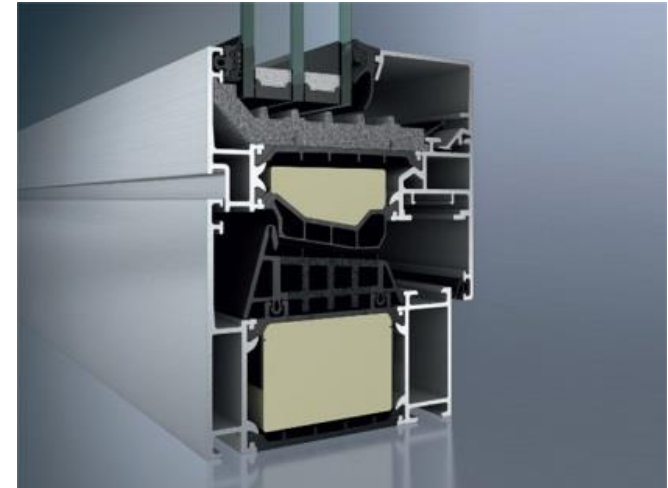


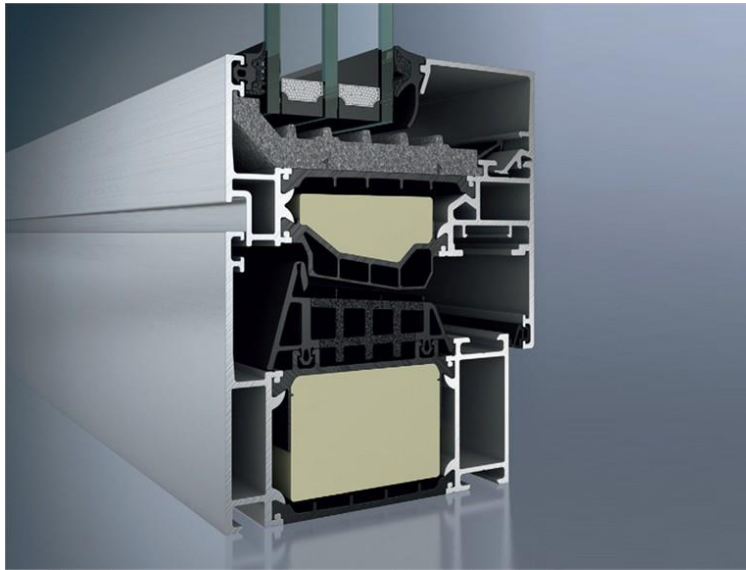
Project: CASA PASSIVA
 Date: **August 7, 2018**
 Location: Brooklyn, NY
 Client: **Chris Benedict**
 Prepared by: Thanos Psalidas (thanos@eas-usa.com)



Based on the information received the following estimate was prepared:

- Profile system: **SCHUCO AWS90.SI, ADS90.SI**
- Hardware: Schuco full perimeter locking with 2 security closures and safety lock
- Color Finish: Custom Powder Coated Color (included) – Color **RAL 7016 Anthracite Grey**
- Frame: AWS90.SI, 90mm Profile System with corresponding Uf-value of **0.18** Btu/(h-ft²·°F)
- Glass Name: **Triple** Glazed Low E Insulated Glass - CLIMATOP Planitherm One
- Glass Spacer: Warm-Edge Spacer System Ψg-value of **0.019** Btu/(h-ft·°F)

Glazing Type	U-value	SHGC	VT
CLIMATOP PLANITHERM ONE	0.0968	0.26	0.59



Schuco AWS 90.SI

Fact Sheet

Optimize energy efficiency with high performance openings. According to the U.S. Green Building Council (USGBC), in the United States alone, buildings account for:

- 72% of electricity consumption
- 24 - 50% of energy use
- 38% of all carbon dioxide (CO₂) emissions

Ceco doors and frames, along with Pemko seals and thresholds combine to provide the some of the industry's most energy efficient openings available today. Our openings are tested and certified by an independent 3rd party test lab. Ceco recommends all design and building professionals compare products based on ASTM C1363 operable door assembly for a more accurate indication of thermal performance.

Ceco doors do not have to sacrifice strength in order to achieve insulating performance. For example, Ceco Trio-E has been certified to a design pressure of +/-100 psf with a hurricane rated opening.

What do the U and R value numbers mean?

U-Factor: Overall coefficient of heat transmission through a built-up panel section measured in BTU's per hour per square foot of area per degree Fahrenheit between the air on one side to the air on the other side (BTU's/hr-ft²-°F) The lower the U-factor, the better the insulation. **R-Value :** Thermal resistance is a measure of ability to retard heat flow. R is an expression of the total resistance to heat flow through a complete panel section or construction assembly. R represents a value of the thermal resistance in hours · square foot·degrees Fahrenheit per BTU of a typical panel section. R is the numerical reciprocal of the U-factor (R=1/U). The higher the R, the higher the insulating value.

Door U - Factor and R - Value Testing

Hollow Metal Door Series/Core	Frame	Test Methodology*					
		ASTM C1363 Operable		ASTM C518 Calculated		ASTM C1363 Sealed in Place ⁺	
		U - Factor	R - Value	U - Factor	R - Value	U - Factor	R - Value
Trio-E / Polyurethane & Steel Stiffened	TB	0.29	3.4	0.09	11.0	N/A	N/A
Trio-E / Polyurethane & Steel Stiffened	Kerf	0.36	2.7	0.09	11.0	N/A	N/A
Imperial / Polyurethane	TB	0.31	3.2	0.09	11.0	N/A	N/A
Imperial / Polyurethane	Kerf	0.40	2.5	0.09	11.0	N/A	N/A
Trio / Polyurethane & Steel Stiffened	TB	0.42	2.4	0.09	11.0	N/A	N/A
Legion / Polystyrene	TB	0.35	2.8	0.16	6.4	N/A	N/A
Regent / Honeycomb	TB	0.53	1.9	0.41	2.4	N/A	N/A
Medallion / Steel Stiffened	TB	0.55	1.6	0.62	1.8	N/A	N/A

Fiberglass Reinforced Polyester Door Series/Core	Frame	Test Methodology*					
		ASTM C1363 Operable		ASTM C518 Calculated		ASTM C1363 Sealed in Place ⁺	
		U - Factor	R - Value	U - Factor	R - Value	U - Factor	R - Value
FRP / Polyurethane	TB	0.35	2.9	0.12	8.0	0.26	3.8
FRP / Polyurethane	HM	0.38	2.6	0.12	8.0	0.26	3.8

TB = Ceco Thermal Break Frame

Kerf = Ceco Weather Kerf Frame

HM = Ceco standard Hollow Metal Frame

*Tested with hardware from other ASSA ABLOY Group brands including Corbin Russwin, Pemko, McKinney, Sargent and Yale

⁺Panel test only - tested without frame

Air Infiltration Testing

What is air infiltration? A measurement of the air leakage around the perimeter of a door opening.

CFM = Cubic Feet per Minute

Door Series/Core	Test Method: ASTM E283*	
	CFM / SQ FT	CFM / LN FT
Any Ceco Door Construction (excluding FRP) with Ceco Thermal Break Frame	0.04	0.06

*Tested with hardware from other ASSA ABLOY Group brands including Corbin Russwin, Pemko, McKinney, Sargent and Yale.

Ceco Door
 9159 Telecom Drive • Milan, TN 38358
 Tel (888) 232-6366 • Fax (888) 232-6462
 archhelp@cecodoor.com
 www.cecodoor.com

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Energy Efficient

ASSA ABLOY, the global leader
 in door opening solutions
 Ceco EEO 0614

5. Warranty

- 5.1 Warranty Type and Period: Five years limited warranty from date of installation.
- 5.2 EAS agrees to repair or replace windows and doors that fail due to material or workmanship within the specified warranty period. The failures include :
- a.) Mechanical or structural failures.
 - b.) Insulation glass failures.
 - c.) Water leakage, air infiltration or condensation on triple-pane units. Under coastal applications or gutterless designs, conditions exist regarding minimal overhang requirements and water-runoff.
 - d.) Defective hardware or failure to properly operate sash hardware. Limited warranty available for sash units over 8 feet tall.
 - e.) Deterioration of metal components beyond normal wear.
- 5.3 Detailed warranty certificate will be provided with details of the Limited Five Year Warranty including conditions, limitations, claim procedures and repair/replacement conditions.

6. Lead Time

- 6.1 **12 weeks (in stages)** following a 50% deposit and approval of specification.
- 6.2 Please note that lead-times change due to production volumes. The estimated lead-time estimate is valid for 30 days.

7. Quotation

- 7.1 All prices are in US Dollars. Due to currency fluctuations the quotation is valid for a period of 30 days.

ACCEPTANCE OF PROPOSAL

The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to manufacture the goods following a 50% deposit and the approval of shop drawings. The balance is due one day prior to day of delivery.

Approved By _____

Signature _____ Date _____

Aeroseal Duct Sealing Specification

Fractional Leakage

1. Duct Preparation
 - a. Inspect air distribution systems for major leakage sites and significant accumulation of hubris or debris
 - b. Remove all debris and significant dust and dirt (>1/8 inch deep) in air distribution system using a NADCA approved duct cleaning method
 - c. Ensure adequate structural support for new and existing ductwork, including structural integrity of all mechanical duct joints and transitions per SMACNA standards.
 - d. Temporarily remove or protect from aerosol particles building controls, fire and smoke sensors as recommended by manufacturer.
 - e. Temporarily disable fire alarms and notify appropriate authorities.
 - f. Temporarily isolate air-moving equipment and block off air inlets and outlets, and other devices and appurtenances as recommended by the manufacturer.
 - g. Protect occupied spaces from aerosol particles using manufacturer procedures.
 - h. All work shall be done in a substantial and workmanlike manner by factory trained technicians.

2. Duct Sealing
 - a. Repair all major leakage sites greater than ½ inch across using mastic and fiberglass mesh tape per SMACNA standards
 - i. Mastic and fiberglass mesh tape shall meet UL 181 standards.
 - b. Seal existing ductwork from the inside using automated aerosolized sealant injection.
 - i. Manufacturer: Aeroseal, LLC
 - ii. Application must be performed by a manufacturer approved service provider
 - iii. Sealant shall comply with UL Outline Scope 1381
 - iv. Sealant must cure with 2 hours with no VOC off-gassing thereafter
 - v. Sealant shall remain elastic after curing
 - vi. Sealant shall be deposited substantially at areas of leakage only
 - c. Provide pre-sealing, post-sealing and sealing profile reports for all duct sections sealed.
 - d. Repair all injection and test holes in existing ductwork using patching plates sealed tight per SMACNA standards.
 - e. Any injection ports in duct board shall be made and repaired using pumpkin-cuts
 - f. Any insulation (internal or external) shall be replaced on the patching plate.

3. Duct Testing
 - a. Provide pre-sealing and post-sealing leakage profile reports indicating percentage reduction of leakage for supply, return and exhaust ductwork and shafts.
 - b. Use manufacturer calibrated blower fan box with digital manometer to measure leakage before and after sealing.

- c. Following completion of air handling unit installations, duct repairs, and duct sealing, test all ductwork to insure that the air distribution system is properly sealed.
 - i. The supply ducts shall have air losses of less than 3% of the total air flow volume measured at the fan or air-moving device.
 - ii. The return ducts shall have air losses of less than 3% of the total air flow volume measured at the fan or air-moving device.
 - iii. The exhaust ducts shall have air losses of less than 5% of the total air flow volume measured at the fan or air-moving device.
 - iv. Leakage at operating pressure shall be calculated by correcting leakage flows measured at 25 Pa to the average pressure seen by the leaks (defined as the average of the static pressure at the plenum and the average of the diffuser pressure at the end of the shortest and longest duct runs)

4. Duct Reassembly and Cleanup
 - a. Reinstall building controls and smoke detectors.
 - b. Enable fire alarms and notify appropriate authorities.
 - c. Remove blocking, reinstall grills and registers, and enable air handling fans.
 - d. Cleanup sealant residue that may have adhered to surfaces in occupied areas as recommended by the Manufacturer.
 - e. All work shall be done in a substantial and workmanlike manner by factory-trained technicians.

5. Warranty
 - a. The Contractor shall warrant that the aerosol sealant application will be free from defects for a period of 3 years from date of the sealing application. If defects should occur during this period, the Contractor shall repair or replace the defective duct seals, including the direct labor costs for performing the repair or replacement, at no additional cost to the Owner.

Aeroseal Duct Sealing Specification ***SMACNA Leakage Class***

1. Duct Preparation
 - b. Inspect air distribution systems for major leakage sites and significant accumulation of hubris or debris
 - c. Remove all debris and significant dust and dirt (>1/8 inch deep) in air distribution system using a NADCA approved duct cleaning method
 - d. Ensure adequate structural support for new and existing ductwork, including structural integrity of all mechanical duct joints and transitions per SMACNA standards.
 - e. Temporarily remove or protect from aerosol particles building controls, fire and smoke sensors as recommended by manufacturer.
 - f. Temporarily disable fire alarms and notify appropriate authorities.
 - g. Temporarily isolate air-moving equipment and block off air inlets and outlets, and other devices and appurtenances as recommended by the manufacturer.
 - h. Protect occupied spaces from aerosol particles using manufacturer procedures.
 - i. All work shall be done in a substantial and workmanlike manner by factory trained technicians.

2. Duct Sealing
 - a. Repair all major leakage sites greater than ½ inch across using mastic and fiberglass mesh tape per SMACNA standards
 - i. Mastic and fiberglass mesh tape shall meet UL 181 standards.
 - b. Seal existing ductwork from the inside using automated aerosolized sealant injection.
 - i. Manufacturer: Aeroseal, LLC
 - ii. Application must be performed by a manufacturer approved service provider
 - iii. Sealant shall comply with UL Outline Scope 1381
 - iv. Sealant must cure with 2 hours with no VOC off-gassing thereafter
 - v. Sealant shall remain elastic after curing
 - vi. Sealant shall be deposited substantially at areas of leakage only
 - c. Provide pre-sealing, post-sealing and sealing profile reports for all duct sections sealed.
 - d. Repair all injection and test holes in existing ductwork using patching plates sealed tight per SMACNA standards.
 - e. Any injection ports in duct board shall be made and repaired using pumpkin-cuts
 - f. Any insulation (internal or external) shall be replaced on the patching plate.

3. Duct Testing
 - a. Following completion of air handling unit installations, duct repairs, and duct sealing, test all ductwork to insure that the air distribution system is properly sealed.
 - i. The supply ducts shall have air losses of less than the Leakage Class indicated in Table 1.
 - ii. The return ducts shall have air losses of less than the Leakage Class indicated in Table 1.

- iii. The exhaust ducts shall have air losses of less than the Leakage Class indicated in Table 1.
- iv. The Leakage Class shall be calculated by correcting leakage rate measured at 0.1 in.wg to the Duct Class maximum operating pressure with the following formula:

$$FP = F_{0.1} \times (P/0.1)^{0.6}$$

Where:

FP = Leakage rate measured at pressure P (units of CFM)
 F_{0.1} = Leakage rate measured at 0.1 in.wg (units of CFM)
 P = Duct maximum operating static pressure (units of in.wg)

The Leakage Class will be identified with the following formula:

$$CL = FP / PN * (D/100)$$

Where:

CL = Leakage Class
 FP = Leakage rate at pressure P (units of CFM)
 P = Duct maximum operating static pressure (units of in.wg)
 N = Constant of 0.65
 D = Duct surface area (units of sqft)

Duct Class (inWC)	1/2, 1, and 2	3	4, 6 and 10
Seal Class	A	A	A
Sealing Applicable	Joints, seams and applicable wall penetrations	Joints, seams and applicable wall penetrations	Joints, seams and applicable wall penetrations
Rectangular Metal	8	4	2
Round Metal	4	2	2
Flexible	8	N/A	N/A
Duct board	8	N/A	N/A
Masonry	8	N/A	N/A

4. Duct Reassembly and Cleanup

- a. Reinstall building controls and smoke detectors.
- b. Enable fire alarms and notify appropriate authorities.
- c. Remove blocking, reinstall grills and registers, and enable air handling fans.
- d. Cleanup sealant residue that may have adhered to surfaces in occupied areas as recommended by the Manufacturer.
- e. All work shall be done in a substantial and workmanlike manner by factory-trained technicians.

5. Warranty

- a. The Contractor shall warrant that the aerosol sealant application will be free from defects for a period of 3 years from date of the sealing application. If defects should occur during this period, the Contractor shall repair or replace the defective duct seals, including the direct labor costs for performing the repair or replacement, at no additional cost to the Owner.

Technical Product Data

(MD-C-200v3)

THERMAL INSULATION AND AIR BARRIER ICC-ES ESR-3500

Specification Sections: 07 21 19 Foamed-in-Place Insulation, 07 27 00 Spray Polyurethane Foam Air Barriers

PRODUCT DESCRIPTION

Icynene ProSeal™ is a closed cell spray applied polyurethane foam insulation and air barrier material suitable for buildings in accordance with the IRC and the IBC including Type I, II, III, IV and V construction. It delivers high R-value and Class II water vapor permeance required in certain climate zones. Initial pass thickness may be 3 inches. The product is for use as a thermal insulation and air barrier in:

- exterior walls as continuous insulation
- wall cavities
- floor assemblies
- ceiling assemblies
- attics (vented and unvented)
- crawl spaces (vented and unvented)

PROPERTIES OF CURED FOAM

Characteristic	Test Method	Value
Core Density	ASTM D 1622	2.4 lb/ft ³
Color		Cream
Aged Thermal Resistance: at 1"	ASTM C 518	R-7.1
at 2" (Calculated)		R-14
at 3" (Calculated)		R-21
at 3½"		R-25
Air Permeance	ASTM E 2178	< 0.02 L/s.m ² at 1"
Water Vapor Permeance	ASTM E 96	0.97 perm at 1.5"
Water Absorption	ASTM D 2842	0.6%
Dimensional Stability at 7 days (% Volume)	ASTM D 2126	8.9% at 158°F and 97% RH
Compressive Strength	ASTM D 1621	40 lb/in ²
Tensile Strength	ASTM D 1623	41 lb/in ²
Closed Cell Content (% Volume)	ASTM D 6226	98%
Fungus Testing	ASTM C 1338	No Growth

BURN CHARACTERISTICS

Surface Burning at 4 inches:	ASTM E 84	Class 1
Flame Spread Index		25
Smoke Development		300
Commercial Fire Resistance	NFPA 285	Assembly Passed*
Commercial Fire Resistance	ASTM E 119	1,2 & 3 Hour Ratings*
DC 315 Thermal Barrier	NFPA 286	> 15 minutes
Wall & Ceiling Application Maximum Thickness	ACC377	Walls- none Ceiling- none
Attic & Crawl Space Walls & Roof Uncoated Thickness	ACC377 Appendix X	Walls - 6" Roof - 8"

*consult Icynene Engineering Department for details.

- Icynene ProSeal™ must be covered with ½" of gypsum board, DC-315 intumescent paint coating @ 24 wet mils or approved thermal barrier.
- Icynene ProSeal™ is subject to all applicable National/ State and County building codes regarding fire prevention. Requirements for Thermal Barrier and Ignition Barrier coverings must be met as per the applicable building code as required by the authority having jurisdiction.
- Icynene ProSeal™ per ACC377 Appendix X test reporting is approved for use in limited access attics and crawl spaces without an ignition barrier or an intumescent paint coating.

AIR BARRIER/ MECHANICAL VENTILATION

- Icynene ProSeal™ fills any shaped cavity, and adheres to most construction materials, creating assemblies with very low air permeance.
- Additional interior or exterior air infiltration protection is subject to applicable codes.
- All buildings insulated and air sealed with Icynene ProSeal™ must be designed to include adequate mechanical ventilation/ outdoor air supply for optimum IAQ (Indoor Air Quality).
- For mechanical ventilation see ASHRAE Standard 62 – Ventilation for Acceptable Indoor Air Quality or any other acceptable good engineering practice.

WATER VAPOR PERMEANCE & ABSORPTION

- Icynene ProSeal™ is a Class II vapor retarder, at 1½" thickness, which reduces the amount of moisture that can diffuse through the insulation.
- Icynene ProSeal™ meets FEMA criteria for resisting water absorption.
- It is resistant to moisture allowing it to be used below the base flooding elevation in flood prone areas.

ENVIRONMENTAL AND HEALTH

- Icynene ProSeal™ is California Department of Public Health EHLB v1.1-2010 Emissions Specification Section 01350 compliant for offices and classrooms.

INSTALLATION

- Icynene ProSeal™ is installed by a network of Licensed Dealers, trained in its installation.
- Maximum thickness per pass is 3 inches for first pass only, then 2 inches maximum for additional passes. Wait until first layer cools before applying a second layer/lift over the initial layer/lift.
- This product should not be installed within (3") of heat emitting devices, (or as specified by Code) where the temperature is in excess of 180°F, in accordance with applicable codes.
- It can be installed in hot, humid or freezing conditions. Minimum substrate temperature for application is 22°F (-6°C).
- Surface preparation is generally not necessary.
- Within seconds, the foaming process is complete.

HANDLING AND SAFETY

For information on Health and Safety, refer to the Spray Polyurethane Foam Alliance Health and Safety guidance documents at www.spraypolyurethane.com.

AVAILABILITY

Contact Icynene Inc. at 800-758-7325 or visit our website at www.Icynene.com.

WARRANTY

WHEN INSTALLED PROPERLY IN ACCORDANCE WITH INSTRUCTIONS, THE COMPANY WARRANTS THAT THE PROPERTIES OF THE PRODUCT MEET PRODUCT SPECIFICATIONS AS OUTLINED IN THIS TECHNICAL DATA SHEET. SAVE AND EXCEPT ANY EXCLUSIONS REFERENCED IN THE WARRANTY.

TECHNICAL

Icynene Licensed Dealers and Icynene Inc. provide support on both technical and regulatory issues. Architectural specifications in CSI 3-Part format and design details are available at our website at www.Icynene.com.

REGULATORY

- ESR-3500 has been issued by the ICC-ES for Icynene ProSeal™.
- Icynene ProSeal™ has been tested as per the requirements of the International Code Council Evaluation Service's AC377 Acceptance Criteria (November 2012).
- Meets ASTM C1029 Type II classification.
- For regulatory issues concerning Icynene ProSeal™ contact Icynene at 800-758-7325.

RELATED REFERENCES

All physical properties were determined through testing by accredited third party agencies. Icynene Inc. reserves the right to change specifications in its effort of continuous improvement. Please confirm that technical data literature is current.

PACKAGING AND STORAGE

- Packaging - 55 US gallon, closed top steel drums
- Component 'A' - 550 lb. per drum. Base Seal® MDI
- Component 'B' - 510 lb. per drum. Icynene ProSeal™ - Resin
- Icynene ProSeal™ (Component A and Component B) ideally should be stored between 60°F (15°C) and 85°F (30°C).
- Component A should be protected from freezing.
- Shelf life is 12 months.



PRODUCT CERTIFIED
FOR LOW CHEMICAL
EMISSIONS



Telephone: 905.363.4040
Toll Free: 800.758.7325
www.Icynene.com
inquiry@icynene.com

Updated February 2016

Health & Safety Homeowners

COMMITTED TO THE RESPONSIBLE USE OF SPRAY
FOAM CHEMISTRY FOR OVER 25 YEARS.

Icynene spray foam insulation products have an excellent health and safety record spanning more than 425,000 projects over more than 25 years. Nonetheless, safe handling practices during and immediately following installation are required to eliminate the possibility of health effects from exposure to isocyanates. Asthma, other lung problems, and irritation of the nose and throat can result from inhalation of isocyanates. Direct contact with the skin and eyes can result in irritation. Different individuals will react differently to the same exposures; some will be more sensitive than others.

Everyone (other than Icynene-certified spray technicians) must vacate the job site, remaining completely out of the building or at least 50 feet away, while the spray is applied and for at least 2 hours* after spraying is completed to allow active ventilation of the job site and to ensure the foam chemicals are completely cured. No exceptions.

Independent studies and third party toxicologist verification indicates that when the prescribed ventilation rates and periods are followed, Icynene spray foam insulation is safely cured.

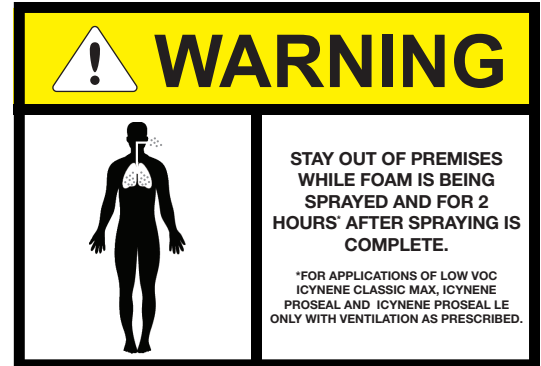
*** For installations of low VOC products Icynene ProSeal and Icynene ProSeal LE in the United States only, re-occupancy of the job site is permitted after 2 hours provided that the rate of air exchange during spraying and for 2 hours thereafter equals or exceeds 40 Air Changes per Hour (ACH). For applications of low VOC Icynene Classic Max in the United States only, re-occupancy is permitted after 2 hours provided rate of air exchange during and for 2 hours thereafter equals or exceeds 10 Air Changes per Hour.**



Icynene Inc. 6747 Campobello Road
Mississauga, Ontario L5N 2L7 Canada

Ph: 1.800.758.7325 • ICYNENE.COM

SL-519 • Updated April 2017



CLIENT ACKNOWLEDGEMENT

NAME:

BUILDING ADDRESS:

CITY:

STATE / PROVINCE:

ZIP / POSTAL CODE:

I have read and understand the information on this document. I understand that I must vacate the premises during spraying and for at least 2 hours* after spraying has been completed.

SIGNATURE:

DATE:

Email completed form to hsagreements@icynene.com or fax 1-888-340-2552.

 **ICYNENE**[®]
The Evolution of Insulation

Health & Safety Certified Sprayer

Icynene spray foam insulation products have an excellent health and safety record spanning more than 425,000 projects over more than 25 years. Nonetheless, safe handling practices during and immediately following installation are required to eliminate the possibility of health effects from exposure to isocyanates. Asthma, other lung problems, and irritation of the nose and throat can result from inhalation of isocyanates. Direct contact with the skin and eyes can result in irritation. Different individuals will react differently to the same exposures; some will be more sensitive than others. Severe asthma attacks have been reported in some sensitized workers exposed repeatedly to isocyanates while not wearing proper protective equipment. Some reports indicate a reaction and sensitization can occur following a single, sustained occupational exposure to isocyanates without proper protective equipment above the OSHA permissible exposure limit. But sensitization might not occur immediately in some individuals. Consistent use of personal proper protective equipment to prevent exposure during spraying and within the 1 hour**-period after spraying is completed is critical to eliminating the health hazard. Once sensitization has occurred, a worker might not be able work safely with spray foam insulation again.

Sprayers, sprayer helpers, and anyone else present during spraying or within 1 hour** after spraying is complete: You must ventilate at levels prescribed on this page and must wear proper Personal Protective Equipment (PPE) at all times during spray, including full-body-coverage, chemical-protective clothing and a NIOSH-certified respirator with fresh air supply. While spraying and for 1 hour** after spraying is completed, no one must be allowed within 50 feet of the sprayed foam without wearing this type of PPE at all times. Adequate active, negative pressure ventilation (exhaust fans) of the job site must be in place during spray and for 2 hours** after spray is complete to allow for re-occupancy.

For installations of low VOC products Icynene Classic Max, Icynene ProSeal and Icynene ProSeal LE in the United States only, re-entry of the job site is permitted after 1 hour** and re-occupancy of the job site is permitted after 2 hours** provided that ventilation rates are followed as recommended on this page.

Independent studies and third party toxicologist verification indicates that when the prescribed ventilation rates and periods are followed, Icynene spray foam insulation is safely cured.

WARNING

WEAR PROPER PERSONAL PROTECTIVE EQUIPMENT AT ALL TIMES ON PREMISES DURING SPRAYING & FOR AT LEAST 1 HOUR* AFTER SPRAYING IS COMPLETE.

*FOR APPLICATIONS OF LOW VOC ICYNENE CLASSIC MAX, ICYNENE PROSEAL AND ICYNENE PROSEAL LE ONLY WITH VENTILATION AS SPECIFIED ON THIS PAGE.



RE-ENTRY AND RE-OCCUPANCY PERIODS

Times based upon ventilating during and after a spray application.

Ventilation Rate (Air Changes per Hour)	Re-entry period for sprayers, helpers, informed trade workers and contractors	Re-occupancy period for all others
At 0.3 ACH	24 hours	24 hours
At 1.0 ACH	12 hours*	24 hours
At 10.0 ACH	4 hours*	24 hours
At 10.0 ACH <small>For Icynene Classic Max</small>	1 hour**	2 hours**
At 40.0 ACH	1 hour**	2 hours**

* Twelve (12) and four (4) hour re-entry for trades applies to all Icynene products sold in the United States.

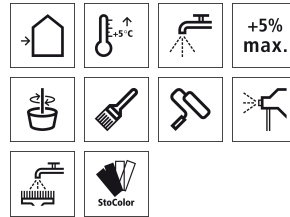
** One (1) hour re-entry and two (2) hour re-occupancy applies only to low VOC products:

- Icynene Classic Max at 10 ACH
- Icynene ProSeal / Icynene ProSeal LE at 40 ACH

Technical data sheet

StoColor Lotusan®

Facade paint with Lotus-Effect® Technology, natural protection against algae and fungal attacks, without biocide film protection



Characteristics

- Areas of application**
- exterior
 - for paint coats with reduced adhesion of dirt particles, suitable for mineral and organic, non-elastic substrates
 - not suitable for surfaces that are horizontal (e.g. including joint areas in masonry) or sloping and subject to weathering

Properties

- texture-retaining
- very high CO₂ and water vapour permeability
- reduced wettability with water
- Lotus-Effect® Technology: reduced adhesion of dirt particles and self-cleaning when exposed to rain
- dirt runs off with the rain
- natural protection against algae and fungi
- without biocide film protection
- low-stress

Appearance

- matt

Technical data

Criterion	Standard / test regulation	Value/ Unit	Notes
Density	EN ISO 2811	1.4 - 1.6 g/cm ³	
Diffusion-equivalent air layer thickness	EN 1062 -3	0.01 m	V1 high

Technical data sheet

StoColor Lotusan®

Water permeability rate w	EN 1062 -3	0.05 kg/(m ² *h ^{0.5})	W3 low
Water vapour diffusion resistance factor μ	EN ISO 7783-2	50	average value
Gloss	EN 1062-1	matt	G3
Dry layer thickness	EN 1062-1	220 μm	E4 > 200; ≤ 400
Grain size	EN 1062-1	< 100 μm	S1 fine

The characteristic values stated are average values or approx. values. We use natural raw materials in our products, which means that the stated values can vary slightly in the same delivery batch; this does not affect the suitability of the product for its intended use.

Substrate

Requirements

The substrate must be firm, dry, clean, and load-bearing, as well as free from sinter layers, efflorescence and release agents. Damp or not fully cured substrates can lead to defects in following layers, such as bubble formation or cracks.

Preparations

Check existing coatings for their load-bearing capacity. Remove any non load-bearing or structurally weak coatings.

Application

Application temperature

Lowest temperature of substrate/air: +5 °C
Highest temperature of substrate/air: +30 °C

Material preparation

Intermediate coat diluted with max. 5% water.
Finish diluted with max. 5 % water.

Use as little water as possible to achieve application consistency. Stir well before

Technical data sheet

StoColor Lotusan[®]

application. For machine application, the amount of water to add depends on the requirement of the respective machine/pump. As a rule, strong colour shades need less added water to achieve the optimum application consistency. Diluting the material too much will make application more difficult and will result in poorer characteristics (e.g. hiding power, colour shade).

Consumption	Type of application	Approx. consumption	
	per paint coat	0.17 - 0.20	l/m ²
	for 2 coats	0.34 - 0.40	l/m ²

Material consumption depends on the application, substrate, and consistency, among other factors. The stated consumption values are only to be used as a guide. If required, determine precise consumption values on the basis of the specific project.

Coating procedure	<p>Substrate coating: Depends on the type and condition of the substrate. A substrate coating of Sto-HydroGrund is generally recommended.</p> <p>Intermediate coat: StoColor Lotusan[®]</p> <p>Finish: StoColor Lotusan[®]</p> <p>Two paint coats are always necessary for attaining an optimal water-repellent effect.</p>
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Application	<p>by paint brush, by roller, by airless spray-gun</p> <p>Sprayable without producing major mist: Nozzle: 4/17 - 4/25 Pressure: 100 - 150 bar</p> <p>Use a nozzle extension and a flexible whip hose to achieve optimum results.</p>
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Drying, curing, ready for next coat	<p>High humidity and/or low temperatures prolong drying.</p> <p>During unfavourable weather conditions it is very important to apply suitable protective measures (e.g. protection against rain) to the work in progress and freshly completed facades.</p>
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Technical data sheet

StoColor Lotusan®

At +20 °C temperature (air and substrate) and 65 % relative air humidity: over-coatable after approx. 8 hours.

Cleaning the tools

Clean tools with water immediately after use.

Indications, recommendations, special information, miscellaneous

The water-repellent effect can vary in strength depending on weathering and colour shade.

The water-repellent effect only acts on oily/greasy dirt to a limited extent, due to its reduced wettability with water.

Delivery

Colour shade

white, limited tintability in accordance with the StoColor System

Colour stability:

The effects of the weather, humidity, UV radiation, and deposits can lead to changes in the coating surface over time. This can result in colour changes. This is a dynamic process, which varies according to climate conditions and the degree of exposure. National regulations, data sheets etc. apply.

Extender material breakdown:

When coated surfaces are exposed to mechanical impact it is possible that for darker, intense colour shades the areas of impact change to a lighter colour. This is due to the natural extenders used. This does not impair the quality and functionality of the product.

Colour accuracy:

It is not possible to give any warranty for uniform colour accuracy and freedom from stains due to chemical and/or physical curing processes and fluctuations in the weather and different substrate conditions, especially in the case of:

- a) uneven absorption behaviour of the substrate
- b) different substrate moisture levels over the entire the surface
- c) partially very different alkalinity/substances from the substrate
- d) direct solar radiation with sharply delineated shadowing on the freshly applied coating.

Emulsifier washouts:

In case drying is delayed and the coating layers have not fully dried through,

Technical data sheet

StoColor Lotusan[®]

surface effects (streaking) caused by dew, mist, water spray or rain can occur during initial stages of weathering because of water-soluble processing aids in the coatings. Depending on the intensity of the colour shade, this effect can occur to varying degrees. This does not constitute an impairment of product quality. These effects usually disappear with the following rainfall.

Tintable	With max. 3 % StoTint Aqua.
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Packaging	pail
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Storage

Storage conditions	Store tightly sealed in frost-free conditions. Protect from heat and direct sunlight.
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Storage life	The quality of the product in its original container is guaranteed until the maximum storage life has expired. The storage life date can be deduced from the batch number of the container.
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Batch number explanation:

Number 1 = the last number of year, numbers 2 + 3 = a calendar week

i.e.: 5450013223 – storage life until week 45 of the year 2015

Certificates/approvals

ETA-12/0561	StoTherm Vario 7 (EPS and StoLevell FT) European technical approval
ETA-13/0901	StoTherm Mineral 5 (MW/MW-L and StoLevell FT) European technical approval
ETA-13/0581	StoTherm Mineral 8 (MW-L - System A / System B) European technical approval
ETA-08/0303	StoTherm Wood 1(HWF and StoLevell Uni, dowel/bracket) European technical approval
Test report P 1977-1	Lotus-Effect [®] for facade paints

Technical data sheet

StoColor Lotusan®

Soiling behaviour

Test report P 2371-1	Facade paints test Soiling behaviour
Test report P 3193	Soiling - long-term test Soiling behaviour
Test report P 5086-4	Lotusan® Testing carbon dioxide permeability
Microbiological testing of facade paints	Test report Microbiological test
Test report 139/2000	Lotusan® as impregnation
Test report AT 008/00	Physical characteristics - comparison of facade paints
IBP-Report FEB-5/1999	Comparison of surface wetting and drying Determining surface wetting and drying behaviour
Report - Lotus-Effect	Self-cleaning microstructured surfaces Professional journal

Identification

Product group Facade paint

Composition In accordance with the VdL directive (German Paint and Printing Ink Association) on coating materials for buildings, polymer dispersion, polysiloxane emulsion, titanium dioxide, silicon dioxide, water, additives

Safety Please observe the safety data sheet

Technical data sheet

StoColor Lotusan[®]

Special notes

The information or data in this technical data sheet serves to ensure the product's intended use, or its suitability for use, and is based on our findings and experience. Nevertheless, users are responsible for establishing the suitability of the product for its intended use.

Applications other than those explicitly mentioned in this technical data sheet are only permissible after prior consultation. Where no approval is given, such applications are at the risk of the user. This applies particularly to combinations with other products.

When a new technical data sheet is published, all previous technical data sheets are no longer valid. The latest version is available on the Internet.

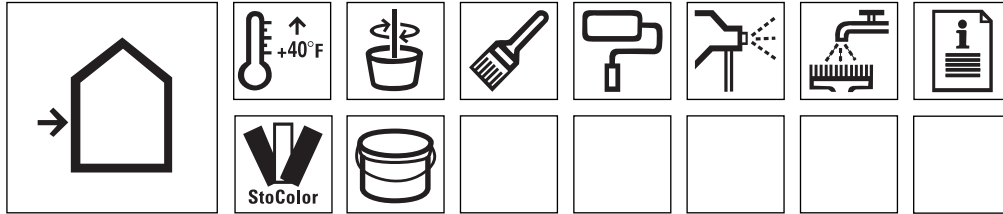
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StoCoat™ Lotusan®

The exterior coating with Lotus-Effect®



Technical Data

REPORT	TEST METHOD	TEST RESULTS	
Accelerated Weathering	ASTM G-155	2,000 hours	No Deleterious Effects
Tensile Strength psi (MPa)	ASTM D-412		182 (1.25)
Mold Resistance	ASTM D-3273	28 day exposure	No Mold Growth
Adhesion to Concrete psi (MPa)	ASTM D-4541		550 (3.79)
Water Vapor Permeability perms (ng/Pa·s·m ²)	ASTM E-96 Wet-cup method	2 coats	40 (2280)
VOC (g/L)	Calculated		36.2 (70.3**)
Percent Solids, by volume			52

Typical values for material cured at 73°F (23°C) and 50% R.H.

*Percent Solids by volume is approximated from change in thickness from wet application to measured dry film.

** Less water and exempt solvents

Features	Benefits
1 Super-hydrophobic	<ul style="list-style-type: none"> Extremely water repellent Outstanding resistance to soiling Improved resistance to mold, mildew and algae
2 Vapor Permeable	Allows substrate to breathe naturally, resists blisters caused by trapped water vapor
3 UV Resistant	Excellent color retention
4 Water-based	Safe, non-toxic; cleans up with water
5 Low VOC	Safe for workers and the environment

Surface Preparation

Concrete and masonry surfaces: Surfaces must be free of all bond-inhibiting materials, including dirt, efflorescence, form oil and other foreign matter. Loose or damaged material must be removed by waterblasting, sandblasting or mechanical wire brushing and repaired. Avoid application over irregular surfaces. Resurface, patch or level surfaces to required tolerance and smoothness with appro-

priate Sto leveling materials. Fill surface voids. Refer to ASTM D-4258 and ASTM D-4261 for complete details on methods of preparing cementitious substrates for coatings.

Exterior Insulation and Finish Systems (EIFS):

Surface must be clean, sound, and free of all bond-inhibiting materials, including dirt and efflorescence.

StoCoat Lotusan is a smooth, vertical, above grade exterior wall coating with BIONICS technology that mimics the self cleaning capabilities of the lotus leaf.

Volume Yield

+/- 4.7gal (18L)

Coverage

200-270 ft² per gallon (4.9-6.5 m² per liter) per coat, applied at 5-7 mils (0.13 to 0.18 mm), wet.

940-1270 ft² (85-115 m²) per pail for a single coat, applied at 5-7 mils (0.13 to 0.18 mm), wet.

470-635 ft² (44-58 m²) per pail for two coats, applied at 5-7 mils (0.13 to 0.18 mm) per coat, wet.

Packaging

5 gallon pail.

Color

42 Standard Colors or Custom Color Match.

Shelf Life

12 months, if properly stored and sealed.

Storage

Protect from extreme heat [90°F (32°C)], freezing, and direct sunlight.

216 StoCoat™ Lotusan®

Mixing

Mix with a clean, rust-free electric drill and paddle.

Application

Apply only to sound and clean, dry, properly prepared, frost-free surfaces. Apply StoCoat Lotusan with brush, roller, or proper spray equipment.

Once applied, the working time is up to 20 minutes depending upon material, ambient temperatures and surface conditions.

ALWAYS check color for proper match. If color does not match, STOP-call your Sto representative. For best results always prime cementitious substrates. Apply coating in a continuous application, always working from a wet edge or architectural break to eliminate cold joints. Minor shade variations may occur from batch to batch (refer to batch no. on pail). Avoid installing separate batches side-by-side and avoid application in direct sunlight. Avoid installing new finish adjacent to weathered or aged finish. Sto Corp. will not be responsible for shade or color variation from batch to batch, variation caused by application or substrate deficiencies, or fading resulting from natural causes such as weather.

See Tech Hotline Nos. 0694-C, 0893-EC and 1202-CF for helpful tips on prevention of color problems. Protect installed product from rain, freezing, and continuous high humidity until completely dry.

EIFS: select colors with a lightness value of 20 or greater.

Concrete and Stucco substrates:

Apply 805 Sto Hot Prime® in one coat by brush, roller, or spray to a thickness of 5 wet mils.

Concrete Masonry substrates:

Apply 804 Sto Primer Smooth in one coat by brush, roller, or spray to a thickness of 6-8 wet mils.

Allow primer to dry completely before applying finish coating. Select one of the options below, depending on type construction, weather exposure and required level of performance:

Decorative and Protective finish coating (one coat application):

Apply one coat, 5-7 wet mils, 216 Lotusan to primed surface.

Weatherproofing (two coat application):

Apply one coat, 5-7 wet mils, 216 StoCoat Lotusan to primed surface. Allow first coat, 216 StoCoat Lotusan to dry, and apply a second coat, 5-7 wet mils, 216 StoCoat Lotusan.

Curing/Drying

Dries within 24 hours under normal conditions [70°F (21°C), 50% RH]. Drying time varies with temperature/humidity and surface conditions.

Lotus-Effect®

Lotus-Effect is not immediate and requires up to 30 days of weathering after it is applied to develop. Lotus-Effect develops with aging and environmental conditions. Some highly textured surfaces may not show the complete Lotus-Effect.

Clean Up

Clean tools and equipment with water immediately after use. Dried material can only be removed mechanically.

Limitations

- Protect installed materials from rain, freezing, and continuous high humidity until completely dry.
- Apply when ambient and surface temperatures are 40°F (4°C) and rising.
- Do not apply if the surface temperature is less than 5°F (2.8°C) above the ambient dew point temperature.
- Do not apply in freezing conditions or during precipitation.
- Do not overcoat with solvent-based materials.
- Do not use below grade, on horizontal surfaces, or in areas of ponding water.
- Dark colors and colors requiring organic pigments may not be available.
- Custom color samples will not show the Lotus-Effect until weathered.
- Maximum powerwash pressure is 500 psi (3.43 MPa). Consult a Sto Corp. representative if higher pressures are required.
- Do not use detergents when cleaning/powerwashing StoCoat Lotusan coating. Please consult a Sto Corp. representative if pressure washing with water is not sufficient for cleaning StoCoat Lotusan.
- Dark colors formulated with Lotusan Base 1 have a reduced Lotus-Effect.

Health And Safety

Health Precautions

Product is water-based. As with any chemical construction product, exercise care when handling.

Safety Precautions

Use adequate ventilation. Safety goggles and protective gloves are recommended. Remove contaminated clothing immediately.

First Aid

SKIN CONTACT: Wash thoroughly with soap and water.
EYE CONTACT: Flush immediately with water for 10-15 minutes and contact a physician.
RESPIRATORY PROBLEMS: Remove affected person to fresh air immediately and contact a physician.
HYGIENE: Wash hands immediately after use. Wash clothing before reuse.

Spills

Collect with suitable absorbent material such as cotton rags.

Disposal

Dispose of in accordance with local, state or federal regulations.

Warning

KEEP CONTAINERS CLOSED WHEN NOT IN USE. KEEP OUT OF THE REACH OF CHILDREN. NOT FOR INTERNAL CONSUMPTION. FOR INDUSTRIAL USE ONLY. Consult the Material Safety Data Sheet for further health and safety information.

LIMITED WARRANTY

THIS PRODUCT IS SUBJECT TO A WRITTEN LIMITED WARRANTY WHICH CAN BE OBTAINED FREE OF CHARGE FROM: Sto Corp., 3800 Camp Creek Parkway, Building 1400, Suite 120, Atlanta, GA 30331; Tel: 404-346-3666; Fax: 404-346-3119.

ATTENTION

This product is intended for use by qualified professional contractors, not consumers, as a component of a larger construction assembly as specified by a qualified design professional, general contractor or builder. It should be installed in accordance with those specifications and Sto's instructions. Sto Corp. disclaims all, and assumes no, liability for on-site inspections, for its products applied improperly, or by unqualified persons or entities, or as part of an improperly designed or constructed building, for the nonperformance of adjacent building components or assemblies, or for other construction activities beyond Sto's control. Improper use of this product or use as part of an improperly designed or constructed larger assembly or building may result in serious damage to this product, and to the structure of the building or its components. **STO CORP. DISCLAIMS ALL WARRANTIES EXPRESSED OR IMPLIED EXCEPT FOR EXPLICIT LIMITED WRITTEN WARRANTIES ISSUED TO AND ACCEPTED BY BUILDING OWNERS IN ACCORDANCE WITH STO'S WARRANTY PROGRAMS WHICH ARE SUBJECT TO CHANGE FROM TIME TO TIME.** For the fullest, most current information on proper application, clean-up, mixing and other specifications and warranties, cautions and disclaimers, please refer to the Sto Corp. website, www.stocorp.com.

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SCR155-216 12/07 VEN 5609





AIRFLOW & ZONE CONTROLS

MR Modulo

Adjustable Constant Airflow Regulator

PRODUCT
SPECIFICATIONS
& TECHNICAL
DATA



GENERAL

The model MR Modulo Adjustable Constant Airflow Regulator is a modulating orifice that automatically regulates airflows in duct systems to constant levels. The passive control element responds to duct pressure and requires no electric or pneumatic sensors or controls.

The MR Modulo compensates for changes in duct pressure caused by thermal stack effect, building pressure, dust-clogged filters, etc. The MR Modulo also provides a quiet, low-cost solution to balancing forced-air systems for heating, air conditioning and ventilation, eliminating the need for on-site balancing. The MR Modulo will regulate airflow in supply, return, or exhaust duct systems. It can be mounted horizontally or vertically, and can be fitted in ductwork and accessories.

The active control element of the MR Modulo is a flexible bulb that inflates and deflates in response to the static pressure difference across the control. This operation regulates the free-area opening through the control, resulting in maintenance of velocity and specific airflow setpoints. Each MR Modulo is designed and produced for control of air in temperatures ranging from 14° to 140°F (-10° to 60°C).

CONSTRUCTION

The MR Modulo is constructed of PC / ABS plastic, and it is UL 2043 safety classified and labeled for flame and smoke generation. The assembly is sized to fit inside standard rigid round ducting, as well as fittings such as take-offs, tees, etc. A double-lip airtightness seal around the circumference ensures a tight, no-leak fit.

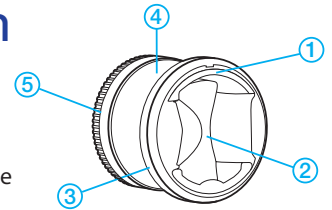
PERFORMANCE

The MR Modulo airflow regulators control airflow accurately to within ± 3 CFM (5 m³/h) for nominal airflow ≤ 30 CFM (50 m³/h) and $\pm 10\%$ for nominal airflow > 30 CFM (50 m³/h) throughout the target operating pressure range of 0.2 to 1.0 in. w.g. (50 to 250 Pa). Each diameter of MR Modulo regulator is available in multiple factory-calibrated setpoints (see performance curves). Field adjustment of airflow setpoints is achieved by twisting the integral rotating ring to the desired setpoint. No tools are required.

INSTALLATION

The MR Modulo will push-fit into circular ducts in close proximity to a take-off or a terminal. Mounting can be horizontal or vertical. The MR Modulo orientation must correspond to the airflow direction indicated on the device.

MR Modulo Construction



1. Removable clip
2. Regulating silicon membrane
3. Double-lip airtightness seal
4. Housing
5. Rotating airflow adjustment ring

Information indicated directly on the product:

- Flow direction, diameter, operating differential pressure range, part number, and date of manufacture
- Airflow setting range correlation table in CFM and m³/h

Typical Applications

- Supply and exhaust air for offices
- Balancing exhaust and supply airflows in high-rise building duct risers
- Bathroom exhaust in nursing homes, hotels, motels, dormitories, apartment buildings, offices, etc.
- Clean room air supply balancing for ceiling filter modules. Maintains constant airflow, even as filter resistance increases
- Regulation of make-up air
- Balancing supply airflow from packaged roof-top A/C units
- Balancing supply and exhaust of heat recovery ventilation systems
- Regulating outdoor air injection from central supply fan into individual room fan coil units or heat pumps
- Balancing airflows on series-fan-powered terminal unit systems
- Supply air to sleeping quarters in military facilities, etc.

MAINTENANCE

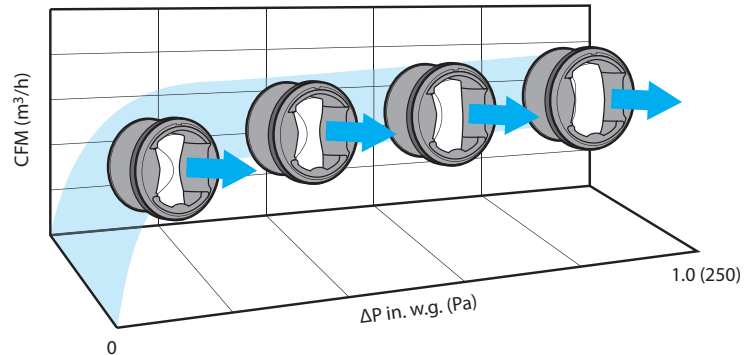
The MR Modulo needs no maintenance when used in normal conditions. There is no risk of dust deposits or obstruction because the MR Modulo has no airways subject to clogging. If the intended application includes air heavily loaded with grease or dust, a fitting with an access panel or door, such as that used for flame dampers, should be provided.

WARRANTY

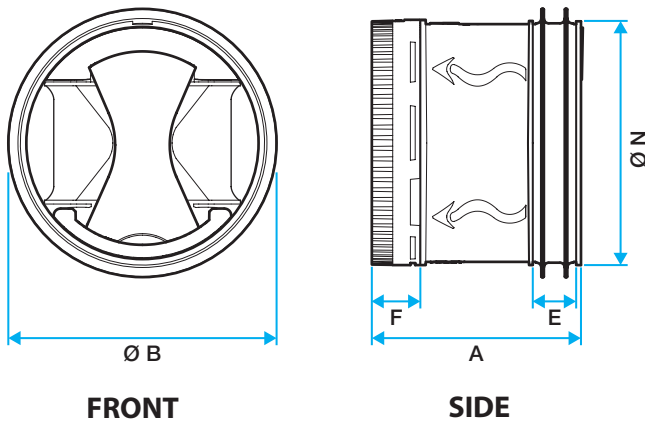
Guaranteed for five (5) years, from date of shipment, against all defects in material or workmanship, provided that the material has been installed and used under normal conditions. This warranty is limited to the repair or replacement of the material.

How the MR Modulo Works

Constant airflow is achieved by the inflating action of the MR Modulo's bulb. At minimum static air pressure, the bulb is deflated and has a shape similar to an hourglass. As the static pressure increases across the bulb, it inflates, thereby reducing the free area around the bulb. At the same time, the higher static pressure increases the air velocity, resulting in **CONSTANT AIRFLOW**. This occurs regardless of pressure differences in the range of 0.2 to 1.0 in. w.g. (50 to 250 Pa). The air velocity in the duct is in the range of 60 to 700 ft/min. (0.3 to 3.5 m/s).



MR Modulo Dimensions



Ø Duct Diameter	ØN	ØB	E	F	A	Weight
4" (100 mm)	3.62" (92 mm)	4.13" (105 mm)	0.55" (14 mm)	0.51" (13 mm)	2.76" (70 mm)	0.26 lbs (0.12 kg)
5" (125 mm) 10-50 CFM	4.57" (116 mm)	5.20" (132 mm)	0.55" (14 mm)	0.51" (13 mm)	2.76" (70 mm)	0.33 lbs (0.15 kg)
5" (125 mm) 60-115 CFM	4.57" (116 mm)	5.20" (132 mm)	0.55" (14 mm)	0.67" (17 mm)	4.33" (110 mm)	0.37 lbs (0.17 kg)
6" (150 mm)	5.79" (147 mm)	6.02" (153 mm)	0.55" (14 mm)	0.75" (19 mm)	4.65" (118 mm)	0.82 lbs (0.37 kg)
8" (200 mm)	7.48" (190 mm)	8.27" (210 mm)	0.79" (20 mm)	0.91" (23 mm)	5.67" (144 mm)	1.31 lbs (0.59 kg)
10" (250 mm)	9.37" (238 mm)	10.32" (262 mm)	0.79" (20 mm)	1.02" (26 mm)	7.05" (179 mm)	2.25 lbs (1.02 kg)

Typical Specification

Model MR Modulo Adjustable Constant Airflow Regulators by American ALDES Ventilation Corporation, Bradenton, Florida, shall operate solely on duct pressure and require no external power supply. Each regulator shall be capable of being field adjusted to the required airflow setpoint, as indicated on the schedule, by twisting the rotating ring to the corresponding airflow set value. The device shall be rated for use in air temperatures ranging from 14° to 140°F (-10° to 60°C).

Constant Airflow Regulators shall be capable of maintaining constant airflow within ± 3 CFM (5 m³/h) for nominal airflow ≤ 30 CFM (50 m³/h) and $\pm 10\%$ for nominal airflow > 30 CFM (50 m³/h) throughout the target operating pressure range of 0.2 to 1.0 in. w.g. (50 to 250 Pa) differential pressure. Sound power levels shall not exceed those for each size and CFM rating as scheduled.

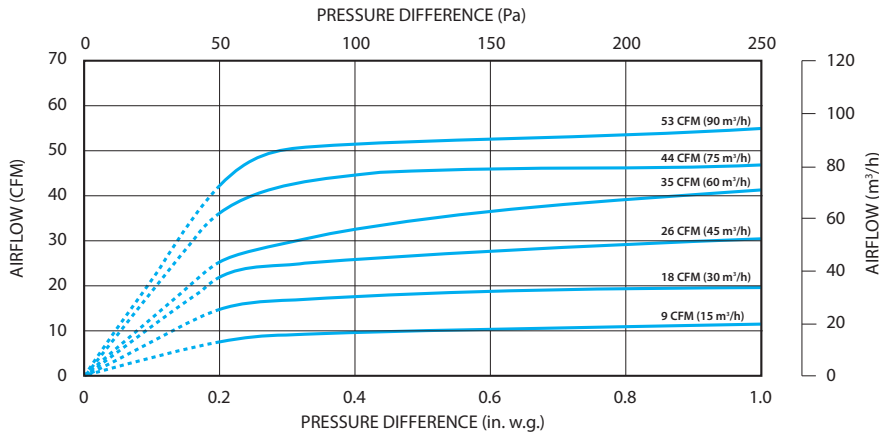
Regulators shall be provided as an assembly consisting of a PC/ABS plastic housing and regulating silicon membrane. A rotating adjustment ring shall allow for setting of airflow to calibrated setpoints. No tools shall be needed to set airflow. Each assembly shall be fitted with a double-lip airtightness seal in elastomer. All regulators must be classified per UL 2043 and carry the UL mark indicating compliance.

All MR Modulo Adjustable Constant Airflow Regulators will require no maintenance and must be warranted for a period of no less than five (5) years. MR Modulo Adjustable Constant Airflow Regulators shall be installed in tight ducting systems in accordance with all applicable codes and manufacturer's instructions.

MR Modulo Airflow Performance Data

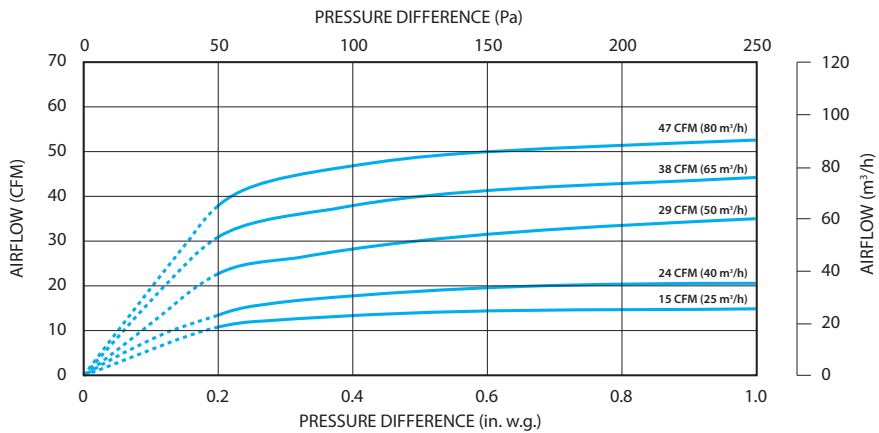
Performance charts reflect airflow variation for each size MR Modulo according to the pressure difference between upstream and downstream of the device. The MR Modulo is designed for the differential operating range from 0.2-1.0 in. w.g. (50-250 Pa). Airflow measurements taken at 68°F (20°C) at 1 atmosphere pressure. The MR Modulo regulates within the following nominal airflow tolerances: ± 3 CFM (5 m³/h) for nominal airflow ≤ 30 CFM (50 m³/h) and $\pm 10\%$ for nominal airflow > 30 CFM (50 m³/h). Sizes are nominal. Product is designed to be inserted into duct of indicated diameter.

4" DIAMETER (100 mm) REGULATING ELEMENT

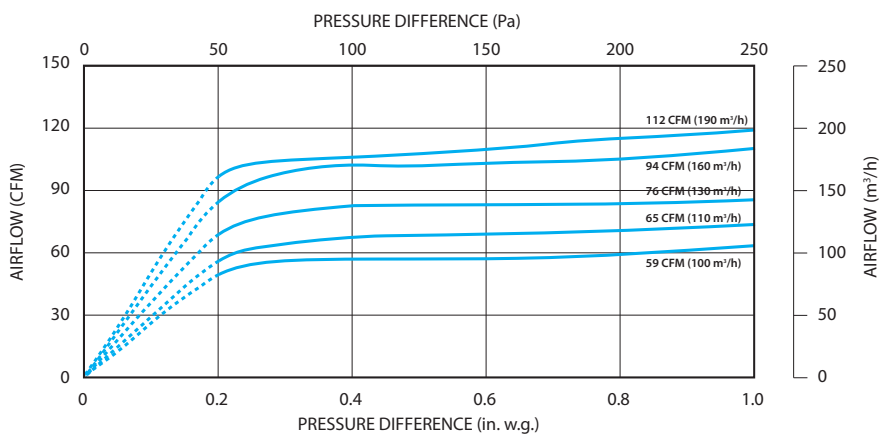


PART NUMBER	AVAILABLE SETPOINTS
11016308	9 CFM (15 m ³ /h)
	12 CFM (20 m ³ /h)
	15 CFM (25 m ³ /h)
	18 CFM (30 m ³ /h)
	21 CFM (35 m ³ /h)
	24 CFM (40 m ³ /h)
	26 CFM (45 m ³ /h)
	32 CFM (55 m ³ /h)
	41 CFM (70 m ³ /h)
	44 CFM (75 m ³ /h)
53 CFM (90 m ³ /h)	

5" DIAMETER (125 mm) REGULATING ELEMENT



PART NUMBER	AVAILABLE SETPOINTS
11016309	9 CFM (15 m ³ /h)
	15 CFM (25 m ³ /h)
	18 CFM (30 m ³ /h)
	26 CFM (45 m ³ /h)
	29 CFM (50 m ³ /h)
	35 CFM (60 m ³ /h)
	38 CFM (65 m ³ /h)
	41 CFM (70 m ³ /h)
	44 CFM (75 m ³ /h)
	47 CFM (80 m ³ /h)
50 CFM (85 m ³ /h)	

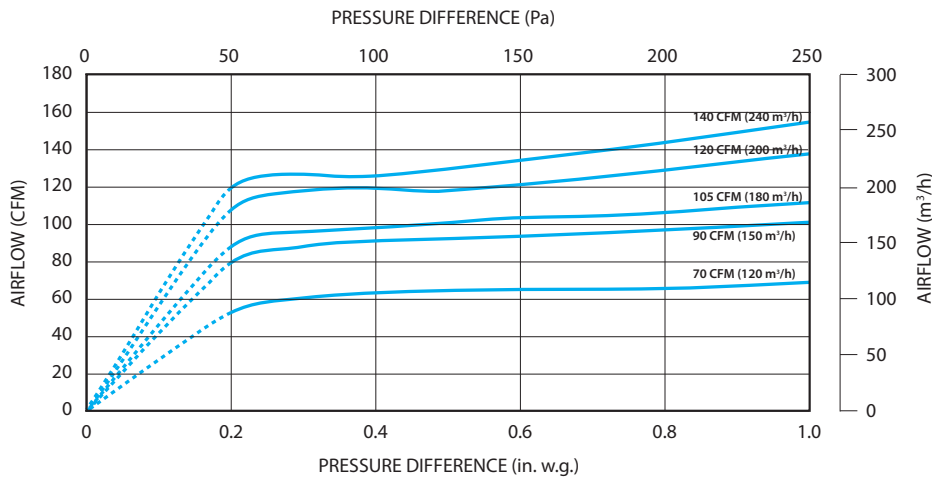


PART NUMBER	AVAILABLE SETPOINTS
11016310	59 CFM (100 m ³ /h)
	65 CFM (110 m ³ /h)
	71 CFM (120 m ³ /h)
	76 CFM (130 m ³ /h)
	82 CFM (140 m ³ /h)
	88 CFM (150 m ³ /h)
	94 CFM (160 m ³ /h)
112 CFM (190 m ³ /h)	

MR Modulo Airflow Performance Data

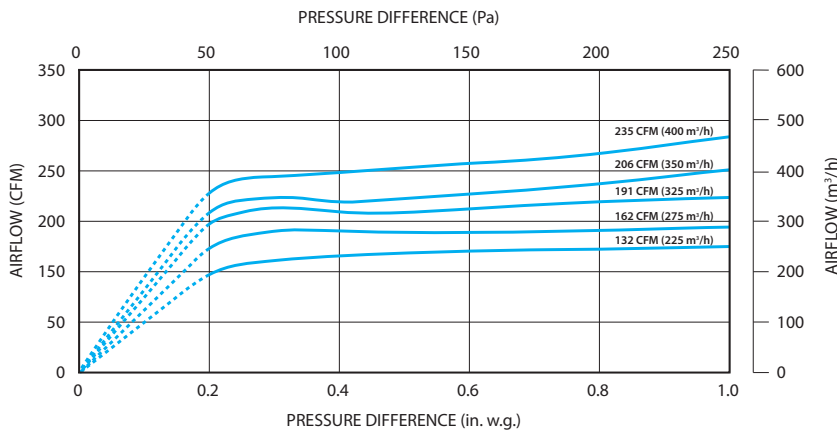
Performance charts reflect airflow variation for each size MR Modulo according to the pressure difference between upstream and downstream of the device. The MR Modulo is designed for the differential operating range from 0.2-1.0 in. w.g. (50-250 Pa). Airflow measurements taken at 68°F (20°C) at 1 atmosphere pressure. The MR Modulo regulates within the following nominal airflow tolerances: ± 3 CFM (5 m³/h) for nominal airflow ≤ 30 CFM (50 m³/h) and $\pm 10\%$ for nominal airflow > 30 CFM (50 m³/h). Sizes are nominal. Product is designed to be inserted into duct of indicated diameter.

6" DIAMETER (150 mm) REGULATING ELEMENT



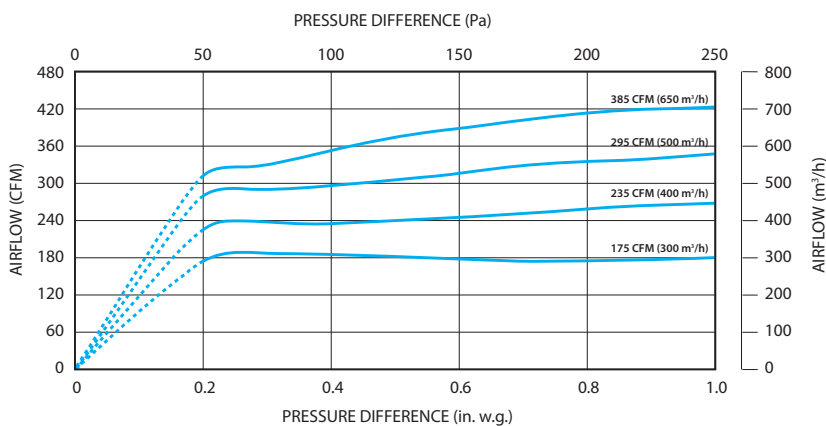
PART NUMBER	AVAILABLE SETPOINTS
11016311	60 CFM (100 m ³ /h)
	65 CFM (110 m ³ /h)
	70 CFM (120 m ³ /h)
	75 CFM (130 m ³ /h)
	80 CFM (140 m ³ /h)
	90 CFM (150 m ³ /h)
	95 CFM (160 m ³ /h)
	100 CFM (170 m ³ /h)
	105 CFM (180 m ³ /h)
	110 CFM (190 m ³ /h)
	120 CFM (200 m ³ /h)
125 CFM (210 m ³ /h)	
140 CFM (240 m ³ /h)	

8" DIAMETER (200 mm) REGULATING ELEMENT



PART NUMBER	AVAILABLE SETPOINTS
11016313	132 CFM (225 m ³ /h)
	147 CFM (250 m ³ /h)
	162 CFM (275 m ³ /h)
	177 CFM (300 m ³ /h)
	191 CFM (325 m ³ /h)
	206 CFM (350 m ³ /h)
	235 CFM (400 m ³ /h)

10" DIAMETER (250 mm) REGULATING ELEMENT



PART NUMBER	AVAILABLE SETPOINTS
11016314	175 CFM (300 m ³ /h)
	205 CFM (355 m ³ /h)
	235 CFM (400 m ³ /h)
	265 CFM (450 m ³ /h)
	295 CFM (500 m ³ /h)
	385 CFM (650 m ³ /h)

MR Modulo Acoustic Data

Sound power levels of noise (Lw) at duct output. The following tables give the sound power levels of noise (Lw) expressed in decibels per octave (dB/oct) as well as the global sound power levels in dB(A) according to the pressure drop. These sound power levels are results of tests carried out by a Dutch independent laboratory (PEUTZ) and are given at the duct outlet. Measures were carried out in accordance with NF EN ISO 3741 and NF EN ISO 5135 norms, with an MR Modulo fitted into a duct with an upstream and downstream straight length equal to 3 diameters.

Ø6" (150 mm)			Differential Pressure DP in. w.g. (Pa)																															
Airflow			0.2 (50)					0.4 (100)					0.8 (150)					1.0 (200)																
m ³ /h	CFM	L/s	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))								
110	65	31	31	31	30	24	19	10	12	33	36	37	40	34	31	25	17	40	38	40	44	39	37	32	26	45	39	43	48	44	43	38	33	52
120	70	33	31	31	30	24	19	11	13	32	37	38	40	34	31	25	17	41	39	41	44	40	37	32	26	46	41	44	48	44	43	39	33	53
130	75	36	31	31	30	24	19	11	13	31	38	38	40	35	32	26	18	41	41	42	44	40	38	33	26	46	42	45	49	44	43	39	33	53
140	80	39	31	31	30	25	20	11	13	31	39	39	40	36	32	26	18	41	42	43	45	40	38	33	26	46	44	47	49	45	44	39	33	54
150	90	42	31	31	30	25	20	11	13	31	40	40	40	36	33	26	18	41	43	44	45	41	39	33	26	46	46	48	49	45	44	39	33	55
160	95	44	31	31	30	26	20	11	13	31	42	41	39	37	33	27	19	42	44	45	45	41	39	33	26	47	47	49	50	45	44	40	33	56
170	100	47	31	31	30	26	21	12	14	31	43	41	39	38	34	27	19	42	46	46	45	42	40	34	27	47	49	51	50	45	45	40	33	56
180	105	50	32	31	30	27	21	12	14	32	44	42	39	39	34	27	20	43	47	47	45	42	40	34	27	48	50	52	50	45	45	40	33	57
190	110	53	31	31	30	27	22	13	14	32	43	42	39	39	35	28	21	43	47	47	45	42	40	34	27	48	50	51	50	45	45	40	33	57
200	120	56	31	31	30	27	22	13	14	32	43	42	39	39	35	29	21	43	47	46	45	42	40	35	28	47	50	51	49	45	44	40	33	56
210	125	58	30	31	31	28	22	14	14	32	43	41	39	39	36	30	22	43	47	46	45	42	40	35	28	47	50	50	49	45	44	40	34	56
240	140	67	29	31	31	28	23	17	13	33	42	40	40	40	37	32	25	44	46	44	44	42	40	37	30	48	50	48	48	44	43	40	34	55

Ø8" (200 mm)			Differential Pressure DP in. w.g. (Pa)																															
Airflow			0.2 (50)					0.4 (100)					0.8 (150)					1.0 (200)																
m ³ /h	CFM	L/s	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))								
225	132	63	29	27	24	23	18	11	13	27	39	39	36	33	31	26	18	39	43	42	41	39	37	32	24	44	46	45	46	44	42	38	29	49
250	147	70	30	28	26	24	19	12	13	29	41	40	37	35	33	26	19	40	44	43	42	40	38	32	24	45	47	47	45	44	42	37	28	49
275	162	76	31	30	27	26	20	13	13	30	42	41	38	38	34	27	20	42	46	45	42	41	38	32	24	45	49	48	45	44	42	36	27	49
300	177	83	32	32	29	27	21	14	14	31	44	41	39	40	36	28	21	44	47	46	42	42	39	32	23	46	50	50	45	44	42	35	26	49
325	191	90	34	33	30	29	23	16	14	33	45	42	40	41	37	30	23	44	48	47	44	43	40	34	26	48	51	51	48	45	44	38	28	51
350	206	97	36	34	31	31	25	18	15	35	46	43	40	42	37	31	25	45	49	48	46	44	42	36	28	49	52	53	52	47	46	40	31	53
400	235	111	39	37	34	35	28	21	17	38	48	45	42	43	39	34	28	47	51	51	50	47	45	40	32	53	55	57	59	50	50	44	36	58

Ø10" (250 mm)			Differential Pressure DP in. w.g. (Pa)																															
Airflow			0.2 (50)					0.4 (100)					0.8 (150)					1.0 (200)																
m ³ /h	CFM	L/s	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))								
300	175	83	38	33	29	25	22	12	12	33	44	38	40	40	31	22	15	42	43	44	42	38	37	29	22	44	43	49	44	36	41	36	30	47
350	205	97	38	33	30	27	22	13	12	33	46	40	41	41	33	24	17	44	46	46	44	41	38	31	24	46	46	51	46	40	43	38	32	49
400	235	111	38	34	31	30	23	13	13	34	47	42	42	43	34	26	18	46	49	47	45	44	40	33	26	48	50	52	48	44	45	40	33	52
450	265	125	37	34	33	33	23	14	13	36	49	44	43	45	36	28	20	47	51	49	47	47	42	35	28	50	54	54	51	49	47	42	35	54
500	295	139	37	34	34	36	24	15	14	38	50	46	45	47	37	29	22	49	54	51	49	50	43	37	30	53	58	55	53	53	49	44	37	57
550	325	153	38	36	37	38	26	18	15	40	50	46	45	47	38	31	23	49	53	51	49	50	44	38	31	53	57	55	53	54	50	44	37	57
650	385	181	40	39	41	42	31	23	18	44	49	46	46	46	40	33	25	50	52	50	50	51	45	39	32	54	55	54	54	55	51	45	38	58

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Use

The Zehnder ComfoAir 550 ventilation unit was specially developed for use in residential and commercial buildings with high ventilation demand. It combines maximum comfort, simple operation and high efficiency with flexible integration into building services. The ComfoAir 550 ventilation unit moves 324 cfm of air at an external pressure of 0.8" wc.

Efficiency

The integrated cross-counterflow heat exchanger achieves efficiencies of up to 95%. For user comfort this means no unpleasant draft effects, because the supply air is heated almost to room temperature even when external temperatures are around freezing.

Fans

The two supply and extract fans are driven by efficient DC motors. Differential pressures in the supply and extract air distribution systems can be compensated thanks to direct control. The especially quiet fans can be adjusted to the required volumetric flow in 1% increments. The air volumes of the selectable stages can be set to between 29 cfm and 324 cfm on the Zehnder ComfoAir 550.

Filters

The ComfoAir 550 ventilation unit is equipped with a class G4 filter (MERV 7/8). An optional F7 pollen filter (MERV 13) is available for outside air.

Installation

The Zehnder ComfoAir 550 ventilation unit is characterised by its compact design. All air and electrical connections are located on the top. The condensate drain is located on the bottom of the unit to save space.

Operation

The ventilation unit is controlled using a control unit commonly employed in living areas. The ComfoAir 550 is controlled by the CC-Ease control unit as standard.

Servicing

All necessary servicing is simple to perform on the Zehnder ComfoAir 550 ventilation unit. Filter replacement requires no tools thanks to the filter covers integrated in the front of the unit. The heat exchanger can also be easily removed from the unit for cleaning after opening the front. Please see the unit operating instructions for additional notes on servicing tasks.

Frost protection

If the ventilation unit is operated without a geothermal heat exchanger, the condensate in the extract air may freeze. The frost protection setting prevents this by variably reducing the supply air volume. In order to ensure reliable operation even at extreme outside temperatures, an optional electrical preheater register is available.



CC-Ease control unit



Wireless remote control

Bypass

During summer nights and in the transition periods with strong sunshine, the house often becomes too warm, while the outside air remains pleasantly cool. In this case heat removal by what is known as *free cooling* helps: The cooler outside air is fed to the rooms in the living area, bypassing the heat exchanger. The Zehnder ComfoAir 550 ventilation unit is equipped with an automatic bypass for just this purpose. The bypass is a standard component and takes 100% of the extract air past the heat exchanger. The personal comfort temperature is adjustable.

Options

- **Moisture recovery with the Zehnder enthalpy exchanger**
The Zehnder enthalpy cross-counterflow heat exchanger provides a hygienically ideal solution for excessively dry air in winter. Not only heat, but also up to 65% of the moisture contained in the extract air is transferred from the exhaust air to the supply air. Supply and extract air flows are kept completely separate therefore no transfer of odors or bacteria.
- **Zehnder ComfoFond-L brine geothermal heat exchanger**
The Zehnder ComfoFond-L utilises the ground as passive storage via a brine loop. During the summer, it extracts heat from the outside air and transfers it to the ground. In winter, the outside air is preheated using the heat stored in the ground. It is controlled using the ComfoAir 550 or an optional universal controller.
- **Electric air heater and hot water postheater**
An external electrical air heater or hot water postheater guarantees a defined supply air temperature, even in extreme climatic conditions and demanding situations.
- **Wireless remote control**
More installation freedom. With the Zehnder wireless remote control the ventilation unit can be wirelessly controlled from several switching points distributed throughout the house or flat.
- **Chimney sweep control**
Simultaneous operation of a house or flat ventilation system and an open flue fireplace can be registered in the control unit. This prevents a controller-related negative pressure. In a frost protection situation both fans are stopped. Pure supply or extract air mode is not possible and the intact fan is also switched off if a fault occurs.

Technical specifications

Unit dimensions	
Max. air volume	324 cfm
Min. air volume	29 cfm
Height	31.5"
Width	28.5"
Depth	22.17"

Benefits

- Comfort ventilation up to 324 cfm
- Heat recovery with an efficiency of up to 95%
- Moisture recovery with the Zehnder enthalpy exchanger (optional)
- Low power consumption thanks to EC direct current motors
- Automatic 100% summer bypass
- Infinitely variable frost protection function, efficient even at low temperatures
- Quick, safe installation and servicing
- Simple operation
- Integrated preheater (optional)
- Integrated controller for brine geothermal heat exchanger
- Electrical and hot water postheater integration possible
- Controls can be expanded by wireless remote control
- Digital CC-Ease control unit
- CO₂ control (optional)
- With weekly timer as standard
- Chimney sweep control

Article numbers

L = supply air left, R = supply air right, V = integrated electric preheater register
 Enthalpy = enthalpy heat exchanger integrated

Product	Article number	Reference number
ComfoAir 550 L Luxe	471 339 520	9252
ComfoAir 550 R Luxe	471 339 525	9253
ComfoAir 550 VL Luxe	471 339 540	9305
ComfoAir 550 VR Luxe	471 339 545	9436
ComfoAir 550 L Luxe Enthalpy	471 339 530	9254
ComfoAir 550 R Luxe Enthalpy	471 339 535	9255
ComfoAir 550 VL Luxe Enthalpy	471 338 540	9437
ComfoAir 550 VR Luxe Enthalpy	471 338 545	9438

Accessories	Article number	Reference number
ComfoControl CC-Ease control unit	655 010 100	9257
Housing for surface mounting for CC-Ease control unit	659 000 250	9259
Wireless remote control	655 000 755	9238
ComfoAir 550 assembly base	642 300 140	9287

Filters	Article number	Reference number
Filter for ComfoAir 550 G4 (MERV 7/8)	006 040 201	9240
Filter for ComfoAir 550 F7 (MERV 13)	006 040 211	9241

Function

- Frost protection function/automatic defrost
- Supply and extract air separate and infinitely variably programmable
- Switch on and off delay for bathroom switch
- Adjustable comfort temperature
- Filter replacement indicator
- Supply and extract air can be switched off separately

Description
Comfort ventilation unit ComfoAir 550 Luxe

The Zehnder ComfoAir 550 Luxe is a centralised, compact ventilation unit with heat recovery and integrated summer bypass. This ventilation unit is eminently suited to new buildings as well as in renovation projects. The ComfoAir 550 Luxe can be installed both wall-hanging and on the floor with an optionally available base. It is connected via 4 x 7" pipe connections at the top of the unit. The housing, made of galvanised or painted sheet steel, is acoustically and thermally insulated. EC direct current fans guarantee power-saving operation and provide high electrical efficiency. Supply and extract fans can be controlled separately and can be precisely adjusted to balance air volume to within one percent. The core of the ComfoAir 550 Luxe is the plastic cross-counterflow heat exchanger with up to 95%. It is controlled by the cabled (ComfoControl) CC-Ease, which is connected to the ventilation unit by the on site cable. All operating statuses and error messages can be read from the control unit display. The ComfoAir 550 is delivered with a safety mains plug for connecting to the mains. The filters are replaced easily from the front by the user without opening the unit.

Options:

- Integrated electric preheater (CA550 VL and CA550 VR)
- Units with integrated enthalpy heat exchanger (CA550 L Luxe Enthalpy and CA550 R Luxe Enthalpy)

Controller features:

- Automatic frost protection controller
- Timer-controlled filter servicing display
- G4 (MERV 7/8) (optionally available in filter class F7 (MERV 13))
- With automatic and temperature-controlled 100% summer bypass
- Fault history including the last three error messages
- Supply and exhaust fans can be activated separately
- Connection options for external intermittent ventilation switch
- Comfort temperature controller
- External 'OFF' contact
- Weekly timer programmes
- Chimney sweep control
- Integrated controller for Zehnder ComfoFond-L brine geothermal heat exchanger
- Control and regulating functions with external 0-10 V transducer

Ventilation unit

Zehnder ComfoAir 550

Descriptions

Technical specifications

Heat exchanger:	Plastic
Fans:	EC direct current radial fans
Filters:	Extract air: G4 (MERV 7/8) Outside air: G4 (optional F7 (MERV 13)
Condensate connection:	DN 32 mm
Air duct connections:	4 x 7" at top
Electrical connection:	230 V, 50 - 60 Hz
Temperature range:	Min. 50 °F/max. 104 °F
Acoustic performance (min./max.):	Extract air 28 dB(A)/63 dB(A) Supply air: 35 db(A) / 79 dB(A)
Heat recovery:	Up to 95%
Volumetric flow:	Maximum 324 cfm at 0.96" wc external Minimum 29 cfm at 0.02" wc external
Power consumption:	
At 132 cfm and 0.40" wc:	0.18 W/cfm
Dimensions:	Height: 31.5" Width: 28.5" Depth: 22.4"
Weight:	103.6 lb

Versions:	Product	Art. number	Ref. number
	ComfoAir 550 R Luxe	471 339 525	9253
	ComfoAir 550 L Luxe	471 339 520	9252
	ComfoAir 550 ERV R	471 336 440	9255
	ComfoAir 550 ERV L	471 336 435	9254
	ComfoAir 550 EX R Luxe VV	471 339 545	9436
	ComfoAir 550 EX L Luxe VV	471 339 540	9305
	ComfoAir 550 PL R Luxe ERV	471 338 545	9438
	ComfoAir 550 PL L Luxe ERV	471 338 540	9437

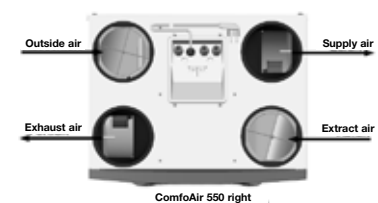
Manufacturer: **Zehnder GmbH**
Almweg 34
77933 Lahr
+49 (0) 7821/586-0

Air direction

The figures on the right show the air directions (top view).

Certificates

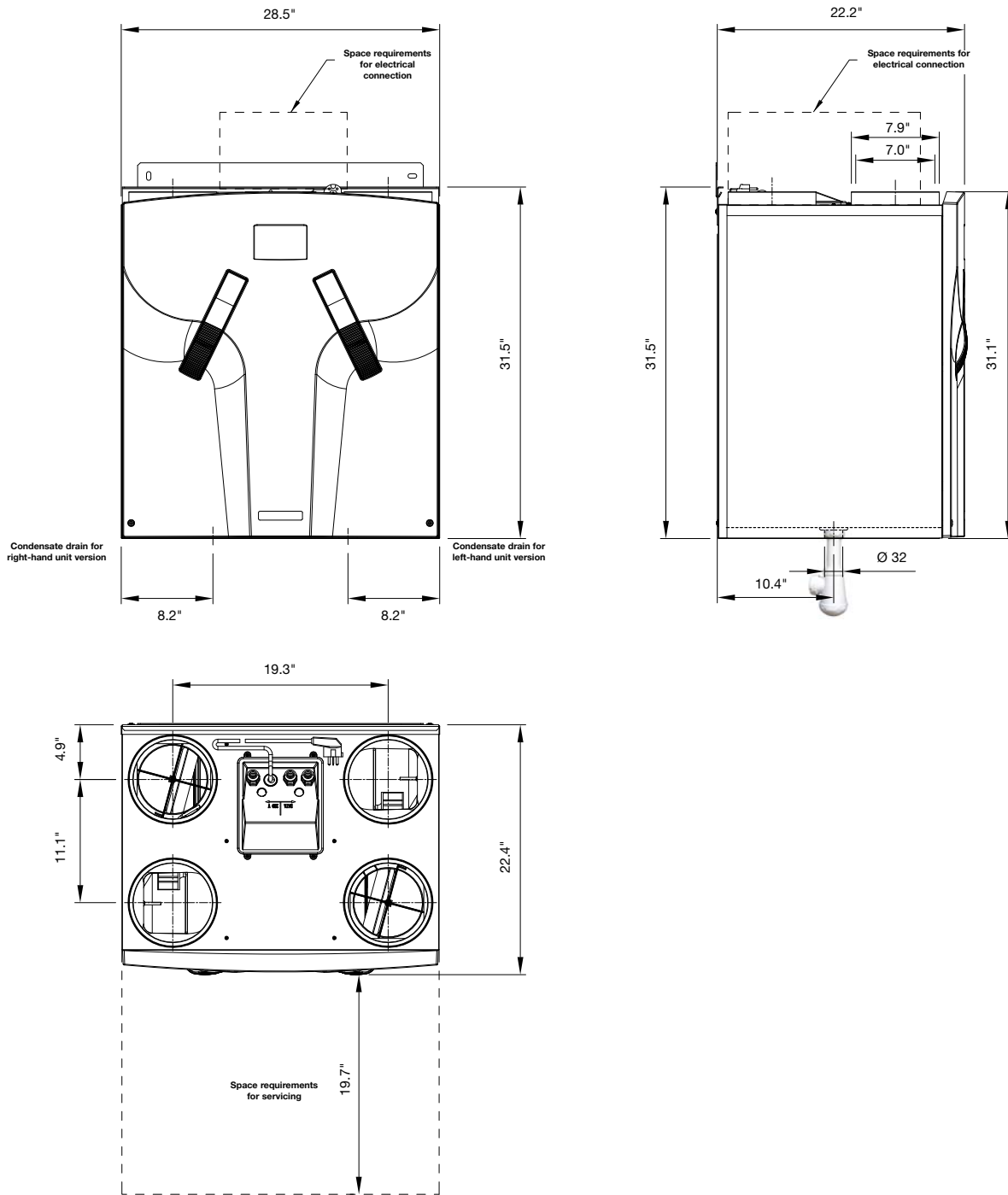
- General Building Regulations [Germany] approval applied for.
- Passive House Certified



Ventilation unit

Zehnder ComfoAir 550

Dimensions



Ventilation unit

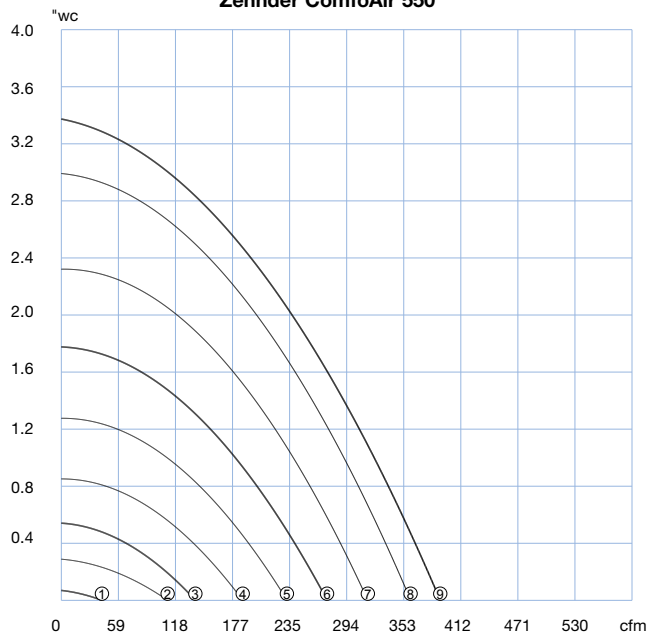
Zehnder ComfoAir 550

Stage	Speed %	Air volume	Pressure	Power	Current	COS ϕ (-)	Installed noise level		Weight lb
		Qv	ΔP_{st}	consumption	consumption		Extract air dB(A)	Supply air dB(A)	
		cfm	" wc	W	A				

Zehnder ComfoAir 550

(1) Absent	15%	29	0.02	13	0.12	0.47	28	35	103.6
(2)	30%	82	0.12	26	0.22	0.51	38	50	
(3) Stage 1	40%	106	0.24	41	0.35	0.51	44	58	
(4)	50%	132	0.40	69	0.57	0.53	48	63	
(5)	60%	165	0.60	110	0.86	0.56	52	67	
(6) Stage 2	70%	194	0.86	160	1.21	0.57	55	71	
(7)	80%	224	1.14	220	1.65	0.58	59	74	
(8)	90%	253	1.45	310	2.22	0.61	63	78	
(9) Stage 3	100%	271	1.65	350	2.459	0.62	63	79	

Zehnder ComfoAir 550



Sound, supply air

Ventilation unit		Acoustic performance at the intake air connection at a distance of 0 ft						
Type	Speed	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
ComfoAir 550	9	78	78	79	69	70	66	53
ComfoAir 550	8	78	77	77	67	69	65	52
ComfoAir 550	7	75	75	73	66	66	61	48
ComfoAir 550	6	73	72	70	63	63	56	43
ComfoAir 550	5	70	70	66	58	58	51	38
ComfoAir 550	4	67	68	61	53	53	44	32
ComfoAir 550	3	63	65	55	45	44	35	24
ComfoAir 550	2	56	55	47	37	37	25	14
ComfoAir 550	1	45	39	29	26	21	9	12

Sound, extract air

Ventilation unit		Acoustic performance at the extract air connection at a distance of 0 ft						
Type	Speed	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
ComfoAir 550	9	67	66	63	51	49	42	33
ComfoAir 550	8	66	65	64	50	47	41	3
ComfoAir 550	7	63	62	60	48	45	37	27
ComfoAir 550	6	60	60	54	45	41	33	23
ComfoAir 550	5	57	57	50	41	37	28	20
ComfoAir 550	4	52	55	46	36	32	21	18
ComfoAir 550	3	46	51	38	29	25	14	13
ComfoAir 550	2	45	44	33	27	18	8	11
ComfoAir 550	1	40	29	22	20	3	6	13

Sound, unit emission

Ventilation unit		Acoustic performance at the extract air connection at a distance of 0 ft					
Type	Speed	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	db(A)
ComfoAir 550	9	57	56	53	46	44	54
ComfoAir 550	8	56	55	52	45	43	53
ComfoAir 550	7	53	52	50	42	40	50
ComfoAir 550	6	50	49	48	39	36	48
ComfoAir 550	5	47	47	46	34	32	45
ComfoAir 550	4	44	45	39	30	27	41
ComfoAir 550	3	38	41	32	24	21	35
ComfoAir 550	2	37	36	27	20	15	28
ComfoAir 550	1	26	29	20	19	17	25

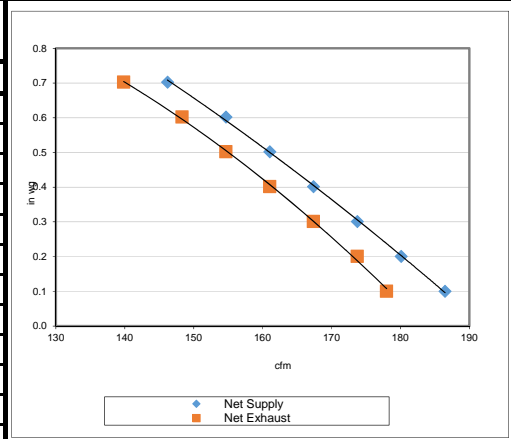
ERV SPECIFICATION SHEET

Testing Agency:	Exova Materials Testing Inc.	Model:	200DX
Date Tested:	August 1, 2016	Serial Number:	xxxxx
Manufacturer:	UltimateAir Inc.	Options Installed:	Optional Active Defrost Below 12 F
Address:	178 Mill Street Athens, Ohio 45701		
Phone:	(740)-594-2277	Electrical Requirements:	120 VAC 1.4 Amps

VENTILATION PERFORMANCE

Maximum Continuous Rated Airflows: 73 L/s @ 0°C 155 CFM	Low Temperature Ventilation Factor Low Temperature Imbalance Factor Standby Power	LTVF= n/a LTIF= n/a 6.5 W n/a
Airflow Range for Multispeed Unit: High Speed: 73 L/s		Exhaust Air Transfer Ratio: 0.1

External Static Pressure		Net Supply Airflow		Gross Airflow				Power
				Supply		Exhaust		
Pa	in. W.C.	L/s	cfm	L/s	cfm	L/s	cfm	Watts
25	0.1	78	166	88	186	84	178	253
50	0.2	75	160	85	180	82	174	251
75	0.3	73	154	82	174	79	167	243
100	0.4	70	148	79	167	76	161	242
125	0.5	67	142	76	161	73	155	238
150	0.6	64	136	73	155	70	148	232
175	0.7	62	130	69	146	66	140	226



NOTE: FAN CURVE PERFORMED ON HIGH SPEED

ENERGY PERFORMANCE

	Supply Temperature		Net Airflow		Supply / Exhaust Flow Ratio	Average Power Watts	Sensible Recovery Efficiency	Apparent Sensible Effectiveness	Net Moisture Transfer
	°C	°F	L/s	cfm					
HEAT-ING	0	32	73	155	1.00	236	83	96	0.62
	4	39.2	73	155	1.00	242	82*	98*	0.49*
	-8	17.6	62	131	1.00	224	84*	96*	0.72*
COOL-ING	35	95	69	146	1.01	240	36**	75	0.27

*Description of Defrost: Patented, climate dependant, controlled input heat (optional)

Comments from testing agency:
Fan curve test was done at ERV maximum speed

* These data points not listed per HVI
 ** Indicates Total Recovery Effectiveness, not Sensible Recovery Efficiency
 250 Pascals = 1" of Water : 0.47 L/s = 1 cfm

Testing was performed in general accordance with CAN/CSA-C439-09, Standard Methods of Test for Rating The Performance of Heat Recovery Ventilators, and was conducted in accordance with normal professional standards.



UltimateAir®



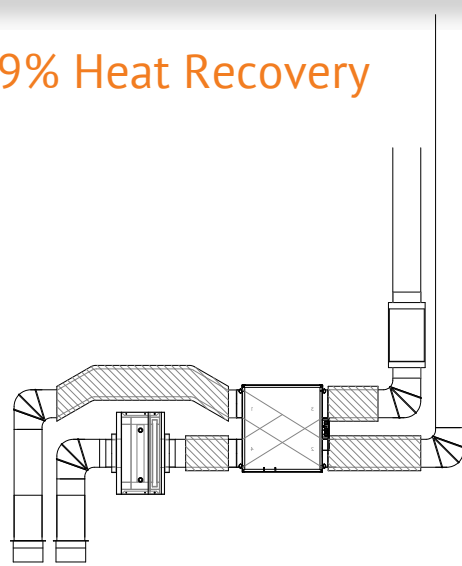
Ventilation for Your Passive House

Whole House Ventilation With Up to 99% Heat Recovery

99% Heat Recovery Efficiency
Third-Party Tested CAN/CSA-C439-09

Standard laboratory methods of testing
for the performance of energy-recovery
ventilators

MERV 12 Filtration
High Efficiency Brushless Motors
Designed & Made In the USA since 1989
Less than 0.8 Watt/CFM



Current PHPP Inputs are NOT based on Actual Tested Performance

Model 200DX:

PHPP Heat Recovery Efficiency----- 86%
Efficiency Humidity Recovery----- 43%
Electric Efficiency-----0.72 watt/cfm

Model ER80M:

PHPP Heat Recovery Efficiency----- 87%
Efficiency Humidity Recovery----- 43%
Electric Efficiency-----0.72 watt/cfm



Submittal Data Sheet

0.5-Ton Wall Mounted Unit

CTXS07LVJU

FEATURES

- Connects with multi-split systems
- Intelligent eye occupancy sensor
- Vertical and horizontal auto swing
- Hot start technology
- 12 year limited parts and compressor warranty with online registration

BENEFITS

- Low ambient heat operation down to 0° F
- Titanium apatite photocatalytic air purifying





Submittal Data Sheet

0.5-Ton Wall Mounted Unit

CTXS07LVJU

PERFORMANCE

Indoor Unit Model No.	CTXS07LVJU	Indoor Unit Name:	0.5-Ton Wall Mounted Unit
Type:	Wall Mounted	Rated Cooling Conditions:	Indoor (°F DB/WB): 80 / 67 Ambient (°F DB/WB): 95 / 75
Rated Cooling Capacity (Btu/hr):	7,000	Rated Heating Conditions:	Indoor (°F DB/WB): 70 / 70 Ambient (°F DB/WB): 47 / 43
Sensible Capacity (Btu/hr):		Rated Piping Length(ft):	
Cooling Input Power (kW):	0.040	Rated Height Separation (ft):	
Rated Heating Capacity (Btu/hr):	8,500		
Heating Input Power (kW):	0.05		

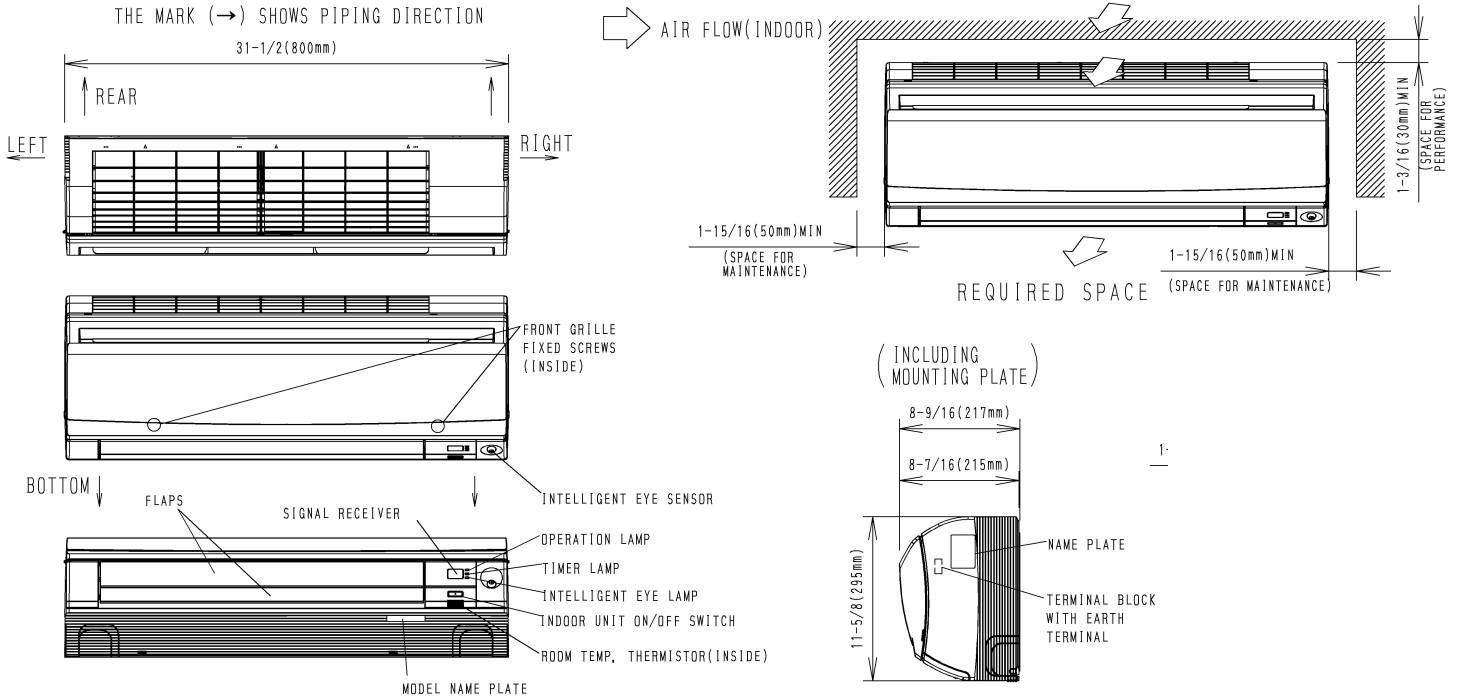
INDOOR UNIT DETAILS

Power Supply (V/Hz/Ph):	208-230 / 60 / 1	Airflow Rate (H/M/L/SL) (CFM):	332/261/194/145
Power Supply Connections:	See Outdoor Unit for Electrical Specs	Moisture Removal (Gal/hr):	
Min. Circuit Amps MCA (A):		Gas Pipe Connection (inch):	3/8
Max Overcurrent Protection (MOP) (A):		Liquid Pipe Connection (inch):	1/4
Dimensions (HxWxD) (in):	11-5/8 x 31-1/2 x 8-9/16	Condensate Connection (inch):	5/8
Panel (HxWxD) (in):		Sound Pressure (H/M/L/SL) (dBA):	38/32/22/22
Net Weight (lb):	20	Sound Power Level (dBA):	54
Panel Weight (lb):		Ext. Static Pressure (Rated/Max) (inWg):	0.00 / 0.00

Submittal Data Sheet
 0.5-Ton Wall Mounted Unit
 CTXS07LVJU

DIMENSIONAL DRAWING

CTXS07LVJU





Submittal Data Sheet

FTXS09LVJU

FTXS09LVJU





Submittal Data Sheet

FTXS09LVJU

FTXS09LVJU

PERFORMANCE

Indoor Unit Model No.	FTXS09LVJU	Indoor Unit Name:	FTXS09LVJU
Type:	Wall Mounted	Rated Cooling Conditions:	Indoor (°F DB/WB): 80 / 67 Ambient (°F DB/WB): 95 / 75
Rated Cooling Capacity (Btu/hr):	9,000	Rated Heating Conditions:	Indoor (°F DB/WB): 70 / 70 Ambient (°F DB/WB): 47 / 43
Sensible Capacity (Btu/hr):	8,100	Rated Piping Length(ft):	
Cooling Input Power (kW):	0.590	Rated Height Separation (ft):	
Rated Heating Capacity (Btu/hr):	12,000		
Heating Input Power (kW):	0.79		

INDOOR UNIT DETAILS

Power Supply (V/Hz/Ph):	208-230 / 60 / 1	Airflow Rate (H/M/L/SL) (CFM):	381/279/194/145
Power Supply Connections:	See Outdoor Unit for Electrical Specs	Moisture Removal (Gal/hr):	2.4
Min. Circuit Amps MCA (A):		Gas Pipe Connection (inch):	3/8
Max Overcurrent Protection (MOP) (A):		Liquid Pipe Connection (inch):	1/4
Dimensions (HxWxD) (in):	11-5/8 x 31-1/2 x 8-7/16	Condensate Connection (inch):	5/8
Panel (HxWxD) (in):		Sound Pressure (H/M) (dBA):	41/22
Net Weight (lb):	20	Sound Power Level (dBA):	
Panel Weight (lb):		Ext. Static Pressure (Rated/Max) (inWg):	0.00 / 0.00

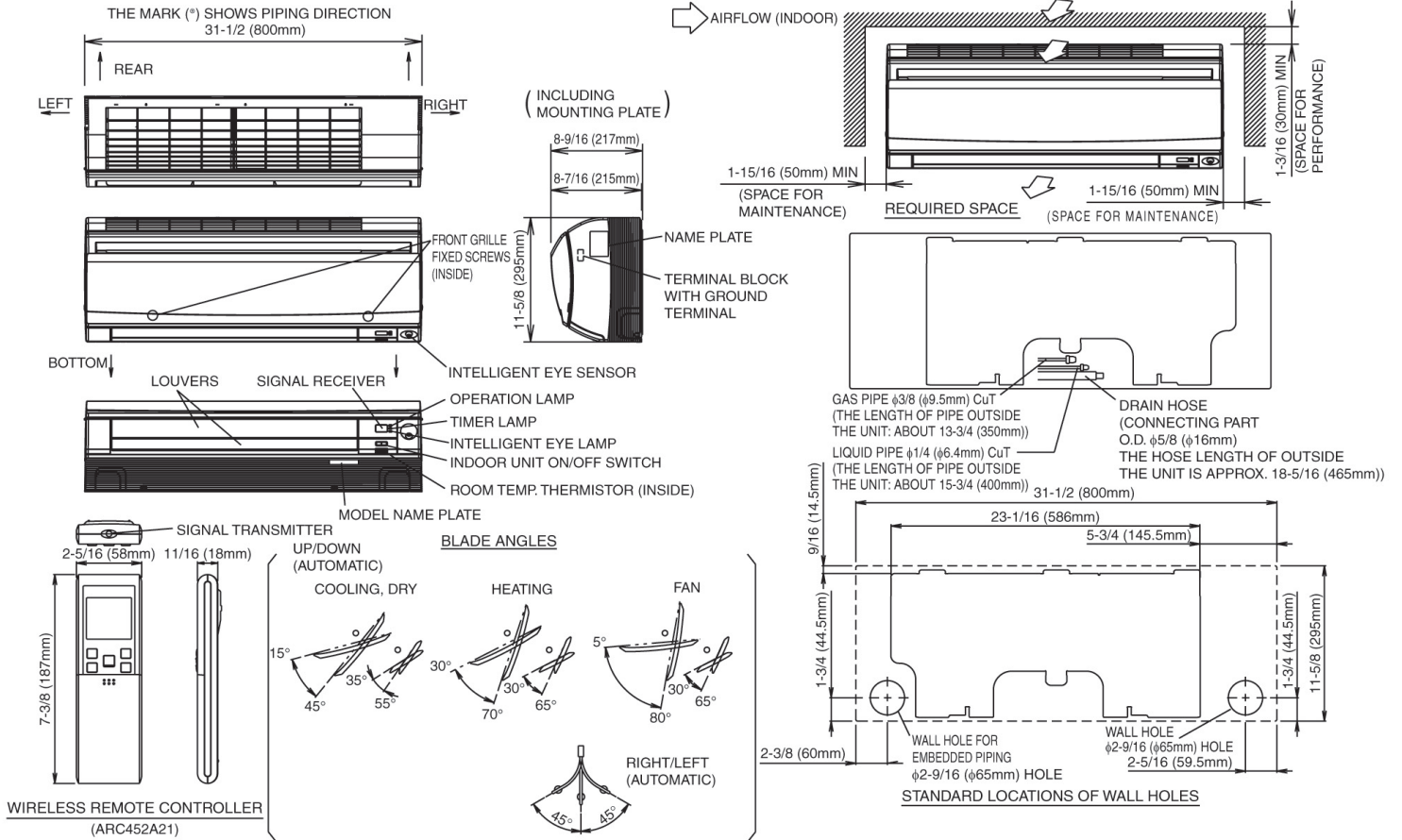
Submittal Data Sheet

FTXS09LVJU

FTXS09LVJU

DIMENSIONAL DRAWING

FTXS09,12LVJU





Submittal Data Sheet

FTXS12LVJU

FTXS12LVJU

FEATURES

- Intelligent eye occupancy sensor
- Weekly timer for programmable comfort
- Low ambient heat operation down to 0° F
- Titanium apatite photocatalytic air purifying
- 12 year limited parts and compressor warranty with online registration

BENEFITS

- Quiet operation





Submittal Data Sheet

FTXS12LVJU

FTXS12LVJU

PERFORMANCE

Indoor Unit Model No.	FTXS12LVJU	Indoor Unit Name:	FTXS12LVJU
Type:	Wall Mounted	Rated Cooling Conditions:	Indoor (°F DB/WB): 80 / 67 Ambient (°F DB/WB): 95 / 75
Rated Cooling Capacity (Btu/hr):	12,000	Rated Heating Conditions:	Indoor (°F DB/WB): 70 / 70 Ambient (°F DB/WB): 47 / 43
Sensible Capacity (Btu/hr):	9,250	Rated Piping Length(ft):	
Cooling Input Power (kW):	0.940	Rated Height Separation (ft):	
Rated Heating Capacity (Btu/hr):	14,400		
Heating Input Power (kW):	0.97		

INDOOR UNIT DETAILS

Power Supply (V/Hz/Ph):	208-230 / 60 / 1	Airflow Rate (H/M/L/SL) (CFM):	403/309/205/155
Power Supply Connections:	See Outdoor Unit for Electrical Specs	Moisture Removal (Gal/hr):	4.0
Min. Circuit Amps MCA (A):		Gas Pipe Connection (inch):	3/8
Max Overcurrent Protection (MOP) (A):		Liquid Pipe Connection (inch):	1/4
Dimensions (HxWxD) (in):	11-5/8 x 31-1/2 x 8-7/16	Condensate Connection (inch):	5/8
Panel (HxWxD) (in):		Sound Pressure (H/M) (dBA):	45/23
Net Weight (lb):	22	Sound Power Level (dBA):	
Panel Weight (lb):		Ext. Static Pressure (Rated/Max) (inWg):	0.00 / 0.00

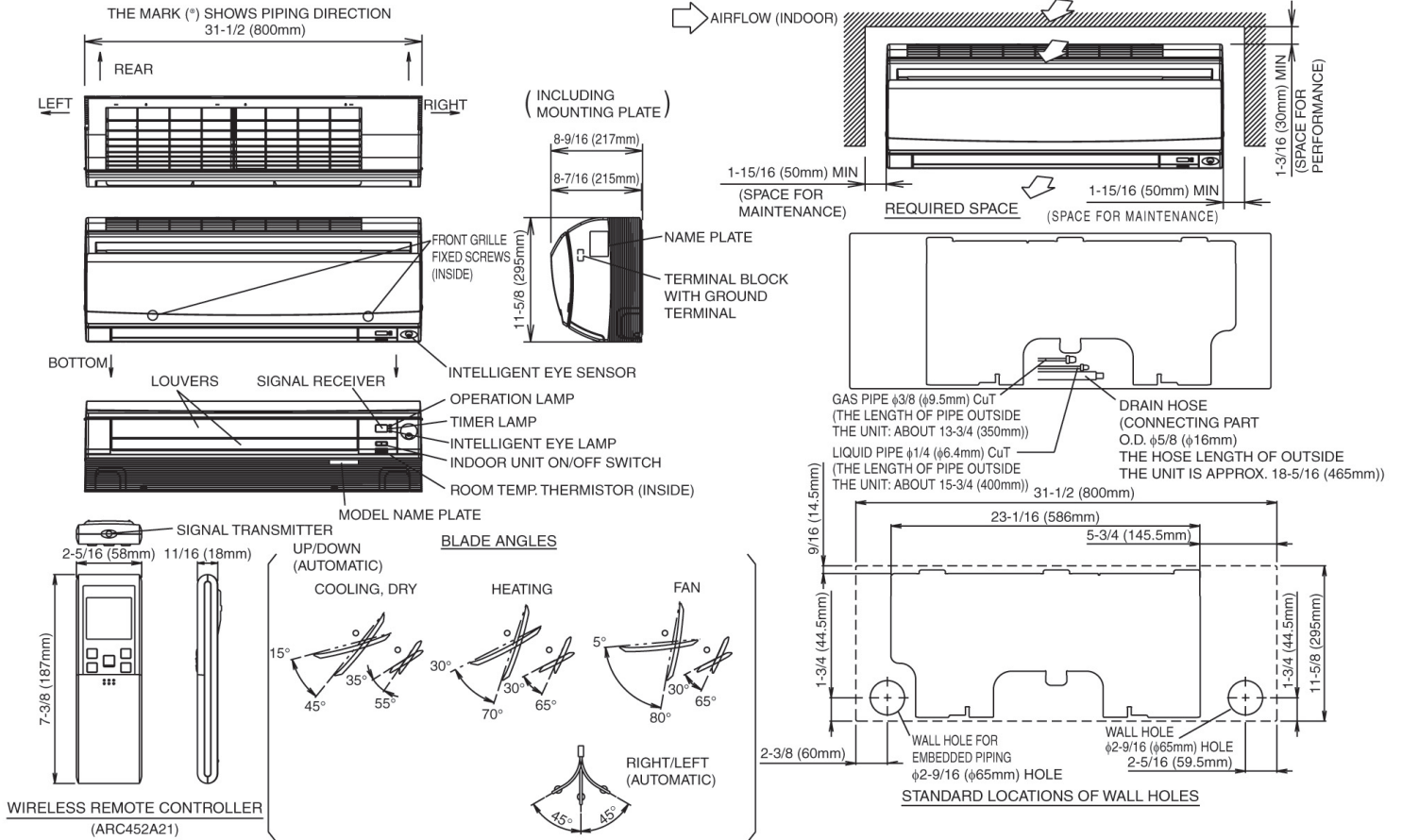
Submittal Data Sheet

FTXS12LVJU

FTXS12LVJU

DIMENSIONAL DRAWING

FTXS09, 12LVJU





Submittal Data Sheet

2 PORT HP, DUCTLESS OD 1.5 TON

2MXS18NMVJU

FEATURES

- Up to 18.9 SEER / Up to 12.7 EER / Up to 12.5 HSPF
- High-efficiency inverter driven swing compressor
- Low ambient cooling to 5°F / -4°F with optional drain pan heater
- Specialized drain pan design for improved cold climate drainage

BENEFITS

- 12 Year limited parts warranty with online registration
- 5 Year limited parts warranty for commercial applications
- High efficiency cooling and heating operation provides utility bill savings
- Multiple indoor unit style options: wall mounted, floor standing, ceiling cassette, slim duct
- May qualify for regional utility rebates and incentives
- Compatible with optional Daikin ENVi Wi-Fi capable Smart Control





Submittal Data Sheet

2 PORT HP, DUCTLESS OD 1.5 TON

2MXS18NMVJU

PERFORMANCE

Outdoor Unit Model No.	2MXS18NMVJU	Outdoor Unit Name:	2 PORT HP, DUCTLESS OD 1.5 TON
Type:	Heat Pump		
Rated Cooling Conditions:	Indoor (°F DB/DB): 80 / 67 Ambient (°F DB/WB): 95 / 75	Rated Heating Conditions:	Indoor (°F DB/WB): / Ambient (°F DB/WB): /
Rated Piping Length(ft):	25		
Rated Height Difference (ft):	49.00		
Rated Cooling Capacity (Btu/hr):	18,000	Rated Heating Capacity (Btu/hr):	18,900
Cooling Input Power (kW):		Heating Input Power (kW):	
EER (Non-Ducted/Ducted):	12.50 / 9.50	Heating COP (Non-Ducted/Ducted):	4.1 / 4.1
SEER (Non-Ducted/Ducted):	18.90 / 14.00	HSPF (Non-Ducted/Ducted):	10.7 / 8.2
Max/Min Cooling Capacity (Btu/hr):	21,000 /	Max/Min Heating Capacity (Btu/hr):	25,000 /

OUTDOOR UNIT DETAILS

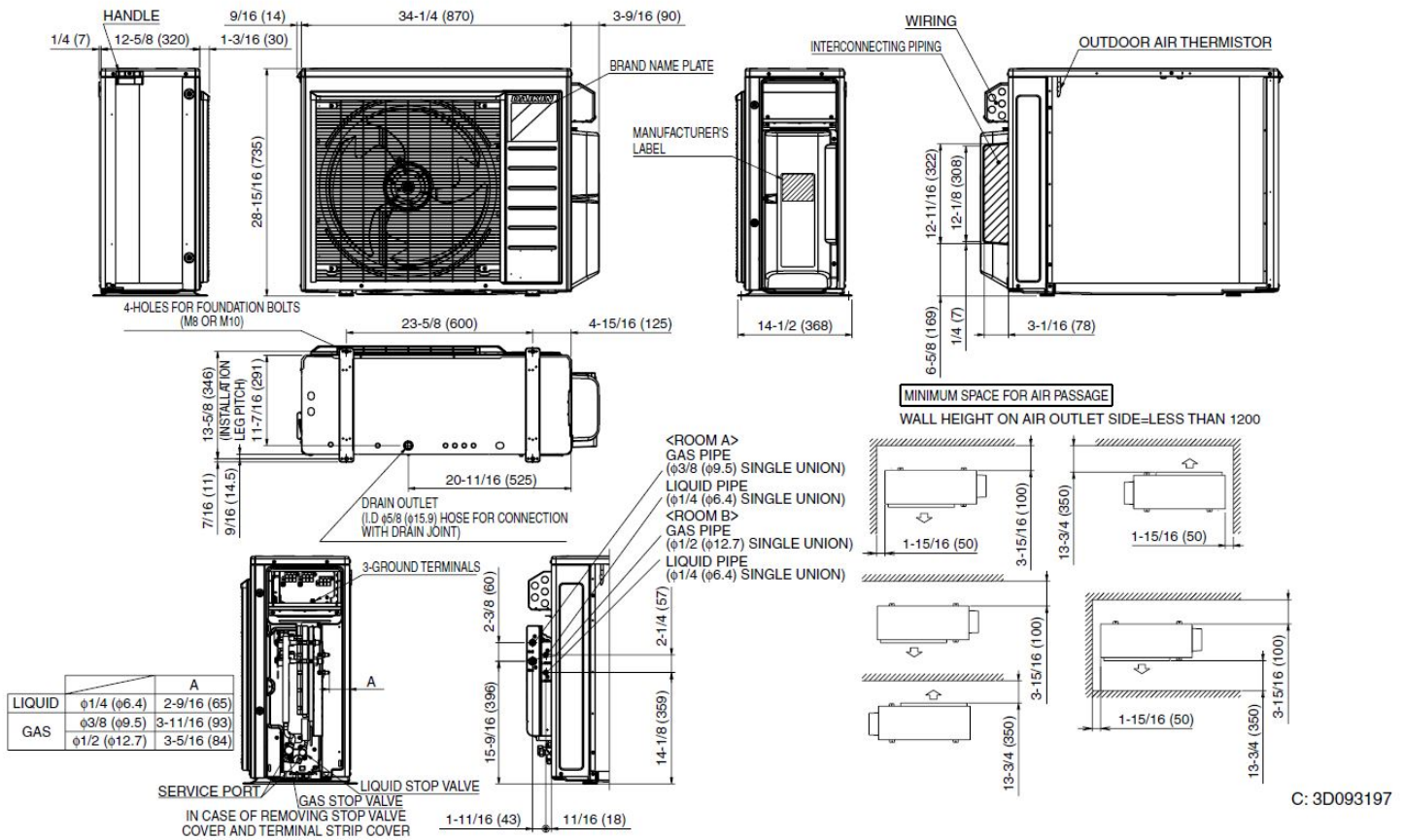
Power Supply (V/Hz/Ph):	208-230 / 60 / 1	Compressor Type:	Inverter
Power Supply Connections:	L1, L2, Ground	Capacity Control Range (%):	-
Min. Circuit Amps MCA (A):	15.80	Airflow Rate (H) (CFM):	2,150
Max Overcurrent Protection (MOP) (A):	20.00	Gas Pipe Connection (inch):	3/8
Max Starting Current MSC(A):	14.00	Liquid Pipe Connection (inch):	1/4
Rated Load Amps RLA(A):	14.0	Sound Pressure (H) (dBA):	50
Dimensions (HxWxD) (in):	29 x 34-1/4 x 12-5/8	Sound Power Level (dBA):	
Net Weight (lb):	123		

Submittal Data Sheet
 2 PORT HP, DUCTLESS OD 1.5 TON
 2MXS18NMVJU

SYSTEM DETAILS

Refrigerant Type:	R-410A	Cooling Operation Range (°F DB):	14 - 115
Holding Refrigerant Charge (lbs):	3.9	Heating Operation Range (°F WB):	5 - 72
Additional Charge (lb/ft):	0.01	Max. Pipe Length (Vertical) (ft):	49
Pre-charge Piping (Length) (ft):	98	Cooling Range w/Baffle (°F DB):	14 - 115
Max. Pipe Length (Total) (ft):	164	Heating Range w/Baffle (°F WB):	-4 - 72
Max Height Separation (Ind to Ind ft):	49		

DIMENSIONAL DRAWING



C: 3D093197



Submittal Data Sheet

3 PORT HP, DUCTLESS OD 2 TON

3MXS24NMVJU

FEATURES

- Up to 18.9 SEER / Up to 12.7 EER / Up to 12.5 HSPF
- High-efficiency inverter driven swing compressor
- Low ambient cooling to 5°F / -4°F with optional drain pan heater
- Specialized drain pan design for improved cold climate drainage

BENEFITS

- 12 Year limited parts warranty with online registration
- 5 Year limited parts warranty for commercial applications
- High efficiency cooling and heating operation provides utility bill savings
- Multiple indoor unit style options: wall mounted, floor standing, ceiling cassette, slim duct
- May qualify for regional utility rebates and incentives
- Compatible with optional Daikin ENVi Wi-Fi capable Smart Control





Submittal Data Sheet
3 PORT HP, DUCTLESS OD 2 TON
3MXS24NMVJU

PERFORMANCE

Outdoor Unit Model No.	3MXS24NMVJU	Outdoor Unit Name:	3 PORT HP, DUCTLESS OD 2 TON
Type:	Heat Pump		
Rated Cooling Conditions:	Indoor (°F DB/DB): 80 / 67 Ambient (°F DB/WB): 95 / 75	Rated Heating Conditions:	Indoor (°F DB/WB): / Ambient (°F DB/WB): /
Rated Piping Length(ft):	25		
Rated Height Difference (ft):	49.00		
Rated Cooling Capacity (Btu/hr):	24,000	Rated Heating Capacity (Btu/hr):	24,000
Cooling Input Power (kW):		Heating Input Power (kW):	
EER (Non-Ducted/Ducted):	12.50 / 9.70	Heating COP (Non-Ducted/Ducted):	4.6 / 3.9
SEER (Non-Ducted/Ducted):	17.90 / 14.00	HSPF (Non-Ducted/Ducted):	12.5 / 8.2
Max/Min Cooling Capacity (Btu/hr):	30,000 /	Max/Min Heating Capacity (Btu/hr):	36,000 /

OUTDOOR UNIT DETAILS

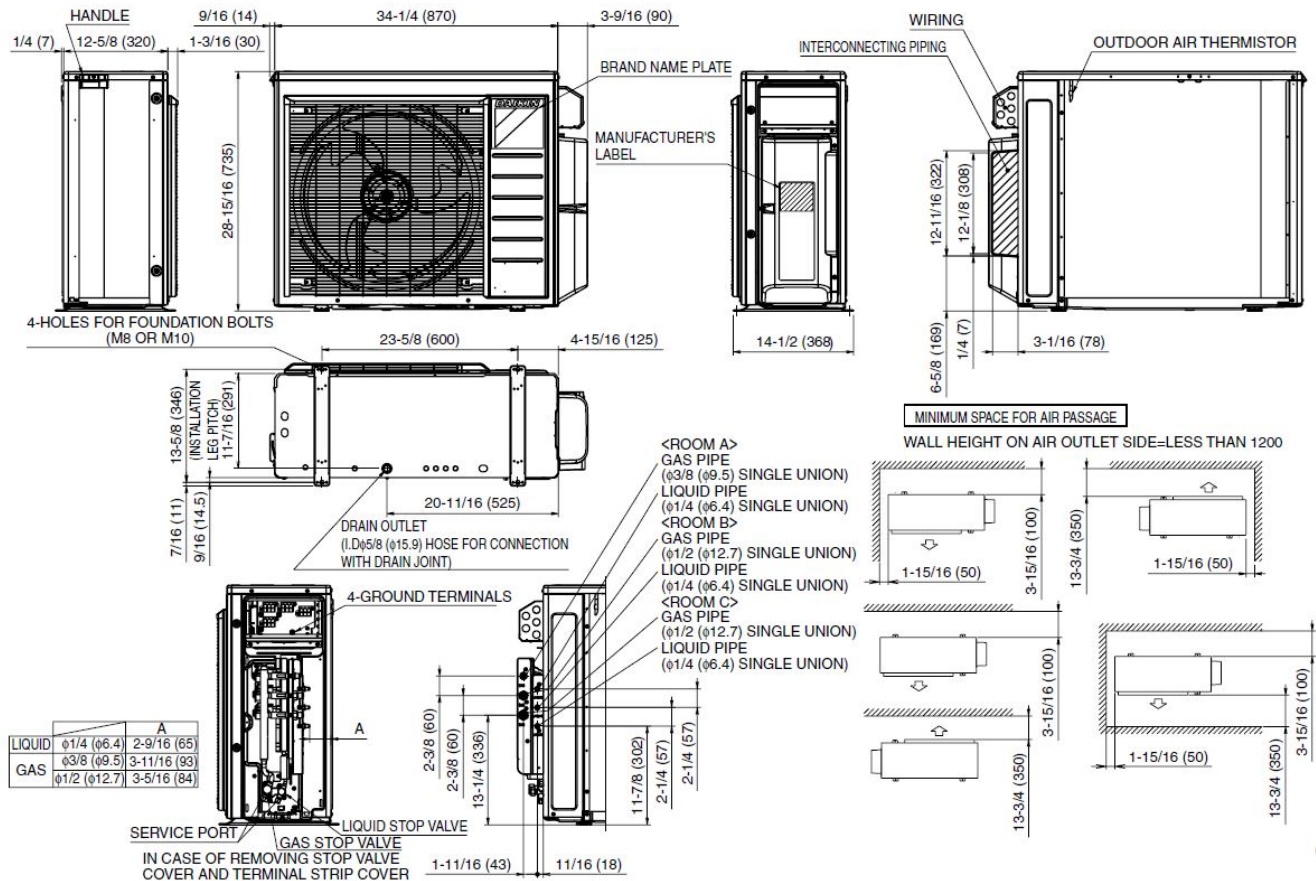
Power Supply (V/Hz/Ph):	208-230 / 60 / 1	Compressor Type:	Inverter
Power Supply Connections:	L1, L2, Ground	Capacity Control Range (%):	-
Min. Circuit Amps MCA (A):	18.70	Airflow Rate (H) (CFM):	2,094
Max Overcurrent Protection (MOP) (A):	20.00	Gas Pipe Connection (inch):	1/2
Max Starting Current MSC(A):	15.50	Liquid Pipe Connection (inch):	1/4
Rated Load Amps RLA(A):	15.5	Sound Pressure (H) (dBA):	52
Dimensions (HxWxD) (in):	29 x 34-1/4 x 12-5/8	Sound Power Level (dBA):	
Net Weight (lb):	137		

Submittal Data Sheet
3 PORT HP, DUCTLESS OD 2 TON
3MXS24NMVJU

SYSTEM DETAILS

Refrigerant Type:	R-410A	Cooling Operation Range (°F DB):	14 - 115
Holding Refrigerant Charge (lbs):	6.2	Heating Operation Range (°F WB):	5 - 72
Additional Charge (lb/ft):	0.01	Max. Pipe Length (Vertical) (ft):	49
Pre-charge Piping (Length) (ft):	132	Cooling Range w/Baffle (°F DB):	14 - 115
Max. Pipe Length (Total) (ft):	230	Heating Range w/Baffle (°F WB):	-4 - 72
Max Height Separation (Ind to Ind ft):	49		

DIMENSIONAL DRAWING



C: 3D093198



Submittal Data Sheet

4 PORT HP, DUCTLESS OD 3 TON

4MXS36NMVJU

FEATURES

- Up to 18.9 SEER / Up to 12.7 EER / Up to 12.5 HSPF
- High-efficiency inverter driven swing compressor
- Low ambient cooling to 5°F / -4°F with optional drain pan heater
- Specialized drain pan design for improved cold climate drainage

BENEFITS

- 12 Year limited parts warranty with online registration
- 5 Year limited parts warranty for commercial applications
- High efficiency cooling and heating operation provides utility bill savings
- Multiple indoor unit style options: wall mounted, floor standing, ceiling cassette, slim duct
- May qualify for regional utility rebates and incentives
- Compatible with optional Daikin ENVi Wi-Fi capable Smart Control





Submittal Data Sheet
4 PORT HP, DUCTLESS OD 3 TON
4MXS36NMVJU

PERFORMANCE

Outdoor Unit Model No.	4MXS36NMVJU	Outdoor Unit Name:	4 PORT HP, DUCTLESS OD 3 TON
Type:	Heat Pump		
Rated Cooling Conditions:	Indoor (°F DB/DB): 80 / 67 Ambient (°F DB/WB): /	Rated Heating Conditions:	Indoor (°F DB/WB): / Ambient (°F DB/WB): /
Rated Piping Length(ft):	25		
Rated Height Difference (ft):	49.00		
Rated Cooling Capacity (Btu/hr):	36,000	Rated Heating Capacity (Btu/hr):	36,000
Cooling Input Power (kW):		Heating Input Power (kW):	
EER (Non-Ducted/Ducted):	9.20 / 7.90	Heating COP (Non-Ducted/Ducted):	4.5 / 3.5
SEER (Non-Ducted/Ducted):	17.70 / 14.00	HSPF (Non-Ducted/Ducted):	12.2 / 8.2
Max/Min Cooling Capacity (Btu/hr):	38,000 /	Max/Min Heating Capacity (Btu/hr):	43,000 /

OUTDOOR UNIT DETAILS

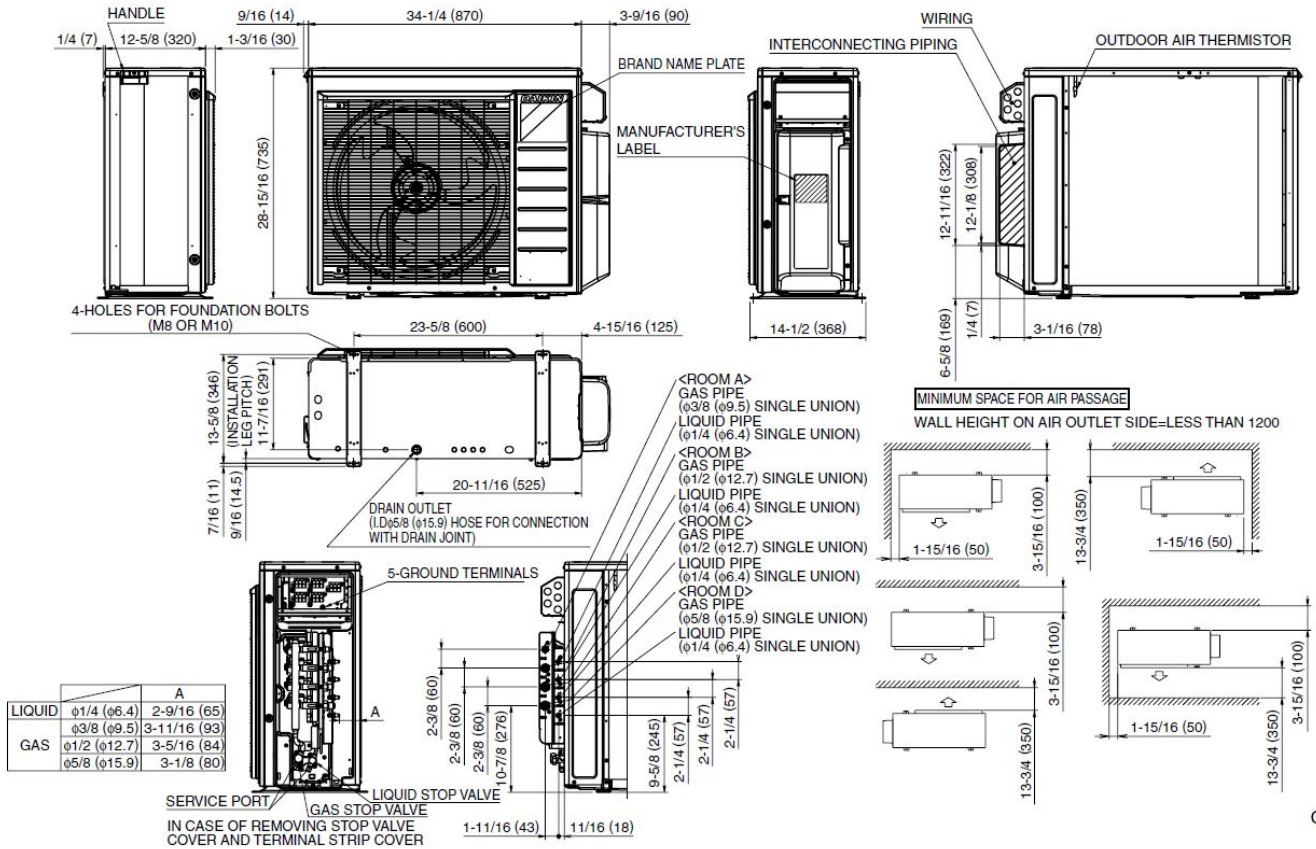
Power Supply (V/Hz/Ph):	208-230 / 60 / 1	Compressor Type:	Inverter
Power Supply Connections:	L1, L2, Ground	Capacity Control Range (%):	-
Min. Circuit Amps MCA (A):	19.75	Airflow Rate (H) (CFM):	2,613
Max Overcurrent Protection (MOP) (A):	20.00	Gas Pipe Connection (inch):	1/2
Max Starting Current MSC(A):	17.50	Liquid Pipe Connection (inch):	1/4
Rated Load Amps RLA(A):	17.5	Sound Pressure (H) (dBA):	54
Dimensions (HxWxD) (in):	29 x 34-1/4 x 12-5/8	Sound Power Level (dBA):	
Net Weight (lb):	139		

Submittal Data Sheet
 4 PORT HP, DUCTLESS OD 3 TON
 4MXS36NMVJU

SYSTEM DETAILS

Refrigerant Type:	R-410A	Cooling Operation Range (°F DB):	14 - 115
Holding Refrigerant Charge (lbs):	6.2	Heating Operation Range (°F WB):	5 - 72
Additional Charge (lb/ft):	0.01	Max. Pipe Length (Vertical) (ft):	49
Pre-charge Piping (Length) (ft):	132	Cooling Range w/Baffle (°F DB):	14 - 115
Max. Pipe Length (Total) (ft):	230	Heating Range w/Baffle (°F WB):	-4 - 72
Max Height Separation (Ind to Ind ft):	49		

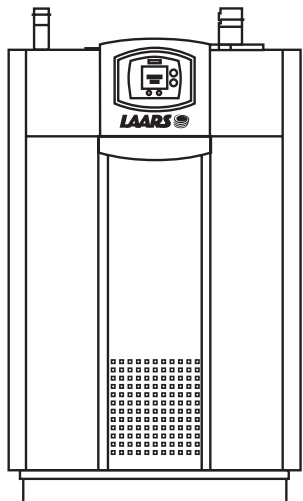
DIMENSIONAL DRAWING



C: 3D093199

NEOTHERM®

Volume Water Heater



NTV | Volume Water Heater

Indoor Sizes 150-850

Submission Data



Date:

Project #:

Engineer:

Prepared By:

Bid Date:

Project Name:

Location:

Contractor:

Standard Equipment

- High condensing efficiency
- Modulation down to 20% of full fire (5:1 turndown)
- Sealed combustion chamber
- Pre-mix stainless steel burner
- Low NOx system exceeds the most stringent regulations for air quality - less than 10ppm NOx
- Horizontal or vertical direct vent
- Horizontal vent and air terminals
- Vent and air pipe lengths of up to 100 equivalent feet (each)
- Built-in condensate trap
- Vent temperature cutoff feature
- Direct spark ignition system
- Sensor for domestic water tank
- 160 psi maximum working pressure
- Stainless steel heat exchanger with welded construction (no gaskets)
- ASME "H" stamp
- 125 psi (861 kPa) ASME rated pressure relief valve
- Water flow switch (399-850 only)
- Temperature & pressure gauge
- Drain valve
- Electronic PID modulating control
- Large user-interface and display
- Alarm output
- Accepts external (4-20mA or 0-10V) modulation signal
- On/off toggle switch
- Manual reset high limit
- Burner site glass
- Zero clearance to combustible surfaces
- Built-in cascade function for up to eight NeoTherms
- 5 year limited warranty

Heater Data

Number of Units:

Fuel

- Natural
- Propane

- Pump included (150-500 only)
- No pump

Factory Mounted Options

- CSD-1 (covers FM & GAP) (500-850 only)
- Low water cutoff (500-850 only)
- High & Low gas pressure switches (500-850 only)
- Additional auto reset high limit (285-850 only)
- Bell for ignition failure
- 30 psi pressure relief valve
- 50 psi pressure relief valve
- 60 psi pressure relief valve
- 75 psi pressure relief valve
- 125 psi pressure relief valve (std)
- 150 psi pressure relief valve



Sizing Data

Model	Input		Output		Thermal Efficiency %	Gas Conn. Size inches	Water Conn. Size inches	Shipping Weight	
	BTU/h	kW	BTU/h	kW				lbs	kg
NTV 150	150,000	44.0	143,550	42.1	95.7	½ NPT	1¼ NPT	220	100
NTV 199	199,000	58.3	193,030	56.6	97.0	½ NPT	1¼ NPT	245	111
NTV 285	285,000	83.5	272,460	79.8	95.6	¾ NPT	2 NPT	350	159
NTV 399	399,000	117.0	374,237	109.7	96.3	¾ NPT	2 NPT	410	186
NTV 500	500,000	147.0	483,500	141.7	96.7	1 NPT	2 NPT	480	218
NTV 600	600,000	175.8	576,000	167.0	95.3	1 NPT	2 NPT	394	179
NTV 750	750,000	219.8	723,000	208.9	96.6	1½ NPT	2 NPT	469	213
NTV 850	850,000	249.1	810,900	236.7	95.7	1½ NPT	2 NPT	502	228

Accessories for Field Mounting

- Water flow switch (150-285 only)
- Low water cutoff
- High & Low gas pressure switches
- Additional auto reset high limit

Clearances

Appliance Surface	Suggested Service Access Clearance	
	inches	cm
Left Side	1	2.5
Right Side	12	31
Top	24	61
Back	6	15
Closet, Front	6	15
Alcove, Front	24	61
Vent	–	–

Certified by CSA for zero clearance to combustible materials on all sides.

Vent System

Size	Intake (Air) Pipe	Exhaust (Vent) Pipe	Maximum Allowable Equivalent Length*	
150	3"	3"	100 ft	30 m
199	3"	3"	100 ft	30 m
285	3"	3"	20 ft	6.1 m
	4"	4"	100 ft	30 m
399	4"	4"	100 ft	30 m
500	4"	4"	100 ft	30 m
600	4"	4"	40 ft	22 m
	6"***	6"***	100 ft**	30 m**
750	4"	4"	40 ft	22 m
	6"	6"	100 ft	30 m
850	4"	4"	40 ft	22 m
	6"	6"	100 ft	30 m

Installations in the U.S. require exhaust vent pipe that is a combination of PVC & CPVC complying with ANSI/ASTM D1785 F441, polypropylene pipe that complies with ULC S636, or stainless steel complying with UL1738. Installations in Canada require exhaust vent pipe that is certified to ULC S636.

Intake (air) pipe may be ABS, PVC, CPVC or galvanized material.

Installer must comply fully with manufacturer's installation instructions, including use of minimum exhaust length CPVC, to maintain ANSI Z21.13 safety certification.

Closet and alcove installations do not allow the use of PVC under any circumstances

* To calculate max equivalent length, measure the linear feet of the pipe, and add 5 feet (1.5m) for each elbow used.

** Allowed only if the vent pipe is no more than 20 equivalent feet longer than the air pipe.

Electrical Data

Sizes	Volts	Heater		Pump Connection Ratings (System Pump and DHW Pump Connections)
		Phase	Amps	
150-850 No pump	120	Single	2*	n/a
150-199 With pump	120	Single	7*	115V - Maximum 1HP
285-500 With pump	120	Single	8*	115V - Maximum 1 HP

*Minimum 15A circuit required

Recovery Data

Size	GPH Delivered								
	REQUIRED WATER TEMPERATURE RISE								
	40°F GPH	50°F GPH	60°F GPH	70°F GPH	80°F GPH	90°F GPH	100°F GPH	120°F GPH	140°F GPH
150	431	345	287	246	215	191	172	144	123
199	579	463	386	331	290	257	232	193	166
285	818	654	545	467	409	363	327	273	234
399	1153	923	769	659	577	513	461	384	329
500	1451	1161	967	829	726	645	580	484	415
600	1729	1383	1152	988	864	768	691	576	494
750	2170	1736	1447	1240	1085	964	868	723	620
850	2434	1947	1622	1391	1217	1082	973	811	695

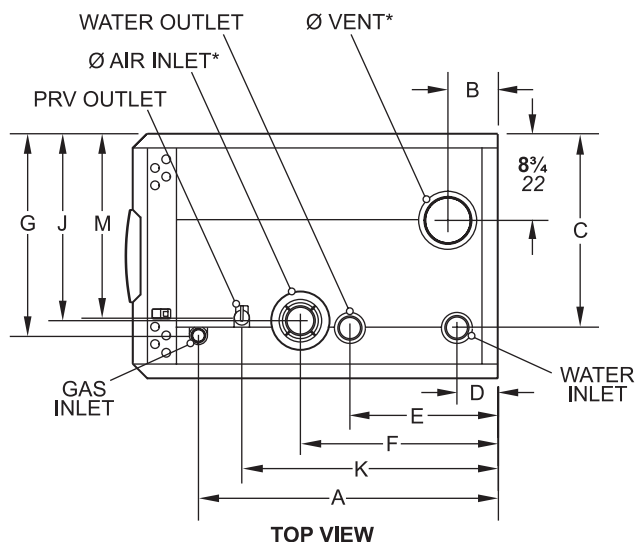
Size	L/h Delivered								
	REQUIRED WATER TEMPERATURE RISE								
	22°C L/h	28°C L/h	33°C L/h	39°C L/h	44°C L/h	50°C L/h	56°C L/h	67°C L/h	78°C L/h
150	1629	1303	1086	931	814	724	651	543	465
199	2190	1752	1460	1251	1095	973	876	730	626
285	3091	2473	2061	1766	1545	1374	1236	1030	883
399	4359	3487	2906	2491	2181	1937	1744	1453	1245
500	5485	4388	3657	3134	2743	2438	2194	1828	1567
600	6536	5288	4355	3735	3266	2903	2612	2177	1867
750	8203	6562	5470	4687	4101	3644	3281	2733	2344
850	9201	7360	6131	5258	4600	4090	3678	3066	2627

Water Flow Requirements

Size	NORMAL WATER*					
	Flow gpm	H/L feet	Temp Rise °F	Flow lpm	H/L m	Temp Rise °C
150	19	57	15	72	17.4	8
199	25	28	15	95	8.5	8
285	36	33	15	98	10.1	8
399	50	35	15	189	10.7	8
500	63	28	15	239	8.5	8
600	60	24	19	227	7.3	11
750	68	35	21	257	10.7	12
850	68	26	24	257	7.9	13

*Maximum water hardness of 10 grains per gallon allowed

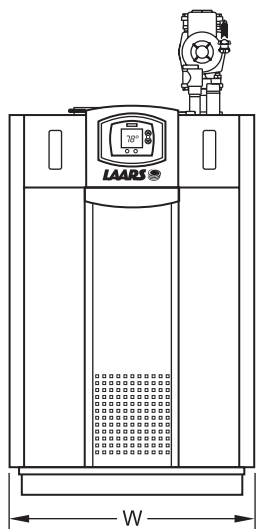
Dimensional Data



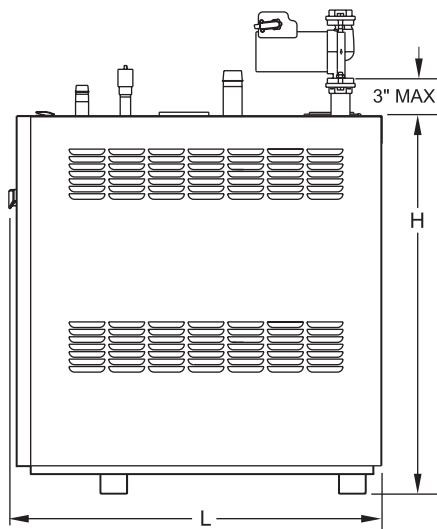
Size	W		L		H		AIR INLET		VENT	
	in	cm	in	cm	in	cm	in	cm	in	cm
150	25	64	19½	49	38¼	97	3	7.6	3	7.6
199	25	64	26¾	68	38¼	97	3	7.6	3	7.6
285	25	64	26¾	68	38¼	97	4½	11	4½	11
399	25	64	31½	80	38¼	97	4½	11	4½	11
500	25	64	37¾	96	38¼	97	4½	11	4½	11
600	25	64	37¾	96	38¼	97	4½	11	4½	11
750	25	64	51	130	38¼	97	4½	11	6½	17
850	25	64	55¼	130	38¼	97	4½	11	6½	17

Dimensions are nominal and are shown in inches, cm.

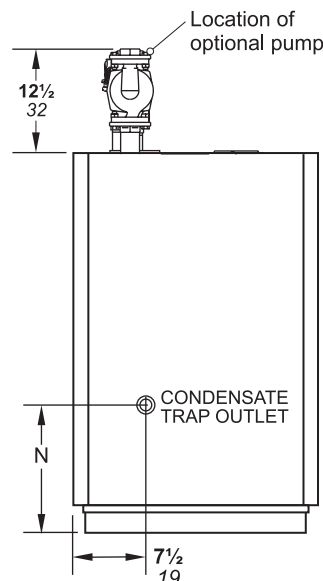
*NeoTherm is shipped with adapters for the air and vent that accept standard pipe of the proper size and type.



FRONT VIEW



RIGHT SIDE VIEW



BACK VIEW

Size	A		B		C		D		E		F		G		J		K		M		N	
	in	cm	in	cm	in	cm	in	cm	in	cm	in	cm	in	cm	in	cm	in	cm	in	cm	in	cm
150	13¼	34	5¼	14	19	48	3¼	8	10¾	28	7½	19	14¼	36	19½	49	7½	19	15¼	39	13	33
199	20½	52	5¼	14	19	48	3¼	8	17¾	45	7½	19	14¼	36	19½	49	11¾	30	15¼	39	13	33
285	20¼	52	7¼	19	19¾	50	4¼	16	11¼	29	13½	34	14	36	15	38	17	43	18¾	48	13	33
399	25	64	5¼	13	19¾	50	4¼	11	14¾	37	18½	47	19¼	49	16½	42	21¾	55	18¾	48	13	33
500	30¼	77	5¼	13	19¾	50	4¼	11	15¼	38	20	51	20½	52	19	48	26	66	18¾	48	13	33
600	29¾	76	5	13	19½	50	4¼	11	15	38	20	51	3	8	19	48	26	66	18¾	48	8¼	21
750	35½	90	6	15	19½	50	5¼	13	19	48	40½	103	3¼	8	19	48	30¾	78	18¾	48	8¼	21
850	39¾	101	6	15	19½	50	5¼	13	19	48	44¾	114	3½	9	19	48	35	89	18¾	48	8¼	21

Laars Heating Systems Company reserves the right to change specifications, components, features, or to discontinue products without notice.



800.900.9276 • Fax 800.559.1583 (Customer Service, Service Advisors)
 20 Industrial Way, Rochester, NH 03867 • 603.335.6300 • Fax 603.335.3355 (Applications Engineering)
 1869 Sismet Road, Mississauga, Ontario, Canada L4W 1W8 • 905.238.0100 • Fax 905.366.0130

www.Laars.com

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 NIAGARA



TAMPERPROOF™

FIXED MOUNT AERATOR Female Threads



TAMPERPROOF™

FIXED MOUNT AERATOR

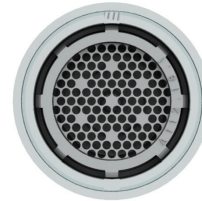
Female Threads

FEATURES

- Tamperproof aerators for commercial applications - ideal for hotels and other commercial uses
- Works well in kitchens and baths
- Accessible with special key
- Patented Equiforce Technology guarantees a consistent flow rate across a wide range of pressure
- 0.5 GPM is 77% more efficient than standard faucets
- Includes all parts necessary for proper installation and operation
- Housing constructed of solid, low-lead brass with high-polished chrome finish
- 10 year warranty



BUBBLE SPRAY



NEEDLE SPRAY



SPECIFICATIONS



Item Number	Flow Rate	Finish	Spray
N3205NFTP-PC-T*	0.5 GPM	Chrome	Needle
N3210NFTP-PC-T	1.0 GPM	Chrome	Needle
N3210BFTP-PC-T	1.0 GPM	Chrome	Bubble
N3215NFTP-PC-T	1.5 GPM	Chrome	Needle

Technology: Equiforce

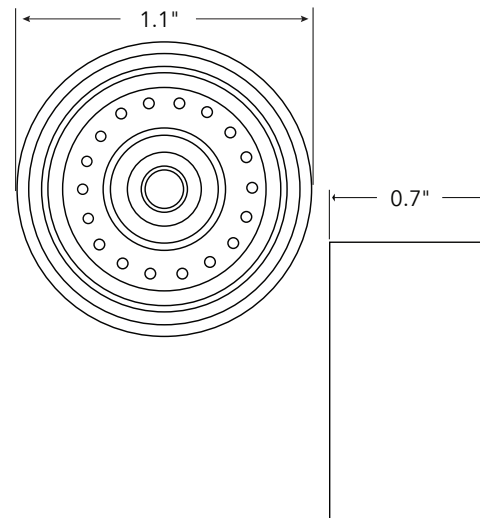
Materials: Low-lead brass with high-polished chrome finish

ASME Certification: A112.18.1

CSA Certification: B125.1

**Not WaterSense Certified*

MEASUREMENTS



*WARRANTY DETAILS: Niagara Conservation Corp. guarantees to the original purchaser or recipient of an aerator or showerhead that it is free from defects in material and workmanship for a period of 10 years. Niagara will, at our choice, replace any part of the aerator or showerhead which is, in our opinion, defective provided that the product has not been abused, misused, altered, or damaged after its purchase. This includes damage due to the use of tools or harsh chemicals. Call Niagara for complete warranty details.

CORPORATE HQ 1200 Lakeside Parkway, Suite 450, Flower Mound, Texas 75028 USA

(t) 800.831.8383 (p) 817.391.0800 (f) 682.200.6962 (e) info@niagaracorp.com

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niagaracorp.com



TAMPERPROOF

Fixed Mount Aerator

Male Threads

Available In **UHET™** WATER-SAVING KITS



Needle Spray



Bubble Spray



FEATURES

- Tamperproof aerators for commercial applications - ideal for hotels and other commercial uses
- Works well in kitchens and baths
- Accessible with special key
- Includes all parts necessary for proper installation and operation
- Patented flow compensator gives consistent flow rate across wide range of pressure

SPECIFICATIONS

ITEM NUMBER	FLOW RATE	FINISH	SPRAY
N3205NMTP-PC-T*	0.5	Chrome	Needle
N3210NMTP-PC-T	1	Chrome	Needle
N3210BMTP-PC-T	1	Chrome	Bubble
N3215NMTP-PC-T	1.5	Chrome	Needle

Technology Pressure-Compensating
ASME Certification A112.18.1
CSA Certification B125.1

** Not WaterSense Certified*



Needle Spray



NIAGARA
CONSERVATION®

*LIMITED LIFETIME WARRANTY on vitreous china products. Toilet tank trim: fill valve and flush valve assembly and plumbing fittings are warranted for a period of ten years to the purchaser from the date of purchase. Call Niagara Conservation for complete warranty details.

CORPORATE HQ 1200 Lakeside Parkway, Suite 450, Flower Mound, Texas 75028 USA
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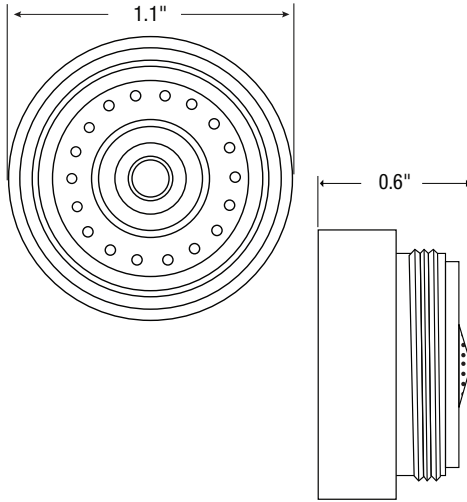
TAMPERPROOF FIXED MOUNT AERATOR

Male Threads



MEASUREMENTS

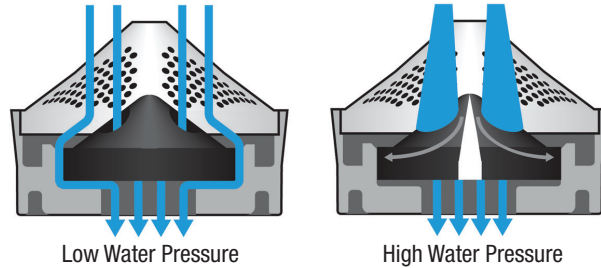
Length: 0.6"
Diameter: 1.1"



NOTE: Dimensions are subject to change.

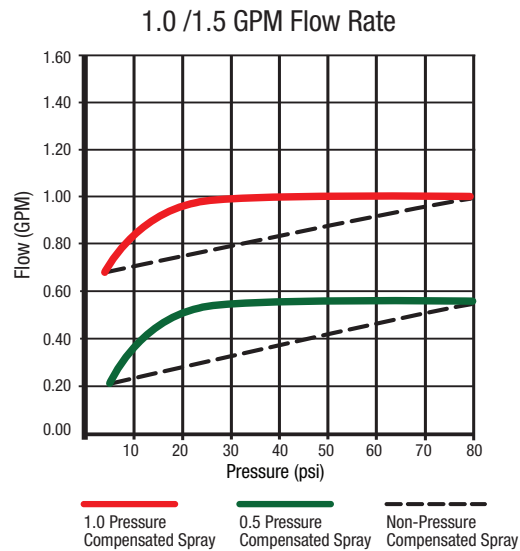
EQUIFORCE® TECHNOLOGY

Constant Output Regardless of Pressure



At low pressure, water is allowed to flow through three holes in the center of the compensator around the scallop cutouts on the edges. As water pressure increases, the force presses down on the compensator, causing it to flex. As it flexes, the scalloped cuts seal off, allowing water to only flow through the center holes. As water pressure increases further, the compensator continues to flex and the shape of the holes distort, reducing the size of the openings. This further controls the amount of water that flows through them. The shape and hardness of the rubber help maintain a level flow rate as the pressure increases.

Constant Flow Rate Across Wide Range of Pressure



WARRANTIES

Warranty for Niagara showerheads and aerators obtained through wholesale, municipalities, utilities or other commercial channels:

10-year Limited Warranty to the purchaser from the date of purchase. Niagara will replace any part that, in our opinion, has proved defective; provided the product has not been abused, misused, altered, or damaged after its purchase. For complete warranty details, contact Niagara Conservation at 800.831.0800.

FFEH3054US

FREESTANDING RANGE

30" ELECTRIC



AVAILABLE COLORS



Stainless

PRODUCT DIMENSIONS

Height (Max.)	36-5/8"
Width	29-7/8"
Depth (Incl. Handle)	29-3/16"

MORE EASY-TO-USE FEATURES

Keep Warm Zone

Keep food warm until everything — and everyone — is ready.

Hidden Bake

Keeping the bottom of your oven clean is easy with a hidden heating element.

One-Touch Self Clean

Your oven cleans itself — so you don't have to. Self-clean options available in 2- and 3-hour cycles.

Store-More™ Storage Drawer

With the Store-More™ Storage Drawer, you will have extra space to store your cookware.

CERTIFICATIONS

A.D.A.- Compliant

When properly installed, this model is A.D.A.-qualified based on the United States Access Board's A.D.A./A.B.A. Accessibility Guidelines and the Department of Justice's 2010 A.D.A. Standards for Accessible Design.



SIGNATURE FEATURES

Upgrade Your Kitchen with a Built-In Look

Upgrade your kitchen and get the look of a built-in range, with the fit of a traditional freestanding range. The Frigidaire® front control freestanding range easily fits into a 30" cutout.

Flexible Five Element Cooktop

Experience ultimate cooking flexibility with a powerful radiant cooktop that has five elements designed to handle all of your cooking needs.

Quick Boil

Get meals on the table faster with our expandable 3,000W element — water boils faster than the traditional setting.

Extra-Large Element

With our extra-large 12" element, you have more flexibility to fit larger pots and pans.

ELEMENTS	SIZE	WATTS
Right Front	12"	2,700
Right Rear	6"	1,200
Left Front	6"/9" Expandable	1,400/3,000
Left Rear	6"	1,200
Center	Keep Warm Zone	100

FFEH3054US FREESTANDING RANGE

30" ELECTRIC

FRIGIDAIRE

FEATURES

Oven Control/Timing System	Ready-Select® Controls
Surface Type	Black Ceramic Glass
Window	Extra-Large
Exterior Door Finish	Stainless
Handle Design	Stainless
Exterior Finish (Side Panels)	Black
Oven Cleaning System	Self Clean
Drawer Functionality	Storage

OVEN CONTROLS

Bake	Yes
Broil	Yes
Delay Bake	Yes
Delay Start	Yes
Self-Clean	2, 3 Hour
Delay Clean	Yes
Kitchen Timer	Yes
Timed Cook Option	Yes
Auto Oven Shut-Off	12 Hours
Oven Lock-Out	Yes

COOKTOP FEATURES

Right Front Element (Watts)	12" - 2700
Right Rear Element (Watts)	6" - 1200
Left Front Element (Watts)	SpaceWise® Expandable 6"/9" - 1400/3000
Left Rear Element (Watts)	6" - 1200
Center Element (Watts)	Keep Warm Zone - 100
Hot Surface Indicator Light	Yes
Element "On" Indicator Light	Yes

OVEN FEATURES

Capacity (Cu.Ft.)	5.0
Oven Light	1 Incandescent 40W
Rack Configuration	2 Standard
Baking System	Even Baking Technology
Broiling System	Vari-Broil™ (Hi/Lo)
Bake Element/Broil Element (Watts)	3,500/3,900

CERTIFICATIONS

A.D.A. Compliant ¹	Yes
-------------------------------	-----

SPECIFICATIONS

Oven Interior (H x W x D)	18-5/8" x 24-3/8" x 19-1/8"
Power Supply Connection Location	Middle Bottom Rear
Voltage Rating	240V/208V/60Hz
Connected Load (kW Rating) @ 240/208 Volts	12.5/9.5
Minimum Circuit Required (Amps)	40
Shipping Weight (Approx.)	170 Lbs.

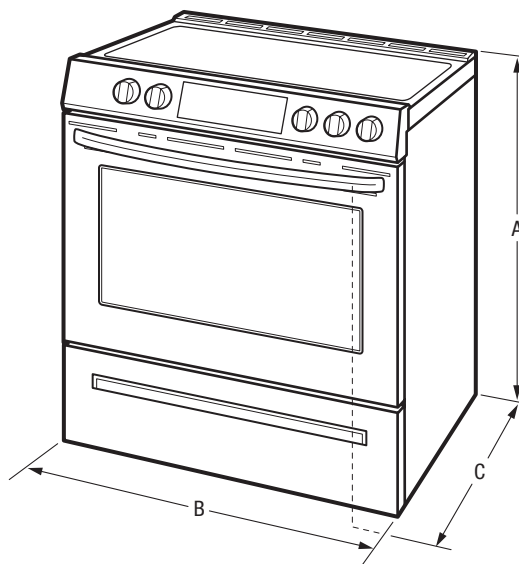
¹When properly installed, this model is A.D.A.-qualified based on the United States Access Board's A.D.A./A.B.A. Accessibility Guidelines and the Department of Justice's 2010 A.D.A. Standards for Accessible Design.

PRODUCT DIMENSIONS

A - Height (Max.)	36-5/8"
B - Width	29-7/8"
C - Depth (Incl. Handle)	29-3/16"
Depth with Door Open 90°	47"

CABINET CUTOUT DIMENSIONS

Height (Standard)	36"
Width (Min.)	30"
Depth (Min.)	24"



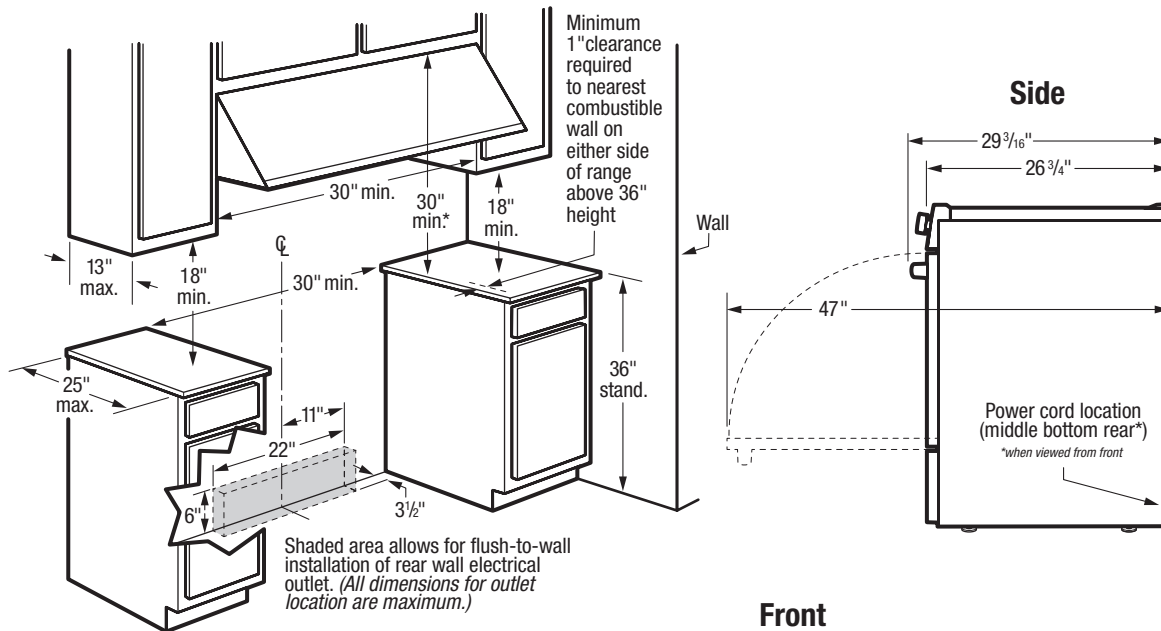
Note: For planning purposes only. Always consult local and national electric, gas and plumbing codes. Refer to Product Installation Guide for detailed installation instructions on the web at frigidaire.com.

Specifications subject to change. Accessories information available on the web at frigidaire.com

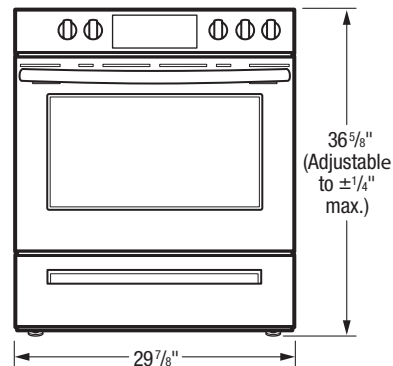
FRIGIDAIRE

USA • 10200 David Taylor Drive • Charlotte, NC 28262 • 1-800-FRIGIDAIRE • frigidaire.com
CANADA • 5855 Terry Fox Way • Mississauga, ON L5V 3E4 • 1-800-265-8352 • frigidaire.ca

FFEH3054U 09/18
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***Note:** 30" minimum clearance between top of cooking surface and bottom of unprotected wood or metal overhead cabinet; or 24" minimum clearance when bottom of wood or metal overhead cabinet is protected by not less than 1/4" flame-retardant millboard covered with not less than No. 28 MSG sheet steel, 0.015" stainless steel, 0.024" aluminum or 0.020" copper. 0" clearance is minimum for rear of range. Follow all dimension requirements provided above to prevent property damage, potential fire hazard, and incorrect countertop and cabinet cuts.



INSTALLATION SPECIFICATIONS

- Product Shipping Weight (approx.) - 170 Lbs.
- Single phase 3- or 4-wire cable, 120/240 or 120/208 Volt, 60 Hertz, fused on both sides of line with ground.
- Connected Load (kW Rating) @ 240/208 Volts = 12.5/9.5 kW
- Recommended Circuit Breaker - 40 Amps
- Always consult local and national electric codes.
- Make sure wall coverings around range can withstand heat generated by range.
- Floor beneath range MUST be solid and level.
- Overhead cabinetry should not exceed a 13" maximum depth.
- Absolute minimum horizontal distance between overhead cabinets installed to either side of appliance must be no less than maximum width of appliance.
- Range can be installed flush to wall with 0" minimum rear clearance.
- Minimum 1" clearance required from edge of rangetop to nearest combustible wall on either side of range above 36" height.
- Allow 30" minimum clearance between top of cooking surface and bottom of unprotected wood or metal overhead cabinet; or 24" minimum clearance when bottom of wood or metal overhead cabinet is protected by not less than 1/4" flame-retardant millboard covered with not less than no. 28 MSG sheet steel, 0.015" stainless steel, 0.024" aluminum or 0.020" copper.
- To reduce risk of fire when using overhead cabinetry, install range hood that projects horizontally a recommended minimum of 5" beyond bottom of cabinets.
- Follow all dimension requirements provided to prevent property damage, potential fire hazard, and incorrect countertop and cabinet cuts.





Top Mount Refrigerators

FFHT1831Q S/M/P/E/Q

18 Cu. Ft. Top Mount



Product Dimensions

Height (Including Hinges & Rollers)	66-1/8"
Width	30"
Depth (Including Door)	29-7/8"

More Easy-To-Use Features

Independent Temperature Controls

Color-Coordinated Door Hinge Covers¹

Clear Dairy Door

Reversible Door

Door can be installed to open left or right based on your needs.

Garage-Ready

Our top freezer offers the flexibility to work in your home or in your garage. It's built to handle extreme temperature conditions.

A.D.A. - Compliant²

With accessible shelving, and controls that are positioned within arm's reach and allow one-hand operation, our top-freezer refrigerator is A.D.A.-Compliant.



ENERGY STAR®

Signature Features

Built with American Pride

Appliances that are high-performing, more accessible, and more innovative than ever — designed, built, and engineered in the U.S.A.

SpillSafe® Shelves

Designed to keep spills contained, making cleanup a breeze.

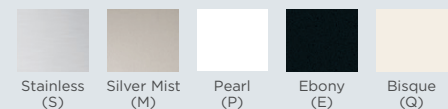
Store-More™ Humidity-Controlled Crisper Drawers

Our humidity-controlled crisper drawers are designed to keep your fruits and vegetables fresh so you don't have to worry about stocking up.

Full-Width Wire Freezer Shelf

Gives you a way to organize items in your freezer better so you can find food quickly.

Available in:



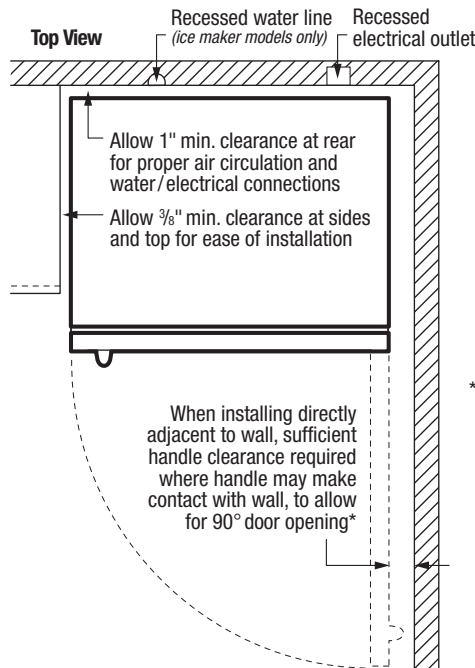
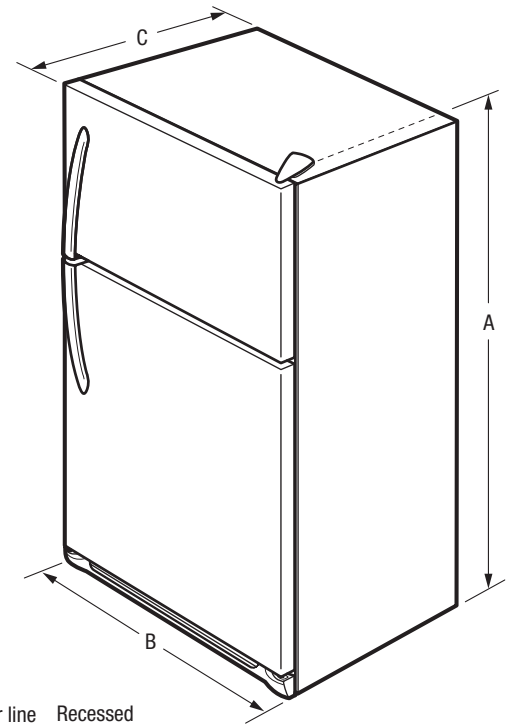
¹Select models only.

²When properly installed, this model is A.D.A.-qualified based on the United States Access Board's A.D.A./A.B.A. Accessibility Guidelines and the Department of Justice's 2010 A.D.A. Standards for Accessible Design.

Features	
Door Design	UltraSoft™
Door Handle Design	Stainless Steel (S), Color-Coordinated (M/P/E/Q)
Cabinet Finish (Textured)	Black (S), Color-Coordinated (M/P/E/Q)
Door Stops	Yes
Door Hinge Covers	Black (S), Color-Coordinated (M/P/E/Q)
Door Reverse Option	Yes
Left-Swing Door	
Rollers - Front/Rear	Fixed/Yes
Sound Package	
Toe Grille	Black (S), Color-Coordinated (M/P/E/Q)
Garage-Ready	Yes
Refrigerator Features	
Interior Lighting	Bright
Refrigerator Shelves	2 Full-Width SpillSafe® Glass
Deli Drawer	1 Half-Width
Wine/Can Rack	
Store-More™ Crisper Drawers	2 Clear
Humidity Controls	2
Dairy Compartment	Clear Dairy Door
Door Bins	3 Full-Width White
Door Racks	
Non-Slip Bin Liner	
Tall Bottle Retainers	
Gallon Door Storage	1
Freezer Features	
Door Bins	
Door Racks	2 Full-Width Clear
Freezer Shelves	1 Full-Width Wire
Factory Ice Maker w/ Large Ice Bin	Optional (PN# IM116)
Lighting	
Certifications	
A.D.A. - Compliant ¹	Yes
ENERGY STAR®	Yes
Specifications	
Total Capacity (Cu. Ft.)	18.0
Refrigerator Capacity (Cu. Ft.)	14.1
Freezer Capacity (Cu. Ft.)	3.9
Power Supply Connection Location	Right Bottom Rear
Water Inlet Connection Location	Bottom Right
Voltage Rating	120V / 60Hz / 15A
Connected Load (kW Rating) @ 120 Volts ²	.72
Amps @ 120 Volts	6.0
Minimum Circuit Required (Amps)	15
Shipping Weight (Approx.)	205 Lbs.

¹When properly installed, this model is A.D.A.-qualified based on the United States Access Board's A.D.A./A.B.A. Accessibility Guidelines and the Department of Justice's 2010 A.D.A. Standards for Accessible Design.

²For use on adequately wired 120V, dedicated circuit having 2-wire service with a separate ground wire. Appliance must be grounded for safe operation.



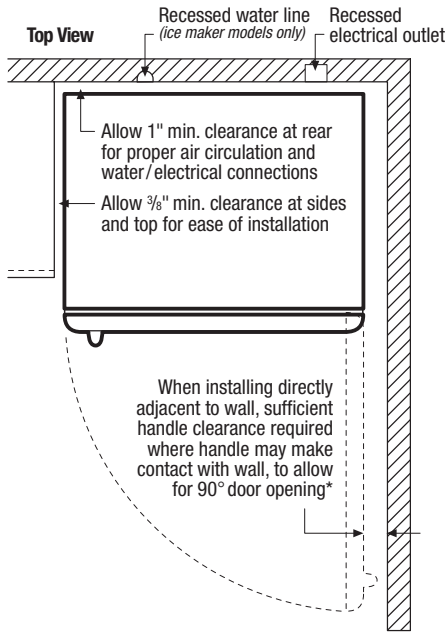
* When installing refrigerator adjacent to wall, cabinet or other appliance that extends beyond front edge of unit, 20" minimum clearance recommended to allow for optimum 140° door swing, providing complete crisper access and removal. (Absolute 3" minimum clearance will ONLY allow for 90° door swing which will provide limited crisper access with restricted removal.)

NOTE: For planning purposes only. Always consult local and national electric and plumbing codes. Refer to Product Installation Guide for detailed installation instructions on the web at frigidaire.com.

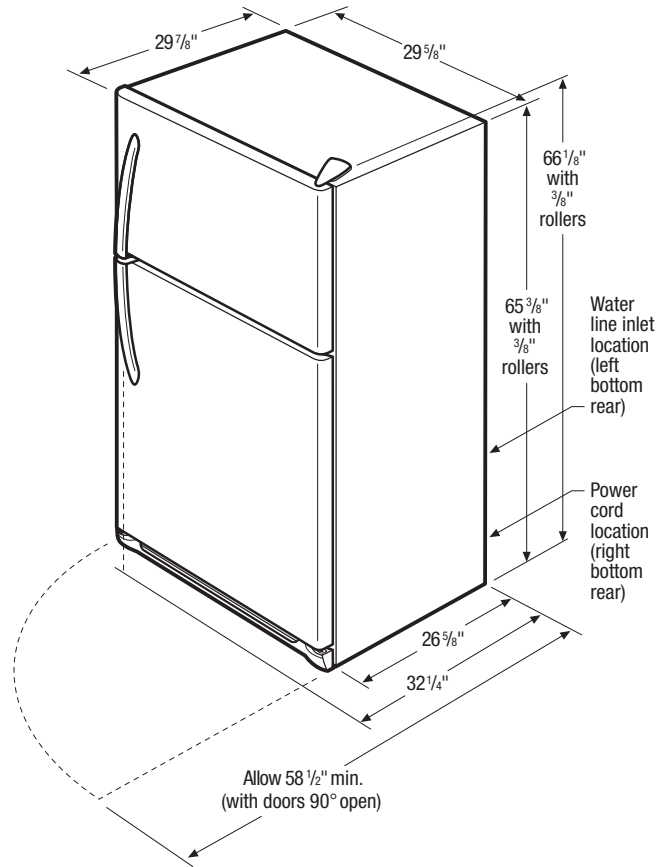


Product Dimensions	
A - Height (Incl. Hinges & Rollers)	66-1/8"
B - Width	30"
C - Depth (Incl. Door)	29-7/8"
Depth with Door Open 90°	58-1/2"

Accessories information available on the web at frigidaire.com



*When installing refrigerator adjacent to wall, cabinet or other appliance that extends beyond front edge of unit, 20" minimum clearance recommended to allow for optimum 140° door swing, providing complete crisper access and removal. (Absolute 3" minimum clearance will ONLY allow for 90° door swing which will provide limited crisper access with restricted removal.)



Top Mount Refrigerator Specifications

- Product Shipping Weight (approx.) - 205 Lbs.
- An electrical supply with grounded three-prong receptacle is required. The power supply circuit must be installed in accordance with current edition of National Electrical Code (NFPA 70) and local codes & ordinances.
- Voltage Rating - 120V/60 Hz/15 Amps
- Connected Load (kW Rating) @ 120 Volts = .72kW
- Amps @ 120 Volts = 6.0 Amps
- Always consult local and national electric & plumbing codes.
- Floor should be level surface of hard material, capable of supporting fully loaded refrigerator.
- Minimum 3/8" clearance required for sides and top of refrigerator with 1" clearance at rear to allow for ease of installation, proper air circulation, and plumbing/electrical connections.
- When installing refrigerator adjacent to wall, cabinet or other appliance that extends beyond front edge of unit, 20" minimum clearance recommended to allow for optimum 140° door swing, providing complete crisper access and removal. (Absolute 3" minimum clearance will ONLY allow for 90° door swing which will provide limited crisper access with restricted removal.)

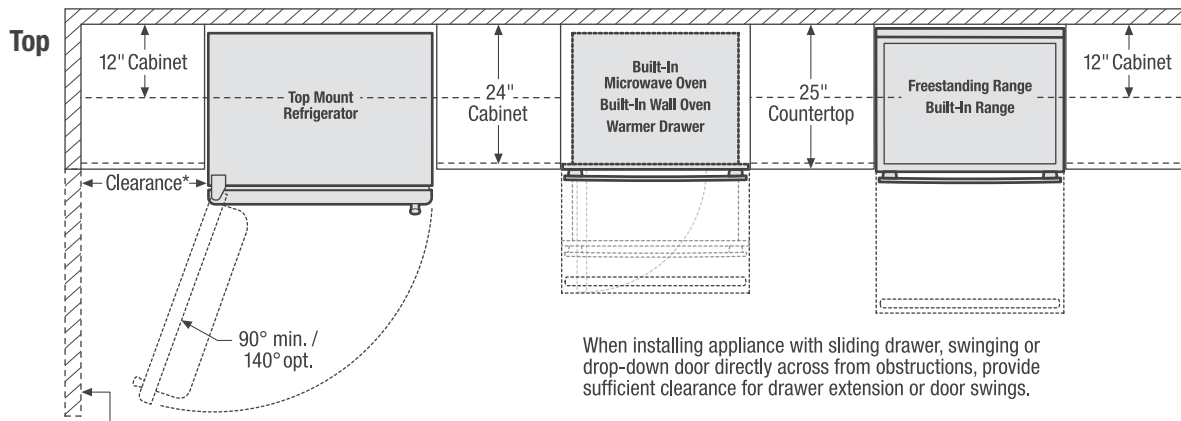
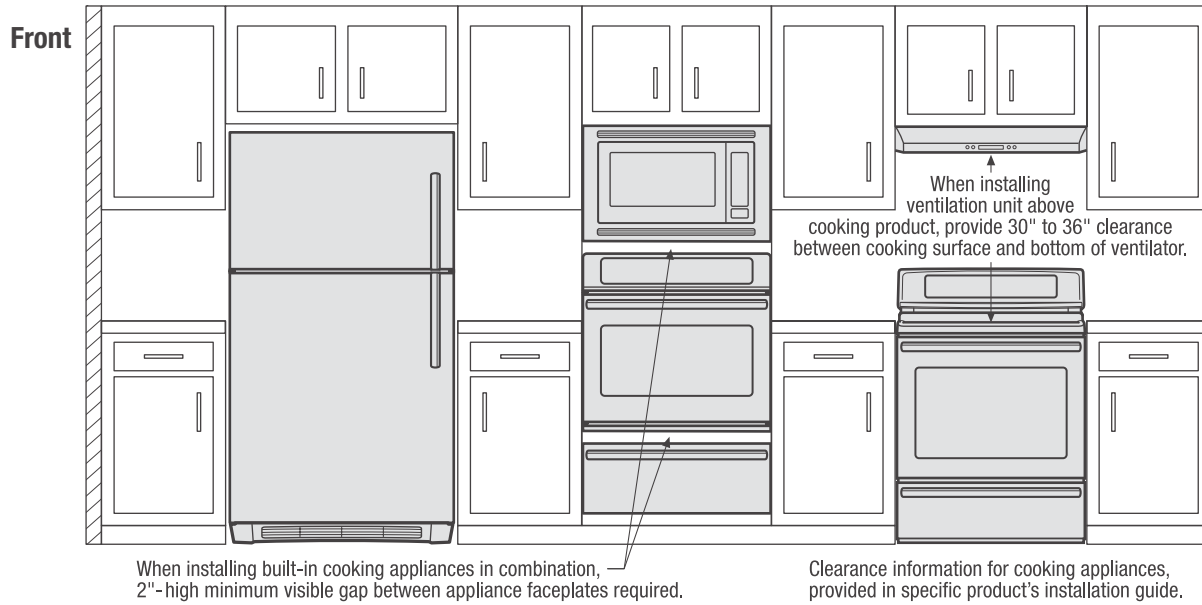
- To ensure optimum performance, do not install in areas where temperature drops below 55° F or rises above 110° F and avoid installing in direct sunlight or close proximity to range, dishwasher or other heat source.
- For proper ventilation, front grille MUST remain unobstructed.
- Recess electrical outlet when possible.
- Optional Ice Maker Kit (PN# IM116) available for installation in ice maker-ready models only.
- Water recess on rear wall recommended to prevent water line damage.
- Water Pressure - Cold water line must provide between 30 and 100 pounds per square inch (psi).
- Copper tubing with 1/4" O.D. recommended for water supply line with length equal to distance from rear of unit to household water supply line plus 7 additional feet. Optional Water Supply Installation Kits available.

Note: For planning purposes only. Refer to Product Installation Guide on the web at frigidaire.com for detailed instructions.

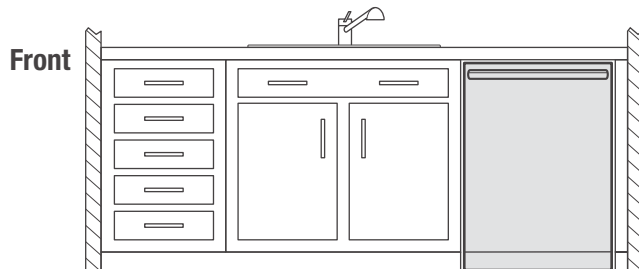
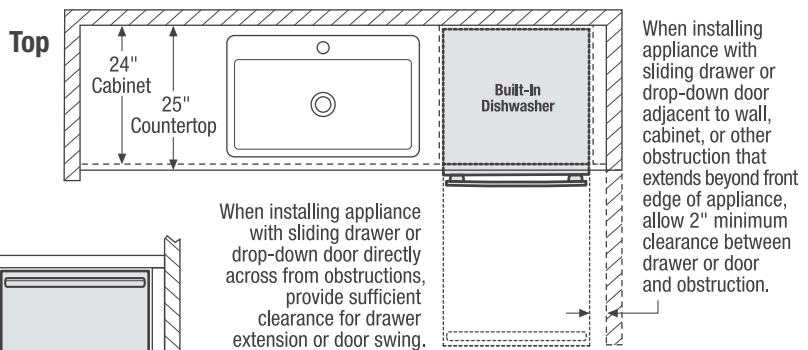
Optional Accessories

- Ice Maker Kit - (PN# IM116).

Use these dimensions and clearance instructions for planning purposes only. For detailed installation instructions, refer to installation guide, packed with product, or on the web at frigidaire.com.



*When installing top mount refrigerator adjacent to wall, cabinet or other appliance that extends beyond front edge of unit, 20" minimum clearance recommended to allow for optimum 140° door swing, providing complete crisper access and removal. (Absolute 3" minimum clearance will ONLY allow for 90° door swing which will provide limited crisper access with restricted removal.)



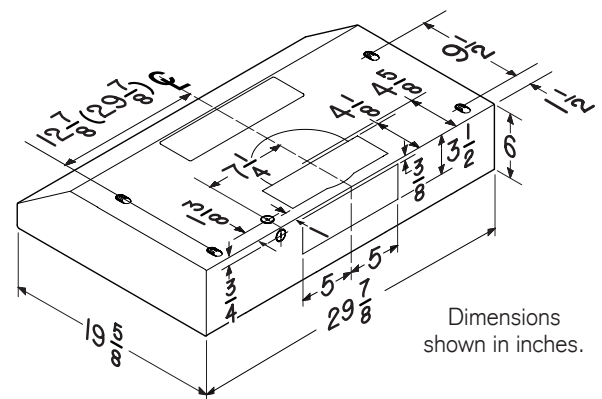
The clean, contemporary shape of Glacier complements any kitchen design. Impressive LED lighting and superior smoke and odor removal are a mere introduction to everything this hood has to offer.

SIZE	WHITE	BLACK	SLATE	STAINLESS	GREASE FILTER(S) (replacement)	NON-DUCTED FILTER(S)
30-in.	BCSEK130WW	BCSEK130BL	BCSEK130SL*	BCSEK130SS	HPFA130 (Type C1)	HPF30 (Type Xc)

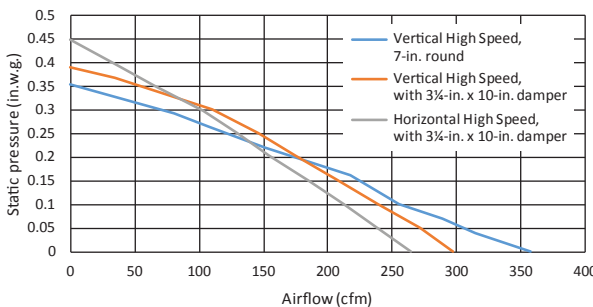
PERFORMANCE						
Duct Orientation	Size	Damper	Sones		CFM @ 0.1 Ps	
			Normal	High	Normal	High
Vertical - Rectangular	3¼-in. x 10-in.	Included	1.5	5.0	140	230
Horizontal - Rectangular	3¼-in. x 10-in.	Included	1.5	5.0	110	210
Round - Vertical	7-in.	Sold Separately	1.5	5.0	150	250

* Not available in Canada.

FEATURES	
Control type	2-speed Rocker
Delay off	no
Filter Clean Reminder	no
Heat Sentry™	no
ADA Capable	yes
Lighting	1-level ENERGY STAR® LED (included)
Grease Filter(s)	Open Mesh (Qty. 2)
Installation Hardware	EZ1 Bracket
ENERGY STAR®	yes
Recirculation	Non-ducted filter(s) sold separately
AC INPUT	
120V, 60 Hz - 0.65 AMPS	
OPTIONAL ACCESSORIES	
7-in. Round Damper	BP87
MOUNTING HEIGHT	
18-in. to 24-in. from cooktop to bottom of hood	
LIMITED WARRANTY	
1-year	
3-year (LED modules only)	
<i>(See installation manual for full warranty text.)</i>	
FOR INDOOR USE ONLY	



Dimensions shown in inches.



HVI-2100 CERTIFIED RATINGS comply with new testing technologies and procedures prescribed by the Home Ventilating Institute, for off-the-shelf products, as they are available to consumers. Product performance is rated at 0.1 in. static pressure, based on tests conducted in AMCA's state-of-the-art test laboratory. Sones are a measure of humanly-perceived loudness, based on laboratory measurements.



MODEL BCSEK130SL	ALL OTHER MODELS

99045741A

La forme simple et contemporaine de Glacier convient à tous les styles de cuisine. L'éclairage DEL impressionnant et l'élimination supérieure de la vapeur et des odeurs de cuisson ne sont qu'un avant-goût de tout ce que cette hotte a à offrir.

LARGEUR	BLANC	NOIR	ARDOISE	INOX	FILTRE(S) À GRAISSSES (remplacement)	FILTRE(S) DE RECIRCULATION
30 po	BCSEK130WW	BCSEK130BL	BCSEK130SL*	BCSEK130SS	HPFA130 (Type C1)	HPF30 (Type Xc)

RENDEMENT						
Orientation du conduit	Largeur	Volet	Sones		pi³/min @ 0,1 Ps	
			Normal	Haute	Normal	Haute
Rectangulaire vertical	3¼ po x 10 po	inclus	1,5	5,0	140	230
Rectangulaire horizontal	3¼ po x 10 po	inclus	1,5	5,0	110	210
Rond vertical	7 po	vendu séparément	1,5	5,0	150	250

* Non offert au Canada.

CARACTÉRISTIQUES	
Type de commande	À bascule à 2 vitesses
Arrêt différé	non
Rappel d'entretien des filtres	non
Détecteur Heat Sentry ^{MC}	non
Capacité ADA	oui
Éclairage	ENERGY STAR® DEL à 1 intensité (inclus)
Filtre(s) à graisses	Mailles ouvertes (qté 2)
Matériel pour l'installation	Supports EZ1
ENERGY STAR®	oui
Recirculation	Filtre(s) de recirculation vendus séparément

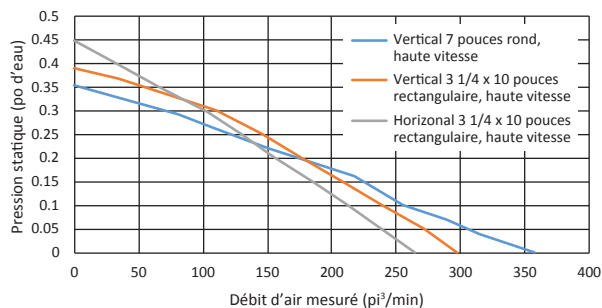
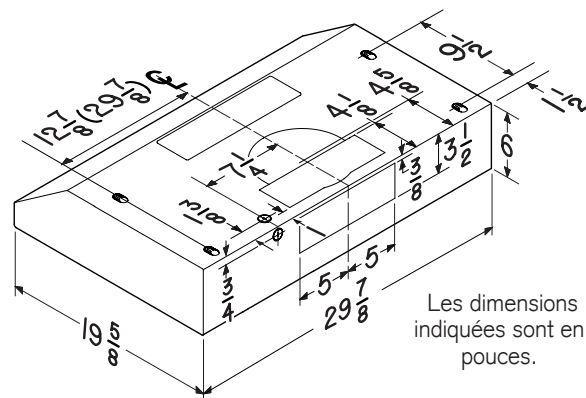
ALIMENTATION CA	
120 V, 60 Hz - 0,65 A	

ACCESSOIRES OPTIONNELS	
Volet rond de 7 po	BP87

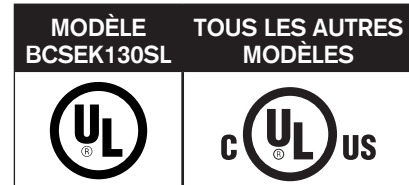
HAUTEUR DE MONTAGE	
De 18 po à 24 po au-dessus de la surface de cuisson	

GARANTIE LIMITÉE	
1 an	
3 ans (modules DEL seulement)	
<i>(Voir le manuel d'installation pour le texte complet de la garantie.)</i>	

POUR UTILISATION À L'INTÉRIEUR SEULEMENT



L'HOMOLOGATION HVI-2100 est conforme aux nouvelles techniques et procédures d'essai prescrites par le Home Ventilating Institute pour les produits d'emploi courant, dès leur disponibilité pour les consommateurs. Le rendement du produit est évalué à une pression statique de 0,1 po, d'après les tests effectués dans le laboratoire d'essai ultra-perfectionné de l'AMCA. Le sone est une mesure de la perception humaine de la puissance sonore, d'après des mesures effectuées en laboratoire.



ENERGYGUIDE

Refrigerator-Freezer

- Automatic Defrost
- Top-Mounted Freezer
- No Through-the-Door-Ice-Service



Electrolux
FFHT1831Q*
Capacity: 18.0 Cubic Feet

Compare ONLY to other labels with yellow numbers.
Labels with yellow numbers are based on the same test procedures.

Estimated Yearly Energy Cost

\$44



Cost range not available

363 kWh

Estimated Yearly Electricity Use

Your cost will depend on your utility rates and use.

Cost range based only on models of similar capacity with automatic defrost, top-mounted freezer, no through-the-door-ice-service

Estimated energy cost based on a national average electricity cost of 12 cents per kWh.

PART NO. A02090710



Canada

ENERGUIDE

Energy consumption / Consommation énergétique

322 kWh
per year / par année

▼ This Model



**Uses least energy /
Consomme le moins
d'énergie**

Similar models
compared

Model number

Type 3

16.5 TO 18.4 CU. FT.
volume in ft³/ volume en pi³

FFHT1831Q*

**Uses most energy /
Consomme le plus
d'énergie**

Modèles similaires
comparés

Numéro du modèle

Removal of this label before first retail purchase is an offense (S.C. 1992, c. 36).
Enlever cette étiquette avant le premier achat au détail constitue une infraction (L.C. 1992, ch. 36).



The **ENERGY STAR**® mark on this EnerGuide label signifies that this is an energy-efficient appliance. Its energy performance meets or exceeds the Government of Canada's high efficiency levels. Use the EnerGuide rating to determine how this appliance compares to other similar models.

La marque **ENERGY STAR**® sur cette étiquette ÉnerGuide signifie que l'appareil est éconergétique et que son rendement énergétique satisfait ou dépasse les niveaux de haute efficacité du gouvernement du Canada. Utilisez la cote ÉnerGuide afin de comparer le rendement de l'appareil avec celui d'autres modèles similaires.