the 1270-nm and 1330-nm light paths.

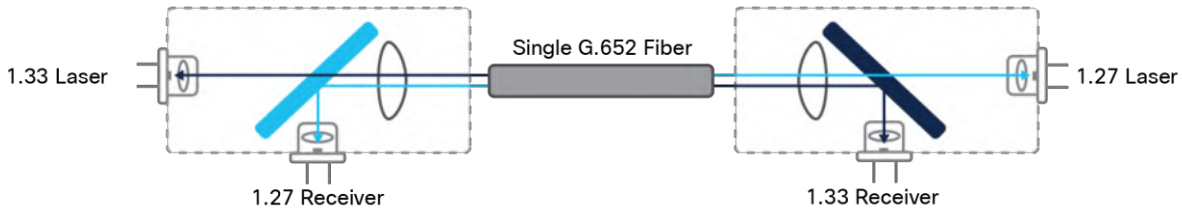

Figure 3.
Bidirectional transmission of a single strand of SMF

The SFP-10G-BXD-I and SFP-10G-BXU-I SFPs also support Digital Optical Monitoring (DOM) functions according to the industry-standard SFF-8472 Multisource Agreement (MSA). This feature gives the end user the ability to monitor real-time parameters of the SFP, such as optical output power, optical input power, temperature, laser bias current, and transceiver supply voltage.

Cisco SFP-10G-ER-S module (S-Class)

The Cisco 10GBASE-ER module supports a link length of up to 40 kilometers on SMF (G.652). SFP-10G-ER-S does not support FCoE.

Cisco SFP-10G-ER module

The Cisco 10GBASE-ER Module supports a link length of up to 40 kilometers on standard Single-Mode Fiber (SMF, G.652).

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Cisco SFP-10G-ER-I module

The Cisco 10GBASE-ER Industrial Temperature Module supports a link length of up to 40 kilometers on standard Single-Mode Fiber (SMF, G.652). The SFP-10G-ER-I for Industrial Operating Temperature Range is a multirate 10GBASE-ER, 10GBASE-EW and OTU2/2e module.

Cisco SFP-10G-BX40D-I and SFP-10G-BX40U-I (for 40Km single-fiber bidirectional applications)

The Cisco SFP-10G-BX40D-I and SFP-10G-BX40U-I SFPs operate on a single strand of standard SMF.

A SFP-10G-BX40D-I device is always connected to a SFP-10G-BX40U-I device with a single strand of standard SMF with an operating transmission range up to 40 km.

The communication over a single strand of fiber is achieved by separating the transmission wavelength of the two devices. SFP-10G-BX40D-I transmits a 1330-nm channel and receives a 1270-nm signal. The SFP-10G-BX40U-I transmits at a 1270-nm wavelength and receives a 1330-nm signal.

The SFP-10G-BX40D-I and SFP-10G-BX40U-I SFPs support Digital Optical Monitoring (DOM) functions according to the industry-standard SFF-8472 Multisource Agreement (MSA). This feature gives the end user the ability to monitor real-time parameters of the SFP, such as optical output power, optical input power, temperature, laser bias current, and transceiver supply voltage.

Cisco SFP-10G-ZR-S module (S-Class)

The Cisco 10GBASE-ZR module supports link lengths of up to about 80 kilometers on standard SMF (G.652). This interface is not specified as part of the 10 Gigabit Ethernet standards and is, instead, built according to Cisco specifications. SFP-10G-ZR-S does not support FCoE.

Cisco SFP-10G-ZR module

The Cisco SFP-10G-ZR is a multirate 10GBASE-ZR, 10GBASE-ZW, and OTU2/OTU2e module. It supports link lengths of up to about 80 kilometers on standard Single-Mode Fiber (SMF, G.652). This interface is not specified as part of the 10 Gigabit Ethernet standard and is instead built according to Cisco specifications.

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Cisco SFP+ Twinax copper cables

Cisco SFP+ Copper Twinax (Figure 4) direct-attach cables are suitable for very short distances and offer a cost-effective way to connect within racks and across adjacent racks. Cisco offers passive Twinax cables in lengths of 1, 1.5, 2, 2.5, 3, 4 and 5 meters, and active Twinax cables in lengths of 7 and 10 meters.

Figure 4.
Cisco direct-attach twinax copper cable assembly with SFP+ connectors

Cisco SFP+ Active optical cables

Cisco SFP+ Active Optical Cables (Figure 5) are direct-attach fiber assemblies with SFP+ connectors. They are suitable for very short distances and offer a cost-effective way to connect within racks and across adjacent racks. Cisco offers Active Optical Cables in lengths of 1, 2, 3, 5, 7, and 10 meters.

Figure 5.
Cisco direct-attach active optical cables with SFP+ connectors

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Platform support

Cisco SFP+ modules are supported on a wide range of Cisco switches and routers*:

- 7600 Series Router
- ASR 901
- ASR 903
- ASR 1000 Series Router
- ASR 9000 Series Router
- ASR 9000v Series Router
- Catalyst 2350 and 2360 Series Switches
- Catalyst 2960-S, 2960-X, and 2960-XR Series Switches
- Catalyst 3100 Blade Switches
- Catalyst 3560, 3560-E, and 3560-X Series Switches
- Catalyst 3750, 3750-E, and 3750-X Series Switches
- Catalyst 3850 Series Switches
- Catalyst 4500 and 4500-X Series Switches
- CRS Router
- MDS 9000
- ME 4500
- ME 4900NCS 6000 Series Router
- Nexus 2000, 3000, and 4000 Series Switches
- Nexus 9000 and 9500 (modular) Series Switches
- RF Gateway Series
- SCE 8000
- Shared Port Adapter (SPA)
- Unified Computing System (UCS) Switches

* Not all devices listed support every module. For details about which modules run in which devices and other compatibility information, refer to the document "Cisco 10 Gigabit Ethernet Transceiver Modules Compatibility Matrix": https://www.cisco.com/en/US/docs/interfaces_modules/transceiver_modules/compatibility/matrix/OL_6974.html.

Additional platforms may continually be added; please check the compatibility matrix for the latest information and for the Cisco compatible operating system for each platform.

Connectors: Dual LC/PC connector (-SR, -LRM, -LR, -ER, -ZR and FET-10G).

Note: Only connections with patch cords with PC or UPC connectors are supported. Patch cords with APC connectors are not supported. All cables and cable assemblies used must be compliant with the standards specified in the standards section.

Product specifications

Table 2 provides cabling specifications for the Cisco SFP+ modules.

Table 2. SFP+ port cabling specifications

Cisco SFP+	Wavelength (nm)	Cable Type	Core Size (Microns)	Modal Bandwidth (MHz*km)*3	Cable Distance*1
Cisco SFP-10G-SR-S[a]	850	MMF	62.5	160 (FDDI)	26m
Cisco SFP-10G-SR			62.5	200 (OM1)	33m
Cisco SFP-10G-SR-X			50.0	400	66m
			50.0	500 (OM2)	82m
			50.0	2000 (OM3)	300m
			50.0	4700 (OM4)	400m
			50.0	4700 (OM5)	400m

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Cisco SFP+	Wavelength (nm)	Cable Type	Core Size (Microns)	Modal Bandwidth (MHz*km)*3	Cable Distance*1
Cisco SFP-10G-LRM	1310 	MMF SMF 	62.5 50.0 50.0 G.652	500 400 500 -	220m 100m 220m 300m
Cisco FET-10G	850 	MMF 	50.0 50.0 50.0 50.0	500 (OM2) 2000 (OM3) 4700 (OM4) 4700 (OM5)	25m 100m 100m 100m
Cisco SFP-10G-LR-S[a] **Cisco SFP-10G-LR** **Cisco SFP-10G-LR-X** **Cisco SFP-10G-LR10-I**[b]	1310	SMF	G.652	-	10km
Cisco SFP-10G-BXD-I	1330	SMF	G.652	-	10km[b]
Cisco SFP-10G-BXU-I	1270	SMF	G.652	-	10km[b]
Cisco SFP-10G-ER-S*[4a] **Cisco SFP-10G-ER***[4] **Cisco SFP-10G-ER-I***[4]	1550	SMF	G.652	-	40km*[2]
Cisco SFP-10G-BX40D-I*[6]	1330	SMF	G.652	-	40km
Cisco SFP-10G-BX40U-I*[6]	1270	SMF	G.652	-	40km
Cisco SFP-10G-ZR-S*[5a] **Cisco SFP-10G-ZR***[5]	1550	SMF	G.652	-	80km
Cisco SFP-H10GB-CU1M	-	Twinax cable, passive, 30AWG cable assembly	-	-	1m
Cisco SFP-H10GB-CU1-5M	-	Twinax cable, passive, 30AWG cable assembly	-	-	1.5m
Cisco SFP-H10GB-CU2M	-	Twinax cable, passive, 30AWG cable assembly	-	-	2m
Cisco SFP-H10GB-CU2-5M	-	Twinax cable, passive, 30AWG cable assembly	-	-	2.5m
Cisco SFP-H10GB-CU3M	-	Twinax cable, passive, 30AWG cable assembly	-	-	3m

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Cisco SFP+	Wavelength (nm)	Cable Type	Core Size (Microns)	Modal Bandwidth (MHz*km)*3	Cable Distance*1
Cisco SFP-H10GB-CU4M	-	Twinax cable, passive, 24AWG or 26AWG cable assembly	-	-	4m
Cisco SFP-H10GB-CU5M	-	Twinax cable, passive, 24AWG or 26AWG cable assembly	-	-	5m
Cisco SFP-H10GB-ACU7M	-	Twinax cable, active, 30 AWG cable assembly	-	-	7m
Cisco SFP-H10GB-ACU10M	-	Twinax cable, active, 28 AWG cable assembly	-	-	10m
Cisco SFP-10G-AOC1M	-	Active Optical Cable assembly	-	-	1m
Cisco SFP-10G-AOC2M	-	Active Optical Cable assembly	-	-	2m
Cisco SFP-10G-AOC3M	-	Active Optical Cable assembly	-	-	3m
Cisco SFP-10G-AOC5M	-	Active Optical Cable assembly	-	-	5m
Cisco SFP-10G-AOC7M	-	Active Optical Cable assembly	-	-	7m
Cisco SFP-10G-AOC10M	-	Active Optical Cable assembly	-	-	10m

*1 Minimum cabling distance for -SR, -LRM, -LR, -ER modules is 2m, according to the IEEE 802.3ae.

*2 Links longer than 30km are considered engineered links as per IEEE 802.3ae.

*3 Specified at transmission wavelength.

*4 Requires 5 dB 1550nm fixed loss attenuator for < 20km. Attenuator is available as a spare. The part number is 15216 ATT LC 5=.

*5 Requires 15dB attenuator if Link Distance < 5km.

Requires 10dB attenuator if Link Distance is between 5km and 25km.

Requires 5dB attenuator if Link Distance is between 25km and 45km.

*6 Requires 15dB attenuator if Link Distance < 5km.

Requires 10dB attenuator if Link Distance is between 5km and 15km.

Requires 5dB attenuator if Link Distance is between 15km and 25km.

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Attenuator is available as a spare. The part numbers:

- 5dB - 15216 ATT LC 5=
- 10dB - 15216 ATT LC 10=
- 15dB - 15216 ATT LC 15=

a - No FCoE support.

b - Links up to 15 km are supported as engineered links as long as channel insertion loss < 6.2 dB.

Table 3 lists the main optical characteristics for the Cisco SFP+ modules.

Table 3. Optical transmit and receive specifications

Product	Type	Transmit Power (dBm)*		Receive Power (dBm)*		Transmit and Receive Wavelength (nm)
		Maximum	Minimum	Maximum	Minimum	
Cisco SFP-10G-SR-S **Cisco SFP-10G-SR**	10GBASE-SR 850nm MMF	-1.2**	-7.3	-1.0	-9.9	840 to 860
Cisco SFP-10G-SR-X	10GBASE-SR, 10GBASE-SW and OTU2e 850nm MMF	-1.2**	-7.3	-1.0	-9.9	840 to 860
Cisco SFP-10G-LRM	10GBASE-LRM 1310nm MMF and SMF	0.5	-6.5	0.5	-8.4 (in average) and -6.4 (in OMA)***	1260 to 1355
Cisco FET-10G	FET-10G 850nm MMF	-1.3	-8	-1	-9.9	840 to 860
Cisco SFP-10G-LR-S **Cisco SFP-10G-LR**	10GBASE-LR 1310nm SMF	0.5	-8.2	0.5	-14.4	1260 to 1355
Cisco SFP-10G-LR-X	10GBASE-LR, 10GBASE-LW and OTU2e 1310nm SMF	0.5	-8.2	0.5	-14.4	1260 to 1355
Cisco SFP-10G-LR10-I	10GBASE-LR, CPRI 1310 SMF	0.5	-8.2	0.5	-14.4	1260 to 1355
Cisco SFP-10G-BXD-I	10G-SFP Bidirectional for 10km	0.5	-8.2	0.5	-14.4	1320 to 1340 (Tx) 1260 to 1280 (Rx)
Cisco SFP-10G-BXU-I	10G-SFP Bidirectional for 10km	0.5	-8.2	0.5	-14.4	1260 to 1280 (Tx) 1320 to 1340 (Rx)
Cisco SFP-10G-ER-S **Cisco SFP-10G-ER** **Cisco SFP-10G-ER-I**	10GBASE-ER 1550nm SMF	4.0	-4.7	-1	-15.8	1530 to 1565

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Product	Type	Transmit Power (dBm)*		Receive Power (dBm)*		Transmit and Receive Wavelength (nm)
		Maximum	Minimum	Maximum	Minimum	
Cisco SFP-10G-BX40D-I	10G-SFP Bidirectional for 40km	4.5	-2.7	-9	-21.2	1320 to 1340 (Tx) 1260 to 1280 (Rx)
Cisco SFP-10G-BX40U-I	10G-SFP Bidirectional for 40km	4.5	-2.7	-9	-21.2	1260 to 1280 (Tx) 1320 to 1340 (Rx)
Cisco SFP-10G-ZR-S **Cisco SFP-10G-ZR**	10GBASE-ZR 1550nm SMF	4.0	0	-7	-24	1530 to 1565

* Transmitter and receiver power is in average, unless specified.

** The launch power shall be the lesser of the class 1 safety limit or the maximum receive power. Class 1 laser requirements are defined by IEC 60825-1: 2001.

*** Both average and OMA specifications must be met simultaneously.

Table 4 details optical specifications for the Cisco SFP-10G-ZR modules.

Table 4. SFP-10G-ZR optical parameters

Parameter	Symbol	Minimum	Typical	Maximum	Units	Notes and Conditions
Transmitter						
Transmitter wavelength		1530		1565	nm	
Side-mode suppression ratio	SMSR	30			dB	
Transmitter extinction ratio		9			dB	
Transmitter optical output power	Pout	0		4.0	dBm	Average power coupled into single-mode fiber
Receiver						
Receiver optical input wavelength		1260		1565	nm	Receiver Sensitivity specified over 1530-1565nm only, with 3dB degradation permitted from 1260-1530nm
Receiver damage threshold		+5			dBm	
Receiver Overload		-7			dBm	

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Parameter	Symbol	Minimum	Typical	Maximum	Units	Notes and Conditions
Receiver performance at 10GE LAN and 10GE WAN rates, non-FEC application						
Receiver sensitivity		-24			dBm	At BER=1E-12 with PRBS31 and 10GE frame
Chromatic Dispersion Penalty@ 1600 ps/nm				3	dB	
Receiver performance at OTU2/OTU2e rates, FEC application						
Receiver sensitivity		-27			dBm	At Pre-FEC BER=1E-5 for GFEC and Pre-FEC BER=7E-4 for EFEC with PRBS31 and OTU2 frame
Chromatic Dispersion Penalty@ 1300 ps/nm				3	dB	

Note: Parameters are specified over temperature and at end of life unless otherwise noted. When shorter distances of single-mode fiber are used (<40km), an inline optical attenuator must be used to avoid overloading and damaging the receiver.

Table 5 describes the bail latch color code for each type of optical SFP+ module.

Table 5. SFP+ optical modules color code

Product	Bail Latch Color
Cisco SFP-10G-T-X	Golden/Yellow
Cisco SFP-10G-SR-S **Cisco SFP-10G-SR** **Cisco SFP-10G-SR-X**	Beige
Cisco SFP-10G-LRM	Orange
Cisco FET-10G	Brown
Cisco SFP-10G-LR-S **Cisco SFP-10G-LR** **Cisco SFP-10G-LR-X** **Cisco SFP-10G-LR10-I**	Blue
Cisco SFP-10G-BXD-I **Cisco SFP-10G-BXU-I**	Blue
Cisco SFP-10G-ER-S **Cisco SFP-10G-ER** **Cisco SFP-10G-ER-I**	Red

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Product	Bail Latch Color
Cisco SFP-10G-BX40D-I **Cisco SFP-10G-BX40U-I**	Red
Cisco SFP-10G-ZR-S **Cisco SFP-10G-ZR**	Green
Cisco SFP-H10GB-CU1M	Beige
Cisco SFP-H10GB-CU1-5M	Black
Cisco SFP-H10GB-CU2M	Brown
Cisco SFP-H10GB-CU2-5M	Yellow
Cisco SFP-H10GB-CU3M	Orange
Cisco SFP-H10GB-CU4M	Green
Cisco SFP-H10GB-CU5M	Gray
Cisco SFP-H10GB-ACU7M	Blue
Cisco SFP-H10GB-ACU10M	Red
Cisco SFP-10G-AOC1M	Beige
Cisco SFP-10G-AOC2M	Brown
Cisco SFP-10G-AOC3M	Orange
Cisco SFP-10G-AOC5M	Gray
Cisco SFP-10G-AOC7M	Blue
Cisco SFP-10G-AOC10M	Red

Table 6 provides the maximum power consumption and operating temperature range ratings per Cisco SFP+ module.

Table 6. SFP+ modules power consumption

Product	Power Consumption (W)	Operating Temperature Range
Cisco SFP-10G-T-X	2.5W	EXT
Cisco SFP-10G-SR-S **Cisco SFP-10G-SR**	1	COM
Cisco SFP-10G-SR-X	1	EXT
Cisco SFP-10G-LRM	1	COM

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Product	Power Consumption (W)	Operating Temperature Range
Cisco FET-10G	1	COM
Cisco SFP-10G-LR-S **Cisco SFP-10G-LR**	1	COM
Cisco SFP-10G-LR-X	1	EXT
Cisco SFP-10G-LR10-I	1	IND
Cisco SFP-10G-BXD-I **Cisco SFP-10G-BXU-I**	1	IND
Cisco SFP-10G-ER-S **Cisco SFP-10G-ER**	1.5	COM
Cisco SFP-10G-ER-I	1.5	IND
Cisco SFP-10G-BX40D-I **Cisco SFP-10G-BX40U-I**	1.2	IND
Cisco SFP-10G-ZR-S **Cisco SFP-10G-ZR**	1.5	COM
Cisco SFP-H10GB-CU1M	0.1	COM
Cisco SFP-H10GB-CU1-5M	0.1	COM
Cisco SFP-H10GB-CU2M	0.1	COM
Cisco SFP-H10GB-CU2-5M	0.1	COM
Cisco SFP-H10GB-CU3M	0.1	COM
Cisco SFP-H10GB-CU4M	0.1	COM
Cisco SFP-H10GB-CU5M	0.1	COM
Cisco SFP-H10GB-ACU7M	1	COM
Cisco SFP-H10GB-ACU10M	1	COM
Cisco SFP-10G-AOC1M	1	COM
Cisco SFP-10G-AOC2M	1	COM
Cisco SFP-10G-AOC3M	1	COM
Cisco SFP-10G-AOC5M	1	COM
Cisco SFP-10G-AOC7M	1	COM
Cisco SFP-10G-AOC10M	1	COM

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Dimensions

Dimensions (H x W x D): 8.5 x 13.4 x 56.5mm. Cisco SFP+ connectors typically weigh 75 grams or less.

Environmental Conditions and Power Requirements

Operating temperature range:

- Commercial temperature range (COM): 0 to 70° C (32 to 158° F)
- Extended temperature range (EXT): -5 to 85° C (23 to 185° F)
- Industrial temperature range (IND): -40 to 85° C (-40 to 185° F)
- Storage temperature range: -40 to 85° C (-40 to 185° F)

Warranty

- Standard warranty: 5 years
- Expedited replacement available via a Cisco SMARTnet® Service support contract

Cisco environmental sustainability

Information about Cisco's environmental sustainability policies and initiatives for our products, solutions, operations, and extended operations or supply chain is provided in the "Environment Sustainability" section of Cisco's Corporate Social Responsibility (CSR) Report.

Reference links to information about key environmental sustainability topics (mentioned in the "Environment Sustainability" section of the CSR Report) are provided in the following table:

Sustainability	Topic	Reference
General	Information on product-material-content laws and regulations	Materials
	Information on electronic waste laws and regulations, including our products, batteries and packaging	WEEE Compliance
	Information on product takeback and resuse program	Cisco Takeback and Reuse Program
	Sustainability Inquiries	Contact: csr_inquiries@cisco.com
	Countries and Regions Supported	Regulatory Compliance Page 19
Power	Power (Including Pluggable)	Table 6: Power Consumption
Material	Product packaging weight and materials	Contact: environment@cisco.com
	Weight	Dimensions Page 17

Cisco makes the packaging data available for informational purposes only. It may not reflect the most current legal developments, and Cisco does not represent, warrant, or guarantee that it is complete, accurate, or up to date. This information is subject to change without notice.

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Ordering information

Table 7 provides the ordering information for Cisco SFP+ modules and related cables.

Table 7. Ordering information

Description	Product Number
Cisco 10GBASE-T SFP+ Module for CAT6A cables (up to 30 meters)	SFP-10G-T-X
Cisco 10GBASE-SR SFP+ Module for MMF S-Class	SFP-10G-SR-S
Cisco 10GBASE-SR SFP+ Module for MMF	SFP-10G-SR
Cisco multirate 10GBASE-SR, 10GBASE-SW and OTU2e SFP+ Module for MMF, extended temperature range	SFP-10G-SR-X
Cisco 10GBASE-LRM SFP+ Module for MMF and SMF	SFP-10G-LRM
Cisco 10GBASE-LR SFP+ Module for SMF S-Class	SFP-10G-LR-S
Cisco 10GBASE-LR SFP+ Module for SMF	SFP-10G-LR
Cisco multirate 10GBASE-LR, 10GBASE-LW and OTU2e SFP+ Module for SMF, extended temperature range	SFP-10G-LR-X
Cisco multirate 10GBASE-LR, CPRI 3-8, Industrial Temperature Module	SFP-10G-LR10-I
Cisco 10GBASE-BX10-D Bidirectional for 10km	SFP-10G-BXD-I
Cisco 10GBASE-BX10-U Bidirectional for 10km	SFP-10G-BXU-I
Cisco 10GBASE-ER SFP+ Module for SMF S-Class	SFP-10G-ER-S
Cisco 10GBASE-ER SFP+ Module for SMF	SFP-10G-ER
Cisco multirate 10GBASE-ER, 10GBASE-EW and OTU2e SFP+ Module for SMF, Industrial Temperature range	SFP-10G-ER-I
Cisco 10GBASE-BX40-D Bidirectional for 40km	SFP-10G-BX40D-I
Cisco 10GBASE-BX40-U Bidirectional for 40km	SFP-10G-BX40U-I
Cisco 10GBASE-ZR SFP+ Module for SMF S-Class	SFP-10G-ZR-S
Cisco multirate 10GBASE-ZR, 10GBASE-ZW and OTU2e SFP+ Module for SMF	SFP-10G-ZR
10GBASE-CU SFP+ Cable 1 Meter, passive	SFP-H10GB-CU1M
10GBASE-CU SFP+ Cable 1.5 Meter, passive	SFP-H10GB-CU1-5M
10GBASE-CU SFP+ Cable 2 Meter, Passive	SFP-H10GB-CU2M
10GBASE-CU SFP+ Cable 2.5 Meter, Passive	SFP-H10GB-CU2-5M
10GBASE-CU SFP+ Cable 3 Meter, passive	SFP-H10GB-CU3M

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Description	Product Number
10GBASE-CU SFP+ Cable 4 Meter, passive	SFP-H10GB-CU4M
10GBASE-CU SFP+ Cable 5 Meter, passive	SFP-H10GB-CU5M
10GBASE-CU SFP+ Cable 7 Meter, active	SFP-H10GB-ACU7M
10GBASE-CU SFP+ Cable 10 Meter, active	SFP-H10GB-ACU10M
10GBASE-AOC SFP+ Cable 1 Meter	SFP-10G-AOC1M
10GBASE-AOC SFP+ Cable 2 Meter	SFP-10G-AOC2M
10GBASE-AOC SFP+ Cable 3 Meter	SFP-10G-AOC3M
10GBASE-AOC SFP+ Cable 5 Meter	SFP-10G-AOC5M
10GBASE-AOC SFP+ Cable 7 Meter	SFP-10G-AOC7M
10GBASE-AOC SFP+ Cable 10 Meter	SFP-10G-AOC10M

Regulatory and standards compliance

Standards:

- GR-20-CORE: Generic Requirements for Optical Fiber and Optical Fiber Cable
- GR-326-CORE: Generic Requirements for Single-Mode Optical Connectors and Jumper Assemblies
- GR-1435-CORE: Generic Requirements for Multifiber Optical Connectors
- IEEE 802.3: 10-Gigabit Ethernet
- ITU-T G.709: Interfaces for the Optical Transport Network
- ITU-T G.975: GFEC
- ITU-T G.975.1: EFEC
- SFP+ MSA SFF-8431 (Optical Modules, Active Optical Cables, and Passive Twinax cables)
- SFP+ MSA SFF-8461 (Active Twinax cables)

Safety:

- Laser Class 1 21CFR-1040 LN#50 7/2001
- Laser Class 1 IEC60825-1
- Cable jacket of SFP+ copper modules is UL #E116441 Compliant
- All length SFP+ copper cables are ELV and RoHS Compliant

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Next steps

Learn more about Cisco 10GBASE SFP+ fiber modules or 10GBase SFP+ copper modules (twinax cable) by contacting your sales representative or visiting https://www.cisco.com/en/US/products/ps6574/index.html.

For S-Class SFP+ 10 Gigabit Modules, refer to the link below:
https://www.cisco.com/c/en/us/products/interfaces-modules/transceiver-modules/datasheet-listing.html.

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Document history

New or revised topic	Described in	Date
New PID SFP-10G-LR10-I added	Ordering Information	March 04, 2021

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Closet Connector Housing (CCH)

4 rack units, holds 12 CCH connector panels

CORNING

Designed based on thousands of hours of customer feedback, Corning Cable Systems Closet Connector Housings (CCHs) offer more than two dozen innovative features that make installation and troubleshooting of fiber optic connectivity faster, easier and more cost effective.
From fiber and cable routing and strain relief, to port labeling and termination, these housings reduce the risk of error that can disrupt networks.

Closet Connector Housings (CCHs) provide interconnect or cross-connect capabilities between outside plant, riser or distribution cables and opto-electronics. Like all LANscape Solutions hardware, the housings accept CCH connector panels. In addition, the housings accept CCH cassettes and CCH modules.

The units are designed for rack mounting in 19-in (48 cm) racks or optional 23-in (58 cm) equipment racks (1.75-in EIA hole spacing). They are available in rack space options of 1U (two panels, cassettes or modules), 2U (four panels, cassettes or modules), 3U (six panels, cassettes or modules) and 4U (twelve panels, cassettes or modules). The 1U, 2U and 3U options feature a slide-out tray and see-through, removable top covers. The CCH-04U features a clear door, removable front and rear enclosures and a platinum-painted interior for maximum visibility and access.

Every CCH housing is shipped complete with strain relief brackets, routing clips and guides, and mounting brackets for proper installation. Documentation labels are provided and components can be added as needed to construct a fiber distribution frame for any application. All housings include a removable tinted polycarbonate front door. All size housings have field-installable lock kits available for both front and rear doors.

All CCH housings can also be upgraded for pigtail splicing to full fiber capacity and easy, modular fiber management through the use of CCH Splice Cassettes (CCH-CS), or for easy, modular fiber management when using field-installable connectors through the use of CCH Slack Cassettes (CCH-CF).

Part Number: CCH-04U

Features and Benefits

Interconnect and cross-connect capability
Ideal for field connectorization

Removable, translucent top covers (1U, 2U, 3U), removable rear cover (4U)
Visibility and ease of access for installation, testing and troubleshooting

CORNING

Closet Connector Housing (CCH)

4 rack units, holds 12 CCH connector panels

CORNING

Features and Benefits

Internal and external strain-relief options
Flexibility for installation and moves, adds and changes (MACs)

Accepts panels, modules and cassettes
Variety of field termination options

Adaptable to use as a modular splice housing
Splices are stored and protected in same footprint

Standards

Approval and Listings	Meets ANSI/TIA/EIA-568A and 606

Specifications

General Specifications	
Application	Enterprise Networks, Data Center
Mounting Type	Rack 19-in, Rack 23-in, Cabinet-mount
Product Type	Fiber Optic Hardware

Design - Hardware	
Housing Color	Black
Housing Type	CCH
Height Unit	4U
Locking Availability	Front or rear
Maximum Number of Panels per Housing	12
Panel or Module Type	CCH
Splice Tray Options	Use CCH Splice Cassette (CCH-CS)

Mechanical Characteristics	
Dimensions (HxWxD)	17.8 cm x 48.3 cm x 43 cm (7 in x 19 in x 17 in)

CORNING

Closet Connector Housing (CCH)

4 rack units, holds 12 CCH connector panels

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Chemical Characteristics	
RoHS	Free of hazardous substances according to RoHS 2002/95/EG

Ordering Information

Part Number	CCH-04U
Product Description	Closet Connector Housing (CCH), 4 rack units, holds 12 CCH connector panels

Shipping Information

Units per Delivery	1/1

RoHS COMPLIANT

Corning Cable Systems LLC • PO Box 489 • Hickory, NC 28603-0489 USA
800-743-2675 • FAX: 828-325-5060 • International: +1-828-901-5000 • www.corning.com/cablesystems
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Closet Connector Housing Panels (CCH-CP)

A LANscape® Solutions Product

Corning
Cable Systems

Applications

- The panels are used with field-installable connectors or in applications where the preconnectorized cables are routed directly from the equipment to the piece of interconnect hardware
- Provides an efficient way to securely mate two or more connectors

Description

Closet connector housing panels are offered in a wide variety of fiber counts for use with the LANscape® Solutions hardware products. The panels are used with field-installable connectors or in applications where the preconnectorized cables are routed directly from the equipment to the interconnect hardware.

The panels are available with a variety of industry-standard adapter types. In most applications, the closet connector housing panels are designed for applications where specified labeling and connector identification are required. This is accomplished by the use of colored icons, which come standard on panels as space allows.

Features / Benefits

- Designed to accommodate all industry-standard adapter types
- Universal approach is used; one panel size fits in all standard LANscape Solutions hardware (for example, CCH, PCH, CCS, WCH, ICH,EDC, FZB)
- Available in 6-, 8- and 12-fiber count options in most adapter styles; 16- and 24-fiber count options available in MT-RJ and LC duplex styles
- Unique color-coded connector labeling system (space permitting)

24-Fiber LC Duplex Connector | Photo LAN661

72-Fiber MTP® Connector Panel | Photo LAN659

12-Fiber ST® Compatible Connector Panel | Photo LAN662

12-Fiber SC Duplex Connector Panel | Photo LAN658

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Closet Connector Housing Panels (CCH-CP)

A LANscape® Solutions Product

Corning Cable Systems

Ordering Information

Adapter Code	Fiber Type	Alignment	Housing	UPC/ APC	Fibers/ Adapter	Available Fibers/Panel Counts 6	8	12	16	24	36	72	144
LC Duplex													
A8	62.5 µm Multimode	Ceramic	Composite	UPC	2		X	X	X	X			
D3	50 µm Multimode	Ceramic	Composite	UPC	2		X	X	X	X			
E4	LOMMF*	Ceramic	Composite	UPC	2		X	X	X	X			
A9	Single-mode	Ceramic	Composite	UPC	2		X	X	X	X			
SC Duplex													
91	62.5 µm Multimode	Composite	Composite	UPC	2		X	X					
G7	50 µm Multimode	Ceramic	Composite	UPC	2		X	X					
E7	LOMMF	Ceramic	Composite	UPC	2		X	X					
59	Single-mode	Ceramic	Composite	UPC	2		X	X					
MT-RJ													
97	62.5 µm Multimode	N/A	Composite	UPC	2		X	X	X	X			
G1	50 µm Multimode	N/A	Composite	UPC	2		X	X	X	X			
E1	LOMMF	N/A	Composite	UPC	2		X	X	X	X			
98	Single-mode	N/A	Composite	UPC	2		X	X	X	X			
SC													
56	62.5 µm Multimode	Composite	Composite	UPC	1	X	X	X					
G6	50 µm Multimode	Ceramic	Composite	UPC	1	X	X	X					
E6	LOMMF	Ceramic	Composite	UPC	1	X	X	X					
3C	Single-mode	Ceramic	Composite	UPC	1	X	X	X					
6C	Single-mode	Ceramic	Composite	APC	1	X	X	X					
ST® Compatible Connector													
25T	62.5 µm Multimode	Composite	Composite	UPC	1	X	X	X					
15T	62.5 µm Multimode	Ceramic	Composite	UPC	1	X	X	X					
G5	50 µm Multimode	Ceramic	Composite	UPC	1	X	X	X					
E5	LOMMF	Ceramic	Composite	UPC	1	X	X	X					
19T	Single-mode	Ceramic	Composite	UPC	1	X	X	X					
FC													
11	Single-mode	Metal	Metal	UPC	1	X	X	X					
21	Single-mode	Metal	Metal	APC	1	X	X	X					
MTP® Connector													
69	62.5 µm Multimode	N/A	Composite	UPC	12						X	X	X
G3	50 µm	N/A	Composite	UPC	12						X	X	X
E3	LOMMF	N/A	Composite	UPC	12						X	X	X
89	Single-mode	N/A	Composite	UPC	12						X	X	X
90	Single-mode	N/A	Composite	APC	12						X	X	X

Fiber Type	Housing Color
62.5 µm Multimode	Beige
50 µm Multimode	Black
50 µm LOMMF	Aqua
Single-mode	Blue
Single-mode APC	Green

**LOMMF = Laser-Optimized Multimode Fiber*

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Discovering Beyond Imagination

LANscape®
Fiber Cabling Solutions for Premises Networks

Ordering Information *(continued)*

Closet Connector Panels

CCH - CP ☐☐ - ☐☐
1 **2**

Use the following options to construct the part number:

1 Select fiber count.

06 = 6 fibers
08 = 8 fibers
12 = 12 fibers
16 = 16 fibers
24 = 24 fibers
36 = 36 fibers
72 = 72 fibers
E4 = 144 fibers

Confirm fiber count for desired adapter is available in preceding chart.

2 Select adapter code from chart on previous page.

Pigtailed Closet Connector Panels (pigtail is 3 m long)

CCH - CP ☐☐ - ☐☐ - P03 ☐☐
1 **2** **3**

Use the following options to construct the part number:

1 Select fiber count.

06 = 6 fibers
08 = 8 fibers
12 = 12 fibers
16 = 16 fibers
24 = 24 fibers
36 = 36 fibers
72 = 72 fibers
E4 = 144 fibers

Confirm fiber count for desired adapter is available in preceeding chart

2 Select adapter code.

From chart on previous page.

3 Select fiber type.

MIC® Subunit (Standard Fiber Cable Option)

CH = Standard multimode (50/125 µm)
SH = Laser-optimized multimode (50/125 µm) Sx +
KH = Multimode (62.5/125 µm)
RH = Single-mode

Ribbon Fiber

CJ = Standard multimode (50/125 µm)
SJ = Laser-optimized multimode (50/125 µm) Sx +
KJ = Multimode (62.5/125 µm)
RJ = Single-mode

OptiStrip™ Buffered Fiber

KN = Multimode (62.5/125 µm)
RN = Single-mode

Ordering Information *(continued)*

Colored Icons

Pack of 50 Colored Icons

ICN - □ □ □
1

Use the following options to construct the part number:

1 Select icons.

Blank Icons

YLB = Blank (Yellow)
RDB = Blank (Red)
GRB = Blank (Green)
BLB = Blank (Blue)
WTB = Blank (White)

Etched Icons

BLP = Phone (Blue)

RDC = Computer (Red)

GRT = Cable TV (Green)

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Fiber Cabling Solutions for Premises Networks

CONCEPT™, TYPE 4 AND 12

INDUSTRY STANDARDS

Wall-mounting brackets required to maintain UL/CSA external mounting requirement.

CONCEPT solid single-door, door with window and flush-mount models

UL 508A Listed; Type 4, 12; File No. E61997 cUL Listed per CSA C22.2 No. 94; Type 4, 12; File No. E61997

NEMA/EEMAC Type 4, 12, 13
CSA, File No. 42186: Type 4, 12
VDE IP66
IEC 60529, IP66

CONCEPT two-door models

UL 508A Listed; Type 12; File No. E61997 cUL Listed per CSA C22.2 No. 94; Type 12; File No. E61997

NEMA/EEMAC Type 12
CSA, File No. 42186, Type 12
VDE IP 55
IEC 60529, IP55

APPLICATION

CONCEPT™ Enclosures are ideal for machine control applications. With streamlined styling, flush quarter-turn latches and an attractive, durable finish. Available in solid or window single-door and two-door landscape, flush-mount and sloped-top versions for application and mounting flexibility. Two-door landscape models provide full-width access and easy panel installation.

SPECIFICATIONS

- 14, 16 or 18 gauge steel (see table)
- Seams continuously welded and ground smooth
- Corner-formed doors
- Simple easy-to-remove and install hinge pins with built-in captivation clip
- High-torque threadless studs and fasteners on door
- Minimum-width body flange provides maximum door opening (210 degrees)
- External formed body flange
- Panel mounting studs fit optional CONCEPT panels and other accessories
- Mounting holes in back of body for optional external wall-mount brackets
- Hidden hinges
- Doors are interchangeable and easily removed by pulling clip-style hinge pins
- Seamless foam-in-place gasket
- Quarter-turn slotted latch(es)
- Door alignment device on doors wider than 30 in.
- Four hinges on 60-in.-high enclosures
- Grounding stud on body; bonding provision on door (except window-door models)
- Provisions for thermoplastic data pocket (right-hand hinged door on two-door models)
- Hardware kit with panel mounting nuts, panel grounding hardware and sealing washers
- Single-door enclosures have a three-point latch system on enclosures where A is equal to or greater than 42-in. with quarter-turn, slotted latch
- Window-door enclosures have a clear polycarbonate window flush with door surface
- Mounting frame on flush-mount enclosures extends completely around enclosure
- Two-door enclosures have a overlapping door design which provides full-width access
- Two door enclosures have a three-point latch system on right-hand hinged door furnished with flush slotted insert
- Illustrated instruction sheet

FINISH

Two standard finishes are available: ANSI 61 gray or RAL 7035 textured light-gray polyester powder paint inside and out.

ACCESSORIES

Door Stop Kit
Handles
Lock Inserts
CONCEPT™ Panels
Mounting-Bracket Kits

MODIFICATION AND CUSTOMIZATION

Hoffman excels at modifying and customizing products to your specifications. Contact your local Hoffman sales office or distributor for complete information.

BULLETIN: CW1

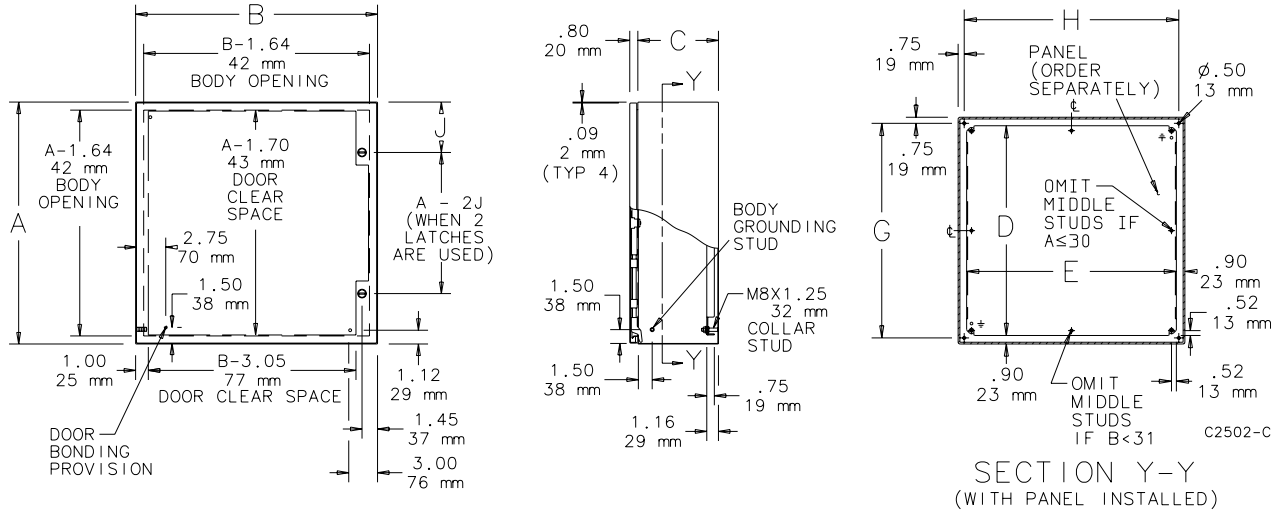
Standard Product **Single-Door Enclosures**

Catalog Number	AxBxC in./mm	Finish	Door Ga.	Body Ga.	CONCEPT Panel	Conductive CONCEPT Panel	Panel Size D x E in./mm	Mounting G x H in./mm	Latches qty.	Latches style	J in./mm
CSD12126	12.00 x 12.00 x 6.00 305 x 305 x 152	ANSI 61 Gray	16	18	CP1212	CP1212G	10.20 x 10.20 259 x 259	10.50 x 10.50 267 x 267	1	Quarter-turn	6.00 152
CSD12126LG	12.00 x 12.00 x 6.00 305 x 305 x 152	RAL 7035 Lt. Gray	16	18	CP1212	CP1212G	10.20 x 10.20 259 x 259	10.50 x 10.50 267 x 267	1	Quarter-turn	6.00 152
CSD16126	16.00 x 12.00 x 6.00 406 x 305 x 152	ANSI 61 Gray	16	18	CP1612	CP1612G	14.20 x 10.20 361 x 259	14.50 x 10.50 368 x 267	1	Quarter-turn	8.00 203
CSD16126LG	16.00 x 12.00 x 6.00 406 x 305 x 152	RAL 7035 Lt. Gray	16	18	CP1612	CP1612G	14.20 x 10.20 361 x 259	14.50 x 10.50 368 x 267	1	Quarter-turn	8.00 203
CSD16166	16.00 x 16.00 x 6.00 406 x 406 x 152	ANSI 61 Gray	16	18	CP1616	CP1616G	14.20 x 14.20 361 x 361	14.50 x 14.50 368 x 368	1	Quarter-turn	8.00 203
CSD16166LG	16.00 x 16.00 x 6.00 406 x 406 x 152	RAL 7035 Lt. Gray	16	18	CP1616	CP1616G	14.20 x 14.20 361 x 361	14.50 x 14.50 368 x 368	1	Quarter-turn	8.00 203
CSD16206	16.00 x 20.00 x 6.00 406 x 508 x 152	ANSI 61 Gray	16	18	CP2016	CP2016G	18.20 x 14.20 462 x 361	14.50 x 18.50 368 x 470	1	Quarter-turn	8.00 203
CSD16206LG	16.00 x 20.00 x 6.00 406 x 508 x 152	RAL 7035 Lt. Gray	16	18	CP2016	CP2016G	18.20 x 14.20 462 x 361	14.50 x 18.50 368 x 470	1	Quarter-turn	8.00 203
CSD20166	20.00 x 16.00 x 6.00 508 x 406 x 152	ANSI 61 Gray	16	18	CP2016	CP2016G	18.20 x 14.20 462 x 361	18.50 x 14.50 470 x 368	1	Quarter-turn	10.00 254
CSD20166LG	20.00 x 16.00 x 6.00 508 x 406 x 152	RAL 7035 Lt. Gray	16	18	CP2016	CP2016G	18.20 x 14.20 462 x 361	18.50 x 14.50 470 x 368	1	Quarter-turn	10.00 254
CSD20206	20.00 x 20.00 x 6.00 508 x 508 x 152	ANSI 61 Gray	16	18	CP2020	CP2020G	18.20 x 18.20 462 x 462	18.50 x 18.50 470 x 470	1	Quarter-turn	10.00 254
CSD20206LG	20.00 x 20.00 x 6.00 508 x 508 x 152	RAL 7035 Lt. Gray	16	18	CP2020	CP2020G	18.20 x 18.20 462 x 462	18.50 x 18.50 470 x 470	1	Quarter-turn	10.00 254
CSD24166	24.00 x 16.00 x 6.00 610 x 406 x 152	ANSI 61 Gray	16	18	CP2416	CP2416G	22.20 x 14.20 564 x 361	22.50 x 14.50 572 x 368	1	Quarter-turn	12.00 305
CSD24166LG	24.00 x 16.00 x 6.00 610 x 406 x 152	RAL 7035 Lt. Gray	16	18	CP2416	CP2416G	22.20 x 14.20 564 x 361	22.50 x 14.50 572 x 368	1	Quarter-turn	12.00 305
CSD24206	24.00 x 20.00 x 6.00 610 x 508 x 152	ANSI 61 Gray	16	18	CP2420	CP2420G	22.20 x 18.20 564 x 462	22.50 x 18.50 572 x 470	1	Quarter-turn	12.00 305
CSD24206LG	24.00 x 20.00 x 6.00 610 x 508 x 152	RAL 7035 Lt. Gray	16	18	CP2420	CP2420G	22.20 x 18.20 564 x 462	22.50 x 18.50 572 x 470	1	Quarter-turn	12.00 305
CSD24246	24.00 x 24.00 x 6.00 610 x 610 x 152	ANSI 61 Gray	14	16	CP2424	CP2424G	22.20 x 22.20 564 x 564	22.50 x 22.50 572 x 572	2	Quarter-turn	5.00 127
CSD24246LG	24.00 x 24.00 x 6.00 610 x 610 x 152	RAL 7035 Lt. Gray	14	16	CP2424	CP2424G	22.20 x 22.20 564 x 564	22.50 x 22.50 572 x 572	2	Quarter-turn	5.00 127
CSD16128	16.00 x 12.00 x 8.00 406 x 305 x 203	ANSI 61 Gray	16	18	CP1612	CP1612G	14.20 x 10.20 361 x 259	14.50 x 10.50 368 x 267	1	Quarter-turn	8.00 203
CSD16128LG	16.00 x 12.00 x 8.00 406 x 305 x 203	RAL 7035 Lt. Gray	16	18	CP1612	CP1612G	14.20 x 10.20 361 x 259	14.50 x 10.50 368 x 267	1	Quarter-turn	8.00 203
CSD16168	16.00 x 16.00 x 8.00 406 x 406 x 203	ANSI 61 Gray	16	18	CP1616	CP1616G	14.20 x 14.20 361 x 361	14.50 x 14.50 368 x 368	1	Quarter-turn	8.00 203
CSD16168LG	16.00 x 16.00 x 8.00 406 x 406 x 203	RAL 7035 Lt. Gray	16	18	CP1616	CP1616G	14.20 x 14.20 361 x 361	14.50 x 14.50 368 x 368	1	Quarter-turn	8.00 203
CSD16208	16.00 x 20.00 x 8.00 406 x 508 x 203	ANSI 61 Gray	16	18	CP2016	CP2016G	18.20 x 14.20 462 x 361	14.50 x 18.50 368 x 470	1	Quarter-turn	8.00 203
CSD16208LG	16.00 x 20.00 x 8.00 406 x 508 x 203	RAL 7035 Lt. Gray	16	18	CP2016	CP2016G	18.20 x 14.20 462 x 361	14.50 x 18.50 368 x 470	1	Quarter-turn	8.00 203
CSD20168	20.00 x 16.00 x 8.00 508 x 406 x 203	ANSI 61 Gray	16	18	CP2016	CP2016G	18.20 x 14.20 462 x 361	18.50 x 14.50 470 x 368	1	Quarter-turn	10.00 254
CSD20168LG	20.00 x 16.00 x 8.00 508 x 406 x 203	RAL 7035 Lt. Gray	16	18	CP2016	CP2016G	18.20 x 14.20 462 x 361	18.50 x 14.50 470 x 368	1	Quarter-turn	10.00 254
CSD20208	20.00 x 20.00 x 8.00 508 x 508 x 203	ANSI 61 Gray	16	18	CP2020	CP2020G	18.20 x 18.20 462 x 462	18.50 x 18.50 470 x 470	1	Quarter-turn	10.00 254
CSD20208LG	20.00 x 20.00 x 8.00 508 x 508 x 203	RAL 7035 Lt. Gray	16	18	CP2020	CP2020G	18.20 x 18.20 462 x 462	18.50 x 18.50 470 x 470	1	Quarter-turn	10.00 254
CSD20248	20.00 x 24.00 x 8.00 508 x 610 x 203	ANSI 61 Gray	16	18	CP2420	CP2420G	22.20 x 18.20 564 x 462	18.50 x 22.50 470 x 572	1	Quarter-turn	10.00 254
CSD20248LG	20.00 x 24.00 x 8.00 508 x 610 x 203	RAL 7035 Lt. Gray	16	18	CP2420	CP2420G	22.20 x 18.20 564 x 462	18.50 x 22.50 470 x 572	1	Quarter-turn	10.00 254
CSD24168	24.00 x 16.00 x 8.00 610 x 406 x 203	ANSI 61 Gray	16	18	CP2416	CP2416G	22.20 x 14.20 564 x 361	22.50 x 14.50 572 x 368	1	Quarter-turn	12.00 305
CSD24168LG	24.00 x 16.00 x 8.00 610 x 406 x 203	RAL 7035 Lt. Gray	16	18	CP2416	CP2416G	22.20 x 14.20 564 x 361	22.50 x 14.50 572 x 368	1	Quarter-turn	12.00 305
CSD24208	24.00 x 20.00 x 8.00 610 x 508 x 203	ANSI 61 Gray	16	18	CP2420	CP2420G	22.20 x 18.20 564 x 462	22.50 x 18.50 572 x 470	1	Quarter-turn	12.00 305
CSD24208LG	24.00 x 20.00 x 8.00 610 x 508 x 203	RAL 7035 Lt. Gray	16	18	CP2420	CP2420G	22.20 x 18.20 564 x 462	22.50 x 18.50 572 x 470	1	Quarter-turn	12.00 305
CSD24248	24.00 x 24.00 x 8.00 610 x 610 x 203	ANSI 61 Gray	14	16	CP2424	CP2424G	22.20 x 22.20 564 x 564	22.50 x 22.50 572 x 572	2	Quarter-turn	5.00 127
CSD24248LG	24.00 x 24.00 x 8.00 610 x 610 x 203	RAL 7035 Lt. Gray	14	16	CP2424	CP2424G	22.20 x 22.20 564 x 564	22.50 x 22.50 572 x 572	2	Quarter-turn	5.00 127
CSD24308	24.00 x 30.00 x 8.00 610 x 762 x 203	ANSI 61 Gray	14	16	CP3024	CP3024G	28.20 x 22.20 716 x 564	22.50 x 28.50 572 x 724	2	Quarter-turn	5.00 127
CSD24308LG	24.00 x 30.00 x 8.00 610 x 762 x 203	RAL 7035 Lt. Gray	14	16	CP3024	CP3024G	28.20 x 22.20 716 x 564	22.50 x 28.50 572 x 724	2	Quarter-turn	5.00 127

Catalog Number	AxBxC in./mm	Finish	Door Ga.	Body Ga.	CONCEPT Panel	Conductive CONCEPT Panel	Panel Size D x E in./mm	Mounting G x H in./mm	Latches qty.	Latches style	J in./mm
CSD363016	36.00 x 30.00 x 16.00 914 x 762 x 406	ANSI 61 Gray	14	14	CP3630	CP3630G	34.20 x 28.20 869 x 716	34.50 x 28.50 876 x 724	2	Quarter-turn	5.00 127
CSD363016LG	36.00 x 30.00 x 16.00 914 x 762 x 406	RAL 7035 Lt. Gray	14	14	CP3630	CP3630G	34.20 x 28.20 869 x 716	34.50 x 28.50 876 x 724	2	Quarter-turn	5.00 127
CSD483616	48.00 x 36.00 x 16.00 1219 x 914 x 406	ANSI 61 Gray	14	14	CP4836	CP4836G	46.20 x 34.20 1173 x 869	46.50 x 34.50 1181 x 876	1	3-point	24.00 610
CSD483616LG	48.00 x 36.00 x 16.00 1219 x 914 x 406	RAL 7035 Lt. Gray	14	14	CP4836	CP4836G	46.20 x 34.20 1173 x 869	46.50 x 34.50 1181 x 876	1	3-point	24.00 610
CSD242420	24.00 x 24.00 x 20.00 610 x 610 x 508	ANSI 61 Gray	14	14	CP2424	CP2424G	22.20 x 22.20 564 x 564	22.50 x 22.50 572 x 572	2	Quarter-turn	5.00 127
CSD242420LG	24.00 x 24.00 x 20.00 610 x 610 x 508	RAL 7035 Lt. Gray	14	14	CP2424	CP2424G	22.20 x 22.20 564 x 564	22.50 x 22.50 572 x 572	2	Quarter-turn	5.00 127
CSD302420	30.00 x 24.00 x 20.00 762 x 610 x 508	ANSI 61 Gray	14	14	CP3024	CP3024G	28.20 x 22.20 716 x 564	28.50 x 22.50 724 x 572	2	Quarter-turn	5.00 127
CSD302420LG	30.00 x 24.00 x 20.00 762 x 610 x 508	RAL 7035 Lt. Gray	14	14	CP3024	CP3024G	28.20 x 22.20 716 x 564	28.50 x 22.50 724 x 572	2	Quarter-turn	5.00 127
CSD363020	36.00 x 30.00 x 20.00 914 x 762 x 508	ANSI 61 Gray	14	14	CP3630	CP3630G	34.20 x 28.20 869 x 716	34.50 x 28.50 876 x 724	2	Quarter-turn	5.00 127
CSD363020LG	36.00 x 30.00 x 20.00 914 x 762 x 508	RAL 7035 Lt. Gray	14	14	CP3630	CP3630G	34.20 x 28.20 869 x 716	34.50 x 28.50 876 x 724	2	Quarter-turn	5.00 127

Purchase panels separately.

Optional NEMA-size panels require conversion kit Catalog Number CCPM4.



tyco | Illustra

Data Sheet

Pro 2MP, 3MP, 5MP, 8MP Mini-Dome

Key Benefits

- Exposure profile settings allow the mini-dome to adapt to scenarios such as license plate recognition, gaming, and more
- Ultra low light capabilities to maintain color image quality without IR
- One-click image profiles allow operators to set, save, and export picture settings
- Improved accuracy for facial detection with updated library and algorithms
- Bubble-free design reduces installation time while increasing IR video quality

Enriched Video Quality With Reduced Configuration Time

The Illustra Pro Gen3 Mini-Dome maximizes video quality while minimizing installation costs and configuration time. Integrated IR provides uninhibited images in total darkness by removing the bubble from the housing, reducing glare and increasing distance capabilities. Additionally, Illustra® IntelliZip bandwidth management has been improved to optimize resource savings in scenes with varying activity levels. Building off the previous generation of cameras, the Gen3 Mini-Dome improves on important features such as Wide Dynamic Range, effective failover redundancy, cybersecurity, and Video Intelligence Analytics. Available in a range of resolutions and lens options, the Gen3 Mini-Dome can be added to a variety of deployments in both medium- and large-sized facilities.

Smart Technologies Simplify Setup and Configuration

Smart Wide Dynamic Range available in the Pro Gen3 Mini-Dome reduces configuration time while greatly improving the quality of the video stream in varying lighting environments. By effectively reading the scene, the Mini-Dome can adjust contrasting and overall scene balance without operator intervention or maintenance. Setup times are also reduced with the addition of application profiles that automatically adjust the camera's settings based on the environment.

Johnson Controls

Transform Data at the Edge with Video Intelligence Analytics

Save resources when you offload analytic streaming from network video recorders to the edge on Illustra cameras. Video Intelligence Analytics provide real-time event alarms that allows for quick reaction to incidents and behaviors as they occur. Choose from a variety of analytic rules to customize the solution that will be most beneficial to your business and begin gathering transformative data instantly.

Safeguard Against Cyber Attacks Across Devices

Illustra Pro IP cameras have been designed to be resilient against cyber-threats. This solution includes "secure boot" which ensures the camera will not start if software has been tampered with in any way. Additional safeguard controls include an enhanced security mode which forces the use of complex, non-default passwords and encrypted communications. Our products are gated, analyzed, tested and required to meet or exceed the rigorous standards of the Johnson Controls Cyber Solutions Product Security Program for every consecutive release. This holistic approach is aimed at providing peace of mind to our customers. Our security mindset begins at initial design concept and is supported through deployment, including a rapid incident response to meet the comprehensive and evolving cybersecurity environments.

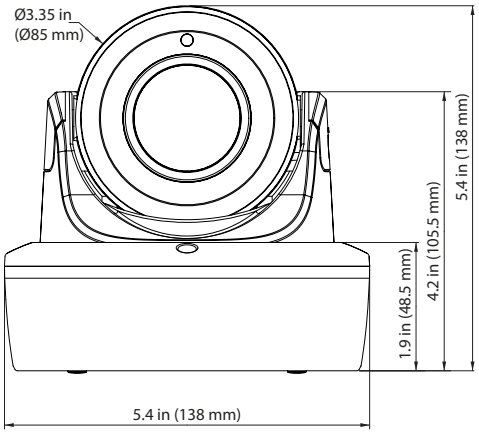
Specifications

Operational	**2MP**		**3MP**		**5MP**		**8MP**	
Video Compression	H.264 / H.265 / MJPEG / IntelliZip							
Max Frame Rate	2MP @ 60fps		3MP @ 30fps 2MP @ 60fps		5MP @ 30fps 2MP @ 60fps		8MP @ 30fps 2MP @ 60fps	
Resolution & Aspect Ratio	1920x1080 (1080p) 16:9 1664x936 (HD+) 16:9 1280x720 (720p) 16:9 1024x576 (PAL+) 16:9 960x544 (qHD) 16:9 816x464 16:9 640x360 (nHD) 16:9 480x272 16:9		2048x1536 4:3 1920x1080 (1080p) 16:9 1664x936 (HD+) 16:9 1280x960 4:3 1280x720 (720p) 16:9 800x600 (SVGA) 4:3 640x480 (VGA) 4:3 640x360 (nHD) 16:9 480x360 4:3 384x288 4:3		2592x1944 4:3 2048x1536 4:3 1920x1080 (1080p) 16:9 1664x936 (HD+) 16:9 1280x960 4:3 1280x720 (720p) 16:9 800x600 (SVGA) 4:3 640x480 (VGA) 4:3 480x360 4:3 384x288 4:3		3840x2160 (4K) 16:9 3264x1840 16:9 2688x1520 16:9 2560 x 1440 16:9 1920x1080 (1080p) 16:9 1664x936 (HD+) 16:9 1280x720 (720p) 16:9 1024x576 (PAL+) 16:9 960x544 (qHD) 16:9 816x464 16:9 640x360 (nHD) 16:9 480x272 16:9	
Video Streams	Quad Streaming							
Imager	Progressive Scan RGB 1/2.8" CMOS						Progressive Scan RGB 1/1.8" CMOS	
Image Orientation Settings	None, Mirror, Flip, Flip and Mirror, Corridor (rotate 90° right or left)							
Lens Type	Motorized Varifocal and Focus, P-Iris							
Focus Control	One-Touch Auto Focus or Remote Adjustment							
Focal Length	**2.7-13.5mm**	**7-22mm**	**2.7-13.5mm**	**7-22mm**	**2.7-13.5mm**	**6-22mm**	**3.6-10mm**	**6-22mm**
Field of View Wide (H/V)	112°/58°	40°/21°	100°/73°	36°/26°	103°/74°	40°/30°	95°/53°	50°/28°
Field of View Telephoto (H/V)	35°/20°	18°/10°	32°/24°	16°/12°	33°/25°	18°/13°	49°/28°	24°/14°
Aperture	f/1.4 (W) f/2.8 (T)	f/1.7 (W) f/2.8 (T)	f/1.4 (W) f/2.8 (T)	f/1.7 (W) f/2.8 (T)	f/1.4 (W) f/2.8 (T)	f/1.6 (W) f/2.4 (T)	f/1.5 (W) f/2.8 (T)	f/1.6 (W f/2.4 (T)
Minimum Illumination								
Color, 1/4s, 30 IRE, AGC	0.01 Lux	0.02 Lux	0.02 Lux	0.03 Lux	0.03 Lux	0.02 Lux	0.03 Lux	0.02 Lux
B/W, 1/4s, 30 IRE, AGC	0.0001 Lux	0.0002 Lux	0.0002 Lux	0.0003 Lux	0.0002 Lux	0.0002 Lux	0.0004 Lux	0.0005 Lux
w/ IR	0.0 Lux	0.0 Lux	0.0 Lux	0.0 Lux	0.0 Lux	0.0 Lux	0.0 Lux	0.0 Lux
IR Distance	130ft (40m)							
Dynamic Range	True WDR 120 dB Technologies		True WDR 120 dB Technologies		True WDR 110 dB Technologies		True WDR 120 dB Technologies	

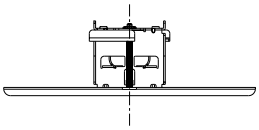
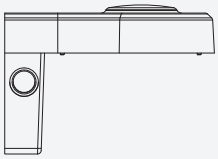
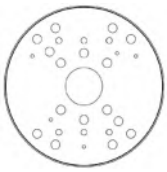
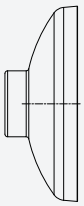
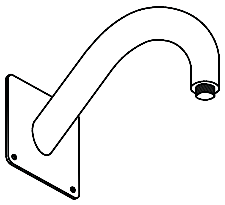
Day/Night	True Day/Night
Shutter Speed	1/4 - 1/10,000
ONVIF-Compliant	Profiles S
Video Intelligence Analytics	Linger, Exit, Direction, Abandoned/Removed objects, Queue, Dwell, Enter, Object detection, Crowd, Perimeter
Motion Detection Zones	3
Face Detection	Yes
Blur Detection	Yes
Privacy Zones	9
Alarm Input/Output	2/1
Analog Video Output	Yes
Audio	Bi-Directional Full-Duplex
Simultaneous Users	10
Supported Languages	Arabic, Chinese (Simplified), Chinese (Traditional), Czech, Danish, English (default), French, German, Hungarian, Italian, Japanese, Korean, Netherlands, Polish, Portuguese, Russian, Spanish, Swedish, Turkish
Network	
Ethernet Interface	10/100/1000 BaseT, RJ-45, Auto-Negotiation
Supported Protocols	TCP/IP, IPv4, IPv6, TCP, UDP, HTTP, FTP, DHCP, WS-Discovery, DNS, DDNS, RTP, TLS, RTSP, ICMP, Unicast, Multicast, NTP, SMTP, WS-Security, SNMP, CIDS, FSTP, UPnP™, SIP

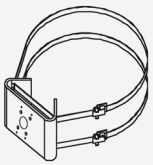
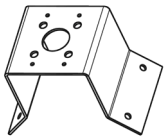
Configuration Management	
Web Browsers	IE 9 and above, Firefox, Safari, Chrome
Security	Secure Boot, Enhanced Security Mode (forces complex passwords, HTTPS and disables discovery); TLS 1.2 (256 bit cipher minimum); Security Overview Page (status and configuration); RTSP Authentication; IEEE 802.1X Client; Remote Accessible Audit logs; Role-Based Access Control
Onboard Storage	
Card Support	micro SDXC up to 512GB
Pre-Alarm Recording	Yes
Recording Format	MP4 File Format
Recording Trigger	Dry Contact Alarms, Motion Detection, Face Detection, Video Intelligence
TrickleStor	Yes
Electrical	
Power	Power over Ethernet (PoE) IEEE 802.3af/802.3at Type 1 Class 3; 24 VAC Max Draw: PoE 12.95W, 24 VAC 16.5W
Physical	
Dimensions (RxH)	Ø5.4in x 5.4in (Ø138 x 138mm)
Weight	2.5 lb (1.13 kg)
Housing Color	Signal White - RAL 9003
Operating Temperature	-58° to +140°F (-50° to +60°C)
Humidity	Up to 90% Non-Condensing
Vandal Resistant	IK10
Outdoor Rating	IP66/IP67
Regulatory	
Safety	EN60950-1; UL60950-1; IEC 60950-1; CSA 22.2 No. 60950
Emissions	FCC Part 15 Class A; EN55032 Class A; AS/NZS CISPR 32 Class A; ICES-003/NMB-003 Class A
Immunity	EN55024; EN50130-3
Enviornment	RoHS; WEEE

Pro Mini-Domes



Accessories

Accessory Type	Image	Model Number	Description	Dimensions	Color
Flush Mount		IPSMDFLUSHOW3	Recessed Mount for Indoor/ Outdoor Pro Gen3 Mini-Domes	Ø10.236 x 2.459 in (Ø260 x 62.46 mm)	RAL 9003
Wall Mount		IPSMDWALL3	Wall Mount Kit: Indoor/Outdoor, White	6.3 x 3.3 x 9.1 in (160.5 x 83 x 230.5 mm)	RAL 9003
Mounting Plate		IPSMDEBPLATE	Universal Electrical Box Mounting Plate	Ø5.6 x 0.13 in (Ø143 x 3.3 mm)	RAL 9003
Pendant Cap		ADCi6DPCAPIW	Pendant Cap: Outdoor, White	Ø5.16 x 2.17 in (Ø141 x 55 mm)	RAL 9003
Gooseneck Arm		ADLOMARM	For use with Pendant Cap	4.4 x 8.78 x 4.4 in (112.5 x 222.9 x 112.5 mm)	RAL 9003

Pole Mount Adapter		ADCDMPOLE	For use with Pendant Cap and Gooseneck Arm, or directly to the camera back plate	Wraps around pole	RAL 9003
Outside Corner Mount Adapter		ADCDMCRNRO	For use with Pendant Cap and Gooseneck Arm, or directly to the camera back plate.	5.18 x 7.58 in (131.5 x 192.5 mm)	RAL 9003

Ordering Information

Model	Description
IPS02-D12-OI03	Illustra Pro 2MP MiniDome, motorised P-Iris 2.7-13.5mm, Indoor/Outdoor IP67, IK10, TDN w/IR, TWDR
IPS02-D17-OI03	Illustra Pro 2MP MiniDome, motorised P-Iris 7-22mm, Indoor/Outdoor IP67, IK10, TDN w/IR, TWDR
IPS03-D12-OI03	Illustra Pro 3MP MiniDome, motorised P-Iris 2.7-13.5mm, Indoor/Outdoor IP67, IK10, TDN w/IR, TWDR
IPS03-D17-OI03	Illustra Pro 3MP MiniDome, motorised P-Iris 7-22mm, Indoor/Outdoor IP67, IK10, TDN w/IR, TWDR
IPS05-D12-OI03	Illustra Pro 5MP MiniDome, motorised P-Iris 2.7-13.5mm, Indoor/Outdoor IP67, IK10, TDN w/IR, TWDR
IPS05-D14-OI03	Illustra Pro 5MP MiniDome, motorised P-Iris 6-22mm, Indoor/Outdoor IP67, IK10, TDN w/IR, TWDR
IPS08-D13-OI03	Illustra Pro 8MP MiniDome, motorised P-Iris 3.6-10mm, Indoor/Outdoor IP67, IK10, TDN w/IR, TWDR
IPS08-D14-OI03	Illustra Pro 8MP MiniDome, motorised P-Iris 6-22mm, Indoor/Outdoor IP67, IK10, TDN w/IR, TWDR

Accessories

Model	Description
IPSMDFLUSHOW3	Illustra Pro Series: Recess Mount, Indoor/Outdoor Gen 3
IPSMDWALL3	Illustra Pro Series: Wall Mount, Indoor/Outdoor
IPSMDEBPLATE	Illustra:Universal Electrical Box Mounting Plate
ADCi6DPCAPIW	Illustra 600/610 Dome pendant cap indoor, white, ¾" NPT
ADLOMARM	Mount, wall arm, no plate
ADCDMPOLE	Twin strap clamp pole-mount adaptor for use with ADCDMWALL. White finish
ADCDMCRNRO	Corner adaptor, outside corner, used with ADLOMARM / ADCBMARM

About Johnson Controls

Johnson Controls is a global diversified technology and multi-industrial leader serving a wide range of customers in more than 150 countries. Our 120,000 employees create intelligent buildings, efficient energy solutions, integrated infrastructure and next generation transportation systems that work seamlessly together to deliver on the promise of smart cities and communities. Our commitment to sustainability dates back to our roots in 1885, with the invention of the first electric room thermostat.

For additional information, please visit www.illustracameras.com or follow Illustra on LinkedIn, Twitter, and Facebook.

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IL1204-DS-201910-R06-HS-EN

MAGNASPHERE®

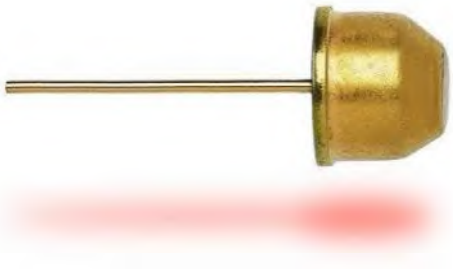
Security Contacts Product Catalog

INVENTED and DESIGNED to address the undetected breaches of security that could occur when using easily exploitable and fragile reed switch sensors, MAGNASPHERE'S award-winning and patented technology is virtually unbeatable and unbreakable.

For more product information, visit magnasphere.com or call 262-347-0711

Contacts made with Magnasphere Technology are Superior to reed switch contacts

"Most people don't realize how easy it is for an intruder to defeat a reed switch security system contact and evade detection," said Rick Kirschman, President of MAGNASPHERE Corp. "Magnets are the kryptonite to the common reed switch. If a rogue magnet was placed within range of a reed switch contact, an intruder could enter almost any home undetected without triggering an alarm. How safe are you really if your home security system can be defeated with a simple magnet?"



Invented by Dr. Randall Woods, the MAGNASPHERE® high security switch was designed to address the undetected breaches of security that could occur while using reed switch based home security system contacts. *"When my neighbor's home got robbed and the alarm didn't go off, I wanted to know why," said Dr. Woods. "I soon discovered the reed switch security flaw and set out to design a more secure switch technology that would do the job that I thought the reed switch contact was supposed to do."*

The US Government demanded a more effective countermeasure to protect its highest classified areas. While these Magnasphere defeat resistant HSS devices are now commonly used to detect breaches in high security facilities, their higher cost and large size made them an impractical security solution for most residential applications. Resistant to external magnetic defeat tampering, virtually unbreakable, and contact-weld resistant, MAGNASPHERE's patented "reed switch free" technology provides the absolute highest level of intrusion detection available to any security system owner today. In fact, MAGNASPHERE's MSS series provides the same level of external magnetic defeat protection found in the Federal Government's most secure installations, but at a fraction of the cost and size.

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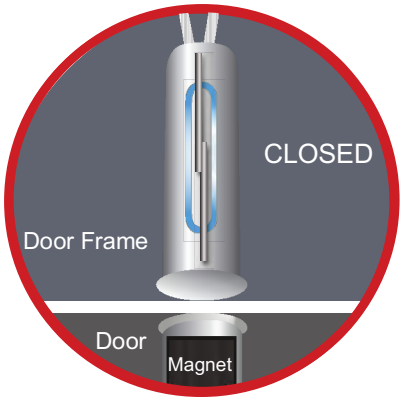
Reed vs. MAGNASPHERE®

Security contacts are made with a decades-old technology called the Reed switch.

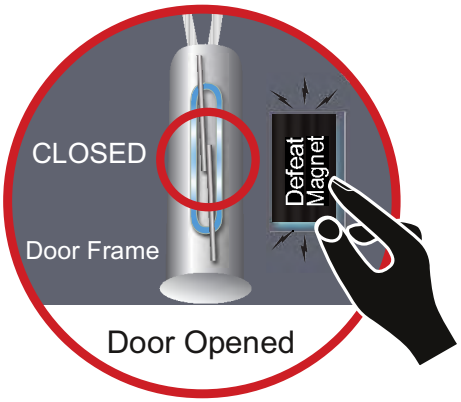
Reed switches have three inherent weaknesses when used in security contacts: (1) Easily defeated with magnets, (2)Prone to permanent contact weld failure (from lightning and power surges), and (3)fragile (made mostly of glass, they are subject to damage even when packaged as security contacts).

SECURE: NO ALARM



Reed contacts operate on magnetic fields. Most contacts are Closed in the secure position (Closed Loop) when the door is closed and the magnet is near the switch.

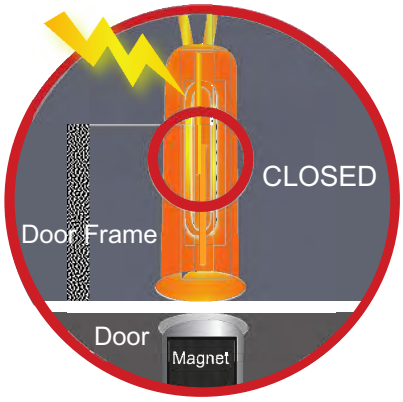
FAILED: NO ALARM



Reed switch contacts are globally magnetic: they will respond to the strongest magnetic field anywhere around the contact –– not solely to the door magnet. When compromised, reed contacts will still send secure signals.

Introducing a defeat magnet OUTSIDE the door will keep the reed contacts closed, allowing an intruder to enter without alerting the security system. They FAIL SECURE.

NO ALARM



When closed reed contacts are exposed to power surges such as lightning strikes, they are prone to permanent contact welding.

FAILED: NO ALARM

Reed contacts operate by magnetic induction, so they are not attracted to the door magnet.

Once contacts have welded closed, they remain in that state though the door is open. They FAIL SECURE.

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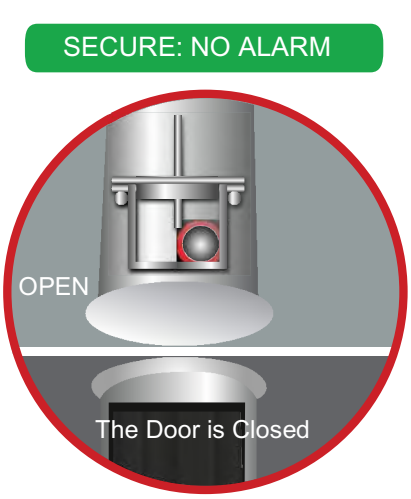
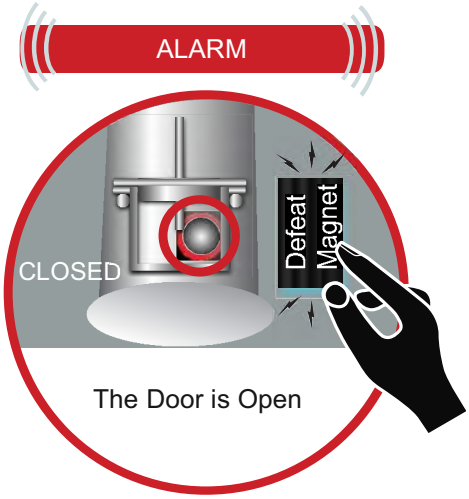
Reed vs. MAGNASPHERE®

The patented, award-winning MAGNASPHERE switch technology was designed as a security device which over comes the deficiencies of reed contacts. The MAGNASPHERE switch is (1) Resistant to magnetic defeat and tamper,(2) Resistant to permanent contact welding from lightning and power surges, and (3) Robust, all metal welded construction is virtually unbreakable.

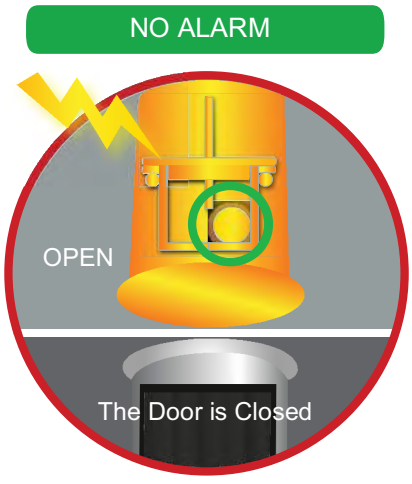


MAGNASPHERE security sensors' magnet ball contact is open in the secure position (Open Loop) when the door is closed and the door magnet is near the switch.

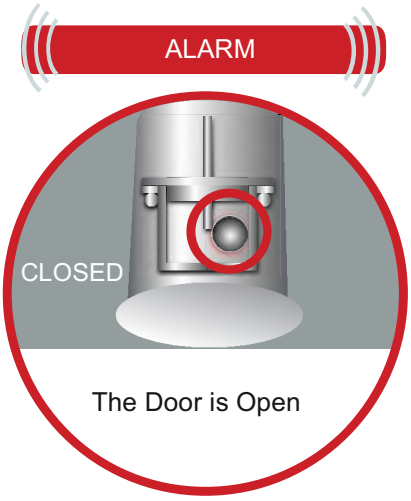


MAGNASPHERE's contact is a spherical magnet and operates in a defined activation zone directed toward the door magnet.

A defeat magnet introduced OUTSIDE the door will have no effect on the ball contact. When the door is opened, the contact will close, and the SYSTEM WILL ALARM.



MAGNASPHERE Security Sensors are Open Loop and highly resistant to contact welding from power surges and lightning strikes.



Because the magnet ball contact will not weld, when the door is opened the contact will close and the SYSTEM WILL ALARM.

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MAGNASPHERE®

Underwriters Laboratories Testing Criteria UL-634 Connectors and Switches for Use with Burgular-Alarm Systems

There are 40 standards that must be met to achieve listing to UL-634, which covers basic contacts, including Balanced Magnetic Switches, defined by UL-634 Section 3, Glossary, as: 3.2 BALANCED MAGNETIC SWITCH (BMS) - A switch that is constructed in such a manner or that includes additional components that increase resistance to magnetic, electrical and mechanical tampering or defeat.

It should be noted that while devices made with BMS provide “higher security” than standard contacts, they are not considered HIGH SECURITY CONTACTS until criteria listed below is met.

In addition,there are 8 testing criteria that must be met to achieve UL-634 Level 1 HIGH SECURITY. They are included in these categories:

- Mechanical Protection Against Tampering®
- Electrical Protection Against Tampering
- Compromise Test – Mechanical and Mercury Switches
- Compromise Test – Magnetic Switches
- Compromise Test – Enclosures
- Detection Test – Measures Activation Distances

Beyond the UL-634 Level 1 listing,there are 8 additional requirements that must be met to achieve UL-634 Level 2 HIGH SECURITY:

- Made with Balanced Magnetic Switches (BMS)
- Nuisance Alarm Test
- Cover or Enclosure Tamper Test (When Applicable)
- Magnet Assembly Cover Removal Alarm Test (When Applicable)
- Switch Assembly Removal Tamper Test (When Applicable)
- Foreign Magnetic Field Tamper Alarm Test
- Foreign Magnetic Field Compromise Tests
- Extended Endurance Test

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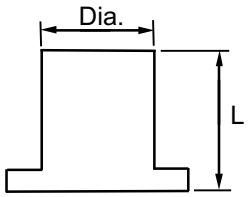
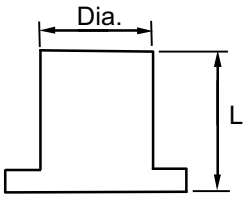
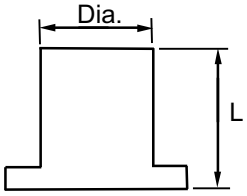
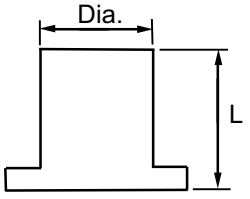
Magnasphere MSS Contacts

Available Part Numbers

SECURITY c UL us LISTED

MSS-19CT Recessed Contact 	SIZE 3/4" Dia. x 7/8" L [20mm Dia. x 23mm L] 	MAX Gap **1/2" [12.7mm]** Color(s) **Brown, Grey and White**	**Magnasphere Electrical Specifications** Max Current: **0.25A** Resistive Max Voltage: **30 VDC** Max Power: **.25 W** Resistive Configuration: "**Open Loop**" w/ Target Magnet in Place **Screw Terminals**
MSS-19CL Recessed Contact 	SIZE 3/4" Dia. x 7/8" L [20mm Dia. x 23mm L] 	MAX Gap **1/2" [12.7mm]** Color(s) **Brown, Grey and White**	**Magnasphere Electrical Specifications** Max Current: **0.25A** Resistive Max Voltage: **30 VDC** Max Power: **.25 W** Resistive Configuration: "**Open Loop**" w/ Target Magnet in Place #22 AWG **12" [30.5cm] Leads**
MSS-25C Recessed Contact 	SIZE 1" Dia. x 1.2" L [25mm Dia. x 30mm L] 	MAX Gap **1/2" [12.7mm]** Color(s) **White**	**Magnasphere Electrical Specifications** Max Current: **0.25A** Resistive Max Voltage: **30 VDC** Max Power: **.25 W** Resistive Configuration: "**Open Loop**" w/ Target Magnet in Place #22 AWG **12" [30.5cm] Leads**
MSS-25CL Recessed Contact 	SIZE 1" Dia. x 7/8" L [25mm Dia. x 23mm L] 	MAX Gap **1/2" [12.7mm]** Color(s) **Brown, Grey and White**	**Magnasphere Electrical Specifications** Max Current: **0.25A** Resistive Max Voltage: **30 VDC** Max Power: **.25 W** Resistive Configuration: "**Open Loop**" w/ Target Magnet in Place #22 AWG **12" [30.5cm] Leads**

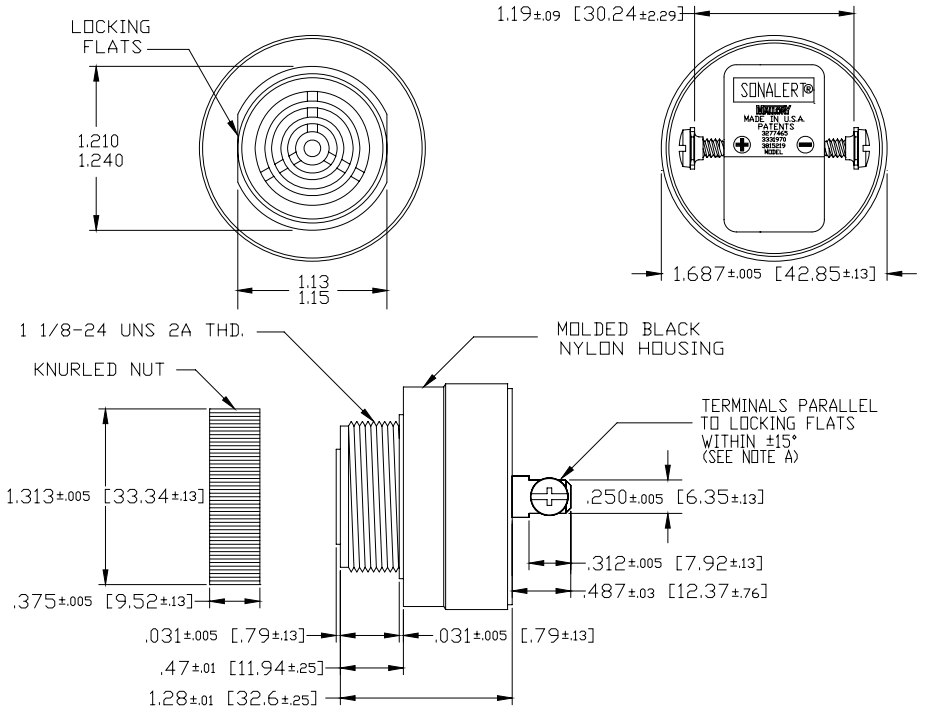
Mallory Sonalert Products Inc.	Part # SC616N
Sales Outline Drawing	Revision D

Specifications:

Sound level Category	Loud Sound Level
Mode of Operation	Continuous tone
Mounting	Panel (see note B)
Voltage Rating	6 to 16 Vdc
Frequency	2900 Hz ±500 Hz
Loudness (Min. Voltage)	80 dB(A) min. @ 2 FT and 6 Vdc
Loudness (Max Voltage)	95 dB(A) min. @ 2FT and 16 Vdc
Current Draw	6 mA Max @ 6 Vdc
Current Draw	22 mA Max @ 16 Vdc
Storage Temperature	-40°C to +85°C
Operating Temperature	-30°C to +65°C
Weight (Typical)	1.5 oz (42 g)
Housing	6/6 Nylon, Color Black
Options	For other options contact factory

Dimensions: Inches (mm)

UL Recognized



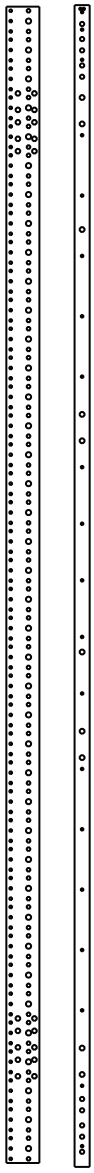
NOTE A: TERMINALS-.032 BRASS TIN PLATED, TAPPED FOR #6-32 SCREW. TWO #6-32 NICKEL PLATED BRASS SCREWS INCLUDED. WILL ACCEPT 1/4" QUICK CONNECT.

NOTE B: MOUNTING- REMOVE BLACK PLASTIC NUT AND INSERT THREADED FRONT THROUGH 1.25" HOLE PUNCHED IN PANEL, IF ORIENTATION IS NEEDED, NOTE LOCKING FLATS ON DRAWING. SCREW NUT BACK ON. DO NOT OVERTIGHTEN.

Instruction Sheet

BB SERIES

Copper Buss Bars



THANK YOU

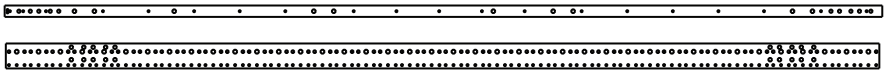
Thank you for purchasing a BB Series Copper Buss Bar. Please read these instructions thoroughly before installing or assembling this product.

PRODUCT FEATURES

• Buss bars come in BB-xx-1 (1” wide) or BB-40 (2” wide) models.

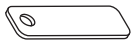
Middle Atlantic Products

SUPPLIED COMPONENTS AND HARDWARE



Buss Bar (x1; width varies based on model)

Sliding Nut (x4)



Isolation Washer (x4)

Shoulder Washer (x4)

1/4-20 Bolt (x4)

NOTE:
- Hardware quantities drop from 4 to 2 for the BB-12 model.
- To ensure the proper isolation of the Buss Bar from the racks, the supplied hardware must be installed exactly as shown.

REQUIRED TOOLS

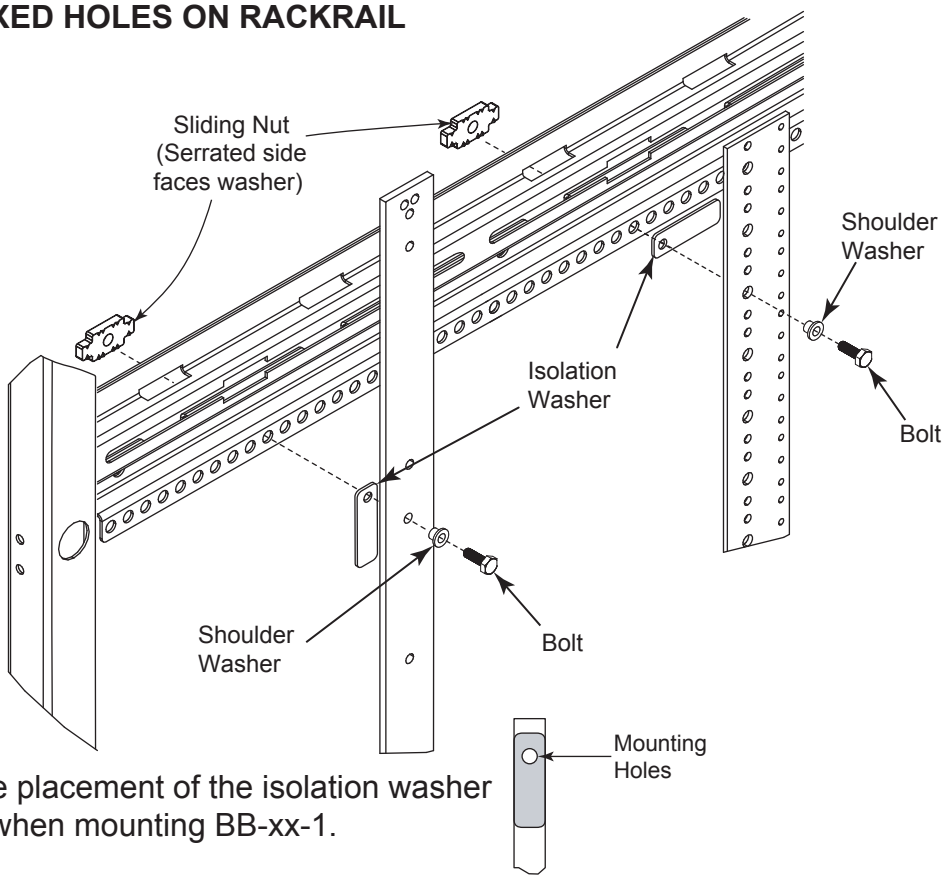
- 7/16" Wrench

INSTALLATION

Using the supplied hardware, mount the BB-xx-1 (1” wide) or BB-40 (2” wide) to all four internal rackrail mounting brackets, or for the BB-12, mount to the two internal rackrail mounting brackets. Mount bars to either the fixed rackrail or rackrail slots as shown on page 3.

NOTE: The xx portion of model numbers mentioned refers to the different rack heights.

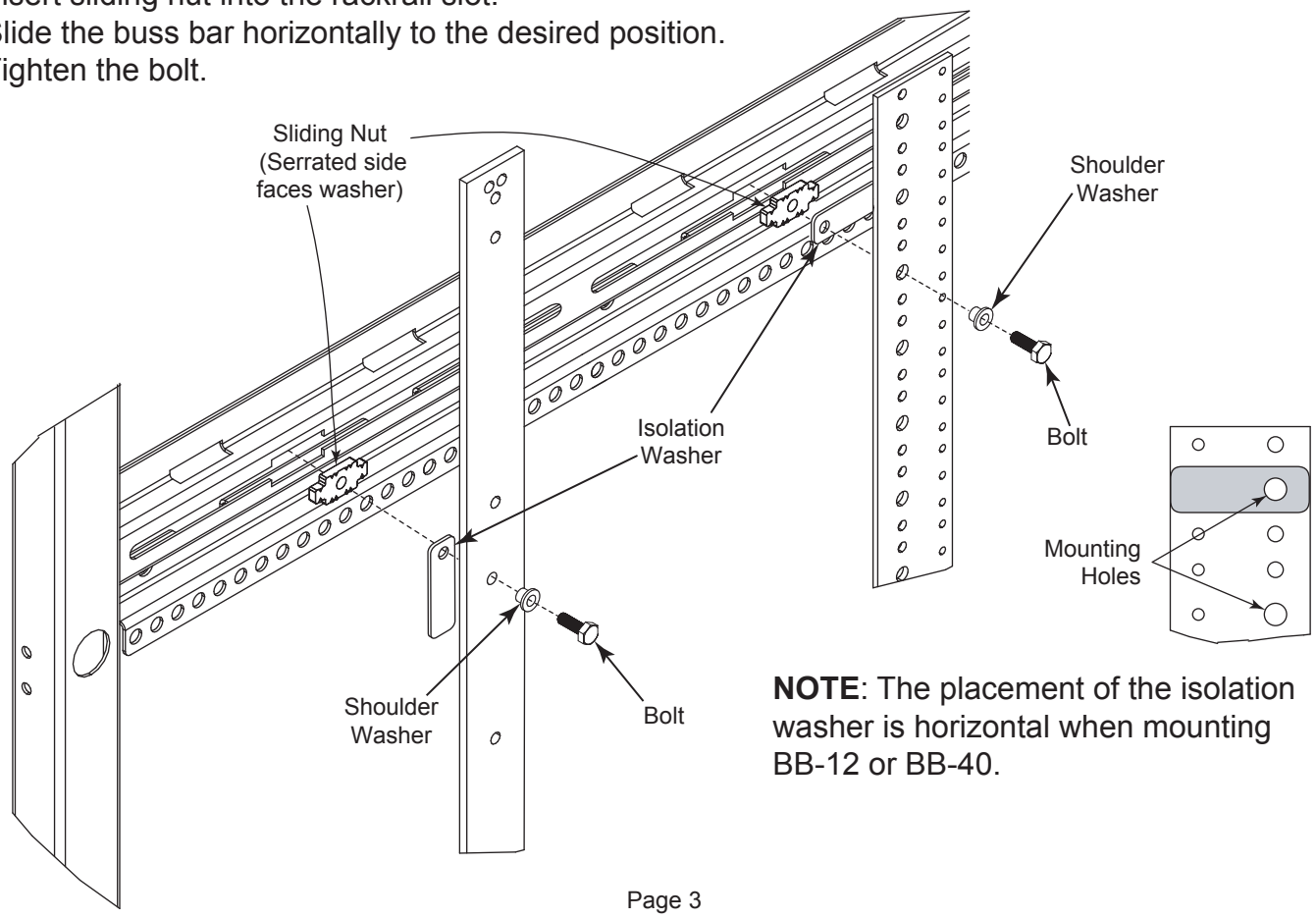
MOUNTING TO FIXED HOLES ON RACKRAIL



NOTE: The placement of the isolation washer is vertical when mounting BB-xx-1.

MOUNTING TO POSITIONABLE RACKRAIL SLOTS

1. Loosely fasten all the hardware to buss bar.
2. Insert sliding nut into the rackrail slot.
3. Slide the buss bar horizontally to the desired position.
4. Tighten the bolt.



NOTE: The placement of the isolation washer is horizontal when mounting BB-12 or BB-40.

WARRANTY
Middle Atlantic Products (the "Company") warrants the Universal product to be free from defects in material or workmanship under normal use and conditions for the lifetime of the product.

The Company's entire liability to the purchaser, and the purchaser's (or any other party's) sole and exclusive remedy, under this warranty shall be limited, at the Company's option, to either (a) return of and refund of the price paid for, or (b) repair or replacement at the Company's factory of the products purchased, or any part or parts thereof, which the Company has determined to be defective after inspection thereof at the Company's factory.
This warranty does not cover damage due to acts of God, accident, misuse, abuse or negligence by parties other than the Company, or any modification or alteration of the products. In addition, this warranty does not cover damage due to improper handling, assembly, installation or maintenance.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, IN NO EVENT SHALL THE COMPANY BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT, OR CONSEQUENTIAL DAMAGES WHATSOEVER (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION OR ANY OTHER PECUNIARY LOSS) ARISING OUT OF THE USE OF THE PRODUCTS PURCHASED, EVEN IF THE COMPANY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THE COMPANY'S LIABILITY TO THE PURCHASER (OR ANY OTHER PARTY) HEREUNDER, IF ANY, SHALL IN NO EVENT EXCEED THE PURCHASE PRICE OF THE PRODUCTS PAID TO THE COMPANY.

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Factory Distribution
USA: NJ - CA - IL Canada: ON - BC
At Middle Atlantic Products we are always listening. Your comments are welcome.

Middle Atlantic Products is an ISO 9001 and ISO 14001 Registered Company.

DWR Series

wall mount rack

pivoting, sectional wall cabinet is ideal for larger systems in both secured and non-secured areas

features:

- Available in 17”, 22”, 26” and 32” overall depths with 15”, 20”, 24” and 30” of useable depth
- Tool-Free Quick-Mount™ system for easy, one-person mounting of the center section to the backpan on the jobsite
- Center section rear channel accommodates slim power to save space
- Optional minimum-clearance latch allows side-by-side or interior corner mounting
- Reversible padlockable center section is keyed differently from optional front door for security
- 2” knockouts, 4” knockouts for Wiremold 4000® Series raceways, and knockouts for UCP Series universal connector panels on side
- Grounding/bonding stud in top and bottom of center section and backpan facilitates proper grounding and bonding of electronic equipment, as per NEBS and NEC standards
- Finished in a durable black textured powder coat
- UL listed in the US and Canada

see inside for important information regarding useable depths

specifications:

EIA compliant 19” wall mount rack shall be Middle Atlantic Products model # DWR-__-__ (refer to chart). Overall dimensions shall be 23.4” W x __” H x __” D (refer to chart). Weight capacity shall be __ lbs. Tool-Free Quick-Mount™ system enables one-person installation. Useable depth shall be __” (refer to chart) and shall extend into the back pan 3.5”. Center section and back pan shall be steel, phosphate pre-treated and finished in a black textured powder coat. Adjustable rackrail shall be constructed of 11-gauge steel with tapped 10-32 mounting holes in universal EIA spacing with black e-coat finish and marked rack spaces. Rack shall be constructed to swing open for component cabling access, center section shall pivot for either left or right opening. Rack shall have a rear knockout panel with 1/2”, 3/4”, 1”, 1-1/2”, 2” and 3” electrical knockouts installed in base, and a rear knockout panel with 1/2”, 3/4”, 1”, 1-1/2”, 2” and 3” electrical knockouts, and BNC knockouts for UHF/VHF antennas installed in top. Large laser knockout on back pan shall have a 12-1/2” x 12-1/2” cutout for electrical pull-box. Fan knockouts on top and bottom shall allow for installation of up to four 4-1/2” fans. Rack shall have 2” knockouts, 4” knockouts for Wiremold 4000® Series raceways, and knockouts for UCP Series universal connector panels on the side. Top, bottom and sides shall feature vertical vent pattern. DWR Series enclosures shall satisfy the 2013 CBC; 2012 IBC & ASCE 7-10 (2010 Edition) for use in areas of high seismicity, using an assumed Site Class D soil condition with lateral force requirements for protecting 155 lbs. of essential equipment in locations with the highest level of seismicity and top floor or rooftop installations with an Importance factor (Ip) of 1.5 when used with DWRSR-ZL Latch. DWR Series shall be OSHPD approved for fixed equipment anchorage in California healthcare facilities. Rack shall be UL Listed in the US and Canada to the UL-2416 (NWIN) Category when used with optional bonding kit, model # PET-K-__. DWR Series shall meet all enclosure requirements towards PCI DSS (Payment Card Industry Data Security Standard) Compliance. Rack shall be GREENGUARD Gold Certified. Rack shall comply with the requirements RoHS EU Directive 2011/65/EU. Rack shall be manufactured by an ISO 9001 and ISO 14001 registered company. Rack shall be warrantied to be free from defects in materials or workmanship under normal use and conditions for the lifetime of the rack.

Customizable specification clips available at middleatlantic.com

RoHS · c UL us LISTED · GREENGUARD GOLD · PRODUCT CERTIFIED FOR LOW CHEMICAL EMISSIONS UL.COM/GG UL 2818 · PCI COMPLIANT ENCLOSURE · PEP eco PASS PORT®

EIA/TIA COMPLIANT | **US PATENT# 7, 278, 183** | **SEISMIC CERTIFIED**

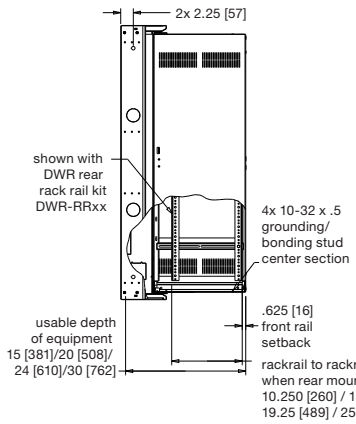
options:

- Front doors shall be reinforced steel, model # FD-XX (solid), VFD-XX (vented, 25% open area), LVFD-XX (vented, 64% open area), PFD-XX (plexi), (XX= # of rackspaces of DWR rack)
- Keyless Latch replaces keylock, fits front & rear doors, shall be models # LATCH
- Rear rail kit 11-gauge, 10-32 threaded, sold in pairs, hardware included, shall be model # DWR-RRXX
- Fan kits with two 4-1/2” exhaust fans, fan guards and vent blockers shall be model # DWR-FK17 (fits DWR-xx-17), DWR-FK22 (fits DWR-xx-22), Fan kits with two 6” exhaust fans, fan guards and vent blockers shall be DWR-FK6-26 (fits DWR-xx-26), DWR-FK6-32 (fits DWR-xx-32)
- Vent Blockers used to promote active thermal management, shall be model # VBK-D17 (fits DWR-XX-17), VBK-SD22 (fits DWR-XX-22), VBK-E20 (fits DWR-XX-26)
- Optional cover plate / shelf kit shall be model # DWR-CVR
- Minimum-clearance latch shall allow side-by-side or corner mounting, shall be model # DWRSR-ZL
- Optional bonding kit for UL-2416 (NWIN) compliance shall be Middle Atlantic Products PET-K-D/EWR (for backpan to center section), PET-K-D/EWRD (for backpan to center section to front door), PET-K-FD (for front door to center section), PET-K-DWRFK (for fan kit to center section)

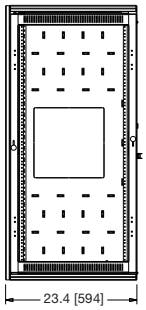
DWR Series
basic dimensions

all dimensions in inches unless otherwise noted [all dimensions in brackets are in millimeters]

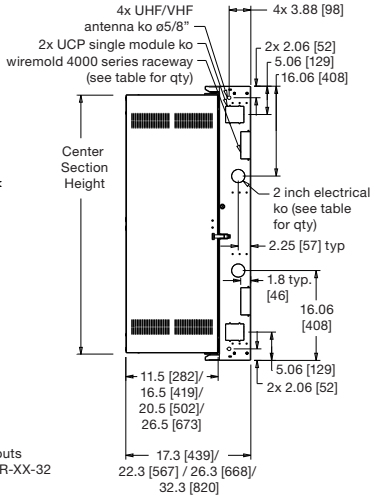
side view



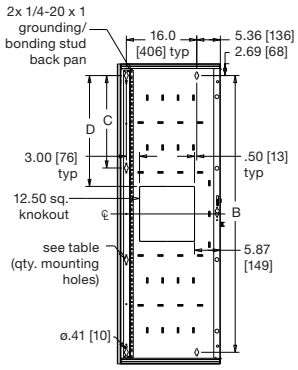
front view
center section



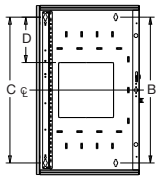
side view



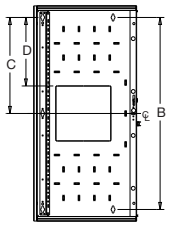
front view
backpan:
DWR-35-xx



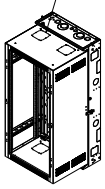
front view
backpan:
DWR-10-xx
DWR-12-xx
DWR-16-xx
DWR-18-xx



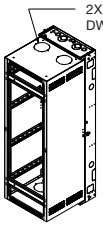
front view
backpan:
DWR-21-xx
DWR-24-xx



2X 4 1/2" fan knockouts
DWR-XX-17/DWR-XX-22



2X 6" fan knockouts
DWR-XX-26/DWR-XX-32



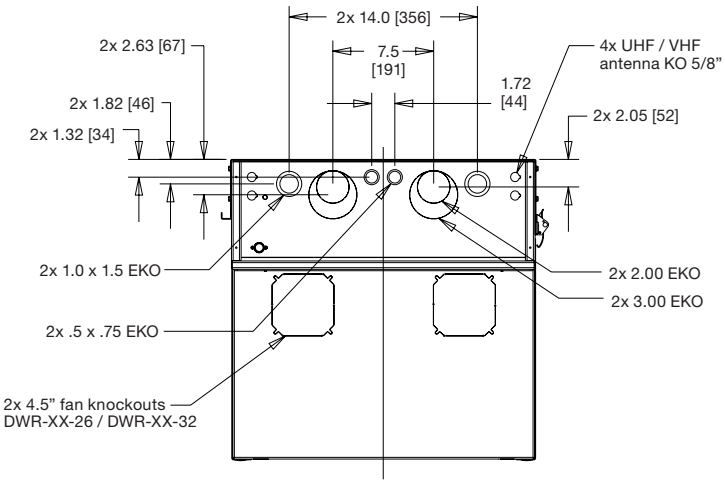
Note: 17", 22" and 32" deep models are represented in this drawing (DWR-xx-17) / (DWR-xx-22) / (DWR-xx-26) / (DWR-xx-32)

Part #	Overall Height	Center Section Height	Racking Height	Useable Depth	Rackspaces	Weight Capacity	2" EKO Backpan Qty.	Wiremold 4000 Series Qty.	A Wiremold 4000 Series Spacing	B Mounting Hole Spacing	C Mounting Hole Spacing Hinge Side	D Knockout Top to Mounting Hole Spacing	Qty. of Mounting Holes
DWR-10-17	24.50 [622]	21.63 [549]	17.50 [445]	15	10 spaces	200 lbs.	-	1	12.25 [311]	19.13 [486]	19.13 [486]	3.31 [84]	4
DWR-10-22	24.50 [622]	21.63 [549]	17.50 [445]	20	10 spaces	200 lbs.	-	1	12.25 [311]	19.13 [486]	19.13 [486]	3.31 [84]	4
DWR-12-17	28.00 [711]	25.13 [638]	21.00 [533]	15	12 spaces	200 lbs.	-	1	14.00 [356]	22.63 [575]	22.63 [575]	5.06 [129]	4
DWR-12-22	28.00 [711]	25.13 [638]	21.00 [533]	20	12 spaces	200 lbs.	-	1	14.00 [356]	22.63 [575]	22.63 [575]	5.06 [129]	4
DWR-12-26	28.00 [711]	25.13 [638]	21.00 [533]	24	12 spaces	200 lbs.	-	1	14.00 [356]	22.63 [575]	22.63 [575]	5.06 [129]	4
DWR-12-32	28.00 [711]	25.13 [638]	21.00 [533]	30	12 spaces	200 lbs.	-	1	14.00 [356]	22.63 [575]	22.63 [575]	5.06 [129]	4
DWR-16-17	35.00 [889]	32.13 [816]	28.00 [711]	15	16 spaces	200 lbs.	-	1	17.50 [445]	29.63 [752]	29.63 [752]	8.56 [217]	4
DWR-16-22	35.00 [889]	32.13 [816]	28.00 [711]	20	16 spaces	200 lbs.	-	1	17.50 [445]	29.63 [752]	29.63 [752]	8.56 [217]	4
DWR-18-17	38.50 [978]	35.63 [905]	31.50 [800]	15	18 spaces	250 lbs.	-	1	19.25 [489]	33.13 [841]	33.13 [841]	10.31 [262]	4
DWR-18-22	38.50 [978]	35.63 [905]	31.50 [800]	20	18 spaces	250 lbs.	-	1	19.25 [489]	33.13 [841]	33.13 [841]	10.31 [262]	4
DWR-18-26	38.50 [978]	35.63 [905]	31.50 [800]	24	18 spaces	250 lbs.	-	1	19.25 [489]	33.13 [841]	33.13 [841]	10.31 [262]	4
DWR-18-32	38.50 [978]	35.63 [905]	31.50 [800]	30	18 spaces	250 lbs.	-	1	19.25 [489]	33.13 [841]	33.13 [841]	10.31 [262]	4
DWR-21-17	43.75 [1111]	40.88 [1038]	36.75 [933]	15	21 spaces	250 lbs.	4	2	10.56 [268]	38.33 [975]	19.19 [487]	12.94 [329]	4
DWR-21-22	43.75 [1111]	40.88 [1038]	36.75 [933]	20	21 spaces	250 lbs.	4	2	10.56 [268]	38.33 [975]	19.19 [487]	12.94 [329]	4
DWR-24-17	49.00 [1245]	46.13 [1172]	42.00 [1067]	15	24 spaces	300 lbs.	4	2	10.56 [268]	43.63 [1108]	21.81 [554]	15.56 [395]	5
DWR-24-22	49.00 [1245]	46.13 [1172]	42.00 [1067]	20	24 spaces	300 lbs.	4	2	10.56 [268]	43.63 [1108]	21.81 [554]	15.56 [395]	5
DWR-24-26	49.00 [1245]	46.13 [1172]	42.00 [1067]	24	24 spaces	300 lbs.	4	2	10.56 [268]	43.63 [1108]	21.81 [554]	15.56 [395]	5
DWR-24-32	49.00 [1245]	46.13 [1172]	42.00 [1067]	30	24 spaces	300 lbs.	4	2	10.56 [268]	43.63 [1108]	21.81 [554]	15.56 [395]	5
DWR-35-17	68.25 [1734]	65.38 [1661]	61.25 [1558]	15	35 spaces	300 lbs.	4	2	10.56 [268]	62.83 [1597]	21.00 [533]	25.19 [640]	6
DWR-35-22	68.25 [1734]	65.38 [1661]	61.25 [1558]	20	35 spaces	300 lbs.	4	2	10.56 [268]	62.83 [1597]	21.00 [533]	25.19 [640]	6
DWR-35-26	68.25 [1734]	65.38 [1661]	61.25 [1558]	24	35 spaces	300 lbs.	4	2	10.56 [268]	62.83 [1597]	21.00 [533]	25.19 [640]	6

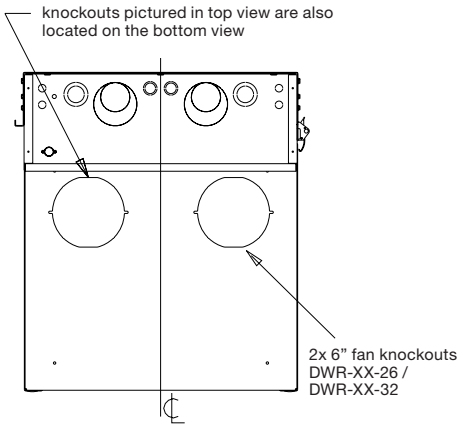
DWR Series
basic dimensions

all dimensions in inches unless otherwise noted [all dimensions in brackets are in millimeters]

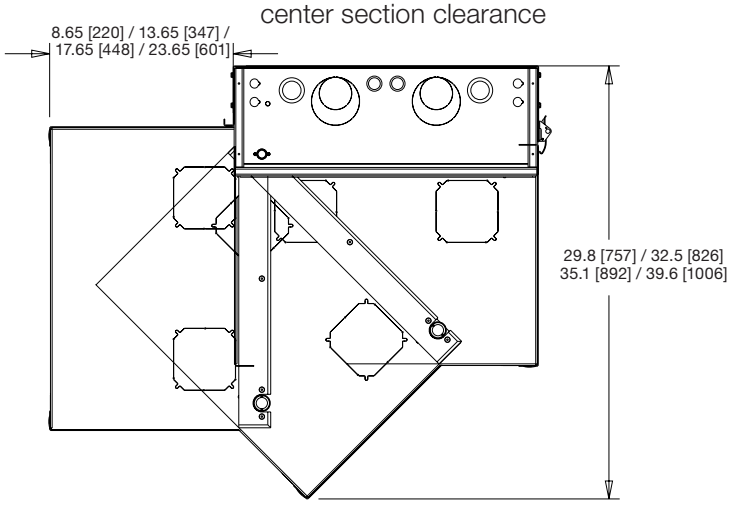
top view
(knockout pictured in top view are also on the bottom view)

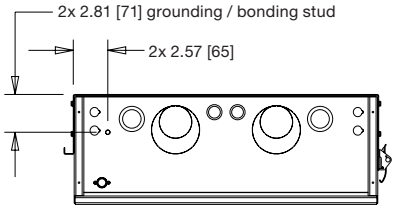


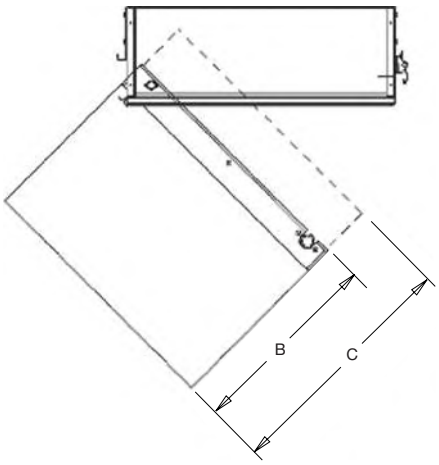
top view

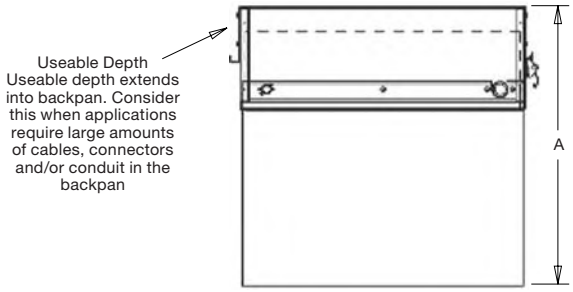


center section clearance









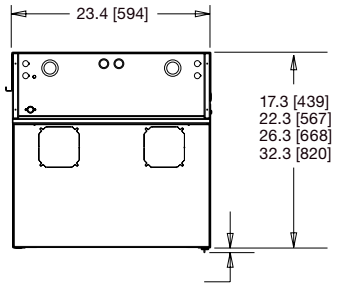
Part #	A Overall Depth	B Center Section Depth	C Useable Depth
DWR-xx-17	17.3 [439]	11.5 [292]	15.0 [381]
DWR-xx-22	22.3 [567]	16.5 [419]	20.0 [508]
DWR-xx-26	26.3 [668]	20.5 [521]	24.0 [610]
DWR-xx-32	32.3 [820]	26.5 [673]	30.0 [762]

DWR Series

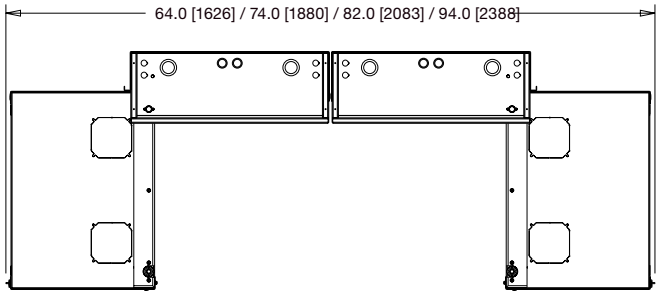
with minimum-clearance latch installed basic dimensions

all dimensions in inches unless otherwise noted [all dimensions in brackets are in millimeters]

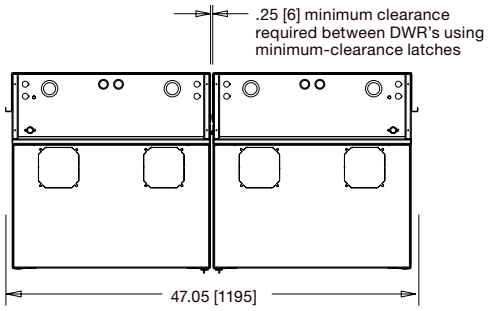
top view



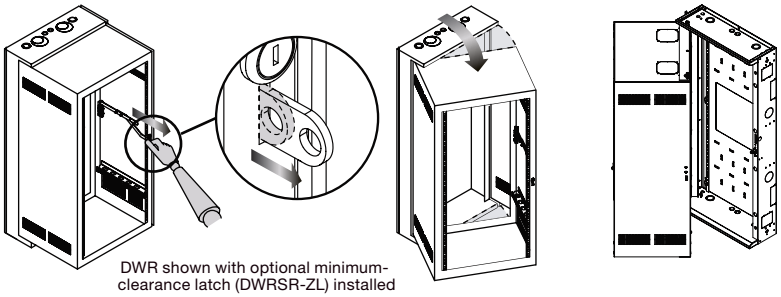
top view
(2 DWR's fully opened)



top view
(2 DWR's closed position)



optional DWRSR-ZL
minimum-clearance latch operation:



DWR shown with optional minimum-clearance latch (DWRSR-ZL) installed

Center Section Trim Power		
Part #	PD-815 Series (Qty)	PD-2415 Series (Qty)
DWR-10-xx	1	N/A
DWR-12-xx	1	N/A
DWR-16-xx	1	N/A
DWR-18-xx	1	N/A
DWR-21-xx	1 or 2	N/A
DWR-24-xx	1 or 2	N/A
DWR-35-xx	1 or 2	1

LT-1Rx Series
rackmount lights

rackmount lights provide ambient lighting for front and rear of rackmount components

features:

- Retractable LED light shelf
- Dimmable LED light bar provides evenly distributed illumination for component viewing
- Constructed of 18-gauge steel
- Available in durable flat black powder coat or a black brushed and anodized finish
- 2 rear USB style output ports for connection of LED gooseneck work lights
- Aesthetically pleasing dimmable LED logo optional (LT-1RA)
- UL Listed plug-in power supply

LT-1R

LT-1RA

rear view

specifications:

Rackmount light shall be Middle Atlantic Products model # LT-1RX (X = finish, refer to chart). One rackspace rackmount light shall contain retractable light shelf with LED light bar containing a total of ten white and amber lights for color balance. Rackmount light shall include front mounted dimmer knob (LT-1R only). Hidden dimmer switches to control logo and light brightness on bottom of retractable light shelf (LT-1RA). Light shelf shall extend and light bar shall illuminate automatically when pressed. Rackmount light shall have ball bearing slides for retractable light shelf and shall have a weight capacity of 20 lbs. Rackmount light shall be constructed of 18-gauge steel. Unit shall provide two rear USB style, 5 volt DC output ports for use with optional gooseneck LED light. Rackmount light shall be warrantied to be free from defects in material or workmanship under normal use and conditions for a period of 3 years.

Customizable specification clips available at middleatlantic.com

EIA/TIA COMPLIANT

options:

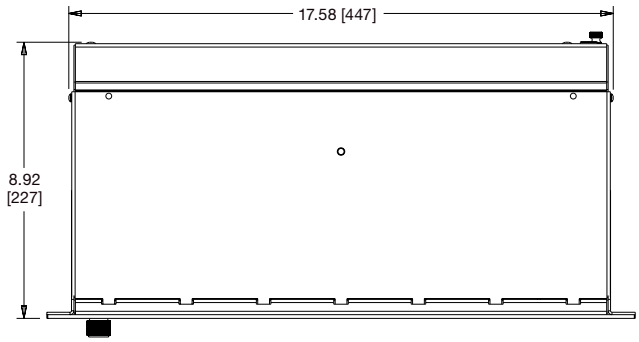
- Rear Gooseneck light shall be Middle Atlantic Products model # LT-GN

LT-GN

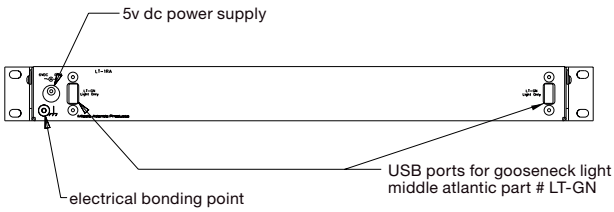
LT-1R Series
basic dimensions

all dimensions in inches unless otherwise noted [all dimensions in brackets are in millimeters]

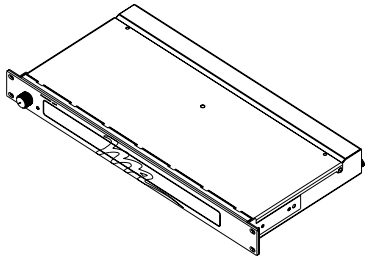
top view



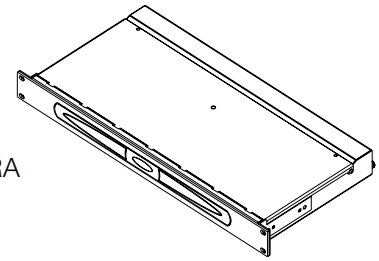
rear view



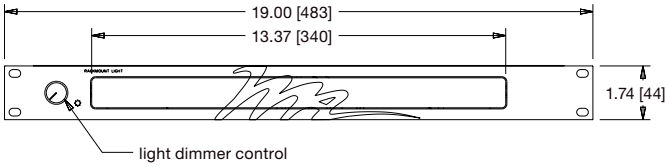
LT-1R



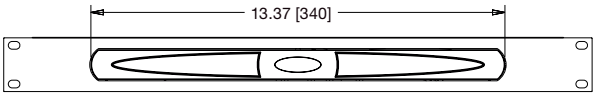
LT-1RA



front view

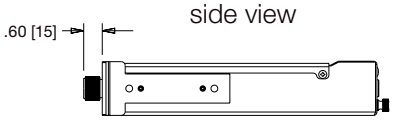


front view

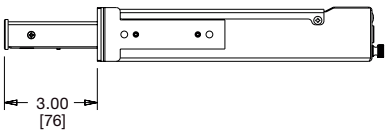


LT-1RA and LT-1R
dimmer for light and logo is located
under drawer, ref instruction sheet I-00171

side view



side view
light drawer open



Part #	Finish
LT-1R	flat black powder coat
LT-1RA	black brushed and anodized

SARGENT®
ASSA ABLOY

Inner Strength, Redefined!

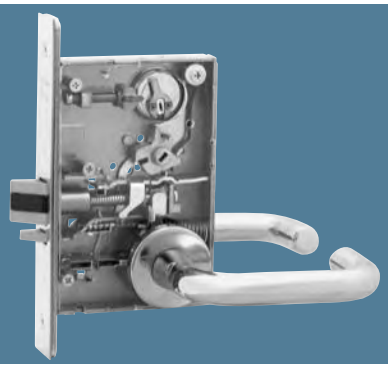
8200 Series Mortise Lock

ASSA ABLOY, the global leader in door opening solutions

SARGENT
ASSA ABLOY

Raising the bar of excellence.

The 8200 Series mortise lock is designed and constructed with the highest quality components to provide maximum security, performance, and durability, making it the strongest lock on the block. Considered the industry benchmark for all mortise locks on the market today, the robust lock is an attractive solution with a multitude of lever and escutcheon styles available.



Features

- ANSI/BHMA Grade 1 certified for cycle and strength requirements
- UL-cUL listed for 3 hour fire doors and windstorm applications
- Thru-bolted lever trim and strengthened cylinder retainer
- Available with security key systems (Degree, Signature, KESO, and XC)
- Available in 58 different functions, including electromechanical, security (freewheeling, security escutcheon, anti-vandal pull trim) and monitoring
- 6 lever designs, 2 roses/escutcheons designs, and 14 architectural finishes offered
- Available with behavioral health trim
- 10-year warranty
- Patented design and construction

Benefits

Strength & Reliability: Far exceeds independently verified testing, making it the strongest and most durable mortise lock in the industry. Verified for over 14 million cycles.

Security: Several security features provide additional resistance against vandalism and unauthorized entry.

Flexibility & Aesthetics: Aesthetic design combined with a variety of functions, lever designs and architectural finishes match a wide range of styles and make it ideal for all types of applications (e.g. offices, hospitals, behavioral health environments, schools/universities).

Ease of Install and Maintenance: Multifunctional lockbody makes switching functions on-site easy and reduces inventory requirements.

MicroShield™

MicroShield®
As part of their promise to provide innovative solutions to their customers, certain ASSA ABLOY Group brands offer the MicroShield® technology, registered with the EPA and FDA. MicroShield® is a silver-based antimicrobial coating designed to inhibit the growth of bacteria.
MicroShield® is a registered trademark of Yale Security Inc., an ASSA ABLOY Group company.

ASSA ABLOY is the global leader in door opening solutions, dedicated to satisfying end-user needs for security, safety and convenience

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90763 04/17

Data Sheet

Software House PSX Power Solutions Pre-Wired Systems

PSX-WISU16-E8S

Key Benefits

- Provides uniform installations across an enterprise
- One enclosure, one AC drop, network-ready
- Standard or network managed option – capable of integrating with C-CURE 9000
- Enables operational efficiencies and global standards
- Tie wrap or panduit wire duct cable management option
- UL & CE certified
- Customized design and high reliability operation
- Available for 120V AC or 230V AC

Standardized, Uniform Installations

Software House PSX Power Solutions pre-wired systems provide three-to-one integration, saving space and cost while enabling operational efficiencies and global standards across the enterprise. These systems offer a faster installation, and easier maintenance and troubleshooting. The pre-wired all-in-one systems include wire harnesses for panel power, lock control, fault and tamper switches with preinstalled connectors for iSTAR boards, resulting in a complete and ready to install system.

The pre-wired systems come with ready to mount GCM and ACM boards and are available in 120V or 230V AC versions with tie wrap and panduit cable management options. The network managed systems monitor input and output power, faults, batteries and individual lock outputs while providing auto-testing and reporting of battery standby. Managed systems are also able to integrate into C-CURE 9000 for seamless monitoring and control of the power system.

Specifications

Physical	
Dimensions (H x W x D)	PSX-E4S: 61 x 50 x 12 cm (24 x 20 x 4.5 in) PSX-E8S: 91 x 76 x 12 cm (36 x 30 x 4.5 in)
Weight	PSX-E4S: 13.6kg (30 lbs) PSX-E8S: 31.8kg (70 lbs)
Power Supplies	
PSX-75	75W Power Supply Board 6A/12V or 3A/24V
PSX-150	150W Power Supply Board 12A/12V or 6A/24V
PSX-250	250W Power Supply Board 20A/12V or 10A/24V
Battery Charging	
Charger	Independent built-in charger for sealed lead-acid or gel type batteries
	Microprocessor dual rate charging of 12V or 24V battery sets
Standby	Auto switchover to battery when AC fails
	Zero voltage drop (when switched over to battery backup)
Supervision	
AC Fault	Form "C" contacts
SYS Fault	Form "C" contacts (low or no battery, short to earth ground, power supply fail)
Distribution Modules	
PSX-D8P	8 auxiliary outputs, Class II power limited at 2.5A per output
PSX-C8	8 relay lock control outputs, fused at 3A per output
PSX-M8	8 relay managed outputs, fused at 3A per output
Network Management	
PSX-NL4	Four-port module; Monitors and reports power supply status; Tests and reports battery health status
PSX-M8	Monitors 8 individual outputs; Remote reset each output; Set window thresholds for voltage & current (Requires PSX-NL4)
Regulatory Compliance	
UL/cUL	UL294, UL/cUL1076, ULC S319
CSA/FCC	CSA C22.2 #107.1 | FCC Part 15, CSFM

Ordering Information

PSX Wired Systems - Dual Wall-Mounted Models, Pre-Wired 8-Reader iSTAR Ultra SE Boards FAI, Low Battery Disconnect, Smart Battery Charger

Model Number	Description
PSX-WISU08-E4S	75/150W, Wired for 8 reader iStar Ultra, 8 Aux Outputs, **120VAC**
PSX-WISU08-E4SN	75/150W, Wired for 8 reader iStar Ultra, Network Connected, 8 Aux Outputs, **120VAC**
PSX-WSE08-E4S	75/150W, Wired for 8 reader iStar Ultra SE, 8 Lock Outputs, 8 Aux Outputs, **120VAC**
PSX-WSE08-E4SN	75/150W, Wired for 8 reader iStar Ultra SE, 8 Network Managed Outputs, 8 Aux Outputs, **120VAC**
PSX-WISU08-E4SE	75/150W, Wired for 8 reader iStar Ultra SE, 8 Aux Outputs, **230VAC**
PSX-WISU08-E4SNE	75/150W, Wired for 8 reader iStar Ultra SE, Network Connected, 8 Aux Outputs, **230VAC**
PSX-WSE08-E4SE	75/150W, Wired for 8 reader iStar Ultra SE, 8 Lock Outputs, 8 Aux Outputs, **230VAC**
PSX-WSE08-E4SNE	75/150W, Wired for 8 reader iStar Ultra SE, 8 Network Managed Outputs, 8 Aux Outputs, **230VAC**

PSX Wired 16 Reader Systems - Dual Power Supply/Battery Charger, Wall Mounted Models, Pre-wired for iStarUltra/SE Boards

FAI, Low Battery Disconnect, Smart Battery Charger

Model Number	Description
PSX-WISU16-E8S	150/250W, Wired for 16 reader iStar Ultra, Tie Wrap, 16 Aux Outputs, **120VAC**
PSX-WISU16-E8SN	150/250W, Wired for 16 reader iStar Ultra, Tie Wrap, Network Connected, 16 Aux Outputs, **120VAC**
PSX-WSE16-E8S	150/250W, Wired for 16 reader iStar Ultra SE, Tie Wrap, 16 Lock Outputs, 16 Aux Outputs, **120VAC**
PSX-WSE16-E8SN	150/250W, Wired for 16 reader iStar Ultra SE, Tie Wrap, 16 Network Managed Outputs, 16 Aux Outputs, **120VAC**
PSX-WISU16-E8SE	150/250W, Wired for 16 reader iStar Ultra SE, Tie Wrap, 16 Aux Outputs, **230VAC**
PSX-WISU16-E8SNE	150/250W, Wired for 16 reader iStar Ultra SE, Tie Wrap, Network Connected, 16 Aux Outputs, **230VAC**
PSX-WSE16-E8SE	150/250W, Wired for 16 reader iStar Ultra SE, Tie Wrap, 16 Lock Outputs, 16 Aux Outputs, **230VAC**
PSX-WSE16-E8SNE	150/250W, Wired for 16 reader iStar Ultra SE, Tie Wrap, 16 Network Managed Outputs, 16 Aux Outputs, **230VAC**
PSX-WPISU16E8S	150/250W, Wired for 16 reader iStar Ultra, Panduit, 16 Aux Outputs, **120VAC**
PSX-WPISU16E8SN	150/250W, Wired for 16 reader iStar Ultra, Panduit, Network Connected, 16 Aux Outputs, **120VAC**
PSX-WPSE16E8S	150/250W, Wired for 16 reader iStar Ultra SE, Panduit, 16 Lock Outputs, 16 Aux Outputs, **120VAC**
PSX-WPSE16E8SN	150/250W, Wired for 16 reader iStar Ultra SE, Panduit, 16 Network Managed Outputs, 16 Aux Outputs, **120VAC**

About Johnson Controls

Johnson Controls is a global diversified technology and multi-industrial leader serving a wide range of customers in more than 150 countries. Our 120,000 employees create intelligent buildings, efficient energy solutions, integrated infrastructure and next generation transportation systems that work seamlessly together to deliver on the promise of smart cities and communities. Our commitment to sustainability dates back to our roots in 1885, with the invention of the first electric room thermostat.

For additional information, please visit www.swhouse.com or follow Software House on LinkedIn, Twitter, and Facebook.

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SH1192-DS-201812-R01-HS-EN

SOFTWARE HOUSE®

DATA SHEET

RM-DCM-2

Door Control Module with Enclosure

Shown with optional I8 input module, R8 output module, and battery

Features That Make a Difference:

- Full-featured local door control module lowers wiring costs
- Complete set of inputs and outputs to control one door
- Flexible control options for reader LEDs and beep patterns
- Easily expandable
- Additional internal etch connections support magnetic lock features and accommodate local bypass switch
- Optional LCD provides clear instructions that help simplify startup and diagnostics
- Status LEDs on inputs and outputs for quick troubleshooting
- Built-in tamper switch provides secure installation
- Plug-in screw terminals reduce installation time

Put a full-featured RM-4E door control module in a UL listed, tamper-protected enclosure and you have the powerful Software House® RM-DCM-2. RM-DCM-2 is designed to support up to two RM-4Es and a choice of up to two I8 input boards or R8 output boards, providing a single enclosure for doors with IN and OUT readers.

RM-DCM-2 supports both Wiegand and magnetic stripe readers and provides additional wiring to magnetic locks if required.

The RM-4E modules create the connectivity between a reader and a control panel when third party card readers are used on a C•CURE® system. In addition, the RM-4E modules provide two supervised inputs and two SPDT relays (no ARM-1s are necessary). The LEDs and optional LCD display provide diagnostics to simplify the installation.

RM-DCM-2 provides standby power with its built-in uninterruptible power supply (UPS).

With its robust feature set, RM-DCM-2 is designed to handle the most demanding access control applications with ease while offering numerous installation and service features that lower its life cycle cost.

tyco

SOFTWARE HOUSE®

SPECIFICATIONS

Physical

Enclosure Dimensions (H x W x D) . . .356 x 305 x 89 mm (14 x 12 x 3.5 in)
RM-4E Board-Only
Dimensions (H x W) . . . . . .136 x 181 mm (5.375 x 7.125 in)
Weight (with 4Ah battery) . . . . . .5.9 kg (11 lbs)
Weight (without battery) . . . . . .4.5 kg (8 lbs)
Construction. . . . . .20 AWG metal wall mounted locking cabinet with tamper switch on door

Environmental

Operating and Storage Temperature . . . . . .0 ° to 50°C (32° to 122°F) 5 to 95% RH, non-condensing

Electrical

Power Requirements without Reader or Relays . . . . . .+12 VDC +/- 5% or +24 VDC +/-10%, 280 mA max
Power Requirements, Maximum, with Reader and Relays . . . . . .+12 VDC +/- 5% or +24 VDC +/-10%, 550 mA max
Output Relay Power Ratings. . . . . .Up to 30 VAC/DC, 5A maximum
Reader LED Output Controls . . . . . .4.0 volts to 5.25 volts, 20mA max
Power Available for Reader. . . . . .5 VDC +/- 10% or 12 VDC +/- 10%, 125mA max (at 5V or 12V)
Optional Battery . . . . . .12V/4Ah battery provides nominal 4 hours backup time

Regulatory

UL 294
CE, including EN50081-1, EN50130-4, EN50133
FCC Part 15 Class A
RoHS

Communications

Communications Bus . . . . . .RM bus from iSTAR controller or apC/8X panel
Communications Type . . . . . .RS-485 half duplex, two-wire
Maximum Distance. . . . . .1,219 m (4,000 ft)

Reader, Inputs & Outputs

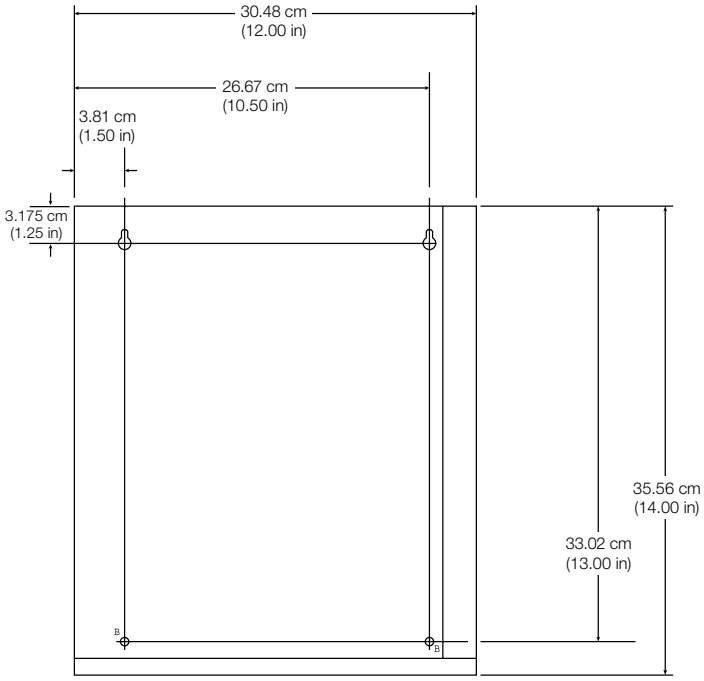
Reader Ports . . . . . .One
Reader Support . . . . . .Wiegand or magnetic stripe
Reader Control Lines Available . . . . .Red LED, green LED, yellow LED, beeper
Keypad Support . . . . . .Terminals provided for external 3x4 matrix keypad
Supervised Inputs. . . . . .Two, double-resistor
Output Relays. . . . . .Two, Form C, dry contact
Tamper Input . . . . . .One

Indicators and Switches

Three status LEDs for each supervised input
LED on each relay output
LEDs for RS-485 transmit and receive
LED for power-on
Optional LCD for diagnostics
Eight position dipswitch for feature selection:

- Wiegand/magnetic stripe reader type
- Tamper bypass
- LED pattern
- RM bus termination
- Input LED disable

Mounting Specifications



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Microsoft GOLD CERTIFIED Partner

ISV/Software Solutions
Networking Infrastructure Solutions

SOFTWARE HOUSE

A Tyco International Company

Multi-Technology Reader with Indala Support (SWH-4130)

Features That Make a Difference:

- Triple-receiver design allows simultaneous reading of HID® proximity cards, Indala® proximity cards, and contactless smart cards
- Reads more than 10 different types and formats of proximity cards and contactless smart cards, including most common Indala formats
- Download new functionality or enhancements for a future-proof solution
- Encryption and custom keys for secure transmission of data
- Mount on metal with optional isolation spacer
- Indoor/outdoor use
- Built-in tamper switch provides secure installation
- Plug-in screw terminals reduce installation time
- ISO compliant - 14443A, 14443B, 15693
- Lifetime warranty

Software House Multi-Technology Reader with Indala Support offers a unique, versatile single reader solution for reading both HID and Indala proximity cards simultaneously, while also reading multiple 13.56 MHz smart card technologies – including MIFARE® encrypted sectors – all with one reader. This powerful reader enables you to mix card populations of HID and Indala proximity cards without needing two separate readers, while also allowing a smooth, cost-effective transition to smart cards over time.

The reader continuously cycles between low and high frequency signals to read the presented card. Readers may be field-configured to enable or disable selected card formats and technologies.

The Multi-Technology Reader with Indala Support can be updated at any time with flash firmware. This saves significant time and money by allowing you to simply flash new card protocols or formats directly to the reader. The reader is configurable to read a specific encrypted MIFARE sector and block using standard or custom MIFARE read keys.

Important features such as a built-in tamper switch, two-piece connectors, and isolation spacers help reduce installation time. Coupled with robust environmental ratings and a lifetime warranty, the Software House Multi-Technology Reader with Indala Support is the clear choice for companies looking for a powerful, cost-effective way to use multiple card technologies.

SOFTWARE HOUSE

A Tyco International Company

Multi-Technology Reader with Indala Support

Physical

Dimensions (H x W x D). . . . . 111 x 84 x 28 mm (4.37 x 3.31 x 1.10 in)
Form Factor. . . . . Single-gang mounting
Environmental (Interior/Exterior)-35° to 67°C (-31° to 151°F) 0 to 100% relative humidity
Index of Protection IP65
Weight. . . . . 0.34 Kg (12 oz.)
Color . . . . . Black
Accessories. . . . . Optional isolation spacer

Electrical

Power Requirements . . . . . 9.6 to 16 VDC, 150mA maximum current
Wiring Terminations . . . . . Plug-in screw terminals
Wiring Details
Pin 1. . . . . External beeper control
Pin 2. . . . . Ground
Pin 3. . . . . Power (8 to 16VDC)
Pin 4. . . . . D1 Wiegand
Pin 5. . . . . D0 Wiegand
Pin 6. . . . . Reserved for future use
Pin 7. . . . . External green LED control
Pin 8. . . . . External red LED control
Pin 9. . . . . RS485/A – used for flash upgrade
Pin 10. . . . . RS485/B – used for flash upgrade
Pin 11. . . . . Tamper (normally closed)
Pin 12. . . . . Tamper (normally closed)

Cable Recommendations . . . 22 AWG [60 m (200 ft) max] or 18 AWG [150 m (500 ft) max], stranded Operational
Read Range . . . . . Up to 102 mm (4 in), depending on technology of card
Read Time. . . . . Technology-dependent (typically < 300 msec)

Regulatory

FCC Part 15 Class C
CE
RoHS
WEEE
ISO 14443A, 14443B, 15693

Card Technology and Format Information

Card Technologies Supported

HID proximity
Indala proximity
MIFARE serial number
DESFire® serial number
ISO 14443A, 14443B, and 15693 serial number
iCLASS® serial number
MIFARE sector read

Communications

Wiegand data stream to controller
Flashable via local RS-485

Proximity Configuration Using Program Card

Enable/disable specific proximity technology
Indala formats supported:
- Wiegand 26-bit
- ACC 37-bit (default)
- SWH 37-bit
- (Note: only one Indala format is supported at any one time)

HID formats supported:
- Wiegand 26-bit
- Corporate 1000 35-bit
- SWH 37-bit
- Pass-through HID formats

Smart Card Configuration Using Program Card

Pass-through output (128 bits, entire MIFARE block)
Fixed length output (26-bit, 32-bit, 35-bit, 37-bit, 64-bit)
MIFARE sector
- Select a sector (0-15); select a block (0-3)
- Customize encryption keys
- Specify data format (number of bits output)

Ordering Information

Model Numbers	Description
SWH-4130	Multi-Technology Reader with Indala Support, single-gang, black, ACC 37-bit format
SWH-4130-G	Multi-Technology Reader with Indala Support, single-gang, gray, ACC 37-bit format
SWH-4130-26B	Multi-Technology Reader with Indala Support, single-gang, black, 26-bit format
SWH-4130-G-26B	Multi-Technology Reader with Indala Support, single-gang, gray, 26-bit format
SWH-4130-37B	Multi-Technology Reader with Indala Support, single-gang, black, SWH 37-bit format
SWH-4130-G-37B	Multi-Technology Reader with Indala Support, single-gang, gray, SWH 37-bit format

Related Products

RM Readers

iSTAR Edge

iSTAR Pro

Approvals

RoHS 2002/95/EC

www.swhouse.com

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1008431000

CRM-V-2

IP Flush Master Station

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DESCRIPTION

- Compatible with AlphaCom, IC-EDGE and iPBXs (SIP)
- Made for CCoIP® - Critical Communication over IP
- Robust aluminium front plate
- Large high contrast display with backlight for excellent readability
- Four dynamic navigation keys and four DAK keys for quick access to system menus and directory entries.
- White light behind all keys for excellent readability in dark environments
- Optional noise cancelling goose-neck microphone
- Optional handset unit
- Optional IP DAK-48 Unit
- Remote software upgrade, configuration and monitoring
- Integrated data switch with advanced networking and security functions
- Powered from the IP network cable using Power over Ethernet (PoE)
- Superb audio quality – high bandwidth codec, active noise cancellation, acoustic echo cancellation and high output power amplifier
- Clean relay output contact for control of external equipment

The CRM-V-2 IP Flush Master with Display is an IP control room intercom intended for use in control and guard rooms. The station features a large high contrast display with adjustable backlight and up to 8 lines with 20 characters. The station has four direct access keys. Each key has a red and a green LED to show status.

The IP station supports open standards and is compatible with ICX-AlphaCom, IC-EDGE and iPBXs using SIP technology. When working in ICX-AlphaCom mode, the IP station supports special services only available using the CCoIP protocol, as employed by the AlphaCom server. Examples of services are emergency broadcast with volume override, CCTV integration, call priority, and AlphaNet multisite networking and event scripting.

Like all Zenitel stations, the CRM-V-2 features superb audio quality. This is enabled through a set of advanced technologies such as active noise filtering, acoustic echo cancellation, wide band audio codec, and high power audio outputs. The IP station has an integrated managed data switch providing advanced networking and security features. The integrated switch provides support for:

- Protection from unwanted access Protection from unwanted access
- Quality of Service (QoS) by managing data traffic
- Increased system availability through redundant LAN infrastructure
- Cost efficient installation by providing shared network connections

To provide maximum availability the station comes with advanced supervision functions. The station line test will detect if there is any faults in the network or station electronics. In addition the station supports tone test, testing the complete transmission path including microphone and speaker. The status of the stations is reported to AlphaWeb as well as to 3rd party management systems using SNMP, Syslog or OPC.

In IC-EDGE mode, the CRM-V-2 can be configured as the Edge Controller.

See also: additional documentation on wiki.zenitel.com

SPECIFICATIONS

GENERAL	
Dimensions (WxHxD)	125 x 280 x 33 mm
Weight	0.63 kg
Temperature Range	-15ºC to + 50ºC
Relative humidity	< 95% not condensing
User interface	Backlit graphical display, 35 mm x 68 mm, 4 function keys, 4 programmable direct access keys (DAK), Green/Red status, LED per DAK, Full keypad, Call indication LED
Power	Power over Ethernet, IEEE 802.3 a-f, Class 0, Local power 19 – 27 VDC, Idle 4W, max. 8W
Connectors	RJ45 (Ethernet) - RJ11 (Handset & Headset), Pluggable screw terminals (I/O local power)
Remote control Max. switching capacity , Max. voltage relay, Max current relay	3 digital inputs, 1 relay output and one logical output, 30W DC, 60V DC, 1A DC
SIP	RFC 3261, SIP Info (DTMF), RFC 2833 (DTMF)
IP protocols	IIP v4 - TCP - UDP - HTTPS – TFTP - RTP - RTCP -DHCP - SNMP - DiffServ - TOS – STENTOFON CCoIP® - SIP
LAN protocols	Power over Ethernet (IEEE 802.3 a-f), VLAN (IEEE 802.1pq), Network Access Control (IEEE 802.1x), STP (IEEE 802.1d), RSTP (IEEE 802.1d-2004)
Audio technology	Telephony 3.4kHz (G.711) , Wideband/HD Voice (G.722), Active noise filtering, Acoustic echo cancellation, Open duplex, Volume override
Audio output	1.5 Watt - 75 dB @ 1 m from speaker, additional connector for external speaker, max 5 W
Management and operation	HTTPS (Web configuration), DHCP and static IP, Remote automatic software upgrade, Centralized monitoring, Status LED
Advanced features	Dual port managed data switch supporting VLAN and network access control
Compliance	CE and FCC Part 15
IP Rating	IP-32

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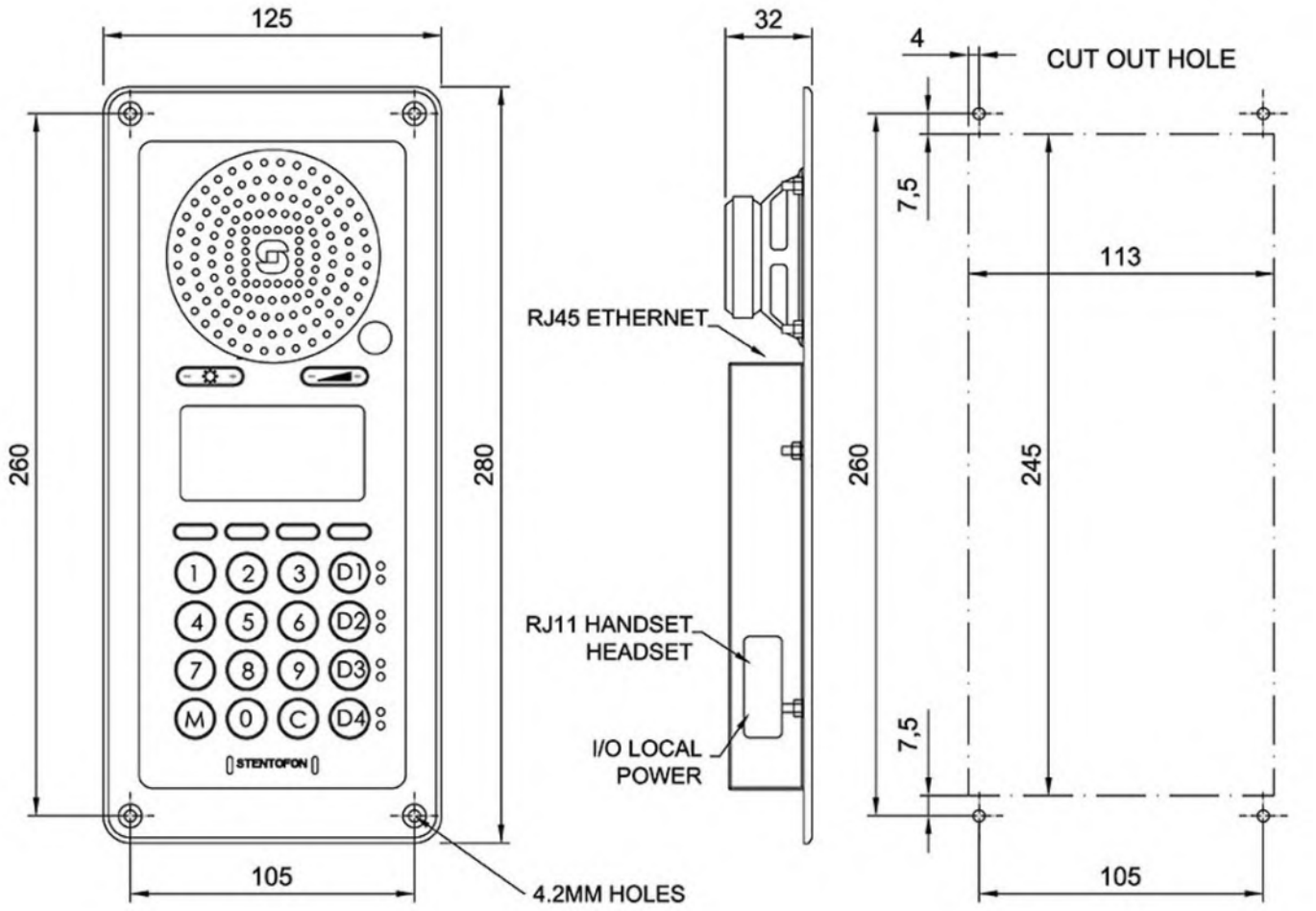
TECHNICAL DIMENSIONS



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ACCESSORIES

CRM-V-DAK48
Item number: 1008010100

CRM-V-GN
Item number: 1008097500

CRM-V-HS
Item number: 1008097100

ON-WALL BACK BOX
Item number: 1008098600

FLUSH MOUNT BACK BOX
Item number: 1008098700

DESK STAND FOR IP FLUSH MASTER
Item number: 2810020001

SINGLE DESK STAND
Item number: 2810020006

DUAL DESK STAND
Item number: 2810020005

TRIPLE DESK STAND
Item number: 2810020004

CRM-VH
Item number: 2213100000

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1008315030

TCIV-3+

IP and SIP Video Intercom

- IC-Edge
- SIP
- Video Intercom
- Door Intercom
- ICX-AlphaCom
- ONVIF - Profile S
- UL Certified Intercom
- Turbine
- IP66
- IK08
- HD Voice
- Active Noise Cancelling

Video

- H.264

The TCIV+ Turbine Compact Video Intercom combines the unrivaled high-quality audio of Zenitel's Turbine Compact Series with exceptional video, providing users a communication solution for any situation and allowing seamless integration with other security systems.

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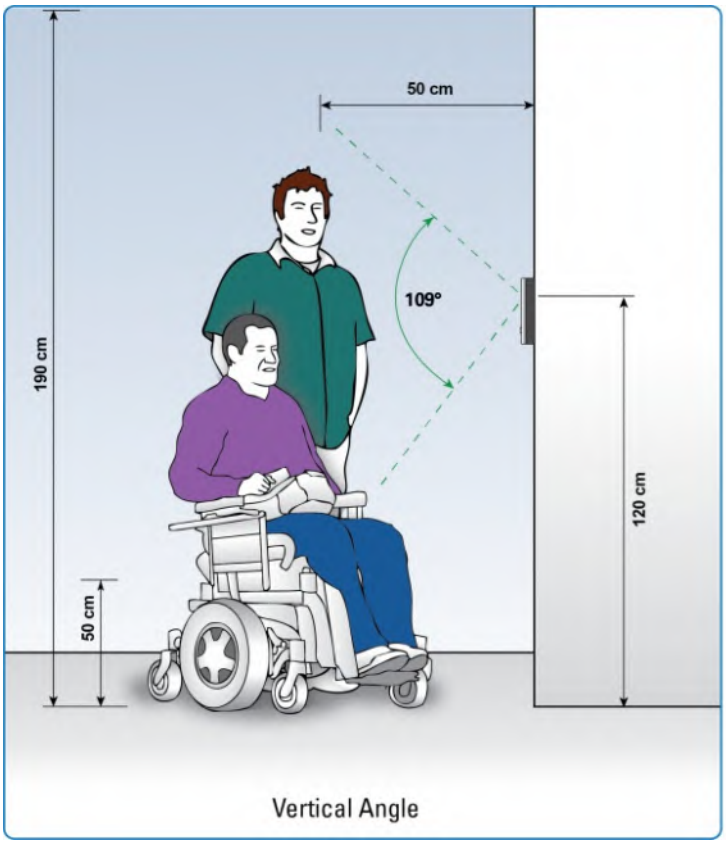
DESCRIPTION

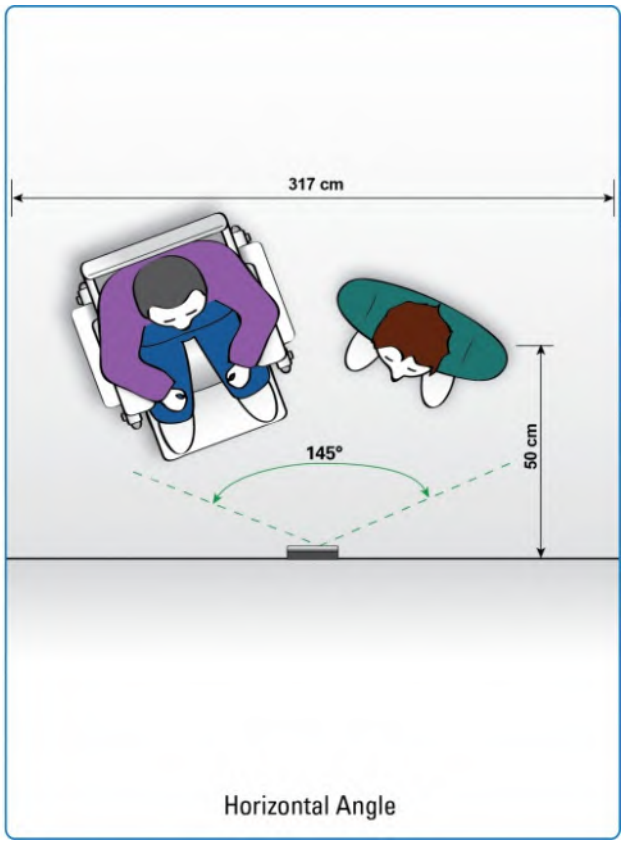
- Powerful audio technology including high sound pressure, automatic volume gain control, and active noise echo canceling
- HD video up to 1080p resolution
- Wide angle lens
- High performance hardware platform with 4x Cortex-A53 CPU cores and 512MB LPDDR4 RAM
- ONVIF Profile S certified
- Vandal Resistant Design
- IP66 - Dirt, dust and water resistant
- Cybersecurity compliant
- Can operate in SIP, IC-EDGE and ICX-AlphaCom mode

All IP stations in the Turbine series utilize the latest technology to create unparalleled audio quality. Some of the many features include: HD voice quality, Open Duplex, Active Noise Cancellation, MEMS microphone, a 10W Class D amplifier and our unique speaker grille design. These features, in conjunction the company's 70+ years of experience with acoustic technology, are just a few of the many factors that contribute to our superior audio quality. The Turbine IP Video Intercom range expands this feature set with wide FoV HD Video, Digital PTZ and support for H.264 and MJPEG.

Field of View



Vertical Angle



Horizontal Angle

See Zenitel Wiki for more information

SPECIFICATIONS

AUDIO	
SPL peak power at 1m in open duplex	90 dB
SPL peak power at 1m in half duplex	100 dB
SPL peak power at 1m in program distribution and announcement	100 dB
Noise cancelling - suppression of musical noise	Yes
Codecs	G.711, G.722, G.729
Frequency range, G.722 Codec	200 Hz – 7000 Hz
Audio technology	Modes: Full open duplex, switched open duplex
	Adaptive jitter buffer
	Custom Ringing Tone
	Audio Mixing – Conversation and Group Call

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AUDIO	
	Sound Level Detection / scream alarm (only in AlphaCom)
	Automatic gain control (microphone)
Internal speaker amplifier	10 W class D
Internal speaker	10 W
Microphone technology	Digital MEMS, omnidirectional microphone
Automatic Volume Control (AVC)	Yes
Acoustic Echo Cancellation (AEC)	Yes

VIDEO	
Image Sensor	1/2.5" RGB CMOS
Lens	F 2.0, fixed iris
Light Sensitivity	Down to 1 lux
Resolution	240 / 480p / 960x720p / 1440x1080p*
Frame Rate	Up to 30 FPS in 1440x1080p**
Supported Codecs	MJPEG, H.264 ***
Digital PTZ	Yes
Digital Zoom	Up to 2x
Field of View	horizontal=145 degrees, vertical=109 degrees ****
Snapshot Function	No
IR LED	No
Parallel videostreams	6 (1x SIP H.264, 2x HTTP MJPEG, 3x RTSP sessions)
	* MJPEG does not support 720p and 1080p resolution.
	** 30 FPS is only supported in H.264 mode, while MJPEG is limited to 10 FPS.
	*** AlphaCom mode supports only RTSP H.264 mode, while other modes support SIP H.264.
	**** FoV depends on video mode (may be subject to change)

HARDWARE	
Ethernet connector	1 x RJ-45
All other connectors	Tool less, spring loaded, vibration proof terminals
General inputs and outputs	6 (configurable)
Outputs	12mA as LED drivers
Change-over relay (NO+NC+COM)	SELV
Power options	PoE, PoE+, external power supply
PoE (Power over Ethernet)	IEEE 802.3af standard, IEEE 802.3at
External power supply	24VDC - 48VDC
Power consumption	Idle 3.5W, max 12W (depending on volume)
Audio Line out / Induction loop signal	0 dBV
Button backlight	LED
Call indication	Icons/colors for hearing impaired.

PROCESSOR / CHIPSET	
CPU cores	4 x Cortex-A53
CPU Clock Speed	1.6 GHz
RAM	512 MB LPDDR4
Flash	1 GB
Video encoder	MJPEG, H.264
Dual Image	Yes

CONSTRUCTION	
Dimensions (HxWxD)	180 x 120 x 73 mm / 7.1” x 4.7” x 2.9”
Dimensions after flush mount	180 x 120 x 24 mm / 7.1” x 4.7” x 0.9”
Dimensions with on wall box	180 x 120 x 86 mm / 7.1” x 4.7” x 3.4”
Weight	1 kg / 2.2 lbs.

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CONSTRUCTION	
Faceplate material	2 mm / 0.08” PMMA, color printed on backside
Base / frame material	3 mm / 0.12” Aluminum alloy - A413.0, AlSi12Fe, painted
Electronics cover material	Polycarbonate (semi translucent)
Gasket material	TPV
Fastening bracket material	SECC Steel
Button material	3 mm / 0.12” Polycarbonate (transparent)
Button travel length	1.25 mm
Button activation force	350 gf
Button push-cycles before failure	300 000
Loudspeaker poke protection, large diameter object	3D cast aluminum speaker grille
Loudspeaker poke protection, small diameter objects	Stainless steel mesh, acoustically transparent
Anechoic Design	Open flow anechoic design eliminates "standing waves"
NETWORKING & PROTOCOLS	
Protocols	IPv4 (with DiffServ), SIP, TCP, UDP, HTTPS, TFTP, RTP, RTSP, RTCP, SRTP, DHCP, SNMP, Vingtor-Stentofon CCoIP®, NTP, ONVIF, WS-Discovery
LAN protocols	Power over Ethernet (IEEE 802.3 a-f), Power over Ethernet (IEEE 802.3at)
Management and operation	HTTP/HTTPS (Web configuration). DHCP and static IP. Remote automatic software upgrade. Centralized monitoring.
Advanced supervision functions	E.g network test, tone test, status reports (only in AlphaCom)
SIP support	RFC 3261 (SIP base standard) RFC 3515 (SIP refer) RFC 2976 (SIP info), SIP using TLS, RFC 5630 SIPS URI scheme
DTMF support	RFC 2833, 2976 (SIP info)
Integration and API	AlphaCom, Scripting (plugins)
ENVIRONMENTAL	
IP rating	IP-66, tested according to EN 60529 (applies when mounted in TA-1 back box)
Operating temperature range	-30° to 70° C / -22° to 158 ° F
Storage temperature range	-40° to 70° C / -40° to 158 ° F
Relative humidity	< 95% not condensing
UV-resistant	Yes
CERTIFICATIONS	
ONVIF Conformance	Profile S for streaming video
OTHER SPECIFICATIONS	
IP address information	Speaks IP address after system boot
Button lifetime	> 1 000 000 cycles
Country of manufacture	Poland

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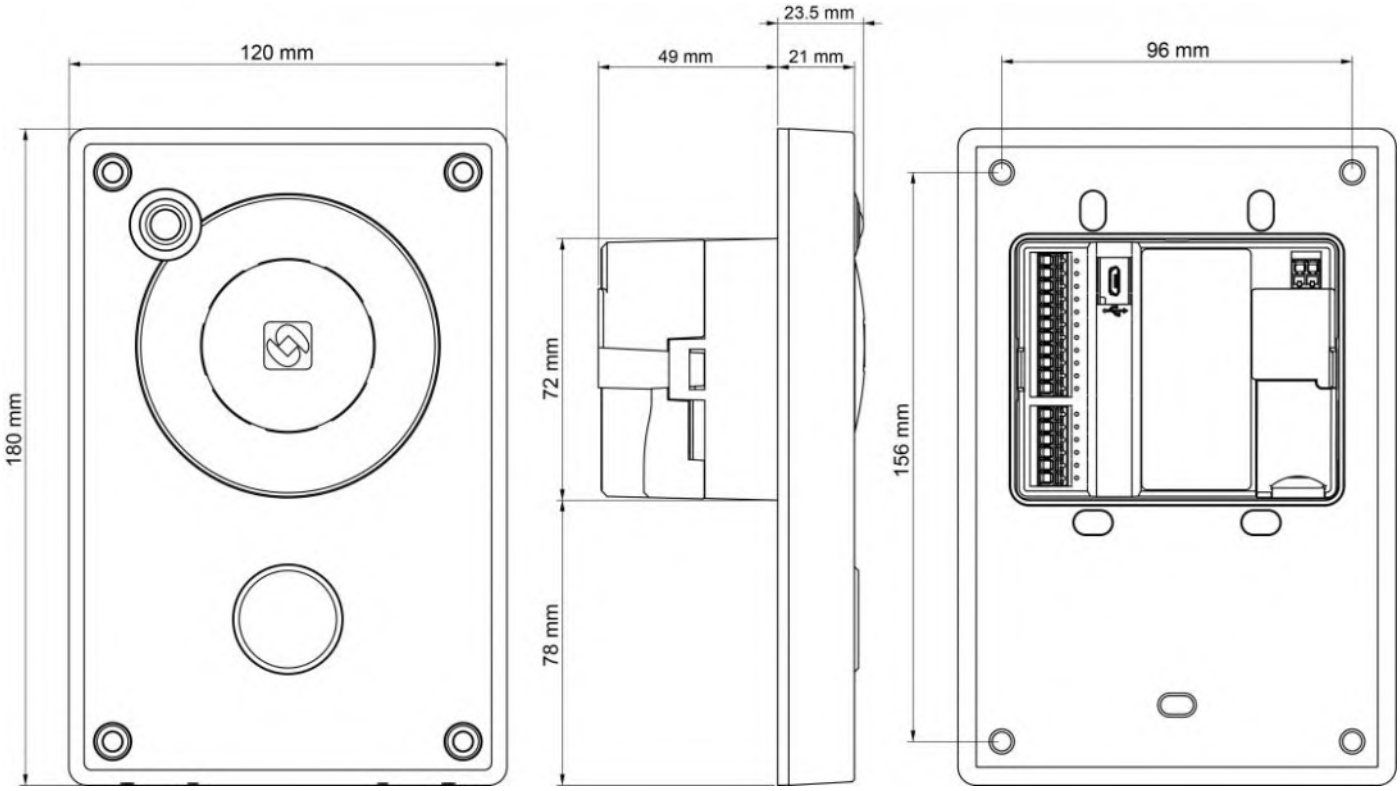

ACCESSORIES

TA-1
Item number: 1008140010

TA-2
Item number: 1008140020

TA-5
Item number: 1008140050

TA-18
Item number: 1008140180

TA-14
Item number: 1008140140

TOUCHLESS SENSOR
Item number: 2390020100

USED WITH

1490003010

ITSV-3

Powerful Desktop Video Phone with 7” Touch Screen & Real-Time HD Video Telephony

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1490002010

ITSV-2

Powerful Desktop Video Phone with 5” capacitive touch screen and support for 720p HD video.

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SF Project No. 2066902 June4, 2021
Fit-Up Administrative Headquarters Suite 440E &455E
Capital Gallery East Tower

Telecommunications Product Data for Basis of Design Only

Telecommunicatio Ground Bar Kit

OR-GB2X12TGBKIT

Telecommunications Ground Bar Kit, 12W x 2" H with 6 5/16" hole sets & 3 7/16" hole sets."

features & benefits

- Manufactured of 1/4" thick electrolytic tough pitch 110 alloy copper bar
- Includes 1-1/2" insulators and 1" off-set stainless steel mounting brackets
- Includes one 1/2 oz. tube of antioxidant joint compound
- Meets BICSI an EIA/TIA 607 standards
- Kit includes 1 - copper ground bar with brackts and insulators, 6 - #6 compression lugs, 3 - #2 compression lugs, 1 - 2/0 compression lug, 1 - 4/0 compression lug, 12 - 1/4"-20 x 3/4" SS hex head cap screw, 12 - 1/4"-20 SS lock washers, 12 - 1/4"-20 SS hex nut, 6 - 3/8"-16 x 1" SS hex head cap screw, 6 - 3/8"-16 SS lock washer, & 6 - 3/8"-16 SS hex nuts

specifications

General Info

Type: Telecomm Ground Bars

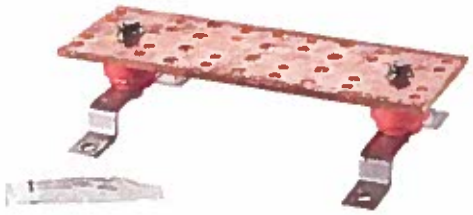
Dimensions

Height Metric: 51 mm
Height U S: 2"
Width Metric: 305 mm
Product Weight U S: 5 lbs

Buy American Act Compliance

Telecommunicatio Main Ground Bar Kit

OR-GB4X12TMGBKIT



Telecommunications Main Ground Bar Kit, 12W x 4" H with 12 5/16" hole sets & 6 7/16" hole sets."

features & benefits

- Manufactured of 1/4" thick electrolytic tough pitch 110 alloy copper bar
- Includes 1-1/2" insulators and 1" off-set stainless steel mounting brackets
- Includes one 1/2 oz. tube of antioxidant joint compound
- Meets BICSI an EIA/TIA 607 standards
- Kit includes 1 - copper ground bar with brackets and insulators, 6 - #6 compression lugs, 3 - #2 compression lugs, 1 - 2/0 compression lug, 1 - 4/0 compression lug, 12 - 1/4"-20 x 3/4" SS hex head cap screw, 12 - 1/4"-20 SS lock washers, 12 - 1/4"-20 SS hex nut, 6 - 3/8"-16 x 1" SS hex head cap screw, 6 - 3/8"-16 SS lock washer, & 6 - 3/8"-16 SS hex nuts

specifications

General Info

Type: Telecomm Ground Bars

Dimensions

Height Metric: 102 mm
Height U S: 4"
Width Metric: 305 mm
Product Weight U S: 8 lbs

Buy American Act Compliance

SECTION ONE

Category 6A (10GX) System

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Category 6A (10GX) System	**7-21**
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10GX Traceable Patch Cords	12
10GX Modular Cords	13
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10GX IDC System	16
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10GX Shielded Pre-Terminated Cabling System	19
QSFP+/SFP+ Direct Attached Cables	20
Small OD Copper Patch Cords	21

The copper cabling system that does it all, the 10GX Category 6A System supports the most demanding current and future high-end applications with performance beyond the Category 6A standard. The system is comprised of 10GX System Cables (either 10GXS or 10GX), preloaded or modular 10GX Patch Panels, 10GX Modular Jacks and 10GX Modular Cords. Together, these components form an end-to-end system that guarantees 625 MHz of usable bandwidth to support full implementation of 10GBASE-T applications and broadband video at 860 MHz. A truly long-term investment, the 10GX System is designed to outlast several equipment and application upgrades.

The 10GX System is available in a 10GX Pre-Terminated System that features proven modular components with superior performance and intuitive plug-and-play installation for saving significant time and money. For cross-connect and interconnect systems, the 10GX IDC System is a high-performance, space-saving modular connection system. For harsher EMI environments, the 10GX Shielded System and the 10GX Shielded Pre-Terminated System provide a higher degree of noise immunity in a true end-to-end shielded system that maintains shielding integrity throughout the entire system.

10GX System is based on Belden's innovative enabling technologies.

EquiSpline maintains structural integrity which improves cable roundness and optimizes electrical performance.

EquiBlock barrier technology improves heat transfer and blocks noise coupling.

Bonded-Pair technology offers uniform spacing of conductors for exceptional structural stability and superior electrical performance.

REVConnect technology, revolutionary connectivity that features insulation piercing contacts for a stable, reliable termination, superior electrical performance, and high PoE support.

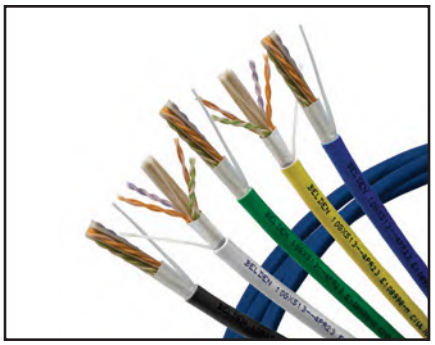
MatriX IDC technology positions each IDC at a right angle to its adjacent IDC to cancel out Alien Crosstalk and provide stable high-performance in high-density environments.

FleXPoint PCB technology positions the compensation circuitry in 10GX Modular Jacks directly at the plug's point of contact for better crosstalk performance.

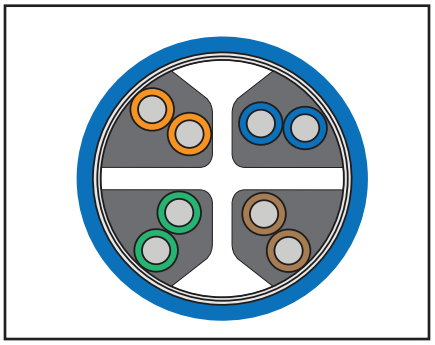
Dual-Flex PCB technology in the RJ45 Coupler of the 10GX Pre-Terminated Cabling Systems ensures an uninterrupted electrical path for enhanced reliability.

10GXS Small Diameter Cable, 10 Gigabit Ethernet, Category 6A

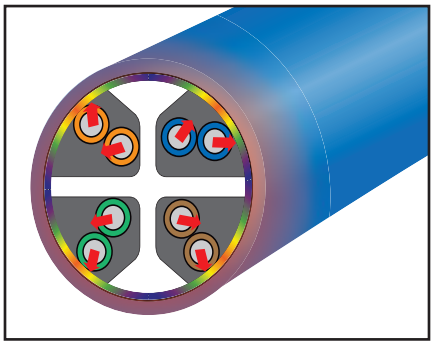
Nonbonded-Pair and Bonded-Pair



10GXS System Cable



EquiSpline™ Design



EquiBlock™ Barrier Effects

The demand for 10G performance is growing. Emerging applications are poised to take advantage of higher 10Gb/s speeds and call for higher power delivered over the cable. With an effective diameter of just 0.265" for CMP and 0.273" for CMR, 10GXS Cables have proven performance that exceeds Category 6A requirements for 100-meter channels. These cables are ideal for LANs and enterprise data centers that require both high-density and high-bandwidth connections for current and emerging network applications.

Documents contributing to LEED points are available at info.belden.com/leed-credits

Applications:

- 10GBASE-T Ethernet
- 1000BASE-T as well as 2.5G and 5G Ethernet
- PoE PSE Type 1 (15 W), PSE Type 2 (30 W) PSE Type 3 (60 W), PSE Type 4 (100 W)
- IEEE 802.11ac Wave 1 and Wave 2 High-Throughput Wi-Fi
- Eliminates length de-rating up to 60C for 10GBASE-T
- HDBaseT, Broadband (CATV) and
- High-Speed Internet (DOCSIS)

10GXS Category 6A, 4-pair, 23 AWG, Plenum-CMP

Description		Belden Part Number			
		Nonbonded-Pair		Bonded-Pair	
Color	Length	Spool Package	Spool-in-Box Package	Spool Package	Spool-in-Box Package
Red	305 m (1000 ft)	10GXS13 0021000	10GXS13002A1000	10GXS33 0021000	10GXS33002A1000
Orange	305 m (1000 ft)	10GXS13 0031000	10GXS13003A1000	10GXS33 0031000	10GXS33003A1000
Yellow	305 m (1000 ft)	10GXS13 0041000	10GXS13004A1000	10GXS33 0041000	10GXS33004A1000
Green	305 m (1000 ft)	10GXS13 0051000	10GXS13005A1000	10GXS33 0051000	10GXS33005A1000
Blue	305 m (1000 ft)	10GXS13 D151000	10GXS13D15A1000	10GXS33 D151000	10GXS33D15A1000
Purple	305 m (1000 ft)	10GXS13 0071000	10GXS13007A1000	10GXS33 0071000	10GXS33007A1000
Gray	305 m (1000 ft)	10GXS13 0081000	10GXS13008A1000	10GXS33 0081000	10GXS33008A1000
White	305 m (1000 ft)	10GXS13 0091000	10GXS13009A1000	10GXS33 0091000	10GXS33009A1000
Black	305 m (1000 ft)	10GXS13 0101000	10GXS13010A1000	10GXS33 0101000	10GXS33010A1000

10GXS Category 6A, 4-pair, 23 AWG, Riser-CMR

Description		Belden Part Number			
		Nonbonded-Pair		Bonded-Pair	
Color	Length	Spool Package	Spool-in-Box Package	Spool Package	Spool-in-Box Package
Red	305 m (1000 ft)	10GXS12 0021000	10GXS12002A1000	10GXS32 0021000	10GXS32002A1000
Orange	305 m (1000 ft)	10GXS12 0031000	10GXS12003A1000	10GXS32 0031000	10GXS32003A1000
Yellow	305 m (1000 ft)	10GXS12 0041000	10GXS12004A1000	10GXS32 0041000	10GXS32004A1000
Green	305 m (1000 ft)	10GXS12 0051000	10GXS12005A1000	10GXS32 0051000	10GXS32005A1000
Blue	305 m (1000 ft)	10GXS12 0061000	10GXS12006A1000	10GXS32 0061000	10GXS32006A1000
Purple	305 m (1000 ft)	10GXS12 0071000	10GXS12007A1000	10GXS32 0071000	10GXS32007A1000
Gray	305 m (1000 ft)	10GXS12 0081000	10GXS12008A1000	10GXS32 0081000	10GXS32008A1000
White	305 m (1000 ft)	10GXS12 0091000	10GXS12009A1000	10GXS32 0091000	10GXS32009A1000
Black	305 m (1000 ft)	10GXS12 0101000	10GXS12010A1000	10GXS32 0101000	10GXS32010A1000

10GXS Category 6A, 4-pair, 23 AWG, LSZH

Description		Belden Part Number			
		Nonbonded-Pair		Bonded-Pair	
Color	Length	Spool Package	Spool-in-Box Package	Spool Package	Spool-in-Box Package
Blue	305 m (1000 ft)	10GXS24 0061000	Available	10GXS44 0061000	Available
Purple	305 m (1000 ft)	10GXS24 0071000	Available	10GXS44 0071000	Available
Gray	305 m (1000 ft)	10GXS24 0081000	Available	10GXS44 0081000	Available
White	305 m (1000 ft)	10GXS24 0091000	Available	10GXS44 0091000	Available

LSZH 10GXS products will be available soon

10GX UTP System Cable, 10 Gigabit Ethernet, Category 6A

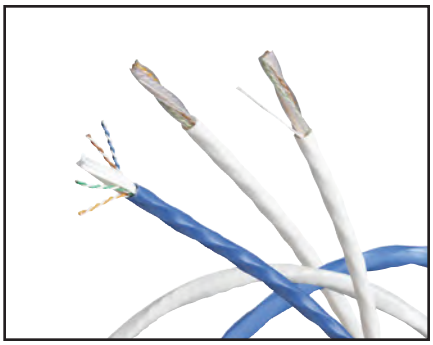
Nonbonded-Pair and Bonded-Pair

The 10GX Cable delivers performance that goes beyond the ANSI/TIA/EIA 568-C.2 Category 6A standard. When used as the horizontal cable within the Belden 10GX System, it provides 625 MHz of proven channel bandwidth and a data rate of 10 Gigabits per second. This performance is made possible through the innovative RoundFleX™ design that serves to reduce alien crosstalk by randomizing the distance between the cables.

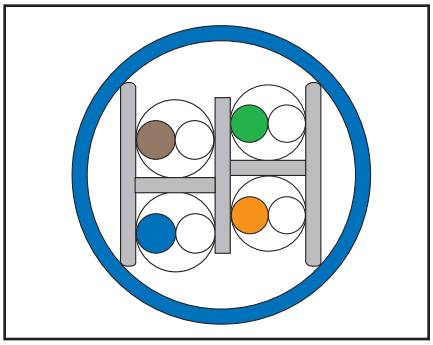
Applications:

- 10GBASE-T Full Power Implementation (IEEE 802.3an)
- 10GBASE-T Low Power Implementation (Short Reach Mode) (IEEE 802.3an)
- 1000BASE-T Applications (IEEE 802.3ab)
- PoE PSE Type 1 (15 W), PSE Type 2 (30 W) PSE Type 3 (60 W), PSE Type 4 (100 W)
- Broadband Video (CATV) & High Speed Internet (DOCSIS) over UTP up to 860 MHz

Documents contributing to LEED points are available at info.belden.com/leed-credits



10GX System Cable



Innovative RoundFleX Design

10GX, 4-pair, 23 AWG, CMR, Category 6A

Description		Belden Part Number	
		Nonbonded-Pair	Bonded-Pair
Color	Length	Spool Package	Spool Package
Red	305 m (1000 ft)	**10GX12 0021000**	Available
Orange	305 m (1000 ft)	**10GX12 0031000**	Available
Yellow	305 m (1000 ft)	**10GX12 0041000**	**10GX32 0041000**
Green	305 m (1000 ft)	**10GX12 0051000**	Available
Blue	305 m (1000 ft)	**10GX12 0061000**	**10GX32 0061000**
Purple	305 m (1000 ft)	**10GX12 0071000**	Available
Gray	305 m (1000 ft)	**10GX12 0081000**	**10GX32 0081000**
White	305 m (1000 ft)	**10GX12 0091000**	**10GX32 0091000**
Black	305 m (1000 ft)	**10GX12 0101000**	Available
Yellow	458 m (1500 ft)	**10GX12 0041500**	Available
White	458 m (1500 ft)	**10GX12 0091500**	Available
Black	458 m (1500 ft)	**10GX12 0101500**	Available
Blue	762 m (2500 ft)	**10GX12 0062500**	Available

Spool-in-Box is available upon request

10GX, 4-pair, 23 AWG, CMP, Category 6A

Description		Belden Part Number	
		Nonbonded-Pair	Bonded-Pair
Color	Length	Spool Package	Spool Package
Yellow	305 m (1000 ft)	**10GX13 0041000**	**10GX33 0041000**
Green	305 m (1000 ft)	**10GX13 0051000**	Available
Blue	305 m (1000 ft)	**10GX13 D151000**	**10GX33 D151000**
Purple	305 m (1000 ft)	**10GX13 0071000**	Available
Gray	305 m (1000 ft)	**10GX13 0081000**	**10GX33 0081000**
White	305 m (1000 ft)	**10GX13 0091000**	**10GX33 0091000**
Black	305 m (1000 ft)	**10GX13 0101000**	Available
Black	458 m (1500 ft)	**10GX13 0101500**	Available
Yellow	762 m (2500 ft)	**10GX13 0042500**	Available
Blue	762 m (2500 ft)	**10GX13 D152500**	Available

Spool-in-Box is available upon request

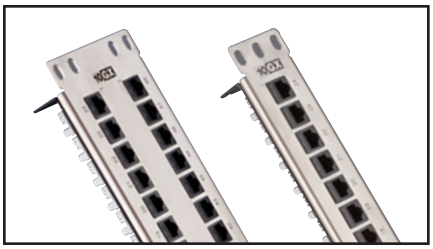
10GX, 4-pair, 23 AWG, LSZH, Category 6A

Description		Belden Part Number	
		Nonbonded-Pair	Bonded-Pair
Color	Length	Spool Package	Spool Package
Blue	305 m (1000 ft)	**10GX24 0061000**	**10GX44 0061000**
Purple	305 m (1000 ft)	**10GX24 0071000**	**10GX44 0071000**
White	305 m (1000 ft)	**10GX24 0091000**	**10GX44 0091000**

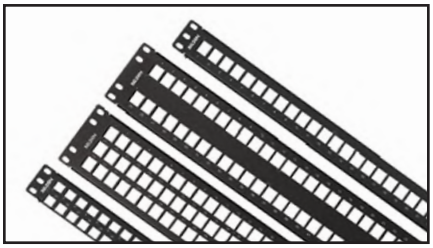
Spool-in-Box is available upon request

10GX Patch Panels

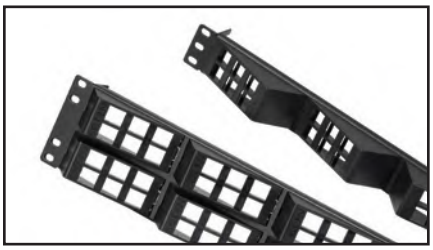
Preloaded and Modular



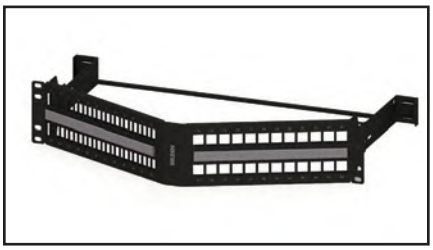
10GX KeyConnect Patch Panel (Preloaded)



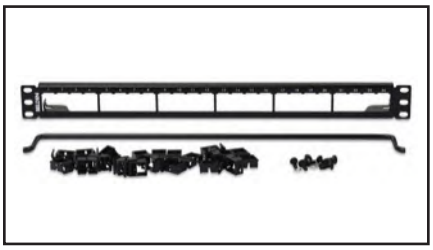
KeyConnect Patch Panel (Empty)



KeyConnect AngleFlex Patch Panel (Empty)



KeyConnect Angled Patch Panel, 48-port, 2U (Empty)



KeyConnect Front Access Patch Panel, 24-port, 1U (Empty)

The 10GX Patch Panel is a fully loaded patch panel designed to be used within the 10GX System. The 10GX Patch Panel features the revolutionary 10GX Connector, specifically designed to meet the difficult challenges of 10 Gb/s transmission. 10GX Patch Panels are available in high-density options such as 24 ports in 1U or 48 ports in 2U, but the phenomenal ANEXT performance of the 10GX Connector has allowed Belden to also support an ultra high-density option offering the 10GX Ultra High-Density Patch Panel supporting 48 ports in 1U. The unmatched Beyond 10G™ performance exceeds all parameters specified in the Category 6A standard. All performance characteristics including ANEXT, NEXT, FEXT, Insertion Loss and Return Loss have been set to guarantee transmission performance up to 625 MHz.

KeyConnect Patch Panels are robust all-metal modular patch panels that provide a flexible, versatile and high-density termination solution for Data Center and Telecommunications Room installations. The modular KeyConnect Patch Panels are available in 24-port/1U, 48-port/2U, 72-port/2U and 48-port/1U configurations.

The KeyConnect Patch Panel series also includes the unique AngleFlex Patch Panel available in 24-port/1U and 48-port/2U configurations. Patent-pending removable angled inserts provide intuitive left, right or bi-directional patch cord routing and more efficient switch connection. Angled inserts eliminate the need for horizontal cable management, for a 27% space savings per rack.

The KeyConnect and AngleFlex panels can be configured using 10GX KeyConnect Modular Jacks or Multimedia Modules.

The KeyConnect Front Access Patch Panels are available in 24-port/1U, 48-port/2U, and 72-port/2U configurations and are designed for applications where space is limited behind the panel.

10GX Patch Panels

Description	Belden Part Number
10GX KeyConnect Patch Panels (Preloaded)	
10GX KeyConnect Patch Panel, 24-port, 1U, Titanium (Preloaded)	**AX103254**
10GX KeyConnect Patch Panel, 48-port, 2U, Titanium (Preloaded)	**AX103256**
10GX Ultra High-Density Patch Panel (Preloaded)	
10GX Ultra High-Density Patch Panel, 1U, 48-port, Titanium (Preloaded)	**AX103264**
10GX KeyConnect Angled Patch Panel (Preloaded)	
10GX KeyConnect Angled Patch Panel, 24-port, 1U, Black (Preloaded)	**AX105363**
10GX KeyConnect Angled Patch Panel, 48-port, 2U, Black (Preloaded)	**AX105364**
10GX KeyConnect Angled Patch Panel, 48-port, 1U, Black (Preloaded)	**AX105365**

KeyConnect Modular Patch Panels

Description	Belden Part Number
KeyConnect Modular Patch Panels (Empty)	
KeyConnect Patch Panel, 24-port, 1U, Black (Empty)	**AX103114**
KeyConnect Patch Panel, 48-port, 2U, Black (Empty)	**AX103115**
KeyConnect Patch Panel, 72-port, 2U, Black (Empty)	**AX103116**
KeyConnect Patch Panel, 48-port, 1U, Black (Empty)	**AX103121**
KeyConnect AngleFlex Modular Patch Panels (Empty)	
KeyConnect AngleFlex Patch Panel, 24-port, 1U, Black (Empty)	**AX103248**
KeyConnect AngleFlex Patch Panel, 48-port, 2U, Black (Empty)	**AX103249**
KeyConnect Angled Modular Patch Panels (Empty)	
KeyConnect Angled Patch Panel, 24-port, 1U, Black (Empty)	**AX104599**
KeyConnect Angled Patch Panel, 48-port, 2U, Black (Empty)	**AX104601**
KeyConnect Angled Patch Panel, 48-port, 1U, Black (Empty)	**AX104600**

KeyConnect Front Access Patch Panels

Description	Belden Part Number
KeyConnect Front Access Patch Panels	
KeyConnect Front Access Patch Panel, 24-port, 1U, Black	**AX106288**
KeyConnect Front Access Patch Panel, 48-port, 2U, Black	**AX106289**
KeyConnect Front Access Patch Panel, 72-port, 2U, Black	**AX106290**
Labeling Kit (12 strips and LabelFlex sheets for 96 ports)	**AX106291**
Spare Bezel Kit for Front Access Patch Panel, 24-Pack	**AX106292-B24**

10GX Modular Connectors

REVConnect, KeyConnect and MDVO-Style

The 10GX Module is available in two termination styles: standard punch down, available in both the KeyConnect and MDVO styles, and our proprietary, revolutionary style of the REVConnect system. REVConnect modules are supported by a single core termination, which leads to a highly-reliable, gas-tight termination. The universal core then supports your choice between a jack or plug, both styles supporting the same strong, full-channel performance provided by Belden's 10GX System including superior ANEXT, NEXT, FEXT, Insertion Loss, and Return Loss over a guaranteed 625MHz of bandwidth, including superior PoE.

The KeyConnect version has a keystone footprint, and is designed to be used with KeyConnect and AngleFlex Patch Panels and with KeyConnect and MediaFlex Workstation Outlets. The MDVO-Style is designed to be used with Flex Patch Panels as well as Interface and MediaFlex Workstation Outlets. The modular jacks can also be mixed and matched with a wide variety of adapters and boxes to suit practically any installation configuration for workstation outlet, consolidation point

REVConnect Jack Housings available in 19 colors

RVAFPUBK-S1, REVConnect 10GX Field-Mount UTP Plug

AX102281, 10GX KeyConnect Modular Jack

10GX Modular Jacks

Color	Belden Part Number			
	REVConnect Jacks		Punch Down Jacks	
	Single Pack	Bulk Pack (24 Connectors)	KeyConnect-Style	MDVO-Style
Gray	RVAMJKUGY-S1	RVAMJKUGY-B24	AX102280	AX102269
Almond	RVAMJKUAL-S1	RVAMJKUAL-B24	AX102281	AX102270
Electric White	RVAMJKUEW-S1	RVAMJKUEW-B24	AX102282	AX102271**
Black	RVAMJKUBK-S1	RVAMJKUBK-B24	AX102283	AX102272
Ivory	RVAMJKUIV-S1	RVAMJKUIV-B24	AX103073	AX102562
Brown	RVAMJKUBR-S1	RVAMJKUBR-B24	AX104158*	—
Red	RVAMJKURD-S1	RVAMJKURD-B24	AX104153*	—
Orange	RVAMJKUOR-S1	RVAMJKUOR-B24	AX104152*	—
Yellow	RVAMJKUYL-S1	RVAMJKUYL-B24	AX104154*	—
Green	RVAMJKUGN-S1	RVAMJKUGN-B24	AX104155*	—
Blue	RVAMJKUBL-S1	RVAMJKUBL-B24	AX104156*	—
Purple	RVAMJKUPR-S1	RVAMJKUPR-B24	AX104157*	—
TIA Brown	RVAMJKUTN-S1	RVAMJKUTN-B24	AX102290	AX102279
TIA Red	RVAMJKUTR-S1	RVAMJKUTR-B24	AX102285	AX102274
TIA Orange	RVAMJKUTO-S1	RVAMJKUTO-B24	AX102284	AX102273
TIA Yellow	RVAMJKUTY-S1	RVAMJKUTY-B24	AX102286	AX102275
TIA Green	RVAMJKUTG-S1	RVAMJKUTG-B24	AX102287	AX102276
TIA Blue	RVAMJKUTB-S1	RVAMJKUTB-B24	AX102288	AX102277
TIA Purple	RVAMJKUTP-S1	RVAMJKUTP-B24	AX102289	AX102278

*Only available in KeyConnect-Style
** MDVO-style jack is white
REVConnect dust caps and color icons available on pg 63

REVConnect Plugs, Tools and Accessories

Description	Single Pack	Bulk Pack
REVConnect 10GX Plugs		
UTP (Black)	RVAFPUBK-S1	RVAFPUBK-B24
Shielded	RVAFPSME-S1	RVAFPSME-B24
REVConnect Termination Tool		
Universal Termination Tool	RVUTT01	—
Tool Blade Replacement Set	RVUTB01	—
Tool Belt Clip	RVUTC01	—
Replacement Cable Prep Tool	RVUCT01	—
REVConnect Spare Cores		
Replacement Caps and Cable Managers 50 in pack	—	RVUCOEW-B50

10GX Module, Category 6A - Replacement X-Bars

Description	Belden Part Number
Replacement X-Bars, bag of 24 pieces	PX103838R

10GX Traceable Patch Cords

Bonded-Pair Patch Cords

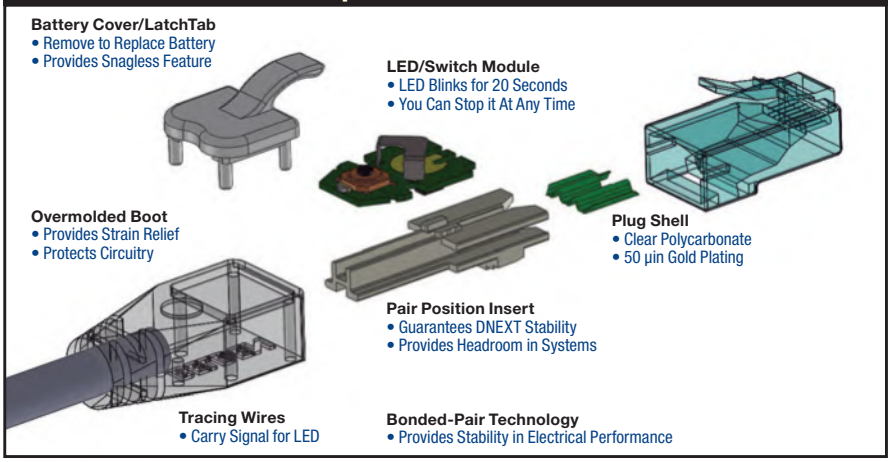
Unique Features

Belden Traceable Bonded-Pair Patch Cords have several unique features that make them a exceptional alternative to other patch cords on the market. They feature a highly-efficient and bright LED with a battery life expectancy of seven years, or 1,000 activations (battery is also replaceable). When activated, the LED blinks for 20 seconds and can be stopped at any time with a second press of the button. The LED and its tracing wires are integrated right into the patch cord, eliminating the need for a separate power source.

Key Specifications

- Available in 10GX and CAT6+ for end-to-end Belden 10GX, 4800, 3600 and 2400 systems
- Exceptionally bright, efficient LED light for easy identification in both bright and dark environments
- Belden Bonded-Pair technology for extra robustness, performance and reliability
- Bar code tagging on each end of the cord compatible with DCIM systems
- Low-profile plug boot supports ultra-high density 48-port 1U patch panels
- 100% factory tested and certified for Category 6A and Category 6
- Replaceable battery with 7-year life expectancy or 1,000 activations
- Available in a variety of colors and sizes, with custom lengths available to 250 feet
- Backed by superior support and a Belden 25-year Certified System Warranty

Traceable Patch Cord Components



10GX Traceable Patch Cord, Bonded-Pair, 4-Pair, 24 AWG Solid, T568A/B-T568A/B, CMR

Description	Belden Part Number							
	Red	Orange	Yellow	Green	Blue	Gray	White	Black
2 ft (0.6 m)	CAT1102002	CAT1103002	CAT1104002	CAT1105002	CAT1106002	CAT1108002	CAT1109002	CAT1100002
4 ft (1.2 m)	CAT1102004	CAT1103004	CAT1104004	CAT1105004	CAT1106004	CAT1108004	CAT1109004	CAT1100004
7 ft (2.1 m)	CAT1102007	CAT1103007	CAT1104007	CAT1105007	CAT1106007	CAT1108007	CAT1109007	CAT1100007
10 ft (3.0 m)	CAT1102010	CAT1103010	CAT1104010	CAT1105010	CAT1106010	CAT1108010	CAT1109010	CAT1100010
15 ft (4.6 m)	CAT1102015	CAT1103015	CAT1104015	CAT1105015	CAT1106015	CAT1108015	CAT1109015	CAT1100015
25 ft (7.6 m)	CAT1102025	CAT1103025	CAT1104025	CAT1105025	CAT1106025	CAT1108025	CAT1109025	CAT1100025

Custom lengths available up to 250-ft

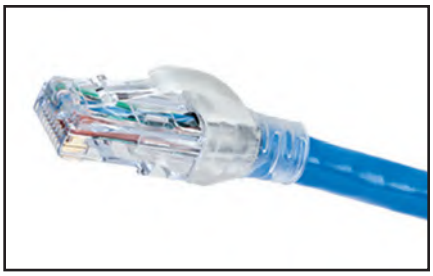
10GX Modular Cords

Bonded-Pair Cords and Nonbonded-Pair Pigtails

The 10GX Modular Cords are 4-pair 24 AWG UTP modular cords designed to be used within the Belden 10GX System. Belden has designed the 10GX Modular Cord based on a patent-pending plug management bar design which allows for very good control of the internal plug NEXT. The Bonded-Pair patch cable design offers very good Alien crosstalk performance, while maintaining the important mechanical characteristics such as flexibility. The 10GX Modular Cords' design, with a very small footprint, makes them fully compatible with the highest density hubs that utilize RJ45 jack connections.

The 10GX Modular Cords are available in dark colors which match the horizontal cable colors and are also available in TIA/EIA-606 standard (pastel) colors. The unmatched performance exceeds all parameters specified in the Category 6A standard. All performance characteristics have been set to guarantee transmission performance up to 625 MHz.

- Exceeds TIA and ISO transmission and mechanical performance requirements
- Ordering code scheme to customize Bonded-Pair Patch Cord and Pigtail configurations



10GX Modular Cord

10GX Modular Cords

Description	Belden Part Number					
	Yellow	Green	Blue	Gray	White	Black
10GX Patch Cord, Bonded-Pair, 4-pair, 24 AWG Solid, T568A/B-T568A/B, CMR						
2 ft (0.6 m)	CA21104002	CA21105002	CA21106002	CA21108002	CA21109002	CA21100002
4 ft (1.2 m)	CA21104004	CA21105004	CA21106004	CA21108004	CA21109004	CA21100004
7 ft (2.1 m)	CA21104007	CA21105007	CA21106007	CA21108007	CA21109007	CA21100007
10 ft (3.0 m)	CA21104010	CA21105010	CA21106010	CA21108010	CA21109010	CA21100010
15 ft (4.6 m)	CA21104015	CA21105015	CA21106015	CA21108015	CA21109015	CA21100015
25 ft (7.6 m)	CA21104025	CA21105025	CA21106025	CA21108025	CA21109025	CA21100025
xxx	CA21104xxx	CA21105xxx	CA21106xxx	CA21108xxx	CA21109xxx	CA21100xxx
10GX Patch Cord, Bonded-Pair, 4-pair, 24 AWG Solid, T568A/B-T568A/B, CMR, TIA Colors						
2 ft (0.6 m)	CA21114002	CA21115002	CA21116002	—	—	—
4 ft (1.2 m)	CA21114004	CA21115004	CA21116004	—	—	—
7 ft (2.1 m)	CA21114007	CA21115007	CA21116007	—	—	—
10 ft (3.0 m)	CA21114010	CA21115010	CA21116010	—	—	—
15 ft (4.6 m)	CA21114015	CA21115015	CA21116015	—	—	—
25 ft (7.6 m)	CA21114025	CA21115025	CA21116025	—	—	—
xxx	CA21114xxx	CA21115xxx	CA21116xxx	—	—	—
10GX Pigtail, Nonbonded-Pair, 4-pair, 23 AWG Solid, T568A-Open, CMR						
15 ft (4.6 m)	—	—	CA31206015	CA31208015	CA31209015	—
25 ft (7.6 m)	—	—	CA31206025	CA31208025	CA31209025	—
35 ft (10.6 m)	—	—	CA31206035	CA31208035	CA31209035	—
50 ft (15.2 m)	—	—	CA31206050	CA31208050	CA31209050	—
xxx	—	—	CA31206xxx	CA31208xxx	CA31209xxx	—
10GX Pigtail, Nonbonded-Pair, 4-pair, 23 AWG Solid, T568B-Open, CMR						
15 ft (4.6 m)	—	—	CA31306015	CA31308015	CA31309015	—
25 ft (7.6 m)	—	—	CA31306025	CA31308025	CA31309025	—
35 ft (10.6 m)	—	—	CA31306035	CA31308035	CA31309035	—
50 ft (15.2 m)	—	—	CA31306050	CA31308050	CA31309050	—
xxx	—	—	CA31306xxx	CA31308xxx	CA31309xxx	—
10GX Pigtail, Nonbonded-Pair, 4-pair, 23 AWG Solid, T568A-Open, CMP						
15 ft (4.6 m)	—	—	CA32206015	CA32208015	CA32209015	—
25 ft (7.6 m)	—	—	CA32206025	CA32208025	CA32209025	—
35 ft (10.6 m)	—	—	CA32206035	CA32208035	CA32209035	—
50 ft (15.2 m)	—	—	CA32206050	CA32208050	CA32209050	—
xxx	—	—	CA32206xxx	CA32208xxx	CA32209xxx	—
10GX Pigtail, Nonbonded-Pair, 4-pair, 23 AWG Solid, T568B-Open, CMP						
15 ft (4.6 m)	—	—	CA32306015	CA32308015	CA32309015	—
25 ft (7.6 m)	—	—	CA32306025	CA32308025	CA32309025	—
35 ft (10.6 m)	—	—	CA32306035	CA32308035	CA32309035	—
50 ft (15.2 m)	—	—	CA32306050	CA32308050	CA32309050	—
xxx	—	—	CA32306xxx	CA32308xxx	CA32309xxx	—

Use xxx to specify length in feet - 001-100 ft in increments of 1 ft - 105-295 ft in increments of 5 ft
All pigtails also available in Bonded-Pair

Modular Cord Configuration Matrices

10GX, CAT6+ and CAT5E Modular Cords

To use the configuration Matrices, make a selection from each category and combine to form a custom part number. See examples.

These matrices can be used to build the part number for any Modular Cord configuration. Refer back to these matrices as needed, when designing Category 6+ (Section Two) and Category 5e systems (Section Three).

Patch Cords Ordering Information

CA	22	1	06	007

Performance		
10GX	=	CA
CAT6+	=	C6
CAT5E	=	C5

Cable		
10GX Bonded-Pair, Solid, CMR	=	21
10GX Bonded-Pair, Solid, CMP	=	22
C6/5 Bonded-Pair, Solid, CMR	=	01
C6/5 Bonded-Pair, Solid, CMP	=	02

Termination
568A/B-T568A/B = 1

Colors		
Brown	=	01
Red	=	02
Orange	=	03
Yellow	=	04
Green	=	05
Blue	=	06
Purple	=	07
Gray	=	08
White	=	09
Black	=	00
TIA Red	=	12
TIA Orange	=	13
TIA Yellow	=	14
TIA Green	=	15
TIA Blue	=	16
TIA Purple	=	17

Colors		
1 ft (0.3 m)	=	001
2 ft (0.6 m)	=	002
3 ft (0.9 m)	=	003
4 ft (1.2 m)	=	004
5 ft (1.5 m)	=	005
6 ft (1.8 m)	=	006
7 ft (2.1 m)	=	007
8 ft (2.4 m)	=	008
9 ft (2.7 m)	=	009
10 ft (3.0 m)	=	010
11 ft (3.4 m)	=	011
12 ft (3.7 m)	=	012
13 ft (4.0 m)	=	013
14 ft (4.3 m)	=	014
15 ft (4.6 m)	=	015
20 ft (6.1 m)	=	020
25 ft (7.6 m)	=	025

Example:

CA22106007 – 10GX Patch Cord, Bonded-Pair, 4-pair, 24 AWG Solid, CMP, T568A/B-T568A/B, Blue, 7 ft (2.1 m)

Pigtails Part Ordering Information

C6	01	3	09	025

Performance		
10GX	=	CA
CAT6+	=	C6
CAT5E	=	C5

Cable		
10GX Bonded-Pair, Solid, CMR	=	21
10GX Bonded-Pair, Solid, CMP	=	22
C6/5 Bonded-Pair, Solid, CMR	=	01
C6/5 Bonded-Pair, Solid, CMP	=	02
CA/C6/C5 NonBonded, CMR	=	31
CA/C6/C5 NonBonded, CMP	=	32

Termination		
T568A-Open	=	2
T568B-Open	=	3

Colors		
Brown	=	01
Red	=	02
Orange	=	03
Yellow	=	04
Green	=	05
Blue	=	06
Purple	=	07
Gray	=	08
White	=	09
Black	=	00
TIA Red	=	12
TIA Orange	=	13
TIA Yellow	=	14
TIA Green	=	15
TIA Blue	=	16
TIA Purple	=	17

Colors		
15 ft (4.6 m)	=	015
20 ft (6.1 m)	=	020
25 ft (7.6 m)	=	025
35 ft (10.6 m)	=	035
50 ft (15.2 m)	=	050
75 ft (22.9 m)	=	075
100 ft (30.5 m)	=	100

Example:

C601309025 – CAT6+ Pigtail, Bonded-Pair, 4-pair, 24 AWG Solid, CMR, T568B-Open, White, 25 ft (7.6 m)

Crossover Patch Cords Ordering Information

C5	01	5	02	010

Performance		
10GX	=	CA
CAT6+	=	C6
CAT5E	=	C5

Cable		
10GX Bonded-Pair, Solid, CMR	=	21
10GX Bonded-Pair, Solid, CMP	=	22
C6/5 Bonded-Pair, Solid, CMR	=	01
C6/5 Bonded-Pair, Solid, CMP	=	02

Termination		
Crossover T568A-T568B	=	4
Crossover IEEE	=	5
Rollover	=	6

Colors		
Brown	=	01
Red	=	02
Orange	=	03
Yellow	=	04
Green	=	05
Blue	=	06
Purple	=	07
Gray	=	08
White	=	09
Black	=	00

Colors		
1 ft (0.3 m)	=	001
2 ft (0.6 m)	=	002
3 ft (0.9 m)	=	003
4 ft (1.2 m)	=	004
5 ft (1.5 m)	=	005
6 ft (1.8 m)	=	006
7 ft (2.1 m)	=	007
8 ft (2.4 m)	=	008
9 ft (2.7 m)	=	009
10 ft (3.0 m)	=	010
11 ft (3.4 m)	=	011
12 ft (3.7 m)	=	012
13 ft (4.0 m)	=	013
14 ft (4.3 m)	=	014
15 ft (4.6 m)	=	015
20 ft (6.1 m)	=	020
25 ft (7.6 m)	=	025

Example:

C501502010 – CAT5E Patch Cord, Bonded-Pair, 4-pair, 24 AWG Solid, CMR, Crossover IEEE, Red, 10 ft (3.0 m

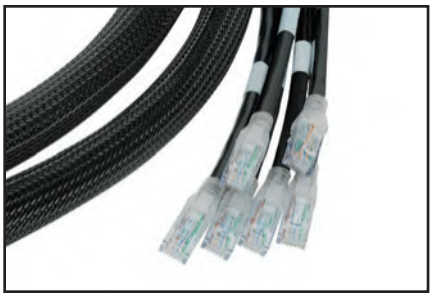
10GX Pre-Terminated Cabling System

Cable Assemblies, Couplers, Patch Panels

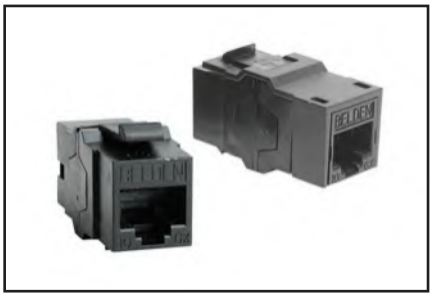
The 10GX Pre-Terminated Cabling System delivers rapid deployment coupled with guaranteed Category 6A performance and headroom, without the need for tradeoffs or compromise in performance and reliability. Bringing a new level of ease and convenience to cabling system design, ordering and installation, the system allows users to deploy their high-performance 10 Gigabit networks with optimal speed and efficiency.

Proven modular components are the cornerstone of the system. These include the 10GX Pre-Terminated Cable Assemblies and the 10GX RJ45 Modular Couplers. These components rely on unique enabling technologies: Belden's Bonded-Pair technologies ensure that the cable assemblies boast exceptional structural stability and unfailing electrical performance; and the patent-pending Dual-FleX design ensures controlled plug/jack mated connection on both sides of the coupler to provide an uninterrupted electrical path for superior connector reliability and transmission performance.

With simple planning, easy ordering and rapid delivery, the 10GX Pre-Terminated Cabling System can reduce installation time and labor costs by as much as 90 percent. In addition, this "green" system provides for plug-and-play installation and component reusability, resulting in lower installed cost and less waste.

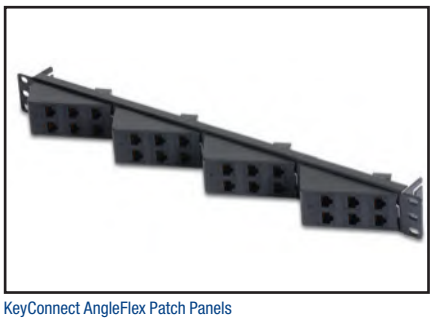


10GX Pre-Terminated Cable Assemblies



10GX RJ45 Coupler

10GX KeyConnect Patch Panels (Preloaded)



KeyConnect AngleFlex Patch Panels

10GX Cable Assemblies

Description	Belden Part Number	
	6-Cable	8-Cable
10GX Pre-Terminated Cable Assembly, Bonded-Pair, 4-Pair, 24 AWG Solid, T568A/B-T568A/B		
CMR, Black	**CA21100xxxA06**	**CA21100xxxA08**
CMR, Blue	**CA21106xxxA06**	**CA21106xxxA08**
CMR, White	**CA21109xxxA06**	**CA21109xxxA08**
CMP, Black	**CA22100xxxA06**	**CA22100xxxA08**
CMP, Blue	**CA22106xxxA06**	**CA22106xxxA08**
CMP, White	**CA22109xxxA06**	**CA22109xxxA08**

Use xxx to specify length in feet - 006-100 ft in increments of 1 ft - 105-295 ft in increments of 5 ft

10GX KeyConnect Patch Panels

Description	Belden Part Number
10GX KeyConnect Coupler Patch Panels (Preloaded)	
10GX KeyConnect Coupler Patch Panel, 24-port, 1U, Titanium (Preloaded)	**AX104141**
10GX KeyConnect Coupler Patch Panel, 48-port, 2U, Titanium (Preloaded)	**AX104142**
10GX KeyConnect Coupler Patch Panel, 48-port, 1U, Titanium (Preloaded)	**AX104592**
10GX KeyConnect AngleFlex Coupler Patch Panel, 24-port,1U, Black (Preloaded)	**AX104569**
10GX KeyConnect AngleFlex Coupler Patch Panel, 48-port, 2U, Black (Preloaded)	**AX104571**
10GX KeyConnect Angled Coupler Patch Panel (Preloaded)	
10GX KeyConnect Angled Coupler Patch Panel, 24-port, 1U, Black (Preloaded)	**AX105300**
10GX KeyConnect Angled Coupler Patch Panel, 48-port, 2U, Black (Preloaded)	**AX105301**
10GX KeyConnect Angled Coupler Patch Panel, 48-port, 1U, Black (Preloaded)	**AX105348**
10GX KeyConnect Vertical Mount Patch Panel (Preloaded)	
10GX KeyConnect Vertical Mount Patch Panel, 8-Port, Black (Preloaded)	**AX105366***

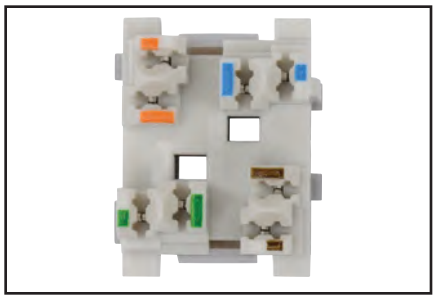
Empty Patch Panels can be used when colored couplers are used

*Mount in XZUK01 and XZUK02 brackets

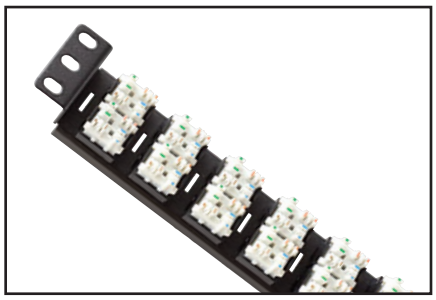
10GX KeyConnect RJ45 Coupler

Belden Part Number						
Orange	Red	Yellow	Green	Blue	White	Black
AX104015	**AX104016**	**AX104017**	**AX104018**	**AX104019**	**AX104023**	**AX104024**

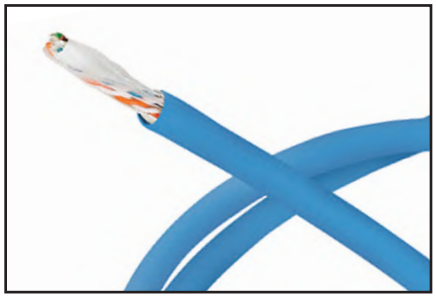
Complete the 10GX Pre-Terminated System with 10GX Modular Cords, see page 13 for ordering information.



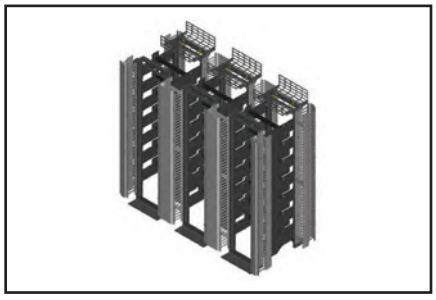
10GX IDC Connector



10GX IDC Patch Panel, shown with 10GX IDC Connectors



10GX IDC X-Connect Cable



10GX IDC Frame

10GX IDC System

Connecting Components, Accessories, X-Connect Cable

The Belden 10GX IDC System is a high-performance, space-efficient modular connection system. The system meets the TIA/EIA 568-C.2 standard, plus it is uniquely engineered to deliver unmatched 10G performance — handling 10GBase-T data networking and multimedia applications with headroom to spare.

The 10GX IDC System is extremely flexible in that it accommodates the configuration of large cross-connect systems and the configuration of interconnect systems within racks. Because of its modularity, the system also accommodates future moves, adds and changes (MACs) with ease.

10GX IDC System

Description	Belden Part Number
10GX IDC Patch Panel Components	
10GX IDC Patch Panel, 24-port, 1U, Black (Empty)	**AX104138**
10GX IDC Connector (24 units/pkg)	**AX104139**
10GX IDC Block Front (100 units/pkg)	**AX102679**
10GX IDC Block Rear (100 units/pkg)	**AX102680**
10GX IDC Accessories	
10GX IDC Test Adapter	**AX104006**
10GX IDC X-Connect Cable	
10GX IDC X-Connect Cable	**10GX12 XXX1000**

Use xxx to specify color of cable. See page 11 for available colors.

10GX IDC Frame	
Two Post Self Supporting Rack	**BHHR194**
6 in. Vertical Manager	**BHVH006**
12 in. Vertical Manager	**BHVH012**
Front-to-Back Trough Kit 42 in.	**AX104225**
Front-to-Back Trough Kit 38 in.	**AX104225-S**
Overhead Kit	**AX104226**

Fiber*Express* Field Termination
FX Brilliance Universal Connectors

FX Brilliance Universal Connectors

Brilliant in design and universal in implementation, FX Brilliance Universal no-epoxy, no-polish, no-crimp field-installable connectors make fiber field termination faster, easier and better with our industry-leading design.

FASTER

- Faster fiber termination in as few as 5 seconds
- Faster installation proficiency through simple termination technique
- Faster 250 µm direct installation eliminating break-out kits

EASIER

- Easier with no epoxy or polishing
- Easier no-crimp design
- Easier with duplex clips to hold TX/RX pairs together

BETTER

- Better termination yield with integrated VFL feedback
- Better universal cable support for 250 µm, 900 µm, 2 mm Jacketed, 3 mm Jacketed
- Better universal fiber support for OM1, OM2, OM3, OM4 as well as OS2

Three Simple Steps

Connector Performance	Maximum Insertion Loss	Typical Insertion Loss	Return Loss
Multimode	0.5 dB	0.2 dB	25 dB
Singlemode UPC	0.5 dB	0.3 dB	50 dB
Singlemode APC	0.5 dB	0.3 dB	60 dB

Description	Belden Part Number			
	Multimode, OM1	Multimode, OM2	Multimode, OM3/ OM4 - Aqua	Multimode, OM4 - Erika Violet
LC with 900 µm Boot, 25 per package	AX105200-B25	AX105201-B25	AX105202-B25	AX105252-B25
SC with 900 µm Boot, 25 per package	AX105205-B25	AX105206-B25	AX105207-B25	AX105253-B25
ST with 900 µm Boot, 25 per package	AX105210-B25	AX105211-B25	AX105212-B25	AX105254-B25

Replace -B25 with -S1 for sample 1 per package.

Description	Belden Part Number			
	Singlemode, OS2		Singlemode, OS2/APC	
	1 per package	25 per package	1 per package	25 per package
LC with 900 µm Boot	AX105203-S1	AX105203-B25	-	-
SC with 900 µm Boot	AX105208-S1	AX105208-B25	AX105209-S1	AX105209-B25
ST with 900 µm Boot	AX105213-S1	AX105213-B25	-	-

FX Brilliance Universal includes a boot for 900 µm Tight Buffered fiber. Boots for 2 mm/3 mm Jacketed fiber are sold separately.

Description	Belden Part Number
250 µm Boot, 25 per package	FXBUB0250B25N
2 mm Jacketed Boot, 25 per package	AX105214-B25
3 mm Jacketed Boot, 25 per package	AX105215-B25

Description	Belden Part Number
LC Duplex Clip (Black), 25 per package	FXBUCLLDB25N
SC Duplex Clip (Black), 25 per package	FXBUCLSDB25N

FiberExpress Patch Panel Systems (continued)

FX Patch Rack Mount, Wall Mount Patch Panels, Adapter Strips and Accessories

Economical yet effective. Low to medium density rack mount fiber panels with simple adapter strips are the mainstay for fiber field termination.

FASTER

- Faster access to rear side (trunk) connectivity without removing patch cords

EASIER

- Easier on the budget with economical adapter strips
- Easier access to the trunk side connectivity with swing out faceplate

BETTER

- Better support for mixed field-term connectivity including splicing
- Better use of valuable space through a compact footprint

Rack Mount Patch Panels

Description	Maximum Number of Adapter Strips	Splice Trays	Belden Part Number
1U Rack Mount	2	1 x 8" (Up to 24-Splices)	AX100041
2U Rack Mount	4	2 x 8" (Up to 48-Splices)	AX100068
3U Rack Mount (Rear Access)	4	2 x 8" (Up to 48-Splices)	AX104934
4U Rack Mount	8	4 x 8" (Up to 96-Splices)	AX100116

Wall Mount Patch Panels

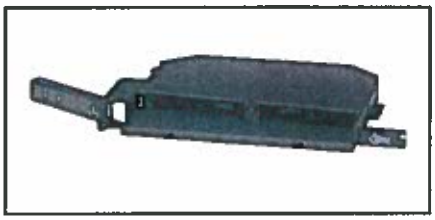
Description	Maximum Number of Adapter Strips	Splice Trays	Belden Part Number
Small Wall-Mount	2	1 x 8" (Up to 24-Splices)	AX100495
Medium Wall-Mount	4	2 x 8" (Up to 48-Splices)	AX100540
Large Wall-Mount	8	4 x 8" (Up to 96-Splices)	AX100542

Standard Optical Fiber Adapter Strips

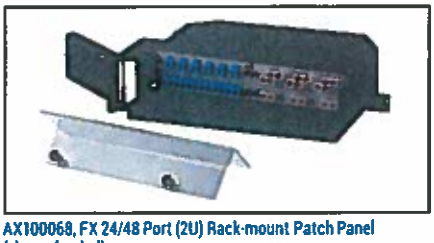
		Belden Part Number			
Patch Ports (fibers)	Family	OM1 Beige Adapters	OM3 Aqua Adapters	SM Blue Adapters	SM/APC Green Adapters
LC Duplex					
12 (24)	FX Patch	AX101741	-	AX101743	AX105561
6 (12)	FX Patch	AX101729	-	AX101731	AX105537
SC Duplex					
6 (12)	FX Patch	AX100098	-	AX101409	AC301420
3 (6)	FX Patch	AX100094	-	AX101407	-
SC Simplex					
12 (12)	FX Patch	-	-	AX100532	AC302349
ST					
12 (12)	FX Patch	← AX100528 →			-
6 (6)	FX Patch	← AX100534 →			-

Standard Optical Fiber Accessories

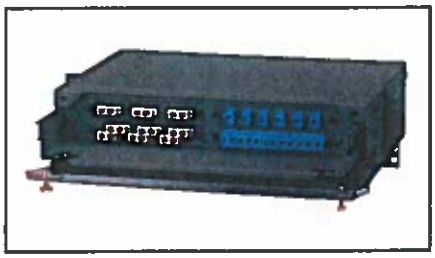
Description	Belden Part Number
FX Patch Blank Strip	AX100066
1U Front Cover, Smoked Plexiglas	AX100045
8" Splice Kit (Tray, Holders, Wiremarkers & Cover)	A0649869



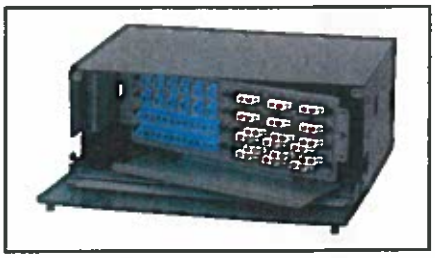
AX100041, FX 12/24 Port (1U) Rack-mount Patch Panel



AX100068, FX 24/48 Port (2U) Rack-mount Patch Panel (shown loaded)



AX104934, FX (3U) Rack-Mount Patch Panel (Rear Access) (shown loaded)

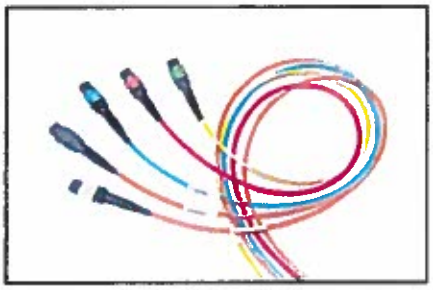


AX100116, FX 48/96 Port (4U) Rack-mount Patch Panel (shown loaded)

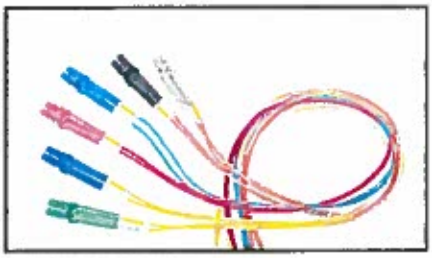
AX100495, Small Wall Mount

Fiber*Express* Pre-Terminated Assemblies

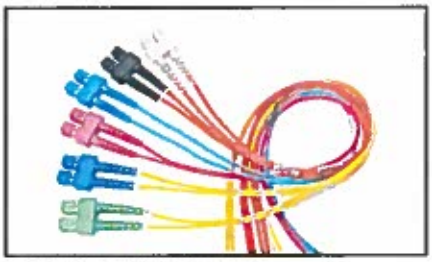
FX Patch Cords



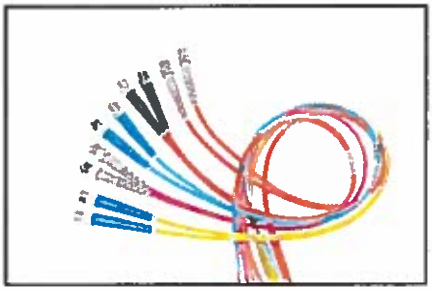
FX MPO-12(f) Patch Cords, Assortment



FX LC Duplex Patch Cords, Assortment



FX SC Duplex Patch Cords, Assortment



FX ST Patch Cords, Assortment

Uncomplicated, robust, versatile and conveniently available. Superior quality and performance FX patch cords deliver a robust design to withstand the rigours of daily use in both off- the-shelf standard configurations and rapid custom tailored installations.

FASTER

- Faster delivery with off-the shelf availability of standard items
- Faster identification of fiber type with Erika Violet for OM4 cable and connectors

EASIER

- Easier installation in dense cable trays with small diameter cord options
- Easier ordering with simple intelligent *Smart*Part Numbers
- Easier polarity management with industry leading easy-to-use duplex clips

BETTER

- Better architectural flexibility with low-loss OM4 0.2 dB MPO and 0.15 dB LC connectors
- Better ruggedization with larger diameter cord options
- Better flexibility with multiple connector options including LC, SC, ST and MPO
- Better quality through exhaustive design validation against TIA standards

FX Patch Cords - Standard Performance

Description	FX OM1	FX OM3	FX OM4	FX SM	FX SM/APC
Cable Performance - LC/SC/ST					
IL Max. 850 nm/1300 nm (dB/Km)	3.5/1.2	3.25/1.2	3.0/1.2	–	
IL Max. 1310 nm/1550 nm (dB/Km)	–	–	–	0.5/0.5	
Fire Rating	LC/SC/ST: Riser				
Cable Style	LC: 2 mm Duplex Zip Cord LC Uniboot: 2mm Round Cord SC/ST/Hybrid: 3 mm Duplex Zip Cord				
Connector Performance - LC/SC/ST					
IL Max. (dB)	0.25	0.25	0.15	0.35	0.35
Polish - RL Typ. (dB)	PC - 30	PC - 30	PC - 30	UPC - 55	APC - 65

Description	FX OM1	FX OM3	FX OM4	FX SM	FX SM/APC
Cable Performance - MPO					
IL Max. 850 nm/1300 nm (dB/Km)	3.5/1.2	3.25/1.0	3.0/1.0	–	
IL Max. 1310 nm/1550 nm (dB/Km)	–	–	–	0.5/0.5	
Fire Rating	Plenum				
Cable Style	MPO-12: 3.0 mm Round				
Connector Performance - MPO					
IL Max. (dB)	0.5	0.35	0.2	–	0.75
Polish - RL Typ. (dB)	PC - 30	PC - 30	PC - 30	–	APC - 60

FX Accessory Duplex Clips

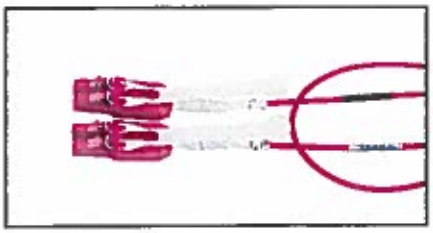
Description	Belden Part Number				
	OM1 Beige	OM3 Aqua	OM4 Erika Violet	OS2 Blue	OS2 Green
LC Duplex	FXFACLLDB25T	FXFACLLDB25A	FXFACLLDB25E	FXFACLLDB25B	FXFACLLDB25G
Mini-LC Duplex	← FXFACLLMB25N (Black) →				

Fiber*Express* Pre-Terminated Assemblies (continued)

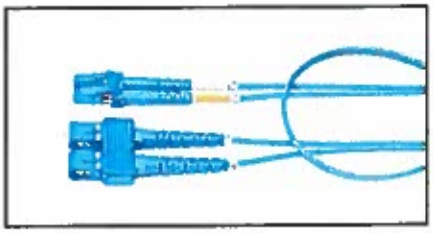
FX Patch Cords

Standard FX Patch Cords

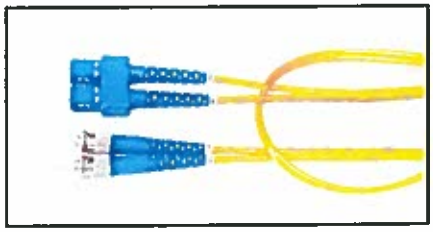
Length (m)	OM1 Beige/Orange	OM3 Aqua	OM4 Erika Violet	OS2 Blue/Yellow	OS2/APC Green/Yellow
MPO-12(f) to MPO-12(f)					
2	-	FP3MFMF002M	FP4MFMF002M	-	FPSMFMF002M
3	-	FP3MFMF003M	FP4MFMF003M	-	FPSMFMF003M
5	-	FP3MFMF005M	FP4MFMF005M	-	FPSMFMF005M
LC-UHD Uniboot to LC-UHD Uniboot					
2	-	FP3LULU002M	FP4LULU002M	FPSLULU002M	-
3	-	FP3LULU003M	FP4LULU003M	FPSLULU003M	-
5	-	FP3LULU005M	FP4LULU005M	FPSLULU005M	-
LC Duplex to LC Duplex					
2	-	FP3LDLD002M	FP4LDLD002M	FPSLDLD002M	FPSLALA002M
3	-	FP3LDLD003M	FP4LDLD003M	FPSLDLD003M	FPSLALA003M
5	-	FP3LDLD005M	FP4LDLD005M	FPSLDLD005M	FPSLALA005M
LC-Duplex to Mini-LC Duplex					
2	-	FP3LDLM002M	FP4LDLM002M	FPSLDLM002M	-
3	-	FP3LDLM003M	FP4LDLM003M	FPSLDLM003M	-
5	-	FP3LDLM005M	FP4LDLM005M	FPSLDLM005M	-
SC Duplex to SC Duplex					
2	FP1SDSD002M	FP3SDSD002M	FP4SDSD002M	FPSSDSD002M	FPSSASA002M
3	FP1SDSD003M	FP3SDSD003M	FP4SDSD003M	FPSSDSD003M	FPSSASA003M
5	FP1SDSD005M	FP3SDSD005M	FP4SDSD005M	FPSSDSD005M	FPSSASA005M
ST to ST (Duplex Cord)					
2	FP1STST002M	FP3STST002M	FP4STST002M	FPSSTST002M	-
3	FP1STST003M	FP3STST003M	FP4STST003M	FPSSTST003M	-
5	FP1STST005M	FP3STST005M	FP4STST005M	FPSSTST005M	-
Hybrid: LC Duplex to SC Duplex					
3	FP1LDSD003M	FP3LDSD003M	FP4LDSD003M	FPSLDSD003M	FPSLASA003M
Hybrid: SC Duplex to ST					
3	FP1SDST003M	FP3SDST003M	-	FPSSDST003M	-



FP4LULU003M, LC-UHD Uniboot w/Pull-Tab to LC-UHD Uniboot w/Pull-Tab, OM4 Erika Violet



FP3LDSD003M, Hybrid LC Duplex to SC Duplex, OM3 Aqua



FPSSOST003M, Hybrid SC Duplex to ST, OS2 Blue

Tailored FX Patch Cords

Building a *Smart*Part Number

Fixed Letter Series	1. Choose Fiber Type	2. Choose Connector 1	3. Choose Connector 2	4. Choose Length*	5. Choose Fire Rating	6. Choose Cable Construction	7. Choose Polarity	8. Choose Jacket Color
FP	S	LB	LB	10M5	R	4	S	Y

Fiber Type	
1	OM1
3	OM3
4	OM4
S	OS2

Connector 1	
LD	LC Duplex
LC	LC Simplex
LM	Mini-LC Duplex
LA	LC/APC Duplex
LB	LC/APC Simplex
SD	SC Duplex
SC	SC Simplex
SA	SC/APC Duplex
SB	SC/APC Simplex
ST	ST
MM	MPO-12(m)
MF	MPO-12(f)
LU	LC-UHD Uniboot
LH	LC-UHD Duplex
LJ	LC-UHD Simplex
LE	LC-UHD/APC Duplex
LF	LC-UHD/APC Simplex

Connector 2	
LD	LC Duplex
LC	LC Simplex
LM	Mini-LC Duplex
LA	LC/APC Duplex
LB	LC/APC Simplex
SD	SC Duplex
SC	SC Simplex
SA	SC/APC Duplex
SB	SC/APC Simplex
ST	ST
MM	MPO-12(m)
MF	MPO-12(f)
LU	LC-UHD Uniboot
LH	LC-UHD Duplex
LJ	LC-UHD Simplex
LE	LC-UHD/APC Duplex
LF	LC-UHD/APC Simplex

Length*
001M to 300M (use M as decimal)

Fire Rating	
R	Riser
P	Plenum
L	LSZH
N	CM/PVC

Cable Construction	
2	Duplex 2.0 mm
3	Duplex 3.0 mm
4	Simplex 2.0 mm
5	Simplex 3.0 mm
6	Round 2.0 mm
7	Round 3.0 mm

Polarity	
X	A/B (Cross)
S	A/A (Straight)
A	Type-A
B	Type-B
C	Type-C

Jacket Color	
O	Orange
Y	Yellow
A	Aqua
E	Erika V.

*For assemblies greater than 15 m in length consider Multi-fiber cable assemblies with robust features such as heavier cable jackets and pulling eyes.

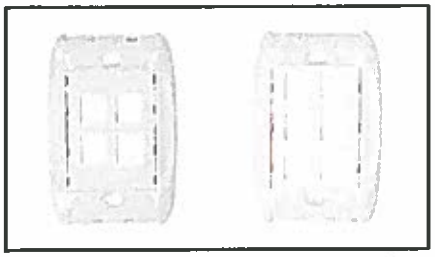
Examples:

FPSLALA10M5L2XY - LC/APC duplex to LC/APC duplex, 10.5m in length, OS2 Singlemode LSHZ (Low Smoke Zero Halogen) 2 mm duplex zip cord with A-to-B polarity and a yellow cable jacket

FP4MFMM010MP6AA - MPO-12 female to MPO-12 male, 10m in length, OM4 multi mode Plenum 2 mm round interconnect cable with Type-A polarity and aqua cable jacket and connectors

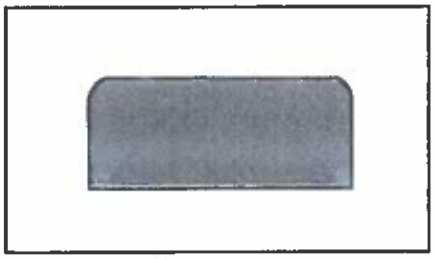
Fiber*Express* Workstation Outlets

MediaFlex Faceplate Kits, Workstation Outlets, and Window Covers



AX102428, AX102430, MediaFlex KeyConnect Faceplate Kit

AX101874, MediaFlex Adapter Box, Double-Gang



AX101777, Labeling Window Cover for MediaFlex Plates

Tasteful designs balancing purpose and elegance. Grounded in the reconfigurable KeyConnect platform Belden workstation outlets provide a stylish footprint for copper, fiber and multimedia connectivity at the workstation.

FASTER

- Faster installation with support for standard NEMA type outlet boxes

EASIER

- Easier customizability for mixed copper, fiber and multimedia using the KeyConnect keystone-style system
- Easier port identification through elegant integrated label holders
- Easier mounting in constrained spaces with optional angled

BETTER

- Better cable management and bend radius control with surface adapter boxes
- Better looking modern curved styling available in a variety of colors

MediaFlex Faceplate Kits

Description	Belden Part Number	
	Almond	Elec. White
MediaFlex Faceplate Kit, KeyConnect-Style		
2-port, Flush, Single-gang	AX104494	AX104495
4-port, Flush, Single-gang	AX102428	AX102429
6-port, Flush, Single-gang	AX102430	AX102431
2-port, Angled, Single-gang	AX104498	AX104499
4-port, Angled, Single-gang	AX102432	AX102433

MediaFlex Workstation Outlets

Description	Belden Part Number	
	Almond	Elec. White
MediaFlex Plates		
Single-gang	AX101746	AX101747
Double-gang	AX101870	AX101871
MediaFlex Surface Adapter Boxes		
Single-gang	AX102481	AX102482
Double-gang	AX101874	AX101875

Contact Customer Service for other colors and configurations.

MediaFlex ID Window Covers

Description	Belden Part Number
Window Cover, Clear, bag of 25 units	AX101773
Window Cover, Gray, bag of 25 units	AX101774
Window Cover, Almond, bag of 25 units	AX101775
Window Cover, Elec. White, bag of 25 units	AX101776
Window Cover, Black, bag of 25 units	AX101777

Fiber*Express* Workstation Outlets (continued)

MediaFlex Multimedia Inserts and KeyConnect Adapters

MediaFlex Inserts

Description	Belden Part Number		
	Almond	Elec. White	Black
MediaFlex KeyConnect Module Insert			
2-port, Flush, bag of 10 pieces	AX102410	AX102411	AX102737
2-port, Angled, bag of 10 pieces	AX102412	AX101872	AX102735
MediaFlex Filler Inserts			
1 unit, bag of 10 pieces	AX101758	AX101759	AX101760
MediaFlex Multimedia Insert, Copper			
3-port RCA (Angled)	AX101878	AX101879	AX101880
SVHS Module (Angled)	AX101882	AX101883	AX101884
SVGA Module (IDC interface) (Angled)	AX101886	AX101887	AX101888
SVGA Feed Through (Angled)	AX102335	AX102336	AX102337
SVGA Feed Through, 3.5 mm Audio (Angled)	AX105158-AL	AX105158-EW	AX105158-BK
MediaFlex Multimedia Insert, Fiber			
Duplex SC Multimode	AX101940	AX101941	AX101942
Duplex SC Singlemode	AX101936	AX101937	AX101938
SC/APC Duplex	AX105638-AL	AX105638-EW	AX105638-BK

Contact Customer Service for other colors and configurations.

KeyConnect Adapters

Description	Belden Part Number		
	Almond	Elec. White	Black
LC Duplex OM3 (Aqua Adapter)	AX104937	AX104938	AX104939
LC Duplex OM4 (Erika Violet Adapter)	AX105641-AL	AX105641-EW	AX105641-BK
LC Duplex SM (Blue Adapter)	AX102419	AX102420	AX102421
LC Duplex SM/APC (Green Adapter)	AX105642-AL	AX105642-EW	AX105642-BK
SC Simplex OM1 (Beige Adapter)	AX102683	AX102684	AX102685
SC Simplex OM3 (Aqua Adapter)	AX105643-AL	AX105643-EW	AX105643-BK
SC Simplex SM (Blue Adapter)	AX102686	AX102687	AX102688
SC/APC Simplex SM (Green Adapter)	AX105374-AL	AX105374-EW	AX105374-BK

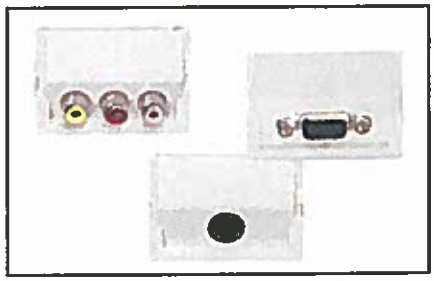
Refer to the Belden copper catalog for a larger selection of multimedia adapters.

Why Shutters?
- *SM higher power*
- *Block Light if user end of port is not in use*
- *Not intended to block dust and contamination*

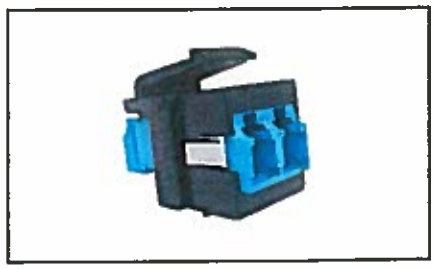
Ideal of Passive Optical Networking/LAN designs.

MediaFlex Inserts for KeyConnect Modules: AX102410, Flush, 2-port, Almond and AX102412, Angled, 2-Port, Almond

AX101760, MediaFlex Filler Insert, 1-unit



AX101878, MediaFlex RCA Inserts, 3-port, Almond
AX101882, MediaFlex SVHS Inserts, 1-port, Almond
AX101886, MediaFlex SVGA Inserts, 1-port, Almond



AX104939, KeyConnect Adapter, LC Duplex, OM3 (Aqua Adapter), Black

FiberExpress Breakout Cables

Tight Buffer – Indoor Riser, Plenum & LSZH Rated

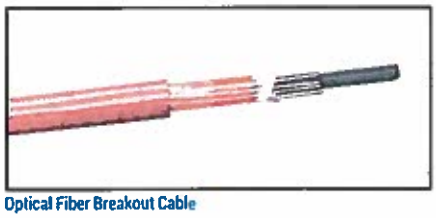
Robust terminations in demanding environments. All the ease of 900 µm tight buffered termination with only one fiber per sub-unit enables the ultimate bond between the connector and the cables' Aramid yarns resulting in unmatched strength and durability.

Applications:

- Horizontal distribution for Fiber-to-the-desk
- In-building backbone
- Factory floor automation
- Broadcast and A/V in-building installations

Additional Options

- 2.5 mm and 2.9 mm Subunits
- MSHA (Mining) Approvals



Optical Fiber Breakout Cable

Description	Construction	Fiber Count	Fiber	Sub-Unit OD	Cable OD		Weight		Tensile Strength			
									Operation		Installation	
				mm	mm	in	Kg/km	lb/1000 ft.	N	lbs-f	N	lbs-f
Color-coded Sub-Units		2	900 µm TB	2.0	6.6	0.26	36	24	400	90	800	180
		4	900 µm TB	2.0	8.2	0.32	52	35	755	170	1535	345
		6	900 µm TB	2.0	9.1	0.36	80	54	1025	230	2070	465
		8			10.3	0.41	103	69	1335	300	2670	600
		10			11.6	0.46	128	86				
		12			13.1	0.51	164	110				

Above specifications provide a general representation for the product family. Improved specifications may exist for Riser, Plenum or LSZH constructions. Consult individual technical data sheets for exact specifications.

Standard Configurations

Fiber Count	Belden Part Number				
	OM1 Orange	OM3 Aqua	OM4 Erika Violet	OM4 Aqua	OS2 Yellow
Plenum					
2	B9B013	B9C013	FI4B002PB	B9E013	B9W013
4	B9B014	B9C014	FI4B004PB	B9E014	B9W014
6	B9B015	B9C015	FI4B006PB	B9E015	B9W015
12	B9B018	B9C018	FI4B012PB	B9E018	B9W018
LSZH/Riser					
2	B9B130	B9C130	FI4B002LB	B9E130	B9W130
4	B9B131	B9C131	FI4B004LB	B9E131	B9W131
6	B9B132	B9C132	FI4B006LB	B9E132	B9W132
12	B9B135	B9C135	FI4B012LB	B9E135	B9W135

For an exhaustive selection contact Belden customer service or your local Belden Representative for more details.

Specifications

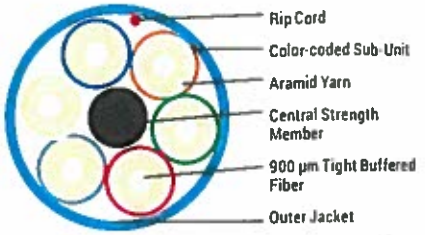
Bend Radius (vs. Cable OD)

Installation	15 x OD
Operation	10 x OD

Temperature Range

Storage	-40°C to 70°C (-40°F to 158°F)
Installation (Plenum/LSZH)	0°C to 60°C (32°F to 140°F)
Installation (Plenum/LSZH)	0°C to 60°C 32°F to 140°F
Installation (Riser)	-10°C to 60°C (14°F to 140°F)
Operation (Plenum/LSZH)	0°C to 70°C (32°F to 158°F)
Operation (Riser)	-20°C to 70°C (-4°F to 158°F)

Legend



Compliance

- TIA/EIA-568-C.3
- ISO/IEC 11801, 2nd Edition
- Telcordia GR-409-CORE
- RoHS II 2011/65/EU
- REACH EC1907-2006
- NEC/CEC OFNR/OFN FT.4 (RISER - PVC)
- NEC/CEC OFNR/OFN FT.4 (LSZH - FRPE)
- NEC/CEC OFNP/OFN FT.6 (PLENUM - PVC or PVDF)

Fiber*Express* Distribution Cables

Tight Buffer – Indoor Riser & Plenum Rated

Fast installation, easy termination. Sub-unitized cables provide easy routing and 900 µm tight-buffered fiber supporter fast and robust field-termination.

Applications:

- Horizontal distribution for Fiber-to-the-desk
- In-building backbone
- Factory floor automation
- Data Center EDA areas

Additional Options

- MSHA (Mining) Approvals

Indoor Specifications

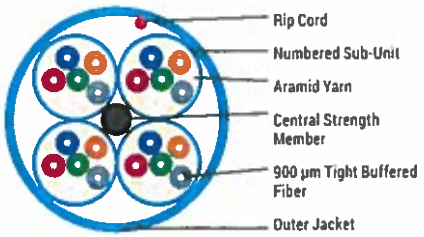
Bend Radius (vs. Cable OD)

Installation	15 x OD
Operation	10 x OD

Temperature Range

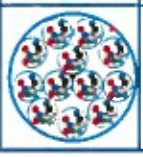
Storage	-40°C to 70°C (-40°C to 158°F)
Installation (Plenum/LSZH)	0°C to 60°C (32°F to 140°F)
Installation (Riser)	-10°C to 60°C (14°F to 140°F)
Operation (Plenum/LSZH)	0°C to 70°C (32°F to 158°F)
Operation (Riser)	-20°C to 70°C (-4°F to 158°F)

Legend



Compliance

- TIA/EIA-568-C.3
- ISO/IEC 11801, 2nd Edition
- Telcordia GR-409-CORE
- RoHS II 2011/65/EU
- REACH EC1907-2006
- NEC/CEC OFNR/OFN FT.4 (RISER - PVC)
- NEC/CEC OFNR/OFN FT.4 (LSZH - FRPE)
- NEC/CEC OFNP/OFN FT.6 (PLENUM - PVC or PVDF)

Description	Construction	Fiber Count	Fiber	Sub-Unit OD	Cable OD		Weight		Tensile Strength			
									Operation		Installation	
				mm	mm	in	Kg/km	lb/1000 ft	N	lbs-f	N	lbs-f
Non-Unitized		2	900 µm TB	N/A	4.8	0.19	22	15	222	50	556	125
		4	900 µm TB	N/A	4.8	0.19	25	17	222	50	556	125
		6					31	21				
		8			5.8	0.23	36	24	334	75	667	150
		10					39	26				
		12					43	29				
		16			8.8	0.35	64	43	556	125	1112	250
		24					80	54				
Unitized 6-Fiber Sub-Units		24	900 µm TB	4.5	13.1	0.52	145	97	1001	225	2002	450
		36			16.0	0.63	221	148	1668	375	3336	750
Unitized 12-Fiber Sub-Units		36	900 µm TB	5.5	14.1	0.56	162	109	1001	225	2002	450
		48			15.5	0.61	207	139	1423	320	2847	640
		72			19.0	0.75	321	216	2002	450	4226	950
		96			22.8	0.90	536	360	2780	625	5560	1250
		144			25.4	1.00	602	404	4226	950	8452	1900

Above specifications provide a general representation for the product family. Improved specifications may exist for Riser, Plenum or LSZH constructions. Consult individual technical data sheets for exact specifications.

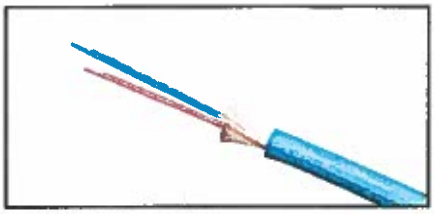
Fiber*Express* Distribution Cables (continued)

Tight Buffer – Indoor Riser & Plenum Rated

Standard Indoor Configurations

Fiber Count	Belden Part Number				
	OM1 Orange	OM3 Aqua	OM4 Erika Violet	OM4 Aqua	OS2 Yellow
Non-unitized - Riser					
2	B9B037	B9C037	–	B9E037	B9W037
6	B9B039	B9C039	–	B9E039	B9W039
12	B9B042	B9C042	–	B9E042	B9W042
24	B9B601	B9C601	–	B9E601	B9W601
Non-unitized - Plenum					
2	B9B043	B9C043	FI4D002P9	B9E043	B9W043
6	B9B045	B9C045	FI4D006P9	B9E045	B9W045
12	B9B048	B9C048	FI4D012P9	B9E048	B9W048
24	B9B611	B9C611	FI4D024P9	B9E611	B9W611
Unitized 6-Fiber Sub-Units - Riser					
24	B9B602	B9C602	–	B9E602	B9W602
Unitized 6-Fiber Sub-Units - Plenum					
24	B9B612	B9C612	FI4D024PJ	B9E612	B9W612
Unitized 12-Fiber Sub-Units - Plenum					
48	–	B9C616	FI4D048PK	B9E616	B9W616
72	–	B9C620	FI4D072PK	B9E620	B9W620
96	–	B9C623	FI4D096PK	B9E623	B9W623
144	–	B9C621	FI4D144PK	B9E621	B9W621

For an exhaustive selection contact Belden customer service or your local Belden Representative for more details.



Optical Fiber Distribution Cable

FiberExpress Distribution Cables (continued)

Tight Buffer – Indoor/Outdoor Riser, Plenum & LSZH Rated

Indoor/Outdoor Specifications

- Environmental Protection
  - UV Resistant Jacket
  - Moisture Resistant Jacket
  - Fungus Resistant Jacket
  - Water Blocking Aramid
  - Water Blocking Tape

Additional Options

- MSHA (Mining) Approvals

Indoor/Outdoor Specifications

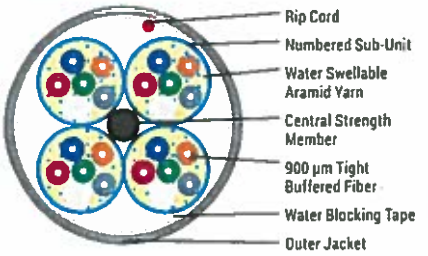
Bend Radius (vs. Cable OD)

Installation	20 x OD
Operation	10 x OD

Temperature Range

Storage	-40°C to 70°C (-40 to 158°F)
Installation	-20 to 70°C (-4 to 158°F)
Operation	-40 to 70°C (-40 to 158°F)

Legend



Compliance

- TIA/EIA-568-C.3
- ISO/IEC 11801, 2nd Edition
- Telcordia GR-20-CORE
- RoHS II 2011/65/EU
- REACH EC1907-2006
- NEC/CEC OFNR/OFN FT.4 (RISER - PVC)
- NEC/CEC OFNR/OFN FT.4 (LSZH - FRPE)
- NEC/CEC OFNP/OFN FT.6 (PLENUM - PVC or PVDF)

Description	Construction	Fiber Count	Fiber	Sub-Unit OD	Cable OD		Weight		Tensile Strength			
									Operation		Installation	
				mm	mm	in	Kg/km	lb/1000 ft.	N	lbs-f	N	lbs-f
Non-Unitized		2	900 µm TB	N/A	4.8	0.19	22	15	222	50	556	125
		4	900 µm TB	N/A	4.8	0.19	25	17	222	50	556	125
		6					31	21				
		8			5.8	0.23	36	24	334	75	667	150
		10					39	26				
		12					43	29				
		16			8.8	0.35	64	43	556	125	1112	250
		24					80	54				
Unitized 6-Fiber Sub-Units		24	900 µm TB	4.5	13.1	0.52	145	97	1001	225	2002	450
		36			16.0	0.63	221	148	1668	375	3336	750
Unitized 12-Fiber Sub-Units		36	900 µm TB	5.5	14.1	0.56	162	109	1001	225	2002	450
		48			15.5	0.61	207	139	1423	320	2847	640
		72			19.0	0.75	321	216	2002	450	4226	950
		96			22.8	0.90	536	360	2780	625	5560	1250
		144			25.4	1.00	602	404	4226	950	8452	1900

Above specifications provide a general representation for the product family. Improved specifications may exist for Riser, Plenum or LSZH constructions. Consult individual technical data sheets for exact specifications.

FiberExpress Armored Distribution Cables (continued)

Tight Buffer – Indoor/Outdoor, Riser and Plenum Rated

Indoor/Outdoor Specifications

- Environmental Protection
  - UV Resistant Jacket
  - Moisture Resistant Jacket
  - Fungus Resistant Jacket
  - Water Blocking Aramid
  - Water Blocking Tape

Additional Options

- MSHA (Mining) Approvals

Indoor/Outdoor Specifications

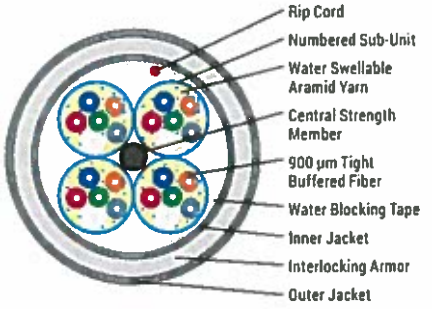
Bend Radius (vs. Cable OD)

Installation	20 x OD
Operation	15 x OD

Temperature Range

Storage	-40°C to 70°C (-40°F to 158°F)
Installation	-20°C to 70°C (-4°F to 158°F)
Operation	-40°C to 70°C (-40°F to 158°F)

Legend



Compliance

- TIA/EIA-568-C.3
- ISO/IEC 11801, 2nd Edition
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- NEC/CEC OFNR/OFN FT.4 (RISER - PVC)
- NEC/CEC OFNR/OFN FT.4 (LSZH - FRPE)
- NEC/CEC OFNP/OFN FT.6 (PLENUM - PVC or PVDF)

Description	Construction	Fiber Count	Fiber	Sub-Unit OD	Cable OD		Weight		Tensile Strength			
									Operation		Installation	
				mm	mm	in	Kg/km	lb/1000 ft	N	lbs-f	N	lbs-f
Non-Unitized		6	900 µm TB	N/A	14.5	0.57	189	127	360	81	1201	270
		12			15.7	0.62	150	223	400	90	1334	300
		24			17.0	0.67	335	225				
Unitized 6-Fiber Sub-Units		24	900 µm TB	4.5	21.5	0.85	391	263	890	200	2700	600
		36			25.3	1.00	548	368				
Unitized 12-Fiber Sub-Units		48	900 µm TB	5.5	24.6	0.97	540	363	890	200	2700	600
		72			27.8	1.09	716	481				
		96			32.5	1.28	930	625				
		144			35.6	1.40	1005	675				

Above specifications provide a general representation for the product family. Improved specifications may exist for Riser, Plenum or LSZH constructions. Consult individual technical data sheets for exact specifications.

Fiber*Express* Armored Distribution Cables (continued)

Tight Buffer – Indoor/Outdoor Riser & Plenum Rated

Standard Indoor/Outdoor Configurations

Fiber Count	Belden Part Number			
	OM1 Black	OM3 Black	OM4 Black	OS2 Black
Non-unitized - Riser				
6	B9B230T	B9C230T	B9E230T	B9W230T
12	B9B231T	B9C231T	B9E231T	B9W231T
24	B9B232T	B9C232T	B9E232T	B9W232T
Non-unitized - Plenum				
6	B9B240T	B9C240T	B9E240T	B9W240T
12	B9B241T	B9C241T	B9E241T	B9W241T
24	B9B242T	B9C242T	B9E242T	B9W242T
Unitized 6-Fiber Sub-Units - Plenum				
24	B9B243T	B9C243T	B9E243T	B9W243T
Unitized 12-Fiber Sub-Units - Plenum				
48	B9B245T	B9C245T	B9E245T	B9W245T
72	B9B246T	B9C246T	B9E246T	B9W246T
96	B9B247T	B9C247T	B9E247T	B9W247T
144	B9B248T	B9C248T	B9E248T	B9W248T

For an exhaustive selection contact Belden customer service or your local Belden Representative for more details.

BELDEN

SECTION FOUR

Workstation Outlets

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Belden offers a wide variety of workstation outlet systems designed for maximum flexibility, durability, aesthetics and manageability. These systems are available using Belden KeyConnect modularity, MediaFlex flexibility and MDVO-Style options. They come in a wide range of styles, colors and configurations, including single-gang and double-gang faceplates, stainless steel faceplates, adapters and boxes and multimedia outlets and inserts. Several innovative tools and accessories that ease termination and simplify network administration are also available.

KeyConnect Series feature a variety of faceplates, adapters and boxes that are compatible with all KeyConnect UTP and Multimedia Modules. Each modular component of the KeyConnect Workstation Outlet System seamlessly fits together to accommodate any surface mount, furniture or standard electrical plate outlet installation.

MediaFlex Series include a full line of modular faceplates, adapter boxes and inserts that offer the ultimate flexibility in configuring multimedia workstation outlets. They feature a front access design that allows inserts to be easily snapped in and out of openings for fast installation and upgrades.

MDVO Outlet Systems include a wide range of flush and angled entry faceplates, surface adapter boxes, multimedia outlet boxes, multi-user outlet boxes and modular furniture adapters that accept MDVO-Style Modules to support diverse configurations of voice, data and multimedia applications.

The LabelFlex Solution simplifies network management by enabling installers to quickly produce application specific labels for most Belden products, including Modular Jack Connectors, Cross-Connect Systems, Patch Panels, KeyConnect series, MediaFlex series and cable applications.

Workstation Outlets

KeyConnect Faceplates

Compatible with all KeyConnect UTP and Multimedia Modules, KeyConnect Faceplates are designed for maximum flexibility, durability, aesthetics and manageability. They are available in a variety of styles, colors and port configurations to meet all work area outlet application needs, and they provide for easy outlet identification.

Features & Benefits:

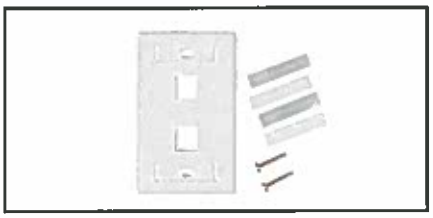
- KeyConnect Faceplates are compatible with all KeyConnect jacks and multimedia modules
- KeyConnect Faceplates are available in almond and electrical white to suit any office decor
  - Fire-retardant plastic with UV stabilizer for protection against color degradation
  - Top and bottom labeling windows for easy outlet identification
  - Compatible with LabelFlex labeling solution
- KeyConnect Faceplates are available in stainless steel finish for institutional applications
- KeyConnect Faceplates are available with mounting studs for wall-mount phone installation
  - Available in stainless steel and white plastic

Faceplates

Description	Belden Part Number	
	Almond	Elec. White
KeyConnect Faceplates		
1-port, with ID Windows, Single-gang	AX103922	AX102660
2-port, with ID Windows, Single-gang	AX103923	AX102655
4-port, with ID Windows, Single-gang	AX102248	AX102249
6-port, with ID Windows, Single-gang	AX102250	AX102251
6-port, with ID Windows, Double-gang	AX102670	AX102671
12-port, with ID Windows, Double-gang	AX102256	AX102257
Single-gang Back Box, 1.89 in.	AX104127	AX102657
Double-gang Back Box, 1.89 in.	AX104130	AX104131

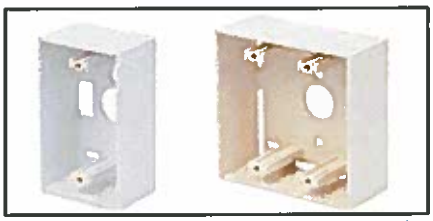
Contact Customer Service for other colors and configurations.

Description	Belden Part Number
KeyConnect Stainless Steel Faceplates with ID Windows	
1-Port, with ID Windows, Single-gang	AX104230
2-Port, with ID Windows, Single-gang	AX104231
4-Port, with ID Windows, Single-gang	AX104232
6-Port, with ID Windows, Single-gang	AX104233
4-Port, with ID Windows, Double-gang	AX104479
6-Port, with ID Windows, Double-gang	AX104480
12-Port, with ID Windows, Double-gang	AX104234
KeyConnect Wall Mount Phone Plates	
Stainless Steel, Recessed Port	AX104126
Elec. White Plastic, Recessed Port	AX102902



AX102655, KeyConnect Single-gang, 2-port Faceplate, Electrical White

AX102256, KeyConnect Double-gang, 12-port Faceplate, Almond

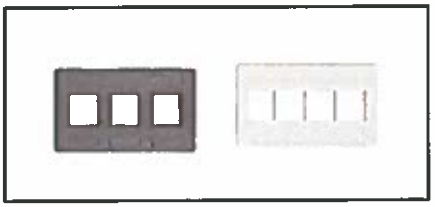


AX102657, KeyConnect Single-gang Back Box, Electrical White
AX104130, KeyConnect Double-gang Back Box, Almond

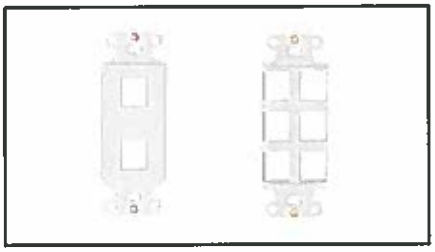
AX102902, KeyConnect Wall Mount Phone Plate, Electrical White, Recessed Port

Workstation Outlets (continued)

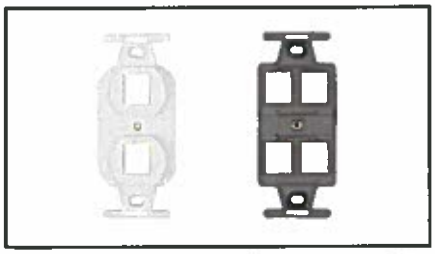
KeyConnect Adapters and Boxes



AX102292, KeyConnect Modular Furniture Adapters: 3-Port, Black and AX103926, 4-port, Almond



AX104112, KeyConnect Decora Adapters: 2-Port, Electrical White and AX104118, 6-port, Electrical White



AX104121, KeyConnect 106 Adapters: 2-Port, Electrical White and AX104125, 4-port, Black

AX104134, KeyConnect Side Entry Boxes: 4-port, Electrical Almond

KeyConnect Adapters and Boxes in various styles, sizes and colors provide flexible surface mount, modular furniture and standard electrical plate outlet installation, including high-density workstation outlets.

Features & Benefits:

- KeyConnect Adapters available in Decora and 106 styles for use with standard electrical plates
- Available in Decora-style 2, 4 and 6-port and 106-style 2 and 4-port configurations for design flexibility
- KeyConnect Modular Furniture Adapters available in 3 and 4-port configurations for high-density workstation outlets in office furniture
- KeyConnect Adapters available in almond, electrical white and black to match electrical plates and suit any office decor
- KeyConnect Boxes available in 1, 2, 4 and 6-port configurations for design flexibility
- KeyConnect Boxes equipped with port shutters to provide dust protection to UTP jacks
- Fire-retardant plastic with UV stabilizer for protection against color degradation
- KeyConnect Adapters are compatible with all KeyConnect UTP and Multimedia Modules

KeyConnect Adapters and Boxes

Description	Belden Part Number		
	Almond	Elec. White	Black
KeyConnect Adapters			
Modular Furniture Adapter, 3-port	AX103925	AX102291	AX102292
Modular Furniture Adapter, 4-port	AX103926	AX102900	AX102901
Decora Adapter, 2-port	AX104111	AX104112	AX104113
Decora Adapter, 4-port	AX103927	AX102266	AX102267
Decora Adapter, 6-port	AX104117	AX104118	AX104119
106 Adapter, 2-port	AX104120	AX104121	AX104122
106 Adapter, 4-port	AX104123	AX104124	AX104125
KeyConnect Side-Entry Boxes, with Shutter Door			
1-port	AX104132	AX102651	–
2-port	AX104133	AX102652	–
4-port	AX104134	AX102653	–
6-port	AX104135	AX102654	–
KeyConnect Side-Entry Boxes, without Shutter Door			
1-port	AX105352-AL	AX105352-EW	AX105352-BK
2-port	AX105353-AL	AX105353-EW	AX105353-BK
4-port	AX105354-AL	AX105354-EW	AX105354-BK
6-port	AX105355-AL	AX105355-EW	AX105355-BK

Contact Customer Service for other colors and configurations.

Workstation Outlets (continued)
KeyConnect Multimedia Modules

KeyConnect Multimedia Modules

Description	Belden Part Number		
	Almond	Elec. White	Black
Multimedia Modules, Copper			
3.5mm Audio Coupler, F/F, Gold	AX105334-AL	AX105334-EW	AX105334-BK
3.5mm Audio Coupler, F/Solder, Gold	AX105335-AL	AX105335-EW	AX105335-BK
S video Coupler, F/F	AX105336-AL	AX105336-EW	AX105336-BK
RCA Gold plated Coupler, F/F, Red	AX105337-AL	AX105337-EW	AX105337-BK
RCA Gold plated Coupler, F/F, White	AX105338-AL	AX105338-EW	AX105338-BK
RCA Gold plated Coupler, F/F, Yellow	AX105339-AL	AX105339-EW	AX105339-BK
RCA Gold plated Coupler, F/F, Green	AX105340-AL	AX105340-EW	AX105340-BK
RCA Gold plated Coupler, F/F, Blue	AX105341-AL	AX105341-EW	AX105341-BK
Video F Coax 3GHz, Recessed, Gold Plated	AX105346-AL	AX105346-EW	AX105346-BK
Video F Coax, Recessed	AX102903	AX102904	AX102905
Video F Coax, Flush	AX102906	AX102907	AX102908
Video BNC Coax, Flush	AX104573	AX104575	AX104574
USB 3.0 Coupler, A to A	AX105342-AL	AX105342-EW	AX105342-BK
USB 2.0 Coupler, B to B	AX105344-AL	AX105344-EW	AX105344-BK
HDMI Coupler (Version 1.4)	AX105345-AL	AX105345-EW	AX105345-BK
Multimedia Modules, Fiber			
LC Duplex OM1 (Beige Adapter)	AX102415	AX102416	AX102417
LC Duplex OM3 (Aqua Adapter)	AX104937	AX104938	AX104939
LC Duplex OM4 (Erika Violet Adapter)	AX105641-AL	AX105641-EW	AX105641-BK
LC Duplex SM (Blue Adapter)	AX102419	AX102420	AX102421
LC Duplex SM/APC (Green Adapter)	AX105642-AL	AX105642-EW	AX105642-BK
SC Simplex OM1 (Beige Adapter)	AX102683	AX102684	AX102685
SC Simplex OM3 (Aqua Adapter)	AX105643-AL	AX105643-EW	AX105643-BK
SC Simplex SM (Blue Adapter)	AX102686	AX102687	AX102688
SC/APC Simplex SM (Green Adapter)	AX105374-AL	AX105374-EW	AX105374-BK
ST Compatible MM/SM	AX102242	AX102243	AX102244

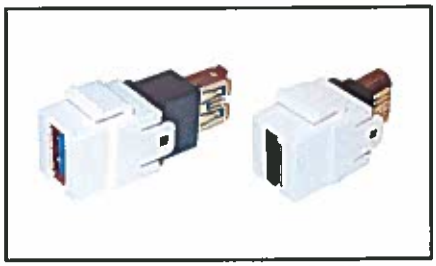
RJ45 Plug Kits and Accessories

Description	Belden Part Number
Multimedia Modules, Fiber	
Video F Coax 3GHz, Recessed, Gold Plated	AX105346-AL
Video F Coax, Recessed	AX102903
Video F Coax, Flush	AX102906
Video BNC Coax, Flush	AX104573
USB 3.0 Coupler, A to A	AX105342-AL
Video F Coax, Flush	AX102906
Video BNC Coax, Flush	AX104573
USB 3.0 Coupler, A to A	AX105342-AL

AX102417, LC Duplex module

AX105334-EW, 3.5mm Audio Coupler and AX105336-EW, S-video Coupler

RCA Gold-plated Couplers (AX105341-EW, AX105340-EW, AX105339-EW, AX105337-EW, AX105338-EW)



AX105342-EW, USB 3.0 Coupler and AX105345-EW, HDMI Coupler

Workstation Outlets (continued)

KeyConnect Tamper-Resistant Faceplates

AX104687, KeyConnect Tamper-Resistant Faceplate with locking cover, patch cord seal and wall gasket

AX104688, KeyConnect Tamper-Resistant Faceplate with locking cover

Belden offers two Tamper-Resistant Faceplates for various applications.

Water Resistant Outlet
The KeyConnect Water Resistant Outlet features a wall mounting gasket and patch cord entry seal, and is designed for the healthcare environment.

Secure Outlet
The KeyConnect Secure Outlet is designed for any application where access to network connections needs to be controlled.

KeyConnect Tamper Resistant Faceplates

Description	Belden Part Number
	White
Faceplate Kit, KeyConnect-Style	
4-port, single-gang with locking cover, patch cord seal and wall gasket (dust and water resistant)	AX104687
4-port, single-gang with locking cover (secure outlet)	AX104688
Secure screw driver bit (Drilled Spanner 1/4")	AX104689

MediaFlex Faceplate Kit for KeyConnect Modules:
AX102428, Single-gang, 4-port, Almond
AX102430, Single-gang, 6-port, Almond

MediaFlex Faceplate Kits

The MediaFlex Faceplate Kits are offered for both KeyConnect and for MDVO-Style Modules.

The MediaFlex Faceplate Kit for KeyConnect Modules offers flexibility in configuring multimedia workstation outlets for current and future network needs. The front access design of the outlets offers easy installation and upgrades while multiple colors, Single-gang and Double-gang configurations and labeling capabilities meet work area aesthetics, density and identification needs.

The MDVO pre-configured MediaFlex Faceplate Kits include a plate, flush MDVO-style inserts, filler inserts, MDVO blank, labeling window covers, labeling paper and all necessary mounting screws.

AX101779, MediaFlex Faceplate Kit, MDVO-Style, 2 port

AX101785, MediaFlex Faceplate Kit, MDVO-Style, 4 port

AX101786, MediaFlex Faceplate Kit, MDVO-Style, 6 port

MediaFlex Faceplate Kits

Description	Belden Part Number			
	Gray	Almond	Elec. White	Black
MediaFlex Faceplate Kit, KeyConnect-Style				
2-port, Flush, Single-gang	AX104493	AX104494	AX104495	AX104496
4-port, Flush, Single-gang	AX104485	AX102428	AX102429	AX104489
6-port, Flush, Single-gang	AX104486	AX102430	AX102431	AX104490
2-port, Angled, Single-gang	AX104497	AX104498	AX104499	AX104500
4-port, Angled, Single-gang	AX104487	AX102432	AX102433	AX104491
6-port, Flush, Double-gang	–	AX102523	AX102524	–
8-port, Flush, Double-gang	–	AX102519	AX102520	–
12-port, Flush, Double-gang	AX104488	AX102434	AX102435	AX104492
6-port,Angled, Double-gang	–	AX102521	AX102522	–
8-port,Angled, Double-gang	–	AX102436	AX102437	–
MediaFlex Faceplate Kit, MDVO-Style				
2-port, Flush	AX101778	AX101779	AX101780	AX101781
4-port, Flush	AX101782	AX101783	AX101784	AX101785
6-port, Flush	AX101786	AX101787	AX101788	AX101789

Workstation Outlets (continued)

MediaFlex Plates, Adapter Boxes and Accessories

MediaFlex Plates are one part of the comprehensive line of plates and inserts that snap together to create a full line of modular workstation outlets.

MediaFlex Plates can be mounted over standard NEMA type outlet boxes and rings to provide support for a variety of MediaFlex Adapters and Inserts. The fully modular construction combined with the front access design provides extensive configuration flexibility for current and future network needs. MediaFlex Plates are available in Single-gang and Double-gang configurations.

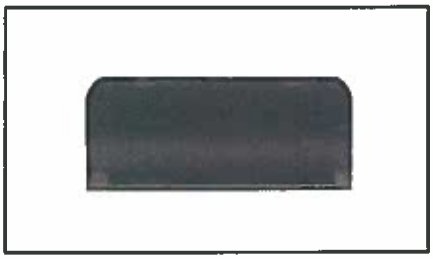
The Double-gang faceplate comes with a stand-off ring included in the package. This ring allows for easy mounting with virtually any industry electrical box or mud/adapter rings, therefore providing added installation flexibility.

Each plate has the capacity of up to 6 ports per Single-gang and 12 ports per Double-gang.

MediaFlex Surface Adapter Boxes can be mounted over standard NEMA type outlet boxes and rings to provide support for the MediaFlex plates. The MediaFlex Surface Adapter Boxes are available as a Double gang configuration. The double gang box allows more room for cable management and bend radius control.

AX101748, MediaFlex Plate, Single-gang

AX101870, MediaFlex Plate, Double-gang



AX101777, Labeling Window Cover for MediaFlex Plates

AX101874, MediaFlex Adapter Box, Double-gang

MediaFlex Workstation Outlets

Description	Belden Part Number			
	Gray	Almond	Elec. White	Black
MediaFlex Plates				
Single-gang	AX101745	AX101746	AX101747	AX101748
Double-gang	AX101869	AX101870	AX101871	AX101872
MediaFlex Surface Adapter Boxes				
Single-gang	AX102480	AX102481	AX102482	AX102483
Double-gang	AX101873	AX101874	AX101875	AX101876

Contact Customer Service for other colors and configurations.

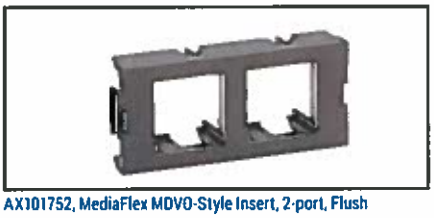
Description	Belden Part Number
MediaFlex ID Windows Covers	
Window Cover, Clear, bag of 25 units	AX101773
Window Cover, Gray, bag of 25 units	AX101774
Window Cover, Almond, bag of 25 units	AX101775
Window Cover, Elec. White, bag of 25 units	AX101776
Window Cover, Black, bag of 25 units	AX101777

Workstation Outlets (continued)
MediaFlex Inserts

MediaFlex Inserts for KeyConnect Modules: AX102410, Flush, 2-port, Almond and AX102412, Angled, 2-Port, Almond

MediaFlex Module Inserts along with MediaFlex Multimedia Inserts and MediaFlex Filler Inserts allow for the easy configuration of outlets. All inserts are front loaded and easily snapped in and out of the MediaFlex Plates for simple installation and maintenance. MediaFlex Module Inserts are available in a 2-port configuration in both Flush and Angled versions for KeyConnect-Style and MDVO-Style Modules. The inserts are two units high for the flush version and three units high for the angled version. Therefore three flush inserts or two angled inserts are required to fully populate a Single-gang MediaFlex Plate.

MediaFlex Filler Inserts are used to fill the unused spaces in low density workstation outlets. They are available in one unit and two unit sizes.



AX101752, MediaFlex MDVO-Style Insert, 2-port, Flush

AX101756, MediaFlex MDVO-Style Insert, 2-port, Angled

AX101760, MediaFlex Filler Insert, 1-unit

AX101764, MediaFlex Filler Insert, 2-unit

MediaFlex Inserts

Description	Belden Part Number	
	KeyConnect-Style	MDVO-Style
MediaFlex Module Insert		
2-port, Flush, Gray, bag of 10 pieces	AX104482	AX101749
2-port, Angled, Gray, bag of 10 pieces	AX104483	AX101753
2-port, Flush, Almond, bag of 10 pieces	AX102410	AX101750
2-port, Angled, Almond, bag of 10 pieces	AX102412	AX101754
2-port, Flush, Elec. White, bag of 10 pieces	AX102411	AX101751
2-port, Angled, Elec. White, bag of 10 pieces	AX102413	AX101755
2-port, Flush, Black, bag of 10 pieces	AX102737	AX101752
2-port, Angled, Black, bag of 10 pieces	AX102738	AX101756
MediaFlex Filler Insert	**1-Unit**	**2-Unit**
Gray, bag of 10 pieces	AX101757	AX101761
Almond, bag of 10 pieces	AX101758	AX101762
Elec. White, bag of 10 pieces	AX101759	AX101763
Black, bag of 10 pieces	AX101760	AX101764

Workstation Outlets (continued)
MediaFlex Inserts

MediaFlex Multimedia Inserts provide optimum flexibility in configuring multimedia workstation outlets that respond to any present or future network needs. MediaFlex Multimedia Inserts along with other MediaFlex Inserts allow for easy configuration of outlets. All inserts are front loaded and easily snapped in and out of the MediaFlex Plates for easy installation and maintenance.

MediaFlex Multimedia Inserts are available in Angled versions only in order to allow for proper management of cable bend radius. The inserts are three units high, therefore two inserts are required to fully populate a Single-gang faceplate and four inserts will fully populate a Double-gang faceplate.

AX101878, MediaFlex RCA Inserts, 3-port, Almond
AX101882, MediaFlex SVHS Inserts, 1-port, Almond
AX101886, MediaFlex SVGA Inserts, 1-port, Almond

AX101940, MediaFlex SC Duplex Multi-mode Insert, Almond

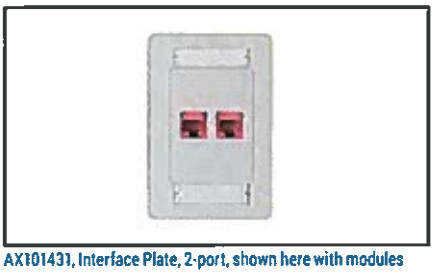
AX101937, MediaFlex SC Duplex Single-mode Insert, White

MediaFlex Inserts

Description	Belden Part Number			
	Gray	Almond	Elec. White	Black
MediaFlex Multimedia Insert, Copper				
3-port RCA	AX101877	AX101878	AX101879	AX101880
SVHS Module	AX101881	AX101882	AX101883	AX101884
SVGA Module (IDC interface)	AX101885	AX101886	AX101887	AX101888
SVGA Feed Through	AX102334	AX102335	AX102336	AX102337
SVGA Feed Through, 3.5 mm Audio	AX105158-GY	AX105158-AL	AX105158-EW	AX105158-BK
MediaFlex Multimedia Insert, Fiber				
Duplex SC Multi-mode	AX101939	AX101940	AX101941	AX101942
Duplex SC Single-mode	AX101935	AX101936	AX101937	AX101938
SC/APC Simplex SM (Green Adapter)	–	AX105374-AL	AX105374-EW	AX105374-BK

Contact Customer Service for other colors and configurations.

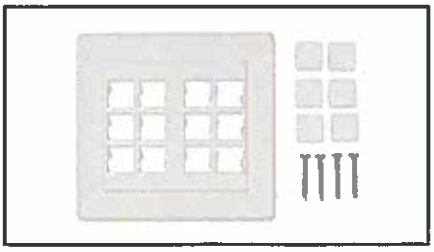
Workstation Outlets (continued)
Interface Plates, MDVO Faceplates



AX101431, Interface Plate, 2-port, shown here with modules

AX101438, Interface Plate, 4-port, with modules and
AX101441, Interface Plate, 6-port with modules

A0405257, MDVO Faceplate, 1-port



A0620807, MDVO Faceplate, 12-port

A0645267, MDVO Angled Entry Faceplate

Interface Plates combine flexibility and ease of use in work area installations. They are designed to accept the EZ-MDVO and other MDVO-Style Modules, UTP modules as well as all the MDVO multimedia modules. The Interface Plates are available in Single-gang and can accept up to 6 modules. They also have labeling capabilities using built-in labeling windows. The faceplates can be attached to standard electrical boxes or wall-mounting hardware for flush-mount installations. The faceplates can also fit over the Interface Adapter Boxes for surface mount installations.

The MDVO Angled Entry Faceplate offers better patch cord protection than traditional faceplates and optimizes patch cord bend radius control. The MDVO Angled Entry Faceplate can accept up to four EZ-MDVO or MDVO Multimedia Modules. The faceplate can be attached to standard electrical boxes or wall-mounting hardware for flush-mount installations. The faceplate can also fit over the Interface Surface Adapter Box for surface mount installations.

Interface Plates

Description	Belden Part Number
Interface Plate, Flush	
Interface Plate, Flush, 2-port, Gray	AX101431
Interface Plate, Flush, 2-port, Almond	AX101432
Interface Plate, Flush, 2-port, White	AX101433
Interface Plate, Flush, 2-port, Black	AX101434
Interface Plate, Flush, 4-port, Gray	AX101435
Interface Plate, Flush, 4-port, Almond	AX101436
Interface Plate, Flush, 4-port, White	AX101437
Interface Plate, Flush, 4-port, Black	AX101438
Interface Plate, Flush, 6-port, Gray	AX101439
Interface Plate, Flush, 6-port, Almond	AX101440
Interface Plate, Flush, 6-port, White	AX101441
Interface Plate, Flush, 6-port, Black	AX101442

MDVO Faceplate

Description	Belden Part Number
MDVO Faceplate Flush	
MDVO Faceplate, Flush, 1-port, Single-gang, Gray	A0405255
MDVO Faceplate, Flush, 1-port, Single-gang, Almond	A0405256
MDVO Faceplate, Flush, 1-port, Single-gang, White	A0405257
MDVO Faceplate, Flush, 1-port, Single-gang, Black	A0405258
MDVO Faceplate, Flush, 8-port, Single-gang, Gray	A0405294
MDVO Faceplate, Flush, 8-port, Single-gang, Almond	A0405295
MDVO Faceplate, Flush, 8-port, Single-gang, White	A0405296
MDVO Faceplate, Flush, 8-port, Single-gang, Black	A0405298
MDVO Faceplate, Flush, 12-port, Double-gang, Gray	A0620806
MDVO Faceplate, Flush, 12-port, Double-gang, Almond	A0620807
MDVO Faceplate, Flush, 12-port, Double-gang, White	A0620808
MDVO Faceplate, Flush, 12-port, Double-gang, Black	A0620809
MDVO Angled Entry Faceplate	
MDVO Angled Entry Faceplate, 4-port, Gray	A0645267
MDVO Angled Entry Faceplate, 4-port, Almond	A0645268
MDVO Angled Entry Faceplate, 4-port, White	A0645269
MDVO Angled Entry Faceplate, 4-port, Black	A0645270

Workstation Outlets (continued)

Interface Surface Adapter Boxes, MDVO Adapters

The Interface/MDVO Surface Adapter Box allows surface mounting of Interface Plates as well as MDVO Flush and Angled entry faceplates. The box can be mounted on any flat surface or can be attached to standard electrical boxes or wall-mounting hardware for additional storage space ordered separately.

The MDVO 106 Adapters are designed for installations using standard NEMA electrical-style faceplates also referred to as 106-type or duplex wall plates.

The MDVO Deco Adapter is designed for installations using Decora style wall plates.

MDVO Modular Furniture Adapters are the ideal outlet adapters for open office furniture applications.

Interface/MDVO Surface Adapter Box

Description	Belden Part Number
Single-gang	
Interface/MDVO Surface Adapter Box, Single-gang, Gray	AX101474
Interface/MDVO Surface Adapter Box, Single-gang, Almond	AX101475
Interface/MDVO Surface Adapter Box, Single-gang, White	AX101476
Interface/MDVO Surface Adapter Box, Single-gang, Black	AX101477

Interface/MDVO Side Entry Box

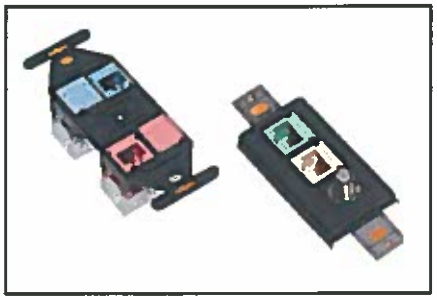
Description	Belden Part Number
Single-gang	
MDVO Side Entry Box, 2-port, Gray	A0645271
MDVO Side Entry Box, 2-port, Almond	A0645272
MDVO Side Entry Box, 2-port, White	A0645273
MDVO Side Entry Box, 2-port, Black	A0645274

MDVO Adapters

Description	Belden Part Number
106 Adapter, Deco Adapter, Furniture Adapter	
MDVO 106 Adapter, 2-port, Gray	AX100304
MDVO 106 Adapter, 2-port, Almond	AX100305
MDVO 106 Adapter, 2-port, White	AX100306
MDVO 106 Adapter, 2-port, Black	AX100307
MDVO 106 Adapter, 4-port, Gray	AX100308
MDVO 106 Adapter, 4-port, Almond	AX100309
MDVO 106 Adapter, 4-port, White	AX100310
MDVO 106 Adapter, 4-port, Black	AX100311
MDVO Deco Adapter, 3-port, Gray	A0409651
MDVO Deco Adapter, 3-port, Almond	A0409652
MDVO Deco Adapter, 3-port, White	A0409653
MDVO Deco Adapter, 3-port, Black	A0409654
MDVO Modular Furniture Adapter, 3-port, Gray	A0407071
MDVO Modular Furniture Adapter, 3-port, Almond	A0407072
MDVO Modular Furniture Adapter, 3-port, White	A0407073
MDVO Modular Furniture Adapter, 3-port, Black	A0407074
MDVO Modular Furniture Adapter, 4-port, Gray	AX100925
MDVO Modular Furniture Adapter, 4-port, Almond	AX100926
MDVO Modular Furniture Adapter, 4-port, White	AX100927
MDVO Modular Furniture Adapter, 4-port, Black	AX100928

AX101474, Interface/MDVO Surface Adapter Box

A0645271, MDVO Side Entry Box, shown here with modules

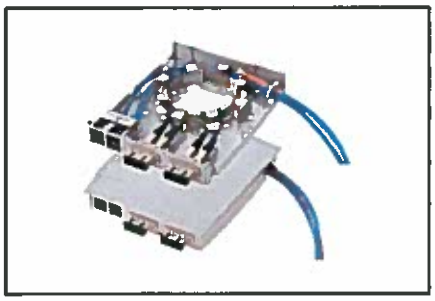


AX100311, MDVO 106 Adapter, 4-port, shown here with modules

A0409654, MDVO Deco Adapter, shown here with modules

AX100925, MDVO Modular Furniture Adapter, 4-port, shown here with modules

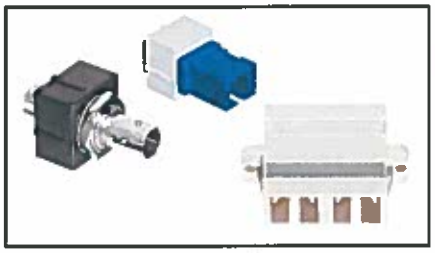
Workstation Outlets (continued)
Multimedia Outlet Boxes and Modules



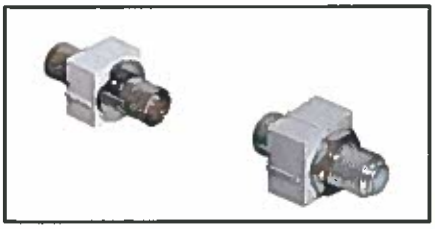
A0643206, MDVO Multimedia Outlet Box, shown here as terminated

The MDVO Multimedia Outlet Box brings unique versatility for multimedia work area installations. The box design provides cable management and helps maintain cable bend radius. The outlet box's low profile design and side-entry offers better protection for patch cords. The outlet box can accept up to six EZ-MDVO, MDVO-Style Jacks or MDVO Multimedia Modules or three SC Duplex adapters. The MDVO Multimedia Outlet Box can be mounted directly on the wall or attached to standard electrical boxes. Included with the MDVO Multimedia box are three SC Duplex Mounting bezels and three MDVO Adapters.

MDVO Multimedia Modules address audio/video and fiber applications. Fiber modules are available for LC Duplex, SC Simplex, SC Duplex and ST Compatible for multi-mode and single-mode connections. The SC Duplex Adapter is a fiber adapter sleeve with flanges that mounts into the SC Duplex mounting bezel (included in the MDVO Multimedia Outlet box). Audio/video modules are available for SVHS, RCA, BNC and Video F connection.



A0407010, MDVO ST Compatible Fiber Module
A0407005, MDVO SC Fiber Module
A0649254, SC Duplex Adapter



A0406997, MDVO BNC Coaxial Module
A0406999, MDVO Video F Coaxial Module

A0407001, MDVO-Style Coaxial, VIDEO F

Multimedia Outlet Boxes and Modules

Description	Belden Part Number
Multimedia Outlet Boxes	
MDVO Multimedia Outlet Box, 6-port, Gray	A0643205
MDVO Multimedia Outlet Box, 6-port, Almond	A0643206
MDVO Multimedia Outlet Box, 6-port, White	A0643207
MDVO Multimedia Outlet Box, 6-port, Black	A0643208

MDVO-Style Modules

Description	Belden Part Number			
	Gray	Almond	Elec. White	Black
MDVO-Style Multimedia Modules, Fiber				
LC Duplex Multi-mode	AX102209	AX102210	AX102211	AX102212
LC Duplex Single-mode	AX102213	AX102214	AX102215	AX102216
SC Simplex, Multi-mode	A0407003	A0407004	A0407005	A0407006
ST Compatible, Multi-mode	A0407007	A0407008	A0407009	A0407010

Custom multimedia connectors are also available, please contact Customer Service for more details.

SC Duplex Adapter	
SC Duplex Adapter, Multi-mode, Beige	A0649254

Description	Belden Part Number			
	Gray	Almond	Elec. White	Black
MDVO-Style Multimedia Modules, Copper				
Coaxial, BNC	A0406995	A0406996	A0406997	A0406998
Coaxial, VIDEO F	A0406999	A0407000	A0407001	A0407002
RCA, feedthrough, White insert	AX101823	AX101824	AX101825	AX101826
RCA, feedthrough, Yellow insert	AX101827	AX101828	AX101829	AX101830
RCA, feedthrough, Red insert	AX101831	AX101832	AX101833	AX101834
RCA, feedthrough, Black insert	AX101835	AX101836	AX101837	AX101838
SVHS, feedthrough	AX101839	AX101840	AX101841	AX101842
3.5 mm Stereo	AX102624	AX102625	AX102626	AX102627

Workstation Outlets (continued)

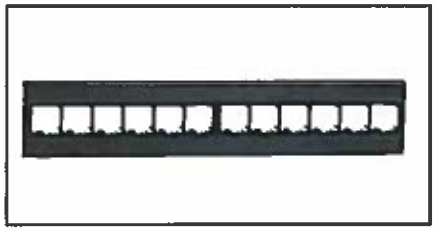
Multi-User Outlet Box, Adapter Strips and CAT5E BIX DVO Outlets

The Multi-User Outlet Box design allows for mixed media installations with a choice of connection strips. The box can accept either one or two 12-port MDVO Adapter Strips, CAT5E Connector Module Strips (BIX or 110), or a combination of both for a maximum of 24 connections.

The CAT5E BIX DVO Workstation Outlets are robust and installer-friendly products, combining punch-down connectors with standard modular jacks. The outlet's unique, completely enclosed housing protects the connectors and allows the wires to be front-terminated on BIX Insulation Displacement Connectors (IDC). The snap-on cover plate allows easy access and eliminates visible mounting screws.

CAT5E BIX DVO Workstation Outlets offer headroom over the Category 5e cabling standard.

AX100222, Multi-User Outlet Box, shown here with modules



AX100223, MDVO Adapter Strip, 12-port

CAT5E BIX DVO Outlets

Multi-User Outlet Box

Description	Belden Part Number			
	Gray	Almond	White	Black
Mutli-User Outlet Box and Adapter Strips				
Multi-User Outlet Box, 24-port	AX100219	AX100220	AX100221	AX100222

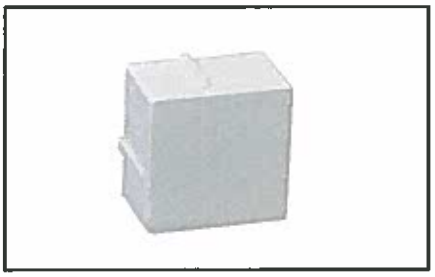
Adapter Strips

Description	Belden Part Number
Adapter Strips for Mutli-User Outlet Box	
KeyConnect Adapter Strip, 12-port, Empty, Black	AX104615
MDVO Adapter Strip, 12-port, Empty, Black	AX100223
CAT5E HD-BIX Connector Module Strip, Universal Wiring 12-port, T568A/B	AX100224
CAT5E HD-110 Connector Module Strip, Universal Wiring 12-port, T568B/A	AX100494

CAT5E BIX DVO Outlets

Description	Belden Part Number			
	Gray	Almond	White	Black
Surface and Flush Mount				
Surface, T568A, 1-port	AX100382	AX100383	AX100384	AX100385
Surface, T568A, 2-port	AX100390	AX100391	AX100392	AX100393
Surface, T568A, 4-port	AX100398	AX100399	AX100400	AX100401
Flush, T568A, 1-port	AX100334	AX100335	AX100336	AX100337
Flush, T568A, 2-port	AX100342	AX100343	AX100344	AX100345
Flush, T568A, 4-port	AX100350	AX100351	AX100352	AX100353

Workstation Outlets (continued)
Accessories



A0405538, MDVO Blank

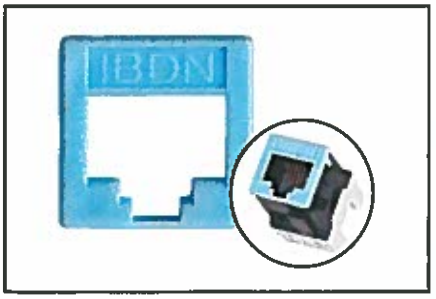
MDVO Blank Inserts can be used in any MediaFlex outlets, Interface plates, MDVO faceplates, adapters or boxes to fill in unused ports.

The Colored Bezels are plastic inserts that fit over the face of MDVO-Style Modules to modify their color. They are particularly useful in installations where the churn rate is high and color identification of outlets is critical (ex.: segmented network with security levels). They also contribute to simplifying the management of the cabling infrastructure by using only one color of module for Moves, Adds and Changes (MACs).

ID Tabs are color-coded identification caps that can be inserted over the MDVO-Style Modules. The ID tabs are available as blank, data or voice coded. They are available in eleven colors to facilitate identification and to match modern office decor. The flexible identification cap also acts as a protective cover eliminating exposure to dust and other contaminants when the module is not in use.

KeyConnect-Style Accessories include blank inserts available in almond, white and black as well as Dust Covers in clear plastic to protect unused ports.

AX100196, ID Tab



AX102022, Colored Bezel

AX101790, Dust Cover, AX102263, KeyConnect Blank Insert

MDVO-Style Accessories

Description	Belden Part Number			
	Gray	Almond	White	Black
MDVO Blank Insert	A0405536	A0405537	A0405538	A0405539
	ID Tab, BLANK	ID Tab, DATA	ID Tab, VOICE	COLORED BEZEL
Gray	AX100182	AX100193	AX100204	AX102014
Almond	AX100183	AX100194	AX100205	AX102015
White	AX100184	AX100195	AX100206	AX102016
Black	AX100185	AX100196	AX100207	AX102017
Orange	AX100186	AX100197	AX100208	AX102018
Red	AX100187	AX100198	AX100209	AX102019
Yellow	AX100188	AX100199	AX100210	AX102020
Green	AX100189	AX100200	AX100211	AX102021
Blue	AX100190	AX100201	AX100212	AX102022
Purple	AX100191	AX100202	AX100213	AX102023
Brown	AX100192	AX100203	AX100214	AX102024

Description	Belden Part Number
Interface Plate ID Window label and clear cover, 50 pieces per bag	AX101868

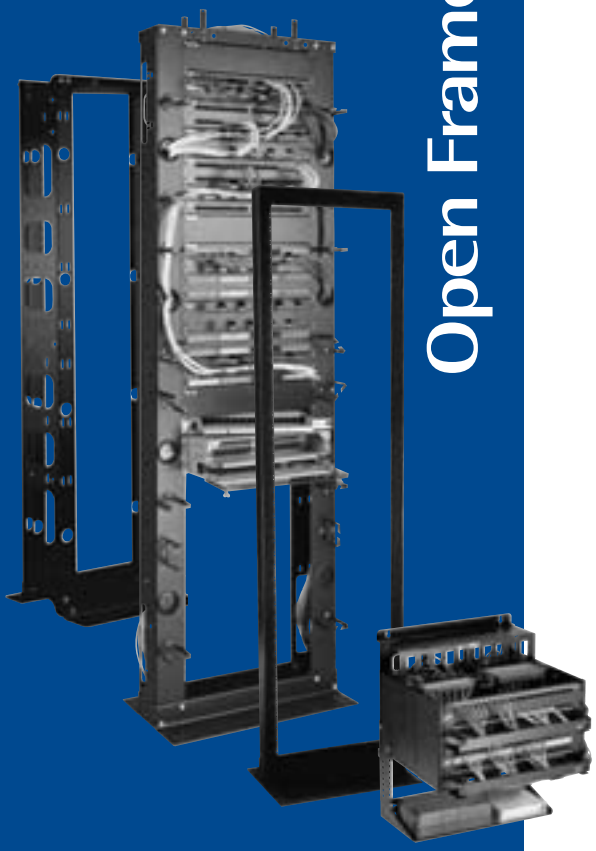
KeyConnect-Style Accessories

Description	Belden Part Number			
	Clear	Almond	White	Black
KeyConnect-Style Blank Insert	–	AX102261	AX102262	AX102263
Dust Cover, Clear, bag of 50 units	AX101790	–	–	–

Description	Belden Part Number
KeyConnect ID Window label and clear cover, 100 pieces per bag	AX104680

BELDEN
SENDING ALL THE RIGHT SIGNALS

12 Open Frame Racks and Accessories



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Please refer to “Terms of Use of Master Catalog” on page 22.22

Introduction

Belden: Resources Of a Higher Magnitude

Belden is the largest company of its kind, combining cable, connectivity, enclosures and many other product solutions for highly technical industries around the globe. As the exclusive occupant in this market position, Belden provides thousands of satisfied customers with over a billion dollars worth of trusted solutions every year, much of which supports the commercial networking sector. By combining our expertise in the design and manufacture of cable, connectivity, enclosures and related products, Belden now offers a product line of staggering magnitude, engineering triumphs and rich resources — worldwide.

Belden Open Frame Racks

The complete line of Belden Open Frame Racks are designed to meet the unique needs of data networks and other cabling systems. Whether it's the protection of sensitive equipment, the ability to mount equipment of varied sizes and depths, or the need to organize and neatly route installed cable, Belden has the solution you need. Belden provides you with single source convenience for all of your cable management requirements.

Enclosures and Racks

Choose from a variety of vertical enclosures, open frame racks and wall mount enclosures, all expertly engineered to optimize product quality and performance and manufactured in the United States for quick availability. Although standard configurations of the most popular enclosures are offered for fast delivery needs, all custom enclosures and racks have numerous mounting, cable and patch cord management options, along with a variety of accessories. This selection of Belden enclosures and racks will meet virtually any mounting, storage or protection requirement for your application.

Cable Ties

Belden cable ties are available in a complete variety of sizes for varying load capacities and are available in standard nylon or weather-resistant nylon.

Single Sourcing Convenience

The Cable Management product families in this catalog are offered to cabling professionals for ultimate convenience in single sourcing. As a Belden customer, you also have the assurance of total dependability by working with a market leader and a trusted partner who has a vested interest in optimizing your operations and investments. We want to make sure you not only get the products you need with ease, but they also perform reliably.

Cable Ties

Type	Tensile/Shear Strength	Length	Weather Resistant
Miniature	18 lbs.	4″ or 8″	
Intermediate	40 lbs.	5 1/2″ to 14 1/2″	●
Standard	50 lbs.	8″ to 17 3/4″	●
Heavy Duty	120 lbs.	15″	
Heavy Duty	175 lbs.	17 3/4″ to 48″	
Velcro	23 lbs./sq.in	8″ or 12″	

Open Frame Racks

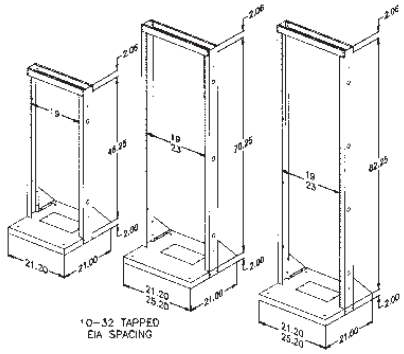
Type	Rack Space	Heights (inches)	Panel Mount (inches)	Width (inches)	Depth (inches)
Swing Rack	43U	84	19	34, 38	15
Distribution Rack	25, 39, 44U	48, 72, 84	19, 23	21.2, 25.2	21
Cable Management Rack	44U	84″	19	23.75, 25.75	15, 22
Copper Rack Kit	44U	84	19	30.75	14
Fiber Rack Kit	44U	84	19, 23	25, 29	14
Wall Mount Rack — Swing Out	19, 25U	36, 48	19	20	12 to 18
Wall Mount Rack — Hinged	2U, 4U, 6U	3.5, 7, 11	19	19, 19.5	4, 9.5

Open Frame Rack Kits & Accessories

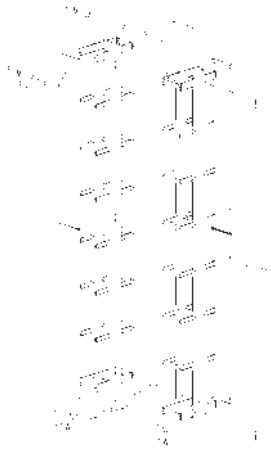
Distribution Racks, Vertical Cable Managers

AX101174 Rack Kit

BDR-Style Distribution Racks



BDR-Style Vertical Cable Managers



Open Frame Rack Kits

Rack Kits are offered for both copper and fiber cabling. Welded and knock-down rack assemblies are available for copper; knock-down rack kits are available for fiber. All units feature one rack with either one or two vertical and two horizontal channels.

Description	Mounting	Weight		Belden Part Number
		Lbs.	Kg	
Copper Rack Kit				
Welded Rack Assembly — Black, 19″ x 84″ (7′) (One Rack w/ 2 Vertical & 2 Horizontal Channels)	44U	145	66	**AX101174**
Knock-Down Rack Assembly — Black, 19″ x 84″ (7′) (One Rack w/ 2 Vertical & 2 Horizontal Channels)	44U	145	66	**AX101175**
Fiber Rack Kit				
Knock-Down Rack Assembly — Black, 19″ x 84″ (7′) (One Rack with 1 Vertical & 2 Horizontal Channels)	44U	106	49	**AX101176**
Knock-Down Rack Assembly — Gray, 23″ x 84″ (7′) (One Rack with 1 Vertical & 2 Horizontal Channels)	44U	113	52	**AX101177**
Floor Mount Rack				
Knock-Down Rack Assembly — Black, 19″ x 84″ (7′) (w/ Two Horizontal Channels)	44U	65	30	**AX101178**
Knock-Down Rack Assembly — Gray, 19″ x 84″ (7′) (w/ Two Horizontal Channels)	44U	65	30	**AX101254**
Knock-Down Rack Assembly — Black, 23″ x 84″ (7′) (w/ Two Horizontal Channels)	44U	70	32	**AX100931**
Knock-Down Rack Assembly — Gray, 23″ x 84″ (7′) (w/ Two Horizontal Channels)	44U	70	32	**AX100930**
Welded Rack Assembly — Black, 19″ x 84″ (7′) (w/ Two Horizontal Channels)	44U	65	30	**AX101179**

Distribution Racks

The Distribution Rack features 19″ or 23″ mounting rails for attaching a variety of rack mounted equipment. 48″, 72″ and 84″ high models are included in the line.

Description	Mounting	Weight		Belden Part Number
		Lbs.	Kg	
48″ Distribution Rack, 19″ Mounting Rails	25U	34	15	**BDR-4819**
72″ Distribution Rack, 19″ Mounting Rails	39U	43	20	**BDR-7219**
84″ Distribution Rack, 19″ Mounting Rails	39U	50	23	**BDR-8419**
84″ Distribution Rack, 19″ Mounting Rails, 4″ Channel with Angle Base,12-24 EIA Spacing	45U	60	27	**BDR-8419-4**
72″ Distribution Rack, 23″ Mounting Rails	39U	45	20	**BDR-7223**
84″ Distribution Rack, 23″ Mounting Rails	45U	52	24	**BDR-8423**
Caster Kit for BDR Racks				**B8912-0100**

Vertical Cable Managers

The Vertical Cable Managers are used to manage patch cords in front and cables in the back. Available in 72″ and 84″ heights, the units are available with removable side panels and doors. They can be used with Distribution Racks (BDR-Style) and Rack Kit.

Description	Belden Part Number
72″ Vertical Cable Manager	**BDR-7201**
84″ Vertical Cable Manager	**BDR-8401**
84″ Vertical Cable Manager, Double Sided with Cover	**BDR-8403**

These products are in the process of being assessed for RoHS compliance. Please check our Web Site for the most current RoHS status.

Open Frame Rack Kits & Accessories

Vertical and Horizontal Cable Management Channel,
Cable Management Racks & Server Racks

AX101181 Horizontal Cable Management Channel

AX101180 Vertical Cable Management Channel

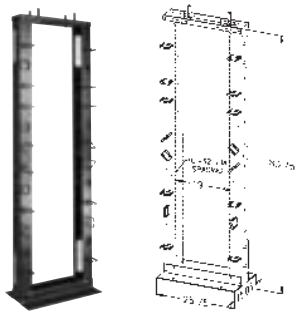
AX101371 Multi-Rack Attachment Spacer

Vertical Cable Management Channel

Vertical Cable Management Channels are offered for both copper and fiber cabling. Available in heights of 84″, the channels make cable organization quick and easy, with Swing Out/Removable doors.

Description	Weight		Belden Part Number
	Lbs.	Kg	
Copper			
Knock-Down Assembly — Black, 5″ x 84″ (7′)	40	18	**AX101180**
Fiber			
Knock-Down Assembly — Gray, 5″ x 84″	35	16	**AX100932**
Knock-Down Assembly — Black, 5″ X 84″	35	16	**AX100933**
Multi-Rack Attachment (Spacer) Kit Use between Two Fiber Vertical Managers (AX100932-933)			**AX101371**

BCR-8419 84″ Cable Management Rack

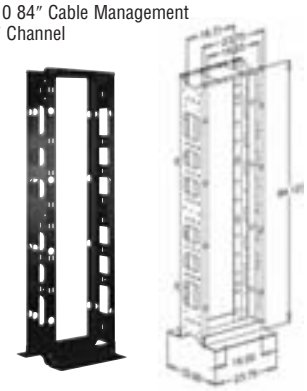


Horizontal Cable Management Channel

Horizontal Cable Management Channels are available in widths of 19″ and 23″. The channels make cable organization quick and easy.

Description	Weight		Belden Part Number
	Lbs.	Kg	
19″ Horizontal Cable Management Channel, Black	6	3	**AX101181**
19″ Horizontal Cable Management Channel, Gray	6	3	**AX101182**
23″ Horizontal Cable Management Channel, Black	8	4	**AX101184**
23″ Horizontal Cable Management Channel, Gray	8	4	**AX101183**

BCR-8419-10 84″ Cable Management Rack w/ 10″ Channel

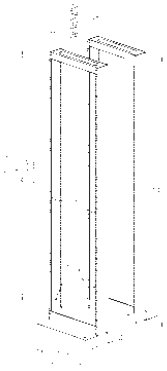


Cable Management Rack

The Cable Management Racks are designed for 19″ rack-mount equipment and are 84″ high. Model BCR-8419-10 features a channel that can be adjusted up to 10″ deep.

Description	Mounting	Weight		Belden Part Number
		Lbs.	Kg	
84″ Cable Management Rack, 19″ Mounting Rails	45	53	24	**BCR-8419**
84″ Cable Management Rack, 19″ Mounting Rails, 10″ Channel with Cable Management	45	60	27	**BCR-8419-10**

BSR-8419 Server Rack



Server Rack

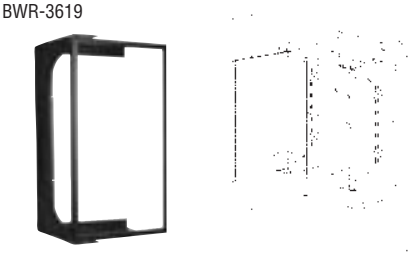
Server Racks are designed for either 19″ or 23″ rack-mount equipment and are 84″ high. The Server Rack is available in depths of 24″, 28″ 32″ and 36″ to accommodate different equipment needs.

Description	Belden Part Number
84″ Four Post Server Rack, 19″ Mounting, Depth 24″	**BSR-8419-24**
84″ Four Post Server Rack, 19″ Mounting, Depth 28″	**BSR-8419-28**
84″ Four Post Server Rack, 19″ Mounting, Depth 32″	**BSR-8419-32**
84″ Four Post Server Rack, 19″ Mounting, Depth 36″	**BSR-8419-36**
84″ Four Post Server Rack, 23″ Mounting, Depth 24″	**BSR-8423-24**
84″ Four Post Server Rack, 23″ Mounting, Depth 28″	**BSR-8423-28**
84″ Four Post Server Rack, 23″ Mounting, Depth 32″	**BSR-8423-32**
84″ Four Post Server Rack, 23″ Mounting, Depth 36″	**BSR-8423-36**

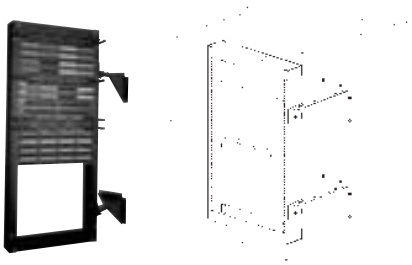
These products are in the process of being assessed for RoHS compliance. Please check our Web Site for the most current RoHS status.

Wall Mount Racks & Accessories

BWR-3619

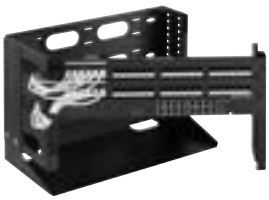


BWR-4819 — Swing out Distribution Racks
19″ x 48″ Depth Range 11.5″ to 15.5″



AX100785 Wall Mount Bracket, 2U

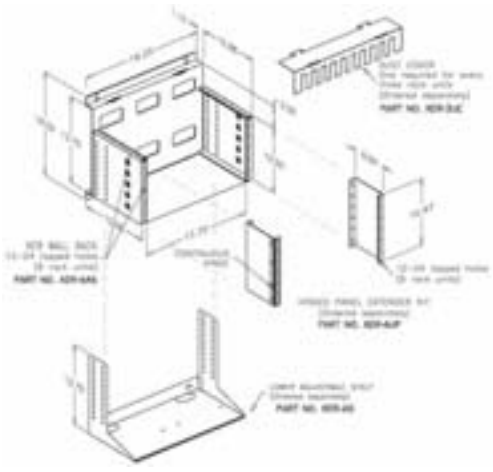
BWR-1219 — 12″ Wall Mont Rack
Hinged mounting
for easy access



Adjustable shelf 2″ - 6″

AX102514 — 4U Wall Mount Bracket w/2U Swivel

BER-6X6 —
6U Wall Mount Rack
w/6U and 6U Front



Wall Mount Racks

Wall Mount Racks are available in two styles: hinged and swing out. The hinged rack is 12″ in height and features an adjustable lower shelf. The swing out rack is available in heights of 36″ and 48″ with 19″ mounting rails. 2U, 4U and 6U Wall Mount Racks are also offered.

Description	Mounting	Weight		Belden Part Number
		Lbs.	Kg	
Swing Out Rack				
36″ Wall Mount Swing Out Rack, 19″ Mounting Rails x 12″ Fixed Depth	18U	30	14	**BWR-3619-12**
36″ Wall Mount Swing Out Rack, 19″ Mounting Rails x 18″ Depth	18U	30	14	**BWR-3619-18**
48″ Wall Mount Swing Out Rack, 19″ Mounting Rails, 11.5–15.5″ Adjustable Depth	25U	39	18	**BWR-4819**
48″ Wall Mount Swing Out Rack, 19″ Mounting Rails x 12″ Fixed Depth	25U	39	18	**BWR-4819-12**
48″ Mount Swing Out Rack, 19″ Mounting Rails x 18″ Depth	25U	39	18	**BWR-4819-18**
Hinged Rack				
12″ Wall Mount Rack, Hinged 19″ Mounting Rails x 9″ Fixed Depth	6U	26	12	**BWR-1219**
Wall Mount Bracket				
2U Wall Mount Bracket, Black	2U	4	2	**AX100785**
4U Wall Mount Bracket, Black	4U	8	4	**AX100786**
4U Wall Mount Bracket w/ 2U Swivel				**AX102514**
6U Wall Mount Rack				
6U Wall Mount Rack with 6U Top and 6U Front Rack Space, Tapped 12-24 EIA	6″	17	8	**BER-6X6**
Bottom Accessory Shelf				**BER-AS**
Front Mounted Swing-out Patch Panel Kit, 6U				**BER-6UP**
Single, 3U Space Top Dust Cover				**BER-3UC**

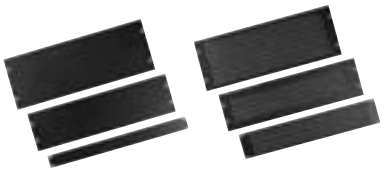
These products are in the process of being assessed for RoHS compliance. Please check our Web Site for the most current RoHS status.

Open Frame Rack Accessories & Cable/Cord Management Units

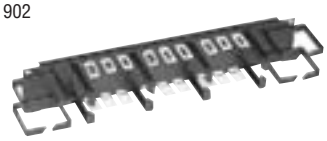
Extender Brackets, Filler Panels, Patch Cord Organizers

Rack Extenders

19″ Filler Panels



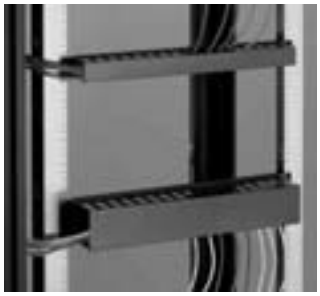
B9511-1902



B9510-1901

B9512-1901

Top: B9512-1902
Bottom: B9512-1902



Open Frame Rack Extender Brackets

The Open Frame Rack Extender Brackets are used to extend a 19″ Panel/Equipment Mounting for 23″.

Description	Belden Part Number
1U 23″ EIA To 19″ EIA Extender Bracket	**B9810-0100**
2U 23″ EIA To 19″ EIA Extender Bracket	**B9811-0200**
3U 23″ EIA To 19″ EIA Extender Bracket	**B9812-0300**
4U 23″ EIA To 19″ EIA Extender Bracket	**B9813-0400**

Filler Panels

Filler Panels are available in solid or vented for improved air flow.

Description	Belden Part Number
1U 19″ Solid Filler Panel, Gray	**A0644497**
2U 19″ Solid Filler Panel, Gray	**A0644499**
1U 19″ Solid Filler Panel, Black	**B9910-0100**
2U 19″ Solid Filler Panel, Black	**B9911-0200**
3U 19″ Solid Filler Panel, Black	**B9912-0300**
4U 19″ Solid Filler Panel, Black	**B9913-0400**
2U 19″ Vented Filler Panel, Black	**B9914-0200**
3U 19″ Vented Filler Panel, Black	**B9915-0300**
4U 19″ Vented Filler Panel, Black	**B9916-0400**

Patch Cord Organizers

The Patch Cord Organizers keep wires and cable under control.
Among the many features of the Patch Cord Organizers are:

- Horizontal / Vertical Patch Cord Management
- Front / Rear Management
- Removable Covers
- Bend Radius Control

Description	Belden Part Number
1U 19″ Cable Organizer	**B9510-1901**
2U 19″ Cable Organizer with Saddle Rings	**B9511-1902**
1U 19″ Rack Mount Cable Organizer with Finger Stock and Cover (1.5″ x 2″)	**B9512-1901**
2U 19″ Rack Mount Cable Organizer with Finger Stock and Cover (3″ x 3″)	**B9512-1902**
2U 19″ Cable Organizer with Finger Stock and Cover Front and Rear	**B9512-1902-FR**
2U 19″ Cable Organizer with Quick Touch (2″ X 3″)	**B9513-1902**
1U 19″ Cable Organizer with Radius (Waterfall)	**B9514-1901**
1U 23″ Cable Organizer	**B9610-2301**
2U 23″ Cable Organizer with Saddle Rings	**B9611-2302**

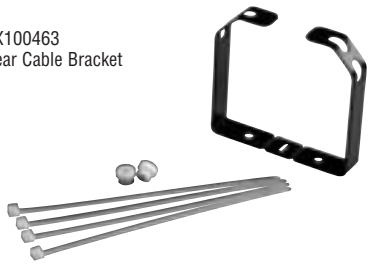
These products are in the process of being assessed for RoHS compliance. Please check our Web Site for the most current RoHS status.

Open Frame Rack Accessories & Cable/Cord Management Units

Ring Panels, Organizer Trays, Brackets & Patch Cord Channel

AX100249 Organizer Tray, 3U

AX100463
Rear Cable Bracket



AX101173 Cable Tie Bar

AX100789 Cable Support Bracket

AX100793 Patch Cord Organizer Channel

AO396695 Organizer Ring Panel, 2U

AO644488 Organizer Panel, 1U

Open Frame Rack Cable and Patch Cord Management

The Open Frame Rack Cable and Patch Cord Management accessories can be used with patch panels in open frame racks for distribution cable and patch cord organization, routing and protection. They allow easier cord access and simplify moves, additions and changes.

Description	Mounting	Belden Part Number
Organizer Ring Panel, Gray	2U	**A0396695**
Organizer Ring Panel, Black	2U	**A0403977**
Organizer Panel, Gray	1U	**A0644488**
Organizer Panel, Black	1U	**A0644489**
Organizer Panel, Gray	2U	**A0644490**
Organizer Panel, Black	2U	**A0644492**
Organizer Tray, Gray	3U	**AX100248**
Organizer Tray, Black	3U	**AX100249**
Rear Cable Bracket, Gray		**AX100462**
Rear Cable Bracket, Black		**AX100463**
Cable Support Bracket, Gray	0U	**AX100788**
Cable Support Bracket, Black	0U	**AX100789**
Patch Cord Organizer Channel, Gray	1U	**AX100792**
Patch Cord Organizer Channel, Black	1U	**AX100793**
Patch Cord Organizer Channel, Gray	2U	**AX100794**
Patch Cord Organizer Channel, Black	2U	**AX100795**
Patch Cord Organizer Channel, Gray	4U	**AX100796**
Patch Cord Organizer Channel, Black	4U	**AX100797**
Cable Tie Bar, Black	0U	**AX101173**

These products are in the process of being assessed for RoHS compliance. Please check our Web Site for the most current RoHS status.

Cable Ties

Miniature, Intermediate, Standard & Heavy-Duty

CTM4018N
Cable Ties

CTM4018B
Cable Ties

Cable Ties

The Cable Ties line features miniature, intermediate, standard and heavy duty cable ties. They are available in tensile strengths ranging from 18 to 175 lbs. and are manufactured from various grades of nylon including weather-resistant nylon for use in sunshine/outdoor applications. They are offered in lengths from 4″ to 48″. Color: Natural (indoor), Black (outdoor). Velcro Cable Ties are also available.

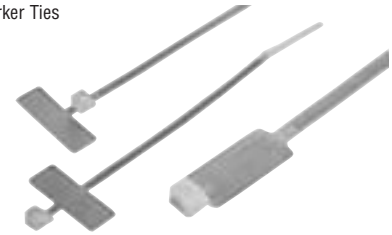
Description	Length		Width		Loop Tensile Strength		Max. Bundled Diameter		Belden Part No.
	in.	mm	in.	mm	Lbs.	N	in.	mm	
Miniature 18 Lbs Tensile Strength									
Nylon Cable Tie, 100 Pcs, Natural, 4″	3.9	100	0.098	2.5	18	80	1.0	25	**CTM4018N**
Nylon Cable Tie, 100 Pcs, Natural, 5.5″	5.6	142	0.098	2.5	18	80	1.4	35	**CTM5P18N**
Nylon Cable Tie, 100 Pcs, Natural, 8″	8.0	203	0.098	2.5	18	80	2.2	55	**CTM8018N**
Intermediate 40 Lbs Tensile Strength									
Nylon Cable Tie, 100 Pcs, Natural, 5.5″	5.6	142	0.125	3.2	40	178	1.4	35	**CTI5P40N**
Nylon Cable Tie, 100 Pcs, Natural, 8″	8.0	203	0.141	3.6	40	178	2.2	55	**CTI8040N**
Nylon Cable Tie, 100 Pcs, Natural, 11″	11.5	292	0.141	3.6	40	178	3.3	85	**CTI11P40N**
Nylon Cable Tie, 100 Pcs, Natural, 14.5″	14.5	368	0.141	3.6	40	178	4.0	103	**CTI14P40N**
Weather Resistant Nylon Cable Tie, 100 Pcs, Black, 5.5″	5.6	142	0.125	3.2	40	178	1.4	35	**CTI5P40BW**
Weather Resistant Nylon Cable Tie, 100 Pcs, Black, 8″	8.0	203	0.141	3.6	40	178	2.2	55	**CTI8040BW**
Weather Resistant Nylon Cable Tie, 100 Pcs, Black, 11.5″	11.5	292	0.141	3.6	40	178	3.3	85	**CTI11P40BW**
Weather Resistant Nylon Cable Tie, 100 Pcs, Black, 14.5″	14.5	368	0.141	3.6	40	178	4.0	103	**CTI14P40BW**
Standard 50 Lbs Tensile Strength									
Nylon Cable Tie, 100 Pcs, Natural, 8″	8.0	203	0.180	4.6	50	222	2.2	55	**CTS8050N**
Nylon Cable Tie, 100 Pcs, Natural, 11″	11.0	280	0.188	4.8	50	222	3.2	81	**CTS1150N**
Nylon Cable Tie, 100 Pcs, Natural, 14.5″	14.5	368	0.188	4.8	50	222	4.0	103	**CTS14P50N**
Nylon Cable Tie, 100 Pcs, Natural, 17.75″	17.7	450	0.188	4.8	50	222	5.1	131	**CTS17P50N**
Weather Resistant Nylon Cable Tie, 100 Pcs, Black, 8″	8.0	203	0.180	4.6	50	222	2.2	55	**CTS8050BW**
Weather Resistant Nylon Cable Tie, 100 Pcs, Black, 11.5″	11.0	280	0.188	4.8	50	222	3.2	81	**CTS1150BW**
Weather Resistant Nylon Cable Tie, 100 Pcs, Black, 14.5″	14.5	368	0.188	4.8	50	222	4.0	103	**CTS14P50BW**
Weather Resistant Nylon Cable Tie, 100 Pcs, Black, 17.75″	17.7	450	0.188	4.8	50	222	5.1	131	**CTS17P50BW**
Heavy Duty 120 Lbs Tensile Strength									
Nylon Cable Tie, 100 Pcs, Natural, 15″	15.0	380	0.298	7.6	120	533	4.3	111	**CTH15120N**

These products are in the process of being assessed for RoHS compliance. Please check our Web Site for the most current RoHS status.

Cable Ties

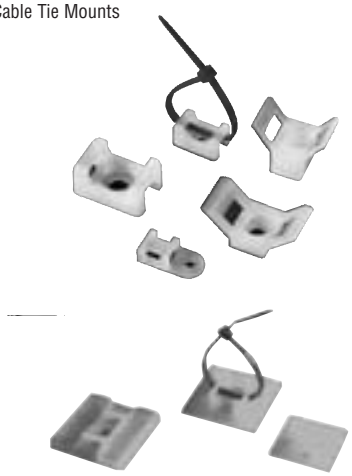
Marker Ties, Cable Tie Mounts

Marker Ties



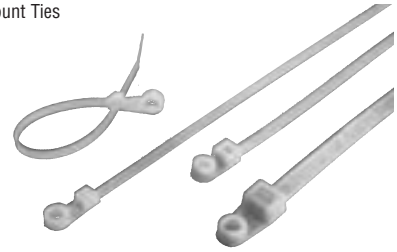
Description	Length		Width		Loop Tensile Strength		Max. Bundled Diameter		Belden Part No.
	in.	mm	in.	mm	Lbs.	N	in.	mm	
Heavy Duty Nylon Cable Tie (175 Lbs Tensile Strength)									
100 pcs, Natural, 17.75″	17.7	450	0.313	8.0	175	778	5.2	134	**CTH17P175N**
100 pcs, Natural, 21.7″	21.7	550	0.313	8.0	175	778	6.5	167	**CTH21P175N**
100 pcs, Natural, 36″	36.0	914	0.352	9.0	175	778	10.6	271	**CTH36P175N**
100 pcs, Natural, 48″	48.0	1219	0.352	9.0	175	778	15.0	382	**CTH48P175N**
Mount Ties									
100 pcs, Natural, 40 lb, 6″	6.7	171	0.145	3.7	40	178	1.6	40	**CTI6040NM**
100 pcs, Natural, 50 lb, 11.75″	11.8	300	0.188	4.8	50	222	3.3	85	**CTS11P50NM**
100 pcs, Natural, 50 lb, 14.5″	14.6	370	0.188	4.8	50	222	4.0	103	**CTS14P50NM**

Cable Tie Mounts



Description	Length		Width		Loop Tensile Strength		Max. Bundled Diameter		Marking Pad		Belden Part No.
	in.	mm	in.	mm	Lbs.	N	in.	mm	in.	mm	
Marker Ties (18 Lbs Tensile Strength)											
100 pcs, Natural, 4″	3.9	100	0.098	2.5	18	80	1.0	25	0.98 x 0.31	25 x 8	**CTM4018NMK**
100 pcs, Natural, 4.25″	4.3	110	0.098	2.5	18	80	1.0	25	0.98 x 0.32	26 x 8	**CTM4P18NMK**
100 pcs, Natural, 5″	5.1	130	0.098	2.5	18	80	1.0	25	1.10 x 0.79	28 x 20	**CTM5018NMK**
100 pcs, Natural, 8″	7.9	200	0.098	2.5	18	80	2.0	50	1.18 x 0.59	30 x 15	**CTM8018NMK**
Marker Ties (50 Lbs Tensile Strength)											
100 pcs, Natural, 8″	7.9	200	0.180	4.6	50	222	2.0	50	1.10 x 0.51	28 x 13	**CTS8050NMK**
100 pcs, Natural, 10.5″	10.6	270	0.180	4.6	50	222	3.0	75	1.10 x 0.51	28 x 13	**CTS10P50MNK**

Mount Ties



Description	Length		Width		Mounting Method	Belden Part No.
	in.	mm	in.	mm		
Cable Tie Mounts						
Cable Tie Mount S.A. M, 100 per bag	0.49	12.5	0.49	12.5	Self Adhesive	**TM100S4**
Cable Tie Mount S.A. M-I, 100 per bag	0.75	19.0	0.74	19.0	#4 M2.5 Screw + Self Adhesive	**TM101SS2**
Cable Tie Mount S.A. M-I-S, 100 per bag	1.10	28.0	1.10	28.0	#4 M2.5 Screw + Self Adhesive	**TM102**
Cable Tie Mount Sc. M-I, 100 per bag	0.50	12.8	0.27	7.0	#4 M2.5 Screw	**TM1**
Cable Tie Mount Sc. I-S-HD, 100 per bag	0.91	23.0	0.63	16.0	1/4 M6 Screw	**TM2**
Cable Tie Mount Sc. I-S-HD, 100 per bag	1.18	30.0	0.58	14.7	#10 M5 Screw	**TM4**

Cable mounts compatible with following cable tie cross section.

S.A. = Self Adhesive
Sc. = Screw on type

M = Miniature
I = Intermediate
S = Standard
HD = Heavy Duty

These products are in the process of being assessed for RoHS compliance. Please check our Web Site for the most current RoHS status.

Cable Ties

Velcro Ties, Saddles, Saddle Ties

AX100781
Velcro Saddle

AX102512
Saddle Tie

AX102516
12″ Fiber Optic Cable Manager

Description	Belden Part Number
Velcro Cable Ties	
Velcro Cable Ties, 25 per Roll, 8″	**AX100783**
Velcro Cable Ties, 25 per Roll, 12″	**AX100784**
Velcro Saddle, 25 pcs	**AX100781**
Velcro Saddle Kit with #8 Wood Screw, 10 pcs	**AX102512**
Velcro Saddle Kit with 10/32 Rack Screw, 10 pcs	**AX102513**
15′ Roll x 5/8″ Polywrap, Cut to length as required	**AX102515**
12″ Fiber Optic Cable Manager	**AX102516**
24″ Fiber Optic Cable Manager	**AX102517**

These products are in the process of being assessed for RoHS compliance. Please check our Web Site for the most current RoHS status.

Middle Atlantic Products

EXCEPTIONAL SUPPORT & PROTECTION™

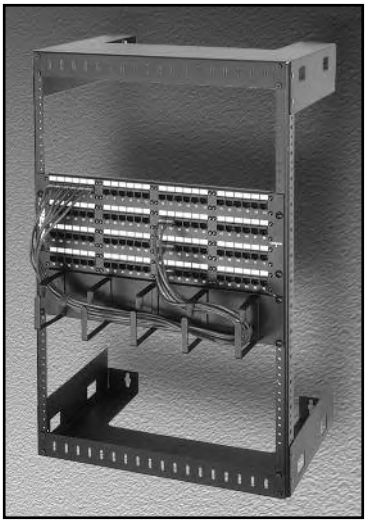
WM Series

EIA/TIA Compliant

WM Series 19" Wall Mount Open Frame Racks
Self-squaring rack for mounting virtually any data or telecommunications equipment

Features

- Self-squaring design
- Available in 12" and 18" depths and 8, 15, and 30 rackspace sizes
- Fixed design prevents kinking or breaking of glass fibers
- 10-32 rack screws included (25 qty for 8 and 15 rackspace sizes, 50 qty for 30 rackspace size)
- Ships knocked-down via UPS
- Durable black powder coat finish



WM-15-12

Architects' and Engineers' Specifications

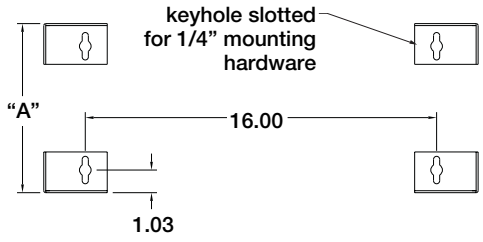
EIA/TIA compliant wall mount open frame rack shall be Middle Atlantic Products model # WM-__-__ (refer to chart). WM shall be constructed of the following materials: top and bottom shall be 14-gauge steel, rackrail shall be 11-gauge steel with tapped 10-32 holes in universal EIA spacing. WM shall be finished in a durable black powder coat. WM shall be GREENGUARD Indoor Air Quality Certified for Children and Schools. WM shall be RoHS EU Directive 2002/95/EC compliant. WM shall be manufactured by an ISO 9001 and ISO 14001 registered company. Wall mount open frame rack shall be warrantied to be free from defects in material or workmanship under normal use and conditions for the lifetime of the product.

96-291/ rev 1c / 06-02-10 / WM Series 19" Wall-Mount Open Frame Racks

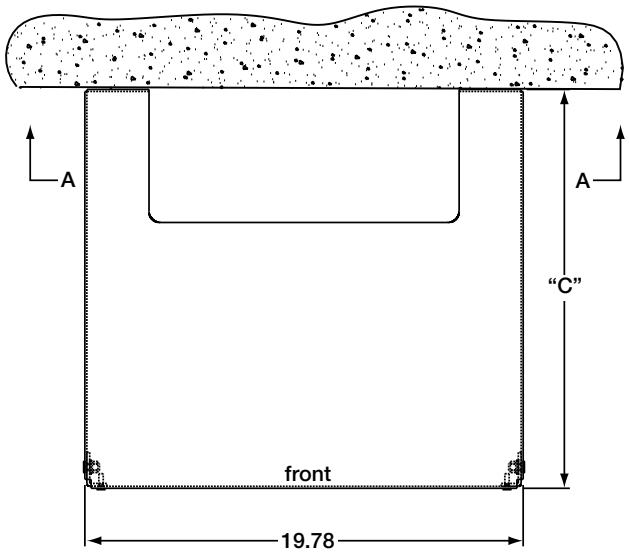
US: New Jersey • California • Illinois • Voice: 973-839-1011 Fax: 973-839-1976 • middleatlantic.com
Canada: Ontario • British Columbia • Voice: 613-836-2501 Fax: 613-836-2690 • middleatlantic.ca

WM Series basic dimensions

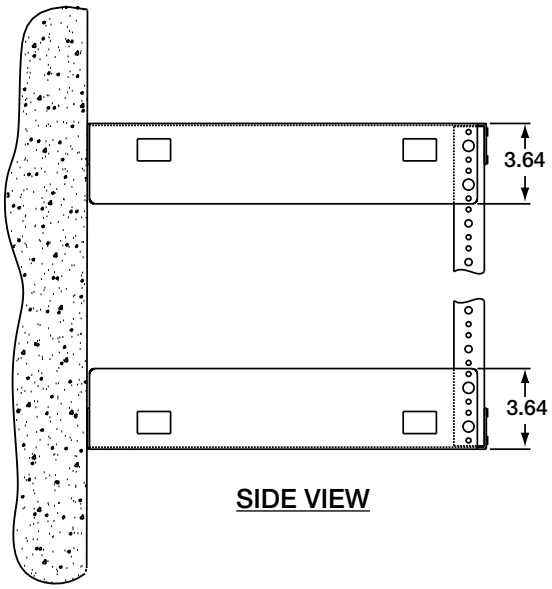
ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED



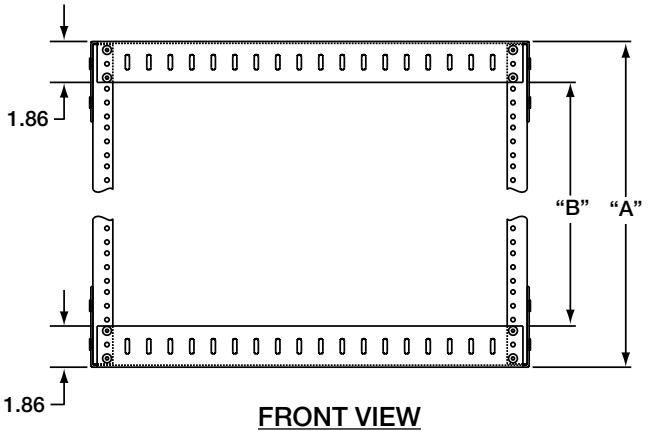
SECTION A-A
(WALL MOUNT DETAILS)



TOP/BOTTOM VIEW



SIDE VIEW

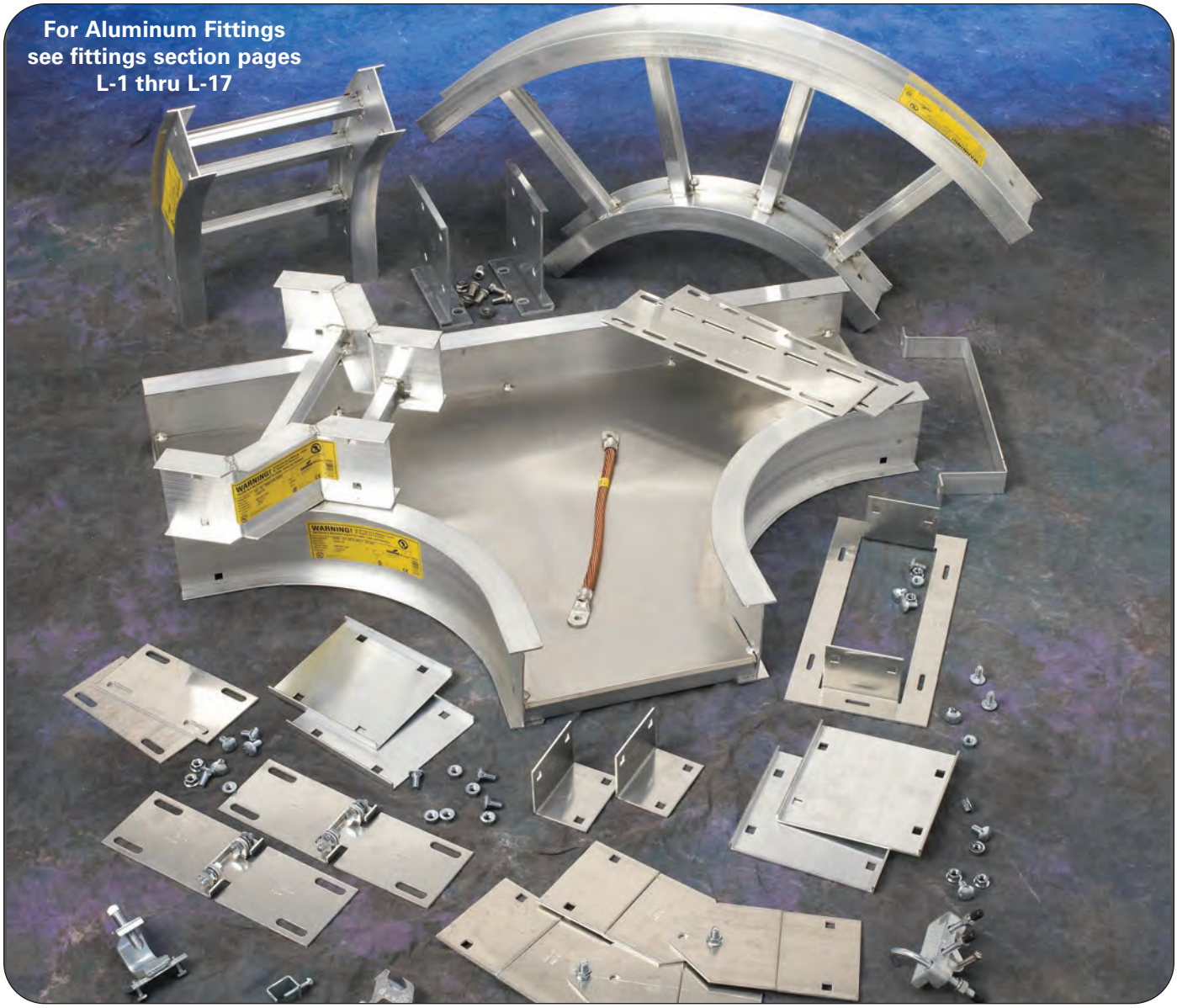


FRONT VIEW

PART #	"A" OVERALL HEIGHT	"B" RACKING HEIGHT/ RACK SPACES	"C" DEPTH	WEIGHT CAPACITY
WM-8-12	17.75	14.00/ 8 SP	12.00	200 lbs.
WM-15-12	30.00	26.25/ 15 SP	12.00	200 lbs.
WM-30-12	56.25	52.50/ 30 SP	12.00	175 lbs.
WM-8-18	17.75	14.00/ 8 SP	18.00	150 lbs.
WM-15-18	30.00	26.25/ 15 SP	18.00	150 lbs.
WM-30-18	56.25	52.20/ 30 SP	18.00	125 lbs.

Middle Atlantic Products

Series 2, 3, 4, & 5 Aluminum - Straight Sections



How The Service Advisor Works

We know that your time is important! That's why the color-coding system in this catalog is designed to help you select products that fit your service needs. Products are marked to indicate the typical lead time for orders of 50 pieces or less.

Customer: How do I select my straight sections. covers, or fittings so that I get the quickest turnaround?

Service Advisor: Each part of our selection chart is shown in colors. If any section of a part number is a different color, the part will typically ship with the longer lead time represented by the colors.

- Green = Fastest shipped items
- Black = Normal lead-time items
- Red = Normally long lead-time items

Example:

34A	VT	-	24	-	144
●	●		●		●

Part will have a normal lead time because of the VT bottom type.

3" NEMA VE 1 Loading Depth
4" Side Rail Height

Straight Section Part Numbering

Prefix

Example: **24 A 09 - 24 - 144**

Series

- **24**
- **H24**
- **34**

Material

- **A** = Aluminum

*Type

Ladder-

- **06** = 6" rung spacing
- **09** = 9" rung spacing
- **12** = 12" rung spacing

Trough-

6" thru 36" wide

- **VT** = Ventilated Trough
- **ST** = Non-Ventilated Trough

*Width

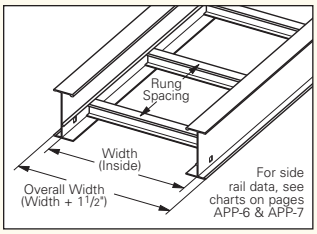
- **06** = 6"
- **09** = 9"
- **12** = 12"
- **18** = 18"
- **24** = 24"
- **30** = 30"
- **36** = 36"

Length

① **144** = 12 ft.	24
② 120 = 10 ft.	
① **240** = 20 ft.	H24
② 144 = 12 ft.	
① **240** = 20 ft.	34
② 144 = 12 ft.	

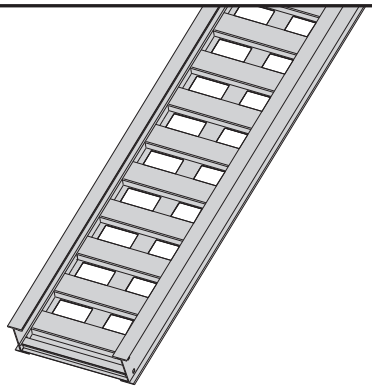
①Primary Length.
②Secondary Length.

See page C-23 for explanation of lengths.

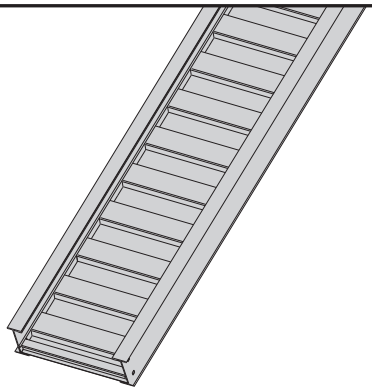


See page APP-1 for additional rung options. *Special sizes available.

Ladder Type
(Specify Rung Spacing)



Ventilated Trough



Non-Ventilated Trough

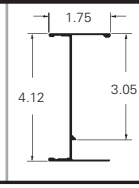
● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

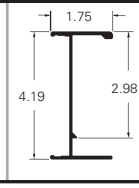
3" NEMA VE 1 Loading Depth
4" Side Rail Height

Values are based on simple beam tests per NEMA VE 1 on 36" wide cable tray with rungs spaced on 12" centers. Cable trays will support without collapse a 200 lb. (90.7 kg) concentrated load over and above published loads. Published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply the published load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable tray must be supported on spans shorter than or equal to the length of the cable tray being installed.

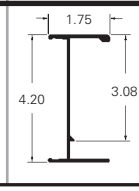
Individual rungs will support without collapse a 200 lb. (90.7 kg) concentrated load applied at the mid-span of the rung, over and above the NEMA rated cable load with a 1.5 safety factor for highlighted NEMA spans and loads.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
24		NEMA: 16A, 12C CSA: 277 kg/m 3.0m D-3m UL Cross-Sectional Area: 1.00 in^2	6	487*	0.001	Area = 1.05 in^2 Sx = 1.34 in^3 Ix = 2.85 in^4	1.8	725*	0.017	Area = 6.77 cm^2 Sx = 21.96 cm^3 Ix = 118.63 cm^4
			8	284	0.003		2.4	422	0.055	
			10	181	0.008		3.0	270	0.136	
			12	126	0.016		3.7	187	0.279	
			14	93	0.030		4.3	138	0.618	
			16	71	0.052		4.9	105	0.883	

When trays are used in continuous spans, the deflection of the tray is reduced by as much as 50%. Design factors: Ix = Moment of Inertia, Sx = Section Modulus.
* When using 18" rung spacing, load capacity is limited to 394 lbs/ft (586.27 kg/m) for 30" tray width and 325 lbs/ft (483.6 kg/m) for 36" tray width.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
H24		NEMA: 20A CSA: 84 kg/m 6.1m D-6m UL Cross-Sectional Area: 1.00 in^2	10	225	0.006	Area = 1.32 in^2 Sx = 1.57 in^3 Ix = 3.69 in^4	3.0	330	0.106	Area = 8.52 cm^2 Sx = 25.73 cm^3 Ix = 153.59 cm^4
			12	156	0.013		3.7	226	0.222	
			14	115	0.023		4.3	171	0.400	
			16	88	0.040		4.9	129	0.693	
			18	70	0.064		5.5	103	1.093	
			20	56	0.098		6.1	83	1.682	

When trays are used in continuous spans, the deflection of the tray is reduced by as much as 50%. Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
34		NEMA: 20B, 16C CSA: 112 kg/m 6.0m E-6m UL Cross-Sectional Area: 1.50 in^2	10	320	0.005	Area = 1.82 in^2 Sx = 2.10 in^3 Ix = 4.98 in^4	3.0	476	0.077	Area = 11.74 cm^2 Sx = 34.41 cm^3 Ix = 207.28 cm^4
			12	222	0.009		3.7	331	0.160	
			14	163	0.017		4.3	243	0.296	
			16	125	0.030		4.9	186	0.505	
			18	99	0.047		5.5	147	0.810	
			20	80	0.072		6.1	119	1.234	

When trays are used in continuous spans, the deflection of the tray is reduced by as much as 50%. Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

All dimensions in parentheses are millimeters unless otherwise specified.

4" NEMA VE 1 Loading Depth
5" Side Rail Height

Straight Section Part Numbering

Prefix

Example: **25 A 09 - 24 - 144**

Series

- **25**
- **35**

Material

- **A** = Aluminum

***Type**

Ladder-

- **06** = 6" rung spacing
- **09** = 9" rung spacing
- **12** = 12" rung spacing

Trough-

6" thru 36" wide

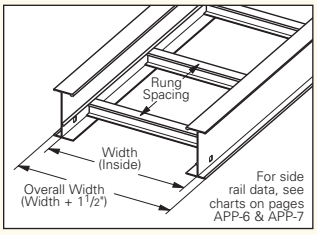
- **VT** = Ventilated Trough
- **ST** = Non-Ventilated Trough

***Width**

- **06** = 6"
- **09** = 9"
- **12** = 12"
- **18** = 18"
- **24** = 24"
- **30** = 30"
- **36** = 36"

Length

① **144** = 12 ft.	25
② 120 = 10 ft.	
① **240** = 20 ft.	35
② 144 = 12 ft.	

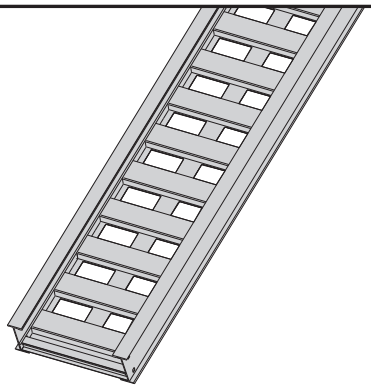


①Primary Length.
②Secondary Length.

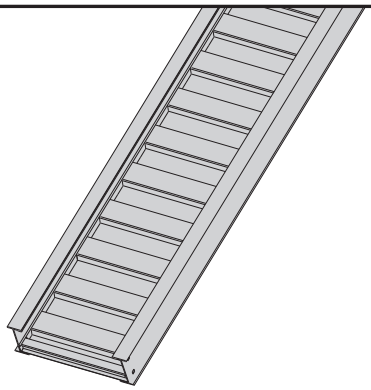
See page C-23 for explanation of lengths.

See page APP-1 for additional rung options. *Special sizes available.

Ladder Type
(Specify Rung Spacing)



Ventilated Trough



Non-Ventilated Trough

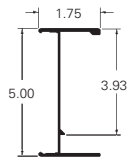
● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

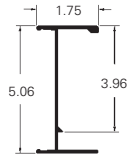
4" NEMA VE 1 Loading Depth
5" Side Rail Height

Values are based on simple beam tests per NEMA VE 1 on 36" wide cable tray with rungs spaced on 12" centers. Cable trays will support without collapse a 200 lb. (90.7 kg) concentrated load over and above published loads. Published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply published load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable tray must be supported on spans shorter than or equal to the length of the cable tray being installed.

Individual rungs will support without collapse a 200 lb. (90.7 kg) concentrated load applied at the mid-span of the rung, over and above the NEMA rated cable load with a 1.5 safety factor for highlighted NEMA spans and loads.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
25		NEMA: 20A, 12C CSA: 67 kg/m 6.0m D-6m UL Cross-Sectional Area: 1.00 in^2	10	200	0.0049	Area = 1.24 in^2 Sx = 1.80 in^3 Ix = 4.62 in^4	3.0	298	0.083	Area = 8.00 cm^2 Sx = 29.50 cm^3 Ix = 192.30 cm^4
			12	139	0.010		3.7	207	0.172	
			14	102	0.019		4.3	152	0.319	
			16	78	0.032		4.9	116	0.545	
			18	62	0.051		5.5	92	0.873	
			20	50	0.078		6.1	74	1.330	

When trays are used in continuous spans, the deflection of the tray is reduced by as much as 50%. Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
35		NEMA: 20B, 16C CSA: 112 kg/m 6.0m E-6m UL Cross-Sectional Area: 1.50 in^2	10	310	0.0036	Area = 1.67 in^2 Sx = 2.35 in^3 Ix = 6.37 in^4	3.0	461	0.060	Area = 10.77 cm^2 Sx = 38.51 cm^3 Ix = 265.14 cm^4
			12	215	0.0073		3.7	320	0.125	
			14	158	0.014		4.3	235	0.232	
			16	121	0.023		4.9	180	0.395	
			18	96	0.037		5.5	142	0.633	
			20	77	0.057		6.1	115	0.965	

When trays are used in continuous spans, the deflection of the tray is reduced by as much as 50%. Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

All dimensions in parentheses are millimeters unless otherwise specified.

5" NEMA VE 1 Loading Depth
6" Side Rail Height

Straight Section Part Numbering

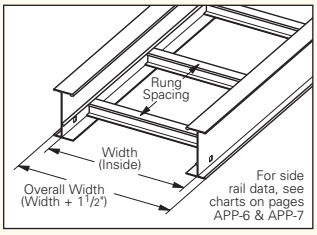
Prefix

Example: **26 A 09 - 24 - 144**

Series
- **26**
- **36**
- **46**
- **H46†**

Material
- **A** = Aluminum

*Type
Ladder-
- **06** = 6" rung spacing
- **09** = 9" rung spacing
- **12** = 12" rung spacing



Trough-
6" thru 36" wide
- **VT** = Ventilated Trough
- **ST** = Non-Ventilated Trough

*Width
- **06** = 6"
- **09** = 9"
- **12** = 12"
- **18** = 18"
- **24** = 24"
- **30** = 30"
- **36** = 36"

Length

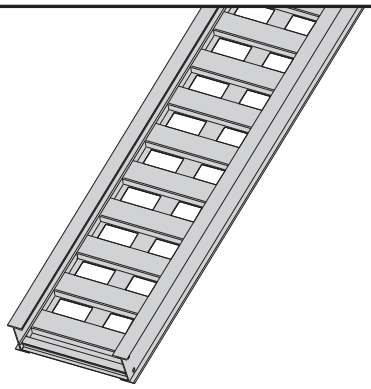
① **144** = 12 ft.	26
② 120 = 10 ft.	
① **240** = 20 ft.	36
② 144 = 12 ft.	
① **240** = 20 ft.	46
② 288 = 24 ft.	
① **240** = 20 ft.	H46
② 300 = 25 ft.	

①Primary Length.
②Secondary Length.

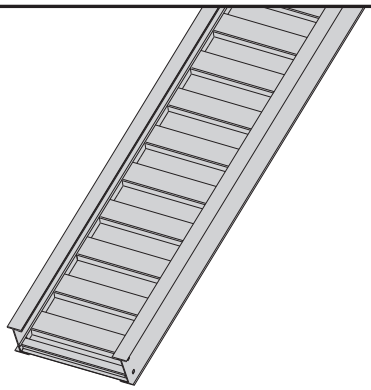
See page C-23 for explanation of lengths.

See page APP-1 for additional rung options. *Special sizes available.

Ladder Type
(Specify Rung Spacing)



Ventilated Trough



Non-Ventilated Trough

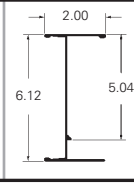
● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

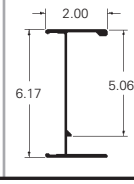
5" NEMA VE 1 Loading Depth
6" Side Rail Height

Values are based on simple beam tests per NEMA VE 1 on 36" wide cable tray with rungs spaced on 12" centers. Cable trays will support, without collapse, a 200 lb. (90.7 kg) concentrated load over and above published loads. Published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply the published load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable tray must be supported on spans shorter than or equal to the length of the cable tray being installed.

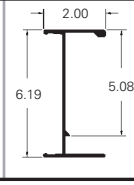
Individual rungs will support without collapse a 200 lb. (90.7 kg) concentrated load applied at the mid-span of the rung, over and above the NEMA rated cable load with a 1.5 safety factor for highlighted NEMA spans and loads.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
26		NEMA: 20A, 16B CSA: 67 kg/m 6.0m D-6m UL Cross-Sectional Area: 1.00 in^2	10	204	0.0028	Area = 1.41 in^2 Sx = 2.53 in^3 Ix = 7.915 in^4	3.0	304	0.049	Area = 9.10 cm^2 Sx = 41.46 cm^3 Ix = 329.45 cm^4
			12	142	0.006		3.7	211	0.101	
			14	104	0.011		4.3	155	0.186	
			16	80	0.019		4.9	119	0.318	
			18	63	0.030		5.5	94	0.509	
			20	51	0.045		6.1	76	0.776	

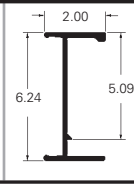
When trays are used in continuous spans, the deflection of the tray is reduced by as much as 50%. Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
36		NEMA: 20B, 16C CSA: 112 kg/m 6.0m E-6m UL Cross-Sectional Area: 1.50 in^2	12	233	0.0043	Area = 1.81 in^2 Sx = 3.36 in^3 Ix = 10.85 in^4	3.7	269	0.073	Area = 11.68 cm^2 Sx = 55.06 cm^3 Ix = 451.61 cm^4
			14	171	0.008		4.3	177	0.136	
			16	131	0.014		4.9	134	0.232	
			18	104	0.022		5.5	101	0.372	
			20	84	0.033		6.1	81	0.566	
			22	69	0.049		6.7	67	0.829	

When trays are used in continuous spans, the deflection of the tray is reduced by as much as 50%. Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
46		NEMA: 20C CSA: 168 kg/m 6.1m E-6m UL Cross-Sectional Area: 1.50 in^2	14	210	0.0071	Area = 2.06 in^2 Sx = 3.59 in^3 Ix = 12.18 in^4	4.3	313	0.121	Area = 13.29 cm^2 Sx = 58.83 cm^3 Ix = 506.97 cm^4
			16	161	0.012		4.9	239	0.207	
			18	127	0.019		5.5	189	0.331	
			20	103	0.030		6.1	153	0.505	
			22	85	0.043		6.7	127	0.739	
			24	72	0.061		7.3	106	1.046	

When trays are used in continuous spans, the deflection of the tray is reduced by as much as 50%. Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
H46		NEMA: 20C+ CSA: 131 kg/m 7.6m E-6m UL Cross-Sectional Area: 2.00 in^2	16	261	0.0085	Area = 2.95 in^2 Sx = 5.33 in^3 Ix = 17.30 in^4	4.9	388	0.145	Area = 19.03 cm^2 Sx = 87.34 cm^3 Ix = 720.08 cm^4
			18	206	0.014		5.5	307	0.233	
			20	167	0.021		6.1	248	0.355	
			22	138	0.030		6.7	205	0.520	
			24	116	0.043		7.3	173	0.737	
			25	88	0.051		7.6	131	0.867	

When trays are used in continuous spans, the deflection of the tray is reduced by as much as 50%. Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

All dimensions in parentheses are millimeters unless otherwise specified.

6" NEMA VE 1 Loading Depth
7" Side Rail Height

Straight Section Part Numbering

Prefix

Example: **37 A 09 - 24 - 144**

Series
- 27
- 37
- 47
- H47†
- 57

Material
- **A** = Aluminum

*Type
Ladder-
- **06** = 6" rung spacing
- **09** = 9" rung spacing
- **12** = 12" rung spacing

Trough-
- 6" thru 36" wide

VT = Ventilated Trough
ST = Non-Ventilated Trough

† H47A & 57A only available in ladder type 9" and 12" rung spacing. See page APP-2.

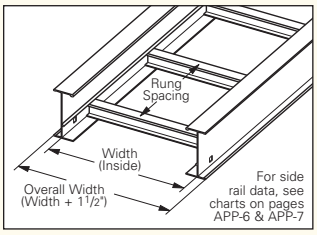
*Width
- **06** = 6"
- **09** = 9"
- **12** = 12"
- **18** = 18"
- **24** = 24"
- **30** = 30"
- **36** = 36"

Length

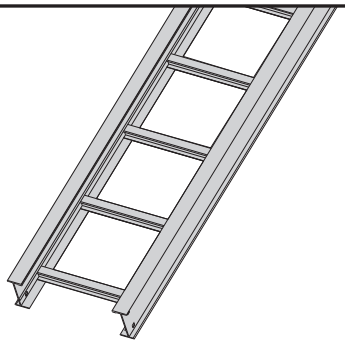
① **144** = 12 ft.	27
② 120 = 10 ft.	
① **240** = 20 ft.	37
② 144 = 12 ft.	
① **240** = 20 ft.	47
② 288 = 24 ft.	
① **240** = 20 ft.	H47
② 300 = 25 ft.	
① **360** = 30 ft.	57
② 300 = 25 ft.	

①Primary Length.
②Secondary Length.

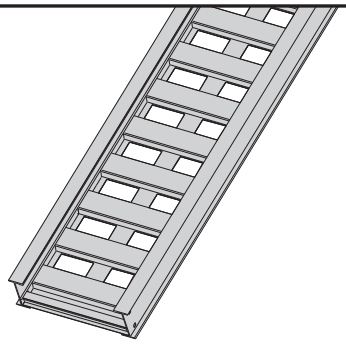
See page C-23 for explanation of lengths.



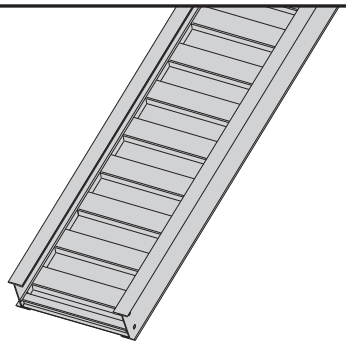
See page APP-1 for additional rung options. *Special sizes available.



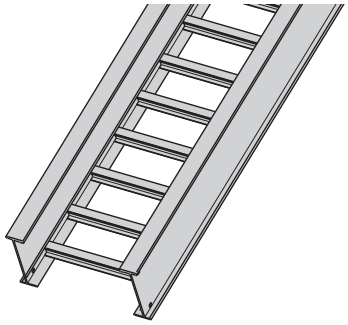
Ladder Type
(Specify Rung Spacing)



Ventilated Trough



Non-Ventilated Trough



57A available in
(9" & 12" rung spacing in
12" to 36" widths)

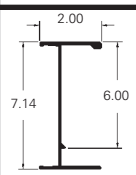
● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

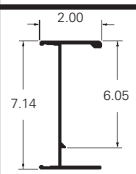
All dimensions in parentheses are millimeters unless otherwise specified.

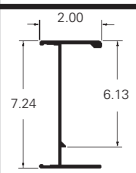
6" NEMA VE 1 Loading Depth
7" Side Rail Height

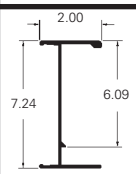
Values are based on simple beam tests per NEMA VE 1 on 36" wide cable tray with rungs spaced on 12" centers. Cable trays will support without collapse a 200 lb. (90.7 kg) concentrated load over and above published loads. Published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply the published load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable tray must be supported on spans shorter than or equal to the length of the cable tray being installed.

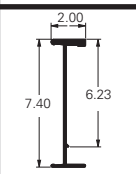
Individual rungs will support without collapse a 200 lb. (90.7 kg) concentrated load applied at the mid-span of the rung, over and above the NEMA rated cable load with a 1.5 safety factor for highlighted NEMA spans and loads.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
27		NEMA: 12C CSA: 68 kg/m 6.0m D-6m UL Cross-Sectional Area: 1.50 in^2	10	177	0.006	Area = 1.63 in^2 Sx = 2.93 in^3 Ix = 11.28 in^4	3.0	269	0.033	Area = 10.52 cm^2 Sx = 48.01 cm^3 Ix = 469.51 cm^4
			12	123	0.013		3.7	177	0.073	
			14	90	0.023		4.3	134	0.131	
			16	69	0.040		4.9	101	0.227	
			18	54	0.064		5.5	81	0.357	
			20	44	0.098		6.1	67	0.534	

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
37		NEMA: 20B, 16C CSA: 101 kg/m 6.1m D-6m UL Cross-Sectional Area: 1.50 in^2	12	222	0.0035	Area = 1.81 in^2 Sx = 3.77 in^3 Ix = 13.50 in^4	3.7	331	0.059	Area = 11.68 cm^2 Sx = 61.78 cm^3 Ix = 561.91 cm^4
			14	163	0.0064		4.3	243	0.109	
			16	125	0.011		4.9	186	0.186	
			18	99	0.017		5.5	147	0.299	
			20	80	0.027		6.1	119	0.455	
			22	66	0.039		6.7	98	0.666	

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
47		NEMA: 20C CSA: 142 kg/m 6.1m E-6m UL Cross-Sectional Area: 2.00 in^2	14	204	0.0048	Area = 2.38 in^2 Sx = 4.94 in^3 Ix = 17.88 in^4	4.3	305	0.083	Area = 15.35 cm^2 Sx = 80.95 cm^3 Ix = 744.22 cm^4
			16	156	0.0082		4.9	233	0.141	
			18	123	0.0132		5.5	184	0.225	
			20	100	0.0201		6.1	149	0.344	
			22	83	0.0295		6.7	123	0.503	
			24	69	0.0418		7.3	103	0.713	

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
H47		NEMA: 20C+ CSA: 241 kg/m 6.1m E-6m UL Cross-Sectional Area: 2.00 in^2	16	233	0.0064	Area = 3.04 in^2 Sx = 6.10 in^3 Ix = 22.91 in^4	4.9	346	0.110	Area = 19.61 cm^2 Sx = 99.96 cm^3 Ix = 953.59 cm^4
			18	184	0.010		5.4	274	0.176	
			20	149	0.016		6.1	222	0.268	
			22	123	0.023		6.7	183	0.393	
			24	103	0.033		7.3	154	0.556	
			25	95	0.038		7.6	142	0.655	

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
57		NEMA: 20C+ CSA: 151 kg/m 9.1m E-6m UL Cross-Sectional Area: 2.00 in^2	20	232	0.011	Area = 4.22 in^2 Sx = 7.73 in^3 Ix = 32.86 in^4	6.1	345	0.187	Area = 27.73 cm^2 Sx = 126.67 cm^3 Ix = 1367.74 cm^4
			22	192	0.016		6.7	285	0.274	
			24	161	0.023		7.3	240	0.388	
			26	136	0.031		7.9	202	0.534	
			28	117	0.042		8.5	174	0.718	
			30	102	0.055		9.1	152	0.947	

When trays are used in continuous spans, the deflection of the tray is reduced by as much as 50%. Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

All dimensions in parentheses are millimeters unless otherwise specified.

6" NEMA VE 1 Loading Depth
8" Side Rail Height

Straight Section Part Numbering

Example: Prefix **S8** **A** **09** - **24** - **144**

Series
- **S8**

Material
- **A** = Aluminum

***Type**
Ladder-
- **09** = 9" rung spacing
- **12** = 12" rung spacing

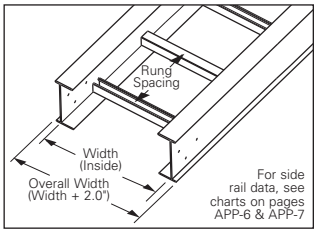
***Width**
- **12** = 12"
- **18** = 18"
- **24** = 24"
- **30** = 30"
- **36** = 36"

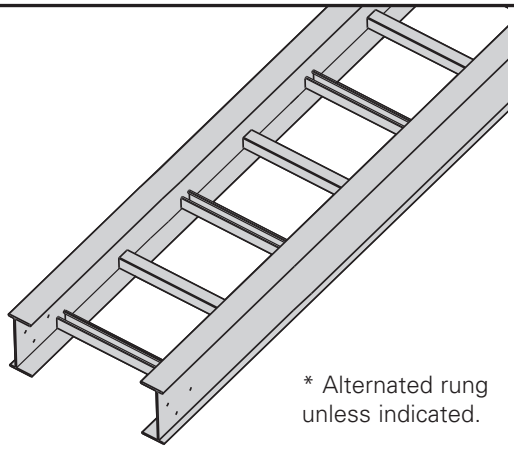
Length
- **480** = 40 ft.
- ① **360** = 30 ft.
- ② 300 = 25 ft.

①Primary Length.
②Secondary Length.

See page C-23 for explanation of lengths.

See page APP-1 for additional rung options. *Special sizes available.

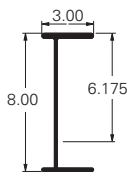




* Alternated rung unless indicated.

Values are based on simple beam tests per NEMA VE 1 on 36" wide cable tray with rungs spaced on 12" centers. Cable trays will support without collapse a 200 lb. (90.7 kg) concentrated load over and above published loads. Published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply the published load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable tray must be supported on spans shorter than or equal to the length of the cable tray being installed.

Individual rungs will support without collapse a 200 lb. (90.7 kg) concentrated load applied at the mid-span of the rung, over and above the NEMA rated cable load with a 1.5 safety factor for highlighted NEMA spans and loads.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
S8A		NEMA: 20C+	20	363	0.007		6.1	540	0.111	
		CSA: 240 kg/m 9.1m	22	300	0.010		6.7	446	0.163	
			24	252	0.013	Area=5.50 in^2	7.3	375	0.230	Area=35.48 cm^2
		UL Cross-Sectional	26	215	0.019	Sx=15.39 in^3	7.9	320	0.317	Sx=252.20 cm^3
		Area: 2.00 in^2	28	185	0.025	Ix=55.35 in^4	8.5	276	0.427	Ix=2303.84 cm^4
			30	161	0.033		9.1	240	0.562	
			40	101	0.146		12.2	151	2.488	

Green = Fastest shipped items Black = Normal lead-time items Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

The following is a list of accessories and fittings that can be provided with S8A tray. For more information on these items, contact our Engineering Department.

● Fittings

Horizontal Bends
30° Bends with 24", 36", or 48" radius
45° Bends with 24", 36", or 48" radius
60° Bends with 24", 36", or 48" radius
90° Bends with 24", 36", or 48" radius

Horizontal Tees & Crosses
With 24", 36", or 48" radius

Vertical Outside Bends
30° Bends with 24", 36", or 48" radius
45° Bends with 24", 36", or 48" radius
60° Bends with 24", 36", or 48" radius
90° Bends with 24", 36", or 48" radius

Vertical Inside Bends
30° Bends with 24", 36", or 48" radius
45° Bends with 24", 36", or 48" radius
60° Bends with 24", 36", or 48" radius
90° Bends with 24", 36", or 48" radius

Reducing Fittings

● Accessories - (standard hardware is stainless steel Type 316)

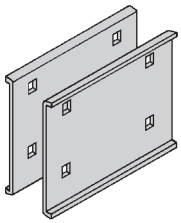
Splice Plate - 9A-1008
Expansion Splice Plate - 9A-1018
Horizontal Adjustable Splice Plate - 9A-1038
Vertical Adjustable Splice Plate - 9A-1028
Hold Down Clamps - 9ZN-1281, 9G-1281, 9A-1281
Guides - S9ZN-1202, S9G-1202
Step Down Splice Plate -
9A-1048 = 8" to 4"
9A-1051 = 8" to 5"
9A-1050 = 8" to 6"
9A-1078 = 8" to 7"
Other Accessories Include:
Offset Splice Plates
Blind Ends
Covers - Standard aluminum cover number with S in front (Example: S807A40)

● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

Wedge Lock Splice Plates

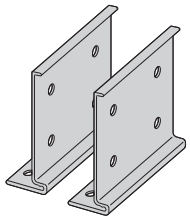
- Furnished in pairs with 1/4" hardware.
- Standard 4-hole pattern.
- Furnished in pairs, with hardware.
- One pair including hardware provided with each section. (Expansion splice quantity subtracted)
- Boxed in pairs with hardware.
- For field installation drill 13/32" hole.



Catalog No.	Height in.	Height mm
9A-1004	4	(101)
9A-1005	5	(127)
9A-1006	6	(152)
9A-1007	7	(178)

H46A, H47A and 57A Mid-Span Splice

- Furnished in pairs with 1/4" hardware.
- Standard for H46A, H47A and 57A straight sections.
- Six bolt design 1/2" Stainless Steel Type 316 hardware standard.
- Available on ladder bottoms only. 09 and 12" rung spacing.
- Furnished in pairs with hardware.

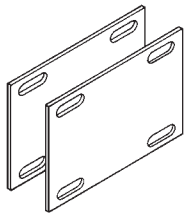


Catalog No.	Tray Series
9A-6006	H46A
9A-6007	H47A, 57A

Expansion Splice Plates

- Expansion plates allow for one inch expansion or contraction of the cable tray, or where expansion joints occur in the supporting structure.
- Furnished in pairs with hardware.
- **Bonding Jumpers are required on each siderail. Order Separately.**

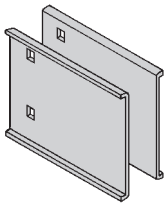
For heavy duty expansion splice plates see page APP-3.



Catalog No.	Height in.	Height mm
9A-1014	4	(101)
9A-1015	5	(127)
9A-1016	6	(152)
9A-1017	7	(178)

Universal Splice Plates

- Furnished in pairs with 1/4" hardware.
- UL Classified.

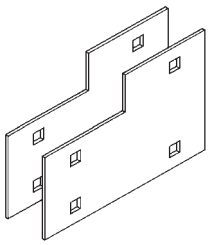


Catalog No.	Height in.	Height mm
9A-1004-1/2	4	(101)
9A-1005-1/2	5	(127)
9A-1006-1/2	6	(152)
9A-1007-1/2	7	(178)

Step Down Splice Plates

- These splice plates are offered for connecting cable tray sections having side rails of different heights.
- Furnished in pairs with hardware.

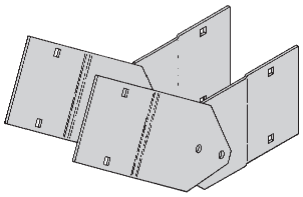
Requires supports within 24" on both sides, per NEMA VE 2.



Catalog No.	Height in.	Height mm
9A-1045	5 to 4	(127 to 101)
9A-1046	6 to 4	(152 to 101)
9A-1060	6 to 5	(152 to 127)
9A-1047	7 to 4	(178 to 101)
9A-1061	7 to 5	(178 to 127)
9A-1062	7 to 6	(178 to 152)

Vertical Adjustable Splice Plates

- These plates provide for changes in elevation that do not conform to standard vertical fittings.
- Furnished in pairs with hardware.
- Bonding Jumpers not required.



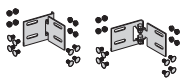
Catalog No.	Height in.	Height mm
9A-1024	4	(101)
9A-1025	5	(127)
9A-1026	6	(152)
9A-1027	7	(178)

Green = Fastest shipped items Black = Normal lead-time items Red = Normally long lead-time items

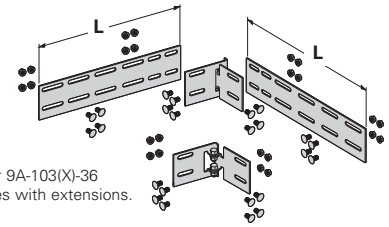
All dimensions in parentheses are millimeters unless otherwise specified.

Horizontal Adjustable Splice Plates

- Offered to adjust a cable tray run for changes in direction in a horizontal plane that do not conform to standard horizontal fittings.
- Furnished in pairs with hardware.
- Bonding jumpers **not** required.
- (X) Insert 4, 5, 6 or 7 for side rail height.



9A-103(X)
Splice only



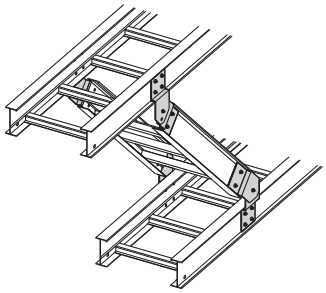
9A-103(X)-12 or 9A-103(X)-36
One pair splice plates with extensions.

Requires supports within 24" on both sides, per NEMA VE 2.

Catalog No.	Cable Tray End Cut	Thru Tray Width in. (mm)	'L' in. (mm)
● 9A-103(X)	Mitered	36 (914)	N/A (NA)
● 9A-103(X)-12	Not mitered	12 (305)	16 (406)
● 9A-103(X)-36	Not mitered	36 (914)	41 (1041)

Branch Pivot Connectors

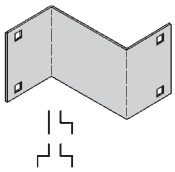
- Branch from existing cable tray runs at any point.
- Pivot to any required angle.
- UL Classified for grounding (bonding jumpers not required).
- Furnished in pairs with hardware.



Catalog No.	Height in. mm
● 9A-2044	4 (101)
● 9A-2045	5 (127)
● 9A-2046	6 (152)
● 9A-2047	7 (178)

Offset Reducing Splice Plate

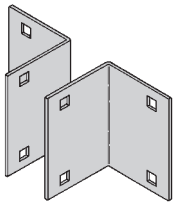
- This plate is used for joining cable trays having different widths. When used in pairs they form a straight reduction; when used singly with a standard splice plate, they form an offset reduction.
- Furnished as one plate with hardware.
- (‡) Insert reduction



Catalog No.	Height in. mm
● 9A-1064-(‡)	4 (101)
● 9A-1065-(‡)	5 (127)
● 9A-1066-(‡)	6 (152)
● 9A-1067-(‡)	7 (178)

Tray to Box Splice Plates

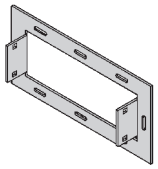
- Used to attach the end of a cable tray run to a distribution box or control panel.
- Furnished in pairs with hardware



Catalog No.	Height in. mm
● 9A-1054	4 (101)
● 9A-1055	5 (127)
● 9A-1056	6 (152)
● 9A-1057	7 (178)

Frame Type Box Connector

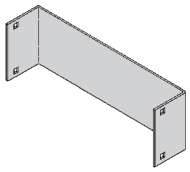
- Designed to attach the end of a cable tray run to a distribution cabinet or control center to help reinforce the box at the point of entry.
- Furnished with tray connection hardware.



Catalog No.	Height in. mm
● 9A-1074-(‡)	4 (101)
● 9A-1075-(‡)	5 (127)
● 9A-1076-(‡)	6 (152)
● 9A-1077-(‡)	7 (178)

Blind End

- This plate forms a closure for a dead end cable tray.
- Furnished as one plate with hardware.
- (‡) Insert tray width



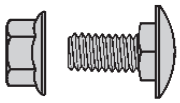
Catalog No.	Height in. mm
● 9A-1084-(‡)	4 (101)
● 9A-1085-(‡)	5 (127)
● 9A-1086-(‡)	6 (152)
● 9A-1087-(‡)	7 (178)

● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

Standard Tray Hardware (for field installation drill 13/32" hole)

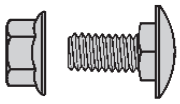
- Finish: Zinc Plated ASTM B633 SC1



Catalog No.	Description
● SNCB 3/8" x 3/4" ZN	Square Neck Carriage Bolt ASTM A307 Grade A
● SFHN 3/8"-16 ZN	Serrated Flange Hex Nut ASTM A563 Grade A

Optional Tray Hardware (for field installation drill 13/32" hole)

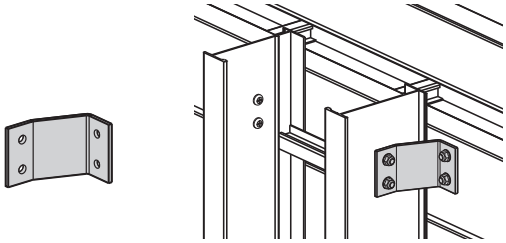
- To order 316 stainless steel hardware add SS6 suffix to catalog number - Example: 9A1004SS6



Catalog No.	Description
● SNCB 3/8" x 3/4" SS6	Square Neck Carriage Bolt AISI 316 Stainless Steel
● SFHN 3/8"-16 SS6	Serrated Flange Hex Nut AISI 316 Stainless Steel

Cross Connector Bracket

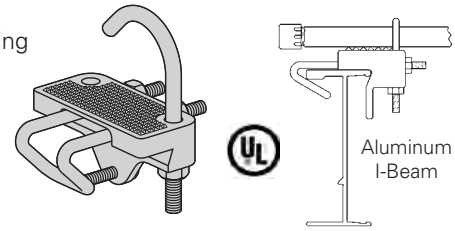
- For field connecting crossing section.
- Furnished in pairs with 3/8" hardware.



Catalog No.
● 9A-1240

Conduit to Cable Tray Adaptor

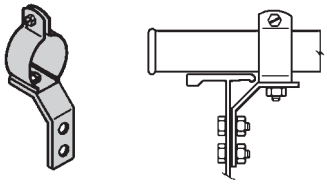
- For easy attachment of conduit terminating at a cable tray.
- Use on aluminum or steel cable trays.



Catalog No.	Conduit Size in.	mm
● 9G-1158-1/2, 3/2	1/2, 3/4	(15, 20)
● 9G-1158-1, 1 1/4	1, 1 1/4	(25, 32)
● 9G-1158-1 1/2, 2	1 1/2, 2	(40, 50)
● 9G-1158-2 1/2, 3	2 1/2, 3	(65, 80)
● 9G-1158-3 1/2, 4	3 1/2, 4	(90, 100)

Conduit to Cable Tray Adaptor

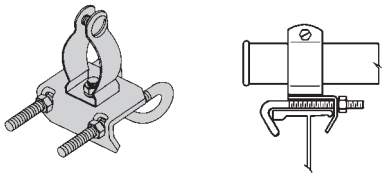
- Assembly required.
- Mounting hardware included.
- Conduit clamps provided.
- (‡) = Insert conduit size (1/2" thru 4").



Catalog No.
● 9ZN-1150-(‡)

Conduit to Cable Tray Adaptor

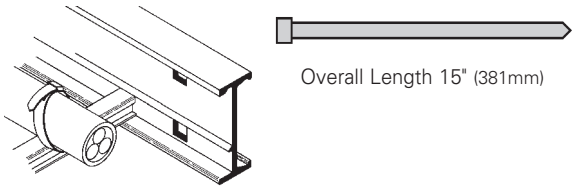
- Assembly required.
- Conduit clamps included.
- (‡) = Insert conduit size (1/2" thru 4").



Catalog No.
● 9ZN-1155-(‡)

Cable Tie (Ladder Tray)

- Nylon ties provide easy attachment of cable to ladder rungs; maximum cable O.D. is 3" (76mm).



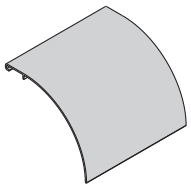
Catalog No.
● 99-2125-15

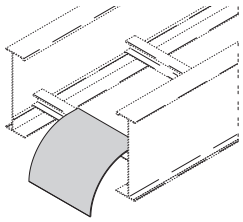
● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

Ladder Drop-Out

- Specially-designed Ladder Drop-Outs provide a rounded surface with 4" (101 mm) radius to protect cable as it exits from the cable tray, preventing damage to insulation. The drop-out will attach to any desired rung.
- (‡) Insert tray width

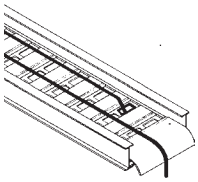


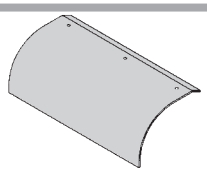


Catalog No.
9A-1104-(‡)

Trough Drop-Out & Drop-Out Bushing

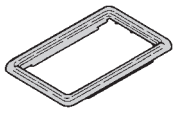
- These devices provide a rounded surface to protect cable as it exits from the trough-type cable tray.
- Hardware is included for attachment of the trough bottom drop-out.
- (‡) Insert tray width





Trough-Type Drop-Out

Catalog No.
9A-1104T-(‡)

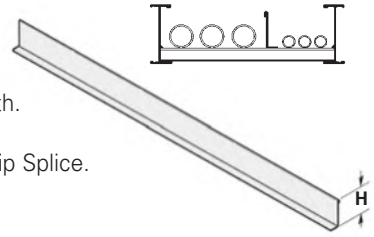


Snap-In Plastic Bushing

Catalog No.
99-1124

Barrier - Straight Section

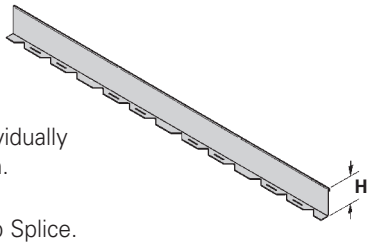
- Length: Insert 120 for [120" - 10 ft.] (3.0 m) or 144 for [144" - 12 ft.] (3.6 m)
- Order catalog number based on loading depth.
- Furnished with four #10 x ½" plated self-drilling screws and a 99-9982 Barrier Strip Splice.



Catalog No.	Side Rail Height in.	Side Rail Height mm	Loading Depth 'H' in.	Loading Depth 'H' mm
73A-Length	4	(101)	3	(76)
74A-Length	5	(127)	4	(101)
75A-Length	6	(152)	5	(127)
76A-Length	7	(178)	6	(152)

Barrier - Horizontal Bend

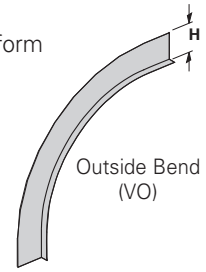
- Horizontal Bend Barriers are flexible in order to conform to any horizontal fitting radius. Can be cut to desired length.
- Standard length is 72" [6 ft.] (1.8 m) - sold individually
- Order catalog number based on loading depth.
- Furnished with three #10 x ½" plated self-drilling screws and a 99-9982 Barrier Strip Splice.



Catalog No.	Side Rail Height in.	Side Rail Height mm	Loading Depth 'H' in.	Loading Depth 'H' mm
73A-90HBFL	4	(101)	3	(76)
74A-90HBFL	5	(127)	4	(101)
75A-90HBFL	6	(152)	5	(127)
76A-90HBFL	7	(178)	6	(152)

Barrier - Vertical Outside Bend

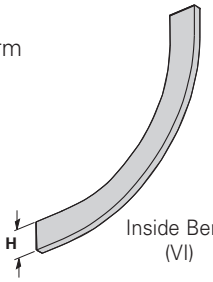
- Vertical Outside Bend Barriers are preformed to conform to a specific vertical outside bend fitting.
- Furnished with three #10 x ½" plated self-drilling screws and a 99-9982 Barrier Strip Splice.
- (*) Insert 30, 45, 60 or 90 for degrees
- (†) Insert 12, 24, 36 or 48 for radius



Catalog No.	Side Rail Height in.	Side Rail Height mm	Loading Depth 'H' in.	Loading Depth 'H' mm
73A-(*)VO(†)	4	(101)	3	(76)
74A-(*)VO(†)	5	(127)	4	(101)
75A-(*)VO(†)	6	(152)	5	(127)
76A-(*)VO(†)	7	(178)	6	(152)

Barrier - Vertical Inside Bend

- Vertical Inside Bend Barriers are preformed to conform to a specific vertical inside bend fitting.
- Furnished with three #10 x ½" plated self-drilling screws and a 99-9982 Barrier Strip Splice.
- (*) Insert 30, 45, 60 or 90 for degrees
- (†) Insert 12, 24, 36 or 48 for radius



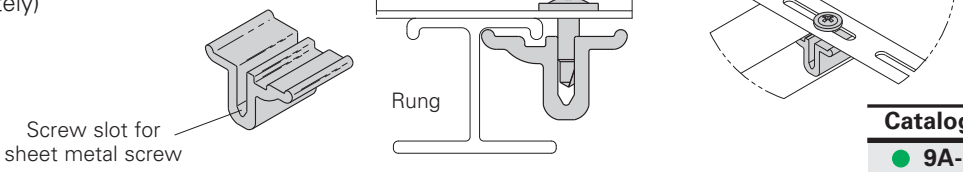
Catalog No.	Side Rail Height in.	Side Rail Height mm	Loading Depth 'H' in.	Loading Depth 'H' mm
73A-(*)VI(†)	4	(101)	3	(76)
74A-(*)VI(†)	5	(127)	4	(101)
75A-(*)VI(†)	6	(152)	5	(127)
76A-(*)VI(†)	7	(178)	6	(152)

Green = Fastest shipped items Black = Normal lead-time items Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

Barrier Strip Clip

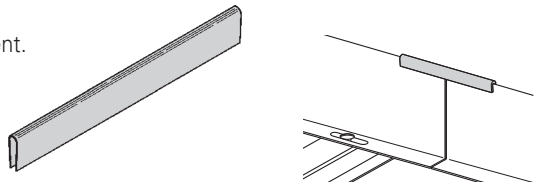
- Provides attachment to rung.
- Allows for installed barrier adjustment.
- Asymmetrical clip provides a wide range for screw location.
- Barriers strip clips not included with barriers. (Must be ordered separately)



Catalog No.
9A-RBC

Barrier Strip Splice

- Plastic splice holds adjoining barrier strips in straight alignment.
- 3" (76mm) long.

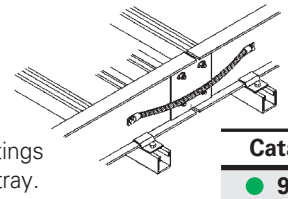


Catalog No.
99-9982

Bonding Jumper

Use at each expansion splice and where the cable tray is not mechanically/electrically continuous to ground. Sold individually.

- Hardware included.
- See table 392.6(B)(2) on page CTS-9 for amperage ratings required to match the UL cross-sectional area of the tray.
- See tray loading chart for UL cross-sectional area.
- Bonding jumper is 14 1/2" (368mm) long.

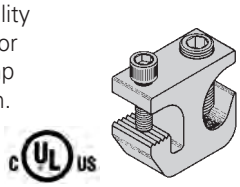


Catalog No.	Copper Wire Size	Ampacity
99-N1	#1	600
99-40	4/0	1600
99-1620	250 MCM	2000

Grounding Clamp

Eaton's B-Line series cable tray is UL® classified as to its suitability as an equipment grounding conductor. If a separate conductor for additional grounding capability is desired, B-Line offers this clamp for bolting the conductor at least once to each cable tray section.

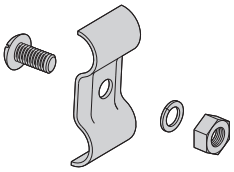
- Accepts #6 AWG to 250 MCM.



Catalog No.	Material
9A-2130	Tin Plated Aluminum

Ground Wire Clamp

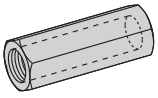
- Mechanically attaches grounding cables to cable tray.
- Hardware included.
- (*) Insert ZN or SS4

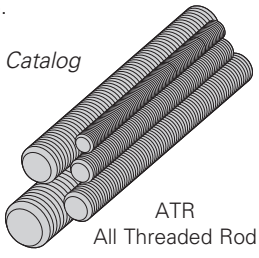


Catalog No.	Material
9(*)-2351	#1 thru 2/0
9(*(-2352	3/0 thru 250 MCM

Thread Rod (ATR) & Rod Couplings

Loading based on safety factor 5.
Standard Finish: Zinc plated
See B-Line series Strut Systems Catalog for other sizes and finishes.


B655
Rod Coupling


ATR
All Threaded Rod

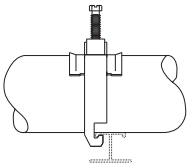
Size	Catalog No.	Available Length	Loading
All Threaded Rod			
3/8"-16	ATR 3/8" x Length	36", 72", 120", 144"	730 lbs.
1/2"-13	ATR 1/2" x Length	36", 72", 120", 144"	1350 lbs.
Rod Coupling			
3/8"-16	B655-3/8"	NA	730 lbs.
1/2"-13	B655-1/2"	NA	1350 lbs.

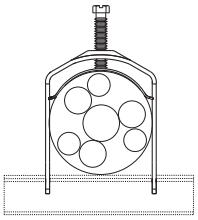
Green = Fastest shipped items Black = Normal lead-time items Red = Normally long lead-time items

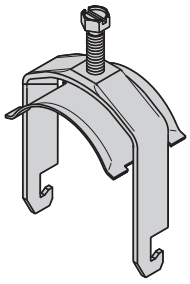
All dimensions in parentheses are millimeters unless otherwise specified.

Stainless Steel Cable Clamp 'P'

- Fits with series 2, 3, & 4 rungs.
- Attaches to rung at any point.
- 14 gauge Type 316 stainless steel material to minimize corrosion and induction heating.
- Plated steel and aluminum also available.





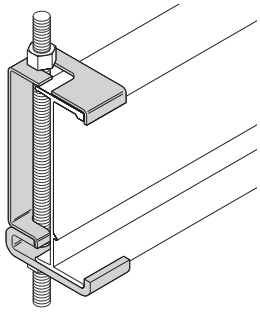


Refer to Section CF Cable Fixing

Catalog No.	Cable Size in.	mm
BP081SS	.250 - .840	(6.4 - 21.3)
BP110SS	.810 - 1.100	(20.6 - 28.0)
BP135SS	.850 - 1.350	(21.6 - 34.8)
BP175SS	1.250 - 1.750	(31.8 - 44.5)
BP205SS	1.550 - 2.050	(39.4 - 52.1)
BP250SS	2.000 - 2.500	(50.8 - 63.5)
BP300SS	2.500 - 3.000	(63.5 - 76.2)
BP325SS	2.750 - 3.250	(69.9 - 82.6)
BP375SS	3.250 - 3.750	(82.6 - 95.3)
BP425SS	3.750 - 4.250	(95.3 - 108.0)
BP475SS	4.250 - 4.750	(108.0 - 120.7)

Hanger Rod Clamp

- For 1/2" ATR.
- Furnished in pairs.
- Order ATR and hex nuts separately.
- Two-piece "J"-hanger design.
- 1500 lbs./pair capacity safety factor 3.
- (*) Insert ZN or G

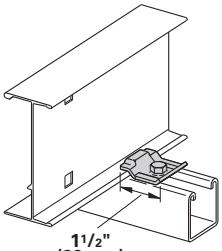


Catalog No.	Height in.	mm
9(*)-5324	4	(101)
9(*)-5325	5	(127)
9(*)-5326	6	(152)
9(*)-5327	7	(178)

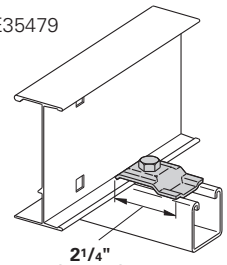
Cable Tray Clamp/Guide

- Features a no-twist design.
- Has four times the strength of the traditional design.
- Each side is labeled to ensure proper installation.
- Furnished in pairs, with or without hardware.
- Not recommended for vertical support.

Patent # RE35479



1 1/2" (39mm) 9ZN-1204 shown. Installed as a guide.



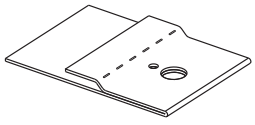
2 1/4" (57mm) 9ZN-1208 shown. Installed as a clamp.

Note: For heavy duty or vertical applications see 9(*)-1241 or 9(*)-1242 page HAT-20

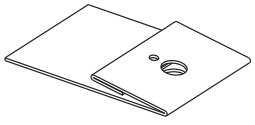
Catalog No. Without Hardware	Catalog No. With Hardware	Overall Length in. (mm)	Hardware Size in.	Finish
9ZN-1204	9ZN-1204NB	1 1/2 (38)	1/4"	G90
9ZN-1208	9ZN-1208NB	2 1/4 (57)	3/8"	G90
9A-1205	--	2 1/4 (57)	1/2"	Alum.
9G-1205	--	2 1/4 (57)	1/2"	HDGAF
9SS6-1205	--	2 1/4 (57)	1/2"	316SS
9ZN-1205	--	2 1/4 (57)	1/2"	G90

Isolator Pad

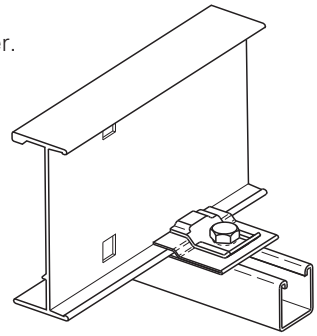
- Use as a friction reducer and/or as a dissimilar metal isolator barrier.
- UV resistant HDPE.
- Temperature range: -100 to 160° F.
- Designed to use with 9(*)-1205 or 9(*)-1208 clamp/guide.
- Color - White.



Isolation pad shown as when used with a guide.



Isolation pad shown with top flange doubled under for clamp application.



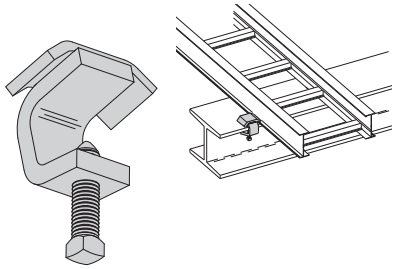
Catalog No.
99-PE34

Green = Fastest shipped items Black = Normal lead-time items Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

Cable Tray Clamp

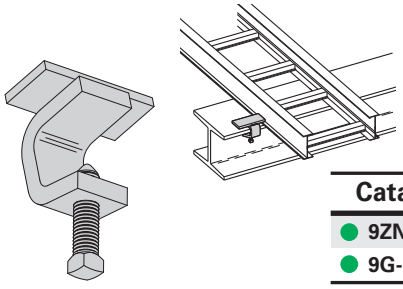
- Hold-down clamps for single or double cable tray runs.
- No drilling of support I-beam or channel is required.
- Sold in pieces - two clamps are required per tray.
- Maximum beam flange thickness 1 1/8" (28.58 mm).



Catalog No.	Finish
9ZN-1249HD	Znplt
9G-1249HD	HDGAF

Cable Tray Guide

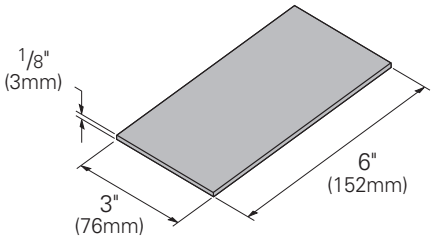
- Expansion guide for single or double cable tray runs.
- Guide allows for longitudinal movement of the cable tray.
- No field drilling of support I-beam or channel is required.
- Guides are required on both sides of cable tray to prevent lateral movement - can be placed on either the inside or outside flange of cable tray.
- Guides are sold in pieces - two guides are required per tray.
- Maximum flange thickness 1 1/8" (28.58 mm).



Catalog No.	Finish
9ZN-1249	Znplt
9G-1249	HDGAF

Nylon Pad

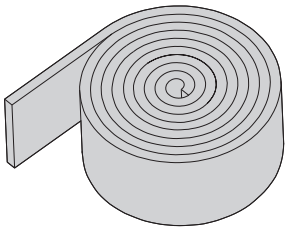
- Use for friction reduction.
- Hardness: Shore D80.
- Low friction coefficient.
- UV resistant.
- Excellent weatherability.
- UL - 94HB.



Catalog No.
99-PE36

Neoprene Roll

- Use for material isolation.
- 1/8" x 2" x 25' roll.
- Hardness: Shore A60.
- Good weatherability.



Catalog No.
99-NP300

DURA-BLOK™ Rooftop Support Bases with B22 Channel

- Designed as a superior rooftop support for cable tray,
- UV resistant and approved for most roofing material or other flat surfaces.
- Can be used with any of B-Line series cable tray clamps and guides.
- Ultimate Load Capacity: 1,000 lbs. (uniform load)

Catalog No.	Height x Width x Length in.	(mm)
DB10-28	5 5/8 x 6 x 28.0	(143 x 152 x 711)
DB10-36	5 5/8 x 6 x 36.0	(143 x 152 x 914)
DB10-42	5 5/8 x 6 x 42.0	(143 x 152 x 1067)
DB10-50	5 5/8 x 6 x 50.0	(143 x 152 x 1270)
DB10-60	5 5/8 x 6 x 60.0	(143 x 152 x 1524)

LEEDS credit available, base made from 100% recycled material.

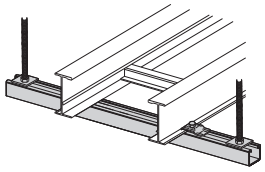
General Note: Consult roofing manufacturer or engineer for roof load capacity. The weakest point may be the insulation board beneath the rubber membrane.

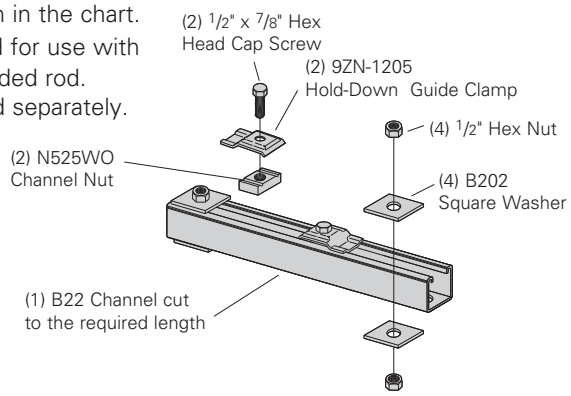
Green = Fastest shipped items Black = Normal lead-time items Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

Trapeze Support Kit

- Eaton's B-Line series trapeze kits provide the components required for a single trapeze support in one package. These kits are available in pre-galvanized steel with zinc-plated hardware, hot dip galvanized steel with 316 stainless steel hardware, or DURA GREEN™ painted steel with zinc-plated hardware.
- The SH channel provides the convenience of pre-punched slots, which eliminate the need for field drilling.
- The illustrated hardware is sealed in a plastic bag and boxed with the channel, which is pre-cut to the appropriate length as shown in the chart.
- Designed for use with 1/2" threaded rod. Order rod separately.





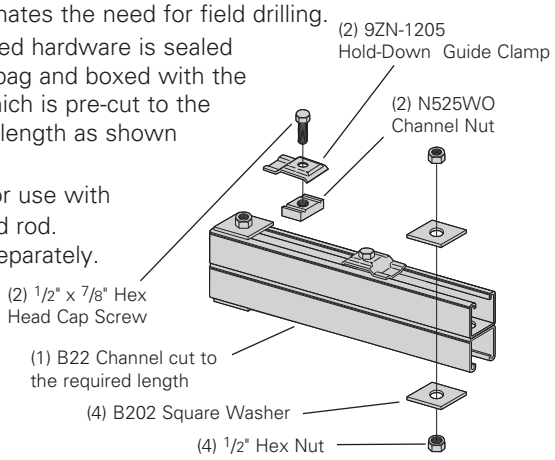
Catalog No.	Tray Width in.	Tray Width mm	Channel Length in.	Channel Length mm	Uniform Load lbs	Uniform Load kN
● 9(*)-5506-22SH(†)	6	(152)	16	(406)	1350	(6.00)
● 9(*)-5509-22SH(†)	9	(229)	18	(457)	1250	(5.56)
● 9(*)-5512-22SH(†)	12	(305)	22	(559)	1125	(5.00)
● 9(*)-5518-22SH(†)	18	(457)	28	(711)	865	(3.85)
● 9(*)-5524-22SH(†)	24	(610)	34	(864)	700	(3.11)
● 9(*)-5530-22SH(†)	30	(762)	40	(1016)	590	(2.62)
● 9(*)-5536-22SH(†)	36	(914)	46	(1168)	510	(2.27)
● 9(*)-5542-22SH(†)	42	(1067)	52	(1321)	450	(2.00)

- (*) Insert P G or GRN
- (†) Insert 3/8 for 3/8" threaded rod hardware.

Safety factor of 3.0 on all loads.

Heavy Duty Trapeze Support Kit

- Eaton's B-Line series trapeze kits provide the components required for a single trapeze support in one package. These kits are available in pre-galvanized steel with zinc-plated hardware, hot dip galvanized steel with 316 stainless steel hardware, or DURA GREEN™ painted steel with zinc-plated hardware.
- The SH channel provides the convenience of pre-punched slots, which eliminates the need for field drilling.
- The illustrated hardware is sealed in a plastic bag and boxed with the channel, which is pre-cut to the appropriate length as shown in the chart.
- Designed for use with 1/2" threaded rod. Order rod separately.

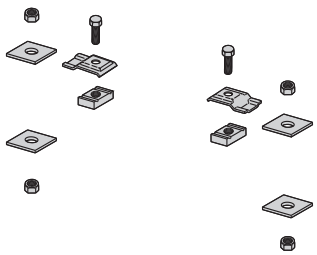


Catalog No.	Tray Width in.	Tray Width mm	Channel Length in.	Channel Length mm	Uniform Load lbs	Uniform Load kN
● 9(*)-5506-22SHA	6	(152)	16	(406)	1350	(6.00)
● 9(*)-5509-22SHA	9	(229)	18	(457)	1350	(6.00)
● 9(*)-5512-22SHA	12	(305)	22	(559)	1350	(6.00)
● 9(*)-5518-22SHA	18	(457)	28	(711)	1350	(6.00)
● 9(*)-5524-22SHA	24	(610)	34	(864)	1350	(6.00)
● 9(*)-5530-22SHA	30	(762)	40	(1016)	1350	(6.00)
● 9(*)-5536-22SHA	36	(914)	46	(1168)	1350	(6.00)
● 9(*)-5542-22SHA	42	(1067)	52	(1321)	1350	(6.00)

- (*) Insert P G or GRN

Safety factor of 3.0 on all loads.

Trapeze Hardware Kit



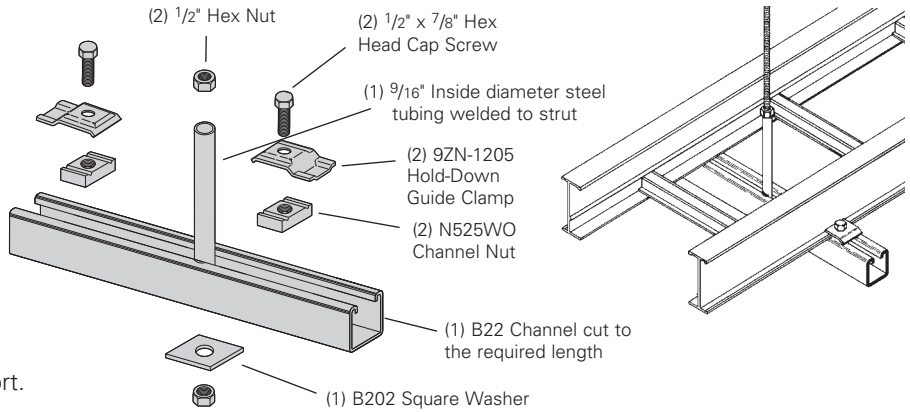
Catalog No.	● 9ZN-5500-1/2	● 9G-5500-1/2
In plastic bag	1 pr. 9ZN-1205 2 HHC Screw 1/2 x 7/8 ZN 2 N525 WO ZN 4 B202 ZN 1/2" sq washer 4 HN 1/2 ZN	1 pr. 9G-1205 2 HHC Screw 1/2 x 7/8 SS6 2 N525 WO SS6 4 B202 HDG 1/2" sq washer 4 HN 1/2" SS6

● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

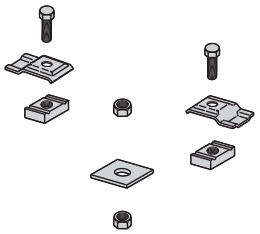
Center Hung Tray Support

- Center Hung Cable Tray Support allows cable to be laid-in from both sides.
- Eliminates costly cable pulling and field cutting of cable tray supports. Labor costs are dramatically reduced.
- Required hardware and threaded rod material for trapeze assemblies are reduced by up to 50%.
- Designed for use with 1/2" threaded rod. (Order rod separately)
- Use with all aluminum and steel cable trays through 24" width.
- Load capacity is 700 lbs. (311kN) per support. Safety factor of 3.0. Eccentric loading is not to exceed a 60% vs. 40% load differential.
- The maximum recommended unsupported span length is 144"/12 ft. (3.66 m).
- Hardware shown is furnished.
- Finish available: Zinc Plated



Catalog No.	Tray Width in.	Tray Width (mm)	Channel Length in.	Channel Length (mm)
9ZN-5212	6", 9", 12"	(152, 228, 305)	18"	(457)
9ZN-5224	18", 24"	(457, 609)	30"	(762)

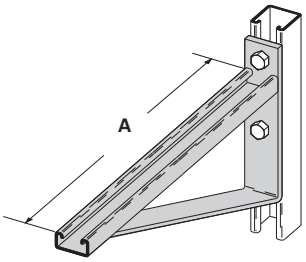
Center Hung Support Hardware Kit



Catalog No.	9ZN-5200
In plastic bag	1 pr. 9ZN-1205 2 HHC Screw 1/2 x 7/8 ZN 2 N525 WO ZN 1 B202 ZN 1/2" sq washer 4 HN 1/2 ZN

Bracket

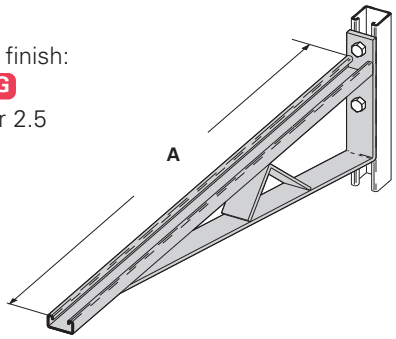
- (*) Insert available finish: ZN GRN or HDG
- Safety Load Factor 2.5



Catalog No.	Uniform Load lbs	Uniform Load kN	Tray Width in.	Tray Width mm	'A' in.	'A' mm
B494-12	1580	(7.02)	6 & 9	(152 & 229)	12	(305)
B494-18	1000	(4.45)	12	(305)	18	(457)
B494-24	996	(4.43)	18	(457)	24	(610)

Bracket

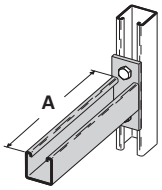
- (*) Insert available finish: ZN GRN or HDG
- Safety Load Factor 2.5



Catalog No.	Uniform Load lbs	Uniform Load kN	Tray Width in.	Tray Width mm	'A' in.	'A' mm
B494-30	924	(4.11)	24	(610)	30	(762)
B494-36	864	(3.84)	30	(762)	36	(914)
B494-42	580	(2.58)	36	(914)	42	(1067)
B494-48	500	(2.22)	42	(1067)	48	(1219)

Cantilever Bracket

- (*) Insert available finish: ZN GRN HDG SS4 or SS6
- Safety Load Factor 2.5



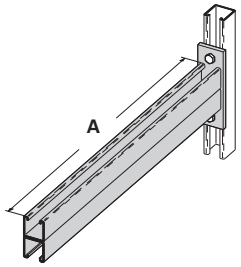
Catalog No.	Uniform Load lbs	Uniform Load kN	Tray Width in.	Tray Width mm	'A' in.	'A' mm
B409-12	960	(4.27)	6 & 9	(152 & 229)	12	(305)
B409-18	640	(2.84)	12	(305)	18	(457)
B409-24	480	(2.13)	18	(457)	24	(610)

Green = Fastest shipped items Black = Normal lead-time items Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

Cantilever Bracket

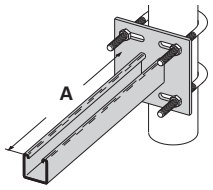
- (*) Insert available finish: ZN GRN HDG or SS4
- Safety Load Factor 2.5



Catalog No.	Uniform Load lbs	Uniform Load kN	Tray Width in.	Tray Width mm	'A' in.	'A' mm
B297-12	1660	(7.38)	6 & 9	(152 & 229)	12	(305)
B297-18	1100	(4.89)	12	(305)	18	(457)
B297-24	835	(3.71)	18	(457)	24	(610)
B297-30	665	(2.93)	24	(610)	30	(762)
B297-36	550	(2.44)	30	(762)	36	(914)
B297-42	465	(2.06)	36	(914)	42	(1067)

Underfloor Support (U-Bolts not included)

- Finishes available: ZN
- Safety Load Factor 2.5

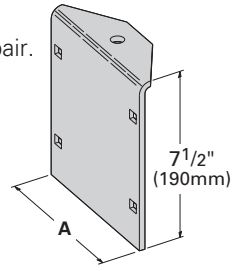


U-Bolt Size	Fits Pipe O.D.
B501-3/4	.841 - 1.050
B501-1	1.051 - 1.315
B501-1 1/4	1.316 - 1.660
B501-1 1/2	1.661 - 1.900
B501-2	1.901 - 2.375
B501-2 1/2	2.376 - 2.875

Catalog No.	Uniform Load lbs	Uniform Load (kN)	Tray Width in.	Tray Width (mm)	'A' in.	'A' (mm)
B409UF-12	800	(3.56)	6 & 9	(152 & 229)	12	(305)
B409UF-21	450	(2.00)	12 & 18	(305 & 457)	21	(533)

Vertical Hanger Splice Plates

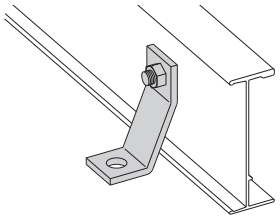
- Design load is 1500 lbs (6.67kN) per pair.
- Safety Factor of 2.5
- Furnished in pairs.
- Hole size: 9/16" (14mm) for 1/2" threaded rod.



Catalog No.	Outside Cable Tray Ht.	'A' in.	'A' (mm)
● 9A-1224	4"	3.84	(97.54)
● 9A-1225	5"	4.73	(120.14)
● 9A-1226	6"	5.84	(148.34)
● 9A-1227	7"	6.84	(173.74)

Heavy Duty Hold Down Bracket

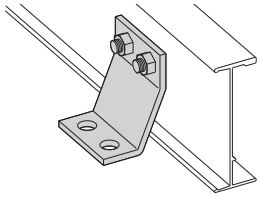
- Design load is 2000 lbs (8.89kN) per pair.
- Two bolt design.
- Sold in pairs.
- 3/8" cable tray attachment hardware provided.
- 1/2" support attachment hardware **not** provided.
- (*) Insert ZN SS4 or SS6
- Recommended for support of vertical trays.

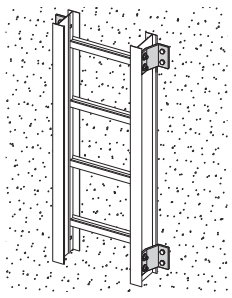


Catalog No.
9(*)-1241

Heavy Duty Hold Down Bracket

- Design load is 4000 lbs (17.79kN) per pair.
- Four bolt design.
- Sold in pairs.
- 3/8" cable tray attachment hardware provided
- 1/2" support attachment hardware **not** provided.
- (*) Insert ZN SS4 or SS6
- Recommended for support of vertical trays.

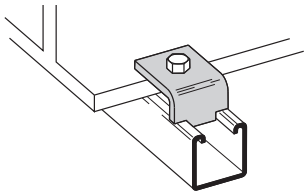




Catalog No.
9(*)-1242

Beam Clamp

- Finishes available: ZN GRN HDG or SS4
- Sold in pieces.
- Design load is 1200 lbs (5.34kN) per pair.
- Safety Load Factor 5.0.
- Order HHCS and Channel Nuts separately.



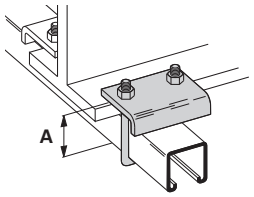
Catalog No.
B355

● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

Beam Clamp

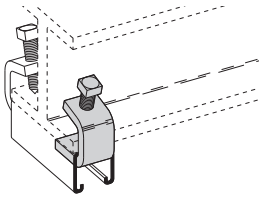
- Finishes available: ZN or HDG
- Sold in pieces.
- *Design load when used in pairs. Safety Load Factor 5.0



Catalog No.	Design Load lbs	Design Load (kN)	'A' in.	'A' (mm)
B441-22	1200	(5.34)	3 3/8	(86)
B441-22A	1200	(5.34)	5	(127)

Beam Clamp

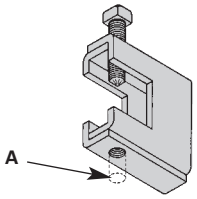
- Finishes available: ZN GRN or HDG
- Sold in pieces.
- *Design load when used in pairs. Safety Load Factor 5.0

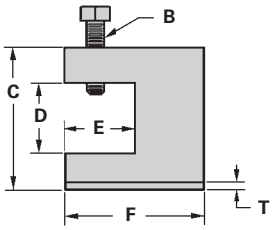


Catalog No.	B212-1/4	B212-3/8
Design Load *	600 lbs. (2.67kN)	1000 lbs. (4.45 kN)
Max. Flange Thick	3/4" (19 mm)	1 1/8" (28.6 mm)
Mat'l. Thickness	1/4" (6.3 mm)	3/8" (9.5 mm)

B305 Thru B308 & B321 Series Beam Clamps

- Finishes available: ZN or HDG
- Setscrew included.
- Safety Load Factor 5.0

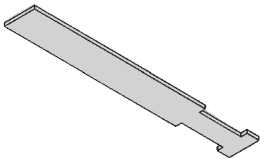




Catalog No.	Rod Size A	B	C in.	C (mm)	D in.	D (mm)	E in.	E (mm)	F in.	F (mm)	T in.	T (mm)	Design Load lbs	Design Load (kN)
B305	3/8"-16	3/8"-16	2 5/16	(58.7)	7/8	(22.2)	1 1/8	(28.6)	2 1/2	(63.5)	11 Ga.	(3.0)	600	(2.67)
B306	3/8"-16	1/2"-13	2 7/16	(61.9)	7/8	(22.2)	1 1/8	(28.6)	2 1/2	(63.5)	7 Ga.	(4.5)	1100	(4.90)
B307	1/2"-13	1/2"-13	2 7/16	(61.9)	7/8	(22.2)	1 1/8	(28.6)	2 1/2	(63.5)	7 Ga.	(4.5)	1100	(4.90)
B308	1/2"-13	1/2"-13	2 9/16	(65.1)	7/8	(22.2)	1 1/8	(28.6)	2 1/2	(63.5)	1/4	(6.3)	1500	(6.68)
B321-1	3/8"-16	1/2"-13	3 9/16	(90.5)	1 11/16	(42.9)	1 5/8	(41.3)	3 1/4	(82.5)	1/4	(6.3)	1300	(5.79)
B321-2	1/2"-13	1/2"-13	3 9/16	(90.5)	1 11/16	(42.9)	1 5/8	(41.3)	3 1/4	(82.5)	1/4	(6.3)	1400	(6.23)

Anchor Strap - for B305 thru B308 & B321 Series

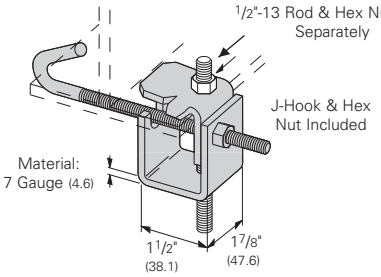
- Finish available: ZN
- For a maximum beam thickness of 3/4" (19mm).
- For thicker beams, step up one flange width size.



Catalog No.	Flange Width in.	Flange Width (mm)
B312-6	Up to 6	(Up to 152)
B312-9	6 - 9	(152 to 228)
B312-12	9 - 12	(228 to 305)

Beam Clamp

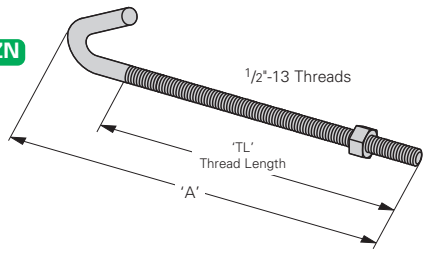
- Finish available: ZN
- Design Load 500 lbs. (2.22 kN)
- Safety Load Factor 5.0
- Recommended torque: 'J'-Hook Nut 125 In.-Lbs. (14.1 kN/m)
- Maximum flange thickness of 3/4" (19mm).



Catalog No.	For Flange Width in.	For Flange Width (mm)	Wt./C lbs	Wt./C (kg)
B750-J4	3 - 6	(76.2 - 152.4)	109	(49.4)
B750-J6	5 - 9	(127.0 - 288.6)	124	(56.2)
B750-J9	8 - 12	(203.2 - 304.8)	135	(61.,2)
B750-J12	11 - 15	(279.4 - 381.0)	147	(66.7)

'J'-Hook

- Finishes available: ZN
- Hex Nut included.

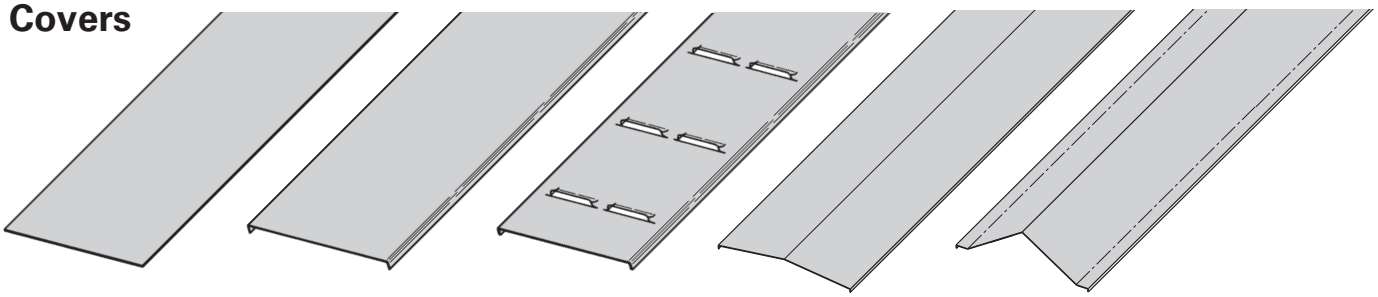


Catalog No.	'A' in.	'A' (mm)	'TL' in.	'TL' (mm)	Wt./C lbs	Wt./C (kg)
B700-J4	8 1/2	(215.9)	5	(127.0)	44	(19.9)
B700-J6	11 1/2	(292.1)	6	(152.4)	53	(24.0)
B700-J9	12 1/4	(368.3)	6	(152.4)	63	(28.6)
B700-J12	17 1/2	(444.5)	6	(152.4)	78	(35.4)

● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

Covers



Solid Non-Flanged | Solid Flanged | Ventilated Flanged | Peaked Flanged | 2 to 3 Pitch Peaked Flanged (See page APP-4)

A full range of covers is available for straight sections and fittings.

Solid covers should be used when maximum enclosure of the cable is desired and no accumulation of heat is expected.
Ventilated covers provide an overhead cable shield, yet allow heat to escape.
We recommend that covers be placed on vertical cable tray runs to a height of 6 ft. (1.83 m) to 8 ft. (2.44 m) above the floor to isolate both cables and personnel. **Flanged covers** have a 1/2 in. (13 mm) flange. Cover clamps are not included with the cover and must be ordered separately. All **peaked covers** are flanged. Standard peaked covers have 1/2" peak. Special purpose peaked covers, having a 2 to 3 pitch, provide additional slope and material thickness. The 2 to 3 pitch fitting covers are of multiple piece, welded construction.

Aluminum Cover Part Numbering

Prefix

Example: **80 7 A - 24 - 144**

Cover Type
- 80 = Solid
- 81 = Ventilated
- 82 = Peaked

Detail
- 6 = Non-Flanged (80 & 81 type only)
- 7 = Flange

Material
- A = Aluminum

Tray Width
- 06 = 6"
- 09 = 9"
- 12 = 12"
- 18 = 18"
- 24 = 24"
- 30 = 30"
- 36 = 36"

Item Description
For Straight Section Cover:
- 144 = 12 ft. (3.66 m)
- 120 = 10 ft. (3.05 m)
- 72 = 6 ft. (1.83 m)
- 60 = 5 ft. (1.52 m)

For fitting covers: Insert suffix of fitting to be covered. See example below.

Examples of Catalog Numbers for Fitting Covers:

Horizontal Bend Cover

Prefix: 80 7 | Suffix: A - 18 - 90 HB 24

- 24 = Radius
- HB = Fitting
- 90 = Angle
- 18 = Width
- A = Material
- 7 = Detail
- 80 = Cover Type

Vertical Bend Cover

Prefix: 80 7 | Suffix: A - 24 - 90 VO 24 - 4*

- 4* = Side Rail* Height
- 24 = Radius
- VO = Fitting
- 90 = Angle
- 24 = Width
- A = Material
- 7 = Detail
- 80 = Cover Type

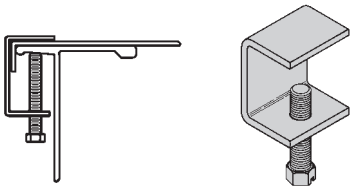
* Required for VO fittings only

● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

Standard Cover Clamp

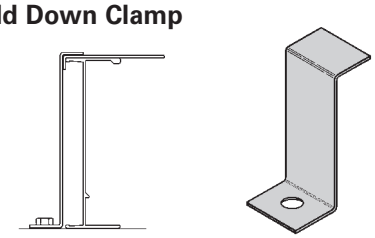
- For indoor service only.
- Setscrew included.
- Sold per piece.



Tray Type	Catalog No.	Side Rail Height
Aluminum	9ZN-9012	All Sizes
	9A-9012	

Combination Cover and Hold Down Clamp

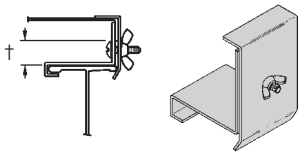
- Sold per piece.
- For indoor service only.



Tray Type	Catalog No.	Side Rail Height in.	(mm)
Aluminum	9A-9043	4	(101)
	9A-9053	5	(127)
	9A-9063	6	(152)
	9A-9073	7	(78)

Raised Cover Clamp

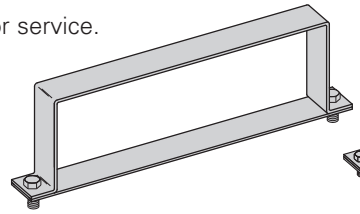
- For indoor service only.
- For use with flanged covers only.
  † Specify gap of 1", 2", 3" or 4".



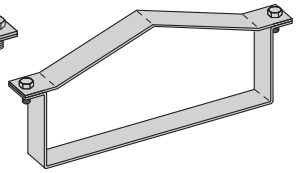
Tray Type	Catalog No.	Side Rail Height
Aluminum	9ZN-9112-†	4 & 5 Deep
	9ZN-9113-†	6 & 7 Deep

Heavy Duty Cover Clamp

- Recommended for outdoor service.
- (‡) Insert tray width
  † Add P to Catalog No.
  for peaked cover clamp.



Peaked Cover Clamp



Catalog No.	Side Rail Height in.	mm
9A-(‡)-9044†	4	(101)
9A-(‡)-9054†	5	(127)
9A-(‡)-9064†	6	(152)
9A-(‡)-9074†	7	(178)

Quantity of Standard Cover Clamps Required

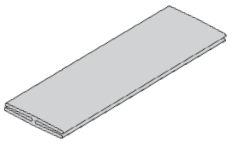
Notes:
When using the Heavy Duty Cover Clamp, only on-half the number of clamps stated above is required.

Additional clamps may be necessary in extreme wind applications.

Straight Section 60" or 72"	4 pcs.
Straight Section 120" or 144"	6 pcs.
Horizontal/Vertical Bends	4 pcs.
Tees	6 pcs.
Crosses	8 pcs.

Conduit to Cable Tray Adaptor

- Used to join covers
- Plastic
- (‡) Insert tray width

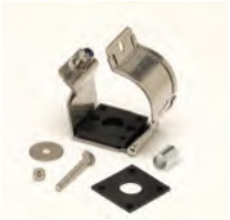


Catalog No.
99-9980-(‡)

Cable Cleats

(see pages O-1 thru O-5) Standard

Trefoil Cable Cleats



Single Cable Cleats

● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

Section 1- Acceptable Manufacturers

1.01 Manufacturer: Subject to compliance with these specifications, Eaton's B-Line series cable tray systems shall be as manufactured by Eaton.

Section 2- Cable Tray Sections and Components

2.01 General: Except as otherwise indicated, provide metal cable trays, of types, classes and sizes indicated; with splice plates, bolts, nuts and washers for connecting units. Construct units with rounded edges and smooth surfaces; in compliance with applicable standards; and with the following additional construction features. Cable tray shall be installed according to the latest revision of NEMA VE 2.

2.02 Materials and Finish: Straight section and fitting side rails and rungs shall be extruded from Aluminum Association Alloy 6063. All fabricated parts shall be made from Aluminum Association Alloy 5052.

2.03 Ladder Cable Trays shall consist of two longitudinal members (side rails) with transverse members (rungs) welded to the side rails. Rungs shall be spaced [6] [9] [12] inches on center. Rung spacing in radiused fittings shall be industry standard 9" and measured at the center of the tray's width. Each rung must be capable of supporting a 200 lb. concentrated load at the center of the cable tray over and above the cable load with a safety factor of 1.5.

2.04 Ventilated Trough Cable Trays shall consist of two longitudinal members (side rails) with a corrugated bottom welded to the side rails or rungs spaced 4" on center. The peaks of the corrugated bottom shall have a minimum flat cable bearing surface of $2\frac{3}{4}$" and shall be spaced on 6" centers. To provide ventilation in the tray, the valleys of the corrugated bottom shall have $2\frac{1}{4}$" x 4" rectangular holes punched along the width of the bottom.

2.05 Non-Ventilated Bottom Trough Cable Trays shall consist of two longitudinal members (side rails) with a corrugated bottom welded to the side rails or a solid sheet over rungs. The peaks of the corrugated bottom shall have a minimum flat cable bearing surface of $2\frac{3}{4}$" and shall be spaced on 6" centers.

2.06 Cable tray loading depth shall be [3] [4] [5] [6] inches per NEMA VE 1.

2.07 Straight sections shall have side rails fabricated as I-beams. Straight sections shall be supplied in standard [12 foot] [24 foot] [10 foot (3 m)] [20 foot (6 m)] lengths.

2.08 Cable tray widths shall be [6] [9] [12] [18] [24] [30] [36] inches or as shown on drawings.

2.09 Splice plates shall be the Wedge-Lock design with 4 nuts and bolts per plate. The resistance of fixed splice connections between an adjacent section of tray shall not exceed 0.00033 ohm.

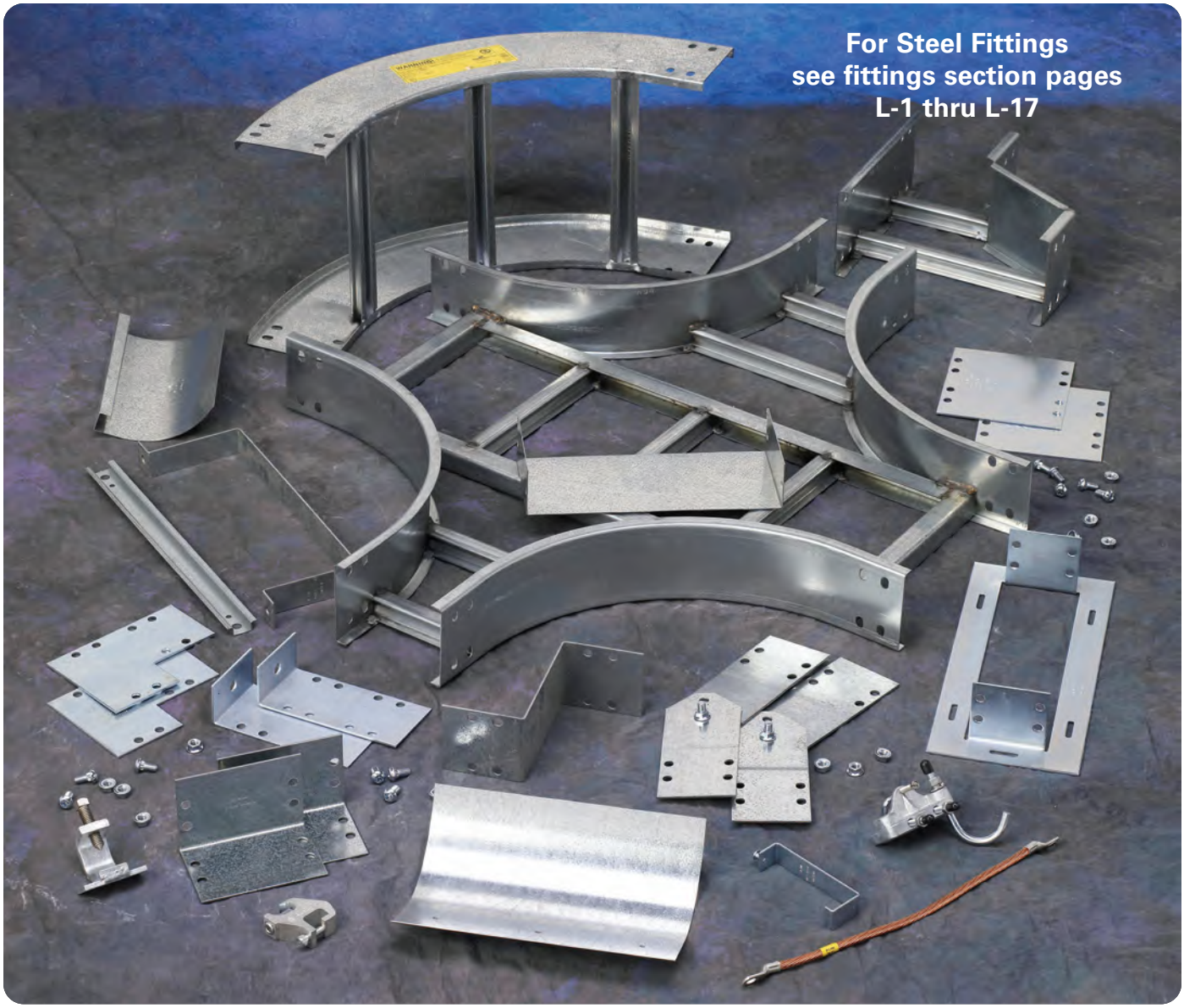
2.10 All fittings must have a minimum radius of [12] [24] [36] [48] inches.

Section 3- Loading Capacities and Testing

3.01 Cable tray shall be capable of carrying a uniformly distributed load of _____ lbs./ft. on a _____ ft. support span with a safety factor of 1.5 when supported as a simple span and tested per NEMA VE 1 5.2. In addition to the uniformly distributed load the cable tray shall support 200 lbs. concentrated load at mid-point of span. Load and safety factors specified are applicable to both the side rails and rung capacities. Cable tray shall be made to manufacturing tolerances as specified by NEMA.

3.02 Upon request, manufacturer shall provide test reports in accordance with the latest revision of NEMA VE 1 or CSA C22.2 No. 126.

Series 2, 3, 4, & 5 Steel - Straight Sections



How The Service Advisor Works

We know that your time is important! That's why the color-coding system in this catalog is designed to help you select products that fit your service needs. Products are marked to indicate the typical lead time for orders of 50 pieces or less.

Customer: How do I select my straight sections. covers, or fittings so that I get the quickest turnaround?

Service Advisor: Each part of our selection chart is shown in colors. If any section of a part number is a different color, the part will typically ship with the longer lead time represented by the colors.

- Green = Fastest shipped items
- Black = Normal lead-time items
- Red = Normally long lead-time items

Example: **258G 12 - 24 - 144**

Part will have a long lead time because of the 258G material.

Changing the part number from 258G to 258P will change the coding to black and reduce lead time.

3" NEMA VE 1 Loading Depth
4" Side Rail Height

Straight Section Part Numbering

Prefix

Example: **248** **P** **09** - **24** - **144**

Series

- **248**
- **346**
- **444**

Material

- **P** = Pre-Galvanized
- **G** = HDGAF

***Type**

Ladder-

- **06** = 6" rung spacing
- **09** = 9" rung spacing
- **12** = 12" rung spacing

Trough-

6" thru 36" wide

- **VT** = Ventilated Trough
- **ST** = Non-Ventilated Trough

***Width**

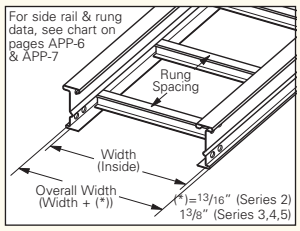
- **06** = 6"
- **09** = 9"
- **12** = 12"
- **18** = 18"
- **24** = 24"
- **30** = 30"
- **36** = 36"

Length

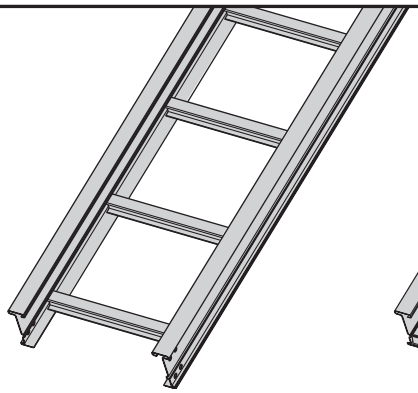
① **144** = 12 ft.	248
② 120 = 10 ft.	
① **240** = 20 ft.	346
② 144 = 12 ft.	
① **240** = 20 ft.	444
② 288 = 24 ft.	

①Primary Length.
②Secondary Length.

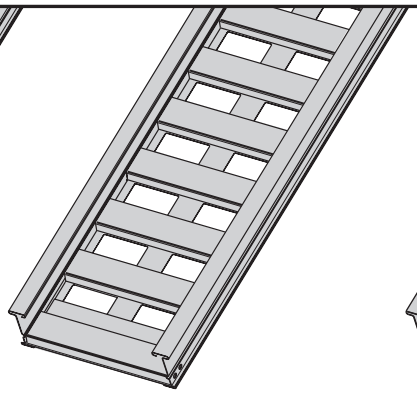
See page C-23 for explanation of lengths.



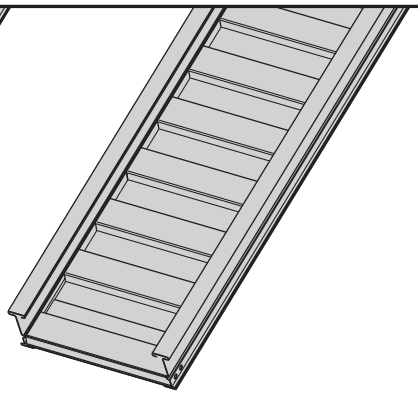
See page APP-1 for additional rung options. *Special sizes available.



Ladder Type
(Specify Rung Spacing)



Ventilated Trough



Non-Ventilated Trough

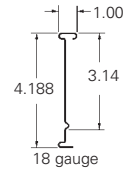
● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

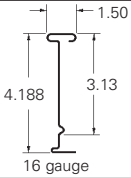
All dimensions in parentheses are millimeters unless otherwise specified.

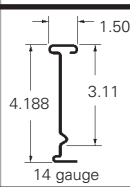
3" NEMA VE 1 Loading Depth
4" Side Rail Height

Values are based on simple beam tests per NEMA VE 1 on 36" wide cable tray with rungs spaced on 12" centers. Cable trays will support without collapse a 200 lb. (90.7 kg) concentrated load over and above published loads. Published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply publish load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable tray must be supported on spans shorter than or equal to the length of the cable tray being installed.

Individual rungs will support without collapse a 200 lb. (90.7 kg) concentrated load applied at the mid-span of the rung, over and above the NEMA rated cable load with a 1.5 safety factor for highlighted NEMA spans and loads.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
248		NEMA: 16A, 12C CSA: D1-3m UL Cross-Sectional Area: 0.40 in^2	6	412*	0.0007	Area = 0.62 in^2 Sx = 0.64 in^3 Ix = 1.43 in^4	1.8	613*	0.012	Area = 4.00 cm^2 Sx = 10.49 cm^3 Ix = 59.52 cm^4
			8	232	0.0022		2.4	345	0.038	
			10	148	0.0054		3.0	221	0.093	
			12	103	0.011		3.7	153	0.192	
			14	76	0.021		4.3	113	0.356	
			16	58	0.036		4.9	86	0.607	

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
346		NEMA: 20A, 16B CSA: D1-6m UL Cross-Sectional Area: 0.70 in^2	10	252	0.0036	Area = 0.89 in^2 Sx = 0.96 in^3 Ix = 2.22 in^4	3.0	375	0.060	Area = 5.74 cm^2 Sx = 15.73 cm^3 Ix = 92.40 cm^4
			12	175	0.0072		3.7	260	0.124	
			14	129	0.013		4.3	191	0.229	
			16	98	0.023		4.9	146	0.391	
			18	78	0.037		5.5	116	0.626	
			20	63	0.056		6.1	94	0.955	

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
444		NEMA: 20B, 16C CSA: E-3m UL Cross-Sectional Area: 1.00 in^2	12	253	0.0055	Area = 1.19 in^2 Sx = 1.27 in^3 Ix = 2.94 in^4	3.7	376	0.093	Area = 7.68 cm^2 Sx = 20.81 cm^3 Ix = 122.37 cm^4
			16	142	0.027		4.9	212	0.295	
			18	112	0.028		5.5	167	0.473	
			20	91	0.042		6.1	135	0.721	
			22	75	0.062		6.7	112	1.055	
			24	63	0.088		7.3	94	1.495	

*When using 18" rung spacing, load capacity is limited to 394 lbs/ft (586.272 kg/m) for 30" cable tray width and 325 lbs/ft (483.6 kg/m) for 36" cable tray width. When cable trays are used in continuous spans, the deflection of the cable tray is reduced by as much as 50%. Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

All dimensions in parentheses are millimeters unless otherwise specified.

4" NEMA VE 1 Loading Depth
5" Side Rail Height

Straight Section Part Numbering

Prefix

Example: **258** **P** **09** - **24** - **144**

Series

- **258**
- **356**
- **454**

Material

- **P** = Pre-Galvanized
- **G** = HDGAF

*Type

Ladder-

- **06** = 6" rung spacing
- **09** = 9" rung spacing
- **12** = 12" rung spacing

Trough-

6" thru 36" wide

- **VT** = Ventilated Trough
- **ST** = Non-Ventilated Trough

*Width

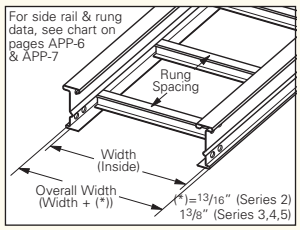
- **06** = 6"
- **09** = 9"
- **12** = 12"
- **18** = 18"
- **24** = 24"
- **30** = 30"
- **36** = 36"

Length

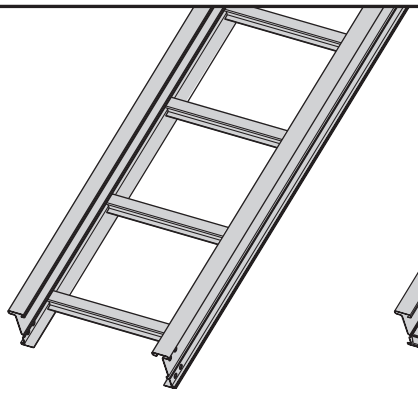
① **144** = 12 ft.	258
② 120 = 10 ft.	
① **240** = 20 ft.	356
② 144 = 12 ft.	
① **240** = 20 ft.	454
② 288 = 24 ft.	

①Primary Length.
②Secondary Length.

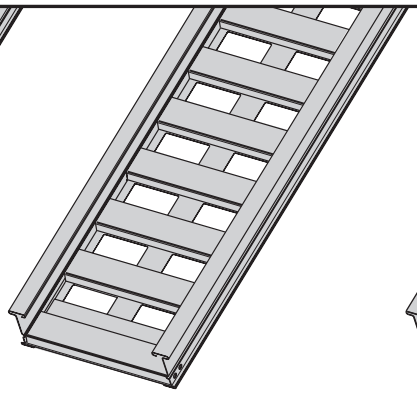
See page C-23 for explanation of lengths.



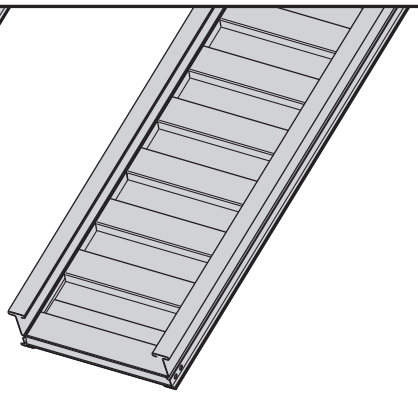
See page APP-1 for additional rung options. *Special sizes available.



Ladder Type
(Specify Rung Spacing)



Ventilated Trough



Non-Ventilated Trough

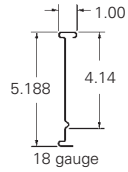
● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

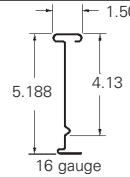
All dimensions in parentheses are millimeters unless otherwise specified.

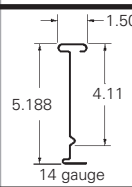
4" NEMA VE 1 Loading Depth
5" Side Rail Height

Values are based on simple beam tests per NEMA VE 1 on 36" wide cable tray with rungs spaced on 12" centers. Cable trays will support without collapse a 200 lb. (90.7 kg) concentrated load over and above published loads. Published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply publish load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable tray must be supported on spans shorter than or equal to the length of the cable tray being installed.

Individual rungs will support without collapse a 200 lb. (90.7 kg) concentrated load applied at the mid-span of the rung, over and above the NEMA rated cable load with a 1.5 safety factor for highlighted NEMA spans and loads.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
258		NEMA: 16A, 12C CSA: D1-3m UL Cross-Sectional Area: 0.40 in^2	6	436*	0.0004	Area = 0.71 in^2 Sx = 0.89 in^3 Ix = 2.44 in^4	1.8	649*	0.007	Area = 4.58 cm^2 Sx = 14.58 cm^3 Ix = 101.56 cm^4
			8	245	0.0013		2.4	365	0.022	
			10	157	0.0032		3.0	234	0.054	
			12	109	0.0066		3.7	162	0.113	
			14	80	0.012		4.3	119	0.209	
			16	61	0.021		4.9	91	0.356	

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
356		NEMA: 20A, 16C CSA: D1-6m UL Cross-Sectional Area: 0.70 in^2	10	276	0.0021	Area = 1.00 in^2 Sx = 1.31 in^3 Ix = 3.73 in^4	3.0	411	0.036	Area = 6.45 cm^2 Sx = 21.47 cm^3 Ix = 155.25 cm^4
			12	192	0.0043		3.7	285	0.074	
			14	141	0.0080		4.3	210	0.136	
			16	108	0.014		4.9	160	0.233	
			18	85	0.022		5.5	127	0.373	
			20	69	0.033		6.1	103	0.568	

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
454		NEMA: 20C CSA: E-6m UL Cross-Sectional Area: 1.00 in^2	12	294	0.0032	Area = 1.34 in^2 Sx = 1.75 in^3 Ix = 4.96 in^4	3.7	438	0.055	Area = 8.65 cm^2 Sx = 28.68 cm^3 Ix = 206.45 cm^4
			16	166	0.010		4.9	246	0.175	
			18	131	0.016		5.5	195	0.280	
			20	106	0.026		6.1	158	0.427	
			22	88	0.037		6.7	130	0.625	
			24	74	0.052		7.3	110	0.886	

*When using 18" rung spacing, load capacity is limited to 394 lbs/ft (586.272 kg/m) for 30" cable tray width and 325 lbs/ft (483.6 kg/m) for 36" cable tray width. When cable trays are used in continuous spans, the deflection of the cable tray is reduced by as much as 50%. Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

All dimensions in parentheses are millimeters unless otherwise specified.

5" NEMA VE 1 Loading Depth
6" Side Rail Height

Straight Section Part Numbering

Prefix

Example: **268 P 09 - 24 - 144**

Series

- 268
- 366
- 464

Material

- **P** = Pre-Galvanized
- **G** = HDGAF

***Type**

Ladder-

- **06** = 6" rung spacing
- **09** = 9" rung spacing
- **12** = 12" rung spacing

Trough-

6" thru 36" wide

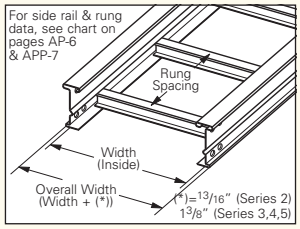
- **VT** = Ventilated Trough
- **ST** = Non-Ventilated Trough

***Width**

- **06** = 6"
- **09** = 9"
- **12** = 12"
- **18** = 18"
- **24** = 24"
- **30** = 30"
- **36** = 36"

Length

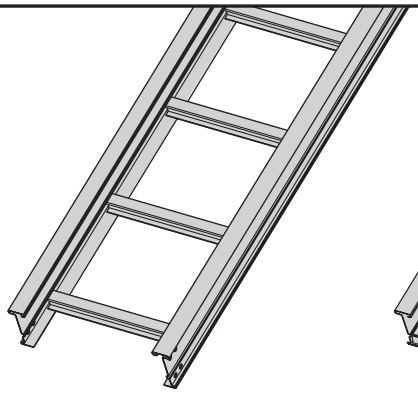
① **144** = 12 ft.	268
② 120 = 10 ft.	
① **240** = 20 ft.	366
② 144 = 12 ft.	
① **240** = 20 ft.	464
② 288 = 24 ft.	



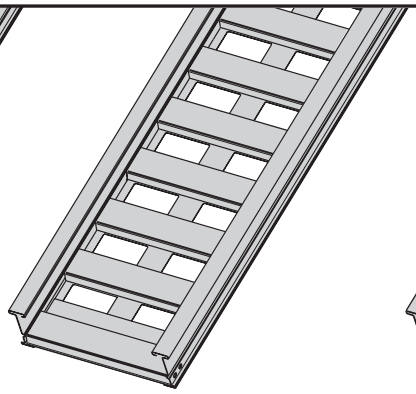
①Primary Length.
②Secondary Length.

See page C-23 for explanation of lengths.

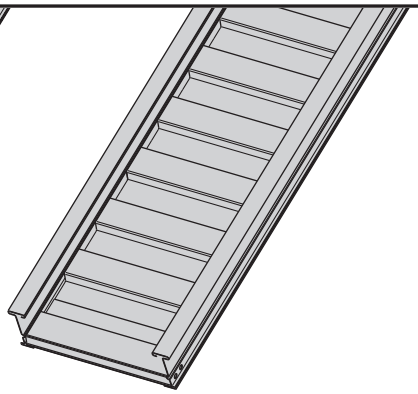
See page APP-1 for additional rung options. *Special sizes available.



Ladder Type
(Specify Rung Spacing)



Ventilated Trough



Non-Ventilated Trough

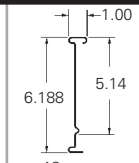
● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

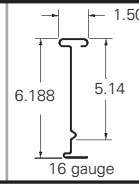
All dimensions in parentheses are millimeters unless otherwise specified.

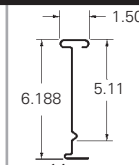
5" NEMA VE 1 Loading Depth
6" Side Rail Height

Values are based on simple beam tests per NEMA VE 1 on 36" wide cable tray with rungs spaced on 12" centers. Cable trays will support without collapse a 200 lb. (90.7 kg) concentrated load over and above published loads. Published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply publish load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable tray must be supported on spans shorter than or equal to the length of the cable tray being installed.

Individual rungs will support without collapse a 200 lb. (90.7 kg) concentrated load applied at the mid-span of the rung, over and above the NEMA rated cable load with a 1.5 safety factor for highlighted NEMA spans and loads.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
268		NEMA: 16A, 12C CSA: D1-3m UL Cross-Sectional Area: 0.70 in^2	6	440*	0.0003	Area = 0.80 in^2 Sx = 1.18 in^3 Ix = 3.81 in^4	1.8	655*	0.005	Area = 5.16 cm^2 Sx = 19.34 cm^3 Ix = 158.58 cm^4
			8	248	0.0008		2.4	368	0.014	
			10	158	0.0020		3.0	236	0.035	
			12	110	0.0042		3.7	164	0.072	
			14	81	0.0078		4.3	120	0.134	
			16	62	0.013		4.9	92	0.228	

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
366		NEMA: 20B, 16C CSA: E-6m UL Cross-Sectional Area: 1.00 in^2	10	300	0.0014	Area = 1.11 in^2 Sx = 1.71 in^3 Ix = 5.74 in^4	3.0	446	0.023	Area = 7.16 cm^2 Sx = 28.02 cm^3 Ix = 238.92 cm^4
			12	208	0.0028		3.7	310	0.048	
			14	153	0.0052		4.3	228	0.089	
			16	117	0.0089		4.9	174	0.151	
			18	93	0.014		5.5	138	0.242	
			20	75	0.022		6.1	112	0.369	

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
464		NEMA: 20C CSA: E-6m UL Cross-Sectional Area: 1.00 in^2	12	342*	0.002	Area = 1.49 in^2 Sx = 2.27 in^3 Ix = 7.65 in^4	3.7	508*	0.035	Area = 9.61 cm^2 Sx = 37.36 cm^3 Ix = 318.42 cm^4
			16	192	0.007		4.9	286	0.113	
			18	152	0.011		5.5	226	0.182	
			20	123	0.016		6.1	183	0.277	
			22	102	0.024		6.7	151	0.406	
			24	85	0.034		7.3	127	0.574	

*When using 18" rung spacing, load capacity is limited to 394 lbs/ft (586.272 kg/m) for 30" cable tray width and 325 lbs/ft (483.6 kg/m) for 36" cable tray width. When cable trays are used in continuous spans, the deflection of the cable tray is reduced by as much as 50%. Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

All dimensions in parentheses are millimeters unless otherwise specified.

6" NEMA VE 1 Loading Depth
7" Side Rail Height

Straight Section Part Numbering

Prefix

Example: **378 P 09 - 24 - 144**

Series

- **378**
- **476**
- **574**

Material

- **P** = Pre-Galvanized
- **G** = HDGAF

***Type**

Ladder-

- **06** = 6" rung spacing
- **09** = 9" rung spacing
- **12** = 12" rung spacing

Trough-

6" thru 36" wide

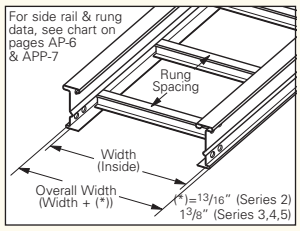
- **VT** = Ventilated Trough
- **ST** = Non-Ventilated Trough

***Width**

- **06** = 6"
- **09** = 9"
- **12** = 12"
- **18** = 18"
- **24** = 24"
- **30** = 30"
- **36** = 36"

Length

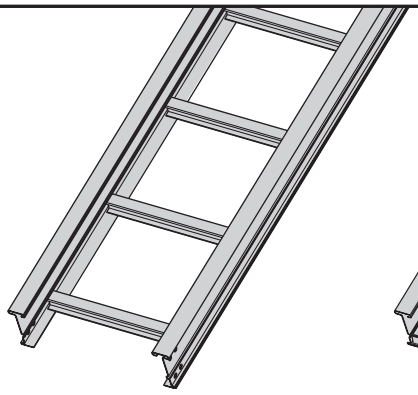
① **144** = 12 ft.	378
② 120 = 10 ft.	
① **240** = 20 ft.	476
② 288 = 24 ft.	
① **240** = 20 ft.	574
② 288 = 24 ft.	



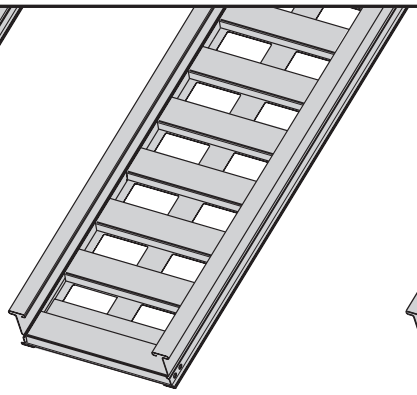
①Primary Length.
②Secondary Length.

See page C-23 for explanation of lengths.

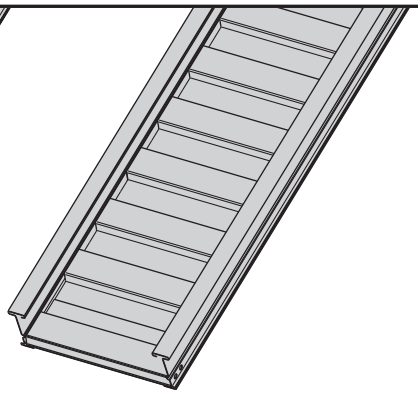
See page APP-1 for additional rung options. *Special sizes available.



Ladder Type
(Specify Rung Spacing)



Ventilated Trough



Non-Ventilated Trough

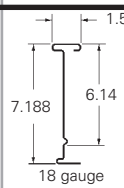
● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

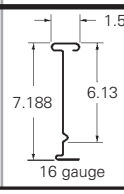
All dimensions in parentheses are millimeters unless otherwise specified.

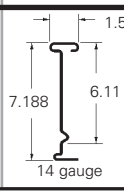
6" NEMA VE 1 Loading Depth
7" Side Rail Height

Values are based on simple beam tests per NEMA VE 1 on 36" wide cable tray with rungs spaced on 12" centers. Cable trays will support without collapse a 200 lb. (90.7 kg) concentrated load over and above published loads. Published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply publish load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable tray must be supported on spans shorter than or equal to the length of the cable tray being installed.

Individual rungs will support without collapse a 200 lb. (90.7 kg) concentrated load applied at the mid-span of the rung, over and above the NEMA rated cable load with a 1.5 safety factor for highlighted NEMA spans and loads.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
378		NEMA: 20A, 16B CSA: D1-3m UL Cross-Sectional Area: 0.70 in^2	8	319	0.0006		2.4	474	0.009	
			10	204	0.0014		3.0	304	0.023	
			12	142	0.0028	Area = 1.01 in^2	3.7	211	0.048	Area = 6.52 cm^2
			14	104	0.0052	Sx = 1.77 in^3	4.3	155	0.089	Sx = 29.01 cm^3
			16	80	0.0089	Ix = 6.90 in^4	4.9	119	0.151	Ix = 287.20 cm^4
			18	63	0.014		5.5	94	0.242	
			20	51	0.022		6.1	76	0.369	

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
476		NEMA: 20B, 16C CSA: D1-6m UL Cross-Sectional Area: 1.00 in^2	12	214	0.0019		3.7	318	0.033	
			16	129	0.0061	Area = 1.22 in^2	4.9	179	0.105	Area = 7.87 cm^2
			18	95	0.010	Sx = 2.14 in^3	5.5	141	0.168	Sx = 35.07 cm^3
			20	77	0.015	Ix = 8.30 in^4	6.1	115	0.255	Ix = 345.47 cm^4
			22	64	0.022		6.7	95	0.374	
			24	53	0.031		7.3	80	0.529	

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
574		NEMA: 20C CSA: E-6m UL Cross-Sectional Area: 1.50 in^2	12	361	0.0014		3.7	537	0.025	
			16	203	0.0046	Area = 1.64 in^2	4.9	302	0.078	Area = 10.58 cm^2
			18	160	0.0073	Sx = 2.87 in^3	5.5	239	0.125	Sx = 47.03 cm^3
			20	130	0.011	Ix = 11.10 in^4	6.1	193	0.191	Ix = 462.02 cm^4
			22	107	0.016		6.7	160	0.280	
			24	90	0.023		7.3	134	0.396	

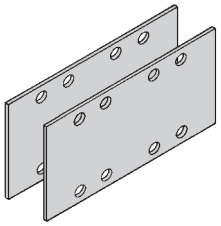
When cable trays are used in continuous spans, the deflection of the cable tray is reduced by as much as 50%. Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

All dimensions in parentheses are millimeters unless otherwise specified.

Series 2, 3, 4, & 5 Steel - Accessories

Splice Plates

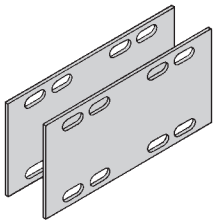
- Standard 8-hole pattern for all steel splice plates.
- Furnished in pairs with hardware.
- One pair including hardware provided with straight section. (Expansion splice quantity subtracted)
- Boxed in pairs with hardware.
- (*) Insert ZN or G



Catalog No.	Height in.	Height mm
9(*)-8004	4	(101)
9(*)-8005	5	(127)
9(*)-8006	6	(152)
9(*)-8007	7	(178)

Expansion Splice Plates

- Expansion plates allow for one inch expansion or contraction of the cable tray, or where expansion joints occur in the support structure.
- Furnished in pairs with hardware.
- Bonding Jumpers are required on each siderail. Order Separately.
- (*) Insert ZN or G

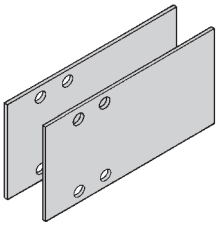


For heavy duty expansion splice plates see page APP-3.

Catalog No.	Height in.	Height mm
9(*)-8014	4	(101)
9(*)-8015	5	(127)
9(*)-8016	6	(152)
9(*)-8017	7	(178)

Universal Splice Plates

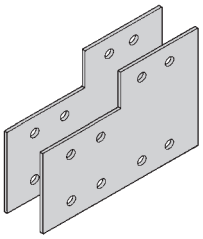
- Used to splice to existing cable tray systems.
- Furnished in pairs with hardware.
- (*) Insert ZN or G



Catalog No.	Height in.	Height mm
9(*)-8004-1/2	4	(101)
9(*)-8005-1/2	5	(127)
9(*)-8006 -1/2	6	(152)
9(*)-8007 -1/2	7	(178)

Step Down Splice Plates

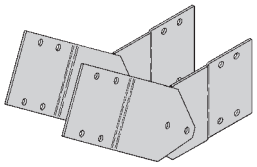
- These splice plates are offered for connecting cable tray sections having side rails of different heights.
- Furnished in pairs with hardware.
- (*) Insert ZN or G



Catalog No.	Height in.	Height mm
9(*)-8045	5 to 4	(127 to 101)
9(*)-8046	6 to 4	(152 to 101)
9(*)-8060	6 to 5	(152 to 127)
9(*)-8047	7 to 4	(178 to 101)
9(*)-8061	7 to 5	(178 to 127)
9(*)-8062	7 to 6	(178 to 152)

Vertical Adjustable Splice Plates

- These plates provide for changes in elevation that do not conform to standard vertical fittings.
- Furnished in pairs with hardware.
- **Bonding Jumpers not required.**
- (*) Insert G or P

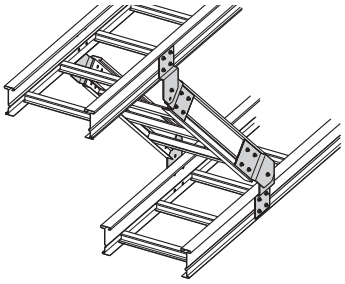


Requires supports within 24" on both sides, per NEMA VE 2.

Catalog No.	Height in.	Height mm
9(*)-8024	4	(101)
9(*)-8025	5	(127)
9(*)-8026	6	(152)
9(*)-8027	7	(178)

Branch Pivot Connectors

- Branch from existing cable tray runs at any point.
- Pivot to any required angle.
- UL Classified for grounding (bonding jumpers not required).
- Furnished in pairs with hardware.
- (*) Insert ZN or G



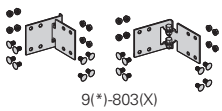
Catalog No.	Height in.	Height mm
9(*)-8244	4	(101)
9(*)-8245	5	(127)
9(*)-8246	6	(152)
9(*)-8247	7	(178)

● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

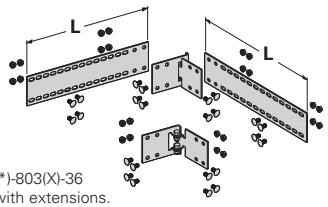
All dimensions in parentheses are millimeters unless otherwise specified.

Horizontal Adjustable Splice Plates

- Offered to adjust a cable tray run for changes in direction in a horizontal plane that do not conform to standard horizontal fittings.
- Furnished in pairs with hardware.
- Bonding jumpers **not** required.
- (*) Insert ZN or G
- (X) Insert 4, 5, 6 or 7 for side rail height.



9(*)-803(X)
Splice only



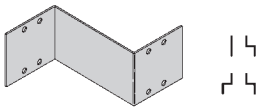
9(*)-803(X)-12 or 9(*)-803(X)-36
One pair splice plates with extensions.

Catalog No.	Cable Tray End Cut	Thru Tray Width in.	(mm)	'L' in.	(mm)
9(*)-803(X)	Mitered	36	(914)	N/A	(NA)
9(*)-803(X)-12	Not mitered	12	(305)	16	(406)
9(*)-803(X)-36	Not mitered	36	(914)	41	(1041)

Requires supports within 24" on both sides, per NEMA VE 2.

Offset Reducing Splice Plate

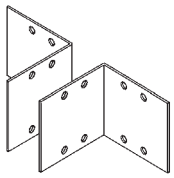
- This plate is used for joining cable trays having different widths. When used in pairs they form a straight reduction; when used singly with a standard splice plate, they form an offset reduction.
- Furnished as one plate with hardware.
- (‡) Insert reduction
- (*) Insert G or P



Catalog No.	Height in.	mm
9(*)-8064-(‡)	4	(101)
9(*)-8065-(‡)	5	(127)
9(*)-8066-(‡)	6	(152)
9(*)-8067-(‡)	7	(178)

Tray to Box Splice Plates

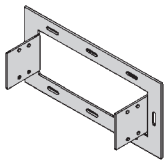
- Used to attach the end of a cable tray run to a distribution box or control panel.
- Furnished in pairs with hardware.
- (*) Insert G or P



Catalog No.	Height in.	mm
9(*)-8054	4	(101)
9(*)-8055	5	(127)
9(*)-8056	6	(152)
9(*)-8057	7	(178)

Frame Type Box Connector

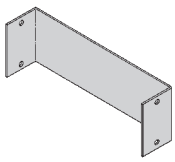
- Designed to attach the end of a cable tray run to a distribution cabinet or control center to help reinforce the box at the point of entry.
- Furnished with tray connection hardware.
- (*) Insert ZN or G
- (‡) Insert tray width



Catalog No.	Height in.	mm
9(*)-8074-(‡)	4	(101)
9(*)-8075-(‡)	5	(127)
9(*)-8076-(‡)	6	(152)
9(*)-8077-(‡)	7	(178)

Blind End

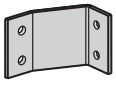
- This plate forms a closure for a dead end cable tray.
- Furnished as one plate with hardware.
- (*) Insert G or P
- (‡) Insert tray width

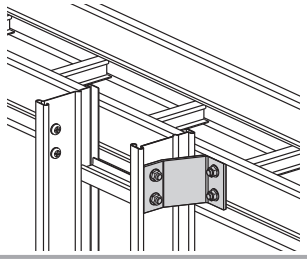


Catalog No.	Height in.	mm
9(*)-8084-(‡)	4	(101)
9(*)-8085-(‡)	5	(127)
9(*)-8086-(‡)	6	(152)
9(*)-8087-(‡)	7	(178)

Cross Connector Bracket

- For field connecting crossing section.
- Furnished in pairs with 3/8" hardware.
- (*) Insert ZN or G





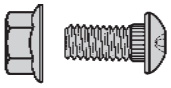
Catalog No.
9(*)-1240

● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

Standard Tray Hardware (for field installation drill 13/32" hole)

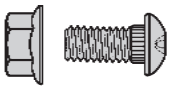
- Finishes: [ZN] Zinc Plated ASTM B633 SC1 for pre-galvanized tray
  [CZ] Chromium Zinc Plated F1136-88 Grade A for hot dip galvanized tray



Catalog No.	Description
● **RNCB 3/8" x 3/4" ZN**	Ribbed Neck Carriage Bolt ASTM A307 Grade A
● **SFHN 3/8"-16 ZN**	Serrated Flange Hex Nut ASTM A563 Grade A
● **RNCB 3/8" x 3/4" CZ**	Ribbed Neck Carriage Bolt ASTM F1136-88 Grade 3
● **SFHN 3/8"-16 CZ**	Serrated Flange Hex Nut ASTM F1136-88 Grade A

Optional Tray Hardware (for field installation drill 13/32" hole)

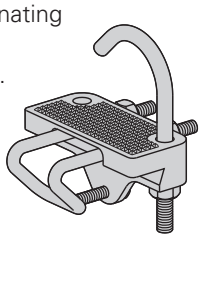
- To order 316 stainless steel hardware add SS6 suffix to catalog number - Example: 9G-8004SS6



Catalog No.	Description
● **RNCB 3/8" x 3/4" SS6**	Ribbed Neck Carriage Bolt AISI 316 Stainless Steel
● **SFHN 3/8"-16 SS6**	Serrated Flange Hex Nut AISI 316 Stainless Steel

Conduit to Cable Tray Adaptor

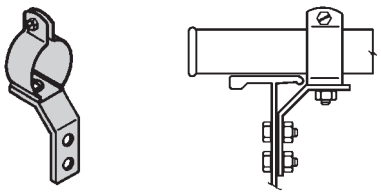
- For easy attachment of conduit terminating at a cable tray.
- Use on aluminum or steel cable trays.



Catalog No.	Conduit Size in.	mm
● **9G-1158-1/2, 3/2**	1/2, 3/4	(15, 20)
● **9G-1158-1, 1 1/4**	1, 1 1/4	(25, 32)
● **9G-1158-1 1/2, 2**	1 1/2, 2	(40, 50)
● **9G-1158-2 1/2, 3**	2 1/2, 3	(65, 80)
● **9G-1158-3 1/2, 4**	3 1/2, 4	(90, 100)

Conduit to Cable Tray Adaptor

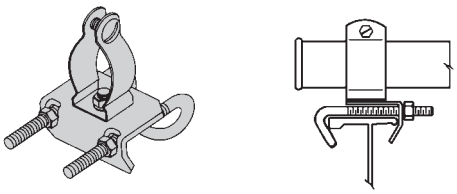
- Assembly required.
- Mounting hardware included.
- Conduit clamps provided.
- (‡) = Insert conduit size (1/2" thru 4").



Catalog No.
● **9ZN-1150-(‡)**

Conduit to Cable Tray Adaptor

- Assembly required.
- Conduit clamps included.
- (‡) = Insert conduit size (1/2" thru 4").

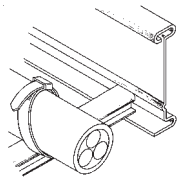


Catalog No.
● **9ZN-1155-(‡)**

Cable Tie (Ladder Tray)

- Nylon ties provide easy attachment of cable to ladder rungs; maximum cable O.D. is 3" (76mm).

Overall Length 15" (381mm)



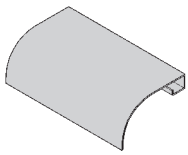
Catalog No.
● **99-2125-15**

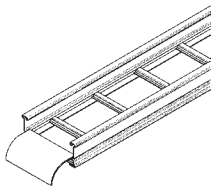
● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

Ladder Drop-Out

- Specially-designed Ladder Drop-Outs provide a rounded surface with 4" (101 mm) radius to protect cable as it exits from the cable tray, preventing damage to insulation. The drop-out will attach to any desired rung.
- (*) Insert P or G
- (‡) Insert tray width

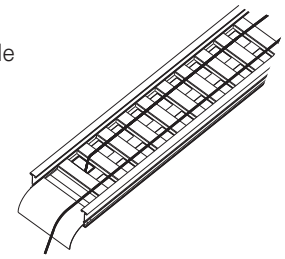


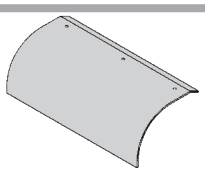


Catalog No.
● 9(*)-1104-(‡)

Trough Drop-Out & Drop-Out Bushing

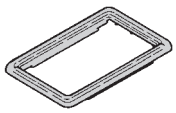
- These devices provide a rounded surface to protect cable as it exits from the trough-type cable tray.
- Hardware is included for attachment of the trough bottom drop-out.
- (*) Insert P or G
- (‡) Insert tray width





Trough-Type Drop-Out

Catalog No.
9(*)-1104T-(‡)

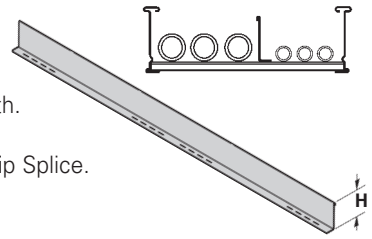


Snap-In Plastic Bushing

Catalog No.
● 99-1124

Barrier - Straight Section

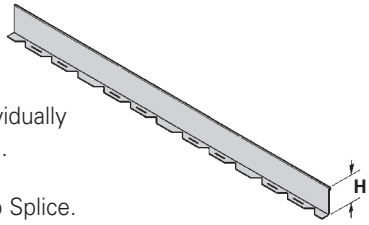
- Length: Insert 120 for [120" - 10 ft.] (3.0 m) or 144 for [144" - 12 ft.] (3.6 m)
- Order catalog number based on loading depth.
- Furnished with four #10 x ½" plated self-drilling screws and a 99-9982 Barrier Strip Splice.
- (*) Insert P or G



Catalog No.	Side Rail Height in.	Side Rail Height mm	Loading Depth 'H' in.	Loading Depth 'H' mm
73(*)-Length	4	(101)	3	(76)
74(*)-Length	5	(127)	4	(101)
75(*)-Length	6	(152)	5	(127)
76(*)-Length	7	(178)	6	(152)

Barrier - Horizontal Bend

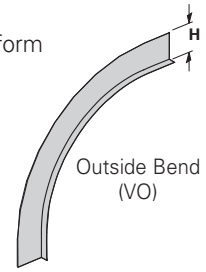
- Horizontal Bend Barriers are flexible in order to conform to any horizontal fitting radius. Can be cut to desired length.
- Standard length is 72" [6 ft.] (1.8 m) - sold individually
- Order catalog number based on loading depth.
- Furnished with three #10 x ½" plated self-drilling screws and a 99-9982 Barrier Strip Splice.
- (*) Insert P or G



Catalog No.	Side Rail Height in.	Side Rail Height mm	Loading Depth 'H' in.	Loading Depth 'H' mm
73(*)-90HBFL	4	(101)	3	(76)
74(*)-90HBFL	5	(127)	4	(101)
75(*)-90HBFL	6	(152)	5	(127)
76(*)-90HBFL	7	(178)	6	(152)

Barrier - Vertical Outside Bend

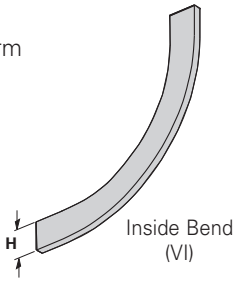
- Vertical Outside Bend Barriers are preformed to conform to a specific vertical outside bend fitting.
- Furnished with three #10 x ½" plated self-drilling screws and a 99-9982 Barrier Strip Splice.
- (*) Insert P or G
- (**) Insert 30, 45, 60 or 90 for degrees
- (†) Insert 12, 24, 36 or 48 for radius



Catalog No.	Side Rail Height in.	Side Rail Height mm	Loading Depth 'H' in.	Loading Depth 'H' mm
73(*)-(**)VO(†)	4	(101)	3	(76)
74(*)-(**)VO(†)	5	(127)	4	(101)
75(*)-(**)VO(†)	6	(152)	5	(127)
76(*)-(**)VO(†)	7	(178)	6	(152)

Barrier - Vertical Inside Bend

- Vertical Inside Bend Barriers are preformed to conform to a specific vertical inside bend fitting.
- Furnished with three #10 x ½" plated self-drilling screws and a 99-9982 Barrier Strip Splice.
- (*) Insert P or G
- (**) Insert 30, 45, 60 or 90 for degrees
- (†) Insert 12, 24, 36 or 48 for radius



Catalog No.	Side Rail Height in.	Side Rail Height mm	Loading Depth 'H' in.	Loading Depth 'H' mm
73(*)-(**)VI(†)	4	(101)	3	(76)
74(*)-(**)VI(†)	5	(127)	4	(101)
75(*)-(**)VI(†)	6	(152)	5	(127)
76(*)-(**)VI(†)	7	(178)	6	(152)

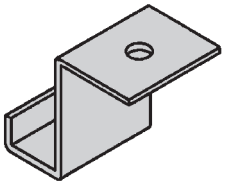
● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

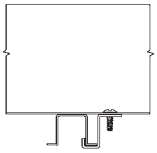
All dimensions in parentheses are millimeters unless otherwise specified.

Series 2, 3, 4, & 5 Steel - Accessories

Barrier Strip Clip

- Zinc plated steel barrier clip fastens to either aluminum or steel ladder rung.
- Furnished with one #10 x 1/2" zinc plated self-drilling screw.

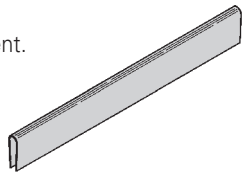


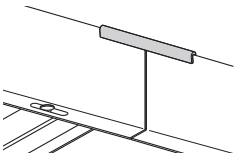


Catalog No.
9ZN-9002

Barrier Strip Splice

- Plastic splice holds adjoining barrier strips in straight alignment.
- 3" (76mm) long.



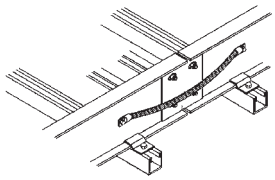


Catalog No.
99-9982

Bonding Jumper

Use at each expansion splice and where the cable tray is not mechanically/electrically continuous to ground. Sold individually.

- Hardware included.
- See table 392.7(B)(2) on page CTS-9 for amperage ratings required to match the UL cross-sectional area of the tray.
- See tray loading chart for UL cross-sectional area.
- Bonding jumper is 14 1/2" (368mm) long.

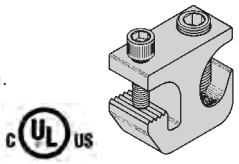


Catalog No.	Copper Wire Size	Ampacity
99-N1	#1	600

Grounding Clamp

B-Line series cable tray is UL® classified as to its suitability as an equipment grounding conductor. If a separate conductor for additional grounding capability is desired, we offer this clamp for bolting the conductor at least once to each cable tray section.

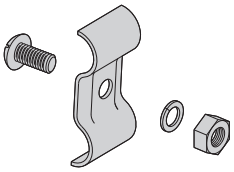
- Accepts #6 AWG to 250 MCM.



Catalog No.	Material
9A-2130	Tin Plated Aluminum

Ground Wire Clamp

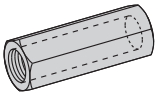
- Mechanically attaches grounding cables to cable tray.
- Hardware included.
- (*) Insert ZN or SS4



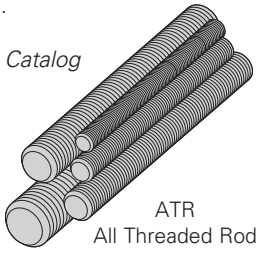
Catalog No.	Material
9(*)-2351	#1 thru 2/0
9(*)-2352	3/0 thru 250 MCM

Thread Rod (ATR) & Rod Couplings

Loading based on safety factor 5.
Standard Finish: Zinc plated
See B-Line series Strut Systems Catalog for other sizes and finishes.



B655
Rod Coupling



ATR
All Threaded Rod

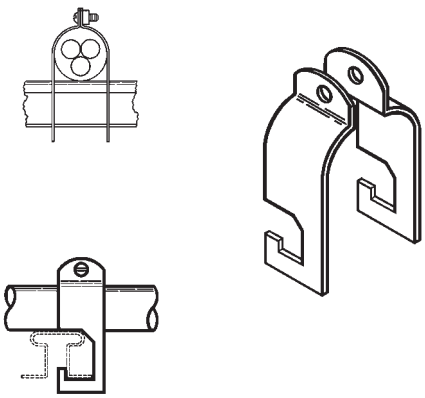
Size	Catalog No.	Available Length	Loading
All Threaded Rod			
3/8"-16	ATR 3/8" x Length	36", 72", 120", 144"	730 lbs.
1/2"-13	ATR 1/2" x Length	36", 72", 120", 144"	1350 lbs.
Rod Coupling			
3/8"-16	B655-3/8"	NA	730 lbs.
1/2"-13	B655-1/2"	NA	1350 lbs.

Green = Fastest shipped items Black = Normal lead-time items Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

Stainless Steel Cable Clamp

- Fits with series 2, 3, 4 & 5 standard steel rungs.
- Shipped flat. Field form around the cable at the time of installation.

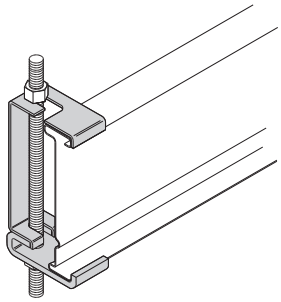


Refer to Section CF Cable Fixing

Catalog No.	Cable Size in.	Cable Size mm
9SS4-4050	0.50 - 0.75	(13 - 19)
9SS4-4075	0.75 - 1.00	(19 - 25)
9SS4-4100	1.00 - 1.25	(25 - 32)
9SS4-4125	1.25 - 1.50	(32 - 38)
9SS4-4150	1.50 - 1.75	(38 - 45)
9SS4-4175	1.75 - 2.00	(45 - 51)
9SS4-4200	2.00 - 2.25	(51 - 57)
9SS4-4225	2.25 - 2.50	(57 - 64)
9SS4-4250	2.50 - 2.75	(64 - 70)
9SS4-4275	2.75 - 3.00	(70 - 76)
9SS4-4300	3.00 - 3.25	(76 - 82)
9SS4-4325	3.25 - 3.50	(82 - 89)
9SS4-4350	3.50 - 3.75	(89 - 95)
9SS4-4375	3.75 - 4.00	(95 - 100)
9SS4-4400	4.00 - 4.25	(100 - 106)
9SS4-4425	4.25 - 4.50	(106 - 113)
9SS4-4450	4.50 - 4.75	(113 - 121)
9SS4-4475	4.75 - 5.00	(121 - 125)

Hanger Rod Clamp

- For 1/2" ATR.
- Furnished in pairs.
- Order ATR and hex nuts separately.
- Two-piece "J"-hanger design.
- 1500 lbs./pair capacity safety factor 3.
- (*) Insert ZN or G

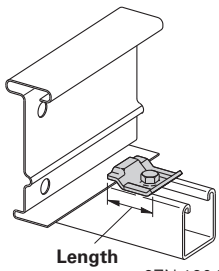


Catalog No.	Height in.	Height mm
9(*)-5324	4	(101)
9(*)-5325	5	(127)
9(*)-5326	6	(152)
9(*)-5327	7	(178)

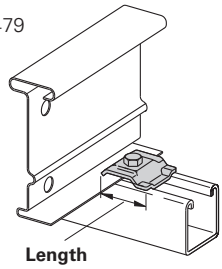
Cable Tray Clamp/Guide

- Features a no-twist design.
- Has four times the strength of the traditional design.
- Each side is labeled to ensure proper installation.
- Furnished in pairs, with or without hardware.
- Not recommended for vertical support.

Patent # RE35479



9ZN-1204 shown.
Installed as a guide.



9ZN-1208 shown.
Installed as a clamp.

When installing this device as an expansion guide on the outside flange of *Steel Side Rail*, use the Catalog No. **B202** Square Washer in order to properly elevate the guide.

Note: For heavy duty or vertical applications see 9(*)-1241 or 9(*)-1242 page HAT-20

Catalog No. Without Hardware	Catalog No. With Hardware	Overall Length in. (mm)	Hardware Size in.	Finish
9ZN-1204	9ZN-1204NB	1 1/2 (38)	1/4"	G90
9ZN-1208	9ZN-1208NB	2 1/4 (57)	3/8"	G90
9A-1205	--	2 1/4 (57)	1/2"	Alum.
9G-1205	--	2 1/4 (57)	1/2"	HDGAF
9SS6-1205	--	2 1/4 (57)	1/2"	316SS
9ZN-1205	--	2 1/4 (57)	1/2"	G90

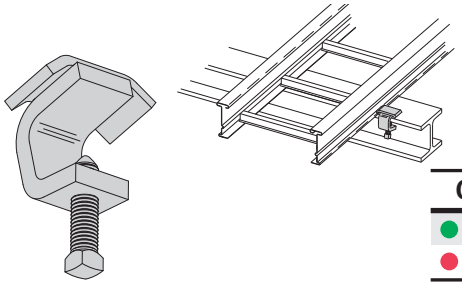
Green = Fastest shipped items Black = Normal lead-time items Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

Series 2, 3, 4, & 5 Steel - Accessories

Cable Tray Clamp

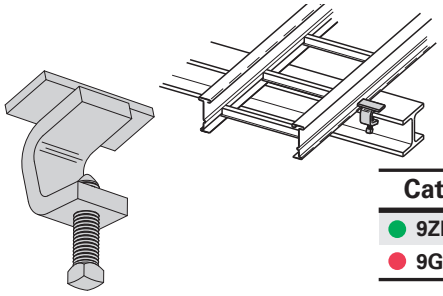
- Hold-down clamps for single or double cable tray runs.
- No drilling of support I-beam or channel is required.
- Sold in pieces - two clamps are required per tray.
- Maximum beam flange thickness 1 1/8" (28.58 mm).



Catalog No.	Finish
9ZN-1249HD	Znplt
9G-1249HD	HDGAF

Cable Tray Guide

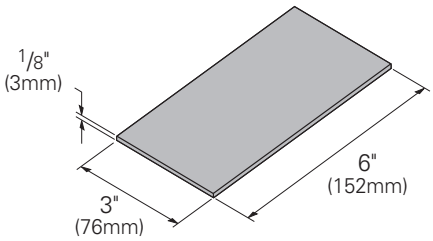
- Expansion guide for single or double cable tray runs.
- Guide allows for longitudinal movement of the cable tray.
- No field drilling of support I-beam or channel is required.
- Guides are required on both sides of cable tray to prevent lateral movement - can be placed on either the inside or outside flange of cable tray.
- Guides are sold in pieces - two guides are required per tray.
- Maximum flange thickness 1 1/8" (28.58 mm).



Catalog No.	Finish
9ZN-1249	Znplt
9G-1249	HDGAF

Nylon Pad

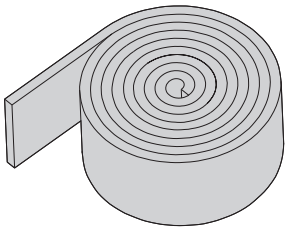
- Use for friction reduction.
- Hardness: Shore D80.
- Low friction coefficient.
- UV resistant.
- Excellent weatherability.
- UL - 94HB.



Catalog No.
99-PE36

Neoprene Roll

- Use for material isolation.
- 1/8" x 2" x 25' roll.
- Hardness: Shore A60.
- Good weatherability.



Catalog No.
99-NP300

DURA-BLOK™ Rooftop Support Bases with B22 Channel

- Designed as a superior rooftop support for cable tray,
- UV resistant and approved for most roofing material or other flat surfaces.
- Can be used with any of B-Line series cable tray clamps and guides.
- Ultimate Load Capacity: 1,000 lbs. (uniform load)

Catalog No.	Height x Width x Length in.	(mm)
DB10-28	5 5/8 x 6 x 28.0	(143 x 152 x 711)
DB10-36	5 5/8 x 6 x 36.0	(143 x 152 x 914)
DB10-42	5 5/8 x 6 x 42.0	(143 x 152 x 1067)
DB10-50	5 5/8 x 6 x 50.0	(143 x 152 x 1270)
DB10-60	5 5/8 x 6 x 60.0	(143 x 152 x 1524)

LEEDS credit available, base made from 100% recycled material.

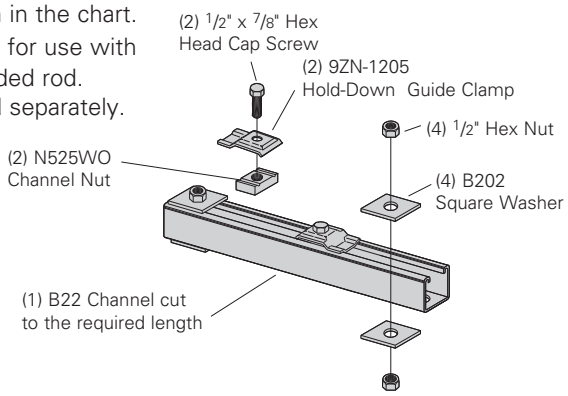
General Note: Consult roofing manufacturer or engineer for roof load capacity. The weakest point may be the insulation board beneath the rubber membrane.

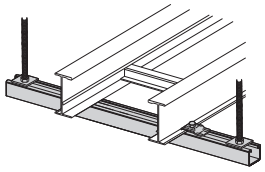
Green = Fastest shipped items Black = Normal lead-time items Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

Trapeze Support Kit

- Eaton's B-Line series trapeze kits provide the components required for a single trapeze support in one package. These kits are available in pre-galvanized steel with zinc-plated hardware, hot dip galvanized steel with 316 stainless steel hardware, or DURA GREEN™ painted steel with zinc-plated hardware.
- The SH channel provides the convenience of pre-punched slots, which eliminate the need for field drilling.
- The illustrated hardware is sealed in a plastic bag and boxed with the channel, which is pre-cut to the appropriate length as shown in the chart.
- Designed for use with 1/2" threaded rod. Order rod separately.





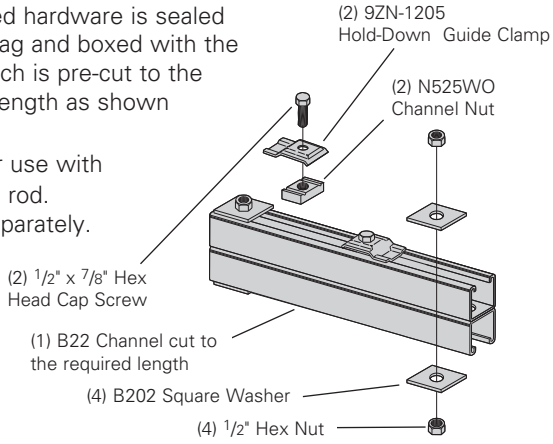
Catalog No.	Tray Width in.	mm	Channel Length in.	mm	Uniform Load lbs	kN
● 9(*)-5506-22SH(†)	6	(152)	16	(406)	1350	(6.00)
● 9(*)-5509-22SH(†)	9	(229)	18	(457)	1250	(5.56)
● 9(*)-5512-22SH(†)	12	(305)	22	(559)	1125	(5.00)
● 9(*)-5518-22SH(†)	18	(457)	28	(711)	865	(3.85)
● 9(*)-5524-22SH(†)	24	(610)	34	(864)	700	(3.11)
● 9(*)-5530-22SH(†)	30	(762)	40	(1016)	590	(2.62)
● 9(*)-5536-22SH(†)	36	(914)	46	(1168)	510	(2.27)
● 9(*)-5542-22SH(†)	42	(1067)	52	(1321)	450	(2.00)

- (*) Insert P G or GRN
- (†) Insert 3/8 for 3/8" threaded rod hardware.

Safety factor of 3.0 on all loads.

Heavy Duty Trapeze Support Kit

- Eaton's B-Line series trapeze kits provide the components required for a single trapeze support in one package. These kits are available in pre-galvanized steel with zinc-plated hardware, hot dip galvanized steel with 316 stainless steel hardware, or DURA GREEN™ painted steel with zinc-plated hardware.
- The SH channel provides the convenience of pre-punched slots, which eliminates the need for field drilling.
- The illustrated hardware is sealed in a plastic bag and boxed with the channel, which is pre-cut to the appropriate length as shown in the chart.
- Designed for use with 1/2" threaded rod. Order rod separately.

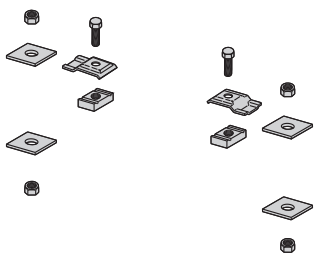


Catalog No.	Tray Width in.	mm	Channel Length in.	mm	Uniform Load lbs	kN
● 9(*)-5506-22SHA	6	(152)	16	(406)	1350	(6.00)
● 9(*)-5509-22SHA	9	(229)	18	(457)	1350	(6.00)
● 9(*)-5512-22SHA	12	(305)	22	(559)	1350	(6.00)
● 9(*)-5518-22SHA	18	(457)	28	(711)	1350	(6.00)
● 9(*)-5524-22SHA	24	(610)	34	(864)	1350	(6.00)
● 9(*)-5530-22SHA	30	(762)	40	(1016)	1350	(6.00)
● 9(*)-5536-22SHA	36	(914)	46	(1168)	1350	(6.00)
● 9(*)-5542-22SHA	42	(1067)	52	(1321)	1350	(6.00)

- (*) Insert P G or GRN

Safety factor of 3.0 on all loads.

Trapeze Hardware Kit



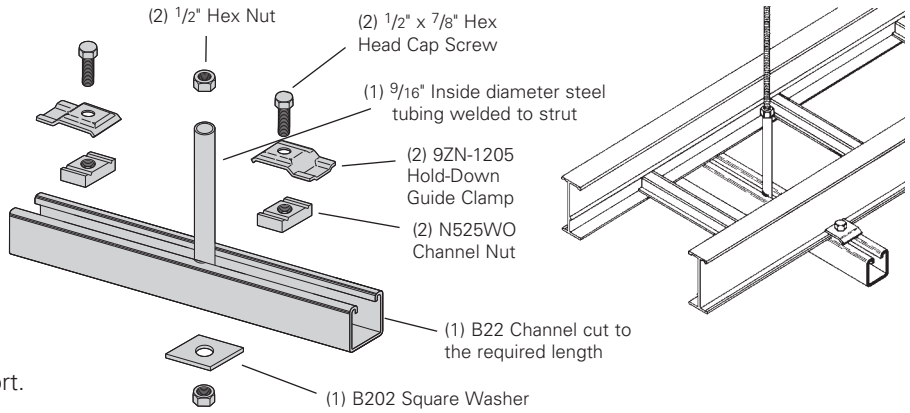
Catalog No.	● 9ZN-5500-1/2	● 9G-5500-1/2
In plastic bag	1 pr. 9ZN-1205 2 HHC Screw 1/2 x 7/8 ZN 2 N525 WO ZN 4 B202 ZN 1/2" sq washer 4 HN 1/2 ZN	1 pr. 9G-1205 2 HHC Screw 1/2 x 7/8 SS6 2 N525 WO SS6 4 B202 HDG 1/2" sq washer 4 HN 1/2" SS6

● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

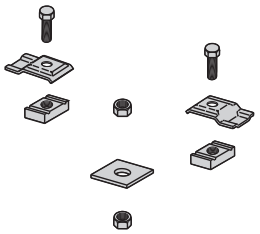
Center Hung Tray Support

- Center Hung Cable Tray Support allows cable to be laid-in from both sides.
- Eliminates costly cable pulling and field cutting of cable tray supports. Labor costs are dramatically reduced.
- Required hardware and threaded rod material for trapeze assemblies are reduced by up to 50%.
- Designed for use with 1/2" threaded rod. (Order rod separately)
- Use with all aluminum and steel cable trays through 24" width.
- Load capacity is 700 lbs. (311kN) per support. Safety factor of 3.0. Eccentric loading is not to exceed a 60% vs. 40% load differential.
- The maximum recommended unsupported span length is 144"/12 ft. (3.66 m).
- Hardware shown is furnished.
- Finish available: Zinc Plated



Catalog No.	Tray Width in.	Tray Width (mm)	Channel Length in.	Channel Length (mm)
● 9ZN-5212	6", 9", 12"	(152, 228, 305)	18"	(457)
● 9ZN-5224	18", 24"	(457, 609)	30"	(762)

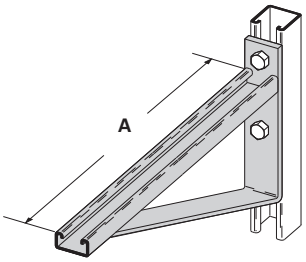
Center Hung Support Hardware Kit



Catalog No.	● 9ZN-5200
In plastic bag	1 pr. 9ZN-1205 2 HHC Screw 1/2 x 7/8 ZN 2 N525 WO ZN 1 B202 ZN 1/2" sq washer 4 HN 1/2 ZN

Bracket

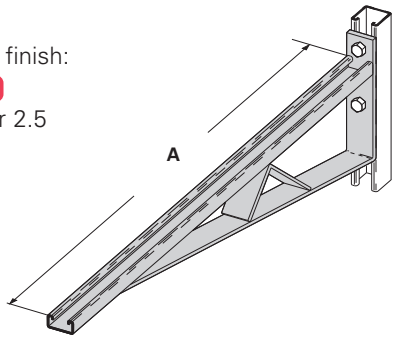
- (*) Insert available finish: ZN GRN or HDG
- Safety Load Factor 2.5



Catalog No.	Uniform Load lbs	Uniform Load kN	Tray Width in.	Tray Width mm	'A' in.	'A' mm
B494-12	1580	(7.02)	6 & 9	(152 & 229)	12	(305)
B494-18	1000	(4.45)	12	(305)	18	(457)
B494-24	996	(4.43)	18	(457)	24	(610)

Bracket

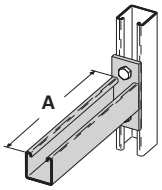
- (*) Insert available finish: ZN GRN or HDG
- Safety Load Factor 2.5



Catalog No.	Uniform Load lbs	Uniform Load kN	Tray Width in.	Tray Width mm	'A' in.	'A' mm
B494-30	924	(4.11)	24	(610)	30	(762)
B494-36	864	(3.84)	30	(762)	36	(914)
B494-42	580	(2.58)	36	(914)	42	(1067)
B494-48	500	(2.22)	42	(1067)	48	(1219)

Cantilever Bracket

- (*) Insert available finish: ZN GRN or HDG
- Safety Load Factor 2.5



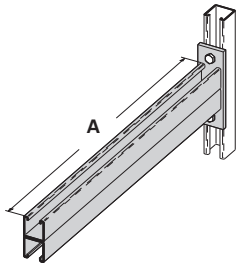
Catalog No.	Uniform Load lbs	Uniform Load kN	Tray Width in.	Tray Width mm	'A' in.	'A' mm
B409-12	960	(4.27)	6 & 9	(152 & 229)	12	(305)
B409-18	640	(2.84)	12	(305)	18	(457)
B409-24	480	(2.13)	18	(457)	24	(610)

● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

Cantilever Bracket

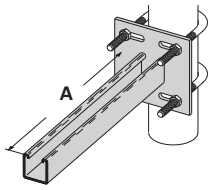
- (*) Insert available finish: ZN GRN or HDG
- Safety Load Factor 2.5



Catalog No.	Uniform Load lbs	Uniform Load kN	Tray Width in.	Tray Width mm	'A' in.	'A' mm
B297-12	1660	(7.38)	6 & 9	(152 & 229)	12	(305)
B297-18	1100	(4.89)	12	(305)	18	(457)
B297-24	835	(3.71)	18	(457)	24	(610)
B297-30	665	(2.93)	24	(610)	30	(762)
B297-36	550	(2.44)	30	(762)	36	(914)
B297-42	465	(2.06)	36	(914)	42	(1067)

Underfloor Support (U-Bolts not included)

- Finishes available: ZN
- Safety Load Factor 2.5

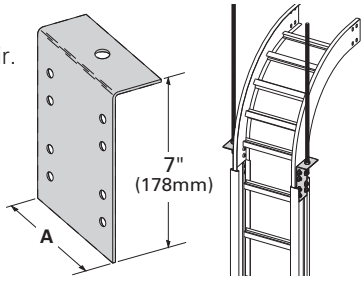


U-Bolt Size	Fits Pipe O.D.
B501-3/4	.841 - 1.050
B501-1	1.051 - 1.315
B501-1 1/4	1.316 - 1.660
B501-1 1/2	1.661 - 1.900
B501-2	1.901 - 2.375
B501-2 1/2	2.376 - 2.875

Catalog No.	Uniform Load lbs	Uniform Load (kN)	Tray Width in.	Tray Width (mm)	'A' in.	'A' (mm)
B409UF-12	800	(3.56)	6 & 9	(152 & 229)	12	(305)
B409UF-21	450	(2.00)	12 & 18	(305 & 457)	21	(533)

Vertical Hanger Splice Plates

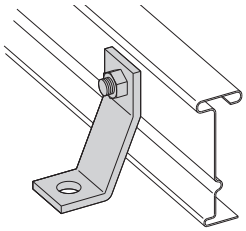
- Design load is 1500 lbs (6.67kN) per pair.
- Safety Factor of 2.5
- Furnished in pairs.
- Hole size: 9/16" (14mm) for 1/2" threaded rod.
- (*) Insert ZN or G



Catalog No.	Outside Cable Tray Ht.	'A' in.	'A' (mm)
● 9(*)-8224	4"	3.84	(97.54)
● 9(*)-8225	5"	4.73	(120.14)
● 9(*)-8226	6"	5.84	(148.34)
● 9(*)-8227	7"	6.84	(173.74)

Heavy Duty Hold Down Bracket

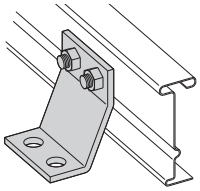
- Design load is 2000 lbs (8.89kN) per pair.
- Two bolt design.
- Sold in pairs.
- 3/8" cable tray attachment hardware provided.
- 1/2" support attachment hardware **not** provided.
- (*) Insert ZN or G
- Recommended for support of vertical trays.

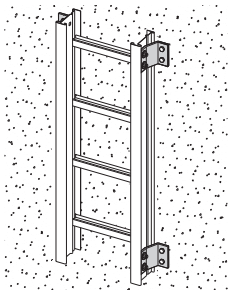


Catalog No.
9(*)-1241

Heavy Duty Hold Down Bracket

- Design load is 4000 lbs (17.79kN) per pair.
- Four bolt design.
- Sold in pairs.
- 3/8" cable tray attachment hardware provided
- 1/2" support attachment hardware **not** provided.
- (*) Insert ZN or G
- Recommended for support of vertical trays.

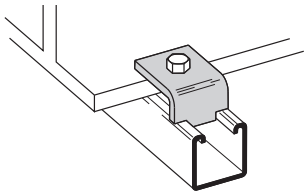




Catalog No.
9(*)-1242

Beam Clamp

- Finishes available: ZN GRN HDG or SS4
- Sold in pieces.
- Design load is 1200 lbs (5.34kN) per pair.
- Safety Load Factor 5.0.
- Order HHCS and Channel Nuts separately.



Catalog No.
B355

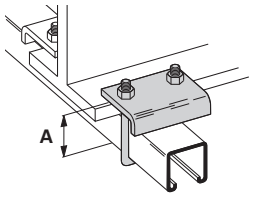
● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

Series 2, 3, 4, & 5 Steel - Accessories

Beam Clamp

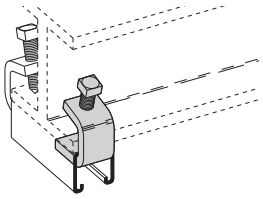
- Finishes available: ZN or HDG
- Sold in pieces.
- *Design load when used in pairs. Safety Load Factor 5.0



Catalog No.	Design Load lbs	Design Load (kN)	'A' in.	'A' (mm)
B441-22	1200	(5.34)	3 3/8	(86)
B441-22A	1200	(5.34)	5	(127)

Beam Clamp

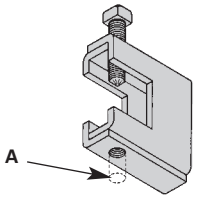
- Finishes available: ZN GRN or HDG
- Sold in pieces.
- *Design load when used in pairs. Safety Load Factor 5.0

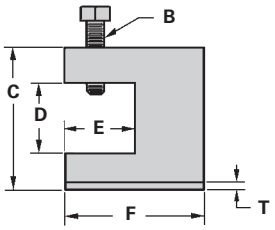


Catalog No.	B212-1/4	B212-3/8
Design Load *	600 lbs. (2.67kN)	1000 lbs. (4.45 kN)
Max. Flange Thick	3/4" (19 mm)	1 1/8" (28.6 mm)
Mat'l. Thickness	1/4" (6.3 mm)	3/8" (9.5 mm)

B305 Thru B308 & B321 Series Beam Clamps

- Finishes available: ZN or HDG
- Setscrew included.
- Safety Load Factor 5.0

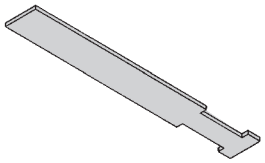




Catalog No.	Rod Size A	B	C in.	C (mm)	D in.	D (mm)	E in.	E (mm)	F in.	F (mm)	T in.	T (mm)	Design Load lbs	Design Load (kN)
B305	3/8"-16	3/8"-16	2 5/16	(58.7)	7/8	(22.2)	1 1/8	(28.6)	2 1/2	(63.5)	11 Ga.	(3.0)	600	(2.67)
B306	3/8"-16	1/2"-13	2 7/16	(61.9)	7/8	(22.2)	1 1/8	(28.6)	2 1/2	(63.5)	7 Ga.	(4.5)	1100	(4.90)
B307	1/2"-13	1/2"-13	2 7/16	(61.9)	7/8	(22.2)	1 1/8	(28.6)	2 1/2	(63.5)	7 Ga.	(4.5)	1100	(4.90)
B308	1/2"-13	1/2"-13	2 9/16	(65.1)	7/8	(22.2)	1 1/8	(28.6)	2 1/2	(63.5)	1/4	(6.3)	1500	(6.68)
B321-1	3/8"-16	1/2"-13	3 9/16	(90.5)	1 11/16	(42.9)	1 5/8	(41.3)	3 1/4	(82.5)	1/4	(6.3)	1300	(5.79)
B321-2	1/2"-13	1/2"-13	3 9/16	(90.5)	1 11/16	(42.9)	1 5/8	(41.3)	3 1/4	(82.5)	1/4	(6.3)	1400	(6.23)

Anchor Strap - for B305 thru B308 & B321 Series

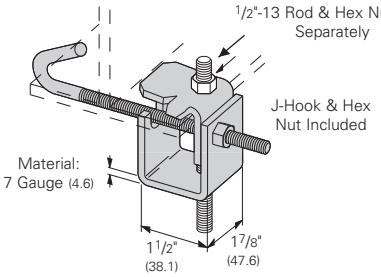
- Finish available: ZN
- For a maximum beam thickness of 3/4" (19mm).
- For thicker beams, step up one flange width size.



Catalog No.	Flange Width in.	Flange Width (mm)
B312-6	Up to 6	(Up to 152)
B312-9	6 - 9	(152 to 228)
B312-12	9 - 12	(228 to 305)

Beam Clamp

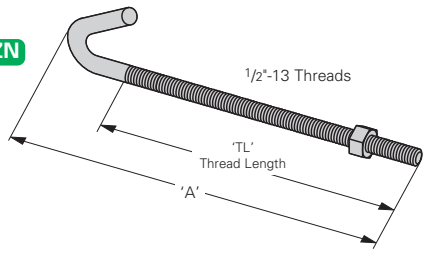
- Finish available: ZN
- Design Load 500 lbs. (2.22 kN)
- Safety Load Factor 5.0
- Recommended torque: 'J'-Hook Nut 125 In.-Lbs. (14.1 kN/m)
- Maximum flange thickness of 3/4" (19mm).



Catalog No.	For Flange Width in.	For Flange Width (mm)	Wt./C lbs	Wt./C (kg)
B750-J4	3 - 6	(76.2 - 152.4)	109	(49.4)
B750-J6	5 - 9	(127.0 - 288.6)	124	(56.2)
B750-J9	8 - 12	(203.2 - 304.8)	135	(61.,2)
B750-J12	11 - 15	(279.4 - 381.0)	147	(66.7)

'J'-Hook

- Finishes available: ZN
- Hex Nut included.

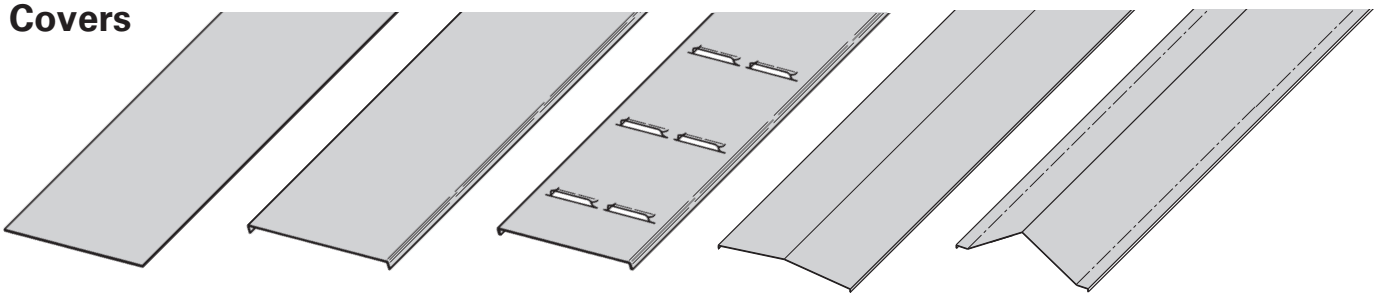


Catalog No.	'A' in.	'A' (mm)	'TL' in.	'TL' (mm)	Wt./C lbs	Wt./C (kg)
B700-J4	8 1/2	(215.9)	5	(127.0)	44	(19.9)
B700-J6	11 1/2	(292.1)	6	(152.4)	53	(24.0)
B700-J9	12 1/4	(368.3)	6	(152.4)	63	(28.6)
B700-J12	17 1/2	(444.5)	6	(152.4)	78	(35.4)

● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

Covers



Solid Non-Flanged | Solid Flanged | Ventilated Flanged | Peaked Flanged | 2 to 3 Pitch Peaked Flanged (See page APP-4)

A full range of covers is available for straight sections and fittings.

Solid covers should be used when maximum enclosure of the cable is desired and no accumulation of heat is expected.
Ventilated covers provide an overhead cable shield, yet allow heat to escape.
We recommend that covers be placed on vertical cable tray runs to a height of 6 ft. (1.83 m) to 8 ft. (2.44 m) above the floor to isolate both cables and personnel. **Flanged covers** have a 1/2 in. (13 mm) flange. Cover clamps are not included with the cover and must be ordered separately. All **peaked covers** are flanged. Standard peaked covers have 1/2" peak. Special purpose peaked covers, having a 2 to 3 pitch, provide additional slope and material thickness. The 2 to 3 pitch fitting covers are of multiple piece, welded construction.

Steel Cover Part Numbering

Prefix

Example: **80 2 P - 24 - 144**

Cover Type
- 80 = Solid
- 81 = Ventilated
- 82 = Peaked

Detail
- 2 = Flanged Steel (248,258, 268 straight sections and all fittings)
- 3 = Flanged Steel (all straight sections except 248, 258, 268)
- 4 = Non-Flanged Steel (80 & 81 type only)

Material
- P = Pre-Galvanized (Not available in Type 83)
- G = HDGAF

Tray Width
- 06 = 6"
- 09 = 9"
- 12 = 12"
- 18 = 18"
- 24 = 24"
- 30 = 30"
- 36 = 36"

Item Description
For Straight Section Cover:

Pre-Galvanized Only
- 144 = 12 ft. (3.66 m)
- 120 = 10 ft. (3.05 m)

Pre-Galvanized & HDGAF
- 72 = 6 ft. (1.83 m)
- 60 = 5 ft. (1.52 m)

For fitting covers: Insert suffix of fitting to be covered. See example below.

Examples of Catalog Numbers for Fitting Covers:

Horizontal Bend Cover

Prefix | Suffix

80 2 P - 18 - 90 HB 24

- 24 = Radius
- HB = Fitting
- 90 = Angle
- 18 = Width
- P = Material
- 2 = Detail
- 80 = Cover Type

Vertical Bend Cover

Prefix | Suffix

80 2 G - 24 - 90 VO 24 - 4*

- 4* = Side Rail* Height
- 24 = Radius
- VO = Fitting
- 90 = Angle
- 24 = Width
- G = Material
- 2 = Detail
- 80 = Cover Type

* Required for VO fittings only

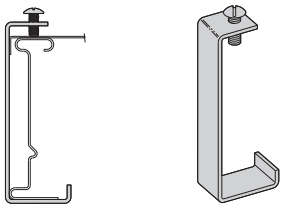
● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

Series 2, 3, 4, & 5 Steel - Accessories

Standard Cover Clamp

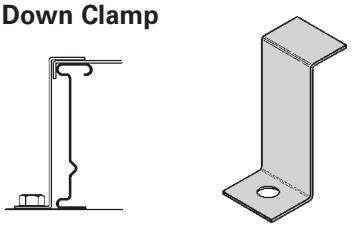
- For indoor service only.
- Screw included.
- Sold per piece.
- (*) Insert ZN or G



Tray Type	Catalog No.	Side Rail Height in.	(mm)
Steel	9(*)-9014	4	(101)
	9(*)-9015	5	(127)
	9(*)-9016	6	(152)
	9(*)-9017	7	(78)

Combination Cover and Hold Down Clamp

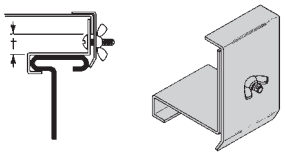
- Sold per piece.
- For indoor service only.
- (*) Insert P or G



Tray Type	Catalog No.	Side Rail Height in.	(mm)
Steel	9(*)-9043	4	(101)
	9(*)-9053	5	(127)
	9(*)-9063	6	(152)
	9(*)-9073	7	(78)

Raised Cover Clamp

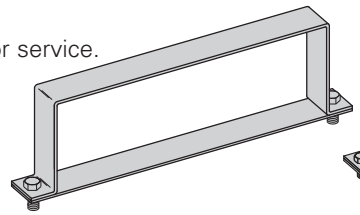
- For indoor service only.
- For use with flanged covers only.
  † Specify gap of 1", 2", 3" or 4".



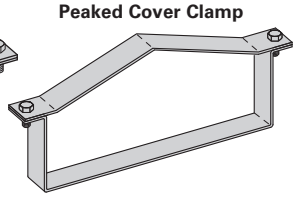
Tray Type	Catalog No.	Tray Type
●	9ZN-9114-†	Series 2 Steel Straight Section
●	9ZN-9115-†	Series 3 & 4 Steel Straight Section
●	9ZN-910†	All Steel Fittings (Also Series 1 Steel Straight Sections)

Heavy Duty Cover Clamp

- Recommended for outdoor service.
- (‡) Insert tray width
  † Add P to Catalog No.
  for peaked cover clamp.
- (*) Insert P or G



Peaked Cover Clamp



Catalog No.	Side Rail Height in.	mm
9(*)-(‡)-9044†	4	(101)
9(*)-(‡)-9054†	5	(127)
9(*)-(‡)-9064†	6	(152)
9(*)-(‡)-9074†	7	(178)

Quantity of Standard Cover Clamps Required

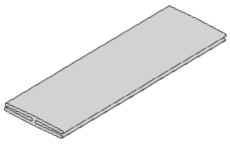
Notes:
When using the Heavy Duty Cover Clamp, only on-half the number of clamps stated above is required.

Additional clamps may be necessary in extreme wind applications.

Straight Section 60" or 72"	4 pcs.
Straight Section 120" or 144"	6 pcs.
Horizontal/Vertical Bends	4 pcs.
Tees	6 pcs.
Crosses	8 pcs.

Conduit to Cable Tray Adaptor

- Used to join covers
- Plastic
- (‡) Insert tray width

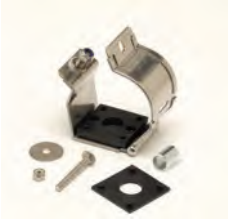


Catalog No.
● 99-9980-(‡)

Cable Cleats

(see pages O-1 thru O-5) Standard

Trefoil Cable Cleats



Single Cable Cleats

● Green = Fastest shipped items ● Black = Normal lead-time items ● Red = Normally long lead-time items

All dimensions in parentheses are millimeters unless otherwise specified.

Section 1- Acceptable Manufacturers

1.01 Manufacturer: Subject to compliance with these specifications, Eaton's B-Line series cable tray systems shall be as manufactured by Eaton.

Section 2- Cable Tray Sections and Components

2.01 General: Except as otherwise indicated, provide metal cable trays, of types, classes and sizes indicated; with splice plates, bolts, nuts and washers for connecting units. Construct units with rounded edges and smooth surfaces; in compliance with applicable standards; and with the following additional construction features. Cable tray shall be installed according to the latest revision of NEMA VE 2.

2.02 Pre-Galvanized Steel: Straight sections, fitting side rails, rungs, and covers shall be made from structural quality steel meeting the minimum mechanical properties and mill galvanized in accordance with ASTM A653 SS, Grade 33, coating designation G90. Hardware finish shall be electrogalvanized zinc per ASTM B633.

2.03 Hot Dip Galvanized Steel: All side rails, covers, splice plates, and rungs shall be made from structural quality steel meeting the minimum mechanical properties of ASTM A1011 SS, Grade 33 for 14 gauge and heavier, ASTM A1008, Grade 33 Type 2 for 16 gauge and lighter, and shall be hot dip galvanized after fabrication in accordance with ASTM A123. Mill galvanized covers are not acceptable for hot dip galvanized cable tray. Hardware finish shall be chromium zinc per ASTM F-1136-88.

2.04 Ladder Cable Trays shall consist of two longitudinal members (side rails) with transverse members (rungs) welded to the side rails. Rungs shall be spaced [6] [9] [12] inches on center. Rung spacing in radiused fittings shall be industry standard 9" and measured at the center of the tray's width. No portion of the rungs shall protrude below the bottom plane of the side rails. Each rung must be capable of supporting a 200 lb. concentrated load at the center of the cable tray over and above the cable load with a safety factor of 1.5.

2.05 Ventilated Trough Cable Trays shall consist of two longitudinal members (side rails) with a corrugated bottom welded to the side rails or rungs spaced 4" on center. The peaks of the corrugated bottom shall have a minimum flat cable bearing surface of $2\frac{3}{4}$" and shall be spaced on 6" centers. To provide ventilation in the tray, the valleys of the corrugated bottom shall have $2\frac{1}{4}$" x 4" rectangular holes punched along the width of the bottom.

2.06 Non-Ventilated Bottom Trough Cable Trays shall consist of two longitudinal members (side rails) with a corrugated bottom welded to the side rails or a solid sheet over rungs. The peaks of the corrugated bottom shall have a minimum flat cable bearing surface of $2\frac{3}{4}$" and shall be spaced on 6" centers.

2.07 Cable tray loading depth shall be [3] [4] [5] [6] inches per NEMA VE 1.

2.08 Straight sections shall have side rails fabricated as I-beams. Straight sections shall be supplied in standard [12 foot] [24 foot] [10 foot (3 m)] [20 foot (6 m)] lengths.

2.09 Cable tray widths shall be [6] [9] [12] [18] [24] [30] [36] inches or as shown on drawings.

2.10 Splice plates shall be manufactured of high strength steel, meeting the minimum mechanical properties of ASTM A1011 HSLAS, Grade 50, Class 1 and be secured with 8 nuts and bolts per plate. The resistance of fixed splice connections between an adjacent section of tray shall not exceed 0.00033 ohm.

2.11 All fittings must have a minimum radius of [12] [24] [36] [48] inches.

Section 3- Loading Capacities and Testing

3.01 Cable tray shall be capable of carrying a uniformly distributed load of _____ lbs./ft. on a _____ ft. support span with a safety factor of 1.5 when supported as a simple span and tested per NEMA VE 1 5.2. In addition to the uniformly distributed load the cable tray shall support 200 lbs. concentrated load at mid-point of span. Load and safety factors specified are applicable to both the side rails and rung capacities. Cable tray shall be made to manufacturing tolerances as specified by NEMA.

3.02 Upon request, manufacturer shall provide test reports in accordance with the latest revision of NEMA VE 1 or CSA C22.2 No. 126.