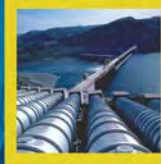
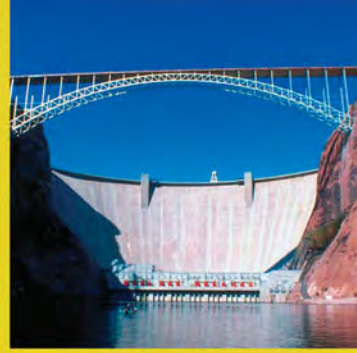


Catalog & Reference Guide | Volume 10



WESCHLER INSTRUMENTS

The **best** resource for measurement, control and test equipment.



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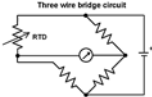
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Welcome to the *Weschler Instruments Product Catalog & Reference Guide*. Here we present a selection of the more popular meters, sensors and test equipment available from our Measurement Specialists. This edition features many new products, as well as 'industry standard' models that have been used for many years.

This catalog also includes condensed information on the Weschler brand products manufactured at our Florida facility. Full specifications and application information for these products can be found on our website www.weschler.com. Also see our website for new products and reference information added since this catalog was printed.

Weschler Instruments distributes over 50 of the leading equipment brands. This catalog shows only a small portion of our total offering. Call, fax or email us for information on any models you don't see here. Our experienced sales team will be happy to assist you in selecting the best products for your application.

75 Years of Power and Process Measurements

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	DIGITAL METERS 11 - 42 Panel, Switchboard, Bargraph, Power, Energy, Process, Multi-function, Counters. ...
	ANALOG METERS 43 - 79 Switchboard, Edgewise, Panel, AC, DC, Power, Synchroscope, Meter Relays...
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CONTROLLERS
DIGITAL METERS
ANALOG METERS
SIGNAL CONDITIONERS
TRANSDUCERS / SENSORS
RECORDERS / DATA LOGGERS
MISC.
TEST EQUIPMENT
TECHNICAL REFERENCE
INDEX

At Weschler Instruments, we have the knowledge and experience to meet all your measurement and control needs.

About Weschler

For more than 60 years, Weschler Instruments has been an innovative, service-oriented manufacturer and distributor of electrical and electronic measuring instruments. Customers worldwide use our products in power generating plants, steel mills, chemical plants, paper mills, automobile factories and other industrial applications that require rugged, reliable and accurate instrumentation. Weschler is best known as the supplier of "Westinghouse style" analog switchboard meters and unique Digital Bargraph meters.

Customized Solutions

Weschler's Measurement and Control Group (MAC) supplies a wide range of products to sense, transmit, measure, display and record your power and process data. Key products include analog and digital panel meters, sensors, transducers, controllers, and more. Industry turns to Weschler's Application Specialists to help choose the best solution from the numerous products available today. We carry products from over 50 manufacturers, so we can recommend the product that best fits the application. Weschler is North America's largest distributor of analog and digital panel meters. We're proud to have one of the most knowledgeable inside sales support teams in the industry, averaging over 24 years experience.

Flexible Manufacturing Process

Weschler sets the industry standard for quality, reliability and dependability. Skilled technicians at Weschler's Meter Modification Center can quickly customize a meter for a particular application. When the customer selects a configuration, the meter chassis that best fits the application is pulled from our extensive stock. Our highly qualified and experienced technicians configure the electrical components, add the customized scale and perform the setup/calibration.

After thorough testing and a quality check, the product is ready for shipment. For added assurance of total quality and performance, Weschler can provide a Certificate of Compliance or Certificate of Conformance, on request. We confidently back the ruggedness and durability of our customized meters by offering a flexible 1 year warranty, or the manufacturer's original warranty if it is longer.

Transformer Advantage

This innovative Weschler product line allows utilities to increase transformer capacity while protecting against overload and outages. We take pride in providing high quality products and frequently adapt our standard units to specific customer needs.

Whether your application is best served by a Weschler product or one of the many products we distribute, our sales specialists will be happy to work with you to solve your measurement and control needs.

Weschler Instruments... where reliability is truly critical.

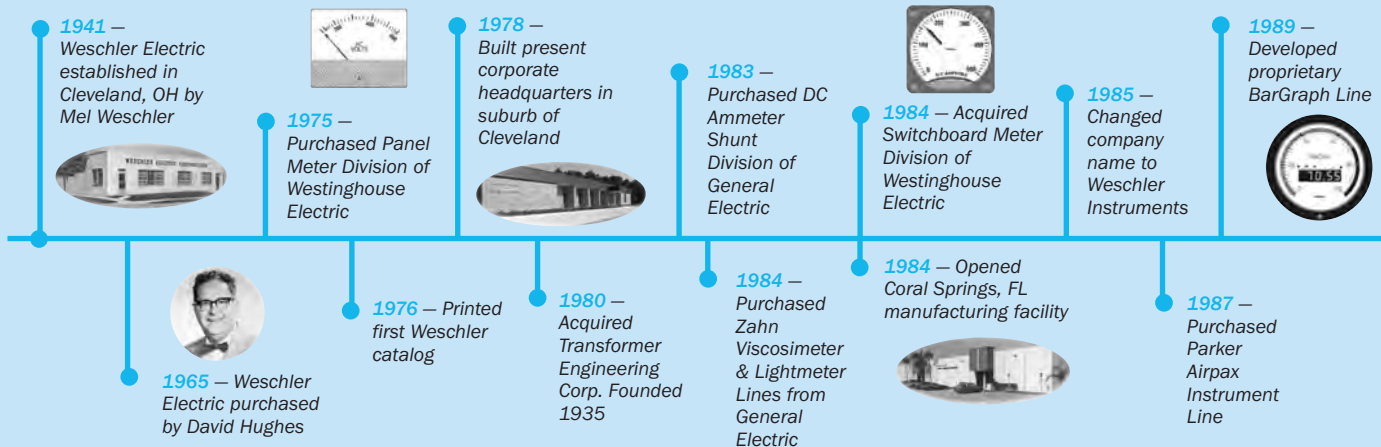
- The headquarters in Cleveland, Ohio is augmented by additional production facilities in Coral Springs, Florida, as well as offices in 5 states. Our state of the art voice and data networks provide prompt and secure information flow between all locations.



- **Inside Sales**
We're proud to have one of the most knowledgeable inside sales teams in the industry, averaging over 24 years experience.



WESCHLER COMPANY TIMELINE



Applications

Our application specialists are ready to provide pre- and post-sale technical support.



Meter Assembly

Analog meter products are assembled by skilled technicians to assure long term reliability.



Fulfillment

Literature requests can be quickly filled by fax, email, or express mail.



Dial Printing

In-house printing allows quick delivery on meters with custom scales and legends.



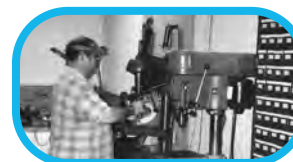
Exhibits

Weschler's technical staff participates in trade shows, conferences and industry standards committees.



Prototype Shop

Small lots and rush orders can be modified in-house to speed delivery.



CAD

Computer-Aided Design and simulation tools cut turn-around time and assure precision.



Production Test

Product performance is verified using a combination of manual and automated tests. Every product is tested before shipment.



Engineering Lab

Our engineering lab tests products to both industrial and military standards. Performance of key components is also verified.



Quality Assurance

QA staff assure conformance to procedures and customer requirements. Experienced QA technicians run an independent verification of performance and can provide certificates of calibration on request.



Electronic Assembly

Electronic products are assembled using a combination of automated and manual assembly processes.



Inventory

To provide rapid delivery, we maintain an extensive stock of parts, subassemblies and finished units.



1992 — Developed bargraph meter for U.S. submarine fleet



1996 — Developed innovative Transformer Guardian Product Line for utility substations



1999 — Developed Transformer Advantage Product Line



2006 — Introduced Premo family of Bargraph Controllers



1990 — Acquired NES Digital Panel Meter Line



1995 — Purchased Volt-Pac Variable Transformer Line from General Electric



2002 — Purchased Measurement and Control business (formerly EIL/Metermaster) from Transcat



2008 — Developed Enhanced Transformer Advantage product line



Bringing you the best in measurement & control since 1941.

In 1941, Mel Weschler started Weschler Electric as a meter repair shop located in Cleveland, OH. The company gradually expanded to offer meter modification and calibration services. It became a Mod Center for Triplet and Simpson brands before David Hughes Sr. purchased the business in 1965. Mr. Hughes was VP of Sales for Hickok at the time, and had previously worked at Simpson. Weschler Electric then added the distribution of RCA and Hickok test equipment as well as Empro shunts and Midwest transformers.

Over the next 10 years, Weschler grew to be the largest Mod Center in the country for Westinghouse meters. When Westinghouse decided to sell their panel meter business in 1975, Weschler seized the opportunity to further expand their meter business. Needing a larger facility due to this additional business, Weschler built their present headquarters building in 1978.

In the early 1980s, the company purchased several product lines from General Electric. When Westinghouse decided to divest their switchboard meter business in 1984, Weschler opened a manufacturing and technical support facility in Coral Springs FL for this line.

In the late 1980s, Weschler Electric established an electronics design group to develop proprietary digital instruments. To emphasize the shift into electronic equipment, the company name was changed to Weschler Instruments. The first Weschler Bargraph products were introduced in 1989. This line expanded in the early 1990s with the

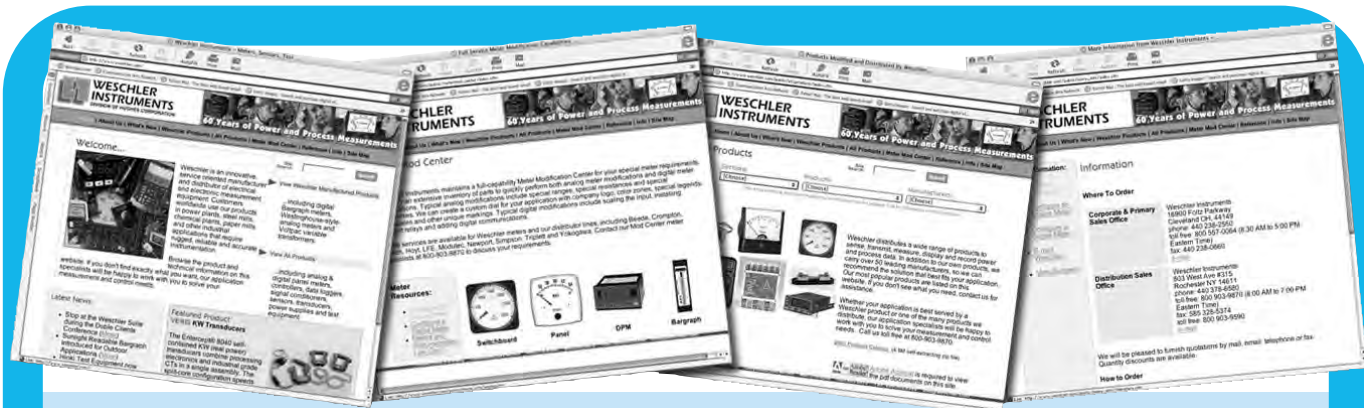
introduction of custom versions for military applications. Products were also qualified for use in nuclear generating plants around the world. To improve response time, the design group moved to the Coral Springs facility in the mid 90s.

With the passing of David Hughes Sr. in 1995, his sons Dave and Doug, who had been involved in the business since the early 70s, jointly took over leadership of the company. In 1996, an experimental Bargraph project for substation monitoring resulted in the development of the Transformer Guardian product line. A second generation product was introduced for this application in 1999.

Weschler experienced significant growth with the acquisition of the Transcat/EIL/Metermaster Measurement and Control business in 2002. Weschler Instruments now operates two production and distribution facilities, as well as sales offices in 5 states. Weschler is both a manufacturer and a distributor of major lines of measurement, display, process control and test equipment.



Our brochure from 1965



For more information, please visit us at:

www.weschler.com

Weschler Premo BarGraph Meter/Controller

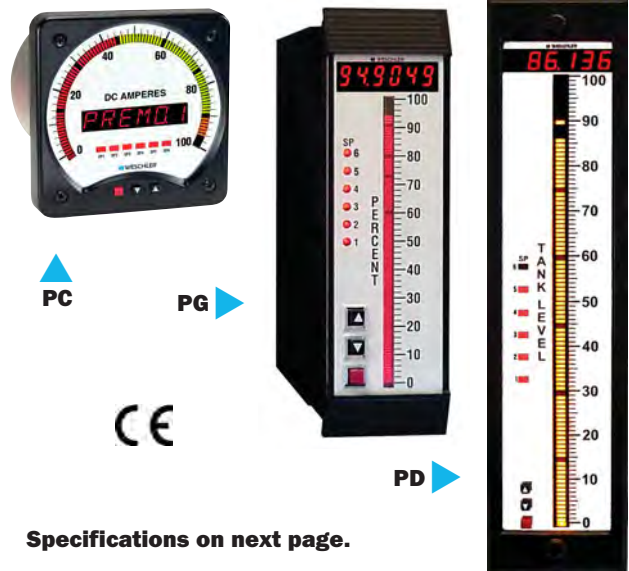
NEW

- 101 segment red, green or tricolor bar
- 6 digit alpha-numeric readout
- Rugged steel case, standard switchboard mounting
- 6 assignable relays with tracking, latching & manual reset functions
- Single or dual analog retransmit
- ASCII, Modbus Serial & Ethernet communications
- Wide variety of input modules
- Datalogging & PID control functions
- Cross channel calculations with multi-channel input modules
- Front panel & external dimming
- Enhanced table calibration for tank level, square law & other non-linear measurements
- Optional SD memory card for long term data logging
- 3 case styles

Direct Measurement of:

- DC Current
- AC Current
- DC Voltage
- AC Voltage
- Frequency
- Power
- Process Loops
- Thermocouples
- RTDs
- Load Cells/ Strain Gauges
- LVDTs
- Pressure
- Speed Pickups/ RPM
- Resistance/Potentiometers
- Quadrature
- Event Counting

The Premo Bargraph Controller is a full featured, high resolution meter for display and control of process parameters. A wide range of input modules measure electrical signals, sensors and transducers. Analog and digital outputs easily connect to remote indicators or a plant SCADA system. Up to 6 setpoints can be programmed to operate within the span of the selected input module. PID control is available from the first two setpoints.



PC PG PD

CE

Specifications on next page.

CONTROLLERS

ORDERING INFORMATION

To Order—Insert Code for Each Letter to Select Catalog Number.
Order Example: PCRGDCQ1A5CXXX

PC	A	B	C	D	E	F	G	H	I	J
A	Style									
	C	4 1/2" Switchboard								
	D	12" Edgewise Vertical								
	G	6" Edgewise Vertical								
B	Bar Color									
	R	Red								
	G	Green								
	T	Tricolor								
C	Digital Display Color									
	R	Red								
	G	Green								
D	Input (partial list)									
	DBQ	DC, 20/50/100/200mV w/24V Excitation								
	DCQ	DC, 2/20/200mA w/24V Exc								
	DGQ	DC, 1A								
	DDQ	DC, 5A								
	ABQ	AC, 200mV/2V/20V, scaled RMS								
	AAQ	AC, 200/600V, scaled RMS								
	AGQ	AC, 200mV/2V/20V, True RMS								
	AFQ	AC, 200/600V, True RMS								
	ACQ	AC, 2/20/200mA, scaled RMS								
	ADQ	AC, 1 Amp, scaled RMS								
	AEQ	AC, 5 Amp, scaled RMS								
	AHQ	AC, 2/20/200mA, True RMS								
	AJQ	AC, 1A, True RMS								
	AKQ	AC, 5A, True RMS								
	PDQ	Process 2/5/10/20/200V/2mA/20mA/Custom								
	TMP	Thermocouple, J/K/R/S/T/B/N								

ORDERING INFORMATION CONTINUED

D	Input continued	
	THP	RTD, 100Ω Pt, 2/3/4-wire
	GHQ	Direct Pressure, 30 psi differential/gage
	GKQ	Direct Pressure, 100 psi differential/gage
	SBQ	Pressure 5/10VDC Exc., 2/20 mV/V, 4/6-wire
	EAP	Line Frequency, 50-500VAC
	FAP	Universal Frequency / RPM / Up Down Counter
	CAP	Quadrature Counter
	REP	Resistance, 2/3/4-wire, 200/2k/20kΩ
	KAP	Single Phase Power, 300V/1A from CT
	KBP	Single Phase Power, 300V/5A from CT
	KCP	DC Watts, 200V/50mV from shunt
	PAD	Dual Process Loop, 4-20mA
	DCD	Dual DC, 2mA
	DBD	Dual DC, 2V
	TAD	Dual Thermocouple, J/K/R/T
	FAD	Dual Frequency
	FBD	Dual Counter
E	Power	
	1	85-265VAC/95-370VDC
	2	15-48VAC/10-72VDC
F	Retransmit (analog output)	
	A	Isolated 4-20mA or 0-20mA, scalable
	V	Isolated 0-10VDC, scalable
	D	Isolated Dual 0-10VDC, scalable
	X	None
G	Communications	
	2	Isolated ASCII Code RS-232
	4	Isolated ASCII Code RS-485
	5	Isolated ModBus Protocol RS-232
	6	Isolated ModBus Protocol RS-485
	8	Ethernet ACSII TCP/IP
	9	Ethernet ModBus TCP/IP
H	Relays (partial list)	
	C	Two 10A Form C
	D	Two 10A Form C & Two 5A Form A
	H	Six Form A
	X	None
I	Memory	
	A	1M with Real time clock
	X	Standard
J	Options (2 digits)	
	D	Continuous external dimming
	W	Spray tight front
	X	None

Weschler Premo BarGraph Meter / Controller

Continued from previous page

SPECIFICATIONS

Digital Display Range:	-199999 to 999999
Decimal Point:	Five positions, front panel selectable
Update Rate:	3 to 10 times per second
Display Dimming:	8 level from front panel; continuous external option
A/D Converter:	Bipolar 17 bit (optional 23 bit)
Counter Functions:	Two built-in Up/Down counters
Data Logging:	Logging with date/time (Memory option A)
Trigger:	Time interval, setpoint, manual
Data storage:	Non-volatile EEPROM
Linearization:	4 selectable 32 point tables, cascadeable
Math Functions:	Sum, difference, ratio or the product of two inputs
Offset Functions:	Tare, compensation and calibration
Peak and Valley:	Min/Max storage with front panel recall
Digital Comm:	RS-232, RS-485, Ethernet
Setpoint Functions:	Hysteresis, on/off delays, one shot, pulse and repeat timers, latching, dual PID, setpoint tracking, logging trigger
Signal Processing:	Averaging, smart filter, rounding, square root
Timer:	Time-up, time-down, or real-time clock modes
Totalizer:	Two, for Total and Batch Total
Analog Output:	Isolated 16-bit, accuracy 0.02% FS
Resolution:	0.4µA on current, 250µV on voltage
Compliance:	500Ω max. for current, 500Ω min. for voltage
Real Time Clock:	Optional, 15 yr Lithium battery backup
Power:	85-265VAC / 95-370VDC @ 5W max
(DC to 400Hz)	15-48VAC / 10-72 VDC @ 5W max
Operating	0-50°C (32-122°F),
Temperature:	<95% (non-condensing) at 40°C
Software:	PC-based configuration utility

Style C

Bar:	7.25" length, 235° arc, ±60° viewing angle
Digits:	0.43" (10.9mm) height
Case:	Steel housing, molded front & rear bezel
Size:	4.43" square bezel, 4.75" behind panel
Mounting:	Fits standard ANSI 4" switchboard cutout

Style G

Bar:	10" length, ±60° viewing angle
Digits:	0.31" (7.9mm) height
Case:	Steel housing, molded rear bezel
Size:	1.7" x 6.04", 7" behind panel
Mounting:	Fits standard ANSI 6" switchboard cutout

Style D

Bar:	4" length, ±60° viewing angle
Digits:	0.43" (10.9mm) height
Case:	Steel housing, metal front, molded rear bezel
Size:	3.15" x 12.9", 7.8" behind panel
Mounting:	Fits Bailey draft gauge cutout

Yokogawa Temperature Controllers

- On/Off, PID, Heat/Cool & Limit Control
- Dynamic auto tune & "SUPER" overshoot suppression
- Compact 1/16 DIN package
- Large LED display
- IP65 splash & dust-proof front panel
- Optional analog retransmit of measured value
- Timer function (UT150)
- Optional heater burnout alarm & two alarm output relays
- Optional 24V AC/DC power supply
- Optional RS-485 MODBUS communication



UT130

SPECIFICATIONS

Input:	
RTD:	3-wire Pt100
T/C (all models):	J, K, T, E, L, U
T/C (UT150 models):	R, S, B, N, platinum
DC In (UT150 models):	0-100mV, 0-5V, 1-5V, 0-10V
Basic Accuracy:	
T/C:	±2°C ±1d
RTD:	±1°C ±1d
DC:	±0.3% ±1d
Setpoints:	1 on UT130, 2 on UT150
Timer (UT150 models):	Up to 100 hours
Retransmit:	4-20mA
Contact Input:	2 points for SP select, run/stop or timer
Contact Output:	2 for alarm, heater disconnect or timer
Alarm:	25 types
Display:	UT130: single 0.7" 3-digit LED UT150: dual (red/green) 4-digit LED
Power:	100-240VAC, 8VA
Approvals:	UL, CSA, CE
Temperature:	0-50°C operating
Dimensions:	48x48x100mm

ORDERING INFORMATION

To Order—Insert Code for Each Letter to Select Catalog Number

A B C Example: UT130-RN/AL/RS

A	Model
	UT130 Temperature Controller
	UT150 Temperature & Voltage Controller
	UT150L Limit Controller
B	Control
	/RN Relay output
	/VN Pulse output ³
	/AN 4-20mA output (UT150 only) ³
	/RR Heat/cool relay outputs ³
	/VV Heat/cool pulse outputs ³
	/AA Heat/cool 4-20mA outputs (UT150 only) ³
C	Options
	/AL Alarm output (2 points)
	/V24 24V AC/DC power supply ³
	/HBA Heater disconnect alarm ^{2,3}
	/RET Analog retransmit (UT150 only)
	/RS RS-485 Communications
	/EX Two contact input (UT150 only) ¹

¹ cannot be ordered with communications when heat/cool control specified

² cannot be ordered with communications

³ not available on UT150L

Yokogawa Advanced Controllers

NEW

Digital Indicating Controllers: UT55A, UT52A, UT35A, UT32A
Program Controllers: UP55A, UP35A
Digital Indicator with Alarms: UM33A

- 8 built-in PID control modes
- 8 built-in PID control types
- Ladder sequence control
- Fuzzy logic control
- Active color LCD display
- Scrolling text
- Programmable function keys
- RS-485 (Modbus) & Ethernet communications
- 3 year warranty



UT32A ▲ **UT35A** ▲ **UP55A** ▲

With built-in **Ladder Sequence Control**, the UT Advanced controllers can replace a small PLC to:

- Monitor and control external machinery
- Implement digital input/output logic functions.

Sequence control and PID control can be performed simultaneously.

The **Fuzzy Logic Control** functions deliver fine control and reduce overshoot or hunting.

8 Built-in Control Types

- PID control
- ON/OFF control (1 point hysteresis)
- ON/OFF control (2 point hysteresis)
- Two-position, two-level control
- Heating/cooling control
- Sample PI control
- Batch PID control
- Feedforward control

8 Built-in Control Modes

- Single-loop control
- Cascade primary-loop control
- Cascade secondary-loop control
- Cascade control
- Loop control for backup
- Loop control with PV switching
- Loop control with PV auto-selector
- Control with PV-hold



To Order—Insert Code for Each Letter to Select Catalog Number.

Universal Input:

Thermocouple: Type K, J, T, B, S, R, N, E, L, U, W, PL-2, PR20-40, W97Re3, W75Re25
 RTD: Pt100, JPt100 (3-wire except 3/4-wire on 55A)
 DC Voltage: 0.4 to 2V, 1 to 5V, 0 to 2V, 0 to 10V, -10 to 20mV, 0 to 100mV
 DC Current: 4 to 20mA, 0 to 20mA
Standard Power Supply: 100-240 V AC
PV Display: 5 digits, 0.1% of FS accuracy

UP55A— [A] [B] [C] — [D] — 00 / [E]	
A Control	0 Standard type
	1 Position proportional type
	2 Heating/cooling type
B Functions	0 None
	1 Remote (1 additional aux. analog) input, 1 additional DI
	2 RS-485 (Max.19.2 kbps, 2/4-wire)
	3 10 additional DOs
	4 3 additional aux. analog inputs, 2 DIs & 5 DOs to be deleted
C Network Communications	0 None
	1 RS-485(Max.38.4 kbps, 2/4-wire)
	2 Ethernet (with serial gateway function)
D Case Color	10 Light Gray
	11 Dark Gray
E Options	/DR Additional direct input (TC & 3/4-wire RTD), current input to Remote (1 additional aux. analog) input, 1 DI to be deleted
	/HA Heater break alarm
	/DC Power supply 24 V AC/DC
	/CT Coating

Model	UT55A	UT52A	UT35A	UT32A	UP55A	UP35A	UM33A
Size	1/4 DIN	1/8 DIN	1/4 DIN	1/8 DIN	1/4 DIN	1/4 DIN	1/8 DIN
# of Analog Inputs Std (Max)	1 (4)	1 (2)	1	1	1 (4)	1	1
# of SPs (PIDs) Max	8	8	4	4	8	4	—
# of Control Modes Max	8	8	1	1	5	1	—
# of Control Types Max	8	8	5	5	4	4	—
Relay, Pulse, Current Output	✓	✓	✓	✓	✓	✓	—
# of Analog Outputs Std (Max)	2 (3)	2 (3)	2	2	2 (3)	2	1
# of Digital Inputs Std (Max)	3 (9)	3 (5)	2 (7)	2 (4)	3 (9)	3 (8)	2
# of Alarms Max	8	8	4	4	8	2	8
# of Digital Outputs Std (Max)	3 (18)	3 (5)	3 (8)	3 (5)	8 (18)	3 (8)	3 (9)
RS-485 communication (Max)	✓ (2)	✓ (1)	✓ (1)	✓ (1)	✓ (2)	✓ (1)	✓ (1)
Ethernet communication	✓	—	✓	—	✓	✓	—
Split Computation Output	✓	✓	—	—	✓	—	✓
Ratio & Square Root Extraction	✓	✓	—	—	✓	—	✓
Remote SP Function	✓	✓	—	—	✓	—	✓
Heater Break Alarm Function	Std type	Std type	Std or Heat/cool	Std type	Std type	Std type	—
Ladder Sequence (max. steps)	✓ (500)	✓ (500)	✓ (300)	✓ (300)	✓ (500)	✓ (300)	—
Control Scan Period (msec)	50/100/200	200	200	200	100/200	200	50/100/200
Bar graph display (Number)	✓ (2)	✓ (2)	✓ (1)	✓ (1)	✓ (2)	✓ (1)	—

See complete [data sheet](#) for additional options and ordering information for UT55A, UT52A, UP35A models.



UM33A ▶

ORDERING INFORMATION

UM33A— [A] [B] — [C] / [D]	
A Control	0 Standard type
B Functions	00 None
	10 1 additional DO (form C relay) + RS-485 comm (Max. 38.4kbps, 2/4-wire)
	20 1 additional DO (form C relay)
	30 6 additional DOs (form C relay; 1 point & open collector; 5 points)
C Case Color	10 Light Gray
	11 Dark Gray
D Options	/LP 24 V DC loop power supply
	/DC Power supply 24 V AC/DC
	/CT Coating

UT32A— [A] [B] — [C] — 00 / [D]	
A Control	0 Standard type
	1 Position proportional type
	2 Heating / cooling type
B Functions	00 None
	10 RS-485 comm (Max.38 kbps, 2/4-wire)
	20 2 additional DIs & 2 additional DOs
C Case Color	10 Light Gray
	11 Dark Gray
D Options	/LP 24 V DC loop power supply
	/HA Heater break alarm
	/DC Power supply 24 V AC / DC
	/CT Coating

UT35A— [A] [B] [C] — [D] — 00 / [E]	
A Control	0 Standard type
	1 Position proportional type
	2 Heating / cooling type
B Functions	0 None
	1 2 additional DIs and 2 additional DOs
	2 5 additional DIs and 5 additional DOs
C Network Communications	0 None
	1 RS-485 (Max.38.4 kbps, 2/4-wire)
	2 Ethernet (with serial gateway function)
D Case Color	10 Light Gray
	11 Dark Gray
E Options	/LP 24 V DC loop power supply
	/HA Heater break alarm
	/DC Power supply 24 V AC / DC
	/CT Coating

CONTROLLERS

Newport Temperature and Process Controllers

NEW

PLATINUM Series

- High accuracy, high performance (24 bit, 20 samples/sec)
- Full autotune PID with fuzzy logic adaptive control
- Universal input (T/C, RTD, thermistor, process V & mA)
- Up to 99 programs with 16 ramps and soaks and chaining
- Bright 3-color (red/green/amber) 9 segment LED display
- Dual display (Pt16D & Pt32D)
- Analog, pulse and relay output options
- USB host communications standard
- Optional Ethernet & RS232/485 with Modbus
- No jumpers to set, totally firmware configurable
- NEMA 4, IP65 front (NEMA 1 on 1/8 DIN size)



ORDERING INFORMATION

Model No.	Output 1	Output 2	Output 3
Single Display Models			
Pt*-330	SPDT Relay	SPDT Relay	-
Pt*-220	0.5 A SSR	0.5 A SSR	-
Pt*-304	SPDT Relay	DC Pulse	-
Pt*-305	SPDT Relay	Analog	-
Pt*-440	DC Pulse	DC Pulse	-
Pt*-224	0.5 A SSR	0.5 A SSR	DC Pulse
Pt*-225	0.5 A SSR	0.5 A SSR	Analog
Pt*-144	SPST Relay	DC Pulse	DC Pulse
Pt*-145	SPST Relay	DC Pulse	Analog
Pt*-444	DC Pulse	DC Pulse	DC Pulse
Pt*-445	DC Pulse	DC Pulse	Analog
Dual Display Models			
Pt**D-330	SPDT Relay	SPDT Relay	-
Pt**D-220	0.5 A SSR	0.5 A SSR	-
Pt**D-304	SPDT Relay	DC Pulse	-
Pt**D-305	SPDT Relay	Analog	-
Pt**D-440	DC Pulse	DC Pulse	-
Pt**D-224	0.5 A SSR	0.5 A SSR	DC Pulse
Pt**D-225	0.5 A SSR	0.5 A SSR	Analog
Pt**D-144	SPST Relay	DC Pulse	DC Pulse
Pt**D-145	SPST Relay	DC Pulse	Analog
Pt**D-444	DC Pulse	DC Pulse	DC Pulse
Pt**D-445	DC Pulse	DC Pulse	Analog
Options			
-EIP	Ethernet with embedded web server (not available on Pt32)		
-C24	Isolated RS232/RS485 @ 1200 to 115,200 baud		
-DC	12-36 Vdc power; 20-36 Vdc for dual display or Ethernet option		

* Insert 32 for 1/32 DIN size, 16 for 1/16 DIN size, 8 for 1/8 DIN size
 ** Insert 16 for 1/16 DIN size, 8 for 1/8 DIN size
 Example: Pt16D-330-C24-DC

SPECIFICATIONS

INPUTS	
Input Types:	Thermocouple, RTD, Thermistor, DC Voltage, DC Current
Current Input:	4 to 20 mA, 0 to 24 mA scalable
Voltage Input:	-100 to 100 mV, -1 to 1 V, -10 to 10 Vdc scalable
Thermocouple Input:	K, J, T, E, R, S, B, C, N
RTD Input:	100/500/1000Ω Pt, 2-, 3- or 4-wire; 0.00385, 0.00392 (100Ω only), or 0.003916 (100Ω only) curves
Thermistor Input:	2252Ω, 5kΩ, 10kΩ
Configuration:	Differential, bipolar
Basic Accuracy:	0.03% FS process, 0.3°C RTD, 0.2°C thermistor, 0.4°C J/K/T/E/C/N, 0.5°C R/S/B
Resolution:	0.1° temperature; 10 μV process
Input Impedances:	
Process Voltage:	10MΩ for ±100 mV, 1MΩ for other voltage ranges
Process Current:	5Ω
Thermocouple:	10kΩ max
Auxiliary Input:	3.5kΩ for 0-10 V, 50kΩ for 0-1 V, 50Ω for Current
A/D Conversion:	24-bit sigma delta
Reading Rate:	20 samples per second
Digital Filter:	Programmable from 0.05 seconds to 6.4 seconds
CMRR:	120 dB
Excitation:	5, 10, 12, and 24 Vdc @ 25 mA, firmware selectable
Setpoint Adjustment:	-9999 to +9999 counts
CONTROL MODES	
Action:	Reverse (heat), direct (cool), or heat/cool
Auto-Tune:	Operator initiated from front panel
Adaptive Tune:	User selectable; fuzzy logic continuous PID tuning optimization
Control Modes:	ON/OFF or the following time/amplitude proportional control modes; selectable manual or auto PID, proportional, proportional with integral, proportional with derivative
Cycle Time:	0.1 to 199 seconds
Ramp and Soak:	Up to 99 saved ramp & soak programs, up to 8 ramp & 8 soak segments with individually selectable events per program
Segment Times:	00.00 to 99.59 (HH:MM) or 00.00 to 99.59 (MM:SS)
CONTROL OUTPUTS	
Analog Output:	Non-isolated, Proportional 0 to 10 Vdc or 0 to 20 mA; 500Ω max; programmable for control or retransmission; accuracy is 0.1% of full scale
DC Pulse:	Non-isolated; 10 Vdc at 20 mA
SPST Relay:	Single pole, single throw mechanical relay, 250 Vac or 30 Vdc at 3 A (resistive load)
SPDT Relay:	Single pole, double throw mechanical relay, 250 Vac or 30 Vdc at 3 A (resistive load)
SSR:	20 to 265 Vac at 0.05-0.5 A (resistive load);
COMMUNICATIONS (USB standard, Serial and Ethernet optional)	
Connection:	USB: Female micro-USB Ethernet: Standard RJ45 Serial: Screw terminals
USB:	USB 2.0 host or device
Ethernet (IEEE 802.3):	10/100 Base-T autoswitching, TCP/IP, ARP, HTTPGET
Serial:	Software selectable RS232 or RS485; programmable 1200 to 115200 baud
Protocols:	Newport ASCII, Modbus® ASCII/RTU
ISOLATION (1min test)	
Power to Input/Output:	2300 Vac; 1500 Vac (low voltage/power option)
Power to Relays/SSR:	2300 Vac
Relay to Relay/SSR:	2300 Vac
SSR to Relay/SSR:	2300 Vac
RS232/RS485 to I/O:	500 Vac
GENERAL	
Operating Temp.:	0 to 50°C (32 to 122°F), 90% RH non-condensing
Line Voltage:	90-240 Vac ±10%, 50-400 Hz, 110-375 Vdc; 5W max.
Low Voltage Option:	12-36 Vdc power; 20-36 Vdc for dual display or Ethernet (not CE or UL)
Display:	4-digit, 9-segment LED
Case depth:	127mm

Optional PT-USB-CABLE is a NEMA4 rated panel mount USB connector with 12" (304mm) cable that connects to the controller's USB port. Includes protective end cap.

Extech PID Controller



48VFL
CE

- Dual 4-digit LED displays for process & setpoint values
- User-friendly menus and tactile keypad
- Fuzzy Logic PID offers intuitive control
- Manual mode overrides automatic control
- One-touch Auto Tuning for quick setup and precise control
- Single stage Ramp and Soak program with Ramp-to-Setpoint Limit
- Soft Start feature for smooth process start-up
- Accepts thermocouple and RTD inputs
- Select input type from display menu - no hardware change
- Two 'Latching' relays with 8 Alarm modes & advanced Timer modes

SPECIFICATIONS

Inputs	
Type K	-58 to 2498°F (-50 to 1370°C)
Type J	-58 to 1832°F (-50 to 1000°C)
Type B	32 to 3272°F (0 to 1800°C)
Type T	-454 to 752°F (-270 to 400°C)
Type E	-58 to 1382°F (-50 to 750°C)
Type R, S	32 to 3182°F (0 to 1750°C)
Type N	-58 to 2372°F (-50 to 1300°C)
Type C	-58 to 3272°F (-50 to 1800°C)
Pt100 RTD (DIN)	-328 to 1652°F (-200 to 850°C)
Pt100 RTD (JIS)	-328 to 1202°F (-200 to 650°C)
Control/Alarm Relay	5 Amp @ 110V, SPST (resistive load)
DC Current Output	4-20mA (resistive); Impedance < 600 ohms
Accuracy	T/C: ±1.8°F (1°C); RTD: ±0.36°F (0.2°C)
Sampling Time	4 samples per second
LED Status	Alarm and Control output status
Control Modes	Fuzzy Logic enhanced three-term PID with Auto Tune <ul style="list-style-type: none"> • Proportional Band 0 to 300.0% • Integral time 0 to 3600 seconds • Derivative time 0 to 900 seconds • Hysteresis 0.0 to 200.0 or 0.0 to 2000 • Cycle time 1 to 100 seconds
Front Panel	Lexan, Drip/Dust proof, IP63
Power Supply	90 to 264 VAC; 50/60 Hz (< 5VA)

ORDERING INFORMATION

48VFL11	1/16 DIN Temperature PID Controller with one relay output
48VFL13	1/16 DIN Temperature PID Controller with 4-20mA output
96VFL11	1/4 DIN Temperature PID Controller with two relay outputs
96VFL13	1/4 DIN Temperature PID Controller with 4-20mA output

Newport Autotune Process & Temperature Controller

- High Accuracy ±0.5°C, 0.03% Rdg.
- Extended 5-Year Warranty
- Universal Inputs
- Relay, SSR, DC Pulse Outputs
- Ramp to Setpoint
- Universal Power Supply, 90-250 VAC or VDC
- Dual Output and Dual Alarm
- Optional RS-232, RS-485, Isolated Analog Output or Remote Setpoint



▲ ICN77

SPECIFICATIONS

Input

Input Types: Thermocouple, RTD, analog voltage, analog current

Thermocouples: J, K, T, E, R, S, B, C, N, and J DIN

Accuracy: ±0.5°C temp; 0.03% rdg. process

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.

Order Example: ICN77-5-3-2-A2

A - B - C - D - E - F

A	Basic Unit
ICN77	1/16 DIN Controller
B	Configuration
5	NEMA-4/IP65 Face with DIN Cutout
R5	Square Bezel with 1 3/4" Round Cutout
C	Primary Output
2	SSR (1A @ 120/240 VAC)
3	SPDT Relay (5A @ 120 VAC)
4	Pulsed 0-10 VDC @ 20 mA Max
5	Non-isolated 1-10V or 0-20 mA
D	Second Output
0	None
2	SSR (1A @ 120/240 VAC)
3	SPDT Relay (5A @ 120 VAC)
4	Pulsed 0-10 VDC @ 20 mA Max
E	Options
A2	Second Alarm Relay
C2	Isolated RS-232
C4	Isolated RS-485
PV	Isolated Analog Output
RSP	Remote Setpoint
F	Optional Power—Include Only if Required
DC	10-34 VAC/VDC Power

ORDERING INFORMATION—ACCESSORIES

SPC-116-S	Splash-Proof Cover for 1/16 DIN Controllers
TP4	Trim Plate Adapter to Install 1/16 DIN Meter in Existing 1/4 DIN Panel Cutout
TP6	Trim Plate Adapter to Install 1/16 DIN Meter in Existing 1/8 DIN Panel Cutout

ATC Temperature Controller

NEW

- Dual 4-digit, seven segment LED display
- PID & On/Off control
- Thermocouple and RTD input
- °C / °F selectable
- Two setpoints
- Field selectable Control Output (Relay or SSR)
- Auxiliary Output - factory installed Relay or SSR
- 1/16 DIN Case, IP65 Front



ATC550

	INPUT RANGES		Resolution	
			1°	0.1°
Pt100 RTD	°C	-150 to 850	-150 to 850	
	°F	-238 to 1562	-199 to 999	
Thermocouple				
	J	°C -199 to 750	-199 to 750	
K	°C	-328 to 1382	-199 to 999	
	°F	-328 to 2462	-199 to 999	
T	°C	-199 to 400	-199 to 400	
	°F	-328 to 750	-199 to 750	
R&S	°C	0 to 1750	N/A	
	°F	32 to 3182	N/A	

ORDERING INFORMATION

ATC550S00000	ATC550 Temperature Controller with Aux Relay output
ATC550S10000	ATC550 Temperature Controller with Aux 12VDC SSR output

SPECIFICATIONS

Inputs:	Thermocouple (J,K,T,R,S) / 3-wire RTD (Pt100)
Sampling Time:	250 ms
Input Filter (FTC):	0.2 to 10.0 seconds
Temperature Unit	°C / °F selectable
Indication Accuracy:	For J, K & T inputs: 0.25% of F.S. ±1° For R & S inputs: 0.5% of F.S. ±2° For RTD inputs: 0.1% of F.S. ±1°
Digital Filter:	Programmable from 0.05 seconds to 6.4 seconds
Excitation:	5, 10, 12, and 24 Vdc @ 25 mA, firmware selectable
Setpoint Adjustment:	-9999 to +9999 counts
Control Action:	PID or ON-OFF
Proportional Band (P):	1.0 to 400.0° (0.0 to 400.0° in cooling)
Times:	0 to 9999 sec Integral (I); 0 to 9999 sec Derivative (D)
Cycle Time:	0.1 to 99.9 sec (heat or cool)
Hysteresis Width:	0.1 to 99.9°
Manual Reset Value:	-19.9 to 19.9°
Heat-Cool Control:	PID (with auto-tuning)
Dead Band:	Programmable from setpoint low limit to setpoint high limit
Control Output:	One, field selectable as relay or SSR drive
SPST Relay:	Single pole, single throw normally open contact, 250 Vac or 30 Vdc at 5 A (resistive load)
SSR Drive:	Voltage pulse, 12 Vdc ±10%, 50 mA
Aux. (Alarm) Output:	One, factory set as either SPST relay or SSR drive, Selectable Deviation or Absolute control mode, 0.1 to 99.9° adjustable hysteresis
Display:	4 digit 7 segment dual LED display Height: 0.3785" (upper), 0.2720" (lower)
LED Indication:	Relay ON, Tune, Soak Time
Operating Temp.:	0 to 50°C (32 to 122°F), <95% RH (non-condensing)
Line Voltage:	85-270V AC/DC, 50-60 Hz, 6VA max. at 230V AC
Dimensions:	52x52x100 mm, 46x46 mm panel cutout (1/16 DIN)

Fuji Temperature and Process Controllers

- PID Plus Self Tuning and Fuzzy Control
- Large LED Display
- NEMA-4X/IP66 Waterproof Faceplate
- Up to 16 Ramp/Soak Segments in Two 8-Segment Patterns
- Heating/Cooling Control
- Timer Function
- Dual Control Output Option
- Digital Input Option
- Analog Retransmission Option
- Programmable Alarms Option
- Heater Break Alarm Option
- RS485 (Modbus™ Protocol) Option
- Free Windows®-Based Software
- Manufactured in an ISO 9001 Facility
- 3-Year Warranty


 **PXR5**

 **PXR9**

 **PXR4**

SPECIFICATIONS

Input

Input signal:	TC: J, K, R, B, S, T, E, N, PL2. RTD: Pt100. Voltage, current. For 1 to 5V/4 to 20 mA DC, 0 to 5V/0 to 20 mA DC
Input filter:	0 to 900.0 sec set in 0.5 sec steps
Input sampling cycle:	0.5 sec

Display

Indication accuracy (at 23°C):	TC: $\pm 0.5\%$ FS ± 1 digit $\pm 1^\circ\text{C}$. TC R (0 to 500°C): $\pm 1\%$ FS ± 1 digit $\pm 1^\circ\text{C}$. TC B (0 to 400°C): $\pm 5\%$ FS ± 1 digit $\pm 1^\circ\text{C}$. RTD, Voltage, Current: $\pm 0.5\%$ FS ± 1 digit
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Control Function

Control action:	On/Off; PID control (with auto-tuning, self-tuning); Fuzzy Control (with auto-tuning)
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Control Outputs

Relay contact:	PXR3 & Output 2: SPST contact, 220 VAC/30 VDC, 3A (resistive load). PXR4, 5, 9: SPDT, 220 VAC/30 VDC, 3A (resistive load)
SSR:	PXR3: 12 to 16 VDC PXR4, 5, 9: ON-17 to 25 VDC; OFF-0.5 VDC or less. Max. current: 20mA or less
4 to 20 mA DC:	PXR3: Allowable load resistance 100 to 500Ω. PXR4, 5, 9: 600Ω or less

Alarm (option)

Alarm type:	Absolute alarm, deviation alarm, zone alarm with upper and lower limits for each; hold function available; alarm latch function provided
Alarm ON-delay:	0 to 9999 sec in 1 sec steps
Process alarm output:	Relay contact: SPST, 220 VAC/30 VDC, 1A (resistive load); Max. 2 points (PXR3), max. 3 points (PXR4, 5, 9)
Heater burnout option (not available on PXR3):	Alarm setting range: 1 to 50A. Available only when control output is relay or SSR drive
Heater burnout alarm output:	Relay contact: SPST, 220 VAC/30 VDC, 1A (resistive load); 1 output point

Remote Setpoint (option)

Input signal:	1 to 5 VDC, 1 point
Accuracy:	$\pm 0.5\%$ ± 1 digit
Input sampling cycle:	0.5 sec
Input impedance:	$\geq 1\text{M}\Omega$

Digital Input (option)

Points:	1 or 2; contact closure. 5 VDC, approx. 2mA
Function (select one):	Set value (SV, SV1 to 3) changeover, start/stop control action, start/reset ramp/soak action, start/stop auto-tuning, cancel alarm latch, start incorporated timer

Retransmission Output (option)

Output signal:	4-20 mA DC
Load resistance:	500 ohms or less
Output accuracy:	$\pm 0.3\%$ FS
Output selection:	PV, SV, MV, DV (SV-PV)

Timer Function (option)

Start:	By digital input option
Setting:	0 to 9999 sec set in 1 sec steps
Action:	Event ON-delay or OFF-delay
Signal output:	Alarm output relays used; 2 points are available

Communication Function (option)

Physical specifications:	EIA RS485
Protocol:	Modbus (RTU). Free Windows®-based software, PXR-LITE included
Connection aspect:	Multi-drop up to 31 controllers
Communication distance:	Total extension 500m or less

Operating Conditions and Structure

Operating temperature:	14 to 122°F (-10 to 50°C)
Mounting method:	Panel flush mounting. PXR3 can be DIN-rail mounted using the optional adapter
External terminal:	Screw terminal

Fuji Temperature and Process Controllers

SPECIFICATIONS, CONTINUED

Power supply voltage:	100 (-15%) to 240V (+10%) AC, 50/60Hz; 24V ($\pm 10\%$) AC/DC
Power consumption:	PXR3: 6VA (100 V), 8VA (220V, 24V). PXR4: 8VA (100V), 10VA (220V), 12VA (24V). PXR5, 9: 10VA (100V), 12VA (220V, 24V)

Reference junction compensation accuracy:	$\pm 1^\circ\text{C}$ at 23°C
Dimensions (HxWxD):	PXR3: 1/32 DIN (24 x 48 x 97mm). PXR4: 1/16 DIN (48 x 48 x 78.8 mm). PXR5: 1/8 DIN (96 x 48 x 78 mm). PXR9: 1/4 DIN (96 x 96 x 79.5 mm)

PXR3 ORDERING INFORMATION

To order—Insert Number Code for Each Letter to Select Catalog Number.

Order Example: PXR3-T-A-Y1-4-V-0A1

A	B	C	D	E	F	G
A Front Panel Size						
PXR3	1/32 DIN (24x48mm)					
B Input Signal						
T	Thermocouple ($^\circ\text{C}$)					
R	Thermocouple ($^\circ\text{F}$)					
N	RTD, Pt100 ohm, 3-wire type ($^\circ\text{C}$)					
S	RTD, Pt100 ohm, 3-wire type ($^\circ\text{F}$)					
B	4-20mA DC, 1-5V DC					
A	0-20mA DC, 0-5V DC					
C Control Output 1						
A	Relay contact output					
C	SSR or SSC drive output					
E	4-20mA DC output					
D Control Output 2						
Y1	None					
A1	Relay contact output					
C1	SSR or SSC drive output					
E1	4-20mA DC output					
E Alarm Options						
4	None					
5	High/low alarm 1 point					
G	High/low alarm 2 points ¹					
F Power Supply						
V	Standard (100-240 VAC, 50/60Hz)					
B	24V AC/DC (50/60Hz)					
G Additional Functions						
OA1	None					
MA1	RS485 communication (Modbus)					
QA1	Retransmission + DI 1 point					
RA1	Retransmission (4-20mA DC)					
TA1	Digital Input (DI) x 2					
VA1	RS485 communications (Modbus) + DI 1 point					

¹High/low alarm 2 points not available when control output 2 is selected

ORDERING INFORMATION – ACCESSORIES

CTL-6-S	Current transformer for 1-30A
CTL-12	Current transformer for 20-50A
RSFC24	RS485 to RS232 signal converter
PXR3 Rail Adapter	Mounting adapter for DIN rail installation for PXR3
PXR4 Terminal Cover	Terminal block protective cover for PXR4

PXR4, 5, 9 ORDERING INFORMATION

To order—Insert Number Code for Each Letter to Select Catalog Number.

Order Example: PXR4-T-A-Y1-4-V-0A1

A	B	C	D	E	F	G
A Front Panel Size						
PXR4	1/16 DIN (48x48mm)					
PXR5	1/8 DIN (48x96mm)					
PXR9	1/4 DIN (96x96mm)					
B Input Signal						
T	Thermocouple ($^\circ\text{C}$)					
R	Thermocouple ($^\circ\text{F}$)					
N	RTD, Pt100 ohm, 3-wire type ($^\circ\text{C}$)					
S	RTD, Pt100 ohm, 3-wire type ($^\circ\text{F}$)					
B	4-20mA DC, 1-5V DC					
A	0-20mA DC, 0-5V DC					
C Control Output 1						
A	Relay contact output					
C	SSR or SSC drive output					
E	4-20mA DC output ¹					
D Control Output 2						
Y1	None					
A1	Relay contact output					
C1	SSR or SSC drive output					
E1	4-20mA DC output ¹					
R1	Retransmission (4-20mA DC)					
E Alarm Options						
4	None					
6	Heater break alarm ^{1,2}					
G	High/low alarm 2 points					
H	High/low alarm 2 points + heater break alarm ^{1,2}					
M	Alarm 3 points					
D	Remote setpoint ³					
P	Remote setpoint + alarm 2 points ³					
F Power Supply						
V	Standard (100-240V AC, 50/60Hz)					
B	24V AC/DC (50/60Hz)					
G Additional Functions						
OA1	None					
MA1	RS485 communication (Modbus)					
SA1	Digital Input (DI) x 1					
TA1	Digital Input (DI) x 21					
VA1	RS485 communications (Modbus)+ DI ^{1,3}					

¹ Heater break option not available with 4-20mA output, or with 2 digital inputs, or with RS485 + 1 digital input.

² Current transformer needed with heater break option.

³ Remote setpoint option not available with RS485 + 1 digital input.

Newport Humidity & Temperature Controllers

- Dual Loop Control
- High Accuracy $\pm 0.5^\circ\text{C}$ and $\pm 2\%$ RH
- 4 Popular DIN Sizes
- 2 Control or Alarm Outputs (optional)
- Choice of Relays, SSR, DC Pulse, Analog Voltage and Current
- Full Autotune PID Control
- Ethernet or RS-232/RS-485 (optional)
- User-friendly, Simple to Configure
- Programmable Ramp and Soak for Humidity and/or Temperature
- RH / Temperature Probe included
- NEMA 4, IP65 Front Bezel

The NEWPORT® iTH Series monitor and control both temperature and relative humidity. The meters accurately display humidity, temperature, or dew point. They also provide dual loop control for both humidity and temperature and are easily programmed for any control or alarming requirement from simple on-off to full autotune PID control.

The LED displays can be programmed to change color between Green, Amber, and Red at any set point or alarm point.

The iTH family is available in four true DIN sizes with NEMA 4, IP65 splash resistant bezels: the ultra compact 1/32 DIN, the popular midsize 1/16 DIN square bezel with dual display, the 1/8 DIN vertical, and the 1/8 DIN horizontal with the big bright 21mm digits.

SPECIFICATIONS

Sensor Specifications

Relative Humidity Accuracy/Range:

- $\pm 2\%$ for 10 to 90% RH
- 3% for 0 to 10% RH and 90 to 100% RH

Non-Linearity: $\pm 3\%$;

Hysteresis: 1% RH

Temperature Accuracy/Range*:

- $\pm 0.5^\circ\text{C}$ ($\pm 1^\circ\text{F}$) for 0 to 80°C (32 to 176°F)
- $\pm 1^\circ\text{C}$ ($\pm 2^\circ\text{F}$) for -40 to 0°C and 80 to 124°C (-40 to 32°F and 176 to 254°F)

*Note: extended temperature range is for Probe only, the iTH's operating temperature is 0 - 50°C .

Resolution: 0.03%, 12 bit for RH; 0.01 $^\circ\text{C}$
14 bit for Temperature

Response Time: 4 sec for RH; 5 sec for Temp
(63% slowly moving air)

General

A/D Conversion: 12 bit RH and 14 bit Temp.

Reading Rate: 2 samples per second max.

Digital Filter: Programmable

Display: 4-digit, 9-segment LED
 • 10.2 mm (0.40"): i32, i16D, i8DV
 • 10.2 mm (0.40") & 21 mm (0.83"): i8DH

Red, green and amber programmable colors for process variable, set point and temp units

Operating: 0 to 50°C (32 to 122°F),

Temperature: 90% RH non-condensing



ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.

Order Example: NE/iTH - i8DH - 00 - 5 - C24

A - B - C - D - E - F

A	Model #	Description
	NE/iTH-i8DH	Temperature and RH Input 1/8 DIN Dual Display Horizontal
	NE/iTH-i8DV	Temperature and RH Input 1/8 DIN Dual Display Vertical
	NE/iTH-i16D	Temperature and RH Input 1/16 DIN Dual Display
	NE/iTH-i32	Temperature and RH Input 1/32 DIN Single Display
B	Outputs (2 digits)	
0	0	Monitor version, no control outputs.
2	2	Two solid state relays (SSR's): 0.5 A @ 120/240 Vac continuous
2	3	SSR and relay: Form "C" SPDT 3A @ 120Vac, 3A @ 240Vac
2	4	SSR and pulsed 10 Vdc @ 20 mA (for use with external SSR)
3	3	2 Relays: Form "C" SPDT 3 A @ 120 Vac, 3 A @ 240 Vac
4	2	Pulsed 10 Vdc @ 20 mA (for use with external SSR) and SSR
4	3	Pulsed 10 Vdc @ 20 mA (for use with external SSR) and relay
4	4	Two pulsed 10 Vdc @ 20 mA (for use with external SSR)
5	2	Analog Output selectable as either control or retransmission of process value; 0 to 10 Vdc or 0-20 mA @ 500 ohm max. & SSR
5	3	Analog Output 0 to 10 Vdc or 0-20 mA @ 500 ohm max & Relay
5	4	Analog Out 0 to 10Vdc or 0-20mA @ 500 ohm max & Pulse 10Vdc
C	RH/Temperature Probe (must select one)	
2		2" (51mm) Probe for iTH with 3ft (0.9m) cable
5		5" (137mm) Probe for iTH with 20ft (6.1m) cable
D	Power Supply	
*		Standard power input: 90-240 Vac $\pm 10\%$, 50-400 Hz, 110-375 Vdc, equivalent voltage (*no entry required)
DC		Low Voltage Power Option: 12 - 36 Vdc; 24 Vac $\pm 10\%$
E	Network Options	
EI		Ethernet with Embedded Web Server
C24		Isolated RS-232 and RS-485/422. (MODBUS & ASCII)
C4EI		Ethernet with Embedded Web Server + Isolated RS-485/422 hub for up to 31 devices
F	Factory Setup	
FS		Factory Setup and Configuration (requires Network Option)

*1 -C4EI or -EI option is not available on the 1/32 DIN. Consult Sales for other Ethernet devices that can connect to an iTH-i32xx-x-C24.

West Process Controller



- Single or Two Loop
- Graphical & Text LCD Display
- USB, RS485, Ethernet
- Profiling & Datalogging Options
- 1/4 DIN Size
- 4 Plug-in Module Slots
- UL, CE

Pro EC44

Simplifying user operation with an intuitive HMI, fast access front USB port and easy-to-use configuration and simulation software, Blue Control©.

SPECIFICATIONS

Input 1 & 2:	T/C: J, K, T, E, R, S, D, B, C, L, N, PtRh RTD: 3-wire Pt100, Ni120 DC: 0-50mV, 10-50mV, 0-5V, 0-10V, 1-5V, 2-10V, 0-20mA, 4-20mA
Aux. Input:	0-5V, 0-10V, 1-5V, 2-10V, 0-20mA, 4-20mA
Loops:	1 or 2 control loops
Control:	ON/OFF, PID heat only & Heat/Cool, Valve Motor Drive, Ratio, Cascade
Profiler:	255 segment profiler shared in 64 programs
PID:	5 PID sets manual or automatic gain scheduling
Alarms:	7 can be set as high, low, deviation, band, control loop, rate of change. Also alarms for sensor break, recorder memory, power
Datalogging:	1sec - 30min interval, non-volatile memory, real time clock
USB:	Host for configuration (read/write) and logged data (read)
Modbus:	Ethernet Modbus TCP; RS485 Modbus RTU (Master/Slave)
I/O:	Up to 2 analog inputs, 9 digital inputs, remote setpoint input; 9 outputs (relay, SSR drive, triac, linear DC, excitation)
Display:	160x80 graphic LCD with red/green backlight, 66x37mm

ORDERING INFORMATION

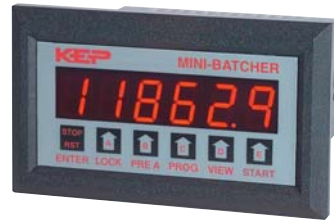
To Order- Insert Code for Each Letter to Select Catalog Number.

Example: EC44-0-C-P-0-2-1-1-8-1-T-1-0-1

EC44-0- [A] - [B] - [C] - [D] - [E] - [F] - [G] - [H] - [I] - [J] - [K] - 1

A Type		H, I Plug-in Module Slot 2 & 3	
C	Controller	0	None
U	Controller with USB	1	Relay Output SPDT
D	Controller/Recorder (Datalogger)	2	DC SSR Drive
R	Controller/Recorder w/USB	Y	Dual DC SSR Drive Output
B Profiler		8	Triac Output
0	None	9	Dual relay Output SPST
P	Profiler	T	24VDC Transmitter Supply
C Power Supply		J Plug-in Slot A	
0	100-240V AC	0	None
2	24-48V AC/DC	1	RS485 Modbus RTU
D Control Loops		3	1 Digital Input
1	One	4	Auxiliary Input
A	One + Auxiliary	5	Ethernet Modbus TCP
2	Two	K Option C	
E Base Option 1		0	None
1	Relay Output SPST	1	8 Digital Inputs
2	Relay + Linear DC Out		
F Base Option 2			
0	None		
1	Relay Output SPST		
2	Relay + Linear DC Out		
G Plug-in Module Slot 1			
0	None		
1	Relay Output SPDT		
2	DC SSR Drive		
L	Linear DC Output		
8	Triac Output		

KEP Batch Controller



MB2

- Display Rate, Batch Size and Number of Batches or Grand Total
- 5 Digit Scaling Factor
- Pulse Input
- 2 Relay Outputs
- Analog Output or Serial/Modbus Options
- NEMA 4X / IP65 Front Panel

The Mini-Batcher is a 6 digit totalizer and 4.5 digit ratemeter with two relay outputs. One output is dedicated to the batch amount (Preset A), the other can be activated for Prewarn or Batch/Grand Total. The unit can count up to the preset (reset to 0) or down from the preset (set to preset). Start, Stop and Reset functions can be activated from the front panel or remote inputs.

Up to 247 units can communicate to a host computer using Modbus RTU protocol. Alternately, an analog output (assignable for Rate or Batch Amount) can be ordered for data logging.

SPECIFICATIONS

Display:	6 digit, 0.55" high LED
Input:	Pulse, 50VDC max, 10kΩ resistance
Ratemeter Display:	Units per second, minute or hour
Accuracy:	0.01% FS (±1 digit)
Sampling Rate:	2 to 24 seconds
Scaling Factor:	0.0001 to 99999 (converts input pulses to engineering units)
Presets:	Two, 5 digits each
Front Panel Lockout:	Complete locked out (except Start/Stop) or the presets can remain accessible
Relays:	Two N.O. 5A, 120/240VAC or 28VDC. (N.C. contacts and NPN transistor output available with solder jumpers)
Relay B On Time:	0.01 to 99.99 sec. or latched (0.00 setting)
Power Consumption:	6.5VA AC or 250mA DC max.
Output Power:	+12VDC @ 50mA, unregulated -10 + 50% (AC powered units only)
Operating Temperature:	0-54°C (32-130°F), <90% RH, non-condensing
Memory:	EEPROM stores data for 10 years if power is lost
Dimensions:	4.44"W x 2.63"H x 4.25"D (113 x 67 x 108mm)
Cutout:	3.622" x 1.772" (92 x 45mm)

ORDERING INFORMATION

To Order—Insert Code for Each Letter to Select Catalog Number.

Order Example: KE/MB2C34

KE/MB2	[A]	[B]	[C]
A Operating Voltage			
A	110 VAC ±15% or 12-15 VDC		
B	220 VAC ±15% or 12-15 VDC		
C	24 VAC ±15% or 12-15 VDC		
B Count Inputs			
3	4-30 VDC or 0-1VDC pulse, 10kHz max.		
3M	30mV mag. pickup, 5kHz max.		
C Options			
1	RS232 Comm., KEP protocol		
2	RS422 Comm., KEP protocol		
3	RS232, Modbus RTU		
4	RS422/RS485, Modbus RTU		
A	Analog Output (4-20/0-20 mA)		

Partlow DIN Controllers



- Dual setpoints with optional remote selection
- Plug-in output modules
- Customizable operator menus
- Process and loop alarms
- Full PID or ON/OFF control
- Heat/Cool operation (with dual outputs)
- Selectable pre-tune, self-tune, manual tune



1160+

SPECIFICATIONS

Inputs:	T/Cs: J, K, C, R, S, T, B, L, N, Pt 20% Rh vs. Pt40% Rh RTD: 3-wire Pt100, <50Ω per lead (balanced) DC (scalable -1999 to +9999): 0-5, 1-5, 0-10 or 2-10VDC; 0-50mV, 10-50mV; 0-20mA, 4-20mA
Accuracy:	±0.1% of input range ±1 digit (T/C CJC better than 1°C)
Input Sample Rate:	4 per second; 14 bit resolution
Impedance:	>10MΩ for T/C and mV ranges, 47kΩ for V ranges, 5Ω for mA ranges
Outputs:	Relay: SPDT, 240VAC@2A resistive SSR Driver: >10VDC nominal into 500Ω min. DC Linear: 0-20, 4-20mA into 500Ω max.; 0-10, 1-5, 2-10, 0-5V into 500Ω min. Triac: 0.01-1A AC, 20-280Vrms, 47-63Hz
Sensor Break Detect:	<2 seconds
Communications:	2-wire, RS-485, Modbus or ASCII
Operating Temperature:	32-131°F (0-55°C), <95% RH non-condensing
Supply Voltage:	100-240V, 50/60Hz or 20-48VAC / 22-65 VDC
Protection:	IP66, NEMA 4X (front panel)

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: PA/1160114300

A	B	C	D	E	F
A Basic Unit					
PA/1160	1160+ PID Controller (1/16 DIN)				
PA/1400	1400+ PID Controller (1/4 DIN)				
PA/1800	1800+ PID Controller (1/8 DIN)				
B-C-D Option Slot 1 Option Slot 2 Option Slot 3					
0	0	0	None		
1	1	1	Relay output		
2	2	2	DC drive output for SSR		
3	3	3	Linear DC output		
-	4	4	24V Transmitter power supply*		
8	8	8	Triac output*		
E Option Slot A					
0	None				
1	RS-485 serial comm				
2	Green upper display				
3	RS-485 & green upper display				
4	Green lower display				
5	RS-485 & green lower display				
6	Green upper & lower display				
7	RS-485 & two green displays				
8	Digital input				
9	Digital input & green upper display				
A	Digital input & green lower display				
B	Digital input & two green displays				
C	Basic Remote Setpoint Input (RSP)				
D	Basic RSP & green upper display				
E	Basic RSP & green upper display				
F	Basic RSP & two green displays				
F Power Supply					
00	100-240VAC				
02	24-48V AC/DC				

*max. one transmitter supply, two triac outputs per unit

Partlow Limit Controllers

- 1/16, 1/8 & 1/4 DIN Sizes
- Dual 4 digit display
- User selectable input type
- Up to three outputs
- 3 year warranty



1801+

SPECIFICATIONS

Input:	Thermocouple J, K, C, R, S, T, B, L, N 3 wire 100 ohm Pt RTD DC linear V (scalable -1999 to +9999) DC linear mA (0-20 or 4-20) DC linear mV (0-50 or 10-50)
Output:	Relay SPDT 2A, 240VAC resistive SSR drive >10VDC into 500Ω min Triac 0.01-1A, 20-280VAC
Output Function:	Limit, alarm (process, deviation/band)
Control:	High/low limit
Operating Temperature:	0-55°C, 20-95% RH
Protection:	IP66, NEMA 4X front; IP20 behind panel

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.

Order Example: PA/1161 010602

A	B	C	D	E	F
A Basic Unit					
PA/1161	1/16 DIN Limit Controller				
PA/1401	1/4 DIN Limit Controller				
PA/1801	1/8 DIN Limit Controller				
B Option Slot 1					
0	Relay Output				
C Option Slot 2					
0	None				
1	Relay Output				
2	DC drive output for SSR				
3	Linear DC output				
4	24V Transmitter power supply*				
8	Triac output				
D Option Slot 3					
0	None				
1	Relay Output				
2	DC drive output for SSR				
3	Linear DC output				
4	24V Transmitter power supply*				
8	Triac output				
E Option Slot A					
0	None				
1	RS-485 serial comm				
2	Green upper display				
3	RS-485 & green upper display				
4	Green lower display				
5	RS-485 & green lower display				
6	Green upper & lower display				
7	RS-485 & two green displays				
8	Digital input				
9	Digital input & green upper display				
A	Digital input & green lower display				
B	Digital input & two green displays				
C	Basic Remote Setpoint Input (RSP)				
D	Basic RSP & green upper display				
E	Basic RSP & green upper display				
B	Digital input & two green displays				
F Power Supply					
00	100-240VAC				
02	24-48V AC/DC				

*One transmitter supply per unit

Newport Digital Indicator Controllers

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: Q2001-CVR6

A	B	C	D	E	F
A Display Resolution and Case Style					
Q2	±1999 Counts (3½-digits)				
Q3	±1999 with "Infinity" Family Bezel and Adapter*				
Q9	±9999 Counts (4-digits)				
Q8	±9999 with "Infinity" Family Bezel and Adapter*				
B Display Type and Meter Power					
0	LED, 120 VAC (49/440 Hz) (BQ20 or BQ90)				
2	LED, 240 VAC (49/440 Hz) (BQ22 or BQ92)				
4	LED, 9–32 VDC (isolated) (BQ24 or BQ94)				
6	LED, 5 VDC** (BQ26 or BQ96)				
8	LED, 24 VAC (BQ28 or BQ98)				
A	LED, 26–56 VDC (isolated) (BQ2A or BQ9A)				
**Not available with AC AVG or True RMS inputs					
C Analog Output Adders					
Max one analog output in addition to recorder output					
0	±1 or ±2 V recorder output, non-isolated				
1	0–5 VDC, non-isolated (BA01)				
2	0–10 VDC, non-isolated (BA01)				
3	0–1 mA, source or sink, non-isolated (BA01)				
4	4–20 mA, source or sink, non-isolated (BA01)				
6	4–20 mA, isolated (BA03)				
D Control Output Adders					
0	None				
1	Dual-Setpoint 10A Relay (BDT1)				
4	BCD (BDD2)				
5	Single-Setpoint 10A Relay (BDS1)				
E Signal Conditioning Input Adders					
<input type="checkbox"/>	Select from Input Table				
F Green LEDs for Display					
G	Green				
0	None				

INPUT TABLE

Code	Q2000/Q3000	Q8000/Q9000
DC Voltage Input		
AVR1	±199.9 mV	±99.99 mV
AVR2	±1.999V	±999.9 mV
AVR3	±19.99V	±9.999V
AVR4	±199.9V	±99.99V
DC Current Input		
BCR1	±19.99 µA	±9.999 µA
BCR2	±199.9 µA	±99.99 µA
BCR3	±1.999 mA	±999.9 µA
BCR4	±19.99 mA	±9.999 mA
BCR5	±199.9 mA	±99.99 mA
BCR6	±1.999A	±999.9 mA
AC AVG Voltage Input		
CVR2	199.9 mV	99.99 mV
CVR3	1.999V	999.9 mV
CVR4	19.99V	9.999V
CVR5	199.9V	99.99V
CVR6	650V	650.0V
AC AVG Current Input		
DCR1	19.99 µA	9.999 µA
DCR2	199.9 µA	99.99 µA
DCR3	1.999 mA	999.9 µA
DCR4	19.99 mA	9.999 mA
DCR5	199.9 mA	99.99 mA
DCR6	1.999A	999.9 mA
DCR7-(*)	(1) 5A = 1000, (2) 5A = 1500, (3) 5A = 2000, (4) 5A = 300, (5) 5A = 500	

Quanta® Standard Features

- Field Selectable Input Ranges
- Recorder Analog Output
- Front-Panel Accessible Span Adjustment
- Bright, 0.56" (14.2 mm) LED Display
- Display Hold and Test
- Screw-Terminal Barrier Strip
- Optional Relay Outputs
- 1/8 DIN Case



Options

- Analog Output for User-Selected Span
- Single-Setpoint 10A SPDT Relay
- Dual-Setpoint with Two 10A SPDT Relays
- Parallel BCD Output, Isolated




INPUT TABLE (CONT'D)

Code	Q2000/Q3000	Q8000/Q9000
True-RMS Voltage Input		
FVR2	199.9 mV	99.99 mV
FVR3	1.999V	999.9 mV
FVR4	19.99V	9.999V
FVR5	199.9V	99.99V
FVR6	650V	650.0V
True-RMS Current Input		
GCR1	19.99 µA	9.999 µA
GCR2	199.9 µA	99.99 µA
GCR3	1.999 mA	999.9 µA
GCR4	19.99 mA	9.999 mA
GCR5	199.9 mA	99.99 mA
GCR6	1.999A	999.9 mA
GCR7-(*)	(1) 5A = 1000, (2) 5A = 1500, (3) 5A = 2000, (4) 5A = 300, (5) 5A = 500	
Frequency/Rate Input (100 mV Hysteresis):		
H	1000 Hz = 1000	1000 Hz = 0–9999
Type J Thermocouple Input		
JDC1	-40 to +760°C	-40.0 to +760.0°C
JDF1	-40 to +1400°F	-40.0 to +999.9°F
Type K Thermocouple Input		
KDC1	-40 to +1260°C	-40.0 to +999.9°C
KDF1	-40 to +1999°F	-40.0 to +999.9°F
Type T Thermocouple Input		
TDC1	-184 to +371°C	-184.0 to +371.0°C
TDF1	-300 to +700°F	-300.0 to +700.0°F
RTD (Pt 100) Input Alpha = 0.00385		
MDC1	-200 to +830°C	-200.0 to +830.0°C
MDF1	-328 to +1526°F	-328.0 to +999.9°F
RTD Input, High Resolution Alpha = 0.00385		
RDC1	-199.9 to +199.9°C	Not available with Q8/Q9
RDF1	-199.9 to +199.9°F	Not available with Q8/Q9
3-Wire Ratio Potentiometer Input		
NPR1	1000 = 1 kOhm	9999 = 1 kOhm
NPR2	1000 = 5 kOhm	9999 = 5 kOhm
2- or 4-Wire Resistance Input		
ORR1	19.99 Ohm	Not available with Q8/Q9
ORR2	199.9 Ohm	Not available with Q8/Q9
ORR3	1999 Ohm	Not available with Q8/Q9
ORR4	19.99 kOhm	Not available with Q8/Q9
Process Signal Input		
P	4–20 mA = 0–100.0	4–20 mA = 0–99.99
Process Signal Input Excitation set to 15 VDC		
E	4–20 mA = 0–100.0	4–20 mA = 0–99.99
Strain-Gage/Microvolt Input Excitation set to 10 VDC (30 mA max)		
S	±100 mV = ±100.0	±100 mV = ±99.99

Weschler Quatro BarGraph Meters

- 101 segment bargraph in red, green or tricolor
- 4-digit 10000 count LED display
- 6" edgewise & 9/64 DIN cases
- Vertical or horizontal orientation

Features

- Single & dual bar configurations
- Adjustable bargraph span
- Bargraph center zero mode
- Four programmable setpoints
- Front panel setpoint status indicators
- Up to 4 relay outputs for control and alarms
- Analog retransmit option with adjustable span
- Wide power supply range (AC & DC)
- Sensor excitation to power 4-20mA transmitters or bridge type sensors



▲ Style A

Direct Measurement of

- DC Current
- AC Current
- DC Voltage
- AC Voltage
- Frequency
- Process Loops

- Thermocouples
- RTDs
- Load Cells/Strain Gauges
- Speed Pickups/RPM
- Pressure
- Resistance/Potentiometers

Bar & Digital

Style A combines a precision 4 digit LED display with a 101 segment bargraph. The bar can be set to display any part of the digital range, from a minimum of 100 counts to the full 12000 A/D counts. Higher bar resolution is useful for applications where the normal operating range is only a portion of the full scale input. Style A offers 4 levels of display brightness, which can be set from the front panel.

ORDERING INFORMATION

Select desired code for each category to build the 15 digit part number.
Example Part Number: MAVTRCXP1AKXXX

A B C D E F G H I J K XXX

A Type	F3	Frequency, 60-500VAC 99.99/999.9/9999Hz (Style A)
L 4 digit, 9/64 DIN Case	GF	Direct Pressure, 15 psi differential (clean, dry gas)
M 4 digit, 6" Edgewise Case	GH	Direct Pressure, 30 psi diff. (dry)
B Style	GK	Direct Pressure, 100 psi diff (dry)
A Digital & bar	M1	RPM, 99.99/999.9/9999Hz, 50mV-30V, w/24V Exc. (Style A)
C Single bar (no digital)	PD	Universal Process, 2V/5V/10V/ 20V/200V/2mA/20mA
D Dual bar (no digital)	PE	Dual Process, (style D only) 2V/10V/20V/200V/2mA/20mA
C Orientation	RD	Resistance, 2kΩ
V Vertical	SA	Strain Gage, 5/10VDC Excitation, 20/2mV/V, 4/6-wire
H Horizontal	SD	Pressure/Load Cell, 5/10V Excitation, 20/2mV/V, 4-wire
D Bar Color	TD	Thermocouple, J Type (0-1400°F) (Style C or D)
R Red	TE	Thermocouple, K Type (0-1999°F) (Style C or D)
G Green	W1	Thermocouple, J,K,R,T; Selectable °C/°F, 1°/0.1° (Style A)
T Tricolor (Style A or C only)	W2	RTD, 100Ω Pt Selectable 3/4-wire, °C/°F, 1°/0.1°, 385/392 (Style A)
E Digital Display Color	I Power	
R Red	1	85-265VAC/95-370VDC
G Green	2	15-48VAC/10-72VDC
X None (Style C or D)	J Retransmit	
F Bar & Scale Position	A	Isolated 16 Bit Output, 4-20mA
C Center bar (Style A)	V	Isolated 16 Bit Output, 0-10VDC
A Center bar, scale left or above	X	None
E Center bar, scale right or below	K Relays	
X Dual bar (Style D)	for Type L:	
G Second Bar Color (right or bottom bar)	2	Two 10A Form C
R Red (Style D only)	4	Two 10A Form C & Two 5A
G Green (Style D only)		Form A **
X None	X	None
H Input (Partial list)	for Type M:	
AA AC Volts, scaled RMS, 200/600V	B	Two 10A Form C
AB AC Volts, scaled RMS, 200mV/2V/20V	E	Two 10A Form C & Two 5A Form A **
AC AC mA, scaled RMS, 2/20/200mA	K	Four 5A Form A
AD AC Amps, scaled RMS, 1A	T	Four 400V 140ma AC/DC SSR
AE AC Amps, scaled RMS, 5A	X	None
DE DC Volts, 2/20/200V/Custom w/Offset and 24V Excitation		
DF DC milliamp, 2/20/200mA w/Offset and 24V Excitation		
DG DC Amps, 1A		
DD DC Amps, 5A		
E1 Line Frequency, 60-500VAC, 199.9Hz, 400Hz optional (Style C or D)		
F2 Frequency, 50mV-30V w/24V Exc. 99.99/999.9/9999Hz (Style A)		

Inputs continued next column

** shared common between A & C

Single Bar

Style C offers a 101 segment red, green or tricolor bar, without digital display. The bar can be set to grow from the bottom or the center of the scale. The center mode is normally used for center zero but can also show deviation around a half-scale value.



▶ Style C



▲ Style D

Dual Bar

The dual bar configuration (Style D) can display two process variables, using the Dual Process input card (PE). Any combination of red and green bars can be specified. Two setpoints are available for each channel. The dual input card may also be used to display one process variable on the left bar and two tracking setpoints on the right bar. In this mode, setpoint 1 is determined by the channel 2 input signal. Setpoint 2 is offset from setpoint 1 by a fixed (user selectable) amount.

The dual bar style can be used with a single channel input module & 4 set points. The left bar displays the process signal; the right bar displays min/max.

SPECIFICATIONS

Input Accuracy:	
DCV, DCA	±(0.06% of reading + 2 counts)
ACV, ACA	±(0.07% of reading + 5 counts)
Temperature	±(0.1% of reading + 3 counts)
Direct Pressure	±(1.0% of range + 3 counts)
Frequency/RPM	±(0.06% of reading + 2 counts)
Strain/Load	±(0.08% of reading + 3 counts)
Process	±(0.06% of reading + 2 counts)
Resistance/Pots	±(0.06% of reading + 2 counts)
Bargraph Display:	4", 101 segment
Bar Viewing Angle:	±40° red or green, ±35° orange
Digital Display:	4 digit LED, 0.31" (7.9mm) height Range -1999 to 9999 counts
Decimal Position:	Front panel selectable n.nnn, nn.nn, nnn.n, nnnn.
Relay Output:	
Form A (SPST)	5A@250VAC, 5A@30VDC (resistive)
Form C (SPDT)	10A@240VAC, 8A@24VDC (resistive)
Analog Output:	Isolated 16 bit, user scalable
mA out	4-20mA, 500Ω maximum loop resistance
Volts out	0-10VDC, 500Ω minimum load resistance
Power Supply:	85-265 VAC / 95-370 VDC @ 2.5W (4.2W) 18-48 VAC / 10-72 VDC @ 2.5W (4.2W)
Sensor Excitation:	24V @ 50mA (2-wire loop power) 10V @ 120mA (bridge excitation)
Operating Temperature:	0 to 60°C, 95% RH (non-condensing)

Weschler Tri-Color Bargraph Meters

- Large, bright display with 16 step dimming
- 40, 50 or 100 segment Tri-Color Bar
- Bar changes color at user adjustable setpoints – Red, Green, Amber
- 5 or 6 digit resolution
- Versatile selection of inputs
- Up to 6 form A or 4 form C relay outputs
- Peak/Valley option
- RS232, RS485 & Ethernet Communications
- Analog retransmit option
- AC or DC power
- Rugged case

Sizes to replace popular edgewise and circular analog meters.

CONFIGURATION OPTIONS

SIZE

BG252	6" Vertical BarGraph
BH252	6" Horizontal BarGraph
BV5A	7 1/2" Vertical BarGraph
BD101	10" Vertical BarGraph
BG241	4 1/2" Square BarGraph
BG261	8 1/2" Square BarGraph
BG281	8" Circle BarGraph

INPUT

DC Volts	50mV to 250V full scale
DC Amps	50µA to 5A full scale
AC Volts RMS	50mV to 250V full scale
AC Amps RMS	1mA to 5A full scale
Process	4-20mA DC
	1-5V DC
	10-50mA DC
Line Frequency	55-65 Hz
MAG Pickup	50Hz-20kHz
Thermocouple	J, K or T
RTD	100 ohm Pt or 10 ohm Cu
Watts	Single & polyphase
VARs	
Power Factor	

POWER

120V AC 50/60Hz
240V AC 50/60Hz
12V DC
24V DC
28V DC
48V DC
125V DC
250V DC
120V AC / 125V DC

COMMUNICATION

RS232
RS485
Ethernet
ModBus

RETRANSMIT

4-20mA
0-1mA
1-5V DC
0-1V DC
10-50mA DC
Excitation Power 24 VDC

DIGITAL DISPLAY COLOR

Green
Amber
Red

Over 10,000 combinations available.

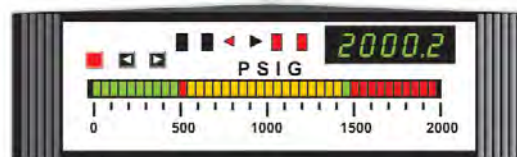
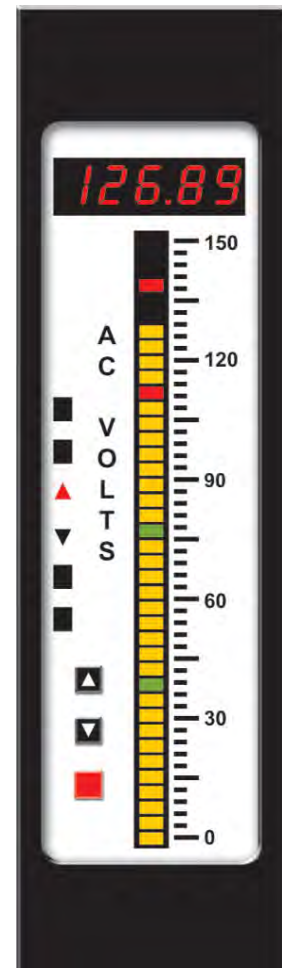
FIELD PROGRAMMABLE FUNCTIONS

- Zero and full scale point location
- Setpoint type (Hi or Low)
- Hysteresis & latching
- Setpoint time delay
- 16 step dimming
- Digital display for engineering units
- Enable/disable front buttons
- I.D. selection for communication
- Bar form
- Peak / Valley enable
- Color zones
- Over / Under range, flashing
- Lamp test



BG261TC

BD101TC



BH252TC

More information online at weschler.com/bargraph

Weschler Bargraph Meters

- Precise digital & vivid proportional (bar) display
- 101 segment single color bar, up to 10" high
- 3 1/2, 4 1/2 or 5 1/2 digit resolution
- Versatile selection of inputs
- Up to 6 form A or 4 form C relay outputs
- Peak/Valley option
- Analog retransmit option
- AC or DC power
- Rugged case

CONFIGURATION OPTIONS

SIZE		POWER	
BG252	6" Vertical BarGraph	120V AC 50/60Hz	
BH252	6" Horizontal BarGraph	240V AC 50/60Hz	
PC101	DIN Size Vertical BarGraph	5V DC	
PH101	DIN Size Horizontal BarGraph	12V DC	
PC202	DIN Size Dual BarGraph	24V DC	
PG101	Single BarGraph	28V DC	
PG202	Dual BarGraph	48V DC	
BI1251	6" Vertical BarGraph	125V DC	
BW1316	6" Vertical BarGraph	250V DC	
BV5A	7 1/2" Vertical BarGraph	120V AC / 125V DC	
BD101	10" Vertical BarGraph		
BG241	4 1/2" Square BarGraph		
BG261	8 1/2" Square BarGraph		
BG281	8" Circle BarGraph		
BG251	6" Circle BarGraph		
INPUT		SETPOINTS	
DC Volts	50mV to 250V full scale	Hi/Lo	
DC Amps	50µA to 5A full scale	Hi/Hi-Hi	
AC Volts RMS	50mV to 250V full scale	Lo/Lo-Lo	
AC Amps RMS	1mA to 5A full scale	Hi-Hi/Hi/Lo/Lo-Lo	
Process	4-20mA DC		
	1-5V DC		
	10-50mA DC		
Line Frequency	55-65 Hz	COMMUNICATION	
MAG Pickup	50Hz-20kHz	RS232	
Thermocouple	J, K or T	RS485	
RTD	100 ohm Pt or 10 ohm Cu	Ethernet	
Watts	single & polyphase	ModBus	
VARs			
Power Factor		RETRANSMIT	
		4-20mA	
		0-1mA	
		1-5V DC	
		0-1V DC	
		10-50mA DC	
		Excitation Power 24 VDC	

LED COLOR
Green
Amber
Red

BAR COLOR
Green
Amber
Red

Over 10,000 combinations available.

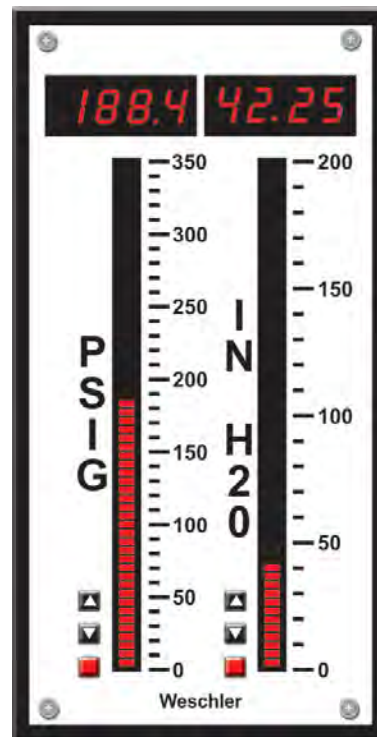
For more information see weschler.com/bargraph



BG241



BG252



PC202

Dixson Bargraph Meters/Controllers



BW051P

BK051P

- Fit Standard Switchboard Cutouts
- Red, Green or Amber LED Bar
- Precise 4 Digit Readout
- Underrange/Overrange Indication
- On/Off Control via Setpoint Relays
- Isolated Retransmit Option
- Transducer Excitation Supply
- Minimum 88,000 hour MTBF
- Two Year Warranty

ORDERING INFORMATION

To Order—Insert Code for Each Letter to Select Catalog Number
 Order Example: BBVRR1RAY1VDL1BX

A B C D E F G H I J K L M N O

A Basic Unit		Basic Unit	
BB	BB101P	BW	BW051P
BC	BB202P (101 Segments each side)*	BK	BK051P
B Bargraph Orientation			
H	Horizontal (BP101P Only)	V	Vertical
C Bargraph Color			
A	Amber	R	Red (Standard)
G	Green	S	Mixed (BW051/BK051 Only)
		T	Tricolor
D 4-Digit Display			
X	None	G	Green
A	Amber	R	Red (Standard)
E Decimal Location			
1	000.0	3	0.000
2	00.00	X	0000
F Setpoint Options (Must be ordered with Alarm Setpoint) (G)			
X	None	A	Amber
R	Red (Standard)	G	Green
G Alarm Setpoint (Must be ordered with Setpoint Option (F))			
X	None	L	Low/Low
H	High/High	A	High/Low
H Program Switches			
X	None	Y	Yes (Standard)
I Primary Power			
1	115 VAC	4	24 VDC
2	230 VAC	6	12 VDC
5	5 VDC	8	48 VDC
J Signal Inputs			
A	Amperes	M	Milliamperes
B	Millivolts	O	Other
C	Degrees C	U	Microamperes
F	Degrees F	V	Volts
K Signal Type			
A	AC	D	DC
		O	RTD or TC
L Signal Linearity			
L	Linear	Q	Square Root
X	Non-linear (TC, RTD, custom)		
M Special Options			
X	None	1	Isolated 2-wire retransmit
3	Auxiliary supply	A	AC/DC converter (for AC in)
B	DC amp (for <1V FS in)	R	RTD in
J	Type J TC in	K	Type K TC in
E	Type E TC in	S	Combination of the above
N Bar Start			
B	Bottom	C	Center
T	Top		
O Terminals/Conformal Coating			
X	Standard/none	Y	Standard/coated
B	Barrier strip terminals	E	End cap
S	Combination of the above		

SPECIFICATIONS

Input Ranges:	
DC Volts	50mV to 250V
DC Current	50mA to 250mA
AC Volts	250mV to 250V
AC Current	1mA to 5A
Thermocouple	J, K, T, E
RTD	Pt 100
DC Accuracy:	±0.04% of span ±1d
AC Accuracy:	±0.5% of span, above 5% of range
Digital Display:	4 digit LED, 0.01% resolution
Enclosure:	Plastic, UL94 V0 or V1
Setpoint Relays:	Form C, 0.4A@125VAC, 2A@30VDC
Setability:	0.1%, with 1.0% hysteresis
Operating temperature:	0 to 60°C
Power:	115/230VAC, 50/60/400Hz, 4VA/channel DC power available
Line Regulation:	±10%
BB101P, BB202P	Bar Segments: 101 Dimensions: 2.16"W x 6"H x 5.8"D Panel Cutout: 1.77" x 5.7" Orientation: Vertical or horizontal
BW051P	Bar Segments: 51 Dimensions: 4.625" x 4.625" x 6.7"D Panel Cutout: 4" dia ANSI switchboard
BK051P	Bar Segments: 51 Dimensions: 3.82"W x 11.25"H x 7.10"D Panel Cutout: 1.77" x 5.7"

*Specify both sides for BB202P

Texmate Intelligent Panel Meters

TIGER FAMILY

Intelligent Meter Controllers with Programmable Logic, Digital Signal Processing Capabilities & Serial Communication



▲ **DI-50E**
1/8 DIN 96X48mm



▲ **DI-60AE**



▲ **GI-50E**
9/32 DIN 144x72mm



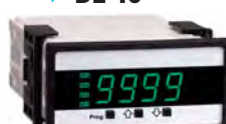
▲ **DI-60E**
1/8 DIN 96X48mm

LEOPARD FAMILY

Smart, Programmable Meter Relays with Isolated Retransmit or Control Loop Outputs



1/8 DIN 96X48mm
▲ **DL-40 LR**



▼ **DL-40**



▲ **BL-40**
1/16 DIN 96X24mm

LYNX FAMILY

Configured for Direct Connection to Most Sensors and Process Signals, with Displays Scalable to Any Unit of Measure



1/8 DIN
96X48mm

▲ **DX-35 LR**



▲ **DX-35**



▲ **DX-40 LR**



▲ **DX-45**

1/16 DIN
96X24mm



▲ **BX-35**



▲ **BX-45**

Tiger Family Features

- Intelligent and super-intelligent digital meters
- Front-panel digital calibration and function selection
- Built-in linearization function, 32 to 125 flexible points
- Built-in sensor excitation voltage 5 V / 10 V / 24 V DC
- Six 5A relays or combinations of 10A relays and 5A relays
- Built-in memory for maximum and minimum readings
- Over 75 signal conditioners, single as well as dual inputs
- Two high-resolution, independently programmable 16-bit analog outputs
- Built-in timer and totalizer (signal integration) inputs, plus user-definable macros and real time clock
- Choice of serial communications – RS232, RS485, Ethernet, ASCII, Modbus and direct drive printer output
- Auto-sensing AC / DC, wide range 85-265 V AC / 95-370 V DC or 15-48 V AC / 10-72 V DC power supply
- Digital "smart" filtering
- Computer programmable
- Data logging up to 7000 samples

Leopard Family Features

- Smart 4-digit meters
- Front-panel digital scaling, offset, and setpoints
- Over 38 different signal conditioners
- Dual 10 and 5-amp relays, 4 relays total plus analog output
- 1/16 DIN meters have 2 or 3 relays or 1 relay plus analog output
- Auto-sensing AC / DC, wide range 85-265 V AC / 95-370 V DC, or 15-48 V AC / 10-72 V DC power supply

Lynx Family Features

- Basic indicator 3.5, 4 or 5 digit, 0.56" and 0.8" LED meters
- Analog scaling and offset from rear
- Over 24 single-input signal conditioners available
- Auto-sensing AC / DC, wide range 85-265 V AC / 95-370 V DC, or 15-48 V AC / 10-72 V DC power supply

SPECIFICATIONS

Tiger Meter Specifications

Accuracy: Built-in compensation and linearization functions enable system accuracies of the order of $\pm 0.0001\%$ of reading for analog inputs. Stop - Start time resolution from $\pm 1\text{sec}$ to $\pm 0.7\text{nsec}$. Digital input and pulse counts ± 1 count.

A/D Converters: A Dual Slope, bipolar 17 bit A/D is provided as standard on the main board. SMART modules have 24 bit or 16 bit Delta-Sigma A/D converters that utilize the internal I²C BUS.

Temperature Coefficient: Typically 30ppm/°C. Compensation can be utilized to achieve system temperature coefficients of 1ppm.

Warm Up Time: Up to 10 minutes, depending on input module.

Conversion Rate: Typically 10 samples per second. However, SMART input modules are available that can convert at 60, 240, 480 or 960 samples per second.

Control Output Rate: Can be selected for 100msec or 10msec. Some SMART modules have SSR outputs that react within 1.2msec.

Excitation Voltage: Depends on input module selected. Typically, 5V, 10V or 24VDC is provided.

Operating Temperature: 0 to 50 °C (32 °F to 122 °F).

Storage Temperature: -20 °C to 70 °C (-4 °F to 158 °F).

Relative Humidity: <95% (non-condensing) at 40 °C (104 °F).

Case Options: NEMA 4X Lens cover
Metal case surround
Panel Adapters

Texmate Intelligent Panel Meters

Leopard Meter Specifications

A/D Converter:	14 bit single slope
Accuracy:	±(0.05% of reading + 2 counts)
Temperature Coefficient:	100 ppm/°C (Typical)
Warm Up Time:	2 minutes
Conversion Rate:	5 conversions per second (Typical)
Operating Temperature:	0 to 60°C, <95% (non condensing)
Storage Temperature:	-20°C to 70°C

Lynx Meter Specifications

A/D Converter:	12 bit dual slope
Accuracy:	±(0.05% of reading + 2 counts)
Temperature Coefficient:	100 ppm/°C (Typical)
Warm Up Time:	2 minutes
Conversion Rate:	3 conversions per second (Typical)
Operating Temperature:	0 to 60°C, <95% (non condensing)
Storage Temperature:	-20°C to 70°C

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: DI-50E-DR-PS1-IA01-IAC-S2-R1

Basic Unit **A** - **B** - **C** - **D** - **E** - **F** - **G**

TIGER FAMILY METER SELECTION

A	DI-50E	Intelligent Modular, 32 pt Linear, Analog out & relays
	DI-60AE	Intelligent Modular, Alpha Numeric 6 digit 0.56" LED
	DI-60E	Intelligent Modular, Numeric 6 digit 0.56" LED
	GI-50E	Intelligent Modular, w/ 5 digit 1" LED
B	Display	
	DR	Red LED
	DG	Green LED
	DB	Super-bright Red LED
C	Power Supply	
	PS1	85-265VAC/95-370VDC
	PS2	15-48VAC/10-72VDC
D	Input Modules – See Input Module List "T" Items	
E	Output Options (leave blank for none)	
AIC	Isolated 4 to 20 mA Analog Output	
	AIV	Isolated 0 to 10 VDC Analog Output
F	Isolated Serial Communications (leave blank for none)	
S1	USB, ASCII	S3 USB, Modbus RTU
	S2 RS-232, ASCII	S5 RS-232, Modbus RTU & ASCII
	S4 RS-485, ASCII	S6 RS-485, Modbus RTU & ASCII
	S8 Ethernet, ASCII	S9 Ethernet, Modbus TCP/IP
G	Relays (leave blank for none)	
OR11	One 10A Form C	OR14 Two 10A Form C, Two 5A Form A*
	OR12 Two 10A Form C	OR23 Two 10A Form C, One 5A Form A
	OR33 Three 5A Form A	OR62 Two 400V AC/DC SSR, 140mA
	OR34 Four 5A Form A	OR64 Four 400V AC/DC SSR, 140mA
	OR46 Six 5A Form A*	*connection between some relay contacts

LEOPARD FAMILY METER SELECTION

A	BL-40	4.0 digit, Modular, Low Profile, Half Height Case
	BL-40H	4.0 digit, Thermocouple & RTD, Half Height Case
	DL-40	4.0 digit, Modular, 1/8 DIN case
	DL-40H	4.0 digit, Thermocouple & RTD, 1/8 DIN Case
B	Display	
	DR	Red LED, 0.56 inch high
	DG	Green LED, 0.56 inch high
	DB	Super bright LED, 0.56 inch high
	LG	Large Green LED, 0.8 or 1 inch high
	LR	Large Red LED, 0.8 or 1 inch high
C	Power Supply	
	PS1	85-265VAC/95-370VDC
	PS2	15-48VAC/10-72VDC
D	Input Modules – See Input Module List "L" Items	
E	Output Options (leave blank for none)	
AIC	Isolated 4 to 20 mA Analog Output	
	AIV	Isolated 0 to 10VDC Analog Output
F	Relays (leave blank for none)	
OR11	Single 10A Form C Relay	
OR12	Two 10A Form C Relays	
OR34	Four 5A Form A Relays	
OR14	Two 10A Form C, Two 5A Form A (some contacts connected)	

LYNX FAMILY METER SELECTION

A	BX-35	3.5 Digit Universal Power Supply, 1/16 DIN Case
	BX-45	4.5 Digit Universal Power Supply, 1/16 DIN Case
	DX-35	3.5 Digit Universal Power Supply, 1/8 DIN Case
	DX-40	4 Digit Universal Power Supply, 1/8 DIN Case
	DX-45	4.5 Digit Universal Power Supply, 1/8 DIN Case
B	Display	
	DR	Red LED
	DG	Green LED
	DB	Super-bright Red LED
	LG	Large Green LED, 0.8 inch high
LR	Large Red LED, 0.8 inch high	
C	Power Supply	
	PS1	85-265VAC/95-370VDC
	PS2	15-48VAC/10-72VDC
D	Input Modules – See Input Module List "LY" Items	

INPUT MODULE SELECTION

Function	Module	For
AC		
AC 1A, Scaled RMS	IA04	T,L,Ly
AC 5A, Scaled RMS	IA05	T,L,Ly
AC 1A, True RMS	IA09	T,L,Ly
AC 5A, True RMS	IA11	T,L,Ly
AC 2/20/200mA, Scaled RMS	IA03	T,L,Ly
AC 2/20/200mA, True RMS	IA08	T,L,Ly
AC 100mV, Scaled RMS	IA10	T,L,Ly
AC 100mV, True RMS	IA12	T,L,Ly
AC 200/600V, Scaled RMS	IA01	T,L,Ly
AC 200mV/2V/20V, Scaled RMS	IA02	T,L,Ly
AC 200/600V, True RMS	IA06	T,L,Ly
AC 200mV/2V/20V, True RMS	IA07	T,L,Ly
DC		
DC 5A	ID04	T,L,Ly
DC 1A	ID09	T,L,Ly
DC 2/20/200mA w/ 24V Exc.	ID03	T,L,Ly
DC 2/20/200mA w/ Offset & 24V Exc.	ID07	T,L,Ly
DC 20/50/100/200mV w/ Offset & 24V Exc.	ID02	T,L,Ly
DC 2/20/200V/Custom w/ 24V Exc.	ID01	T,L,Ly
DC 2/20/200V/Custom w/ Ext. Decimal Select	ID06	T
DC 2/20/200V/Custom w/ External LIN Table Select	ID08	T
DC 2/20/200V/Custom w/ Offset & 24V Exc.	ID05	T,L,Ly
DC Watts, 200V & 50mV from shunt	IW03	T
DC 2V and 3-wire RTD	IDT3	T
Dual DC 2mA	IDD3	T
Dual DC 50mV	IDD2	T
Dual DC 2V	IDD1	T
DC 50mV and 4-20mA	IDD6	T
DC 2V and 4-20mA	IDD5	T
DC 2V and 50mV	IDD4	T
DC 50mV and JKRSTBN Thermocouple	IDT5	T
DC 2V and JKRSTBN Thermocouple	IDT4	T
DC 1-5V Process w/ Offset & 24V Exc.	IP03	T,L,Ly
DC 2/5/10/20V/2/20mA + 3 Digital Inputs	IP10	T
Triple DC 50mV	ITD2	T
Triple DC 2V	ITD1	T
DC 50mV and 50mV and JKRSTBN T/C	ITT6	T
DC 50mV and 2V and JKRSTBN T/C	ITT9	T
DC 2V and 2V and JKRSTBN T/C	ITT7	T
DC 50mV and two JKRSTBN T/C	ITT5	T
DC 2V and two JKRSTBN T/C	ITT3	T
DC Volts and T/C and Frequency	ITTG	T
Quad DC 50mV	IQD2	T
Quad DC 2V	IQD1	T
RTD + DC V + DC V + Frequency	IQT5	T
Smart DC V, 16 bit, 1 to 800 Hz update rates	ISD1*	T
Smart DC V, 16 bit, 1 to 960 Hz update rates	ISD2**	T
Smart DC V, 16 bit, 1 to 800 Hz w/dual SSRs	ISD3*	T
Smart DC V, 16 bit, 1 to 960 Hz w/dual SSRs	ISD4**	T
Smart DC V, High Res & Acc, 24 bit 1-400Hz	ISD5*	T
Smart DC V, High Res & Acc, 24 bit 1-480Hz	ISD6**	T
Smart DC V, High Res & Acc, 1-400Hz w/dual SSRs	ISD7*	T
Smart DC V, High Res & Acc, 1-400Hz w/dual SSRs	ISD8**	T
Smart Dual 3-wire Potentiometer (50 Hz)	ISR3*	T
Smart Dual 3-wire Potentiometer (60 Hz)	ISR4**	T
Smart Dual DC Volts, 16 bit, 1-20Hz update	ISDA*	T
Smart Dual DC Volts, 16 bit, 1-20Hz update	ISDB**	T
Smart Load Cell and RTD	ISSB	T
DC Process 2/5/10/20/200V/2/20mA w/ 24V Exc.	IP07	T,L
DC Process 2/5/10/20/200V/2/20mA w/ 24V Exc & AutoCal	IP08	T

Texmate Intelligent Panel Meters

INPUT MODULE SELECTION - CONTINUED

Function	Module For
COUNTER	
Quadrature Counter	IC02...T
Quadrature Counter w/dual SSRs	IC03...T
Universal Freq./ RPM / Up Down Counter	IF10...T
Dual UP/DOWN Counter	IDC1...T
Counter and T/C and 4-20mA	ITTF...T
Smart Dual Counter and Pressure Direct	ISP1...T
DUAL INPUTS	
3-wire RTD and DC V	IDT3...T
3-wire RTD and 4-20mA	IDP2...T
Dual DC 2mA	IDD3...T
Dual DC 50mV	IDD2...T
DC 50mV and 4-20mA	IDD6...T
DC 2V and 4-20mA	IDD5...T
DC 2V and DC 50mV	IDD4...T
Strain Gage and Frequency	IDS3...T
Dual DC 2V	IDD1...T
Dual Direct Pressure (Abs. or Differential/Gage)	IGY...T
Dual Frequency	IDF2...T
Dual Pressure Input	IDS2...T
Dual Process Loop	IDP1...T
Dual Resistance Input	IDR1...T
Dual RTD Input	IDT2...T
Dual Smart Pressure/Load Cell, 16 bit	ISS5**...T
Dual Smart Pressure/Load Cell, 16 bit	ISS6**...T
Dual Strain Gage Input	IDS1...T
Dual Thermocouple	IDT1...T
Thermocouple and 4-20mA	IDP3...T
Thermocouple and DC mV	IDT5...T
Thermocouple and DC V	IDT4...T
Thermocouple and Load Cell	IDT6...T
Dual UP/DOWN Counter	IDC1...T
Smart Dual 3-wire Potentiometer	ISR3...T
Smart Load Cell and Process (4-20mA)	ISS9...T
Smart Dual DC Volts, 16 bit, 1-20Hz update	ISDA**...T
Smart Dual DC Volts, 16 bit, 1-20Hz update	ISDB**...T
Smart Dual Photo Diode Input	ISSE...T
Smart Dual RTD (50Hz)	IST5**...T
Smart Dual RTD (60Hz)	IST6**...T
4-20mA	
3-wire RTD and 4-20mA	IDP2...T
DC 50mV and 4-20mA	IDD6...T
DC 2V and 4-20mA	IDD5...T
Dual Process Loop	IDP1...T
Thermocouple and 4-20mA	IDP3...T
Process Loop 4-20mA	IP01...T,Ly
Process Loop 4-20mA w/ Ext. Lin Table	IP09...T,Ly
Process Loop 4-20mA w/ 24V Exc. & AutoCal	IP06...T
Process Loop 4-20mA w/ 24V Exc.	IP02...T,Ly
Quad 4-20mA	IQP1...T
Smart Load Cell and Process 4-20mA	ISS9...T
Triple 4-20mA	ITP1...T
4-20mA and 4-20mA and T/C	ITT8...T
T/C and 4-20mA and Counter	ITTF...T
T/C and 4-20mA and DC mV	ITTA...T
T/C and 4-20mA and DC Volts	ITTB...T
T/C and 4-20mA and Frequency	ITTF...T
T/C and T/C and 4-20mA	ITT4...T
FREQUENCY / RPM	
Universal Freq./ RPM / Up Down Counter	IF10...T
Universal Frequency / RPM	IF05...L
Line Frequency	IF08...L
Line Frequency	IF06...T
Dual Frequency	IDF2...T
Strain Gage and Frequency	IDS3...T
RTD and RTD and Frequency	ITTE...T
T/C and 4-20mA and Frequency	ITTF...T
T/C and DC Volts and Frequency	ITTG...T
RTD + DC V + DC V + Frequency	IQT5...T
LVDT	
Smart Dual LVDT (50 Hz)	ISL1**...T
Smart Dual LVDT (60 Hz)	ISL2**...T
OXIDATION REDUCTION POTENTIAL	
Oxidation Reduction Potential (ORP)	IOR1...T
pH	
pH	IH01...T
pH w/ Automatic Temperature Compensation	IH02...T

Function	Module For
POTENTIOMETER	
3-wire Potentiometer 1kΩ min.	IRO2...T,Ly
Linear Potentiometer 1kΩ min.	IRO3...T,L
Smart Dual 3-wire Potentiometer (50 Hz)	ISR3**...T
Smart Dual 3-wire Potentiometer (60 Hz)	ISR4**...T
Smart Quad Potentiometer/Resistance	ISSA...T
Smart Single 3-wire Potentiometer (50 Hz)	ISR1**...T
Smart Single 3-wire Potentiometer (60 Hz)	ISR2**...T
PRESSURE / LOAD CELL	
Universal Direct Pressure	IGYZ...T,Ly
Direct Pressure with 2 Digital Inputs	IGYX...T
Dual Direct Pressure (Abs. or Differential/Gage)	IGY...T
Dual Pressure Input	IDS2...T
Dual Smart Pressure/Load Cell, 16 bit	ISS5**...T
Dual Smart Pressure/Load Cell, 16 bit	ISS6**...T
Pressure/Load Cell 20/2mV/V, 5/10V Exc, 4-wire	IS05...T,Ly
Pressure/Load Cell Ext Exc., 20/2mV/V, 4-wire	IS06...T,Ly
Pressure/Load Cell Ext Exc., High Impedance	IS07...T,L
Pressure/Load Cell Ext Exc., 4/6-wire	IS04...T,L
Pressure/Load Cell w/ AutoCal, 4-wire	IS03...T
Pressure/Load Cell, 4/6-wire	IS02...T,L
Smart Pressure/Load Cell, Standard Res 16 bit	ISS1**...T
Smart Pressure/Load Cell, Standard Res 16 bit	ISS2**...T
Smart Pressure/Load Cell, High Res & Acc 24 bit	ISS3**...T
Smart Pressure/Load Cell, High Res & Acc 24 bit	ISS4**...T
Smart Quad Pressure/Load Cell (50 Hz)	ISS7**...T
Smart Quad Pressure/Load Cell (60 Hz)	ISS8**...T
Smart Pressure Direct & Dual Counter	ISP1...T
Smart Load Cell and Process 4-20mA	ISS9...T
Smart Load Cell and RTD	ISSB...T
Smart Load Cell and Two Digital Inputs	ISSC**...T
Smart Load Cell and Two Digital Inputs	ISSD**...T
Thermocouple and Load Cell	IDT6...T

Function	Module For
PROCESS LOOP	
Dual Process Loop	IDP1...T
Process Loop 4-20mA	IP01...T,Ly
Process Loop 4-20mA w/ Ext. Lin Table	IP09...T
Process Loop 4-20mA w/ 24V Exc. & AutoCal	IP06...T
Process Loop 4-20mA w/ 24V DC Exc.	IP02...T,Ly
QUAD INPUTS	
Quad 4-20mA	IQP1...T
Quad DC 50mV	IQD2...T
Quad DC 2V	IQD1...T
Quad RTD Platinum 2 wire connection	IQT2...T
Quad RTD Platinum 4 wire connection	IQT4...T
RTD + DC V + DC V + Frequency	IQT5...T
Smart Quad Potentiometer/Resistance	ISSA...T
Smart Quad Pressure/Load Cell (50 Hz)	ISS7**...T
Smart Quad Pressure/Load Cell (60 Hz)	ISS8**...T
Smart Quad Thermocouple (50 Hz)	IST3**...T
Smart Quad Thermocouple (60 Hz)	IST4**...T
RESISTANCE	
Dual Resistance 0.2/2/20kΩ	IDR1...T
Resistance 200/2k/20kΩ, 2/3/4-Wire	IRO1...T
Resistance 2kΩ	IRO4...L
Resistance 2kΩ	IRO5...Ly
Smart Quad Potentiometer/Resistance	ISSA...T
Smart Voltage and Resistance	ISD9...T
RTD	
3-wire RTD and DC V	IDT3...T
3-wire RTD and 4-20mA	IDP2...T
Dual RTD	IDT2...T
Quad RTD Platinum 2 wire	IQT2...T
Quad RTD Platinum 4 wire	IQT4...T
RTD + DC V + DC V + Frequency	IQT5...T
RTD, 100Ω Copper 2/3/4-wire	IT13...T
RTD, 100Ω Pt. 2/3/4-wire	IT02...T
RTD, 100Ω Pt. 2/3/4-wire (-199.9 to 199.9 °C)	IT14...T,Ly
RTD, 100Ω Pt. 2/3/4-wire (-199.9 to 199.9 °F)	IT05...T,Ly
RTD, 100Ω Pt. 2/3/4-wire (-200 to 800 °C)	IT03...T,Ly
RTD, 100Ω Pt. 2/3/4-wire (-200 to 1470 °F)	IT04...T,Ly
RTD, 100Ω Pt. 3/4-wire, °C/°F, 1°/0.1°	IT11...L
RTD, 120Ω Nickel 2/3/4-wire	IT12...T
RTD, 1000Ω Pt. Select 3/4-wire, °C/°F, 1°/0.1°	IT15...L
Smart Load Cell and RTD	ISSB...T
Smart Dual RTD (50Hz)	IST5**...T
Smart Dual RTD (60Hz)	IST6**...T
Smart 6 Input - 3 RTD, 2 Process, 1 Digital	IST1**...T
Smart 6 Input - 3 RTD, 2 Process, 1 Digital	IST2**...T
Triple RTD Platinum 100Ω, 4-wire	ITTC...T

Function	Module For
Triple RTD Platinum 100Ω, 2-wire	ITT2...T
RTD and RTD and Frequency	ITTE...T

SINGLE PHASE POWER	
Single Phase Power, 300V/1A	IW01...T
Single Phase Power, 300V/5A	IW02...T
Single Phase Power, 600V/1A	IW04...T
Single Phase Power, 600V/5A	IW05...T

STRAIN GAGE	
Strain Gage and Frequency	IDS3...T
Dual Strain Gage	IDS1...T
Strain Gage	IS01...T,L

THERMOCOUPLE	
Dual Thermocouple JKRSTBN	IDT1...T
T/C JKRSTBN and 4-20mA	IDP3...T
T/C JKRSTBN and DC 50mV	IDT5...T
T/C JKRSTBN and DC 2V	IDT4...T
Thermocouple and Load Cell	IDT6...T
Smart Quad Thermocouple (50 Hz)	IST3**...T
Smart Quad Thermocouple (60 Hz)	IST4**...T
Thermocouple JKRSTBN	IT01...T
T/C, JKRT, Selectable °C/°F, 1°/0.1°	IT10...L
T/C JKRSTBN, 4-20mA and 4-20mA	ITT8...T
T/C JKRSTBN, 4-20mA and Counter	ITTF...T
T/C JKRSTBN, 4-20mA and DC 50mV	ITTA...T
T/C JKRSTBN, 4-20mA and DC 2V	ITTB...T
T/C JKRSTBN, DC 50mV and DC 50mV	ITT6...T
T/C JKRSTBN, DC 2V and DC 50mV	ITT9...T
T/C JKRSTBN, DC 2V and DC 2V	ITT7...T
T/C JKRSTBN, T/C and 4-20mA	ITT4...T
T/C JKRSTBN, T/C and DC 50mV	ITT5...T
T/C JKRSTBN, T/C and DC 2V	ITT3...T
T/C, 4-20mA and Frequency	ITTF...T
T/C, DC Volts and Frequency	ITTG...T
Triple Thermocouple JKRSTBN	ITT1...T

TRIPLE INPUTS	
Smart Load Cell and Two Digital Inputs	ISSC**...T
Smart Load Cell and Two Digital Inputs	ISSD**...T
Smart Pressure Direct & Dual Counter	ISP1...T
Triple 4-20mA	ITP1...T
Triple DC 50mV	IDT2...T
Triple DC 2V	IDT1...T
Triple RTD Platinum 100Ω, 4-wire	ITTC...T
Triple RTD Platinum 100Ω, 2-wire	ITT2...T
RTD and RTD and Frequency	ITTE...T
T/C JKRSTBN, 4-20mA and 4-20mA	ITT8...T
T/C JKRSTBN, 4-20mA and Counter	ITTF...T
T/C JKRSTBN, 4-20mA and DC 50mV	ITTA...T
T/C JKRSTBN, 4-20mA and DC 2V	ITTB...T
T/C JKRSTBN, DC 50mV and DC 50mV	ITT6...T
T/C JKRSTBN, DC 2V and DC 50mV	ITT9...T
T/C JKRSTBN, DC 2V and DC 2V	ITT7...T
T/C JKRSTBN, T/C and 4-20mA	ITT4...T
T/C JKRSTBN, T/C and DC 50mV	ITT5...T
T/C JKRSTBN, T/C and DC 2V	ITT3...T
T/C, 4-20mA and Frequency	ITTF...T
T/C, Volts and Frequency	ITTG...T
Triple Thermocouple JKRSTBN	ITT1...T

*Optimized for 50 Hz rejection. **Optimized for 60 Hz rejection.

ENHANCED TIGER FAMILY MODELS



DI-503
Triple Display Meters



Digital Meter with Annunciators
DI-50/AN6



DI-602A
Dual Display Meters



DI-802X
Dual Line Alphanumeric LCD

Texmate Application-Specific Meters

- 3 1/2 Digit, 4 1/2 Digit and Bargraph Meters
- LED and LCD Displays
- Variety of NEMA & DIN Case Sizes Down to 1/32 DIN
- AC, DC or Loop Powered
- Measure
 - DC Volts
 - AC Volts
 - DC Current
 - AC Current
 - Process mA
 - Temperature (Thermocouple, RTD)
 - Line Frequency
 - Counter
 - Pressure

DU-SERIES 1/8 DIN (96 x 48mm) METERS

Standard user selectable 100/120 VAC or 200/240 VAC power supply, option 24 VAC, or auto sensing isolated AC/DC 9 to 24 VAC, 12 to 36 VDC. 0.56" std. red or optional green or super bright red LED display.

AC Current

- DU-35AC1.....AC Amps, Average, 1A (built-in shunt), 3.5-Digit
- DU-35AC5.....AC Amps, Average, 5A (built-in shunt), 3.5-Digit
- DU-35AC1RMS....AC Amps, RMS, 1A (built-in shunt), 3.5-Digit
- DU-35AC5RMS....AC Amps, RMS, 5A (built-in shunt), 3.5-Digit
- DU-40AC1.....AC Amps, Average, 1A (built-in shunt), 4-Digit
- DU-40AC5.....AC Amps, Average, 5A (built-in shunt), 4-Digit
- DU-40AC1RMS....AC Amps, RMS, 1A (built-in shunt), 4-Digit
- DU-40AC5RMS....AC Amps, RMS, 5A (built-in shunt), 4-Digit

AC Voltage

- DU-35ACAC Volts, Average, 199.9/700.0 VAC
- DU-35ACRMS....AC Volts, True RMS 199.9V/700V
- DU-40ACAC Volts, Average, 700.0 VAC, 4-Digit

AC Line Frequency

- DU-35HZLine Frequency 199.9 or 500 Hz up to 700V AC input w/3.5-Digit

DC Voltage

- DU-35DC Volts Selectable from 2V/20V/200V, 3.5-Digit
- DU-35MVDC mV Selectable 50 mV/100 mV/200 mV, 3.5-Digit
- DU-45DC Volts Selectable from 2 V/20V/200V, 4.5-Digit
- DU-45MVDC mV Selectable 50 mV/100 mV/200 mV 4.5-Digit

Process 4 to 20 mA

- DU-35CLProcess 4 to 20 mA, 3.5-Digit
- DU-35CLE.....Process 4 to 20 mA with 24 VDC Excitation, 3.5-Digit
- DU-45CLProcess 4 to 20 mA, 4.5-Digit

Pressure

- DU-35P.....Strain Gauge, Load Cell, and Pressure, 4- and 6-Wire, 5 VDC Excitation, Selectable Sensitivity from 2 mV to 20 mV/V, 3.5-Digit, 0.56" LED Display

Temperature

- DU-35JC.....Thermocouple J, °C, 3.5-Digit
- DU-35JF.....Thermocouple J, °F, 3.5-Digit
- DU-35KC.....Thermocouple K, °C, 3.5-Digit
- DU-35KF.....Thermocouple K, °F, 3.5-Digit
- DU-35RTDC.....100Ω Pt RTD, 2/3/4-wire, °C, 3.5-Digit
- DU-35RTDF.....100Ω Pt RTD, 2/3/4-wire, °F, 3.5-Digit

Metal Case Option for 96 x 48mm DIN Case

- OP-MTL96X48 Provides Extra Strength and Protection Against Fire
- OP-MTLCLIP Mounting clips



BN-SERIES 1/16 DIN (96 x 24 mm) SHORT-DEPTH METERS

Standard 24 VDC isolated power supply, option 12V or 15 V. Standard 0.56" red, optional green or super bright red LED display.

DC Voltage

- BN-35IDC Volts Selectable from 2V/20V/200V, 3.5-Digit
- BN-45IDC Volts Selectable from 2V/20V/200V, 4.5-Digit

Meters below, 5 VDC power supply. 0.56" standard red or optional green or super bright red LED display.

- BN-35DC Volts Selectable from 2V/20V/200V, 3.5-Digit
- BN-45DC Volts Selectable from 2V/20V/200V, 4.5-Digit

BCD Remote Display

- BN-35BCDRemote BCD Display 3.5-Digit

Meter below, AC/DC auto sensing isolated power supply 85 to 256 VAC/90 to 380 VDC power supply. 0.3" standard red or optional green or super bright red LED display.

Dual AC Volts and Hertz, Signal Powered

- DD-40VHZ.....3.5-Digit, 0.3" LED Display



MU-SERIES 1/32 DIN (48 x 24 mm) METERS

AC/DC auto sensing isolated power supply 12 to 24 VAC/9 to 36 VDC power supply. 0.3" standard red or optional green or super bright red LED display.

- MU-35DC Volts Selectable from 2V/20V/200V
- MU-35CLProcess 4 to 20 mA



UM-SERIES—NEMA CASE LOW-COST UTILITY METERS

Standard user selectable 100/120 VAC or 200/240V AC power supply, optn. 24 VAC, or auto sensing isolated AC/DC 9 to 24 VAC, 12 to 36 VDC. 0.56" std. red or optn. 0.8" std. red (3.5-digit and UM-40AC only) or green or super bright red LED display.

AC Current

- UM-35AC1AC Amps, Average, 1A, 3.5-Digit Display
- UM-35AC5AC Amps, Average, 5A, 3.5-Digit Display

AC Voltage

- UM-35AC700 VAC and 199.9 VAC Full Scale, 3.5-Digit Display
- UM-40AC700.0 VAC FS, 0.1V Resolution, 4-Digit Display

AC Line Frequency

- UM-35HZ40 Hz to 199.9 Hz or 40 Hz to 500 Hz, 3.5-Digit

DC Voltage

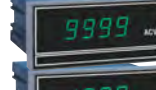
- UM-35±2/20 VDC or Optionally ±2/200 VDC, 3.5-Digit
- UM-35MV±50 mV and ±00 mV Inputs to Suit External DC Current Shunts, 3.5-Digit
- UM-45±2/20 VDC or Optionally ±2/200 VDC, 4.5-Digit
- UM-45MV±50 mV, ±100 mV, or ±200 mV Inputs to Suit Standard DC Current Shunts, 4.5-Digit

Process 4 to 20 mA

- UM-35CL1.4V Loop Drop, Scalable in Engineering Units from -1999 to +1999, 3.5-Digit
- UM-35CLEBuilt-In 24 VDC Loop Excitation
- UM-45CL4.5-Digit Version of UM-35CL as Above

Temperature, 3.5-Digit - specify °C or °F

- UM-35JJ Thermocouple Input, 1° Resolution
- UM-35KK Thermocouple Input, 1° Resolution
- UM-35RTD3-Wire, 100-Ohm RTD, 0.1° or 1° Resolution (specify)



Texmate Application-Specific Meters

Continued from previous page

SD-SERIES 1/8 DIN (96 x 48 mm) ULTRA SHORT-DEPTH

Only 1.2" depth behind panel, including connectors.



4-20mA Loop Powered

SD-50X5-Digit 0.5" LCD. 3.5-27.5mA input span, -19999 to 30000 count display. 6th digit displays F, C, inactive 0 or blank.

MINI-METER DVM-5 SERIES, 1.378 x 0.5 x 1.375" CASE

Process 4 to 20 mA

DVM-5/4-203.5-Digits, 0.276" LED Display, 4-20mA input, 5V power
DVM-5/CL3.5-Digits, 0.276" LED Display, Loop powered



Volt and RTD, 5 VDC Power

DVM-52/20/200 VDC, 0.276" LED Display
DVM-5/G2/20/200 VDC, 0.276" Green LED Display

SM SERIES 3-WIRE DC INPUT

20 mV to 2 VDC, 3.5-Digit LED/LCD, 5 VDC Power

SM-352 to 20 VDC, 0.56" LED, Display Hold
SM-35X2 to 20 VDC, 0.48" LCD, Display Hold
SM-35MV20 mV to 2 VDC LED Constant Current 5 VDC
Power Supply Eliminates Ground Loop Problems
SM-35XMV20 mV to 2 VDC LCD Constant Current 5 VDC
Power Supply Eliminates Ground Loop Problems



SLIM-BEZEL CASE LED AND LCD MINIATURE METERS

Loop-Powered, Process 4 to 20 mA, 0.48" LCD

CM-35XTLLess than 1 VDC Loop Drop and 1 Joule Energy Storage. Fully Scalable
CM-35XTEconomical Standard 6.5V Loop Drop



DC and AC 2-Wire Signal-Powered, 0.48" LCD

SP-35X±3.5 VDC to 199.9 VDC
SP-35XMV50 mV shunt/10 to 100 VDC Power



Low Cost DC Bargraph, 5 VDC Power

AM-2020 Segment, 200 mV to 200 VDC, 5 VDC Power



DC Volts, 4.5 Digit LED/LCD, 5 VDC Power

PM-45X/45X200 mV to 1200V BCD Output Option, LCD
PM-45L200 mV to 1200 VDC and BCD Output Option, LED



J and K Thermocouple Meters LED/LCD

Differential Input Configuration Allows Several Meters to be Operated with Grounded Thermocouples from the same 5VDC Power Supply.

TM35JCType J, °C, LED display
TM35JFType J, °F, LED display
TM35KCType K, °C, LED display
TM35KFType K, °F, LED display



RP AND PM SERIES METERS

DC Input, 110/230 VAC Power

RP-35UEconomy DC inputs, 3.5-Digit, 0.56" LED Display
RP-35APrecision Differential DC Input, 3.5-Digit, 0.56" LED
RP-35ARAuto Dual Ranging, 3.5-Digit, 0.56" LED Display



RP-3500D23.5-Digit Differential Input with Optional BCD
RP-4500D24.5-Digit Differential Input with Optional BCD



DC Input, 5 VDC Power

PM-35ULow Cost, 3.5-Digit, 0.3" LED Display
PM-35ADifferential Inputs, 3.5-Digit, 0.56" LED Display



PM-45LUDifferential Input, 4.5-Digit, 0.4" LED Display
PM-45LUBCDPM-45LU with tri-state parallel BCD Output
PM-45LUMXBCD ..PM-45LU with multiplexed BCD Output
PM-45XUDifferential Input, 4.5-Digit, LCD Display



AM-SERIES 1/16 DIN (96 x 24 mm) SHORT-DEPTH BARGRAPHS

5 VDC power supply. 30 segment standard red or optional green or amber LED display.

Selectable Process 4 to 20 mA or DC Voltage

AM-306 Header Selectable DC Ranges Plus 4 to 20 mA
AM-30R16 DC + 4 to 20 mA w/One 2A/120 VAC Relay
AM-30R26 DC + 4 to 20 mA w/Two 2A/120 VAC Relays



LOOP POWERED LED BARGRAPH

1/16 DIN 96x24mm, 31 segment red or green LEDs. Only 4V loop drop, 3" behind panel.
Available in horizontal or vertical orientation



SB-B314-20mA Loop Powered Bargraph

SLIM BEZEL CASE COUNTERS & TOTALIZERS

Contact closure: 0 - 6,000 CPM or 0 - 600,000 CPM.
3 - 30V pulse: 0 - 500 kHz



PC-45 4.5-Digit, 5V DC Power, LED

ACCESSORIES

OP-N4X/96x48NEMA-4X Clear, Lockable Dustproof & Waterproof Cover (for DU & SD series only)

OP-PSA/96x48NEMA-4X Panel to Case Seal Adapter

PS-2405120V AC Adapter, 24VDC @ 0.5A

PS-505120V AC Adapter, 5VDC @ 0.5A

PS-520120V AC Adapter, 5VDC @ 2A

Simpson Digital Meters/Controllers

Includes new temperature measurement models (H340)

- All Parameters Set from Front Panel
- 7 Segment 4-½ or 3-½ Digit Bright Red Display
- Screw Terminals for Easy Installation
- 1/8 DIN Shallow Depth Case
- Peak/Valley and Password Lockout
- Optional Plug-In Output and Excitation Cards
- Optional Plug-In Cards for One, Two or Four 5 Amp Relays
- NEMA 4X Rated Front Panel



H345



SPECIFICATIONS

Display	
Type:	7 segment, red LED
Quantity:	H335: 3 ½ digit; H345: 4 ½ digit; H340: 4 digit
Height:	0.56" (14.2 mm)
Decimal Point:	H335 and H340: 4-position, user programmable H345: 5-position, user programmable
Brightness:	5 Levels, user programmable
Alarm Indicators:	4 LED indicators for up to four set points
Power Requirements	
AC Voltages:	120, 85-250 VAC @ 10VA
DC Voltages:	9-36 VDC @ 10 VA
Accuracy @ 25°C:	
DC:	H335: 0.1% of input ±1 digit H345: 0.05% of input ±1 digit
AC:	H335: 0.2% ±2 digits H345: 0.1% ±2 digits
Sensor Type	Accuracy Temperature Range
RTD Pt 100	0.2% of input ±2 count -200°C to +200°C
J	0.2% of input ±2 counts -100°C to +760°C
K	0.2% of input ±2 counts -200°C to +1250°C
E	0.2% of input ±2 counts -100°C to +800°C
T	0.2% of input ±2 counts -200°C to +400°C
Mechanical	
Bezel:	3.93 x 2.04 x .52" (98.8 x 51.8 x 13.2 mm)
Depth:	3.24" (82.33mm) behind panel
Panel Cut-out:	½ DIN 3.62 x 1.77" (92 x 45 mm)
Case Material:	PBT-ABS
Weight:	10 oz (283.5g)
Temperature:	0-50°C
Sample Rate:	10/sec

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.

A - B - C - D - E - F

A Basic Temperature Meter		D Analog Output	
H340	4 digit Red LED	0	None
		1	4-20 mA DC
		2	0-10V DC
B Power Supply		E 5 Amp Relays	
1	120V AC	0	None
3	9-36V DC	1	One
4	85-250V AC	2	Two
		4	Four
C Function Range		F Excitation Output	
91	J Thermocouple	0	None
92	K Thermocouple	1	12V DC (30mA max)
93	RTD, Pt100, 3-wire	2	24V DC (30mA max)
94	E Thermocouple		
95	T Thermocouple		

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: H335-1-46-0-1-2

A - B - C - D - E - F

A Basic Panel Meter	
H335	3½ digit Red LED
H345	4½ digit Red LED
B Power Supply	
1	120VAC (3½ digit only)
2	85-250 VAC (4½ digit only)
3	9-36 VDC
4	85-250 VAC (3½ digit only)
C Function/Range	
11	200mV DC
12	2V DC
13	20 VDC
14	200V DC
15	600V DC
21	200µA DC
22	2m ADC
23	20mA DC
24	200mA DC
25	2A DC
26	5A DC
31	200mV AC
32	2V AC
33	20V AC
34	200V AC
35	600V AC
41	200µA AC
42	2mA AC
43	20mA AC
44	200mA AC
45	2A AC
46	5A AC
D Output Signal	
0	None
1	4-20 mA DC Process
2	0-10 VDC Process
6	RS-485 (4½ digit only)
E 5 Amp Relay Outputs	
0	None
1	One
2	Two
4	Four
F Excitation Output (not available with Signal Output)	
0	None
1	12V DC (30mA max)
2	24 DC (30mA max)

Simpson Digital Panel Meters


F35

M235

 DIGITAL
METERS

- Case Size: Standard 1/8 DIN
- Accuracy: $\pm 0.1\%$ (F35); $\pm 0.02\%$ (F45DCV); $\pm 0.5\%$ (F45AC)
- Auto-Zero
- Choice of AC or DC Power Supplies
- Broad Range Scaling and Adjustable Zero Offset for Process Inputs
- User-Selectable Decimal Points
- Optional Excitation Output 12 VDC or 24 VDC
- Easy Installation Using Screw Terminals

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number
Order Example: F35-1-12-1

A	B	C	D
A Basic Unit			
F35	3 ¹ / ₂ -Digit Meter		
F45	4 ¹ / ₂ -Digit Meter		
B Power Supply			
1	120 VAC		
2	220 VAC		
3	9-32 VDC		
C Input Range			
	DC Voltage	AC Voltage	AC RMS
200 mV	11	31	51
2V	12	32	52
20V	13	33	53
200V	14	34	54
	DC Current	AC Current	AC RMS (F35 Only)
200 μ A	21	41	61
2 mA	22	42	62
20 mA	23	43	63
200 mA	24	44	64
2A	25	45	65
5A	26	46	66
Process			
71	4-20 mADC		
72	1-5 VDC		
73	0-10 VDC		
Temperature (F45 only)			
80	J T/C	84	E T/C
81	K T/C	85	R T/C
82	S T/C	86	mV DC
83	T T/C	90	RTD PT 100
	Frequency	RMS (F35)	Sq. Wave (F35)
	20-199.9 Hz	91	93
	20-1999 Hz	92	94
D Excitation Output (DC Input Only)			
0	None		
1	12 VDC		
2	24 VDC		

- Case Size: Standard 3/64 DIN Dimensions
- Accuracy: $\pm 0.5\%$ (M235); $\pm 0.5\%$ (M245)
- Minimum Depth Indicator—Less Than 2.5" (60 mm) of Space
- User-Selectable Decimal Point
- Optional Negative Image, Bright Red Backlighting
- Standard Screw Terminals
- 85V to 250 VAC Power or 9V to 32 VDC

Mini-Max—3/64 DIN, 3¹/₂ and 4¹/₂ Digit AC and Process Indicators

Simpson's Mini-Max AC Voltage/Current Indicators provide high quality, accuracy, and reliability in a compact 60 mm deep case.

SPECIFICATIONS

Power: 85V-250 VAC @ 40 Hz-440 Hz; or 9V-32 VDC

Size: 2.84 x 0.95 x 2.36" WHD (72 x 24 x 60 mm)

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: M235-1-0-11-0

A	B	C	D	E
A Basic Unit				
M235	3 ¹ / ₂ -Digit LCD Meter			
M245	4 ¹ / ₂ -Digit LCD Meter			
B Display				
0	Non-Backlit			
1	Negative Red Backlight			
C Supply Voltage				
0	85-250 VAC			
2	9-32 VDC*			
D Function Range				
11	200 mVDC	31	200 mVAC TRMS	
12	2 VDC	32	2 VAC TRMS	
13	20 VDC	33	20 VAC TRMS	
14	200 VDC	34	200 VAC TRMS	
21	200 μ ADC	36	270 VAC TRMS	
22	2 mADC	41	200 μ AAC TRMS	
23	20 mADC	42	2 mAAC TRMS	
24	200 mADC	43	20 mAAC TRMS	
25	2 ADC	44	200 mAAC TRMS	
26	5 ADC	45	2 AAC TRMS	
71	4-20 mADC	46	5 AAC TRMS	
72	1-5 VDC	81	20-199.9 Hz	
73	0-10 VDC	82	20-1999 Hz	
74	0-100 VDC	83	20-199.9 Hz Sq. Wave	
		84	20-1999 Hz Sq. Wave	
E Excitation Output (NA with Frequency)				
0	None			
1	12 VDC			
2	24 VDC			

* Not Available on Frequency (Hz) Meters

Yokogawa Dual Display Digital Meters

ProPlus Series

- Large Dual-Line 6-Digit Display, 0.60" & 0.46"
- Universal 85-265 VAC or 12/24 VDC Power
- 1/8 DIN case with NEMA 4X, IP65 Front
- Programmable Displays & Function Keys
- 2 or 4 Relays + Isolated 4-20 mA Output Options
- External 4-Relay & Digital I/O Expansion Modules
- USB, RS-232, RS-485 Serial Communication Options
- Modbus® RTU Communication Protocol Standard
- Free Windows Software for Setup & Operation



Process Meters

- 0-20 mA, 4-20 mA, 0-5 V, 1-5 V, and ±10 V Ranges
- Dual-Scale for Level Applications – Single Input
- Isolated 24 VDC @ 200 mA Transmitter Power Supply
- Signal Conditioning for Flow & Round Horizontal Tanks
- 32-Point, Square Root, or Exponential Linearization
- Multi-Pump Alternation Control
- Tare Function

YPP6000



Dual Input Process Meters

- Two Process Inputs: 0-20 mA, 4-20 mA, 0-5 V, 1-5 V, ±10 V
- Math Functions: Addition, Difference, Multiplication, Division, Average, Min, Max, Weighted Average, Ratio, Concentration, & More

ACCESSORIES

P/N	Description
YPPA1002	DIN Rail Mounting Kit for Two Expansion Modules
YPPA1004	4-Relay Expansion Module
YPPA1044	4 Digital Inputs & 4 Digital Outputs Expansion Module
YPPA1200	Meter Copy Cable
YPPA1232	RS-232 Serial Adapter
YPPA1485	RS-485 Serial Adapter
YPPA8008	USB-Serial Adapter
YPPA7485-I	RS-232 to RS-422/485 Isolated Converter
YPPA7485-N	RS-232 to RS-422/485 Non-Isolated Converter
YPPA8232-N	USB to RS-232 Non-Isolated Converter
YPPA8485-I	USB to RS-422/485 Isolated Converter
YPPA8485-N	USB to RS-422/485 Non-Isolated Converter
YPPX6901	Suppressor (snubber): 0.01µF/470Ω, 250 VAC



YPP7000

Temperature Meters

- J, K, T, E, R, S, B, N, C Thermocouples
- 100 or 1000Ω Pt, 10Ω Cu, 120Ω Ni RTDs
- 1° or 0.1° Resolution
- Averages up to 10 RTD Sensors
- Automatic Cold Junction Compensation
- Sensor Break Detection



YPP6400

AC/DC Meters

- (1) High Voltage and (1) High Current Input
- Multiplication for Apparent Power Calculation
- 0-300 VAC or VDC Voltage Input
- 0-5 AAC or ADC Current Input
- Fixed or Alternating Display

SPECIFICATIONS

Display Assignments:	YPP6000: PV1, PV2, PCT (percent), max/min, alternate max & min, set points, units (lower display only), or Modbus input.
Display Assignments:	YPP6060: Ch-A, Ch-B, Ch-C, toggle between (Ch-A & Ch-B, Ch-A & Ch-C, Ch-B & Ch-C, and Ch-A, Ch-B, & Ch-C), toggle between Channel & units, show channel gross value (no tare) or toggle net (tare) and gross values, show relay set points, max & min values, or Modbus input. The second display may also be set to show engineering units or off (no display).
Sensor Excitation:	Process Meters: 24V @ 200mA, can be jumpered for 5 or 10 V
Accuracy:	Process Meters: ±0.03% of calibrated span ±1 count
Accuracy (YPP6400):	ADC: 0.03% FS ±1 count, AAC: 0.1% FS ±1 count, VDC: 0.05% FS ±1 count, VAC: 0.15% FS ±1 count
Accuracy (YPP7000):	J,K,T,E: ±1°C; R,S,B,N,C: ±2°C; Cu/Ni: ±0.1°C; Pt: ±0.4°C
Programming Method:	4 front panel buttons, digital inputs, ProPlus PC software, Modbus registers, or clone setting using Copy function
Display:	200ms update rate, eight intensity levels
Noise Filter:	Programmable from 2 to 199, (0 will disable filter)
Min/Max:	Readings stored until reset by user or power is interrupted
Memory:	All programmed settings are stored in non-volatile memory
Serial Communication:	Modbus RTU protocol, slave ID 1-247. 300-19200 baud rate. Requires serial communication adapter (see Accessories list)
Operating Environment:	-40 to 65°C, <90% RH, non-condensing
Power Line Fuse:	Requires external 5A slo-blow fuse (up to 6 meters per fuse)
Isolation:	4kV input/output to power line, 500V input to output; YPP6400: 500V between inputs, 500V input to output
Connections:	Removeable screw terminal blocks, RJ45 for serial comm.
Dimensions:	4.68" W x 2.45" H x 5.64" D (119 x 62 x 143 mm)
Warranty:	3 years
Isolated 4-20 mA Output:	Loop power: internal 24VDC @40mA max, external 35VDC max Loop resistance: 10-700Ω @24V, 100-1200Ω @35V
Installed Relays:	2 or 4 SPDT, 3A @ 250VAC/30VDC resistive, 1/14 HP
Relay Expansion Module:	Four SPST, 3A @ 250VAC/30VDC resistive, 1/14 HP
Relay Parameters:	Channel, setpoint, hi/lo, deadband, on/off delay, operating mode, reset condition, power-up state
Digital Expansion Module:	Input: hi 3-5 V, lo <1.25V; Output: hi 3.1-3.3V, lo <0.4V; Source 10mA max, sink 1.5mA min; 5V pullup available

ORDERING INFORMATION

Options Installed	Process		Dual Input		AC/DC		Temperature	
	85-265 VAC	12/24 VDC	85-265 VAC	12/24 VDC	85-265 VAC	12/24 VDC	85-265 VAC	12/24 VDC
None	YPP6000-6R0	YPP6000-7R0	YPP6060-6R0	YPP6060-7R0	YPP6400-6R0	YPP6400-7R0	YPP7000-6R0	YPP7000-7R0
2 Relays	YPP6000-6R2	YPP6000-7R2	YPP6060-6R2	YPP6060-7R2	YPP6400-6R2	YPP6400-7R2	YPP7000-6R2	YPP7000-7R2
4-20 mA Output	YPP6000-6R3	YPP6000-7R3	YPP6060-6R3	YPP6060-7R3	YPP6400-6R3	YPP6400-7R3	YPP7000-6R3	YPP7000-7R3
4 Relays	YPP6000-6R4	YPP6000-7R4	YPP6060-6R4	YPP6060-7R4	YPP6400-6R4	YPP6400-7R4	YPP7000-6R4	YPP7000-7R4
2 Relays & 4-20 mA Output	YPP6000-6R5	YPP6000-7R5	YPP6060-6R5	YPP6060-7R5	YPP6400-6R5	YPP6400-7R5	YPP7000-6R5	YPP7000-7R5
4 Relays & 4-20 mA Output	YPP6000-6R7	YPP6000-7R7	YPP6060-6R7	YPP6060-7R7	YPP6400-6R7	YPP6400-7R7	YPP7000-6R7	YPP7000-7R7

for Sunbright Display, change R to H

Laurel High Performance DPMs

FEATURES

- ±99999 Display Span
- User Selectable Ranges
- 60 Readings Per Second
- Adaptive Digital Filter
- 1/8 DIN, NEMA-4X Front
- 5, 10, 24V DC Excitation Out

OPTIONS (all outputs isolated)

- Dual Setpoint Relay Outputs
- Linearized Isolated Analog Transmitter Outputs
- USB, RS-232 & RS-485 Data I/O
- Custom Curve Linearization
- Datalogging PC Software

Laureate™ DPMs offer exceptional accuracy at high reading rates. Advanced programming features provide flexibility in measuring DCV, ACV, DCA, ACA, temperature, weight, strain, process & pot follower.



SPECIFICATIONS

Display	Five 14.2 mm (.56") high LED digits
A-to-D Conversion	
A-to-D rate	60/s at 60 Hz, 50/s at 50 Hz
Display update	3.5/s at 60 Hz, 3/s at 50 Hz
Accuracy at 25°C	
DC, Process	< 0.01% FS ±2 counts
Strain, Load	< 0.01% FS ±2 counts
True RMS	< 0.03% FS (10 Hz-10 kHz)
	CF = 3.0 at full scale (AC or DC coupled)
Thermocouple	< 0.2°C
RTD	< 0.1°C
Noise Rejection	
CMR, DC to 60 Hz	130 dB
NMR to 50/60Hz line	90 dB with min filtering
Transducer Excitation Output (std)	
Output	100 mA @ 5V, 120 mA @ 10V, 50 mA @ 24V
Dual Relay Output (opt)	
Contact relays	8A @ 250 Vac or 24 Vdc
Solid state relays	0.13A @ 140 Vac or 180 Vdc
Linearized Analog Output (opt)	
Level	0-20 mA, 4-20 mA, 0-10 Vdc, -10 to +10 Vdc
Resolution	16 bits (0.0015%)
Environmental	
Operating temperature	0 - 55°C, 95% RH at 40°C, non-condensing
Data Communications (opt)	
Type	USB, RS-232, RS-485 (2- or 4-wire), Ethernet
Protocol	Modbus RTU, Modbus ASCII, Laurel ASCII

ACCESSORIES

CBL01	RJ11 TO DB9 Cable to PC Com port
CBL02	USB to DB9 Adapter
CBL05	USB Cable to PC USB Port

ORDERING INFORMATION

Example: L10010DCV1

<input type="checkbox"/> Laureate Series	L	Laureate Panel Meter
	LW	Laureate Weight Meter
<input type="checkbox"/> Main Board	1	DPM with green LEDs
	2	DPM with red LEDs
	3	Extended, green LEDs
	4	Extended, red LEDs
<small>Note: Extended capability for DPMs is required for custom curve linearization.</small>		
<input type="checkbox"/> Power	0	85-264 Vac/90-370 Vdc
	1	10-48Vdc/12-30 Vac
<input type="checkbox"/> Setpoint Output	0	None
	1	Dual 8 A relays
	2	Dual solid state relays
<input type="checkbox"/> Analog Output (isolated)	0	None
	1	0-20 mA, 4-20 mA, 0-10 V, -10 to +10 V
<input type="checkbox"/> Digital Interface (isolated)	0	None
	1	RS-232
	2	RS-485 (dual RJ11 connectors)
	4	RS-485 (dual RJ45 connectors)
	5	USB
	6	USB to RS-485 Converter
	7	Ethernet
	8	Ethernet to RS-485 Converter

Input Type (isolated)

DC Volts	DCV1	200.00 mV
	DCV2	2.0000 V
	DCV3	20.0000 V
	DCV4	200.00 V
	DCV5	600.0 V
DC Amperes	DCA1	2.0000 mA
	DCA2	20.0000 mA
	DCA3	200.00 mA
	DCA4	5.0000 A

Process Signals (4-20 mA, 0-5 V, etc.)	P	4-20 mA = 0-10000
	P1	Custom Scaling

Strain Gage, Potentiometer (4-wire ratio)	SG	0-200 mV = 0-20000
	SG1	Custom Scaling

Note: The same DC signal conditioner board can be user configured for DC Volts, DC Amps, process, or strain.

100-Ohm Platinum RTDs	P385C	-202 to 850°C
	P385F	-331 to 1562°F
	P392C	-202 to 631°C
	P392F	-331 to 1168°F

Thermocouples	JC	-210 to 760°C	EF	-400 to 1830°F
	JF	-347 to 1400°F	NC	-245 to 1300°C
	KC	-244 to 1372°C	NF	-410 to 2370°F
	KF	-408 to 2501°F	SC	-46 to 1768°C
	TC	-257 to 400°C	SF	-51 to 3214°F
	TF	-430 to 752°F	RC	-45 to 1768°C
	EC	-240 to 1000°C	RF	-49 to 3213°F

Note: The same temperature signal conditioner board can be user configured for all T/C and RTD types

TRMS Volts	RMV1	200.00 mV	RMV2	2.0000 V
	RMV3	20.0000 V	RMV4	200.00 V
	RMV5	600.0 V (ETL approved to 300 V)		
	RMV6	300.0 V		

TRMS Amperes	RMA1	2.0000 mA	RMA2	20.0000 mA
	RMA3	200.00 mA	RMA4	5.0000 A

Note: The same AC RMS signal conditioner can be user-configured for AC Volts or Amps

Load Cells (6-wire ratio)	WM1	-99,999 to +99,999
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Note: Excitation is 10V DC for up to four 350Ω load cells in parallel

DIGITAL METERS

Red Lion Digital Panel Meters

- Voltage, Current, Process & Temperature Inputs
- Five Digit 0.48" (12 mm) LCD
- Red/Green Backlight Changes at Setpoint
- Input Scaling & Units Annunciator
- Min / Max Display Capture
- NEMA 4X/IP65 Front
- Setpoint Relay Output Options
- Optional RS232, RS485 or USB Communications
- Crimson Software for Simple Programming



CUB5I

CUB5TC


The CUB5I offers 4 DC current ranges with a maximum input of 200 mA. The CUB5V has 4 DC voltage ranges and a maximum input of 200 VDC.

- Current Ranges: 0 to 199.9 μ A, 1.999 mA, 19.99 mA, 199.99 mA
- Voltage Ranges: 0 to 199.9 mV, 1.999 V, 19.99 V, 199.9 V

The CUB5P accepts signals from flow meters, pressure sensors, position sensors and other process transmitters. Display can be scaled for readout in the desired units.

- Ranges: 4 to 20 mA, 10 to 50 mA, 0 to 10 V
- Span and Offset Capability

For temperature measurements, the CUB5RT accepts inputs from several types of RTD sensors. The CUB5TC accepts all popular thermocouples.

- RTD: Pt385, Pt392, Ni672, Cu427
- Thermocouple: T, E, J, K, R, S, B, N, or mV

The capability of the CUB5 can be easily expanded with plug-in option cards. Setpoint capability is field installable with the addition of a setpoint output card. Serial communications capability for RS232, RS485 or USB is added with a serial option card.

The CUB5 can be powered from an optional Red Lion Micro Line /Sensor Power Supply (MLPS), which attaches directly to the back of a CUB5. The MLPS operates from 85 to 250 VAC and provides up to 400 mA to drive the meter and sensors.

ORDERING INFORMATION

CUB5IR00	DC Current Meter with Reflective Display
CUB5IB00	DC Current Meter with Backlight Display
CUB5VR00	DC Volt Meter with reflective display
CUB5VB00	DC Volt Meter with backlight display
CUB5PR00	Process Meter with Reflective Display
CUB5PB00	Process Meter with Backlight Display
CUB5TCR0	Thermocouple Meter with Reflective Display
CUB5TCB0	Thermocouple Meter with Backlight Display
CUB5RTR0	RTD Meter with Reflective Display
CUB5RTB0	RTD Meter with Backlight Display
Plug-in Options: *	
CUB5RLY0	One Form C Setpoint Relay Card (1 A @ 30 VDC, 0.3 A @ 125 VAC, resistive)
CUB5SNK0	Dual Sinking Open Collector Output Card (100 mA, 30 VDC max., non-isolated)
CUB5COM1	RS485 Serial Communications Card (half-duplex, addressable, non-isolated)
CUB5COM2	RS232 Serial Communications Card (non-isolated)
CUB5USB0	USB Programming Card
Accessories	
MLPS1000	+12 VDC, 400 mA Micro-Line Power Supply, 85-250 VAC
MLPS2000	+24 VDC, 200 mA Micro-Line Power Supply, 85-250 VAC
CBLPROG0	RS232 Cable (RJ11-DB9)
CBPRO007	RS485 Cable (RJ11-DB9)
CBLUSB00	USB Programming Cable
ENC8B000	NEMA 4X Plastic Enclosure 4.8" H x 4.7" W x 3.77" D

*add -ASSY to CUB5 model number for factory installation of options & meter setup. Crimson software is a free download from the Red Lion website.

SPECIFICATIONS

Range	Resolution	Input R	Max. Input
CUB5I:			
200 μ ADC	10 nA	1.111 k Ω	15 mA
2 mADC	0.1 μ A	111 Ω	50 mA
20 mADC	1 μ A	11 Ω	150 mA
200 mADC	10 μ A	1 Ω	500 mA
CUB5V:			
200 mVDC	10 μ V	1.027 M Ω	75 VDC
2 VDC	0.1 mV	1.027 M Ω	75 VDC
20 VDC	1 mV	1.027 M Ω	250 VDC
200 VDC	10 mV	1.027 M Ω	250 VDC
CUB5P:			
20 / 50 mADC	1 μ A	10 Ω	150 mA
10 VDC	1 mV	538 k Ω	30 V
Accuracy:	0.1% of span at 23 °C for DCV & DCA		
A/D Converter:	16 bit		
NMRR:	60 db, 50/60 Hz for DCV & DCA		
CUB5RT:			
	Range	Accuracy 23 °C	Accuracy 0-50 °C
100 Ω Pt 385/392	-200 to 850 °C	0.4 °C	1.6 °C
120 Ω Nickel 672	-80 to 260 °C	0.2 °C	0.5 °C
10 Ω Copper 427	-100 to 260 °C	0.4 °C	0.9 °C
Input:	2, 3 or 4 wire sensor, 10 Ω max lead res. (3 Ω on Cu RTD)		
Readout:	°C or °F, with 1° or 0.1° resolution		
Offset Range:	-19999 to 19999 digits		
Failed Sensor:	Display shows OPEN or SHORT		
CUB5TC:			
	Range	Accuracy 23 °C	Accuracy 0-50 °C
TC Type T	-200 to 400 °C	2.3 °C	5.8 °C
TC Type E	-200 to 871 °C	2.7 °C	4.9 °C
TC Type J	-200 to 760 °C	1.9 °C	4.3 °C
TC Type K	-200 to 1372 °C	2.3 °C	5.8 °C
TC Type R, S	-50 to 1768 °C	4.5 °C	15.0 °C
TC Type B	200 to 540 °C	9.1 °C	42.6 °C
	540 to 1820 °C	4.5 °C	15.0 °C
TC Type N	-200 to 1300 °C	2.8 °C	8.1 °C
mV	-10.00 to 65.00	0.02 mV	0.08 mV
Readout:	°C or °F, with 1° or 0.1° resolution		
Offset Range:	-999 to 9999 digits		
Failed Sensor:	Display shows OPEN		
Control Inputs:	Three, jumper selectable sink/source, max. input 30 VDC continuous, not isolated to sensor input		
User Input:	Programmable function input Logic Input, Current Sinking (active low)		
Display:	Reflective LCD with full viewing angle or selectable transmissive red/green backlight LED (display color changes at preset when using output module)		
Response Time:	Display 500 ms, Output 800 ms (filter set to 0)		
Power:	9-28 VDC @ 30 mA max. from Class 2 supply; Power circuit not isolated from signal input		
LED Backlight:	Adds 95 mA to supply current		
Temperature:	-35 to 75 °C operating @ min. backlight (35 °C max. at max. backlight), <85% RH (non-condensing)		
Connections:	Wire clamping screw terminals		
Dimensions:	1.54" H x 2.95" W x 1.75" D (40x75x45mm)		

Red Lion Digital Panel Meters

- DC/AC Voltage & Current Measurements
- Process & Temperature Inputs
- Selectable Scaling & Decimal Position
- Large 0.56" High Red LED
- Relay Outputs for Setpoint Control & Alarms
- 1/8 DIN, NEMA 4X/IP65 Front



PAX Lite  

PAX Lite Meters offer flexibility in tough industrial applications. These meters can provide direct display of pressure, speed, flow and other process signals. User scaling and selectable decimal point allow the meter to read out in the desired units. Custom units labeling is available with the PAX Label Kit. A DIP switch controls the backlight for the units label. Enclosures and panel mounting kits are available to simplify system integration.

Front panel buttons on process & temperature meters can be disabled after setup.

Function	DC V/A	AC V/A	5A AC	AC HV	Loop	RTD	TC	Temperature	Process
Model:	PAXLVD, PAXLID	PAXLVA, PAXLIA	PAXLIT	PAXLHV	PAXLCL	PAXLRT	PAXLTC	PAXLT NEW	PAXLA
Digits:	3½ bi-polar	3½ bi-polar	3½	3	3½ bi-polar	4	4	5	5 bi-polar
Power:	115/230 VAC ±10%, switch select, 50/60 Hz, 6 VA				85-250 VAC, 50/60 Hz, 6 VA			50-250 VAC, 50/60 Hz, 12 VA 21.6-250 VDC, 6 W	
Operating Temp.:	0 to 60 °C, <85% RH (non-condensing)					0 to 50 °C, <85% RH (non-condensing)			

SPECIFICATIONS			
Range	Resolution	Max. Input	Basic Accy.
PAXLVD:			(%rdg@23°C)
±2 VDC	1 mV	75 VDC	0.1%+1d
±20 VDC	10 mV	300 VDC	0.1%+1d
±200 VDC	100 mV	300 VDC	0.1%+1d
±300 VDC	1 V	300 VDC	0.1%+1d
PAXLID:			
±200 µADC	0.1 µA	2 mA	0.1%+1d
±2 mADC	1 µA	20 mA	0.1%+1d
±20 mADC	10 µA	200 mA	0.1%+1d
±200 mADC	100 µA	1 A	0.15%+1d
±2 ADC	1 mA	3 A	0.5%+1d
±200 mVDC	100 µV	75 V	0.1%+1d
PAXLVA: (45-500 Hz)			
2 VAC	1 mV	75 V	0.1%+3d
20 VAC	10 mV	300 V	0.1%+3d
200 VAC	100 mV	300 V	0.1%+3d
300 VAC	1 V	300 V	0.1%+3d
PAXLIA: (45-500 Hz)			
200 µAAC	0.1 µA	2 mA	0.1%+3d
2 mAAC	1 µA	20 mA	0.1%+3d
20 mAAC	10 µA	200 mA	0.1%+3d
200 mAAC	100 µA	1 A	0.15%+3d
2 AAC	1 mA	3 A	0.5%+3d
200 mV	100 µV	75 V	0.1%+1d
PAXLA:			
±200 mVDC	10 µV	75 VDC	0.1% of span
±2 VDC	0.1 mV	75 VDC	0.1% of span
±20 VDC	1 mV	250 VDC	0.1% of span
±200 VDC	10 mV	250 VDC	0.1% of span
±10 VDC	1 mV	75 VDC	0.1% of span
±200 µADC	10 nA	15 mA	0.1% of span
±2 mADC	0.1 µA	50 mA	0.1% of span
±20 mADC	1 µA	150 mA	0.1% of span
±200 mADC	10 µA	500 mA	0.1% of span
Relay Outputs:	2 Form C, 5 A @ 240 VAC/28 VDC res., 1/8 HP @ 120 V		
DC Out.:	+24 VDC @ 100 mA (50 mA max if Vin < 50 V)		

PAXLIT:			
5 AAC	2.5 mA	8 A (50 A for 1 sec)	0.5% rdg+5d
Features:	Scaling & selectable decimal position, optional external CT		

PAXLHV:	Resolution	Input R	Basic Accy.
600 V	1 V	1 MΩ	0.1% rdg+2d (45-500 Hz)

PAXLCL:	Resolution	Input R	Max. In	Linearity
4-20 mADC	260d/mA	29.2 Ω	170 mA	0.05%+1d
10-50 mADC	105d/mA	11.8 Ω	170 mA	0.05%+1d
Features:	Wide span & offset adjustment range, 24 V isolated loop supply			

All Models:	
Reading Rate:	2.5/sec.
Input Isolation:	2300 Vrms, for 1 minute. to power (300 Vrms working)
Connections:	Cage-clamp terminal block
Dimensions:	1.95" H x 3.80" W x 4.1" D (50x97x105mm)

SPECIFICATIONS		
PAXLT:	Range	Accuracy 23°C
100 Ω Pt 385/392	-200 to 850°C	0.4°C
120 Ω Nickel 672	-80 to 260°C	0.2°C
10 Ω Copper 427	-100 to 260°C	0.4°C
TC Type T	-200 to 400°C (-328 to 752°F)	2.3°C
TC Type E	-200 to 871°C (-328 to 1600°F)	2.7°C
TC Type J	-200 to 760°C (-328 to 1400°F)	1.9°C
TC Type K	-200 to 1372°C (-328 to 2502°F)	2.3°C
TC Type R, S	-50 to 1768°C (-58 to 3214°F)	4.5°C
TC Type B	200 to 540°C (392 to 1004°F) 540 to 1820°C (1004 to 3308°F)	9.1°C 4.5°C
TC Type N	-200 to 1300°C (-328 to 2372°F)	2.8°C
TC Type C	0 to 2315°C (32 to 4199°F)	1.9°C
mV	-10.00 to 65.00	0.02 mV
RTD Input:	2, 3 or 4 wire sensor, 10Ω max per lead (3Ω on Cu RTD)	
Readout:	°C or °F, with 1° or 0.1° resolution	
Relay Outputs:	2 Form C, 5 A @ 240 VAC/28 VDC res., 1/8 HP @ 120 V	
Features:	Adjustable offset, Min/Max memory, 24 VDC out @ 50 mA	
PAXLRT:	Range	Accuracy 23°C
100 Ω Pt 385/392	-200 to 850°C (-328 to 1562°F)	0.3°C
RTD Input:	3 wire sensor, 20Ω max lead res.	
Readout:	°C or °F, with 1° or 0.1° resolution	
Features:	Adjustable offset, digital filter, Min/Max memory, open/short sensor detection	
PAXLTC:	Range	Accuracy 23°C
TC Type T	-200 to 400°C (-328 to 752°F)	0.8°C (1.4°F)
TC Type E	-200 to 1000°C (-328 to 1832°F)	0.8°C (1.4°F)
TC Type J	-200 to 760°C (-328 to 1400°F)	0.8°C (1.4°F)
TC Type K	-200 to 1250°C (-328 to 752°F)	0.8°C (1.4°F)
TC Type R, S	0 to 1768°C (32 to 3214°F)	2.1°C (3.8°F)
TC Type B	150 to 1820°C (302 to 3308°F)	2.3°C (4.1°F)
TC Type N	-200 to 1300°C (-328 to 2372°F)	0.8°C (1.4°F)
mV	-10.00 to 80.00	0.01%
Readout:	°C or °F, with 1° resolution (0.1° for T, E, J, K, N)	
Features:	Adjustable offset, digital filter, Min/Max memory	

ORDERING INFORMATION	
PAXLVD00	DC Volt Meter
PAXLID00	DC Current Meter
PAXLA000	DC Voltage/Current Process Meter with Dual Relays (not UL)
PAXLA00U	DC Voltage/Current Process Meter with Dual Relays (UL)
PAXLIA00	AC Current Meter
PAXLIT00	5 Amp AC Current Meter
PAXLVA00	AC Volt Meter
PAXLHV00	AC High Voltage Monitor
PAXLTC00	Thermocouple Meter
PAXLRT00	RTD Meter
PAXLTO00	TC/RTD Temperature Meter with Dual Relays (not UL)
PAXLTOU0	TC/RTD Temperature Meter with Dual Relays (UL)
PAXLCL00	Current Loop Meter
Accessories	
PAXLBK30	Units Label Kit

Red Lion Deluxe Panel Meters

- Process, Voltage, Current, Temperature & Strain Gage Inputs
- 5 Digit 0.56" Sunlight Readable Red Display (Green Optional)
- Variable Display Intensity
- 16 Point Scaling for Non-linear Processes
- Four Setpoint Alarm Outputs (Optional)
- 1/8 DIN, NEMA 4X/IP65 Front Bezel
- Digital Communication Options (Free Setup Software)
- Retransmitted Analog Output (Optional)

The PAX® Analog Panel Meters offer many features and performance capabilities to suit a wide range of industrial applications. Five different models handle various analog inputs with 3½ to 5 digit resolution.

The meters provide a MAX and MIN reading memory with programmable capture time. The capture time is used to prevent detection of false max or min readings which may occur during start-up or unusual process events. The signal totalizer (integrator) can be used to compute a time-input product. This is useful to provide a readout of totalized flow, calculate service intervals of motors or pumps. The totalizer can also accumulate batch weighing operations.

Four setpoint output can be configured to suit a variety of control and alarm requirements. A linear DC output (20 mA or 10 V) can be scaled independent of the input range and can track either the input, totalizer, max or min readings.

Communication and bus capabilities are also available as option cards. Readout values and setpoint alarm values can be controlled through the bus. Once the meters have been initially configured, the parameter list may be locked against further modification or only the setpoint values can be made front panel accessible.

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: PAXD0100

PAX

A	Input
D	DC Voltage/Current
P	Process
H	AC TRMS Voltage/Current (requires 85-250V supply)
S	Strain Gage / Bridge
T	Thermocouple / RTD
B	LED Display
00	Red, Sunlight Readable
01	Green
C	Power
00	85 - 250 VAC
10	11 - 36 VDC, 24 VAC

Plug-In Options: *

PAXCDS10	Dual Form C Setpoint Relays (5 A @ 240 VAC or 28 VDC res.)
PAXCDS20	4 Form A Setpoint Relays (3 A @ 250 VAC or 30 VDC res.)
PAXCDS30	4 Setpoint Sinking Open Collector Outputs (0.1 A @ 50V)
PAXCDS40	4 Setpoint Sourcing Open Collector Outputs (0.1 A @ 30V)
PAXCDL10	Analog Output Card (0-20/4-20 mA, 0-10 VDC)
PAXCDC10	RS485 Serial Communications Card with Terminal Block
PAXCDC1C	Extended RS485 Card with Dual RJ11 Connector
PAXCDC20	RS232 Serial Communications Card with Terminal Block
PAXCDC2C	Extended RS232 Card with 9 Pin D Connector
PAXCDC30	DeviceNet Communications Card
PAXCDC40	RS485 Modbus Communications Card
PAXCDC4C	Extended Modbus Card with Dual RJ11 Connector
PAXCDC50	Profibus-DP Communications Card
SFCRUSB1	USB Programming Card, Cable & Software

*add -ASSY to PAX model number for factory installation of options & meter setup. Crimson software is a free download from the Red Lion website.

PAX ▶



SPECIFICATIONS

Range	Resolution	Input R	Max. Input	Basic Accy.
PAXD:				
±200 µADC	10 nA	1.111 kΩ	15 mA	0.03%+3d
±2 mADC	0.1 µA	111 Ω	50 mA	0.03%+3d
±20 mADC	1 µA	11 Ω	150 mA	0.03%+3d
±200 mADC	10 µA	1 Ω	500 mA	0.05%+3d
±2 ADC	0.1 mA	0.1 Ω	3 A	0.5%+3d
±200 mVDC	10 µV	1.066 MΩ	100 V	0.03%+3d
±2 VDC	0.1 mV	1.066 MΩ	300 V	0.03%+3d
±20 VDC	1 mV	1.066 MΩ	300 V	0.03%+3d
±300 VDC	10 mV	1.066 MΩ	300 V	0.05%+3d
100 Ω	0.01 Ω	(0.175 V)	30V	0.05%+3d
1000 Ω	0.1 Ω	(1.75 V)	30V	0.05%+3d
10 kΩ	1 Ω	(17.5 V)	30V	0.05%+3d
PAXP:				
20 mADC	1 µA	20 Ω	150 mA	0.03%+2d
10 VDC	1 mV	500 kΩ	300 V	0.03%+2d
PAXH: (TRMS AC or AC+DC, 50-400 Hz)				
200 mVAC	10 µV	686 kΩ	30 V	0.1%+40d
2 VAC	0.1 mV	686 kΩ	30 V	0.1%+20d
20 VAC	1 mV	686 kΩ	300 V	0.1%+20d
300 VAC	10 mV	686 kΩ	300 V	0.1%+30d
200 µAAC	10 nA	1.11 kΩ	15 mA	0.1%+40d
2 mAAC	0.1 µA	111 Ω	50 mA	0.1%+20d
20 mAAC	1 µA	11.1 Ω	150 mA	0.1%+20d
200 mAAC	10 µA	1.1 Ω	500 mA	0.1%+20d
5 AAC	1 mA	0.02 Ω	7 A	0.5%+5d
PAXS: (2 or 4 wire)				
±24 mVDC	1 µV	100 MΩ	30 V	0.02%+3d
±240 mVDC	10 µV	100 MΩ	30 V	0.02%+3d
PAXT:				
100 Ω Pt 385/392	-200 to 850 °C	0.4 °C	1.6 °C	
120 Ω Nickel 672	-80 to 260 °C	0.2 °C	0.5 °C	
10 Ω Copper 427	-100 to 260 °C	0.4 °C	0.9 °C	
TC Type T	-200 to 400 °C	1.2 °C	2.1 °C	
TC Type E	-200 to 871 °C	1.0 °C	2.4 °C	
TC Type J	-200 to 760 °C	1.1 °C	2.3 °C	
TC Type K	-200 to 1372 °C	1.3 °C	3.4 °C	
TC Type R, S	-50 to 1768 °C	1.9 °C	4.0 °C	
TC Type B	100 to 300 °C	3.9 °C	5.7 °C	
	300 to 1820 °C	2.8 °C	4.4 °C	
TC Type N	-200 to 1300 °C	1.3 °C	3.1 °C	
TC Type C	0 to 2315 °C	1.9 °C	6.1 °C	
RTD Input:	2, 3 or 4 wire sensor, 10Ω max lead res. (3Ω on Cu RTD)			
Readout:	°C or °F, with 1° or 0.1° resolution			
Offset Range:	-19999 to 99999 digits			
Totalizer:	9 digit, 0.001 to 65,000 scale factor, 0.01% accuracy			
A/D Converter:	16 bits, 20 readings/sec.			
Control Inputs:	Three, jumper selectable sink/source, max. input 30 VDC continuous, not isolated to sensor input			
AC Power:	85 to 250 VAC 50/60 Hz, 15 VA.			
LV Power:	11 to 36 VDC, 11 W; 24 VAC, 50/60 Hz, 15 VA			
Input Isolation:	2300 Vrms to AC power, 500 Vrms to LV power, 500 Vrms to digital comm & analog out			
Sensor Power:	24 VDC, 50 mA for DC in, 5/10V on strain gage in			
Temperature:	0 to 50 °C operating, <85% RH (non-condensing)			
Connections:	Cage-clamp terminal block			
Dimensions:	1.95" H x 3.80" W x 4.1" D (50x97x105mm)			

Red Lion Dual Display Panel Meter

- Universal Process Inputs, DC Current, DC Voltage, Process Signals, Resistance, Thermocouples or RTDs
- Wide Range Power Supply: 50–250 VAC & 21.6–250 VDC
- 6/9 Digit Dual Line/Multi-Color Display with 0.7" and 0.35" digits
- Variable Contrast and Intensity Display
- Meter Update Rate up to 160/Second
- Up to Four Setpoint Relays
- Retransmitted Analog Output
- Built-in USB port & Modbus Protocol
- R232 & RS485 Optional

PAX2A


CE

The PAX2A is packed full of features that set it apart from other panel meters. The input, total, min., max. or setpoint value can be displayed on the 0.7" high 6-digit main LCD display. The main display also offers three programmable, easy-to-read colors: red, orange and green. The color change can be tied to the setpoints, providing the operator with a visual display of changing conditions in the application. A second display line is a 0.35" high, green LCD that can be programmed for any of the above parameters as well. This 9-digit display accommodates totalizing applications that easily exceed the normal 6-digit displays. In addition to the dual displays, the meter also includes a 3-character programmable unit indicator.

Beyond the display, the PAX2A provides the maximum in configuration flexibility, allowing users to stock just one meter for numerous applications. Featuring universal input, the same meter accepts DC current, DC voltage, process signal, plus thermocouple and RTD temperature sensor inputs. The PAX2A also has a wide range AC/DC power input.

With its dual display and versatile functionality, the PAX2A delivers an ideal solution for applications that require two parameters to be visualized at the same time (e.g. present temperature and setpoint value or flow rate and total gallons).

The Crimson 2 setup software allows quick and easy configuration of the meter from any PC, using the supplied USB cable.



SPECIFICATIONS

Display:	Positive image LCD
Top Line:	6 digit, 0.71" (18 mm) tri-color backlight (red/green/orange) -199,999 to 999,999 display range
Bottom Line:	9 digit, 0.35" (8.9 mm) green backlight -199,999.999 to 999,999.999 display range
Power:	50 to 250 VAC, 50/60 Hz, 14 VA 21.6 to 250 VDC, 8 W
Annunciators:	4 red 'setpoint active' indicators
Units Label:	3 programmable characters with tri-color backlight
Keypad:	2 programmable function keys, 4 keys total
A/D Converter:	24 bit resolution, conversion rate programmable from 5 to 160 readings/sec.
Input:	Multi-function, user selectable
Current:	± 250 µADC, ± 2.5 mADC, ± 25 mADC, ± 250 mADC, ± 2 ADC
Voltage:	± 250 mVDC, ± 2.0 VDC, ± 10 VDC, ± 25 VDC, ± 100 ADC, ± 200 VDC
Thermocouple:	T, E, J, K, R, S, B, N, and C
RTD:	100Ω Pt (α= 0.00385 & 0.00392), 120Ω Nickel (α= 0.00672), 10Ω Copper (α= 0.00427)
Resistance:	100Ω, 1000Ω, 10kΩ
Excitation Power:	Jumper selectable Transmitter Power: +18 VDC @ 50mA Reference Voltage: +2 VDC, +/- 2% Reference Current: 1 mADC, +/- 2%
Totalizer:	Time Base: Second, minute, hour or day Batch: Can accumulate (gate) input display from a user input Time Accuracy: 0.01% typical Decimal Point: 0 to 0.0000 Scale Factor: 0.001 to 65.000 Low Signal Cut-out: -19,999 to 99,999 Total: 9 digits (main display alternates between high order and low order readouts)
Custom Linearization:	Data Point Pairs: Selectable from 2 to 16 Display Range: -19,999 to 99,999 Decimal Point: 0 to 0.0000 Compensation: User value 0.00 to 650.00 µV/C (for ice point)
Memory:	Non-volatile E2PROM memory retains all programmable parameters and display values
User Inputs:	Two programmable user inputs
Operating Temp:	0 to 50°C, 85% RH max. (non-condensing) (0 to 45°C with all three plug-in cards installed)
Connections:	High compression cage-clamp terminal block
Case:	1/8 DIN, rated for NEMA 4X/IP65 indoor use; IP20 Touch safe; Installation Category II, Pollution Degree 2
Construction:	Flame resistant, one piece bezel/case with synthetic rubber keypad
Dimensions:	1.95" H x 3.80" W x 4.24" D (50x97x108mm)

ORDERING INFORMATION

PAX2A Dual Display Process Meter
(USB cable, panel gasket and mounting clip included)

Plug-In Options: *

PAXCDS10	Dual Form C Setpoint Relays (5 A @ 240 VAC or 28 VDC res.)
PAXCDS20	4 Form A Setpoint Relays (3 A @ 250 VAC or 30 VDC res.)
PAXCDS30	4 Setpoint Sinking Open Collector Outputs (0.1 A @ 50V)
PAXCDS40	4 Setpoint Sourcing Open Collector Outputs (0.1 A @ 30V)
PAXCDL10	Analog Output Card (0-20/4-20 mA, 0-10 VDC)
PAXCDC10	RS485 Serial Communications Card with Terminal Block
PAXCDC1C	Extended RS485 Card with Dual RJ11 Connector
PAXCDC20	RS232 Serial Communications Card with Terminal Block
PAXCDC2C	Extended RS232 Card with 9 Pin D Connector
PAXCDC30	DeviceNet Communications Card

*order PAX2A-ASSY for factory installation of options & meter setup. Crimson 2 software is a free download from the Red Lion website.

Selco Digital Panel Meters

Universal Type

- Seven Output Choices
- Front Panel Membrane Set Buttons
- Eighteen Input Choices
- Available Two Setpoint Displays
- 90-264VAC or 9-60VDC Power Supply
- RS-232C/RS-485 Communications
- Industry Standard 1/8 DIN Size
- 8-Amp Setpoint Contact Relays



▲ A5000 Series

SPECIFICATIONS

Main display:	4 Digit Red LED 14.2mm
Sub display:	Dual, Green LED 8mm (Hi & Lo setpoints)
Conversion rate:	12.5 times/sec
Maximum display:	9999
Overrange indication:	When input exceeds the maximum display, display OL or -OL
Zero display:	Leading zero suppression
Decimal point:	Settable to any digit position
External control:	Start/Hold, Peak Hold, Digital Zero
Operating temperature:	0 to 50°C, 35 to 85% RH
Storage temperature:	-10 to 70°C less than 60% RH
Power supply:	AC 100 to 240V ±10% (AC main unit) DC 9 to 60V (DC main unit)
Power consumption:	Approx. 4VA (at 100V)
Dimensions:	96mm x 48mm (H) x 147.5mm (D) DIN size
Dielectric strength (AC):	Power supply/input terminal/output terminal 2000VAC/1 min. Input terminal/output terminal 500VDC/1 min. Case/power supply/input terminal/output terminal 2000VAC/1 min.
Dielectric strength (DC):	Power supply/input terminal/output terminal 500VDC/1 min. Input terminal/output terminal 500VDC/1 min. Case/power supply/input terminal/output terminal 2000VAC/1 min.
Insulation resistance:	500VDC more than 100MΩ at the above terminals
Input:	
AC Voltage:	40Hz to 1kHz
AC Current:	40Hz to 1kHz
Frequency:	0.1Hz to 200kHz 30V p-p Max.
Strain Gauge:	
Adjustment Span:	1 to 3 mV/V
Excitation:	5V@15mA, 10V@30mA
Analog Output:	0-1V, 0-10V, 1-5V, 4-20mA
Setpoint Relays:	8A@240VAC, 30VDC Resistive

ORDERING INFORMATION

Example SE/A51/25-03

SE/A5 [A] [B] [C] - [D]

A Main Board

- 1 AC 100 - 240V (±10%)
- 2 DC 9 - 60V

B Display Board

- 1 Single (Main Display Only)
- 2 Multiple (Main & Sub Displays)

C Output

- 0 None
- 1 HI & LO setpoint
- 2 Analog output
- 3 RS-232C
- 4 RS-485
- 5 HI & LO setpoint + analog output
- 6 HI & LO setpoint + analog output + RS-232C
- 7 HI & LO setpoint + analog output + RS-485

D Input

Input	Ranges
01 DC voltage (±99.99mV)	1
02 DC voltage (±999.9mV to ±600V)	4
03 DC current (±9.999mA to ±999.9mA)	3
04 AC voltage AVG (99.99mV to 9.999V)	3
05 AC voltage AVG (99.99V to 600V)	2
06 AC voltage RMS (99.99mV to 9.999V)	3
07 AC voltage RMS (99.99V to 600V)	2
08 AC current AVG (9.999mA to 999.9mA)	3
09 AC current AVG (5A)	1
10 AC current RMS (9.999mA to 999.9mA)	3
11 AC current RMS (5A)	1
12 Resistance (99.99Ω to 99.99KΩ)	4
13 Temperature (Thermocouple)	JKTSRB
14 Temperature (RTD)	Pt100
15 Frequency (Open collector, Logic, Magnet)	4
16 Frequency (50 to 500Vrms)	
17 Strain gauge	
18 1 to 5V, 4 to 20mA	

Newport Panel Meters/Controllers

INFCAC Series

- 4-Digit, 14-Segment LED Display, Red or Green
- High $\pm 0.1\%$ of Reading Accuracy
- Wide Selection of AC Current and Voltage Ranges
- Smart Filtering Detects the Difference Between a Spike or Process Change (Patent Pending)
- Front Panel Configuration
- Available with Dual 6 Amp Relays and/or Analog Output

INFC Series

- Process (DC Voltage and Current), Strain Gauge, Thermocouple, and RTD
- Dual Differential Thermocouple and RTD
- pH ORP
- Relay Output Optional
- Isolated or Non-Isolated Analog Output Optional

IDP Series

- Easy Scaling
- 4-Digit LED Display
- Max or Min Recall
- Short Case 4.1" (104 mm)
- Red or Green LED Display
- Power 115 VAC, 230 VAC or 10–32 VDC

INFC ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: INFCP-5-1-2

A - **B** - **C** - **D**

A	Basic Unit
INFCP	Process (DC Voltage and Current)
INFCS	Strain Input
NIFCT	Thermocouple
INFCDT	Dual/Differential Thermocouple
INFCR	RTD
INFCDR	Dual/Differential RTD
INFCPH	pH
INFCOR	ORP
INFCOP	pH/ORP
B	Power and Display
0	115 VAC, Red LED Display
1	230 VAC, Red LED Display
2	115 VAC, Green LED Display
3	230 VAC, Green LED Display
4	10–32 VDC, Red LED Display
5	10–32 VDC, Green LED Display
6	25–56 VDC, Red LED Display
7	25–56 VDC, Green LED Display
C	Relays
0	None
1	Two 6 Amp Form C Relays
D	Analog Output
0	None
1	Non-Isolated Analog
2	Isolated Analog Output



INFCAC



IDP-0

INFCAC ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: INFCAC-0-0-1-0-V5

A - **B** - **C** - **D** - **E** - **F**

A	Basic Unit
INFCAC	AC Voltage and Current Controller
B	Power and LED Color
0	115 VAC, Red LED Display
1	230 VAC, Red LED Display
2	115 VAC, Green LED Display
3	230 VAC, Green LED Display
C	Control Output
0	No Control Output
1	Two 6A Form "C" Relays
D	Analog Output
0	No Analog Output
1	4 to 20 mA or 0 to 10 VDC
E	Communications
0	No Serial Output
1	Isolated RS-232
2	Isolated RS-485 Half Duplex
F	Input Signal
V5	0–750 VAC User Programmable
C5	0–5 AAC User Programmable

IDP ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: IDP-0

A - **B**

A	Basic Unit
IDP	4-Digit Process Meter
IDT	4-Digit Thermocouple Meter
IDpH	4-Digit pH Meter
B	Display/Power
0	Red/115 VAC
1	Red/230 VAC
2	Green/115 VAC
3	Green/230 VAC
4	Red/10–32 VDC
5	Green/10–32 VDC

Newport Digital Panel Meters/Controllers




These meters accept universal inputs—thermocouple, RTD, process voltage/current. Panel mounted, with NEMA-4 (IP65) front bezel, they offer multiple “firsts” for 1/8 DIN instruments:

- Display Changes Colors at Set Point (Yellow, to Green, to Red)
- Fully Programmable Color Display and the Largest Display (21 mm LEDs) of Any 1/8 DIN Instrument
- RS-232 and RS-485 Serial Communications (Optional) in One Instrument
- Built-In Excitation (10 or 24 VDC) is standard

Units also feature $\pm 0.5^{\circ}\text{C}$ accuracy, free Active X Controls software, extended 5-year warranty at no extra charge. Available as monitors only or with two control/alarm outputs.

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: i822-0-DC

A **B** - **C** - **D**

A Base Units	
i800	Monitor only (no control outputs) 1/8 DIN
i8C00	Monitor only (no control outputs) 1/8 DIN Short Case
i8A00	Monitor with Isolated Analog Output 1/8 DIN
i8	Two control outputs 1/8 DIN
i8C	Two control outputs 1/8 DIN Short Case
i8A	Isolated Analog Output with two control outputs
B Control Output #1 & #2 Direct (Cool) or Reverse (Heat) Acting	
22	Two solid state relays (SSR's)
23	SSR and relay: Form “C” SPDT
24	SSR and pulsed 10 Vdc (for use with external SSR)
33	2 Relays: Form “C” SPDT
34	Relay and pulsed (for use with external SSR)
44	Two pulsed 10 Vdc (for use with external SSR)
52	Analog Output (control or retransmission)
53	Analog Output and Relay
54	Analog Output and Pulse
C Network Options	
E1	Ethernet with Embedded Web Server ²
C24	Isolated RS-232 and RS-485 (MODBUS & ASCII)
C4EI	Ethernet with Embedded Internet + Isolated RS-485 ²
D Power Supply	
AC	Standard Power : 90 to 240 VAC/DC
DC	10-34 Vac/dc (optional)

¹ Not Available for the i8A Controller

² Not Available in the Short Case





- 6-Digits
- NEMA-4 (IP65) Front Bezel
- Four Isolated Open Collector Outputs
- Peak and Valley Detection and Memory
- Digital Tare
- 1.5 to 11 or 24 VDC Sensor Excitation



ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: INFP-0210-C2

A **B** - **C** **D** **E** **F** - **G**

A Basic Unit	
INFP	Process (DC Voltage and Current)
INFS	Strain Gauge
INFW	Weight
INF T	Thermocouple and RTD
INFU	Universal Input (Process, Strain and Temp.)
B Split Display—Insert Only If Required	
Z	Split Display (insert “Z” after INF in basic unit)
C Power and Display	
0	115 VAC, Red LED
1	230 VAC, Red LED
2	115 VAC, Green LED
3	230 VAC, Green LED
4	10–32 VDC, Red LED
5	10–32 VDC, Green LED
D Control Output	
0	Four NPN Open Collectors
1	Isolated Parallel BCD
2	Two 7A Relays
3	Two 7A Relays and Two 1A Relay
E Analog Output	
0	None
1	Isolated Analog Output
F Serial Output	
0	None
1	Isolated RS-232
2	Isolated RS-485
G Input Signal	
	Specify T/C, RTD type or DC range

London Electronics Programmable Meter

NEW



Intuitive 2 ▲

- 1/8 DIN, IP65 Front
- Large 0.55" LED Display
- Simplified Setup – No Menus
- Display Filtering
- 10-Point Custom Linearization
- 0.05% Basic DC Accuracy
- Variable Brightness Display



Input types to match common sensors & process signals.

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: INT2-P-0-0-232-R-AC

INT2- **A** - **B** - **C** - **D** - **E** - **F**

A Input Type			
P	DC Process: 0-10V, 1-5V, 0-10mA, 4-20mA		
M	Millivolt Input for use with DC shunts		
T	Temperature: J K T R S N & Pt100, °F & °C		
R	4-Wire Resistance: specify range to 20kΩ		
L	Load Cell: 4/6-wire, w/ 10V excitation		
I	Flow Integrator: 0-10V, 4-20mA		
H	Clock/Timer, numeric or HH:MM:SS display		
C	Counter/Frequency/RPM/Quadrature		
S	Remote Display, serial ASCII data input		
B Analog Output (Isolated)			
O	None	ANV	0-10V
ANI	4-20 mA	ANB	-10 to +10V
C Relay Output (2A@250 VAC)			
O	None	AL4	4 Form A
AL2	2 Form A	SPCO	2 Form C
D Serial Data Output			
O	None	MB	RS-485 ModBus RTU
232	RS-232	EN	Ethernet
485	RS-485, ASCII		
E Display Color			
R	Red	Y	Yellow
G	Green		
F Supply Voltage			
AC	100-240 VAC		
DC	11-30 VDC		

DIGITAL METERS

Crompton Digital Metering System



▲ **1630**

- 35 Measured Parameters
- 0.2% Basic Accuracy
- Field Selectable CT & PT Ratios
- Ethernet or RS-485 Interface
- 1/4 DIN Case

The Integra 1630 has Modbus communication and field selectable system configuration: single-phase, three-phase three-wire or three-phase four-wire.

Measure & Display

- System (average) volts
- System (average) current
- System (total) kW
- System volts (average) THD%
- System current (average) THD%
- Volts L1 - N, L2 - N, L3 - N
- Volts L1 - L2, L2 - L3, L3 - L1
- Volts L1 - N THD%
- Volts L2 - N THD%

- Volts L3 - N THD%
- Volts L1 - L2 THD%
- Volts L2 - L3 THD%
- Volts L3 - L1 THD%
- Current L1, L2, L3
- Current line 1 THD%
- Current line 2 THD%
- Current line 3 THD%
- Neutral current
- Frequency
- Power factor (overall)
- kVAR, kVA, kW
- kW Hr import, export (7 digits)
- kVARh import, export (7 digits)
- kW demand
- Current demand
- Maximum kW demand
- Maximum current demand
- Hours run

SPECIFICATIONS

Measuring Ranges	
Voltage:	80-120% of nominal (functional 5-120%)
Current:	5-120% of nominal
Frequency:	45-66Hz
Power Factor:	0.8 capacitive to 0.8 inductive
THD:	Up to 31st harmonic 0% - 40%
Energy:	7 digit resolution
Input	
PT Ratio (primary):	up to 400kV **
CT Ratio:	9999:5A **
Outputs	
RS-485:	Half duplex (2-wire)
Baud rates:	4800, 9600, 19200, 38400
Pulsed:	1 or 2 Solid state relays
Pulse duration:	60, 100 or 200 milliseconds
Contact rating:	50mA max at 250V AC max.
Auxiliary Supply	
AC/DC supply:	85-287VAC, 85-312VDC, 45-66Hz
DC supply:	10.2-60VDC
Burden:	6VA

** 360MW max at 120% of relevant input

ORDERING INFORMATION

INT-1630 -Example INT-1630-M-5-M-110	
A - B - C - D	
A Input Voltage	
L	57.7-139 L-N (100-240 L-L)
M	140-277 L-N (241-480 L-L)
B Input Current (CT secondary)	
5	5A
1	1A
C Auxiliary Voltage	
L	12-48 V DC
M	100-250V AC/DC
D Options	
000	None
010	RS-485 Modbus RTU
100	One Pulse
200	Two Pulse
210	Two Pulse & Modbus
110	One Pulse & Modbus
070	Ethernet Modbus TCP

Accuenergy DC Power Meter

- Measures Power & Energy
- 3 Line LCD Display
- Limit Alarm
- Analog & Relay Outputs
- Modbus Communication
- Digital Input & Output Options
- 72x72 DIN Mounting

AcuDC243

Applications:

- DC Energy Management
- Solar Photovoltaic Systems
- Industrial DC Control Systems
- Wind Power Generation
- Light Rail Transit Systems
- Metallurgy & Electroplating
- DC Excitation Systems
- Telecommunication Power Distribution

SPECIFICATIONS

Parameter	Accuracy	Resolution	Range
Voltage	0.2%	0.001V	0~1200V
Current	0.2%	0.005A	0~±50000A
Power	0.5%	0.001kW	0~±60000kW
Energy	0.5%	0.01kWh	0~999999.99kWh
Voltage Input Range	Direct Input 0~1000V; Via Hall Effect Sensor 0~1200V		
Input Impedance / Load	2Mohm / <0.6W		
Current Input Range	0~±20A(Direct Input, pick up current 0.02A); 0~±50000A(Via Shunt or Hall Effect Sensor)		
Shunt	50~100mV(programmable)		
Hall Effect Sensor	0~±5V/0~±4V, 4~20mA/12mA±8mA		
Power Consumption	2W(Max)		
Digital Input (DI)	Dry Contact, 2500Vac isolation		
Relay Output (RO)	Form A, 250Vac/30Vdc@3A		
Isolation	4000Vac		
Digital Output (DO)	PhotoMOS, 2500Vac isolation		
Load Voltage Range	0~250Vac/dc, 100mA(max)		
Max Output Frequency	25Hz, 50% duty cycle		
Analog Output (AO)	4-20mA/0~20mA; 0~5V/1-5V		
Load Capacity	mA: 750 Ohm; V: 20 mA		
Communications	RS485, half duplex, 2500Vac isolation		
Protocol	Modbus-RTU, 1200~38400bps		
Operating Temperature	-25°C ~ +70°C 5%~95% RH (non-condensing)		

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: AcuDC243-300-A2-P1-X1-C

AcuDC243— **A** — **B** — **C** — **D** — **E**

A	Voltage Input	1000 1000VDC nominal 600 600VDC nominal 300 300VDC nominal 60 60VDC nominal 5 5V/4V via Hall sensor
B	Current Input	A0 ±20A A1 50 or 100mV shunt A2 Volt Hall Sensor 0 to ±5V/±4V A3 Current Hall Sensor 4-20mA
C	Power Supply	P1 100-415 VAC, 50-60 Hz; 100-300 VDC, 3 W P2 20-60 VDC, 3 W
D	I/O	X1 2DI+2AO (4-20mA/0-20mA) X2 2DI+2AO (0-5V/1-5V) X3 2DI+2RO X4 2DI+2DO
E	Communication	C RS485, Modbus RTU (blank) None

Crompton Digital Meter System

- Display Voltage, Current & Frequency
- True RMS Measurement
- Fully Programmable PT and CT Ratios
- Simple Menu Driven Interface
- ANSI Case
- Bright LED Display


Integra 640

Display up to 12 electrical parameters on 4 screens:

1 System Volts System Current System Frequency	3 Volts L1 - L2 Volts L2 - L3 Volts L3 - L1
2 Volts L1 - N (4 wire only) Volts L2 - N (4 wire only) Volts L3 - N (4 wire only)	4 Current L1 Current L2 Current L3

SPECIFICATIONS

Max Input Voltage:	120% of nominal continuous, 2x for 1 sec.
Input Voltage Burden:	0.2 VA per line, nominal
Max Input Current:	120% of nominal continuous, 20x for 1 sec.
Input Current Burden:	0.6 VA per phase, nominal
System PT (primary):	400kV or 360MW max
System CT:	9999:5A or 360MW max
Auxiliary Supply	
AC Supply:	100 - 250V AC or DC nominal (85 - 287V AC Absolute) (85 - 312V DC Absolute)
Frequency Range:	45 - 66 Hz
DC Supply:	12 - 48V DC (10.2 - 60V DC Absolute)
Supply Burden:	6VA
Measuring Ranges	
Voltage:	70 - 120% of nominal (functional 4 - 120%)
Current:	5 - 120% of nominal
Frequency:	45 - 66Hz
Accuracy	
Voltage:	±0.1% of range ±0.4% of reading
Current:	±0.1% of range ±0.4% of reading
Frequency:	0.15% of mid frequency
Operating Temperature:	-20 to +70°C, <95% RH non-condensing
Storage Temperature:	-30 to +80°C
Enclosure:	Polycarbonate front and base, steel case
Terminals:	Barrier terminal strip, 6-32 screw
Compliance:	UL140758, IEC 1010, IP54 (front face)
Dimensions:	4.31" high x 4.31" wide x 6.7" deep
Panel Cut Out:	4.06" (103mm) diameter, 4 stud positions

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: CR/INT-0643-MIV-5-L

A - **B** - **C** - **D**

A	Basic Unit	CR/INT-0644 Integra 0640, 3 phase 4 wire CR/INT-0643 Integra 0640, 3 phase 3 wire
B	Input Voltage	ELV 100 - 120 V L-L (57.7 - 69.3V L-N) LOV 121 - 240 V L-L (70.1 - 139V L-N) MIV 241 - 480 V L-L (140 - 277V L-N) HIV 481 - 600 V L-L (278 - 346V L-N)
C	Input Current	5 5A CT input
D	Auxiliary Supply	10 100 - 120V AC 19 190 - 240V AC

Accuenergy Power Meters

- Revenue Grade Metering
- 5 Function Display
- Power Quality Analysis
- Over/Under Limit Alarm
- Data-Logging (Acuvim IIR)
- Web Server & Email Enabled
- Remote Switch Control
- Analog & Digital I/O Options
- 92x92 DIN or 4" ANSI Round Mounting


Acuvim II ▲ CE cUL US LISTED

The Acuvim II is a high-end multifunction power meter for monitoring and controlling power distribution systems. Plug-in modules expand the I/O capabilities. Alarms can be set for up to 16 parameters, selected from the 51 available. RS485 Modbus communication is standard, Ethernet is optional. The Acuvim IIR has 4M of onboard memory for datalogging in 3 assignable historical logs.

Measured Parameters:

- Phase Voltage V1, V2, V3, Vlnav
- Line Voltage V12, V23, V31, Vlnav
- Current I1, I2, I3, In, Iavg
- Power P1, P2, P3, Psum
- Reactive Power Q1, Q2, Q3, Qsum
- Apparent Power S1, S2, S3, Ssum
- Frequency F
- Power Factor PF1, PF2, PF3, PF
- Energy Ep_imp, Ep_exp, Ep_total, Ep_net
- Reactive Energy Eq_imp, Eq_exp, Eq_total, Eq_net
- Apparent Energy Es
- Demand Dmd_P, Dmd_Q, Dmd_S, Dmd_I1, Dmd_I2, Dmd_I3
- Harmonics 2nd-31st* & THD (V & I)
- Voltage Crest Factor
- THFF (TIF)
- Current K Factor
- Unbalance & Unbalance Factor (V & I)
- Max/Min Statistics with time stamps for 28 parameters
- Running Hours and Real Time Clock *up to 63rd harmonic on Acuvim IIR

Parameter	Accuracy		Resolution	Range
	Acuvim II	Acuvim IIR		
Voltage	0.2%	0.2%	0.1V	20V~500kV
Current	0.2%	0.2%	0.001A	5mA~50000A
Power	0.5%	0.2%	1W	-9999MW~9999MW
Reactive Power	0.5%	0.2%	1var	-9999MVar~9999Mvar
Apparent Power	0.5%	0.2%	1VA	0~9999MVA
Power Demand	0.5%	0.2%	1W	-9999MW~9999MW
Reactive Power Demand	0.5%	0.2%	1var	-9999MVar~9999Mvar
Apparent Power Demand	0.5%	0.2%	1VA	0~9999MVA
Power Factor	0.5%	0.2%	0.001	-1.000~1.000
Frequency	0.2%	0.2%	0.01Hz	45.00~65.00Hz
Energy, Primary	0.5%	0.2%	0.1kWh	0-99999999.9kWh
Energy, Secondary	0.5%	0.2%	0.001kWh	0-999999.999kWh
Reactive Energy, Primary	0.5%	0.2%	0.1kvarh	0-99999999.9kvarh
Reactive Energy, Sec.	0.5%	0.2%	0.001kvarh	0-999999.999kvarh
Apparent Energy, Primary	0.5%	0.2%	0.1kVAh	0-99999999.9kVAh
Apparent Energy, Sec.	0.5%	0.2%	0.001kVAh	0-999999.999kVAh
Harmonics	2.0%	2.0%	0.1%	0.0%~100.0%
Phase Angle	2.0%	2.0%	0.1°	0.0°~359.9°
Unbalance Factor	2.0%	2.0%	0.1%	0.0%~100.0%
Running Time			0.01h	0~9999999.9h

COMMON SPECIFICATIONS

System Configurations:	3LN/3CT, 3LN/2CT, 2LN/2CT*, 2LN/1CT*, 2LL/3CT, 2LL/2CT, 2LL/1CT*, 1Ø/3Line, 1Ø/2Line
Voltage Input:	400 VAC L-N, 690 VAC L-L full scale, 45-65 Hz
Withstand:	1500 VAC continuous, 3250 VAC for 1 minute
Input Z:	2 Mohm per phase
Current Input:	1 or 5 A nominal, 0-6A metering range
Withstand:	20 Arms continuous, 100A for 1 sec.
Burden:	0.05 VA typical @ 5 Arms
Display:	LCD with white backlight
Temperature:	-25 to 70 °C operating, <95% RH (non-condensing)
Environment:	Pollution degree 2
Dimensions:	3.8" H x 3.8" W x 2.0" D (96x96x51mm)

*not on Acuvim IIR or Acuvim-EL

- Multifunction TRMS Meter
- 4 Quadrant Energy
- Power Quality Analysis
- Demand
- Over/Under Limit Alarm
- Wide Temperature Range
- RS485 Modbus Option
- 92x92 DIN or 4" ANSI Round Mounting


Acuvim-L ▲ CE cUL US LISTED

Measured Parameters:

- Voltage V1, V2, V3, V12, V23, V31
- Current I1, I2, I3, In
- Power P1, P2, P3, Psum
- Reactive Power Q1, Q2, Q3, Qsum
- Apparent Power Ssum
- Frequency F
- Power Factor PF1, PF2, PF3, PF
- Energy Ep_imp, Ep_exp
- Reactive Energy Eq_imp, Eq_exp
- Demand Dmd_I1, Dmd_I2, Dmd_I3, Dmd_P, Dmd_qInput
- Harmonics 2nd-15th & THD (V & I)
- Unbalance (V & I)
- Max/Min (V & I) with time stamps
- Max Demand (I & P)
- Running Hours

Parameter	Accuracy		Resolution	Range
	Acuvim-L	Acuvim-EL		
Voltage	0.5%	0.5%	0.1V	20V~500kV
Current	0.5%	0.5%	0.02%	0~50000A
Current Demand	0.5%	0.5%	0.02%	0~50000A
Power	1.0%	0.5%	0.1%	-4294MW~4294MW
Reactive Power	1.0%	0.5%	0.1%	-4294MVar~4294MVar
Apparent Power	1.0%	0.5%	0.1%	0~4294MVA
Power Demand	1.0%	0.5%	0.1%	0~4294MW
Reactive Power Demand	1.0%	0.5%	0.1%	0~4294MVar
Apparent Power Demand	1.0%	0.5%	0.1%	0~4294MVA
Power Factor	1.0%	0.5%	0.1%	-1.0~1.0
Frequency	0.2%	0.2%	0.01Hz	45~65Hz
Energy	1.0%	0.5%	0.1kWh	0~99999999.9kWh
Reactive Energy	1.0%	0.5%	0.1kvarh	0~99999999.9kvarh
Apparent Energy	1.0%	0.5%	0.1VAh	0~99999999.9kVAh
Harmonics	2.0%	--	0.1%	0~100.0%
Running Time			0.1h	0~9999999.9h

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: Acuvim-EL-D-60-5A-P1

Acuvim— — — —

A Model	II-D Acuvim II
	IIR-D Acuvim II with Datalogging
	AL-D Acuvim L
	BL-D Acuvim L with Energy Pulse & Alarm Outputs
	CL-D Acuvim L with RS485 Modbus Comm (half-duplex)
	EL-D Acuvim L with Time of Use & RS485 Modbus Comm

B Frequency

50	50 Hz
60	60 Hz

C Current Input

5A	5 Amp
1A	1 Amp

D Power Supply

P1	100-415 VAC, 50-60 Hz; 100-300 VDC, 3 W
P2	20-60 VDC, 3 W

Plug-In Options for Acuvim II: (select up to 3)

DI	Four Digital Input (wet) 20-220V AC/DC, 2mA max.
RO	Two Form A Relay Out 250VAC/30VDC, 5A res., 2A inductive
DO	Two Isolated Digital Out 0-250V AC/DC, 100mA, photo-MOS
AO	Two Analog Out specify 0-5V, 1-5V, 0-20mA, 4-20mA (15V max)
AI	Two Analog In specify 0-5V, 1-5V, 0-20mA, 4-20mA
NET	Ethernet Communications 10/100M Modbus TCP/IP

Electro Industries Power Meter

- Multifunction TRMS Measurements
- Meets ANSI C12.20 and IEC 687 0.2% Accuracy Class
- Bright 0.56" 3 Line LED Display
- % of Load Bar for Analog Perception
- Programmable CT & PT Ratios
- Modbus and DNP Protocol
- RS-485, Ethernet or IR communication



Shark



Parameter	Accuracy	Display
Voltage L-L & L-N:	0.1%	0-9999 V or kV, scalable
Current:	0.1%	0-9999 Amps or kAmps
± Watts	0.2%	0-9999 Watts, kWatts, MWatts
±Wh	0.2%	5 to 8 Digits Programmable
±VARs	0.2%	0-9999 VARs, kVARs, MVARs
±VARh	0.2%	5 to 8 Digits Programmable
VA	0.2%	0-9999 VA, kVA, MVA
VAh	0.2%	5 to 8 Digits Programmable
PF	0.2%	±0.5 to 1.0
Frequency	0.01 Hz	45 to 65 Hz
%THD	1.0%	0 to 100%
% Load Bar	1-120%	10 Digit Resolution Scalable

Real time measurements for all parameters; plus Min/Max for V, A, W, VAR, VA, PF, f, %THD: Average for A, W, VAR, VA, PF

SPECIFICATIONS

System:	3 Element Y, 2.5 Element Y, 2 Element Δ, 4 Wire Δ
Voltage Input:	0-416VAC L-N, 0-721VAC L-L
Max. Burden:	0.36VA per phase at 600V, 0.014VA at 120V
Current Withstand:	100A for 10sec, 300A for 3sec, 500A for 1sec
Max. Burden:	0.005VA per phase at 11A
Pass-thru Wire:	0.177" (4.5mm) max dia.
Isolation:	All Inputs & outputs galvanically isolated to 2500VAC
Operating Temp:	-30 to +70°C, <95% RH non-condensing
Sampling:	400+ Samples/Cycle, all channels measured simultaneously
Update Rate:	1sec, except 100msec on Watts, VAR, VA
RS485 Communications:	1200-57600 baud: Modbus RTU, ASCII, DNP 3.0
Ethernet Communications:	10/100BaseT: Modbus TCP/IP, DNP 3.0
IR Communications:	IrDA thru faceplate
Dimensions, Ratings:	4.85"H x 4.82"W x 4.25"D, NEMA12 face

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: EI/Shark100-60-10-V2-D2-485P-X

EI/SHARK **A** - **B** - **C** - **D** - **E** - **F** - **F**

A	Model*	
	100	Power Meter/Transducer with LED Display
	200	Advanced Power Meter/Transducer with LED Display
B	Frequency	
	50	50Hz
	60	60Hz
C	Current Input Class	
	10	0-11A (5A nominal)
	2	0-2A (1A nominal)
D	Functions	Model 100 Model 200
	V1	Volts/Amps V, A, Freq, Power, Energy
	V2	V1 + Power & Frequency V1 + 2M Datalogging
	V3	V2 + Energy Counters V2 + Harmonic Analysis
	V4	V3 + Harmonics & Limits V3 + Limit & Control
E	Power Supply	
	D2	90-264VAC/100-370VDC, 10VA
	D	18-60VDC
F	Communications	
	X	None
	485P	RS-485 & Pulse (standard on Model 200 & Transducers)
	INP10	Ethernet & Pulse
G	Mounting	
	X	ANSI
	DIN	DIN mounting brackets

* Add suffix T for Transducer only (DIN mount) without display

Crompton Metering System

NEW



- DIN Rail Mounting
- 3 Parameter Backlit LCD
- Programmable CT Ratio
- TRMS Measurement
- User Programmable System Configuration
- Pulsed Output & Modbus Standard

Ri3



Button	Screen	Parameter Displayed	Button	Screen	Parameter Displayed
V/Hz	1	Volts L1-N	A	1	Current 1
		Volts L2-N			Current 2
		Volts L3-N			Current 3
	2	Volts L1-L2	2		Neutral Current
		Volts L2-L3	3		L1 Current Max Demand
		Volts L3-L1			L2 Current Max Demand
	3	Frequency			L3 Current Max Demand
		Volts L1-N THD%	4		Neutral Current Max Demand
		Volts L2-N THD%			Current L1 THD%
		Volts L3-N THD%	5		Current L2 THD%
		Volts L1-L2 THD%			Current L3 THD%
		Volts L2-L3 THD%			kW
		Volts L3-L1 THD%	P/PF	1	kVA
E	1	Import kWh			kVAr
	2	Export kWh			kVA
	3	Import kVAh	2		kW Max Demand
	4	Export kVAh	3		Power Factor

SPECIFICATIONS

Nominal input voltage:	100-289V AC L-N (173-500V AC L-L)
Max. input:	120% of nominal overload voltage continuous, 2 x range maximum for 1 second repeated 5 times at 5 minute intervals
Nominal burden:	<0.2VA per phase
Nominal input current:	5A AC rms
Max. input:	120% of nominal overload current continuous, 10 x nominal for 1 second repeated 5 times at 5 minute intervals
Nominal burden:	<0.6VA per phase
Frequency:	45-66Hz
System CT:	primary values 1 to 9999
Auxiliary	
Operating range:	110-400V AC ±10% (99-440V AC absolute limits) or 120-350V DC ±20% (96-420V DC absolute limits)
Burden:	<10VA/5W

Accuracy

Voltage, Current:	0.5%
Neutral Current:	4% (calculated)
Frequency:	0.1Hz
Power factor (PF)	1% of unity
Active power (W)	±1% of range
Reactive power (Var):	±1% of range
Apparent power (VA):	±1% of range
Active energy (kWh):	Class1 (IEC 62053-21)
Reactive energy (kVAh):	±1% of range
THD:	1% up to 31st harmonic
Response time:	1 sec
Pulsed output:	1 solid state relay
Contact rating:	50mA max at 250V AC
RS-485 Modbus output:	1 channel, 2-wire half duplex
Baud rate:	2400, 4800, 9600, 19200, 38400
Enclosure:	UL94V0 polycarbonate, DIN-rail mounting
Dimensions:	72 x 90mm (width x height) as per DIN 43880
Protection rating:	IP52 front, IP30 case
Terminals:	Shrouded screw-clamp 0.05-4mm wire
Operating environment:	-10 to +55°C, <90% RH non-condensing

ORDERING INFORMATION

Ri3-01 Integra Ri3 DIN Mount Digital Metering System

DIGITAL METERS

Yokogawa AC Switchboard Meters

Single, dual, and triple displays

- Field Configurable
- Measures True RMS Current and Voltage
- Accuracy: $\pm 0.2\%$ of Rdg. $\pm 0.1\%$ FS
- Displays MIN/MAX Values
- Scaling to 1250:1 for Potential Transformers, 5000:1 for Current Transformers
- Available for Single- and Three-Phase Systems
- High-Resolution, High-Intensity LED Display
- Fits Standard Panel Cutouts
- Non-Volatile Memory Stores All Setup Parameters
- Options Include RS-485 Communications, Analog Outputs, DC Auxiliary Power Supply

AC WATT/VAR SINGLE FUNCTION

To Order—Insert Number Code for Each Letter to Select Catalog Number.

Order Example: 2491-53-11-5-AHF-0

A	B	C	D	E	F
A	2491	Single Function			
B	Function Connection				
	51	Watt 1P2W			
	52	Watt 1P3W			
	53	Watt 3P3W			
	54	Watt 3P4W (2 $\frac{1}{2}$ Element)			
	55	Watt 3P4W (3 Element)			
	61	Vars 1P2W			
	62	Vars 1P3W			
	63	Vars 3P3W			
	64	Vars 3P4W (2 $\frac{1}{2}$ Element)			
	65	Vars 3P4W (3 Element)			
	71	Power Factor 1P2W			
	72	Power Factor 1P3W			
	73	Power Factor 3P3W			
	74	Power Factor 3P4W (2 $\frac{1}{2}$ Element)			
	75	Power Factor 3P4W (3 Element)			
	91	Phase Angle 1P2W			
	92	Phase Angle 1P3W			
	93	Phase Angle 3P3W			
	94	Phase Angle 3P4W (2 $\frac{1}{2}$ Element)			
	95	Phase Angle 3P4W (3 Element)			
C	AC Input Rating				
	11	120 Volt/1 Amp			
	15	120 Volt/5 Amp			
	21	240 Volt/1 Amp			
	25	240 Volt/5 Amp			
	33	Special (Describe)			
D	Frequency				
	5	50/60 Hz			
	6	400 Hz			
	8	Special Calibration			
E	Analog Output				
	AAA	None			
	AFA	0 to 1 mA			
	AFB	0 to ± 1 mA			
	AHD	4 to 20 mA			
	AHF	12 ± 8 mA			
F	Communication				
	0	None			
	1	RS-485			



2493 ▲



▲ 2491



2492 ▶

AC AMP/VOLT/FREQUENCY SINGLE FUNCTION

To Order—Insert Number Code for Each Letter to Select Catalog Number.

Order Example: 2491-21-1-AHD-0

A	B	C	D	E
A	2491	Single Function		
B	Input Range			
	11	1 Amp AC		
	15	5 Amp AC		
	21	150 Volts AC		
	25	300 Volts AC		
	81	Frequency (150V)		
	83	Frequency (300V)		
C	Frequency			
	1	50/60 Hz		
	2	400 Hz		
	3	Special Calibration		
D	Analog Output			
	AAA	None		
	AFA	0 to 1 mA		
	AFB	0 to ± 1 mA		
	AHD	4 to 20 mA		
	AHF	12 ± 8 mA		
E	Communication			
	0	None		
	1	RS-485		

Yokogawa AC Switchboard Meters

AC VOLT OR AMP

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: 2493-3-01-AFA-1-1

A	B	C	D	E	F	G
A	2493	Triple Display				
B	Connections					
	1	3P3W Volts AC				
	2	3P4W Volts AC				
	5	3-Phase A, B, C Amps AC				
C	Input Rating					
	01	1 A				
	05	5 A				
	10	150 V				
	20	300 V				
	30	600 V				
D	Frequency					
	1	50/60 Hz				
	2	400 Hz				
E	Analog Output					
	AAA	None				
	AFA	0 to 1 mA DC				
	AHD	4 to 20 mA DC				
F	Communication Protocol					
	1	Yokogawa ASCII				
	1	Modbus				
G	Auxiliary Power					
	1	120/240 VAC				
	3	24 VDC				
	4	48 VDC				
	5	125 VDC				

AC VOLT/AMP/HERTZ

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: 2493-08-51-1-AHD-1-1

A	B	C	D	E	F	G
A	2493	Triple Display				
B	Function/Connections					
	07	Volt/Amp/Hz 1P2W				
	08	Volt/Amp/Hz 3P3W				
	09	Volt/Amp/Hz 3P4W				
C	AC Volt/Amp Rating					
	51	150V /1 A				
	55	150V /5 A				
	61	300V /1 A				
	65	300V /5 A				
	71	600V /1 A				
	75	600V /5 A				
D	Frequency					
	1	50/60 Hz				
	2	400 Hz				
E	Analog Output					
	AAA	None				
	AFA	0 to 1 mA DC				
	AHD	4 to 20 mA DC				
F	Communication Protocol					
	1	Yokogawa ASCII				
	2	Modbus				
G	Auxiliary Power					
	1	120/240 VAC				
	3	24 VDC				
	4	48 VDC				
	5	125 VDC				

AC VOLT/AMP AND VOLT/FREQUENCY

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: 2492-16-1-AHD-0-1

A	B	C	D	E	F
A	2492	Dual Display			
B	Function Connection				
	12	150 Volt/1 Amp AC			
	13	300 Volt/1 Amp AC			
	16	150 Volt/5 Amp AC			
	17	300 Volt/5 Amp AC			
	22	150 Volt and 50/60 Hz			
	23	300 Volt and 50/60 Hz			
	26	150 Volt and 400 Hz			
	27	300 Volt and 400 Hz			
C	Frequency (NA For Frequency Units)				
	1	50/60 Hz			
	2	400 Hz			
D	Analog Output				
	AAA	None			
	AFA	0 to 1 mA			
	AHD	4 to 20 mA			
E	Communication				
	0	None			
	1	RS-485			
F	Auxiliary Power Supply				
	1	120 Volt 50/60 Hz			
	2	240 Volt 50/60 Hz			

AC WATT/VAR/POWER FACTOR

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: 2493-34-11-1-AFA-1-1

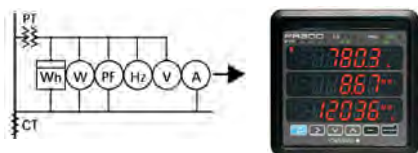
A	B	C	D	E	F	G
A	2492	Dual Display				
B	Function/Connection					
	40	Watt/VAR 1P2W				
	41	Watt/VAR 1P3W				
	42	Watt/VAR 3P3W				
	43	Watt/VAR 3P4W (2½ Element)				
	44	Watt/VAR 3P4W (3 Element)				
	45	Watt/PF 1P2W				
	46	Watt/PF 1P3W				
	47	Watt/PF 3P3W				
	48	Watt/PF 3P4W (2½ Element)				
	49	Watt/PF 3P4W (3 Element)				
C	AC Input Rating					
	12	120 Volt/1 Amp				
	13	120 Volt/5 Amp				
	16	240 Volt/1 Amp				
	17	240 Volt/5 Amp				
D	Frequency					
	5	50/60 Hz				
	6	400 Hz				
E	Analog Output					
	AAA	None				
	AFA	0 to 1 mA				
	AHD	4 to 20 mA				
F	Communication					
	0	None				
	1	RS-485				
G	Aux. Power Supply					
	1	120 Volt 50/60 Hz				
	2	240 Volt 50/60 Hz				

2493	Triple Display	
B	Function/Connection	
	34	Watt/VAR/PF 1P2W
	35	Watt/VAR/PF 1P3W
	36	Watt/VAR/PF 3P3W
	37	Watt/VAR/PF 3P4W (2½ Element)
	38	Watt/VAR/PF 3P4W (3 Element)
C	AC Input Rating	
	11	120 Volt/1 Amp
	15	120 Volt/5 Amp
	21	240 Volt/1 Amp
	25	240 Volt/5 Amp
D	Frequency	
	1	50/60Hz
	2	400Hz
E	Analog Output	
	AAA	None
	AFA	0 to 1 mA
	AHD	4 to 20 mA
F	Communication Protocol	
	1	Yokogawa ASCII
	2	Modbus
G	Aux. Power Supply	
	1	120/240 VAC
	3	24 VDC
	4	48 VDC
	5	125 VDC

Yokogawa Power and Energy Meters

- Multiple Measured Parameters – Power and Energy (Active, Regenerative, Reactive, Apparent) plus Voltage, Current, Frequency, Power Factor and Demand
- Selectable System Configurations – Single and Three Phase; Two, Three and Four Wire
- Selectable Input Voltage Range – 120V, 240V, 480V
- CT & PT Ratios Entered from the Front Panel
- Standard RS-485 and Optional Ethernet Communications with Modbus Protocol
- Analog and Pulse Outputs
- Digital Input for Integration Start/Stop or Demand Alarm Release
- ANSI 4" Round or DIN 96 Square Mounting

A single unit replaces up to 11 analog meters, contributing to savings on cost, space and wiring.



Eight display screens are available on the PR300. The three parameters displayed in each screen are user selectable.

ORDERING INFORMATION

To Order—Insert Code for Each Letter to Select Catalog Number.
Order Example: PR300-42203-6A-0

PR300 - **A** **B** **C** **D** **E** - **F** **G** - 0

A	Basic Unit
3	Universal three-wire system (single-phase two-wire, single-phase three-wire, three-phase three wire)
4	Universal four-wire system (single-phase two-wire, single-phase three-wire, three-phase three-wire, three-phase four-wire)
5	Three-phase four-wire (2.5 element)
B	Input
1	Universal voltage (150/300/600V), 1A AC
2	Universal voltage (150/300/600V), 5A AC
C	Additional Inputs & Outputs
0	1 digital input
1	1 digital input, 1 analog output
2	1 digital input, 1 pulse output
3	1 digital input, 1 analog input, 1 pulse output
D	Communications
0	RS-485 (PC Link, Modbus ASCII & Modbus RTU protocols)
3	Ethernet (Modbus TCP protocol)*
E	Optional Measuring Functions
0	None
3	Demand measurement (1 demand alarm output)
F	Power Supply
6	100-240V AC (50/60Hz) or 130-300V DC
G	Phase Indication
A	A, B, C
R	R, S, T

*Ethernet includes RS-485 for communication to other PR300 meters



PR300
POWERCERT



SPECIFICATIONS

Accuracy:	Active energy	±0.5%
	Active power	±0.5% of FS
	Voltage, Current	±0.25% of FS
	Frequency	±0.5Hz
	Demand	±0.5%
Max. Input Voltage:	150V, 300V, 600V	
Max. Input Current:	1.2X FS continuous, 2X for 10s, 10X for 3s	
Frequency:	45 to 65 Hz	
Digital Input:	On level: 4.5-25V DC, Off level: within ±1VDC	
Demand Function:	Average power or average current	
Demand Period:	1 to 60 minutes	
Analog Output:	4-20mA DC	
Load:	<600Ω	
Measured Item:	Active power, reactive power, apparent power, phase voltage, phase current, power factor or frequency	
Pulse Output:	Pulse proportional to energy	
Measured Item:	Active energy, regenerative energy, reactive energy (Lead/Lag) or apparent energy	
Units:	0.1 to 5000.0 kWh/pulse; set in 100Wh increments	
Signal:	Open collector, 30V DC @ 200mA max.	
Alarm Output:	Alarms when measured demand exceeds setpoint	
Signal:	Open collector, 30V DC @ 200mA max.	
RS-485:	2-wire (half-duplex)	
Address:	01 to 99 (31 units max.)	
Baud Rate:	19200, 9600 & 2400 bps	
Protocol:	PC Link (with or without checksum), Modbus (RTU, ASCII)	
Ethernet:	IEEE802.3 compliant 10Base-T/100Base-TX	
IP Address:	Set from front panel. Only one address required for each PR300 cluster.	
Gateway:	RS-485 port on Ethernet meter communicates with RS-485 port on other PR300 meters	
Data Backup:	Last integrated value of active energy, regenerative energy, reactive energy & apparent energy are stored in non-volatile memory	
Withstand Voltage:	2500V AC between V & A inputs, power and ground; 2500V AC from V & A inputs, power and ground to digital input, pulse output, analog output, communications port and alarm output	
Operating Temp.:	0 to 50°C, 20-90% RH non-condensing	
Temperature Effect:	0.01%/°C	
Display:	Three 5-digit LEDs with unit & function annunciators	
Power:	100-240VAC ±10% (50/60Hz), 130-300V DC ±15%	
Power Consumption:	10VA, 5W max.	
Case:	Polycarbonate UL94-V0	
Connections:	Screw terminals (except Ethernet)	
Size:	ANSI: 4.33" x 4.33" x 5.05" (110 x 110 x 128 mm) DIN: 96 x 96 x 126 mm	

Electro Industries Multi-Function Power Monitor

- Built-in Ethernet Connectivity (DMMS-350)
- ANSI Footprint
- True RMS .2% Accuracy (DMMS-300)
- .3% Accuracy (DMMS-425)
- Harmonic Distortion to 31st Order
- Harmonic Waveform Capture (DMMS-300)
- MIN/MAX Demand
- 10 Channels of Analog Transducer Output
- ModBus, DNP 3.0
- Utility Grade



ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: DMMS-300-R-2E-X-KV-KA-MW-120-115A-MODR-X

A	B	C	D	E	F	G	H	I	J	K	L
A Basic Unit											
DMMS-300	Multi-Function Power Monitor										
DMMS-350	Multi-Function Power Monitor										
DMMS-425	Multi-Function Power Monitor										
B Reading Type (N/A for DMMS-425)											
X	KVAH Reading										
R	KVARH Reading										
C Connection											
3E	3 Element-3-Phase 4-Wire Wye (3 PTs)										
2.5E	2.5 Element-3-Phase 4-Wire Wye (2 PTs)										
2E	2 Element-3-Phase 3-Wire Delta										
D Harmonic Capability (N/A for DMMS-425)											
X	None										
H	Harmonics to 31 st Order										
E Volts Label											
V	Volts Label										
KV	Kilovolts Label										
F Amps Label											
A	Amps Label										
KA	Kiloamps Label										
G Power Label											
KW	Kilowatts Label										
MW	Megawatts Label										
H Operation Monitoring Voltage											
120	120/208V (Direct Reading or PTs)										
G	277/480 (Direct Reading)										
I Operating Power											
115A	115 VAC ±20%, 6 VA										
230A	230 VAC ±20%, 6 VA										
D	24-48 VDC ±20%, 6 VA										
D2	125 VAC or DC ±20%, 6 VA Universal										
D4	12 VDC ±20%, 6 VA										
J COM Protocol											
MODR	ModBus RTU										
MODA	ModBus ASCII										
DNP	DNP 3.0										
EI	EI-Bus										
K Relay Options											
X	None										
NL	2 Relays-1 KYZ Pulse (DMMS-300 only)										
NL2	3 KYZ Pulses										
L Output Module Option											
SF485DB	RS485 Output (Digital)										
SF532DB	RS232 Output (Digital)										
SHNI-1	10 Channel 0-1mA (DMMS 300 only)										
SHNI-20	10 Channel 4-20mA (DMMS 300 only)										

The DMMS-300 is a four-quadrant multi-function power meter that measures:

- 3Ø Voltage (L-N, L-L)
- 3Ø Current
- Neutral Current
- Bi-directional KW (3Ø & Total)
- Bi-directional KVAR (3Ø & Total)
- KVA (3Ø & Total)
- PF (3Ø & Total)
- Bi-directional KWH
- KVAh
- Frequency
- %THD
- K Factor

It replaces individual single-function meters by providing three parameter displays and an easy to use front panel interface, as well as digital and analog connections to a control or monitoring system. The DMMS-300 includes advanced power measurements and min/max storage for power analysis & control. User-defined setpoints are available for most measured values.

The DMMS-350 adds a standard Ethernet TCP/IP connection. The meter is ideal for applications requiring real time metering or data streaming to a LAN or through the Internet. Information is reported using the industry standard Modbus TCP/IP protocol. Harmonic measurements are also standard in the DMMS-350.

The DMMS-425 is an economical power monitor that measures and calculates over 80 electrical parameters, including maximum and minimum values for every reading. This full four-quadrant meter has separate positive and negative Watthour counters and complies with ANSI C12 revenue metering accuracy requirements.

SPECIFICATIONS

Accuracy	DMMS-300	DMMS-350	DMMS-425
Volts:	0.2% of Full Scale	0.2%	0.3%
Amperes:	0.2% of Full Scale	0.2%	0.3%
KW:	0.4% of Full Scale	0.4%	0.6%
KVA:	0.4% of Full Scale	0.4%	0.6%
KVAR:	0.4% of Full Scale	0.4%	0.6%
PF:	1.0% of Full Scale	0.4%	0.6%
KW Hour:	0.4% of Full Scale	0.4%	0.6%
KVA Hour:	0.4% of Full Scale	0.4%	0.6%
KVAR Hour:	0.4% of Full Scale	0.4%	0.6%
Frequency:	0.02 Hz	0.02 Hz	0.02 Hz
Harmonics:	0.50%	0.50%	NA
Input Voltage:	150V phase to neutral, 300V phase to phase-std. 300V phase to neutral, 600V phase to phase-G option 300V phase to neutral, 150V phase to phase-75 option		
Input Current:	5A at Full Scale, 10A maximum		
Burden:	Voltage 0.1 VA maximum; Current 0.1 VA maximum		
Operating Temp.:	-20°C to +70°C		
Sensing Method:	True RMS sampling at 64 samples per cycle		

Electro Industries Utility Billing Meter

DIGITAL METERS



NEXUS 1262 S Base Case



Switchboard Case

- 0.06% W-hr Revenue Meter
- 4 Quadrant Measurements
- Multi-point Compensation
- Pulse Totalizers
- High Speed Power Quality Waveform Recorders
- Load Profiler and I/O
- Graphical LCD Display
- Up to 4 Com Ports
- RJ11 Modem & Ethernet
- Modbus RTU and Modbus TCP
- DNP3 Serial and Ethernet
- Web Server & Email on Alarm
- MV90 Compatible

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number. Example: 1262-A-9S-010-60-S-INP200

A - B - C - D - E - F - G

A	Model	
	1262	Nexus Utility Billing Meter
	1272	Nexus Utility Billing Meter with Advanced Power Quality
B	Memory	
	S	Standard
	A	Advanced
C	Form	
	9S	3E 4W Wye or Delta, S-base case
	45S	2E 3W Delta, S-base case
	36S	2½E 4W Wye, S-base case
	SWB2	Switchboard case
	9A	3E Wye or Delta, A-base case
D	Class	
	02	0 to 2 A (1A nominal)
	010	0 to 10 A (5A nominal)
	020	0 to 20 A (10A nominal)
E	Frequency	
	60	60 Hz
	50	50 Hz
F	Power Supply	
	S	Standard, blade powered *
	SE	External 102-270V AC/DC
	DE	External 18-60V DC
	LV	69V AC ±20%, blade powered *
G	Communication Option	
	X	None
	INP2	Modem with Dial-Out
	INP200	10/100Base T Ethernet
	INP202	Modem & Ethernet (no dial out)

* Not available in switchboard case

SPECIFICATIONS

Accuracy:							
Voltage	0.02%						
Current	0.05%						
Frequency	0.001Hz						
kW, kWh @1.0PF	0.06%						
kWh @0.5PF	0.1%						
kVAR, KVA	0.1%						
PF	0.1%						
Burden on Current Inputs:	Class 2: 0.000312VA @2.5A Class 10, 20: 0.125VA @25A						
Voltage Inputs:	Form 9S, 36S, 9A, SWB: 0 to 277V L-N Form 45S: 0 to 480V L-N Option SE, DE: 600V L-L, 480V L to Vref Option LV: 120V L-L, 69V L to Vref						
Sensing:	16 bit A/D inputs True RMS measurements 8 channel sample & hold						
Digital Inputs:	8 channels, 12VDC self excited for dry contact						
Solid State Outputs (KYZ):	4 channels, form C, 350VDC/120mA, 3750V rms isolation, 35Ω max on resistance						
Timing:	Internal clock accurate to 2 min/month IRIG-B input for sync to external GPS signal Line freq. clock sync - accurate to 1 sec/month						
Standard Communications:	IR port Two RS-485 serial ports Modbus RTU, Modus ASCII, DNP3.0 protocols Data Speeds to 115200 bps Eight high speed input channels						
Display:	Backlit 128x64 graphic LCD						
Operating Temperature:	-40°C to 85°C (Display: -20°C to 60°C)						
Isolation:	Inputs and outputs: 2500V Comm ports: 1000V to earth and each other						
Security:	Hardware & Password Locks						
External Power (SE):	102-270V AC/DC, 50/60Hz, 12VA max.						
External Power (DE):	18-60V DC, 9W max.						
Dimensions:	S case 6.91" dia x 6.2" deep SWB case 6.85"W x 9.32"H x 8.8"D						
Memory:	All setup parameters, measurements & log data stored in nonvolatile RAM						
Model	Log1	Log2	CBEMA	Event	Waveform	Output	Input
1262S	69 days	32 days		512		512	1024
1262A	480 days	133 days		512		512	1024
1272S	85 days	133 days	512	1024	63	512	1024
1272A	555 days	133 days	512	1024	95	512	1024

EXTERNAL OPTIONAL MODULES

External Modules	
EI/1MAON4	4 Channel Analog Outputs, 0-1mA
EI/20MAON4	4 Channel Analog Outputs, 4-20mA
EI/1MAON8	8 Channel Analog Outputs, 0-1mA
EI/20MAON8	8 Channel Anaolgo Output, 4-20mA
EI/8AI1	8 Channel Analog Input, ± 0-1mA
EI/8AI2	8 Channel Analog Input, ± 0-20mA
EI/8AI3	8 Channel Analog Input, ± 0-5VDC
EI/8AI4	8 Channel Analog Input, ± 0-10VDC
EI/4RO1	4 Relay Outputs
EI/4PO1	4 Solid State Pulse Outputs
EI/8DI1	8 Digital Status Inputs, Wet/Dry
EI/MBIO	I/O Module Mounting Brackets } req'd for
EI/PSIO	I/O Power Supply } I/O options
EI/BAT1	External battery for dial out on outage
Single User Software Licenses **	
COMEXT3.1C	Communicator EXT 3.0 for Windows
DISEXT.1C	Dial-in Server License
AIEXT.1C	AiReports EXT Power Analysis for Windows

** Multi-computer licenses also available

Accuenergy DIN Power & Energy Meters

- Utility revenue grade accuracy
IEC 62053-22 0.5s Class / ANSI C12.20 0.5 Class
- Multiple CT input options
- 4 current inputs
- Residual current measurement available
- 10-690Vac direct voltage input
- Automatic 50/60Hz selection & wiring check
- RS-485 with Modbus-RTU
- Standard DIN-rail mount
- Energy pulse output and alarm output
- Optional relay output for alarm and remote control
- Tamper-proof design approved for revenue applications

The AcuRev 1310 Series of three-phase multi-circuit power and energy meters offer revenue grade accuracy and a wealth of other features. A built-in LCD display simplifies setup and local reading of meter data. The Modbus-RTU and pulse outputs allow seamless integration with data acquisition systems.

SPECIFICATIONS

Parameter	Accuracy	Resolution	Range
Active Energy	0.5%	1Wh	0-999999999
Reactive Energy	0.5%	1varh	0-999999999
Apparent Energy	0.5%	1VAh	0-999999999
Voltage	0.5%	0.1	10V-1000KV
Current	0.5%	0.001A	10mA-500000A
Active Power	0.5%	1W	-99 to 99MW
Reactive Power	0.5%	1var	-99 to 99Mvar
Apparent Power	0.5%	1VA	-99 to 99MVA
Power Factor	0.5%	0.001	-1.000 to 1.000
Frequency	0.2%	0.01Hz	50/60
Power Demand	0.5%	1W/var/VA	99MW/Mvar/MVA
Current Demand	0.5%	0.001A	10mA-5000A
System:	Three phase three wire (3P3W), three phase four wire (3P4W), single phase three wire (1P3W), single phase two wire (1P2W)		
Voltage Input:	Rated at 400Vac L-N, 690Vac L-L; 50/60Hz		
Input Impedance:	2MΩ/Phase		
Current Input:	5Aac/1Aac		
Start Current:	10mA		
Pulse Output:	Load 0-250Vac, 100mA (max)		
Isolation:	2500Vac		
Relay Output:	250Vac/30Vdc, 5A (resistive load)		
Isolation:	2000Vac (1min)		
Action Time:	10ms		
Communication:	RS485, Baud Rate 1200-34800		
Protocol:	Modbus-RTU		
Infrared:	Baud Rate 10ms, isolation 2000Vac (1min)		
Temperature:	-25 to 70°C operating		
Power Supply:	100-415Vac, 50/60Hz; 100-300Vdc		
Power Consumption:	<2W or 10VA		
Dimensions:	108 x 90 x 70 mm		

AcuRev 1314 does not support Rogowski coil input for neutral current.

AcuRev 



DIGITAL METERS

Feature	1311	1312	1313	1314
Bi-Directional Energy Measure			◆	◆
Active Energy	◆	◆	◆	◆
Reactive Energy		◆	◆	◆
Apparent Energy		◆	◆	◆
Time-of-Use		◆	◆	◆
Power Demand		◆	◆	◆
Peak Power Demand		◆	◆	◆
Predictive Demand		◆	◆	◆
Current Demand		◆	◆	◆
Peak Current Demand		◆	◆	◆
Voltage	◆	◆	◆	◆
Current	◆	◆	◆	◆
Neutral Current	Calculated	Calculated	Calculated	◆
Residual Current				Calculated
Active Power	◆	◆	◆	◆
Reactive Power		◆	◆	◆
Apparent Power		◆	◆	◆
Power Factor		◆	◆	◆
Frequency		◆	◆	◆
Clock		◆	◆	◆
Running Time	◆	◆	◆	◆
Energy Pulse Output	◆	◆	◆	◆
Relay Output (Alarm or Control)		◆	◆	◆
RS485 Modbus-RTU		◆	◆	◆
Wiring Check	◆	◆	◆	◆
Temperature	◆	◆	◆	◆
SunSpec	◆	◆	◆	◆

ORDERING INFORMATION

To Order—Insert Code for Each Letter to Select Catalog Number.

AcuRev A - B - C Order Example: AcuRev1311-5A-X1

A	Model
1311	Active Power & Energy Meter
1312	Active/Reactive Power & Energy Meter
1313	Bi-Directional Power & Energy Meter
1314	Bi-Directional Power & Energy Meter w/ residual current
B	Current Input
5A	Field configurable CT
333	333mV input CT
RCT	Rogowski coil CT
mA	80/100/200mA input CT
C	I/O
X0	No additional I/O
X1	Relay output

E-Mon D-Mon Three Phase Energy Meters



DIGITAL METERS

- Direct-read 8-digit LCD display without multiplier shows accumulative kWh & "real-time" kW load
- User entered cost per KWH provides to-date energy cost & projected hourly cost based on metered load
- Displays total carbon (CO₂) emissions in pounds (lbs.) & indicates hourly emissions based on metered load
- Utility Grade metering accuracy
- Split-core current sensors install without power interruption, promote enhanced safety and allow remote mounting up to 2000 feet from meter
- Current sensor installation diagnostic indicator
- Parallel up to three sets of current sensors for cumulative reading
- Industrial-grade JIC steel enclosure with padlocking hasp and mounting flanges for indoor installations
- Optional NEMA 4 polycarbonate outdoor enclosure
- Non-volatile memory
- UL Listed/CSA approved
- Certified to ANSI C12.1 and C12.16 (±0.2% for 1-100% load)
- Certified metering to California Bureau of Weights & Measures
- New York City approved, Con Edison approved for RSP program

** Indoor enclosure is 7 1/4" H x 7" W x 3 1/4"D with 3/4" knockout on bottom

Net Meter (E50 Model) adds:

- Direct-read 8-digit LCD display of:
 - Delivered kWh • Net kWh
 - Received kWh • Real-time kW load
- Load profile data of delivered kWh, delivered kVARh and received kWh along with real-time readings of Power Factor, kW, kVA, kVAR, Amps per phase, Volts per phase and Frequency (available via E-Mon Energy software)
- Built-in RS-485 & Ethernet, optional telephone modem

ORDERING INFORMATION

To Order—Insert Code for Each Letter to Select Catalog Number.
Examples: E20-2081600R-G-KIT E50-480200-J06-N-KIT

A	-	B	C	D	E	-	F
A	Model						
E20	3-phase (3 or 4 wire) Energy Meter						
E50	3-phase (3 or 4 wire) Energy Net Meter						
B	System Configuration						
208	120/208-240 V						
480	277/480 V						
600	347/600 V Wye						
C	Split-core Sensor Rating						
100-	100A (7/8" x 1 1/2" window)						
200-	200A (7/8" x 1 1/2" window)						
400-	400A (1 1/2" x 2 3/4" window)						
800-	800A (3 1/4" x 4 1/2" window)						
1600	1600A (3 1/4" x 4 1/2" window)						
3200	3200A (6" x 8" window)						
D	Enclosure						
M	MMU mounting style (E20 only)						
J	Green JIC steel indoor enclosure**						
R	NEMA 4X outdoor enclosure						
E	Communication (E50 only)						
01	RS485:	EZ7	Ethernet:			EZ7	
02	Modbus RTU		EZ7				
04	EZ7		Modbus TCP/IP				
06	Modbus RTU		Modbus TCP/IP				
10	EZ7 w/ modem		Modbus TCP/IP				
F	Type (Includes meter & 3 split-core current sensors)						
G-KIT	Green meter (E20 only)						
N-KIT	Green Net meter (E50 only)						

E-Mon D-Mon Multiple Meter Cabinets

- Compact installation of multiple meters allows for easy and centralized reading.
- Available in configurations for up to 8, 16, or 24 meters. Meters can be factory installed to speed system installation.
- IDRs (Interval Data Recorders) can be factory installed along with the meters, for easy interface to the E-Mon Energy software.
- Three-phase MMU cabinets include prewired voltage feeds.

ORDERING INFORMATION

Model	Capacity	Arrangement	Dimensions
MMU8	8 meters	2 across, 4 down	24"H x 12"W x 7"D
MMU16	16 meters	4 across, 4 down	24"W x 20"H x 7"D
MMU24	24 meters	5 across, 5 down	30"W x 24"H x 7"D

MMU



E-Mon D-Mon Single Phase KWH Meters



◀ **Class 1000**

- Direct-read 8 digit kW & kWh (no multiplier)
- 2 line alpha-numeric LCD display
- Revenue-grade accuracy: $\pm 0.2\%$ from 1-100% of rated load
- Retains readings during power failure
- Split-core sensors for safe & easy installation up to 2000 feet from meter
- Parallel up to three (3) sets of current sensors for cumulative reading.
- Industrial grade JIC steel enclosure for indoor installations with $\frac{3}{4}$ " conduit knockout on bottom and $\frac{1}{2}$ " on top
- UL/CUL Listed
- New York City approved, Con Edison approved for RSP

Dimensions: $6 \frac{3}{4}$ " H x $5 \frac{3}{16}$ " W x $3 \frac{1}{4}$ " D
Split-core current sensors have $7/8$ " x $1 \frac{1}{2}$ " window

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog

Number. Example E10-2120100KIT

E10- A B C D

A	System
2120	120V, 2-Wire (1 sensor)
3208	120/208-240V 3-Wire (2 sensors)
2277	277V, 2-Wire (1 sensor)
B	Split-core Sensor Rating
25-	25A
50-	50A
100	100A
200	200A
C	Enclosure
(blank)	Steel enclosure
R	NEMA 4X polycarbonate outdoor enclosure
D	
KIT	Includes meter & split-core current sensor(s)

DIGITAL
METERS

E-Mon D-Mon Energy Metering Software

E-Mon Energy software allows users to read and monitor energy consumption easily and effectively via on-site or off-site non-dedicated computers.

- Windows 2000, 2003, XP, 7 & 8 compatible
- Graphic profiling provides analytical charts and graphs with demand profiling for 5-, 15-, 30- or 60-minute sampling rates
- Generate and print itemized electric bills (using coincidental peak demand date and time). Software will generate bills from user-specific time periods via profile data
- Reads up to 8 time periods, 4 seasons and multiple holidays for time-of-use (TOU) monitoring
- Reads E-Mon D-Mon meters, either on-site or off-site, via telephone modem, Ethernet or a directly connected computer
- Exports data to spreadsheets for analysis (.csv files)
- Exports data to MV-90 system (.hmf files)
- Optional modem allows meters to be read anywhere in the world where telephone or cellular service is available.
- Reads E-Mon D-Mon meters via IDRs or smart meters with EZ7 protocol directly.



ORDERING INFORMATION

EMONENERGYSW	Energy Monitoring Software, Single License. Include USB Key (RS-485 to USB converter)
EMONENERGYSW -SERVER	Energy Monitoring Server Software
RS232K	RS232 Key
USBK	USB Key
EKM-T	Telephone Key/Modem
EKM-E	Ethernet Key/Modem

E-Mon D-Mon Three Phase kWh/Demand Meters

Class 2000

- Direct-read 8-digit LCD display of accumulative kWh and "real-time" kW load (no multiplier).
- Demand option displays kW/Demand and kW Peak date and time (15 minute interval standard, 30 minutes available)
- Revenue Grade metering accuracy ($\pm 0.2\%$ for 1-100% load)
- Split-core current sensors install without power interruption and allow remote mounting up to 2000 feet from meter
- Current sensor installation diagnostic indicator
- Parallel up to three (3) sets of current sensors for cumulative reading
- Use on 3Ø 4-Wire, 3Ø 3-Wire & 2Ø 3-Wire systems
- Industrial-grade steel enclosure standard (for indoor installation); MMU (Multiple-Meter Unit) cabinet & NEMA 4X raintight enclosure optional
- Non-volatile memory
- UL / CUL Listed
- Certified to California metering standards Bureau of Weights and Measures. Listed by the California Energy Commission. New York City approved, Con Edison approved for RSP program.



← **Class 2000**

IDR →



E-Mon D-Mon Interval Data Recorder

- Reads & records up to 8 or 16 meters; read meters individually or in groups
- Reads kWh (kilowatt-hours) and reads kW (Demand) in 15, 30 or 60-minute kW periods
- Internal data storage for 36 days of 15-minute intervals
- RS-485 communications to computer and other IRDs. Baud rate selectable up to 19200 bps
- Also supports up to 52 Class 3000 meters in either "daisy chain" or "star" configuration
- Powered from E-Mon D-Mon meters (IDR-ST requires 120V power)
- Non-volatile memory maintains data in case of power failure
- Can be mounted on the inside back wall of the MMU cabinet
- Industrial-grade JIC steel enclosure has padlocking hasp, mounting flanges & three 3/4" conduit knockouts on bottom

First meter (which supplies power to IDR) must be within 100 ft. Other meters can be up to 500 ft from IDR.

Dimensions: 9½" H x 6¾" W x 3¾" D

ORDERING INFORMATION

EIDR-8 Interval Data Recorder for up to 8 meters
 EIDR-16 Interval Data Recorder for up to 16 meters

Enclosure Options:

-J JIC steel indoor enclosure
 -M for mounting in MMU cabinet

Communication Options

01	RS485: EZ7	Ethernet: EZ7
02	Modbus RTU	EZ7
04	EZ7	Modbus TCP/IP
06	Modbus RTU	Modbus TCP/IP
10	EZ7 w/ modem	Modbus TCP/IP

Terminations add suffix

RJ RJ jacks
 ST Screw terminals

ORDERING INFORMATION

To Order—Insert Code for Each Letter to Select Catalog Number.
 Order Example: E20-2081600JD-KIT

E20-	A	B	C	D	E
A	System				
	208	120/208-240 V			
	480	277/480 V			
	600	347/600 V Wye			
B	Split-core Sensor Rating				
	100-	100A (7/8"x1½" window)			
	200-	200A (7/8"x1½" window)			
	400-	400A (1½"x2¾" window)			
	800-	800A (3¼"x4½" window)			
	1600	1600A (3¼"x4½" window)			
	3200	3200A (6"x8" window)			
C	Enclosure				
	M	MMU mounting style			
	J	JIC steel indoor enclosure**			
	R	NEMA 4X polycarbonate outdoor enclosure			
D	Options (omit if no options)				
	D-	Demand			
E	KIT Includes meter & 3 split-core current sensors				

** Indoor enclosure is 7 ¼" H x 7" W x 3 ¼"D with ¾" conduit knockout on bottom and 1/2" conduit knockout on top.

Schneider Electric Power Meter

NEW



PM1200

- Measures current, voltage, power, PF, frequency, THD & energy - active, reactive, apparent
- 4 digit TRMS readout with automatic scaling (K, M, G units display)
- Accuracy class 1.0
- Color coded analog load bar
- Rapid setup from the front panel
- User selectable default display page
- Direct connection up to 480Vac
- Modbus RS-485 interface
- Password protected keypad lock

Measurements

Current:	per phase & neutral
Voltage:	average, phase to neutral & phase to phase
Power :	active & apparent; total & per phase
Energy:	active, reactive & apparent
Unbalance:	current, voltage
Power Factor:	average and per phase
Demand:	present & max current, present & max active apparent power
Power Quality:	THD for current & voltage, per phase
Other Parameters:	Frequency, phase angle, run time, RPM



ORDERING INFORMATION

PM1200	Power Meter with energy & demand, RS-485 interface
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SPECIFICATIONS	
Measurement:	True RMS up to 15th harmonic
Sample rate:	20 samples/cycle at 50 Hz
Accuracy (of reading):	Current & voltage 1.0% Active & apparent power 1.0%, reactive 2.0% Apparent energy 1.0% Active energy IEC62053-21 class 1 Reactive energy IEC62053-23 class 2 Power Factor 1%; Frequency 0.1%
Data update rate:	1 second
Voltage inputs:	V1, V2, V3, Vn
Measured voltage:	80-480 V L-L without PTs Up to 999 kV with external PTs
Overload:	1.1 Vin (480V L-L)
Burden:	0.2 VA per phase max.
Impedance:	4MΩ L-L, 2MΩ L-N
Frequency:	45 - 65 Hz
CT primary rating:	1 A to 99.0 kA
CT secondary rating:	1 - 5 A
Current inputs:	A1, A2, A3
Measurement range:	50 mA - 6 A (starting at 5 mA)
Overload:	10 A continuous
Burden:	0.2 VA per phase max.
Input resistance:	< 0.1 ohm
Display:	3 parameter, 4 digit LED with auto-scaling (k, M, G)
Displayed parameters:	User selectable default display page
Communications:	2-wire RS-485, Modbus RTU, up to 19200 bps
Power supply:	44-277 VAC, 50/60 Hz; 44-277 VDC, 3 VA
Operating temperature:	-10 to +60°C (14-140°F), 5-95% RH non-condensing
Dimensions:	96mm x 96mm bezel, 83mm behind panel
Protection:	IP51 front, IP40 back
Rating:	CATIII, protection class 2, pollution class 2

Newport Graphical Display Panel Meter

NEW

- High resolution, backlit graphical display
- Universal Input accepts thermocouples, RTD & Process V/I
- Displays input as horizontal bar graph, line graph or 4 digit readout
- Records 85,000 data points with time stamping
- Data logging based on time and date, alarm 1 or 2, or key press
- Displays min/max process values
- Power from 90 to 240 Vac



DPI1701

This versatile meter can be configured to accept T/Cs (J, K, T, E, R, S), RTDs (2- or 3-wire), voltage (0-10Vdc) or current (0- 20mA). The high intensity, backlit, graphic display (240 x 64) provides powerful display features such as horizontal bar graph, line graph and data logging in real time. Options include two Form C relays, isolated USB or RS232 interface, isolated analog output, isolated 24 Vdc excitation and license-free IEEE802.15.4 wireless transceiver.

ORDERING INFORMATION

DPI1701/N	Graphic panel meter & logger with isolated RS-232
DPI1701-USB-R/N	Graphic panel meter & logger with 2 relays, isolated USB & 24V excitation
DPI1701-USB-AR/N	Graphic panel meter & logger with 2 relays, isolated USB, 24V excitation & analog output
DPI1701-USB-ARW/N	Graphic panel meter & logger with 2 relays, isolated USB, 24V excitation, analog output & wireless receiver

SPECIFICATIONS	
Display:	Monochrome, 240 x 64 dots, yellow backlight
Display Formats:	Standard digital, large digital, horizontal bar graph, line graph charting
Sampling Rate:	4 samples per second
Thermocouple Input:	
Type J:	-100 to 760°C (-148 to 1400°F)
Type K:	-100 to 1260°C (-148 to 2300°F)
Type E:	-200 to 849°C (-328 to 1560°F)
Type T:	-200 to 400°C (-328 to 752°F)
Type R & S:	100 to 1760°C (212 to 3200°F)
T/C Accuracy:	0.5°C (0.9°F); 2.5°C (4.5°F) or 0.5% FS for R & S
RTD Input:	100Ω Platinum, 2 or 3 wire, 0.00385 curve
RTD Range:	-200 to 850°C (-328 to 1562°F)
RTD Accuracy:	0.5°C (0.9°F)
Process Input:	0 to 10 Vdc, 0 to 20 mA/ 4 to 20 mA
Process Accuracy:	0.1% of reading
Data Logging:	Up to 85,000 data points with time stamping
Logging Mode:	Stop When Full or Circular Buffer
Logging Start/Stop:	Press key, alarm 1 or 2 on, alarm 1 or 2 off, time/date
Analog Output:	4 to 20 mA or 0/5 Vdc isolated
Relays:	SPDT, 250 Vac or 30 Vdc @ 3A
Alarm:	Enable/disable, high/low, latch/unlatch
Voltage Excitation:	Isolated 24 Vdc @ 25 mA
PC Interface:	Isolated USB or RS232
RF Transmitter:	ISM 2.4 GHz, direct sequence spread spectrum, 10mW
RF Range:	Up to 40 m (130') indoors, 120 m (400') outdoors
Power:	90 to 240 Vac ±10%, 50 to 400 Hz
Isolation:	3000 Vac Power to I/O, 2300 Vac Power to relays
Operating Conditions:	0 to 50°C (32 to 122°F), 90% RH non-condensing
Dimensions:	48 H x 96 W x 118 mm D (1.89 x 3.78 x 4.65")

Schneider Electric Energy Meter



EM1250

- Measures power, PF, energy - active, apparent, reactive
- Single row, backlit LCD display
- 4 digit TRMS readout with units displayed under each numeric value
- Direct read primary values - no multiplier
- User selectable default display page
- Permanent & resettable energy counters
- Modbus RS-485 interface

Recommended for load monitoring, load balancing, sub-metering & gensets.

System Configurations (User selectable)

- | | |
|----------------------------|--------------|
| 3 phase, 4-wire Y | 3 CTs, 3 PTs |
| 3 phase, 3-wire delta | 2 CTs, 3 PTs |
| 3 phase, 3-wire open delta | 2 CTs, 2 PTs |
| 1 phase, 3-wire | 2 CTs |
| 1 phase, 2-wire | 1 CT |



ORDERING INFORMATION

EM1250	EM1250 class 0.5 accuracy, 5 Amp CT Secondary and RS 485 port
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SPECIFICATIONS

Measurement:	True RMS, two quadrant power and energy
Accuracy:	Active power (kW) & energy (kWh) - class 0.5; Apparent power (kVA) & energy (kVAh) - class 0.5; Reactive power (kVAR) & energy (kVARh) - class 1.0; Power Factor (PF) - class 0.5;
Data update rate:	1 second
Voltage inputs:	V1, V2, V3, Vn
Measured voltage:	80-480 V L-L without PTs Up to 999 kV with external PTs
Overload:	600 V L-L
Burden:	0.2 VA per phase max.
Impedance:	3MΩ L-L and L-N
Frequency:	50/60 Hz ±5%
CT primary rating:	5 A to 99.0 kA for EM1250,
CT secondary rating:	5 A
Current inputs:	A1, A2, A3
Measurement range:	250 mA - 6 A (starting at 5 mA)
Overload:	10 A continuous
Burden:	0.2 VA per phase max.
Input resistance:	< 0.1 ohm
Display:	3 parameter, 4 digit LCD with auto-scaling (k, M, G)
Displayed parameters:	Auto-scrolling with user selectable default display page & password protected setup parameters
Communications:	2-wire RS-485, Modbus RTU
Power supply:	44-277 VAC, 50/60 Hz; 44-277 VDC, 4 VA
Operating temperature:	-10 to +60°C, 5-95% RH non-condensing
Dimensions:	96mm x 96mm bezel, 83mm behind panel
Protection:	IP51 front, IP40 back
Safety:	cULus per UL61010-1, CE
Rating:	CATIII, protection class 2, pollution class 2

Schneider Electric Advanced Energy Meter

NEW

- Use on 3φ LV & MV systems
- Measures, V, A, Freq, PF, plus 4 quadrant power & energy
- Power quality analysis to 15th harmonic
- Large, bright graphic display
- Predicts demand for load management
- Digital kWh output
- Modbus RS-485 interface
- 1/4DIN size



PM5110

Ideal for sub-metering and cost management.

Measurements

Current:	per phase & neutral
Voltage:	total, per phase L-L and L-N
Power :	real, reactive & apparent; total & per phase
Energy:	accumulated active, reactive & apparent
% Unbalance:	current, voltage L-L and voltage L-N
Power Factor:	true & displacement, total and per phase
Demand:	present, last, predicted & peak for avg current, active power, reactive power & apparent power
Power Quality:	THD for current, voltage L-L and voltage L-N
Harmonics:	Individual harmonics to 15th
Timers:	I/O time, operating time, load time
Other Parameters:	Frequency, min/max of instantaneous values with time stamp, alarms with time stamp



ORDERING INFORMATION

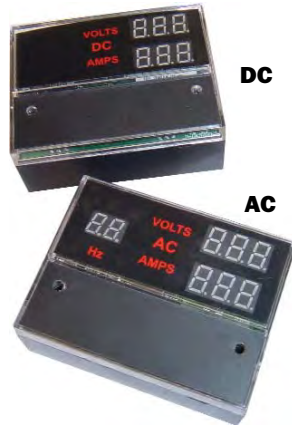
PM5110	Advanced Energy Meter with RS-485 communications
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SPECIFICATIONS

Measurement:	True RMS, four quadrant power and energy
Sampling rate:	64 samples per cycle
Accuracy:	Active energy ±0.5%; reactive energy ±2%; Active power & apparent power - class 0.5; Current, Voltage - class 0.5 Frequency - ±0.05%
Voltage inputs:	V1, V2, V3, Vn
Measured voltage:	20 to 400 V L-N / 35 to 690 V L-L without PTs Up to 1 MV with external PTs
Absolute range:	35 V L-L to 760 V L-L
Impedance:	5MΩ
Current inputs:	A1, A2, A3; 1 A or 5 A nominal
Measured amps:	50 mA - 8.5 A (starting at 5 mA)
Withstand:	10 A continuous, 10s/hr 50A, 1s/hr 500A
Burden:	<0.0262 VA at 8.5 A
Impedance:	< 0.3 mΩ
Frequency:	50/60 Hz ±5%
Demand calculation:	Rolling, fixed and rolling block, thermal methods w/settable interval; can be synchronized to clock or command. Peak demand time stamped & stored
Alarm time stamp:	1s resolution, data stored in non-volatile memory
Digital output:	one scalable from 1 to 9,999,999 pulses per kWh; 40 VDC, 20 mA, 25 Hz max, 50% duty cycle
Display:	Backlit monochrome graphic LCD, 128x128
Display modes:	Vector, graphical or 6 line numerical readout
Front panel indicators:	Green LED for heartbeat/communication; Amber LED for active alarm & energy pulse output
Communications:	2-wire RS-485, Modbus RTU, Modbus ASCII
Power supply:	100-277 VAC L-N or 415V ±5% L-L, 45-65 Hz, <11 VA; 125-250 VDC ±20%, <4W
Operating temperature:	-25 to +70°C, 5-95% RH @50°C non-condensing
Dimensions:	96mm x 96mm bezel, 77mm behind panel
Protection:	IP52 front, IP30 back
Safety:	cULus per UL61010-1, CE
Rating:	CATIII, protection class 2, pollution class 2

Hoyt Multi-Function Digital Meters

- Displays multiple parameters
 - DC Volts & DC Amps
 - AC Volts, AC Amps, Frequency
- High visibility LED display
- Surface or window mounting
- Matches panel cutout of Yokogawa 260 & Modutec 3S
- Made in the USA



D-CK920 ▶

ORDERING INFORMATION

D-CK920-VADC	99.9ADC, 99.9VDC (STD)
D-CK920-VADC-1	200ADC, 99.9VDC
D-CK920-VADC-2	1000ADC, 200VDC
D-CK920-VADC-3	5.0ADC, 99.9VDC
D-CK920-VADC-4	4V@400ADC, 99.9VDC (SPECIAL)
D-CK920-VADC-5	99.9ADC, 99.9VDC
D-CK920-VADC-6	500ADC, 99.9VDC
D-CK920-VADC-7	100ADC, 200VDC, no decimals
D-CK920-VAFAC	99.9AAC, 285VAC (STD)
D-CK920-VAFAC-1	199AAC, 285VAC

SPECIFICATIONS

AC Models:	TRMS Sensing
AC Volts Accuracy:	1% of reading ±1 count between 45 Hz and 65 Hz
Resolution:	1 Volt
Range:	0-285 VAC RMS
AC Amps Accuracy:	2% of reading ± 1 count
Resolution:	0.1 Amp to 99.9 A; 1 Amp from 100 to 999
Range:	999 Amps RMS using CT's with a maximum secondary of 100ma.
Frequency Accuracy:	0.5% from 45-65 Hz ±1 count
Crest Factor:	3:1
DC Models:	
DC Volts Accuracy:	0.1% of reading ±1 count
Resolution:	0.1 Volts to 99.9 VDC; 1 Volt from 100 to 999
Range:	Max. direct input is 100 VDC. Use an external divider to extend the range
DC Amps Accuracy:	1% of reading ±1 count (excluding shunt errors)
Resolution:	0.1 Amp to 99.9 Amps; 1 Amp from 100 to 200
Range:	200 Amps (requires external shunt)
All Models:	
Display:	0.38" LED, High Intensity
Common Mode Rejection:	86dB Typical
Common Mode Range:	±2 Volts
Overvoltage Protection:	1.5 times max input for 1 minute
Operating Temperature:	-20°C to +60°C, 0-95% RH non-condensing
Dimensions:	2.98" W x 2.25" H
Panel Cutout:	2.90" x 1.26" for window mounting

* Overall accuracy of this measurement is predicated on the accuracy of the shunt & length of connecting leads between the shunt and the D-CK920. Drift in the least significant digit may occur due to thermal changes in shunt or the operating environment.

ANALOG METERS

Schneider Electric Multi-Function Digital Meter

- Measure V, A, Freq, PF, Phase angle, Unbalance, RPM
- Use on 3 ϕ & 1 ϕ systems
- Large, bright LED display
- Modbus RS-485 interface
- Quick front panel setup
- Selectable CT & PT ratios
- Analog load bar
- 1/4DIN size

DM6200 ▶



Ideal for control panels, motor control centers & genset panels.

System Configurations (User selectable)

3 phase, 4-wire Y	3 CTs, 3 PTs
3 phase, 3-wire delta	2 CTs, 3 PTs
3 phase, 3-wire open delta	2 CTs, 2 PTs
1 phase, 3-wire	2 CTs
1 phase, 2-wire	1 CT



Measurements

Current:	per phase & neutral
Voltage:	average phase to phase and phase to neutral
Power factor:	average & per phase
Unbalance:	current & voltage
Phase angle:	between V & A on ph1, ph2, ph3
RPM:	speed calculated on output voltage & # of poles (generators only)
Other parameters:	Frequency, Operating time (hours), Number of interruptions

SPECIFICATIONS

Measurement:	TRMS up to 9th harmonic, 20 samples per cycle at 50Hz
Accuracy:	1.0% of reading (ACV, ACA, PF)* 0.1% of reading (Freq) 2 degrees (Phase angle)
Data update rate:	1 second
Voltage inputs:	V1, V2, V3, Vn
Measured voltage:	80-480 V L-L without PTs Up to 999 kV with external PTs
Overload:	1.1 Un (480 V L-L continuous)
Burden:	0.2 VA per phase max.
Frequency:	45-65 Hz
Current CT inputs:	1A to 99.0 kA primary, 1 A to 5 A secondary
Measured current:	50 mA - 6 A (starting at 5mA)
Overload:	10 A continuous
Burden:	0.2 VA per phase max.
Input resistance:	< 0.1 ohm
Display:	3 line, 4 digit LED with auto-scaling (k, M, G).
Displayed parameters:	Auto-scrolling with user selectable default display page & password protected setup parameters.
Analog load bar:	12 segment color coded LEDs
Communications:	2-wire RS-485, up to 19200 baud, Modbus RTU
Power supply:	44-277 VAC, 50/60 Hz; 44-277 VDC, 3 VA
Operating temperature:	-10 to +60°C, 5-95% RH non-condensing
Dimensions:	96mm x 96mm bezel, 83mm behind panel
Protection:	IP51 front, IP40 back
Rating:	CATIII, protection class 2, pollution class 2

* 0.05% of full scale additional error for input current below 100mA

ORDERING INFORMATION

DM6200	Multi-function digital meter with RS-485 communications
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Trumeter Advanced Panel Meters

- Large 4 digit main display
- Alphanumeric display for units, alarm or custom message
- 40 segment curved bargraph
- Dynamic backlight color
- Optional digital & analog outputs
- USB setup software



Two programmable setpoints can trigger the display to change color, flash, change annunciator message or all three at once. Trip when input is above, below, between or outside the setpoints.

SPECIFICATIONS

Input range (Volts):	0 - 600V DC; 0 - 528V AC
Input range (Amps):	0 - 5A DC; 0 - 5A AC, with CT or Shunt: 1000A
Input range (Frequency)	0 - 400Hz
Accuracy:	Volts or Amps: 1%; Frequency: 0.1%
Display modes:	Peak or RMS
Main Display:	4 digits, 12mm [0.47"] high
Annunciator Display:	4 alphanumeric characters, 6mm [0.23"] high
Backlight colors:	Red, Green, White (user selectable)
Positive LCD display:	Black scale on white or colored background
Negative LCD Display:	White or colored scale on black background
Programmable items:	Digital display: offset & gain; auto or fixed range Bargraph: positive, negative or center bar; bar span Custom annunciators Backlight color & intensity Two alarm setpoints Digital & analog outputs (Output models only)
Setup:	16 position switch for standard configurations, USB 2.0 port for custom settings
Free software:	Windows based APM Configurator application
Temperature:	-10 to +60°C operating
IP rating:	IP65 front
Power Supply:	12-24 VAC/VDC nominal
OUTPUT Models:	Two independent analog/digital outputs
Max voltage:	24V
Max current:	50mA
Analog output:	4-20mA
Certification:	UL and cUL (Pending), CE
Dimensions:	72x72x53mm. Panel cutout 68x68mm

ORDERING INFORMATION

APM-VOLT-APN	APM Voltmeter, Positive LCD
APM-VOLT-APO	APM Voltmeter, Positive LCD with Outputs
APM-VOLT-ANN	APM Voltmeter, Negative LCD
APM-VOLT-ANO	APM Voltmeter, Negative LCD with Outputs
APM-AMP-APN	APM Ammeter, Positive LCD
APM-AMP-APO	APM Ammeter, Positive LCD with Outputs
APM-AMP-ANN	APM Ammeter, Negative LCD
APM-AMP-ANO	APM Ammeter, Negative LCD with Outputs
APM-FREQ-APN	APM Frequency Meter, Positive LCD
APM-FREQ-APO	APM Frequency Meter, Positive LCD with Outputs
APM-FREQ-ANN	APM Frequency Meter, Negative LCD
APM-FREQ-ANO	APM Frequency Meter, Negative LCD with Outputs
022128-01	USB Cable

Trumeter Process Meters

- User selectable V/mA input
- Accuracy 0.1% or better
- 20 point linearization table
- Large 4 digit main display
- Alphanumeric display for units, alarm or custom message
- 40 segment curved bargraph
- Dynamic backlight color
- Digital & analog outputs
- USB setup software



The programmable scale, linearization table and custom annunciator allow users to display the process parameter exactly how they want. Dynamic backlighting, in conjunction with setpoints, provides a visual alert when a parameter is out of range. The two outputs can be used to control other systems in the process.

SPECIFICATIONS

Input range (DC):	0 to 10V; ±10V; 0 to 50mA; 4 to 20 mA
Input impedance:	Volts: 100kΩ; mA: 15Ω
Accuracy:	Volts: 0.1%; mA: 0.01%
Main Display:	4 digits, 12mm [0.47"] high
Annunciator Display:	4 alphanumeric characters, 6mm [0.23"] high
Backlight colors:	Red, Green, White (user selectable)
Positive LCD display:	Black scale on white or colored background
Negative LCD Display:	White or colored scale on black background
Programmable items:	Digital display: offset & gain; auto or fixed range Bargraph: positive, negative or center bar; bar span 20 point linearization table Custom annunciators Backlight color & intensity Two alarm setpoints Digital & analog outputs
Setup:	16 position switch for standard configurations, USB 2.0 port for custom settings
Free software:	Windows based APM Configurator application
Temperature:	-10 to +60°C operating
IP rating:	IP65 front
Power Supply:	12-24 VAC/VDC nominal (1.6W max.)
Outputs:	Two independent analog/digital outputs
Max voltage:	24V
Max current:	50mA
Analog output:	4-20mA
Certification:	UL and cUL (Pending), CE
Dimensions:	72x72x53mm. Panel cutout 68x68mm

Use the APM Configurator Software to customize the meter settings for the application.



ORDERING INFORMATION

APM-PROC-APO	APM Process Meter, Positive LCD with Outputs
APM-PROC-ANO	APM Process Meter, Negative LCD with Outputs
022128-01	USB Cable

NEW

Trumeter Shunt & CT Meters

- Large 4 digit main display
- Alphanumeric display for units, alarm or custom message
- 40 segment curved bargraph
- Dynamic backlight color
- Optional digital & analog outputs
- USB setup software



APM ▲



Two programmable setpoints can trigger the display to change color, flash, change annunciator message or all three at once. Trip when input is above, below, between or outside the setpoints.

SPECIFICATIONS

	SHUNT	CT
Input Range:	0 - 1V DC	0 - 5A AC
with CT or Shunt:	10,000A	10,000A
Input Impedance:	1MΩ	CT rated
Accuracy:	0.1% of signal or 0.5mV	0.5%
Main Display:	4 digits, 12mm [0.47"] high	
Annunciator Display:	4 alphanumeric characters, 6mm [0.23"] high	
Backlight Colors:	Red, Green, White (user selectable)	
Positive LCD Display:	Black scale on white or colored background	
Negative LCD Display:	White or colored scale on black background	
Programmable Items:	Digital display offset, gain, range; Bargraph span; Custom annunciators; Backlight color & intensity; Two alarm setpoints; Digital & analog outputs	
Setup:	Rear panel dip switch for standard configurations, USB 2.0 port for custom settings	
Free Software:	Windows based APM Configurator application	
Temperature:	-10 to +60°C operating	
Front Protection:	IP65, NEMA 4, NEMA 12	
Power Supply:	12-24 VDC ±10%	
Output Models:	Two independent analog/digital outputs	
Max Voltage:	24V	
Max Current:	50mA	
Analog Output:	4-20mA	
Certification:	UL and cUL, CE	
Dimensions:	72x72x53mm. Panel cutout 68x68mm	

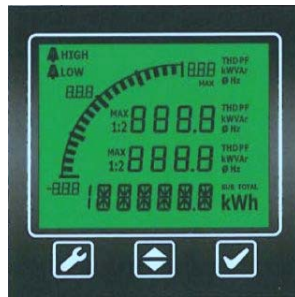
ORDERING INFORMATION

APM-SHUNT-APO	APM Shunt Meter, Positive LCD with Outputs*
APM-SHUNT-ANO	APM Shunt Meter, Negative LCD with Outputs*
APM-CT-APN	APM CT Meter, Positive LCD
APM-CT-APO	APM CT Meter, Positive LCD with Outputs
APM-CT-ANN	APM CT Meter, Negative LCD
APM-CT-ANO	APM CT Meter, Negative LCD with Outputs
022128-01	USB Cable

*Shunt models are non-isolated - for low side DC applications only

Trumeter Power Meters

- User selectable input scale
- 1% basic accuracy
- 4 parameter LCD display
- 20 segment bargraph display
- Front panel or USB setup
- 2 user configurable alarms
- Dynamic backlight color
- Digital, analog & pulse outputs
- Free setup software



APM-POWER ▲



The APM Power Meter is a panel mounted electrical energy meter that measures active and reactive power, as well as many other electrical parameters. It is designed for use on single phase or split phase mains applications up to 300V. Dynamic backlighting, in conjunction with setpoints, provides a visual alert when a parameter is out of range. The outputs can be used to activate external alarms or control other devices.

SPECIFICATIONS

System:	Single phase 2-wire, split phase 3-wire
Input Range (AC):	0 to 300V; 0 to 1000A with external CT
Accuracy:	1% (THD 5%) for voltage & current
Display Modes:	Instantaneous or maximum
LCD Display:	Shows up to 4 parameters simultaneously on the combined digital & bargraph display
Backlight Colors:	Red, Green, White (user selectable)
Positive LCD Display:	Black scale on white or colored background
Negative LCD Display:	White or colored scale on black background
Setup:	via front panel or USB port
Free Software:	Windows based APM Configurator application
Temperature:	-10 to +60°C operating
IP rating:	IP65 front
Power Supply:	90-264V, 50/60Hz, 3W max.
Digital Outputs:	Two pull down; 24V, 50mA max.
Analog Output:	4-20mA
Pulsed Output:	Configurable
Digital Inputs:	Switch closure to low for Reset & Lock
Connections:	Screw terminals
Certification:	UL and cUL (pending), CE
Dimensions:	72x72x75mm. Panel cutout 68x68mm

ORDERING INFORMATION

APM-POWER-APO	APM Power Meter, Positive LCD
APM-POWER-ANO	APM Power Meter, Negative LCD
022128-01	USB Cable

System:

- Single Phase 2-wire (1P2W)
- Single phase 3-wire (1P3W)

Inputs:

- 2x 300V AC
- 2x 1000A via CT
- Reset & Button Lockout

Outputs:

- Isolated 2kV
- Pulsed Output
- 2 Digital Outputs
- 4-20mA Analog Output

Parameters Measured

Demand:

- Active Energy
- Total
- Sub-total

Instantaneous & Max:

- Voltage (V)
- Current (I)
- Reactive Power (VAR)
- Active Power (W)
- Apparent Power (VA)
- Frequency (Hz)
- Power Factor (PF)
- THD Voltage & Current

NLS Panel Meters

MINIATURE PANEL METERS



PM349

- 0.1% Basic DC Accuracy
- Small Stackable Case
- Red, Green or Yellow Display
- Presetable Decimal Point
- MUX BCD Outputs

Temperature: 0-50°C operating
Case Size: 3.125" W x 1.375" H x 3.375" D

DIGITAL METERS

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.

Order Example: NL/PM349/L/G/CS/5/20V

A - B - C - D - E - F

A Model	
NL/PM349	3½ digit DC Voltmeter
NL/PM352	3½ digit DC Voltmeter
NL/PM452	4½ digit DC Voltmeter
B Display Option	
-	0.3" LED digit height
L	Large 0.4" digits
C LED Display Color	
R	Red
Y	Yellow
G	Green

D Reading	
-	Normal
S	Scaled (specify value)
Z	Offset (specify value)
CS	Internal current shunt (specify range)
AC	AC reading (PM352 only)
E Power	
-	Normal
5	5VDC ±5%, 200mA
120	with 120VAC adapter
240	with 240VAC adapter
F Range R _{in}	
200mV	100MΩ (PM349 only)
2V	1000MΩ
20V	1MΩ
20V	10MΩ
1000V	10MΩ

SHORT DEPTH DC VOLTMETERS



X37

- Only ½" behind panel
- 0.56" LED or 0.6" LCD
- 0.1% or 0.2% Accuracy
- Presetable Decimal Point

Power: 5VDC ±5%, 200mA (6mA for X37)
Temperature: 0-50°C operating
Case Size: 4" W x 1.9" H x 1.1" D

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.

Order Example: NL/X37/L/-/20V

A - B - C - D - E

A Model	
NL/X32	3 digit, LED (unipolar)
NL/X34	3½ digit, LED (bipolar)
NL/X37	3 digit, LCD (bipolar)
B Display Option	
L	Backlit LCD
-	Standard LCD or LED
C LED Display Color	
R	Red LED
Y	Yellow LED
G	Green LED
-	LCD

D Reading				
-	Normal			
S	Scaled (specify value)			
Z	Offset (specify value)			
CS	Internal current shunt (specify range)			
E Range		X32	X34, X37	R _{in}
		100mV	200mV	100MΩ
		1V	2V	1MΩ
		10V	20V	1MΩ
		100V	200V	1MΩ
		1000V	1000V	4MΩ

1/8 DIN PANEL METERS



RM350

- 0.1% or 0.2% Accuracy
- Amps, AC, Ω, Ratio Options
- Power Supply Options
- MUX BCD Outputs

Temperature: 0-50°C operating
Case Size: 4.0" W x 1.9" H x 4.5" D

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.

Order Example: NL/RM350/TB/-/G/AC/120/20V

A - B - C - D - E - F - G

A Model	
NL/RM350	3½ digit, 0.56" LED
NL/RM351	3½ digit, 0.6" LCD
NL/RM452	4½ digit, 0.56" LED
NL/RM453	4½ digit, 0.4" LCD
B Connector (mating connector included)	
TB	Terminal block
EC	Edge connector
C Display Option	
-	Standard
L	0.8" LED (RM350 only)
D Display Color	
R	Red LED
Y	Yellow LED
G	Green LED
-	LCD

E Reading	
-	Normal
S	Scaled (specify value)
Z	Offset (specify value)
CS	Internal current shunt (specify range)
AC	AC reading
Ohm	Ohms reading
F Power	
5	5VDC ±5%, 200mA
12	12VDC
24	24VDC
28	28VDC
18	18-34VDC isolated
120	120VAC
240	240VAC
G Range R _{in}	
200mV	100MΩ (RM3xx only)
2V	1000MΩ
20V	1MΩ
20V	10MΩ
1000V	10MΩ

Lascar Multi-Function Graphics Meters

NEW

- Three Color TFT Screen Sizes
- Programmed via USB Interface
- User Selectable Meter Display Styles Including Touch Screen Applications
- 0-40V or 4-20mA DC Input
- 4 to 30 VDC Supply Voltage
- Screw Terminal Connections
- Free Windows Configuration Software
- Optional Thermocouple Add-on Board
- NEMA 6X Version Available

The Panel Pilot Series is a family of color TFT graphics meters that users can program to display a variety of meter styles. Available in 2.4", 2.8" and 3.5" sizes, the meters are programmable via USB interface with free Windows-based configuration software. Users can select the type of meter style they want and personalize the display by selecting preferences in color, text and voltage input scaling. Once programming is complete, the meter is detached and mounted in the panel. Each unit is supplied with a variety of standard display styles. A 2.4" NEMA 6X model is available for hostile environments.


Panel Pilot

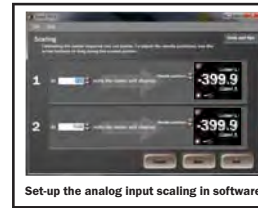

Connect PanelPilot display to PC via USB



Choose the best configuration for your application



Color individual display elements and customize text labels



Set-up the analog input scaling in software



Upload configuration and place meter in application

SPECIFICATIONS

Input:	0-40V DC (single ended)
Ranges:	8 ranges, software selected
Accuracy:	0.05% typical, 0.1% max.
Linearity:	± 1 count
Sample Rate:	3/second
Display:	320 x 240 color TFT touchscreen
Operating Temperature:	0 - 40°C
Supply Voltage:	4 to 30 VDC
Supply Current:	35mA at 30V, 190mA at 4V supply
PC Software:	Windows 7, Vista, 2000, XP

ORDERING INFORMATION

Part #	Description	Input	Dimensions (inch)
SGD24-M	2.4" Panel Pilot	0-40 VDC	3.0 x 1.9 x 0.75
SGD28-M	2.8" Panel Pilot	0-40 VDC	3.4 x 2.3 x 0.80
SGD35-M	3.5" Panel Pilot	0-40 VDC	3.7 x 3.0 x 0.90
SGD24-M420	2.4" Panel Pilot	4-20 mA	3.0 x 1.9 x 0.75
SGD28-M420	2.8" Panel Pilot	4-20 mA	3.4 x 2.3 x 0.80
SGD35-M420	3.5" Panel Pilot	4-20 mA	3.7 x 3.0 x 0.90
SGD24-M-IP	2.4" Panel Pilot NEMA 6X	0-40 VDC	3.0 x 1.9 x 0.75
SGD ADPT-TC	Thermocouple Add-on board, with Type K probe		
CABLE USB A-MF	Type A to Mini USB		

Lascar Enhanced Digital Panel Meters

DUAL COLOR INDICATORS

- Backlit 3½ Digit LCD Display
- Adjustable Hi & Lo Thresholds
- Selectable Normal Color - Green or Red
- 3 Open Collector Outputs (Hi, Lo, OK)
- 4.5-5.5V DC Supply
- Selectable Decimal Point Position
- 3.0" x 1.73" Size with Large 0.75" Digits
- Simple DIP Switch & Pushbutton Setup


DPM950S

ORDERING INFORMATION

DPM950S-FPSI	3.5 Digit Dual Color LCD Meter, ±200mV DC Bipolar Input
DPM942S-FPSI	3.5 Digit Dual Color LCD Meter, 4-20mA DC Input
BEZ900-IP	IP67, NEMA 4X Metal Bezel with Glass Window (fits above meters in same 2.83x1.57" panel cutout)

SPLASHPROOF LOW LIGHT DISPLAYS

- Backlit 3½ Digit LCD Display
- ±200mV DC Bipolar Input
- 4.75-7.5V DC Supply
- Selectable Decimal Point Position
- 1.38" x 0.88" Size, 0.38" Digit Height
- Auto-zero, Auto-polarity


SP400

ORDERING INFORMATION

SP400-EB-W	Black LCD w/ white LED backlight
SP400-EB-R	Black LCD w/ red LED backlight
SP400-EB-B	Black LCD w/ blue LED backlight
SP400-EB-Y	Black LCD w/ yellow LED backlight
SP400-EB-G	Black LCD w/ green LED backlight
SP400-EB-O	Black LCD w/ orange LED backlight
SP400-EB-M	Black LCD w/ magenta LED backlight

SUB-MINIATURE SNAP-IN 3½ DIGIT LCD METERS

ORDERING INFORMATION

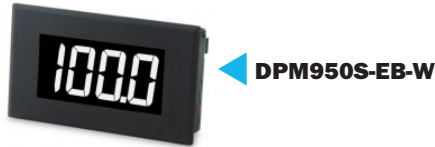
Part #	Description	Digit Height	Dimensions	Power Supply
DPM1AS-BL	±200mV DC Meter w/backlight	0.22"	1.18 x 0.55"	3.0-7.5 or 6.0-15.0 VDC
DPM3AS-BL	±200mV DC Meter w/backlight	0.43"	1.57 x 0.71"	3.0-7.5 or 6.0-15.0 VDC
DPM342	4-20mA Meter w/backlight	0.43"	1.57 x 0.71"	loop-powered


DPM3AS

Lascar Digital Panel Meters (formerly Martel)

900 Series

- Backlit LCD (except red LED on DPM959B)
- Large 0.75" Digit Height
- ±200mV A/D
- IP67/NEMA 4X Bezel Option



SPECIFICATIONS

Dimensions:	2.99" x 1.73" x 0.51" (76.0 x 44.0 x 15.0mm)
Panel Cut-out:	2.83" x 1.57" (72.0 x 40.0mm)
Operating Temp:	0°C to 50°C
LCD Backlight:	50mA@5V (except DPM942, DPM959B)

ORDERING INFORMATION

Model	Function	Accuracy ±1d	Supply VDC
DPM950	DCV**	±0.05%	7.5-14
DPM950S	DCV**	±0.05%	3.5-6.5
DPM959B	DCV**	±0.05%	4.5-5.5
DPM942	4-20mA	±0.05%	loop power
DPM970	ACV**	0.5%	7.5-14
DPM950S-EB-*	DCV**	±0.05%	4.75-7.5
DTM995	°C (Type KTC)	1%	7.5-24

*Specify backlight color: B (blue), G (green), Y (yellow), W (white), M (magenta), R (red), O (orange).

**Specify input range or internal shunt for current measurement.

35/65 Series

- Red LED, Green LED or LCD
- Voltage or Process Inputs
- Display Hold
- 5V power



35X ▲

SPECIFICATIONS

35x Dimensions:	2.57" x 1.10" x 0.77" (64.0 x 28.0 x 16.8mm)
35x Panel Cut-out:	2.05" x 0.81" (52.1 x 20.6mm)
35x Mounting:	Window or bezel
65x Dimensions:	2.3" x 1.1" x 0.71" (59 x 29 x 18.1mm)
65x Panel Cut-out:	2.22" x 1.04" (56.5 x 26.5mm)
65x Mounting:	Snap-in bezel
Digit Height:	0.56" LED, 0.39" LCD
Accuracy:	±0.05% ±1d typ.
Operating Temp:	0°C to 50°C
Power:	5VDC ±5%

ORDERING INFORMATION

DPM35R	Red LED DPM, differential input
DPM35G	Green LED DPM, differential input
DPM65	LCD DPM, differential input
DPM65S	LCD DPM, single-ended input

700 Series

- 1/2" Digit Height
- LED Backlight
- ±200mV A/D
- Function Annunciator
- IP67/NEMA 4X Bezel Option^



SPECIFICATIONS

-BL Dimensions:	2.57" x 1.39" x 1.36" (65.2 x 35.2 x 32.0mm)
-BL Panel Cut-out:	2.38" x 1.20" (60.5 x 30.5mm)
-EB Dimensions:	2.54" x 1.36" x 0.45" (64.5 x 34.5 x 11.5mm)
-EB Panel Cut-out:	2.44" x 1.26" (62.0 x 32.0mm)
Operating Temp:	0°C to 50°C
LCD Backlight:	40mA@5V

ORDERING INFORMATION

Model	Function	Accuracy ±1d	Supply VDC
DPM750S-BL	DCV**	±0.1%	3-15
DPM750S-EB-*	DCV**	±0.05%	4.75-7.5
DPM742-BL	4-20mA	±0.1%	loop power

*Specify backlight color: B (blue), G (green), Y (yellow), W (white), M (magenta), R (red), O (orange).

**Specify input range or internal shunt for current measurement.

^IP67 bezel is P/N BEZ 700-IP

EM32 Series

- 0.31" Digit Height
- Metal Bezel
- Mounts in 32.5mm (1.28") Cutout
- IP67/NEMA 4X Front



EM32 ▲

SPECIFICATIONS

Dimensions:	1.5" dia x 0.93" (38.0 x 23.5mm) excluding pins
Accuracy:	±0.1% ±1d typ.
Input:	±200mV DC*
Operating Temp:	0°C to 50°C
Power:	5VDC ±5% @500microA (50mA for LED)

ORDERING INFORMATION

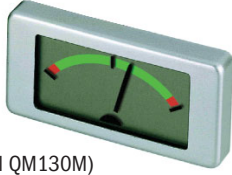
EM32-1B	Circular LCD DPM
EM32-1B-LED	Circular LED DPM

*Specify other ranges or internal shunt for current measurement.

Lascar Quick Mount LCD Panel Meters (formerly Martel)

EMA 1710 Wiper Type

- 9 Segment LCD
- Color Scale



(Martel QM130M)

Input:	0-1 VDC
Resolution:	125 mVDC
Supply:	5-12 VDC @ 1.5 mA

EMV 1200-40 2-Wire Voltage

- Monitoring System Voltage
- Powered from Measured Signal
- Reverse Polarity Protected



(Martel QM100V40)

Input:	4.0-40.0 VDC
Accuracy:	0.4V ± 1 count
Max:	50 VDC @ 3 mA

EMV 1125 Voltage/Current

- 200 mV Full Scale
- Auto-zero, Auto-polarity
- Optional Ranging Board



(Martel QM140V)

Ranges:	200mV, 2V, 20V, 200µa, 2ma, 20ma, 200ma
Accuracy:	0.05% ± 1 count
Supply:	7.5-15 VDC @ 150 µA

EMC 1500 Elapsed Time

- 9999.9 and 99999 Hour Ranges
- Reset & Trip/Total Inputs
- Pulse Output every 100 Hours



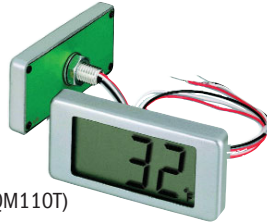
(Martel QM120C)

Supply:	5-27 VDC @ 2.5 µA
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 DIGITAL
METERS

EMT 1900 Temperature

- Readout in Degrees C or F
- Reads Internal Sensor or External 10kΩ NTC Thermistor



(Martel QM110T)

	Internal Sensor	External Sensor
Range:	-10 to +50°C -14 to +122°C	-20 to 220°C -4 to +428°F
Resolution:	0.5°	1°
Supply	4-28 VDC	4-28 VDC

SPECIFICATIONS FOR ALL METERS

Sample Rate:	3 sec.
Character Height:	0.5" (12.5mm) except 0.35" (9mm) on QM120C
Operating Temperature:	0-50°C
Dimensions (W x H):	1.71" x 0.84" (43.0 x 21.4 mm)
Mounting:	7/32" (5.5 mm) hole
Sealing:	IP65 Front

Yokogawa Loop Powered Indicators

- Explosion-Proof NEMA 4X Case
- Analog and Digital Models
- FM and CSA Approved Versions
- Wall Mount or 2" Pipe Mount

MLD ▶



SPECIFICATIONS

Input Resistance:	100Ω (MLD 4-20mA) < 6.5Ω (MLA 4-20mA) < 13.5Ω (MLA 10-50mA) ≈4kΩ (MLA 1-5V)
Standard Scale:	0-100.0% (MLD) 0-100% (MLA)
Accuracy:	±0.05% of full scale [1999] ±1 digit (MLD) ±1.5% of full scale (MLA)
Operating Temperature:	0 to 60°C (MLD), -20 to 60°C (MLA)
Electrical Classification:	FM, CSA, EXPLOSIONPROOF CL1, DIV1, GPS A,B,C,D, DUST-IGNITIONPROOF CLII / III, GPS E,F,G
Case and Cover:	Die cast aluminum, baked polyurethane paint. Dark green; NEMA 4X
Electrical Connection:	1/2" NPT

For special analog scale, add /SC to catalog number and describe (i.e. 0-300 PSI). For special digital readout, add /ENG to catalog number and describe (i.e. 50.0-150.0 GPM).

ORDERING INFORMATION

A	B	C	D	E	Example: MLD-A2/FF1/WHT
A	Model				
	MLA	Loop Indicator (Analog)			
	MLD	Loop Indicator (Digital)			
B	Input Signal				
	-A	4 to 20 mA DC			
	-B	10 to 50 mA DC (MLA only)			
	-C	1 to 5 VDC (MLA only)			
C	Mounting				
	1	2" Horizontal Pipe			
	2	2" Vertical Pipe (or wall mount)			
D	Electrical Class				
	/FF1	FM Explosion Proof			
	/CF1	CSA Explosion Proof			
E	Options				
	/WHT	White scale or face plate			
	/ENG	Engineering Unit Calibration (MLD Only)			
	/SC	Scale in Engineering Units (MLA Only)			
	/SST	Stainless Steel Tag -Up to 8 Characters			

London Electronics DC Loop Powered Meters

- Powered Entirely from the Input Signal
- High Contrast LCD Display
- Clear Visibility in Direct Sunlight
- 1/8 DIN Case
- Detachable Screw Terminal Connectors
- Wide Ranging Zero and Span Control
- Selectable Decimal Point Location
- Simple to Install
- Low Cost
- X10 and X100 Add-On Zeros (Jumper Selectable)

SPECIFICATIONS

Input Ranges:	2-wire connection, 4 mA–20 mADC, 125Ω 10 mA–50 mADC, 50Ω, 1 mA–5 mADC
Display Type:	7-segment, HI-C LCD
Display Height:	12.7 mm 0.50"
Decimal Points:	Selectable internally
Power Voltage:	Line drop <2.5V DC
Power Consumption:	100 mW maximum
CMRR:	65 dB, DC to 450 Hz
Size:	1/8 DIN panel area and cutout
Weight:	150 grams typically
Case Material:	94V-0 UL polycarbonate
Operating Temperature:	-10°C to 50°C
Storage Temperature:	-40°C to 85°C
Relative Humidity:	Non-condensing 90% maximum @ 40°C

PRO ▶


88-PRO

The 88-PRO is a low-cost, 3 ½-digit, scalable, process input indicator. It has an easy-to-read LCD display and detachable screw terminals. The basic 3 ½-digit offers 0 to 1,999 display range. This can be extended to 0 to 199,900 with both add-on zeroes enabled.

ORDERING INFORMATION

88-PRO 3 ½-Digit Loop Powered Meter

Monarch Panel Tachometers and Totalizer

ACT Series

- Universal Input from Optical, Infrared, Proximity and Magnetic Sensors
- Direct TTL and 200 mV to 50 VAC Input Signals
- Selection of Sensors For All Environments

The ACT tachometers offer a simple RPM display or can be interfaced with data acquisition systems in your control room. The ACT-1B/115 operates from a single pulse per revolution. ACT-3/115 is front panel programmable for single or multiple pulses per revolution and for scaling. The ACT-3 is supplied with NIST CERTIFICATE and has 2 alarm set points, offset analog voltage, current, TTL pulse and RS-232 outputs and offers a counter (totalizer) mode.

ACT-1B ▼


SPECIFICATIONS

	ACT-1B/115	ACT-3/115
Speed Range	5 to 100,000 RPM	5 to 999,99 RPM
Accuracy	1 RPM	.001%, .0001 to 10 RPM
Display	.56" H red LED	.56" H red LED
Totalizer	N/A	1-99,999
Alarm Capability	N/A	Two alarm set points. Front panel programmable as high or low.
Analog Outputs	N/A	Voltage(0-5 VDC), Current (4-20 mA)
Pulse Repeater	N/A	Pulse Output, 0-5V TTL compatible
Dimensions	1/8 DIN by 4.5" deep	1/8 DIN by 7" deep.

Compatible speed sensors on page 118

ORDERING INFORMATION

ACT-3/115	Tach/Totalizer
ACT-1B/115	Tach (1 Pulse/Rev)

Yokogawa Explosion-Proof Meters

- Die-cast NEMA 4X, IP68 enclosures
- 90° rotatable display with wide viewing angle
- Two ¾" NPT conduit holes
- Flanges for wall or pipe mounting
- Through-glass button programming
- Password protection
- FM, CSA, ATEX, and IECEx approvals
- Easy field setup and wiring

YPP6801 Level Meter

- Display level in feet & inches
- 4-20 mA input loop-powered
- Lower display for tag, volume, or %
- 20-segment tank level bargraph
- 32-point linearization
- Live input calibration
- Open collector alarm output
- Loop or external DC-powered backlight

YPP6820 Rate/Total Meter

- 4-20 mA input loop-powered
- 5-digit rate display
- 7-digit totalizer
- 32-point, square root or exponential linearization
- Rate in units per second, minute, hour, or day
- Open collector pulse or alarm output
- Loop or external DC-powered backlight
- HART® protocol transparent

YPP6830 Pulse Input Rate/Total Meter

- Pulse, open collector, NPN, PNP, TTL, switch contact, sine wave (coil), square wave, opto-isolated inputs
- 5-digit top display for Rate or Total
- 7 alphanumeric character lower display for Rate, Total, Grand Total, Units, and Tag
- 13-digit Totalizer with total overflow feature
- Isolated 4-20 mA output for Rate, Total, or Grand Total
- 2 isolated open collector pulse outputs, to 5 kHz
- Battery, DC, or output loop-powered models
- Gate function for rate display of slow pulse rates
- K-Factor, scaling, or live input calibration with 32-point linearization
- Automatic Rate, Total, and Grand Total unit conversions
- 1024 point on-board data logging
- Modbus communication RS-485 options

YPP6870 Process Meter

- 4-20 mA input
- 3½ digit, 1" (25.4 mm) display
- 1 V drop (4 V with backlight)
- Loop-powered backlight option
- HART® protocol transparent

LEVEL METER



YPP6801 ▲

RATE/TOTAL



YPP6820
YPP6830 ▲

PROCESS METER



YPP6870 ▲

SPECIFICATIONS

Model	YPP6801	YPP6820	YPP6830	YPP6870
Meter Type	Level Meter	Rate/Total	Rate/Total	Process
Input	4-20 mA	4-20 mA	Pulse	4-20 mA
Accuracy	±0.03% of span ±1d	±0.03% of span ±1d	---	±0.1% of span ±1d
Display	5-digit	5-digit	5-digit	3½ digits
Type	Feet & Inches	Decimal	Decimal	Decimal
Upper Display	0.7" (17.8 mm)	0.7" (17.8 mm)	0.7" (17.8 mm)	1.0" (25.4 mm)
Lower Display	0.4" (10.2 mm)	0.4" (10.2 mm)	0.4" (10.2 mm)	None
Process/Rate	399' 11"	99,999	99,999	1,999
Total	N/A	9,999,999	9,999,999	N/A
Rate & Total	N/A	Dual	Dual	N/A
Programming Method	Front Panel, Through-glass	Front Panel, Through-glass	Front Panel, Through-glass	Front Panel
Voltage Drop	3.0 V (6.0 V*)	3.0 V (6.0 V*)	N/A	1.0 V (4.0 V*)
Power Options	Input Loop	Input Loop	Output Loop, Battery, 12-36 VDC	Input Loop
Backlight	Standard	Standard	Standard	Optional

Common Specifications:

Temperature:	-40 to 75°C operating, <90% RH non-condensing
Enclosure:	die cast aluminum NEMA 4X, IP68 explosion-proof
Mounting:	Wall, pipe, conduit
Connections:	Screw terminals accept 12-22 AWG wire
Approvals:	FM, CSA, ATEX, IECEx, CE
Dimensions:	5.25" x 5.65" x 4.86" (134 x 144 x 124mm)
Warranty:	3 years standard

* with backlight

ORDERING INFORMATION

YPP6801-0K1	Feet & Inches Meter with Backlight & Open Collector Output
YPP6820-0K1	Analog Input Rate/Totalizer with Backlight
YPP6830-AP0-0	Pulse Input Rate/Totalizer, DC powered
YPP6830-APA-0	Pulse Input Rate/Totalizer, DC powered with isolated loop output
YPP6830-BM0-0	Pulse Input Rate/Totalizer, Battery powered (or DC with battery backup*)
YPP6830-BMA-0	Pulse Input Rate/Totalizer, Battery powered (or DC with battery backup*) w/ isolated loop output
YPP6830-BTA-0	Pulse Input Rate/Totalizer, Battery powered (or DC with battery backup*) w/ output loop-powered backlight and isolated loop output
YPP6830-CTB-0	Pulse Input Rate/Totalizer, Output loop powered with loop output
YPP6830-DTB-0	Pulse Input Rate/Totalizer, Output loop with battery backup* (or battery powered) w/ loop output
YPP6870-0L0	Large Display Process Meter
YPP6870-0K0	Large Display Process Meter with Backlight

YPP6830 options (not available on -CTB and -DTB versions):

2-wire RS-485 connection with Modbus protocol: Replace ending -0 in part number with -M.**

Isolated signal 2-wire RS-485 with Modbus protocol: Replace ending -0 in part number with -I.**

* Battery will provide backup power when other power supply is lost.

**RS-485 communication functions only when powered by DC.

London Electronics Large Display Meters

Fusion

- Analog & Digital Inputs
- Large, Bright Digits
- Setup Without Menus
- Indoor & Outdoor Models
- Choice of Mounting Position



Easy Reader



SPECIFICATIONS

Process Input:	0-10V, ±13V, 4-20mA, ±24mA	Serial Input:	RS232 or RS485
Resistance:	1MΩ on V, 33Ω on mA		300-115200 baud
Excitation:	24V 60mA	Display:	-1999 to 9999 (4d)
Temperature Input:	Type J, K, T, R, S, B		-199999 to 999999 (6d)
	3 or 4 wire PT100 RTD	Accuracy:	±0.05% of range
Counter Input:	4 channels	Analog Out:	>1kΩ 16 bit resolution
Signal Type:	Logic level; AC tach; NPN, PNP pulses <24V; 100mV inductive pickup; Contact closure	Relays:	SPST 2A@250VAC resistive Selectable NO or NC Selectable energize or deenergize
Range:	0-40kHz	Temperature:	0-50°C operating
Excitation:	24V 60mA	Connectors:	detachable screw terminals
Loadcell Input:	4 or 6 wire	Power:	50VA max.
Resistance:	>10MΩ	Case:	Black uPVC, 75mm depth
Excitation:	10V 120mA		

ORDERING INFORMATION

Example: Fusion2-F2-4N-P-0-AL2-232-B-AC-1-0

Fusion2 - **A** - **B** - **C** - **D** - **E** - **F** - **G** - **H** - **I** - 0

A Digit Height	F2 2" (57mm) F4 4" (102mm) F6 6" (150mm) F8 8" (200mm) F12 12" (300mm) F16 16" (400mm)	E Alarm Outputs	0 None AL2 2 alarms AL4 4 alarms SPCO 2 SPDT relays DSS 2 solid state relays
B Digit Format	4N 4 digit numeric 4C 4 digit clock 6N 6 digit numeric 6C 6 digit clock 8N 8 digit numeric	F Serial Output	0 None 232 RS232 485 RS485
C Function	C Counter H Clock/timer L Loadcell M Millivolt P Process S2 RS232 slave S4 RS485 slave T Temperature	G Display Color	R Red G Green Y Yellow B Blue W White RDLV Red bright GDLV Green bright YDLV Yellow bright BDLV Blue bright
D Analog Output	0 None ANI 4-20mA ANV 0-10V ANB ±10V	H Supply	AC 95-265VAC 50/60Hz DC 11-30VDC
		I Mounting	1 Panel, IP65 front 2 Wall, IP65 3 Top Suspension, IP65 4 Wall, IP54 5 Top Suspension, IP54 6 Rear Suspension IP54

A simple and affordable way to see and share important measurements over large distances:

- 2" (57mm) digits for viewing up to 65ft (20m)
- 4" (102mm) digits for viewing up to 130ft (40m)

Available in 5 input types, these meters can be configured from the front panel.

SPECIFICATIONS

Process Input (Type P):	4-20mA, 0-10V, 1-5V, scalable
Accuracy:	±0.1% range ±1d @25°C
Display by:	1, 2, 5, 10, 20, 50
Count Input (Type C):	NPN, PNP or contact closure
Accuracy:	±0.05% range ±1d @25°C
Slave Input (Type S):	RS232, RS422, RS485 or TTY
Format:	ASCII data from 300-9600 baud
Addressing:	00 to FF
Reset:	Front panel or remote contact closure
Excitation:	24VDC, up to 30mA (except Slave)
Operating Temperature:	0-50°C, <95% RH non-condensing
Power:	95-265VAC, 11-30VDC
Dimensions:	ER2 10.3x5.8x1.8" (260x140x45mm) ER4 16.4x7.7x1.8" (415x195x45mm)
Sealing:	IP54 dust tight (IP65 optional)

ORDERING INFORMATION

To Order—Insert Code for Each Letter to Select Catalog Number. Example ER4P-2-0-0

ER **A** **B** - **C** - **D** - **E**

A Digit Size	2 2" 4 4"
B Type	P Process Input C Count/rate Input S Slave (ASCII) H HH:MM Clock T TC & PT100 RTD
C Mounting	1 Flush Panel 2 Wall 3 Suspension 6 Top of Cabinet
D Power	0 95 - 265VAC DC 11-30VDC
E Brightness	0 Normal DLV Ultrabright

West Digital Thermostats



- Heating or cooling applications
- J thermocouple
- Single set-point, on/off control
- Zero point shift
- Adjustable hysteresis

ET2001

SPECIFICATIONS

Sensor range:	-30 to 400°C / -22 to 752°F
Display:	4 digits, 12.5mm, 7 segment LED
Input:	J Thermocouple EN 60751
C 1 output:	5A models: 250V AC, 5A (resistive load), NO contact 8A models: 250V AC, 8A (resistive load), NO & NC contacts 16A models: 250V AC, 16A (resistive load), NO contact
Dimensions:	77H x 35W x 71D mm, 29 x 71mm cutout
Safety:	EN 61010-1: 2010 (Pollution degree2, overvoltage category II)
EMC:	EN 61326-1: 2006
Protection class:	Front panel: IP65; Rear panel: IP20
Temperature:	0-50°C operating, non-condensing

ORDERING INFORMATION

To Order—Insert Code for Each Letter to Select Catalog Number.

ET2001 **A** **B** **C** **D** Example: ET2001J11005C

A	Sensor Type
J	J Thermocouple
B	Voltage (Power)
230	230V AC, +%10 -%20, 50/60Hz
110	110V AC, +%10 -%20, 50/60Hz
024	24V AC, ± %10
SM	9-30V DC / 7-24V AC, 50/60Hz
C	Relay
05	5A relay
08	8A relay
16	16A relay
D	Units
C	Celsius
F	Fahrenheit



- Heating or cooling applications
- Thermocouple or Pt100 input
- Dual setpoint (control/alarm)
- Relay & SSR drive
- Zero point shift
- Adjustable soft start

ET2011

SPECIFICATIONS

Sensor range:	Pt100 -99.9 to 300.0°C (-99.9 to 543.0°F) Pt100 -200 to 600°C (-328 to 1112°F) J T/C 0 to 600°C (32 to 1112°F) K T/C 0 to 1300°C (32 to 2372°F) T T/C 0 to 400°C (32 to 752°F) S & R T/C 0 to 1700°C (32 to 3092°F)
Display:	4 digits, 12.5mm, 7 segment LED
C/A 2 output:	Relay: 250V AC, resistive load 8A models: Selectable as NO+NC Control or Alarm2 output. 16A models: Selectable as NO Control or Alarm2 output.
SSR output:	Max 20mA 12Volt (as control output)
Dimensions:	77H x 35W x 71D mm, 29 x 71mm cutout
Protection class:	Front panel: IP65; Rear panel: IP20
Temperature:	0-50°C operating, non-condensing

ORDERING INFORMATION

To Order—Insert Code for Each Letter to Select Catalog Number.

ET2011 **A** **B** **C** **D** Example: ET2011T110P

A	Sensor Type
RT	Pt100 RTD, 3-wire
T	J, K Thermocouple
B	Voltage (Power)
230	230V AC, +%10 -%20, 50/60Hz
110	110V AC, +%10 -%20, 50/60Hz
024	24V AC, ± %10, 50/60Hz
SM	9-30V DC / 7-24V AC, 50/60Hz
C	Relay
(blank)	8A relay
P	16A relay
D	Units
(blank)	Celsius
F	Fahrenheit

West Digital Timers

- Dual contact timed output
- Start, reset & hold digital inputs
- Start/stop control from front panel
- HH:MM or MM:SS
- Scale 0:01 to 99:59 minutes / 0:01 to 99:59 hours
- Adjustable increasing & decreasing steps
- Time remaining displayed
- Upper and lower adjustable timer limits
- Audible tones



ET2432

SPECIFICATIONS

Display:	4 digits, 12.5mm, 7 segment LED
Input:	Start, reset gate: Mechanical contact (minimum 50ms)
Output:	2 relays: 250V AC, 8A (resistive load), NO & NC control output
Relay life:	30,000,000 switching for no-load operation; 300,000 switching for 8A resistive load at 250V AC
Dimensions:	77H x 35W x 71D mm, 29 x 71mm cutout
Safety:	EN 61010-1: 2010 (Pollution degree2, overvoltage category II)
Protection class:	Front panel: IP65; Rear panel: IP20
Temperature:	0-50°C operating, non-condensing

ORDERING INFORMATION

ETM2432230	Digital Timer, 230V AC, ±%10, 50/60Hz
ETM243224	Digital Timer, 24V DC/AC, ± %10, 50/60Hz
ETM243212	Digital Timer, 12V DC/AC, ± %10, 50/60Hz
ETM2432SM	Digital Timer, 9-30V DC / 7-24V AC, 50/60Hz

Laurel Programmable Counters

FUNCTIONS

- Rate, Frequency, Period
- Simultaneous Total & Rate
- Time Interval, Stopwatch
- Quadrature Position or Rate
- Ratio / Draw
- Batch Controller
- Analog Totalizer
- Phase Angle & Power Factor
- Duty Cycle

FEATURES

- ±999,999 Display Span
- Scaling in Engineering Units
- Crystal Time Base Error <0.001%
- Sensor Excitation Output
- 1/8 DIN, NEMA-4X Front Panel

OPTIONS

- Dual Relay Outputs
- Isolated Analog Outputs
- USB, RS-232 & RS-485 Data I/O
- Custom Curve Linearization
- Datalogging PC Software

Exceptional flexibility is provided by advanced programmable features and by modular architecture with a choice of main boards (basic or extended), signal conditioners (FR, VF or QD), power supplies, analog output, relay outputs, and serial data I/O.

The FR module provides two independently scalable frequency or pulse input channels. These channels can be combined arithmetically to display the sum or difference of two flows, the ratio of two rates, etc. As a counter, each channel may be independently set and scaled to count up to or down from a preset value. The displayed channel (A or B) is selected via front panel pushbutton. The totals are stored in non-volatile memory & retained in the absence of power.

SPECIFICATIONS

Display	Six 14.2 mm (.56") high LED digits
Conversion Technique	
Frequency measurement technique	1/period
Rate	Gate time + 30 ms + 0-2 input periods
Gate time	Selectable 0 to 199.99 sec
Scale Factor	±10 ⁻¹⁰ to ±10 ⁶
Isolation	250V RMS working, 2.3kV RMS test
FR Signal Conditioner (2 channels)	
Inputs	AC, pulses from NPN or PNP transistors, contact closures, magnetic pickups
Level	±12 mV min, 250 Vac max
Frequency	CH A: 0 Hz to 1 MHz; CH B: 0 Hz to 250 kHz
VF Signal Conditioner	
Inputs	0-10 V, 0-1 mA, 4-20 mA
Span error	< 0.015% of full scale ±1 count
Span tempco	< 0.003% of reading/°C
Zero tempco	< 0.001% of full scale/°C
QD Signal Conditioner	
Inputs	Quadrature encoders to 250 kHz
Polarity	Differential or single-ended
Error correction	Zero index (z-channel)
Transducer Excitation Output (std)	
Output	100 mA @ 5 V, 120 mA @ 10 V, 50 mA @ 24 V
Isolation	50 Vdc to meter ground
Data Communications (opt)	
Type	USB, RS-232, RS-485 (2- or 4-wire), Ethernet
Protocols	Modbus RTU, Modbus ASCII, Laurel ASCII, Modbus TCP
Operating Temperature	0°C to 55°C



ORDERING INFORMATION

Example: L50010FR

<input type="checkbox"/> L	Laureate™ with plug-in screw terminal connectors		
<input type="checkbox"/> Main Board			
5	Meter with green LEDs		
6	Meter with red LEDs		
7	Extended, green LEDs		
8	Extended, red LEDs		
<input type="checkbox"/> Power			
0	85-264 Vac/90-300 Vdc		
1	10-48 Vdc/12-30 Vac		
<input type="checkbox"/> Setpoint Output			
0	None		
1	Dual 8 A relays (250 Vac/24 Vdc)		
2	Dual 130mA solid state relays (140 Vac/180 Vdc)		
<input type="checkbox"/> Analog Output (isolated, 16 bit)			
0	None		
1	0-20 mA, 4-20 mA, 0-10 V, ±10 V		
<input type="checkbox"/> Digital Interface (isolated)			
0	None	5	USB
1	RS-232	6	USB to RS-485 Converter
2	RS-485 (dual RJ11)	7	Ethernet
4	RS-485 (dual RJ45)	8	Ethernet to RS-485 Converter
<input type="checkbox"/> Input Type (isolated)			
FR	Frequency		
With main boards 5 & 6: Scalable to ±999,999 for frequency, period/up/down total, interval, rate or square root of rate.			
With main boards 7 & 8: Above plus rate and total simultaneously, custom curve linearization, ratio, draw, arithmetic functions (A*B, A/B, A/B-1, A+B, A-B), phase angle, stopwatch, batch counting.			
VF1	4-20 mA		
VF2	0-1 mA		
VF3	0-10 V		
With main boards 5 & 6: V-to-F converter for rate or square root of rate from differential pressure or target type flow meters.			
With main boards 7 & 8: Above plus rate and total simultaneously, linearization of nonlinear inputs, batch counting, 1/rate (time).			
QD	Quadrature		
With main boards 5 & 6: Scalable to ±999,999 for position from encoders.			
QDR	Quadrature Rate		
With main boards 7 & 8: Scalable to ±999,999 for position or rate from encoders.			

ACCESSORIES

CBL01	RJ11 TO DB9 Cable to PC Com port
CBL02	USB to DB9 Adapter
CBL05	USB Cable to PC USB Port

Red Lion Counters & Timers

- Count Speeds up to 10 kHz
- 9 Programmable Timer Ranges
- Eight Digit, 0.35" (9 mm) LCD
- Green or Red LED Backlight
- Contact, Logic, Open Collector or High Voltage Input
- Front Panel or Remote Reset
- Standard Wire Connections or Optional Plug-in Terminal Block
- NEMA 4X/IP65 Front Bezel Fits 1/32 DIN Cutout



▲ **CUB7**

NEW

SPECIFICATIONS

Low Voltage Input:	28 VDC max.
Sink mode:	High >3.0 VDC (internal pull-down), Low <1.5 VDC (internal pull-up), I_{in} 5 μ A max.
Source mode:	High >3.0 VDC (internal pull-down), Low <1.5 VDC, I_{in} 5 mA max.
Count Speed:	10 kHz max with 50% duty cycle, 30 Hz max in Low Frequency mode
Trigger:	Count input counts on negative edge. Timer runs when input is low.
High Voltage Input:	50-250 VDC/VAC 50/60 Hz, I_{in} 5 mA max.
Isolation:	2500 VAC, 1 min.
Trigger:	Count input adds one count with voltage present. Timer runs when voltage is present.
Reset Input:	Active low to clear display to zero (5 msec min.), Low <1.5 VDC (internal pull-up), I_{in} 20 μ A max.
Timer Resolution:	0.001 sec to 1 hr in 9 ranges
Timer Accuracy:	0.025%
Power:	Non-replaceable internal 3.6 VDC lithium battery
Battery Life:	7 years typical continuous operation
LED Backlight:	Requires external supply 6-26 VDC @ 25 mA max.
Temperature:	0 to 50 °C operating, <85% RH (non-condensing)
Connections:	22 gauge wire, wire length minimum 10"
Dimensions:	1.1" H x 2" W x 1.7" D (28x51x43mm)

ORDERING INFORMATION

CUB7CCSO	CUB7 Counter, Low Voltage Input, Reflective Display
CUB7CCGO	CUB7 Counter, Low Voltage Input, Green Display
CUB7CCRO	CUB7 Counter, Low Voltage Input, Red Display
CUB7CVSO	CUB7 Counter, High Voltage Input, Reflective Display
CUB7CVGO	CUB7 Counter, High Voltage Input, Green Display
CUB7CVRO	CUB7 Counter, High Voltage Input, Red Display
CUB7TCSO	CUB7 Timer, Low Voltage Input, Reflective Display
CUB7TCGO	CUB7 Timer, Low Voltage Input, Green Display
CUB7TCRO	CUB7 Timer, Low Voltage Input, Red Display
CUB7TVSO	CUB7 Timer, High Voltage Input, Reflective Display
CUB7TVGO	CUB7 Timer, High Voltage Input, Green Display
CUB7TVRO	CUB7 Timer, High Voltage Input, Red Display (Call for cross reference to old CUB7 model numbers)

Accessories:

TB100003	3 Position Terminal Block for CUB7CCSO, CUB7TCSO
TB100004	4 Position Terminal Block for CUB7CCGO, CUB7TCGO, CUB7CCRO, CUB7TCRO, CUB7CVSO, CUB7TVSO
TB100005	5 Position Terminal Block for CUB7CVGO, CUB7TVGO, CUB7CVRO, CUB7TVRO
ENC13000	NEMA 4X Plastic Enclosure 3.13" H x 3.21" W x 2.16" D
BMK80000	CUB7 Base Mount

Red Lion Counter/ Rate Meters

- Large 6 or 8 Digit LED Display
- Input Rates to 25 kHz
- Programmable Scaling
- Programmable Decimal Point
- Variety of Sensor Inputs
- Sensor Excitation
- AC or DC Powered
- 1/8 DIN, NEMA 4X Front
- Bi-Directional Counting & Remote Reset



▲ **PAX Lite**



The PAX® Lite Counter is a versatile totalizing counter that can be adapted to a wide variety of counting, measuring, and positioning readout applications. The PAX® Lite Rate Meter provides the versatility and flexibility needed to accommodate virtually any rate measuring application.

Both meters can be scaled for direct readout in terms of the units being measured. Each meter is programmed through a combination of front panel buttons and DIP switches. Once the programming is complete, the buttons can be disabled by a DIP switch setting.

SPECIFICATIONS

Input Range:	25 kHz max. (0.01 Hz min. on Rate Meter)
Input:	30V DC max. DIP switch selectable for pulses from a variety of sources including NPN-OC, TTL outputs, and most Red Lion® sensors.
Logic Trigger Levels:	V_L = 1.5 V max.; V_H = 3.75 V min.
Current Sinking:	Internal 7.8 k Ω pull-up to +12 VDC, 1.9 mA max.
Current Sourcing:	Internal 3.9 k Ω pull-down, 8 mA max. @ 30 VDC.
Magnetic Pick-up (Rate Meter only):	
Sensitivity:	200 mV peak
Hysteresis:	100 mV
Input Impedance:	3.9k Ω @ 60 Hz
Maximum Input:	\pm 40 V peak, 30 Vrms
Rate Meter Accuracy:	\pm 0.01%
Control Inputs (Counter Only):	
Functions:	Count Up/Down, Remote Reset, Inhibit, Store
Max. Input:	30 VDC continuous
Isolation:	Not isolated to sensor input common
Logic State:	Active Low, 22 k Ω pull-up to +12 V,
Logic Levels:	Active: V_{in} < 0.9 VDC; Inactive: V_{in} > 3.6 VDC
Response Time:	25 μ sec max. for Up/Down and Inhibit, 10 msec. max. for Reset and Store
Display:	6-digit, 0.56" (14.2 mm) or 8-digit, 0.4" (10.1 mm)
Decimal Point:	Programmed by front panel keys
Power:	115/230 VAC, switch select, 50/60 Hz, 6 VA. 10 to 16 VDC @ 0.1 A max.
AC Power Isolation:	2300V rms, 1 min. to input & DC in/out
Sensor Power:	9 to 17.5 VDC @ 100 mA max.
Temperature:	0 to 60 °C operating, <85% RH (non-condensing)
Connections:	Cage-clamp terminal block
Dimensions:	1.95" H x 3.80" W x 4.1" D (50x97x105mm)

ORDERING INFORMATION

PAXLC600	6 Digit PAX Lite Counter
PAXLC800	8 Digit PAX Lite Counter
PAXLR000	6 Digit PAX Lite Rate Meter

Accessories:

ENC5B000	NEMA 4X Plastic Enclosure 7.4" H x 7.4" W x 5.11" D
ENC5C000	Enclosure for 2 PAX meters 7.4" H x 7.4" W x 5.11" D

Also available:

PAXLCR00	Dual Counter & Rate Meter with Dual Relay Outputs
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Red Lion Deluxe Counters, Timers & Rate Meters

- Bi-Directional Counting to 20 kHz
- 8 Counting & Timing Modes
- Programmable Scaling
- Eight Digit, 0.46" (12 mm) LCD
- Green/Red LED Backlight Changes at Setpoint
- NEMA 4X/IP65 Front
- Setpoint Relay Output Option
- RS232 or RS485 Communications


CUB5


SPECIFICATIONS

Counter A:	8 digit display, -9999999 to 99999999
Counter B:	7 digit display (positive only)
Count Rate:	20 kHz max. at 50% duty cycle, except Dual = 16 kHz, Quadrature = 14 kHz, Quadrature x4 = 13 kHz
Rate Meter:	6 digit display, with R designator on left
Frequency:	20k Hz max., 0.01Hz min., Accuracy 0.01%
Count/Rate Input A:	Source, Sink, Logic, Mag pickup; DIP switch selectable
Current Sinking:	Internal 7.8 kΩ pull-up to + supply
Current Sourcing:	Internal 3.9 kΩ pull-down, 7 mA max. @ 28 VDC.
Logic Input:	VIL = 1.25 V max.; VIH = 2.75 V min.; VMAX = 28 VDC
Magnetic Pick-up:	Sensitivity 200 mV peak, 100 mV hysteresis, Maximum input ±40 V peak, 30 Vrms
Count/Rate Input B:	Logic signals only
Trigger levels:	VIL = 1.0 V max; VIH = 2.4 V min; VMAX = 28 VDC
Current sinking:	Internal 10 kΩ pull-up resistor to + supply
Filter (LO Freq.):	Damping capacitor for switch contact bounce. Limits input to 50 Hz max. & pulse widths to 10 msec min.
Timer:	7 digit display, with t designator on left
Resolution:	Selectable 0.001 sec to 1 hr, Accuracy 0.01%
Cycle Counter:	6 digit display, with C designator on left
Rate:	10 Hz max. except Input B is 500 Hz with filter off
Timer/Cycle Inputs:	Logic Inputs, Current Sinking (active low)
Pulse Width:	1 ms min.
Software Filter:	50 msec start/stop debounce delay when enabled
User Input:	Programmable function input Logic Input, Current Sinking (active low)
Display:	Reflective LCD with full viewing angle or selectable transmissive red/green backlight LED (display color changes at preset when using relay module)
Power (not isolated):	9-28 VDC @ 30 mA max. from Class 2 supply
LED Backlight:	Adds 95 mA to supply current
Temperature:	-35 to 75 °C operating @ min. backlight (35 °C max. at max. backlight), <85% RH (non-condensing)
Connections:	Wire clamping screw terminals
Dimensions:	1.54" H x 2.95" W x 1.75" D (40x75x45mm)

ORDERING INFORMATION

CUB5R000	CUB5 Dual Counter & Rate Indicator with Reflective Display
CUB5B000	CUB5 Dual Counter & Rate Indicator with Backlight Display
CUB5TR00	CUB5 Preset Timer and Cycle Counter with Reflective Display
CUB5TB00	CUB5 Preset Timer and Cycle Counter with Backlight Display
Plug-in Options:*	
CUB5RLY0	One Form C Setpoint Relay Card (0.3 A @125VAC, 1 A @ 28VDC, resistive)
CUB5COM1	RS485 Serial Communications Card (non-isolated)
CUB5COM2	RS232 Serial Communications Card (non-isolated)
CUB5USB0	USB Programming Card
Accessories:	
MLPS1000	+12 VDC, 400 mA Micro-Line Power Supply, 85-250 VAC
MLPS2000	+24 VDC, 200 mA Micro-Line Power Supply, 85-250 VAC
CBLPROG0	RS232 Cable (RJ11-DB9)
CBPRO007	RS485 Cable (RJ11-DB9)
CBLUSB00	USB Programming Cable
ENC8B000	NEMA 4X Plastic Enclosure 4.8" H x 4.7" W x 3.77" D

- Count, Dual Counter, Rate & Slave Display
- 0.56" Sunlight Readable 6 Digit Red Display
- Variable Display Intensity
- 4 Setpoint Relay Outputs
- Modbus Communication
- Analog Retransmit (PAXI)
- 10 point linearization (PAXI)
- 1/8 DIN, NEMA 4X/IP65 Front


PAX


SPECIFICATIONS

Input Range:	34 kHz max. (13 kHz max for dual counter) 0.01 Hz min. on Rate Meter
Input:	30V DC max. DIP switch selectable for pulses from a variety of sources including NPN-OC, TTL outputs, and most Red Lion® sensors.
Logic Trigger Levels:	V _L = 1.5 V max.; V _H = 3.75 V min.
Current Sinking:	Internal 7.8 kΩ pull-up to +12 VDC, 1.9 mA max.
Current Sourcing:	Internal 3.9 kΩ pull-down, 7 mA max. @ 28 VDC.
Magnetic Pick-up (PAXR & PAXI models):	
Sensitivity:	200 mV peak, 100 mV hysteresis
Input Impedance:	3.9kΩ @ 60 Hz
Maximum Input:	±40 V peak, 30 Vrms
Rate Meter:	±0.01% accuracy, 5 digit display
Control Inputs:	Three, jumper selectable sink/source, max. input 30 VDC continuous, not isolated to sensor input
AC Power:	85 to 250 VAC 50/60 Hz, 18 VA.
LV Power:	11 to 36 VDC, 14 W; 24 VAC, 50/60 Hz, 15 VA
Input Isolation:	2300 Vrms to AC power, 500 Vrms to LV power
Sensor Power:	12 VDC ±10%, 100 mA max., short circuit protected
Temperature:	0 to 50 °C operating, <85% RH (non-condensing)
Connections:	Cage-clamp terminal block
Dimensions:	1.95" H x 3.80" W x 4.1" D (50x97x105mm)

ORDERING INFORMATION

PAXC0000	PAX Counter, Red Display, AC Supply
PAXC0100	PAX Counter, Green Display, AC Supply
PAXC0010	PAX Counter, Red Display, LV Supply
PAXC0110	PAX Counter, Green Display, LV Supply
PAXR0000	PAX Rate Meter, Red Display, AC Supply
PAXR0100	PAX Rate Meter, Green Display, AC Supply
PAXR0010	PAX Rate Meter, Red Display, LV Supply
PAXR0110	PAX Rate Meter, Green Display, LV Supply
PAXI0000	PAX Count/Rate/Slave, Red Display, AC Supply
PAXI0100	PAX Count/Rate/Slave, Green Display, AC Supply
PAXI0010	PAX Count/Rate/Slave, Red Display, LV Supply
PAXI0110	PAX Count/Rate/Slave, Green Display, LV Supply
PAXLCRU0	Dual Counter & Rate Meter with Dual Relay Outputs
Plug-In Options for all models: *	
PAXCDS10	Dual Form C Setpoint Relays (5 A @ 240 VAC or 28 VDC res.)
PAXCDS20	4 Form A Setpoint Relays (3 A @ 250 VAC or 30 VDC res.)
PAXCDS30	4 Setpoint Sinking Open Collector Outputs (0.1 A @ 50 V)
PAXCDS40	4 Setpoint Sourcing Open Collector Outputs (0.1 A @ 30 V)
Plug-In Options for PAXI only: *	
PAXCDL10	Analog Output Card (0-20/4-20 mA, 0-10 VDC)
PAXCDC10	RS485 Serial Communications Card with Terminal Block
PAXCDC1C	Extended RS485 Card with Dual RJ11 Connector
PAXCDC20	RS232 Serial Communications Card with Terminal Block
PAXCDC2C	Extended RS232 Card with 9 Pin D Connector
PAXCDC40	RS485 Modbus Communications Card
PAXCDC4C	Extended Modbus Card with Dual RJ11 Connector
PAXUSB00	USB Programming Card (not UL)
Accessories:	
ENC5B000	NEMA 4X Plastic Enclosure 7.4" H x 7.4" W x 5.11" D

*add -ASSY to CUB5 or PAX model number for factory installation of options & meter setup. Crimson software is a free download from the Red Lion website.

Simpson 1/8 DIN Counter Totalizer, Rate/Totalizer/Batch



▲ **S664**



- NEMA-4X Front Panel
- Four Frequency Ranges Available (99 Hz, 999 Hz, 9 kHz, 35 kHz)
- Easy to Use (Install/Wire/Mount, Select Range, and Go)
- Bright Red LEDs for Easy Viewing
- Minimum Mounting Depth Required
- 120 or 240 VAC
- Optional Excitation Output 12 VDC @ 100 mA
- Modular Design
- Screw Terminals for Easy Installation

SPECIFICATIONS

Display Type:	7 segment, bright red LED, 0.56" H
Power:	120/240 VAC
Operating Temp:	0 to 55°C
Size:	3.6" W x 1.8" H x 3.24" D (92 x 48 x 82 mm)

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number. Order Example: S664-1-1-0-0-0

A - B - C - D - E - F

A Basic Unit	
S664	Frequency Counter
B Power Supply	
1	120 VAC
2	240 VAC
C Input Type	
1	Standard Pulse Input
2	Quadrature input
D Output Type	
0	None
1	1 Mechanical Relay
2	2 Mechanical Relays
E Excitation Output	
0	None
1	12 VDC
F Other	
0	None



▲ **S660**



- NEMA-4X Front Panel
- Uses Words, Not Symbols for Easier Programming
- Bright Red LEDs for Easy Viewing
- Large, Tactile Buttons Can Be Pressed with Gloves On
- Standard 1/8 DIN Cutout
- Up to Two 5 Amp Relays Optional
- Optional Excitation Output 12 VDC
- Screw Terminals for Easy Installation

SPECIFICATIONS

Display Type:	7 segment, bright red LED, 0.56" H
Power:	120/240 VAC
Operating Temp:	0 to 55°C
NMRR:	60 dB @ 50/60 Hz
Size:	3.6" W x 1.8" H x 3.24" D (92 x 48 x 82 mm)

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number. Order Example: S660-1-2-2-1-0

A - B - C - D - E - F

A Basic Unit	
S660	Preset Up/Down Counter
S661	Preset Rate Counter
S662	Preset Totalizing/Batch Counter
S663	Preset Totalizing/Rate Counter
B Power Supply	
1	120 VAC
2	240 VAC
C Input Type	
1	Standard Pulse Input
2	Quadrature
D Output Type	
0	None
1	1 Mechanical Relay
2	2 Mechanical Relays
E Excitation Output	
0	None
1	12 VDC
F Other	
0	None

ATC Digital Timers & Counters

1/16 DIN Digital Display Timer

- Timing from .01 sec. to 999 hrs
- Timing Up to or Down from the set point
- Timing LED indicates output relay status
- Switch selectable timing ranges are tamper proof when panel mounted
- High intensity green LED display
- Non-volatile elapsed time memory option
- Time preset can be adjusted while timing
- Passes NEMA showering arc noise test



▲ **425A**
CE SR cRU US

SPECIFICATIONS

Ranges:	0 to 9.99, 99.9 or 999 Sec/Min/Hrs Range selected by switch on side of unit
Load Relay:	SPDT or DPDT Life 10 million operations (no load)
Relay Contact Rating:	5 A resistive @ 250 VAC or 30 VDC 1/10HP @ 120 VAC
Temperature:	0° to 140°F (-18° to 60°C) operating
Noise Immunity:	Showering arc per NEMA ICS2-230
Surge Withstand:	4500 volt, 50 microsecond without damage
Mounting:	Panel mount or 8-pin octal plug-in
Power:	120 VAC, 50/60 Hz; (10%, -20%); 5W max
Repeat Accuracy:	±0.1% over rated voltage & temperature
Reset Time:	100 ms minimum
Cycle Progress Display:	3 digit green, 7 segment numeric LED
Timing Display:	Red LED blinks slowly (once per second) during timing; blinks rapidly after time out.
Memory:	EEPROM 100,000 read/write cycles optional
Case:	1/16 DIN (48x48x94mm)

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number. Example: 425A300G10MX

425A300 A B C D

A	Power	
	G	120-240 VAC, 50/60Hz
	Q	120 VAC, 50/60Hz
B	Relay Output	
	10	Instantaneous SPDT, delay SPDT*
	20	Delay DPDT**
C	Memory	
	X	None
	M	EEPROM stores elapsed time and time remaining during power loss
D	Mode	
	X	Time Up
	D	Time Down

Accessories

0000-825-85-00	8-Pin surface/DIN rail socket
0407-025-13-00	Hold down clips for above socket
0405-320-02-00	Panel mounting bracket
0319-261-45-00	Plug-in socket kit (8-pin)
600-3-0011	8-Pin socket w/rear facing terminals

* Timing starts when power is applied. The instantaneous relay energizes, the digital display begins to increment from 0 and the timing LED blinks slowly. When the preset value is reached, the LED blinks rapidly and the Delayed SPDT relay is energized. The timer remains in this timed-out condition until reset by removing power.

** Timing starts when power is applied. The digital display begins to increment from 0 and the timing LED blinks slowly. When the preset value is reached, the LED stops, the timing LED blinks rapidly and the Delayed DPDT relay energizes. The timer remains in this timed-out condition until reset by removing power.

Multi-Function Multi-Range Timer Counter

NEW

- Dual 4-digit LED display
- 1/16 DIN case, IP65 front
- Programmable input scaling
- 2 setpoints & SPST NO Relays
- Timer down counting
- Counter up/down counting
- Batch counting



CE cRU US ▲ **385AR**

SPECIFICATIONS

Sensor Type:	NPN opr PNP
Input Type:	3-30V pulse from proximity switch, solid state device, or potential free contact encoder
Input Speed:	3Hz/30Hz/5kHz
Accuracy:	Time: ±0.05% of setting, Count: ±0 counts
Scale Factor:	0.001 to 9.9999 x 10 ⁿ , n=-3,-2,-1,0,1,2,3
Reset:	Front, remote, power interruption
Timer Ranges:	0-99.99 / 0-999.9 / 0-9999 sec 0-99.59 min:sec, 0-999.9 / 0-9999 min, 0-99.59 hr:min, 0-999.9 / 0-9999 h
Counter Ranges:	-999 to 9999 counts
Timer Modes:	ON delay, Interval, Cyclic ON first, Cyclic OFF first, Batch
Counter Modes:	ON delay, Interval, Auto reset, Time pulse Repeat, Batch
Relay Outputs:	2 SPST-NO, 5A @ 230VAC
Sensor Supply:	12VDC @ 30mA, short circuit protected
Temperature Rating:	0 to 50°C operating, <95% RH
Power:	85-270 VAC/DC, 50/60 Hz, 5VA max
Case:	1/16 DIN (48x48x110mm), IP65 front

Multi-Function Timer Counter

- Functions as a Timer, Counter, Frequency Meter or Tachometer
- 8 digit high resolution LCD display
- Front IP66 water protection
- 15 selectable display options
- Battery operated



▲ **5708A**

SPECIFICATIONS

Timer:	Display units: day/hour/min/sec 15 display functions (front panel selectable)
Counter:	6 display functions (front panel selectable) Frequency response is programmable for elimination of outside switch key-bounce, and edge trigger. <50 cps/<100 cps /<600 cps (rising and falling edge)
Frequency Meter:	Response 2.5 Hz-1300 Hz 4-digit display 2,500-1300 Hz
Tachometer:	RPM range 150 RPM-78,000 RPM Max. 5-Digit display 150-78000
Reset:	Front Panel / Remote
Display:	8 digit LCD (8mm high)
Count Input:	Switch Closure, Dry Contact
Temperature Rating:	14° to 131° F (-10° to 55° C) operating
Operating Power:	LR44 Battery
Case:	1/32 DIN (48x48x110mm), IP66 front water protection
Screw Type:	M3

ORDERING INFORMATION

385AR-100-T5X	Multi-Function Multi-Range Timer Counter
5708A	Multi-Function Timer Counter

ATC Digital Timers

Direct Replacement for Electromechanical Timers

- Replaces Round Case *Eagle* Timers
- Two Timing Modes - On Delay or Reverse Start Delay
- Five Timing Ranges - 1ms to 199 hrs
- Data Retention with EEPROM Memory or Battery Backup
- Simple Keypad Time Setting
- DIP Switches for Mode & Range Setting
- Sealed Faceplate
- Keypad Lockout of Time Setting
- Instantaneous Contact Directly Tracks Control Input



▲ 655



The 655 plugs directly into the mounting case of many older timers, without wiring changes.

SPECIFICATIONS

Timing Ranges:	0.001 SEC to 19.999 SEC 0.01 SEC to 199.99 SEC 0.1 SEC to 1999.9 SEC 1 SEC to 199 MIN 59 SEC 1 MIN to 199 HR 59 MIN
Timing Modes:	On Delay or Reverse Start Delay
Reset Time:	25 mSEC
Control Voltage Initiate Time:	25 mSEC
Memory:	EEPROM or Lithium Battery (Replaceable)
Time Setting:	Front Panel Keypad
Time Repeat Accuracy:	± 0.005 SEC
Display:	LCD, 4½ Digit, 7/16" High
Relay Outputs:	2 N.O., 2 N.C. Contacts
Relay Life:	50,000,000 mechanical operations
Contact Rating:	7 Amps resistive, 240 VAC
Temperature Rating:	32° to 140°F (0° to 60°C) operating
Power:	120 or 240 VAC, +10%, -20%, 50/60 Hz.
Power Consumption:	5.2VA
Short Circuit Protection:	1/4 Amp Fuse
Transient Voltage Protection:	Metal Oxide Varistor
NEMA Rating:	NEMA 12
Terminals:	Screw Terminals
Mounting:	Plug-in Case
Dimensions:	3.07" dia x 4.25" long barrel 4.15" w x 3.76" h x 1.3" d bezel

ORDERING INFORMATION

655-8-1000	Timer 120VAC w/EEPROM Memory
655-8-1001	Timer 240VAC w/EEPROM Memory
655-8-3000	Timer 120VAC w/Battery Memory
655-8-3001	Timer 240VAC w/Battery Memory

Accessories:

652-3-0130	Replacement Lithium Battery
600-3-3950	Base Mounting Bracket (surface mount)
651-3-0128	Mounting Gasket, 1/8" Thick (Included with Timer)
651-3-0129	Mounting Gasket, 1/4" Thick (Included with Timer)

Repeat Cycle Timer

NEW

- Selectable T1 & T2 Times
- Simple Front Panel Setup
- Rugged, SPDT Solid-state Relay Outputs
- Reset Input Synchronizes Multiple Units
- Standard 15 Terminal Plug-In Round Case
- Panel Mounts in Switchboard Housing or 3.19" Cutout
- Easily Replaces Round Case *Eagle* Timers



▲ CS100

The CS100 is a simple repeat cycle timer with T1 and T2 timers up to 25 seconds each, plus a third timer (T3) that extends the T1 time to a maximum of 50 seconds. The four front panel push-buttons provide easy access to timer settings. A Reset input on the back of the unit allows multiple units to be synchronized.

The four SSR (Solid State Relay) outputs are configured as three SPDT (Single Pole Double Throw) and one SPST (Single Pole Single Throw). Relay outputs and control voltage initiate times have a maximum reset time of approximately 10 milliseconds.

The CS100 has a standard 15 terminal, plug-in round case, which is designed to minimize down time during replacement. The CS100 is quickly & easily removed from the front. A replacement timer can be plugged into the existing housing, eliminating the need for rewiring. The CS100 can also be panel mounted in a 3.19" round cutout.

SPECIFICATIONS

Timing Ranges:	T1 = 0.1 - 25 SEC T2 = 0 - 24 SEC T3 = 0-25 SEC
Timing Mode:	Repeat Cycle
Time Setting:	Front Panel Pushbuttons
Time Repeat Accuracy:	± 0.005 SEC
Display:	Red LED, 2 Digit
Relay Outputs:	4 Solid state relays
Relay Contacts:	Three SPDT (form C), one SPST (form A)
Contact Rating:	4 A @ 130 VAC, zero-crossing
Off-State Leakage Current:	0.1 mA at maximum voltage
Reset Time:	10 mSEC
Temperature Rating:	32° to 122°F (0° to 50°C) operating
Power:	100-132 VAC, 50/60 Hz.
Power Consumption:	2.4VA
Transient Voltage Protection:	Metal Oxide Varistor
NEMA Rating:	NEMA 12
Terminals:	Screw Terminals
Mounting:	Plug-in Case
Dimensions:	3.07" dia x 4.1" long barrel 3.15" w x 4.72" h x 2.2" d bezel

ORDERING INFORMATION

CS100	Repeat Cycle Timer
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KEP Counters & Timers

KAL-D06 8 Digit Electronic Counter

- Low speed input for contact closures
- High speed input sinks 18V max
- Optional quadrature & high voltage inputs
- 10 year lithium battery – no external power needed
- NEMA 4X (IP65) front
- UL recognized



KAL-DTIME 8 Digit Electronic Timer

- Electronic or contact closure input
- Powered by 10 year lithium battery
- High voltage input optional
- NEMA 4X (IP65) front
- UL Listed



924K Counter, Rate Meter & Timer

- Displays actual value, presets, batch count or total count
- 3 predefined parameter settings
- Tracking presets
- 4 stage RESET modes
- 2 relay outputs
- 3 stage key lockout



SPECIFICATIONS

Display:	LCD, digits 0.35" (9mm) high
Readout:	8 digits with leading zero blanking
Reset:	Panel or external (can be disabled)
Backlight:	Requires external 5V supply (20 mA)
Hi-speed Input:	NPN sink; 18V, 10kHz max
Lo-speed Input:	NPN sink or contact closure; 18V, 30Hz max
Quadrature Input:	NPN sink or push pull, 18V, 2.5kHz max
Reset Input:	>15ms NPN sink or contact closure; 18V max
Direction Input:	NPN sink or contact closure; 18V max (Lo=down)
Hi-voltage Input:	Count 10 pulses/sec max; opto-isolated 250VAC/120VDC max
Hi-voltage Reset:	>15ms, opto-isolated 250VAC/120VDC max
Temperature:	-10 to 60°C operating
Case:	24 x 48 x 52 mm

SPECIFICATIONS

Display:	LCD, digits 0.35" (9mm) high
Readout:	8 digits with leading zero blanking SECONDS: 99999999 MINUTES and SECONDS: 99999-59 HOURS and 1/100ths: 99999-99 HOURS and MINUTES: 99999-59
Reset:	Panel or external (can be disabled)
Backlight:	Requires external 5V supply (20 mA)
Timing Input:	NPN sink, negative edge trigger; 18V max
Reset Input:	>15ms NPN sink or contact closure; 18V max
Direction Input:	NPN sink or contact closure; 18V max (Lo=down)
Hi-voltage Input:	Opto-isolated 250VAC/120VDC max
Hi-voltage Reset:	>15ms, opto-isolated 250VAC/120VDC max
Temperature:	-10 to 60°C operating
Case:	24 x 48 x 52 mm

SPECIFICATIONS

Display:	2 line, 6 digit red LCD
Count Inputs:	NPN/PNP, 5kΩ, 55 kHz max
Switching Level:	Low=0-4 VDC, High=12-30 VDC (924KA)
Count Modes	
Pulse:	cnt.dir, up.dn, up.up, quad, quad 2, quad 4, A/B, (A-B)/A x 100%
Frequency:	A, A-B, A+B, quad, A/B, (A-B)/A x 100%
Timer:	FrErun, Auto, InpA.InpB., InpB.InpB.
Monitor/Reset Inputs:	MPI, lock, gate, reset
Pulse Duration:	10 ms/1 ms min.
Relay 1:	Form A, programmable NO or NC
Relay 2:	Form C
Max. Switching:	250 VAC / 110 VDC, 3 A, 750 VA / 90 W
Sensor Supply:	24 VDC, 80mA
Temperature:	-20 to +65 °C operating
Protection:	IP65 (front)
Case:	1/8 DIN (48 x 48 x 107mm)

ORDERING INFORMATION

KAL-D06	8 digit counter with 10 yr battery	KAL-DTIME	8 digit timer with 10 yr battery
KAL-DQUAD06	8 digit counter with 10 yr battery & Quadrature Input	KAL-DTIMEAC/DC	8 digit timer with 10 yr battery & High Voltage Input
KAL-D06AC/DC	8 digit counter with 10 yr battery & High Voltage Input	924KA*	Counter, Rate, Timer; 90-260 VAC power
		924KB*	Counter, Rate, Timer; 10-30 VDC power

*Add suffix 0 for relay outputs, 1 for opto-coupler outputs

KEP Counter/Timer

LCD preset add/subtract counter, timer, frequency meter

903K/904K Series

- 6-Digit Counter, Timer or Frequency Meter
- 2 Preset Values (Type 903K 1 Preset)
- Input Scaling (0.0001 to 9.9999) Multiplier
- 2-Line LCD Display
- Count and Preset Range of -999999 to 999999
- Add or Subtract Count Control
- AC or DC Operation
- Secondary Preset Batch Counter (904K)
- 24 VDC to Power Peripherals



▲ 904K

SPECIFICATIONS

Display:	6-digit, 2-line, 7 segment LCD with sign
Preset:	Type 904 two preset values Type 903 one preset value
Supply voltage:	115 VAC, 230 VAC, 48 VAC or 24 VAC (tolerance $\pm 10\%$) or 11 to 30 VDC
Housing:	48 x 48 mm DIN
Protection:	IP 65 (front)
Power Supply:	24 VDC, 80 mA

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number
Order Example: 904K-A-0-A

A - B - C - D

A Basic Unit	
903K	Single Output
904K	Dual Outputs
B Input Voltage	
A	115 VAC
B	230 VAC
C	11 to 30 VDC
D	24 VAC
E	48 VAC
C Outputs	
0	Relay
1	Opto-Isolated collector and emitter
D Options	
—	Blank if None
A	Backlit LCD Display (904K only)

KEP Totalizer/Rate Meter

Ratemeter/totalizer/process monitor from analog inputs



▲ INT69RT

Intellect-69 Series

- High/Low Scaling from Front Panel
- 2 Set Points Assignable To Rate or Total
- Display Rate (Pressure, Level, Watts, Etc.), Peak and Valley and Integrated Total
- 0-5V, 0-10V, 1-5V, 4-20 mA or 0-20 mA Analog Input
- NEMA 4X/IP 65 Front Panel
- +24V Output for Peripherals
- RS-422/RS-232 Serial Communications
- 4-20 mA Output
- Square Root Extraction
- Optional Rate Per Day Feature

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: INT69RT-A-L-1-A-C1

A - B - C - D - E

A Basic Unit	
INT69RT	Ratemeter/Totalizer
INT69R	Ratemeter Only
INT69PM2	Process Monitor Displays from -19999 to +49999
INT69T	Totalizer Only
B Operating Voltage	
A	110 VAC $\pm 15\%$ or 12 to 24 VDC
B	220 VAC $\pm 15\%$ or 12 to 24 VDC
C Inputs	
—	Blank for INT69PM2
L	Linear (standard)
S	Square Law (optional)
D Control Outputs	
1	2-Open Collector Outputs (standard)
2	2-10 Amp Form C Relays (optional)
E Options (Multiple Options Available)	
A	Analog Output (4-20 mA)
D	Rate per Day, Hour or Minute
C1	RS-232 communications
C2	RS-422 communications

KEP Totalizer/Rate Meter

**Low Cost, Pulse Input,
Totalizer & Ratemeter**



MINItronic Series

- CSA Approved
- Separate Scaling Factors for A and B Inputs
- Display Rate and Total
- Pulse Input—10 kHz Maximum
- Security Lockout
- RS-422/RS-232 Serial Communication
- NEMA-4X/IP65 Front Panel
- Separate Add/Subtract Simultaneous Inputs
- Quadrature and U/D Direction Control Inputs
- 30 mV Magnetic Pickup Inputs
- 4–20 mA or 0–20 mA Analog Output



ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: MRT-A-3-1

A - B - C - D

A Basic Unit	
MRT	6-Digits, Counter/Ratemeter
MC2	6-Digits, Counter Only
MR2	5-Digits, Rate Only
B Operating Voltage	
A	110 VAC ±15% or 12 to 15 VDC
B	220 VAC ±15% or 12 to 15 VDC
C	24 VAC ±15% or 12 to 15 VDC
C Count Inputs	
3	Standard, 4–30 VDC Simultaneous Inputs
3M	Mag. Input, Input A Only, 30mV Input (Input B, 4–30V)
3MB	Mag. Input, Inputs A and B, 30 mV input
5	4–30V Pulses on Input A, 4–30V Direction Control Input on Input B
5M	30 mV Pulses on Input A, 4–30V Direction Control Input on Input B
9	Quadrature, Accepts 4–30V Pulses
9MB	Quadrature, Accepts 30 mV Pulses (A and B)
D Control Outputs	
1	RS-232 Communications
2	RS-422 Communications
A	Analog Output (4–20/0–20 mA)
CE	CE Approved Version

NOTE: RS-232/RS-422 and analog output options can not be combined.

Newport 6-Digit Rate Meter/Totalizer

6-digit ratemeter/totalizer offers user programming via the 5 front-panel keys. Scale factor may be programmed from -99,999 to 999,999 (any decimal point, multiply or divide), while offset may be programmed from -99,999 to 999,999 (any decimal point).



Programs are stored in non-volatile memory, with three levels of program lockout for security. Optional features include Hi or Lo setpoints for control or alarm, plus RS-232 communication. Fixed decimal point or autoranging is standard.



SPECIFICATIONS

Functions:	Rate and totalize selected by menu
Display:	6-digit, 7-segment red LED display
Inputs	
Type:	Single input. TTL, CMOS, NPN open collector, contact closure and magnetic pickup compatible; selected by dip switch. Non-isolated
Level:	Max. 60V; min. 25 mV rms
Frequency:	30 kHz maximum
Excitation:	Regulated, 5.0, 8.2, or 12.5V selected by DIP switch, 100 mA max
Accuracy:	± 1/2 LSD of total; 0.01% of the rate ± 1/2 LSD
Setpoints:	Two, optional
Alarm Outputs:	Optional
Communication:	RS-232, analog output, optional
Power:	230 ±15% VAC
Dimensions/Weight:	1.9" H x 3.8" W x 6" D (48 x 96 x 152 mm)/16 oz (454g)
Panel Cutout:	1.8" H x 3.6" W (45 x 92 mm)

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number. Order Example: INFCTRA-0-1-1-0-R

A - B - C - D - E - F

A Basic Unit	
INFCTRA	
B Power and Display	
0	115 VAC, Red LED
1	230 VAC, Red LED
2	115 VAC, Green LED
3	230 VAC, Green LED
C Control Output	
0	None
1	Dual 6 Amp
D Analog Output	
0	None
1	Analog Output
E Serial Output	
0	None
1	RS-232
F Configuration	
R	Ratemeter
T	Totalizer

Weschler Analog Switchboard Meters

- High accuracy, full view design
- Volts, amps, watts, vars, speed, frequency and power factor
- High overload capacity
- Military and Nuclear versions
- Ultimate in reliability and performance
- Special scales and calibration
- Formerly **Westinghouse** brand

Type K-241 & 261 instruments are designed to achieve the ultimate in reliability and performance. These instruments are recommended for use on electric utility switchboards and industrial process control panels. Commercial instruments comply with ANSI Standard C39.1 for 1% class switchboard instruments. The Hi-Shock versions were developed to meet the special needs of U.S. Navy shipboard applications. They are also suitable for commercial, marine and industrial applications subjected to humid conditions or severe mechanical shocks.

TAUT-BAND SUSPENSION

Type K-241 & 261 instruments, except those which rotate continuously, use taut-band suspension. The taut-band suspension has unique advantages over the conventional pivot and jewel movement:

- It eliminates friction, giving better accuracy and almost perfect repeatability.
- It gives top performance under adverse conditions of shock and vibration.
- It reduces maintenance, thereby saving money throughout the lifetime of the instrument.
- It assures longer life, reducing annual depreciation and replacement costs.
- It has greater sensitivity, reducing power burdens on circuits being measured.

FULL VIEW DESIGN

To facilitate quick, accurate reading, even under adverse conditions, all K-241 instruments feature the Westinghouse 'full view' 250° design. The window is flat, reducing light reflection to minimize the need for a non-glare surface. The dial scale is beveled for a 60° viewing angle.



▲ **KA241**

MODIFICATIONS AVAILABLE

DIALS:

- Black
- Dual Scale
- Special Colors, Legends
- Weather resistant Cover

ELECTRICAL:

- Intermediate Ratings
- Special Calibrations
- Offset or Suppressed Zero
- Multiple Rating
- Special Sensitivity

Types Available

Function	Ranges	Type Designation	Mechanism
DC Microammeter	50µA to 1mA	KX-241 Com & HI, 241 Com	Permanent-magnet moving coil
DC Milliammeter	1mA to 1A	KX-241 Com & HI, 241 Com	Permanent-magnet moving coil
DC Ammeter	1A to 50A	KX-241 Com & HI, 241 Com	Permanent-magnet moving coil
DC Millivoltmeter	50mV to 1V	KX-241 Com & HI, 241 Com	Permanent-magnet moving coil
DC Voltmeter	1V to 800V	KX-241 Com & HI, 241 Com	Permanent-magnet moving coil
AC Milliammeter	10mA to 1A	KA-241 Com & HI, 261 Com	Iron Vane
AC Ammeter	1A to 20A	KA-241 Com & HI, 261 Com	Iron Vane
AC Voltmeter	10V to 750V	KA-241 Com & HI, 261 Com	Iron Vane
AC Frequency	50, 60 & 400Hz	KX-241 Com & HI	With Separate Transducer
AC Frequency	50, 60 & 400Hz	KR3-241 Com	Self Contained Transducer
AC Frequency	395-405Hz	KR4-241 HI	Self Contained Transducer
AC Power Factor	0-1-0	KI-241 Com & HI, 261 Com	Rotating Vane
AC Power Factor	0.5-1-0.5	KJ-241 Com	Self Contained Transducer
AC Synchroscope	--	KI-241 Com & HI, 261 Com	Rotating Vane
AC Wattmeter	0.1 to 10A	KP-241 Com & HI, 261 Com & HI	Self Contained Transducer
AC Varmeter	0.1 to 10A	KP-241 Com & HI, 261 Com & HI	With External Phase Shifter
AC Varmeter	0.1 to 10A	KV-241 Com & HI, 261 Com & HI	Self Contained Transducer
Rectifier Milliammeter	1mA to 1A	KC-241 Com & HI, 261 Com	Permanent-magnet moving coil
Rectifier Ammeter	1A to 17A	KC-241 Com & HI, 261 Com	Permanent-magnet moving coil
Rectifier Voltmeter	5V to 600V	KC-241 Com & HI, 261 Com	Permanent-magnet moving coil
Resistance Thermometer	All Popular Ranges	KX-241 Com & HI, 261 Com	Self Contained Bridge
Speed Indicator	0-25, up to 13000pps	KX-241 Com & HI, 261 Com	Self Contained Transducer
Synchrotie	0-360°	KS-241 Com, Unmounted Transmitter	Self-Synchronous

See more information online at weschler.com/analog

Yokogawa Mini Switchboard Meters



2182

Mini Switchboard Series

- Compact Size 3" Case
- Rugged, Durable Construction
- No Shadows on Scale
- Accurate and Readable, Even from Sharp Angles
- Accurate to Within ±1.5% of Full Scale
- Attractive, Uncluttered Scales
- Taut-Band Suspension



2185

SPECIFICATIONS

Accuracy	±1.5% of FS basic accuracy class
Rectifier Instruments	±1.5% @ 25°C calibrated on sine
Operating Temperature Range	0–40°C (32°F–104°F)
Dielectric Level	2,600 VAC for 1 minute between circuit & case
Overload Rating	Voltmeter or potential coils—1.2x continuous; AC ammeters—2x continuous, 10x for 1 second; Current coils other than AC ammeters 1.5x continuous, 10x for 1 second
Response Time	Approx. 2.5 seconds
Position of Use	Vertical (scale)
Full Scale Deflection Angle/Length	250°/5.5"
Case	ABS resin, black
Size (H x W x D)	3.18" x 3.18" x 4.35"
Barrel (cutout)	2.84" Dia.

ORDERING INFORMATION

AC/DC Amps, Volts and Frequency

To Order—Insert Number Code for Each Letter to Select Catalog Number.

Order Example: 218200-A42 (0-150)

A - B

A Basic Unit	
218100	DC Ammeters and Voltmeters
218200	AC Ammeters and Voltmeters
218830	Frequency Meters
B Rating and Scale	
DC Ammeter	DC Voltmeter
AKM 500 mADC	VNL 30 VDC
ALA 1 ADC	VNT 50 VDC
ALS 5 ADC	VPK 100 VDC
AMT 10 ADC	VPZ 150 VDC
AND 15 ADC	VRX 300 VDC
ANG 20 ADC	V01 1 mADC
ANL 30 ADC	35- 10-50 mADC
A01 50 mVDC	36- 4-20 mADC
A05 100 mVDC	37- 1-5 VDC
AC Ammeter	AC Voltmeter
AKG 300 mAAC	VPK 100 VAC
AKM 500 mAAC	VPZ 150 VAC
ALA 1 AAC	V12 150 VAC(for PT)
ALC 1.5 AAC	VRX 300 VAC
ALS 5 AAC	VSI 600 VAC
A42 5 AAC (for CT)	V20 70-130 VAC*
AMF 7.5 AAC	V21 140-260 VAC*
AMT 10 AAC	* Expanded Scale
ANL 30 AAC	
Frequency Meter	
H40 115V 45-55 Hz	H60 230V 45-55 Hz
H41 115V 55-65 Hz	H61 230V 55-65 Hz
H42 115V 45-65 Hz	H62 230V 45-65 Hz

SPECIFICATIONS

In accordance with ANSI Specifications C39.1

Accuracy: Power Factor	±5% of scale length
Accuracy: Watts/VARS	±1.5% of FS value
Operating Temperature Range	0–40°C (32°F–104°F)
Dielectric Level	2,600 VAC for 1 minute between circuit & case

NOTE: All units supplied with external transducers. Except balanced Power Factor Meter.

ORDERING INFORMATION

Watt, Var & Power Factor

To Order—Insert Number Code for Each Letter to Select Catalog Number.

Order Example: 2185-34-W56

A - B - C

A Basic Unit		
2185	AC Wattmeters	
2186	AC Varmeters	
2187	AC Power Factor Meter	
B Function/Connection		
Watts		
31	Single Phase	
34	Three Phase, Four Wire	
35	Three Phase, Three Wire-Unbalanced	
36	Three Phase, Four Wire-Unbalanced	
Vars		
31	Single Phase	
33	Three Phase, Three Wire	
34	Three Phase, Four Wire	
35	Three Phase, Three Wire-Unbalanced	
36	Three Phase, Four Wire-Unbalanced	
Power Factor		
31	Single Phase	
33	Three Phase, Three Wire	
35	Three Phase, Three Wire-Unbalanced	
36	Three Phase, Four Wire-Unbalanced	
C Input		
Watts	VARs	Power Factor
W55 120V-1A AC	M55 120V-1A AC	C55 120V-1A AC
W56 120V-5A AC	M56 120V-5A AC	C56 120V-5A AC
W65 240V-1A AC	M65 240V-1A AC	C65 240V-1A AC
W66 240V-5A AC	M66 240V-5A AC	C66 240V-5A AC

OPTIONS (WHERE APPLICABLE)

- Custom Scaling
- Nonstandard Ranges
- Adjustable Potentiometer (Voltmeters Only)
- Color Bands

Yokogawa DC Current and Voltage Switchboard Meters

DB Series

- No Shadows on Scale
- Accurate to Within $\pm 1\%$ FS
- Metal or Plastic Case (DB-40)
- High-Shock Design Meets MIL-M-16034A and MIL-S-901 (DB-14)
- Weathertight Construction Ideal for Adverse Conditions (DB-40)
- Easy to Read Up to 30 Feet Away (DB-16)
- Taut-Band Suspension
- UL Recognition (optional)

DB-40 ▶


SPECIFICATIONS

In accordance with ANSI Specifications C39.1

Input	$\pm 1\%$ of FS basic accuracy class		
Operating Temperature Range	0-40°C (32°F-104°F)		
Dielectric Level	2,300 VAC for 1 minute between circuit and case		
Overload Rating	Voltmeter or potential coils - 1.2x continuous; Current coils -1.5x continuous, 10x for 1 second		
Sensitivity	Zero Left Voltmeters: 1000 Ω /V Zero Center Voltmeters: 2000 Ω /V		
Response Time	Approx. 2.5 seconds (except AB-16)		
Position of Use	Vertical (Scale)		
Full Scale Deflection Angle	250°		
Case Size	4¼"	4¼"	8¾"
Model	DB-14	DB-40	DB-16
Size (H x W x D)	4.33" x 4.33" x 4.85"	8.69" x 8.69" x 4.85"	
Barrel (cutout)	4.03"		
Full Scale Length	6.9"		13.8"

DC VOLTMETERS

Scale and Rating (V)	DB-14 Cat. No.	DB-40 Metal Case Cat. No. *	DB-16 Cat. No.
0-15	101 013 NDND	103 011 NDND	121 011 NDND
0-30	101 013 NLNL	103 011 NLNL	121 011 NLNL
0-50	101 013 NTNT	103 011 NTNT	121 011 NTNT
0-75	101 013 PBPB	103 011 PBPB	121 011 PBPB
0-150	101 013 PZPZ	103 011 PZPZ	121 011 PZPZ
0-300	101 013 RXRX	103 011 RXRX	121 011 RXRX
0-400	101 013 SCSC	103 011 SCSC	121 011 SCSC
0-500	101 013 SFSF	103 011 SFSF	121 011 SFSF
0-600	101 013 SJSJ	103 011 FJFJ	121 011 SJSJ
150-0-150	101 014 PZPZ	103 012 PZPZ	121 012 PZPZ
300-0-300	101 014 RXRX	103 012 RXRX	121 012 RXRX
500-0-500	101 014 SFSF	103 012 SFSF	121 012 SFSF
600-0-600	101 014 SJSJ	103 012 SJSJ	121 012 SJSJ

* add suffix /P for ABS plastic case

OPTIONS

Custom Scaling
Non-standard Ranges
Adjustable Potentiometer (Voltmeters Only)
Color Bands
Illumination
UL Recognition

DC AMMETERS

Scale and Rating	DB-14 Cat. No.	DB-40 Metal Case Cat. No. *	DB-16 Cat. No.
0-200 μ A	----	103 111 LALA	---
0-300 μ A	101 113 EGEG	103 111 EGEG	121 111 EGEG
0-500 μ A	101 113 EMEM	103 111 EMEM	121 111 EMEM
0-1 mA	101 113 FAFA	103 111 FAFA	121 111 FAFA
0-2 mA	101 113 FGFG	103 111 FGFG	121 111 FGFG
0-5 mA	101 113 FXFX	103 111 FXFX	121 111 FXFX
0-10 mA	101 113 GZGZ	103 111 GZGZ	121 111 GZGZ
0-30 mA	101 113 HMHM	103 111 HMHM	121 111 HMHM
0-50 mA	101 113 HYHY	103 111 HYHY	121 111 HYHY
0-100 mA	101 113 JRJR	103 111 JRJR	121 111 JRJR
0-200 mA	101 113 KAKA	103 111 KAKA	121 111 KAKA
0-300 mA	101 113 KGKG	103 111 KGKG	121 111 KGKG
0-500 mA	101 113 KMKM	103 111 KMKM	121 111 KMKM
10-50 mA	101 193 HX**	103 191 HX**	121 191 HX**
4-20 mA	101 193 HE**	103 191 HE**	121 191 HE**
1-5 mA	101 193 FY**	103 191 FY**	121 191 FY**
0-1 A	101 113 LALA	103 111 LALA	121 111 LALA
0-5 A	101 113 LSLS	103 111 LSLS	121 111 LSLS
0-10 A	101 113 MTMT	103 111 MTMT	121 111 MTMT
0-15 A	101 113 NDND	103 111 NDND	121 111 NDND
0-20 A	101 113 NGNG	103 111 NGNG	121 111 NGNG
0-30 A	101 113 NLNL	103 111 NLNL	121 111 NLNL

DC AMMETERS - SHUNT RATED (50mVDC)

Scale (Amps)	DB-14 Cat. No.	DB-40 Metal Case Cat. No. *	DB-16 Cat. No.
0-15	101 123 CAND	103 121 CAND	121 121 ECND
0-20	101 123 CANG	103 121 CANG	121 121 ECNG
0-30	101 123 CANL	103 121 CANL	121 121 ECNL
0-40	101 123 CANP	103 121 CANP	121 121 ECNP
0-50	101 123 CANT	103 121 CANT	121 121 ECNT
0-75	101 123 CAPB	103 121 CAPB	121 121 ECPB
0-100	101 123 CAPK	103 121 CAPK	121 121 ECPK
0-150	101 123 CAPZ	103 121 CAPZ	121 121 ECPZ
0-200	101 123 CARL	103 121 CARL	121 121 ECRL
0-300	101 123 CARX	103 121 CARX	121 121 ECRX
0-400	101 123 CASC	103 121 CASC	121 121 ECSC
0-500	101 123 CASF	103 121 CASF	121 121 ECSF
0-750	101 123 CASM	103 121 CASM	121 121 ECSM
0-1000	101 123 CASS	103 121 CASS	121 121 ECSS
0-1200	101 123 CASV	103 121 CASV	121 121 EC SV
0-1500	101 123 CATC	103 121 CATC	121 121 ECTC
0-2000	101 123 CATM	103 121 CATM	121 121 ECTM
0-3000	101 123 CAUA	103 121 CAUA	121 121 ECUA

* add suffix /P for ABS plastic case

**Specify scale values

Yokogawa AC Current Switchboard Meters

AB Series

- Rugged, Durable Construction
- No Shadows on Scale
- Accurate and Readable Even from Sharp Angles
- Accurate to Within $\pm 1\%$ of Full Scale
- Attractive, Uncluttered Scales
- High-Shock Design Meets MIL-M-16034A and MIL-S-901 (AB-14)
- Weathertight Construction Ideal for Adverse Conditions (AB-40)
- Easy to Read Up to 30 Feet Away (AB-16)
- Taut-Band Suspension



AB-16 ▲



AB-40 ▲



AB-14 ▲

Photos not to scale

OPTIONS

Custom Scaling
Nonstandard Ranges
Color Bands
UL Recognition
Illumination

SPECIFICATIONS

In accordance with ANSI Specifications C39.1			
Accuracy	$\pm 1\%$ of FS basic accuracy class		
Rectifier Instruments	$\pm 1\frac{1}{2}\%$ @ 25°C calibrated on sine wave		
Operating Temperature Range	0–40°C (32°F–104°F)		
Dielectric Level	2,300 VAC for 1 minute between circuit & case		
Overload Rating	Voltmeter or potential coils— 1.2x continuous; AC ammeters—2x continuous, 10x for 1 second; Current coils other than AC ammeters 1.5x continuous, 10x for 1 second		
Response Time	Approx. 2.5 seconds (except AB-16)		
Position of Use	Vertical (scale)		
Full Scale Deflection Angle	250°		
Case Size	4 $\frac{1}{4}$ "	4 $\frac{1}{4}$ "	8 $\frac{3}{4}$ "
Model	AB-14	AB-40	AB-16
Size (H x W x D)	4.33" x 4.33" x 4.85"		8.69" x 8.69" x 4.85"
Barrel (cutout)	4.03"		
Full Scale Length	6.9"		13.8"

ORDERING INFORMATION

Self-Contained, 40/70 Hz

Rating (amperes)	Scale (amperes)	AB-14 Cat. No.	AB-40 Metal Case Cat. No. *	AB-16 Cat. No.
1	0-1	101 133 LALA	103 131 LALA	121 131 LALA
1.5	0-1.5	101 133 LCLC	103 131 LCLC	121 131 LCLC
2	0-2	101 133 LELE	103 131 LELE	121 131 LELE
3	0-3	101 133 LJLJ	103 131 LJLJ	121 131 LJLJ
5	0-5	101 133 LLSL	103 131 LLSL	121 131 LLSL
7.5	0-7.5	101 133 MFMF	103 131 MFMF	121 131 MFMF
10	0-10	101 133 MTMT	103 131 MTMT	121 131 MTMT
15	0-15	101 133 NDND	103 131 NDND	121 131 NDND
20	0-20	101 133 NGNG	103 131 NGNG	121 131 NGNG
30	0-30	101 133 NLNL	103 131 NLNL	121 131 NLNL

Transformer-Rated, 40/70 Hz

5	0-10	101 133 LSMT	103 131 LSMT	121 131 LSMT
5	0-15	101 133 LSND	103 131 LSND	121 131 LSND
5	0-20	101 133 LSNJ	103 131 LSNJ	121 131 LSNJ
5	0-25	101 133 LSNJ	103 131 LSNJ	121 131 LSNJ
5	0-30	101 133 LSNL	103 131 LSNL	121 131 LSNL
5	0-40	101 133 LSNP	103 131 LSNP	121 131 LSNP
5	0-50	101 133 LSNT	103 131 LSNT	121 131 LSNT
5	0-75	101 133 LSPB	103 131 LSPB	121 131 LSPB
5	0-100	101 133 LSPK	103 131 LSPK	121 131 LSPK
5	0-150	101 133 LSPZ	103 131 LSPZ	121 131 LSPZ
5	0-200	101 133 LSRL	103 131 LSRL	121 131 LSRL
5	0-250	101 133 LSRS	103 131 LSRS	121 131 LSRS
5	0-300	101 133 LSRX	103 131 LSRX	121 131 LSRX
5	0-400	101 133 LSSC	103 131 LSSC	121 131 LSSC
5	0-500	101 133 LSSF	103 131 LSSF	121 131 LSSF
5	0-600	101 133 LSSJ	103 131 LSSJ	121 131 LSSJ
5	0-800	101 133 LSSN	103 131 LSSN	121 131 LSSN
5	0-1000	101 133 LSSS	103 131 LSSS	121 131 LSSS
5	0-1200	101 133 LSSV	103 131 LSSV	121 131 LSSV
5	0-1500	101 133 LSTC	103 131 LSTC	121 131 LSTC
5	0-2000	101 133 LSTM	103 131 LSTM	121 131 LSTM
5	0-2500	101 133 LSTV	103 131 LSTV	121 131 LSTV
5	0-3000	101 133 LSUA	103 131 LSUA	121 131 LSUA
5	0-4000	101 133 LSUE	103 131 LSUE	121 131 LSUE
5	0-5000	101 133 LSUJ	103 131 LSUJ	121 131 LSUJ
5	0-6000	101 133 LSUP	103 131 LSUP	121 131 LSUP
5	0-7000	101 133 LSUS	103 131 LSUS	121 131 LSUS
5	0-8000	101 133 LSUW	103 131 LSUW	121 131 LSUW

* add suffix /P for ABS plastic case

Yokogawa AC Voltage Switchboard Meters

AB Series

- Rugged, Durable Construction
- No Shadows on Scale
- Accurate and Readable, Even from Sharp Angles
- Accurate to Within $\pm 1\%$ of Full Scale
- Attractive, Uncluttered Scales
- High-Shock Design Meets MIL-M-16034A and MIL-S-901 (AB-14)
- Weathertight Construction Ideal for Adverse Conditions (AB-40)
- Easy to Read Up to 30 Feet Away (AB-16)
- Taut-Band Suspension


AB-40 ▲

AB-16 ▲

Photos not to scale

ORDERING INFORMATION

Self-Contained, 50/60 Hz

Rating (volts)	Scale Volts	AB-14 Cat. No.	AB-40 Metal Case Cat. No. *	AB-16 Cat. No.
150	0-150	101 023 PZPZ	103 021 PZPZ	121 021 PZPZ
250	0-250	101 023 RSRS	103 021 RSRS	121 021 RSRS
300	0-300	101 023 RXRX	103 021 RXRX	121 021 RXRX
500	0-500	101 023 SFSF	103 021 SFSF	121 021 SFSF
600	0-600	101 023 SJS	103 021 SJSJ	121 021 SJSJ
750	0-750 #	**	103 021 SMSM	121 021 SMSM

Transformer-Rated, 50/60 Hz

150	0-300	101 023 PZRX	103 021 PZRX	121 021 PZRX
150	0-600	101 023 PZSJ	103 021 PZSJ	121 021 PZSJ
150	0-750	101 023 PZSM	103 021 PZSM	121 021 PZSM
150	0-3000	101 023 PZUA	103 021 PZUA	121 021 PZUA
150	0-5250	101 023 PZUL	103 021 PZUL	121 021 PZUL
150	0-9000	101 023 PZUY	103 021 PZUY	121 021 PZUY
150	0-15kV	101 023 PZWZ	103 021 PZWZ	121 021 PZWZ
150	0-18kV	101 023 PZXE	103 021 PZXE	121 021 PZXE
150	0-45kV	101 023 PZXU	103 021 PZXU	121 021 PZXU
150	0-150kV	101 023 PZYR	103 021 PZYR	121 021 PZYR
250	0-600	101 023 RSSJ	103 021 RSS	121 021 RSSJ

Expanded Scale Self-Contained, 50/60 Hz

110-130	110-130	**	103 071 PNPN	121 071 PNPN
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Expanded Scale Transformer-Rated, 50/60 Hz

110-130	+	**	103 071 PN.+	121 071 PN.+
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Rectifier-Type 1.5% 20-3000 Hz

15	0-15	**	103 151 NDND	121 151 NDND
30	0-30	**	103 151 NLNL	121 151 NLNL
150	0-150	**	103 151 PZPZ	121 151 PZPZ
150	+	**	103 151 PZ.+	121 151 PZ.+
300	0-300	**	103 151 RXRX	121 151 RXRX
600	0-600	**	103 151 STST	121 151 STST

Ground-Detector Type-Single-Phase 50/60 Hz

150	0-150	**	103 021 PZPZ	121 021 PZPZ
150	+	**	103 021 PZ.+	121 021 PZ.+
300	0-300	**	103 021 RXRX	121 021 RXRX
600	0-600	**	103 021 SJSJ	121 021 SJSJ

* add suffix /P for ABS plastic case

UL Version Not Available

** High Shock Version Not Available

+ Order by Description. Specify P.T. (Potential Transformer) Ratio if Used, and Scale Desired.

SPECIFICATIONS

In accordance with ANSI Specifications C39.1

Accuracy	$\pm 1\%$ of FS basic accuracy class
Rectifier Instruments	$\pm 1\frac{1}{2}\%$ @ 25°C calibrated on sine wave
Operating Temperature Range	0-40°C (32°F-104°F)
Dielectric Level	2,300VAC for 1 minute between circuit & case
Overload Rating	Voltmeter or potential coils— 1.2x continuous; AC ammeters— 2x continuous, 10x for 1 second; Current coils other than AC ammeters 1.5x continuous, 10x for 1 second
Response Time	Approx. 2.5 seconds (except AB-16)
Position of Use	Vertical (scale)
Full Scale Deflection Angle	250°
Case Size	4 $\frac{1}{4}$ " 4 $\frac{1}{4}$ " 8 $\frac{1}{4}$ "
Model	AB-14 AB-40 AB-16
Size (H x W x D)	4.33" x 4.33" x 4.85" 8.69" x 8.69" x 4.85"
Barrel (cutout)	4.03"
Full Scale Length	6.9" 13.8"

OPTIONS

Custom Scaling
Nonstandard Ranges
Adjustable Potentiometer (Voltmeters Only)
Color Bands
Illumination (Red or White)
UL Recognition

AB-40 with Red Illumination ▲


Yokogawa AC Watt & VAR Switchboard Meters

- Rugged, Durable Construction
- No Shadows on Scale
- Accurate and Readable, Even from Sharp Angles
- Accurate to Within ±1% of Full Scale
- Attractive, Uncluttered Scales
- Weathertight Construction Ideal for Adverse Conditions (AB-40)
- Easy to Read Up to 30 Feet Away (AB-16)
- Taut-Band Suspension

SPECIFICATIONS

In accordance with ANSI Specifications C39.1

Accuracy	±1% of FS basic accuracy class	
Rectifier Instruments	±1½% @ 25°C calibrated on sine wave	
Operating Temperature Range	0–40°C (32°F–104°F)	
Dielectric Level	2,300VAC for 1 minute between circuit & case	
Overload Rating	Voltmeter or potential coils—1.2x continuous; AC ammeters—2x continuous, 10x for 1 second; Current coils other than AC ammeters 1.5x continuous, 10x for 1 second	
Response Time	Approx. 2.5 seconds (except AB-16)	
Position of Use	Vertical (scale)	
Full Scale Deflection Angle	250° (360° for synchrosopes)	
Case Size	4¼"	8¾"
Model	AB-40	AB-16
Size (H x W x D)	4.33" x 4.33" x 4.85"	8.69" x 8.69" x 4.85"
Barrel (cutout)	4.03"	
Full Scale Length	6.9"	13.8"

VAR METER ORDERING INFORMATION

Rating (Amperes)	Rating (Volts)	Scale	AB-40 Cat. No.	AB-16 Cat. No.
Single Phase/2-Wire, 1-Element, Transformer Rated, 60 Hz				
5	120	†	103 31□A...	121 31□A...
5	120	†	103 762 A...*	121 762A...*
3-Phase/3-Wire, 2-Element, Transformer Rated, 50/60 Hz (Cannot Use with External Phase Shifter)				
5	120	†	103 28□A...	121 28□A...
5	120	†	103 812A...•	121 812A...•
3-Phase, 3-Wire, 2-Element, Transformer-Rated, 60 Hz for Use with External Phase Shifters				
5	120	†	103 32□A...	121 32□A...
5	120	†	103 772A...*	121 772A...*
3-Phase/4-Wire, 2½-Element, Transformer-Rated, 50/60 Hz (Cannot Use External Phase Shifter)				
5	208☆	†	103 29□B...	121 29□B...
5	208☆	†	103 742B...▲	121 742B...▲
3-Phase/4-Wire, 2½-Element, Transformer-Rated, 60 Hz for Use with External Phase Shifters				
5	120	†	103 34□A...	121 34□A...
5	120	†	103 792A...*	121 792A...*

† Order by description. Specify CT (Current Transformer) and/or PT (Potential Transformer) ratios if used and scale desired.
 * Used for 0-Center when calibrating watts are less than ±380.
 • Used for 0-Center when calibrating watts less than ±658.
 ▲ Used for 0-Center when calibrating watts are less than ±760.
 ☆ The 2½-element varmeters used on 4-wire 3-phase 120V L-N systems are rated 208V because they are connected line-to-line.
 □ Sixth digit signifies pointer deflection (1-zero left, 2-zero center).



AB-16 ▲



AB-40 ▲

Photos not to scale

WATT METER ORDERING INFORMATION

AC Wattmeters Non-Isolated (cannot be use with external phase shifter for VARs)

Rating Amperes/Volts	Scale	AB-40 Cat. No.	AB-16 Cat. No.
1.25 120	0-125 Watts	103 211AARC7GCB	121 211AARC7GCB
2.50 120	0-250 Watts	103 211AAWP7CJB	121 211AAWP7CJB
5 120	0-500 Watts	103 211ARBU7CRB	121 211ARBU7CRB
10 120	0-1000 Watts	103 211AWDP7DAB	121 211AWDP7DAB
Single-Phase/2-Wire, 1-Element, Transformer-Rated, 50/60 Hz			
5 120	+	103 21□A.....	121 21□A.....
3-Phase/3-Wire, 2-Element, Transformer-Rated, 50/60 Hz			
5 120	+	103 22□A.....	121 22□A.....
5 240		103 22□C.....	121 22□C.....
5 480*		103 22□D.....	121 22□D.....
5 600*		103 22□E.....	121 22□E.....
3-Phase/4-Wire, 2½-Element, Transformer-Rated, 50/60 Hz (voltage balanced)			
5 69	+	103 25□F.....	121 25□F.....
5 120		103 25□A.....	121 25□A.....
5 240		103 25□C.....	121 25□C.....

+ Order by Description. Specify CT (Current Transformer) and/or PT (Potential Transformer) Ratios if used, and Scale Desired.
 * UL Version in Short Case, Non-UL Version in Long Case.
 □ Sixth Digit Signifies Pointer Deflection (1-Zero Left, 2-Zero Center)

OPTIONS (WHERE APPLICABLE)

- Custom Scaling
- Nonstandard Ranges
- Zero-Center
- Color Bands
- Nonstandard Frequencies

ANALOG METERS

Yokogawa Power Factor, Frequency & Synchroscope Meters

- Rugged, Durable Construction
- No Shadows on Scale
- Accurate and Readable, Even from Sharp Angles
- Accurate to Within $\pm 1\%$ of Full Scale
- Attractive, Uncluttered Scales
- Weathertight Construction Ideal for Adverse Conditions (AB-40)
- Easy to Read up to 30 Feet Away (AB-16)
- Taut-Band Suspension Except Synchrosopes


AB-16

AB-40

ORDERING INFORMATION

Power Factor			AB-40	AB-16
Amperes	Volts	Scale	Cat. No.	Cat. No.
Single-Phase 2 Wire 60 Hz				
5	120	.5-1-.5	103 412 FCAD	121412 FCAD
3-Phase 3 & 4 Wire, 50 & 60 Hz, Balanced System Only				
5	120	.5-1-.5	103 402 FCAD	121 402 FCAD
5	208*	.5-1-.5	103 402 CCAD	121 402 CCAD
5	240	.5-1-.5	103 402 FEAD	121 402 FEAD
5	480	.5-1-.5	103 402 FFAD	121 402 FFAD
5	600	.5-1-.5	103 402 FGAD	121 402 FGAD
3-Phase 3 Wire, 50/60 Hz, Unbalanced Systems				
5	120	.5-1-.5	103 462 FCAD	—
5	240	.5-1-.5	103 462 FEAD	—
3-Phase 4-Wire, 50/60 Hz, Unbalanced Systems				
5	120+	.5-1-.5	103 472 FCAD	—
5	208+	.5-1-.5	103 472 CCAD	—
5	240++	.5-1-.5	103 472 FEAD	—
Frequency Meters, 120V Rated				
Scale (Hz)	Center Freq, Hz	AB-40 Cat. No.	AB-16 Cat. No.	
45-55	50	103 372 AGAG	121 372 AGAG	
45-65	55	103 372 AJAJ	121 372 AJAJ	
48-52	50	103 372 AKAK	121 372 AKAK	
50-70	60	103 372 ALAL	121 372 ALAL	
55-65	60	103 372 ANAN	121 372 ANAN	
58-62	60	103 372 ATAT	121 372 ATAT	
59-61	60	103 372 ASAS	121 372 ASAS	
350-450	400	103 372 BHBH	121 372 BHBH	
390-410	400	103 372 BLBL	121 372 BLBL	
Synchrosopes—Pivot and Jewel				
Scale	Normal Freq.	VAC	AB-40 Cat. No.	AB-16 Cat. No.
Slow-Fast	50/60	120	106 452 ADAA	120 452 ADAA
Slow-Fast	50/60	240	106 452 DDAA	120 452 DDAA
Slow-Fast	400	120	106 452 ACAA	120 452 ACAA

* Line to line 208V (120V line to neutral)

+ Line to line

++ Line to neutral

SPECIFICATIONS

In accordance with ANSI Specifications C39.1

Accuracy	$\pm 1\%$ of FS basic accuracy class			
Rectifier Instruments	$\pm 1\%$ @ 25°C calibrated on sine wave			
Power Factor Meters	$\pm 1\%$ of scale length			
	Balanced system			
	(20-100% rated current)			
	Unbalanced system			
	($\pm 3\%$ of scale length)			
Frequency Meters	45 Hz-55 Hz, ± 0.15 Hz			
	55 Hz-66 Hz, ± 0.15 Hz			
	58 Hz-62 Hz, ± 0.093 Hz			
	350 Hz-450 Hz, ± 1.5 Hz			
Operating Temperature Range	0-40°C (32°F-104°F)			
Dielectric Level	2,300 VAC for 1 minute between circuit and case			
Overload Rating	Voltmeter or potential coils, 1.2x continuous AC ammeters, 2x continuous, 10x for 1 second. Current coils other than AC ammeters, 1.5x continuous, 10x for 1 second			
Response Time	Approx. 2.5 seconds (except AB/DB-16)			
Position of Use	Vertical (scale)			
Full Scale Deflection Angle	250°			
Case Size	Model	Size (H x W x D)	Barrel (Cutout)	Scale Length
4 $\frac{1}{2}$ "	AB-14	4.33" x 4.33" x 6.75"	4.03"	6.9"
4 $\frac{1}{2}$ "	AB-40	4.33" x 4.33" x 6.75"	4.03"	6.9"
8 $\frac{1}{2}$ "	AB-16	8.69" x 8.69" x 6.75"	4.03"	13.8"

Yokogawa Dual Display Meters

NEW



Dual-View

- Taut Band Movement
- 0.56" 3½ Digit Display
- High Intensity Red, Green or Blue LEDs
- Switchboard Case with IP54 Front

SPECIFICATIONS

Input Impedance:	1MΩ on DCV & ACV
Input Burden:	<210mV for inputs <500mA DC, <510mV for inputs >500mA DC ACA <0.2VA @ 5AAC; ACV <0.5VA @ 600V
Input Frequency:	45Hz to 65Hz on ACV & ACA
Power Supply:	120VAC ±15%, 50/60Hz ±2Hz, <3.5VA standard;
Dial:	White scale with black markings & black pointer (standard).
Digital Display:	-1999 to 1999 with selectable decimal
Analog Accuracy:	±1% of full scale deflection at 25°C
Digital Accuracy:	AC ±0.1% of reading ±3 counts at 25°C. DC ±2 counts
Overload:	DCV & ACV: continuous 1.2x or 700V max.; 1.5x for 10sec DC Current: continuous 1.2x; 1.5x for 5sec AC Current: continuous 2x; 5x for 10sec
Operating Temperature:	0°C to 60°C, <90% RH @40°C
Storage Temperature:	-20°C to 70°C
Size:	4.33" x 4.33" x 5.0" Deep

OPTIONS

Custom scale
Custom legend
Black dial
Digital scale different from analog
240VAC power supply
DC power supply

ORDERING INFORMATION

Input Rating/ Scale	Red LED Cat. No.	Green LED Cat. No.	Blue LED Cat. No.
DCV			
0-50mV	123011ABAB	124011ABAB	125011ABAB
0-100mV	123011AEAE	124011AEAE	125011AEAE
0-200mV	123011 AHAH	124011 AHAH	125011 AHAH
50-0-50mV	123012 ABAB	124012 ABAB	125012 ABAB
100-0-100mV	123012AEAE	124012AEAE	125012AEAE
200-0-200mV	123012AHAH	124012AHAH	125012AHAH
0-10V	123011MTMT	124011MTMT	125011MTMT
0-10V	123011PKPK	124011PKPK	125011PKPK
0-150V	123011PZPZ	124011PZPZ	125011PZPZ
0-300V	123011RXRX	124011RXRX	125011RXRX
0-600V	123011SJSJ	124011SJSJ	125011SJSJ
10-0-10V	123012MTMT	124012MTMT	125012MTMT
100-0-100V	123012PKPK	124012PKPK	125012PKPK
150-0-150V	123012PZPZ	124012PZPZ	125012PZPZ
300-0-300V	123012RXRX	124012RXRX	125012RXRX
600-0-600V	123012SJSJ	124012SJSJ	125012SJSJ

ORDERING INFORMATION (CONT'D)

Input Rating/ Scale	Red LED Cat. No.	Green LED Cat. No.	Blue LED Cat. No.
DCA			
0-200uA	123111EAEA	124111EAEA	125111EAEA
0-500uA	123111EMEM	124111EMEM	125111EMEM
200-0-200uA	123112EAEA	124112EAEA	125112EAEA
500-0-500uA	123112EMEM	124112EMEM	125112EMEM
0-1mA	123111FAFA	124111FAFA	125111FAFA
0-10mA	123111GZGZ	124111GZGZ	125111GZGZ
0-100mA	123111JRJR	124111JRJR	125111JRJR
0-500mA	123111KMKM	124111KMKM	125111KMKM
0-1A	123111LALA	124111LALA	125111LALA
1-0-1mA	123112FAFA	124112FAFA	125112FAFA
10-0-10mA	123112GZGZ	124112GZGZ	125112GZGZ
100-0-100mA	123112JRJR	124112JRJR	125112JRJR
500-0-500mA	123112KMKM	124112KMKM	125112KMKM
1-0-1A	123112LALA	124112LALA	125112LALA
1-5mA	123191FYFY	124191FYFY	125191FYFY
4-20mA	123191HEHE	124191HEHE	125191HEHE
10-50mA	123191HXHX	124191HXHX	125191HXHX
ACV			
0-150V	123021PZPZ	124021PZPZ	125021PZPZ
0-250V	123021RSRS	124021RSRS	125021RSRS
0-300V	123021RXRX	124021RXRX	125021RXRX
0-600V	123021SJSJ	124021SJSJ	125021SJSJ
ACV Transformer Rated (150V)			
0-150V/0-250V	123021PZRS	124021PZRS	125021PZRS
0-150V/0-300V	123021PZRX	124021PZRX	125021PZRX
0-150V/0-500V	123021PZSF	124021PZSF	125021PZSF
0-150V/0-600V	123021PZSJ	124021PZSJ	125021PZSJ
0-150V/0-750V	123021PZSM	124021PZSM	125021PZSM
0-150V/0-1500V	123021PZTC	124021PZTC	125021PZTC
0-150V/0-3.00kV	123021PZVJ	124021PZVJ	125021PZVJ
0-150V/0-5.00kV	123021PZVT	124021PZVT	125021PZVT
0-150V/0-5.25kV	123021PZVW	124021PZVW	125021PZVW
0-150V/0-6.00kV	123021PZVX	124021PZVX	125021PZVX
0-150V/0-9.00kV	123021PZWJ	124021PZWJ	125021PZWJ
0-150V/0-15.00kV	123021PZWZ	124021PZWZ	125021PZWZ
0-150V/0-18.00kV	123021PZXE	124021PZXE	125021PZXE
0-150V/0-45.0kV	123021PZXU	124021PZXU	125021PZXU
0-150V/0-150.0kV	123021PZYR	124021PZYR	125021PZYR
0-150V/0-200kV	123021PZYU	124021PZYU	125021PZYU
0-250V/0-600V	123021RSSJ	124021RSSJ	125021RSSJ
ACA			
0-1A	123131LALA	124131LALA	125131LALA
0-5A	123131LSLS	124131LSLS	125131LSLS
ACA Transformer Rated (5A)			
0-5A/0-10.00A	123131LSMT	124131LSMT	125131LSMT
0-5A/0-15.00A	123131LSND	124131LSND	125131LSND
0-5A/0-20.0A	123131LSNG	124131LSNG	125131LSNG
0-5A/0-25.0A	123131LSNJ	124131LSNJ	125131LSNJ
0-5A/0-30.0A	123131LSNL	124131LSNL	125131LSNL
0-5A/0-40.0A	123131LSNP	124131LSNP	125131LSNP
0-5A/0-50.0A	123131LSNT	124131LSNT	125131LSNT
0-5A/0-75.0A	123131LSPB	124131LSPB	125131LSPB
0-5A/0-100.0A	123131LSPK	124131LSPK	125131LSPK
0-5A/0-150.0A	123131LSPZ	124131LSPZ	125131LSPZ
0-5A/0-200A	123131LSRL	124131LSRL	125131LSRL
0-5A/0-250A	123131LSRS	124131LSRS	125131LSRS
0-5A/0-300A	123131LSRX	124131LSRX	125131LSRX
0-5A/0-400A	123131LSSC	124131LSSC	125131LSSC
0-5A/0-500A	123131LSSF	124131LSSF	125131LSSF
0-5A/0-600A	123131LSSJ	124131LSSJ	125131LSSJ
0-5A/0-800A	123131LSSN	124131LSSN	125131LSSN
0-5A/0-1000A	123131LSSS	124131LSSS	125131LSSS
0-5A/0-1200A	123131LSSV	124131LSSV	125131LSSV
0-5A/0-1500A	123131LSTC	124131LSTC	125131LSTC

ANALOG METERS

Crompton Switchboard Meters

- 250° Linear Scale
- AC Instruments with True RMS Circuit
- Rugged Pivot & Jewel Movement
- IP54 Front
- cUL & CE Certifications
- ANSI C39.1 Performance
- Terminal Cover (007 Case)

AC/DC SWITCHBOARD METER SPECIFICATIONS

Accuracy:	±1% Full Scale
Response Time:	Approx. 2.5 Seconds to Full Scale
Scale Arc:	250° Full Scale Deflection
Overshoot:	33% Maximum
Continuous Overload:	Ammeter: 2x, Voltmeter: 1.2x
Momentary Overload (1 second):	AC ammeter: 50x, DC ammeter: 10x
Dielectric Withstand:	2300 VAC for 1 Minute
Operating Temperature:	0°C to 60°C (078: -20°C to 65°C)
Size (H x W x D):	4.3" x 4.3" x 2.4" (007 case)
(Add 1"D for terminal studs)	4.3" x 4.3" x 3.4" (078 case)



007 ▶

AC AMMETERS - RMS READING SELF CONTAINED

Rating	Scale	Standard Case Catalog Number	4 1/2" Square Flange Hi-Shock Case Catalog Number
1A	0-1A	007-05FA-LALA-C7	078-05FJ-LALA-C6
1.5A	0-1.5A	007-05FA-LCLC-C7	078-05FJ-LCLC-C6
2A	0-2A	007-05FA-LELE-C7	078-05FJ-LELE-C6
3A	0-3A	007-05FA-LJLJ-C7	078-05FJ-LJLJ-C6
5A	0-5A	007-05FA-LSLS-C7	078-05FJ-LSLS-C6
7.5A	0-7.5A	007-05FA-MFMF-C7	078-05FJ-MFMF-C6
10A	0-10A	007-05FA-MTMT-C7	078-05FJ-MTMT-C6
15A	0-15A	007-05FA-NDND-C7	078-05FJ-NDND-C6
20A	0-20A	007-05FA-NGNG-C7	078-05FJ-NGNG-C6
30A	0-30A	007-05FA-NLNL-C7	078-05FJ-NLNL-C6

AC VOLTMETERS - RMS READING SELF CONTAINED

Rating	Scale	Standard Case Catalog Number	4 1/2" Square Flange Hi-Shock Case Catalog Number
150V	0-150V	007-05GA-PZPZ-C7	078-05GJ-PZPZ-C6
250V	0-250V	007-05GA-RSRS-C7	078-05GJ-RSRS-C6
300V	0-300V	007-05GA-RRXR-C7	078-05GJ-RRXR-C6
500V	0-500V	007-05GA-SFSF-C7	078-05GJ-SFSF-C6
600V	0-600V	007-05GA-SJSJ-C7	078-05GJ-SJSJ-C6
750V	0-750V	007-05GA-SMSM-C7	078-05GJ-SMSM-C6

AC AMMETERS - RMS READING TRANSFORMER RATED

5A	0-10A	007-05FA-LSMT-C7	078-05FJ-LSMT-C6
5A	0-15A	007-05FA-LSND-C7	078-05FJ-LSND-C6
5A	0-20A	007-05FA-LSNG-C7	078-05FJ-LSNG-C6
5A	0-25A	007-05FA-LSNJ-C7	078-05FJ-LSNJ-C6
5A	0-30A	007-05FA-LSNL-C7	078-05FJ-LSNL-C6
5A	0-40A	007-05FA-LSNP-C7	078-05FJ-LSNP-C6
5A	0-50A	007-05FA-LSNT-C7	078-05FJ-LSNT-C6
5A	0-75A	007-05FA-LSPB-C7	078-05FJ-LSPB-C6
5A	0-100A	007-05FA-LSPK-C7	078-05FJ-LSPK-C6
5A	0-150A	007-05FA-LSPZ-C7	078-05FJ-LSPZ-C6
5A	0-200A	007-05FA-LSRL-C7	078-05FJ-LSRL-C6
5A	0-250A	007-05FA-LSRS-C7	078-05FJ-LSRS-C6
5A	0-300A	007-05FA-LSRX-C7	078-05FJ-LSRX-C6
5A	0-400A	007-05FA-LSSC-C7	078-05FJ-LSSC-C6
5A	0-500A	007-05FA-LSSF-C7	078-05FJ-LSSF-C6

Note: Additional meters with scales up to 8,000A available

AC VOLTMETERS - RMS READING TRANSFORMER RATED

150V	0-300V	007-05GA-PZRX-C7	078-05GJ-PZRX-C6
150V	0-600V	007-05GA-PZSJ-C7	078-05GJ-PZSJ-C6
150V	0-750V	007-05GA-PZSM-C7	078-05GJ-PZSM-C6
150V	0-3000V	007-05GA-PZUA-C7	078-05GJ-PZUA-C6
150V	0-5250V	007-05GA-PZUL-C7	078-05GJ-PZUL-C6
150V	0-6000V	007-05GA-PZUP-C7	078-05GJ-PZUP-C6
150V	0-9000V	007-05GA-PZUY-C7	078-05GJ-PZUY-C6
150V	0-15 KV	007-05GA-PZWC-C7	078-05GJ-PZWC-C6
150V	0-18 KV	007-05GA-PZWD-C7	078-05GJ-PZWD-C6
150V	0-45 KV	007-05GA-PZWJ-C7	078-05GJ-PZWJ-C6
250V	0-600V	007-05GA-RSSJ-C7	078-05GJ-RSSJ-C6

Custom scales available on request.

007 meters are 50/60 Hz. Hi-Shock meters are 60 Hz, use C5 suffix for 50Hz.

FREQUENCY METERS 120V SELF CONTAINED

Center Frequency	Accuracy Hz	Scale	Standard Case Catalog Number	4 1/2" Square Flange Hi-Shock Case Catalog Number
50 Hz	±0.15	45-55 Hz	007-41LA-PNAG-AG	078-41LJ-PNAG-AG
50 Hz	±0.15	46-54 Hz	007-41LA-PNAH-AH	078-41LJ-PNAH-AH
50 Hz	±0.25	45-65 Hz	007-41LA-PNAJ-AJ	078-41LJ-PNAJ-AJ
60 Hz	±0.25	50-70 Hz	007-41LA-PNAL-AL	078-41LJ-PNAL-AL
60 Hz	±0.15	55-65 Hz	007-41LA-PNAN-AN	078-41LJ-PNAN-AN
60 Hz	±0.15	56-64 Hz	007-41LA-PNAO-AO	078-41LJ-PNAO-AO
60 Hz	±0.08	58-62 Hz	007-41LA-PNAT-AT	078-41LJ-PNAT-AT

Frequency Meter Depth 3.4"

For 200-250V operation, use code RN instead of PN.

Crompton Switchboard Meters

DC AMMETERS - SELF CONTAINED

Rating	Scale	4½" Square Flange	
		Standard Case Catalog Number	Hi-Shock Case Catalog Number
200 uA	0-200 uA	007-05AA-EAEA	078-05AJ-EAEA
300 uA	0-300 uA	007-05AA-EEEE	078-05AJ-EEEE
500 uA	0-500 uA	007-05AA-EMEM	078-05AJ-EMEM
800 uA	0-800 uA	007-05AA-EWEW	078-05AJ-EWEW
1 mA	0-1 mA	007-05AA-FAFA	078-05AJ-FAFA
2 mA	0-2 mA	007-05AA-FGFG	078-05AJ-FGFG
5 mA	0-5 mA	007-05AA-FXFX	078-05AJ-FXFX
10 mA	0-10 mA	007-05AA-GZGZ	078-05AJ-GZGZ
20 mA	0-20 mA	007-05AA-HFHF	078-05AJ-HFHF
30 mA	0-30 mA	007-05AA-HMHM	078-05AJ-HMHM
50 mA	0-50 mA	007-05AA-HYHY	078-05AJ-HYHY
100 mA	0-100 mA	007-05AA-JRJR	078-05AJ-JRJR
200 mA	0-200 mA	007-05AA-KAKA	078-05AJ-KAKA
300 mA	0-300 mA	007-05AA-KGKG	078-05AJ-KGKG
500 mA	0-500 mA	007-05AA-KMKM	078-05AJ-KMKM
800 mA	0-800 mA	007-05AA-KWKW	078-05AJ-KWKW
1A	0-1A	007-05AA-LALA	078-05AJ-LALA
5A	0-5A	007-05AA-LSLS	078-05AJ-LSLS
10A	0-10A	007-05AA-MTMT	078-05AJ-MTMT
15A	0-15A	007-05AA-NDND	078-05AJ-NDND
20A	0-20A	007-05AA-NGNG	078-05AJ-NGNG
30A	0-30A	007-05AA-NLNL	078-05AJ-NLNL

DC AMMETERS - SHUNT RATED

Rating	Scale	4½" Square Flange	
		Standard Case Catalog Number	Hi-Shock Case Catalog Number
50 mV	0-15A	007-05AA-EYND	078-05AJ-EYND
50 mV	0-20A	007-05AA-EYNG	078-05AJ-EYNG
50 mV	0-30A	007-05AA-EYNL	078-05AJ-EYNL
50 mV	0-40A	007-05AA-EYNP	078-05AJ-EYNP
50 mV	0-50A	007-05AA-EYNT	078-05AJ-EYNT
50 mV	0-75A	007-05AA-EYPB	078-05AJ-EYPB
50 mV	0-100A	007-05AA-EYPK	078-05AJ-EYPK
50 mV	0-150A	007-05AA-EYPZ	078-05AJ-EYPZ
50 mV	0-200A	007-05AA-EYRL	078-05AJ-EYRL
50 mV	0-300A	007-05AA-EYRX	078-05AJ-EYRX
50 mV	0-400A	007-05AA-EYSC	078-05AJ-EYSC
50 mV	0-500A	007-05AA-EYSF	078-05AJ-EYSF
50 mV	0-750A	007-05AA-EYSM	078-05AJ-EYSM
50 mV	0-1000A	007-05AA-EYSS	078-05AJ-EYSS
50 mV	0-1200A	007-05AA-EYSU	078-05AJ-EYSU
50 mV	0-1500A	007-05AA-EYTC	078-05AJ-EYTC
50 mV	0-2000A	007-05AA-EYTM	078-05AJ-EYTM
50 mV	0-3000A	007-05AA-EYUA	078-05AJ-EYUA

100mV shunt rated meters also available.

TRANSDUCER INDICATORS

Rating	4½" Square Flange	
	Standard Case Catalog Number	Hi-Shock Case Catalog Number
1/5 mA DC (suppressed zero)	007-05RA-GM	078-05RJ-GM
4/20 mA DC (suppressed zero)	007-05RA-HG	078-05RJ-HG
10/50 mA DC (suppressed zero)	007-05RA-HZ	078-05RJ-HZ
50-0-50mV DC (shunt rated)	007-05CA-GB	078-05CJ-GB
100-0-100mV DC (shunt rated)	007-05CA-GM	078-05CJ-GM

Custom scale –
Specify markings and legend



007 ▶

ANALOG METERS

DC VOLTMETERS (SENSITIVITY 1000 OHMS PER VOLTS)

Rating	Scale	4½" Square Flange	
		Standard Case Catalog Number	Hi-Shock Case Catalog Number
15V	0-15V	007-05VA-NDND	078-05VJ-NDND
30V	0-30V	007-05VA-NLNL	078-05VJ-NLNL
50V	0-50V	007-05VA-NTNT	078-05VJ-NTNT
75V	0-75V	007-05VA-PBPB	078-05VJ-PBPB
150V	0-150V	007-05VA-PZPZ	078-05VJ-PZPZ
300V	0-300V	007-05VA-RXR X	078-05VJ-RXR X
400V	0-400V	007-05VA-SCSC	078-05VJ-SCSC
500V	0-500V	007-05VA-SFSF	078-05VJ-SFSF
600V	0-600V	007-05VA-SJSJ	078-05VJ-SJSJ
750V	0-750V	007-05VA-SMSM	078-05VJ-SMSM
800V	0-800V	007-05VA-SNSN	078-05VJ-SNSN

DC VOLTMETERS - ZERO CENTER (2000 OHMS PER VOLT)

Rating & Scale	4½" Square Flange	
	Standard Case Catalog Number	Hi-Shock Case Catalog Number
150-0-150V	007-05NA-RXR X	078-05NJ-RXR X
300-0-300V	007-05NA-SJSJ	078-05NJ-SJSJ
500-0-500V	007-05NA-SSSS	078-05NJ-SSSS
600-0-600V	007-05NA-SUSU	078-05NJ-SUSU

OPTIONS

- Custom scales
- Color zones
- Red or colored lines or marks
- Customer logo or graphics
- Polychloroprene panel gasket

Crompton Switchboard Power Meters

AC WATTMETER AND VARMETER SPECIFICATIONS

Burden per element:	Current Circuit: 2 VA; Voltage Circuit: 1 VA
Scale Arc:	250° Full Scale Deflection
Accuracy Class:	1.0
Accuracy Maintained:	80-110% rated voltage, 0.1 lead to 0.1 lag PF
Overload:	1.2x continuous
Certification:	c-UL-us
Dielectric Withstand:	2600 VRMS for 1 minute
Operating Temperature:	0 to 60°C (32 to 140°F)
Size (H x W x D):	4.30" x 4.30" x 5.19"



▲ **007-218**



▲ **007-425**

AC WATTMETERS

Phase/ Wire	Amps/ Volts	Scale	Standard Case Catalog Number	4½" Square Flange Hi-Shock Case Catalog Number
1 element, transformer rated, 50/60 Hz, taut band, integral transducer				
1 / 2	5/120	To Suit	007-215A-QQ-C7	078-215J-QQ-C6
1 / 2	5/240	To Suit	007-215A-QS-C7	078-215J-QS-C6
2 element, transformer rated, 50/60 Hz, taut band, integral transducer				
3 / 3	5/120	To Suit	007-218A-QQ-C7	078-218J-QQ-C6
3 / 3	5/208	To Suit	007-218A-QR-C7	078-218J-QR-C6
3 / 3	5/240	To Suit	007-218A-QS-C7	078-218J-QS-C6
3 / 3	5/380	To Suit	007-218A-QX-C7	078-218J-QX-C6
3 / 3	5/480	To Suit	007-218A-QT-C7	078-218J-QT-C6
2½ element, transformer rated, 50/60 Hz, taut band, integral transducer				
3 / 4	5/69	To Suit	007-219A-QL-C7	078-219J-QL-C6
3 / 4	5/120	To Suit	007-219A-QQ-C7	078-219J-QQ-C6
3 / 4	5/277	To Suit	007-219A-QY-C7	078-219J-QY-C6
3 / 4	5/346	To Suit	007-219A-QZ-C7	078-219J-QZ-C6

Specify Current Transformer and Voltage Transformer and Preferred Scale

AC VARMETERS

Phase/ Wire	Amps/ Volts	Scale	Standard Case Catalog Number	4½" Square Flange Hi-Shock Case Catalog Number
2 element, transformer rated, 50/60 Hz, taut band, integral transducer				
3 / 3	5/120	To Suit	007-311A-QQ-C7	078-311J-QQ-C6
3 / 3	5/208	To Suit	007-311A-QR-C7	078-311J-QR-C6
3 / 3	5/240	To Suit	007-311A-QS-C7	078-311J-QS-C6
3 / 3	5/380	To Suit	007-311A-QX-C7	078-311J-QX-C6
3 / 3	5/480	To Suit	007-311A-QT-C7	078-311J-QT-C6

2½ element, transformer rated, 50/60 Hz, taut band, integral transducer				
3 / 4	5/120	To Suit	007-311UA-QL-C7	078-311UJ-QL-C6
3 / 4	5/208	To Suit	007-311UA-QR-C7	078-311UJ-QR-C6
3 / 4	5/480	To Suit	007-311UA-QT-C7	078-311UJ-QT-C6

Specify Current Transformer and Voltage Transformer and Preferred Scale

AC POWER FACTOR METERS (BALANCED LOAD)

Phase/ Wire	Amp/ Volt	Scale	Standard Case Catalog Number	4½" Square Flange Hi-Shock Case Catalog Number
1 / 2	5/120	0.5-1-0.5	007-425A-QQAD-C6	078-425J-QQAD-C6
1 / 2	5/240	0.5-1-0.5	007-425A-QSAD-C6	078-425J-QSAD-C6
3 / 3 or 4	5/120	0.5-1-0.5	007-427A-QQAD-C6	078-427J-QQAD-C6
3 / 3 or 4	5/208	0.5-1-0.5	007-427A-QRAD-C6	078-427J-QRAD-C6
3 / 3 or 4	5/240	0.5-1-0.5	007-427A-QSAD-C6	078-427J-QSAD-C6
3 / 3 or 4	5/480	0.5-1-0.5	007-427A-QTAD-C6	078-427J-QTAD-C6

Power Factor meters may be used on loads down to 20% of current rating and between 90% and 110% of voltage rating.



Features three neon bulbs for phase indication and two neon bulbs to indicate either correct or incorrect phase sequence.

Burden 2.5VA

◀ **007-12PA**

AC PHASE SEQUENCE INDICATORS

Volts	Hz	Standard Case Catalog Number
100-150V	50/60 Hz	007-12PA-P2C6
151-300V	50/60 Hz	007-12PA-P3C6
301-500V	50/60 Hz	007-12PA-P4C6

Crompton Digital/Analog Switchboard Meters



- Rugged taut band construction
- 3½ digit LED display
- Wide selection of inputs
- Standard ANSI 4½" switchboard mounting

◀ 007-DI

Many standard ranges not shown.
*Custom scales and custom ranges on request.

SPECIFICATIONS

Display:	250° analog, 0.3" high digital
Response:	2.5 seconds to FS analog, update 1/sec digital
Input:	DCV: 1Mohm input impedance DCA: 200mV drop at FS ACV: 1kohm/V ACA: mA ranges 200mV drop, 1-10A use internal CT
Burden:	3VA @ 60Hz
Overload:	1.2x continuous, 1.5x for 10 sec.
Enclosure:	IP54 front (IP55 with panel gasket)
Dielectric Withstand:	2000 VAC for 1 Minute
Operating Temperature:	0°C to 60°C
Size (H x W x D):	4.3" x 4.3" x 3.4" (Add 1"D for terminals)

AC AMMETERS DIRECT READING (40-70Hz)

Digital accuracy ±0.1% ±1 counts, analog accuracy ±1%.

Rating	Scaling*	Catalog No.
1A	0-1A	007-DIBA-LALA-C6-**
1.5A	0-1.5A	007-DIBA-LCLC-C6-**
2A	0-2A	007-DIBA-LELE-C6-**
3A	0-3A	007-DIBA-LJLJ-C6-**
5A	0-4A	007-DIBA-LSLS-C6-**
8A	0-5A	007-DIBA-MJMJ-C6-**
10A	0-10A	007-DIBA-MTMT-C6-**

AC AMMETERS TRANSFORMER RATED (40-70Hz)

Digital accuracy ±0.1% ±1 counts, analog accuracy ±1%.

Rating	Scaling*	Catalog No.
5A	0-15A	007-DIBA-LSND-C6-**
5A	0-20A	007-DIBA-LSNG-C6-**
5A	0-25A	007-DIBA-LSNJ-C6-**
5A	0-30A	007-DIBA-LSNL-C6-**
5A	0-50A	007-DIBA-LSNT-C6-**
5A	0-75A	007-DIBA-LSPB-C6-**
5A	0-100A	007-DIBA-LSPK-C6-**
5A	0-150A	007-DIBA-LSPZ-C6-**
5A	0-200A	007-DIBA-LSRL-C6-**
5A	0-250A	007-DIBA-LSRS-C6-**
5A	0-300A	007-DIBA-LSRX-C6-**
5A	0-500A	007-DIBA-LSSF-C6-**
5A	0-600A	007-DIBA-LSSJ-C6-**
5A	0-750A	007-DIBA-LSSM-C6-**
5A	0-1000A	007-DIBA-LSSS-C6-**
5A	0-1200A	007-DIBA-LSSU-C6-**
5A	0-1500A	007-DIBA-LSTC-C6-**
5A	0-1600A	007-DIBA-LSTE-C6-**

Add power supply suffix to catalog number:

AC VOLTMETERS DIRECT READING (40-70Hz)

Digital accuracy ±0.1% ±3 counts, analog accuracy ±1%.

Rating	Scaling*	Catalog No.
200mV	0-200mV	007-DIWA-KAKA-C6-**
250mV	0-250mV	007-DIWA-KDKD-C6-**
500mV	0-500mV	007-DIWA-KMKM-C6-**
1V	0-1V	007-DIWA-LALA-C6-**
5V	0-5V	007-DIWA-LSLS-C6-**
10V	0-10V	007-DIWA-MTMT-C6-**
15V	0-15V	007-DIWA-NDND-C6-**
30V	0-30V	007-DIWA-NLNL-C6-**
150V	0-150V	007-DIWA-PZPZ-C6-**
250V	0-250V	007-DIWA-RSRS-C6-**
300V	0-300V	007-DIWA-RXRX-C6-**
500V	0-500V	007-DIWA-SFSF-C6-**
600V	0-600V	007-DIWA-SJSJ-C6-**

AC VOLTMETERS TRANSFORMER RATED (40-70Hz)

Rating	Scaling*	Catalog No.
150V	0-300V	007-DIWA-PZRX-C6-**
150V	0-600V	007-DIWA-PZSJ-C6-**
150V	0-750V	007-DIWA-PZSM-C6-**
150V	0-3000V	007-DIWA-PZUA-C6-**
150V	0-6000V	007-DIWA-PZUP-C6-**

DC VOLTMETERS - DIRECT READING

Digital accuracy ±0.5% ±1 counts, analog accuracy ±1%.

Rating	Scaling*	Catalog No.
200mV	0-200mV	007-DIVA-KAKA-**
1V	0-1V	007-DIVA-LALA-**
5V	0-5V	007-DIVA-LSLS-**
10V	0-10V	007-DIVA-MTMT-**
150V	0-150V	007-DIVA-PZPZ-**
300V	0-300V	007-DIVA-RXRX-**
600V	0-600V	007-DIVA-SJSJ-**
150-0-150V	150-0-150V	007-DINA-RXRX-**
300-0-300V	300-0-300V	007-DINA-SJSJ-**
600-0-600V	600-0-600V	007-DINA-SUSU-**

DC AMMETERS - DIRECT READING

Rating	Scaling*	Catalog No.
1mA	0-1mA	007-DIAA-FAFA-**
10mA	0-10mA	007-DIAA-GZGZ-**
20mA	0-20mA	007-DIAA-HFHF-**
50mA	0-50mA	007-DIAA-HYHY-**
100mA	0-100mA	007-DIAA-JRJR-**
200mA	0-200mA	007-DIAA-KAKA-**
500mA	0-500mA	007-DIAA-KMKM-**
1A	0-1A	007-DIAA-LALA-**

Shunt rated & suppressed zero DC Ammeters also available.

** POWER SUPPLY

MU - 12 Volts DC ±15%	PQ - 120 Volts AC ±15%
BD - 24 Volts DC ±15%	A2 - 12-48 Volts DC
NR - 48 Volts DC ±15%	A5 - 120-250 Volts AC/DC
PR - 120 Volts DC ±15%	
PS - 125 Volts DC ±15%	

Weschler Analog Edgewise and Panel Meters

Type 252 edgewise instruments were designed specifically for the nuclear power industry. Their ruggedness and reliability make them an excellent choice for any control panel. These instruments incorporate the same taut-band suspension system that is used in the Weschler switchboard meters.

They are available for direct measurement of standard electrical quantities, or in combination with transducers for measuring any other electrical or mechanical quantity that can be converted into a proportional electrical quantity.

SPECIFICATIONS

The V252 & H252 Meters exceed the requirements for the 2% class specified in ANSI C39.1, and may be calibrated to 1% initial accuracy. They meet the flammability requirements of IEEE Standard 420-1973 and they have passed the seismic qualification tests under IEEE Standard 344-1987.

Accuracy	1 1/2% of full scale deflection, 1% on special order.
Waveform Compensation	to 15% of third harmonic content.
Instantaneous Overload	35x AC rating, 100x DC rating
Voltage to Ground	1200V dc or peak ac, 800 volts ac rms
Shielding	Magnetically shielded
Net Weight	1 1/2 pound
Input	self-contained
DC	50µA to 50A 50mV to 750V
AC	10mA to 20A 5V to 600V

Transducer-type frequency meters, varmeter, wattmeters and power factor meters are available.

MECHANISM

The DC instrument is of the permanent magnet moving-coil type in a core magnet construction. For ac measurement the same mechanism is used, but rectifiers and an rms network are added. This design is practically immune to the effects of magnetic fields from adjacent conductors regardless of their orientation.

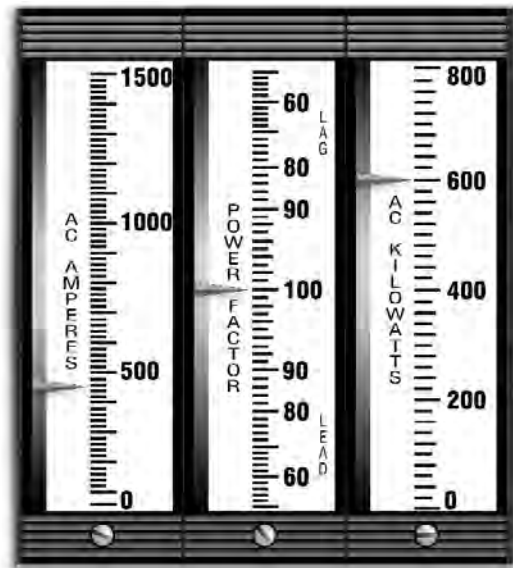
CONSTRUCTION

All components are mounted on a plastic drawer which slides into a plastic case with a clear, curved window. The entire assembly is treated to be static free. The plastic is polycarbonate (ASTM D635) for impact strength and flame retardance. Pointer edge and dial markings are on the same arc so that there is no parallax error. Instruments may be stacked horizontally or vertically.

See more information online at weschler.com/analog

MODIFICATIONS AVAILABLE

- Internal illumination
- Non-glare window
- Dual scale or rating
- Straight fine tubular pointer
- Offset, center, or suppressed zero
- Gasketed construction



▲ 252 Edgewise ▼

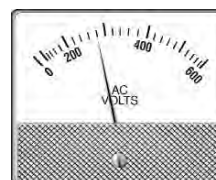


ALSO AVAILABLE:

351/371 panel ▼



Airpax panel ▼



▲ 20/20 panel



▲ 221/251

Yokogawa Edgewise Switchboard Meters

SPECIFICATIONS

Accuracy Class Standard:	±1.5% of FS span AC horizontal; ±2% for AC vertical
Repeatability:	±2% of FS
Operating Environment Temp.:	-4°F to 150°F (-20°C to 65°C)
Panel Mounting:	Vertical or Horizontal
Case Size:	2.294" H x 6.040" W x 5.765" D
Panel Cutout:	1.791" x 5.695"
AC Amperes	
Type:	Iron-Vane
Frequency:	40/70 Hz
AC Volts	
Type:	Iron-Vane
Frequency:	60 Hz

DC AMPERES ORDERING GUIDE

Rating	Scale	Vertical	Horizontal
1-5 mA	**	180 183 FYAA 8ABA	180 181 FYAA 8ABA
4-20 mA	**	180 183 HEAA 8ABA	180 181 HEAA 8ABA
10-50 mA	**	180 183 HXAA 8ABA	180 181 HXAA 8ABA

DC Amperes

Scale/ Rating	Terminal Resistance	Vertical	Horizontal
0-50 µA	4735	180 113 CYCY	180 111 CYCY
0-100 µA	1480	180 113 DRDR	180 111 DRDR
0-500 µA	226	180 113 EMEM	180 111 EMEM
0-1 mA	40	180 113 FAFA	180 111 FAFA
0-10 mA	5.0	180 113 GZGZ	180 111 GZGZ
0-500 mA	0.10	180 113 KMKM	180 111 KMKM
0-1A	0.05	180 113 LALA	180 111 LALA
0-5A	0.010	180 113 LSLS	180 111 LSLS
0-10A	0.005	180 113 MTMT	180 111 MTMT
0-30A	0.001	180 113 NLNL	180 111 NLNL
0-50A	0.001	180 113 NTNT	180 111 NTNT

DC Ammeters-50mV Shunt Rated

Scale/ Rating	Terminal Resistance	Vertical	Horizontal
0-10	12.5	180 123 ECMT	180 121 ECMT
0-30	12.5	180 123 ECNL	180 121 ECNL
0-60	12.5	180 123 ECNW	180 121 ECNW
0-100	12.5	180 123 ECPK	180 121 ECPK
0-300	12.5	180 123 ECRL	180 121 ECRL
0-500	12.5	180 123 ECSC	180 121 ECSC
0-1KA	12.5	180 123 ECVA	180 121 ECVA

DC Volts-1000 Ω/Volt

Rating/ Scale	Terminal Resistance	Vertical	Horizontal
0-1	1000	180 013 LALA	180 011 LALA
0-5	5000	180 013 LSLS	180 011 LSLS
0-15	15000	180 013 NDND	180 011 NDND
0-50	50000	180 013 NTNT	180 011 NTNT
0-150	150000	180 013 PZPZ	180 011 PZPZ
0-300	300000	180 013 RXRX	180 011 RXRX
0-600	600000	180 013 SJSJ	180 011 SJSJ
150-0-150	150000	180 014 PZPZ	180 012 PZPZ
300-0-300	300000	180 014 RXRX	180 012 RXRX

180



ANALOG METERS

AC AMPERES ORDERING GUIDE

AC Amperes—50/70 Hz, Iron Vane

Scale	Transformer Rating	±2% Accuracy Vertical	±1.5% Accuracy Horizontal
0-1A		180 143 LALA	180 141 LALA
0-5A	Self-	180 143 LSLS	180 141 LSLS
0-10A	Contained	180 143 MTMT	180 141 MTMT
0-20A		180 143 NGNG	180 141 NGNG
0-30A		180 143 NLNL	180 141 NLNL
0-50A		180 143 NTNT	180 141 NTNT

AC Amperes Transformer Rated, 5A

0-10A	10/5	180 143 LSMT	180 141 LSMT
0-25A	25/5	180 143 LSNJ	180 141 LSNJ
0-50A	50/5	180 143 LSNT	180 141 LSNT
0-75A	75/5	180 143 LSPB	180 141 LSPB
0-100A	100/5	180 143 LSPK	180 141 LSPK
0-150A	150/5	180 143 LSPZ	180 141 LSPZ
0-200A	200/5	180 143 LSRL	180 141 LSRL
0-400A	400/5	180 143 LSSC	180 141 LSSC
0-500A	500/5	180 143 LSSF	180 141 LSSF
0-1 kA	1000/5	180 143 LSVA	180 141 LSVA
0-1.2 kA	1200/5	180 143 LSVB	180 141 LSVB
0-1.5 kA	1500/5	180 143 L SVC	180 141 L SVC

AC Voltmeters—60 Hz, Iron-Vane Type

0-150V		180 033 PZPZ	180 031 PZPZ
0-300V	Self-	180 033 RXRX	180 031 RXRX
0-500V	Contained	180 033 SFSF	180 031 SFSF
0-600V		180 033 SJSJ	180 031 SJSJ

AC Voltmeters—Transformer-Rated, 150 Volt

0-300	240/120	180 033 PZRX	180 031 PZRX
0-600	480/120	180 033 PZSJ	180 031 PZSJ
0-750	600/120	180 033 PZSM	180 031 PZSM
0-3 KV	2400/120	180 033 PZVJ	180 031 PZVJ
0-5.25 KV	4200/120	180 033 PZVW	180 031 PZVW
0-6 KV	4800/120	180 033 PZVX	180 031 PZVX

Yokogawa Edgewise Panel Meters

- DC & AC Meters
- Four Display Sizes: 1½", 2", 2½" and 3½"
- Horizontal or Vertical Orientation
- Meets ANSI C-39.1
- Shielded, Dust Tight Case (Model 185)
- Stackable Mounting



▲ **185 - 3 Stack Mounted**



▲ **280 Series - 3 Sizes**

ORDERING INFORMATION

Use Ordering Code Guide to complete Part #. Insert Model Code in box [1] and Orientation in box [2].

DC Ammeters - Zero Left, self-contained

50 μA	[1] 11 [2] CYCY
100 μA	[1] 11 [2] DRDR
200 μA	[1] 11 [2] EAEA
500 μA	[1] 11 [2] EMEM
1 mA	[1] 11 [2] FAFA
5 mA	[1] 11 [2] FAFX
10 mA	[1] 11 [2] GZGZ
20 mA	[1] 11 [2] HFHF
25 mA	[1] 11 [2] HJHJ
50 mA	[1] 11 [2] HYHY
100 mA	[1] 11 [2] JRJR
250 mA	[1] 11 [2] KDKD
300 mA	[1] 11 [2] KGKG
500 mA	[1] 11 [2] KMKM
1 Amp	[1] 11 [2] LALA
1.5 Amp	[1] 11 [2] LCLC
2 Amp	[1] 11 [2] LELE
3 Amp	[1] 11 [2] LJLJ
5 Amp	[1] 11 [2] LSLS
10 Amp	[1] 11 [2] MTMT **

DC Ammeters - Zero Center, self-contained

50-0-50 μA	[1] 11 [2] CYCY
100-0-100 μA	[1] 11 [2] DRDR
500-0-500 μA	[1] 11 [2] EMEM
1-0-1 mA	[1] 11 [2] FAFA
5-0-5 mA	[1] 11 [2] FAFX
50-0-50 mA	[1] 11 [2] HYHY
5-0-5 Amp	[1] 11 [2] LSLS

DC Ammeters - Zero Left, 50mV Shunt Rated (Lead Resistance: 0.05-0.07Ω)

Scale:	
1 Amp	[1] 12 [2] ECLA
5 Amp	[1] 12 [2] ECLS
10 Amp	[1] 12 [2] ECMT
20 Amp	[1] 12 [2] ECNG
50 Amp	[1] 12 [2] ECNT
300 Amp	[1] 12 [2] ECRX
500 Amp	[1] 12 [2] ECSF

DC Ammeters - Zero Left, 100mV Shunt Rated (Lead Resistance: 0.05-0.07Ω)

Scale:	
1 Amp	[1] 12 [2] GBLA
5 Amp	[1] 12 [2] GBLS
10 Amp	[1] 12 [2] GBMT
20 Amp	[1] 12 [2] GMNG
50 Amp	[1] 12 [2] GBNT
300 Amp	[1] 12 [2] GBRX
500 Amp	[1] 12 [2] GBSF

SPECIFICATIONS

Model	185	286	287	288
Nominal Size	2"	1½"	2½"	3½"
Face Dimensions	0.92" x 2.258"	0.498" x 1.719"	0.673" x 2.645"	0.673" x 3.525"
Bezel Dimensions	1.255" x 3.025"	0.77" x 2.075"	0.99" x 3.015"	0.99" x 3.89"
Depth behind panel (incl studs)	3.3"	2.47"	3.42"	3.21"
Cutout (single)	0.94" x 2.286"	0.5" x 1.650"	0.687" x 2.580"	0.687" x 3.460"
Scale Length	1.78"	1.25"	1.93"	2.70"
Dielectric Rating RMS	1800V	1500V	1500V	2600V
Overshoot (max)	40%	25%	40%	40%
Accuracy	2% DC, 3% AC @ 60Hz sine			
Response Time	2 sec for DC & 2.5 sec for AC, except 3 sec for μA			
Overload	185: Voltmeter 50% momentary, 20% sustained; Ammeter 900% momentary, 20% sustained 280 Series: DC Voltmeter 20% momentary & sustained; DC Ammeter 20% sustained			

DC Voltmeters - Zero Left 1000Ω/V

10 Volts	[1] 01 [2] MTMT
15 Volts	[1] 01 [2] NDND
30 Volts	[1] 01 [2] NLNL
50 Volts	[1] 01 [2] NTNT
100 Volts	[1] 01 [2] PKPK
150 Volts	[1] 01 [2] PZPZ
200 Volts	[1] 01 [2] RLRL *
300 Volts	[1] 01 [2] RXRX *

DC Voltmeters - Zero Left, Rated 0-1mADC

(for use with External Resistor—not included)

Scale:	
500 Volts	[1] 17 [2] FASF
600 Volts	[1] 17 [2] FASJ
750 Volts	[1] 17 [2] FASM

DC Voltmeters - Zero Center, self-contained

(1000Ω/V except 2000Ω/V in Model 185)

15-0-15 Volts	[1] 01 [2] NDND
30-0-30 Volts	[1] 01 [2] NLNL
50-0-50 Volts	[1] 01 [2] NTNT
150-0-150 Volts	[1] 01 [2] PZPZ *

AC Voltmeters - Zero Left, Rectifier Type 1000Ω/V

10 Volts	[1] 05 [2] MTMT
15 Volts	[1] 05 [2] NDND
30 Volts	[1] 05 [2] NLNL
50 Volts	[1] 05 [2] NTNT
100 Volts	[1] 05 [2] PKPK
150 Volts	[1] 05 [2] PZPZ

AC Ammeters - Zero Left, Rectifier Type

500 μA	[1] 15 [2] EMEM
1 mA	[1] 15 [2] FAFA
5 mA	[1] 15 [2] FAFX
10 mA	[1] 15 [2] GZGZ
20 mA	[1] 15 [2] HFHF

* Not available in 1½"

** Model 185 only

ORDERING CODE GUIDE

[1] Insert Model Number:	
185	2" Edgewise
286	1½" Edgewise
287	2½" Edgewise
288	3½" Edgewise
[2] Insert Orientation:	
Zero Left Meters:	
1	Horizontal
3	Vertical
Zero Center Meters:	
2	Horizontal
4	Vertical

OPTIONS

Custom Scaling
Non-standard Ranges
Pointer Color
Color Bands
External Resistor
Bezel Mounting Kit (Model 185)
Stacked Mounting

Bezel & mounting hardware included with 280 Series. Order separately for Model 185.

International Instruments Edgewise Panel Meters

3 1/2" and 6" Switchboard Meters

- Accuracy: $\pm 1.5\%$ (1151/1251)
- Single (1146/1151) or Dual Indicators (1246/1251)
- Rugged Construction
- Flush Stacking
- EMI Shielded
- Illumination Available

Single/Dual Models

1151/1251 and 1146/1246

These meters were initially developed to meet the demanding specifications of the Atomic Energy Commission with respect to seismic qualifications, long-life and high accuracy. The resulting product line is the most rugged and reliable available. Models 1146 and 1246 are 3 1/2 inch meters, 1151 and 1251 6-inch models, both series of instruments manufactured of modern black plastic with a design compatibility that makes them perfectly suited for use together on the same panel board. Windows are tough clear Lexan®.


1151 ▲

1251 ▲

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.

Order Example: 1151-V-B-ACA 0-5/0-300

1251-V-B-ACV 0-150/0-600/B-ACA 0-5/0-400

Single A-B-C-D

Dual A-B-C-D-C-D-C-D

A - B - C - D

A	Model				
	1151	6" Single			
	1251	6" Dual			
	1146	3 1/2" Single			
	1246	3 1/2" Dual			
B	Orientation				
	H	Horizontal			
	V	Vertical			
C	Zero Position				
		Horizontal		Vertical	
		L	Left	T	Top
		C	Center	C	Center
		R	Right	B	Bottom
D	Standard Ranges, All Models				
	AC Volts		AC Amperes		
	0-10, 15, 25, 50, 150, 300, 500		0-5		
	DC Volts		DC Amperes		
	0-5, 10, 15, 25, 30, 50, 100, 150, 200, 300, 500		0-1, 2, 5, 10, 15, 25, 50, 100*		
	DC Microamperes		DC Milliamperes		
	0-50, 100, 200, 300, 400, 500		0-1, 2, 3, 4, 5, 10, 20, 50, 100, 200, 500, 4-20, 10-50		

*=50mV shunt rated

SPECIFICATIONS

	1146/1246	1151/1251
Accuracy (% of FS)	DC:2 AC:3	DC:1.5 AC:2.5
Repeatability	In Accordance with ANSI C39.1	
Overload	In Accordance with ANSI C39.1	
Response Time (sec. max.)	3.0	2.5
Dielectric Strength (VRMS 60 Hz/1 min)	2600	
Overshoot (max)	40%	20%
Terminals (variations available)	Threaded stud (10-32)	Threaded stud (1/4-28)
Scale length-inches (mm)	2.7(68.6)	4.5(114.3)
Zero adjustment	Yes	Yes
Pointer (other colors available)	Red Delta	
Weight (oz)	1146.8/1246:10	1151:25/1251:30

OPTIONS

Factory Scaling—Custom Scaling (Specify)
Factory Ranging
Illumination—1151 & 1251 Only
Adjustable Potentiometer—Voltmeters Only
Zero Center
Colored Bands—Price Per Color

Also available: 1 1/2", 2 1/2" & 3 1/2" Edgewise Meters

International Instruments Thin Panel Meters



4" Edgewise Meters

- Compact Design for High Density Installations
- Rugged Construction
- Flush Stacking
- EMI Shielded
- Vertical or Horizontal Styles

◀ **1140**

SPECIFICATIONS

Accuracy:	±2% of full scale
Repeatability:	In Accordance with ANSI C39.1
Overload:	In Accordance with ANSI C39.1
Response Time:	2 sec. max.
Dielectric Strength:	500VRMS 60 Hz/1 min
Overshoot:	20% max
Terminals:	Solder terminals (variations available)
Scale length:	3.7"
Zero adjustment:	Optional
Pointer:	Red standard, other colors on request
Enclosure:	Steel housing with internal magnetic shield
Dimensions:	0.515"W × 5.094"H × 4.52" behind panel
Panel Cutout:	0.54" × 4.75"

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: 1140-V-B-DCmA 0-5/0-300

A - B - C - D / E

A	Model			
	1140	4" Ultra-Thin Edgewise		
B	Orientation			
	H	Horizontal		
	V	Vertical		
C	Zero Position			
	Horizontal		Vertical	
	L	Left	T	Top
	C	Center	C	Center
	R	Right	B	Bottom
D	Standard Ranges			
	DC Volts	DC Amps	DC Microamps	DC Milliamps
	0-5, 10, 15,	0-1, 2, 5, 10,	0-50, 100, 200,	0-1, 2, 3, 4, 5,
	25, 30, 50,	15, 25, 50,	300, 400, 500	10, 20, 50, 100,
	100, 150, 200,	100*, 200*		200, 500, 4-20
	300, 500			
E	Scale			
	No entry: Scale matches meter range			
	Custom: Specify scale and legend			

*=50mV shunt rated

AC Voltmeters and Ammeters also available

Yokogawa ToughMeter Analog Panel Meters

Designed to Operate in Harsh Environments

- Metal Case and Polycarbonate Window
- Gasket Sealed Bezel
- Dust & Moisture Protection on Terminals & Zero Adjust
- IP66 Environmental Rating
- Made in the USA



270

SPECIFICATIONS

Case Size	2 1/2"	3 1/2"
Size (dia x depth)	2.70" x 1.88"	3.50" x 1.88"
Cutout (dia)	2.23"	2.55"
Mounting studs	4-40 on 2.44" BCD x3	4-40 on 3.16" BCD x3
Terminals	1/4" - 28	1/4" - 28
Accuracy	±2% DC, ±3% AC	
Repeatability	±2%	
Overload	120% continuous	
Overshoot	10% max	
Response Time	2 sec max	
Vibration Sine	3G 10-80 Hz	
Vibration Random	3G (P&J), 5G (TB) 10-1000 Hz	
Shock	50G	
Operating Temperature	-45 to +70°C	

Vibration, temperature and environmental specifications exceed ANSI C39.1

ORDERING INFORMATION

Use Ordering Code Guide to complete Part #. Insert Model Code in box [1] and Case Sizes in box [2].
Example: 270220LSLS is taut band, 2 1/2" meter, 5VDC.

DC Ammeters - Zero Left

20 µA	[1][2]	00CFCF
50 µA	[1][2]	00CYCY
100 µA	[1][2]	00DRDR
1 mA	[1][2]	00FAFA
2 mA	[1][2]	00FGFG
4 mA	[1][2]	00FSFS
500 mA	[1][2]	00KMKM
4-20 mA	[1][2]	00HEHE

DC Ammeters - Zero Left, 50 mV Shunt Rated (Lead Resistance 0.05-0.07Ω)

20 A	[1][2]	24ECNG
30 A	[1][2]	24ECNL
50 A	[1][2]	24ECNT
75 A	[1][2]	24ECPB
100 A	[1][2]	24ECPK
150 A	[1][2]	24ECPZ
200 A	[1][2]	24ECRL
250 A	[1][2]	24ECRS
300 A	[1][2]	24ECRX
400 A	[1][2]	24ECSC
500 A	[1][2]	24ECSF
600 A	[1][2]	24ECSJ
800 A	[1][2]	24ECSN
1.0 kA	[1][2]	24ECVA
1.5 kA	[1][2]	24ECVC
2.0 kA	[1][2]	24ECVE

DC Voltmeters - Zero Left

1 V	[1][2]	24GBGB
5 V	[1][2]	20LSLS
10 V	[1][2]	20MTMT
15 V	[1][2]	20NDND
30 V	[1][2]	20NLNL
50 V	[1][2]	20NTNT
80 V	[1][2]	20PDPD
100 V	[1][2]	20PKPK
150 V	[1][2]	20PZPZ
200 V	[1][2]	20RLRL
300 V	[1][2]	20RXRX
500 V	[1][2]	20SF SF
600 V	[1][2]	20SJSJ

AC Ammeters - Self-Contained, Iron Vane

1 A	271 [2]	40LALA
5 A	271 [2]	40LSLS

AC Ammeters - Transformer Rated, 0-5A Iron Vane

Scale		
50 A	271 [2]	40LSNT
75 A	271 [2]	40LSPB
100 A	271 [2]	40LSPK
150 A	271 [2]	40LSPZ
200 A	271 [2]	40LSRL
300 A	271 [2]	40LSRX
500 A	271 [2]	40LSSF
600 A	271 [2]	40LSSJ
800 A	271 [2]	40LSSN
1000 A	271 [2]	40LSSS
1500 A	271 [2]	40LSTC
2000 A	271 [2]	40LSTM

AC Voltmeters - Iron Vane

10 V	271 [2]	44MTMT
15 V	271 [2]	44NDND
25 V	271 [2]	44NJNJ
50 V	271 [2]	44NTNT
100 V	271 [2]	44PKPK
150 V	271 [2]	44PZPZ
300 V	271 [2]	44RXRX
500 V	271	3 44SF SF
600 V	271	3 44SJSJ

AC Voltmeters - Transformer Rated, 0-150V Iron Vane

Scale		
600 V	271 [2]	44PZSJ
750 V	271 [2]	44PZSM
3000 V	271 [2]	44PZVJ

AC Ammeters - Rectifier type

1 mA	[1][2]	10FAFA
2 mA	[1][2]	10FGFG
5 mA	[1][2]	10FXFX
10 mA	[1][2]	10GZGZ
20 mA	[1][2]	10HFHF
50 mA	[1][2]	10HYHY
100 mA	[1][2]	10JRJR
500 mA	[1][2]	10KMKM
1 A	[1][2]	10LALA
5 A	[1][2]	10LSLS

AC Voltmeters - Rectifier type

10 V	[1][2]	30MTMT
15 V	[1][2]	30NDND
25 V	[1][2]	30NJNJ
50 V	[1][2]	30NTNT
100 V	[1][2]	30PKPK
150 V	[1][2]	30PZPZ
300 V	[1][2]	30RXRX

OPTIONS

- Zero Center (DC meters)
- Custom Scaling
- Non-standard Ranges
- Color Bands

ORDERING CODE GUIDE

[1] Insert Model Number

270	Taut Band
271	Pivot & Jewel

[2] Insert Case Size

2	2 1/2 inches
3	3 1/2 inches

Yokogawa DC Current & Voltage Meters

Horizon Line and Big Look Series

- Accuracy: $\pm 2\%$ of Full Scale
- Meets ANSI C-39.1
- Four Display Sizes: 1½", 2½", 3½", and 4½"
- Severe Duty Meters Optional (2½" to 4½") to Meet UL1437

ORDERING INFORMATION

Use Ordering Code Guide to complete Part #. Insert Model Code in box 1 and Case Size in box 2.

DC Ammeters—Zero Left

1 Amp	1 2	OOLALA
1.5 Amp	1 2	OOLCLC
2 Amp	1 2	OOLELE
3 Amp	1 2	OOLJLJ
5 Amp	1 2	OOLSLS
10 Amp	1 2	OOMTMT
15 Amp	1 2	OONDND
20 Amp	1 2	OONGNG*
30 Amp	1 2	OONLNL*
50 Amp	1 2	OONTNT**

DC Ammeters—Zero Center

1-0-1 Amp	1 2	O1LALA
2-0-2 Amp	1 2	O1LELE
5-0-5 Amp	1 2	O1LSLS
10-0-10 Amp	1 2	O1MTMT
15-0-15 Amp	1 2	O1NDND*
20-0-20 Amp	1 2	O1NGNG*
30-0-30 Amp	1 2	O1NLNL*
50-0-50 Amp	1 2	O1NTNT**

DC Ammeters—Zero Left, 50mV, Shunt Rated (Lead Resistance Range: .05-.07 Ohm)

Scale Only

20 Amp	1 2	24ECNG
30 Amp	1 2	24ECNL
50 Amp	1 2	24ECNT
75 Amp	1 2	24ECPB
100 Amp	1 2	24ECPK
150 Amp	1 2	24ECPZ
200 Amp	1 2	24ECRL
250 Amp	1 2	24ECRS
300 Amp	1 2	24ECRX
400 Amp	1 2	4ECSC
500 Amp	1 2	24ECSF
600 Amp	1 2	24ECSJ
800 Amp	1 2	24ECSN
1 Kiloamp	1 2	24ECVA
1.5 Kiloamp	1 2	24ECVC
2 Kiloamp	1 2	24ECVE

* Not available in 1½"

** Not available in 1½" and 2½"

SPECIFICATIONS

Model	251/255			
Case Size	1½"	2½"	3½"	4½"
Size (H x W x D)	1.86" x 2.19" x 1.34"	2.66" x 3.12" x 1.81"	3.32" x 3.89" x 1.83"	4.18" x 4.73" x 1.83"
Barrel (cutout)	1.53"	2.19"	2.72"	2.72"
Window (cutout)	1.05" x 2.18"	1.45" x 3.11"	1.84" x 3.88"	2.22" x 4.72"
Model	250/254			
Case Size	1½"	2½"	3½"	4½"
Size (H x W x D)	1.76" x 1.76" x 1.34"	2.69" x 2.69" x 1.85"	3.50" x 3.50" x 1.85"	4.41" x 4.85" x 1.85"
Barrel (cutout)	1.53"	2.17"	2.72"	2.72"
Scale Length	1.40"	2.06"	2.88"	3.93"
Accuracy	2%			
Repeatability	$\pm 0.5\%$			
Response Time	2 sec. (3 sec. on μA)			
Operating Temperature	0-40°C			
Storage Temperature	-10°C-50°C			
Dielectric	2600V for 1 min. (Otherwise per ANSI except 1½" size 1500V)			

ORDERING INFORMATION

DC Voltmeters—Zero Left

1.0 Volts	1 2	20LALA
1.5 Volts	1 2	20LCLC
3 Volts	1 2	20LJLJ
5 Volts	1 2	20LSLS
8 Volts	1 2	20MJMJ
10 Volts	1 2	20MTMT
15 Volts	1 2	20NDND
30 Volts	1 2	20NLNL
40 Volts	1 2	20PNPN
50 Volts	1 2	20TNTNT
80 Volts	1 2	20PDPD
100 Volts	1 2	20PKPK
150 Volts	1 2	20PZPZ
200 Volts	1 2	20RLRL
250 Volts	1 2	20RSRS
300 Volts	1 2	20RXRX
500 Volts	1 2	20SFSF**
600 Volts	1 2	20SJSJ**

DC Voltmeters—Zero Left, Rated 0-1mADC (for use with External Resistor—not included)

Scale Only

500 Volts	1 2	04FASF
600 Volts	1 2	04FASJ
750 Volts	1 2	04FASM

DC Voltmeters—Zero Center

5-0-5 Volts	1 2	21LSLS
10-0-10 Volts	1 2	21MTMT
30-0-30 Volts	1 2	21NLNL
50-0-50 Volts	1 2	21NTNT
80-0-80 Volts	1 2	21PDPD
150-0-150 V	1 2	21PZPZ
300-0-300 V	1 2	21RXRX
500-0-500 V	1 2	21SFSF**
600-0-600 V	1 2	21SJSJ**

** Not available in 1½" and 2½"



Horizon 251/255



Big Look 250/254

ORDERING CODE GUIDE

1	Insert Model Number:	CASE AND MOVEMENT
	250	Big Look - Taut Band
	251	Horizon - Taut Band
	254	Big Look - Pivot & Jewel
2	Insert Case Size:	DISPLAY SIZE
	1	1½"
	2	2½"
	3	3½"
4	4½"	

OPTIONS (WHERE APPLICABLE)

Custom Scaling
Non-standard Ranges
1% Accuracy
Adjustable Potentiometer (Voltmeters Only)
Zero-Center
Color Bands
Bezel
Insulated Cap Nuts

Yokogawa DC Current & Voltage Meters

Stylist Series

- Accuracy: ±2% of Full Scale
- Meets ANSI C-39.1
- Four Display Sizes: 1½", 2½", 3½" and 4½"
- Severe Duty Meters Optional (2½" to 4½") to Meet UL1437
- Surface-Mount & Window-Mount Models

ORDERING INFORMATION

Use Ordering Code Guide to complete Part #. Insert Model Code in box [1] and Case Size in box [2].

DC Ammeters—Zero Left

10 microamp	[1][2]	00BZBZ
20 microamp	[1][2]	00CFCF
50 microamp	[1][2]	00CYCY
100 microamp	[1][2]	00DRDR
200 microamp	[1][2]	00EAEA
500 microamp	[1][2]	00EMEM
1 milliamp	[1][2]	00FAFA
2 milliamp	[1][2]	00FGFG
5 milliamp	[1][2]	00FXFX
10 milliamp	[1][2]	00GZGZ
20 milliamp	[1][2]	00HFHF
50 milliamp	[1][2]	00HYHY
100 milliamp	[1][2]	00JRJR
200 milliamp	[1][2]	00KAKA
500 milliamp	[1][2]	00KMKM
1 Amp	[1][2]	00LALA
1.5 Amp	[1][2]	00LCLC
2 Amp	[1][2]	00LELE
3 Amp	[1][2]	00LJLJ
5 Amp	[1][2]	00LSLS
10 Amp	[1][2]	00MTMT
15 Amp	[1][2]	00NDND*
20 Amp	[1][2]	00NGNG*
30 Amp	[1][2]	00NLNL*
50 Amp	[1][2]	00NTNT*

DC Ammeters—Zero Center

10-0-10 microamp	[1][2]	01BZBZ
25-0-25 microamp	[1][2]	01CJ CJ
50-0-50 microamp	[1][2]	01CYCY
100-0-100 microamp	[1][2]	01DRDR
500-0-500 microamp	[1][2]	01EMEM
1-0-1 milliamp	[1][2]	01FAFA
5-0-5 milliamp	[1][2]	01FXFX
10-0-10 milliamp	[1][2]	01GZGZ
25-0-25 milliamp	[1][2]	01HJHJ
50-0-50 milliamp	[1][2]	01HYHY
100-0-100 milliamp	[1][2]	01JRJR
200-0-200 milliamp	[1][2]	01KAKA
500-0-500 milliamp	[1][2]	01KMKM
1-0-1 Amp	[1][2]	01LALA
3-0-3 Amp	[1][2]	01LJLJ
5-0-5 Amp	[1][2]	01LSLS
10-0-10 Amp	[1][2]	01MTMT
15-0-15 Amp	[1][2]	01NDND*
25-0-25 Amp	[1][2]	01NJNJ*
50-0-50 Amp	[1][2]	01NTNT*

* Not available in 1½"

SPECIFICATIONS

Window Mount Models		261/265		
Case Size		2½"	3½"	4½"
Size (H x W x D)		2.29" x 3.01" x 2.10"	2.90" x 3.73" x 2.13"	4.60" x 5.18" x 2.13"
Zero cutout		0.228" dia.	0.228" dia.	0.228" dia.
Window cutout		1.27" x 2.90"	1.595" x 3.61"	2.345" x 5.02"
Surface Mount Models		260/264		
Case Size	1½"	2½"	3½"	4½"
Size (H x W x D)	1.75" x 1.75" x 1.55"	2.27" x 2.99" x 1.80"	2.87" x 3.70" x 1.80"	3.96" x 5.10" x 1.80"
Barrel cutout	1.55"	2.22"	2.82"	2.82"
Scale Length	1.66"	2.29"	2.85"	4.01"

Accuracy	2% of full scale
Overload	Voltmeters: 50% momentary, 20% sustained; Ammeters: 10x momentary, 20% sustained
Response Time	2 sec. max., except 3 sec. for microammeters
Dielectric	2600V for 1 min. except 1½" size 1500V
Standard	ANSI C-39.1 below 500V

Stylist 260

with custom color scale



DC Ammeters—Zero Left, 50mV, Shunt Rated

(Lead Resistance Range: .05-.07 Ohm)

Scale Only:

20 Amp	[1][2]	24ECNG
30 Amp	[1][2]	24ECNL
50 Amp	[1][2]	24ECNT
75 Amp	[1][2]	24ECPB
100 Amp	[1][2]	24ECPK
150 Amp	[1][2]	24ECPZ
200 Amp	[1][2]	24ECRL
250 Amp	[1][2]	24ECRS
300 Amp	[1][2]	24ECRX
500 Amp	[1][2]	24ECSF
750 Amp	[1][2]	24ECSM
1000 Amp	[1][2]	24ECSS
1500 Amp	[1][2]	24ECTC
2000 Amp	[1][2]	24ECTM

ORDERING CODE GUIDE

[1] Insert Model Number:	CASE and MOVEMENT
260	Surface Mount - Taut Band
261	Window Mount - Taut Band
264	Surface Mount - Pivot & Jewel
265	Window Mount - Pivot & Jewel
[2] Insert Case Size:	
1	1½"
2	2½"
3	3½"
4	4½"

Options: Color Bands, Mirrored Scale, Non-standard Ranges, Custom Scaling, Severe Duty, Bezel Mounting, Insulated Cap Nuts

DC Voltmeters—Zero Left

50 millivolts	[1][2]	24ECEC
100 millivolts	[1][2]	24GBGB
1.0 Volts	[1][2]	20LALA
1.5 Volts	[1][2]	20LCLC
3 Volts	[1][2]	20LJLJ
5 Volts	[1][2]	20LSLS
8 Volts	[1][2]	20MJMJ
10 Volts	[1][2]	20MTMT
15 Volts	[1][2]	20NDND
30 Volts	[1][2]	20NLNL
40 Volts	[1][2]	20NPNP
50 Volts	[1][2]	20NTNT
80 Volts	[1][2]	20PDPD
100 Volts	[1][2]	20PKPK
150 Volts	[1][2]	20PZPZ
200 Volts	[1][2]	20RLRL
250 Volts	[1][2]	20RSRS
300 Volts	[1][2]	20RXRX
500 Volts	[1][2]	20SFSF
600 Volts	[1][2]	20SJSJ
750 Volts	[1][2]	20SMSM
1000 Volts	[1][2]	20SSSS

DC Voltmeters—Zero Left, Rated 0-1mADC

(for use with External Resistor—not included)

Scale Only:

500 Volts	[1][2]	04FASF
600 Volts	[1][2]	04FASJ
750 Volts	[1][2]	04FASM

DC Voltmeters—Zero Center

50-0-50 millivolts	[1][2]	25ECEC
100-0-100 millivolts	[1][2]	25GBGB
5-0-5 Volts	[1][2]	21LSLS
10-0-10 Volts	[1][2]	21MTMT
30-0-30 Volts	[1][2]	21NLNL
50-0-50 Volts	[1][2]	21NTNT
80-0-80 Volts	[1][2]	21PDPD
150-0-150 V	[1][2]	21PZPZ
300-0-300 V	[1][2]	21RXRX
500-0-500 V	[1][2]	21SFSF
600-0-600 V	[1][2]	21SJSJ

Simpson Analog Panel Meters DC Voltage/Current



▲ 2123/2124



▲ 1327/1329

Wide Vue Style: Models 1227, 1327 & 1329

- UL Recognized
- Wide Angle Visibility
- Plastic Case with Clear Acrylic Window
- Additional Ranges Upon Request

Century Style: Models 2122, 2123 & 2124

- UL Recognized
- Phenolic Case and Glass Window
- Additional Ranges Upon Request

DC Ammeters		Model 1227 2½"	Model 1327 3½"	Model 1329 4½"
Range	Scale	Catalog #	Catalog #	Catalog #
0-1	0-1	02440	02640	02820
0-1.5	0-1.5	02450	02650	02830
0-2	0-2	02460	02660	02840
0-3	0-3	02470	02670	02850
0-5	0-5	02480	02680	02860
0-10	0-10	02490	02690	02870
0-15	0-15	02500	02700	02880
0-25	0-25	02510	02710	02890
0-30	0-30	02520	02720	02900
0-50	0-50	02530	02730	02910
0-50 mV	0-100	02540*	02740*	02920*
0-50 mV	0-150	02550*	02750*	02930*
0-50 mV	0-200	02552*	02760*	02940*
0-50 mV	0-300	02554*	02770*	02950*
0-50 mV	0-500	—	02780*	02960*
15-0-15	15-0-15	—	02790	—
30-0-30	30-0-30	—	02800	—
50-0-50	50-0-50	—	02810	—

DC Ammeters		Model 2122 2½"	Model 2123 3½"	Model 2124 4½"
Range	Scale	Catalog #	Catalog #	Catalog #
0-1	0-1	17400	17475	17565
0-1.5	0-1.5	17401	17476	—
0-2	0-2	17402	17477	17567
0-3	0-3	17403	17478	17568
0-5	0-5	17404	17479	17569
0-10	0-10	17405	17480	17570
0-15	0-15	17406	17481	17571
0-25	0-25	17407	17482	17572
0-30	0-30	17408	17483	17573
0-50	0-50	17409	17484	17574
0-50 mV	0-100	17410*	17485*	17575*
0-50 mV	0-150	—	17486*	17576*
0-50 mV	0-200	17412*	17487*	17577*
0-50 mV	0-300	—	17488*	17578*
0-50 mV	0-500	—	17489*	17579*
15-0-15	15-0-15	—	17490	—
30-0-30	30-0-30	—	17491	—

* DC Current meters are self-contained through 50 amps. Higher ranges are supplied as 50mV meters and require an external shunt.

Both WideVue and Century styles are available in 1 ½" Sizes. Call for info.

SPECIFICATIONS

Accuracy:	± 2% of Full Scale
Operating Temp:	-20 to 65°C
Overload (1 Sec):	10 Times Full Scale Rating
Overload (Continuous):	1.5 Times Full Scale Rating

Dimensions	Height	Width	Housing
1227	2.47"	2.47"	2.17" Dia.
1327	3.25"	3.25"	2.73" Dia.
1329	4.68"	4.68"	2.75" Dia.
2122	2.34"	2.38"	2.16" Dia.
2123	3.00"	3.00"	2.69" Dia.
2124	4.20"	4.66"	2.69" Dia.

DC Millivoltmeters	Model 1227 2½"	Model 1327 3½"	Model 1329 4½"
Range	Scale	Catalog #	Catalog #
0-50	0-50	07010	07020
50-0-50	50-0-50	—	07021
			07031

DC Millivoltmeters	Model 2122 2½"	Model 2123 3½"	Model 2124 4½"
Range	Scale	Catalog #	Catalog #
0-50	0-50	17472	17540
50-0-50	50-0-50	—	17541
			17635

DC Voltmeters	Model 1227 2½"	Model 1327 3½"	Model 1329 4½"
Range	Scale	Catalog #	Catalog #
0-5	0-5	09550	09720
0-10	0-10	09560	09740
0-15	0-15	09570	09750
0-25	0-25	09580	09760
0-30	0-30	09590	09770
0-50	0-50	09600	09780
0-100	0-100	09610	09790
0-150	0-150	09620	09800
0-200	0-200	09622	09810
0-250	0-250	09623	09820
0-300	0-300	09630	09830
0-500	0-500	09640	09840
0-750	0-750	09650**	09850

DC Voltmeters	Model 2122 2½"	Model 2123 3½"	Model 2124 4½"
Range	Scale	Catalog #	Catalog #
0-5	0-5	17445	17525
0-10	0-10	17446	17527
0-15	0-15	17447	17528
0-25	0-25	17448	17529
0-30	0-30	17449	17530
0-50	0-50	17450	17531
0-100	0-100	17451	17532
0-150	0-150	17452	17533
0-200	0-200	—	17534
0-250	0-250	—	17535
0-300	0-300	17455	17536
0-500	0-500	17456	17537
0-750	0-750	—	17538

DC Milliammeters	Model 1227 2½"	Model 1327 3½"	Model 1329 4½"
Range	Scale	Catalog #	Catalog #
0-1	0-1	06175	06310
0-3	0-3	06180	06320
0-5	0-5	06190	06330
0-10	0-10	06200	06340
0-25	0-25	06220	06370
0-50	0-50	06230	06380

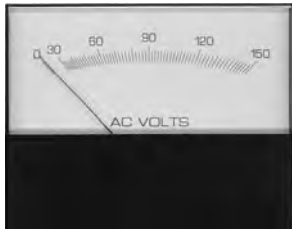
DC Milliammeters	Model 2122 2½"	Model 2123 3½"	Model 2124 4½"
Range	Scale	Catalog #	Catalog #
0-1	0-1	17430	17510
0-3	0-3	17431	17511
0-5	0-5	17432	17512
0-10	0-10	17433	17513
0-25	0-25	17436	17516
0-50	0-50	17437	17517

**External Multiplier furnished

Jewell DC Current & Voltage Meters

Modutec S & W Series

- Five Display Sizes: 1 1/2", 2 1/2", 3 1/2", 4 1/2" and 5 1/2"
- Shielded Taut-Band Movement
- Surface-Mount or Window-Mount Models



S Series



W Series

ORDERING INFORMATION

Use Ordering Code Guide to complete Part #. Insert Size Code in box 1 and Model Code in box 2.

DC Millivoltmeters - Zero left, 200Ω/V

0-50	1 2	-DMV-050
0-100	1 2	-DMV-100

DC Millivoltmeters - Zero center, 200Ω/V

50-0-50	1 2	-DMV-50U50
100-0-100	1 2	-DMV-1H1

DC Voltmeters - Zero left, 1000Ω/V, except *10kΩ/V

0-1	1 2	-DVV-001
0-1.5	1 2	-DVV-0015
0-2	1 2	-DVV-002
0-3	1 2	-DVV-003
0-5	1 2	-DVV-005
0-10	1 2	-DVV-010
0-15	1 2	-DVV-015
0-20	1 2	-DVV-020
0-25	1 2	-DVV-025
0-30	1 2	-DVV-030
0-40	1 2	-DVV-040
0-50	1 2	-DVV-050
0-75	1 2	-DVV-075
0-80	1 2	-DVV-080
0-100	1 2	-DVV-100
0-150	1 2	-DVV-150
0-200	1 2	-DVV-200
0-250	1 2	-DVV-250
0-300	1 2	-DVV-300
0-500	1 2	-DVV-500
0-600	1 2	-DVV-600 *
0-750	1 2	-DVV-750 *
0-1000	1 2	-DVV-1000 *

DC Voltmeters - Zero center, 1000Ω/V, except *10kΩ/V

5-0-5	1 2	-DVV-5U5
10-0-10	1 2	-DVV-10U10
15-0-15	1 2	-DVV-15U15
25-0-25	1 2	-DVV-25U25
50-0-50	1 2	-DVV-50U50
100-0-100	1 2	-DVV-1H1
150-0-150	1 2	-DVV-1.5H1.5
300-0-300	1 2	-DVV-3H3
500-0-500	1 2	-DVV-5H5
600-0-600	1 2	-DVV-6H6 *

SPECIFICATIONS

Model	W Series				
Case Size	1 1/2"	2 1/2"	3 1/2"	4 1/2"	5 1/2"
Size (H x W x D)	1.77 x 2.26 x 1.83"	2.29 x 3.01 x 2.10"	2.90 x 3.73 x 2.12"	4.06 x 5.18 x 2.17"	4.60 x 5.97 x 2.17"
Window (cutout)	0.935 x 2.15"	1.27 x 2.90"	1.595 x 3.61"	2.345 x 5.02"	2.59 x 5.78"
Model	S Series				
Case Size	1 1/2"	2 1/2"	3 1/2"	4 1/2"	5 1/2"
Size (H x W x D)	1.75 x 2.24 x 1.55"	2.27 x 2.99 x 1.80"	2.87 x 3.70 x 1.80"	3.96 x 5.10 x 1.80"	4.48 x 5.85 x 1.80"
Barrel (cutout)	1.55"	2.22"	2.82"	2.82"	2.82"
All Models:					
Scale Length	1.75"	2.41"	3.0"	4.22"	5.12"
Accuracy	±2% of full scale				
Repeatability	±0.5% of full scale				
Response Time	1.5 sec. (except 3 sec. for $\leq 50\mu A$ full scale)				

ORDERING INFORMATION

DC Microammeters - Zero left		
0-50	2600	1 2 -DUA-050
0-100	640	1 2 -DUA-100
0-200	220	1 2 -DUA-200
0-500	135	1 2 -DUA-500
DC Microammeters - Zero center		
25-0-25	2600	1 2 -DUA-25U25
50-0-50	640	1 2 -DUA-50U50
100-0-100	230	1 2 -DUA-1H1
500-0-500	35	1 2 -DUA-5H5
DC Milliammeters - Zero left		
0-1	35.0	1 2 -DMA-001
0-2	12.5	1 2 -DMA-002
0-3	7.2	1 2 -DMA-003
0-5	3.8	1 2 -DMA-005
0-10	2.2	1 2 -DMA-010
0-15	3.3	1 2 -DMA-015
0-20	2.5	1 2 -DMA-020
0-25	2.0	1 2 -DMA-025
0-30	1.7	1 2 -DMA-030
0-50	1.0	1 2 -DMA-050
0-100	.50	1 2 -DMA-100
0-150	.33	1 2 -DMA-150
0-200	.25	1 2 -DMA-200
0-300	.166	1 2 -DMA-300
0-500	.10	1 2 -DMA-500
0-750	.066	1 2 -DMA-750
DC Milliammeters - Zero center		
1-0-1	35.0	1 2 -DMA-1U1
5-0-5	3.5	1 2 -DMA-5U5
10-0-10	2.2	1 2 -DMA-10U10
25-0-25	2.0	1 2 -DMA-25U25
50-0-50	1.0	1 2 -DMA-50U50
100-0-100	.50	1 2 -DMA-1H1
200-0-200	.25	1 2 -DMA-2H2
500-0-500	.10	1 2 -DMA-5H5
DC Ammeters - Zero left, self-contained		
0-1	.050	1 2 -DAA-001
0-1.5	.033	1 2 -DAA-001.5
0-2	.025	1 2 -DAA-002
0-3	.0166	1 2 -DAA-003
0-5	.010	1 2 -DAA-005
0-10	.0050	1 2 -DAA-010
0-15	.0033	1 2 -DAA-015 **
0-20	.0025	1 2 -DAA-020 **
0-25	.0020	1 2 -DAA-025 **
0-30	.0015	1 2 -DAA-030 **
0-50	.0010	1 2 -DAA-050 **
DC Ammeters - Zero center, self contained		
1-0-1	.050	1 2 -DAA-1U1
3-0-3	.016	1 2 -DAA-3U3
5-0-5	.010	1 2 -DAA-5U5
10-0-10	.005	1 2 -DAA-10U10
15-0-15	.003	1 2 -DAA-15U15 **
25-0-25	.002	1 2 -DAA-25U25 **
50-0-50	.001	1 2 -DAA-50U50 **

ORDERING CODE GUIDE

1	Insert Size Code:	CASE SIZE
1		1 1/2"
2		2 1/2"
3		3 1/2"
4		4 1/2"
5		5 1/2"
2	Insert Model Code:	STYLE
S		Surface Mount
W		Window Mount

OPTIONS

Custom Scaling	Color Bands
Mirror Scale	Illumination
High Torque Movement	Sealed Case
Suppressed Zero	Bezel Mount Kit

ORDERING INFORMATION

DC Ammeters - Zero left, 50mV, shunt rated	
0-75	1 2 -DAA-075
0-100	1 2 -DAA-100
0-150	1 2 -DAA-150
0-200	1 2 -DAA-200
0-300	1 2 -DAA-300
0-500	1 2 -DAA-500
0-750	1 2 -DAA-750
0-1000	1 2 -DAA-1000
0-1200	1 2 -DAA-1200
0-1500	1 2 -DAA-1500
0-2000	1 2 -DAA-2000
DC Ammeters - Zero left, 100mV, shunt rated	
0-75	E 1 2 -DAA-075
0-100	E 1 2 -DAA-100
0-150	E 1 2 -DAA-150
0-200	E 1 2 -DAA-200
0-300	E 1 2 -DAA-300
0-500	E 1 2 -DAA-500
0-750	E 1 2 -DAA-750
0-1000	E 1 2 -DAA-1000
0-1200	E 1 2 -DAA-1200
0-1500	E 1 2 -DAA-1500
0-2000	E 1 2 -DAA-2000
DC Ammeters - Zero center, 50mV, shunt rated	
75-0-75	1 2 -DAA-75U75
100-0-100	1 2 -DAA-1H1
200-0-200	1 2 -DAA-2H2
300-0-300	1 2 -DAA-3H3
400-0-400	1 2 -DAA-4H4
500-0-500	1 2 -DAA-5H5

** not available in 1 1/2" size

Jewell DC Current & Voltage Meters

Modutec PB Series

- Four Display Sizes: 1½", 2½", 3½", and 4½"
- Shielded Taut-Band Movement
- Large, Easy to Read Scale



PB Series

ORDERING INFORMATION

Use Ordering Code Guide to complete Part #. Insert Size Code in box 1.

DC Millivoltmeters - Zero left, 200Ω/V

0-50	1	PB-DMV-050
0-100	1	PB-DMV-100

DC Millivoltmeters - Zero center, 200Ω/V

50-0-50	1	PB-DMV-50U50
100-0-100	1	PB-DMV-1H1

DC Voltmeters - Zero left, 1000Ω/V, except *10kΩ/V

0-1	1	PB-DVV-001
0-1.5	1	PB-DVV-0015
0-2	1	PB-DVV-002
0-3	1	PB-DVV-003
0-5	1	PB-DVV-005
0-10	1	PB-DVV-010
0-15	1	PB-DVV-015
0-20	1	PB-DVV-020
0-25	1	PB-DVV-025
0-30	1	PB-DVV-030
0-40	1	PB-DVV-040
0-50	1	PB-DVV-050
0-75	1	PB-DVV-075
0-80	1	PB-DVV-080
0-100	1	PB-DVV-100
0-150	1	PB-DVV-150
0-200	1	PB-DVV-200
0-250	1	PB-DVV-250
0-300	1	PB-DVV-300
0-500	1	PB-DVV-500
0-600	1	PB-DVV-600 *
0-750	1	PB-DVV-750 *
0-1000	1	PB-DVV-1000 *

DC Voltmeters - Zero center, 1000Ω/V, except *10kΩ/V

5-0-5	1	PB-DVV-5U5
10-0-10	1	PB-DVV-10U10
15-0-15	1	PB-DVV-15U15
25-0-25	1	PB-DVV-25U25
50-0-50	1	PB-DVV-50U50
100-0-100	1	PB-DVV-1H1
150-0-150	1	PB-DVV-1.5H1.5
300-0-300	1	PB-DVV-3H3
500-0-500	1	PB-DVV-5H5
600-0-600	1	PB-DVV-6H6 *

SPECIFICATIONS

Model	PB Series			
Case Size	1½"	2½"	3½"	4½"
Size (H x W x D)	1.75 x 1.75 x 1.39"	2.70 x 2.70 x 1.77"	3.50 x 3.50 x 1.77"	4.41 x 4.85 x 1.84"
Barrel (cutout)	1.53"	2.20"	2.75"	2.79"
Scale Length	1.26"	2.10"	2.90"	4.00"

Accuracy	±2% of full scale
Repeatability	±0.5% of full scale
Response Time	1.5 sec. (except 3 sec. for ≤50μA full scale)

The PB series industrial panel board meters meet or exceed the requirements of ANSI C39.1. The mounting stud configuration complies with ANSI standards. Number of studs varies by size: 1½" meters - 2 studs; 2½" & 3½" meters - 3 studs; 4½" meters - 4 studs.

ORDERING INFORMATION

DC Microammeters - Zero left

0-50	4000Ω	1	PB-DUA-050
0-100	900	1	PB-DUA-100
0-200	306	1	PB-DUA-200
0-500	203	1	PB-DUA-500

DC Microammeters - Zero center

25-0-25	4000	1	PB-DUA-25U25
50-0-50	900	1	PB-DUA-50U50
100-0-100	305	1	PB-DUA-1H1
500-0-500	41	1	PB-DUA-5H5

DC Milliammeters - Zero left

0-1	43.0	1	PB-DMA-001
0-2	16.7	1	PB-DMA-002
0-3	8.3	1	PB-DMA-003
0-5	3.8	1	PB-DMA-005
0-10	2.2	1	PB-DMA-010
0-15	3.3	1	PB-DMA-015
0-20	2.5	1	PB-DMA-020
0-25	2.0	1	PB-DMA-025
0-30	1.7	1	PB-DMA-030
0-50	1.0	1	PB-DMA-050
0-100	.50	1	PB-DMA-100
0-150	.33	1	PB-DMA-150
0-200	.25	1	PB-DMA-200
0-300	.166	1	PB-DMA-300
0-500	.10	1	PB-DMA-500
0-750	.066	1	PB-DMA-750

DC Milliammeters - Zero center

1-0-1	35.0	1	PB-DMA-1U1
5-0-5	3.4	1	PB-DMA-5U5
10-0-10	1.8	1	PB-DMA-10U10
25-0-25	2.0	1	PB-DMA-25U25
50-0-50	1.0	1	PB-DMA-50U50
100-0-100	.50	1	PB-DMA-1H1
200-0-200	.25	1	PB-DMA-2H2
500-0-500	.10	1	PB-DMA-5H5

DC Ammeters - Zero left, self-contained

0-1	.050	1	PB-DAA-001
0-1.5	.033	1	PB-DAA-0015
0-2	.025	1	PB-DAA-002
0-3	.0166	1	PB-DAA-003
0-5	.010	1	PB-DAA-005
0-10	.0050	1	PB-DAA-010
0-15	.0033	1	PB-DAA-015 **
0-20	.0025	1	PB-DAA-020 **
0-25	.0020	1	PB-DAA-025 **
0-30	.0015	1	PB-DAA-030 **
0-50	.0010	1	PB-DAA-050 **

DC Ammeters - Zero center, self contained

1-0-1	.050	1	PB-DAA-1U1
3-0-3	.016	1	PB-DAA-3U3
5-0-5	.010	1	PB-DAA-5U5
10-0-10	.005	1	PB-DAA-10U10
15-0-15	.003	1	PB-DAA-15U15 **
25-0-25	.002	1	PB-DAA-25U25 **
50-0-50	.001	1	PB-DAA-50U50 **

ORDERING CODE GUIDE

1	Insert Size Code:	CASE SIZE
1		1½"
2		2½"
3		3½"
4		4½"

OPTIONS

Custom Scaling	Suppressed Zero
Mirror Scale	Color Bands
High Torque Movement	Heavy Damping

ORDERING INFORMATION

DC Ammeters - Zero left, 50mV, shunt rated

0-75	1	PBS-DAA-075
0-100	1	PBS-DAA-100
0-150	1	PBS-DAA-150
0-200	1	PBS-DAA-200
0-300	1	PBS-DAA-300
0-500	1	PBS-DAA-500
0-750	1	PBS-DAA-750
0-1000	1	PBS-DAA-1000
0-1200	1	PBS-DAA-1200
0-1500	1	PBS-DAA-1500
0-2000	1	PBS-DAA-2000

DC Ammeters - Zero left, 100mV, shunt rated

0-75	E 1	PB-DAA-075
0-100	E 1	PB-DAA-100
0-150	E 1	PB-DAA-150
0-200	E 1	PB-DAA-200
0-300	E 1	PB-DAA-300
0-500	E 1	PB-DAA-500
0-750	E 1	PB-DAA-750
0-1000	E 1	PB-DAA-1000
0-1200	E 1	PB-DAA-1200
0-1500	E 1	PB-DAA-1500
0-2000	E 1	PB-DAA-2000

DC Ammeters - Zero center, 50mV, shunt rated

75-0-75	1	PBS-DAA-75U75
100-0-100	1	PBS-DAA-1H1
200-0-200	1	PBS-DAA-2H2
300-0-300	1	PBS-DAA-3H3
400-0-400	1	PBS-DAA-4H4
500-0-500	1	PBS-DAA-5H5

** not available in 1½" size

Yokogawa AC Current and Voltage Meters

Horizon Line and Big Look Series

- Accuracy: $\pm 2\%$ Iron Vane Type; $\pm 3\%$ Rectifier Type
- Four Display Sizes: 1½", 2½", 3½", and 4½"
- Severe Duty Meters Optional (2½" to 4½") to Meet UL1437

ORDERING INFORMATION

Use Ordering Code Guide to complete Part #. Insert Model Code in box [1] and Case Size in box [2].

AC Microammeters and Milliammeters, Rectifier Type, Accuracy $\pm 3\%$ (60 Hz Sinewave @ 25°C)

500 μ A	[1][2]	10EMEM
800 μ A	[1][2]	10EWEW
1 mA	[1][2]	10FAFA
1.5 mA	[1][2]	10FDFD
2 mA	[1][2]	10FGFG
3 mA	[1][2]	10FNFN
5 mA	[1][2]	10FXFX
10 mA	[1][2]	10GZGZ
20 mA	[1][2]	10HFHF

AC Milliameters-Self Contained, 25-400 Hz, Iron Vane, Pivot and Jewel

10 mA	[1][2]	40GZGZ*
25 mA	[1][2]	40HJHJ*
50 mA	[1][2]	40HYHY*
100 mA	[1][2]	40JRJR*
200 mA	[1][2]	40KAKA*
500 mA	[1][2]	40MKKM*

AC Ammeters-Self Contained, 25-400 Hz, Iron Vane, Pivot and Jewel

1 Amp	[1][2]	40LALA*
3 Amp	[1][2]	40LJLJ*
5 Amp	[1][2]	40LSLS*
8 Amp	[1][2]	40MJMJ*
10 Amp	[1][2]	40MTMT*
15 Amp	[1][2]	40NDND*
20 Amp	[1][2]	40NGNG*
30 Amp	[1][2]	40NLNL*
50 Amp	[1][2]	40NTNT**
80 Amp	[1][2]	40PDPD**

AC Ammeters-Transformer Rated, 0-5 Amperes, 25-400 Hz, Iron Vane, Pivot and Jewel (Scale Only)

10 Amp	[1][2]	40LSMT*
15 Amp	[1][2]	40LSND*
20 Amp	[1][2]	40LSNG*
30 Amp	[1][2]	40LSNL*
40 Amp	[1][2]	40LSNP*
50 Amp	[1][2]	40LSNT*
75 Amp	[1][2]	40LSPB*
80 Amp	[1][2]	40LSPD*
100 Amp	[1][2]	40LSPK*
150 Amp	[1][2]	40LSPZ*
200 Amp	[1][2]	40LSRL*
300 Amp	[1][2]	40LSRX*
400 Amp	[1][2]	40LSSC*
500 Amp	[1][2]	40LSSF*
600 Amp	[1][2]	40LSSJ*
800 Amp	[1][2]	40LSSN*
1.0 kA	[1][2]	40LSVA*
1.2 kA	[1][2]	40LSVB*
1.5 kA	[1][2]	40LSVC*
2.0 kA	[1][2]	40LSVE*
3.0 kA	[1][2]	40LSVJ*

SPECIFICATIONS

Model	251/255			
Case Size	1½"	2½"	3½"	4½"
Size (H x W x D)	1.86" x 2.19" x 1.34"	2.66" x 3.12" x 1.81"	3.32" x 3.89" x 1.83"	4.18" x 4.73" x 1.83"
Barrel (cutout)	1.53"	2.19"	2.72"	2.72"
Window (cutout)	1.45" x 2.18"	1.45" x 3.11"	1.84" x 3.88"	2.22" x 4.72"

Model	250/254			
Case Size	1½"	2½"	3½"	4½"
Size (H x W x D)	1.76" x 1.76" x 1.34"	2.69" x 2.69" x 1.85"	3.50" x 3.50" x 1.85"	4.41" x 4.85" x 1.85"
Barrel (cutout)	1.53"	2.17"	2.72"	2.72"
Scale Length	1.40"	2.06"	2.88"	3.93"

All Models:

Accuracy	2% iron vane type, 3% AC rectifier type (60 Hz sinewave)
Repeatability	$\pm 0.5\%$
Response Time	2.5 sec.
Operating Temperature	0-40°C

AC Voltmeter-Self Contained, Rectifier Type, Accuracy $\pm 3\%$ (60 Hz Sinewave @ 25°C)

10 Volts	[1][2]	30MTMT
15 Volts	[1][2]	30NDND
20 Volts	[1][2]	30NGNG
25 Volts	[1][2]	30NJNJ
30 Volts	[1][2]	30NLNL
50 Volts	[1][2]	30NTNT
80 Volts	[1][2]	30PDPD
100 Volts	[1][2]	30PKPK
150 Volts	[1][2]	30PZPZ
200 Volts	[1][2]	30RLRL**
250 Volts	[1][2]	30RSRS**
300 Volts	[1][2]	30RXRX**

AC Voltmeter-Expanded Scale, Rectifier Type, Accuracy $\pm 0.5\%$ of full scale

110-130 Volts	[1][2]	37PNPN**
105-125 Volts	[1][2]	37PTPT**

AC Voltmeter-Self Contained, Iron Vane, Pivot and Jewel 60 Hz

Available in 250 and 251 only

3 Volts	[1][2]	44LJLJ*
5 Volts	[1][2]	44LSLS*
10 Volts	[1][2]	44MTMT*
15 Volts	[1][2]	44NDND*
30 Volts	[1][2]	44NLNL*
50 Volts	[1][2]	44NTNT*
100 Volts	[1][2]	44PKPK*
150 Volts	[1][2]	44PZPZ*
300 Volts	[1][2]	44RXRX*
500 Volts	[1][2]	44SFSF**
600 Volts	[1][2]	44SJSJ**

AC Voltmeter-Self Contained, Iron Vane, Pivot and Jewel 400 Hz

Available in 250 and 251 only

150 Volts	[1][2]	45PZPZ*
300 Volts	[1][2]	45RXRX*

AC Voltmeter-Transformer Rated, 0-150 Volts Iron Vane, Pivot and Jewel, 60 Hz

Available in 250 and 251 only

600 Volts	[1][2]	44PZSJ*
750 Volts	[1][2]	44PZSM*
3 kV	[1][2]	44PZVJ*

* Not Available in 1½" ** Not available in 1½" and 2½"
*** Custom scale can be matched to any transformer primary voltage



Big Look 250/254 Series



Horizon Line 251/255

ORDERING CODE GUIDE

[1] Insert Model Number:	
CASE AND MOVEMENT	
250	Big Look - Taut Band
251	Horizon - Taut Band
254	Big Look - Pivot & Jewel
255	Horizon - Pivot & Jewel
[2] Insert Case Size:	DISPLAY SIZE
1	1½"
2	2½"
3	3½"
4	4½"

OPTIONS (WHERE APPLICABLE)

Custom Scaling
Non-standard Ranges
1% Accuracy
Adjustable Potentiometer (Voltmeters Only)
Zero-Center
Color Bands
Bezel
Insulated Cap Nuts

Yokogawa AC Current and Voltage Meters

Stylist Series

- Accuracy: ±2% Iron Vane Type; ±3% Rectifier Type
- Four Display Sizes: 1 1/2", 2 1/2", 3 1/2" and 4 1/2"
- Severe Duty Meters Optional (2 1/2" to 4 1/2") to Meet UL1437

ORDERING INFORMATION

Use Ordering Code Guide to complete Part #. Insert Model Code in box [1] and Case Size in box [2].

AC Milliammeters, Rectifier Type, 60 Hz

1 mA	[1][2]	10FAFA
5 mA	[1][2]	10FXFX
10 mA	[1][2]	10GZGZ
25 mA	[1][2]	10HJHJ
50 mA	[1][2]	10HYHY
100 mA	[1][2]	10JRJR
200 mA	[1][2]	10KAKA*

AC Milliammeters-Self Contained, 50-400 Hz Iron Vane***

10 mA	[1][2]	40GZGZ*
25 mA	[1][2]	40HJHJ*
50 mA	[1][2]	40HYHY*
100 mA	[1][2]	40JRJR*
250 mA	[1][2]	40KDKD*
500 mA	[1][2]	40KMKM*

AC Ammeters-Self Contained, 50-400 Hz Iron Vane***

1 Amp	[1][2]	40LALA*
2 Amp	[1][2]	40LELE*
3 Amp	[1][2]	40LJLJ*
5 Amp	[1][2]	40LSLS*
10 Amp	[1][2]	40MTMT*
15 Amp	[1][2]	40NDND*
20 Amp	[1][2]	40NGNG*
30 Amp	[1][2]	40NLNL*
50 Amp	[1][2]	40NTNT*

AC Ammeters-Self Contained, Rectifier Type, 60 Hz

1 Amp	[1][2]	10LALA*
2 Amp	[1][2]	10LELE*
3 Amp	[1][2]	10LJLJ*
5 Amp	[1][2]	10LSLS*
10 Amp	[1][2]	10MTMT*
15 Amp	[1][2]	10NDND*
20 Amp	[1][2]	10NGNG*
25 Amp	[1][2]	10NJNJ*
30 Amp	[1][2]	10NLNL*

AC Ammeters-Transformer Rated, 0-5 Amperes, Rectifier Type, 60 Hz

Scale Only:		
50 Amp	[1][2]	10LSNT*
75 Amp	[1][2]	10LSPB*
100 Amp	[1][2]	10LSPK*
150 Amp	[1][2]	10LSPZ*
200 Amp	[1][2]	10LSRL*
300 Amp	[1][2]	10LSRX*
500 Amp	[1][2]	10LSSF*
600 Amp	[1][2]	10LSSJ*
800 Amp	[1][2]	10LSSN*
1000 Amp	[1][2]	10LSSS*
1500 Amp	[1][2]	10LSTC*
2000 Amp	[1][2]	10LSTM*

SPECIFICATIONS

Window Mount Models		261/265			
Case Size		2 1/2"	3 1/2"	4 1/2"	
Size (H x W x D)		2.29" x 3.01" x 2.10"	2.90" x 3.73" x 2.13"	4.60" x 5.18" x 2.13"	
Zero cutout		0.228" dia.	0.228" dia.	0.228" dia.	
Window cutout		1.27" x 2.90"	1.595" x 3.61"	2.345" x 5.02"	
Surface Mount Models		260/264			
Case Size		1 1/2"	2 1/2"	3 1/2"	4 1/2"
Size (H x W x D)		1.75" x 1.75" x 1.55"	2.27" x 2.99" x 1.80"	2.87" x 3.70" x 1.80"	3.96" x 5.10" x 1.80"
Barrel cutout		1.55"	2.22"	2.82"	2.82"

Accuracy	2% iron vane type, 3% AC rectifier type (60 Hz sinewave)
Overload	Voltmeters: 50% momentary, 20% sustained; Ammeters: 10x momentary, 20% sustained
Response Time	2.5 sec. max.
Dielectric	2600V for 1 min. except 1 1/2" size 1500V

Stylist 260

with optional white on black scale



AC Ammeters-Transformer Rated, 0-5 Amperes, 50-400 Hz, Iron Vane***

Scale Only:		
10 Amp	[1][2]	40LSMT*
15 Amp	[1][2]	40LSND*
20 Amp	[1][2]	40LSNG*
30 Amp	[1][2]	40LSNL*
40 Amp	[1][2]	40LSNP*
50 Amp	[1][2]	40LSNT*
75 Amp	[1][2]	40LSPB*
80 Amp	[1][2]	40LSPD*
100 Amp	[1][2]	40LSPK*
150 Amp	[1][2]	40LSPZ*
200 Amp	[1][2]	40LSRL*
300 Amp	[1][2]	40LSRX*
400 Amp	[1][2]	40LSSC*
500 Amp	[1][2]	40LSSF*
600 Amp	[1][2]	40LSSJ*
800 Amp	[1][2]	40LSSN*
1.0 kA	[1][2]	40LSVA*
1.2 kA	[1][2]	40LSVB*
1.5 kA	[1][2]	40LSVC*
2.0 kA	[1][2]	40LSVE*
3.0 kA	[1][2]	40LSVJ*

ORDERING CODE GUIDE

[1] Insert Model Number:	CASE and MOVEMENT
260	Surface Mount - Taut Band or Iron Vane
261	Window Mount - Taut Band or Iron Vane
264	Surface Mount - Pivot & Jewel
265	Window Mount - Pivot & Jewel
[2] Insert Case Size:	
1	1 1/2"
2	2 1/2"
3	3 1/2"
4	4 1/2"

Options: Custom Scaling, Non-standard Ranges, Severe Duty, Color Bands, Bezel Mounting, Insulated Cap Nuts

AC Voltmeter-Self Contained, Rectifier Type

3 Volts	[1][2]	30LJLJ**
5 Volts	[1][2]	30LSLS**
10 Volts	[1][2]	30MTMT**
15 Volts	[1][2]	30NDND**
25 Volts	[1][2]	30NJNJ**
50 Volts	[1][2]	30NTNT**
100 Volts	[1][2]	30PKPK**
150 Volts	[1][2]	30PZPZ**
300 Volts	[1][2]	30RXRX**
500 Volts	[1][2]	30SF5F**
600 Volts	[1][2]	30SJSJ**

AC Voltmeter-Expanded Scale, Rectifier Type

Accuracy ±0.5% FS		
105-125 Volts	[1][2]	37PTPT*
210-250 Volts	[1][2]	37RRRR

AC Voltmeter-Self Contained, 60 Hz Iron Vane***

5 Volts	[1][2]	44LSLS*
10 Volts	[1][2]	44MTMT*
15 Volts	[1][2]	44NDND*
30 Volts	[1][2]	44NLNL*
50 Volts	[1][2]	44NTNT*
100 Volts	[1][2]	44PKPK*
150 Volts	[1][2]	44PZPZ*
300 Volts	[1][2]	44RXRX*
500 Volts	[1][2]	44SF5F*
600 Volts	[1][2]	44SJSJ*

AC Voltmeter-Transformer Rated, 0-150 Volts

Scale Only		
750 Volts	[1][2]	30PZSM**
1500 Volts	[1][2]	30PZTC**
3000 Volts	[1][2]	30PZUA**

AC Voltmeter-Transformer Rated, 0-150 Volts Iron Vane***

Scale Only:		
600 Volts	[1][2]	44PZSJ*
750 Volts	[1][2]	44PZSM*
3 kV	[1][2]	44PZVJ*

* Not Available in 1 1/2"

** 1 1/2" in surface mount only

*** Use 260 for Surface Mount, 261 for Window Mount

Simpson Analog Panel Meters AC Voltage/Current



Century Style



Wide Vue

Wide Vue Style:
Models 1247, 1257, 1347, 1357, 1349 & 1359

Century Style:
Models 2142, 2143, 2152, 2153, 2144 & 2154

- UL Recognized
- Wide Angle Visibility
- Phenolic Case with Acrylic Window
- Additional Ranges Upon Request

- UL Recognized
- Phenolic Case and Glass Window
- Additional Ranges Upon Request

ANALOG METERS

AC Ammeters (Self-Contained)		Model 1257 2½"	Model 1357 3½"	Model 1359 4½"
Range	Scale	Catalog #	Catalog #	Catalog #
0-1	0-1	02560	03130	03260
0-2	0-2	—	03150	03280
0-3	0-3	02575	03160	03290
0-5	0-5	02580	03170	03300
0-10	0-10	02590	03180	03310
0-15	0-15	02599	03190	03320
0-25	0-25	02609	03200	03330
0-30	0-30	02615	03205	03335
0-50	0-50	02619	03210	03340
0-75	0-75	—	03215	03345

AC Ammeters (Self-Contained)		Model 2152 2½"	Model 2153 3½"	Model 2154 4½"
Range	Scale	Catalog #	Catalog #	Catalog #
0-1	0-1	17665	17695	17740
0-2	0-2	—	17697	17742
0-3	0-3	17667	17698	17743
0-5	0-5	17668	17699	17744
0-10	0-10	17669	17700	17745
0-15	0-15	17670	17701	17746
0-25	0-25	17671	17702	17747
0-30	0-30	17672	17703	17748
0-50	0-50	17673	17704	17749
0-75	0-75	—	17710	17755

AC Ammeters** (for use with CT)		Model 1257 2½"	Model 1357 3½"	Model 1359 4½"
Range	Scale	Catalog #	Catalog #	Catalog #
0-5	0-25	—	35074	35078
0-5	0-50	—	35075	35079
0-5	0-75	—	35076	35080
0-5	0-100	02622	03220	03350
0-5	0-150	02624	03230	03360
0-5	0-200	02626	03240	03370
0-5	0-300	02627	03250	03380

AC Ammeters** (for use with CT)		Model 2152 2½"	Model 2153 3½"	Model 2154 4½"
Range	Scale	Catalog #	Catalog #	Catalog #
0-5	0-25	—	35082	35086
0-5	0-50	—	35083	35087
0-5	0-75	—	35084	35088
0-5	0-100	176744	17706	17751
0-5	0-150	—	17707	17752
0-5	0-200	—	17708	17753
0-5	0-300	—	17709	17754

SPECIFICATIONS

Accuracy:	±2% of Full Scale (±3% Rectifier Type)
Operating Temp:	-20 to 65°C
Overload (1 Sec):	10 Times Full Scale Rating
Overload (Continuous):	1.5 Times Full Scale Rating

Dimensions	Height	Width	Housing
1247, 1257	2.47"	2.47"	2.17" Dia.
1347, 1357	3.25"	3.25"	2.73" Dia.
1349, 1359	4.68"	4.68"	2.75" Dia.
2142, 2152	2.34"	2.38"	2.16" Dia.
2143, 2153	3.00"	3.00"	2.69" Dia.
2144, 2154	4.20"	4.66"	2.69" Dia.

AC Voltmeters-Rectified	Model 1247 2½"	Model 1347 3½"	Model 1349 4½"
Range	Scale	Catalog #	Catalog #
0-5	0-5	10015	10020
0-10	0-10	10016	10030
0-15	0-15	—	10040
0-50	0-50	—	10050
0-150	0-150	10017	10060
0-300	0-300	10018	10070

AC Voltmeters-Rectified	Model 2142 2½"	Model 2143 3½"	Model 2144 4½"
Range	Scale	Catalog #	Catalog #
0-5	0-5	17460	17542
0-10	0-10	—	17543
0-15	0-15	—	17544
0-50	0-50	—	17545
0-150	0-150	17462	17546

Voltmeters-Iron Vane	Model 1257 2½"	Model 1357 3½"	Model 1359 4½"
Range	Scale	Catalog #	Catalog #
0-5	0-5	—	10160
0-10	0-10	09670	10170
0-15	0-15	09675	10180
0-25	0-25	09680	10190
0-50	0-50	09690	10200
0-100	0-100	09695	10210
0-150	0-150	09700	10220
0-250	0-250	09705	10230
0-300	0-300	09710	10240
0-500	0-500	09715*	10250*

Voltmeters-Iron Vane	Model 2152 2½"	Model 2153 3½"	Model 2154 4½"
Range	Scale	Catalog #	Catalog #
0-10	0-10	17685	17726
0-15	0-15	17686	17727
0-25	0-25	17687	17728
0-50	0-50	17688	17729
0-100	0-100	—	17730
0-150	0-150	17690	17731
0-250	0-250	17691	17732
0-300	0-300	17692	17733
0-500	0-500	—	17734*

AC Milliammeters	Model 1257 2½"	Model 1357 3½"	Model 1359 4½"
Range	Scale	Catalog #	Catalog #
0-10	0-10	06294	06625
0-50	0-50	06295	06630
0-100	0-100	06296	06640
0-250	0-250	06297	06650
0-500	0-500	06300	06660

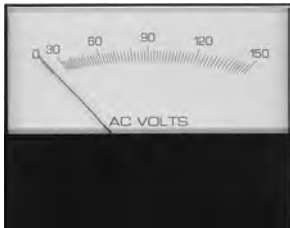
AC Milliammeters	Model 2152 2½"	Model 2153 3½"	Model 2154 4½"
Range	Scale	Catalog #	Catalog #
0-10	0-10	17680	—
0-50	0-50	17681	17716
0-100	0-100	17682	17717
0-250	0-250	17683	17718
0-500	0-500	17684	17719

* External multipliers are furnished on AC meters having a range of 500 volts or higher.
** These meters require an external current transformer.

Jewell AC Current and Voltage Meters

Modutec S & W Series

- Five Display Sizes: 1 1/2", 2 1/2", 3 1/2", 4 1/2" and 5 1/2"
- Shielded Taut-Band Movement
- Surface-Mount or Window-Mount Models



S Series



W Series

These meters are available in both moving coil (rectifier type) and iron vane versions. The iron vane construction is relatively insensitive to input distortion. The rectifier type is less affected by frequency variations.

ORDERING INFORMATION

Use Ordering Code Guide to complete Part #. Insert Size Code in box [1] and Model Code in box [2].

AC Voltmeters – Self-contained, rectifier type, 900Ω/V

0-3	[1][2]	-AVV-003
0-5	[1][2]	-AVV-005
0-10	[1][2]	-AVV-010
0-15	[1][2]	-AVV-015
0-25	[1][2]	-AVV-025
0-50	[1][2]	-AVV-050
0-100	[1][2]	-AVV-100
0-150	[1][2]	-AVV-150
0-300	[1][2]	-AVV-300
0-500	[1][2]	-AVV-500
0-600	[1][2]	-AVV-600

AC Voltmeters – Transformer rated, 0-150V, rectifier type

0-750	[1][2]	-AVV-750
0-1500	[1][2]	-AVV-1500
0-3000	[1][2]	-AVV-3000

AC Voltmeters – Iron vane: self-contained, 60Hz nominal

0-3	[1][2]	-AVC-003 **
0-5	[1][2]	-AVC-005 **
0-10	[1][2]	-AVC-010 **
0-15	[1][2]	-AVC-015 **
0-30	[1][2]	-AVC-030 **
0-50	[1][2]	-AVC-050 **
0-100	[1][2]	-AVC-100 **
0-150	[1][2]	-AVC-150 **
0-300	[1][2]	-AVC-300 **
0-500	[1][2]	-AVC-500 **
0-600	[1][2]	-AVC-600 **

AC Voltmeters – Iron vane: transformer rated, 0-150V, 60Hz

0-600	[1][2]	-AVCX-600 **
0-750	[1][2]	-AVCX-750 **
0-1500	[1][2]	-AVCX-1500 **
0-3000	[1][2]	-AVCX-3000 **

SPECIFICATIONS

Model	W Series				
Case Size	1 1/2"	2 1/2"	3 1/2"	4 1/2"	5 1/2"
Size (H x W x D)	1.77 x 2.26 x 1.83"	2.29 x 3.01 x 2.10"	2.90 x 3.73 x 2.12"	4.06 x 5.18 x 2.17"	4.60 x 5.97 x 2.17"
Window (cutout)	0.935 x 2.15"	1.27 x 2.90"	1.595 x 3.61"	2.345 x 5.02"	2.59 x 5.78"
Model	S Series				
Case Size	1 1/2"	2 1/2"	3 1/2"	4 1/2"	5 1/2"
Size (H x W x D)	1.75 x 2.24 x 1.55"	2.27 x 2.99 x 1.80"	2.87 x 3.70 x 1.80"	3.96 x 5.10 x 1.80"	4.48 x 5.85 x 1.80"
Barrel (cutout)	1.55"	2.22"	2.82"	2.82"	2.82"
All Models:					
Scale Length (Rect/Iron)	1.75"	2.41"/2.15"	3.0"/2.7"	4.22"/3.8"	5.12"/---
Accuracy	±2% iron vane type, ±3% AC rectifier type (60 Hz sine wave)				
Repeatability	±2% iron vane, ±0.5% rectifier type				
Response Time	1.5 sec. (except 3 sec. for ≤50μA full scale)				

OPTIONS (WHERE APPLICABLE)

Custom Scaling	Illumination
Mirror Scale	Custom Artwork
High Torque Movement	Sealed Case
Color Bands	Bezel Mount Kit

Also Available: VU Meters & Elapsed Time Meters

ORDERING INFORMATION

AC Milliammeters – Self-contained, rectifier type

0-1	1100W	[1][2]	-AMA-001
0-5	260	[1][2]	-AMA-005
0-10	140	[1][2]	-AMA-010
0-25	90	[1][2]	-AMA-025
0-50	45	[1][2]	-AMA-050
0-100	6.0	[1][2]	-AMA-100
0-200	1.5	[1][2]	-AMA-200 *
0-500	.4	[1][2]	-AMA-500 *

AC Milliammeters – Iron vane: Self-contained, 60Hz nominal input (50-400Hz range)

0-10	2600	[1][2]	-AMC-010 **
0-25	430	[1][2]	-AMC-025 **
0-50	105	[1][2]	-AMC-050 **
0-100	27	[1][2]	-AMC-100 **
0-250	4.3	[1][2]	-AMC-250 **
0-500	1.1	[1][2]	-AMC-500 **

AC Ammeters – Self-contained, rectifier type

0-1	.07	[1][2]	-AAA-001 *
0-1.5	.05	[1][2]	-AAA-0015 *
0-2	.04	[1][2]	-AAA-002 *
0-3	.025	[1][2]	-AAA-003 *
0-5	.015	[1][2]	-AAA-005 *
0-10	.0075	[1][2]	-AAA-010 *
0-15	.005	[1][2]	-AAA-015 *
0-20	.004	[1][2]	-AAA-020 *
0-25	.0037	[1][2]	-AAA-025 *
0-30	.0025	[1][2]	-AAA-030 *
0-50	.0015	[1][2]	-AAA-050 *

AC Ammeters – Iron vane: Self-contained, 60Hz nominal input (50-400Hz range)

0-1	.26	[1][2]	-AAC-001 **
0-1.5	.12	[1][2]	-AAC-0015 **
0-2	.07	[1][2]	-AAC-002 **
0-3	.048	[1][2]	-AAC-003 **
0-5	.022	[1][2]	-AAC-005 **
0-10	.005	[1][2]	-AAC-010 **
0-15	.003	[1][2]	-AAC-015 **
0-20	.002	[1][2]	-AAC-020 **
0-25	.002	[1][2]	-AAC-025 **
0-30	.0015	[1][2]	-AAC-030 **
0-50	.001	[1][2]	-AAC-050 **

ORDERING CODE GUIDE

[1] Insert Size Code:	CASE SIZE
1	1 1/2"
2	2 1/2"
3	3 1/2"
4	4 1/2"
5	5 1/2"

[2] Insert Model Code:

STYLE	
S	Surface Mount
W	Window Mount

AC Ammeters – Transformer rated, 0-5A, rectifier type

0-60	[1][2]	-AAAX-060 *
0-75	[1][2]	-AAAX-075 *
0-100	[1][2]	-AAAX-100 *
0-150	[1][2]	-AAAX-150 *
0-200	[1][2]	-AAAX-200 *
0-300	[1][2]	-AAAX-300 *
0-400	[1][2]	-AAAX-400 *
0-500	[1][2]	-AAAX-500 *
0-600	[1][2]	-AAAX-600 *
0-800	[1][2]	-AAAX-800 *
0-1000	[1][2]	-AAAX-1000 *
0-1500	[1][2]	-AAAX-1500 *
0-2000	[1][2]	-AAAX-2000 *

AC Ammeters – Iron vane: Transformer rated, 0-5A, 60Hz nominal input (50-400Hz range)

0-60	[1][2]	-AACX-060 **
0-75	[1][2]	-AACX-075 **
0-100	[1][2]	-AACX-100 **
0-150	[1][2]	-AACX-150 **
0-200	[1][2]	-AACX-200 **
0-300	[1][2]	-AACX-300 **
0-500	[1][2]	-AACX-500 **
0-600	[1][2]	-AACX-600 **
0-800	[1][2]	-AACX-800 **
0-1000	[1][2]	-AACX-1000 **
0-1500	[1][2]	-AACX-1500 **
0-2000	[1][2]	-AACX-2000 **

Frequency Meters – Pointer Type Electronic

45-65 Hz	120V	[1][2]	-FRQ-55/120-20 **
45-55	120	[1][2]	-FRQ-50/120-10 **
55-65	120	[1][2]	-FRQ-60/120-10 **
380-420	120	[1][2]	-FRQ-400/120-40 **
45-55	230	[1][2]	-FRQ-50/230-10 **
55-65	230	[1][2]	-FRQ-60/230-10 **

*not available in 1 1/2" size

**not available in 1 1/2" or 5 1/2" sizes

Jewell AC Current and Voltage Meters

Modutec PB Series

- Four Display Sizes: 1½", 2½", 3½", and 4½"
- Shielded Taut-Band Movement
- Large, Easy to Read Scale



▲ PB Series

These meters are available in both moving coil (rectifier type) and iron vane versions. The iron vane construction is relatively insensitive to input distortion. The rectifier type is less affected by frequency variations.

ORDERING INFORMATION

Use Ordering Code Guide to complete Part #. Insert Size Code in box **1**.

AC Voltmeters - Self-contained, rectifier type, 900Ω/V

0-3	1	PB-AVV-003
0-5	1	PB-AVV-005
0-10	1	PB-AVV-010
0-15	1	PB-AVV-015
0-25	1	PB-AVV-025
0-50	1	PB-AVV-050
0-100	1	PB-AVV-100
0-150	1	PB-AVV-150
0-300	1	PB-AVV-300
0-500	1	PB-AVV-500
0-600	1	PB-AVV-600

AC Voltmeters - Transformer rated, 0-150V, rectifier type

0-750	1	PB-AVX-750
0-1500	1	PB-AVX-1500
0-3000	1	PB-AVX-3000

AC Voltmeters - Iron vane: self-contained, 60Hz nominal

0-3	1	PB-AVC-003 *
0-5	1	PB-AVC-005 *
0-10	1	PB-AVC-010 *
0-15	1	PB-AVC-015 *
0-30	1	PB-AVC-030 *
0-50	1	PB-AVC-050 *
0-100	1	PB-AVC-100 *
0-150	1	PB-AVC-150 *
0-300	1	PB-AVC-300 *
0-500	1	PB-AVC-500 *
0-600	1	PB-AVC-600 *

AC Voltmeters - Iron vane: transformer rated, 0-150V, 60Hz

0-600	1	PB-AVCX-600 *
0-750	1	PB-AVCX-750 *
0-1500	1	PB-AVCX-1500 *
0-3000	1	PB-AVCX-3000 *

SPECIFICATIONS

Model	PB Series			
Case Size	1½"	2½"	3½"	4½"
Size (H x W x D)	1.75 x 1.75 x 1.39"	2.70 x 2.70 x 1.77"	3.50 x 3.50 x 1.77"	4.41 x 4.85 x 1.84"
Barrel (cutout)	1.53"	2.20"	2.75"	2.79"
Scale Length	1.26"	2.10"	2.90"	4.00"

Accuracy	±2% iron vane type, ±3% AC rectifier type (60 Hz sinewave)
Repeatability	±2% iron vane, ±0.5% rectifier type
Response Time	1.5 sec. (except 3 sec. for ≤50μA full scale)

The PB series industrial panel board meters meet or exceed the requirements of ANSI C39.1. The mounting stud configuration complies with ANSI standards. Number of studs varies by size: 1½" meters - 2 studs; 2½" & 3½" meters - 3 studs; 4½" meters - 4 studs.

OPTIONS (WHERE APPLICABLE)

Custom Scaling	Color Bands
Mirror Scale	Custom Artwork
High Torque Movement	Heavy Damping

Also Available: VU Meters & Elapsed Time Meters

ORDERING INFORMATION

AC Milliammeters - Self-contained, rectifier type

0-1	1100 Ω	1	PB-AMA-001
0-5	260	1	PB-AMA-005
0-10	140	1	PB-AMA-010
0-25	90.0	1	PB-AMA-025
0-50	45.0	1	PB-AMA-050
0-100	6.0	1	PB-AMA-100
0-200	1.5	1	PB-AMA-200
0-500	.4	1	PB-AMA-500

AC Milliammeters - Iron vane: Self-contained, 60Hz nominal input (50-400Hz range)

0-10	2600	1	PB-AMC-010 *
0-25	430	1	PB-AMC-025 *
0-50	105	1	PB-AMC-050 *
0-100	27	1	PB-AMC-100 *
0-250	4.3	1	PB-AMC-250 *
0-500	1.1	1	PB-AMC-500 *

AC Ammeters - Self-contained, rectifier type

0-1	.07	1	PB-AAA-001 *
0-1.5	.05	1	PB-AAA-0015 *
0-2	.04	1	PB-AAA-002 *
0-3	.025	1	PB-AAA-003 *
0-5	.015	1	PB-AAA-005 *
0-10	.0075	1	PB-AAA-010 *
0-15	.005	1	PB-AAA-015 *
0-20	.004	1	PB-AAA-020 *
0-25	.0037	1	PB-AAA-025 *
0-30	.0025	1	PB-AAA-030 *
0-50	.0015	1	PB-AAA-050 *

AC Ammeters - Iron vane: Self-contained, 60Hz nominal input (50-400Hz range)

0-1	.20	1	PB-AAC-001 *
0-1.5	.012	1	PB-AAC-0015 *
0-2	.07	1	PB-AAC-002 *
0-3	.048	1	PB-AAC-003 *
0-5	.022	1	PB-AAC-005 *
0-10	.005	1	PB-AAC-010 *
0-15	.003	1	PB-AAC-015 *
0-20	.002	1	PB-AAC-020 *
0-25	.002	1	PB-AAC-025 *
0-30	.0015	1	PB-AAC-030 *
0-50	.001	1	PB-AAC-050 *

ORDERING CODE GUIDE

1 Insert Size Code:	CASE SIZE
1	1½"
2	2½"
3	3½"
4	4½"

ORDERING INFORMATION

AC Ammeters - Transformer rated, 0-5A, rectifier type

0-60	1	PB-AAAX-060
0-75	1	PB-AAAX-075
0-100	1	PB-AAAX-100
0-150	1	PB-AAAX-150
0-200	1	PB-AAAX-200
0-300	1	PB-AAAX-300
0-400	1	PB-AAAX-400
0-500	1	PB-AAAX-500
0-600	1	PB-AAAX-600
0-800	1	PB-AAAX-800
0-1000	1	PB-AAAX-1000
0-1500	1	PB-AAAX-1500
0-2000	1	PB-AAAX-2000

AC Ammeters - Iron vane: Transformer rated, 0-5A, 60Hz nominal input (50-400Hz range)

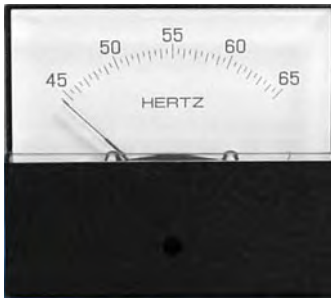
0-60	1	PB-AACX-060 *
0-75	1	PB-AACX-075 *
0-100	1	PB-AACX-100 *
0-150	1	PB-AACX-150 *
0-200	1	PB-AACX-200 *
0-300	1	PB-AACX-300 *
0-500	1	PB-AACX-500 *
0-600	1	PB-AACX-600 *
0-800	1	PB-AACX-800 *
0-1000	1	PB-AACX-1000 *
0-1500	1	PB-AACX-1500 *
0-2000	1	PB-AACX-2000 *

Frequency Meters - Pointer Type Electronic

45-65 Hz	120V	1	PB-55/120-20 *
45-55	120	1	PB-50/120-10 *
55-65	120	1	PB-60/120-10 *
380-420	120	1	PB-400/120-10 *
45-55	230	1	PB-50/230-10 *
55-65	230	1	PB-60/230-10 *

*not available in 1½" size

Yokogawa AC Motor Load and Frequency Meters


250 ▲

255 ▲

Horizon Line and Big Look Series

- Accuracy: $\pm 2\%$ of Full Scale, $\pm 3\%$ of span for Frequency
- Meets ANSI C-39.1
- Four Display Sizes: 1½", 2½", 3½", and 4½"
- Severe Duty Meters Optional (2½" to 4½") to Meet UL1437
- Surface-Mount or Window-Mount Models

SPECIFICATIONS

Model	251/255		
Case Size	2½"	3½"	4½"
Size (H x W x D)	2.66" x 3.12" x 1.81"	3.32" x 3.89" x 1.83"	4.18" x 4.73" x 1.83"
Barrel (cutout)	2.19"	2.72"	2.72"
Window (cutout)	1.45" x 3.11"	1.84" x 3.88"	2.22" x 4.72"
Model	250/254		
Case Size	2½"	3½"	4½"
Size (H x W x D)	2.69" x 2.69" x 1.85"	3.50" x 3.50" x 1.85"	4.41" x 4.85" x 1.85"
Barrel (cutout)	2.17"	2.72"	2.72"
Scale Length	2.06"	2.88"	3.93"
Accuracy	$\pm 2\%$ of Full Scale, $\pm 3\%$ of span for Frequency		
Repeatability	$\pm 0.5\%$		
Response Time	2.5 sec.		
Operating Temperature	0-40°C		
Storage Temperature	-10°C-50°C		
Dielectric	2600V for 1 min. (Otherwise per ANSI) except 1½" size 1500V		

ORDERING INFORMATION

AC Motors Load Indicators

Rating Amps	Scale Marking	Type	2½"	3½"	4½"
5	0-150% motor load current, Red band: 100-150	250	250240LSPZ7AAA	250340LSPZ7AAA	250440LSPZ7AAA
5	0-150% motor load current	250	250240LSPZ7AAB	250340LSPZ7AAB	250440LSPZ7AAB
	Green band: 0-100, yellow: 100-125, red: 125-150				
5	0-150% motor load current, Red band: 100-150	251	251240LSPZ7AAJ	251340LSPZ7AAJ	251440LSPZ7AAJ
5	0-150% motor load current	251	251240LSPZ7AAK	251340LSPZ7AAK	251440LSPZ7AAK
	Green band: 0-100, yellow: 100-125, red: 125-150				

AC Frequency Meters, Self Contained, Accuracy $\pm 3\%$ of Span

Voltage Input	Center Frequency	Scale (Hz)			
120 VAC	50	45-55	<input type="checkbox"/> 250AGAG	<input type="checkbox"/> 350AGAG	<input type="checkbox"/> 450AGAG
120 VAC	55	45-65	<input type="checkbox"/> 250AJAJ	<input type="checkbox"/> 350AJAJ	<input type="checkbox"/> 450AJAJ
120 VAC	60	55-65	<input type="checkbox"/> 250ANAN	<input type="checkbox"/> 350ANAN	<input type="checkbox"/> 450ANAN
120 VAC	400	380-420	<input type="checkbox"/> 250BKBK	<input type="checkbox"/> 350BKBK	<input type="checkbox"/> 450BKBK
208 VAC	50	45-55	<input type="checkbox"/> 250GGGG	<input type="checkbox"/> 350GGGG	<input type="checkbox"/> 450GGGG
208 VAC	55	45-65	<input type="checkbox"/> 250GJGJ	<input type="checkbox"/> 350GJGJ	<input type="checkbox"/> 450GJGJ
208 VAC	60	55-65	<input type="checkbox"/> 250GNGN	<input type="checkbox"/> 350GNGN	<input type="checkbox"/> 450GNGN
208 VAC	400	380-420	<input type="checkbox"/> 250HKHK	<input type="checkbox"/> 350HKHK	<input type="checkbox"/> 450HKHK
240 VAC	50	45-55	<input type="checkbox"/> 250DGDG	<input type="checkbox"/> 350DGDG	<input type="checkbox"/> 450DGDG
240 VAC	55	45-65	<input type="checkbox"/> 250DJDJ	<input type="checkbox"/> 350DJDJ	<input type="checkbox"/> 450DJDJ
240 VAC	60	55-65	<input type="checkbox"/> 250DNDN	<input type="checkbox"/> 350DNDN	<input type="checkbox"/> 450DNDN
240 VAC	400	380-420	<input type="checkbox"/> 250EKEK	<input type="checkbox"/> 350EKEK	<input type="checkbox"/> 450EKEK

Insert: 254 - for Big Look
255 - for Horizon Line

Simpson Frequency Meters

- Four Different Models
- 2½", 3½" and 4½" sizes

Simpsons frequency meters are ideal for monitoring line frequency. They are used wherever fast, precise monitoring of complex circuits is essential. Segmental scale meters present a selected frequency range across the entire dial face in linear fashion, where other meters are squeezed into a quarter of an inch of space.



Wide-Vue ▲



Century ▲



Rectangular ▲



Round ▲

SPECIFICATIONS

Accuracy:	3% of span
Suspension:	Pivot and Jewel
Movement:	Small Core Magnet

ORDERING INFORMATION

Model: 1287, 2½" WIDEVUE			Model: 1387, 3½" WIDEVUE			Model: 1389, 4½" WIDEVUE		
Cat #	Frequency	Voltage	Cat #	Frequency	Voltage	Cat #	Frequency	Voltage
35100	45-55 HZ	120V	35106	45-55 HZ	120V	35112	45-55 HZ	120V
35101	45-55 HZ	240V	35107	45-55 HZ	240V	35113	45-55 HZ	240V
35102	55-65 HZ	120V	35108	55-65 HZ	120V	35114	55-65 HZ	120V
35103	55-65 HZ	240V	35109	55-65 HZ	240V	35115	55-65 HZ	240V
35104	380-420 HZ	120V	35110	380-420 HZ	120V	35116	380-420 HZ	120V
35105	380-420 HZ	240V	35111	380-420 HZ	240V	35117	380-420 HZ	240V
Model: 2182, 2½" CENTURY			Model: 2183, 3½" CENTURY			Model: 2184, 4½" CENTURY		
Cat #	Frequency	Voltage	Cat #	Frequency	Voltage	Cat #	Frequency	Voltage
35118	45-55 HZ	120V	35124	45-55 HZ	120V	35130	45-55 HZ	120V
35119	45-55 HZ	240V	35125	45-55 HZ	240V	35131	45-55 HZ	240V
35120	55-65 HZ	120V	35126	55-65 HZ	120V	35132	55-65 HZ	120V
35121	55-65 HZ	240V	35127	55-65 HZ	240V	35133	55-65 HZ	240V
35122	380-420 HZ	120V	35128	380-420 HZ	120V	35134	380-420 HZ	120V
35123	380-420 HZ	240V	35129	380-420 HZ	240V	35135	380-420 HZ	240V
Model: 187, 2½" RECTANGULAR			Model: 87, 3½" RECTANGULAR			Model: 89, 4½" RECTANGULAR		
Cat #	Frequency	Voltage	Cat #	Frequency	Voltage	Cat #	Frequency	Voltage
35136	45-55 HZ	120V	35142	45-55 HZ	120V	35148	45-55 HZ	120V
35137	45-55 HZ	240V	35143	45-55 HZ	240V	35149	45-55 HZ	240V
35138	55-65 HZ	120V	35144	55-65 HZ	120V	35150	55-65 HZ	120V
35139	55-65 HZ	240V	35145	55-65 HZ	240V	35151	55-65 HZ	240V
35140	380-420 HZ	120V	35146	380-420 HZ	120V	35152	380-420 HZ	120V
35141	380-420 HZ	240V	35147	380-420 HZ	240V	35153	380-420 HZ	240V
Model: 185, 2½" ROUND			Model: 85, 3½" ROUND					
Cat #	Frequency	Voltage	Cat #	Frequency	Voltage			
35154	45-55 HZ	120V	35160	45-55 HZ	120V			
35155	45-55 HZ	240V	35161	45-55 HZ	240V			
35156	55-65 HZ	120V	35162	55-65 HZ	120V			
35157	55-65 HZ	240V	35163	55-65 HZ	240V			
35158	380-420 HZ	120V	35164	380-420 HZ	120V			
35159	380-420 HZ	240V	35165	380-420 HZ	240V			

ANALOG METERS

Crompton 3½" Fiesta Panel Meters

016 Series

- 90° Scale Arc
- Dust and Water Jet Protected to IP55 (IEC529)
- Withstands High Levels of Shock, Vibration, Dirt & Humidity
- Contoured Window Gives a Wide Viewing Angle
- Complies with ANSI-C39 (IEC 51)
- UL Approval for Selected Ranges. File Number E87815

SPECIFICATIONS

AC Accuracy:	2.5% (iron vane construction)
DC Accuracy Class:	1.5 (moving iron construction)
Overload	
Ammeters:	x1.2 for 2 hours, x10 for 5 seconds
Voltmeters:	x1.2 for 2 hours, x2 for 5 seconds
Burden	
AC Ammeters:	0.5 VA
AC Voltmeters:	4.5 VA Maximum
Operating Temperature:	-20°C to 65°C (-4°F to 149°F)
Storage Temperature:	-30°C to 70°C (-22°F to 158°F)

ORDERING INFORMATION

Rating	Scaling	Catalog No.
A.C. Ammeters - True RMS Reading (Self Contained 40/70Hz)		
5A	0-5A	• 016-02AA-LSL
10A	0-10A	016-02AA-MTMT
15A	0-15A	016-02AA-NDND
20A	0-20A	016-02AA-NGNG
30A	0-30A	016-02AA-NLNL
5A	Transformer Rated	• 016-02AA-LS**
A.C. Voltmeters - True RMS Reading		
150V	0-150V	• 016-02VA-PZPZ
300V	0-300V	• 016-02VA-RXR
600V	0-600V	• 016-02VA-SJSJ
150V	Transformer Rated	• 016-02VA-PZ**
D.C. Ammeters		
0-50 mV	To Suit Requirements	016-01AA-EC**
0-1 mA	To Suit Requirements	• 016-01AA-FA**
0-5 mA	To Suit Requirements	016-01AA-FX**
0-10 mA	To Suit Requirements	016-01AA-HA**
0-20 mA	To Suit Requirements	• 016-01AA-HF**
Milliammeters - Suppressed Zero (no zero set unless specified)		
4/20 mA	To Suit Requirements	• 016-01RA-HG**
D.C. Voltmeters (Sensitivity 1000Ω/Volt)		
0-15V	0-15V	016-01VA-NDND
0-30V	0-30V	016-01VA-NLNL
0-50V	0-50V	• 016-01VA-NTNT
0-150V	0-150V	• 016-01VA-PZPZ
0-300V	0-300V	• 016-01VA-RXR
0-600V	0-600V	016-01VA-SJSJ
Frequency Meters, 120V* (Self Contained)		
Rating & Scale	Accuracy	Catalog No.
45-55 Hz	0.15	• 016-41SA-PNAG-AG
45-65 Hz	0.25	• 016-41SA-PNAJ-AJ
55-65 Hz	0.15	• 016-41SA-PNAN-AN
56-64 Hz	0.25	• 016-41SA-PNAO-AO
360-440 Hz	1.25	016-41SA-PNBI-BI

*Alternate voltage rating 200-250V use code RN instead of PN, Alternate voltage rating 380-480V use code SE instead of PN

- UL Recognized
- ** Specify Scale

016-02 ▶



016-41 ▶



016-01 ▶



Options

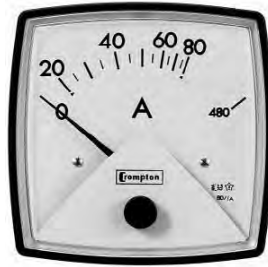
- Non-Reflecting Window
- Heavily Damped Movement
- Panel Gasket
- Clamp Band Fixing
- Colored Internal Gasket

Elapsed Time Meters also available for 115V, 230V and 480V, 50 or 60Hz.

Crompton AC Overload Ammeters

- X6 Overload Scaling for Motor Start Duty
- True RMS Reading, Self Contained 50/60Hz
- 3½" & DIN sizes

Fiesta ▶



Fiesta 3½" Panel Meter

ORDERING INFORMATION

Accuracy: 2.5% Burden: 0.5VA Scale: 90°
Transformer rated

Rating	Input	Catalog #
5A	0-5-30A (x6)	016-026A-LS**-C6
5A	0-5-10A (x2)	016-022A-LS**-C6

** state required scaling at time of order

DIN Panel Meters

ORDERING INFORMATION

Class 1.5, Burden 0.5VA (specify 50 or 60Hz)

X6 Overload		72x72	96x96
Rating	Scaling	Catalog #	Catalog #
5A	0-5-30A	E243-026A-LSLS-C7	E244-026A-LSLS-C7
10A	0-10-60A	E243-026A-MTMT-C7	E244-026A-MTMT-C7
15A	0-15-90A	E243-026A-NDND-C7	E244-026A-NDND-C7
20A	0-20-120A	E243-026A-NGNG-C7	E244-026A-NGNG-C7
30A	0-30-180A	E243-026A-NLNL-C7	E244-026A-NLNL-C7
5A	Transformer rated	E243-026A-LS**-C7	E244-026A-LS**-C7

DIN meters also available with X2 & X5 overload scaling

ORDERING INFORMATION

Class 1.5, Burden 0.5VA (specify 50 or 60Hz)

X3 Overload		72x72	96x96
Rating	Scaling	Catalog #	Catalog #
5A	0-5-15A	E243-023A-LSLS-C7	E244-023A-LSLS-C7
10A	0-10-30A	E243-023A-MTMT-C7	E244-023A-MTMT-C7
15A	0-15-45A	E243-023A-NDND-C7	E244-023A-NDND-C7
20A	0-20-60A	E243-023A-NGNG-C7	E244-023A-NGNG-C7
30A	0-30-90A	E243-023A-NLNL-C7	E244-023A-NLNL-C7
5A	Transformer rated	E243-023A-LS**-C7	E244-023A-LS**-C7

** state required scaling at time of order

Yokogawa DIN Power Meters

- Self-contained (no external transducer)
- Taut band construction
- 1.5 accuracy class (W & VAR)
- 96mm, ¼ DIN size
- Flame retardant ABS case
- 2600V dielectric strength to case

DN96A ▶



SPECIFICATIONS

Deflection:	90°
Accuracy Class	1.0 (W & VAR), 5.0 (Power Factor)
Environment:	0 to 45°C, <75% RH
Insulation Resistance:	>10MΩ at 500V DC
Depth:	83mm

White on black scale with black pointer standard.

Specify full scale value and PT & CT ratios when ordering.

$$\text{Calibration watts or vars} = \frac{\text{MAX. full scale value}}{\text{PT ratio} \times \text{CT ratio}}$$

Calibration watts are 65% to 150%, calibration vars are 33% to 150%.

Also available: 250° deflection (DN96B).

ORDERING INFORMATION

To Order: Specify Model, Range & Frequency followed by -L-BL

A - B - C - L - BL

Example: DN96A51-W55-N-L-BL

	Watts	VAR	Power Factor
A Model			
1 phase, 2 wire	DN96A51	DN96A61	DN96A71
1 phase, 3 wire	DN96A52	DN96A62	DN96A72
3 phase, 3 wire unbal	DN96A55	DN96A65	DN96A75
3 phase, 4 wire bal	DN96A54	DN96A64	---
3 phase, 4 wire unbal	DN96A56	DN96A66	DN96A76

B Range			
1A, 120V	W55	M55	C55
5A, 120V	W56	M56	C56
1A, 240V	W65	M65	C65
5A, 240V	W66	M66	C66
1A, 63.5V	W11	M11	C11*
5A, 63.5V	W12	M12	C12*

C Frequency			
50/60 Hz	N	---	---
50 Hz	---	A	A
60 Hz	---	B	B

*3 phase, 4 wire

Yokogawa DC Voltage and Current DIN Meters

DN Series

- 1.5 Accuracy Class
- 90° or 250° Deflection
- 96 x 96 mm Size (1/4 DIN)
- Taut-Band Suspension
- Safety Terminal Cover
- Optional Set Pointer



← **DN96A**

DN96B
with set pointer →



SPECIFICATIONS

Accuracy	1.5
Movement	Moving coil with taut band suspension
Full Scale Deflection	DN96A: 90°, DN96B: 250°
Scale Arc Length	DN96A: 95mm, DN96B: 161mm
Operating Temperature Range	DN96A: 0-45°C (32°F-113°F) DN96B: 0-55°C (32°F-131°F)
Dielectric Strength	3,320V AC for 5 sec., circuit and case
Insulation Resistance	>10MΩ at 500V DC, circuit to case
Position of Use	Vertical (Scale)
Case Depth (including connectors)	DN96A: 60mm, DN96B: 101mm
Panel Cutout	92 x 92 mm
Connections	Screw terminals with safety cover

DC VOLTMETERS

Scale & Rating (Volts)	Type: P/N:	96 x 96 90°	96 x 96 250°
0-1	VLA-N-L-BL	VLA-N-L-BL	---
0-3	VLJ-N-L-BL	VLJ-N-L-BL	---
0-5	VLS-N-L-BL	VLS-N-L-BL	---
0-10	VMT-N-L-BL	VMT-N-L-BL	---
0-15	VND-N-L-BL	---	---
0-30	VNL-N-L-BL	VNL-N-L-BL	---
0-50	VNT-N-L-BL	VNT-N-L-BL	---
0-75	VPB-N-L-BL	---	---
0-100	VPK-N-L-BL	VPK-N-L-BL	---
0-150	VPZ-N-L-BL	---	---
0-300	VRX-N-L-BL	VRX-N-L-BL	---
0-450	VSD-N-L-BL	---	---
0-500	VSF-N-L-BL	VSF-N-L-BL	---
0-600	VSJ-N-L-BL	VSJ-N-L-BL	---
1-0-1	ELA-N-L-BL	---	---
10-0-10	EMT-N-L-BL	---	---
25-0-25	ENJ-N-L-BL	---	---
50-0-50	ENT-N-L-BL	---	---
100-0-100	EPK-N-L-BL	---	---
150-0-150	EPZ-N-L-BL	---	---
300-0-300	ERX-N-L-BL	---	---
1-5	VLR-N-L-BL	VLR-N-L-BL	---

OPTIONS

Custom Markings
Custom Scales
Adjustable Potentiometer (Voltmeters Only)
Color Bands
Set Pointer

72mm size also available (90° deflection only)

DC AMMETERS

Scale & Rating (Amps)	Type: P/N:	96 x 96 90°	96 x 96 250°
-----------------------	------------	-------------	--------------

0-50μ	ACY-N-L-BL	---
0-100μ	ADR-N-L-BL	---
0-300μ	AEG-N-L-BL	AEG-N-L-BL
0-500μ	AEM-N-L-BL	AEM-N-L-BL
0-1m	AFA-N-L-BL	AFA-N-L-BL
0-3m	AFN-N-L-BL	AFN-N-L-BL
0-5m	AFX-N-L-BL	AFX-N-L-BL
0-10m	AGZ-N-L-BL	AGZ-N-L-BL
0-30m	AHM-N-L-BL	AHM-N-L-BL
0-50m	AHY-N-L-BL	AHY-N-L-BL
0-100m	AJR-N-L-BL	AJR-N-L-BL
0-300m	AKG-N-L-BL	AKG-N-L-BL
0-500m	AKM-N-L-BL	AKM-N-L-BL
0-1	ALA-N-L-BL	ALA-N-L-BL
0-1.5	ALC-N-L-BL	ALC-N-L-BL
0-2	ALE-N-L-BL	ALE-N-L-BL
0-3	ALJ-N-L-BL	ALJ-N-L-BL
0-5	ALS-N-L-BL	ALS-N-L-BL
0-7.5	AMF-N-L-BL	AMF-N-L-BL
0-10	AMT-N-L-BL	AMT-N-L-BL
0-15	AND-N-L-BL	AND-N-L-BL
0-20	ANG-N-L-BL	ANG-N-L-BL
0-30	ANL-N-L-BL	ANL-N-L-BL
50-0-50μ	DCY-N-L-BL	---
100-0-100μ	DDR-N-L-BL	---
500-0-500μ	DEM-N-L-BL	---
1-0-1m	DFA-N-L-BL	---
2.5-0-2.5m	DFK-N-L-BL	---
5-0-5m	DFX-N-L-BL	---
10-0-10m	DGZ-N-L-BL	---
25-0-25m	DHJ-N-L-BL	---
50-0-50m	DHY-N-L-BL	---
75-0-75m	DJG-N-L-BL	---
100-0-100m	DJR-N-L-BL	---
250-0-250m	DKD-N-L-BL	---
500-0-500m	DKM-N-L-BL	---
1-0-1	DLA-N-L-BL	---
2.5-0-2.5	DLG-N-L-BL	---
5-0-5	DLS-N-L-BL	---
10-0-10	DMT-N-L-BL	---
15-0-15	DND-N-L-BL	---
4-20m	AHE-N-L-BL	AHE-N-L-BL
10-50m	AHX-N-L-BL	AHX-N-L-BL

Shunt Rated -- Specify Scale

0-50mV	A01-N-L-BL	A01-N-L-BL
0-100mV	A05-N-L-BL	A05-N-L-BL
50-0-50mV	D01-N-L-BL	D01-N-L-BL

Yokogawa AC Voltage & Current DIN Meters

DN Series

- 1.5 Accuracy Class
- 90° or 250° Deflection
- 96 x 96 mm Size (1/4 DIN)
- Mean or RMS Reponding
- Motor Load (Overload) Ammeters
- Safety Terminal Cover
- Optional Set Pointer



DN96A



DN96B
with set pointer

OPTIONS

- 400Hz Operation
- Custom Markings
- Custom Scales
- Adjustable Potentiometer (Voltmeters Only)
- Color Bands
- Set Pointer

72mm size also available (90° deflection only)

SPECIFICATIONS

Accuracy Class	1.5 @ 50/60Hz (400Hz available)
Method	Taut band rectifier type (all DN96B, DN96A mean); Pivot & jewel moving iron (DN96A RMS)
Full Scale Deflection	DN96A: 90°, DN96B: 250°
Scale Arc Length	DN96A: 95mm, DN96B: 161mm
Operating Temperature Range	DN96A: 0-45°C (32°F-113°F) DN96B: 0-55°C (32°F-131°F)
Dielectric Strength	3,320V AC for 5 sec., circuit and case
Insulation Resistance	>10MΩ at 500V DC, circuit to case
Case Depth (w/terminals)	DN96A: 60mm, DN96B: 101mm
Panel Cutout	92 x 92 mm
Connections	Screw terminals with safety cover

AC VOLTMETERS

Scale & Rating (Volts)	Type	96 x 96 90° P/N: DN96A20-	96 x 96 250° DN96B21-
0-3	Mean	VLJ-N-L-BL	VLJ-N-L-BL
0-5	Mean	VLS-N-L-BL	VLS-N-L-BL
0-10	Mean	VMT-N-L-BL	VMT-N-L-BL
0-15	Mean	VND-N-L-BL	---
0-30	Mean	VNL-N-L-BL	VNL-N-L-BL
0-50	Mean	VNT-N-L-BL	VNT-N-L-BL
0-75	Mean	VPB-N-L-BL	---
0-100	Mean	VPK-N-L-BL	VPK-N-L-BL
0-150	Mean	VPZ-N-L-BL	VPZ-N-L-BL
0-200	Mean	VRL-N-L-BL	---
0-300	Mean	VRX-N-L-BL	VRX-N-L-BL
0-600	Mean	VSJ-N-L-BL	VSJ-N-L-BL
For External PT--specify scale			
0-150	Mean	V12-N-L-BL	V12-N-L-BL
0-150/√3	Mean	---	V13-N-L-BL
0-275	Mean	V51-N-L-BL	---
Scale & Rating (Volts)	Type	96 x 96 90° P/N: DN96A30-	96 x 96 250° DN96B20-
0-10	RMS	VMT-N-L-BL	---
0-15	RMS	VND-N-L-BL	---
0-30	RMS	VNL-N-L-BL	---
0-50	RMS	VNT-N-L-BL	VNT-N-L-BL
0-100	RMS	VPK-N-L-BL	VPK-N-L-BL
0-150	RMS	VPZ-N-L-BL	---
0-200	RMS	VRL-N-L-BL	---
0-250	RMS	VRS-N-L-BL	---
0-300	RMS	VRX-N-L-BL	VRX-N-L-BL
0-500	RMS	VSF-N-L-BL	VSF-N-L-BL
0-600	RMS	VSJ-N-L-BL	---
70-130	RMS	---	V20-N-L-BL
140-260	RMS	---	V21-N-L-BL
For External PT--specify scale			
0-150	RMS	V12-N-L-BL	V12-N-L-BL
0-150/√3	RMS	V13-N-L-BL	V13-N-L-BL

AC AMMETERS

Scale & Rating (Amps)	Type	96 x 96 90° P/N: DN96A20-	96 x 96 250° DN96B21-
0-200μ	Mean	AEA-N-L-BL	---
0-300μ	Mean	---	AEG-N-L-BL
0-500μ	Mean	AEM-N-L-BL	AEM-N-L-BL
0-1m	Mean	AFA-N-L-BL	AFA-N-L-BL
0-5m	Mean	AFX-N-L-BL	AFX-N-L-BL
0-10m	Mean	AGZ-N-L-BL	AGZ-N-L-BL
0-20m	Mean	AHF-N-L-BL	---
0-30m	Mean	---	AHM-N-L-BL
0-50m	Mean	---	AHY-N-L-BL
0-100m	Mean	---	AJR-N-L-BL
0-300m	Mean	---	AKG-N-L-BL
0-500m	Mean	---	AKM-N-L-BL
Scale & Rating (Amps)	Type	96 x 96 90° P/N: DN96A31-	96 x 96 250° DN96B20-
0-50m	RMS	AHY-N-L-BL	---
0-100m	RMS	AJR-N-L-BL	---
0-300m	RMS	AKG-N-L-BL	---
0-500m	RMS	AKM-N-L-BL	---
0-1	RMS	ALA-N-L-BL	ALA-N-L-BL
0-3	RMS	ALJ-N-L-BL	ALJ-N-L-BL
0-5	RMS	ALS-N-L-BL	ALS-N-L-BL
0-10	RMS	AMT-N-L-BL	AMT-N-L-BL
0-20	RMS	ANG-N-L-BL	ANG-N-L-BL
0-30	RMS	ANL-N-L-BL	ANL-N-L-BL
0-1-2 (2X)	RMS	A22-N-L-BL	A22-N-L-BL
0-5-10 (2X)	RMS	A25-N-L-BL	A25-N-L-BL
0-10-20 (2X)	RMS	A26-N-L-BL	A26-N-L-BL
0-15-30 (2X)	RMS	A27-N-L-BL	---
0-30-60 (2X)	RMS	A29-N-L-BL	---
0-1-3 (3X)	RMS	A32-N-L-BL	A32-N-L-BL
0-5-15 (3X)	RMS	A35-N-L-BL	A35-N-L-BL
0-10-30 (3X)	RMS	A36-N-L-BL	A36-N-L-BL
0-15-45 (3X)	RMS	A37-N-L-BL	---
0-20-60 (3X)	RMS	A38-N-L-BL	---
0-1-5 (5X)	RMS	---	A52-N-L-BL
0-5-25 (5X)	RMS	---	A55-N-L-BL
For External CT--specify scale			
0-1	RMS	A41-N-L-BL	A41-N-L-BL
0-5	RMS	A42-N-L-BL	A42-N-L-BL
0-1-2 (2X)	RMS	A43-N-L-BL	A43-N-L-BL
0-5-10 (2X)	RMS	A44-N-L-BL	A44-N-L-BL
0-1-3 (3X)	RMS	A45-N-L-BL	A45-N-L-BL
0-5-15 (3X)	RMS	A46-N-L-BL	A46-N-L-BL
0-1-5 (5X)	RMS	---	A47-N-L-BL
0-5-25 (5X)	RMS	---	A48-N-L-BL

Yokogawa Frequency DIN Meters

DN Series

- 1.0 or 0.5 Accuracy Class
- 90° or 250° Deflection
- 96 x 96 mm Size (1/4 DIN)
- Taut-Band Suspension
- Safety Terminal Cover
- Optional Set Pointer



▲ DN96A



▲ DN96B

OPTIONS

- Custom Markings
- Custom Scales
- Color Bands
- Set Pointer

72mm size also available with 90° deflection

SPECIFICATIONS

Mechanism	Taut band suspension
Full Scale Deflection	DN96A: 90°, DN96B: 250°
Scale Arc Length	DN96A: 95mm, DN96B: 161mm
Operating Temperature Range	DN96A: 0-45°C (32°F-113°F) DN96B: 0-55°C (32°F-131°F)
Dielectric Strength	3,320V AC for 5 sec., circuit and case
Insulation Resistance	>10MΩ at 500V DC, circuit to case
Case Depth (w/terminals)	DN96A: 60mm, DN96B: 101mm
Panel Cutout	92 x 92 mm
Connections	Screw terminals with safety cover

ORDERING INFORMATION

Scale & Input	Accuracy	96 x 96 90°	96 x 96 250°
Hz	Volts	Class	P/N: DN96A80- DN96B80-
45-55	115V	0.5	H40-N-L-BL H40-N-L-BL
55-65	115V	0.5	H41-N-L-BL H41-N-L-BL
45-65	115V	1.0	H42-N-L-BL H42-N-L-BL
350-450	115V	1.0	--- H49-N-L-BL
45-55	230V	0.5	H60-N-L-BL H60-N-L-BL
55-65	230V	0.5	H61-N-L-BL H61-N-L-BL
45-65	230V	1.0	H62-N-L-BL H62-N-L-BL
350-450	230V	1.0	--- H69-N-L-BL

Analog Meters

Yokogawa Synchroscope DIN Meters

DN Series

- Use on Single or 3-Phase Circuits
- Full 360° Rotation
- 50/60 and 400Hz Models
- 96 x 96 mm Size (1/4 DIN)
- Safety Terminal Cover
- Optional Synchronizing Relay Output

DN96B ▲



SPECIFICATIONS

Mechanism	Cross coil, moving magnets
Deflection	360°
Operating Temperature Range	0-55°C (32°F-131°F)
Dielectric Strength	3,320V AC for 5 sec., circuit and case
Insulation Resistance	>10MΩ at 500V DC, circuit to case
Response Time	<3 seconds
Relay Contacts	Form C, 250V/5A AC
Synchronizing Signal	$\Delta f < \pm 0.3\text{Hz}$; $\Delta \phi < \pm 15^\circ$; delay < 0.03Hz, 0.3°
Synchronizing LED	included in Relay Output models
Rated Power	5VA (7VA with relay)
Case Depth (w/terminals)	130mm
Panel Cutout	92 x 92 mm
Connections	Screw terminals with safety cover

ORDERING INFORMATION

Input	Meter	Meter with Relay Output
Volts	Hz	P/N: DN96B90- DN96B91-
110	50/60	VPM-N-L-BL VPM-N-L-BL
110	400	VPM-C-L-BL VPM-C-L-BL
220	50/60	VRM-N-L-BL VRM-N-L-BL
220	400	VRM-C-L-BL VRM-C-L-BL

OPTIONS

- Color
- ±15° Scale Markings
- Custom Logos
- Shipboard Hi-Shock Construction

Crompton DIN Panel Meters

- 48, 72, 96 & 144mm Case Sizes
- 1.5% Accuracy Class
- 90° & 240° Versions

Moving Coil DC Ammeters and Voltmeters

The linear scale is calibrated down to zero. Accuracy is maintained down to 10%.

Accuracy:	Class 1.5
Impedance:	Voltmeters: 1000Ω/V above 1V Millivolt meters use a 5mA movement.
Ammeters:	75mV internal shunt above 60mA

Model Code	48 x 48 mm	72 x 72 mm	96 x 96 mm	144 x 144 mm
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Short Scale (90°)

DC Ammeters	E242-89A	E243-01A	E244-01A	E246-01A
DC Voltmeters	E242-89V	E243-01V	E244-01V	E246-01V
Center Zero:				
DC Ammeters	E242-89C	E243-01C	E244-01C	E246-01C
DC Voltmeters	E242-89N	E243-01N	E244-01N	E246-01N

Long Scale (240°)

DC Ammeters	----	E243-05A	E244-05A	E246-05A
DC Voltmeters	----	E243-05V	E244-05V	E246-05V
Center Zero:				
DC Ammeters	----	E243-05C	E244-05C	E246-05C
DC Voltmeters	----	E243-05N	E244-05N	E246-05N

Suppressed zero (e.g. 4-20mA, 1-5V) models also available.

Range Codes

Ammeter	DC			AC TRMS			Voltmeter	DC			AC TRMS		
	Range	Code						Range	Code				
200 μA	EAEA	•					50 mV	HYHY	•				
250 μA	EBEB	•					60 mV	JCJC	•				
400 μA	EIEI	•					75 mV	JDJD	•				
600 μA	EQEQ	•					100 mV	JRJR	•				
1 mA	FAFA	•	•				150 mV	JXJX	•				
1.5 mA	FD	•	•				250 mV	KDKD	•				
2.5 mA	FKFK	•	•				400 mV	KJKJ	•				
5 mA	FXFX	•	•				600 mV	KPKP	•				
6 mA	GCGC	•	•				1 V	LALA	•				
10 mA	GZGZ	•	•				1.5 V	LCLC	•				
15 mA	HCHC	•	•				2.5 V	LFLF	•				
20 mA	HFHF	•	•				4 V	LLLL	•				
25 mA	HJHJ	•	•				5 V	LSLS	•				
40 mA	HSHS	•	•				6 V	LWLW	•				
100 mA	HZHZ	•	•				10 V	MTMT	•	•			
250 mA	KDKD	•	•				15 V	NDND	•	•			
400 mA	KJKJ	•	•				20 V	NGNG	•	•			
600 mA	KPKP	•	•				25 V	NJNJ	•	•			
1 A	LALA	•	•	•			40 V	NPNP	•	•			
1.5 A	LCLC	•	•	•			60 V	NWNW	•	•	•		
2.5 A	LFLF	•	•	•			100 V	PKPK	•	•	•		
4 A	LLLL	•	•	•			150 V	PZPZ	•	•	•		
5 A	LSLS	•	•	•			250 V	RSRS	•	•	•		
6 A	LWLW	•	•	•			300 V	RXR	•	•	•		
10 A	MTMT	•	•	•			400 V	SCSC	•	•	•		
15 A	NDND	•	•	•			500 V	SFSF	•	•	•		
20 A	NGNG	•	•	•			600 V	SJSJ	•	•	•		
25 A	NJNJ	•	•	•									
30 A	NLNL	•	•	•									
40 A	NPNP	•	•	•									

• Available Range



DIN Short Scale



DIN Long Scale

Moving Iron AC Ammeters and Voltmeters

Meters indicate true RMS value, substantially independent of system waveform. Scales are calibrated down to 20%.

Accuracy:	Class 1.5
Frequency:	50 or 60Hz (specify)
Burden:	Ammeters: 0.5VA; Voltmeters: 4.5VA maximum

Model Code	48 x 48 mm	72 x 72 mm	96 x 96 mm	144 x 144 mm
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Short Scale (90°)

AC Ammeter	E242-75A	E243-02A	E244-02A	E246-02A
AC Voltmeter	E242-75V	E243-02V	E244-02V	E246-02V

CT Rated AC Ammeters also available.

Rectifier AC Ammeters and Voltmeters

Meters are average responding, calibrated for RMS of sine wave.

Accuracy:	Class 1.5
Frequency:	50/60Hz

Model Code	48 x 48 mm	72 x 72 mm	96 x 96 mm	144 x 144 mm
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Short Scale (90°)

AC Ammeter	E242-89B	E243-01B	E244-01B	E246-01B
AC Voltmeter	E242-89W	E243-01W	E244-01W	E246-01W

Long Scale (240°)

AC Ammeter	----	E243-05B	E244-05B	E246-05B
AC Voltmeter	----	E243-05W	E244-05W	E246-05W

DIN Frequency



Frequency Meters

Frequency meters use an integral electronic converter and a moving coil indicator.

Accuracy:	Class 0.5
Burden:	4VA maximum

Model Code	48 x 48 mm	72 x 72 mm	96 x 96 mm
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Short Scale (90°)	E242-41S	E243-41S	E244-41S
Long Scale (240°)*	----	----	E244-41L

Range Code	45/55Hz	55/65Hz	45/65Hz	360/440Hz
100-125V AC	PLAG-AG	PLAN-AN	PLAJ-AJ	PLBI-BI
200-250V AC	RNAG-AG	RNAN-AN	RNAJ-AJ	RNBI-BI

* 360/440Hz not available

ORDERING INFORMATION

To Order: Specify Model Code followed by Range Code

Example: E242-75V-PZPZ

General Specifications:

Environment:	-20°C to +60°C
Case:	UL94V0 polycarbonate case, glass window, IP52
Depth:	64mm

Standard dials are white matte with black printed scales and bar knife-edge pointers. Black dials with white or yellow scales and pointers are also available.

Hoyt Industrial & Military Panel Meters

Round Panel Meters



- Metal or Phenolic Case
- 2¹/₂" - 4¹/₂" Sizes
- DC & AC Types
- Wide Variety of Options
- Military Qualified Versions (2¹/₂" & 3¹/₂")

◀ **17/3**

SPECIFICATIONS

Movement:	DC moving coil, AC repulsion		
Accuracy:	2% of full scale		
Case:	Metal or phenolic, with glass front		
Dimensions:	Bezel dia.	Body dia.	Depth behind panel
17/3-P, 552-P	2.69"	2.20"	1.88"
17/L-P, 560-P	3.22"	2.50"	1.88"
582-P, 584-P	3.50"	2.75"	1.89"
574P, 617P	4.50"	3.75"	1.95"
17/3-WR, 552-WR	2.55"	2.06"	1.83"
17/L-WR, 560-WR	3.22"	2.50"	1.94"
570-WR, 580-WR	3.66"	3.00"	2.09"
574-WR, 617-WR	4.50"	3.75"	1.89"
Terminals:	10-32 studs		

Options: Color bands, white on black dial, wide or narrow bezel, straight side metal case, LED illumination, 1/4-28 studs, pointer style, pointer color.

Also available: 6351/2 Series 3¹/₂" Metal Case Sealed Meters for extreme duty applications.

250° DC Meters



- High Impact Metal Case
- 2", 3" and 3-3/8" Sizes
- 2% Accuracy
- Illumination Option

◀ **250**

SPECIFICATIONS

Movement:	Highly damped pivot & jewel		
Deflection:	250 degrees		
Accuracy:	2% standard, 1% available		
Case:	Iron case standard, brass case available		
Dimensions:	250-20	250-30	250-375
Bezel diameter	2.29"	3.32"	3.80"
Body diameter	2.05"	3.00"	3.36"
Depth behind panel	2.51"	2.50"	2.50"
Terminals:	10-32 studs		

Other options: Color bands, white on black dial, bezel style, pointer style.

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.

A - **B** - **C** - **D** - **E** Example: 17/3-P-5mADC-300GPM

A	Model	
	17/3	2 ¹ / ₂ " DC meter
	552	2 ¹ / ₂ " AC meter
	17/L	3" DC meter
	560	3" AC meter
	582	3 ¹ / ₂ " DC meter (phenolic case only)
	584	3 ¹ / ₂ " AC meter (phenolic case only)
	570	3 ¹ / ₂ " DC meter (metal case only)
	580	3 ¹ / ₂ " AC meter (metal case only)
	574	4 ¹ / ₂ " DC meter
	617	4 ¹ / ₂ " AC meter
B	Case	
	P	Phenolic case
	WR	Wide rim metal case
	MM	Sealed metal case
C	Standard Ranges	
	DC	20, 50, 100, 200, 500uA 1, 2, 5, 10, 20, 50, 100, 200, 500mA & 4-20mA 1, 2, 5, 10, 20, 50A 50, 100, 150, 300, 500mV 1, 3, 5, 10, 15, 30, 50, 100, 150, 300, 500, 750V
	AC	10, 20, 50, 100, 200, 500mA 1, 2, 5, 10, 20, 50A 50, 100, 150, 300, 500mV 1, 3, 5, 10, 15, 30, 50, 100, 150, 300, 600V
D	Scale	Specify range and legend
E	Options	

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.

A - **B** - **C** - **D** - **E** Example: 250-20-BL-5mADC-5mADC-RP

A	Model	
	250-20	2" meter
	250-30	3" meter
	250-375	3-3/8" meter
B	Bezel	
	BL	Black
	CHR	Chrome
C	Standard Ranges	
	DC	20, 50, 100, 200, 500uA 1, 2, 5, 10, 20, 50, 100, 200, 500mA & 4-20mA 1, 2, 5, 10, 20, 50A 50, 100, 150, 300, 500mV 1, 3, 5, 10, 15, 30, 50, 100, 150, 300, 500, 750V
D	Scale	Specify range and legend
E	Options	
	RP	Red pointer
	BP	Black pointer
	IL	Illumination (specify 12 or 24 VDC)

LFE/API Analog Panel Meters

Replacements for popular styles and sizes

7000 Series

Phenolic case, glass window

2 1/2"	7025
3 1/2"	7035
4 1/2"	7045
5 1/2"	7055



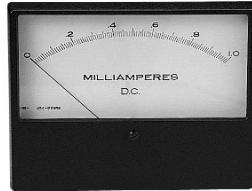
Panelist Series

Black phenolic case, glass window

3 1/2"	303
4 1/2"	503
5 1/2"	603

Clear plastic case & window

2 1/2"	202
3 1/2"	302
4 1/2"	502
5 1/2"	602



Round Series

Polycarbonate case, plastic or glass window

3 1/2"	1235
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Meteor Series

Plastic window & case

2 1/2"	204
3 1/2"	304
4 1/2"	504
5 1/2"	604

Obsolete - call for suitable alternatives



Edgewise Series

Plastic window & case

1 1/2"	1015
2 1/2"	1025
3 1/2"	1035
3 1/2" shielded	371



Ruggedized Series

Sealed metal case

2 1/2"	255
3 1/2"	355
4 1/2"	455



See more info online at weschler.com/LFE

A&M Ruggedized Panel Meters

- Steel Case, Glass Window
- Watertight
- Magnetic Shielding (90° models)
- Mounting per Mil-M-10304E



90° ▲



250° ▲

Accuracy 90°:	2% DC & Iron Vane, 3% Rectifier Type
250°:	1% DC, 2% Rectifier Type

To order: specify model, input & scale

Style/Size	Model	Type
90° Round		
2 1/2"	263	AC Rectifier Type
	264	RF Core Magnet
	265	DC Core Magnet
	266	AC Iron Vane
3 1/2"	363	AC Rectifier Type
	364	RF Core Magnet
	365	DC Core Magnet
	366	AC Iron Vane
90° Square		
1 1/2"	133	AC Rectifier Type
	135	DC Core Magnet
2 1/2"	233	AC Rectifier Type
	235	DC Core Magnet
	236	AC Iron Vane
250° Round		
2 1/2"	2432	AC Rectifier Type
	2452	RF Core Magnet
3 1/2"	3432	AC Rectifier Type
	3452	DC Self-shielding
4 1/2"	443	AC Rectifier Type
	445	DC Self-shielding

Hoyt Illuminated Meters

Features bright white, even backlighting with no hot spots or shadowing. No holes to drill or bulbs to burn out.

3100 Series

- Window, Surface & Bezel Mount
- Many Voltage & Current Ranges
- UL Recognition Optional
- Accuracy 2% of Full Scale



Size	Model	Type
1 1/2"	3115	DC Moving Coil
	3116R	AC Rectifier Type
2 1/2"	3125	DC Moving Coil
	3126	AC Repulsion
3 1/2"	3135	DC Moving Coil
	3136	AC Repulsion
4 1/2"	3145	DC Moving Coil
	3146	AC Repulsion

5000 Series

- Vibration & Harsh Environment Resistant
- Many Voltage & Current Ranges
- UL Recognition Optional
- Accuracy 2%, except Rectifier Type 3%



Size	Model	Type
1 1/2"	5015	DC Moving Coil
	5016R	AC Rectifier Type
2 1/2"	5025	DC Moving Coil
	5026	AC Repulsion
3 1/2"	5035	DC Moving Coil
	5036	AC Repulsion

ELumination Lighting (Optional on 3100 & 5000 series meters)

Light Intensity: 10–13 ft-L

Power Required: 3–18VDC, 60mA max.

Line Frequency Meters also available

To order: Specify model, input & scale

Triplett Analog Panel Meters

Obsolete - Call for Suitable Replacement

Replacements for popular styles and sizes

G Series

Plastic window & case

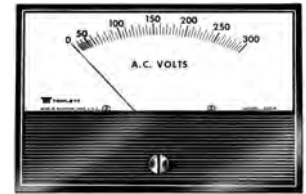
1 1/2"	120-G
2 1/2"	220-G, 230-G
3 1/2"	320-G, 330-G
4 1/2"	420-G, 430-G
5 1/2"	520-G, 530-G



R Series

Plastic window & case

4 1/2"	420-R, 430-R
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GL Series

Glass window, plastic case

2 1/2"	220-GL, 230-GL
3 1/2"	320-GL, 330-GL
4 1/2"	420-GL, 430-GL
5 1/2"	520-GL, 530-GL



Phenolic Series

Glass window, phenolic case

2 1/2" rectangular	227-T, 237-S
3 1/2" rectangular	327-T, 337-S
4 1/2" rectangular	420, 430
6 1/2" rectangular	626, 636
2 1/2" round	221-T, 231-S
3 1/2" round	321-T, 331-S



GL/B Series

Glass window, plastic case, integral bezel

3 1/2"	320-GL/B, 330-GL/B
4 1/2"	420-GL/B, 430-GL/B
5 1/2"	520-GL/B, 530-GL/B



Ruggedized Series

Plastic window, steel case, sealed

1 1/2" rectangular	127-HR
2 1/2" round	221-HR
3 1/2" round	321-HR



See more info online at weschler.com/triplett

Hoyt VU Meters

- Industry Standard for Volume Level Measurements
- Sizes from 1.5" to 4.5"
- Choice of Styles & Mounting
- Made in U.S.A.

The VU meter is the standard level indicator for audio frequency transmission systems. VU meters are used to measure sound or noise levels in broadcast monitoring, public address systems and anywhere volume level measurements are to be made. The VU also is useful for the measurement of noise level and other audio frequency energy where the established dynamic characteristics of the VU meter give a common result for measurements taken in different laboratories.

The VU meter is designed to read zero VU or 100% with 1.228 volts applied to the instrument and the 3600 ohm series resistance. This represents 4 db above 1 milliwatt in 600 ohms. The combination of a special copper oxide rectifier and an extremely sensitive movement with special magnetics give these meters very high sensitivity. Two scales types are available with white, black or buff background color. A black pointer is standard, red optional.

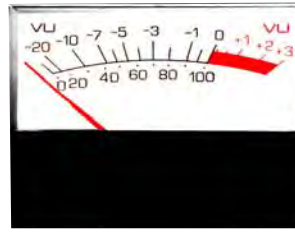
TYPE A SCALE

The "A" Scale reads "-20 to +3" in type on the top of the arc, with "0-100" in type on the bottom of the arc.

TYPE B SCALE

The "B" Scale reads "0-100" in type on the top of the arc, with "-20 to +3" in type on the bottom of the arc.

To order: Specify model, mounting, scale type/color, VU
Custom legends & logos available on request.



▲ 3135



▲ 17/3

Size	Model	Style
1 ¹ / ₂ "	2018-22	Rectangular, panel or bezel mount
	3115	Rectangular, surface or window mount
2 ¹ / ₂ "	17/3	Round, phenolic
	2025	Rectangular, panel or bezel mount
	635	Rectangular, phenolic
	685	Edgewise
	3125	Rectangular, surface or window mount
3 ¹ / ₂ "	4025	Rectangular, phenolic & glass
	2035	Rectangular, panel or bezel mount
	2135	Rectangular, low profile phenolic
	582	Round, phenolic
	597	Rectangular, phenolic
	3135	Rectangular, surface or window mount
4 ¹ / ₂ "	4035	Rectangular, phenolic & glass
	2045	Rectangular, panel or bezel mount
	2145	Rectangular, low profile phenolic
	647	Rectangular, phenolic
	3145	Rectangular, surface or window mount
	4045	Rectangular, phenolic & glass

Simpson Analog Meter Relays

- Commercially Sealed Moisture and Dust Proof
- Single and Dual Set Points
- Calibration not Affected by Steel Panel Mounting
- Rugged Metal Case for Rigorous Environments
- Wide Variety of Control, Alarm and Limit Use
- Relays Can Be Set for Manual or Automatic Reset

Rugged Seal

The 33 Series instruments offer a wide variety of applications in control, alarm and limit use. Photo conductor sensing eliminates all interference with the indicating meter. These relays incorporate an amplifier input which drives a rugged high torque pivot and jewel or taut-band meter.

Metal cased construction withstands rigorous environmental conditions. The metal cover with a drawn steel rear case gives complete magnetic isolations. In addition, each meter is moisture, dust, and dirt proof and recommended for use in wash down areas.



▲ 33 Series

ANALOG METERS

SPECIFICATIONS

Calibration Accuracy:	±2% of Full Scale (except ±3% for ACA)
Control Point(s) Adjustment:	Single: 0-100% of arc Double, Low limit 0-95% of arc. High limit 5-100% of arc. Adjustable within 4° of each other
Switching:	Within 1% of indication
Differential:	"ON", "Off" difference is within 0.5% of FS
Frequency Response:	50-1000 Hz
Relay Contacts:	5 amps, 115 VAC
Operation Temperature:	5° to 55°C
Overload (1 second)	10 Times Full Scale Rating
Overload (Continuous)	1.5 Times Full Scale Rating
Power:	108-132 VAC, 50-400 Hz

SPECIFICATIONS

Range	Scale	Model 3323 3½" SSP Cat. #	Model 3323 3½" DSP Cat. #	Model 3324 4½" SSP Cat. #	Model 3324 4½" DSP Cat. #
DC Millivoltmeters					
0-50	0-50	21663	21623	21670	21630
DC Volts					
0-1	0-1	21664	21624	21671	21631
0-50	0-50	21665	21625	21672	21632
DC Milliammeters					
0-1	0-1	21661	21621	21668	21628
AC Voltmeters					
0-10	0-10	21675	21635	21679	21639
0-150	0-150	21676	21636	21680	21640
0-300	0-300	21681	21641	21682	21642
AC Ammeters					
0-5	0-5	21673	21633	21677	21637

Crompton Meter Relays

- Monitors and Controls Any Variable Which Can be Converted Into an AC or DC Signal
- Rugged Shock and Vibration Resistant Design
- Indicator, Relays and Power Unit in One Housing
- Control Function Continues if the Indicator Becomes Damaged
- Stable Electronic Switching Circuit Does Not Use Lamps, Photocells, Inductors or Capacitors
- Taut Band, Fluid Damped Indicator
- Isolated Input Signal
- LED Relay State Indicators

Series 239 and 007 meter relays combine a highly accurate indicator with High and Low set point relays. The relays can operate alarm and control devices when the monitored signal value moves outside the chosen set point limits shown by adjustable red index pointers.

A single compact case houses the unit which requires only the input signal and power supply thus saving space and installation time.



239 ▲

SPECIFICATIONS

Input Signal Ratings

Frequency Monitoring: 45/65 Hz or 55/65 Hz

DC Voltage: 10 mV to 600V, 1k ohm/V

DC Current: 1 uA to 15A, 20 mV drop

AC Voltage: 10V to 600V 1k ohm/V

AC Current: 1A to 15A, 5A CT Operation

Thermocouples: Standard Outputs Min. 10 mV Span

RTD Operation: 10 Ohm Copper, 100 Ohm Platinum

Overloads: 1.2 x continuous, up to 200V or 100 mA
10 x for 10 seconds

Damping Time: 1 Second

Operating Time: 250 ms to 10 sec adjustable (007)

250 ms to 20 sec adjustable (239)

Relay Operation: SPDT contact on each setpoint (DPDT on 239)

Contact Rating: 5A, 250V, 1000W non-inductive

External Power Supply

An External AC or DC supply is required for operation of all Meter Relays and must be specified at the time of ordering.

AC – Standard Unit will accept 120V or 240V, 60 Hz

(Selectable internally at factory)

DC – 12V, 24V, 48V and 125V DC

Note: External Supplies derived from rectified AC must be externally filtered to minimize Ripple Content.

Scales:

Standard Scales may be selected from the 1, 1.5, 2, 3, 4, 5, 6, 8, 10 and multiples of 10 or 100 in standard face type. Any caption using standard face type may be specified. Center zero scales are standard where the end value is listed in the above series.

Relay State Indicators:

Red LED relay state indicators are fitted in dial as standard at no extra charge.

Ordering Information:

Due to the Versatility of this product it is difficult to list the complete part numbers for all the various functions. Please provide the basic catalog number listed above, along with input, scale, frequency, external power supply, and any options (see table below) you may require. We will then generate a complete part number.

007 ▶



Crompton Meter Relays

239 SERIES ORDERING INFORMATION

239-302A	2 Output Relays, 2 Set Points, High/Low Control
239-301A	1 Output Relay, 1 Set Point, High Control Only
239-307A	1 Output Relay, 1 Set Point, Low Control Only
239-300A	1 Output Relay, 2 Set Points, High/Low Control
239-30TA	2 Output Relays, 2 Set Points, High/Low Control, Thermocouple Applications Fitted with Cold Junction Compensation Circuitry
239-30RA	2 Output Relays, 2 Set Points as 239-30TA but for RTD Applications
239-304A	2 Output Relays, 2 Set Points, High Relay Downscale Energized, Low Relay Upscale Energized
239-305A	2 Output Relays, 2 Set Points, both Relays Downscale Energized

Note: Specify Calibration Information (See below Ordering Information)

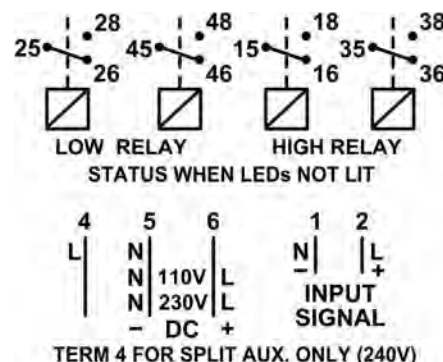
007 SERIES ORDERING INFORMATION

007-302A	2 Output Relays, 2 Set Points, High/Low Control (mid-band de-energized)
007-301A	1 Output Relay, 1 Set Point, High Control Only
007-307A	1 Output Relay, 1 Set Point, Low Control Only
007-300A	1 Output Relay, 2 Set Points, Low Control
007-30TA	2 Output Relays, 2 Set Points, High/Low Control, Thermocouple Applications (Specify Type), Fitted with Cold Junction Compensation Circuitry
007-30RA	2 Output Relays, 2 Set Points, same as 007-30TA, but for 2, 3 or 4 wire RTDs (Specify 10 ohm Copper or 100 ohm Platinum)
007-303A	2 Output Relays, 2 Set Points, both Relays Upscale Energized
007-304A	2 Output Relays, 2 Set Points, High Relay, Downscale Energized, Low Relay Upscale Energized
007-305A	2 Output Relays, 2 Set Points, both Relays Downscale Energized

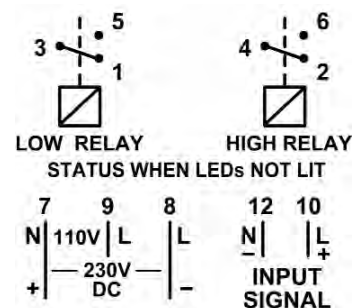
Note: Specify Calibration Information (See below Ordering Information)

OPTIONAL EXTRAS

Description	Code
4-20 mA DC Suppressed Zero Input	HG
5 AAC input - A 5A/10A internal CT is fitted permitting connection to the secondary of any of an external instrument transformer	LS
Latching on both relays (specify reset operation)	Consult
Mirror Dial	Consult
Thumb Screw Set Point Adjuster(s)	FK
Expanded Scale	
Off-Set Zero Scale	
Time Proportional Control-Models 239-30T and 239-30RA	TP
Extended Operating Temperature Range (-25 to +60°C)	ET
12V, 24V, 48V External Power	MU, BD, BE
125 VDC External Power	BI
Retrofit Mounting Plate Allows Model 239 to be mounted in place of Model 237 using same holes	RP
Double Pole, Double throw relays have 0.3 to 20 Second Adjustable Time Delay as Standard	
Other options and special features available upon request	



239 Terminal Diagram



007 Terminal Diagram

Low relay activates when signal is below setpoint.

High relay activates when signal is above high setpoint.

Weschler Meter Relays

NEW

- 3 1/2" & 4 1/2" sizes
- Variety of control, alarm & limit uses
- Direct input immune to RF interference
- Long life LED & phototransistor detector
- Adjustable time delay:
0-2 or 0-20 seconds
- Single or double control points:
Jumper selectable high or low acting



▲ **CMT-Y**

Economical replacement for 3.5" and 4.5" meter relays from Beede, LFE and Simpson. Also replaces the Crompton 4.5" meter relays.

ORDERING INFORMATION

CMT-Y4	4.5" Meter Relay
CMT-Y3	3.5" Meter Relay

Specify range, scale, number of setpoints and type* (hi or low) when ordering.

*Failsafe operation is standard.

Made in USA

SPECIFICATIONS

Accuracy	AC: ±3% of full scale; DC: ±2% of full scale	Setpoint Adjustment	Front panel knob; Internal jumper selectable Hi/Lo. Single: high limit, 0-100% of arc; Double: high limit 5-100% of arc, low limit 0-95% of arc, adjustable to within 4° of each other
Movement	Core type, self-shielding with taut band suspension	Switching	Within 2% of indication
Tracking	±3%	Auto/Manual Reset	Latching function enabled independently for each relay by removing jumpers on terminal block. Add and replace with a normal open pushbutton switch.
Repeatability	Within 0.5% of full scale	Operating Temperature	+41°F to 122°F (5°C to +50°C)
Relay	DPDT per setpoint 5A @ 120/240VAC resistive	Dial	90° flattened arc
Power	100-132VAC, 50-400Hz, or 8-32DC		
Size (W x H x D)	CMT-Y3: 3.25" x 3.25" x 3.4" behind panel CMT-Y4: 4.7" x 4.0" x 3.4" behind panel		
Case	Phenolic		

ANALOG METERS

Hioki Meter Relays



▲ **2104**

- Electronic Design for High Accuracy and Repeatability
- Ultra-sensitive 1 µA, 10 mV DC Movements
- Illuminated Dial
- One or Two Form C (SPDT) Relays
- Relay Operation Delayed at Power-up

SPECIFICATIONS

Meter class:	±2.5% class on 2103; ±1.5% class on 2104
Setting accuracy:	±1.5% of scale length
Sensitivity:	DC & AC ammeters: 50mV DC Voltmeters: 10kΩ/V, except 100kΩ/V below 500mV FS AC Voltmeters: 1kΩ/V, except 10kΩ/V below 500mV FS
Type:	AC meters are rectifier type
Minimum H/L interval:	Within 3% of scale length
Relay power up delay:	Approx. 2 second
Relay output response:	Approx. 0.5 second
Contact rating:	5A@250V AC, 30V DC, resistance load
Power supply:	120 or 240V AC ±10%
Dimensions:	2103: 3.31" W x 2.83" H x 4.63" D (84 x 72 x 118 mm) 2104: 4.12" W x 3.48" H x 4.63" D (105 x 89 x 118 mm)
Panel cutout:	2.8" W x 2.53" H (71 x 64mm)

ORDERING INFORMATION

To Order—Insert Code for Each Letter to Select Catalog Number .

A **B** - **C** - **D** Example: 2103HL-120-500mVDC

A	Model	2103	3" meter relay
		2104	4" meter relay
B	Contact Type	H	One relay, activate above setpoint
		L	One relay, activate below setpoint
		HL	One H relay and one L relay
C	Power Supply	120	120VAC ±10% 12 12VDC
		240	240VAC ±10% 24 24VDC
D	Range (self-contained):	DC	1, 10, 20, 50, 100, 200, 500µA 1, 2, 5, 10, 20, 50, 100, 200, 500mA & 4-20mA 1, 2, 5, 10, 20A 10, 30, 50, 100, 150, 300, 500mV 1, 3, 5, 10, 15, 30, 50, 100, 150, 300V & 1-5V
		AC	200, 500µA 1, 2, 5, 10, 20, 50, 100, 200, 500mA 1, 2, 5A 50, 100, 150, 300, 500mV 1, 3, 5, 10, 15, 30, 50, 100, 150, 300V

Full scale >300V available on request.

For full scale >20A DC, use external shunt with 50mV DC meter.

For full scale >5A AC, use external CT with 1A or 5A AC meter.

Options: Zero center, expanded scale

LFE Analog Optical Meter Relays

Series Analog Optical Meter-Relays

195 Series Optical Meter-Relays

- Plug-In Control Module
- Long Life Lamp Operation
- Plastic Front and Base
- Proven Optical Setpoints
- On/Off or Alarm Control


195

196 Series Optical Meter-Relays

- Modern Rectangular Appearance
- Plug-In Control Module
- Proven Optical Setpoints


196

The 195 Series and 196 Series Meter-Relays contain an exclusive light sensitive transistor switch that provides the ultimate in control simplicity and reliability. This switch controls the load relays. There are no pointer contacts or mechanical interference in the meter mechanism. The controllers are supplied with a plug-in control module that mounts directly on the rear of the Meter-Relay or may be remotely mounted with an accessory cable.

OPTICAL METER-RELAYS—195 & 196 SERIES SPECIFICATIONS

	DC Ranges		AC Ranges (Rectifier Type)	
	Current	Voltage	Current	Voltage
Accuracy:	±2%	±2%	±3%	±3%
Balance:	±1%	±1%	±1%	±1%
Repeatability:	±2%	±2%	±2%	±2%
Resistance Tolerance:	±20%	±5%	—	<10V ±20% ≥10V ±5%
Overload Capacity	1 Second	1000%	≤100V 1000%	150%
	Continuous	150%	>100V 200%	150%
Calibration Frequency:	N/A	N/A	60 Hz	60 Hz
Overshoot (maximum):	20%	20%	20%	20%
Response Time (maximum):	3 sec	3 sec	3 sec	3 sec
Supply Power:	120 VAC ⁵⁰ / ₆₀ Hz 7 VA MAX			
Load Relay Rating:	DPDT 5A @ 120 VAC Relative			

Effects of shock, vibration, humidity and temperature are equal to or better than ANSI C39.1-1981. Safety (dielectric test, leakage and other hazards): instruments are equal to or better than ANSI C39.5-1974.

The above tolerance limits apply to the standard ranges listed in this bulletin. Special instruments may vary from these limits. Rated circuit to ground voltage=800 RMS (1100 Peak).

*Depth = Front of Panels to End of Terminals

DIMENSIONS

196 Series Dimensions

Model	Height	Width	Depth*	Depth w/Module*
1963 (3½")	3.006	3.756	2.897	6.745
1964 (4½")	3.756	4.632	2.897	6.745

195 Series Dimensions

Model	Height	Width	Depth*	Depth w/Module*
1953 (3½")	3.50	3.50	2.897	6.745
1954 (4½")	4.41	4.85	2.897	6.745

OPTIONS (WHERE APPLICABLE)

Setpoint Stop (Sgl or Dbl)

Screwdriver Adjust

Non-listed Ranges

Suppressed Ranges

Stabister Protection:

DC (Left or right)

DC (zero center)

AC

AC or DC Voltmeters w/cal. adjust pot

One-time eng. charge for "customer specials"

Double High or Double Low or Double Reversed

LFE Analog Optical Meter Relays

DC Ranges

On/Off Control, Single High Setpoint

Range	Part Number
Microamperes	
0-50	XX-10CY-CY00
50-0-50	XX-16CY-CY00
0-100	XX-10DR-DR00
0-200	XX-10EA-EA00
0-500	XX-10EM-EM00
Milliamperes	
0-1 to 0-800	(See Note)
0-1	XX-10FA-FA00
0-5	XX-10FX-FX00
0-10	XX-10GZ-GZ00
0-500	XX-10KM-KM00
Amperes	
0-1 to 0-50	(See Note)
0-5	XX-10LS-LS00
0-20	XX-10NG-NG00
0-50	XX-10NT-NT00
Millivolts (Shunt Rated)	
0-50	XX-11EC-EC00
0-100	XX-11GB-GB00
Millivolts (For Transducer Applications)	
0-50	XX-12HY-HY00
0-100	XX-12JR-JR00
Volts 1000 Ohms/Volt	
0-1 to 0-600	(See Note)
0-150	XX-12PZ-PZ00
0-300	XX-12RX-RX00
0-600	XX-12SJ-SJ00

DC Ammeters 50 mV Shunt-Rated
On/Off Control, Single High Setpoint

Scale	Part Number
Amperes	
0-1	XX-11EC-LA00
0-2	XX-11EC-LE00
0-3	XX-11EC-LJ00
0-5	XX-11EC-LS00
0-7.5	XX-11EC-MF00
0-10	XX-11EC-MT00
0-15	XX-11EC-ND00
0-20	XX-11EC-NG00
0-30	XX-11EC-NL00
0-40	XX-11EC-NP00
0-50	XX-11EC-NT00
0-60	XX-11EC-NW00
0-75	XX-11EC-PB00
0-80	XX-11EC-PD00
0-100	XX-11EC-PK00
0-150	XX-11EC-PZ00
0-200	XX-11EC-RL00
0-250	XX-11EC-RS00
0-300	XX-11EC-RX00
0-400	XX-11EC-SC00
0-500	XX-11EC-SF00
0-600	XX-11EC-SJ00
0-800	XX-11EC-SN00
0-1000	XX-11EC-VA00
0-1200	XX-11EC-VB00
0-1500	XX-11EC-VC00
0-2000	XX-11EC-VE00

AC Ranges

On/Off Control, Single High Setpoint

Range	Part Number
Micromperes	
0-500	XX-14EM-EM00
0-800	XX-14EW-EW00
Milliamperes	
0-1	XX-14FA-FA00
Amperes Transformer Rated	
0-5	XX-14LS-LS00
0-10	XX-14LS-MT00
0-15	XX-14LS-ND00
0-20	XX-14LS-NG00
0-25	XX-14LS-NJ00
0-30	XX-14LS-NL00
0-40	XX-14LS-NP00
0-50	XX-14LS-NT00
0-75	XX-14LS-PB00
0-100	XX-14LS-PK00
0-150	XX-14LS-PZ00
0-200	XX-14LS-RL00
0-250	XX-14LS-RS00
0-300	XX-14LS-RX00
0-400	XX-14LS-SC00
0-500	XX-14LS-SF00
0-600	XX-14LS-SJ00
0-800	XX-14LS-SN00
Volts 1000 Ohms/Volt	
0-10 to 0-300	(See Note)
0-150	XX-15PZ-PZ00

Note: Order by Description

DC Ammeters 100 mV Shunt-Rated
On/Off Control, Single High Setpoint

Scale	Part Number
Amperes	
0-1	XX-11GB-LA00
0-2	XX-11GB-LE00
0-3	XX-11GB-LJ00
0-5	XX-11GB-LS00
0-7.5	XX-11GB-MF00
0-10	XX-11GB-MT00
0-15	XX-11GB-ND00
0-20	XX-11GB-NG00
0-30	XX-11GB-NL00
0-40	XX-11GB-NP00
0-50	XX-11GB-NT00
0-60	XX-11GB-NW00
0-75	XX-11GB-PB00
0-80	XX-11GB-PD00
0-100	XX-11GB-PK00
0-150	XX-11GB-PZ00
0-200	XX-11GB-RL00
0-250	XX-11GB-RS00
0-300	XX-11GB-RX00
0-400	XX-11GB-SC00
0-500	XX-11GB-SF00
0-600	XX-11GB-SJ00
0-800	XX-11GB-SN00
0-1000	XX-11GB-VA00
0-1200	XX-11GB-VB00
0-1500	XX-11GB-VC00
0-2000	XX-11GB-VE00

ORDERING GUIDE

Model Number	Part Number Prefix
1953	Change XX to V3
1954	Change XX to V4
1963	Change XX to W3
1964	Change XX to W4

195 & 196 SERIES METER RELAY ACCESSORIES AND OPTIONS

Accessories/Parts

Description	Part Number
Control Module (Factory Style #3)	
High Setpoint	8889-0003
Low Setpoint	8889-2003
Double Setpoint	8889-3003
Control Modules (Factory Style #2)	
High Setpoint	8889-0001
Low Setpoint	8889-2001
Double Setpoints	8889-3001
Remote Mounting Kit	
Complete Kit	1125-426
Kit w/o cable	1125-425
New Style Lamp/Holder Assembly	
	1207-246
Current Transformers (20 mA AC Secondary)	
Primary Rating:	
5A	2062-0150

195 & 196 OPTIONAL SETPOINTS

Range	Part Number	
Single Low Setpoint		
Same as Single	Same as Single High	Same as Single
High Setpoint	Setpoint Models Except	High Setpoint
Models	Change digit #3 from 1 to 2	Models
Double Setpoint		
Same as Single	Same as Single High	
High Setpoint	Setpoint Models Except	Single High
Models	Change Digit #3 from 1 to 3	Setpoint

Reference Only - Call for Suitable Replacements

Beede Analog Meter Relays

MR4—Versatile Relay in Rugged Housing for Hostile Environments

- Display: Analog Pointer Style
- Case Size: Available in 3- or 4-Inch Case
- Optical, Noncontacting Setpoints
- Solid-State Optics—Completely Immune to Ambient Light
- Long-Life, Solid-state, Infrared LED Light Source
- Setpoint Control Knobs Designed for Rough Handling
- Optional, Remote Mounted Relays
- Available with High-Impact Resistant, Noryl Resin Cover or Clear Lexan
- Single or Dual Setpoints
- Wide Variety of Relay Logic Available

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: MR4-23-07-0/5 AAC-B-04-FS(0-150 AC Amperes)

Model Table A	Range/Scale Table B	Options Table C
Table A	Model	Style
3-Inch	MR4-13-07	Centurion
	MR4-23-07	Centurion
	MR4-13-13	QA-Lexan
	MR4-23-13	QA-Lexan
4-Inch	MR4-14-07	Centurion
	MR4-24-07	Centurion
	MR4-14-13	QA-Lexan
	MR4-24-13	QA-Lexan
	MR4-14-05	Motor Load
	MR4-24-05	Motor Load
Table B	Standard Ranges	
AC Milliamp	0-50 mAAC, 0-100 mAAC, 0-500 mAAC	
AC Amperes	0-1 AAC, 0-2.5 AAC, 0-5 AAC	
AC Volts	0-150 VAC, 0-300 VAC, 0-600 VAC	
Frequency	45-55 Hz, 46-65 Hz, 55-65 Hz	
AC Motor Load**	Adjustable from 0.5 AAC to 7.5 AAC	
Table C (Options)	Single Setpoint	Double Setpoint
Power, 12 VDC to 24 VDC	A-01	A-01
Power, 11 VAC to 30 VAC	A-06	A-06
Relay Logic, High-High	—	B-02
Relay Logic, Low-Low	B-04	B-04
Relay Logic, Delayed	B-05	B-05
Relay, Dual Setpoint DPDT		C-21
Relay, Delayed Latch*	H-10	H-12
Alarm Lights*	D-01	D-03
Manual Reset Switch*	D-04	D-05
Setpoints, Screwdrive Adjust*	F-01	F-01
Terminal Safety Cover	F-07	F-07
Dustproof & Splashproof Resistant	F-10	F-10

* Per Setpoint

** MR2 Style, 4-Inch Only

S Standard (Input Range and Scale are the Same)

FS Factory Scaling (custom-specify scaling)



MR4 ▲

SPECIFICATIONS

Display	Analog pointer style
Power	115/230 VAC @ 47 Hz-63 Hz, 12V-24 VDC optional
Accuracy	±2% of full scale
Coincidence	±1% of operating span
Operating Temperature	-20°F-165°F
Relays	5A @ 115V-230 VAC, gold-plated contacts Single setpoint 1 DPDT Dual setpoint 2 SPDT
Failsafe Logic Mode	Standard
Size	
Centurion Type (Noryl Resin)	
3-inch	3.13" H x 3.24" W x 5.245" D
4-inch	4.21" H x 5.03" W x 5.245" D
QA Type (Clear Lexan)	
3-inch	2.90" H x 3.73" W x 5.58" D
4-Inch	4.07" H x 5.19" W x 5.58" D
AC Milliamp	0-50, 0-100, 0-500
AC Volts (Rectified)	0-150, 300 or 600
AC Motor Load Current	0.5A-7.5A
AC Current	0-1, 0-5, 0-10
Frequency	55 to 65 Hz

Reference Only - Call for Suitable Replacements

Triplett Analog Panel Meters

G Series

Models: 120-G (1½"), 220-G/230-G (2½"), 320-G (3½"), 420-G/430-G (4½")



320G

- Four Stud Mounting
- Taut Band Suspension Standard for Sensitive Ranges
- Standard Indication Accuracy of $\pm 2\%$ for AC & DC
- Customized Scales Available
- 5½" Models Available
- Special Pointers and Other Options Also Available

Range	Res. (Ω)	230-G	330-G	430-G
AC Milliammeters				
0-10	4000	153-0142	153-0107	153-0114
0-50	120	153-0147	153-0112	153-0119
0-100	40	153-0149	153-0128	153-0135
0-250	5.9	153-0152	153-0131	153-0138
0-500	1.55	153-0155	153-0133	153-0140

Range	Res. (Ω)	230-G	330-G	430-G
AC Ammeters				
0-1	.38	153-0001	153-0008	153-0015
0-2	.092	153-0003	153-0010	153-0017
0-3	.039	153-0005	153-0012	153-0019
0-5	.014	153-0006	153-0013	153-0020
0-10	.004	153-0065	153-0058	153-0044
0-15	.003	153-0066	153-0059	153-0045
0-25	.002	153-0068	153-0061	153-0047
0-30	.001	153-0069	153-0062	153-0048
0-50	.00035	153-0070	153-0063	153-0049

A basic 0-50 Ampere AC instrument; dial reads "AC Amperes", transformer not included

0-75	—	53-1099	53-1248	53-1177
0-100	—	53-1363	53-1537	53-1464
0-150	—	53-1350	53-1538	53-1249
0-200	—	53-1529	53-1348	53-1534
0-300	—	53-1586	53-1315	53-1389
0-500	—	53-1814	53-1316	53-1371

Range	Res. (Ω)	230-G	330-G	430-G
AC Voltmeters (Ω/V)				
0-10	10	153-0072	153-0051	153-0037
0-50	50	153-0077	153-0056	153-0042
0-100	91	153-0022	153-0027	153-0032
0-150	125	153-0023	153-0028	153-0033
0-250	144	153-0025	153-0030	153-0035
0-300	144	153-0026	153-0031	153-0036
0-500*	125	153-0214	153-0213	153-0166

* Model	Res. (Ω)
152-0977	4000
152-0979	1170
152-0981	400
152-0984	210
152-0992	2300
152-0994	825

Range	Res. (Ω)	120-G	220-G	320-G	420-G
DC Microammeters (Pivot & Jewel)					
0-50	2300	152-0977*	152-0143	152-0072	152-0001
0-100	825	152-0979*	152-0145	152-0074	152-0003
0-200	360	152-0981*	152-0147	152-0076	152-0005
0-500	156	152-0984*	152-0150	152-0079	152-0008

Range	Res. (Ω)	120-G	220-G	320-G	420-G
DC Microammeters (Taut Band)					
0-5	15,000	—	152-1155	52-3071	52-3072
0-10	7,500	—	152-0226	152-0233	152-0240
0-20	2,500	—	152-0228	152-0235	152-0242
0-50	825	152-0992*	152-0231	152-0238	152-0245
0-100	360	152-0994*	152-0247	152-0254	152-0261
0-200	156	—	152-0249	152-0256	152-0263
0-500	40	—	152-0252	152-0259	152-0266
0-1000 ⁺	12.5	—	152-1270	152-1290	152-1344
50-0-50	360	—	152-1236	152-0357	152-1239

Range	Res. (Ω)	120-G	220-G	320-G	420-G
DC Milliammeters					
0-1	55	152-0956	152-0152	152-0081	152-0010
0-5	8.5	152-0961	152-0157	152-0086	152-0015
0-10	3.1	152-0962	152-0159	152-0088	152-0017
0-25	2.0	152-0965	152-0162	152-0091	152-0020
0-50	1.0	152-0967	152-0164	152-0093	152-0022
0-100	.50	152-0969	152-0166	152-0095	152-0024
0-200	.25	152-0971	152-0168	152-0097	152-0026
0-500	.10	152-0974	152-0171	152-0100	152-0029

Range	Res. (Ω)	120-G	220-G	320-G	420-G
DC Ammeters					
0-1	—	152-0938	152-0173	152-0102	152-0031
0-5	—	—	152-0176	152-0105	152-0034
0-10	—	—	152-0177	152-0106	152-0035
0-30	—	—	152-0182	152-0110	152-0039

A basic 0-50 Millivolt DC instrument; dial reads "DC Amperes", shunt not included

0-50	—	—	52-4142	52-3156	52-4994
0-100	—	—	152-1183	152-1294	152-1198
0-150	—	—	152-1184	152-1293	152-1199
0-200	—	—	152-1185	152-1299	152-1200
0-250	—	—	152-1186	152-1312	152-1201
0-300	—	—	152-1187	52-3095	152-1202
0-500	—	—	152-1188	52-4426	152-1203
0-750	—	—	152-1189	152-1345	152-1204
0-1000	—	—	152-1190	152-1171	52-3845

Range	Res. (Ω)	120-G	220-G	320-G	420-G
DC Millivoltmeters					
0-50	6.7	152-0927	152-0183	152-0112	152-0041
0-100	13.5	—	—	152-0113	152-0042
0-150	20.2	—	—	152-0114	152-0043

Range	Res. (Ω)	120-G	220-G	320-G	420-G
DC Voltmeters (Ω/V)					
0-5	1000	152-0905	152-0193	152-0122	152-0051
0-10	1000	152-0906	152-0195	152-0124	152-0053
0-25	1000	152-0909	152-0198	152-0127	152-0056
0-30	1000	152-0910	152-0199	152-0128	152-0057
0-50	1000	152-0911	152-0200	152-0129	152-0058
0-100	1000	152-0913	152-0202	152-0131	152-0060
0-150	1000	152-0914	152-0203	152-0132	152-0061
0-200	1000	—	—	152-0133	152-0062
0-250	1000	—	—	152-0134	152-0063
0-300	1000	—	—	152-0135	152-0064
0-500	1000	—	—	152-0136	152-0065
0-1000**	2000	—	—	152-0138	152-0067
0-5000**	2000	—	—	152-0142	152-0071

⁺Dial Reads 0-1 DC Milliampere

**External Multiplier Box - Included

WESCHLER INSTRUMENTS

**Reference Only - Call for
Suitable Replacements**

Triplett Analog Panel Meters

- Two Stud Mounting (Except 220-GL, 230-GL, Four Stud Mounting). 4 Stud Mounting Available on 320-GL and 420-GL
- Taut Band Suspension Standard for Sensitive Ranges
- Standard Indication Accuracy of $\pm 2\%$ for AC & DC
- Customized Scales Available
- 5½" Models Available
- Special Pointers and Other Options Also Available



GL-Series ▲

Range	Res. (Ω)	230-GL	330-GL	430-GL
AC Milliammeters				
0-10	4000	53-1956	153-0614	153-0550
0-50	120	53-1957	153-0617	153-0553
0-100	40	53-1958	153-0618	153-0554
0-250	5.9	53-1959	153-0620	153-0556
0-500	1.55	53-1960	153-0621	153-0557
AC Ammeters				
0-1	.38	53-1961	153-0605	153-0587
0-2	.092	53-1962	153-0606	153-0588
0-3	.039	53-1963	153-0607	153-0589
0-5	.014	53-1964	153-0608	153-0590
0-10	.004	53-2085	153-0609	153-0591
0-15	.003	53-2086	153-0610	153-0592
0-25	.002	53-2087	153-0611	153-0593
0-30	.001	—	153-0612	153-0594
0-50	.00035	53-2088	153-0613	153-0595
A basic 0-50 Ampere AC instrument; dial reads "AC Amperes", transformer not included				
0-75	—	53-1965	53-1617	53-1837
0-100	—	53-1966	53-1753	53-1610
0-150	—	53-1967	53-1578	53-1759
0-200	—	53-1968	53-1891	53-1915
0-300	—	53-1970	53-1755	53-1561
0-500	—	53-1971	53-1579	53-1603
AC Voltmeters (Ω/V)				
0-10	10	53-1972	153-0583	153-0541
0-50	50	53-1973	153-0586	153-0544
0-100	91	53-1974	153-0528	153-0545
0-150	125	53-1975	153-0529	153-0546
0-250	144	—	153-0531	153-0547
0-300	144	—	153-0532	153-0548
0-500*	125	—	153-0680	153-0549

*Required Multiplier Box - Included

Range	Res. (Ω)	220-GL	320-GL	420-GL
DC Microammeters (Pivot & Jewel)				
0-50	2300	52-7551	152-2135	152-2084
0-100	825	52-7552	152-2136	152-2085
0-200	360	52-7643	152-2137	152-2086
0-500	156	52-7644	152-2138	152-2087
DC Microammeters (Taut Band)				
0-5	15,000	52-7645	152-2054	152-2039
0-10	7,500	52-7646	152-2055	152-2040
0-20	2,500	52-7647	152-2056	152-2041
0-50	825	52-7648	152-2057	152-2042
0-100	360	52-7649	152-2058	152-2043
0-200	156	52-7650	152-2059	152-2044
0-500	40	52-7651	152-2060	152-2045
0-1000+	12.5	52-7652	152-2061	152-2046
50-0-50	360	52-7653	152-2182	152-2250
100-0-100	156	52-7654	152-2183	152-2251
500-0-500	12.5	52-7655	152-2184	152-2252
DC Milliammeters				
0-1	55	52-7548	152-2047	152-2032
0-5	8.5	52-7656	152-2050	152-2035
0-10	3.1	52-7657	152-2051	152-2036
0-25	2.0	52-7658	152-2053	152-2038
0-50	1.0	52-7659	152-2121	152-2110
0-100	.50	52-7660	152-2123	152-2112
0-200	.25	52-7661	152-2125	152-2114
0-500	.10	52-7662	152-2129	152-2118
DC Ammeters				
0-1	—	52-7663	152-2230	152-2242
0-5	—	52-7664	152-2232	152-2244
0-10	—	52-7665	152-2233	152-2245
0-30	—	—	152-2236	152-2248
0-50	—	—	152-2237	152-2249
A basic 0-50 Millivolt DC instrument; dial reads "DC Amperes", shunt not included				
0-50	—	52-7666	52-7446	52-6259
0-100	—	52-7667	52-6110	52-6260
0-150	—	52-7668	52-6381	52-6261
0-200	—	52-7669	52-7447	52-5254
0-250	—	52-7670	52-7448	52-6262
0-300	—	52-7671	52-6108	52-6263
0-500	—	52-7672	52-6109	52-6264
0-750	—	52-7673	52-7449	52-7460
0-1000	—	52-7674	52-7450	52-6266
DC Millivoltmeters				
0-50	6.7	52-7549	152-2258	152-2076
0-100	—	—	152-2259	152-2240
0-150	—	—	152-2260	152-2241
DC Voltmeters (Ω/V)				
0-5	1000	52-7675	152-2134	152-2097
0-10	1000	52-7676	152-2077	152-2098
0-25	1000	52-7677	152-2079	152-2100
0-30	1000	52-7678	152-2080	152-2101
0-50	1000	52-7553	152-2223	152-2102
0-100	1000	52-7679	152-2224	152-2103
0-150	1000	52-7680	152-2225	152-2104
0-200	1000	—	152-2226	152-2105
0-250	1000	—	152-2227	152-2106
0-300	1000	—	152-2228	152-2107
0-500	1000	—	152-2229	152-2108
0-1000*	2000	—	152-2254	152-2434
0-5000*	2000	—	152-2257	152-2437

*Dial Reads 0-1 DC Milliampere

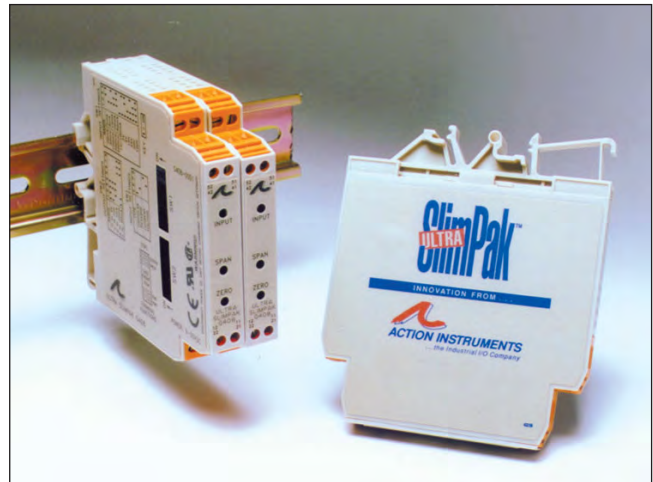
Action Instruments™ DIN Rail Mount Signal Conditioners, Isolators, Alarms, and Power Supplies

- Wide Ranging and Field Configurable for Maximum Flexibility
- ASIC Based Design for Maximum Reliability
- Lifetime Warranty
- High Density DIN Rail Mount Saves Panel Space

Ultra SlimPak

Ultra SlimPak offers a wide selection of functions, input types and ranges. These modules accept most process signals and output the commonly required voltages, current, and alarm trips.

SPECIFICATIONS	
Isolation:	1800 VDC between input, output, and power
Humidity:	15 to 95% (@45 °C) Operating
Temperature Range	
Operating:	0 to 55 °C
Storage:	-25 to 70 °C
Power	
Consumption:	1.5W typical, 2.5W Max.
Range:	9 to 30 VDC
Alarm Relays:	5A @ 120 VAC or 28 VDC 2A @ 240 VAC
Housing:	
EG8:	0.5"W x 3.54"H x 4.34"D, including rail (12.6 x 90 x 110.2mm)
EG12:	0.7"W x 3.54"H x 4.34"D, including rail (17.7 x 90 x 110.2mm)
Agency Approvals:	CSA per C22.2, UL per UL508, CE



SIGNAL
CONDITIONERS

SPECIFICATIONS AND ORDERING INFORMATION					
Cat #	Function	Input	Input Span (Field Configurable)	Housing	Output (Field Configurable)
G408	Isolator	DC Volt	10 mV to 100V 1 mA to 100 mA	EG8	DC Voltage (0-5V, 0-10V) DC Current (0-1 mA, 0-20 mA, 4-20 mA)
G108	Limit Alarm	DC Current	10 mV to 200V 1 mA to 100 mA Bipolar switch for ±100% span	EG12	Alarm (Dual SPDT Relay)
G418	Isolator	RTD	Platinum RTD 25°C to 800°C	EG12	DC Voltage (0-5V, 0-10V) DC Current (0-1 mA, 0-20 mA, 4-20 mA)
G118	Limit Alarm		Copper RTD 25°C to 468°C	EG12	Alarm (Dual SPDT Relay)
G428	Isolator	Thermocouple	B: 500°C to 1820°C E: -150°C to 1000°C	EG12	DC Voltage (0-5V, 0-10V) DC Current (0-1 mA, 0-20 mA, 4-20 mA)
G128	Limit Alarm		J: -200°C to 750°C K: -200°C to 1370°C R/S: 50°C to 1760°C T: -150°C to 400°C	EG12	Alarm (Dual SPDT Relay)
G438	Isolator	Pot	100 ohms to 100k ohms	EG8	DC Voltage (0-5V, 0-10V) DC Current (0-1 mA, 0-20 mA, 4-20 mA)
G448*	Isolator	Strain Gauge	0.5 mV/V to 50 mV/V Adjustable Excitation: 1-10 VDC, 120 mA	EG12	DC Voltage (0-5V, 0-10V) DC Current (0-1 mA, 0-20 mA, 4-20 mA)
G468	Isolator	AC Voltage AC Current	50 mVAC to 200 VAC	EG8	DC Voltage (0-5V, 0-10V) DC Current (0-1 mA, 0-20 mA, 4-20 mA)
G168	Limit Alarm		5 mA AC to 5 AAC**	EG12	Alarm (Dual SPDT Relay) DC Voltage (0-5V, 0-10V)
G478	Isolator	Frequency	2 Hz to 10 kHz	EG8	DC Current (0-1 mA, 0-20 mA, 4-20 mA)
WV905	Power Supply	AC Power	100 to 240 VAC; 50 to 60 Hz	17.5mm	24 VDC @ 500 mA

*Requires 18-30VDC power supply

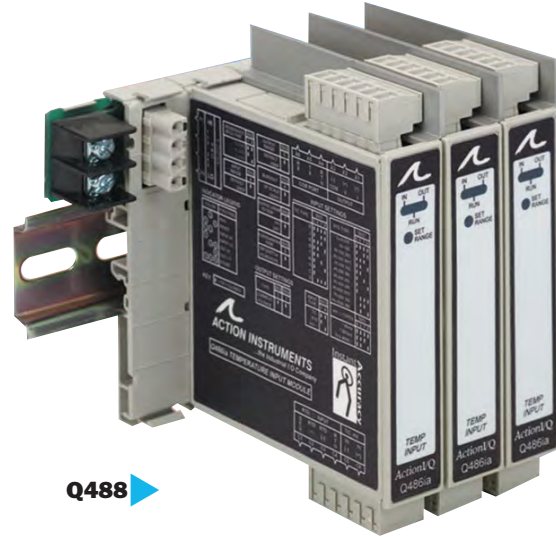
**1 to 5AAC range requires C006 0.1Ω shunt

Action Instruments™ IQ Signal Conditioners

- Multi-Channel DC, RTD, T/C Conditioners—Lower Cost/Point
- Ideal for Large Numbers of Data Points
- Extreme Operating Temperature—from -40 to 80 °C
- SnapLoc Terminal Blocks
- Optional I/Q Rail Power Bus—Saves Installation Time
- Interlocking Modules—Solid, Reliable Mounting

SPECIFICATIONS

Isolation:	From 1800 to 4000 VDC, input to output and channel to channel
Humidity:	15–90% @ 45 °C
Operating Temperature:	-40 to 80 °C (Q5XX Series) 0 to 55 °C (Q4XX Series)
Power:	12 to 35 VDC output loop (Q5XX Series) 18 to 30 VDC output common (Q4XX Series)
Response Time:	100 mSec (10–90%) typical
Approvals:	UL508, CSA C22.2, CE


Q488

HOW TO ORDER—Select the unit with the output of your choice and then add the code that identifies the input range to satisfy your application. Example: Q510-4004 is a 4-channel RTD Input, 2-wire transmitter, with a 0–250 °C range and 4–20 mA output.

DC ORDERING INFORMATION

4-20 mA	Q500
1-Channel	-1B00
2-Channel	-2B00
4-Channel	-4B00

DC ORDERING INFORMATION

Input Range	Q501 (1 Ch)	Q501 (2 Ch)
4–20 mA	-1B00	-2B00
0–10V	-1B03	-2B03
0–5V	-1B04	-2B04
1–5V	-1B05	-2B05

Q520 (T/C) ORDERING INFORMATION

Temp Range	Type J	Type K	Type T
0–500 °F	-0B01	-0B04	-0B07
0–1000 °F	-0B02	—	—
0–2000 °F	—	-0B05	—
0–250 °C	—	—	-0B08
0–500 °C	-0B03	—	—
0–1000 °C	—	-0B06	—

ORDERING INFORMATION—ACCESSORIES

WV905	24VDC @ 500mA Power Supply, 100–240VAC
MD02	TS32 DIN Rail (2m) Slotted (G-rail)
MD03	TS35 x 7.5 DIN Rail (2m) Slotted (H-rail)
IQRL-D002	IQ Rail for 2 Modules (Q488 only)
IQRL-D004	IQ Rail for 4 Modules (Q488 only)
IQRL-D008	IQ Rail for 8 Modules (Q488 only)

ACTION I/Q SIGNAL CONDITIONERS

Cat #	Input Type	Range	Output	Channels	Circuit Type
Q500	DC Current	0–20/4–20 mA	0–20/4–20 mA	1, 2 or 4	Input Loop Powered
Q501	DC Current DC Volts	4–20 mA 0–5V, 0–10V, 1–5V	4–20 mA	1 or 2	Isolated 2-Wire Transmitter
Q510	3-wire RTD Pt100Ω	See Below	4–20 mA	2 or 4	2-Wire Transmitter
Q488	TC (B, C, E, J, K, N, R, S, T) Pt RTD (100, 200, 500, 1000), Cu RTD (9), Ni RTD (120), 90mV, 900mV, 4000Ω	-270 to +1370 °C (type K) -200 to +850 °C (Pt 100)	0–1mA, 4–20mA, 0–5V, 0–10V	1	Isolated 2-Wire Transmitter (2, 3 or 4-wire input)
Q520	T/C (J,K,T)	See Blow	4–20 mA	2	Isolated 2-Wire Transmitter
Q438	Potentiometer	100Ω to 100kΩ	0–1mA,	1	3-wire to 2-Wire Transmitter
Q448	Bridge	±5mV to ±200mV	4–20mA, 0–5V, 0–10V	1	Isolated 4-wire to 2-Wire Transmitter
Q478	Frequency	2Hz – 10kHz	0–10V	1	Isolated 2-Wire Transmitter

T/C cold junction compensation (standard). Output linear to mV input.

Q510 (RTD) ORDERING INFORMATION

Temp Range	Q510 (2-Ch)	Q510 (4-Ch)
0–100 °C	-0B01	-4B01
0–150 °C	-0B02	-4B02
0–200 °C	-0B03	-4B03
0–250 °C	-0B04	-4B04
0–500 °C	-0B05	-4B05
0–200 °F	-0B06	-4006
0–300 °F	-0B07	-4B07
0–400 °F	-0B08	-4B08
0–500 °F	-0B09	-4B09
0–1000 °F	-0B10	-4B10

Other inputs & AC powered modules also available.

API DIN Transmitters, Isolators & Alarms

- Wide Choice of Inputs: Volts AC/DC, Amps AC/DC, Process V/mA, Strain, Frequency, RTD, Potentiometer
- Variable Brightness I/O Status LEDs
- 1200V Isolation
- Output Test Button
- Lifetime Warranty


APD4380

SPECIFICATIONS

LoopTracker®:	Variable brightness LEDs indicate I/O level & status
Test Button:	Sets output to test level, toggles relay or resets latching relay
Response Time:	70 msec typical (AC input: 200 msec)
Isolation:	1200 Vrms power/input, power/output, input/output
Input Loop Supply:	15 VDC ±10%, regulated, 25 mA max. (DC & freq inputs)
Temperature:	-10°C to +60°C operating
Power:	80-265 VAC (50/60 Hz), 48-300 VDC standard; 9-30 VDC, 10-32 VAC optional
Dimensions:	0.89" W x 4.62" H x 4.81" D (22.5x117x122 mm)
DC Input Z:	Volts: >200kΩ (>1MΩ on APD4380, >2.5MΩ on APD HV-DC), Current: 50Ω or 1.25 VDC @ 20 mA
AC Input:	40-1000 Hz,
AC Input Z:	Volts: >220kΩ, Current: 10Ω or 1 VDC @ 20 mA
Frequency Input:	Sensitivity ±2.5 mV to ±2.5 V, field adjustable
Frequency Input Z:	10kΩ at max sensitivity, 100kΩ at min sensitivity
Strain Gauge Input:	APD4059: 200kΩ input Z APD1500/20/30: 1MΩ input Z
RTD Input:	100 Pt, 10 Cu, 120 Ni, 1000 NiFe types. Excitation: 10 ma @10Ω, 2 mA @100Ω typical, 100°F (55°C) min. span. Specify 0°C resistance (10-2000Ω), 2- or 3-wire, & alpha (385 typical).
Thermistor Input:	Typically 2kΩ-20kΩ. Specify PTC or NTC, temperature curve & range (°C or °F)
ALARMS:	
Alarm Setpoint(s):	0-100% of span, adjustment front panel accessible
Deadband:	1-100% of span, adjustment front panel accessible
Relay Ratings:	8 A @ 240 VAC resistive, 5 A @ 240 VAC inductive, 8 A @ 30 VDC resistive, 3.5A @30V inductive.
TRANSMITTERS:	
Output Adjust:	Zero & span pots, front panel accessible
Output Loop Supply:	20 VDC nom., regulated, 25 mA max.

OPTIONS & ACCESSORIES

OPTIONS—add to end of model number

Transmitters

MO1 In/Out reversal (e.g. 4-20mA in gives 20-4mA out)

Factory Set Alarms

L	Single LO going alarms (APD1x00 models)
HH	HI/HI alarms (APD1x20 models)
LL	LO/LO alarms (APD1x20 models)
IB	Alarms between setpoints (APD1x30 models)
HT	Latching alarm with pushbutton reset
HP	Latching alarm with power off reset
R	Reverse acting alarms (relays energized in alarm condition)

All Models

D	9-30 VDC, 10-32 VAC power
U	Conformal coating for moisture resistance

ACCESSORIES—order as a separate line item

API BP4	Spare removable 4 terminal plug
API TK36	DIN rail, 35 mm W x 39° L, aluminum

ORDERING INFORMATION

DIN TRANSMITTERS & ISOLATORS

Field Selectable Range:

Model	Input Range	Output Range
APD 4380	47 switch selectable, 0-10 mVDC to 0-130 VDC, ±5 mVDC to ±65 VDC, 0-200 μADC to 0-50 mADC*	18 switch selectable, 0-1 VDC to 0-10 VDC ±5 VDC to ±10 VDC (10mA max), 0-2 mADC to 0-20 mADC, 4-20 mADC (20V compliance, 1000Ω @ 20 mA)
APD HV-DC	8 switch selectable, 0-100 VDC to 0-1200 VDC or custom to 2000 VDC	
APD 6380	28 switch selectable: 0-40 mVAC to 0-300 VAC TRMS, 22 switch selectable: 0-4 mAAC to 0-200 mAAC TRMS	
APD 4008	Any full-range potentiometer from 0-100Ω to 0-1MΩ, 55 switch selectable, 0-10% to 0-100%	
APD 7580	30 switch selectable, 0-100 Hz to 0-30 kHz, 100 mVrms to 150Vrms	
APD 4059	13 switch selectable: 5 mV to 400 mV; 1-10 VDC exc. for 1-4 350Ω bridge or strain gauge sensors, 120 mA max.	

Factory Set Range:

Model	Input Range (specify)	Output Range (specify)
APD 4300	0-100 mVDC to 0-300 VDC, ±100 mVDC to ±10 VDC, 0-1 mADC to 0-900 mADC*	0-1 VDC to 0-10 VDC ±1 VDC to ±10 VDC (10mA max),
APD 6010	0-40 mVAC to 0-300 VAC TRMS, 0-1 mAAC to 0-1000 mAAC TRMS	0-1 mADC to 0-20 mADC, 4-20 mADC (20V compliance, 1000Ω @ 20 mA)
APD 4001	RTD (10-2000Ω), or Thermistor (2k-20kΩ), (specify type, curve, °C or °F & range)	
APD 7010	0-25 Hz to 0-20 kHz, 100 mVrms to 150Vrms	

* input loop power supply may be connected for sourcing or sinking.

DIN ALARMS

Field Selectable Range:

Model	Input Range	Output
APD 1080	24 switch selectable, 0-50 mVDC to 0-10 VDC, ±5 VDC to ±10 VDC, 0-1 mADC to 0-20 mADC*	2 DPST relays, 8A, 1 setpoint
APD 1090	24 switch selectable, 0-50 mVDC to 0-10 VDC, ±5 VDC to ±10 VDC, 0-1 mADC to 0-20 mADC*	2 DPST relays, 8A, 2 setpoints

Factory Set Range:

Model	Input Range (specify)	Output (see Options)
APD 1000	0-100 mVDC to 0-300 VDC, 0-1 mADC to 0-20 mADC, 4-20 mADC*	2 DPST relays, 8A, 1 HI setpoint
APD 1020		2 DPST relays, 8A, 2 setpoints HI/LO
APD 1030		2 DPST relays, 8A, 2 setpoints, band alarm
APD 1600	0-50 mVAC to 0-300 VAC, 0-1 mAAC to 0-1000 mAAC	2 DPST relays, 8A, 1 HI setpoint
APD 1620		2 DPST relays, 8A, 2 setpoints HI/LO
APD 1630		2 DPST relays, 8A, 2 setpoints, band alarm
APD 1400	RTD (10-2000Ω), or Thermistor (2k-20kΩ), (specify type, curve, °C or °F & range)	2 DPST relays, 8A, 1 HI setpoint
APD 1420		2 DPST relays, 8A, 2 setpoints HI/LO
APD 1430		2 DPST relays, 8A, 2 setpoints, band alarm
APD 1800	Any full-range potentiometer from 0-100Ω to 0-1MΩ	2 DPST relays, 8A, 1 HI setpoint
APD 1820		2 DPST relays, 8A, 2 setpoints HI/LO
APD 1830		2 DPST relays, 8A, 2 setpoints, band alarm
APD 1700	0-10 Hz to 0-20 kHz, 100 mVrms to 150Vrms	2 DPST relays, 8A, 1 HI setpoint
APD 1720		2 DPST relays, 8A, 2 setpoints HI/LO
APD 1730		2 DPST relays, 8A, 2 setpoints, band alarm
APD 1500	100Ω to 10kΩ bridge, strain gauge, load cell; 5-2000 mV; 1-10 VDC excitation, 30 mA max. Specify excitation voltage, mV range and mV/V	2 DPST relays, 8A, 1 HI setpoint
APD 1520		2 DPST relays, 8A, 2 setpoints HI/LO
APD 1530		2 DPST relays, 8A, 2 setpoints, band alarm

* input loop power supply may be connected for sourcing or sinking.

Action Instruments™ Isolating Two-Wire Transmitter

- Isolated, Linearized Current Loop Output for an RTD or Thermocouple Input
- HART Compatible or Field Configurable with Optional Display
- Intrinsically Safe Operation or with Display and EP Enclosure
- Programmable for 11 T/C Types, 6 RTD Types, mV or Ohm inputs



▲ **T79D**

The model T798 is a programmable temperature transmitter that can be factory or field configured using the optional 1 or 2 line alphanumeric display.

The model T798 is Highway Addressable Remote Transducer (HART) based, temperature transmitter that can be factory or field configured using an optional 1 or 2 line alphanumeric display, optional PC based modem and software. Alternatively an HC275 Hand-Held Communicator loaded with the Action T798 Device Description from the Hart Foundation Library can be used.

Both the T798 and T797 accept thermocouple (B, C, E, J, K, L, N, R, S, T, U & special) and 2, 3, or 4 wire Platinum RTDs (385 or 392 alpha) as well as millivolt (mV) and resistance inputs.

SPECIFICATIONS

Linearization:	Thermocouple and RTD linearization to $\pm 0.05^\circ\text{C}$.
Output:	Analog, two-wire 4-20 mA
Transmitter Accuracy:	$\pm 0.05\%$ of the millivolt or ohm equivalent input reading, or the value from the Accuracy Table, whichever is greater; plus $\pm 0.05\%$ of the span. For thermocouples, add $\pm 0.5^\circ\text{C}$ (0.9°F) for cold junction compensation.
Output	Analog Zero: 100% of Sensor range --- Non-interacting
Adjustments:	Analog Full-scale: Normal or Reverse Acting
Operating Temperature:	Electronics & Display (with reduced visibility): -40°C to 85°C , (-40°F to $+185^\circ\text{F}$) Display (full visibility): -20°C to $+70^\circ\text{C}$, (-4°F to $+158^\circ\text{F}$)

ORDERING INFORMATION

T797-0000	Temperature Transmitter, Non IS
T797-1000	Temperature Transmitter, IS-FM/CSA
T798-0000	Temperature Transmitter, Hart, Non IS
T798-1000	Temperature Transmitter, Hart, IS-FM/CSA

Displays & Options

T79D-2000	Two Line Alphanumeric Display
T79D-1000	One line alpha-numeric Display
T79E-1000	Weather Proof Head-Mount Enclosure
T79A-P000	Pipe Mount Bracket for T79E-0/D only
T79A-D000	DIN Rail Mounting Kit
T79A-M000	T797 Configuration Modem
T79A-MH00	T798 Hart Configuration Modem
T79A-C000	Configuration Software for T797 & T798

Action Instruments™ DC Input, Field Configurable Isolator with Math Functions

- Multi-Function, Multi-Channel Input.
- DC-Frequency or Frequency-DC Conversion for Totalization/Integration Applications.
- Math Capability Supports Many Process Control Functions.
- Switch Selectable or PC Programmable Ranges.



The Q498 is a DC powered, DIN rail mount, DC input signal conditioner. The unit is fully isolated to 1800V between input, output and power. Two isolated analog inputs each accept either a DC voltage or current. One analog output delivers either DC bi-polar voltage or uni-polar current. The Q498 also has a separated frequency input channel and a frequency output, as well as a discrete input and output channel.

The Q498 can perform single or double input math calculations on the input values. The available operators are: +, -, *, /, Sq, Sqroot & Average. Process control functions include Hi/Lo Select, Rate of Change Limiter and Track & Hold. The frequency input can also have the math functions applied. A 25-point linearization function is available for Channel 1 Analog input only. All output math and process control functions require the C698 software.

SPECIFICATIONS

Analog Input Ranges (Two Isolated Channels)	$\pm 150\text{mV}$, $\pm 1.5\text{V}$, $\pm 15\text{V}$, $\pm 150\text{V}$ $\pm 2.5\text{mA}$, $\pm 25\text{mA}$
Analog Maximum Overload (continuous)	200V DC for voltage inputs; 170mA DC and/or 60V DC maximum for current inputs (self-resetting fuse)
Analog Output Ranges	0-20mA, 0-10V, $\pm 10\text{V}$
Analog Output Drive	0-20mA: 12VDC compliance. (600 Ω maximum) Voltage ranges: 10mA drive (1000 Ω load minimum)
Analog Output Accuracy	$\pm 0.005\%$ of the FS Input Range ($\pm 0.05\%$ on 150 volts range), plus $\pm 0.05\%$ of the FS Output Range ($\pm 0.1\%$ for output loads $< 200\Omega$)
Analog Response Time	750msec max. (10-90%)
Analog Input Impedance	$\geq 100\text{k}\Omega$ on voltage ranges $> 1.5\text{V}$, $\geq 10\text{M}\Omega$ on voltage ranges $< 1.5\text{V}$ 70 Ω typical (non-overload) on all current ranges
Analog Output Impedance	Less than 3 Ω on voltage output ranges $\geq 500\text{k}\Omega$ on current output ranges
Frequency Input	One channel with two voltage range inputs: 150mV to 50Vrms with 5Vp noise suppression, or 0.5V to 150Vrms with 20Vp noise suppression, 2Hz to 10kHz in software selectable ranges.
Frequency Output	$\pm 0.1\%$, 2Hz to 10kHz in software selectable ranges Open collector pulled up through 20k to 18V, with 1mA drive. Sinks up to 20mA from 24V external supply.
Discrete Input	Input active to Common, with soft pull-up (1mA) to +18V
CMR (DC to 60Hz)	$\geq 90\text{dB}$ for 60Hz and 120dB @ DC
Power Requirements	9-30VDC, 2.5 watts max
Isolation	Input to Input to Output to Power, 1800VDC
Size	DIN rail case (0.88" x 4.0" x 4.59")
Operating Temperature	0 $^\circ\text{C}$ to +55 $^\circ\text{C}$ (32 to 131 $^\circ\text{F}$)

ORDERING INFORMATION

Q498-0000	DC-Frequency Isolator
C698-0000	Configuration Software & PC Serial Cable
H902	0.2Amp, 24VDC Power Supply
H910	1Amp, 24VDC Power Supply
H915	2.3Amp, 24VDC Power Supply

Selco Transmitters

- Miniature Size
- Variety of Input Types
- 1500V Isolation
- AC or DC Powered
- DIN Rail Mounting

TZ-1XA


SPECIFICATIONS

Basic Accuracy:	±0.1% of full scale, except ±0.2% of full scale on CA, DA & EA types
Load/supply variation:	±0.06% of full scale each
Temperature coefficient:	±0.02% FS/°C
Response time:	<50ms (0 to 90%) except 500ms on CA type, 700ms on DA & EA types
Front adjustments:	±5% for zero & span
Insulation resistance:	>100MΩ at 500VDC, between input and output or power supply
Dielectric strength:	1 min. at 1500VAC, between input and output or power supply
Power supply:	24VDC ±10% 100-240VAC ±10%
Operating temperature:	-5 to 50°C, <90% RH (non-condensing)
Case material:	Black ABS, 94V-2
Dimensions (mm):	25 W x 99 H x 41 D

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: TZ-1XA-22L

A	B	-	C	D	E
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A	Basic Unit	
TZ-1	Transmitter, 100-240 VAC powered	
TZ-5	Transmitter, 24 VDC powered	
B	Input Type	
XA	DC Volts/mA	
FA	DC mV/μA	
EA	AC Volts (TRMS, AC coupled, 40-1000Hz)	
DA	AC Amps (TRMS, CT coupled, 40-1000Hz)	
AA	RTD (Pt100, 3-wire, α=385)	
CA	Thermocouple (J, K, R, S or T)	
BA	Potentiometer	
LA	mA loop (TZ-5 only)	
C	Input Range	
Select code from input table for type specified above		
D	Output Range	Allowable Load
0	0 to 5 VDC	>2kΩ
1	1 to 5 VDC	
2	0 to 10 VDC	>4kΩ for positive output,
3	-10 to +10 VDC	>10kΩ for negative output
4	-2 to +2 VDC	>2kΩ for positive output,
5	-2.5 to +2.5 VDC	>10kΩ for negative output
6	-5 to +5 VDC	
7	0 to 4 VDC	>2kΩ
A	4 to 20 mADC	
B	0 to 20 mADC	<550Ω
E	Response Time (XA & FA types only)	
L	Normal (50 msec)	
H	Fast (1 msec on type XA, 3msec on type FA)	

INPUT RANGES

Input Type XA - DC Volts/mA

Code	Range	Input Resistance	Maximum Input
0	0 to 5 VDC	>1MΩ	-50 to +150% of full scale
1	1 to 5 VDC		
2	0 to 10 VDC		
3	-10 to +10 VDC		
4	0 to 1 VDC		
5	0 to 100 mVDC		
6	0 to 60 mVDC		
7	0 to 20 VDC		
8	-2 to +2 VDC		
9	-5 to +5 VDC		
A	4 to 20 mADC	250Ω	
B	0 to 20 mADC		

Input Type FA - DC mV/μA

Code	Range	Input Resistance	Maximum Input
0	0 to 5 mVDC	>1MΩ	-50 to +150% of full scale
1	0 to 10 mVDC		
2	0 to 50 mVDC		
3	0 to 60 mVDC		
4	0 to 100 mVDC	1kΩ	
A	0 to 10 μADC		
B	0 to 100 μADC		
C	0 to 200 μADC	500Ω	

Input Type EA - AC Volts

Code	Range	Input Resistance	Maximum Input
1	0 to 35 VAC	>200kΩ	150% of full scale or 300VAC
2	0 to 100 VAC	>1MΩ	
3	0 to 110 VAC		
4	0 to 200 VAC		
5	0 to 220 VAC		

Input Type DA - AC Amps

Code	Range	Input Resistance	Maximum Input
1	0 to 1 AAC	<0.05Ω	7.5 AAC
2	0 to 5 AAC		

Input Type AA - RTD

Code	Range	Input Resistance	Maximum Input
0	-50 to +50 °C	Pt100 (3-wire)	-50% to 150% of full scale
1	0 to 100 °C		
2	0 to 200 °C		
3	0 to 300 °C		
4	-20 to +80 °C		

Input Type CA - Thermocouple

Code	TC	Range	Input Res.	Max. Input
J0	J	0 to 1000 °C	>1MΩ	±150%
K2	K	-50 to +200 °C		
K3	K	0 to 200 °C		
K4	K	-50 to +1200 °C		
K5	K	0 to 1200 °C		
R0	R	0 to 1700 °C		
S0	S	0 to 1700 °C		
T0	T	-50 to +350 °C		
T1	T	0 to 350 °C		

Input Type BA - Potentiometer

Code	Range	Input Resistance
1	0 to 100%	100Ω to 10kΩ

Input Type LA - mA loop

Code	Range	Input Resistance
A	4 to 20 mADC	250Ω

Custom ranges for any input type are available on special order.

Selco Signal Conditioners

Programmable Transmitter

- Change Input and Output Range by Front DIP Switches
- AC or DC Power
- Selectable Filter 50/500msec
- Normal or Reverse Output
- DIN Rail Mount


TW-4M

SPECIFICATIONS

Basic Accuracy:	±0.25% FS
Linearity:	Less than ±0.1% of full scale
Temperature coefficient:	±0.02% FS/°C
Response time:	<50ms (0 to 90%) with filter off
Insulation resistance:	>100MΩ at 500VDC, between input and output or power supply
Dielectric strength:	1 min. at 2000VAC, between input and output or power supply
Power supply:	24VDC ±10% 100-240VAC ±10%
Power consumption:	<80mA (at 24VDC) <50mA (at 100-240VAC)
Operating temperature:	-5 to 50°C, <95% RH (non-condensing)
Maximum input:	-50 to +150% of range
Dimensions (mm):	48 W x 98 H x 41 D
Connections:	M3.5 screw terminals

Input Range	Input Resistance	
0 to 5 VDC	>1MΩ	
0 to 10 VDC		
0 to 60 mVDC		
1 to 5 VDC		
-5 to +5 VDC		
-10 to +10 VDC	250Ω	
4 to 20 mADC		
0 to 20 mADC	Allowable Load Resistance	
Output Range		
0 to 5 VDC		>2kΩ
1 to 5 VDC		
-5 to +5 VDC		
0 to 10 VDC		>4kΩ
-10 to +10 VDC		
4 to 20 mADC	<550Ω	
0 to 20 mADC		

ORDERING INFORMATION

SE/TW-4M-1-N	Programmable Transmitter, 100-240 VAC Power
SE/TW-4M-4-N	Programmable Transmitter, 24VDC Power
SE/TZ-41	Signal Isolator, Self powered
SE/TH-2X-**L	Signal Isolator, AC powered (insert input/output codes)
SE/TH-5X-**L	Signal Isolator, DC powered (insert input/output codes)

Example: SE/TH-5X-42L for 0-1V in and 0-10V out

Signal Isolators

- Small Size
- AC or DC Powered (TH)
Self-powered (TZ)
- Easy Connection
- DIN Rail Mount


TH-2X

TZ-41

TZ-41 SPECIFICATIONS

Signal input:	0 to 20mA, 4 to 20mA, 0 to 5mA
Signal output:	Same as signal input (1:1 ratio)
Input current:	Max. 30mA
Load:	Max. 1000Ω
Voltage loss:	Approx. 3.3V between input and output
Output ripple:	<0.5% (20mA at 250V)
Temperature coefficient:	Less than ±100PPM/°C
Accuracy:	±0.1% (23 ±1°C) at 250V load
Additional error:	+0.1%/100Ω at load <250Ω -0.1%/100Ω at load >250Ω & <600Ω
Operating temperature:	-5 to +50°C, less than 90% RH
Insulation resistance:	>100MΩ at 500VDC (input to output)
Dielectric strength:	1 min. at 2kVAC (input to output)
Dimensions (mm):	25 W x 98 H x 41 D

TZ-41 will also provide 0 to 5V or 1 to 5V output.

TH-2X & TH-5X SPECIFICATIONS

Basic Accuracy:	±0.1% of full scale
Load/supply variation:	±0.06% of full scale each
Temperature coefficient:	±0.02% FS/°C
Response time:	<50ms (0 to 90%)
Input resistance:	>1MΩ on VDC, 250Ω on mADC
Insulation resistance:	>100MΩ at 500VDC, between input and output or power supply
Dielectric strength:	1 min. at 1500VAC, between input and output or power supply
Power supply:	24VDC ±10% 100-240VAC ±10%
Power consumption:	<50mA @ 24VDC, <20mA @ 100VAC
Operating temperature:	-5 to 50°C, <90% RH (non-condensing)
Maximum input:	-50 to +150% of range
Dimensions (mm):	13 W x 99 H x 115 D

Input Code	Range	Input Code	Range
0	0 to 5 VDC	6	0 to 60 mVDC
1	1 to 5 VDC	7	0 to 20 VDC
2	0 to 10 VDC	8	-2 to +2 VDC
3	-10 to +10 VDC	9	-5 to +5 VDC
4	0 to 1 VDC	A	4 to 20 mADC
5	0 to 100 mVDC	B	0 to 20 mADC

Output Code	Range	Allowable Load
0	0 to 5 VDC	>2kΩ
1	1 to 5 VDC	
2	0 to 10 VDC	>4kΩ for positive output,
3	-10 to +10 VDC	>10kΩ for negative output
A	4 to 20 mADC	<550Ω

Laurel DIN Rail Transmitters

- Analog or Pulse Input, Analog Output
- RS232/485 or Ethernet Interface
- Modbus & ASCII Protocols
- Dual Relay Outputs
- Input/Digital/Analog/Relay Isolation
- Free Setup Software



LT

Laureate LT Series transmitters provide serial data conversion and analog retransmit for all popular industrial signals. These modules use the proven circuitry of Laurel panel meters and counters for exceptional accuracy at high update rates.

Laureate transmitters are easily configured from a PC using the graphical Laurel Instrument Setup Software. The isolated analog output can be digitally scaled to any portion of the full range. Dual relay outputs add alarm and control capability. Programmable modes include operation above or below setpoint, latching or non-latching, hysteresis and band deviation.

Each DC transmitter is precalibrated for all DCV & DCA ranges. The user can change the range without recalibration. On temperature transmitters, the thermocouple or RTD type is field selectable. Measurement ranges can be as wide as the entire span of the sensor type or as narrow as 15°. Cold junction compensation and open sensor detection are included.

Standard functions on pulse input models are frequency, period, rate, A to B interval, up/down total to 999999. Extended models provide additional user-configurable functions.

SPECIFICATIONS

Analog Output:	4-20mA, 0-20mA, 0-10V, ±10V
Compliance (mA):	10V (0-500Ω load)
Compliance (V):	2mA (>5kΩ load)
Accuracy:	±0.02% of span (analog inputs) ±0.01% of span (pulse inputs)
Resolution:	16 bits (65536 steps)
Digital Output:	RS-232/485 (2- or 4-wire) or Ethernet
Protocols:	LT models: Modbus RTU, Modbus ASCII, Laurel ASCII LTE models: Modbus (TCP, RTU or ASCII) & Laurel ASCII
Baud Rate:	300-19200
Analog Input Accuracy:	DCV, mA: ±0.01% of FS ±2 counts ACV, mA: ±0.15% of FS ±2 counts (10Hz-10kHz) Strain gage, load cell: ±0.01% of FS ±2 counts Resistance: ±0.01% of range ±2 counts RTD: ±0.04°C conformity error typ. (3 & 4 wire) Thermocouple: ±0.2°C conformity error typ.
Update Rate:	50 or 60/sec for analog inputs
Thermocouple Input:	FS range is maximum for each sensor type
Frequency/Pulse Input:	AC, magnetic pickups, pulses from NPN or PNP sensors, contact closures, digital logic
Channel A Frequency:	0.005Hz to 1MHz
Channel B Frequency:	0.005Hz to 250kHz
Time Base Accuracy:	±2ppm
Signal Level:	12mV min, 250VAC max
Update Rate:	Gate time + 30ms + 1 period (20/sec at 60Hz)
Gate Time:	0.01 to 199.99 sec (selectable)
Curve Fitting:	Square root extraction standard, Custom curve fitting with extended input board
Quadrature Input:	Differential or single ended
Transitions Monitored:	x1, x2 or x4
Transitions/sec:	250k max.
Error Correction:	Zero index (Z-channel)
Relay Outputs:	Two SPST-NO (Form A) solid-state relays 120mA@140VAC/180VDC
Excitation Output:	5V@100mA, 10V@120mA, 24V@50mA (jumper select)
Isolation:	50V from signal ground
Power:	DC or 47-63 Hz
Isolation:	250Vrms power/analog/relay
Temperature:	0-55°C operating; <95% RH 0-40°C, non-condensing
Size:	129 x 104 x 22.5 mm
Mounting:	35mm DIN rail
Connections:	Detachable screw terminal plugs, RJ45 for Ethernet

ACCESSORIES

CBL04	RS-232 cable to PC serial port or USB adapter
CBL02	USB to RS-232 cable adapter
LTNET485	Ethernet to RS485 Server. Connects up to 31 Laureate LT transmitters, meters and counters with RS485 interfaces to one Ethernet port.

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number
Order Example: LT20DCV1

A	B	C	D
A Transmitter Output			
LT	4-20mA, RS232/RS485, 2 relays		
LTE	4-20mA, Ethernet, 2 relays		
B Main Board Type			
2	Standard analog input		
4	Extended analog input ¹		
6	Standard pulse input (frequency, rate, totalizing, timing)		
8	Extended pulse input [§]		
C Power			
0	85-264VAC, 95-300VDC		
1	12-34VAC, 10-48VDC		
2	Power over Ethernet (LTE models only)		
D Input Type (analog main board)			
DCV1	±200.00mV DC	RMV1	200mV AC Trms
DCV2	±2.0000V DC	RMV2	2.0000V AC Trms
DCV3	±20.000V DC	RMV3	20.000V AC Trms
DCV4	±200.00V DC	RMV4	200.00V AC Trms
DCV5	±600.0V DC	RMV5	600.0V AC Trms
DCV6	±300.0V DC	RMV6	300.0V AC Trms
DCA1	±2.0000mA DC	RMA1	2.0000mA AC Trms
DCA2	±20.000mA DC	RMA2	20.000mA AC Trms
DCA3	±200.00mA DC	RMA3	200.00mA AC Trms
DCA4	±5.000A DC	RMA4	5.000A AC Trms
R1	0-20.000kΩ	R4	0-20.000kΩ
R2	0-200.00kΩ	R5	0-200.00kΩ
R3	0-2.000kΩ	R6	0-2.000MΩ (special)
P	Process 4-20mA in/out	C427	Cu10 RTD *
P1	Process Custom mA scaling	J	Type J TC *
SG	Strain Gage 200mV	K	Type K TC *
SG1	Strain Gage Custom scaling	R	Type R TC *
WM1	4/6-wire Load Cell Custom scale	S	Type S TC *
P385	100Ω Pt RTD α=385 *	T	Type T TC *
P392	100Ω Pt RTD α=392 *	E	Type E TC *
N672	Ni120 RTD *	N	Type N TC *
Input Type (pulse main board)			
FR	Dual channel frequency/pulse		
VF1	4-20mA (process totalizing, square root extraction)		
VF2	0-1mA (process totalizing, square root extraction)		
VF3	0-10V (process totalizing, square root extraction)		
QD	Quadrature**		

¹ Adds custom curve linearization & rate from successive readings.

[§] Adds phase angle, duty cycle, up/down counting, rate & total simultaneously, custom linearization, arithmetic functions (A+B, A-B, AxB, A/B, A/B-1), power factor, batch control.

* Specify °C or °F. TC or RTD type is jumper selectable.

** Scalable for encoder position. Extended board adds scalable rate.

Adtech Two-Wire Transmitters

- Wide Operating Temperature
- Adjustable Zero & Span
- Die Cast Aluminum Housing
- Optional DIN mounting or NEMA Housing

100 Series


SPECIFICATIONS

Output:	4-20mA
Accuracy:	0.1% of span (0.25% for AC)
Isolation:	600V DC, 350VAC
Protection:	RFI & reverse polarity protection standard
Operating Temp:	-31 to 85°C
Power:	8-42VDC
Size:	2.4" W x 3.0" H x 2.1" D (for T/C head mounting)

ORDERING INFORMATION

Model	Function	Ranges
AD/ACX141	AC Current	7, from 0-0.8 to 0-5 A (<0.5VA burden)
	AC Voltage	21, from 0-0.67 to 0-255 V
AD/FDX150	Frequency	11, from 0-30Hz to 0-30kHz
AD/MVX106	DC mV	8, from 0-0.5 to 0-100mV (non-isolated)
AD/MVX126	DC mV	8, from 0-0.5 to 0-100mV
AD/PTX173	3-wire Pot	50Ω to 100kΩ (non-isolated)
AD/RBX174	RTD	2, 3 or 4-wire, 1-400Ω (non-isolated)
AD/RBX172	RTD	2, 3 or 4-wire, 1-400Ω
AD/TCX126	Thermocouple	B, E, J, K, R, S, T

Options (add suffix):

-H22	Surface mounting plate
-H20A	DIN mount
-H13A	NEMA 4 housing
-H15	NEMA 7 housing

Adtech Field Selectable Alarms

- Single or Dual Setpoint
- Universal Relay Action - Normal or Fail Safe, High or Lo Limit
- 0-30 Second Adjustable Time Delay
- Latching Action
- LED Indication of Alarm Status
- Potentiometer Setpoint Adjustment


500 Series

SPECIFICATIONS

Input Ranges:

ACA	0-1, 0-5 (selectable avg or TRMS) burden <0.5VA
ACV	0-0.25, 0-2.5, 0-25, 0-250
DCV	0-5, 0-10, ±5, ±10, 1-5
DCmA	0-1, ±1 (R = 200Ω) 0-10, ±10 (R = 20Ω) 0-20, ±20, 4-20 (R = 10Ω)
DCmV	0-100
T/C	J, K, T, E, R, S, B
RTD	2, 3 or 4-wire, 1-400Ω

Accuracy: 0.1% of span (0.25% for AC)

Relay Output: SPDT, 10A @ 240VAC or 30VDC, resistive

Response Time: <200 msec

Trip Adjustment: 0-100% of span

Dead Band Adjustment: 1-100% of span

Power Supply: 100-240VAC (24V DC optional)

Temperature: -15 to 60°C operating

Dimensions:

DIN mount	2.25" W x 3.11" H x 3.3" D (57x79x84mm)
NEMA 4	4.4" W x 6.75" H x 4.3" D (112x172x109mm)

Isolation: Input/Output/Power, 1500VAC

ORDERING INFORMATION

Model	Setpoint	Function
AD/ACA514	Single	ACV, ACA
AD/ACA515	Dual	ACV, ACA
AD/DCA514	Single	DCV, DCmA
AD/DCA515	Dual	DCV, DCmA
AD/MVA514	Single	DCmV
AD/MVA515	Dual	DCmV
AD/RBA514	Single	RTD & Resistance
AD/RBA515	Dual	RTD & Resistance
AD/TCA514	Single	Thermocouple
AD/TCA515	Dual	Thermocouple

Options (add suffix):

-P2	24VDC power
-H26	Surface Mounting Plate
-H27	NEMA 4 housing
-H15D2	NEMA 7 housing (Class 1 Group B, C, D)

Adtech Loop Powered Indicators

- 3½ Digit 0.5" LCD Display
- Reverse Polarity Protection
- 2.3V Maximum Burden
- Signal Powered, No External Power Needed
- -30 to +80°C Operating Temperature
- 2.5 readings/second
- Accuracy ±3 counts

Accepts a 4-20mA process input signal from a 2, 3 or 4-wire transmitter. Displays the input as mA, 0-100% or in engineering units such as °C, °F, RPM, ft, gallons or lbs. Jumpers are provided to select decimal position and display range. Two potentiometers adjust zero & span.

ORDERING INFORMATION

AD/LPI 25	NEMA 4X Housing
AD/LPI 30	NEMA 7 Explosion Proof Housing, Class 1 Group B, C, D
AD/LPI 40	NEMA 7 Explosion Proof Housing with integral Series 100 2-wire transmitter
AD/LPI 40D	NEMA 7 Explosion Proof Housing with integral Series 200 2-wire transmitter

LPI 25

LPI 30


Action Instruments™ Low Profile Signal Conditioners

- Low Power
- Higher Accuracy
- Field Configurable
- E-Mail Alarm Notification

SlimPak II


SPECIFICATIONS

Output:	0-10V, 0-20mA, 4-20mA
Accuracy (In/Out):	±0.015% rng / ±0.05% rng
Isolation:	1800V AC/DC, In/Out/Power
Operating Temp:	0 to 60°C, <95% RH
Power:	9-30VDC, 1W typ.
Alarm:	2 SPDT, 5A@120VAC
Size:	0.5" wide DIN rail case
Approvals:	UL508, CSA C22.2, CE

ORDERING INFORMATION

Model	Function	Range
WV408-2000	DC	±150mV, 1.5/15/150V, 2.5/25mA +reverse
WV418-2000	RTD	2/3/4 wire: Pt100, Cu10
WV428-2000	T/C	J,K,T,R,S,E,B,N,C,B
WV438-2000	Potentiometer	100Ω to 100kΩ
WV448-2000	Bridge	±5/10/20/50/100/200mV (1-10VDC, 120mA excitation)
WV468-2000	AC	50/150/500mV, 5/20/50/150/250V, 20/100mA +reverse (40-400Hz)
WV478-2000	Frequency	0-10kHz (150mV-150V)
WVC16-2000	Communication	Up to 32 modules to Ethernet 10Base-T
C650-2000	Software	Includes serial cable
WV905	Power Supply	24VDC @0.5A

Also available as Limit Alarms with latching relays & reset switch

Pyromation Temperature Transmitters

- Wide Operating Temperature Range
- Factory or Field Configurable
- Sensor Break & Short Circuit Detection
- T/C Head Mounting (441 & 442)
Industrial or Explosion Proof Housing (642)
- FM & CSA Approved Intrinsically Safe & Non-Incendive

642

441


SPECIFICATIONS

Input:	T/C J,K,T,E,R,S,B,N,L,U,C,D RTD Pt or Ni, 100/500/1000, 2/3/4-wire DC -10 to 100mV Resistance 400Ω, 2000Ω
Accuracy:	0.2°C (Pt100), 1°C (K/T/C)
Output:	2-wire, 4-20mA or 20-4mA
Maximum Load:	(Vsupply - 8V)/25mA
Power Supply:	8-30V DC (40V max on 642 models)
Operating Temperature:	-40 to 85°C, condensing allowable
Dimensions (441, 442):	1.73" dia x 0.9" (44x23mm)
Galvanic Isolation:	3.75kV AC

ORDERING INFORMATION

PM/441	Temperature Head Transmitter
PM/442	Temperature Head Transmitter with HART® protocol
PM/642A	Programmable HART® Transmitter
PM/642AT	Programmable HART® Transmitter with digital display
PM/642C	Programmable HART® Transmitter, explosion proof housing

For factory configuration, specify input type & range (°C or °F); for field configuration, order communication cable & software

NLS Series 8000 Signal Conditioners

- Input, Output, Isolation, Power Supply and Special Functions Combined in One Low Cost Modular Unit
- Field-Settable Range, Span and Configuration
- Fuse Protected Linear Power
- UL Recognized
- High Impact, Flame Retardant Polycarbonate Case

The Series 8000 signal conditioners are designed with a modular architecture to allow full input, output, and special function selectability and interchangeability. They can also be used as isolators, signal amplifiers, and transmitters.

8000-1-1


NLS Series 8000 Signal Conditioners

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.

Order Example: 8000-1-1-01(0-27.2V)-60(4-20mADC)

A - **B** - **C** - **D** - **E**

A Basic and Power—See Base Style Selection Chart	
8000-1-1	8-Pin, 120 VAC Power
8000-2-1	11-Pin, 120 VAC Power
8000-3-1	20-Pin, 120 VAC Power
8000-2-2	11-Pin, 240 VAC Power
8000-3-2	20-Pin, 240 VAC Power
8000-1-3	8-Pin, 9-30 VDC Power
8000-2-3	11-Pin, 9-30 VDC Power
8000-3-3	20-Pin, 9-30 VDC Power

B Input Code	
01	DC: Voltage to 300, Current to 100 mA—Specify Range
02	Potentiometer: Any Value from 0-100Ω to 100 kΩ
03	AC: Voltage to 250 V, Current to 100 mA—Specify Range
04	Thermocouple: non-linearized J, K, T, E, R, S, or B—Specify Type and range. See special function "43" for Linearization
05	RTD: Pt100Ω (∞00385), Cu10Ω or Ni120Ω—Specify Type and Range
06	DC Millivolts: 0-200 (8 mV min span)—Specify Range
08	LVDT: 50 mV/V to 800 mV/V RMS—Specify Range
09	Strain Gauge: 2 mV/V to 20 mV/V—Specify Range
10	Frequency: 0-50 kHz (50 Hz min span)—Specify Range
11	Ramp/Soak Programmer
12	High Select: up to 4 inputs: 4-20 mA, 1-5V, or 0-10V—Specify Range
13	Low Select: up to 4 inputs: 4-20 mA, 1-5V, or 0-10V—Specify Range
14	Add/Subtract: up to 4 inputs: 4-20 mA, 1-5V, or 0-10V—Specify Range
15	Multiply (A x B)—Specify # of inputs and type
16	Divide (A x B)—Specify # of inputs and type

C Output Code	
60	DC: 0-12V (100 mV min) or 0-50 mA (1 mA min)—Specify Range
70	Frequency: 5V (TTL), 0-50 kHz (11 pulses/hour min)—Specify Range
71	Frequency: Contact Closure 0-2 Hz (11 pph min)—Specify Range
72	Frequency: 24V pulse 0-50 kHz (11 pph min)—Specify Range
73	Valve Positioner: Pot 100-9.9 kΩ, 10k-100 kΩ; 4-20 mADC, 0-1 VDC or 0-10 VDC—Specify feedback type
80	Single Alarm Setpoint: Single Turn Pot. Screwdriver Adj.

81	Single Alarm Setpoint: Remote 4-20 mADC
82	Single Alarm Setpoint: Remote 1-5 VDC
83	Single Alarm Setpoint: Remote 0-1 VDC
84	Single Alarm Setpoint: Remote 0-10 VDC
85	Single Alarm Setpoint: Multi-turn Pot., Screwdriver Adj.
86	Single Alarm Setpoint: Plus Top Mounted Knob, 0-100%
87	Single Alarm Setpoint: Remote Pot., 0-100Ω to 100 kΩ
90	Dual Alarm Setpoint: Single Turn Pot. Screwdriver
91	Dual Alarm Setpoint: Remote 4-20 mADC
92	Dual Alarm Setpoint: Remote 1-5 VDC
93	Dual Alarm Setpoint: Remote 0-1 VDC
94	Dual Alarm Setpoint: Remote 0-10 VDC
95	Dual Alarm Setpoint: Multi-turn Pot., Screwdriver Adj.
96	Dual Alarm Setpoint: Plus Top Mounted Knob, 0-100%
97	Dual Alarm Setpoint: Remote Pot., 0-100Ω to 100 kΩ

D Special Functions	
00	None
40	Square Root
41	Power Term: N ^m Power
42	N ^m Root: Adjustable root 0.5 to 5
43	Thermocouple Linearization (type/range specified by input code)
44	Curve Fit Linearization: Curve or formula must be provided
45	Ramp Buffer: Delays signal action (adj. 1 sec to 20 min)
46	Peak/Valley Sample Hold: Specify Peak or Valley
48	Rate of Change Processor: (Specify time base, 1 sec etc.)

E Options for Alarm Setpoints	
00	None
01	Low or Low/Low relay sense (Single or dual alarms)
02	High/High relay sense (Dual alarms)
03	Fail-Safe Operation (Dual alarms)
04	Transmitter Output 0-1V output for process, Setpoint #1 and Setpoint #2 (Setpoint output not avail. with strain gage, add/subtract, or high/low select)
05	Latching relay(s): Jumper selectable for Latch/Non-Latch
07	Voltage Output (24V @ 15 mA) replaces relay contacts
Options for Temperature Inputs	
06	Down scale burnout for thermocouple input
08	Differential RTD input: Specify differential range
09	Differential thermocouple input: Specify differential range

BASE STYLE SELECTION CHART

Output Code	Type	60	80, 85, 86 90, 95, 96	73, 81, 82, 83, 84, 91, 92, 93 94; or 80, 85, 86 90, 95, 96 w/ 07	70	71	60 72	70, 71 72 w/46
01/03/04/06/10	DC, AC, Frequency	8	11	20	8	11	11	20
02	Potentiometer	8	20	20	8	20	20	20
05	RTD	20	20	20	8	20	20	20
09	Strain Gauge	11	20	20	11	11	—	—
08	LVDT	11	20	—	20	20	—	—
15/16	Multiply/Divide	8	20	20	8	20	20	20
12/13/14	High/Low	20	20	20	20	20	—	—
11	Ramp/Soak	20	20	—	—	20	—	—

To determine the number of pins required for the signal conditioner, select input code and output code and read across and down. Make sure to order mounting socket.

ACCESSORIES

Mounting Sockets—Required and Sold Separately

DR011	11-Pin Barrier Terminal Socket for DIN Rail or Flush Mount
DR014	Din Rail—Three Foot Length Metal Channel Track
DR018	8-Pin Barrier Terminal Socket for DIN Rail or Flush Mount
SM004	DIN Rail—Four Foot Length Plastic Channel Track

SM008	8-Pin Barrier Terminal Socket for Channel Track
SM011	11-Pin Barrier Terminal Socket for Channel Track
SM020	20-Pin Barrier Terminal Socket for Channel Track
SX008	Explosion Proof Housing (Meets Class I, Group D, Class II, Group E, F, and G)

Pyragon Loop Isolator

- Signal Powered CMOS Circuitry
- Precise Duplication of Input Signals
- 4–20 or 10–50 mA, Same Unit
- High Common Mode Rejection
- 1500 VRMS Isolation
- Mounts on Bulkhead or in 3" Conduit Box

 **10AI**

Provides the Necessary Signal Isolation for Noisy Process Circuits

If your process signals are influenced by ground loops, high common mode noise, or other interference, you need the Transmation Model 10 Auto-Isolator. Requiring no separate power supply, Auto-Isolator operates efficiently from input signal current, and precisely retransmits the current applied to the input with an accuracy of $\pm 0.1\%$ of span.

Usable with milliamp signal ranges of 4–20, 10–50, or other ranges between 4 and 50 mA. The instrument can be bulkhead-mounted or installed in a 3-inch cast conduit box. A trim potentiometer, accessible through the instrument's top plate, permits precise adjustment of current transfer as a function of load resistance up to 500 ohms at 20 mA, and 250 ohms at 50 mA.



SPECIFICATIONS

Input:	4–20 mA, 10–50 mA, or other spans within range of 4–50 mA
Output Ratings:	4–20 mA with loads from 0–500 ohms 10–50 mA with loads from 0–250 ohms
Accuracy:	$\pm 0.1\%$ of span
Size/Weight:	2.95" diameter, 1.88" high/6 oz

ORDERING INFORMATION

10AI	Model 10 Auto-Isolator
10AI-EXP	Model 10 in Explosion Proof Housing

Pyragon Universal Temperature Transmitters

- Configurable for Eight T/Cs, 12 RTDs, Millivolts, Ohms
- Unmatched Programmability: Input Type, Range, Zero, Span, Linear Output, Engineering Units; Calibration Runs
- Exceptionally Economical: Reduces Inventory and Maintenance Costs
- Built for Reliability: RFI Protected, Isolated, Environmentally Tough, Five-Year Warranty

SPECIFICATIONS

Input Types	
Thermocouple:	Types J, K, T, E, R, S, N, B
RTD:	Pt DIN 43760 (50, 100, 200, 500 Ω); Pt JIS C 1604 (100 Ω); Pt Burns 0.003902 α (100, 200, 500 Ω); Ni Bristol's 7NA (110 Ω); Ni Minco (120 Ω); Cu Minco (10 Ω); Cu China 0.00428 α (50 Ω)
mV:	-100 to + 100 mV
Resistance:	0 to 1000 Ω
Accuracy:	$\pm 0.05\%$ of span ± 1 digit
Input Span Limits:	Any span within range limits
Input Resolution:	0.1°, 1 μ V, 0.005 Ω
Output Range:	4 to 20 mA, calibrated; 3.7 to 22 mA, maximum
Output Resolution:	0.002 mA
RTD Excitation Current:	200 μ A, typical
Temperature Effect	
T/C and mV:	$\pm 0.2 \mu$ V/ $^{\circ}$ C max $\pm 0.005\%$ of input reading/ $^{\circ}$ C
RTD and Ω :	$\pm 0.002 \Omega$ / $^{\circ}$ C max $\pm 0.005\%$ of input reading/ $^{\circ}$ C
Loop Supply Voltage:	13V + (load resistance x 20 mA), min; 48V, max
Size	3.10 x 1.75 x 3.77" HWD


2800T 

ORDERING INFORMATION

2800T	Universal Temperature Transmitter, Digital Display (NI FM Approved)
2800T-EXP	2800T in Explosion Proof Housing
2850T	2800T with HART Protocol
100665-651	32 mm DIN Rail Adaptor–2800T
100665-652	35 mm DIN Rail Adaptor–2800T

Laurel Quad Loop Splitter/Transmitter

Drive multiple devices from one signal

- Accepts 4-20mA, 1-5V, 0-5V or 0-10V Input
- Four Independent 4-20mA Outputs
- Remote Output Grounds Can Differ By Up to $\pm 10V$
- Indicator LED for Each Connected Output
- Loop Current Test Point for Each Output (200mV=20mA)
- Front Panel Zero and Span Adjustments for Each Output
- AC or DC Powered

QLS
CE


SPECIFICATIONS

Input Signal:	4-20mA, 1-5V, 0-5V, 0-10V (jumper selectable)
Input Resistance:	4-20mA: 50 Ω , 1-5V: 412k Ω , 0-5V: 464k Ω , 0-10V: 935k Ω
Transmitter Excitation:	24Vdc, 30mA max
Signal Outputs:	4-20mA
Signal Isolation:	Input and output grounds can be the same or differ up to $\pm 10V$ from each other (input/output, output/output)
Voltage Compliance:	12V (600 Ω per loop at 20mA)
Zero & Span Adjust:	$\pm 10\%$ for each output with 25-turn potentiometers
Load Regulation:	$\pm 0.005\%$ of span from 0 to 600 Ω
Accuracy:	$\pm 0.02\%$ max span error at 23°C
AC Rejection:	90dB from DC to 60Hz
Response Speed:	2ms risetime, 7ms settling time to 0.1% of final value
Loop Indication:	Yellow LED lamp per loop, brightness proportional to current
Power Isolation:	Galvanic isolation from power to signals. 250V AC working, 1.0kV AC for 60 sec, 1.7kV DC for 2 sec
Power Consumption:	3.5W max, all loops delivering 20mA
Operating Temp.:	-40 to +70°C, <95% at 40°C (non-condensing)
Connectors:	Detachable plug-in screw-clamp connectors for 28-12 AWG wire
Mounting:	DIN rail, ventilaton holes at top & bottom. Leave 6 mm (1/4") between units, or force air with a fan
Dimensions:	22.5 x 103 x 128 mm (0.9" x 4.1" x 5.0")

Benefits of a Loop Splitter:

Load devices can share a common ground.

Each loop drives a single load, which reduces voltage compliance problems.

If an output loop opens, only a single device is affected.

If one device fails, other loops continue to operate.

Each loop can be adjusted to compensate for device inaccuracy.

ORDERING INFORMATION

QLS-1	Quad Isolated Output Loop Splitter/Retransmitter, 95-264 Vac (47-63 Hz) or 90-300 Vdc power
QLS-2	Quad Isolated Output Loop Splitter/Retransmitter, 10-48 Vdc or 12-32 Vac (47-63 Hz) power

Weschler Process Loop Splitter

- Three Separate 4 mA to 20 mA Outputs
- Flexible and Simple Scaling
- DIN Rail Mounting
- Excitation Output
- Screw Terminal Connections
- Wide Power Supply Range
- Low Input Resistance
- Narrower Case than Previous Model

SPECIFICATIONS

Input	
Input Signal:	4 mA–20 mA, 0–10 mA
Input Resistance:	50Ω
Excitation Voltage:	20 VDC nominal, 28mA max
Output	
Number of Outputs:	3
Output Range:	4 mA–20 mA, 0–10 mA
Adjustability:	Zero ±1 mA, span ±9 mA
Accuracy:	±0.1% of span
Speed of Response:	200 milliseconds
Isolation:	380V to earth and power
Drive Capacity:	600Ω per loop
Power Consumption:	3W max
Operating Temperature:	0–50°C, <90% RH non-condensing
Size (mm):	22.5 W x 99 H x 111 D
Mounting:	DIN rail EN50 022
Sealing:	IP40

The TIM-018 allows one 4 to 20 mA signal to be split into three separate loops. Each output has its own zero and span adjustments, which are accessible from the front panel.

All loops are load isolated so an open or short on one loop will not affect the other loops. An internal 20V supply provides sensor excitation.

Note: All loop + terminals are internally connected.



TIM018-Mk2

ORDERING INFORMATION

TIM018-Mk2-AC	Process Loop Splitter for 95-265VAC operation
TIM018-Mk2-DC	Process Loop Splitter for 11-30VDC operation

Pyragon Universal Process I/O Module

- Direct Replacement for Transmation 3000 Series Modules
- Universal Input Includes TC, RTD, mA DC, mVDC
- 4 Digit Alpha-Numeric LED Display
- Input Isolated from Output and Power
- 4 Year Warranty

ORDERING INFORMATION

P3100	Alarm/Transmitter in Metal Case
P3100-WOC	Alarm/Transmitter w/o case
P3100T	Transmitter Only

The P3100 accepts a wide variety of inputs. The 4 digit display provides a local readout. Use the P3100 in a new installation or to replace existing 3000 series units.

P3100



SPECIFICATIONS

Models Replaced:	3510A, 3520A, 3530A, 3540A, 3610A, 3620A, 3630A, 3640A, 3650A, 3660A, 3510DRA, 3520DRA, 3530DRA, 3540DRA, 3610DRA, 3620DRA, 3630DRA, 3640DRA, 3650DRA, 3660DRA, 3510T, 3530T, 3610T, 3630T, 3650T, 3900F, 3909F
Input Types	
Thermocouple:	J, K, T, E, R, S, B, L, U, N
RTD (2 or 3 wires):	100Ω Pt (α.00385, .00392, .003916); 200, 500 & 1000Ω Pt (α.00385); 120Ω Ni and 10Ω Cu
Current:	±20 & ±50mA DC ranges
Voltage:	±1 & ±10V DC ranges
Millivolts:	±70mV
Potentiometer (3 wire) & Resistance (2 wire):	50, 200 & 2000 ranges
Frequency:	Counts/minute, Hz & kHz ranges
Signal Output:	4-20mA DC (600Ω Load) or 1-5V DC, 10-50mA DC optional
LED Display:	4-Digit Alphanumeric, Decimal Point configurable for 0, 1st, 2nd or 3rd place
Front Panel Buttons:	Relay Trip & Recovery parameters, Relay states override, Latch reset and output manual mode
Analog Accuracy:	0.1% of Span or 10mV referred to input
Loop Power:	24VDC supply to power input mA signals up to 21mA
DPDT Relay:	Configurable delay & latching
Working Voltage:	300VAC Input to Output to Input Power
Isolation:	1000VDC Input to Output to Input Power
Configuration Interface:	RS232, 1200 baud, ASCII half duplex
Operating Temperature:	0–50°C
Power (jumper selectable):	100–240VAC, 50/60Hz and 24VDC ±10%

Laurel Serial to Analog Transmitter

- RS-232/485 or Ethernet Input
- Isolated 4-20mA or 0-10V Output
- ASCII & Modbus Protocols
- AC or DC Power
- DIN Rail Mount
- Dual Relay Outputs



The Laurel LTS transmitter converts digital data to an analog signal. It accepts Modbus and ASCII protocols. Using the custom Laurel protocol, digital data can be retrieved from long character strings by specifying the character positions, start and stop ASCII characters, how many characters to skip and how many characters to pass. The 16 bit analog output is isolated from the power and digital sections. Span is field adjustable using the free Laurel setup software. Input data rate determines the output update rate (up to 75/sec).

SPECIFICATIONS

Serial Input:	RS232/485 (2- or 4-wire) or Ethernet
Baud Rate:	300-19200
Analog Out:	4-20mA, 0-20mA, 0-10VDC, $\pm 10V$ (user selectable)
Compliance (mA):	10V (0-500 Ω load)
Compliance (V):	2mA (>5k Ω load)
Accuracy:	$\pm 0.02\%$ of output span (16 bit resolution)
Isolation:	250Vrms between power/analog/digital
Relay Outputs:	Two SPST-NO (Form A) solid-state relays 120mA@140VAC/180VDC
Temperature:	0-55°C operating; <95% at 40°C, non condensing
Size:	129 x 104 x 22.5 mm
Mounting:	35mm DIN rail. Leave 6mm btwn modules or fan cool
Connections:	Detachable screw terminal plugs, RJ45 for Ethernet

ORDERING INFORMATION

To Order—Insert Code for Each Letter to Select Catalog Number.
Order Example: LTS60

LTS	<input type="checkbox"/> A	<input type="checkbox"/> B
A	Serial Input	
6	RS232/485 in, 4-20mA out	
E6	Ethernet in, 4-20mA out	
B	Power	
0	85-264VAC (47-63Hz), 90-300VDC; 3W max.	
1	12-32VAC (47-63Hz), 10-48VDC	
2	Power over Ethernet (for LTSE6 only)	
Accessories:		
CBL04	RS-232 cable to PC serial port	
CBL02	USB to RS-232 cable adapter	

API Frequency to DC Transmitters

- 0-1mA, 4-20mA, 0-1V or $\pm 10V$ Output
- 2000V Isolation
- Simple field setup (7580)
- Input & Output Status LEDs
- Functional Test Button
- Lifetime Warranty

7580



These API transmitters accept a frequency input and provide an optically isolated DC voltage or current output that is linearly proportional to the input.

Full three-way isolation makes these modules useful for ground loop elimination, common mode signal rejection and noise pickup reduction. The input and output ranges on the 7580 are field configured via switches - no software required. Ranges on the 7010 are factory set and must be specified when ordered. The internal loop supply can be used to power external devices, often eliminating the need for a separate supply.

ORDERING INFORMATION

To Order—Insert Code for Each Letter to Select Catalog Number.
Order Example: API 7010GDU

<input type="checkbox"/> A	<input type="checkbox"/> B
A	Model
API 7010G	Frequency to DC Transmitter, 115VAC, factory ranged
API 7580G	Frequency to DC Transmitter, 115VAC, field rangeable
B	Options
A230	Powered by 230VAC $\pm 10\%$, 50/60Hz, 2.5W max
D	Powered by 9-30VDC, 2.5W typical
U	Conformal coating for moisture resistance
HC	High current output to 50mA (7010G only)
M09	High voltage output to 24VDC (7010G only)
EXTSUP	Open collector [sink] output (7010G only)
Accessories:	
API 008	8-pin octal socket
API 008FS	Finger safe 8-pin octal socket
API TK36	35mm DIN rail, 39" long, aluminum

SPECIFICATIONS

7010 Input Range:	Factory set - specify on order Minimum 0-25Hz, maximum 0-20kHz
7580 Input Range:	Field selectable via rotary switches and tables Low range: Min 0-100Hz, max 0-1500Hz High range: Min 0-2kHz, max 0-30kHz
Input Voltage:	100mVrms - 150Vrms
Input Impedance (min):	10k Ω (7580), 100k Ω (7010)
Input Sensitivity:	25mV to 2.5V (pot adjustable)
Output Ranges:	0-1V min, 0-10V max, $\pm 1V$ min, $\pm 10V$ max (bipolar mode), 0-2mA min, 0-20mA max (current mode). Factory set on 7010 - specify on order, Field settable on 7580
Compliance (mA):	20V, 1000 Ω
Output Zero Adjust:	$\pm 15\%$ of span
Output Span Adjust:	$\pm 10\%$ of span
Accuracy:	Better than $\pm 0.2\%$ of span
Response Time (typ):	70msec (7010), 110msec (7580 hi range), 600msec (7580 lo range)
Isolation:	2000Vrms power/input/output
Loop Supply:	18VDC unregulated, 25mA max.
Power (standard):	115VAC $\pm 10\%$, 50/60Hz, 2.5W max
Temperature:	-10 to 60°C operating
Status Indicators:	Variable brightness LEDs indicate level & status
Connections:	8-pin octal socket (order separately)

Plug-in API Transmitters and Isolators are available for most sensors and process signals.

Action Instruments Plug-In Signal Conditioners, Isolators and Alarms

ENVIRONMENTAL SPECIFICATIONS

Isolation

Between Input, Output and Power

Limit Alarms: 1000 VDC

Signal Conditioners: 1500 VDC

Temperature Range: Operating: 0 to 60°C

Signal Conditioners: 1500 VDC

Humidity: 15 to 95% (@45° C)

Power: 120 VAC ±10%, 50/60 Hz

Consumption: 30W Typical, 5W Max

Agency Approvals: CSA per C22.2 and UL per UL508



ActionPak ▲

SPECIFICATIONS AND ORDERING INFORMATION

Model #	Function	Input	Input Span (Field Configurable)	Output (Field Configurable)
AP4380	Isolator Single	DC Volt	10 mV to 100V	DC Voltage (0-5V, 0-10V)
AP4390	Isolator Dual	DC Current	1 mA to 100 mA	DC Current (0-1 mA, 4-20 mA)
AP4382	Isolator (Bipolar Output)			DC Voltage (±5V, ±10V)
AP1080	Limit Alarm Single	DC Volt	10 mV to 200V	Single Trip (DPDT, 5A)
AP1090	Limit Alarm Dual	DC Current	1 mA to 100 mA	Single/Dual Trip (2 SPDT, 5A)
AP4351	Isolator	Thermocouple	B: 500°C to 1820°C	DC Voltage (0-5V, 0-10V)
			E: -150°C to 1000°C	DC Current (0-1 mA, 4-20 mA)
AP1280	Limit Alarm Single		J: -200°C to 750°C	Single Trip (DPDT, 5A)
AP1290	Limit Alarm Dual		K: -200°C to 1370°C	Single/Dual Trip (2 SPDT, 5A)
			R/S: 50°C to 1760°C	
		T: -150°C to 400°C		
AP4081	Conditioner	Bridge	10 mV to ±200 mV	DC Voltage (0-5V, 0-10V)
				DC Current (0-1 mA, 4-20 mA)
AP6380	Conditioner	AC Voltage	50 mV to 200 VAC	DC Voltage (0-5V, 0-10V)
			5 mA to 100 mA AC	DC Current (0-1 mA, 4-20 mA)
AP1690	Limit Alarm Single	AC Current	10mA to 100 mA AC	Single/Dual Trip (2 SPDT, 5A)
AP7380	Conditioner	Frequency	2 Hz to 10 kHz	DC Voltage (0-5V, 0-10V)
				DC Current (0-1 mA, 4-20 mA)
AP7500	Conditioner	DC (Fixed Range)	Specify: 4-20 mA, 0-10V, 1-5V, 0-5V, 0-10V, or 10-50 mA	Frequency (0-9 ppm up to 0-10 kHz) TTL: 0/6V
AP7501	Conditioner	DC (Fixed Range)	Specify: 4-20 mA, 0-10V, 1-5V, 0-5V, 0-10V, or 10-50 mA	Frequency (0-0.12 ppm up to 0-130 ppm) DPDT Relay: 5A Max
AP4003	Conditioner	Potentiometer (Wide Ranging)	Specify: 0-100% pot 100Ω to 100Ω pots	DC 0-20mA, 4-20 mA, 0-5V, 0-10V

MOUNTING ACCESSORIES FOR ACTION PRODUCTS

Mounting Hardware (for ActionPak IQ and SlimPak)

MD02 TS32 DIN Rail, 2 Meters, Slotted (G-Rail)

MD03 TS35 x 7.5 DIN Rail, 2 Meters, Slotted (H-Rail)

Mounting Hardware (for Action Pak Only)

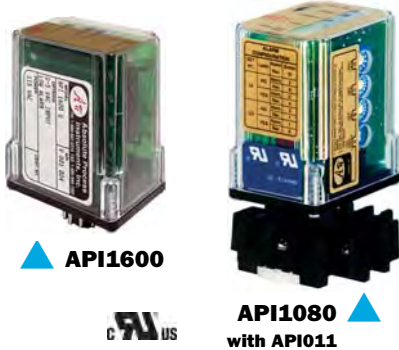
MD08 8-Pin DIN Rail Socket (Surface or Rail Mountable)

MD11 11-Pin DIN Rail Socket (Surface or Rail Mountable)

These sockets mount on standard DIN Rails MD02 or MD03

API Plug-In Alarms

- Easy-to-install Plug-in Modules
- Wide Choice of Inputs: Volts AC/DC, Amps AC/DC, Process V/mA, Frequency, Thermocouple, RTD
- One DPDT Relay or Two SPDT Relays
- Field Adjustable Alarm Setpoint(s)
- Lifetime Warranty



SPECIFICATIONS

LoopTracker®:	Variable brightness green LED indicates input level & status
Alarm Setpoint(s):	0-100% of span, field adjustable
Test/Reset Button:	Toggle relay(s) to opposite state or resets latching relay
Response Time:	70 milliseconds typical
Relay Ratings:	7 A @ 240 VAC maximum resistive load, 3.5 A @ 240 VAC maximum inductive load, 8 A @ 30 VDC max.
Temperature:	-10°C to +60°C operating
Dimensions:	1.75" W x 2.75" H x 2.38" D (excluding socket)
AC Input:	40-1000 Hz sinusoid
Frequency Input:	100 mV to 150 Vrms, 10kΩ input Z, 600V DC or peak AC common mode
Thermocouple Input:	Automatic cold junction compensation & upscale burnout protection. Specify Type J, K, T, E, R or S & range
RTD Input:	Specify 0°C resistance (10-2000Ω), 2- or 3-wire, & alpha (385 typical).
Thermistor Input:	Specify PTC or NTC, temperature curve & range
Input Burden:	1.0 VDC typical @20mA on models with field selectable range
Loop Supply:	18 VDC nominal, unregulated, 25 mA

OPTIONS & ACCESSORIES

OPTIONS—add to end of model number

For Unshaded Fixed Range Models:

R	Reverse-acting alarms
L	Low trip (on decreasing signal)
HT	Latching alarm, push button reset
HP	Latching alarm, power-off reset

For Shaded Fixed Range Models:

R	Reverse-acting alarms
A	Adjustable deadbands, 1% to 100% of span, adjusted symmetrically about each setpoint
HH	HI/LO trip
LL	LO/LO trip

All Models:

U Conformal coating for moisture resistance

ACCESSORIES—order as a separate line item

API 011	11-pin socket	For chassis or
API 011 FS	11-pin finger safe socket	DIN rail mounting
API TK36	DIN rail, 35 mm W x 39" L, aluminum	

ORDERING INFORMATION

Field Selectable Range:

Model	Input Range	Alarm Relay	Deadband	Power
API 1080 G	24 selectable ranges, 0-50 mVDC to ±10 VDC, 0-1 mAADC to 4-20 mAADC, 18V @25mA loop supply	1 DPDT relay configurable for HI/LO, latching, normal/reverse	1-100% of span, 12 turn pot	115 VAC
API 1080 G A230				230 VAC
API 1080 G P				80-265 VAC, 48-300 VDC
API 1080 G D				9-30 VDC
API 1090 G	26 selectable ranges, 0-50 mVDC to ±10 VDC, 0-1 mAADC to 4-20 mAADC, 18V @25mA loop supply	2 SPDT relays configurable for HI/LO, latching, normal/reverse	1-100% of span, 12 turn pots	115 VAC
API 1090 G A230				230 VAC
API 1090 G P				80-265 VAC, 48-300 VDC
API 1090 G D				9-30 VDC

Factory Set Range:

Model	Input Range	Alarm Relay	Deadband	Power
API 1000 G	0-100 mVDC to 0-300 VDC or	1 DPDT relay HI alarm std. See options list.	1-100% of span, 12 turn pot	115 VAC
API 1000 G A230				230 VAC
API 1000 G P	0-1 mAADC to 0-900 mAADC (specify on order)	1 DPDT relay HI alarm std. See options list.	1-100% of span, 12 turn pot	80-265 VAC, 48-300 VDC
API 1000 G D				9-30 VDC
API 1000 G 5A	>0-900 mAADC to 0-5 ADC (specify on order)	2 SPDT relays HI/LO alarms, internal jumper configurable for LO/HI.	Fixed 1% of span, standard. See options for adjustable deadband	115 VAC
API 1000 G A230 5A				230 VAC
API 1000 G P 5A	Includes API 011 socket w/0.1Ω 25W shunt	2 SPDT relays HI/LO alarms, internal jumper configurable for LO/HI.	Fixed 1% of span, standard. See options for adjustable deadband	80-265 VAC, 48-300 VDC
API 1000 G D 5A				9-30 VDC
API 1020 G	0-100 mVDC to 0-300 VDC or	2 SPDT relays HI/LO alarms, internal jumper configurable for LO/HI.	Fixed 1% of span, standard. See options for adjustable deadband	115 VAC
API 1020 G A230				230 VAC
API 1020 G P	0-1 mAADC to 0-900 mAADC (specify on order)	2 SPDT relays HI/LO alarms, internal jumper configurable for LO/HI.	Fixed 1% of span, standard. See options for adjustable deadband	80-265 VAC, 48-300 VDC
API 1020 G D				9-30 VDC
API 1020 G 5A	>0-900 mAADC to 0-5 ADC (specify on order)	2 SPDT relays HI/LO alarms, internal jumper configurable for LO/HI.	Fixed 1% of span, standard. See options for adjustable deadband	115 VAC
API 1020 G A230 5A				230 VAC
API 1020 G P 5A	Includes API 011 socket w/0.1Ω 25W shunt	2 SPDT relays HI/LO alarms, internal jumper configurable for LO/HI.	Fixed 1% of span, standard. See options for adjustable deadband	80-265 VAC, 48-300 VDC
API 1020 G D 5A				9-30 VDC

API 1600 G	0-50 mVAC to 0-300 VAC or	1 DPDT relay HI alarm std. See options list.	1-100% of span, 12 turn pot	115 VAC
API 1600 G A230				230 VAC
API 1600 G P	0-1 mAAC to 0-900 mAAC (specify on order)	1 DPDT relay HI alarm std. See options list.	1-100% of span, 12 turn pot	80-265 VAC, 48-300 VDC
API 1600 G D				9-30 VDC
API 1600 G 5A	>0-900 mAAC to 0-5 AAC (specify on order)	2 SPDT relays HI/LO alarms, internal jumper configurable for LO/HI.	Fixed 1% of span, standard. See options for adjustable deadband	115 VAC
API 1600 G A230 5A				230 VAC
API 1600 G P 5A	Includes API 011 socket w/0.1Ω 25W shunt	2 SPDT relays HI/LO alarms, internal jumper configurable for LO/HI.	Fixed 1% of span, standard. See options for adjustable deadband	80-265 VAC, 48-300 VDC
API 1600 G D 5A				9-30 VDC
API 1620 G	0-50 mVAC to 0-300 VAC or	2 SPDT relays HI/LO alarms, internal jumper configurable for LO/HI.	Fixed 1% of span, standard. See options for adjustable deadband	115 VAC
API 1620 G A230				230 VAC
API 1620 G P	0-1 mAAC to 0-900 mAAC (specify on order)	2 SPDT relays HI/LO alarms, internal jumper configurable for LO/HI.	Fixed 1% of span, standard. See options for adjustable deadband	80-265 VAC, 48-300 VDC
API 1620 G D				9-30 VDC
API 1620 G 5A	>0-900 mAAC to 0-5 AAC (specify on order)	2 SPDT relays HI/LO alarms, internal jumper configurable for LO/HI.	Fixed 1% of span, standard. See options for adjustable deadband	115 VAC
API 1620 G A230 5A				230 VAC
API 1620 G P 5A	Includes API 011 socket w/0.1Ω 25W shunt	2 SPDT relays HI/LO alarms, internal jumper configurable for LO/HI.	Fixed 1% of span, standard. See options for adjustable deadband	80-265 VAC, 48-300 VDC
API 1620 G D 5A				9-30 VDC

API 1005 G	4-20 mA, 1.25VDC max burden, 18V @25mA loop supply	1 DPDT relay HI alarm std.	1-100% of span, 12 turn pot	115 VAC
API 1005 G A230				230 VAC
API 1005 G P				80-265 VAC, 48-300 VDC
API 1005 G D				9-30 VDC
API 1025 G	4-20 mA, 1.25VDC max burden, 18V @25mA loop supply	2 SPDT relays configurable for HI/LO, LO/HI, LO/LO, HI/HI	Fixed 1% of span, standard. See options for adjustable.	115 VAC
API 1025 G A230				230 VAC
API 1025 G P				80-265 VAC, 48-300 VDC
API 1025 G D				9-30 VDC

API 1700 G	Frequency, (specify range on order) Min: 0-10Hz, Max: 0-20kHz	1 DPDT relay HI alarm std.	1-100% of span, 12 turn pot	115 VAC
API 1700 G A230				230 VAC
API 1700 G P				80-265 VAC, 48-300 VDC
API 1700 G D				9-30 VDC
API 1720 G	Frequency, (specify range on order) Min: 0-10Hz, Max: 0-20kHz	2 SPDT relays configurable for HI/LO, LO/HI, LO/LO, HI/HI	Fixed 1% of span, standard. See options for adjustable.	115 VAC
API 1720 G A230				230 VAC
API 1720 G P				80-265 VAC, 48-300 VDC
API 1720 G D				9-30 VDC

API 1200 G	Thermocouple type*, °C or °F temperature range (specify range on order)	1 DPDT relay HI alarm std.	1-100% of span, 12 turn pot	115 VAC
API 1200 G A230				230 VAC
API 1200 G P				80-265 VAC, 48-300 VDC
API 1200 G D				9-30 VDC
API 1220 G	Thermocouple type*, °C or °F temperature range (specify range on order)	2 SPDT relays configurable for HI/LO, LO/HI, LO/LO, HI/HI	Fixed 1% of span, standard. See options for adjustable.	115 VAC
API 1220 G A230				230 VAC
API 1220 G P				80-265 VAC, 48-300 VDC
API 1220 G D				9-30 VDC

*For RTD/thermistor input, change API1200 to API1400 or API1220 to API1420

API Plug-In Transmitters & Isolators

- Easy-to-install Plug-in Modules
- Wide Choice of Inputs: Volts AC/DC, Amps AC/DC, Process V/mA, Strain, Thermocouple, RTD, Potentiometer
- Variable Brightness I/O Status LEDs
- 2000V Isolation (1200V on LPT-1,-2)
- Lifetime Warranty


API4380

API6010G5A

 SIGNAL
CONDITIONERS

SPECIFICATIONS

LoopTracker®:	Variable brightness LEDs indicate input/output level & status
Test Button:	Sets output to test level for verification. or resets latching relay
Response Time:	70 msec typical (AC input: 200 msec)
Output Loop Supply:	20 VDC nominal, regulated, 25 mA max.
Isolation:	2000 Vrms power/input, power/output, input/output (1200V on LPI models)
Temperature:	-10°C to +60°C operating
Dimensions:	1.75" W x 2.75" H x 2.38" D (excluding socket)
DC Input:	up to 500 V or 5 A on factory set models
DC Input Z:	Volts: 1MΩ (200kΩ on API4300 & API4310; 50kΩ on API4440) Current: 10Ω on API4380 & API4385; 50Ω on API4440
Input Burden:	1 VDC @ 20 mA typical (9 VDC @ 20 mA on LPI1 & LPI2)
Input Loop Supply:	18 VDC nominal, unregulated, 25 mA (not available on API4380HV3 & LPT models)
AC Input:	40-1000 Hz,
AC Input Z:	Volts: 1MΩ (0-4V), 200kΩ (>4V & API 6010) Current: 10Ω (API6380)
Input Burden:	1 VDC @ 20 mA typical (API6010)
Strain Gauge Input:	200kΩ input Z; excitation 0-10 VDC (switch selectable), 120 mA max.
Thermocouple Input:	Automatic cold junction compensation & upscale burnout protection. Specify Type J, K, T, E, R or S & range
RTD Input:	Specify 0°C resistance (10-2000Ω), 2- or 3-wire, & alpha (385 typical).
Thermistor Input:	Typically 2kΩ-20kΩ. Specify PTC or NTC, temperature curve & range (°C or °F)

OPTIONS & ACCESSORIES

OPTIONS—add to end of model number

U Conformal coating for moisture resistance

ACCESSORIES—order as a separate line item

API 008	8-pin socket (use API011 for API4059)	For chassis or
API 008 FS	8-pin finger safe socket	DIN rail mounting
API CLP1	Module hold-down spring clip	
API TK36	DIN rail, 35 mm W x 39" L, aluminum	

ORDERING INFORMATION

Field Selectable Range:

Model	Input Range	Output Range	Power
API 4380 G	24 switch selectable, 0-50 mVDC to 0-10 VDC ±50 mVDC to ±10 VDC 0-1 mAADC to 0-20 mAADC	16 switch selectable, 0-1 VDC to 0-10 VDC ±1 VDC to ±10 VDC (10mA max), 0-2 mAADC to 0-20 mAADC (20V compliance, 1000Ω @ 20 mA)	115 VAC
API 4380 G A230			230 VAC
API 4380 G P			80-265 VAC, 48-300 VDC
API 4380 G D			9-30 VDC
API 4380 G HV3	23 switch selectable, 0-1 VDC to 0-200 VDC ±1 VDC to ±200 VDC	16 switch selectable, 0-1 VDC to 0-10 VDC ±1 VDC to ±10 VDC (10mA max), 0-2 mAADC to 0-20 mAADC (20V compliance, 1000Ω @ 20 mA)	115 VAC
API 4380 G HV3 A230			230 VAC
API 4380 G HV3 P			80-265 VAC, 48-300 VDC
API 4380 G HV3 D			9-30 VDC
API 4385 G	28 switch selectable, -50.0 mVDC to 20-40 VDC ±50 mVDC to ±10 VDC 0-200 μADC to 10-50 mAADC	16 switch selectable, 0-1 VDC to 0-10 VDC ±1 VDC to ±10 VDC (10mA max), 0-2 mAADC to 0-20 mAADC (20V compliance, 1000Ω @ 20 mA)	115 VAC
API 4385 G A230			230 VAC
API 4385 G P			80-265 VAC, 48-300 VDC
API 4385 G D			9-30 VDC

API 6380 G	20 switch selectable, Average responding 0-50 mVAC to 0-250 VAC 0-5 mAAC to 0-200 mAAC	16 switch selectable, 0-1 VDC to 0-10 VDC ±1 VDC to ±10 VDC (10mA max), 0-2 mAADC to 0-20 mAADC (20V compliance, 1000Ω @ 20 mA)	115 VAC
API 6380 G A230			230 VAC
API 6380 G P			80-265 VAC, 48-300 VDC
API 6380 G D			9-30 VDC
API 6380 G S	20 switch selectable, TRMS 0-50 mVAC to 0-250 VAC 0-5 mAAC to 0-200 mAAC	16 switch selectable, 0-1 VDC to 0-10 VDC ±1 VDC to ±10 VDC (10mA max), 0-2 mAADC to 0-20 mAADC (20V compliance, 1000Ω @ 20 mA)	115 VAC
API 6380 G A230 S			230 VAC
API 6380 G P S			80-265 VAC, 48-300 VDC
API 6380 G D S			9-30 VDC
API 6380 G HV	24 switch selectable, Average responding 0-50 mVAC to 0-600 VAC 0-5 mAAC to 0-200 mAAC	16 switch selectable, 0-1 VDC to 0-10 VDC ±1 VDC to ±10 VDC (10mA max), 0-2 mAADC to 0-20 mAADC (20V compliance, 1000Ω @ 20 mA)	115 VAC
API 6380 G A230 HV			230 VAC
API 6380 G P HV			80-265 VAC, 48-300 VDC
API 6380 G D HV			9-30 VDC
API 6380 G S HV	24 switch selectable, TRMS 0-50 mVAC to 0-600 VAC 0-5 mAAC to 0-200 mAAC	16 switch selectable, 0-1 VDC to 0-10 VDC ±1 VDC to ±10 VDC (10mA max), 0-2 mAADC to 0-20 mAADC (20V compliance, 1000Ω @ 20 mA)	115 VAC
API 6380 G A230 S HV			230 VAC
API 6380 G P SHV			80-265 VAC, 48-300 VDC
API 6380 G D S HV			9-30 VDC

API 4059 G *	Strain gauge/bridge 14 switch selectable from 0-5 mV (0.5 mV/V) to 0-400 mV (40 mV/V)	16 switch selectable, 0-1 VDC to 0-10 VDC ±1 VDC to ±10 VDC 0-2 mAADC to 0-20 mAADC	115 VAC
API 4059 G A230 *			230 VAC
API 4059 G P *			80-265 VAC, 48-300 VDC
API 4059 G D *			9-30 VDC

API 4008 G	Any full-range potentiometer from 0-100Ω to 0-1MΩ	18 switch selectable, 0-1 VDC to 0-10 VDC ±5 VDC to ±10 VDC 0-2 mAADC to 0-20 mAADC	115 VAC
API 4008 G A230			230 VAC
API 4008 G P			80-265 VAC, 48-300 VDC
API 4008 G D			9-30 VDC

Factory Set Range:

Model	Input Range (specify)	Output Range (specify)	Power
API 4300 G	0-100 mVDC to 0-500 VDC ±100 mVDC to ±10 VDC 0-1 mAADC to 0-900 mAADC	0-1 VDC to 0-10 VDC ±1 VDC to ±10 VDC (10mA max), 0-1 mAADC to 0-20 mAADC (20V compliance, 1000Ω @ 20 mA) suffix HC = 20-50 mAADC	115 VAC
API 4300 G A230			230 VAC
API 4300 G P			80-265 VAC, 48-300 VDC
API 4300 G D			9-30 VDC
API 4310 G	0-10 mVDC to 0-100 mVDC ±10 mVDC to ±100 mVDC 0-100 μADC to 0-1 mAADC	0-1 VDC to 0-10 VDC ±1 VDC to ±10 VDC 0-1 mAADC to 0-20 mAADC	115 VAC
API 4310 G A230			230 VAC
API 4310 G P			80-265 VAC, 48-300 VDC
API 4310 G D			9-30 VDC

Add suffix 5A for >0-900 mAADC to 0-5 ADC input (specify on order). Includes API 008 socket w/0.1Ω 25W shunt

API 6010 G	0-50 mVAC to 0-300 VAC or 0-1 mAAC to 0-900 mAAC	0-1 VDC to 0-10 VDC ±1 VDC to ±10 VDC 0-1 mAADC to 0-20 mAADC	115 VAC
API 6010 G A230			230 VAC
API 6010 G P			80-265 VAC, 48-300 VDC
API 6010 G D			9-30 VDC

Add suffix 5A for >0-900 mAAC to 0-5 AAC input (specify on order). Includes API 008 socket w/0.1Ω 25W shunt

API LPI-1 *	4-20 mA	4-20 mA	4-20 mA loop
API LPI-2 *	2 independent 4-20 mA	2 independent 4-20 mA	4-20 mA loop

API 4130 G L	Thermocouple °C or °F temperature (specify type J K T E R or S & °C or °F range)	0-1 VDC to 0-10 VDC ±1 VDC to ±10 VDC 0-1 mAADC to 0-20 mAADC	115 VAC
API 4130 G L A230			230 VAC
API 4130 G L P			80-265 VAC, 48-300 VDC
API 4130 G L D			9-30 VDC

API 4001 G L	RTD or Thermistor °C or °F temperature (specify type, curve & range)	0-1 VDC to 0-10 VDC ±1 VDC to ±10 VDC 0-1 mAADC to 0-20 mAADC	115 VAC
API 4001 G L A230			230 VAC
API 4001 G L P			80-265 VAC, 48-300 VDC
API 4001 G L D			9-30 VDC

API 4440 G	0-100 mVDC to 0-200 VDC 0-1 mAADC to 0-50 mAADC	Square root of input 0-1 VDC to 0-10 VDC ±1 VDC to ±10 VDC 0-1 mAADC to 0-20 mAADC	115 VAC
API 4440 G A230			230 VAC
API 4440 G P			80-265 VAC, 48-300 VDC
API 4440 G D			9-30 VDC

* Not UL Recognized

Weschler DC Ammeter Shunts

Type HA — 1 Through 500 Amperes



← HA Type

ORDERING INFORMATION

Amp	Length	Width	C-C Mounting	Type HA—50 mV Order Code	Type HA—100 mV Order Code
1	6.0"	1.25"	5.25"	HA-1-50	HA-1-100
2	6.0"	1.25"	5.25"	HA-2-50	HA-2-100
5	6.0"	1.25"	5.25"	HA-5-50	HA-5-100
10	6.0"	1.25"	5.25"	HA-10-50	HA-10-100
20	6.0"	1.25"	5.25"	HA-20-50	HA-20-100
50	6.0"	1.25"	5.25"	HA-50-50	HA-50-100
100	6.0"	1.25"	5.25"	HA-100-50	HA-100-100
200	6.0"	1.25"	5.25"	HA-200-50	HA-200-100
300	6.0"	1.25"	5.25"	HA-300-50	HA-300-100
500	6.0"	1.25"	5.25"	HA-500-50	HA-500-100

Type Lab — 10 Through 1000 Amperes



← Lab Type

ORDERING INFORMATION

Amp	Type Lab — 50 mV			Type Lab — 100 mV		
	Length	Width	Order Code	Length	Width	Order Code
10	5.0"	1.25"	LAB-10-50	6.25"	1.25"	LAB-10-100
15	5.0"	1.25"	LAB-15-50	6.25"	1.25"	LAB-15-100
25	5.0"	1.25"	LAB-25-50	6.25"	1.25"	LAB-25-100
50	5.0"	1.25"	LAB-50-50	6.25"	1.25"	LAB-50-100
100	5.0"	1.25"	LAB-100-50	6.25"	1.25"	LAB-100-100
150	5.0"	1.25"	LAB-150-50	6.25"	1.25"	LAB-150-100
200	5.0"	1.25"	LAB-200-50	6.25"	1.25"	LAB-200-100
250	6.75"	1.87"	LAB-250-50	8.0"	1.875"	LAB-250-100
300	6.75"	1.87"	LAB-300-50	8.0"	1.875"	LAB-300-100
400	6.75"	1.87"	LAB-400-50	8.0"	1.875"	LAB-400-100
1000	6.75"	2.37"	LAB-1000-50	8.0"	2.375"	LAB-1000-100

← MLA



Lightweight Types

Type MLC — 800 Through 1200 Amperes

ORDERING INFORMATION— MLC-50 MV

Order Code	Amp	Length	Width
MLC-800-50	800	4.5"	2.5"
MLC-1000-50	1000	4.5"	2.5"
MLC-1200-50	1200	4.5"	2.5"

Type MLA — 5 Through 150 Amperes

ORDERING INFORMATION— MLC-50 MV

Order Code	Amp	Length	Width
MLA-5-50	5	2.0"	1.25"
MLA-10-50	10	2.0"	1.25"
MLA-15-50	15	2.0"	1.25"
MLA-20-50	20	2.0"	1.25"
MLA-30-50	30	2.0"	1.25"
MLA-50-50	50	2.0"	1.25"
MLA-75-50	75	2.0"	1.25"
MLA-80-50	80	2.0"	1.25"
MLA-100-50	100	2.0"	1.25"
MLA-150-50	150	2.0"	1.25"

Type MLB — 170 Through 600 Amperes

ORDERING INFORMATION— MLB-50 MV

Order Code	Amp	Length	Width
MLB-170-50	170	3.25"	1.75"
MLB-200-50	200	3.25"	1.75"
MLB-250-50	250	3.25"	1.75"
MLB-300-50	300	3.25"	1.75"
MLB-400-50	400	3.25"	1.75"
MLB-500-50	500	3.25"	1.75"
MLB-600-50	600	3.25"	1.75"

NK Technologies DC Current Transducers

- Hall-effect sensor and signal conditioner in a single package
- Jumper selectable input ranges to 400 A
- 4-wire configuration



ORDERING INFORMATION

Order Code *	Description	Output
DT1-005-24U-U	50, 75, and 100 A Range	0-5 VDC
DT1-420-24U-U	50, 75, and 100 A Range	4-20 mA
DT2-005-24U-U	100, 150, and 200 A Range	0-5 VDC
DT2-420-24U-U	100, 150, and 200 A Range	4-20 mA
DT3-005-24U-U	150, 225, and 300 A Range	0-5 VDC
DT3-420-24U-U	150, 225, and 300 A Range	4-20 mA
DT4-005-24U-U	200, 300, and 400 A Range	0-5 VDC
DT4-420-24U-U	200, 300, and 400 A Range	4-20 mA

* Add suffix FL for solid core, SP for split core

SPECIFICATIONS

Output Signal:	4-20 mA, 0-5 VDC or 0-10 VDC
Output Limit:	4-20 mA: 23 mA 0-5 VDC: 5.75 VDC 0-10 VDC: 11.5 VDC
Output Polarity:	Unipolar, Bipolar available
Accuracy:	1.0% FS
Power Supply:	Universal 20-50 VDC, 22-38 VAC, 2VA Max. Power Input and Output Signal are Not Isolated
Power Consumption:	2 VA
Loading:	4-20 mA: 650Ω Maximum 0-5VDC: 25kΩ Min. 0-10VDC: 50kΩ Min.
Linearity:	0.75% FS
Current Ranges:	Jumper Selectable 0-400A
Sensing Aperture:	0.85" (21.5 mm) Sq
Case:	UL 94V-0 Flammability Rated
Environmental:	-4 to 122°F (-20 to 50°C), 0-95% RH Non-Condensing

Empro Shunts



Type A ▲



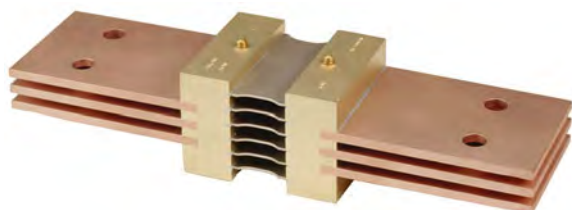
Type B ▲



Type C ▲



Type E ▲



Type WT ▲

Type A — 20 Through 600 Amperes

ORDERING INFORMATION

Amp	Type A — 50 mV			Type A — 100 mV		
	Length	Width	Order Code	Length	Width	Order Code
20	4.125"	0.675"	A-20-50			
50	4.125"	0.675"	A-50-50	5.75"	0.675"	A-50-100
75	4.125"	0.675"	A-75-50	5.75"	0.675"	A-75-100
100	4.125"	0.675"	A-100-50	5.75"	0.675"	A-100-100
125	4.125"	0.813"	A-125-50			
150	4.125"	0.938"	A-150-50	5.75"	0.93"	A-150-100
175	4.125"	0.75"	A-175-50			
200	4.125"	0.813"	A-200-50	5.75"	0.813"	A-200-100
250	4.125"	1.063"	A-250-50	5.75"	1.063"	A-250-100
300	4.125"	1.25"	A-300-50	5.75"	1.25"	A-300-100
375	4.625"	0.938"	A-375-50	6.25"	0.938"	A-375-100
400	4.625"	1.00"	A-400-50	6.25"	1.00"	A-400-100
500	4.625"	1.25"	A-500-50	6.25"	1.25"	A-500-100
600	4.625"	1.50"	A-600-50	6.25"	1.50"	A-600-100

Type B — 300 Through 1000 Amperes

ORDERING INFORMATION

Amp	Type B — 50 mV			Type B — 100 mV		
	Length	Width	Order Code	Length	Width	Order Code
300	5.875"	1.75"	B-300-50	7.75"	1.75"	B-300-100
400	5.875"	2.00"	B-400-50	7.75"	2.00"	B-400-100
500	5.875"	2.00"	B-500-50	7.75"	2.00"	B-500-100
600	5.875"	2.00"	B-600-50	7.75"	2.00"	B-600-100
750	5.875"	2.25"	B-750-50	7.75"	2.25"	B-750-100
800	5.875"	2.375"	B-800-50	7.75"	2.375"	B-800-100
1000	5.875"	2.50"	B-1000-50	7.75"	2.50"	B-1000-100
1200	5.875"	3.00"	B-1200-50	7.75"	3.00"	B-1200-100

Type C — 1000 Through 2000 Amperes

ORDERING INFORMATION

Amp	Type C — 50 mV			Type C — 100 mV		
	Length	Width	Order Code	Length	Width	Order Code
1000	9.063"	2.625"	C-1000-50	10.875"	2.625"	C-1000-100
1200	9.063"	3.00"	C-1200-50	10.875"	3.00"	C-1200-100
1500	9.063"	3.00"	C-1500-50	10.875"	3.00"	C-1500-100
2000	9.063"	3.25"	C-2000-50	10.875"	3.25"	C-2000-100

Type E — 1500 Through 2000 Amperes

ORDERING INFORMATION

Amp	Type E — 50 mV			Type E — 100 mV		
	Length	Width	Order Code	Length	Width	Order Code
1500	9.625"	3.00"	E-1500-50	11.25"	3.00"	E-1500-100
2000	9.625"	4.00"	E-2000-50	11.25"	4.00"	E-2000-100

Type WT — 600 Through 10000 Amperes

ORDERING INFORMATION

Amp	Type WT — 50 mV			Type WT — 100 mV		
	Length	Width	Order Code	Length	Width	Order Code
600				12.0"	3.0"	WT-600-100
750				12.0"	3.0"	WT-750-100
800				12.0"	3.0"	WT-800-100
1000	9.063"	3.0"	WT-1000-50	12.0"	3.0"	WT-1000-100
1200	9.063"	3.0"	WT-1200-50	12.0"	4.0"	WT-1200-100
1500	9.063"	3.0"	WT-1500-50	18.5"	4.0"	WT-1500-100
2000	9.063"	4.0"	WT-2000-50	18.5"	4.0"	WT-2000-100
2500	15.625"	4.0"	WT-2500-50	18.5"	5.0"	WT-2500-100
3000	15.625"	4.0"	WT-3000-50	18.5"	5.0"	WT-3000-100
4000	15.625"	5.0"	WT-4000-50	18.563"	5.0"	WT-4000-100
5000	15.625"	5.0"	WT-5000-50	18.563"	5.0"	WT-5000-100
6000	15.625"	6.0"	WT-6000-50	18.563"	6.0"	WT-6000-100
7500	15.625"	6.0"	WT-7500-50			
8000	15.625"	6.0"	WT-8000-50			
10000	16.0"	8.0"	WT-10000-50			

Instrument Transformer AC Split Core Current Transformers

Model 600 – Window 2 x 5.5"
Model 601 – Window 4.5 x 4.5"
Model 604 – Window 1.42 x 1.53"

- 50-400 Hz
- 0.6kV, BIL 10kV FW



Leads (600, 601, 604) #16 AWG, 24"

ORDERING INFORMATION - MODEL 600

Order Code	Current Ratio	ANSI Metering Class @ 60 Hz			VA @ 1% Class
		B0.1	B0.2	B0.5	
600-401	400:5	2.4	4.8		1.5
600-501	500:5	2.4	4.8		2.0
600-601	600:5	2.4	2.4		2.5
600-801	800:5	1.2	1.2	2.4	5.0
600-102	1000:5	1.2	1.2	2.4	7.5
600-122	1200:5	0.6	1.2	1.2	15.0
600-152	1500:5	0.6	0.6	1.2	20.0
600-162	1600:5	0.6	0.6	1.2	20.0
600-202	2000:5	0.6	0.6	0.6	30.0

ORDERING INFORMATION - MODEL 601

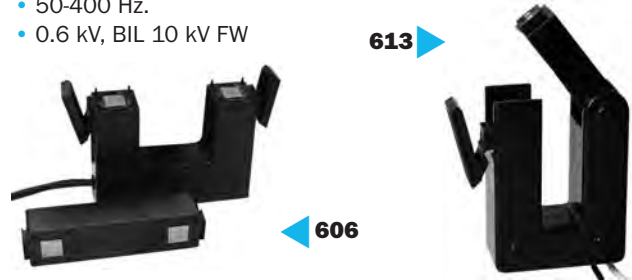
Order Code	Current Ratio	ANSI Metering Class @ 60 Hz			VA @ 1% Class
		B0.1	B0.2	B0.5	
601-401	400:5	4.8	-	-	1.0
601-501	500:5	4.8	4.8	-	1.5
601-601	600:5	2.4	4.8	-	2.0
601-801	800:5	1.2	2.4	4.8	2.5
601-102	1000:5	1.2	1.2	4.8	5.0
601-122	1200:5	1.2	1.2	2.4	10.0
601-152	1500:5	1.2	1.2	1.2	15.0
601-162	1600:5	1.2	1.2	1.2	15.0
601-202	2000:5	0.6	0.6	1.2	20.0

ORDERING INFORMATION - MODEL 604

Order Code	Current Ratio	Burden VA	Accuracy
604-101	100:5	1	±5%
604-1250	125:5	1	±5%
604-151	150:5	2	±4%
604-1750	175:5	2	±3%
604-201	200:5	2	±2%
604-251	250:5	2	±2%
604-301	300:5	2	±1.5%
604-401	400:5	2.5	±1.5%
604-1000T	100:0.1	-	±3%

Model 613 – Window 0.8 x 1.95" (indoor only)
Model 606 Weatherproof - Window 2.7 x 2.75"
Model 608 Weatherproof – Window 2.6 x 6.25"

- 50-400 Hz.
- 0.6 kV, BIL 10 kV FW



Leads (613) #16 AWG, 24"

Secondary Cable (606, 608) #16 AWG, 6ft

ORDERING INFORMATION - MODEL 613

Order Code	Current Ratio	Burden VA	Accuracy 60Hz
613-101	100:5	1	5%
613-1250	125:5	1.25	5%
613-151	150:5	1.5	5%
613-1750	175:5	1.75	5%
613-201	200:5	2.5	4%
613-251	250:5	2.5	4%
613-301	300:5	3	2%
613-401	400:5	3	2%

ORDERING INFORMATION - MODEL 606

Order Code	Current Ratio	Burden VA	Accuracy 60Hz
606-201	200:5	2.5	2%
606-251	250:5	3	1%
606-301	300:5	3.5	1%
606-351	350:5	4	1%
606-401	400:5	5	1%
606-501	500:5	6	1%
606-601	600:5	8	1%
606-751	750:5	10	1%
606-801	800:5	12	1%
606-102	1000:5	15	1%
606-122	1200:5	20	1%

ORDERING INFORMATION - MODEL 608

Order Code	Current Ratio	Burden VA	Accuracy 60Hz
608-501	500:5	6	1%
608-601	600:5	8	1%
608-801	800:5	12	1%
608-102	1000:5	13	1%
608-122	1200:5	16	1%
608-152	1500:5	25	1%
608-162	1600:5	27	1%
606-202	2000:5	33	1%
608-252	2500:5	42	1%
608-302	3000:5	50	1%
608-322	3200:5	54	1%

Weschler AC Voltage Transformers

460 ▶

- 600V Insulation Level, 10kV BIL
- Accuracy Class 0.6W, 1.2x at 60Hz
- 150VA at 30°C, 100VA at 55°C
- 60Hz



ORDERING INFORMATION

Order Code	Voltage Rating (line to line)	Turns Ratio
460-069	69.3:120	0.58:1
460-120	120:120	1:1
460-208	208:120	1.73:1
460-240	240:120	2:1
460-288	288:120	2.4:1
460-300	300:120	2.5:1
460-480	480:120	4:1
460-600	600:120	5:1
460-380	380:120	3.15:1 for 50 Hz

467 ▶

- 600V Insulation Level, 10kV BIL
- ±1% Accuracy Class up to 5VA Burden
- 40VA at 30°C, 27VA at 55°C
- 60Hz



ORDERING INFORMATION

Order Code	Voltage Rating (line to line)	Turns Ratio
467-069	69.3:120	0.58:1
467-120	120:120	1:1
467-208	208:120	1.73:1
467-240	240:120	2:1
467-288	288:120	2.4:1
467-300	300:120	2.5:1
467-480	480:120	4:1
467-600	600:120	5:1
467-380	380:120	3.17:1 for 50 Hz

Flexcore Split Core CT

- Seven Opening Sizes
- 1 or 5 Amp Secondaries
- 0.333V or 1.0V Secondaries
- Indoor or Outdoor Use



Flexible split-core opens with a twisting motion. Silicone rubber encapsulation protects against moisture, dirt, oil and corona. Remains flexible from -45° to +200°C.

FC ▲

SPECIFICATIONS

Insulation Level:	0.6kV, BIL 10kV Full Wave
Frequency:	50-400Hz
Thermal factor:	1.25 at 30°C, 1.0 at 55°C
Accuracy:	
200:5 thru 300:5	4%
400:5 thru 500:5	3%
600:5 thru 800:5	2%
1000:5 thru 6000:5	1%
Leads:	12 feet long with spade connectors, Black wire = X1, White wire = X2

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: FC-1000/5-8

A - B - C

A Model	
FC	Split core CT
FCL	UL Listed (Indoor use only) File E186575
B Ratio	
	See chart for available sizes
C Inside Diameter (inches)	
	4, 6, 8, 11, 18, R, R411
	(R= 2-3/4 x 6-5/8, R411= 4 x 11)

AVAILABLE SIZES

Ratio	4"	6"	8"	11"	18"	R	R411	Burden
200/5	X	-	-	-	-	-	-	2VA
250/5	X	-	-	-	-	-	-	2VA
300/5	X	X	-	-	-	-	-	2VA
400/5	X	X	-	-	-	X	-	2VA
500/5	X	X	-	-	-	X	-	3VA
600/5	X	X	-	-	-	X	-	5VA
800/5	X	X	-	-	-	X	-	5VA
1000/5	X	X	X	-	-	X	-	5VA
1200/5	X	X	X	-	-	X	-	5VA
1500/5	X	X	X	X	-	X	X	15VA
1600/5	X	X	X	X	-	X	X	15VA
2000/5	X	X	X	X	X	X	X	25VA
2400/5	-	X	X	X	X	X	X	30VA
2500/5	-	X	X	X	X	X	X	35VA
3000/5	-	X	X	X	X	X	X	45VA
3500/5	-	X	X	X	X	X	X	45VA
4000/5	-	X	X	X	X	X	X	45VA
5000/5	-	X	X	X	X	X	X	45VA
6000/5	-	X	X	X	X	X	X	45VA

Weschler AC Current Transformers

- Solid Core
- 0.6kV Insulation Class, BIL 10kV Full Wave
- 50-400 Hz
- 8-32 Studs or 24" Leads



▲ RL Case Style



▲ SFT Case Style



▲ SHT Case Style



▲ RBT Case Style



◀ RBL Case Style

▼ DRL Case Style



◀ RT Case Style



Models 2SFT and 2SHT—Window Dia. 1.13"
Model 2RL—Window Dia. 1.15"
Model 2DRL—Window Dia. 1"

ORDERING INFORMATION

2SFT, 2SHT, 2RL, 2DRL

Catalog #	Current Ratio	Model 2S, 2R		Model 2DRL	
		Accuracy @ 60 Hz	Burden VA @ 60 Hz	Accuracy @ 60 Hz	Burden VA @ 60 Hz
2**-500	50:5	±3%	2.0	±2%	1.5
2**-600	60:5	±2%	2.0	±1%	2.5
2**-750	75:5	±2%	2.0	±1%	3.5
2**-800	80:5	±2%	2.0	±1%	4.0
2**-101	100:5	±1%	2.0	±1%	5.0
2**-121	120:5	±1%	2.5	±1%	5.0
2**-1250	125:5	±1%	2.5	±1%	5.0
2**-151	150:5	±1%	4.0	±1%	8.0
2**-201	200:5	±1%	4.0	±1%	10.0
2**-251	250:5	±1%	6.0	±1%	12.5
2**-301	300:5	±1%	8.0	±1%	15.0
2**-401	400:5	±1%	10.0	±1%	20.0

Model 5—Window Dia. 1.56"

ORDERING INFORMATION

Model 5SFT, 5SHT, 5RT, 5RBT, 5RL, 5RBL

Catalog #	Current Ratio	Accuracy @ 60 Hz	Burden VA @ 60 Hz
5**-750	75:5	±2%	1.5
5**-101	100:5	±2%	2.0
5**-151	150:5	±1%	5.0
5**-201	200:5	±1%	5.0
5**-251	250:5	±1%	10.0
5**-301	300:5	±1%	12.5
5**-401	400:5	±1%	12.5
5**-501	500:5	±1%	20.0
5**-601	600:5	±1%	25.0
5**-751	750:5	±1%	25.0
5**-801	800:5	±1%	25.0
5**-102	1000:5	±1%	25.0
5**-122	1200:5	±1%	30.0

Model 7—Window Dia. 2.50"

ORDERING INFORMATION

Model 7SFT, 7SHT, 7RT, 7RBT, 7RL, 7RBL

Catalog #	Current Ratio	Accuracy at 60 Hz	Burden at 60 Hz
7**-151	150:5	±1%	5.0
7**-201	200:5	±1%	5.0
7**-251	250:5	±1%	5.0
7**-301	300:5	±1%	12.5
7**-401	400:5	±1%	15.0
7**-501	500:5	±1%	25.0
7**-601	600:5	±1%	30.0
7**-751	750:5	±1%	30.0
7**-801	800:5	±1%	35.0
7**-102	1000:5	±1%	30.0
7**-122	1200:5	±1%	35.0
7**-152	1500:5	±1%	40.0
7**-162	1600:5	±1%	45.0

Model 76—Window Dia. 3.00"

ORDERING INFORMATION

Model 76SFT, 76SHT, 76RT, 76RBT, 76RL, 76RBL

Catalog #	Current Ratio	Accuracy at 60 Hz	Burden at 60 Hz
76**-251	250:5	±1%	5.0
76**-301	300:5	±1%	6.0
76**-401	400:5	±1%	10.0
76**-501	500:5	±1%	10.0
76**-601	600:5	±1%	10.0
76**-751	750:5	±1%	10.0
76**-801	800:5	±1%	12.5
76**-102	1000:5	±1%	10.0
76**-122	1200:5	±1%	10.0
76**-152	1500:5	±1%	12.5
76**-162	1600:5	±1%	12.5
76**-202	2000:5	±1%	15.0

NOTE: **Insert case style when ordering

See CT Application Note in Technical Reference Section.

Weschler AC Current Transformers

3P3 ▶



Model 8 — Window Dia. 3.25"

ORDERING INFORMATION

Model 8SHT, 8RL

Catalog #	Current Ratio	V.A. for ±1%	ANSI Metering Class @ 60 Hz				
	Amperes	Class	B0.1	B0.2	B0.5	B0.9	B1.8
8**-201	200:5	5.0	1.2	1.2	—	—	—
8**-251	250:5	7.5	0.6	1.2	2.4	—	—
8**-301	300:5	15.0	0.6	0.6	1.2	2.4	—
8**-401	400:5	25.0	0.3	0.6	1.2	1.2	—
8**-501	500:5	35.0	0.3	0.3	0.6	1.2	—
8**-601	600:5	50.0	0.3	0.3	0.6	1.2	2.4
8**-751	750:5	50.0	0.3	0.3	0.3	0.6	1.2
8**-801	800:5	60.0	0.3	0.3	0.3	0.6	1.2
8**-102	1000:5	75.0	0.3	0.3	0.3	0.6	1.2
8**-122	1200:5	75.0	0.3	0.3	0.3	0.6	0.6
8**-152	1500:5	90.0	0.3	0.3	0.3	0.6	0.6
8**-162	1600:5	100.0	0.3	0.3	0.3	0.6	0.6
8**-202	2000:5	120.0	0.3	0.3	0.3	0.3	0.3
8**-252	2500:5	50.0	0.3	0.3	0.3	0.3	—
8**-302	3000:5	60.0	0.3	0.3	0.3	0.3	—
8**-352	3200:5	70.0	0.3	0.3	0.3	0.3	—
8**-402	4000:5	80.0	0.3	0.3	0.3	0.3	—

Model 170 — Window Dia. 4.25"

ORDERING INFORMATION

Model 170SHT, 170RL

Catalog #	Current Ratio	V.A. for ±1%	ANSI Metering Class @ 60 Hz				
	Amperes	Class	B0.1	B0.2	B0.5	B0.9	B1.8
170**-201	200:5	5.0	1.2	1.2	—	—	—
170**-251	250:5	5.0	1.2	1.2	—	—	—
170**-301	300:5	12.5	0.6	0.6	1.2	2.4	—
170**-401	400:5	25.0	0.6	0.6	1.2	1.2	2.4
170**-501	500:5	25.0	0.3	0.3	0.6	1.2	2.4
170**-601	600:5	25.0	0.3	0.3	0.6	0.6	1.2
170**-751	750:5	40.0	0.3	0.3	0.3	0.3	0.6
170**-801	800:5	50.0	0.3	0.3	0.3	0.3	0.6
170**-102	1000:5	75.0	0.3	0.3	0.3	0.3	0.6
170**-122	1200:5	100.0	0.3	0.3	0.3	0.3	0.6
170**-152	1500:5	80.0	0.3	0.3	0.3	0.6	0.6
170**-162	1600:5	90.0	0.3	0.3	0.3	0.6	0.6
170**-202	2000:5	105.0	0.3	0.3	0.3	0.3	0.3
170**-252	2500:5	130.0	0.3	0.3	0.3	0.3	0.3
170**-302	3000:5	165.0	0.3	0.3	0.3	0.3	0.3
170**-352	3200:5	190.0	0.3	0.3	0.3	0.3	0.3
170**-402	4000:5	215.0	0.3	0.3	0.3	0.3	0.3

NOTE: **Insert case style when ordering

ORDERING INFORMATION

Model 3P3 — Window Dia. 0.97" Phase Center 2.31"

Catalog #	Current Ratio	Accuracy @ 60 Hz	Burden VA@60Hz
3P3-500	50:5	±3%	2.0
3P3-600	60:5	±2%	2.0
3P3-750	75:5	±2%	2.0
3P3-800	80:5	±2%	2.0
3P3-101	100:5	±1%	2.0
3P3-121	120:5	±1%	2.5
3P3-1250	125:5	±1%	2.5
3P3-151	150:5	±1%	4.0
3P3-201	200:5	±1%	5.0
3P3-251	250:5	±1%	7.5
3P3-301	300:5	±1%	10.0

ORDERING INFORMATION

Model 3P4 — Window Dia. 1.56" Phase Center 3.56"

Catalog #	Current Ratio	ANSI Metering Class @ 60 Hz				
		B0.1	B0.2	B0.5	B0.9	B1.8
3P4-500	50:5	4.8	-	-	-	-
3P4-101	100:5	1.2	2.4	-	-	-
3P4-151	150:5	0.6	1.2	2.4	-	-
3P4-201	200:5	0.6	0.6	1.2	2.4	-
3P4-251	250:5	0.6	0.6	1.2	2.4	2.4
3P4-301	300:5	0.3	0.3	0.6	1.2	2.4
3P4-401	400:5	0.3	0.3	0.6	1.2	1.2
3P4-501	500:5	0.3	0.3	0.6	0.6	1.2
3P4-601	600:5	0.3	0.3	0.6	0.6	1.2
3P4-751	750:5	0.3	0.3	0.6	0.6	0.6
3P4-801	800:5	0.3	0.3	0.6	0.6	0.6
3P4-102	1000:5	0.3	0.3	0.3	0.6	0.6

Model 180/181 — Window Dia. 2.5"

ORDERING INFORMATION

Model 180RL, 180SHT, 181

Catalog #	Current Ratio	V.A. for ±1%	ANSI Metering Class @ 60 Hz				
	Amperes	Class	B0.1	B0.2	B0.5	B0.9	B1.8
180**-101	100:5	2.5	1.2	2.4	—	—	—
180**-151	150:5	5.0	0.6	1.2	—	—	—
180**-201	200:5	12.5	0.6	0.6	1.2	—	—
180**-251	250:5	12.5	0.3	0.3	1.2	—	—
180**-301	300:5	25.0	0.3	0.3	0.6	1.2	2.4
180**-401	400:5	50.0	0.3	0.3	0.3	0.6	1.2
180**-501	500:5	50.0	0.3	0.3	0.3	0.6	1.29
180**-601	600:5	50.0	0.3	0.3	0.3	0.6	0.6
180**-751	750:5	50.0	0.3	0.3	0.3	0.3	0.6
180**-801	800:5	75.0	0.3	0.3	0.3	0.3	0.3
180**-102	1000:5	100.0	0.3	0.3	0.3	0.6	0.6
180**-122	1200:5	125.0	0.3	0.3	0.3	0.6	0.6
180**-152	1500:5	160.0	0.3	0.3	0.3	0.3	0.3
180**-162	1600:5	175.0	0.3	0.3	0.3	0.3	0.3

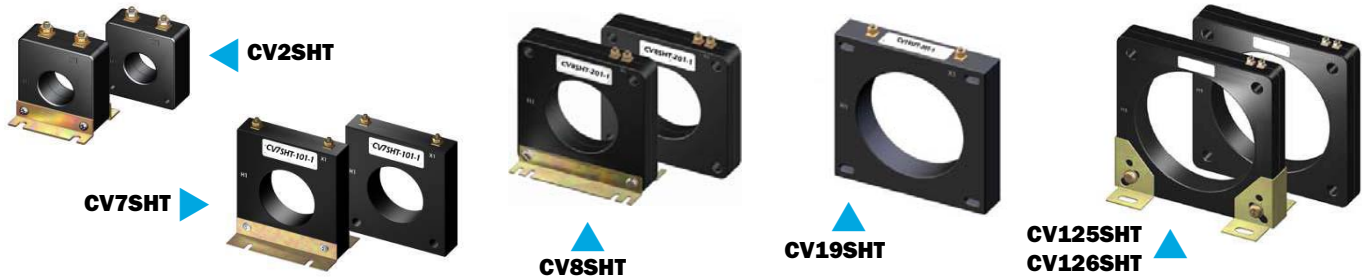
Electromagnetic Industries Voltage Output Current Transformers

- Primary Current to 3000A
- Windows from 1.13" to 8.25"
- Safe Low Voltage AC Output
- Heavy Secondary Wires Not Required
- Use Long Secondary Leads with No Accuracy Loss



SPECIFICATIONS

Output:	0 - 1.0V AC secondary voltage (other secondary voltages available)
Frequency:	50-400 Hz
Accuracy:	0.3% at 60 Hz, except 0.6% for transformers rated <100A
Insulation Level:	600 Volts, 10kV BIL full wave
Terminals:	Two 8-32 UNC brass studs with flat washer, lock washer & nut (8-32 screws optional)



ORDERING INFORMATION

	Window dia. 1.13"	2.50"	3.25"	4.25"	6.40"	8.25"
Amps AC						
50	CV2SHT-500-1	CV7SHT-500-1	---	---	---	---
60	CV2SHT-600-1	CV7SHT-600-1	---	---	---	---
75	CV2SHT-750-1	CV7SHT-750-1	---	---	---	---
80	CV2SHT-800-1	CV7SHT-800-1	---	---	---	---
100	CV2SHT-101-1	CV7SHT-101-1	CV8SHT-101-1	CV19SHT-101-1	---	---
120	CV2SHT-121-1	CV7SHT-121-1	CV8SHT-121-1	CV19SHT-121-1	---	---
150	CV2SHT-151-1	CV7SHT-151-1	CV8SHT-151-1	CV19SHT-151-1	---	---
200	CV2SHT-201-1	CV7SHT-201-1	CV8SHT-201-1	CV19SHT-201-1	---	---
250	CV2SHT-251-1	CV7SHT-251-1	CV8SHT-251-1	CV19SHT-251-1	---	---
300	CV2SHT-301-1	CV7SHT-301-1	CV8SHT-301-1	CV19SHT-301-1	---	---
400	CV2SHT-401-1	CV7SHT-401-1	CV8SHT-401-1	CV19SHT-401-1	CV125SHT-401-1	CV126SHT-401-1
500	---	CV7SHT-501-1	CV8SHT-501-1	CV19SHT-501-1	CV125SHT-501-1	CV126SHT-501-1
600	---	CV7SHT-601-1	CV8SHT-601-1	CV19SHT-601-1	CV125SHT-601-1	CV126SHT-601-1
750	---	CV7SHT-751-1	CV8SHT-751-1	CV19SHT-751-1	CV125SHT-751-1	CV126SHT-751-1
800	---	CV7SHT-801-1	CV8SHT-801-1	CV19SHT-801-1	CV125SHT-801-1	CV126SHT-801-1
1000	---	---	CV8SHT-102-1	CV19SHT-102-1	CV125SHT-102-1	CV126SHT-102-1
1200	---	---	---	CV19SHT-122-1	CV125SHT-122-1	CV126SHT-122-1
2000	---	---	---	---	CV125SHT-202-1	CV126SHT-202-1
2500	---	---	---	---	CV125SHT-252-1	CV126SHT-252-1
3000	---	---	---	---	---	CV126SHT-302-1

8-32 terminal studs standard. For terminal screws, replace T in part number with Y

CV2 and CV7 models are also available with molded mounting feet. For this option, replace SHT in the part number with SFT. For SHT models, order mounting bracket separately.

CV2SFT



CV7SFT



DIMENSIONS

Model	H*	W	D	Weight	Term. Spacing	Mounting	Bracket P/N
CV2SHT	2.68"	2.4"	1.0"	0.5#	1.10"	Two 0.17"d holes, 1.87" apart	1121A00019-1
CV2SFT	2.67"	2.39"	1.0"	0.5#	1.10"	Molded feet, 1.73" x 1.75" hole pattern	---
CV7SHT	4.70"	4.56"	1.13"	1.5#	3.26"	Two 0.40"d holes, 3.42" apart	1121A00021-1
CV7SFT	4.85"	4.54"	1.10"	1.5#	3.50"	Molded feet, 3.76" x 1.84" hole pattern	---
CV8SHT	5.73"	5.73"	1.15"	3#	0.55"	Four 0.42"d holes, 4.70" apart	1121A00022-1
CV19SHT	6.00"	6.00"	1.18"	3#	3.50"	Four 0.24" x 0.56" slots, 5.16" apart	1121A00022
CV125SHT	8.45"	8.45"	1.30"	3.5#	0.60"	Four 0.54"d holes, 6.75" apart	1121A00018
CV126SHT	10.48"	10.48"	1.53"	3.5#	0.75"	Four 0.56" x 0.88" slots, 8.5" apart	1121A00018

*excluding terminals

Instrument Transformer AC Current Transducers

- Large Window Area
- 4-20mA DC Output
- 0.5% FS accuracy
- 120VAC or 24VDC Power

The PCL is a 4 terminal device with separate connections for power and load. The PCM is a two terminal device. 24V is applied between the + terminal and ground. The output load may be inserted in either the - line for negative ground systems or the + line for positive ground systems.



SPECIFICATIONS

Output Signal:	Average responding, RMS calibrated	
Linear Range:	0-120% of rated current (typical)	
Frequency:	50/60Hz	
Operating Temperature:	-30 to 60°C	
Insulation Level:	600V, 10kV BIL full wave	
Maximum Output:	30mA DC	
Output Ripple:	1% max peak	
Supply Voltage:	PCL 120VAC ±10%	
	PCM 24VDC ±10%	
Output Load:	PCL <1000 ohms	
	PCM <600 ohms	
Size (LxWxH, inches)		Window dia
PCL-5 thru 75	2.7 x 2.4 x 4.5	0.94"
PCL-100 & up	4.5 x 4.7 x 4.9	2.13"
PCM-5 thru 20	2.7 x 2.4 x 2.75	0.93"
PCM-30 & up	4.5 x 4.7 x 4.9	1.25"

ORDERING INFORMATION

Model	Rated Current	Connections
PCL-5	5A	#8 screws
PCL-20	10A, 15A, 20A*	
PCL-75	25A, 50A, 75A*	
PCL-100	100A	#8 studs
PCL-150	150A	
PCL-200	200A	
PCL-300	300A	
PCL-400	400A	
PCL-600	600A	
PCM-5	5A	#10 screws
PCM-10	10A	
PCM-20	20A	
PCM-30	30A	
PCM-50	50A	
PCM-75	75A	
PCM-100	100A	
PCM-150	150A	
PCM-200	200A	
PCM-300	300A	#8 studs

*Switch selectable

NK Technologies Ground Fault Sensor

NEW



- Fixed or selectable setpoint
- Solid-state or relay output
- Green LED Power-On indication

Detects ground fault (earth leakage) conditions by monitoring all current-carrying conductors in a grounded single or three phase system.

SPECIFICATIONS

Setpoint:	AG1, AG2: factory calibrated AG3: field jumper selected
Solid-state Output:	Isolated dry contact AC Switch: 1A @ 240VAC DC Switch: 0.15A @ 30VAC Leakage <10 micro Amps (N.O.), <2.5mA (N.C.)
Mechanical Output:	Single pole relay Auto Reset: SPDT, 1A @ 125VAC, 2A @ 30VDC Latching: SPST, 1A @ 125VAC, 2A @ 30VDC
Response Time:	200ms @ 5% above trip point 60ms @ 50% above trip point 15ms @ 500% above trip point
Isolation:	5kVAC (tested)
Frequency:	50-400 Hz (monitored circuit)
Power Supply:	66-132VAC 19.2-28.8VAC/DC
Loading:	2VA max.
Case:	UL94 V0 Flammability Rated
Environment:	-4 to 122°F (-20 to 50°C), < 95% RH, non-condensing
Size:	3.9" W x 3.0" H x 1.5" D (99x76x38mm)
Listings:	UL 1053, Class 1 Recognized, CE

ORDERING INFORMATION

To Order Insert Code for Each Letter to Select Catalog Number

AG A - B - C - D - E Example: AG1-NOAC-120-FS-005

A Setpoint

1	5-100mA factory set
2*	80-950mA factory set
3	5/10/30mA jumper set (TR3 only)

B Output Type

NOAC	Normally Open solid state, 1A @ 240VAC
NCAC	Normally Closed solid state, 1A @ 240VAC
NODC	Normally Open solid state, 0.15A @ 30VDC
NCDC	Normally Closed solid state, 0.15A @ 30VDC
NCR1	Normally Closed SPST Relay (requires LA option)
NOR1	Normally Open SPST Relay (requires LA option)
SDT1	SPDT Relay (Form C) with autoreset (requires DEN or ENE option)

C Power Supply

120	120VAC
24U*	24VAC/VDC

D Options

FS	Normally Energized (solid state output only)
NF	Normally De-energized (solid state output only)
ENE	Normally Energized, auto-reset (SDT1 output only)
DEN	Normally De-energized, autoreset (SDT1 output only)
LA	Latching (NOR1 and NCR1)

E Setpoint

TR3	Tri-set (5/10/30mA)
nnn	Factory set trip point in mA

*Not UL recognized.

Weschler Transducers

CLD001J ▶



AC & DC Transducers—Metal Case

- Accuracy: $\pm 0.2\%$ or 0.5%
- Wide Variety of Input and Output Options
- Rugged Metal Can Construction
- 5 kV Transient Protection
- Sizes:
 - Can size 1: 3.976" L x 2.012" W x 4.096" H
 - Can size 2: 5.236" L x 3.769" W x 4.717" H

AC CURRENT TRANSDUCER

Transducer Type	Input	Output	Aux. Power	Can Size	Part # $\pm 0.5\%$	Part # $\pm 0.2\%$
Single (average sensing)	0-1 AAC	0-1 mADC	None	1	CTA100JA	CTA100ZA
Single (average sensing)	0-1 AAC	4 mA-20 mADC	120 VAC	2	CTD100JA	CTD100ZA
Single (TRMS sensing)	0-1 AAC	0-1 mADC	120 VAC	2	CTA100JT	CTA100ZT
Single (TRMS sensing)	0-1 AAC	4 mA-20 mADC	120 VAC	2	CTD100JT	CTD100ZT
Single (average sensing)	0-5 AAC	0-1 mADC	None	1	CTA500JA	CTA500ZA
Single (average sensing)	0-5 AAC	4 mA-20 mADC	120 VAC	2	CTD500JA	CTD500ZA
Triple (average sensing)	0-5 AAC	0-1 mADC	None	2	CTA503JA	CTA503ZA
Single (TRMS sensing)	0-5 AAC	0-1 mADC	120 VAC	2	CTA500JT	CTA500ZT
Single (TRMS sensing)	0-5 AAC	4 mA-20 mADC	120 VAC	2	CTD500JT	CTD500ZT

Specifications on PAGE 98. ▶

AC VOLTAGE TRANSDUCER

Transducer Type	Input	Output	Aux. Power	Can Size	Part # $\pm 0.5\%$	Part # $\pm 0.2\%$
Single (average sensing)	0-150 VAC	0-1 mADC	None	1	ETA150JA	ETA150ZA
Single (average sensing)	0-300 VAC	0-1 mADC	None	1	ETA300JA	ETA300ZA
Single (average sensing)	0-600 VAC	0-1 mADC	None	1	ETA600JA	ETA600ZA
Single (average sensing)	0-150 VAC	4 mA-20 mADC	120 VAC	2	ETD150JA	ETD150ZA
Single (average sensing)	0-300 VAC	4 mA-20 mADC	120 VAC	2	ETD300JA	ETD300ZA
Single (average sensing)	0-600 VAC	4 mA-20 mADC	120 VAC	2	ETD600JA	ETD600ZA
3 Inputs (average sensing)	0-150 VAC	0-1 mADC	None	2	ETA153JA	ETA153ZA
3 Inputs (average sensing)	0-300 VAC	0-1 mADC	None	2	ETA303JA	ETA303ZA
Single (TRMS sensing)	0-150 VAC	0-1 mADC	120 VAC	2	ETA150JT	ETA150ZT
Single (TRMS sensing)	0-300 VAC	0-1 mADC	120 VAC	2	ETA300JT	ETA300ZT
Single (TRMS sensing)	0-150 VAC	4 mA-20 mADC	120 VAC	2	ETD150JT	ETD150ZT
Single (TRMS sensing)	0-300 VAC	4 mA-20 mADC	120 VAC	2	ETD300JT	ETD300ZT

Specifications on PAGE 98. ▶

AC FREQUENCY TRANSDUCER—CAN SIZE "2"

Frequency	Input	Output	Part # $\pm 1.0\%$	Part # $\pm 0.1\%$
45-55 Hz	120V	0-1 mA	FQA050J	FQA050Z
45-65 Hz	120V	0-1 mA	FQA055J	FQA055Z
55-65 Hz	120V	0-1 mA	FQA060J	FQA060Z
375-425 Hz	120V	0-1 mA	FQA400J	FQA400Z
45-55 Hz	120V	4-12-20 mADC	FQD050J	FQD050Z*
45-65 Hz	120V	4-12-20 mADC	FQD055J	FQD055Z*
55-65 Hz	120V	4-12-20 mADC	FQD060J	FQD060Z*
375-425 Hz	120V	4-12-20 mADC	FQD400J	FQD400Z*

Specifications on PAGE 98. ▶

*Accuracy is 0.2%

Weschler Transducers

AC WATT TRANSDUCER—CAN SIZE "2"

Connection	No. of Elements	Rating	Output	Aux. Power	Part # ±0.5%	Part # ±0.2%
1 \emptyset 2-wire	1 element	120V/5A	±1 mADC	None	WTB010J	WTB010Z
3 \emptyset 3-wire	2 element	120V/5A	±1 mADC	None	WTB020J	WTB020Z
3 \emptyset 4-wire	2 ¹ / ₂ element	120V/5A	±1 mADC	None	WTB025J	WTB025Z
3 \emptyset 4-wire	3 element	120V/5A	±1 mADC	None	WTB030J	WTB030Z
1 \emptyset 2-wire	1 element	120V/5A	4 mA–20 mADC	None	WTD010J	WTD010Z
3 \emptyset 3-wire	2 element	120V/5A	4 mA–20 mADC	None	WTD020J	WTD020Z
3 \emptyset 4-wire	2 ¹ / ₂ element	120V/5A	4 mA–20 mADC	None	WTD025J	WTD025Z
3 \emptyset 4-wire	3 element	120V/5A	4 mA–20 mADC	None	WTD030J	WTD030Z

AC VAR TRANSDUCER—CAN SIZE "2"

Connection	No. of Elements	Rating	Output	Aux. Power	Part # ±0.5%	Part # ±0.2%
1 \emptyset 2-wire	1 element	120V/5A	±1 mADC	None	VTB010J	VTB010Z
3 \emptyset 3-wire	2 element	120V/5A	±1 mADC	None	VTB020J	VTB020Z
3 \emptyset 4-wire	2 ¹ / ₂ element	120V/5A	±1 mADC	None	VTB025J	VTB025Z
3 \emptyset 4-wire	3 element	120V/5A	±1 mADC	None	VTB030J	VTB030Z
1 \emptyset 2-wire	1 element	120V/5A	4-12-20 mADC	None	VTD010J	VTD010Z
3 \emptyset 3-wire	2 element	120V/5A	4-12-20 mADC	None	VTD020J	VTD020Z
3 \emptyset 4-wire	2 ¹ / ₂ element	120V/5A	4-12-20 mADC	None	VTD025J	VTD025Z
3 \emptyset 4-wire	3 element	120V/5A	4-12-20 mADC	None	VTD030J	VTD030Z

AC WATT/VAR TRANSDUCER—CAN SIZE "2"

Connection	No. of Elements	Rating	Output	Part # ±0.5%	Part # ±0.2%
1 \emptyset 2-wire	1 element	120V/5A	±1 mADC x 2	WVB010J	WVB010Z
3 \emptyset 3-wire	2 element	120V/5A	±1 mADC x 2	WVB020J	WVB020Z
3 \emptyset 4-wire	2 ¹ / ₂ element	120V/5A	±1 mADC x 2	WVB025J	WVB025Z
3 \emptyset 4-wire	3 element	120V/5A	±1 mADC x 2	WVB030J	WVB030Z
1 \emptyset 2-wire	1 element	120V/5A	W: 4–20mA, VAR: 4-12–20 mA	WVD010J	WVD010Z
3 \emptyset 3-wire	2 element	120V/5A	W: 4–20mA, VAR: 4-12–20 mA	WVD020J	WVD020Z
3 \emptyset 4-wire	2 ¹ / ₂ element	120V/5A	W: 4–20mA, VAR: 4-12–20 mA	WVD025J	WVD025Z
3 \emptyset 4-wire	3 element	120V/5A	W: 4–20mA, VAR: 4-12–20 mA	WVD030J	WVD030Z

AC POWER FACTOR—CAN SIZE "2"

Connection	Lag—Lead	Output	Part # STD TC	Part # Low TC
1 \emptyset 2-wire	-0.5 to 1.0 to +0.5	1-0-1 mADC	PFB010J	PFB010Z
3 \emptyset 3-wire	-0.5 to 1.0 to +0.5	1-0-1 mADC	PFB020J	PFB020Z
3 \emptyset 4-wire	-0.5 to 1.0 to +0.5	1-0-1 mADC	PFB030J	PFB030Z
1 \emptyset 2-wire	-0.5 to 1.0 to +0.5	4-12-20 mADC	PFF010J	PFF010Z
3 \emptyset 3-wire	-0.5 to 1.0 to +0.5	4-12-20 mADC	PFF020J	PFF020Z
3 \emptyset 4-wire	-0.5 to 1.0 to +0.5	4-12-20 mADC	PFF030J	PFF030Z

AC PHASE ANGLE—CAN SIZE "2"

Connection	Phase Angle	Output	Part # ±2°	Part # ±1°
1 \emptyset 2-wire	60°–0–60°	1-0-1 mADC	PAB010J	PAB010Z
3 \emptyset 3-wire	60°–0–60°	1-0-1 mADC	PAB020J	PAB020Z
3 \emptyset 4-wire	60°–0–60°	1-0-1 mADC	PAB030J	PAB030Z
1 \emptyset 2-wire	60°–0–60°	4-12-20 mADC	PAF010J	PAF010Z
3 \emptyset 3-wire	60°–0–60°	4-12-20 mADC	PAF020J	PAF020Z
3 \emptyset 4-wire	60°–0–60°	4-12-20 mADC	PAF030J	PAF030Z

NOTE: Also available in plastic foot-mounted or DIN rail.
For ranges not listed, contact Weschler.

Weschler Transducers

SPECIFICATIONS - ALL AC MODELS

Output	0-1 or ±1mADC into 10kΩ max., 10VDC compliance 4-20mADC into 750Ω max., 15VDC compliance
Response Time	<400ms (0-99% of output)
Output Ripple	0.5% of span, peak-to-peak max
Isolation	2500VAC input to output, power & case 2000VAC aux. power to output & case 500VAC output to case
External Span Adjustment	Zero: ±1% min; Span: ±2% min
Surge Withstand	IEEE472/ANSI C37.90.1-1989, JIS C111 (5kV, 1.2 x 50μs)
Insulation Resistance	>10MΩ@500VDC input/output/power/case
Operating Temperature	-20°C to 60°C; 0-90% RH non-condensing

AC CURRENT & VOLTAGE TRANSDUCERS

Current Models	
Input Burden	<0.2VA
Ovrange	200% of rated input continuous; 1000% of rated input for 5 sec
Voltage Models	
Input Burden	150VAC: <0.8VA; 300 VAC: <1.6VA (TRMS) 150VAC: <1.8VA; 300 VAC: <3.6VA (Avg. Sensing)
Ovrange	120% of rated input continuous
Temperature Drift	±250ppm/°C of span, 0.5% models ±140ppm/°C of span, 0.2% models
Options (specify when ordering)	
50Hz, 50/60Hz or 400Hz operation (60Hz standard)	
230VAC, 24VDC* or 48VDC* Auxiliary Power (*average sensing models only)	

AC WATT & VAR TRANSDUCERS

Input Burden	Voltage: <0.5VA per element @120V Current: <0.2VA per element
Voltage Input Range	100-135VAC, input powered 0.5% models 85-135VAC, input powered 0.2% models 0-120% of rated input, auxiliary powered models
Voltage Ovrange	150% of rated input continuous (aux. powered only)
Current Input Range	10-200% of rated input with accuracy
Current Ovrange	200% continuous, 1000% for 5 seconds
Output Calibration	120VAC/1A = 0-100 watts/element 120VAC/5A = 0-500 watts/element
Temperature Drift	±250ppm/°C of span, 0.5% models ±80ppm/°C of span, 0.2% models
Influences (% of span)	<0.5% for PF, phase interaction or current imbalance

COMBINED AC WATT/VAR TRANSDUCERS

Input Burden	Voltage: <0.5VA per element Current: <0.2VA per element
Voltage Input Range	100-135VAC, input powered 0.5% models 85-135VAC, input powered 0.2% models 0-120% of rated input, auxiliary powered models
Voltage Ovrange	150% of rated input continuous (aux. powered only)
Current Input Range	10-200% of rated input with accuracy
Current Ovrange	200% continuous, 1000% for 5 seconds
Temperature Drift	±250ppm/°C of span, 0.5% models ±80ppm/°C of span, 0.2% models
Influences (% of span)	<0.5% for PF, phase interaction or current imbalance

Options for Watt, VAR & Watt/VAR Models

50Hz or 400Hz operation (60Hz standard)
1AAC Current Rated
240VAC Voltage Rated
480 VAC Voltage Rated (not available on 0.2% units)
120VAC, 240VAC, 24VDC or 48VDC Auxiliary Power
Special Calibration to Customer PT & CT

POWER FACTOR TRANSDUCERS

Specifications same as Combined Watt/VAR Models except:	
Accuracy	±0.01 power factor
Temperature Drift	±500ppm/°C of span, suffix J models ±150ppm/°C of span, suffix Z models
Low Current Detect	<4%
Influences (% of span)	<1% for voltage, <2% for current

Options for PF Models

1 AAC Current Rated
120VAC, 240VAC, 24VDC or 48VDC Auxiliary Power

AC PHASE ANGLE TRANSDUCERS

Specifications same as Combined Watt/VAR Models except:	
Temperature Drift	±500ppm/°C of span, suffix J models ±80ppm/°C of span, suffix Z models
Influences	<0.5° for voltage, <1° for current

Options for Phase Angle Models

50Hz or 400Hz operation (60Hz standard)
1AAC Current Rated
120VAC, 240VAC, 24VDC or 48VDC Auxiliary Power
Full Scale = Lagging Phase Angle
±90° Phase Angle

FREQUENCY TRANSDUCER

Input Burden	<0.1VA @120V
Voltage Input Range	100-135VAC, input powered models ±20% of rated voltage, aux. powered models
Temperature Drift	±250ppm/°C of span, suffix J models ±50ppm/°C of span, suffix Z models
Harmonics	Fundamental through 9th harmonic

Options for Frequency Models

240 Volt Input
24VDC or 48VDC Aux. Power (0.2% models only)
1-0-1 mADC Output

DC TO DC ISOLATION TRANSDUCERS

Input Burden	<1 mA
Output Compliance	10VDC
Accuracy (>10% of range)	±0.5% of FS
Response Time	500ms (0-99%)
Calibration Adjustments	±5% (zero & FS)
Temperature Range	0-40°C, 20-90% RH non-condensing
Isolation	2600VAC input to output, power & case 1000VAC aux power to output & case 1000VAC output to case
Surge Withstand	IEEE472/ANSI C37.90.1-1989 SWC
Auxiliary Power	120VAC ±10%, 2VA

DC TO DC ORDERING INFO

Input	Output	Aux. Power	Case Size	Part #
0-1mADC	4-20mADC	120VAC	2	CLD001J
0-1mADC	0-1mADC	120VAC	2	CLD002J
0-1mADC	0-10VDC	120VAC	2	CLD003J
0-50mVDC	4-20mADC	120VAC	2	CLD101J
0-50mVDC	0-1mADC	120VAC	2	CLD102J
0-50mVDC	0-10VDC	120VAC	2	CLD103J

NK Technologies AC Current Transducers

AT and ATP current transducers combine a current transformer and signal conditioner in a single package. These transducers offer jumper selected current input ranges with proportional industry standard 4-20 mA, 0-5 VDC and 0-10 VDC outputs. The AT and ATP series are designed for application on "linear" or sinusoidal AC loads. Available in a split core or two types of solid core cases.

ATR and ATPR transducers combine a current transformer and True RMS signal conditioner in a single package. The ATR and ATPR series provide True RMS outputs on distorted waveforms found on VFD and SCR outputs or on linear loads in "noisy" power environments. Available in a solid or split core case.

AT & ATP SPECIFICATIONS

	-005 Models	-010 Models	-420 Models
Output Signal:	0-5 VDC	0-10 VDC	4-20 mA
Output Limit:	10 VDC	15 VDC	40 mA
Accuracy:	1.0% FS	1.0% FS	0.5% FS
Frequency Range:	50-60 Hz	50-60 Hz	20-100 Hz
Power Supply:	Self or External	Self or External	Loop or External
Isolation Voltage:	UL Listed to 1270 VAC, Tested to 5 kV		
Sensing Aperture:	-FF Case: 0.55" (14 mm) Diameter -FT Case: 0.75" (19 mm) Diameter -SP Case: 0.85" (21.5 mm) Sq.		
Case:	UL 94V-0 Flammability Rated		
Environmental:	-4 to 122 °F (-20 to 50 °C), 0-95% RH, Non-Condensing		
Listings:	UL 508 Industrial Control Equipment (USA and Canada), CE		

ATR & ATPR SPECIFICATIONS

Output Signal:	4-20 mA, Loop-Powered, True RMS
Output Limit:	23 mA
Accuracy:	0.8% FS (1.0% on ATR3 & 4)
Frequency Range:	10-400 Hz
Power Supply:	24VDC Nom., 40 VDC Max., 120 VAC
Isolation Voltage:	UL Listed to 1270 VAC, Tested to 5 kV (600 VAC on ATR3 & 4)
Sensing Aperture:	-FT Models: 0.75" (19 mm) Dia. -FL Models: 3.0" (76 mm) Dia. -SP Models: 0.85" (21.5 mm) Sq.
Case:	UL 94V-0 Flammability Rated
Environmental:	-4 to 122 °F (-20 to 50 °C), 0-95% RH, Non-Condensing
Listings:	UL 508 Industrial Control Equipment (USA and Canada)



Loading (All Models)

Loop Power:	$R_L < 500\Omega$
External Power:	$R_L > 50k\Omega$
Self Powered:	Accuracy for $R_L > 1M\Omega$, add 1.3% for $R_L = 100 k\Omega$

ORDERING INFORMATION

A	Model	AT	Average sensing, loop or self-powered
B	Input Ranges	0	0-2/5A
		1	0-10/20/50A
		2	0-100/150/200A
		3	0-375/500/750A
		4	0-1000/1333/2000A
C	Output	420	4-20mA
		005	0-5 VDC (0,1,2 only)
		010	0-10 VDC (0,1,2 only)
D	Power	24L	24 VDC Loop Powered (4-20mA only)
		000	Self powered (DC output only)
E	Case	FF	Fixed core, front terminals (0,1,2 only)
		FT	Fixed core, top terminals (0,1,2 only)
		SP	Split core
		FL	Fixed core (3 & 4 only)

A	Model	ATP	Average sensing, ext. powered
		ATPR	True RMS sensing, ext. powered
B	Input Ranges	0	0-2/5A (ATP only)
		1	0-10/20/50A (ATP only)
		2	0-100/150/200A (ATP only)
		3	0-375/500/750A
		4	0-1000/2000A
C	Output	420	4-20mA
		005	0-5 VDC
		010	0-10 VDC
D	Power	24U	24V AC/DC, isolated output
		120	120VAC
E	Case	FF	Fixed core, front terminals (0,1,2 only)
		FL	Fixed core (3 & 4 only)
		SP	Split core (0,1,2 only)

A	Model	ATR	TRMS sensing, loop powered
B	Input	3	0-375/500/750A
		4	0-1000/1333/2000
C	Output	420	4-20mA
D	Power	24L	24VDC, loop powered
E	Case	FL	Fixed core

NK Technologies Split-Core AC Current Transducers

- TRMS sensing for distorted waveforms
- 2A to 200A Full Scale
- DCV Output

ATPR-SP


ORDERING INFORMATION

P/N	Full Scale Ranges	Output
ATPR0-005-24D-SP	2, 5 A	0-5V DC
ATPR1-005-24D-SP	10, 20, 50 A	0-5V DC
ATPR2-005-24D-SP	100, 150, 200 A	0-5V DC
ATPR0-010-24D-SP	2, 5 A	0-10V DC
ATPR1-010-24D-SP	10, 20, 50 A	0-10V DC
ATPR2-010-24D-SP	100, 150, 200 A	0-10V DC

SPECIFICATIONS

Power Supply:	24 VDC nominal (20-28 VDC)
Output:	0-5 or 0-10 VDC, proportional to RMS Current, 10kohm minimum load impedance
Response Time:	600 ms
Range:	Jumper selected
Output Ripple:	1% Maximum
Isolation Voltage:	UL listed to 1270 VAC, tested to 5000 VAC
Frequency Range:	10-400 Hz
Sensing Aperture:	0.85" (21.6 mm) sq.
Case:	UL94 V0 Flammability Rated
Environmental:	-4 to 122°F (-20 to 50°C), <95% RH, non-condensing
Listings:	Designed to meet UL 508 Industrial Control Equipment
Dimensions:	3.53"W x 2.25"H x 1.18"D (90x57x30mm); 3.04" (77.2mm) mounting centers

- Average or TRMS sensing
- 800A to 1600A Full Scale
- 4-20mA Output
- Loop Powered

ATR-LS


ORDERING INFORMATION

P/N	Response	Range
AT-8-420-24L-LS	Average	0-800 A
AT-10-420-24L-LS	Average	0-1000 A
AT-12-420-24L-LS	Average	0-1200 A
AT-16-420-24L-LS	Average	0-1600 A
ATR-8-420-24L-LS	TRMS	0-800 A
ATR-10-420-24L-LS	TRMS	0-1000 A
ATR-12-420-24L-LS	TRMS	0-1200 A
ATR-16-420-24L-LS	TRMS	0-1600 A

SPECIFICATIONS

Power Supply:	24 VDC nominal (12-32 VDC)
Output:	4-20 mA Loop powered
Output Limit:	23 mA
Accuracy:	1% FS
Response Time:	600 ms (90% step change)
Range:	Fixed
Isolation Voltage:	Designed to meet UL 508 2200 VAC
Frequency Range:	AT: 50/60 Hz (average responding) ATR: 20-400 Hz (True RMS responding)
Sensing Aperture:	2.30" (58.42 mm) X 3.42" (86.87 mm)
Case:	UL94 V0 flammability rated, DIN rail mounting
Environmental:	-4 to 122°F (-20 to 50°C), <95% RH, non-condensing
Listings:	Designed to meet UL 508 Industrial Control Equipment
Dimensions:	4.82"W x 6.97"H x 3.75"D (123x177x96mm); DIN rail mounting

NK Technologies DC Current Transducers

- 3-wire Configuration
- 24V DC Powered
- DCV Output
- Solid Core

DT


ORDERING INFORMATION

P/N	Range	Output
DTB-005-24D-U-FF	0 - 50 A DC	0 - 5 V DC
DTB-010-24D-U-FF	0 - 50 A DC	0 - 10 V DC
DTC-005-24D-U-FF	0 - 100 A DC	0 - 5 V DC
DTC-010-24D-U-FF	0 - 100 A DC	0 - 10 V DC

SPECIFICATIONS

Power Supply:	24 VDC, <2 VA
Configuration:	3-wire (output low tied to power supply low)
Response Time:	500 ms
Accuracy:	±1% FS
Isolation Voltage:	Designed to UL 508 1270 VAC, tested to 5000 VAC
Sensing Aperture:	0.55" (14 mm) dia.
Case:	UL94 V0 Flammability Rated
Environmental:	-4 to 122°F (-20 to 50°C), <95% RH, non-condensing
Listings:	Designed to meet UL 508 Industrial Control Equipment
Dimensions:	3.30"W x 2.18"H x 0.92"D (84x56x24mm); 2.75" (69.9mm) mounting centers

Veris AC Current Transducers

- Solid & split core styles
- Ranges from 10 to 2400A
- DC V & 4-20 mA outputs
- Self or loop powered
- Multi-range models for versatility (switch selectable range)
- Removable & adjustable bracket for installation flexibility
- 100% solid state, no moving parts to fail
- 5-year warranty



H921
H922
H923

H221
H321
H421



H721
H722
H723



H822



SPECIFICATIONS

Sensor Power:	mA output: 30mA (max) @12-30VDC Voltage output: induced from monitored conductor
Insulation Class:	600VAC RMS (300VAC RMS on H723 & H923), CE: 300VAC RMS
Frequency:	50/60 Hz
Temperature Range:	-15° to 60°C (5° to 140°F), 10-90% RH non-condensing
Accuracy:	±2% F.S. from 10% to 100% of selected range (minimum ±0.4A on HC721 & HC921)
Response Time:	2 sec.
Terminal Block Wire Size:	24-14 AWG (0.2 to 2.1 mm ²)
Agency Approval:	UL 508 open device listing for 75°C insulated conductor
CE:	EN61010-1 CAT III, pollution degree 2, basic insulation (all models except H822 & H421)

ORDERING INFORMATION

Model	Full Range (A)	Output (DC)	Housing	Window	Range Select	Size (inches)	Agency	Mounting
H721LC	10/20/40	4-20mA	solid core	0.7"	switch	3.0x2.8x1.1	UL508	removable bracket, 3.8" mtg ctr
H721HC	50/100/200	4-20mA	solid core	0.7"	switch	3.0x2.8x1.1	UL508	removable bracket, 3.8" mtg ctr
H921	30/60/120	4-20mA	split core	0.8"	switch	3.1x2.8x1.4	UL508	removable bracket, 2.5" mtg ctr
H221	100 to 300	4-20mA	split core	1.4"	adjustment pot*	4.7x4.2x1.1	UL508	
H321	300 to 800	4-20mA	split core	2.5"	adjustment pot*	6.0x5.5x1.2	UL508	
H421	1000 to 2400	4-20mA	split core	2.5"	adjustment pot*	6.0x8.1x1.1	---	
H722LC	10/20/40	0-5V	solid core	0.7"	switch	3.0x2.8x1.1	UL508	removable bracket, 3.8" mtg ctr
H722HC	50/100/200	0-5V	solid core	0.7"	switch	3.0x2.8x1.1	UL508	removable bracket, 3.8" mtg ctr
H822	10	0-5V	solid core	0.7"	switch	2.8x2.3x1.1	UL508	removable bracket, 1.7" mtg ctr
H822-20	20	0-5V	solid core	0.7"	switch	2.8x2.3x1.1	UL508	removable bracket, 1.7" mtg ctr
H922	30/60/120	0-5V	split core	0.8"	switch	3.1x2.8x1.4	UL508	removable bracket, 2.5" mtg ctr
H723LC	10/20/40	0-10V	solid core	0.7"	switch	3.0x2.8x1.1	---	removable bracket, 3.8" mtg ctr
H723HC	50/100/200	0-10V	solid core	0.7"	switch	3.0x2.8x1.1	---	removable bracket, 3.8" mtg ctr
H923	20/100/150	0-10V	split core	0.8"	switch	3.1x2.8x1.4	---	removable bracket, 2.5" mtg ctr

*factory set fixed range also available. Add suffix SP & specify value.

Veris VFD Current Transducer & Switches

For load side monitoring of variable frequency drives

H720 Transducer

- 4-20 mA output
- 20-80 Hz frequency

H904 & H934 Switches

- Microprocessor design provides accurate status for VFD loads
- Monitors 4 frequencies to detect mechanical failures
- Automatically compensates for frequency & amperage changes
- Self-adjusting trip point to detect belt loss undercurrent
- Relay output for control (H934)



H720



H904

SPECIFICATIONS

Sensor Power:	H904/H934: Induced from monitored conductor; H720: 12-30VDC
Insulation Class:	600VAC RMS
Frequency Range:	H720: 10 to 80 Hz; H904/H934: 20 to 34 Hz for on/off status, 34 to 75 Hz for belt loss indication. On/Off status for Variable Frequency Drive (VFD) outputs
Temperature Range:	-15° to 60°C (5° to 140°F), 10-90% RH non-condensing
Off Delay (H904/H934):	0 sec to 2 min.
Status Output (H904/H934):	N.O. 0.1A@30VAC/DC; Min trip point: 3.5A or less
Relay (H934):	Contacts:5A @250VAC, 30VDC resistive; Coil: 10mA @24V AC/DC
Accuracy (H720):	0.5% of F.S. (combined linearity, hysteresis, and repeatability)
Terminal Block Wire Size:	24-14 AWG (0.2 to 2.1 mm ²)
Agency Approvals:	UL 508 open device listing CAT III, pollution degree 2, basic insulation

ORDERING INFORMATION

Model	Full Range (A)	Status Output	Housing	Window	Range Select	Size (inches)	Relay	Mounting
H720	20 to 200	4-20mA DC	solid core	0.7"	adjustment pots	3.2x2.2x1.0	---	removable bracket, 3.0" mtg ctr
H904	135	N. O. w/status LED	split core	0.8"	automatic	3.1x2.8x1.1	---	removable bracket, 2.5" mtg ctr
H934	135	N. O. w/status LED	split core	0.8"	automatic	3.1x2.8x1.1	SPST N.O.	removable bracket, 2.5" mtg ctr

Crompton AC Current and Voltage Transducers

- CE Compliant (CE Marked)
- Flexible Design with up to Three Transducers in One Housing
- UL Approved
- Enclosure to IEC529 (IP50)
- Flame Retardant
- 35 mm DIN Rail Mount or Key Hole Slots

AC Current, Voltage, Frequency and DC

- Average Sensing and True RMS
- Self Powered and Auxiliary
- Current Measuring to 0.5% Accuracy
- Isolated Input and Output

253 

FREQUENCY

Input	Frequency	Output	Catalog Number
120 VAC	45-55 Hz	0-1 mADC	253-THZU-PQFA-AG
120 VAC	55-65 Hz	0-1 mADC	253-THZU-PQFA-AN
120 VAC	45-65 Hz	0-1 mADC	253-THZU-PQFA-AJ
120 VAC	360-440 Hz	0-1 mADC	253-THZU-PQFA-BI

AC CURRENT

	Input	Auxiliary Power	Output	Catalog Number
AC Current—Average Sensing, Single-Phase	5A AC/60 Hz	Self	0-1 mADC	253-TAAU-LSFA-C6
	5A AC/60 Hz	120 VAC	4-20 mADC	253-TALU-LSHG-C6-DG
AC Current—Average Sensing, 3-Phase, 3 DC Outputs	5A AC/60 Hz	120 VAC	0-1 mADC	256-TASU-LSFA-C6-DG
	5A AC/60 Hz	120 VAC	4-20 mADC	256-TALU-LSHG-C6-DG
AC Current—True RMS Sensing, Single-Phase	5A AC/60 Hz	120 VAC	0-1 mADC	253-TARU-LSFA-C6-DG
AC Current—True RMS Sensing, 3-Phase, 3 DC Outputs	5A AC/60 Hz	120 VAC	0-1 mADC	256-TARU-LSFA-C6-DG
AC Current—Bi-Directional	5A AC/60 Hz	Self (120 VAC)	±1 mADC	256-TABU-LSM1-C6-PQ-T3

AC VOLTAGE

Input	Auxiliary Power	Output	Catalog Number
AC Voltage—Average Sensing, Single-Phase			
120 VAC/60 Hz	Self	0-1 mADC	253-TVAU-PQFA-C6
120 VAC/60 Hz	120 VAC	4-20 mADC	253-TVLU-PQHG-C6-DG
AC Voltage—True RMS Sensing, Single-Phase			
120 VAC/60 Hz	120 VAC	0-1 mADC	253-TVRU-PQFA-C6-DG
AC Voltage—True RMS Sensing, 3-Phase, 3 DC Outputs			
120 VAC/60 Hz	120 VAC	0-1 mADC	256-TVRU-PQFA-C6-DG
Input	System	Output	Catalog Number
AC Voltage—Average Sensing, 3-Phase, 3 DC Outputs			
120 VAC/60 Hz	3-Phase, 3-Wire	4-20 mADC	256-TVLU-PQHG-C6-DG
120 VAC/60 Hz	3-Phase, 4-Wire	0-1 mADC	256-TVSU-PQFA-C6-DG
Input	Auxiliary Power	Output	Catalog Number
AC Voltage—Suppressed Zero AC, Expanded Scale			
108-132 VAC	Self	0-1 mADC	253-TVZU-A9FA-C6

Crompton Transducers

AC Power Transducers

- Wide Range of Transducers to Measure All Forms of Power
- Available in Single-Phase, 3-Phase 3- or 4-Wire
- Self Powered Units Permit Voltage Variations Up to 20% of Nominal Input
- Measures both Import and Export Power
- Accuracy Class 0.5



DC/DC & TEMPERATURE

Input	Auxiliary Power	Output	Catalog Number
DC Current	120 VAC	0-1 mADC	256-TTAU-**FA-DG
DC Millivolts	120 VAC	0-1 mADC	256-TTMU-**FA-DG
DC Voltage	120 VAC	0-1 mADC	256-TTVU-**FA-DG
K Thermocouple	120 VAC	0-1 mADC	256-TTNU-KTFA-DG
T Thermocouple	120 VAC	0-1 mADC	256-TTCU-TTFA-DG
J Thermocouple	120 VAC	0-1 mADC	256-TTFU-JTFA-DG

AC POWER

System	Input	Type	Output	Catalog Number
AC Watts (Active Power)				
1 Ph, 2 Wire	120V/5A	1 Element	0-1 mADC	256-TWКУ-QQFA-C6-**
1 Ph, 3 Wire	240V/10A	1 Element	0-1 mADC	256-TWКУ-Q8FA-C6-**
3 Ph, 3 Wire	120V/5A	2 Element	0-1 mADC	256-TWMU-QQFA-C6-**
3 Ph, 4 Wire	120V/5A	2 ½ Element	0-1 mADC	256-TWNU-QQFA-C6-**
** Specify Range				
AC VARS (Reactive Power)				
1 Ph, 2 Wire	120V/5A	1 Element	0-1 mADC	256-TXКУ-QQFA-C6-**
1 Ph, 3 Wire	240V/10A	1 Element	0-1 mADC	256-TXКУ-Q8FA-C6-**
3 Ph, 3 Wire	120V/5A	2 Element	0-1 mADC	256-TXMU-QQFA-C6-**
3 Ph, 4 Wire	120V/5A	2 ½ Element	0-1 mADC	256-TXNU-QQFA-C6-**
** Specify Range				
AC VA (Apparent Power)				
1 Ph, 3 Wire	120V/10A	1 Element	0-1 mADC	256-TYКУ-QQFA-C6-**
3 Ph, 3 Wire	120V/5A	2 Element	0-1 mADC	256-TYMU-QQFA-C6-**
3 Ph, 4 Wire	120V/5A	2 ½ Element	0-1 mADC	256-TYNU-QQFA-C6-**
** Specify Range				
Power Factor (Suits Analog Meters) - Accuracy Class 0.2				
1 Ph, 2 Wire	120V/5A	0-1-0	1-0-1 mADC	256-XFSU-QQFA-C3-Z1-DG
1 Ph, 2 Wire	120V/5A	1-0-1-0-1	1-0-1 mADC	256-XFAU-QQFA-C3-E4-DG
3 Ph, 3 Wire	120V/5A	0-1-0	1-0-1 mADC	256-XFWV-QQFA-C3-Z1-DG
3 Ph, 3 Wire	120V/5A	1-0-1-0-1	1-0-1 mADC	256-XFGU-QQFA-C3-E4-DG
3 Ph, 4 Wire	120V/5A	0-1-0	1-0-1 mADC	256-XFVU-QQFA-C3-Z1-DG
3 Ph, 4 Wire	120V/5A	1-0-1-0-1	1-0-1 mADC	256-XFDU-QQFA-C3-E4-DG

Crompton Power & Energy Transducer Systems

- Replaces multiple single function transducers
- Measures up to 50 electrical parameters
- True 3 and 4 wire measurement
- Power, energy & power quality data
- Pulsed, analogue and digital outputs
- Programmable VT and CT ratios
- Local or remote configuration & monitoring
- DIN rail or base mounted styles

Up to 50 electrical and power quality parameters can be measured and communicated into building management systems or viewed through the PC configuration software.

These transducers can be programmed using the configuration software or the optional Integra display unit. The display unit can be permanently mounted near the transducer, or connected when configuration or status information is required.

SPECIFICATIONS

Input	Voltage	Current
Max Continuous:	120% nominal	120% nominal
Max Short Duration:	2x for 1 sec.	20x for 1 sec.
Burden:	< 0.2 VA	< 0.6 VA
PT Ratio (primary):	up to 400kV **	
CT Primary:	9999:5A **	
Outputs		
RS485:	Two wire half duplex	
Baud Rate:	2400, 4800, 9600, 19200	
Pulsed:	Clean contact SPNO, 100V DC 0.5A max	
Pulse Duration:	60, 100 or 200 milliseconds	
Auxiliary Supply		
AC/DC:	85-287 V AC / 85-312 V DC Absolute, 45-66 Hz	
DC:	10.2-60 V DC Absolute	
Supply Burden:	6VA	
Measuring Ranges		
Voltage:	80-120% of nominal (functional 5-120%)	
Current:	5-120% of nominal	
Frequency:	45-66Hz	
Power Factor:	0.8 capacitive to 0.8 inductive	
THD:	Up to 31st harmonic 0% - 40%	
Energy:	7 digit resolution	
Accuracy		
Voltage, Current:	±0.17% of range	
Frequency:	0.15% of mid frequency	
Power:	±0.2% of range	
Power Factor:	1% of unity	
Reactive Power (VAR):	±0.5% of range	
Apparent Power (VA):	±0.2% of range	
THD:	±1%	
Neutral Current:	±0.95% of range	
Energy:	KWh 1% IEC1036	
KVArh:	2%	
Analog Output:	±0.2%	
Operating Temperature:	-20 to +60°C, <90% RH	
Enclosure	Polycarbonate	
DIN Transducer:	5.5"H x 3.72"W x 3.72"D (140 x 95 x 95mm)	
Base Mount Transducer:	5.2"H x 3.74"W x 5.24"D (132 x 95 x 134mm)	
Display:	4.31"H x 4.31"W x 2.9"D (110 x 110 x 74mm)	
Panel Cut Out (Display):	4.06" (103mm) diameter, 4 studs	

** 360MW max at 120% of relevant input

1560 ▶



ORDERING INFORMATION

To Order: Insert Code for Each Letter to Select Catalog Number.

Example INT-1563-M-5-M-013-1

INT- - - - - -

A	Model
1561	single phase 5A CT input, DIN Rail
1562	single phase 3 wire 5A CT input, DIN Rail
1563	3 phase 3 wire 5A CT input, DIN Rail
1564	3 phase 4 wire 5A CT input, DIN Rail
1581	single phase 5A CT input, Base mount
1582	single phase 3 wire 5A CT input, Base mount
1583	3 phase 3 wire 5A CT input, Base mount
1584	3 phase 4 wire 5A CT input, Base mount
B	Input Voltage
L	57.7 - 139V L-N (1561 & 1581) 114 - 278 V L-L, 57.7 - 139V L-N (1562 & 1582) 100 - 240 V L-L, 57.7 - 139V L-N (1563,4 & 1583,4)
M	140 - 277 V L-N (1561 & 1581) 279 - 480 V L-L, 140 - 240V L-N (1562 & 1582) 241 - 480 V L-L, 140 - 277V L-N (1563,4 & 1583,4)
C	Input Current
5	5A (CT secondary)
D	Auxiliary Supply
L	12 - 48V DC
M	100 - 250V AC/DC
E	Communications Options
010	1 Modbus
012	1 Modbus, 2 analog
013	1 Modbus, 3 analog
014	1 Modbus, 4 analog
110	1 pulse/relay, 1 Modbus
112	1 pulse/relay, 1 Modbus, 2 analog
113	1 pulse/relay, 1 Modbus, 3 analog
114	1 pulse/relay, 1 Modbus, 4 analog
210	2 pulse/relay, 1 Modbus
212	2 pulse/relay, 1 Modbus, 2 analog
410	4 pulse/relay, 1 Modbus
412	4 pulse/relay, 1 Modbus, 2 analog
610	6 pulse/relay, 1 Modbus
612	6 pulse/relay, 1 Modbus, 2 analog
F	Analog Output Range
0	No output
1	0-20 mA, 10V compliance, user configurable as 4-20 mA (3 channels max)
2	0-1 mA, 10V compliance
3	-1/0/+1 mA, 10V compliance
4	0-5 mA, 10V compliance
6	0-10 mA, 10V compliance

Veris Split Core KW Transducers



- Meter electronics and current transformers in a single package
- Split-core system eliminates the need to remove conductors
- Automatic compensation for CT orientation
- Continuous TRMS Readings

SPECIFICATIONS

Input Primary Voltage	208-480VAC rms, 50/60Hz
Number of Phases Monitored	One or Three
Internal Isolation	2000VAC rms
Insulation Class	600VAC rms
Temperature Range	0 to 60°C, 50°C for 2400A
Humidity Range	0 to 95% non-condensing
Accuracy	±1%
Output	4-20mA
Supply Power (current loop)	9-30VDC; 30mA max.
CT Opening	Small 1.5" x 1.25" (38x32mm) Medium 2.9" x 2.45" (73x62mm) Large 5.5" x 2.45" (140 x 62mm)

Models with Modbus and Pulse Outputs also available.

ORDERING INFORMATION

Single CT Models for Use w/ Balanced 3Ø Loads or 1Ø 2 Wire Installations

Model	Voltage	Max. Amps	CT Size
VE/H8041-0100-2	208/240	100	small
VE/H8041-0300-2	208/240	300	small
VE/H8041-0400-3	208/240	400	medium
VE/H8041-0800-3	208/240	800	medium
VE/H8041-0800-4	208/240	800	large
VE/H8041-1600-4	208/240	1600	large
VE/H8041-2400-4	208/240	2400	large
VE/H8042-0100-2	480	100	small
VE/H8042-0300-2	480	300	small
VE/H8042-0400-3	480	400	medium
VE/H8042-0800-3	480	800	medium
VE/H8042-0800-4	480	800	large
VE/H8042-1600-4	480	1600	large
VE/H8042-2400-4	480	2400	large

Three CT Models for Use with Any 3Ø Load or 1Ø 3 Wire Installations

Model	Voltage	Max. Amps	CT Size
VE/H8043-0100-2	208	100	small
VE/H8043-0300-2	208	300	small
VE/H8043-0400-3	208	400	medium
VE/H8043-0800-3	208	800	medium
VE/H8043-0800-4	208	800	large
VE/H8043-4600-4	208	1600	large
VE/H8043-2400-4	208	2400	large
VE/H8044-0100-2	480	100	small
VE/H8044-0300-2	480	300	small
VE/H8044-0400-3	480	400	medium
VE/H8044-0800-3	480	800	medium
VE/H8044-0800-4	480	800	large
VE/H8044-1600-4	480	1600	large
VE/H8044-2400-4	480	2400	large

Veris Current Switch & Relay



H735 ▲

- Independent switch & relay operation
- Command & status in one device
- Adjustable setpoint
- Relay & switch status LEDs simplify setup



SPECIFICATIONS

Current Range:	1-135A
Sensor Power:	Induced
Insulation Class:	600VAC rms
Frequency Range:	50/60Hz.
Temperature Range:	-15° to 60°C
Humidity Range:	0-95% non-condensing
Setpoint Adjustable:	1-135A
Hysteresis:	10% Typical
Dimensions:	2.95" x 2.68" x 1.04"
Sensor Opening:	0.75" (19mm) Dia.

ORDERING INFORMATION

Model	Relay	Contacts*	Coil	Solid State Output
VE/H735	Form A (SPST)	5(3)A@250VAC, 30VDC, 1/6HP	24VAC/DC 10mA	0.1A@30VAC/DC N.O.
VE/H738	Form A (SPST)	10(5)A@250VAC, 30VDC, 1/3HP	24VAC/DC 10mA	1.0A@30VAC/DC N.O.
VE/H739	Form A (SPST)	10(5)A@250VAC, 30VDC, 1/3HP	24VAC/DC 10mA	0.2A@120VAC/DC N.O.
VE/H748	Form C (SPDT)	8(3.5)A@250VAC, 30VDC, 1/4HP	24VAC/DC 10mA	1.0A@30VAC/DC N.O.
VE/H749	Form C (SPDT)	8(3.5)A@250VAC, 30VDC, 1/4HP	24VAC/DC 10mA	0.2A@120VAC/DC N.O.
VE/H758	Form A (SPST)	10(5)A@250VAC, 30VDC, 1/3HP	9-12VDC 10mA	1.0A@30VAC/DC N.O.
VE/H759	Form A (SPST)	10(5)A@250VAC, 30VDC, 1/3HP	9-12VDC 10mA	0.2A@120VAC/DC N.O.

* Resistive load (inductive load).

Also available in split core style (H930 series)

NK Technologies Ground Fault Relays

- Large 1.82" (46.2mm) window
- 3 digit trip point display
- SPDT relay output
- Adjustable setpoint & delay
- Test button
- DIN rail mounting
- AC or DC powered

AGLD


AGLD Series Ground Fault Sensors keep machinery and their operators safe from accidental shocks. The large, one piece solid-core design allows for installation over wires feeding heavy loads. The output relay will change state at any point between 5 and 100 mA, or 80 and 950 mA. A delay can be set to allow down stream protection to activate before this sensor, keeping the main circuit protection hot and the equipment energized while the smaller faults are cleared. The large LED display shows the precise trip point and the extra delay clearly, in any light condition. The display flashes when there is current sensed over the trip point.

SPECIFICATIONS

Power Supply:	120 VAC or 24 VAC/DC (22-36 V)
Consumption:	<4 VA
Output:	SPDT (form C) electromechanical relay, 1 A @ 120 VAC, 2 A @ 30 VDC Max.
Output Operation:	Normally energized or normally de-energized
LED Display:	3 digits, shows trip point in mA. Displays delay period when adjusted (ms X10) Off: Power off
Response Time:	30-980 ms
Response Adjust:	Single turn potentiometer
Setpoint Range:	5-100 mA or 80-950 mA
Setpoint Adjust:	Single turn potentiometer
Isolation Voltage:	Tested to 5000 VAC
Frequency Range:	50-60 Hz
Environment:	-4 to 122°F (-20 to 50°C), <95% RH, non-condensing
Case:	DIN rail mount, UL94 V0 flammability rated
Dimensions:	4.2" H x 3.0" W x 3.25" D (107 x 76 x 83 mm)
Sensing Aperture:	1.82" (46.2 mm)
Listings:	Designed to meet UL 508 Industrial Control
Warranty:	5 years

ORDERING INFORMATION

	Range	Supply	Relay
AGLD-1-SDT-24U-DEN-ADJ	5-100 mA	24 VAC/DC	Normally de-energized
AGLD-1-SDT-24U-ENE-ADJ	5-100 mA	24 VAC/DC	Normally energized
AGLD-1-SDT-24U-LA-ADJ	5-100 mA	24 VAC/DC	Latching
AGLD-1-SDT-120-DEN-ADJ	5-100 mA	120 VAC	Normally de-energized
AGLD-1-SDT-120-ENE-ADJ	5-100 mA	120 VAC	Normally energized
AGLD-1-SDT-120-LA-ADJ	5-100 mA	120 VAC	Latching
AGLD-2-SDT-24U-DEN-ADJ	80-950 mA	24 VAC/DC	Normally de-energized
AGLD-2-SDT-24U-ENE-ADJ	80-950 mA	24 VAC/DC	Normally energized
AGLD-2-SDT-24U-LA-ADJ	80-950 mA	24 VAC/DC	Latching
AGLD-2-SDT-120-DEN-ADJ	80-950 mA	120 VAC	Normally de-energized
AGLD-2-SDT-120-ENE-ADJ	80-950 mA	120 VAC	Normally energized
AGLD-2-SDT-120-LA-ADJ	80-950 mA	24 VAC/DC	Latching

NK Technologies Large AC Current Sensing Switches

- Sense currents to 1600 A
- Split-core for easy installation
- SPDT relay output
- Adjustable setpoint & delay
- Status LED
- DIN rail or panel mounting
- AC or DC powered

ASXP


SPECIFICATIONS

Power Supply:	120 VAC or 24 VAC/DC (22-36 V)
Consumption:	<4 VA
Output:	SPDT (form C) electromechanical relay, 1 A @ 120 VAC, 2 A @ 30 VDC Max.
Setpoint Adjust:	Single turn potentiometer with setpoint shown on label
Hysteresis:	5% of setpoint
Indicating:	Bi-Color LED Green: Power on, current within range Red: Power on, current over Setpoint Off: Power off or current less than 20% of range
Response Time:	400-900 ms (Current 90% over setpoint)
Output Operation:	Normal or Fail-Safe (selectable)
Start Delay:	0.5 to 16 seconds (single turn potentiometer adjust)
Isolation Voltage:	Tested to 5000 VAC
Frequency Range:	10-100 Hz (6-100 Hz for MS series)
Environment:	-4 to 122°F (-20 to 50°C), <95% RH, non-condensing
Case:	Panel or DIN rail mount, UL94 V0 flammability rated
LS Case Dimensions:	Core: 6.97" x 4.82" x 1.34" (177 x 122.4 x 34 mm) Base: 3.10" x 3.75" x 1.48" (78.7 x 95.1 x 37.6 mm)
MS Case Dimensions:	Core: 3.16" x 3.43" x 1.17" (80.3 x 87.1 x 29.7 mm) Base: 3.10" x 3.75" x 1.48" (78.7 x 95.1 x 37.6 mm)
Sensing Aperture:	LS Case: 2.3" x 3.42" (58.42 x 86.87 mm) MS Case: 2.22" x 1.19" (56.4 x 30.1 mm)
Listings:	Designed to meet UL 508 Industrial Control
Warranty:	5 years

ORDERING INFORMATION

ASXP2-SDT-24U-MS	50-200 A, 24 VAC/DC supply, MS case
ASXP4-SDT-24U-MS	100-400 A, 24 VAC/DC supply, MS case
ASXP6-SDT-24U-MS	150-600 A, 24 VAC/DC supply, MS case
ASXP8-SDT-24U-MS	200-800 A, 24 VAC/DC supply, MS case
ASXP2-SDT-120-MS	50-200 A, 120 VAC supply, MS case
ASXP4-SDT-120-MS	100-400 A, 120 VAC supply, MS case
ASXP6-SDT-120-MS	150-600 A, 120 VAC supply, MS case
ASXP8-SDT-120-MS	200-800 A, 120 VAC supply, MS case
ASXP8-SDT-24U-LS	200-800 A, 24 VAC/DC supply, LS case
ASXP10-SDT-24U-LS	400-1000 A, 24 VAC/DC supply, LS case
ASXP12-SDT-24U-LS	600-1200 A, 24 VAC/DC supply, LS case
ASXP16-SDT-24U-LS	1000-1600 A, 24 VAC/DC supply, LS case
ASXP8-SDT-120-LS	200-800 A, 120 VAC supply, LS case
ASXP10-SDT-120-LS	400-1000 A, 120 VAC supply, LS case
ASXP12-SDT-120-LS	600-1200 A, 120 VAC supply, LS case
ASXP16-SDT-120-LS	1000-1600 A, 120 VAC supply, LS case

NK Technologies AC Current Switches

If you control or monitor electric powered loads, you need current switches. Monitor fans, pumps, lights, and heaters for proper operation. Current switches give positive feedback that the load is operating and are much easier to install than alternatives like pressure switches, optical sensors, or zero speed switches.

AS and ASX current switches combine a current sensor, signal conditioner, and limit alarm in a single package. AS1 series are well suited to automation systems of all kinds with their universal solid-state outputs and a wide frequency response. AS3 series have a high current output that works well with relay logic control schemes. ASX series combine the AS3 design with a built in adjustable time delay. All models feature high visibility LED indication and rugged construction. AC monitoring models are available in solid and split core cases.



SPECIFICATIONS

	AS1 Series	AS3 Series	ASX Series	NEW
Power Required:	None – Self Powered	None – Self Powered	None – Self Powered	
Setpoint Range:	1-150A (fixed core) 1.5-150A (split core)	1-6, 6-40, 40-175A (fixed core) 1-6, 6-40, 40-200A (split core)	1.5-12, 12-55, 50-200 A	
Isolation Voltage:	UL Listed to 1270 VAC	UL Listed to 1270 VAC	UL Listed (pending) to 1270 VAC	
Frequency Range:	6-100 Hz	6-100 Hz	50-100 Hz	
Outputs				
Solid State N.O.:	0.2A @ 240 VAC/VDC	1A @ 240 VAC	1.0A @ 240 VAC	
Solid State N.C.:	0.2A @ 135 VAC/VDC	1A @ 240 VAC	1.0A @ 240 VAC	
Solid State -15 Option:	N/A	15A @ 120 VAC, 10A @240 VAC	N/A	
Off State Leakage:	None	NC only: 2.5 mA	NC only: 2.5 mA	
Response Time:	0.120 Second	0.120 Second	0.1 Second	
Hysteresis:	5% of Setpoint	5% of Setpoint	5% of Setpoint	
Sensing Aperture:	0.55", 14 mm Dia. (FF Case) 0.75", 19 mm Dia. (FT Case) 0.85", 21.5 mm Sq. (SP Case)	0.55", 14 mm Dia. (FF Case) 0.85", 21.5 mm Sq. (SP Case)	0.75", 19 mm Dia. (FT Case) 0.85", 21.5 mm Sq. (SP Case)	
Case:	UL 94V-0 Flammability Rated	UL 94V-0 Flammability Rated	UL 94V-0 Flammability Rated	
Environmental:	-58 to 149° F (-50 to 65° C) 0-95% RH, Non-condensing	-58 to 149° F (-50 to 65° C) 0-95% RH, Non-condensing	5 to 158° F (-15 to 70° C)	
Listings:	UL and ULC 508 Listed, CE	UL and ULC 508 Listed, CE	UL and ULC 508, CE (pending)	

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Example: AS1 - NCU-FT

A - B - C - D

A	Basic Model		C	Case and Connection
	AS1	AC Sensing, Single Range	FF	Fixed Core, Front Connection
	AS3, ASX	AC Sensing, 3 Ranges	FT	Fixed Core, Top Connection (AS1, ASX only)
B	Output		SP	Split Core
	NOU	AS1 Normally Open	D	Options
	NCU	AS1 Normally Closed	GO	Fixed GO/No-GO Setpoint (AS1 only)
	NOAC	AS3, ASX, Normally Open	(blank)	Adjustable Setpoint
	NCAC	AS3, ASX, Normally Closed	NL	No LED (AS1, AS3 only)
			15	15A @ 120 VAC Output (AS3 only)

NK Technologies Easy Setup AC Current Switches

- Trip point can be set before installation or with no load present
- Trip point indicated on potentiometer label
- Self-powered
- 2 second inrush delay
- 5 year warranty



ORDERING INFORMATION

P/N	Full Scale Range	Output	Case
ASL1-NOU-FF	1-10 A *	N.O.	Solid-core
ASL1-NCU-FF	1-10 A *	N.C.	Solid-core
ASL2-NOU-FF	10-50 A **	N.O.	Solid-core
ASL2-NCU-FF	10-50 A **	N.C.	Solid-core
ASL3-NOU-FF	50-100 A	N.O.	Solid-core
ASL3-NCU-FF	50-100 A	N.C.	Solid-core
ASL4-NOU-FF	100-150 A	N.O.	Solid-core
ASL4-NCU-FF	100-150 A	N.C.	Solid-core

For split-core, replace FF with SP. Split-core range: * 2-20 A ** 20-50 A

SPECIFICATIONS

Output Type:	Solid-state universal contact (AC/DC)
Accuracy:	±1%
Repeatability:	1.0% FS
Response Time:	100 ms (to 90% step change)
Frequency Range:	AC 10-100 Hz
Power Supply:	Self-powered from the monitored circuit
Relay Capacity:	150 mA up to 240 VAC/DC N.O. 200 mA up to 135 VAC/DC N.C.
Linearity:	1.00% FS
Current Range:	1-150 A
Sensing Aperture:	FF Case: 0.55" (19 mm) diameter SP Case: 0.85" (21.6 mm) diameter
Case:	UL94 V0 Flammability Rated
Environment:	-4 to 122°F (-20 to 50°C) 0-95% RH, non-condensing
Listings:	UL/cUL, CE
FF Case Dimensions:	3.3"W x 2.2"H x 0.92"D (83.8x55.4x23.2mm); 2.75" (69.9mm) mounting centers
SP Case Dimensions:	3.53"W x 2.7"H x 1.19"D (90x69x30.2mm); 3.04" (77.2mm) mounting centers

- Digital display of trip point
- Top access trip adjustment
- Long life solid-state output
- AC or DC powered
- Solid core
- 5 year warranty



ORDERING INFORMATION

P/N	Range	Output
ASD1-NOAC-24U-FL	1-50 A	N.O.
ASD1-NCAC-24U-FL	1-50 A	N.C.
ASD2-NOAC-24U-FL	4-200 A	N.O.
ASD2-NCAC-24U-FL	4-200 A	N.C.

SPECIFICATIONS

Power Supply:	24 VAC/DC (< 2 VA consumption)
Digital Output:	Magnetically isolated solid-state switch
Output Rating:	1.0 A up to 240 VAC (AC only)
Off-State Leakage:	<10 μA normally open, <2.5 mA normally closed
Contact Response Time:	40-120 ms
Setpoint Range:	ASD1: 1-50 A (adjustable) ASD2: 4-200 A (adjustable)
Hysteresis:	5% of setpoint
Isolation Voltage:	Tested to 5000 VAC
Frequency Range:	6-100 Hz
Sensing Aperture:	0.74" (19 mm) diameter
Case:	UL94 V0 Flammability Rated
Environmental:	-4 to 122°F (-20 to 50°C), <95% RH, non-condensing
Listings:	Designed to meet UL 508 Industrial Control Equipment
Dimensions:	3.9"W x 2.9"H x 1.5"D (99x74x38mm); 3.38" (85.8mm) mounting centers

NK Technologies DC Current Switches

- DC & AC sensing
- Relay or solid-state output
- AC or DC powered
- 3 kV isolation
- Solid core
- 5 year warranty



ORDERING INFORMATION

P/N	Output Type	Power
DS3-SDT-24U	SPDT relay (Form C)	24 V AC/DC
DS3-NOU-24U	Solid-state N.O.	24 V AC/DC
DS3-SDT-12U	SPDT relay (Form C)	12 V AC/DC
DS3-NOU-12U	Solid-state N.O.	12 V AC/DC

SPECIFICATIONS

Output:	Isolated dry contact
Output Rating:	Solid-state: 0.15 A @ 240 VAC or VDC (N.O. Only) Relay: 5.0 A @ 240 VAC, 5.0 A @ 30 VDC (SPDT)
Off-state Leakage:	<10 μA
Response Time:	100 ms (10% above setpt), 20 ms (100% above setpt)
Setpoint Range:	DC: 2-20, 10-50 and 20-100 A, jumper selectable; Derate by $\sqrt{2}$ for AC
Hysteresis:	5% of setpoint
Isolation Voltage:	3 kV
Frequency Range:	DC to 400 Hz
Sensing Aperture:	0.75" (19.1 mm) dia.
Case:	UL94 V0 Flammability Rated
Environment:	-4 to 122°F (-20 to 50°C) 0-95% RH, non-condensing
Listings:	UL 508 Industrial Control Equipment (US & Canada), CE
Dimensions:	3.9"W x 2.9"H x 1.5"D (99x74x38mm); 3.38" (85.8mm) mounting centers

NK Technologies Compact AC Current Switches

- Fixed 0.5A trip point
- Long life solid-state output
- No external power required
- Normally open or normally closed output
- 5 year warranty



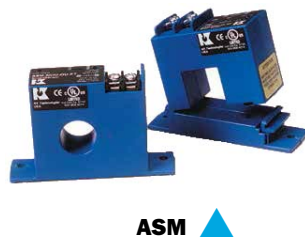
ORDERING INFORMATION

P/N	Description
AS1-NOU-CC	Compact AC Current Switch with N.O. Output
AS1-NCU-CC	Compact AC Current Switch with N.C. Output

SPECIFICATIONS	
Output/Indication:	Solid-state contact, normally open or normally closed
Indicating Range:	0.5 A trip point
Output Rating:	150 mA, 120 VAC or DC max.
Dimensions:	1.125"W x 0.56"D x 1.5"H
Aperture:	0.30" ID
Pigtail Leads:	24"
Case:	UL94 V0 Flammability Rated
Mounting:	Slides directly onto monitored conductor
Environment:	-4 to 122°F (-20 to 50°C), 0-95% RH, non-condensing
Frequency Response:	50-400 Hz
Listings:	UL/cUL, CE

NK Technologies Smart AC Current Switches

- Self-calibrating trip points
- Over, under or over/under limit detection
- Long life solid-state output
- No external power required
- Solid and split-core styles
- 5 year warranty



It takes just a couple seconds of steady running conditions for the sensor to lock onto the normal current level. Upon sensing the average operating current, the ASM self-learns and establishes a limit-alarm trip point at 85% or 125% of the normal current (underload or overload).

SPECIFICATIONS

Power Supply:	None—Self-powered
Output:	Magnetically isolated solid-state relay
Output Rating:	N.O. Version: 0.30 A @ 135 VAC or VDC (Not polarity sensitive) N.C. Version: 0.20 A @ 135 VAC or VDC
Off-state Leakage:	<10 μ A
Response Time:	200 ms
Setpoint Range:	Solid-core: 1.5-150 A Split-core: 2.8-150 A
Setpoint:	Overload: +25% of Load (-OL) Underload: -15% of Load (-UL) Over/Underload: -15 to +25% of load (OU)
Hysteresis:	5% of setpoint
Overload:	500 A @ 6sec., 1000 A @ 1sec.
Isolation Voltage:	UL listed to 1270 VAC, tested to 5000 VAC
Frequency Range:	6-100 Hz
Dimensions:	3.50" x 2.25" x 1.20", 3.04" mounting centers
Aperture:	0.74"-0.85"
Case:	UL94 V0 Flammability Rated
Environment:	-4 to 122°F (-20 to 50°C), 0-95% RH, non-condensing
Listings:	UL/cUL, CE

ORDERING INFORMATION

P/N	Output	Operation	Case
ASM-NOU-OL-FT	N.O.	Overload	Solid-core
ASM-NOU-UL-FT	N.O.	Underload	Solid-core
ASM-NOU-OU-FT	N.O.	Over/Underload	Solid-core
ASM-NCU-OL-FT	N.C.	Overload	Solid-core
ASM-NCU-UL-FT	N.C.	Underload	Solid-core
ASM-NCU-OU-FT	N.C.	Over/Underload	Solid-core
ASM-NOU-OL-SP	N.O.	Overload	Split-core
ASM-NOU-UL-SP	N.O.	Underload	Split-core
ASM-NOU-OU-SP	N.O.	Over/Underload	Split-core
ASM-NCU-OL-SP	N.C.	Overload	Split-core
ASM-NCU-UL-SP	N.C.	Underload	Split-core
ASM-NCU-OU-SP	N.C.	Over/Underload	Split-core

NK Technologies AC Current Indicators

- Provides quick visual indication of current flow
- Integral or remote LED
- No external power required
- Small size mounts easily on conductor
- 5 year warranty



ORDERING INFORMATION

P/N	Description
ACI-0.5-L	AmpFlasher AC Current Indicator with integral LED
ACI-0.5-P	AmpFlasher AC Current Indicator with LED on 24" leads

SPECIFICATIONS	
Output/Indication:	Standard: LED (flashing, red) Optional: 24" Pigtails for Remote LED
Indicating Range:	0.5 A-100 A
LED On Trip Point:	<500 mA (factory set)
Dimensions:	1.125"W x 0.56"D x 1.5"H
Aperture:	0.30" ID
Pigtail Leads:	24"
Case:	UL94 V0 Flammability Rated
Mounting:	Slides directly onto monitored conductor
Environment:	-4 to 122°F (-20 to 50°C), 0-95% RH, non-condensing
Frequency Response:	50-400 Hz
Listings/Certifications:	UL 508 Industrial Control Equipment (USA & Canada)

Noshok Pressure Transducers and Transmitters

- Thin Film and Diffused Semiconductor Sensor
- High Accuracy and Long Term Stability
- Ranges from 2 through 10,000 psi
- Corrosion Resistant Stainless Steel Construction
- Span and Zero Adjustments

Noshok Series 615 and 625 pressure transmitters and transducers are designed to provide a previously unequalled level of performance, utilizing diffused semiconductor or sputtered thin film technology. Series 625 transmitters were developed for applications that require pressure measurement in potentially explosive environments. RFI, EMI, and ESD protection has been engineered in as a standard feature.


615/625


SPECIFICATIONS

Output Signal:	4-20 mA, 2-wire; 1-5 Vdc, 1-6 Vdc, 0-5 Vdc and 0-10 Vdc, 3-wire
Pressure Ranges:	Vacuum and compound through 10,000 psi
Proof Pressure:	0-2 psi through 0-10000 psi: 1.5 times range
Burst Pressure:	0-2 psi through 0-7500 psi: 4 times range 0-10000 psi; 2 times range
Accuracy BFSL: (includes repeatability, hysteresis, and linearity)	± 0.25% FS (standard) ± 0.125% FS (standard)
Input Excitation:	10-30 Vdc for current output 14-30 Vdc for voltage output
Stability:	± 0.2 %FS per year
Temperature Ranges:	Compensated 32 ° to 175 °F/0 to 80 °C Effect ±0.01%/°F of zero and span Medium: 20 ° to 212 °F/-30 ° to 100 °C Ambient: 15 ° to 175 °F/-10 ° to 80 °C
Response Time:	Less than 1 ms
Durability:	100 million cycles minimum
Adjustment:	±5% FS of zero and span
Environmental Protection:	NEMA 4X, IP65 (IEC 529)
Electromagnetic Capability per IEC 1000 (EN 50081, EN 50082):	4-2 ESD Level 2 4-3 Fields (RFI) Level 2, (EN 50081, EN 50082) 4-4 Burst Level 3, 4-5 Surge Level 2
Electrical Protection:	Reverse polarity, overvoltage, and short circuit protection
Shock:	Less than ±0.05% FS effect for 100 g's @ 20 ms
Vibration:	Less than ± 0.01% FS effect for 15 g's @ 0-2000 Hz

ORDERING INFORMATION

To Order Insert Number Code for Each Letter to Select Catalog Number

A - B - C - D - E - F

A	Basic Unit			
615	High Performance			
625	Intrinsically Safe; FM, CSA approved			
B	Pressure Range			
	Code	Range	Code	Range
	30V	0-30 "Hg VAC	30/60	30 "Hg/60 psig
	30/15	30 "Hg/15 psig		
	2	0- 2 psig		
	5	0-5 psig	500	0-500 psig
	15	0-15 psig	750	0-750 psig
	30	0-30 psig	1000	0-1000 psig
	60	0-60 psig	2000	0-2000 psig
	100	0-100 psig	3000	0-3000 psig
	150	0-150 psig	5000	0-5000 psig
	300	0-300 psig	7500	0-7500 psig
			10000	0-10,000 psig
C	Accuracy (BFSL)			
1	±0.25% of FS			
2	±0.125% of FS			
D	Output Signal			
1	4-20 mA dc 2-wire			
2	0-5 Vdc, 3-wire (615 only)			
5	0-10 Vdc, 3-wire (615 only)			
E	Process Connections			
2	1/4" NPT male			
8	1/2" NPT male			
F	Electrical Connections			
1	36" cable (connected to option 8)			
3	6 Pin BENDIX (615 only)			
6	1/2" NPT conduit with 36" cable (615 only)			
8	Hirschmann with mating connector			
G	Options			
ORF	Stainless Steel Threaded Orifice			

Series 1800 Attachable Loop Indicator

SPECIFICATIONS

Display:	0.4" digits, -1999 to 9999
Accuracy:	±0.2 % Full Scale, ±1 digit
Update rate:	5 times/second
Filtering:	Digital, field selectable .2, .5, 1 or 1.5 seconds
Range:	The 4-20mA signal from the transmitter can be assigned any display value within the display range. Both scaling points are individually adjustable using the push buttons inside the case
Temp:	Ambient 32 ° to 122°F (0 ° to 50 °C) Effect : ±0.006% Full Scale/ °F
Electrical:	Requires 4-20mA output and Hirschmann (DIN 43650A) connector
Environmental:	IP65, NEMA 4X according to EN 60529/IEC529

Series 1800 Attachable Loop Indicator

- 4 Digit LCD Display
- Rotates for Best Viewing
- Field Installable on 615 Series

ORDERING INFORMATION

NO/1800



Noshok Pressure Transducers and Transmitters

- Thin Film and Diffused Semiconductor Sensor
- High Accuracy and Long Term Stability
- RFI, EMI, and ESD Protection per IEC 1000
- High Overpressure Protection
- Corrosion Resistant Stainless Steel Construction

Series 100 and 200 pressure transmitters and transducers are designed to provide a previously unequalled level of performance, utilizing diffused semiconductor or sputtered thin film technology. Series 100 and 200 transducers are highly accurate, shock resistant and extremely stable over a long period of time.

ORDERING INFORMATION

To Order: Insert Number Code for Each Letter to Select Catalog Number
Order Example: 100-7500-1-5-2-7-ORF

A	B	C	D	E	F
A Basic Unit					
100	4-20 mAdc Output				
200	DC Voltage Output				
B Pressure Range					
Code	Range	Code	Range		
30V	0-30" VAC	30/60	30"/60 psig		
30/15	30"/15 psig	30/150	30"/150 psig		
30/30	30"/30 psig				
5	0-5 psig	1000	0-1000 psig		
30	0-30 psig	1500	0-1500 psig		
60	0-60 psig	2000	0-2000 psig		
100	0-100 psig	3000	0-3000 psig		
200	0-200 psig	5000	0-5000 psig		
300	0-300 psig	7500	0-7500 psig		
500	0-500 psig				
10000	0-10000 psig				
15A	0-15 psia	150A	0-150 psia		
30A	0-30 psia	200A	0-200 psia		
60A	0-60 psia	300A	0-300 psia		
100A	0-100 psia				
C Accuracy (BFSL)					
1	±0.5% of FS				
2	±0.25% of FS				
D Output Signal					
1	4-20 mAdc, 2-wire (100 only)				
2	0-5 Vdc, 3-wire (200 only)				
4	1-6 Vdc, 3-wire (200 only)				
5	0-10 Vdc, 3-wire (200 only)				
E Process Connections					
1	1/8" NPT male				
2	1/4" NPT male				
3	7/16" 20 UNF-2A male				
F Electrical Connections					
1	36" cable (connected to option 7)				
2	4-pin BENDIX				
3	6-pin BENDIX				
6	1/2" NPT Conduit with 36" Cable				
7	Mini Hirschmann with mating connector				
G Options					
ORF	Stainless steel threaded orifice				



100



SPECIFICATIONS

Output Signal:	4-20 mA, 2-wire; 0-5V, 3-wire; 0-10V, 3-wire; 1-6V, 3-wire; 1-5V, 3-wire; 1-11V, 3-wire
Pressure Ranges:	Vacuum and compound through 15,000 psi; gauge and absolute
Proof Pressure:	0-5, 0-10, 0-7500 through 0-15000 psi: 1.5 times 0-15 psi through 0-6000 psi: 2 times range
Burst Pressure:	0-5, 0-10, 0-7500 through 0-15000 psi: 2 times 0-15 psi through 0-6000 psi: 5 times range
Accuracy BFSL: (includes repeatability, hysteresis, and linearity)	±0.5% FS (standard) ±0.25% FS (optional)
Repeatability:	±0.05% FS
Hysteresis:	±0.1% FS
Input Excitation:	14-30 Vdc for voltage output; 12-30 for 4-20 mA
Temperature Ranges:	Compensated 0 ° to 175 °F/-16 to 80°C Effect ±0.02% FS/°F for zero and span Medium -22 ° to 212 °F/-30 ° to 100 °C Ambient -40 ° to 185 °F/-40 ° to 85 °C
Response Time:	Less than 1 ms (between 10-90% FS)
Durability:	100 million cycles minimum
Adjustment:	±5% FS of zero and span
Environmental Protection:	NEMA 4X, IP65 (IEC 529)
Electromagnetic Compatibility per IEC 1000 (EN 50081, EN 50082):	4-2 ESD Level 2 4-3 Fields (RFI) Level 2, (EN 50081, EN 50082) 4-4 Burst Level 3, 4-5 Surge Level 2
Electrical Protection:	Reverse polarity, overvoltage, and short circuit protection
Shock:	Less than ±0.05% FS effect on 100 g's @ 20 ms on any axis
Vibration:	Less than ±0.05% FS effect for 30 g's @ 5-2000 Hz on any axis

Noshok Pressure Transmitter

- Up to 20:1 Span Turn Down
- Proven Diffused Semiconductor or Sputtered Thin Film Strain Gage Technology
- Built-in Process Temperature Display
- Built-in Selectable Process Digital Filtering
- Welded 316 S/S Pressure Chamber
- 32 Point Process Linearization
- Adjustable Display for Easy Viewing
- 12 Different Measurement Units
- CE Compliant

The NOSHOK Series 750 digital pressure transmitter combines the reliability and long life of diffused semiconductor and sputtered thin film strain gage sensors with digital electronics for outstanding performance and value. With up to 20:1 span turn down and -2.5 to 99% zero point adjustment there is maximum flexibility to meet the most unusual application requirements. Additional features including 32 point process linearization, adjustable display orientation and integral process temperature measurement give the Series 750 an advantage over many other pressure transmitters.



▲ 750

ORDERING INFORMATION

To Order Insert Number Code for Each Letter to Select Catalog Number
Order Example: 750-1500-1-1-2-1-ORF

A	B	C	D	E	F
A Basic Unit					
750	Digital Pressure Transmitter				
B Pressure Range	Code	Range	Code	Range	
	5	0 to 5 psig	1500	0 to 1500 psig	
	25	0 to 25 psig	3000	0 to 3000 psig	
	100	0 to 100 psig	7500	0 to 7500 psig	
	250	0 to 250 psig	15000	0 to 15000 psig	
	500	0 to 500 psig			
	5A	0 to 5 psia	100A	0 to 100 psia	
	25A	0 to 25 psia	250A	0 to 250 psia	
C Accuracy (BFSL)					
1	±0.05% of FS				
D Output Signal					
1	4 to 20 mA, 2-wire				
E Process Connections					
2	1/4" NPT male				
8	1/2" NPT male				
F Electrical Connections					
1	Cable gland M2-x1.5 with internal terminal block, accepts cable diameter from .25 to .5 inch				
G Options					
ORF	Stainless steel threaded orifice				

SPECIFICATIONS

Output Signal:	4 to 20 mA, 2-wire
Accuracy	±0.05% Full Scale (Best Fit Straight Line), including the effects of linearity, hysteresis and repeatability; ±0.15% Full Scale for 0 to 15000 psig range
Total accuracy:	±0.15% Full Scale Full Scale, including the effects of linearity, hysteresis
Hysteresis:	±0.04% Full Scale
Repeatability:	±0.05% Full Scale
Stability:	±1 % Full Scale for 1 year
Pressure ranges:	Standard ranges from vacuum through 15,000 psig
Proof pressure:	3.5 times Full Scale for ranges through 0 to 250 psig; 2 times Full Scale for ranges greater than 0 to 250 psig through 0 to 7,500 psig; 1.2 times Full Scale for 0 to 15,000 psig;
Burst Pressure	5 times Full Scale for ranges 0 to 5psi through 0 to 7 500 psi 2 times Full Scale for higher ranges
Power supply:	10 to 30 Vdc, unregulated
Turn down effect on accuracy	Turn down up to 5:1, no effect on accuracy
Adjustment:	Turn down greater than 5:1, accuracy x turndown/5
Response time:	<10 milliseconds (between 10% and 90% Full Scale)
Temperature ranges	Compensated -4° to 176°F (-20° to 80°C) Zero effect is ±0.01% Full Scale/°F within compensated range Span effect is ±0.01% Full Scale/°F within compensated range Ambient -4° to 158°F (-20° to 70°C) Media -22° to 221°F (-30 to 105°C) Storage -31° to 176°F (-35 to 80°C)
Wetted materials:	316 stainless steel (ranges up through 0 to 250 psi) 316 stainless steel with 17-4PH stainless steel diaphragm (ranges 0 to 500 psig and higher)
Housing material:	Fiberglass reinforced PBT (polybutylene terephthalate)
Environmental rating:	IP65, NEMA 4X according to EN 60529/IEC529
Electromagnetic rating:	CE compliant, emission to EN 50081-1. EN 50081-2 compatibility and EN 50082-2 (Radio Frequency Interference, Electromagnetic Interference and Electrostatic Interference protection)
Electrical rating:	Reverse polarity, over-voltage and short circuit protection
Shock:	100g's according to IEC770 for mechanical shock
Vibration:	5g's according to IEC770 under resonance conditions
Weight:	Approximately 24 oz.

Ashcroft Digital Pressure Gauges

- 4 1/2" Digit Display, 1/2" Character Height
- Maximum Pressure Indication
- Selectable Engineering Units
- Chemical Resistant Case
- Optional Weatherproof Boot

The D1005PS is a versatile and economical choice for general pressure applications. Stainless steel wetted parts are suitable for dry air and many other media. Popular features such as backlight, peak hold and engineering units display are standard on the D1005PS.



D1005PS

SPECIFICATIONS

Case Size:	2 1/2", Noryl®
Accuracy:	1/2% FS standard, 1/4% available
Connection:	1/4 NPT, bottom
Power:	2 AAA batteries 4 level battery indicator in display
Temperature:	-10 °C to 60 °C (14-140 °F)
Proof Pressure:	200%, up to 1000psi 150%, 3000 & 5000psi 120%, 9999psi

Keypad Functions:

Auto/Off:	Never, 5, 10, 20 minutes
Backlight:	4 auto off options
Max (Peak Hold):	Displays peak value
Zero/Clear:	Zeroes display or clears max value
Engineering Units:	psi, in.H ₂ O, cmHg, mmHg, kPa, mPa, Bar, kg/cm ² , ft.H ₂ O
Field Calibration:	Zero and span

ORDERING INFORMATION

To Order - Insert Range Code and Units to Complete Catalog Number.
AS/D1005PS02L - 30psi

AS/D1005PS02L - **A**

A Range (include units suffix)

psi	ftH ₂ O	inH ₂ O	inHg/psi
30	70	-30/0	-30/30
60	140	(vacuum)	-30/60
100	230		-30/100
200	460		-30/150
300	700		-30/300
500			(compound)
1000			
3000			
5000			
9999			
10000			
15000			
19999			

Also available:

kPa, MPa, bar, kg/cm² pressure ranges;
kPa, mmHg, cmHg, bar, kg/cm² vacuum ranges;
kPa, bar, kg/cm², ftH₂O compound ranges.

Options:

±0.25% of span accuracy
Protective boot
3, 9, 12 o'clock connections

- 1/4% Full Scale Accuracy
- Extra Large 5 Digit Display
- 4-20mA & Switch Outputs in One Unit (2274)
- NEMA4, IP65 Case
- Selectable Damping, Update Rate, Engineering Units, Auto-Off
- Min/Max (Peak Hold) Display



2174

Specify these multi-function digital gauges when any combination of local indication, 4-20mA output and switching is required. Easy menu configuration speeds installation & setup. All points between zero and full scale remain within stated accuracy even after rezeroing.

SPECIFICATIONS

Digit Height:	(3") 0.6", (4 1/2") 0.88"
Bargraph:	10 segment % of range
Temperature:	10-60 °C (14-140 °F)
Proof Pressure:	200%
Loop Power:	12-36 VDC
Battery:	(3") Two AA, (4 1/2") Two C
Switch Rating:	30VDC/1A, 25VAC/0.5A
Approvals:	CE, FM, CSA

ORDERING INFORMATION

To Order - Insert Code for Each Letter to Select Catalog Number.
Example AS/302274SD02L - 100psi - XU1BL

AS/ **A** **B** **C** **D** - **E** - **F**

A Case	30 3" stainless steel 45 4 1/2" thermoplastic	F Options X followed by one or more 2 digit codes: AY Black aluminum case for 4 1/2" size EC Electro polished case for 3" size U1 One SPDT switch (2274 only) U2 Two SPDT switch (2274 only) AO 4-20mA output for 2274 EN Flying leads for 4 1/2" case (terminal blocks std for 4 1/2" case, flying leads std for 3" case) BL Display backlight BK Battery backup for 2174 & 2274 S7 Weatherproof carry case (3" only) B1 Black rubber boot (3" only) B2 Orange rubber boot (3" only) PP Protective front cover (3" only)
B Model	2074 Battery powered 2174 Loop powered, 4-20mA output 2274 Line powered (12-36 VDC, 2VA)	
C Wetted Parts	SD 316 stainless steel (socket) 17-4 stainless steel (sensor)	
D Connection	02L 1/4 NPT 04L 1/2 NPT (4 1/2" case only)	

E Range (include units suffix)

psi	ftH ₂ O	inH ₂ O*	mmH ₂ O	inHg	mmHg	compound
30	30	800	60	60	1500	15#/vac
60	60	1000	100	100	2000	30#/vac
100	160		160	160	3000	60#/vac
160	200		200	200		
200	200		300	300		
300	300		400	400		
600	400		600	600		
800	600		800	800		
1000	1000		1000	1000		
1500				1600		
2000				2000		
3000				3000		
5000				6000		
8000						
10000						
15000						
20000						

* 20 °C, 60 °C & 4 °C reference options

Ashcroft Pressure Gauges

- 4 1/2", Grade 2A (±0.5% FS)
- Long Life, Teflon Coated Movement
- Adjustable, Self-Locking Pointer
- Temperature Compensated
- Liquid-Filled Performance in a Dry Gauge (option XLL)

The 1279 series is designed for long life in harsh industrial applications. The phenolic case provides superior chemical and heat resistance. Five bourdon tube systems handle a wide range of pressures and a variety of media. The Plus™ Performance option (XLL) reduces the effects of pulsations and vibrations without the maintenance problems of liquid filling.



▲ **1279 Duragauge®**

ORDERING INFORMATION

To Order - Insert Code for Each Letter to Select Catalog Number.
Example: AS/1279BS02LXLLSG-0/3000psi

AS/451279 A B C D - E

AS/451279 4 1/2" Duragauge, grade 2A	
A	Tube/Socket Material (max. psi)
A	Phosphor bronze/brass (1000)
B	4130 steel/1019 steel(5000)
R	316 stainless/1019 steel (20000)
S	316SS/ 316SS (20000)
P	K Monel/Monel 400 (30000)
B	Case
S	Solid front
SH	Solid front, hermetic seal
SL	Solid front, liquid fill
C	Connection
02L	1/4 NPT, lower
04L	1/2 NPT, lower
02B	1/4 NPT, back
04B	1/2 NPT, back
D	Options X followed by 1 or more 2 digit codes
LL	Dynamic dampening
OS	Overload stop
TS	Throttle screw
SG	Safety glass
PD	Plastic window
NN	Paper tag
NH	Stainless steel tag
GV	Silicone filled
E	Range (include units suffix)

psi		Compound	Vacuum
0/15	0/800	30"Hg/15psi	30/0 inHg
0/30	0/1000	30"Hg/30psi	34/0 ftH ₂ O
0/60	0/1500	30"Hg/60psi	
0/100	0/2000	30"Hg/100psi	
0/160	0/3000	30"Hg/150psi	
0/200	0/5000	30"Hg/300psi	
0/300	0/10000		
0/400	0/20000		
0/600	0/30000		

Metric ranges also available.
Other features and options available on request.

Call for information on other Ashcroft dial gauges, including:

- Type 1009 2 1/2" & 3 1/2" Process Gauges, with ranges from vacuum to 15000 psi (Grade 1A, ±1% FS)
- Type 1083 3" Test Gauges, with ranges from vacuum to 1000 psi (Grade 2A, ±0.5% FS)

- 4 1/2", Grade 2A (±0.5% FS)
- 4-20 mA, 2-Wire Output
- Adjustable Zero & Span
- Hermetically Sealed Phenolic Case
- FM Approved to 10,000psi

Reliable Duragauge® construction provides the analog pressure indication. An isolated optical sensor drives the transmitter output.



▶ **2279 Duratran®**

SPECIFICATIONS

Operating Temperature:	-40°F to 160°F
Overpressure:	130% of range w/o damage to tube
Power Supply:	12-40VDC
Loop Resistance:	500Ω max at 24V, 1kΩ max at 36V
Adjustments:	Transmitter span & zero adjustment on dial, Gauge zero adjustment on pointer
Case:	Phenolic, hermetically sealed
Lens:	Laminated safety glass
Electrical:	30" leads, 1/2" liquid tight conduit fitting

ORDERING INFORMATION

To Order - Insert Code for Each Letter to Select Catalog Number.
Example AS/452279P04LXFMLL - 0/3000psi

AS/452279 A B C D - E

AS/ 2279 4 1/2" Duratran, grade 2A	
A	Tube/Socket Material
S	316SS / 316SS
P	K Monel / Monel 400
B	Case
SH	Solid front, hermetic seal
C	Connection
04L	1/2 NPT, bottom
D	Options X followed by 1 or more 2 digit codes:
LL	Dynamic damping
FM	FM approval
PD	Plastic window
NN	Paper tag
NH	Stainless steel tag
GB	Oxygen cleaned
E	Range (add psi suffix)

psi	
0/12	0/600
0/15	0/800
0/30	0/1000
0/60	0/1500
0/100	0/2000
0/160	0/3000
0/200	0/5000
0/300	0/10000
0/400	0/20000

Metric, vacuum, compound, dual scale & receiver gauge dials available on request.
Use 2288 series for lower ranges

Ashcroft Test Gauges

- Rugged & Portable
- 0.05% FS Total Error Band
- 0.66" Display Characters
- NEMA 4, IP65 Stainless Steel Case
- Selectable Damping, Update Rate, Engineering Units, Languages
- Meets ASME B40.7



▲ 2089

These Precision Digital Test Gauges are available with 0.05%, 0.1% or 0.25% total error band (TEB) accuracy. TEB accuracy includes the effects of linearity, hysteresis, repeatability and temperature from 0 to 150°F. Ashcroft uses the conservative terminal point accuracy method for TEB. This allows rezeroing to eliminate sensor offset. All points between zero and full scale remain within stated accuracy.

SPECIFICATIONS

Dial:	3"
Case:	300 series stainless steel, electroplated, weatherproof
Proof pressure:	2X gauge pressure
Display:	4 1/2" digit backlit LCD
Bargraph:	10 segment % of range
Temperature:	-18 to 63°C (0-150°F)
Battery:	3 AAA, >1000 hours
EMI:	CE EN50082-1 (1997)

Keypad Functions

Engineering Units: psi, "Hg, "H₂O, ftSW, Bar, mBar, kPa, mPa, mmHg, cmH₂O, mmH₂O, kg/cm²

Update Rate:	10/sec, 5/sec, 2/sec, 1/sec
Auto off:	2, 5, 15, 30 min, never
Dampening:	None, 2, 4, 6, 8 readings
Min/Max:	Stores min/max values when displayed
Zero/Clear:	Zeros display or clears min/max values
Backlight:	on/off, 10 sec., 30 sec., 1 min., 5 min.
Language:	English, Spanish, French, Italian, German, Portuguese, Dutch
Contrast:	Seven levels
Calibration:	10 points, password protected
Configuration:	Scroll thru menu & option choices

ORDERING INFORMATION

To Order - Insert Code for Each Letter to Select Catalog Number.

Example AS/302089SD0L-100psi-XDB1

AS/30 A B C - D - E

A Model
2089 0.05% FS accuracy
2086 0.10% FS accuracy
2084 0.25% FS accuracy
B Wetted Parts
SD 316 stainless steel
C Connection
02L 3/4 NPT, lower
D Range (include units suffix)

E Options
XD 3 o'clock connection
XE 9 o'clock connection
B1 Black rubber boot
B2 Orange rubber boot
NH Metal Tag
NN Paper Tag
CD1 Certificate of Conformance
C4 Certified Calibration data (standard w. 2089)

psi	Compound	psi (absolute)
10	600 15#/vac	15
15	800 30#/vac	25 ⁽¹⁾
30		50
60		
100	2000 ⁽²⁾	
160	2500 ⁽¹⁾	
200 ⁽²⁾	3000	
300	5000	
500	7000	

Temperature options 4°C, 20°C, 60°F.
Metric units available on request.
(1) 2086 and 8084 only.
(2) Accuracy meets ASME B40.7 resolution requirements through 199.9 psi (200 psi) and 1999.9 psi (2000 psi).

Ashcroft Pressure Switches

- Long Life Sensor & Relay (>10 million operations)
- Watertight Metal Enclosure
- Deadband Adjustable to 0.5%
- Bright Local Display (optional)



▲ NPI

This electronic pressure switch will outlast mechanical switches in high cycle applications. The pressure sensor is a stable thin film transducer with proven reliability and long life. The adjustable, narrow deadband solves many pipeline and elevated tank applications that cannot be satisfied with mechanical products. An optional LED display provides local pressure indication and simplifies switchpoint setup.

SPECIFICATIONS

Enclose:	Epoxy coated aluminum NEMA 3, 4, 4X, 13 & IP66 Optional NEMA 7, 9 & Div I or II hazardous locations
Wetted Parts:	14-4 PH stainless steel diaphragm AISI 316 stainless steel fitting
Display:	3 1/2 digit LED indicates process pressure ±1%
Status Lights:	Process pressure, set pressure, reset pressure, relay output
Output:	SPDT Relay rated 10A @250VAC/30VDC
Life:	>10 million operations at rated load
Electrical:	3/4 NPT connection

ORDERING INFORMATION

To Order - Insert Number Code for Each Letter to Select Catalog Number. Example: AS/NPAN7DCS02-100psi

AS/ A B C D E F - G

A Function	G Range	psi	Setpoint Limits	psi Proof	psi Burst
		NPA Single setpoint, adjustable deadband	60	3-60	120
NPI Single setpoint, adjustable deadband, process and setpoint display	100	5-100	200	800	
B Enclosure	200	10-200	400	1600	
					N4 Watertight NEMA 3,4, 4X, 13 & IP66
N7 Explosion proof NEMA 3, 4, 4X, 13, 7, 9 & IP66 (NPA only)	300	15-300	600	2400	
					C Output
D SPDT Relay	500	25-500	1000	4000	
D Power Equipment					
L 110VAC, 50/60Hz	750	35-750	1500	6000	
C 24VDC					
V 250VAC, 50/60Hz	1000	50-1000	2000	8000	
E Pressure Port					
S01 1/8 NPT Male	3000	150-3000	4500	20000	
S02 1/4 NPT Male					
S03 1/8 NPT Female	5000	250-5000	7500	22500	
S04 1/4 NPT Female					
S05 7/16 - 20 SAE - 1/4 SAE	7500	375-7500	9000	25000	
S06 1/2 NPT Male & 1/4 NPT Female					
S07 1/4 AMINCO - Female	10000	500-10000	12000	30000	
F Option					
XEA External Setpoint Adjustment	15000	750-15000	18000	45000	
- None					
	20000	1000-20000	24000	60000	

Kobold Temperature Transmitters

- 4-20mA Output
- Hermetically Sealed Electronics
- Easily Re-Programmable via PC
- Low Cost and Easy Installation

The TST transmitter fits in a low profile housing which is only 2" long. PC calibration software allows temperature range, offset, burnout options and other features to be field selected without recalibration.

TST



- 4-20mA Output, Loop Powered
- Rugged 316 SS Construction
- -200 to 600°C Range
- Adjustable Zero & Span

The TMA series is factory calibrated. Zero and span potentiometers are accessible at the connector for recalibration.



TMA
with optional
AUF display

SPECIFICATIONS

Maximum Pressure:	
Threaded Version:	1500 PSIG
Tri-clamp Version:	500 PSIG
Probe Material:	316 Stainless Steel
Power Required:	9-30 VDC loop powered
RTD Type:	Pt100, class B
Output Accuracy:	±0.1% of Span
Ambient Temperature:	-40°F to 158°F

SPECIFICATIONS

Ambient Temperature:	-40°C to +70°C
Max. Pressure:	1450 PSIG
Probe:	316 SS, 1/4" dia
Power Required:	12-36 VDC
RTD Type:	Pt100, class B
Output Accuracy:	±0.1% of Span
Connector:	Hirshmann plug
Protection:	NEMA 4X, IP65

ORDERING INFORMATION

To Order - Insert Code for Each Letter to Select Catalog Number.
Example KO/TST-A4-040-PV-06-C

KO/TST - - - - -

A Fitting Style

A2	1/4" NPT, Adjustable immersion depth
A4	1/2" NPT, Adjustable immersion depth
F2	1/4" NPT, fixed immersion depth
F4	1/2" NPT, fixed immersion depth
T15	1 1/2" Tri-clamp
T2	2" Tri-clamp
T25	2 1/2" Tri-clamp
T3	3" Tri-clamp

B Available Immersion Depth

025	2.5"	040	4"
060	6"	090	9"
120	12"	180	18"
240	24"	EP	Custom (specify)

C Cable (6' standard length)

PV	PVC jacket (220°C process max)
TF	Teflon jacket
TA	316 SS armored
TB	316 SS braided
0	None (use for option H)(BELOW)

D Available Measuring Range

02	0 to 120°F	04	0 to 200°F
06	0 to 300°F	08	0 to 400°F
10	0 to 500°F	12	0 to 750°F
14	0 to 950°F	16	0 to 1100°F
18	-58 to 120°F	E	Custom scaling (specify)

E Options

C	1/2" NPT conduit hub
H	DIN43650 Hirshmann Plug in place of cable
EC	Extended cable length, specify length

KO/TST-PKIT Field calibration kit includes 9pin serial cable, 110VAC power pack & Windows software

ORDERING INFORMATION

To Order - Insert Code for Each Letter to Select Catalog Number.
Example KO/TMA-S2514A-025-05

KO/TMA - - -

A Fitting Style

S2514F	1/4" NPT, Fixed immersion depth
S2512F	1/2" NPT, Fixed immersion depth
S2514A	1/4" NPT, Adjustable depth
S2512A	1/2" NPT, Adjustable depth

B Available Immersion Depth

025	2.5"	040	4"
060	6"	090	9"
120	12"		

C Available Measuring Range

05	0 to 50°C (32/122°F)
10	0 to 100°C (32/212°F)
15	0 to 150°C (32/302°F)
20	0 to 200°C (32/392°F)
40	0 to 400°C (32/752°F)
60	0 to 600°C (32/1112°F)
55	-50 to 50°C (-58/122°F)
51	-50 to 150°C (-58/302°F)
24	-200 to 400°C (-328/752°F)
26	-200 to 600°C (-328/1112°F)
E	Custom (specify)

The AUF display can be added to any 4-20 mA output that uses the Hirshmann connector. Installed between the transmitter and the cable, the AUF is fully scalable through two control buttons. Power is provided by the 4-20 mA loop, so no additional power supply is required.

SPECIFICATIONS

Display:	4-digit red LED 5/16" tall	Sampling Rate:	0.33-20s, adjustable
Range:	-1999 to 9999	Switch:	Open Collector, 60mA max., PNP
Loop Voltage Load:	5 volts	Protection:	NEMA 4

ORDERING INFORMATION

KO/AUF1000 Local Digital Display KO/AUF1001 Local Display w/Alarm

Noshok Temperature Indicators/Transmitters

- High accuracy replacement for bimetal, liquid bulb & glass thermometers
- Large 4 digit LED display
- 4-20 mA programmable linearized output
- Stable Pt100 Class A RTD sensor
- All stainless construction
- IP65, NEMA 4 rating

820


SPECIFICATIONS

Temperature sensor:	RTD (Pt100 DIN EN 60751, Class A)
Case material:	316 stainless steel housing & probe
Maximum pressure:	500 psig (on probe)
Power supply:	9-36 Vdc, polarity protected
Power consumption:	15 mA @ 24 Vdc + output current, 950 mW max.
Current output:	4 mA to 20 mA, 3-wire, linear to temperature; Max load (Ω): (Vsupply-9V) / 20 mA
Isolation:	500 Vdc, input probe to output
Hysteresis:	1% of range standard
Accuracy:	$\pm 0.25\%$ full scale (0.18 °F + 0.40% of reading) max. with default calibration; $\pm 0.125\%$ full scale (0.18 °F + 0.20% of reading) max. with one-point factory or customer calibration
Open circuit detection:	Upscale (22 mA) or downscale (2.5 mA)
Response time:	0.5 sec to 30 sec (software selectable)
Display:	4-digit green LED, decimal point selectable by software
Operating range:	-40°F to 176°F (-40°C to 80°C) ambient
Protection:	NEMA 4, IP65
Optional switch output:	SPDT relay, NPN source or PNP sink transistor
Dimensions:	3.0" dia x 1.8" deep (76.2x45.7mm); Total stem length is selected length plus 1.2"

ORDERING INFORMATION

To Order - Insert Code for Each Letter to Select Catalog Number.
Example: 820-1-1-D-8-32/200-48-090-6

A - B - C - D - E - F - G - H - I

A	Series		
	820	Bottom connection	
	821	Back connection	
B	Accuracy		
	1	$\pm 0.25\%$ full scale	
	2	$\pm 0.125\%$ full scale	
C	Output		
	1	4-20 mA	
D	Burnout		
	U	Upscale	
	D	Downscale	
E	Process Connection		
	0	None	
	2	1/4" NPT male	
	8	1/2" NPT male	
	48	1/2" NPT male w/adjustable compression fittings	
F	Range		
	-50/200	-50 to 120°F	32/200 32 to 200°F
	-50/300	-50 to 300°F	32/300 32 to 300°F
	-50/400	-50 to 400°F	32/400 32 to 400°F
	32/120	32 to 120°F	
G	Electrical Connection		
	36	Integral 36" cable	
	48	M12 x 1 (5-pin)	
H	Stem Length		
	025	2.5"	120 12"
	040	4"	150 15"
	060	6"	180 18"
	090	9"	240 24"
I	Stem Diameter		
	2	1/4"	4 1/2"
	3	3/8"	6 6mm

- Platinum RTD sensor
- Switch and analog outputs
- 4-digit LED display
- Pushbuttons adjust set points, switch function & analog output span
- Measuring insert replaceable without opening process connection
- IP67 protection with optional cover

850


SPECIFICATIONS

Temperature sensor:	RTD (Pt100 2-wire, Class B)
Wetted materials:	316Ti stainless steel
Housing material:	Stainless steel
Working pressure:	6 mm Stem Diameter: 600 psi 8 mm Stem Diameter: 1,500 psi
Power supply:	12 Vdc to 30 Vdc, unregulated
Power consumption:	50 mA, without load
Signal output:	4 to 20 mA scaleable from 20-100% of range
Switch points:	Individually adjustable via external control keys
Number of switches:	1 or 2 (PNP)
Switch function:	NO/NC; windows & hysteresis function adjustable
Set point adjustment:	0.1° steps within temperature range
Reset point adjustment:	0.1° steps from beginning temperature range until (set point -0.1°)
Switch rating:	100 mA per switch
Accuracy:	Class B $\pm 0.1\%$ of the temperature range
Display:	7 Segment-LED, red 4-digit, height 0.3"; Selectable for °F or °C
Display orientation:	Upper part rotates 330°
Operating range:	-13°F to 158°F (-25°C to 70°C) ambient
Protection:	NEMA 4, IP65 (IEC 529)
Dimensions:	1.4" dia x 4.37" high (36x111mm) plus stem length

ORDERING INFORMATION

To Order - Insert Code for Each Letter to Select Catalog Number.

Example: 850-1-2--50/400-2-090-6-PC

A - B - C - D - E - F - G - H

A	Series	
	850	Temperature Transmitter/Switch
B	Switch	
	1	Two N.O. or N.C. switches-PNP
	2	One N.O. or N.C. switch-PNP (with 4-20 mA analog output)
C	Process Connection	
	2	1/4" NPT male
	8	1/2" NPT male
D	Range	
	-50/400	-50 to 400°F
	32/750	32 to 750°F
	32/1100	32 to 1100°F
	-300/1100	-300 to 1100°F
E	Electrical Connection	
	2	M12 x 1 (4-pin)
F	Stem Length	
	025	2.5"
	040	4"
	060	6"
	090	9"
	120	12"
G	Stem Diameter	
	3	Tapered from 6 mm - 3 mm tip (for fast response)
	6	6 mm
	8	8 mm
H	Option	
	(blank)	None
	PC	Clear Thermoplastic Polyurethane Protective Cover IP67

Raytek Infrared Temperature Sensors

CI Series Compact Infrared Sensor



- Type J or K, or 0-5 V Output
- IP 65 (NEMA-4) Stainless Steel Electronics Housing
- 4:1 Optics at 90% Energy
- Powered by 12-24VDC at 20mA

Replaces traditional probes with J-type or K-type thermocouple output.

Functions accurately when used in conjunction with the thermocouple break protection circuitry in most controllers, displays, and transmitters.

SPECIFICATIONS

Spectral Response	7 to 18 μ m
Accuracy	$\pm 2\%$ or $\pm 3^\circ\text{C}$
Resolution	0.5 $^\circ\text{C}$
Response Time	350ms (95%)
Emissivity	fixed at 0.95
D:S Ratio	4:1
Cable	1m (3.3') standard
Output Impedance (J/K)	50 Ω
Minimum Load (mV)	50k Ω
Power	12-24VDC $\pm 5\%$, 20mA
Ambient Temperature:	
Sensing head	0 to 70 $^\circ\text{C}$
With air cooling	up to 90 $^\circ\text{C}$
With water cooling	up to 260 $^\circ\text{C}$
Relative Humidity	10 to 95%, non-condensing
Size	0.75" dia. x 3.4" long

ORDERING INFORMATION

RA/CI-1A	IR Temperature Sensor, J T/C, 0-155 $^\circ\text{C}$
RA/CI-2A	IR Temperature Sensor, K T/C, 0-155 $^\circ\text{C}$
RA/CI-3A	IR Temperature Sensor, 10mV/ $^\circ\text{C}$ Linear Voltage, 0-155 $^\circ\text{C}$
RA/CI-1B	IR Temperature Sensor, J T/C, 100-500 $^\circ\text{C}$
RA/CI-2B	IR Temperature Sensor, K T/C, 100-500 $^\circ\text{C}$
RA/CI-3B	IR Temperature Sensor, 10 mV/ $^\circ\text{C}$ Linear Voltage, 100-500 $^\circ\text{C}$

OPTIONS / ACCESSORIES

-10L	3m (10') Cable, 105 $^\circ\text{C}$
-W	Air/water cooled jacket with lens purge & 1m (3.3') 260 $^\circ\text{C}$ cable
RA/CIADJB	Adjustable mounting bracket
RA/CIACFB	Fixed mounting bracket
RA/CIACRA	Right angle mirror
RA/CIAP	Air purge collar
RA/CI1CON	Thermocouple cable extension connector kit for CI1
RA/CI2CON	Thermocouple cable extension connector kit for CI2
RA/CIACCB10H	3 Meter (10', 260 $^\circ\text{C}$) extension cable
RA/CIACCB50H	15 Meter (50', 260 $^\circ\text{C}$) extension cable

MI3 Series Miniature Infrared Sensors

- Adjustable Emissivity,
Peak/Valley Hold & Averaging
- 2:1, 10:1 or 22:1 Optics
- IP65, NEMA 4 rated
- Fast response time <20mSec
- Alarm relay output
- USB interface for remote setup
- Optional RS-485, Modbus &
Ethernet communications



Two-piece infrared temperature measurement system. Order miniature sensing head and die-cast or DIN-rail electronics housing separately.

SPECIFICATIONS

Spectral Response:	8 to 14 microns (LT range)
Optical Resolution:	LTS 2:1, 10:1, 22:1 LTH 10:1, 22:1 LTF 10:1 G5 10:1
Temperature Range:	LTS (2:1, 10:1) -40 to 600 $^\circ\text{C}$ (-40 to 1112 $^\circ\text{F}$) LTF (LTS 22:1) 0 to 1000 $^\circ\text{C}$ (32 to 1832 $^\circ\text{F}$) LTH -40 to 600 $^\circ\text{C}$ (-40 to 1112 $^\circ\text{F}$) G5 250 to 1650 $^\circ\text{C}$ (482 to 3002 $^\circ\text{F}$)
System Accuracy:	$\pm 1\%$ of reading or $\pm 1^\circ\text{C}$, whichever is greater
Thermocouple Output:	$\pm 1\%$ of reading or $\pm 2.5^\circ\text{C}$, whichever is greater
System Repeatability:	$\pm 0.5\%$ of reading or $\pm 0.5^\circ\text{C}$ (1 $^\circ\text{F}$)
Temp. Coefficient:	$\pm 0.05^\circ\text{K}$ per $^\circ\text{K}$, or $\pm 0.05\%$ per $^\circ\text{K}$
Temp. Resolution:	0.1 $^\circ\text{C}$ or 0.2 $^\circ\text{F}$ * (LT range)
Response Time:	130ms (90%), except 20ms for LTF
Emissivity:	0.100 to 1.100 digitally adjustable
Transmission:	0.100 to 1.000 digitally adjustable
Signal Processing:	Peak hold, valley hold, variable averaging filter, adjustable up to 998 seconds
Alarm Relay:	48 VAC, 300 mA, optically isolated solid state relay
Power Supply:	8-32VDC, 4W
Electronics Housing:	-10 to 65 $^\circ\text{C}$ (14 to 150 $^\circ\text{F}$), 10-95% RH non-cond.
Dimensions:	Sensing Head: 28 x 14 mm, M12x1 thread MI3 housing: 104 x 70 mm MI3M housing: 90 x 108 x 61 mm

*Scaled temperature dynamic range < 500 $^\circ\text{C}$ (< 932 $^\circ\text{F}$)

ORDERING INFORMATION

COMMUNICATION BOX

RAYMI3COMM	Cast zinc housing with display & USB 2.0
RAYMI3COMM4	Cast zinc housing with display, USB 2.0 & RS-485
RAYMI3COMMM	Cast zinc housing with display, USB 2.0 & Modbus
RAYMI3COMME	Cast zinc housing with display, USB 2.0 & Ethernet HTTP
RAYMI3MCOMM	4-channel DIN mount with USB 2.0 & RS-485
RAYMI3MCOMMM	4-channel DIN mount with USB 2.0 & Modbus
RAYMI3MCOMME	4-channel DIN mount with USB 2.0 & Ethernet HTTP
RAYMI3MCOMMA	4-channel DIN mount with USB 2.0 & 4 galvanic isolated analog outputs

SENSING HEAD	RAYMI3	A	-	B	-	C	Example: RAYMI310LTSB3
A	Optical Resolution						
02	2:1						
10	10:1						
20	22:1						
B	Temperature Range						
LT	-40 $^\circ\text{C}$ to 600 $^\circ\text{C}$ (-40 $^\circ\text{F}$ to 1112 $^\circ\text{F}$) **						
G5	250 $^\circ\text{C}$ to 1650 $^\circ\text{C}$ (482 $^\circ\text{F}$ to 3002 $^\circ\text{F}$)						
C	Model						
S	Standard response, 120 $^\circ\text{C}$ (248 $^\circ\text{F}$) max. ambient						
F	Fast response (20ms), 120 $^\circ\text{C}$ (248 $^\circ\text{F}$) max. ambient (10:1 only)						
H	High ambient, up to 180 $^\circ\text{C}$ (356 $^\circ\text{F}$) ambient						

1 meter (3.3ft) cable standard. Cable length options: Add suffix CB3 for 3m (10ft), CB8 for 8m (26ft), CB15 for 15m (49ft), CB30 for 30m (98ft).

** 0 to 1000 $^\circ\text{C}$ (32 to 1832 $^\circ\text{F}$) for LTF and LTS 22:1 models

Raytek Programmable IR Sensors



▲ CM

- -20 to 500 °C (-4 to 932 °F) Range
- 13:1 Optics at 90% Energy
- 150ms (95%) Response Time
- RS-232 Digital Communications
- Adjustable Signal Processing
- DataTemp® Multidrop Software Compatible
- Sensor status indicator LED

Designed for easy integration, the CM sensor with J-type or K-type thermocouple output can easily replace traditional contact probes. A user scalable 0-5 volt output is available for applications susceptible to noise. This rugged, single piece NEMA4 sensor has silicon optics to provide excellent optical resolution.

SPECIFICATIONS

Accuracy (mV):	± 1.5% of reading or ± 2°C
Accuracy (T/C):	± 1.5% of reading or ± 4°C
Spectral Response:	8 to 14 microns
Resolution:	0.1°C
Emissivity:	0.10 to 1.10 (adjustable)
Transmissivity:	0.10 to 1.00 (adjustable)
Signal Processing:	Peak hold, valley hold, variable averaging
Output:	100Ω Zout (TC types) 50kΩ min load (Voltage type)
Self-diagnostics:	Alarm, out of range, unstable, fault
Power Supply:	12-24 VDC ±20% @ 10mA
Digital Output:	Two-way RS232 digital output
Alarm Output:	Transistor, 24VDC ±20% <20mA
Ambient Temperature:	0-70°C (32-160°F)
Housing:	IP 65 (NEMA-4) stainless steel
Size:	0.75" dia x 3.7" long, 3/4-16 UNF thread
Cable:	1m (3.3 ft) standard, 3m available

ORDERING INFORMATION

RAYCMLTV	CM sensor, 0-5V user-scalable output
RAYCMLTJ	CM sensor, Type J TC output
RAYCMLTK	CM sensor, Type K TC output

Add suffix 3 for 3m (9.8') cable

Kobold Ultrasonic Level Transmitters

- Monitor tanks and bins up to 24.5 feet deep
- Non-contact sensor
- Compatible with viscous, sticky or chemically aggressive media
- Compact and easily installed
- 4-20 mA transmitter
- Automatic temperature compensation
- On-board display for easy calibration
- Loop powered and Intrinsically Safe versions



▲ NEO-5001

SPECIFICATIONS

Range:	NEO-5001: 18 feet from sensor face NEO-5003: 24.5 feet from sensor face
Span:	NEO-5001: 17.5 feet NEO-5003: 24 feet
Display:	NEO-5001: LCD; NEO-5003: LED
Dead Band:	0.5 feet (6 inches)
Accuracy:	±0.25% of span
Repeatability:	±0.125"
Fitting:	2" NPT
Probe Material:	PVDF
Enclosure Material:	PP (UL 94V0)
Temp. Range:	-40 to 140°F
Pressure Rating:	30 PSI @ 75°F
Beam Angle:	±8° off vertical
Sensor Frequency:	50 kHz
Signal Output:	NEO-5001: 4-20 mA DC (2-wire) into 350Ω max. NEO-5003: 4-20 mA DC (3-wire) into 350Ω max.
Supply Voltage:	14 to 36 VDC
Current Draw:	NEO-5003: 200 mA max.
Relay:	NEO-5003: SPDT 12 amps @ 240 VAC/120 VDC
Dimensions:	2.8" dia x 6.3" long, excluding cable port
Protection:	NEMA 4X
Intrinsic Safety Rating (NEO-5001IS only):	
CSA/NRTL/C:	Class I, Div 1 Groups A,B,C,D Class II, Div 1 Groups E,F & G Class III, Temp Code: T3C
Vmax, Imax:	32.0 VDC, 130 mA
Cl, Li:	0 microFarads, 0 microHenries

Beam Divergence

Range	Radius	Range	Radius
1'	2.6"	13'	21.5"
2'	4.2"	14'	23.1"
3'	5.7"	15'	24.7"
4'	7.3"	16'	26.3"
5'	8.9"	17'	27.8"
6'	10.5"	18'	29.4"
7'	12.1"	19'	31.0"
8'	13.6"	20'	32.6"
9'	15.2"	21'	34.2"
10'	16.8"	22'	35.7"
11'	18.4"	23'	37.3"
12'	20.0"	24'	38.8"



▲ NEO-5003

ORDERING INFORMATION

KO/NEO-5001	Loop-powered Level Transmitter with LCD display
KO/NEO-5001IS	Intrinsically safe loop-powered Level Transmitter with LCD display
KO/NEO-5003	DC powered Level Transmitter with LED display & relay output

Newport USB Sensors

Humidity/Temperature

- Connects Directly to Computer USB Port
- Free Software Converts PC into Humidity/Temperature Meter, Data Logger or Chart Recorder
- 316 Stainless Steel Housing & Removable Filter
- Optional Wall Mount Kit


RH-USB

SPECIFICATIONS

Relative Humidity Range:	2 to 98% RH
Accuracy:	±3% RH (@ 15 to 90% RH)
Repeatability:	±1% RH
Temperature Range:	-17 to 49°C (1 to 120°F)
Accuracy:	±1°C (±1.8°F)
USB Connector:	Type A plug on 2m (6') shielded cord
Software (included free):	Requires Windows® 2000, XP, VISTA (32-bit) or Windows 7 (64-bit)
Housing Material:	316 stainless steel
Dimensions:	138 L x 16 mm Dia (5.5 x 0.625")

ORDERING INFORMATION

RH-USB	Humidity temperature sensor with USB connector
CAL-3-HU	NIST traceable calibration certificate.
HX70-MKIT	Wall/duct mounting kit

Pressure

- 1000 Updates per Second
- USB2.0 Compatible
- Free Software Converts PC into Data Logger or Chart Recorder
- 316 Stainless Steel Wetted Parts
- Gage or Absolute Pressure


PX409

SPECIFICATIONS

Accuracy:	0.08% BSL typical (linearity, hysteresis & repeatability)		
Long Term Stability:	±0.1% FS typical, 1-Year		
Isolation:	100MΩ @50Vdc (2 MΩ after EMI filter), case to terminal		
A to D Conversion:	24-bit, 1000 updates per second		
USB Connector:	Type A plug on 2m (6') shielded cord		
Temperature:	-29 to 85°C (-20 to 185°F) compensated range		
Wetted Parts:	316L stainless steel, IP65 rating		
Sensor Type/Life:	Micro-machined silicon /1 million pressure cycles (min)		
Shock:	50 g, 11 ms half sine, vertical and horizontal axis		
Dimensions:	119 L x 22 mm Dia (4.1 x 0.88"), ¼-18 NPT fitting		

ORDERING INFORMATION

RANGE		GAGE	ABSOLUTE
psi	bar	Model No.	Model No.
0 to 10.00 inH2O	0 to 25.00 mb	PX409-10WGUSB	—
0 to 1.000	0 to 69.00 mb	PX409-001GUSB	—
0 to 2.500	0 to 172.0 mb	PX409-2.5GUSB	—
0 to 5.000	0 to 345.0 mb	PX409-005GUSB	—
0 to 15.00	0 to 1.000	PX409-015GUSB	PX409-015AUSB
0 to 30.00	0 to 2.100	PX409-030GUSB	PX409-030AUSB
0 to 50.00	0 to 3.400	PX409-050GUSB	PX409-050AUSB
0 to 100.0	0 to 6.900	PX409-100GUSB	PX409-100AUSB
0 to 150.0	0 to 10.30	PX409-150GUSB	PX409-150AUSB
0 to 250.0	0 to 17.20	PX409-250GUSB	PX409-250AUSB
0 to 500.0	0 to 34.50	PX409-500GUSB	PX409-500AUSB
0 to 750.0	0 to 51.70	PX409-600GUSB	PX409-600AUSB
0 to 1000	0 to 69.00	PX409-1.0KGUSB	PX409-1.0KAUSB
0 to 1500	0 to 103.0	PX409-1.5KGUSB	PX409-1.5KAUSB
0 to 2500	0 to 172.0	PX409-2.5KGUSB	PX409-2.5KAUSB
0 to 3500	0 to 241.0	PX409-3.5KGUSB	PX409-3.5KAUSB
0 to 5000	0 to 345.0	PX409-5.0KGUSB	PX409-5.0KAUSB

Kobold Low Flow Sensor

- 0.4 to 400 GPH sizes
- Compact Size, Low Cost
- Resistant to Aggressive Media

The DPL Series is ideal for applications requiring accurate flow measurement of transparent liquid media. A paddle wheel turbine interrupts an internal infra-red beam to generate a frequency output proportional to flow. The sapphire axle and bearing system assures long service life.


DPL

SPECIFICATIONS

Detector	
Power:	4.6-16 VDC, 15mA max.
Output Sink:	18mA max.
Pull-up:	Internal 10kohm
Output Signal:	Frequency
Emitter LED:	
Supply:	15-50mA,
Forward Voltage:	1.2-1.5VDC
Wiring:	6 ft. PVC cable
Accuracy:	±5% of full scale ±1.5% optional
Linearity:	±1.5% optional
Wetted Parts	
Body:	Polypropylene, sapphire, polysulfone
Seals:	Buna-N standard, Viton, EPDM optional
Fittings:	½" bsp standard, hose-barb ½" PVC optional
Max. Pressure:	145 PSIG
Temperature:	-40°F to 160°F
Protection:	NEMA 4X

ORDERING INFORMATION

Freq. at Model	Range		max flow (Hz)	Nom (PSI)
	Max DP GPH	oz/sec		
KO/DPL-1005	0.4 - 8.0	0.014 - 0.28	272	11
KO/DPL-1018	0.8 - 28	0.028 - 1.0	471	11
KO/DPL-1060	3.0 - 95	0.11 - 3.4	528	10
KO/DPL-1120	6.0 - 190	0.21 - 6.8	300	15
KO/DPL-1250	16 - 400	0.57 - 14	399	19

OPTIONS

-V	Viton seals
-E	EPDM seals
-S	Hose Barb fittings, ½" PVC
-F2	1/2 frequency
-F4	1/4 frequency
-F8	1/8 frequency
-C	±1.5% accuracy calibration

Yokogawa Rotameter Flow Indicators



RGC

- Easy to Install & Maintain
- Low Pressure Loss
- Stainless Steel Housing
- No External Power Required
- Optional Limit Switches

For continuous flow measurement of liquids & gases, the RGC Rotameter is installed vertically with flow direction upwards. The conical glass metering tube includes a free rotating float which provides self-stabilization. Flow is read on the metering tube scale at the top of the float.

SPECIFICATIONS

Process Connection:	NPT thread stainless steel, 375mm (14.7") height
Metering Tube:	Borosilicate (Duran 50), 300mm (11.81") high
Float Material:	for liquid: Stainless Steel; for gas: PTFE
Operating Pressure:	Max. 16 bar / 232 PSIG
Operating Temperature:	- 25°C to + 100°C
Measuring Span:	10:1
Measuring Accuracy:	1.6% (qG=50%)

OPTIONS

Adjustable Limit switches (Min, Max, Min/Max, Min/Min, Max/Max)
 ATEX explosion proof
 Power supply (for limit switches)
 Threaded connections

ORDERING INFORMATION

Part Number	Max. Flow	Connection	Part Number	Max. Flow	Connection
Air (60°F, 14.7 PSIG)			Water (60°F, 14.7 PSIG)		
RGC4720A	0.9 SCFM	1/2"	RGC4700A	0.44 GPM	1/2"
RGC4721A	1.45 SCFM	1"	RGC4701A	0.7 GPM	1/2"
RGC4722A	2.3 SCFM	1"	RGC4702A	1.1 GPM	1"
RGC4723A	3.6 SCFM	1"	RGC4703A	1.75 GPM	1"
RGC4724A	5.8 SCFM	1"	RGC4704A	2.8 GPM	1"
RGC4725A	9 SCFM	1"	RGC4705A	4.4 GPM	1"
RGC4726A	14.5 SCFM	1"	RGC4706A	7 GPM	1"
RGC4727A	23 SCFM	1"	RGC4707A	11 GPM	1"
RGC4728A	36 SCFM	2"	RGC4708A	17.5 GPM	2"
RGC4729A	58 SCFM	2"	RGC4709A	28 GPM	2"
RGC4730A	90 SCFM	2"	RGC4710A	44 GPM	2"
Air (20°C, 1 bar abs.)			Water (20°C, 1 bar abs.)		
RGC4720	1600 l/h	1/2"	RGC4700	100 l/h	1/2"
RGC4721	2500 l/h	1/2"	RGC4701	160 l/h	1/2"
RGC4722	4000 l/h	1"	RGC4702	250 l/h	1"
RGC4723	6300 l/h	1"	RGC4703	400 l/h	1"
RGC4724	10 m ³ /h	1"	RGC4704	630 l/h	1"
RGC4725	16 m ³ /h	1"	RGC4705	1000 l/h	1"
RGC4726	25 m ³ /h	1"	RGC4706	1600 l/h	1"
RGC4727	40 m ³ /h	1"	RGC4707	2500 l/h	1"
RGC4728	63 m ³ /h	2"	RGC4708	4000 l/h	2"
RGC4729	100 m ³ /h	2"	RGC4709	6300 l/h	2"
RGC4730	160 m ³ /h	2"	RGC4710	10000 l/h	2"



RMC

- Stainless Steel Construction
- Large Indicator Dial
- Optional Digital Display
- Adjustable Limit Switches (Optional)
- Wide Temperature and Pressure Range
- Available with Analog Output & HART Communication

The RMC Rotameter is used to measure flow rates of liquids and gases. Its special application is in troubled, opaque or aggressive mediums. The instrument is mounted in a vertical pipeline with flow direction upwards. A float moves within the shaped conic metal tube. The position of the float is magnetically transmitted to the indicator.

SPECIFICATIONS

Process Connection:	Stainless steel flange, 250mm (9.85") height
Flange Rating:	150 lbs.
Degree of Protection:	IP66/67
Indicator Housing:	161mm (6.34") dia.
Wetted Parts:	Stainless steel (PTFE available)
Process Pressure:	Max. 19 bar / 275 PSIG
Process Temperature:	- 25°C to + 200°C
Ambient Temperature:	- 25°C to + 100°C
Measuring Span:	10:1
Measuring Accuracy:	1.6% (qG=50%)

ORDERING INFORMATION

Part Number	Max. Flow	Connection	Part Number	Max. Flow	Connection
Air (60°F, 14.7 PSIG)			Water (60°F, 14.7 PSIG)		
RMC1011	2.5 SCFM	1/2"	RMC1001	34 GPH	1/2"
RMC1012	5 SCFM	1/2"	RMC1002	1.1 GPM	1/2"
RMC1013	8 SCFM	1/2"	RMC1003	2.2 GPM	1/2"
RMC1014	13 SCFM	1/2"	RMC1004	4 GPM	1/2"
RMC1015	25 SCFM	1/2"	RMC1005	5.5 GPM	1"
RMC1016	32 SCFM	1"	RMC1006	10 GPM	1"
RMC1017	45 SCFM	1"	RMC1007	15 GPM	1"
RMC1018	70 SCFM	1"	RMC1008	22 GPM	2"
RMC1019	100 SCFM	2"	RMC1009	38 GPM	2"
Air (20°C, 1 bar abs.)			Water (20°C, 1 bar abs.)		
RMC2011	2.8 m ³ /h	1/2"	RMC2001	2.2 l/m	1/2"
RMC2012	6 m ³ /h	1/2"	RMC2002	4.2 l/m	1/2"
RMC2013	9 m ³ /h	1/2"	RMC2003	8.5 l/m	1/2"
RMC2014	15 m ³ /h	1/2"	RMC2004	17 l/m	1/2"
RMC2015	28 m ³ /h	1/2"	RMC2005	22 l/m	1"
RMC2016	36 m ³ /h	1"	RMC2006	38 l/m	1"
RMC2017	55 m ³ /h	1"	RMC2007	55 l/m	1"
RMC2018	75 m ³ /h	1"	RMC2008	85 l/m	1"
RMC2019	110 m ³ /h	2"	RMC2009	140 l/m	2"

OPTIONS

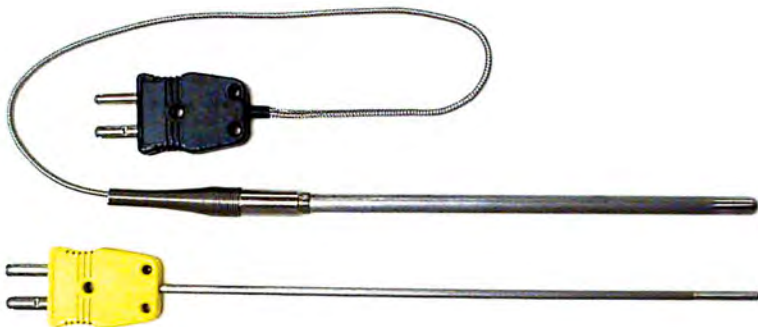
Adjustable limit switches	Digital display
Signal output (4-20mA, 0-20mA, pulse)	HART communication
Power supply (24VDC, 115/230VAC)	Threaded connections
Process pressure to 400 bar	Flameproof enclosure
Painted aluminum indicator housing	PTFE wetted parts
ATEX, FM(US,C), NEPSI approvals	Extended temperature range

Pyromation Insulated Thermocouples

The thermocouple element is encased in a metal sheath that can be formed and bent.

Extension leadwire of the same thermocouple material connects to remote panel meters or transmitters. Sheath fittings can be specified to mount the probe in thermowells with NPT threads.

Standard or Miniature Thermocouple Plugs are available to simplify field installation. These can be ordered with or without extension leadwire.



SPECIFICATIONS

Thermocouples and Thermocouple Wire		Reference Junction 0°C (32°F)	
T/C Type	Temperature Range	Limits of Error	
		Standard	Special
J	0 to 293°C (32 to 559°F)	± 2.2°C (4°F)	± 1.1°C (2°F)
	293 to 750°C (559 to 1382°F)	± 0.75%	± 0.4%
K	0 to 293°C (32 to 559°F)	± 2.2°C (4°F)	± 1.1°C (2°F)
	293 to 1250°C (559 to 2282°F)	± 0.75%	± 0.4%
E	0 to 340°C (32 to 644°F)	± 1.7°C (3°F)	± 1°C (2°F)
	340 to 900°C (644 to 1652°F)	± 0.5%	± 0.4%
T	0 to 133°C (32 to 270°F)	± 1°C (2°F)	± 0.5°C (1°F)
	133 to 350°C (270 to 662°F)	± 0.75%	± 0.4%
N	0 to 293°C (32 to 559°F)	± 2.2°C (4°F)	± 1.1°C (2°F)
	0 to 1250°C (559 to 2282°F)	± 0.75%	± 0.4%

Thermocouple Extension Wire		Reference Junction 0°C (32°F)	
Ext. Wire Type	Temperature Range	Limits of Error	
		Standard	Special
KX	0 to 200°C (32 to 392°F)	± 2.2°C (4°F)	—
JX	0 to 200°C (32 to 392°F)	± 2.2°C (4°F)	± 1.1°C (2°F)
EX	0 to 200°C (32 to 392°F)	± 1.7°C (3°F)	—
TX	0 to 100°C (32 to 212°F)	± 1.0°C (2°F)	± 0.5°C (1°F)
NX	0 to 200°C (32 to 392°F)	± 2.2°C (4°F)	—

* For sheathed thermocouples without leadwire or plug, part number ends with

H	Sheath Terminations	
	10(1)	Sheath stripped 1"
	10(2)	Sheath stripped 2"
	10(3)	Sheath stripped 3"
Example	PM/J43GM-012-00-10(1)	

ORDERING INFORMATION

To Order: Insert Code for Each Letter to Select Catalog Number
Order Example PM/J43GM-012-10B-15-F3-036-2

ABCDE-F-G-H-I-J-K

A	Thermocouple Type	
PM/J	Type J	
PM/K	Type K	
PM/E	Type E	
PM/T	Type T	
PM/N	Type N	
B	Sheath Diameters	
1	1/16" (0.063)	
2	1/8" (0.125)	
3	3/16" (0.188)	
4	1/4" (0.250)	
6	3/8" (0.375)	
C	Sheath Material	
8	316 stainless steel (type J, K, E, T)	
3	Inconel 600 (type J, K, E, T)	
9	304 stainless steel (type J, K, N)	
D	Junction Type	
G	Grounded	
U	Ungrounded	
E	Limits of Error	
-	Standard	
M	Special	
F	Sheath Length	
nnn	Three digit sheath length in inches	
G	Re-Adjustable Compression Fitting	
00	None	
10B	1/4" NPT SS for 1/4", 3/8" sheath OD	
10C	1/2" NPT SS for 3/16", 1/4"	
11B	1/4" NPT Brass for 1/8", 3/16", 1/4", 3/8"	
11C	1/2" NPT Brass for 1/4", 3/8"	
H	Leadwire Transition*	
15	Relief spring (400°F rating)	
13	Same size transition	
00	None	
I	Extension Leadwire	
F3	Fiberglass (stranded)	
F3B	Fiberglass with stainless steel overbraid (stranded)	
T3	Teflon (stranded)	
T3B	Teflon with stainless steel overbraid (stranded)	
00	None	
J	Leadwire Length	
nnn	Lead length in inches using 3 digits	
K	Wire Terminations	
2	2" split leads	
3	2" split leads w/ spade lugs	
4	Standard male plug	
6	Miniature male plug	
4MC	Standard male plug with mating connector	
6MC	Miniature male plug with mating connector	

Other types and configurations available on request

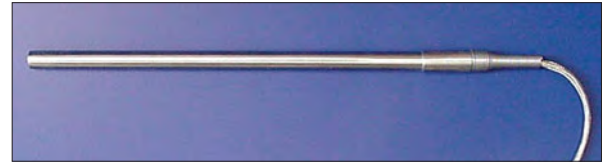
Pyromation Platinum RTD's

- Low and High temperature ranges
- 3 or 4 wire elements
- Accuracy exceeds DIN class B requirements
- Rugged 316 stainless sheath

These high accuracy platinum RTDs are built to DIN specifications, with $\alpha=0.00385$ and accuracy of $\pm 0.1\%$ @ 0°C . Call for other resistance values or configurations

To Order: Insert Code for Each Letter to Select Catalog Number
 Order Example PM/R1T185H483-12-00-15-T3-048-2
 PM/ABCDE-F-G-H-I

A Temperature Range	
R1T185L	Low-temp -200°C to 204°C
R1T185H	Hi-temp -200°C to 600°C
B Sheath Diameters	
28	1/8" (0.125)
38	3/16" (0.188)
48	1/4" (0.250)
68	3/8" (0.375)
C RTD Element	
3	3 wire
4	4 wire
D Sheath Length	
nn	Two digit sheath length in inches



E Re-Adjustable Compression Fitting	
00	none
10B	1/4" NPT SS for 1/4", 3/8" sheath OD
10C	1/2" NPT SS for 3/16", 1/4"
11B	1/4" NPT Brass for 1/8", 3/16", 1/4", 3/8"
11C	1/2" NPT Brass for 1/4", 3/8"
F Leadwire Transition	
15	Relief spring (400°F rating)
13	Same size transition
G Extension Leadwire	
T3	3 conductor teflon insulation
T3A	3 conductor teflon insulation with stainless steel flex armor
F3	3 conductor fiberglass insulation
F3A	3 conductor fiberglass with flex stainless steel armor
H Leadwire Length	
nnn	Lead length in inches using 3 digits
I Wire Terminations	
2	Leads split 2" with 1/4" strip
3	Leads split 2" with spade lugs

Vaisala Transmitters

NEW

CO₂ Transmitters

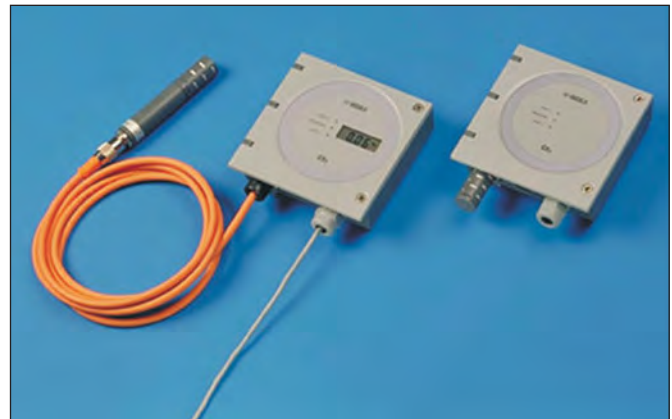
- Silicon-Based NDIR Sensor
- NEMA 4X enclosure
- Interchangeable Probes
- Easy Installation
- LCD Display Option
- Analog Retransmit
- Two Alarm/Relay Outputs

The GMT Series Transmitters measure CO₂ in harsh and humid environments. A patented sensor provides outstanding time and temperature stability. The case is sealed and corrosion resistant. Choose from 10 measurement ranges:
 2%, 3%, 5%, 10%, 20% full scale versions in the GMT221.
 2000, 3000, 5000, 7000 or 10000 ppm versions in the GMT222.

Humidity Transmitter

- Fixed or remote probe
- Optional LCD display
- Full 0-100% RH measurement
- Durable HUMICAP sensor
- Quick-change probe
- NEMA 4X, IP65 case

The HMT100 Series Transmitters are designed for humidity & temperature monitoring in demanding environments. The patented humidity sensor is resistant to dust & most chemicals. Single channel models transmit humidity or dewpoint. Dual channel models also transmit temperature. Measurement range is 0-100% RH, -40 to 80°C temperature, -20 to 80°C dew point temperature. Units with 4-20mA output(s) are loop powered. Voltage output models require an external 9-24VAC or 10-36VDC power supply.



SPECIFICATIONS

Dimensions:	4.7 x 4.7 x 1.3" + 4" sensor or remote probe
Housing:	ABS plastic
Operating Temperature (transmitter without display):	-40 to 60°C (HMT100), -20 to 60°C (GMT220)
Probe Cable:	Cable lengths to 39ft (10m) available

Vaisala Humidity & Temperature Transmitters

- Measure humidity, temperature, dew point, mixing ratio, absolute humidity and wet bulb temperature
- Small sensor head for use in tight spaces
- Small sensor mass for fast response
- Graphical display shows trends & 1 year history
- Analog & alarm relay outputs
- Corrosion resistant NEMA 4 (IP65) housing
- Single point field calibration



HMT333 ▲

The HMT333 Transmitter is a full featured front end for industrial and commercial humidity measurements. The HMT333 sensor provides accurate reading with excellent long-term stability, over the entire temperature range. The sensor is immune to particle contamination and most chemicals. A chemical purge to clean the sensor (via heating) can be initiated manually or at set intervals.

Two analog outputs easily connect to meters, controllers, recorders and other equipment. The RS-232 interface simplifies setup and calibration. RS-485 & Ethernet options permit networking the HMT333 with other devices. Windows software is available to download and display the measurement data.

Datalogger option records up to 4 years of data.

SPECIFICATIONS

Parameters:

Standard:	Relative Humidity (RH) Temperature (T)
Optional:	Dewpoint Temperature (Td) Absolute Humidity g/m3 (a) Wet Bulb Temperature (Tw) Mixing Ratio g/Kg (x) Enthalpy (h)
Temperature Range:	-40 to 80°C (176 °F)
Accuracy at 20°C:	±0.2°C
Temperature dependence:	±0.0025°C/°C
Temperature sensor:	Pt100 class B
RH Accuracy:	0-90 %RH: ±2% RH 90-100 %RH: ±1.7% RH Response time: 8 sec. in still air
Accuracy of analog output:	±0.05% full scale
External loads:	Current outputs: <500Ω 0-1V output: >2kΩ 0-5V & 0-10V outputs: >10kΩ
Power consumption @24VDC:	110mA max, 220ma during purge
Operating temperature:	-40 to 60°C (-40 to 140°F) with local display: 0 to 60°C (32 to 140°F)
Keypad:	Sealed pushbuttons
Display menus:	English, Spanish, French, German,
Alarm relays:	0.5A@250VAC, SPDT
RS 485/422 interface:	Full or half duplex, 9600 baud
Dimensions:	Housing: 7.2x4.7x3.0" (183x119x77mm) Probe: 3.5" x 0.5" dia (89x 12mm)

Additional HMT330 models available for high temperature (180°C), high pressure, vacuum, high humidity and other applications. Also available: HMT360 Series Intrinsically Safe Transmitters.

ORDERING INFORMATION

To Order—Insert Code for Each Letter to Select Catalog Number.
Order Example: HMT333 E0B201BCDC1B01AABC

HMT333	A	B	C	D	E	F	G	H	I	J	K
	L	M	N	O							

A	Cable Length	
E0	2m (6.5ft)	
F0	5m (16.3ft)	
G0	10m (32.5ft)	
B	Transmitter Type	
A	RH+T	
B	RH+T+Td+Tdf+a+Tw+x+ppm+pw+pws+h+dT	
C	Display	
0	No display	
1	Graphic LCD with keypad	
D	Power Supply, Alarm Output	
0	10-35 VDC, 24 VAC	
1	10-35 VDC, 24 VAC isolated	
3	100-240 VAC with 115V cord	
E	Analog Output Level	
1	4-20 mA	
2	0-20 mA	
3	0-1 V	
4	0-5 V	
5	0-10 V	
F	Analog Output Signal (3 digits: Ch1, Ch2, Ch3)	
B	RH	0 to 100%RH
C	T	
D	Td	-20 to +100 °C (-4 to +212 °F)
E	Tdf	-20 to +100 °C (-4 to +212 °F)
F	a	0 to 600 g/m3 (0 to +262 gr/ft3)
G	Tw	0 to +100 °C (32 to 212 °F)
H	x	0 to 500 g/kg d.a. (0 to 3500 gr/lb d.a.)
J	h	-40 to 1500 kJ/ kg (-17.2 to 644.9 Btu/lb)
K	ppm	0 to 5000
L	pw	0 to 1000 hPa (0 to 14.5 psi)
M	pws	0 to 1000 hPa (0 to 14.5 psi)
N	dT	-10 to 50 °C (14 to 122 °F)
G	Analog Output Range for Temperature	
C	-40 to +80 °C (-40 to +176 °F)	
D	-40 to +120°C (-40 to +248°F)	
H	Output Units	
1	Metric	
2	Non-metric	
I	Options (2 Digits: Slot 1, Slot 2)	
1	Relay Output	2
4	Ethernet (requires external power)	6
0	None	
J	Cable Fitting	
A	Cable gland M20* 1.5	
B	1/2 NPT conduit fitting	
K	Mounting	
0	Normal	
1	Wall plate	
4	DIN rail	
L	Humidity Sensor	
1	General purpose, Humicap180	
2	with sensor purge, Humicap180C	
M	Sensor Protection	
A	PPS grid & stainless steel netting (14 microns)	
B	PPS plastic grid	
C	Sintered stainless filter	
N	Installation Kit	
AB	None	
BB	Duct	
O	PC Accessories	
A	None	
B	Serial cable	
C	Software & cable	

TRANSDUCERS/
SENSORS

Kobold Digital Temperature Sensor

- Measuring Range -58 to 250°F
- Semiconductor Sensor
- Scalable 4-20mA Output
- Easy-to-Read LED Display
- All Stainless Steel Construction



Programmable Features

- Lockout Code
- Dampening
- Transmitter Span

SPECIFICATIONS

Display Type:	3-digit red LED
Display Resolution:	0.5° from -10° to +100°, 1° below -10 and above 100°
Accuracy:	14 to 185°F: ±0.9°F 14 to -58°F: ±3.6°F 185 to 250°F: ±3.6°F
Pressure:	1150 PSIG max.
Process Temp:	250°F max.
Ambient Temp:	120°F max.
Material:	316L Stainless Steel housing & probe
Remote Probe Cable:	Teflon, 8ft. std.
Power:	24 VDC ±20% @ 20 mA
Output:	4-20 mA, 3-wire, 500Ω max. load
Sample Rate:	0.5 Sec./sample
Dampening:	Averaging 2, 4, 8, 16, 32, or 64 samples
Electrical Connection:	4-Pin Micro-DC male plug or PVC jacketed cable
Electrical Protection:	NEMA 4/IP 65

ORDERING INFORMATION

To Order: Insert Code for Each Letter to Select Catalog Number

TDA -15 - - - - Example TDA-15-N4-F2-0-L3M

A	Process Connection				
	N4	1/2" NPT	N5	3/4" NPT	
	R4	1/2" BSP	R5	3/4" BSP	
	D6	Remote Probe (Smooth Shank)			
B	Measuring Range				
	F2	0 to 250°F			
	F3	-58 to 250°F (only available with Remote Probe)			
	H2	-20 to 120°C			
	H3	-50 to 125°C (only available with Remote Probe)			
C	Probe Length				
	0	12mm / 1/2" (not Available with Remote Probe)			
	1	100mm / 4"			
	2	185mm / 7.25" (not Available with Remote Probe)			
D	Electrical Connection				
	L3M	Micro-DC plug, 4-Pin male			
	L3P	3 Ft. PVC cable			
	L3S	Custom length PVC cable			

Kobold Magneto-Inductive Flowmeters

NEW

- Flow Rates from 0.26 GPM to 200 GPM
- Use with Conductive Liquids, Acids & Caustic
- No Moving Parts
- Digital Display Option
- Frequency or mA Output



SPECIFICATIONS

Liquid:	Conductivity >30 μS/cm
Accuracy:	±2.0% of full scale
Repeatability:	±1% of full scale
Straight Pipe:	Requires 3X dia. upstream, 2X downstream
Operating Temp.:	32-176°F (140°F max. with PVC fittings)
Pressure:	145 PSIG max @ 70°F
Pressure Drop:	3.6 PSI max @ 100% rated flow
Electrical Protection:	NEMA 4X/IP 65
Power Supply:	24 VDC ±20% required
Connector:	Micro-DC male, 4-pin (5-pin on C34)
Frequency Output	PNP open collector, 200 mA max.
Analog Output	4-20 mA, 3-wire, 500Ω max.
Switch Output	PNP or NPN open collector, 300 mA max.

Compact electronic units (C34 Output Type) have a digital display and programmable switch setpoint, reset point, switch logic, 4-20 mA span/zero, dampening & lockout code. Set via 2-button keypad. Models with Integral Totalizer & Batch Controller electronics are also available.

ORDERING INFORMATION

MIK- - - - Example MIK-5NAU4NL343

A	Body Material					
	5NA	Ryton with Buna-N Seal, 316L Electrode				
	5VA	Ryton with FKM Seal, 316L Electrode				
	6FC	PVDF with FFKM Seal, Hastelloy C4 Electrode				
B	Range					
		Fitting Set Size (")				
		GPM	N	P	M	A
	U1	0.013-0.26				
	U2	0.04-0.8	1/4	1/2	--	1/2
	U4	0.13-2.6				
	U5	0.2-4.0	3/8	3/4	3/8	1/2
	U7	0.4-8.0				
	U8	0.65-13	1/2	1	1/2	1
	UA	0.8-16				
	UB	1.3-26	1	--	1	1-1/2
	UD	2.0-40				
	UE	4.0-80	1-1/2	--	1-1/2	2
	UG	6.5-130				
	UH	10-200	2	--	2	2-3/4
C	Fitting Set*					
	N	NPT female PVC				
	P	PVC hose barb				
	M	PVC glue socket				
	A	BSPP male				
D	Output					
	F300	Frequency 0-500Hz				
	F390	User Specified 50-1000Hz full scale				
	L343	4-20mA				
	C34N	4-20mA & NPN switch				
	C34P	4-20mA & PNP switch				

* PVDF butt weld tube & polypro NPT female fittings also available for some ranges.

Kobold Differential Pressure & Thermal Flow Sensors

- 1-7 through 100-600 GPM Rates
- Bronze or Stainless Housing
- 4-20mA Process Output
- Rugged 316 Stainless Steel Bellows

The RCD series uses an orifice technique to generate a differential pressure which varies with flowrate but is unaffected by system pressure fluctuations. The single measuring bellows is coupled to a high accuracy hall effect detector.



SPECIFICATIONS

Maximum Pressure:	580 PSIG
Maximum Temperature:	176°F
Seals:	Buna-N
Display:	3 digit LED
Output:	4-20mA, 3 wire
Output Accuracy:	±3% of full scale
Input Power:	24VDC ±20%, 80mA
Optional Switch:	PNP or NPN open collector, 80mA max.
Electronics Housing:	304 SS, NEMA 4x
Electrical Connection:	Micro-DC male, 5 pin

ORDERING INFORMATION

KO/RCD- ABCD	Example KO/RCD-1105GN4C34P
A Material	
11	Bronze
12	Stainless Steel
B Flow Rate & Fitting Size	
05GN4	1-7.2 GPM, 1/2" NPT
10GN4	2-11.2 GPM, 1/2" NPT
15GN5	2-17.6 GPM, 3/4" NPT
20GN5	2.5-22.5 GPM, 3/4" NPT
25GN6	5-35 GPM, 1" NPT
30GN6	8-44.5 GPM, 1" NPT
35GN8	10-73 GPM, 1 1/2" NPT
40GN8	20-114 GPM, 1 1/2" NPT
45GN9	20-184 GPM, 2" NPT
50GN9	25-240 GPM, 2" NPT
55GNB	30-280 GPM, 3" NPT
60GNB	50-410 GPM, 3" NPT
65GNB	100-620 GPM, 3" NPT
C Type	
C3	Compact Electronics
D Output	
4P	4-20mA and 1 PNP switch
4N	4-20mA and 1 NPN switch
OR	2 PNP switches
OM	2 NPN switches
Options	
-C	Calibrate for specific gravity other than water (<0.95 or >1.05)
-V	Calibrate for viscous liquids (viscosity >10cSt)

Gas flowmeters also available.

- Temperature Independent Output
- 8 Segment LED Flow Rate Bar
- Optional Setpoint Relay
- Wide Viscosity Range
- No Moving Parts
- Extremely Low Pressure Loss
- NPT & Sanitary Fittings



The KAL-A uses the calorimetric principle to continuously monitor the flow of both viscous and non-viscous media. Flow rate is transmitted via a 4-20mA output, while an optional switch provides an alarm function. A single RTD element is used to both heat the probe tip and measure temperature. The internal microprocessor compensates for media temperature changes. An absence of protrusions prevents contaminants from building up on the probe tip.

SPECIFICATIONS

Sensing Range	
Water:	0.05 - 2 m/s
Oils (approx.):	0.1 - 4 m/s
Response Time:	5.6s typ.
Maximum Pressure:	1450 PSIG (Sanitary 600 PSIG)
Ambient Temperature:	0°F to 176°F
CIP Temperature:	280°F
Housing:	NEMA 4 Nylon, Explosion Proof (AI) optional
Output:	4-20mA, 3-wire into 500Ω max.
Linearity:	±10% of full scale
Zero Adjustment:	0-75% of range
Span Adjustment:	25-100% of range
Power:	24±2VDC, 300mA max
Switch Option:	
Adjustment:	by Potentiometer
Output:	PNP open collector, 24V, 400mA max.
Status Indicator:	Bi-colored LED

ORDERING INFORMATION

KO/KAL-7215	304 SS Sensor, 1/2" NPT fitting
KO/KAL-7315	316-Ti SS Sensor, 1/2" NPT fitting
KO/KAL-7320	316-Ti SS Sensor, 3/4" NPT fitting
KO/KAL-7340S	316-Ti SS Sensor, 1 1/2" Tri-Clamp fitting

OPTIONS

-P	PNP Switch
-M12	6' cable & Micro DC connector

Also available with switch output in place of 4-20mA output.

Kobold Target-Type Flow Sensor

- 1.5-8 to 225-500 GPM Water
- Bronze and Stainless Bodies
- Variety of Wetted Materials
- Line Sizes 3/8" to 3" NPT
- Compact LED display with switch and 4-20 mA flow transmitter


DPT-C ▲

Standard Ranges (specify bronze or stainless body):

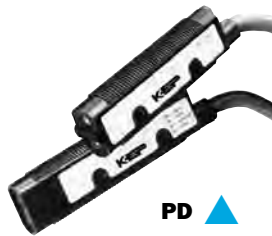
Fitting	GPM water
3/8" NPT	1.5-8 3-12.5
1/2" NPT	1.5-8 3-18
3/4" NPT	1.7-15 5-25
1" NPT	5-20 20-35
1 1/2" NPT	15-45 25-60
2" NPT	25-120 40-200
3" NPT	175-400 225-500

SPECIFICATIONS

Flow Range, Liquids:	1.5-8 GPM through 225-500 GPM water
Accuracy:	±3% of full scale
Repeatability:	±1% of full scale
Straight Pipe Required:	Inlet: 10 X Diameter; Outlet: 5 X Diameter
Operating Temperature:	-10 to 176°F
Maximum Pressure:	580 PSIG @ 70°F
Wetted Materials:	
Bronze Versions:	Bronze, 316-Ti stainless steel, buna-N, ceramic
Stainless Versions:	316-Ti stainless steel, viton, ceramic
Programmable Functions:	Lockout code, switch logic, switch setpoint and hysteresis, dampening
Input Power:	24 VDC ±20%, 80 mA max.
Display:	3 digit LED
Switch Type:	PNP open collector
Switch Rating:	300 mA max., short circuit protected
Analog Output:	4-20 mA, 3-wire, R _L =500 ohms max.

KEP Photoelectric Sensors

- Non-contact sensing
- Small size, low cost
- Various sensing types
- Low power consumption
- Shock resistant
- Hole or bulkhead mounting


PD ▲

SPECIFICATIONS

Input Voltage:	10-30 VDC (above 55°C derate to 24 VDC at 70°C)
Power Dissipation:	1W max
Response Time:	1 ms max, dark-to-light or light-to-dark
Sensitivity:	20:1 adjustment
Power On Delay:	<300 ms
Output Transistors:	Sourcing: 100 mA max
Sinking:	250 mA max (>55°C, derate to 120 mA max at 70°C); Off-state voltage: 30 VDC max
Off-state leakage:	10 µA max
Operating Modes:	Output turns on when the beam is complete or output turns on when the beam is broken
Alignment Indicator:	LED intensity varies with signal strength
Operating temperature:	-20 to +70°C (-4 to +158°F), <95% RH, noncondensing
Case material:	Polyurethane case, polycarbonate lens
Ratings:	NEMA 4, 6, 13
Mounting:	18 mm x1 threaded hole, thru hole (nut included) or side mounting with #4 screws
Length:	Sensor: 3.1 inches; Cable: 6 feet
Approvals:	UL and CSA

ORDERING INFORMATION

Model	Type	Max Range
PDS25	Wide-Angle Thru-Beam Photo Source	25 ft
PDD25	Wide-Angle Thru-Beam Photo Detector	25 ft
PDP02	Visible Beam Sensi Detector, Diffused Proximity	2 inches
PDPS08	Short Range Photo Detector, Diffused Proximity	8 inches
PDR25	Visible Beam Photo Detector, Reflex	25 ft
PDRP15	Polarized Visible Beam Photo Detector, Reflex	15 ft
PDF00	Fiber Optic Photo Detector	6 inches

Mounting brackets and target reflectors available separately.

Red Lion Photoelectric Sensors

- Retroreflective, proximity (diffuse) & opposed beam pairs
- Modulated LED light beam for immunity to ambient light
- 10-30VDC operation with reverse polarity protection
- LED signal strength indicator
- NEMA 1, 2, 3, 3S, 4, 4X, 12, 13


PRDC ▲

SPECIFICATIONS

Input Voltage:	10-30 VDC, 0% ripple max, Reverse polarity protected, 25 mA max. (Model EMDC = 20 mA max)
Outputs:	Current sinking NPN or current sourcing PNP transistors, open collector, short circuit protected to +30 VDC
Sinking:	150 mA max, Off-state voltage: 30 VDC max;
NPN VSAT	0.2 V @ 10 mA load; 1 V max. @ 150 mA max. load
PNP VSAT	<1 V @ 10 mA load; <2 V @ 150 mA max. load
Off-state Leakage:	1 µA max
Response Time:	Responds to light or dark signal duration ≥ 1 ms
Alignment Indicator:	LED intensity varies with signal strength
Operating Temperature:	-4 to +158°F (-20 to +70°C)
Case Material:	Valox housing
Ratings:	NEMA 1, 2, 3, 3S, 4, 4X, 12, 13
Dimensions:	1.21"H x 0.48"W x 1.5"D plus 0.6" thread length
Mounting:	18 mm x1 threaded hole, thru hole (nut included) or side mounting with #4 screws
Rear Panel:	Light/dark switch, gain adjustment, signal strength LED
Cable Length:	6 feet

ORDERING INFORMATION

RRDC0000	Retroreflective DC Photo-Electric Sensor
PRDC0000	Proximity (Diffuse) DC Photo-Electric Sensor
EMDC0000	DC Emitter (Opposed Beam Pair)
RCDC0000	DC Receiver (Opposed Beam Pair)
Accessories	
MB200000	Bottom Mount Bracket Kit
MB300000	Side Mount Bracket Kit
RT100000	1-1/2" Dia. Prismatic Reflector (Model RRDC)
RT200000	3" Dia. Prismatic Reflector (Model RRDC)

ATC Westcon Tach Generators

- Corrosion-Resistant
- 15,000 Hour Running Time
- Watertight Housings (Optional)
- Explosion-Proof—UL Listed (Type E)

SPECIFICATIONS

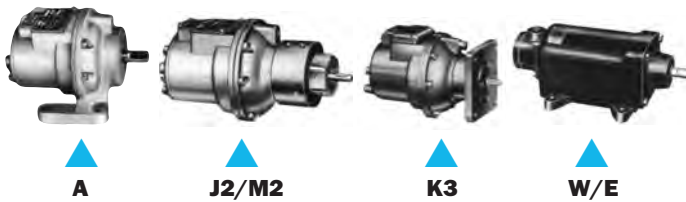
OUTPUT

Model 750: 6 VDC per 1000 RPM (5000 RPM max)
 Model 758: 10 VAC per 1000

Frequency Responsive Speed Ranges

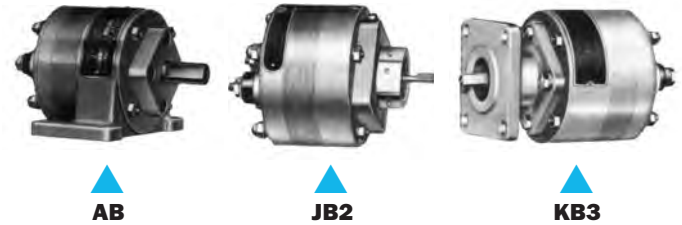
F86 Series: 500 RPM-20,000 RPM
 F44 Series: 500 RPM-40,000 RPM
 F25: 40,000 RPM-100,000 RPM

MODEL 750 DC GENERATORS



Type A	750-9901000	Type K3	750-9903000
Type A140R	750-282799	Type K30	750-9905000
Type J2	750-9906000	Type W	750-9905002
Type J2R	750-9906002	Type E	750-9905001
Type M2	750-9906001		

MODEL 758 AC GENERATORS



Type AB	758-9901000	Type KBF6	758-0136522-902
Type ABF	758-9901001	Type KB30	758-0134277-901
		Type KBF30	758-0134277-903
Type JB2	758-9905000	Type W	758-9910002
Type JBF2	758-0133477-902	Type WF	758-0133484-902
Type JB5	758-9905001		
Type JBF5	758-0134030-901	Type E	758-9910001
Type KB3	758-9907000	Type EF	758-0131483-902
Type KBF3	758-9911000		
Type KB6	758-9908000		

BEARINGLESS AC GENERATORS

Type XF86	758-9989002	Type XF44	758-0088466
Type XPF86	758-0077533	Type GF44	758-0049982
Type GF86	758-9912002	Type GP44	758-0084866
Type GPF86	758-0300008		

Monarch Speed Sensors

ROS-W

Optical (1 to 250,000 RPM). Remote Optical Sensor with visible Red LED light source and Green LED on-target indicator. Complete with mounting bracket and 8' cable. Operates up to 3 feet and 45° from reflective target. Stainless Steel Sensor .625" dia. By 2.9".

P5-11

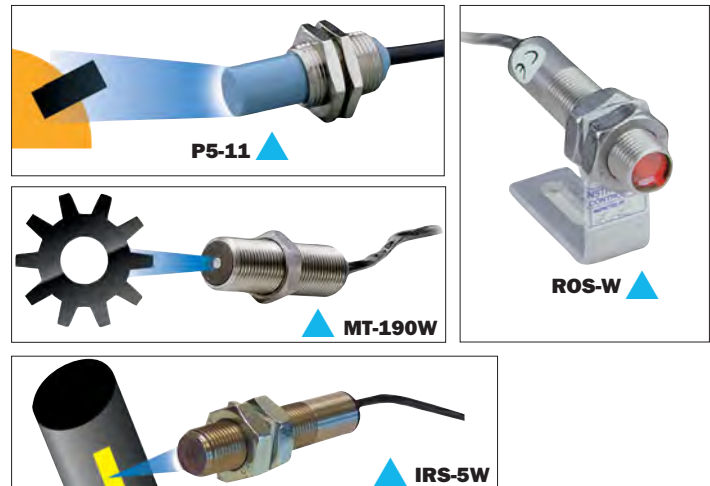
Proximity (1 to 60,000 RPM). Probe style inductive sensor for use up to .2 inches from a .5" metallic target. Can work with one pulse per revolution from bolt head, keyway, etc. Sensor Dimensions: M14X1 thread, 1.26" long.

MT-190W

Magnetic Sensor with Amplifier (1 to 100,000 RPM). Recommended for use with 60 tooth gear, .25" gap, .106" pole piece dia., Sensor Dimensions: 5/8 x 18 UNF thread, 2" long.

IRS-W

Infrared (1 to 999,990 RPM). Infrared Sensor with 8' cable. Use without Reflective Tape at .5" sensing gap from target. Senses white to black contrasting marks or beam can be interrupted by solid objects. Dimensions: 0.625"DIA x 2.9"L.



ORDERING INFORMATION

ROS-W	Remote Optical Sensor
MT-190W	Magnetic Sensor
P5-11	Proximity Sensor
IRS-W	Infrared Sensor
Accessories	
T-5	Reflective Tape (5' x 1/2")

Newport Load Cells

Miniature Compression Load Cell

ORDERING INFORMATION

Capacity (lb.)	Model Number
0-25	LCGD-25
0-50	LCGD-50
0-100	LCGD-100
0-250	LCGD-250
0-500	LCGD-500
0-1000	LCGD-1K
0-2000	LCGD-2K
0-5000	LCGD-5K
0-10,000	LCGD-10K
0-50,000	LCGD-50K

SPECIFICATIONS

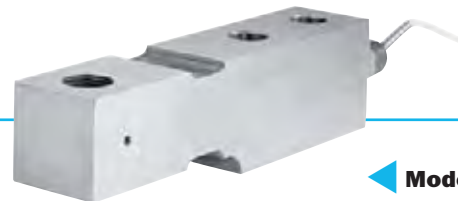
Excitation:	10 VAC/ DC
Output:	2 mV/ V nominal
Accuracy Class:	0.25%
Material:	Stainless Steel
Linearity:	±0.25% FSO
Hysteresis:	±0.20% FSO
Repeatability:	±0.10% FSO
Safe Overload:	150% FSO


LCGD-500 ▲

 ▲ **LCGD-50**

Cantilever Beams

- Tension/Compression
- Load Button, Rod End and Base Plate Mounting Accessories


 ◀ **Model LC501**

SPECIFICATIONS

Output:	3 mV/ V ±0.0075 mV/ V
Excitation:	10 VDC (15 VDC max)
Accuracy:	0.03% FSO
Calibrated Air:	0%, 50%, 100%, 50%, 0%
Linearity:	0.03% FSO
Hysteresis:	0.02% FSO
Repeatability:	0.02% FSO
Zero Balance:	±1% FSO
Safe Overload:	150% FSO
Material:	Stainless Steel

ORDERING INFORMATION

Capacity (lb.)	Model Number	Accessories for LC501 Series		
		Load Button Model	Rod End Model	Base Plate Model
±100	LC501-100	LBC-012	REC-012M	BP-10
±200	LC501-200	LBC-012	REC-012M	BP-10
±500	LC501-500	LBC-012	REC-012M	BP-10
±1000	LC501-1K	LBC-012	REC-012M	BP-15
±2000	LC501-2K	LBC-012	REC-012M	BP-15
±5000	LC501-5K	LBC-012	REC-012M	BP-15
±10,000	LC501-10K	LBC-034	REC-034M	BP-20

Low Profile Load Cells

ORDERING INFORMATION

Compression			Tension/Compression	
Capacity (lb.)	Cable Style Model No.	Connector Style Model No.	Capacity	Model No.
0-50	LC401-50	LC411-50	±50	LCHD-50
0-100	LC401-100	LC411-100	±100	LCHD-100
0-250	LC401-250	LC411-250	±500	LCHD-500
0-500	LC401-500	LC411-500	±1K	LCHD-500
0-1000	LC401-1K	LC411-1K	±3K	LCHD-3K
0-3000	LC401-3K	LC411-3K	±5K	LCHD-5K
0-5000	LC401-5K	LC411-5K	±10K	LCHD-10K
0-10,000	LC401-10K	LC411-10K	±20K	LCHD-20K
0-20,000	LC401-20K	LC411-20K	±30K	LCHD-30K
0-50,000	LC401-50K	LC411-50K	±50K	LCHD-50K


 ▲ **Model LC411**

SPECIFICATIONS

Output (FSO):	3 mV/ V ±0.25%		
Excitation:	10 VDC (15 VDC max)		
Calibrated at:	0%, 50%, 100%, 50%, 0%		
Zero Balance:	±1% FSO		
Safe Overload:	150% FSO		
		Compression	
Linearity:	≥3000 lb:	0.10% FSO	Tension/Compression
	<3000 lb:	0.13% FSO	0.10% FSO
Hysteresis:	≥3000 lb:	0.10% FSO	0.08% FSO
	<3000 lb:	0.12% FSO	0.08% FSO
Repeatability:		0.05% FSO	0.03% FSO

Hioki Chart Recorders



**MR8880-20
+ MR9000**

- 4 analog channels + 8 logic inputs
- Sample rate up to 1M/sec
- Directly record a 480V power line
- Isolated inputs to measure 3 phase circuits
- Stores data on CF card or USB memory stick
- Optional portable printer attaches easily
- Wide operating temperature range

Use the MR8880 to measure:

- Instantaneous waveform at startup or a suddenly generated abnormal waveform.
- RMS value fluctuations for a power line over extended time period.
- Fluctuations in low voltage signals or sensor outputs.

SPECIFICATIONS			
Input Channels	4 analog (isolated ch-ch & ch-earth) + 8 logic (common GND)	Ext. Storage	2GB flash card or USB stick
Analog Ranges	10mV - 100V/div (10 div FS), switchable RMS or instantaneous.	Data Backup	40 minutes for internal data
RMS Value	30Hz - 10kHz, crest factor 2	Printing	Optional thermal printer, recording speed 10mm/sec, 4.4" wide paper
Resolution	1/640 of range	PC Interface	USB 2.0 mini-B
Bandwidth	DC-100kHz (-3dB)	Battery	8xAA or optional rechargeable pack
Max. Voltage	600VAC Hi-Lo	Battery Life	AA: 45 min, Pack: 3 hours
Measure Modes	High speed or real time	AC Adapter	100-240VAC, also charges battery
Time Axis	Hi speed: 100µs-100ms/div	DC Power	10-28VDC, 11VA (40VA w/printer)
Record Interval	Real time: 100µs-1min (19 steps)	Isolation	600V AC/DC CAT III, (input to earth) 300V AC/DC CAT IV
A/D Resolution	14 bits	Temperature	-10 to 50°C operating, <80% RH
Max Sample Rate	1MS/s	Input Connectors	Isolated BNC for analog channels
Display	5.7" TFT color LCD, 640x480 (VGA)	Dimensions	8.1 x 7.8 x 2.7" (205x199x67mm) with Printer 12.0 x 7.8 x 2.7" (303x199x67mm)
Memory	14 bits x 1M words/ch		

ORDERING INFORMATION		ACCESSORIES	
HK/MR8880-20	Memory HiCorder*	HK/9197	Input Leads 600V
HK/MR9000	Printer Unit	HK/9661	AC Clamp-on Probe 500A
		HK/9320-01	4ch Logic Probe
		HK/Z1000	Rechargeable Battery Pack
		HK/9830	2GB Memory Card
		HK/C1003	Carrying Case

*Includes ac adapter, alkaline battery box, strap, USB cable, waveform software.

- Compact and easy to carry
- 2 analog channels + 4 logic inputs
- Fast 1MS/sec performance
- Large 480x272 color LCD
- Simple USB interface
- Store up to 2GB data on flash card



8870-20

- 10 isolated analog inputs
- 10ms sampling and recording across all channels
- Record to USB flash drive for easy computer transfer
- Replace storage media during real-time recording
- Thermocouple & Pulse inputs

NEW



LR8431-20

SPECIFICATIONS	
Input Channels	2 analog (isolated ch-ch & ch-earth) + 4 logic (common GND)
Analog Ranges	10mV - 50V/div (10 div FS), 12 ranges
Resolution	1/100 of range
Max Input	DC 400V
Bandwidth	DC to 50kHz (-3db)
Time Axis	100µs-5min/div, 20 ranges plus 2x-10x and 0.5-0.001x
Memory	12 bits x 2M word/ch
Ext. Storage	2GB flash card (optional)
Display	4.3" WQVGA TFT color LCD (480x272)
Measurement	Instantaneous or RMS value display (DC & 50/60Hz).
Functions	Numerical calculations, cursor readout, scaling, screen copy, waveform data & settings backup, start condition retention, auto-save
PC Interface	USB 2.0 mini-B for data export
Power Supply	100-240VAC adapter & charger; optional rechargeable battery pack (2hr run time); DC supply: 10-16V @10VA
Dimensions	7.0 x 4.0 x 1.6" (176 x 101 x 41mm)

ORDERING INFO	ACCESSORIES
HK/8870-20 Memory HiCorder	HK/9197 Input Leads 600V
Supplied with AC adapter, strap, USB cable & application disk.	HK/9661 AC Clamp-on Probe 500A
Order test leads, battery pack, logic probe and memory card separately.	HK/9320-01 4ch Logic Probe
	HK/9780 Rechargeable Battery Pack
	HK/9830 2GB Memory Card
	HK/9782 Carrying Case

SPECIFICATIONS	
Inputs	10 analog (isolated scanning method) + 4 pulse (common GND)
Measurements	Voltage: ±100mV to ±60V, 1-5V, 6 ranges, max resolution 5mV Thermocouple: K, J, E, T, N, R, S, B; -200 to 2000°C (varies by type) Pulse: 0 to 1000M, voltage or open collector input
Max Input	DC 60V (Analog inputs), DC -5 to +10V (Pulse inputs)
Isolation	30VAC, 60VDC input to chassis or input to input
Record Interval	10ms to 1 hour, 19 selections
Digital Filters	50Hz, 60Hz or OFF (selectable)
Memory	Internal: 3.5Mwords (7MB of 2 byte data or 4 byte pulse meas.) External: 2GB flash memory card
Display	4.3" WQVGA TFT color LCD (480x272)
Functions	Save data to memory card in real time. Numerical calculations, external trigger input, trigger out alarm out, scaling
Connections	Analog in: M3 screw terminals; Pulse in: BNC
PC Interface	USB 2.0 mini-B for control & data export from memory card
Power Supply	100-240VAC adapter & charger; optional rechargeable battery pack (2.5hr run time); DC supply: 10-16V
Dimensions	7.0 x 4.0 x 1.6" (176 x 101 x 41mm)

ORDERING INFO	ACCESSORIES
HK/LR8431-20 Memory HiLogger	HK/9641 Pulse Input Leads
Supplied with AC adapter, USB cable & measurement guide. Order test leads, battery pack and memory card separately.	HK/9780 Rechargeable Battery Pack
	HK/9830 2GB Memory Card
	HK/9812 Soft Case
	HK/9782 Carrying Case

Yokogawa Paperless Portable Recorders

NEW

- High resolution TFT color display
- Innovative two point touch screen for control & viewing
- Modular inputs & outputs
- Up to 100 analog channels (GP20)
- Variety of data & graphic display screens
- Non-volatile internal & removable data memory
- Modbus/TCP standard, Modbus/RTU optional
- Portable metal case with IP65 splashproof screen
- Real time remote monitoring from a web browser
- Free setup, viewing & analysis software



ORDERING INFORMATION

To Order, Insert Code for Each Letter to Select Catalog Number.

A - B / C / D / E Example: GP10-1E1D/MT/UH/UC10/CR11

A	Model	
GP10	Data acquisition unit; portable; 5.7" display	
GP20	Data acquisition unit; portable; 12.1" display	
B	Memory/Power	
-1E1D	Standard memory, 100-240 VAC power, US cord	
C	Options	
/C2	RS-232 serial Modbus RTU	
/C3	RS-422/485 serial Modbus RTU	
/UH	USB interface, dual ports	
/MC	Communication channels*	
/D5	VGA output (GP20 only)	
/FL	Fail output, 1 relay	
/LG	Log scale & scientific notation display	
/MT	Math computation capability (includes report functions)	
/AS	Advanced security functions (complies with FDA 21CFR Part 11)	
D	Analog input options (select one or none)	slots req'd
/UC10	Universal analog input; 10 ch; clamp terminals	1
/UC20	Universal analog input; 20 ch; clamp terminals	2
/UC30	Universal analog input; 30 ch; clamp terminals	3
/UC40	Universal analog input; 40 ch; clamp terminals (GP20 only)	4
/UC50	Universal analog input; 50 ch; clamp terminals (GP20 only)	5
/US10	Universal analog input; 10 ch; screw terminals	1
/US20	Universal analog input; 20 ch; screw terminals	2
/US30	Universal analog input; 30 ch; screw terminals	3
/US40	Universal analog input; 40 ch; screw terminals (GP20 only)	4
/US50	Universal analog input; 50 ch; screw terminals (GP20 only)	5
E	Digital I/O options (select one or none)	
/CR01	Digital input; 16 inputs	1
/CR10	Digital output; 6 output relays	1
/CR11	Digital I/O; 16 inputs and 6 output relays	2
/CR20	Digital output; 12 output relays (GP20 only)	2
/CR21	Digital I/O; 16 inputs and 12 output relays (GP20 only)	3
/CR40	Digital output; 24 output relays (GP20 only)	4
/CR41	Digital I/O; 16 inputs and 24 output relays (GP20 only)	5

*Required to read & display channels from other Modbus devices.

Model	GP20	GP10
Color LCD Display:	12.1" TFT (800×600)	5.7" TFT (640×480)
No. of module slots:	10	3
Analog input channels:	100 max.	30 max.
No. of math channels (/MT option):	100	50
No. of comm. channels (/MC option):	300	50

These recorders include a touch screen display and smart user interface to: capture & save waveforms, output image files, scroll through data, review historical trends, display digital values at any location, zoom on time axis, draw or write on waveform area and many other capabilities.

SPECIFICATIONS

Communications:	Ethernet 10BASE-T/100BASE-TX standard
Configuration:	Cascade max. 4 level (10BASE-T), max. 2 level (100BASE-TX), segment length: Max. 100 m
Functions:	E-mail client, FTP client, FTP server, Web server, SNMP client, SNMP server, DHCP client, Modbus/TCP client/server (client requires /MC option)
Security functions:	Key lock, user login, SSL support
Clock functions:	With calendar function, accuracy: ±5 ppm (0 to 50°C)
Internal flash memory:	500MB
External storage:	SD memory card, up to 32GB (FAT32 or FAT16), 1GB incl. with /UH option: USB2.0 external flash memory (Keyboard/mouse: USB1.1)
Rated supply voltage:	90 to 132 VAC, 180 to 264 VAC; 50/60 Hz
Power consumption:	Max 110 VA @ 240 VAC (GP20), 60 VA @ 240 VAC (GP10)
Insulation resistance:	≥20 MΩ between Ethernet or RS-422/485 and each insulation terminal and earth (at 500 VDC)
Withstand voltage:	3000 VAC for 1 minute between power terminal & earth
Temperature:	0-50°C operating, 20-80% RH non-condensing
Dimensions (W×H×D)	
GP10:	144×168×197 mm (144×168×248 including modules)
GP20:	288×318×197 mm (288×318×248 including modules)
Universal Analog Input Module UC10 & US10	
DCV:	20 mV, 60 mV, 200 mV, 1 V, 2 V, 6 V, 20 V, 50 V
Standard signal:	0.4-2 V, 1-5 V
RTD:	Pt100, JPt100, Cu10 GE, Cu10 L&N, Cu10 WEED, Cu10 BAILEY, Cu10 (20°C) α=0.00392, Cu10 (20°C) α=0.00393, Cu25 (0°C) α=0.00425, Cu53 (0°C) α=0.00426035, Cu100 (0°C) α=0.00425, J263B, Ni100 (SAMA), Ni100 (DIN), Ni120, Pt25, Pt50, Pt100 WEED, Cu10 GOST, Cu50 GOST, Cu100 GOST, Pt46 GOST, Pt100 GOST
Thermocouple:	R, S, B, K, E, J, T, N, W, L, U, W97Re3-W75Re25, KpvsAu7Fe, Platinel 2, PR20-40, NiNiMo, W/WRe26, N(AWG14), XK GOST
DI:	Level, Contact
DC current:	0-20 mA, 4-20 mA, external shunt resistor
Scan intervals:	100/200/500 ms, 1/2/5 s
Insulation resistance:	≥20 MΩ between inputs & internal circuitry (at 500 VDC)
Withstand voltage:	3000 VAC for 1 minute between inputs & internal circuitry, 1000 VAC for one minute between analog input channels
Measuring accuracy:	20 mV DC: ± (0.01% of reading + 5 μV) 6V (1-5V) DC: ± (0.01% of reading + 2 mV) Pt100 RTD: ± (0.02% of reading + 0.2 °C)
Digital Input Module CR01	
Input types:	Open collector or non-voltage contact
Open collector:	≤0.5 V DC when ON, leakage ≤0.5 mA when OFF
Non-voltage contact:	Resistance of 200 Ω or less when ON, 50 kΩ when OFF
Contact rating:	12 V DC, 20 mA or more
Insulation resistance:	≥20 MΩ between inputs & internal circuitry (at 500 VDC)
Withstand voltage:	1500 VAC for 1 minute between inputs & internal circuitry
Digital Output Module CR10	
Output types:	Form C relay contact
Rated load voltage:	100 to 240 V AC or 5 to 24 V DC
Max. load:	264 VAC or 26.4 VDC, 3A/point (resistance load)
Insulation resistance:	≥20 MΩ between outputs & internal circuitry (at 500 VDC)
Withstand voltage:	3000 VAC for 1 minute between outputs & internal circuitry

Fluke Power Logger



▲ 1735

Includes soft carrying case, 4 flexible current probes (15/150/3000A), voltage leads & clips, RS-232 PC interface cable, Power Log software, AC adapter, manual

ORDERING INFORMATION

Fluke 1735 Power Logger

Accessories

FL/MBX 1A/5A	Clamp for secondary CT applications
FL/MBX 5A/50A	Clamp for general applications
FL/C534	Water-tight hard carry case with rollers

- Monitor demand at 15 minute or user-defined averaging periods
- Verify efficiency improvements with energy consumption tests
- Measure harmonic distortion caused by electronic loads
- Capture voltage dips and swells from load switching
- Easily confirm instrument setup with color display of waveforms and trends
- Measure all three phases and neutral with included 4 flexible current probes
- View graphs and generate reports with included Power Log software
- Compact, rugged design with IP65 case, 600 V CAT III and 2-year warranty

The Fluke 1735 Power Logger is ideal for conducting 30-day load studies according to National Electric Code 220.65. The 1735 also logs most electrical parameters and harmonics as well as capturing voltage events. Sets up in seconds with the included flexible current probes and color display.

SPECIFICATIONS

V-rms Wye Ranges	57/66/110/120/127/220/230/240/260/277/347/380/400/417/480 V ac
V-rms Delta Ranges	100/115/190/208/220/380/400/415/450/480/600/660/690/720/830 V ac
Resolution	0.1 V
A-rms Ranges	15/150/3000 A rms (at sine) with supplied flex clamps
Resolution	0.01 A
PF (Power factor)	Range 0-1, Resolution 0.001
Frequency	46-54 Hz and 56-64 Hz, Resolution 0.01 Hz
Power Measurements	P (active), S (apparent), Q (reactive), D (distorting)
Energy Measurements	kWh, kVAh, kVARh
Display	¼ VGA Graphic Color, 320x240 pixel, with background lighting
Battery Life	Typical >12 hours with backlight low and >6 hours with backlight high
Working Temperature	-10 °C to +50 °C (+14 °F to +122 °F)
Dimensions	240 mm x 180 mm x 110 mm (6.1 in x 4.6 in x 2.8 in)

Yokogawa Portable Data Logger



▲ XL122 CE

SP1 Kit includes mating screw terminal block, US power cord, rechargeable battery, protective rubber boot, carrying case, utility software & manual.

Utility software for Windows XP displays data & waveforms, copies data, converts to CSV, saves settings & files.

Accessories

YE/90060	Type K thermocouple, 48" length with mini-plug
YE/93037	Carrying case
YE/94009	Lithium ion battery, 2.4Ah, 7V
YE/91029	Digital I/O cable, 3m
YE/91011	RS232 cable to PC (9 pin)
YE/93039	Stand for tilted desktop, wall or DIN rail mounting
YE/XL900	Datum-LOGGER PC data analysis software (WinXP)

- 8 or 16 isolated analog input channels
- Supports direct TC, RTD and DCV inputs
- 16MB internal memory + flash card capability
- Wide viewing angle 3.5" color LCD
- Trigger and alarm functions
- 1 pulse and 2 digital logic inputs
- 100msec to 1 hour sample interval
- Ethernet, USB, RS232 & RS485
- Web server, FTP client and email functions

SPECIFICATIONS

Input	Type	Accuracy	Resolution
	DCV: ±100/500mV, ±1/5/10/50V, 1-5V F.S.	±0.1% F.S.	10µV
	TC: K,E,J,T,L,U,N	±0.05% F.S. ±1°C	0.1°C
	TC: W,R,S,B	±0.05% F.S. ±2°C	1°C
	3-wire RTD: Pt100, JPt100	±0.05% F.S. ±0.5°C	0.1°C
	Pulse: Instantaneous value, integration, revolution		
	Logic: Voltage, contact		
Maximum Input	±50V		
Measurement Interval	100/200/500ms, 1/2/5/10/20/30s, 1/2/5/10/20/30/60min (8 ch max for 100ms)		
Data Storage	16MB internal memory, External storage: Compact flash memory card (Type II), SD card, USB memory (copy function only)		
Functions	Alarm output (4ch), Trigger function (pre-trigger/triggerdelay), Calculation (inter-channel calculation, linear scaling, statistical operation), Average, Automatic Measurement		
Display Screens	Waveform, digital, bargraph, waveform + digital, alarm summary, log		
Communication	10Base-T/100-BaseTX Ethernet (SMTP, HTTP, FTP, TCP/IP, SNMP protocols) USB 1.1 (Windows XP) RS-232 @2.4-38.4kbps, RS-485 @2.4-115.2kbps half-duplex (ASCII or Modbus RTU protocols)		
Operating Temperature	0 to 50°C, 5 to 85%RH (non-condensing)		
Storage Temperature	-20 to 60°C, <90%RH (non-condensing)		
Size	6.1" x 6.1" x 2.2" (155x155x55mm), without projecting parts or rubber boot		
Weight	1.8 lbs (800g), without battery or rubber boot		
Safety	EN61010-1: Measurement Category I, Pollution degree 2, Rated transient 350Vp-p		

ORDERING INFORMATION

YE/XL121-D/SP1	8 channel Portable Data Station Kit. Plug-in screw terminal block accepts wires
YE/XL122-D/SP1	16 channel Portable Data Station Kit. Plug-in screw terminal block accepts wires
YE/XL124-D/SP1	16 channel Portable Data Station Kit. M3 screw terminal block accepts wires or lugs. [no RTD inputs]

Hioki Strip Chart Recorders



8206-10

- AC or DC voltage to 500V
- AC current to 1000A
- 1 or 2 channels
- 5 paper speeds
- View input level on analog LCD display

8205-10 SPECIFICATIONS

Input:	Voltage or current, 1 channel
DC / AC Voltage:	0.1-500V f.s., 12 ranges
AC Current:	10-1000A f.s., 7 ranges (with optional clamp)
Sampling period:	10ms
Bandwidth:	20Hz - 30kHz, ±3dB
Paper Speed:	20cm/minute to 2cm/hour, 5 ranges
Accuracy:	Voltage: ±2% f.s. Current: ±4% f.s. (using 9651 clamp)
Power:	100-240VAC (50/60Hz) or 9.5-14VDC
Dimensions:	9.9" W x 4.8" H x 3.9" D
Supplied Accessories:	1 roll recording paper, carrying case, input leads

8206-10 SPECIFICATIONS

Input:	Voltage and current, 2 channels alternate recording
AC Voltage:	100/200/500V extended scale, 3 ranges
AC Current:	10-1000A f.s., 7 ranges (with optional clamp)
Sampling period:	10ms
Bandwidth:	30Hz to 30kHz, ±3dB
Paper Speed:	60cm/hour to 2cm/hour, 5 ranges
Accuracy:	Voltage: ±2% f.s. Current: ±4% f.s. (using 9651 clamp)
Power:	100-240VAC (50/60Hz) or 9.5-14VDC
Dimensions:	9.9" W x 4.8" H x 3.9" D
Supplied Accessories:	1 roll recording paper, carrying case, input leads

ORDERING INFORMATION

HK/8205-10	One Channel Micro HiCorder
HK/8206-10	Two Channel Micro HiCorder
HK/9650	Clamp-on Sensor, 100A f.s., 40Hz-1kHz, 3m length
HK/9651	Clamp-on Sensor, 500A f.s., 40Hz-1kHz, 3m length
HK/9668	Clamp-on Sensor, 1000A f.s., 40Hz-1kHz, 3m length
HK/9235	Recording paper (15m, 10 rolls)
HK/9236-01	Recording paper, Climate-resistant (15m, 10 rolls)

Partlow Chart Recorder

- 1 or 2 Trend Pen Versions
- Up to 2 Process or Limit Alarms for Each Pen
- Simple Operation and Set-Up
- Universal Inputs and Power Supply
- NEMA 3 Standard (NEMA 4X Option)
- Optional PC Configuration Port
- RS-485 Communications Option
- Two Year Warranty



MRC5000

SPECIFICATIONS

Input Range:	TC: J, K, T, R, S RTD: 100Ω Platinum, 0.00385 Ω/Ω/°C Current DC: 0 to 20mA, 4 to 20mA Voltage DC: 0 to 25mV, 0 to 50mV, 10 to 50mV, 0 to 5V, 1 to 5V
Chart Size:	10"
Chart Rotation:	User-configured: 8 hr, 12 hr, 24 hr, 48 hr, 7 day
Recording Accuracy:	0.5% of chart span reference accuracy
Power Requirements:	90 - 264VAC 50/60Hz. 18VA max. consumption
Dimensions (WxHxD):	14" x 14" x 3.8" (355.6 x 355.6 x 96.5mm)

ORDERING INFORMATION

To Order-Insert Number Code for Each Letter to Select Catalog Number.

Order Example: PA/51 110211

A	B	C	D	E	F	G	H
---	---	---	---	---	---	---	---

A Pen 1			
PA/51	Recorder only	PA/54	High/Low Limit
PA/52	Recording Controller		
B Pen 2			
0	None	2	Recording Controller
1	Recorder only	4	High/Low Limit
C Pen 1 Outputs			
0	None	2	Two Relays
1	One Relay		
D Pen 2 Outputs			
0	None	2	Two Relays
1	One Relay		
E Digital Communications			
0	None	2	RS-485 Com (Modbus RTU)
1	Configurator Port	3	Configurator Port & RS-485 Com
F Case			
1	Standard-NEMA3	3	NEMA 4X
2	Door Lock		
G Voltage			
1	Standard (90-264V AC)	5	Standard, with CE Approval
3	Standard, with 24V DC Transmitter Power Supply	7	Standard, with CE and Transmitter Power Supply
H Option Suffix			
Blank	None	AA	Alarms and communications connectivity option

One hundred 0-100°F, 24-hour charts are provided with each instrument.

Fuji Strip Chart Recorders

- Inkjet printing technology without physical contact with the paper
- Low-cost
- Lightweight, durable, and trouble-free 100mm recorder
- Available in one- or two-channel continuous trace
- Continuous analog trending on the same axis
- Prints periodic data, scale line, alarm condition, burnout, and parameter data
- Manufactured in an ISO 9001 Facility
- Three-year warranty



SPECIFICATIONS

Input Points:	1 or 2 continuous recording
Input Signals:	TC: B, R, S, K, E, J, T, N, W, L, U, PN RTD: Pt 100Ω DC Voltage: 50mV, 500mV, 5V, 50V range DC Current: 4 to 20mA, converted into voltage with 10Ω or 250Ω shunt resistor
Max. Allowable Input Voltage:	TC, RTD and DC Voltage: ±10V DC or less (50mV, 500mV range) DC Voltage Input: ±100V DC or less (5V, 50V range)
Recording Method:	Inkjet type, 3 colors
Recording Points:	1 or 2 continuous
Chart Paper:	Effective width: 100mm, Z-folding type, length-15.08m
Recording Cycle:	2 sec. minimum (chart speed dependent)
Recording Accuracy:	Indicating accuracy ±0.2%
Chart Speed:	10, 20, 24, 30, 50, 120, 200, 300, 400, 1000, 1200, 1500mm/hour, set from the keyboard
Power Supply:	100 to 120 VAC or 200 to 240 VAC, 50/60Hz
Dimensions (WxHxD):	5.67 x 5.67 x 6.89in. (144 x 144 x 175mm)

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.

Order Example: PHE1-X-Y-32-5Y-OEV

A - B - C - D - E - F

A Recording Points	
PHE1	1 continuous recording point
PHE2	2 continuous recording points
B Input Signal for Ch. 1	
X	B Thermocouple
R	R Thermocouple
S	S Thermocouple
K	K Thermocouple
E	E Thermocouple
J	J Thermocouple
T	T Thermocouple
N	N Thermocouple
W	W Thermocouple
L	L Thermocouple
U	U Thermocouple
P	PN Thermocouple
H	Pt100Ω RTD
A	DC 1-5V
B	DC 4-20mA with shunt resistor
C	DC 10-50mA with shunt resistor
M	DC ±50mV
Q	DC ±500mV
V	DC ±5V
F	DC ±50V
C Input Signal for Ch. 2	
Y	None
X	B Thermocouple
R	R Thermocouple
S	S Thermocouple
K	K Thermocouple
E	E Thermocouple
J	J Thermocouple
T	T Thermocouple
N	N Thermocouple
W	W Thermocouple
L	L Thermocouple
U	U Thermocouple
P	PN Thermocouple
H	Pt100Ω RTD
A	DC 1-5V
B	DC 4-20mA with shunt resistor
C	DC 10-50mA with shunt resistor
M	DC ±50mV
Q	DC ±500mV
V	DC ±5V
F	DC ±50V
D Power Supply	
32	100V/120V AC, 50/60Hz
42	200V/240V AC, 50/60Hz
E Scale Range	
5Y	One channel
55	Two channels
F Alarm Output	
OEV	None
1EV	1-ch. recorder, 2-point/no external control
AEV	1-ch. recorder, 2-point/with external control
2EV	2-ch. recorder, 4-point/no external control
BEV	2-ch. recorder, 4-point/with external control

West Paperless Recorder

NEW

- 5.5" color TFT display
- Strip chart, bargraph & numerical data formats
- 3 or 6 analog inputs
- 4 logic inputs, 3 relay outputs
- Non-volatile flash memory
- RS485 & Ethernet communication
- 144 DIN case with IP54/IP65 front
- Math & web server options
- Setup, comm & evaluation software



DataVU5

SPECIFICATIONS

Inputs	
T/C	J, K, T, R, S, E, N, B, L, U, D, C, Chromel-Copel
RTD	Pt100/50/500/1000, Ni100, Cu50/100 2, 3 or 4 wire
DC	mV: user settable -20mV to +210mV V: user settable -10V to +12V mA: user settable from -22mA to +22mA
Basic Accuracy	
T/C	±0.1% of range (±1°C cold junction)
RTD	±0.5°C
DC	±0.1% of range
Sampling Cycle	250ms, 3 or 6 channels
Input Isolation	350V via optocoupler
Resolution	>14 bits
Triggers	Normal, time & event
Internal Channels	Six, 9 digit, for count, integration & trigger
Relay Outputs	Three SPDT, 3A@230VAC
Digital Inputs	Four binary, logic "1" = 12-30V
Communications	Front panel setup interface standard
Options	RS485 (Modbus RTU), Ethernet (Modbus TCP)
Display	320x240 color TFT
Internal Memory	Flash storage of 350,000 measurements
External Memory	Compact flash card, 2GB max
Math Module	+, -, *, /, SQRT, min, max, sin, cos, tan, exp, ABS, INT, FRC, LOG, LN, humidity, moving avg, !, &, , ^
Temperature	0-50°C operating
Dimensions	144 x 144 x 214mm depth, including connectors

ORDERING INFORMATION

To Order, Insert Code for Each Letter to Select Catalog Number.

Example VU5-3-0-0-3-3 VU5 - **A** - **B** - **C** - **D** - **E**

A	Inputs
3	3 universal channels
6	6 universal channels
B	Power Supply
0	110-240V AC, 48-63Hz, 25VA
1	20-53V AC/DC, 48-63Hz
C	Option 1
0	Lithium battery for memory
1	Lithium battery & Ethernet interface
D	Option 2
0	None
1	Math function module
2	4 digital inputs / 3 relay out & RS232/485
3	Math functions + 4 digital inputs / 3 relay out & RS232/485
E	Option 3
0	None
1	IP65 front seal with wide mounting brackets

Hioki Data Loggers



- Miniature size
- 16,000 or 32,000 reading storage
- Data is retained even when the batteries are dead
- Power saving function

3641-20

Model	Range	Memory*	Feature
Temperature			
HK/3632-20	-20 to 70.0°C	16k	Waterproof with built-in sensor
HK/3633-20	-40 to 180.0°C	16k	External/internal sensor, waterproof
Temperature & Humidity			
HK/3641-20	-40 to 85.0°C, 0-100.0% RH	16k	Alternately record on two channels
Current			
HK/3634-20	0-20.00mA DC	16k	
HK/3636-20	0-50.00/500.0A AC RMS	32k	2ch with optional clamp sensor
HK/3638-20	AC Leakage Current	32k	2ch with optional clamp-on sensor
Voltage			
HK/3635-24	±500.0mVDC	16k	
HK/3635-25	±5.000VDC	16k	
HK/2635-26	±50.00VDC	16k	
HK/3637-20	0-600.0VAC RMS	32k	
HK/3645-20	±50.00mV/500.0mV/ 5.000V/50.00DC	32k	Multi-range logger with preheat signal function
HK/3639-20	9,999count/ interval	32k	Pulse Totalizer (1ch)
HK/3640-20	2000/20000/200000 lux	32k	Illumination (1ch)

*16k readings unit have record interval of 2/5/10/15/20/30 seconds, 1/2/5/10/15/20/30/60 minutes. Models with 32k readings also have a 1sec record interval.

SPECIFICATIONS

Accuracy	
3632-20:	±1.0°C, except ±0.5°C from 0-35.0°C
3633-20:	±0.5°C (0-35.0°C)
3641-20:	±0.5°C (0-35.0°C), ±5 % RH (at 25 °C)
3634-20:	±0.8% rdg ±5d
3636-20:	±1% rdg ±5d (main unit only)
3638-20:	±1% rdg ±5d (main unit only)
3635-24/-25/-26:	±0.8% rdg ±5d
3637-20:	±1% rdg ±5d
3645-20:	±0.5% rdg ±5d
3639-20:	±1d
3640-20:	±4% rdg ±5d
Data Transfer:	500 data elements/second via infrared link
Power Supply:	2 AAA batteries
Dimensions:	2.24"W x 2.91"H x 0.77"D
Environment:	Indoors, 0°C to 50°C, <80% RH

The Communication Base is used to transfer data from a Data Logger to PC. It can collect data on up to 16 channels. Data from multiple Data Loggers that are installed in fixed positions can be collected and then transferred to a PC via RS-232 or USB for analysis and processing.

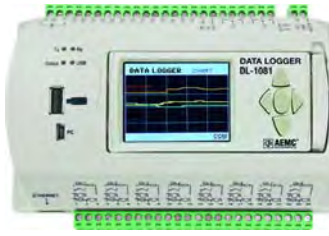
Settings that can be made through the main unit: recording interval, recording start/stop.
Settings that can be made through the Communication Base: current time, recording interval, recording start time, recording method, comment.

HK/3911-20	RS-232 Communications Base
HK/3920-20	USB1.1 Communications Base

AEMC Eight Channel Data Loggers

NEW

- 8 universal analog input channels
- 8 digital I/Os (individually configured as inputs or outputs)
- 2 relay outputs (NO, NC and common)
- 24Vdc output to power up to eight 4 to 20mA transmitters
- RS485 Modbus master or slave
- Ethernet LAN & internet interface
- USB-device interface for configuring, monitoring and download
- USB-host interface for logged data retrieval through a USB flash drive
- Up to 32 configurable alarms
- Up to 128 virtual channels for computations
- Detachable color LCD display (DL-1081)
- Up to 100 channels can be logged at a configurable rate
- Data downloading through the configuration software or the free download DLL
- 4 input channel types: analog, digital, remoted and virtual
- 16GB SD card interface



DL-1081

Inputs rated CAT II



ORDERING INFO

- AE/2134.62 DL-1081 8-channel Data Logger with detachable color LCD display
- AE/2134.61 DL-1080 8-channel Data Logger (no display)

SPECIFICATIONS		
Input Type	Measuring Range	Accuracy
J	-184° to 1832°F (-120 to 1000°C)	± 0.2% (F.R.) ± 1°C
K	-202° to 2501.6°F (-130 to 1372°C)	± 0.2% (F.R.) ± 1°C
T	-202° to 752°F (-130 to 400°C)	± 0.2% (F.R.) ± 1°C
E	-202° to 1436°F (-130 to 780°C)	± 0.2% (F.R.) ± 1°C
N	-202° to 2372°F (-130 to 1300°C)	± 0.2% (F.R.) ± 1°C
R	68° to 3214.4°F (20 to 1768°C)	± 0.2% (F.R.) ± 1°C
S	68° to 3214.4°F (20 to 1768°C)	± 0.2% (F.R.) ± 3°C
B	212° to 3308°F (100 to 1820°C)	± 0.2% (F.R.) ± 3°C
Pt100	-328° to 1562°F (-200 to 850°C)	± 0.15% (F.R.)
Pt1000	-328° to 1562°F (-200 to 850°C)	± 0.15% (F.R.)
Linear	0 to 20mA, 4 to 20mA, 0 to 20mV, 0 to 50mV, 0 to 60mV, -20 to 20mV, 0 to 5V, 0 to 10V *	± 0.15% (F.R.)
Digital Inputs	Logic "0": from 0 to 0.8Vdc, 2msec min. Logic "1": from 3 to 30Vdc, 2msec min.	
Excitation Current	Pt100: 360µA; ; Pt1000: 320µA	
Compensated Resistance	40Ω max for Pt100/Pt1000	
Input Impedance	Temperature & mV: >2MΩ, mA: 15Ω, V: 1.1MΩ	
Digital Outputs	30Vdc max., 200mA max.	
Relay Contacts	3A @ 250Vac; 3A @ 30Vdc max.	
Internal Memory	2MB non-volatile (500k measurements)	
Storage Rate	from 1ms to 24 hours	
Channels Logged	100 max.	
Power Supply	100 to 240Vac, 50/60Hz. 20VA (max)	
Operating Temperature	32-122°F (0-50°C), 80% RH to 85°F (30°C)	
Dimensions	163 x 117 x 76mm, DIN rail mount	

F.R. = Full Range; * = Measurement span is user programmable

AEMC Four Channel AC Current/Voltage Data Loggers

- TRMS **current** recording up to 1200A AC
- Storage rates from 8/second to 1/day
- Four user selectable storage modes
- Stores up to 1,000,000 measurements in non-volatile memory
- Six LED status indicators
- Wireless Bluetooth data communication
- 600V CAT IV; 1000V CAT III rating



- TRMS **voltage** recording to 600V AC/DC
- Storage rates from 8/second to 1/day
- Four user selectable storage modes
- Stores up to 1,000,000 measurements in non-volatile memory
- Six LED status indicators
- Wireless Bluetooth data communication
- 600V CAT IV; 1000V CAT III rating

L104 SPECIFICATIONS

Channels	Four current probe inputs (order probes separately)
Input Connection	One 3 pin connector per channel
Input Range	0 to 1Vac
Accuracy	10 to 50mV (50/60Hz): ±(0.5% of Reading + 1mV) 50 to 1000mV (50/60Hz): ±(0.5% of Reading + 0.5mV)
Input Impedance	100kΩ
Sample Rate	64 samples/cycle
Storage Rate	Programmable from 125ms to 1 per day
Storage Modes	Start/Stop, FIFO, Extended Recording Mode (XRM™)* and Store on Alarm
Recording Length	15 minutes to 8 weeks, programmable using DataView®
Memory	1,000,000 measurement (2MB), non-volatile
Communication	Bluetooth (Class 2), USB module included
Battery Life	Up to 180 days (dependent on storage rate/recording length)
Dimensions	5.904 x 5.904 x 3.568" (150 x 150 x 91mm)

ORDERING INFORMATION

- AE/2126.23 Simple Logger® II Model L104 4 channel AC Current Logger with 4 C batteries & Dataview software
- AE/2140.32 200A clamp-on AC current probe MN93-BK
- AE/2140.33 1200A clamp-on AC current probe SR193-BK
- AE/2140.36 5A/100A clamp-on AC current probe MN193-BK

Simple Logger® II models include Dataview software for real-time display, storage, analysis & reporting.

L264 SPECIFICATIONS

Inputs	Four voltage channels
Input Connection	Five recessed 4mm banana jacks
Input Range	0 to 600Vac/dc
Accuracy	5 to 50V (50/60Hz): ±(0.5% of Reading + 1V) 50 to 600V (50/60Hz): ±(0.5% of Reading + 0.5V)
Input Impedance	16MΩ
Sample Rate	64 samples/cycle
Storage Rate	Programmable from 125ms to 1 per day
Storage Modes	Start/Stop, FIFO, Extended Recording Mode (XRM™)* and Store on Alarm
Recording Length	15 minutes to 8 weeks, programmable using DataView®
Memory	1,000,000 measurements (2MB), non-volatile
Communication	Bluetooth (Class 2), USB module included
Battery Life	Up to 180 days (dependent on storage rate/recording length)
Dimensions	5.904 x 5.904 x 3.568" (150 x 150 x 91mm)

ORDERING INFORMATION

- AE/2126.23 Simple Logger® II Model L264 4 channel Voltage Logger with 5ft test lead set, 4 C batteries & Dataview software
- AE/2126.36 Simple Logger® II Model L564 2 channel Voltage & 2 channel Current Logger with 5ft test lead set, 4 C batteries & Dataview software. Order current probes separately

AEMC Power & Energy Logger

- 1 ϕ , dual (split-phase) & 3 ϕ (Y, Δ) power & energy loggers
- Use on 50Hz, 60Hz, 400Hz & DC distribution systems
- Current measurements from 200mA to 10,000A
- Power measurements: VA, W and var
- Energy measurements: VAh, Wh (source/load indication) & varh (including quadrant indication)
- Power Factor (PF), Cos (ϕ), Tan (Φ) and DPF
- Total Harmonic Distortion (THD) for voltages & currents
- Harmonics up to the 50th order for 50/60Hz & 7th order for 400Hz
- Simultaneous RMS measurements of each phase at 128 samples/cycle and DC
- Storage of measured and calculated values on SD or SDHC card
- Current & voltage ratios configured to external PT & CT
- USB, LAN, and Bluetooth communication
- 3 phases shown on bright, 4 line LCD display (PEL103)
- Includes DataView® software for data storage, real-time display, analysis & report generation



PEL103

* with supplied probe

Each kit includes a PEL Logger, classic tool bag, 3 mini-flex MA193-10-BK current sensors, 5ft USB cable, 4 black test leads w/alligator clips, Multifix mounting system, power cord, 2GB SD card with card reader, DataView software & manuals.

ORDERING INFO

AE/2137.52 PEL103 kit w/LCD display
AE/2137.51 PEL102 kit (no display)

NEW

SPECIFICATIONS

Sampling Frequency	128 samples/cycle @50/60Hz, 16/cycle @400Hz
Data Storage Rate	1 per second
Demand Period	1/2/3/4/5/6/10/12/15/20/30/60 minutes, user selectable
Recorded Parameters	V, I, W, VA, var, PF, Tan, Wh, Vah, varh, THD (V and I), Individual harmonics (1 to 50 per phase), Crest Factor (CF), Cos ϕ / DPF
PT Ratios	Programmable from 50V to 65,000V
CT Ratios	Programmable from 1:1 to 25,000:1 *
Communication Ports	USB 2.0, Ethernet, Wireless Bluetooth Class 1
Operating Temperature	32° to 122°F (0° to 50°C) / up to 85% RH
External Supply	110V/250V (10%) @ 50/60Hz; 400Hz
Back-Up Power	8.4V NiMH battery pack, \approx 5 hours recharge time
Battery Life	Up to 30 minute ride through upon power loss
Dimension/Weight	10.08 x 4.92 x 1.46" (256 x 125 x 37mm) / <1kg
Safety Rating	1000V CAT III / 600V CAT IV, Pollution Degree 2
Measurements:	
Single-Phase RMS Volts	0.1 to 1000V (50/60Hz), 600V (400Hz)
ϕ to ϕ RMS Volts	0.1 to 1700V (50/60Hz), 1200V (400Hz)
DC Volts	0.1 to 1000V
RMS Current*	1mA to 10000A (50/60Hz), 5000A (400Hz)
Power (P, Q, S)	-2 to 2GW, -2 to 2 Gvar, 0 to 2 GVA
Energy (EP, EQ, ES)	0 to 4 x 10 ¹⁸ (Wh, varh, Vah)
Power Factor	-1 to +1

Extech TRMS Data Logger

- Simultaneously measure two AC Voltage inputs or two AC Current inputs or one AC Voltage & one AC Current input
- Programmable sample rate from 1 second to 24 hours
- Store up to 256,000 readings
- LCD indicates time/date, present readings and Min/Max
- USB interface
- Readings can be analyzed using the included software or exported to a spreadsheet



SPECIFICATIONS

AC Current	10 to 200A
AC Voltage	10 to 600V
Resolution	0.1A or 0.1V
Accuracy	\pm (2% rdg \pm 1A), \pm (2% rdg \pm 1V)
Memory	256,000 points
Sampling Rate	1 second to 24 hours
PC Interface	USB, includes software
Power	3.6V Lithium battery
Dimensions	4.5 x 2.5 x 1.3" (114 x 63 x 34mm)

Complete with two Current sensor modules, two Voltage sensor modules, two sets of test leads, two sets of alligator clips, USB cable, Windows compatible software, universal AC Adaptor, 4 AAA batteries and two memory 2032 button batteries.

ORDERING INFORMATION

EX/DL160 Dual Input True RMS AC Voltage/Current Datalogger

AEMC AC Current Data Logger

- Two integral MiniFlex® flexible current probes measure from 0.5A to 1000A
- Dual range 100/1000A
- Programmable storage rates from 8 every second to 1 every day
- 3 user selectable storage modes
- Stores up to 240,000 measurements in non-volatile memory
- Lightweight, compact, fits anywhere
- 5 LED indicators quickly and clearly display logger status



SPECIFICATIONS

Inputs	Two captive MiniFlex® AC current flexible sensors
Range	0.5 to 100AAC, 5 to 1000AAC
Resolution	0.1A
Basic Accuracy	\pm 1% of Reading, 50/60Hz
Sample Rate	64 samples/cycle
Storage Rate	Programmable from 125ms to 1 day
Record Modes	Start/Stop, FIFO and Extended Recording Mode (XRM™)
Record Length	15 minutes to 8 weeks, programmable using DataView
Memory	Non-volatile storage of 240,000 measurements (512kB).
Communications	Optically isolated USB 2.0
Protection	IP40
Rating	600V CAT IV, 1000V CAT III
Operating Temp.	14° to 122°F (-10° to 50°C), <85% RH
Dimensions	4.95 x 2.75 x 1.28" (136 x 70 x 32mm) w/o Sensors
Sensor/Cable	Sensor: 6" (152mm) / Cable: 6 ft (2m)

* In XRM, each time the memory fills, every other of the oldest data samples is discarded to make room for new samples.

ORDERING INFORMATION

AE/2126.37 Simple Logger® II Model ML912 with two mini-flex probes, USB cable, batteries & DataView software

AEMC Simple Logger® II Data Loggers

NEW

- Compact size, battery operated
- Easily installed, operational in seconds
- TRMS measurement for accuracy on distorted waveforms
- Programmable alarm setpoints & triggers
- 5 LED indicators display logger status
- Choice of data storage modes
- Stores >240k measurements in non-volatile memory
- DataView software displays & analyzes real-time data on a PC



MODEL	L101	L102	L111	L261	L322	L432
Channels	One	Two	One	One	One	Two
Input Connector	BNC		Recessed banana jacks		Removeable screw term block	
Measurement Range	0-1V AC (probe dependent)		0-1A AC (probe dependent)		0-600V AC/DC	±20mA DC ±100mV/±1V/±10V
Resolution	0.1mV		0.1mA		0.1V	0.01mA 0.1mV/1mV/10mV
Accuracy (50/60Hz)	10-50mV: ±0.5% of Rdg ±1mV 50-1000mV: ±0.5% of Rdg ±0.5mV		10-50mA: ±0.5% of Rdg ±1mA 50-1000mA: ±0.5% of Rdg ±0.5mV		5-50V: ±0.5% of Rdg ±1V 50-600V: ±0.5% of Rdg ±0.5mV	±0.25% of Rdg ±0.05mA ±0.5% of Rdg ±1mV
Sample Rate	64 samples/cycle				Max. 8 samples at storage interval	
Storage Rate	Programmable from 125mS to 1 day					
CAT III Rating	50V			300V	50V	

MODEL	L562	
Channels	Two	
	Current Channel	Voltage Channel
Input Connection	BNC	Banana jacks
Input Range*	0 to 1VAC (use current probes with a voltage output)	0 to 600VAC/DC
Resolution	0.1mA	0.1V
Accuracy (50/60Hz)	10-50mV: ±0.5% of Rdg ±1mV 50-1000mV: ±0.5% of Rdg ±0.5mV	5-50V: ±0.5% of Rdg ±1V 50-600V: ±0.5% of Rdg ±0.5V
Measurement Input	5Vrms (±7.07V pk-pk max)	1000V
Sample Rate	64 samples/cycle	
Storage Rate	Programmable from 125mS to 1 day	
CAT III Rating	600V	

MODEL	L642
Channels	Two
Input Connection	Mini TC
Measurement Range	°F (°C)
J	-346 to +2192 (-210 to + 1200)
K	-328 to +2501 (-200 to + 1372)
T	-418 to +752 (-250 to + 400)
N	-328 to +2372 (-200 to + 1300)
E	-238 to 1742 (-150 to + 950)
R	32 to 3212 (0 to 1767)
S	32 to 3212 (0 to 1767)
Resolution	0.1° C/F up to 1000° C/F, 1° above 1000° C/F
Accuracy	0.1% to 0.2% + 0.6° to 1°, depending on the range & T/C type
Sample Rate Max.	8 samples at storage interval
Storage Rate	Programmable from 5 sec to 1 day
CAT III Rating	50V

SPECIFICATIONS

Memory	240,000 measurements (512KB)
Recording Length	15 minutes to 8 weeks, programmable using DataView®
Storage Modes	Start/Stop, FIFO and Extended Recording Mode (XRM™)
Communication	USB 2.0 optically isolated
Power	2 x 1.5V AA-cell Alkaline batteries
Battery Life	100 hrs to >45 days, depending on storage rate
Dimensions	5.38 x 2.75 x 1.28" (136 x 70 x 32mm)
Temperature	-10 to 50°C operating

ORDERING INFORMATION

AE/2126.02	Simple Logger® II Model L101 (TRMS, 0 to 1VAC, 1 channel)
AE/2126.03	Simple Logger® II Model L102 (TRMS, 0 to 1VAC, 2 channel)
AE/2126.04	Simple Logger® II Model L111 (TRMS, 0 to 1AAC, 1 channel)
AE/2126.05	Simple Logger® II Model L261 (TRMS, 0 to 600VAC/DC, 1 channel)
AE/2126.06	Simple Logger® II Model L322 (4-20mA DC)
AE/2126.07	Simple Logger® II Model L432 (±100mV,1V,10VDC, 2 channel)
AE/2126.35	Simple Logger® II Model L562 (TRMS Voltage & Current)
AE/2126.08	Simple Logger® II Model L642 (Thermocouple Temperature)
AE/2126.01	Simple Logger® II Model CL601 (Clamp-On, TRMS Current, 0 to 600A, 1.65" jaw opening)

ACCESSORIES

AE/1201.51	AC/DC Current Probe Model SL261 (10A@100mV/A, 100A@10mV/A, BNC)
AE/2115.82	AC Current Probe Model MN261 (24A@100mV/A, 240A@10mV/A, BNC)
AE/1200.72	AC Current Probe Model MR461 (60A@10mV/A, 600A@1mV/A, BNC)
AE/1200.73	AC Current Probe Model MR561 (150A@10mV/A, 1500A@1mV/A, BNC)
AE/2113.49	AC Current Probe Model SR661 (10A@100mV/A, 100A@10mV/A, 1000A@1mV/A, BNC)
AE/2110.90	AC Current Probe Model JM861 (30A@10mV/A, 300A@1mV/A, 3000A@0.1mV/A, BNC)
AE/2140.62	Test Lead Pair, 5 ft w alligator clips, 600V CAT IV, 15A

CLAMP-ON AC LOGGER

Simply clamp-on and start recording, no exposed wires to connect.

- 50/400/600A TRMS ranges
- One button operation
- Alarm function
- 5 LED indicators display logger status
- Optically isolated USB 2.0 output
- Includes DataView® software for data storage, real-time display, analysis & report generation
- 300V CAT IV, 600V CAT III



CL601

Each Simple Logger® II includes USB cable, DataView CD, batteries & manual.

RECORDERS / DATA LOGGERS

Lascar Data Loggers

Lascar USB Data Loggers measure and record a variety of parameters such as temperature, humidity, dew point, voltage and current. Simply insert any of these loggers into your computer's USB port, name it, choose your required sampling rate, set high and low alarms (if required) and set the logger start time. Once configured, the logger can be removed from the computer to log independently. Data is downloaded back to the PC where it can be analyzed and viewed as a graph. All loggers are supplied with configuration software and a 3.6 V battery.

WiFi data loggers measure temperature and humidity or temperature. Data is transmitted wirelessly via a WiFi network and viewed on a PC using Lascar's free configuration and data download software.

USB VOLTAGE & CURRENT DATA LOGGERS


EL-USB-3

- Store More than 32,000 Readings
- High and Low Alarm Thresholds with LED Indicators


EL-USB-4

- Programmable Sample Rates from 1 Sec to 12 Hours
- Screw Terminal Connections

ORDERING INFORMATION

EL-USB-3	Voltage Data Logger, 0-30 VDC Measurement Range
EL-USB-4	Current Data Logger, 4-20 mADC Measurement Range

AC AND DC MILLIVOLT DATA LOGGER

When used with a current clamp, this standalone data logger measures and stores up to 127,000 AC and DC current readings over a 0 to 1000A measurement range (0-723A for AC). In 'energy monitoring' mode, data is converted into power, energy (applying a user defined voltage value) and cost (with a user supplied energy unit cost). The millivolt measurement mode allows for direct measurement of voltage, up to 1V DC (700mV AC).


EL-USB-ACT

- Compatible with AC and DC Current Clamps
- Stores More Than 127,000 Readings
- Programmable Sample Rates from 1 Sec to 12 Hours
- USB Interface for Set-up and Data Download
- Immediate, Delayed and Push-to-start Logging Modes
- High Contrast 4 Digit LCD Screen

ORDERING INFORMATION

EL-USB-ACT	AC and DC Millivolt Data Logger with Current Clamp Input
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STAND-ALONE DATA LOGGERS

These robust, IP67/NEMA 4X rated data logger stores up to 256,000 readings with on-screen programming, data download and graphing independent of the computer. Micro USB interface (cable supplied) allows for PC based set-up and download if required. Also includes a high contrast graphic screen with white backlight, logging rates between 10 sec and 12 hrs, user programmable alarm thresholds, audible alarms, status LEDs and 2 user replaceable batteries.


EL-GFX-1

- -30 to +80°C (-22 to +176°F) Measurement Range
- Stores More Than 256,000 Readings with 0.1°C Resolution
- Programmable Sample Rates from 10 Sec to 12 Hours
- Immediate, Delayed, Push-button or Temperature Triggered Start Mode
- Graphic LCD Shows Real-time Readings, Graph & Current Status
- High & Low Temperature Alarms with Programmable Thresholds

ORDERING INFORMATION

EL-GFX-1	Temperature Data Logger with Graphic LCD Screen
EL-GFX-2	Temperature/RH Data Logger with Graphic LCD Screen

NEW

USB TEMPERATURE DATA LOGGERS


EL-USB-1

- -35° to +80°C (-31° to +176°F) Measurement Range
- Stores More Than 16,000 Readings
- Programmable Sample Rates from 10 Sec to 12 Hours


EL-USB-1-LCD

- High and Low Alarm Thresholds with LED Indicators
- 2½ Digit LCD Display Shows Latest Log & Min/Max Temperatures
- Clear Cap Provides IP67 Seal

ORDERING INFORMATION

EL-USB-1	Temperature Data Logger
EL-USB-1-LCD	Temperature Data Logger with Display
EL-USB-1-PRO	Extended Temperature Data Logger


EL-USB-1-PRO

- -40° to +125°C (-40° to +257°F) Range
- Stores More Than 32000 Readings
- 316 Stainless Steel Case, IP67 Rating

USB TEMPERATURE/RH DATA LOGGERS


EL-USB-2

- -35° to +80°C (-31° to +176°F) & 0-100% RH Measurement Range
- Stores Than 16,000 Dual Readings
- Programmable Sample Rates from 10 Sec to 12 Hours


EL-USB-2-LCD

- High and Low Alarm Thresholds with LED Indicators
- 2½ Digit LCD Display Shows Latest Log & Min/Max Temperatures
- Clear Cap Provides IP67 Seal

ORDERING INFORMATION

EL-USB-2	Temperature/RH Data Logger
EL-USB-2-LCD	Temperature/RH Data Logger with Display
EL-USB-2+	Higher Accuracy (0.3°C) Temperature/RH Data Logger
EL-USB-2-LCD+	Higher Accuracy Temperature/RH Data Logger with Display

USB THERMOCOUPLE DATA LOGGERS


EL-USB-TC

- -200° to +1350°C (-328° to +2462°F) Measurement Range
- Stores More Than 32,000 Readings
- Programmable Sample Rates from 1 Sec to 12 Hours


EL-USB-TC-LCD

- 4 Digit LCD Readout (-LCD model) 0.5°C/1°F Resolution
- Accepts K, J & T Thermocouples via Connector in Base
- Supplied with Type K probe

ORDERING INFORMATION

EL-USB-TC	Thermocouple Data Logger
EL-USB-TC-LCD	Thermocouple Data Logger with Display

WiFi TEMPERATURE LOGGERS

These data loggers measure ambient temperature, RH & dew point. During set-up, the user selects the WiFi network, names the logger, chooses the sample and transfer-to-PC rate as well as high and low alarms. Once programmed, the units can be placed in the range of the WiFi network, transferring data to the PC for on-screen viewing.


EL-WIFI-TH

- Easy Set-Up Using Free PC Software and USB Cable
- LCD Display Shows Min/Max/Last Values plus Alarm & Battery Status
- Adjustable High and Low Alarms
- View Multiple Sensors from 1 PC
- Rechargeable Internal Lithium Polymer Battery
- Sensor's Memory Stores Data if Temporarily Disconnected from WiFi

ORDERING INFORMATION

EL-WIFI-TH	Temperature, Humidity & Dew Point Logger
EL-WIFI-T	Temperature Logger
EL-WIFI-TP	Temperature Logger with external probe

Extech Temperature & Humidity Dataloggers

Thermocouple Datalogger

- Dual & differential temperature measurements
- Time stamped datalogging
- 7 thermocouple types
- Pushbutton or timer triggering
- 3 to 355 second sample rate
- Large 4¹/₂ digit backlit display
- Min/Max/Avg or Min/Max with elapsed time



EA15

SPECIFICATIONS

Range:

J	-200 to 1994°F	-150 to 1090°C
K	-200 to 1999.9°F	-150 to 1370°C
T	-200 to 752°F	-150 to 400°C
E	-200 to 1598°F	-150 to 870°C
R	35 to 1999.9°F	2 to 1767°C
S	35 to 1999.9°F	2 to 1767°C
N	-200 to 1999.9°F	-150 to 1300°C

Resolution: 0.1°

Basic Accuracy: ±0.05% rdg (+1.5°F/+0.75°C) Types J,K,E,T,N
±0.05% rdg (+4°F/+2°C) Types R,S

Dimensions: 6" x 2.8" x 1.5" (152x72x37mm)

Supplied with 2 Type K probes, PC software, RS-232 cable, holster, case & AAA batteries.

EX/EA15	EasyView™ Temperature Datalogger
EX/EA15-NIST	EasyView™ Temperature Datalogger w/ NIST Certificate
EX/871515	Type K General Purpose Temperature Probe
EX/872501-S	Bead Wire Temperature Probe
EX/409996	Soft Vinyl Pouch Carrying Case

Hygro-Thermometer Datalogger

- Dual display of RH, temperature, dew point & wet bulb
- Store up to 15,000 readings
- Sample rates from 1 to 86000 seconds
- Data hold, Relative & Min/Max
- Programmable power off timer



EA25

SPECIFICATIONS

Range:

Dew Point	-91.1 to 139.8°F (-68.4 to 59.9°C)
Wet Bulb	21.7 to 140°F (-5.7 to 60.0°C)
Temperature	-4 to 122°F (-20 to 50°C)
Humidity	0-95% RH
Resolution:	0.1°, 0.1%
Accuracy:	±0.9°F (±0.5°C), ±3% RH
Dimensions:	6"x2"x1.4" (152x72x35mm)

Supplied with probe, stand, protective cover, PC software, RS-232 cable, holster, case & AAA batteries.

EX/EA25	EasyView Hygro-Thermometer Datalogger
EX/EA25-NIST	EasyView Hygro-Thermometer Datalogger w/ NIST certificate

Chart Recorder

- Graphical & digital data display plus date & time
- 49000 reading memory
- Programmable resolution
- Audible & visual alarms
- Wall or benchtop mounting
- RS232 & USB communications



RH520A

SPECIFICATIONS

Temperature:	-20.0 to 140.0°F (-28.0 to 60.0°C)
RH:	10.0 to 95.0%
Accuracy:	±1.8°F (±1°C), ±3% RH
Dimensions:	5" x 7.7" x 0.9" (129x195x22mm)
PC Software:	Lab-View based; calculates & graphs dew point, wet bulb, grains per pound (GPP)

Supplied with 3' probe, stand, RS-232 cable, USB adapter, AA batteries, AC adapter & PC software.

EX/RH520A	Humidity + Temperature Chart Recorder
EX/RH520A-NIST	Humidity + Temperature Chart Recorder w/ NIST certificate
EX/SL123	AC Alarm Relay Module with 9' (3m) cable
EX/SL124	DC Alarm Relay Module with 9' (3m) cable

Datalogger Kits

- Log temperature or temperature/humidity
- Store 8000 readings for each parameter
- Log data for days, weeks or months
- Sample rates from 1sec to 2hrs
- Start on schedule, immediate or magnetic trip
- Program & download multiple modules from one docking station



42275

SPECIFICATIONS

Temperature:	-40°F to 185°F (-40°C to 85°C)
Humidity:	0 to 100%RH
Accuracy:	±1°F (-4 to 122°F), ±2°F (-40 to -4°F, 122 to 185°F) ±0.6°C (-20 to 50°C), ±1.2°C (-40 to 20°C, 51 to 85°C)
	±5%RH
Resolution:	0.1°, 0.1%
Battery:	Lithium, 1 yr life
Module:	3" x 2.3" x 0.88" (76x57.2x22.3mm)

EX/42275	Temperature/Humidity Datalogger Kit
EX/42270	Temperature/Humidity Datalogger
EX/42265	Temperature Datalogger Kit
EX/42260	Temperature Datalogger for 42265

Datalogger kits include docking station & software.

Extech Sound Meters

Datalogging Sound Level Meter

- Meets ANSI & IEC61672-1 Type 2 standards
- Datalogging capability up to 20,000 records
- Three ranges from 30 to 130dB
- Capture up to 10 readings/sec when connected to a PC
- Records readings with date & time stamp
- Min/Max and Data Hold functions
- Auto power off with disable capability
- USB port includes software

HD600 ▶



SPECIFICATIONS

Range:	30-130dB
Basic Accuracy:	±1.4dB
Weighting:	A & C
Response Time:	Fast, slow
Analog Output:	AC/DC
Datalogging:	20,000 points
PC Interface:	USB
Dimensions:	10.9 x 3 x 2" (278 x 76 x 50mm)

Includes Windows® compatible software, USB cable, wind cover, tripod, hard carrying case, AC adaptor, 9V battery

ORDERING INFORMATION

EX/HD600	Datalogging Sound Level Meter
EX/HD600-NIST	Datalogging Sound Level Meter with NIST Certificate
EX/407744	94dB Sound Calibrator for 0.5" & 1" microphones
EX/407766	94/114dB Sound Calibrator

Sound Level Monitor

- Extra large display with bargraph
- Adjustable high or low limit
- OVER display
- External alarm output
- Time stamped Max reading memory
- Meets ANSI Type 2
- Wall, bench or tripod mounting

▶ SL130



SPECIFICATIONS

Frequency:	31.5Hz - 8kHz
Ranges:	30-80dB, 60-110dB, 80-130dB
Resolution:	0.1dB
Weighting:	A & C
Response Time:	Fast (125ms), Slow (1s)
Dimensions:	8.75 x 7.1 x 1.25" (22x18x3.2mm)

Includes swivel microphone, wind cover, AA batteries

ORDERING INFORMATION

EX/SL130G	Sound Level Monitor with 110V AC Adapter
EX/407760	USB Sound Level Datalogger
EX/SL125	15ft (4.7m) Microphone Extension Cable for SL130G
EX/4299	Two 3.6V Lithium Batteries for 407760
EX/TR100	Tripod

Extech Wireless Multimeter/Datalogger

- True RMS AC Voltage and Current
- Datalogging up to 9,999 readings
- Wireless transmission directly to a PC
- 1000V protection on all functions
- Dual sensitivity frequency function
- Auto power off with disable capability
- Backlit triple LCD display includes two sub-displays for simultaneous indication of frequency with voltage and memory data/location information
- IP67 & CAT IV-600V ratings
- 3 year warranty

EX540 ▶



SPECIFICATIONS

Display Counts:	40,000 count
Basic Accuracy:	0.06%
DC/AC Voltage:	0.01mV to 1000VDC; 0.01mV to 1000VAC
DC/AC Current:	0.01µA to 20A
Resistance:	0.01Ω to 40MΩ
Capacitance:	0.001nF to 40mF
Frequency (electrical):	40Hz to 4kHz
Frequency (electronic):	0.001Hz to 100MHz
Temperature (Type K):	-50 to 1382°F (-45 to 750°C)
Duty Cycle:	0.1 to 99.90%
Diode/Continuity Test:	2.8V / Yes
Dimensions:	7.25 x 3.25 x 2.25" (184x83x57mm)

Includes double molded test leads, magnetic hanging strap, Type K bead wire temperature probe, remote receiver with USB cable, Windows® compatible software, 9V battery, hard carrying case

ORDERING INFORMATION

EX540	MultiMeter/Datalogger with 915MHz Wireless PC Interface
EX540-NIST	EX540 with calibration traceable to NIST

Order Model EX542 (433MHz) for use outside North America

USB Sound Level Datalogger

- USB interface for easy setup & data download
- Datalogging capability up to 129,920 records
- 30 to 130dB range
- Selectable data sampling rate
- Records readings with real time clock
- Start logging from PC or manually
- 0.5" electret microphone
- Designed to ANSI & IEC 61672 Class 2 standards

▶ 407760



SPECIFICATIONS

Range:	30-130dB, 31.5 to 8kHz
Basic Accuracy:	±1.4dB
Weighting:	A & C
Response Time:	Fast (125ms), Slow (1s)
Datalogging:	129,920 points
Dimensions:	5.1 x 1.1 x 0.9" (130 x 30 x 25mm)

Includes 3.6V Lithium battery, Windows® compatible software, USB cover, tripod, USB extension cable, and windscreen

Flir Thermal Imagers

NEW

Affordable InfraRed Cameras

- Simultaneous storage of IR/Visual/MSX images
- 2% accuracy
- Large 3" color LCD
- 640 x 480 camera
- File format: radiometric jpg
- Spot measurement mode
- Easy to use, weighs only 1.2 lbs.
- Swappable battery, 4 hour life



E6

Flir E4

- 4,800 pixels (80 x 60)
- <0.15 °C thermal sensitivity
- Centerspot measurement mode

Flir E5

- 10,800 pixels (120 x 90)
- <0.10 °C thermal sensitivity
- Centerspot & Area Box Measurement modes
- Auto hot/cold detection with min/max markers

Flir E6

- 19,200 pixels (160 x 120)
- <0.06 °C thermal sensitivity
- Picture in Picture image
- Centerspot & Area Box Measurement modes
- Auto hot/cold detection with min/max markers

Flir E8

- 76,800 pixels (320 x 240)
- <0.06 °C thermal sensitivity
- Picture in Picture image
- Centerspot & Area Box Measurement modes
- Auto hot/cold detection with min/max markers

Multi-Spectral Dynamic Imaging (MSX) adds visible spectrum definition to IR images by detecting the edges of objects and including that detail in the thermal image. This eliminates the need to refer back to a visual image for detail. Even text becomes clearly visible so a label or identifier can be read within the IR image.

SPECIFICATIONS

Temperature Range:	-4 to 482°F (-20 to 250°C)
Camera:	640 x 480, 9 Hz frame rate
Field of View:	45° x 34°, focus free
Battery:	4 hour Li-ion, rechargeable
Warranty:	2 year (10 year on detector, 5 year on battery)

Includes power supply/charger with four plugs, rechargeable battery, FLIR Tools software, USB cable, and hard transport case. E8 also includes extra battery and external battery charger.

ORDERING INFORMATION

63901-0101	FLIR E4 Compact Thermal Imaging Camera (80x60)
63905-0501	FLIR E5 Compact Thermal Imaging Camera (120x90)
63902-0202	FLIR E6 Compact Thermal Imaging Camera (160x120)
63903-0303	FLIR E8 Compact Thermal Imaging Camera (320x240)

Accessories

T198529	Pouch
T198532	Car Charger

Simpson Elapsed Time Meters



- 6 Digit Readout
- No Reset Capability (Virtually Tamper-proof)
- Six Case Styles
- 1½" and 3½" sizes
- AC and DC Models
- Phenolic cases with glass windows

Accumulate running time and monitor life of AC or DC powered equipment. Synchronous motor provides accurate hour indication (to 99,999.9 hours). Connect in parallel with the equipment being monitored.

ORDERING INFORMATION

Model	Size	Catalog #	Voltage
109ET	1½"	SI/03618	10-80 VDC
112ET	1½"	SI/03622	120 VAC
55ET	3½"	SI/03580	120 VAC
57ET	3½"	SI/03590	120 VAC
1357ET	3½"	SI/03595	120 VAC
2153ET	3½"	SI/17720	120 VAC
55ET	3½"	SI/03600	240 VAC
57ET	3½"	SI/03610	240 VAC
1357ET	3½"	SI/03615	240 VAC
2153ET	3½"	SI/17721	240 VAC

Yokogawa AC Elapsed Time Meters

- Meets ANSI C-39.1
- Five Case Styles
- Wide Selection of Ranges
- Weather Resistance
- UL Recognized

SPECIFICATIONS

Accuracy	Matches frequency control of power system
Vibration Shock	Meets ANSI Specification C39.1
Materials	Case of clear LEXAN®, frame of Noryl®, brass terminal studs, Lucite® front covers
Presentation	6-digit counter in hours and tenths of hours or minutes and tenths of minutes
Insulation Level	Operating at 120, 208, 240 or 480 volts AC, will pass Hi-pot of 2000 VRMS for one minute
Motor	3 Watts typical

ORDERING INFORMATION

1	Insert:	1 - for Register in Hours and Nonresetable
		2 - for Register in Hours and Resetable
		3 - for Register in Minutes and Nonresetable
		4 - for Register in Minutes and Resetable

AC Elapsed Time Meters-Type 240 Big Look

Voltage/Freq.	2½" Size	3½" Size
120V-60 Hz	24021 1 AAAB	24031 1 AAAB
120V-50 Hz	24021 1 ADAB	24031 1 ADAB
208/240V-60 Hz	24021 1 ABAB	24031 1 ABAB
208/240V-50 Hz	24021 1 AEAB	24031 1 AEAB
480V-60 Hz	24021 1 ACAB	24031 1 ACAB

AC Elapsed Time Meters-Type 240 Square Case

120V-60 Hz	24061 1 AAAD	24071 1 AAAD
120V-50 Hz	24061 1 ADAD	24071 1 ADAD
208/240V-60 Hz	24061 1 ABAD	24071 1 ABAD
208/240V-50 Hz	24061 1 AEAD	24071 1 AEAD
480V-60 Hz	24061 1 ACAD	24071 1 ACAD

AC Elapsed Time Meters-Type 240 Round Case

120V-60 Hz	24063 1 AAAD	24073 1 AAAD
120V-50 Hz	24063 1 ADAE	24073 1 ADAE
208/240V-60 Hz	24063 1 ABAD	24073 1 ABAD
208/240V-50 Hz	24063 1 AEAD	24073 1 AEAD
480V-60 Hz	24063 1 ACAE	24073 1 ACAE

AC Elapsed Time Meters-Type 240 Back of Panel (One Size Only)

Voltage/Freq.	Catalog No.
120V-60 Hz	24000 1 AAAA
120V-50 Hz	24000 1 ADAA
208/240V-60 Hz	24000 1 ABAA
208/240V-50 Hz	24000 1 AEAA
480V-60 Hz	24000 1 ACAA

AC Elapsed Time Meters-Conduit Mounted Case and 2½" Round Meter*

Voltage/Freq.	Catalog No.
120V-60 Hz	24025 1 AAAD
208/240V-60 Hz	24025 1 ABAD
480V-60 Hz	24025 1 ACAF

* NOTE: Conduit mount available in non-reset versions ONLY.



Round Case ▲



New Big Look Panel Mounted ▲



Square Case ▲



Back of Panel Unmounted ▲

Yokogawa Hour Meters



- ANSI Switchboard Case
- UL recognized
- Reset & Non-Reset Versions

▲ Switchboard Case

SPECIFICATIONS

Readout:	99,999.9 hours.
Material:	Steel case, polycarbonate cover
Vibration/Shock:	ANSI C39.1
Motor:	3W synchronous
Bezel:	4.33" square
Depth:	4.3" behind panel

Reset requires removal of front cover.

ORDERING INFORMATION

Voltage/Freq.	Non-Reset	Reset
120V-60Hz	103811 AAAB	103822 AAAB
120V-50Hz	103811 ADAB	103822 ADAB
208V-60Hz	103811 AGAB	103822 AGAB
208V-50Hz	103811 AHAB	103822 AHAB
240V-60Hz	103811 ABAB	103822 ABAB
240V-50Hz	103811 AEAB	103822 AEAB
480V-60Hz	103811 ACAB	103822 ACAB
480V-50Hz	103811 AFAB	103822 AFAB

ENM Hour Meters & Counters

Electronic LCD Hour Meter/Counter

- 6 digit LCD Display
- Non-volatile Memory
- Up/down Counting
- Resettable
- Shock Resistant

SPECIFICATIONS

Display:	99999.9 (hour meter)
	0 to 999999 (up counter)
	999999 to 0 (down counter)
Digit Height:	5mm
Power:	8-28VDC
Count Speed:	100/second max.
Terminals:	3/16" male quick connects
Temperature:	-40 to 85°C

ORDERING INFO

Example T1121AB

A	Type	
	T	Timer
	C	Up Counter
	D	Down Counter
B	Style	
	1121A	Screw Mount
	1131A	Clip Mount
	1141A	Rectangular Clip Mount
C	Finish	
	B	Black
	S	Stainless

T1121A ▶



T1131A ▲



T1141A ▶

Hour Meter & Battery Discharge Gauge

- 6 Digit LCD Hour Display
- 10 Segment LED Battery Charge Indicator
- Fits 2" Diameter Hole
- -10 to 65°C Temperature Range

ORDERING INFO

Model	Voltage
PT271AB1	12/24VDC
PT272AB1	24/36VDC
PT273AB1	36/48VDC
PT274AB	70/80VDC



PT271AB1 ▲

T51D ▶



T41E ▶



Electromechanical Hour Meters

- Low Power Consumption
- Solid State Drive Circuit
- Mechanical Indicator Retains Reading
- Quartz Crystal Timing
- Quiet Operation
- Sealed, Tamperproof Plastic Case

SPECIFICATIONS

Display:	99999.9 hours, auto recycle to zero
Digit Height:	0.125"
Temperature:	-30 to 65°C
Terminals:	1/4" male quick connects

ORDERING INFO

Example T51D4

A	Type	
	T41	DC powered hour meter
	T51	AC powered hour meter
B	Style	
	D	Front panel mount (clips)
	E	Back of panel mount (screw holes)
	F	48x48mm panel mount (clips)
C	Power	
	1	230VAC 50/60Hz
	2	115VAC 50/60Hz
	4	24VAC 50/60Hz
	45	10-80VDC

T41F ▲



ATS Large Digital Displays

- Run Time Accumulators
- Production Monitors
- GPS Clock Systems
- Analog Input Displays
- Counters
- Timers



▲ **AE46S-373**



▲ **AE2412**



▲ **STD-525**



▲ **AE44-503**

BRIGHT RUN TIME ACCUMULATORS

AT/AE24-373	2.3 Inch, Four Digit, MM:SS
AT/AE26-373	2.3 Inch, Six Digit, HH:MM:SS
AT/AE44S-373	4 Inch, Six Digit, MM:SS
AT/AE46S-373	4 Inch, Six Digit, HH:MM:SS

Other sizes and configurations available

ANALOG INPUT DISPLAYS

AT/AE24-341	2.3 Inch, Four Digit, 4-20 mA
AT/AE2412-341	2.3 & 1 Inch, Six Digit, 0-5VDC
AT/AE26-341	2.3 Inch, Six Digit, 0-10VDC
AT/AE24F-341	2.3 Inch, Four Digit, Flush Mount
AT/AE2412F-341	2.3 & 1 Inch, Six Digit, Flush Mt.
AT/AE42S-341	4 Inch, Two Digit, 4-20mA
AT/AE43S-341	4 Inch, Three Digit, 0-5VDC
AT/AE44S-341	4 Inch, Four Digit, 0-10VDC
AT/AE45S-341	4 Inch, Five Digit, 4-20mA
AT/AE46S-341	4 Inch, Six Digit, 0-10VDC

Four Digit Resolution

PRECISION TIMERS

AT/STD-11-2	Measure & Display Accurate Elapsed Time: 0.000 - 9999.999 Seconds
AT/STD-525T	Measure Accurate Elapsed Time Minutes, Seconds, Tenths and Hundredths of seconds
AT/2171-2	Handheld Pendant Control

POWER OPTIONS

12VAC	12 VAC, 60HZ
12V3	12 VDC to 15 VDC
24VAC	24 VAC, 60 Hz, 5VA
220V1	220 VAC, 60 Hz, 12.6 VA
PC8	Add 120 VAC Power Cord, 8' long

ENCLOSURE OPTIONS

OPT-N12A	NEMA 12 rated, 16"W x 8"H x 6"D
OPT-N12B	NEMA 12 rated, 24"W x 8"H x 6"D
OPT-N4XA	NEMA 4X rated Stainless Steel, 16"W x 8"H x 6"D
OPT-N4XB	NEMA 4X rated Stainless Steel, 24"W x 8"H x 6"D

NEMA enclosures available on selected models

Large Bright Red LED Displays with digit sizes from 1" to 12" high. Visible from 25 feet to 500 feet. Display temperature, pressure, flow and other process variables. Accumulate machine cycle time, run time or downtime. Monitor production counts. Synchronized clock systems with GPS accuracy. Count-up or countdown elapsed time. Custom units available.

SYNCHRONIZED CLOCK SYSTEMS

AT/MC4181LV	Master Clock to synchronize Clocks, Bells, Time & Attendance System with Computer
AT/GPS-TR3	GPS Master Clock Interface, includes Antenna/Receiver and Interface.
AT/CC2002	Four digit, four inch red LED Clock Single sided, wall mount, 24 VAC
AT/CC2002W2	Four digit, four inch red LED Clock Double sided, wall mount, 24 VAC
AT/CC2002C2	Four digit, four inch red LED Clock Double sided, ceiling mt, 24 VAC
AT/CC2002F	Four digit, four inch red LED Clock Single sided, flush mount, 24 VAC
AT/8901-1821	24VAC, 200VA, (8 Amp) Power Supply. 12" x 12" x 4"

COUNTER OPTION

OPT-230	Event Counter (To 25Hz Speed)
Input signals:	12-120V AC or DC, >20ms duration

PRODUCTION MONITORS

AT/AE44-503J	Monitor GOAL and ACTUAL counts Two lines of four digits, four inch
AT/AE44-503C	Designed for use with Remote Controller.
AT/AE-503DX1	Controller for AE44-503C above

DIGIT SIZE	VIEWING DISTANCE	
	Typical	Maximum
2.3"	70 ft	110 ft
4"	120 ft	200 ft
8"	240 ft	400 ft
12"	360 ft	600 ft

Misc.

Crompton Protector Trip Relays

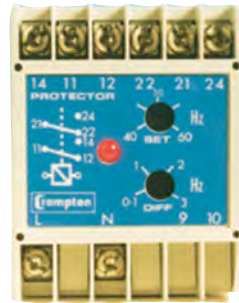
- Phase Loss, Reversal or Sequence
- Under and Over Current or Voltage Protection
- Load Detection
- Monitoring of Systems

The Crompton Protectors provide continuous surveillance of the monitored circuit. When the current moves outside the set point limit, the relay operates. An illuminated LED indicates when the relay is energized. For 3 phase systems, the sequence of connection is not important.

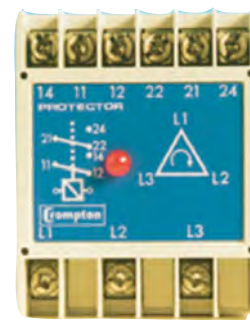
Standard overcurrent relays will energize on trip when the nominal input current plus the user adjustable “over nominal value” is exceeded, after the preset additional delay period if set. The relay will automatically reset to de-energize when the input current is lowered past the setpoint minus the hysteresis (differential) value.

Standard undercurrent relays will de-energize on trip when the input current is below the nominal value minus the user adjustable “under nominal value” after the preset additional delay period if set. The relay will automatically reset to energize when the input current is raised past the setpoint plus the hysteresis value.

On request, any product can be manufactured with the energize/de-energize functions reversed.



▲ **252-PHU**



▲ **252-PVR**



ORDERING INFORMATION

System	Input	Aux. Power	Protection	Catalog Number
AC Current (Adjustable time delay 0-10 sec., fixed hysteresis 1%)				
Single Phase	5A	120V	Under current 40-120%	252-PAUU-LSBX-C6-DG-D1-EB
Single Phase	5A	120V	Over current 40-120%	252-PAOU-LSBX-C6-DG-D1-EA
Single Phase	5A	120V	Under & over current	253-PADU-LSBX-C6-DG-D1-EC
3 Phase 3 or 4 Wire	5A	120V	Under current	253-PAVU-LSBX-C6-DG-D1-EB
3 Phase 3 or 4 Wire	5A	120V	Over current	253-PAPU-LSBX-C6-DG-D1-EA
System	Protection		Catalog Number	
AC Voltage (Adjustable hysteresis 1-15%)				
Single Phase L-N	Under Voltage 75-100%		252-PVUU-PQBX-C6-EB	
	Over Voltage 100-125%		252-PVOU-PQBX-C6-EA	
	Over and Under Voltage		253-PVBU-PQBX-C6-EC	
3 Phase, 3 Wire L-L	Under Voltage 75-100%		252-PVKU-PQBX-C6-EB	
	Over Voltage 100-12%		252-PVAU-PQBX-C6-EA	
	Over and Under Voltage		253-PVMU-PQBX-C6-EC	
3 Phase, 4 Wire L-N	Under Voltage 75-100%		252-PVVU-PQBX-C6-EB	
	Over Voltage 100-12%		252-PVPU-PQBX-C6-EA	
	Over and Under Voltage		253-PVEU-PQBX-C6-EC	
AC Voltage (Adjustable time delay 0-10 sec., fixed hysteresis 1%)				
Single Phase L-N	Under Voltage 75-100%		252-PVZU-PQBX-C6-EB-T1	
Single Phase L-N	Over Voltage 100-12%		252-PVHU-PQBX-C6-EA-T1	
3 Phase, 3 Wire L-L	Under Voltage 75-100%		252-PVJU-PQBX-C6-EB-T1	
3 Phase, 3 Wire L-L	Over Voltage 100-12%		252-PVCU-PQBX-C6-EA-T1	
3 Phase, 4 Wire L-N	Under Voltage 75-100%		252-PVXU-PQBX-C6-EB-T1	
3 Phase, 4 Wire L-N	Over Voltage 100-12%		252-PVSU-PQBX-C6-EA-T1	
System	Input	Protection		Catalog Number
Frequency (Adjustable hysteresis 0.1-3.0Hz)				
Single Phase	120 VAC	Under Frequency 55-65 Hz		252-PHUU-PQBX-C6-EB
Single Phase	120 VAC	Over Frequency 55-65 Hz		252-PHOU-PQBX-C6-EA
Single Phase	120 VAC	Under & Over (2 output relays)		253-PHDU-PQBX-C6-EC
Combined Under/Over Voltage and Under/Over Frequency				
Single Phase	120V / 60 Hz	Over & Under Voltage Over & Under Frequency (50-70 Hz) (4 Independent Double Pole change over relays)		256-PHUV-PQBX-C6

Crompton Protector Trip Relays

ORDERING INFORMATION

System	Input	Protection	Catalog Number	
Phase Sequence & Phase Failure				
3 Phase 3 or 4 Wire	120V L-L 60 Hz	Phase Sequence, Under Voltage	252-PVRU-PQBX-C6	
Phase Balance				
3 Phase 3 or 4 Wire	120V L-L 60 Hz	Phase Loss & Unbalance	252-PSFU-PQBX-C6	
3 Phase 3 or 4 Wire	480V L-L 60 Hz	Phase Loss & Unbalance	252-PSFU-SEBX-C6	
3 Phase 3 or 4 Wire	120V L-L 60 Hz	Phase Loss, Unbalance, Under Voltage	252-PSGU-PQBX-C6-T1-1A	
3 Phase 3 or 4 Wire	480V L-L 60 Hz	Phase Loss, Unbalance, Under Voltage	252-PSGU-SEBX-C6-T1-1A	
Reverse Power				
1 ph or 3 ph, 4w	5A, 120V, 60 Hz	Reverse Power 2-20%	256-PASU-LSBX-PQ-C6-EA	
3 Phase, 3 Wire	5A, 120V, 60 Hz	Reverse Power 2-20%	256-PATU-LSBX-PQ-C6-EA	
1 ph or 3 ph, 4w, Push	5A, 120V, 60 Hz	Reverse Power 2-20%	256-PAQU-LSBX-PQ-C6-EA	
3 ph 3w Push	5A, 120V, 60 Hz	Reverse Power 2-20%	256-PARU-LSBX-PQ-C6-EA	
System	Input	Protection	BUS	Catalog Number
Synchro-Check (Paralleling)				
1ph or 3ph, 3w or 4w	120V/60 Hz	Phase Angle & Voltage	Live BUS	256-PLLU-PQBX-C6
1ph or 3ph, 3w or 4w	120V/60 Hz	Phase Angle & Voltage	Dead BUS	256-PLDU-PQBX-C6
System	Input	Protection	Catalog Number	
DC Voltage Relay				
DC Relay	18-20V*	Under Voltage External Time Delay	252-PDUU-NABX-T1-EB	
DC Relay	18-20V*	Under Voltage Differential 1-15%	252-PDEU-NABX-EB	
DC Relay	24V	Over & Under Voltage (2 relays)	253-PDCU-BDBX-T1-EC-BD	
System	Input	Protection	Aux Power	Catalog Number
DC Millivolts/Thermocouple				
DC Millivolt	50 mV	High Trip	120V	252-PBTU-ECBX-DG-T1-EA
DC Millivolt	50 mV	Low Trip	120V	252-PBSU-ECBX-DG-T1-EA
DC Millivolt	100 mV	High Trip	120V	252-PBTU-GBBX-DG-T1-EA
DC Millivolt	100 mV	Low Trip	120V	252-PBSU-GBBX-DG-T1-EA
Thermocouple**	J,K,T,S,T	High Trip	120V	252-PTOU-T*BX-DB-T1-EA
Thermocouple**	J,K,T,S,T	Low Trip	120V	252-PTUU-T*BX-DB-T1-EB
DC Transducer Trip				
Transducer	1 mADC	Low Trip 0-80%	120V	252-PBAU-FABX-DG-T1-EB
Transducer	1 mADC	Hip Trip 40-120%	120V	252-PBBU-FABX-DG-T1-EA
Transducer	1 mADC	Low/High, 2 relays	120V	252-PBVU-FABX-DG-T1-EC
Transducer	4-20 mADC	Low Trip 0-80%	120V	252-PBAU-HGBX-DG-T1-EB
Transducer	4-20 mADC	Hip Trip 40-120%	120V	252-PBBU-HGBX-DG-T1-EA
Transducer	4-20 mADC	Low/High, 2 relays	120V	252-PBVU-HGBX-DG-T1-EC
Transducer	10 VDC	Low Trip 0-80%	120V	252-PBAU-MTBX-DG-T1-EB
Transducer	10 VDC	Hip Trip 40-120%	120V	252-PBBU-MTBX-DG-T1-EA
Transducer	10 VDC	Low/High, 2 relays	120V	252-PBVU-MTBX-DG-T1-EC
System	Protection	DC Aux. Power	Catalog Number	
Speed Sensing				
5V to 75V peak to peak	3 Trip Points	12 VDC	253-PH3U-BGBX-FS-V2	
	3 Trip Points	24 VDC	253-PH3U-BGBX-FS-V4	

* 20-30V also available

** Specify TC Type and Temperature Range

SPECIFICATIONS

Relay Contacts:	DPDT, 5A@240VAC/24VDC (resistive)
Temperature:	0-60°C operating (0-40°C for UL)
Enclosure:	Flame retardant polycarbonate/ABS, IP50
Dimensions:	252: 2.2" x 2.8" x 4.4" (55 x 70 x 112 mm)
	253: 2.9" x 2.8" x 4.4" (75 x 70 x 112 mm)

Martel Process Power Supplies

ORDERING INFORMATION

24.75STS-3	24V loop Power Pack
MECPS-5	5V Loop Power Supply
MECPS-12	12V Loop Power Supply
MECPS-24	24V Loop Power Supply



← STS-3

MECPS →



For DIN Rail Power Supplies, see Action Instruments Signal Conditioners

MECPS

Loop power supply for transmitters, DC operated peripherals and input/output modules on PLCs.

STS-3

General purpose power supply drives up to eight 4-20mA process loops.

SPECIFICATIONS

Input:	115VAC ±5%, 60Hz
Output:	
MECPS-5	5V ±0.2 VDC @ 300mA
MECPS-12	12V ±0.5 VDC @ 200mA
MECPS-24	24V ±1 VDC @ 100mA
Size:	3" x 2.2" x 1.4"

SPECIFICATIONS

Input:	105-125 VAC or 210-250 VAC, user selectable
Output:	24VDC @ 0.175mA (max.)
Regulation:	Line ±0.1%, Load ±0.1%
Operating Temp.:	-20 to +70°C
Size:	3" x 2.7" x 1"

Extech DC Power Supplies

NEW

- Single, Triple & Quad Outputs
- Constant Voltage or Constant Current
- 5 Models, up to 300W Out
- Analog or Digital Display

ORDERING INFORMATION

EX/382203	Analog 0-30V / 0-3A with fixed 5V/0.5A & 12V/1A outputs
EX/382213	Digital 0-30V / 0-3A with fixed 5V/0.5A & 12V/1A outputs
EX/382260	80W three range, single output power supply
EX/382270	Quad output power supply
EX/382280	Precision 200W single output supply with RS-232 interface



← 382213



382260 →



← 382280

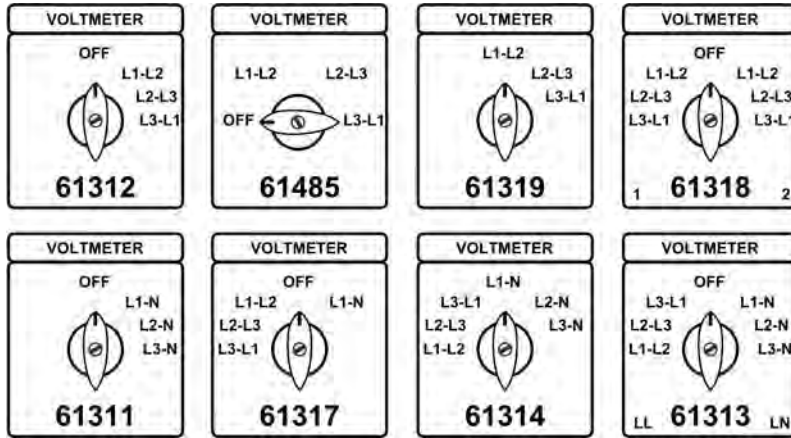
SPECIFICATIONS

Model	382203	382213	382260	382270	382280
Adjustable Outputs:	One	One	One	Four	One
DC Voltage & Current Output	0-30V 0-3A	0-30V 0-3A	0-16.4V/0-5.1A 0-27.6V/0-3.1A	dual 0-30V / 0-5A 0-36.8V/0-2.2A	0-40V 0-5A
Resolution:	---	0.1V / 10mA	10mV / 1mA	0.1V / 1mA	10mV / 1mA
Basic Accuracy:	±7%FS	±1%FS	±1%	±(0.5%+2d)	±(0.05%+9mV), ±(0.2%+9mA)
Ripple and Noise:	<5mV	<30mV	<0.5mV	<1mV	<3mV
Line Regulation:	<0.05%+10mV	<4mV	<4mV	<0.02%+3mV	---
Load Regulation:	<0.05%+10mV	<20mV	<20mV	<0.02%+3mV	1mV/A
Aux Outputs:	fixed 5V/0.5A & 12V/1A	---	---	3-6.5V@3A & 8-15V@1A	---
Display:	dual analog	dual LCD	dual LED	four LED	LCD
Other Features:				series 0-60V@5A parallel 0-30V@10A	200 setup memory RS-232

Control Switches Instrumentation Switches

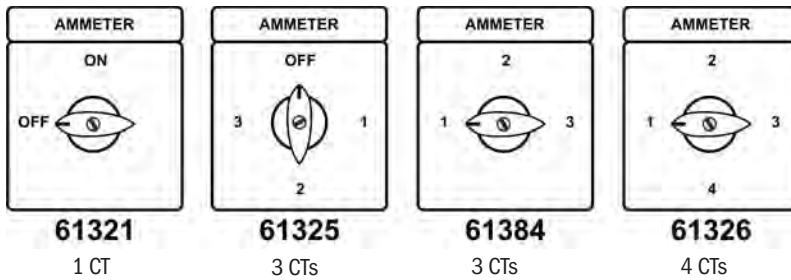
Switch current transformer and potential transformer secondaries to AC ammeters and voltmeters.

VOLTMETER SWITCHES

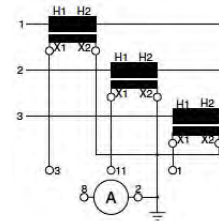


Voltmeter switches are non-shorting (break before make). Ammeter switches are shorting type (make before break).

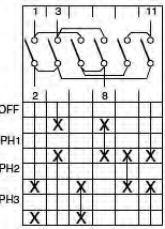
AMMETER SWITCHES - grounded CT, grounded ammeter



61325

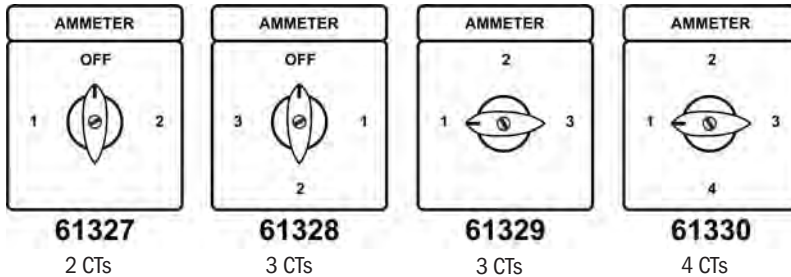


Wiring Diagram

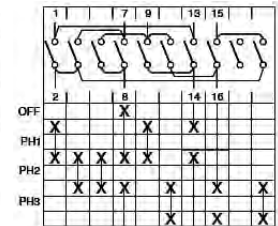
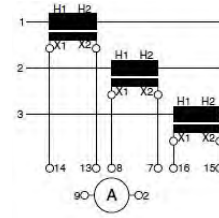


Schematic

AMMETER SWITCHES - 2 pole for floating ammeter

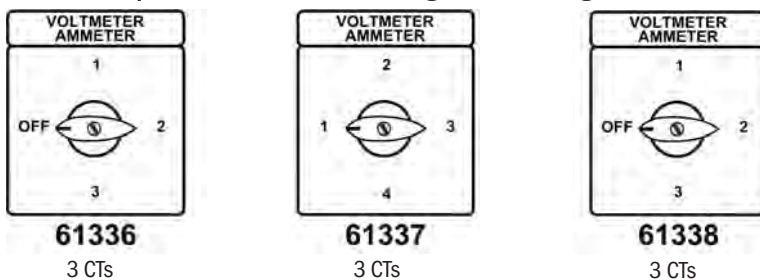


61328



Misc.

VOLTMETER / AMMETER SWITCHES - grounded CT, grounded ammeter



Position
1 = L1-L2, PH1
2 = L2-L3, PH2
3 = L3-L1, PH3

Position
1 = L1-L2
2 = L2-L3, PH1
3 = L3-L1, PH2
4 = L1-N, PH3

Position
1 = L1-N, PH1
2 = L2-N, PH2
3 = L3-N, PH3

ORDERING INFORMATION

To Order—Insert Code for Each Letter to Select Catalog Number.

Example: N20-61336-00

A - B - C

A	Size	
N20		20A, 600V, 12 AWG
N25		25A, 600V, 10 AWG

B	Style Number	
613xx		Select from style diagrams shown e.g. 61325

C	Mounting	
00		48mm plate, 36mm hole pattern
01		64mm plate, 48mm hole pattern

Weschler Fiberglass Enclosures

NEW

- Standard JIC sizes
- Durable fiberglass material is easily punched, drilled or sawed
- UV stabilized for outdoor use
- Rated NEMA 1, 2, 3, 3R, 4, 4X, 12, 13
- Raised cover for additional depth
- Stainless steel hinge & hardware
- Optional back panel & hinged deadfront panel
- Optional polycarbonate window
- RoHS compliant



AM2068RTW



Twist Latch



Snap Latch

These rugged enclosures insulate and protect electronic instrumentation in both indoor and outdoor applications. They are non-corrosive, non-conductive, temperature-resistant and fire-resistant.

DIMENSIONS (inches)

Part No.	Box Size			Cover*		Window	Panel
	H	W	D	H	W	Size	Part No.
AM664R	6.10	6.10	4.18	7.69	7.69	4.25 x 4.25	HFP66
AM864R	8.00	6.13	4.13	9.59	7.71	4.25 x 6.25	HFP86
AM1084R	10.14	8.26	4.13	11.73	9.85	6.50 x 8.37	HFP108
AM1086R	10.14	8.26	6.13	11.73	9.85	6.50 x 8.37	HFP108
AM1206R	12.14	10.26	6.13	13.73	11.85	8.50 x 10.37	HFP120
AM1426R	14.13	12.26	6.13	15.73	13.85	10.50 x 12.37	HFP142
AM1648R	16.27	14.40	8.13	17.87	15.99	11.00 x 13.00	HFP164
AM1868R	18.40	16.40	8.13	20.00	18.00	12.00 x 14.00	HFP186
AM2068R	20.00	16.00	8.13	21.59	17.59	11.00 x 15.00	HFP206

Hinged Panel (optional)



*raised cover adds 1.75" to depth

ORDERING INFORMATION

Select part number for a raised panel box from the table. Add suffix:

- H for Hinged Screw Cover
- T for Hinged Twist Latch Cover
- L for Hinged Snap Latch Cover

Standard cover is solid front. Add Suffix W for window front. Order Hinged Panel separately, if needed.

Weschler Instrument Assemblies

- Digital and analog meters mounted in racks or enclosures
- Wide range of housings available
- For indoor and outdoor applications
- Customized layouts and markings
- Prewired for quick installation
- Use instruments from Weschler or other manufacturers
- Include auxiliary indicators, controls & transducers

Weschler's Meter Modification Center can assemble instruments into housings to simplify installation of one instrument or a large instrument cluster. Select the instruments from the broad Weschler line or any of the suppliers listed in this catalog. Products from several manufacturers can be utilized to meet the application requirements. Choose from a wide selection of racks and enclosures to match the size constraints of the installation. Ancillary controls, indicators, signal conditioners and outputs can be added as needed.

Typical applications include:

- rack mounted instrument clusters for use in a control room,
- meters mounted in a portable case for field use,
- instruments assembled in a weathertight enclosure for outdoor installation.

Contact a Weschler Measurement and Control specialist to discuss your application requirements.



Digital Meter in Outdoor Enclosure with Alarm Lights



Analog Meters on Indoor Enclosure



Bargraph Draft Gauges in Rack Panel

Weschler Polycarbonate Enclosures

- Indoor & Outdoor Use
- Opaque or Clear Cover
- Screw or Snap Latch Closures
- Feet or Flange Mounting
- Optional Hinged Panel & Fixed Back Panel
- UL94-V0 Flammability
- Rated NEMA 1, 2, 3, 3R, 4, 4X, 12, 13 & IP66



Designed to insulate and protect industrial controls and components in both indoor and outdoor applications. These injection molded cases are light weight & impact resistant with good corrosion resistance. A cost effective alternative to metal enclosures for protection from dirt, dust, water & mild acids. Includes removable hinge pin & molded bosses for mounting a DIN rail.



Optional Panels

OPTIONS

Optional Aluminum Panels:

Case	Hinged Front	Fixed Back
AMP664	HFPP66	PLA66
AMP864	HFPP86	PLA86
AMP1084	HFPP108	PLA108
AMP1206	HFPP120	PLA120
AMP1426	HFPP142	PLA142

ORDERING INFORMATION

Insert Code for Each Letter to Select Catalog Number.
Example: AMP664CCNL

AMP **A** **B** **C**

A	Inside Size	H	W	D
664		5.93"	6.16"	3.98"
864		7.94"	6.16"	3.98"
1084		9.93"	8.15"	3.98"
1206		11.92"	10.15"	5.98"
1426		13.94"	12.16"	5.98"

B	Style
--	Solid 4-screw cover
CC	Clear 4-screw cover
H	Solid 2-screw hinged cover
CCH	Clear 2-screw hinged cover
NL	Solid hinged cover w/ plastic latch
CCNL	Clear hinged cover w/ plastic latch
L	Solid hinged cover w/ metal latch
CCL	Clear hinged cover w/ metal latch

C	Mounting
--	4 feet (for top/bottom or side)
F	Top & bottom flanges

Cover adds 0.87" to depth
For outside H & W, add 0.3"; Depth add 0.9"

Adalet Stainless Steel Enclosures

- Type 304 Stainless Steel
- Continuous Hinge (removable hinge pin)
- Watertight Urethane Gasket
- Feet or Flange Mounting
- Optional Fixed Back Panel & Window Kit
- Grounding Studs on Inside of Box and Door
- Rated NEMA 3, 3R, 4, 4X, 12 & 13; UL50



JN4X series enclosures are type 304 stainless steel with a brushed finish. Each enclosure has continuously welded seams ground to a smooth finish and comes complete with four 10-32 weld nuts (for mounting the optional back panel). Grounding studs are provided on the inside of the box and door.

Mounting brackets are welded on the top and bottom outside. The door is sealed with a one-piece neoprene gasket and is secured to the enclosure with a continuous stainless steel piano hinge on one side and stainless steel door clamping hardware on three sides. There are no knock-outs or holes in the box or door. A hardware kit is included.

Part Number	Outside Dimensions			Mounting Holes		Clamps	Panel # (painted steel)	Panel Dimensions		Clearance Panel to Door
	H *	W	D	H	W			H	W	
JN4XHSS-080604	8	6	4	8.75	4	3	08P06	4.88	4.88	3.55
JN4XHSS-080804	8	8	4	8.75	6	3	08P08	6.88	6.88	3.55
JN4XHSS-100804	10	8	4	10.75	6	4	10P08	6.88	6.88	3.55
JN4XHSS-121005	12	10	5	12.75	8	6	12P10	8.88	6.88	4.55
JN4XHSS-080606	8	6	6	8.75	4	3	08P06	10.88	8.88	5.55
JN4XHSS-080806	8	8	6	8.75	6	3	08P08	6.88	6.88	5.55
JN4XHSS-100806	10	8	6	10.75	6	4	10P08	8.88	6.88	5.55
JN4XHSS-101006	10	10	6	10.75	8	6	10P10	8.88	8.88	5.55
JN4XHSS-121006	12	10	6	12.75	8	6	12P10	10.88	8.88	5.55
JN4XHSS-121206	12	12	6	12.75	10	6	12P12	10.88	10.88	5.55
JN4XHSS-140806	14	8	6	14.75	6	4	14P08	12.88	6.88	5.55
JN4XHSS-141206	14	12	6	14.75	10	6	14P12	12.88	10.88	5.55
JN4XHSS-161406	16	14	6	16.75	12	7	16P14	14.88	12.88	5.55
JN4XHSS-121008	12	10	8	12.75	8	6	12P10	10.88	8.88	7.55
JN4XHSS-141208	14	12	8	14.75	10	6	14P12	12.88	10.88	7.55
JN4XHSS-161408	16	14	8	16.75	12	7	16P14	14.88	12.88	7.55
JN4XHSS-161410	16	14	10	16.75	12	7	16P14	14.88	12.88	9.55
JN4XHSS-202010	20	20	10	20.75	18	9	20P20	18.88	18.88	9.55

all dimensions in inches.

* Hinge is on H side.

Optional Window Kit has tempered plate glass in a 304 stainless steel frame with watertight silicone gasket.

Window Kit	Viewing Area		Frame Size	
Part Number	H	W	H	W
EWK-0303SS	3.0	3.0	6.5	6.5
EWK-0503SS	5.0	3.0	8.5	6.5
EWK-0505SS	5.0	5.0	8.5	8.5
EWK-0703SS	7.0	3.0	10.5	6.5
EWK-0707SS	7.0	7.0	10.5	10.5
EWK-0905SS	9.0	5.5	12.5	9.0
EWK-0909SS	9.0	9.0	12.5	12.5
EWK-1111SS	11.0	11.0	14.5	14.5
EWK-1303SS	13.0	3.0	16.5	6.5
EWK-1308SS	13.0	8.0	16.5	11.5
EWK-1313SS	13.0	13.0	16.5	16.5
EWK-1515SS	15.0	15.0	18.5	18.5

Hinged (swing) front panel also available.

Weschler Indoor Enclosures

- NEMA 4X & UL508-4X Indoor Rated
- ABS/Polycarbonate Blend
- Non-Metallic Hinge & Latch
- UL94-5VB Flammability
- Includes Stainless Wall Mounting Bracket



ORDERING INFORMATION

Model	Width	Height	Depth
NBB-10240	5.90	5.90	3.57
NBB-10241	6.79	10.75	4.33
NBB-10243	7.47	11.28	5.50
NBB-10251	10.65	14.55	5.92
NBB-10247	11.73	15.68	6.30
NBB-10245	13.00	13.00	7.04

Dimensions in inches. For inside dimensions, subtract 0.9" from Width & Height, 0.3" from Depth

Pyromation Thermowells

Stepped construction increases speed of response while maintaining mechanical strength

- 0.260" bore standard
- 304 or 316 stainless steel



ORDERING INFORMATION

Insert Code for Each Letter to Select Catalog Number.

Example S4C608

S4

A Female fitting

C	1/2" NPT
D	3/4" NPT
E	1" NPT

B Overall Length

4	4"
6	6"
9	9"
12	12"

C Material

08	316 SS
09	304 SS

Other lengths, diameters, threads & materials available on request.

Adalet Explosionproof Meter Housings

NEW

- Copper-free Aluminum Casting
- Window Cover
- Suitable for Meters, Instruments & Control Equipment



XJO



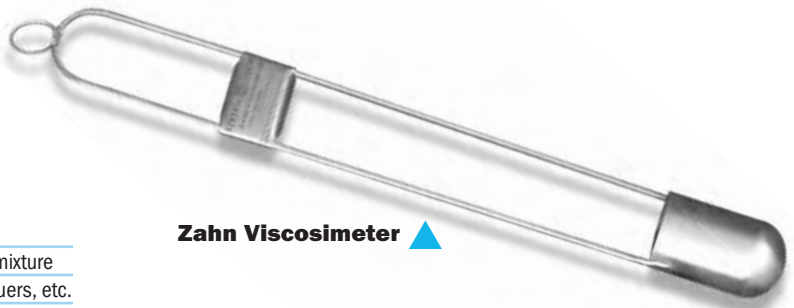
Model	Outside* (W H D)			Window	Opening	Inside (W H D)			Under glass
Certifications: UL1203 & CSA C22.2 No. 25 & 30 - Class I, Group B, C, D & Class II Groups E, F, G; UL50 Type 4									
XJMAGCHN4	7 3/4	7 3/4	8 1/2	5 1/4 dia	5 3/8 dia	6 3/4	6 3/4	5	6 7/8
XJMGCHN4	7 3/4	7 3/4	11 1/2	5 1/4 dia	5 3/8 dia	6 3/4	6 3/4	8	9 7/8
XJKGCHN4	10 3/4	12 3/4	8 15/16	6 11/16 dia	9 dia	9 1/2	11 1/2	6 1/8	6 7/8
XJKAGCHN4	10 3/4	12 3/4	10 15/16	6 11/16 dia	9 dia	9 1/2	11 1/2	8 1/2	8 7/8
XJNGCHN4	13 1/8	14 3/8	9 13/16	8 dia	10 3/4 dia	11 1/2	12 3/4	6	6 5/8
Certifications: UL1203 & CSA C22.2 No. 25 & 30 - Class I, Group C, D & Class II Groups E, F, G; UL50 Type 4									
XJOGCN4	9	9	7 9/16	5 1/4 dia	7 x 7	8	8	5	5 13/16
XJSWGCN4	6 1/8	6 1/8	5 5/8	**	5 x 5	5 1/4	5 1/4	4 1/2	6 1/8

Dimensions in inches *excluding mtg tabs **suitable for 3 1/2" rectangular & 4 1/2" round meters

Weschler Zahn Viscosimeter

Quickly check the viscosity of paint, varnish, lacquer, inks, syrups, or other liquids.

The Zahn viscosimeter (formerly manufactured by G.E.) is a bullet-shaped, corrosion-resistant, stainless-steel cup with a precision drilled orifice. Five sizes are available.



Zahn Viscosimeter ▲

Zahn Cup #	Cat. No.	Orifice Size (in.)	Use
	9109697-		
1	G1	0.078	Very thin oil or very thin mixture
2	G2	0.108	Thin oil, mixed paints, lacquers, etc.
3	G3	0.148	Medium oil and mixed paints, etc.
4	G4	0.168	Heavy mixtures
5	G5	0.208	Extremely heavy mixtures

Weschler Transformer Advantage

Temperature Monitors for Oil-Filled Transformers and Load Tap Changers

Choose from 7 Models: All with flexible cooling control, alarm & SCADA capabilities

- Single, dual and three channel analog gauge replacements
- Calculated winding temperature – no heated thermowell
- Fluid, winding and ambient temperature monitor
- LTC temperature trend indicator

New enhanced features:

- 3 winding temperatures
- Cooling stage monitor
- Auxiliary inputs
- RS-485 & Ethernet communications
- DNP-3 & Modbus protocols



Transformer Advantage ▲

London Electronics Serial to Ethernet Converter

NEW

- Adds EtherNet connectivity to any RS232/485 device
- Selectable RS485 line termination and biasing



This converter uses internet protocol message packeting (IP). Screw terminals make installation easy. Configuration is simple and fast using the supplied software.

SPECIFICATIONS

Ethernet:	Base 10/100 RJ45
Serial Ports:	RS232 or RS485 (half duplex), switch selectable.
Baud Rate:	Set with PC based configuration software.
Temperature:	0 to 50°C operating
Case Material:	UL94 V0 Polycarbonate
Case Sealing:	IP40
Dimensions:	5.4" W x 2.5" H x 1.2" D (137x62x30mm)
Power:	12 to 30V DC, 2 watts max. 120V AC wall adapter optional
Isolation:	Ethernet isolated from power and RS232/RS485. RS232 and RS485 ports not isolated from power.

ORDERING INFORMATION

LE/LEM	Serial to Ethernet Converter with PC software
PRE/PSL	120VAC to 24VDC wall adapter, 12W

ATC Diversified Power Alert

- Verifies zero energy
- Detects single or 3-phase AC
- Detects DC or stored energy
- Redundant circuitry



The eight detector UPA visually alerts to the presence of dangerous AC or DC (Stored Energy) potentials occurring between any combination of the four monitored input lines (L1, L2, L3, GND).



SPECIFICATIONS

Operating Range:	40-750VAC, 50/60/400Hz 30-1000VDC
Detection Threshold:	29VAC 3-phase, 40VAC single phase, 27VDC
Operating Temperature:	-20 to 55°C
Enclosure:	NEMA 4X
Installation:	Requires earth ground connection
Terminations:	6ft leads, #18 AWG
Depth:	UPA-100 1.5" behind panel UPA-130 48mm behind panel

ORDERING INFORMATION

WE/UPA-100	Universal Power Alert for 1 1/4" knockout
WE/UPA-130	Universal Power Alert for 30.5mm hole

Noshok Dial Thermometers

100 Series



- 2" and 3" sizes
- Responsive bi-metal element
- Sealed 304 stainless steel case & bezel
- Accuracy ±1% full scale, grade A, ASME B40.3
- Back or bottom connection
- 2 1/2" to 24" stem length
- Glass lens (polycarbonate optional)

ORDERING INFORMATION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: 100-30-110-090-0/250F

100 -	A	-	B	-	C	-	D	E
A	Size							
	20		2" w/ 1/4" NPT fitting					
	30		3" w/ 1/2" NPT fitting					
B	Connection							
	100		Bottom					
	110		Back					
C	Stem Length							
	025		2.5"		120		12"	
	040		4"		150		15"	
	060		6"		180		18"	
	090		9"		240		24"	
D	Range							
E	Scale							
	F		°F					
	C		°C					
	F/C		°F/°C (dual markings)					

°F or °F/°C	°C
-100/150	-70/70
-40/120	-50/50
-20/120	-45/315
-40/160	-40/70
0/100	-20/120
0/140	-20/60
0/200	-10/110
0/250	0/50
0/600	0/100
20/240	0/200
25/125	0/250
50/300	0/300
50/500	0/450
100/800	10/290
200/1000	100/550

additional ranges & options available

Newport Serial to Ethernet



EIT-W

- Put any serial device on the network in minutes
- Bridge RS-232/RS-485 to TCP/IP
- Auto 10/100 Ethernet, half/full duplex
- TCP, UDP, SNMP, SMTP, TFTP, ICMP, Telnet, DHCP, DNS, HTTP, and ARP
- Bridge ModbusRTU to ModbusTCP/IP
- Built-in Web server Email notifications and SNMP traps
- 3 programmable I/O's
- Includes configuration & COM port redirect software

SPECIFICATIONS

Serial Interface:	RS-232 or RS-485 (2 and 4 wire)
Serial Data:	300-460800 bps; 5- 8 data bits; odd, even or no parity; 1 or 2 stop bits
Flow Control:	Hardware (RTS/CTS) and Software (Xon/Xoff).
Digital I/O:	3 digital input/output lines on RS-485 models
Network Interface:	Fixed or auto 10/100Base-T, half/full duplex, with auto MDI/MDIX
Network Connector:	RJ45
Protocols:	TCP, UDP, SNMP, SMTP, TFTP, ICMP, DHCP, DNS, HTTP, ARP, Modbus TCP/IP, and Telnet
LED Indicators:	100BASE-T, Network Activity/Link, Serial Transmit/Receive
Management:	Embedded Web server, Telnet login, Serial login
Web Server:	Serves dynamic Web pages and Java applets (512kbyte capacity)
Power:	5VDC, 1W max (EIT-W), 10-32VDC, 2W max (EIT-D)
Operating Temperature:	-40 to 80°C (-40 to 185°F)
EIT-W Case:	ABS, 3.67" x 1.08" x 2.60" (94x28x66mm)
EIT-D Case:	Polycarbonate, 4.53" x 1.08" x 3.54" (115x26x91mm)

ORDERING INFORMATION

EIT-W	iServer Serial to Ethernet Converter, wall-mount case with RS-232 serial port (DB9) & universal 100-240VAC Power adapter
EIT-W-485	iServer Serial to Ethernet Converter, wall-mount case with RS-485 serial port (screw terminals), 3 I/Os & universal 100-240VAC Power adapter
EIT-D	iServer Serial to Ethernet Converter, DIN rail case with RS-232 serial port (DB9)
EIT-D-485	iServer Serial to Ethernet Converter, DIN rail case with RS-485 serial port (screw terminals), 3 I/Os
iDRN-PS-1000	Power Supply (switching) 95-240VAC input, 24VDC output @850mA (for EIT-D)

Fluke Handheld Oscilloscopes



The ScopeMeter 190 Series of high performance oscilloscopes have bandwidth of 60, 100, and 200 MHz and sample rates up to 2.5 GS/s. The high resolution color display has a fast update rate and digital persistence mode – making the analysis of complex and dynamic signals that much easier.

Choose the 190 Series for tough troubleshooting problems, like intermittent failures, impulses and signal fluctuations in high speed or sensitive electronic or electromechanical systems. They include automatic measurements, cursors, FFT analysis, paperless recording functions and a DMM input.

For industrial electronic or electromechanical applications, the 120 Series Industrial ScopeMeters offer bandwidth to 40MHz, a dual DMM and paperless recording.

The 125 offers additional capabilities for testing industrial machinery:

- Power & harmonic measurements for single phase and balanced 3-phase systems.
- RPM and Hz reading for motors & engines.
- Vac PWM for motor drive outputs.
- 0.01 ohm resolution for motor & transformer windings.
- a Bus Health function for troubleshooting industrial data networks.

For fast measurement answers and quick display of waveforms all ScopeMeters include Connect-and-View triggering. This feature recognizes signal patterns and automatically sets the oscilloscope for a stable reliable display of even the most complex waveforms. Move from test point to test point and the ScopeMeter will continuously lock onto just about any waveform.

ScopeMeter 190 Series II

NEW

Industrial ScopeMeters

Model	190-202	190-102	190-062	Fluke 123	Fluke 124	Fluke 125
Bandwidth	200 MHz	100 MHz	60 MHz	20 MHz	40 MHz	40 MHz
Max. real time sample rate	2.5 GS/s	1 GS/s	0.5 GS/s	25 MS/s	25 MS/s	25 MS/s
Display	15.3 cm Full Color LCD			10.2 cm Monochrome LCD		
Persistence	Digital Persistence giving analog oscilloscope-like waveform decay			---		
Max. record length	10,000 points per input (Scope mode) 30,000 points per input (ScopeRecord mode)			512 min/max pairs per input		
Number of inputs	2 plus external/DMM input			2		
Number of digitizers	2			2		
Independently floating isolated inputs	Up to 1000 V between inputs, references and ground			600 V RMS max input or any terminal to ground		
Input sensitivity	2 mV/div. ... 100 V/div.			5 mV/div. ... 500V/Div		
Glitch capture	8 ns			40 ns		
Waveform zoom	100x			---		
Timebase range in Scope mode	2 ns/div. to 2 min/div.			10 ns/div. to 1 min/div.	20 ns/div. to 1 min/div.	
Trigger types	Connect-and-View®, Free Run, Single Shot, Edge, Delay, Dual Slope, Video, Video line, Selectable pulse width, N-cycle and External			Connect-and-View®, Free Run, Single Shot, Edge, Video, External		
Scope Measurements	7 cursors , 30 automatic measurements			26 automatic measurements		
Power Measurements	---			---		W, VA, VAR. PF
Scope-Record Trigger modes	Start on Trigger / Stop on Trigger			---		
Capture last 100 screens	Automatic with Replay capability			---		
Dual input TrendPlot	Yes with Cursors and Zoom			Yes	Yes	
Memory for screens	30 screens and set-ups			10	20	
Memory for recordings	10			1		
External Memory	Isolated USB host port for data storage to USB memory			---		
True RMS multimeter	5000 counts, Volts, Amps, Ohms, Continuity, Diode, Temp			---		
Safety certified	1000 V CAT II / 600 V CAT III			600 V CAT III		
Battery power	4 hr Li-Ion battery included			7 hr NiMH		
Line power	Adapter/battery charger included			---		
Size (cm)/Weight	27.0 x 19.0 x 7.0 / 2.2 kg			23.2 x 11.5 x 5.0 / 1.2 kg		
Temperature	0-50°C operating (0-40°C with batteries)			0-50°C operating		
PC and Printer interface	Isolated USB (cable included)			Using optional Optically Isolated adapter/cable		
Warranty	3 years (1 year on accessories)					

Add /S to model number to include Flukeview software, isolated USB cable & hard carrying case

Fluke High Performance Digital Multimeters

NEW



287 ▲

Includes manual, 6 AA batteries, TL71 silicone test leads, probe holder, two AC72 alligator clips

The Fluke 287 True-rms Electronics Logging Multimeter with TrendCapture quickly documents performance and graphically displays results.

- Large 50,000 count, 1/4 VGA display with white backlight. Displays multiple sets of measurements simultaneously
- Logging function with expanded memory stores up to 15,000 recorded events
- TrendCapture graphically displays logged data session
- Zoom up to 14X to view & analyze TrendCapture data
- Selectable ac filter helps display rapidly changing or noisy signals
- Adjustable recording & auto hold thresholds, specify a percentage change in the readings that begins a new event
- On board help screens for measurement functions
- Multiple logging sessions without download
- 0.025 % basic dc accuracy
- True-rms ac and ac+dc
- 100 kHz ac bandwidth
- Real-time clock time-stamps saved readings
- Peak capture to record transients as fast as 250 μ s
- Relative mode to remove test lead resistance from low ohms or capacitance measurements
- Optional FlukeView software to document, store and analyze measurements
- CATIII – 1000V & CAT IV – 600V ratings
- Limited lifetime warranty

SPECIFICATIONS

Function	Range & resolution	Basic Accuracy
VDC, VAC	50.000 mV, 500.00 mV, 5000.0 mV, 5.0000 V, 50.000 V, 500.00 V, 1000.0 V	0.025% (0.4% AC)
ADC, AAC	500.00 μ A, 5.000 μ A, 50.000 mA, 400.00 mA, 5.0000 A, 10.000 A*	0.15% (0.7% AC)
Resistance	500.00 Ω - 500.0 M Ω (7 ranges)	0.05%
Capacitance	1.100 nF - 100.0 mF (9 ranges)	1.0%
Frequency	99.999 Hz - 999.99 kHz (5 ranges)	0.005%
Temperature	-200 to 1350 $^{\circ}$ C, -328 to 2462 $^{\circ}$ F	1.0%

Battery life: 100 hours minimum, 200 hours in logging mode *10A continuous, 20A for up to 30 seconds.
 Environment: -20 $^{\circ}$ C to 55 $^{\circ}$ C, <90% RH up to 37 $^{\circ}$ C Size: 222x102x60 mm (8.75 x 4.03 x 2.38")

Fluke 289 adds 50 Ω range for measuring contacts & motor windings plus a LowZ voltage function for eliminating ghost voltages.



87V ▲

Includes: TL75 Test Leads, AC72 Alligator Clips, holster, 9V battery, temperature probe

The Fluke 87V has improved measurement functions & troubleshooting features, to solve problems on motor drives, in-plant automation, power distribution and electro-mechanical equipment.

- Selectable filters for accurate measurements on adjustable speed drives
- Built-in thermometer
- Capacitance to 10,000 μ F
- 30% larger display
- 2 level backlight
- 4x faster (250 μ S) peak capture
- CATIII-1000V & CATIV-600V rating
- Lifetime warranty

SPECIFICATIONS

Function	Range & resolution	Basic Accuracy (87V)
DC Volts	600.0 mV, 6.000 V, 60.00 V, 600.0 V, 1000 V	0.05 %
AC Volts	600.0 mV, 6.000 V, 60.00 V, 600.0 V, 1000 V	0.7 % (True-rms)
DC Current	600.0 μ A, 6000 μ A, 60.00 mA, 600.0 mA, 6.000 A, 10.00 A	0.2 %
AC Current	600.0 μ A, 6000 μ A, 60.00 mA, 600.0 mA, 6.000 A, 10.00 A	1.0 % (True-rms)
Temperature (excl. probe)	-200 to 1090 $^{\circ}$ C (-328 to 1994 $^{\circ}$ F)	1.0 %
80BK Temperature Probe	-40 to 260 $^{\circ}$ C (-40 to 500 $^{\circ}$ F)	2.2 $^{\circ}$ C or 2 %
Resistance	600.0 Ω , 6.000 k Ω , 60.00 k Ω , 600.0 k Ω , 6.000 M Ω , 50.00 M Ω	0.2 %
Capacitance	10.00 nF, 100.0 nF, 1.000 μ F, 10.00 μ F, 100.0 μ F, 9,999 μ F	1.0 %
Frequency	199.99 Hz, 1.9999 kHz, 19.999 kHz, 199.99 kHz	0.005 %

Battery Life: 100 hours typical with headlight off.
 Size: (LxWxD): 201mm x 98mm x 52mm (7.9in x 3.6in x 2in)

ORDERING INFORMATION

Fluke-87-5	Industrial True-rms Multimeter with Temperature
Fluke-87-5/E2	Industrial Electrician Combo Kit
Fluke-287	True-rms Electronics Logging Multimeter
Fluke-289	True-rms Electronics Logging Multimeter
FVF-SC2	FlukeView® forms software with cable
80BK	Integrated DMM temperature probe
i410	AC/DC current clamp
TLK287	Electronic test lead set
TPAK	Magnetic hanging kit
C280	Soft case

Fluke 87V/E2 Industrial Electrician Combo Kit

Includes special accessories to increase productivity.

- 1.5m heat resistance silicone test leads
- Removable test probes with 4mm of exposed metal for use on industrial circuits
- Plunger style alligator clips
- Magnetic hanger to position and hold meter to steel surfaces
- Temperature probe
- Packaged in a durable carrying case

TEST EQUIPMENT

Fluke Compact Digital Multimeters



Fluke 117



Every Fluke 110 Series meter comes

with a protective holster, TL75 test leads, 9V battery (installed) and manual.

ORDERING INFO

Fluke-114	Electrical Multimeter
Fluke-115	Multimeter
Fluke-116	HVAC Multimeter w/ temp. probe
Fluke-117	Electrician's Multimeter

RECOMMENDED ACCESSORIES

TPAK	Meter hanging kit with magnet
AC220	Alligator clips
C50	Carrying case

These little meters pack more features than some DMMs twice their size:

- True-rms ac voltage and current measurement for accurate readings on all waveforms
- 6000-count display provides improved resolution
- Min/Max/Average feature captures signal fluctuations
- Frequency, capacitance and diode test capabilities (except 114)
- White LED backlight for excellent visibility
- Fast continuity test detects intermittent connections
- IEC CAT III 600V safety rating
- Auto-Volt automatic ac/dc voltage selection

SPECIFICATIONS

Function	Range & resolution	Best accuracy
VDC	600.0 mV, 6.000 V, 60.00 V, 600.0 V	±0.5 % of rdg + 2 d
VAC ¹	600.0 mV, 6.000 V, 60.00 V, 600.0 V	±1.0 % of rdg + 3 d
ADC (Models 115 & 117 only)	6.000 A, 10.00 A ²	±1.0 % of rdg + 3 d
AAC (Models 115 & 117 only)	6.000 A, 10.00 A ²	±1.5 % of rdg + 3 d
Resistance	600.0 Ω, 6.000 kΩ, 60.00 kΩ, 600.0 kΩ, 6.000 MΩ, 40.00 MΩ	±0.9 % of rdg + 1 d
Capacitance (except Model 114)	1000 nF, 10.00 μF, 100.0 μF, 9999 μF	±1.9 % of rdg + 2 d
Frequency ³ (except Model 114)	99.99 Hz, 999.9 Hz, 9.999 Hz, 50.00 kHz	±0.1 % of rdg + 2 d

¹ Specified from 1% of range to 100% of range; CF < 3 up to 4000 counts, 1.5 at full scale.

² 10 A continuous, 20 A for up to 30 seconds, 45-500 Hz.

³ Frequency is ac coupled 5 Hz to 50 kHz for ac volts. Frequency is dc coupled 445 Hz to 5 kHz for ac current.

AC volts is ac-coupled. Auto-V, LoZ and ac mV are dc-coupled.

Battery life: 400 hours typical for alkaline.

33 segment Bargraph display updates 32x/sec.

Additional Model 116 features:

- °F/°C temperature function for HVAC troubleshooting
- 600μA ac & dc ranges for testing flame sensors

Fluke Digital Multimeters



Fluke 179

The 170 series replaces the popular 70 Series. The 175, 177 and 179 are designed tough to withstand the harshest work environments. Accuracy rivals most bench meters.

- Lifetime warranty
- 6000 count display
- 0.09% basic dc accuracy (177 & 179)
- True-rms ac voltage and current measurement
- Min/Max/Average records irregular activity
- Auto and Manual hold
- Frequency, capacitance and resistance capabilities

Every Fluke 170 Series meter comes with TL75 test leads, 9V battery (installed) and manual. The Fluke 179 also includes an 80BK Temperature Probe.

- The 179 measures temperature in °C and °F
- 177 and 179 have a backlight to illuminate the screen in dark workspaces
- IEC 1010 CAT IV 600V, CAT III 1000V safety ratings
- Drop protected to 1 meter
- Overmolded case features integrated probe holders
- Compatible with ToolPak™ meter hanging kit

SPECIFICATIONS

Function	Range & Resolution	Best accuracy
VDC	600.0 mV, 6.000 V, 60.00 V, 600.0 V, 1000V	±0.09 % (177 & 179) ±0.15 % (175)
VAC ¹	600.0 mV, 6.000 V, 60.00 V, 600.0 V, 1000V	±1.0 % of reading
ADC	60.00 mA, 400.0 mA, 6.000 A, 10.00 A ²	±1.0 % of reading
AAC	60.00 mA, 400.0 mA, 6.000 A, 10.00 A ²	±1.5 % of reading
Resistance	600.0 Ω, 6.000 kΩ, 60.00 kΩ, 600.0 kΩ, 6.000 MΩ, 50.00 MΩ	±0.9 % of reading
Capacitance	1000 nF, 10.00 μF, 100.0 μF, 9999 μF	±1.2 % of reading
Frequency ³	99.99 Hz, 999.9 Hz, 9.999 Hz, 99.99 kHz	±0.1 % of reading
Temperature (Model 179)	-40 °C to +400 °C, -40 °F to +752 °F	1.0% of reading

¹All AC voltage and AC current ranges are specified from 5% of range to 100% of range.

²10 A continuous, 20 A for up to 30 seconds.

³Voltage Frequency is specified from 2 Hz to 100 kHz. Current Frequency is specified from 2 Hz to 30 kHz.

Battery life: 200 hours typical for alkaline

Size: (H x W x L): 4.3 cm x 9.0 cm x 18.5 cm

Lifetime Warranty

ORDERING INFO

Fluke-175	Digital Multimeter
Fluke-177	Digital Multimeter
Fluke-179	Digital Multimeter

RECOMMENDED ACCESSORIES

TPAK	Meter hanging kit with magnet
C25	Soft vinyl carrying case
C510	Top grain leather carrying case
i 200	AC current clamp
TL223	Electrical test lead set

Extech CAT IV True RMS Multimeters + NCV

NEW



EX360
Electrical

EX365
Industrial

EX363
HVAC

- 6000 count white LED backlit display
- Fast 60-segment analog bargraph
- LoZ prevents false readings from ghost voltages
- Built-in Non-contact AC Voltage Detector (NCV)
- Smart Data Hold, Peak Hold, Auto Power off



ORDERING INFORMATION

EX360	8 Function TRMS Electrical DMM with NCV
EX363	11 Function TRMS HVAC DMM with NCV
EX365	10 Function TRMS Industrial DMM with NCV

True RMS provides accurate readings when measuring distorted or noisy waveforms. Choose a model designed for Electrical, HVAC, or Industrial applications. Advanced LoZ feature eliminates false readings caused by ghost voltages. CAT IV safety rating ensures the highest level of protection.

SPECIFICATIONS

All Models:

Basic Accuracy (DCV):	0.5%
NCV Detector:	80 to 1000V (50-60Hz) and 160 to 1000V (50-60Hz)
DC/AC Voltage:	0.1mV to 1000V
Resistance:	0.1Ω to 40MΩ
Capacitance:	1nF to 10mF
Frequency:	0.01Hz to 100kHz
Diode Test:	1.5V
Continuity:	Audible and visual
Safety:	EN61010-1 CAT IV 600V
Approvals:	cULus, CE
Dimensions:	6.5 x 3.2 x 1.7" (164x82x44mm)
Accessories Included:	Test leads, 9V battery, holster with tilt stand and built-in magnet. Also general purpose bead wire temperature probe on Model EX363
Warranty:	3 years

Additional Functions:

EX363:	
Temperature (Type K):	-40 to 742°F (-40 to 394°C)
DC/AC Current:	600μA, for flame rod measurements
EX365:	
DC/AC Current:	1mA to 10A

AEMC Digital Multimeters

NEW



5212

5217

5215

- TRMS AC
- Non-contact voltage detection
- Low impedance voltage measurement to help prevent 'ghost' readings
- Auto/manual ranging
- Hold function
- Backlight & flashlight
- Sleep mode for extended battery life
- Temperature, frequency & duty cycle functions (Model 5217)
- Min, Max & Relative measurements (Model 5215 and 5217)

SPECIFICATIONS

AC:	TRMS, 1kHz bandwidth
Basic Accuracy:	DCV: 0.2%+2cts; ACV: 0.5%+4cts
Voltage AC/DC:	750VAC/1000VDC (600V on Model 5212)
Current AC/DC:	6A/10A (4A/10A on Model 5212)
μAmps AC/DC:	600/6000μA (400/4000μA on Model 5212)
Resistance:	60MΩ (40MΩ on Model 5212)
Capacitance:	100mF
LCD display:	6000 count (4000 count on Model 5212)
Ranging:	Auto or manual
Power Off:	Auto (auto power off can be disabled)
Non-Contact Voltage Detect:	Red display with buzzer (AC only)
Max / Min / Max-Min / Δ REL:	Models 5215 & 5217
Other Features:	Diode test, continuity with beeper, LoZ voltage detect, display hold, low battery indication, flashlight, backlight, removable holster, magnetic hanger, direct fuse access
Operating Temperature:	-4 to 122°F (-20 to 50°C)
Safety Rating:	CAT III 600 V
Protection:	IP54, 2m drop resistance
Battery:	2 x AA, 500 hour life
Dimensions:	6.7 x 3.1 x 2" (170x80x50mm) with holster
Accessories Included:	Manual, test leads, 2 AA batteries, soft carry case. Also Thermocouple Adapter with Model 5217
Warranty:	3 years
Additional Functions on Model 5217:	
Frequency/Duty Cycle:	1000Hz
Temperature Measure:	-61° to 2192°F (-55° to 1200°C)

ORDERING INFORMATION

AE/2154.07	Model 5212 4000-count TRMS DMM
AE/2154.08	Model 5215 6000-count TRMS DMM
AE/2154.09	Model 5217 6000-count, TRMS DMM w/freq & temperature

Extech Industrial MultiMeters

- Double Molded Waterproof Case (IP67)
- 11 Functions
- 1000V Protection on All Functions
- True RMS AC
- Dual Sensitivity Frequency Functions
- Large Backlit LCD
- Diode Test Open Circuit 2.8V DC
- Auto Power Off with Disable Feature
- CATIII-1000V & CATIV-600V Ratings
- Drop Proof to 6 Feet

Model EX505

- 4,000 Count
- 0.5% Accuracy
- Data Hold and Relative
- 10A Max Current

Model EX520

- 6000 Count - High Resolution
- 0.09% Accuracy
- Min/Max/Relative/Data Hold
- 20A Max Current

Model EX530

- 40,000 Count - Highest Resolution
- 0.06% Accuracy
- Min/Max/Relative/Data Hold
- 20A Max Current
- Peak Hold (AC only)



SPECIFICATIONS

Measurement Range (auto or manual ranging)

DCV	0.1mV to 1000V (0.01mV on EX530)		
ACV	1mV to 1000V (0.1mV on EX505, 0.01mV on EX530)		
DCA	0.1mA to 20A (10A on EX505)		
ACA	0.1mA to 20A (10A on EX505)		
Ω	EX505:	0.1Ω to 40MΩ	
	EX520:	0.1Ω to 60MΩ	
	EX530:	0.01Ω to 40MΩ	
Capacitance	EX505:	0.01nF to 100mF	
	EX520:	0.01nF to 1000mF	
	EX530:	0.001nF to 40mF	
Frequency	Electrical	Electronic	
	EX505:	5Hz to 1kHz	0.001Hz to 10MHz
	EX520:	10Hz to 400Hz	0.001Hz to 40MHz
EX530:	40Hz to 400Hz	0.001Hz to 100MHz	
Temperature	-50 to 1382°F / -45 to 750°C (-4°F/-20°C min on EX505)		
Duty Cycle	0.1 to 99.9%		
Diode/Continuity	Yes		

Complete with double molded test leads, magnetic hanging strap, Type K bead wire temperature probe (-22 to 572°F/-30 to 300°C), carrying case, and 9V battery.

ORDERING INFORMATION

EX505	True RMS Industrial MultiMeter (4000 count)
EX520	True RMS Industrial MultiMeter (6000 count)
EX530	True RMS Industrial MultiMeter (40,000 count)
EX/TL810	Electrical Test Lead Kit
EX/TP200	Type K Clamp Probe (212°F/100°C)
EX/HG500	Magnetic Hanging Strap

Extech Autoranging MultiMeters

- Backlit 1" High LCD
- Resolution to 0.1mA
- CAT III - 600V Rating
- Audible & Visual Alerts
- Diode/Continuity Check
- Three Year Warranty
- Built-in IR thermometer with laser (450 & 470)



Model 450

- 2000 Count Full Scale
- 0.05% Basic DCV Accuracy
- IR Laser Thermometer
- MAX function

Model 430

- 4000 Count Full Scale
- TRMS AC
- 0.03% Basic DCV Accuracy
- Capacitance & Frequency
- Type K TC Temperature
- Relative Function

Model 470

- all of the Model 430 features plus
- IR Laser Thermometer



SPECIFICATIONS

Measurement Range

DCV	0.1mV to 600V
ACV	0.1mV to 600V
DCA	0.1mA to 20A
ACA	0.1mA to 20A
Ω	0.1Ω to 40MΩ (20MΩ on Model 450)
Models 430 & 470:	
Capacitance	0.01nF to 100μF
Frequency	0.001Hz to 10MHz
Duty cycle	0.1 to 99.9%
Type K TC	-4 to 1382°F (-20 to 750°C)
IR Thermometer (Models 450 & 470):	
Range	-4 to 518°F (-20 to 270°C)
Spot size	8:1
Emissivity	0.95

All models supplied with CAT III test leads, multi-position tilt stand and velcro strip for hanging, protective holster with test lead holder, bead wire temperature probe (except Model 450) and battery.

ORDERING INFORMATION

EX450	MultiMeter with IR Thermometer
EX430	TRMS MultiMeter
EX470	TRMS MultiMeter w/ IR Thermometer
EX/CA310	300A AC clamp-on adapter
EX/380905	2000A AC/DC clamp-on adapter
EX/409996	Pouch carrying case

Yokogawa Digital Multimeters

TY700 Series

- Basic accuracy 0.02%
- True RMS measurement
- Dual 7 segment display with backlight
- 50k count with 51 segment bar graph
- Measures AC/DC Volts to 1kV, AC/DC Amps to 10A, resistance, continuity, temperature, frequency, capacitance & diode test
- Large capacity logging-mode memory
 - TY720: 10,000 data
 - TY710: 1,000 data
- USB communication & application software (optional DMM communication package)
- Rated 1000V CAT III & 600V CAT IV
- Three year warranty


TY720


TY500 Series

- Basic accuracy 0.09%
- True RMS measurement
- 6k count backlit display
- 31 segment bar graph display
- Measures AC/DC Volts to 1kV, AC/DC Amps to 10A, resistance, continuity, temperature, frequency, capacitance & diode test.
- Logging-mode memory for 1600 data points
- USB communication & application software (optional DMM communication package)
- Conforms to safety standards EN61010-1, 1000V CAT III, 600V CAT IV
- Three year warranty


TY530


SPECIFICATIONS

Model	TY720	TY710	TY530	TY520	CA450
DC Volts	7 ranges, 50mV - 1000V (best resolution 0.001mV)		5 ranges, 600mV - 1000V (best resolution 0.1mV)		5 ranges, 600mV - 1000V (best resolution 0.1mV)
AC Volts, TRMS:	6 ranges, 50mV - 1000V (best resolution 0.001mV) 10Hz - 100kHz		5 ranges, 600mV - 1000V (best resolution 0.1mV) 10Hz - 20kHz		5 ranges, 600mV - 1000V (best resolution 0.1mV) 40Hz - 1kHz
DC Amps:	6 ranges, 500μA - 10A (best resolution 0.01μA)		6 ranges, 600μA - 10A (best resolution 0.1μA)		30mA, 100mA ranges (best resolution 0.001mA)
AC Amps, TRMS:	6 ranges, 500μA - 10A (best resolution 0.01μA) 10Hz - 5kHz		6 ranges, 600μA - 10A (best resolution 0.1μA) 10Hz - 1kHz		with optional clamp probe
AC + DC:	Volts, Amps		---		---
Resistance:	6 ranges, 500Ω - 50MΩ (best resolution 0.01Ω)		6 ranges, 600Ω - 60MΩ (best resolution 0.1Ω)		6 ranges, 600Ω - 60MΩ (best resolution 0.1Ω)
Low Power Resistance:	4 ranges, 5kΩ - 5MΩ		---		---
Capacitance:	8 ranges, 5nF - 50mF (best resolution 0.001nF)		6 ranges, 10nF - 1000μF (best resolution 0.01nF)		---
Frequency:	5 ranges, 10Hz - 100kHz (best resolution 0.001Hz)		4 ranges, 100Hz - 100kHz (best resolution 0.01Hz)		3 ranges, 200Hz - 20kHz (best resolution 0.01Hz)
Duty Cycle:	10 - 90% (resolution 1%)		---		---
Temperature (Type K):	-200 to 1372°C (resolution 0.1°C)		-50 to 600°C (resolution 0.1°C)		---
Logarithm (db) Computation:	Yes		---		---
Diode/Continuity Test:	Yes		Yes		Yes
Automatic Data Hold:	Yes		Yes		Yes
Min/Max Memory:	Yes		Yes		Yes
Peak Hold:	Yes		---		Yes
Data Logging Memory:	10000 points		1000 points		1600 points
PC Connection:	Yes		Yes		Yes
DC Current Source/Sink:	---		---		0 to 20mA (resolution 0.001mA)
24V Loop Supply:	---		---		20mA load max.
Step/Sweep mA Output:	---		---		Yes

CA450 Process Multimeter

Functionality of a loop calibrator like the CA11E plus a digital multimeter like the TY520.

- Simultaneous 24 V loop power and mA measurement
- HART mode setting with loop power (250Ω resistance)
- SIMULATE (SINK) function simulates transmitters
- 4-20 mA span/step/auto-step/sweep output
- High accuracy signal measurement: 0.05% @ 30.000mA DC
- Peak/Hold function for DCS power peak-to-peak measurement
- Dedicated sensor modes for direct reading of many sensor signal types
- Current terminal shutter prevents incorrect connections
- Sensor function handles AC load current measurement
- Meets 600 V CAT IV, 1000 V CAT III safety standards
- Transfer data to a PC via IR-U
- Three year warranty


CA450


ORDERING INFO

TY720	4.5 digit DMM with expanded data memory
TY710	4.5 digit DMM with data memory
TY530	3.5 digit DMM with data memory
TY520	3.5 digit DMM
CA450	Process Multimeter
Accessories	
YE/92015	DMM communication package (includes IR adapter, USB cable & PC software)
YE/90051	Type K liquid probe, -50° to 600°C
YE/90056	Type K surface probe, -20° to 500°C
YE/96001	400A AC current clamp probe
YE/96095	180A DC/ 130A AC clamp probe
YE/93029	Carrying case

Fluke Clamp Meters

NEW

Five new models offer an impressive array of innovative features with TRMS current ranges up to 2500A, TRMS voltage ranges to 1000V.



- Measure to 1000A with fixed jaws, 2500A with flexible current probe
- Designed for one hand operation
- Removable display for remote reading up to 30 ft away (381)
- DCV & DCA measurements (most models)
- Resistance & continuity functions
- Frequency to 500Hz (most models)
- Large, backlit display with data hold
- In-rush current function (on most models) for measuring starting current
- Auto shut-off maximizes battery life

SPECIFICATIONS					
	Fluke 373	Fluke 374	Fluke 375	Fluke 376	Fluke 381
AC response	True-rms	True-rms	True-rms	True-rms	True-rms
AC amps (jaw)	600.0 A	600.0 A	600.0 A	999.9 A	999.9 A
Accuracy	2% ± 5 counts (48-62 Hz)	2% ± 5 counts (10-100 Hz)	2% ± 5 counts (10-100 Hz)	2% ± 5 counts (10-100 Hz)	2% ± 5 counts (10-100 Hz)
Crest factor	2.5 @ 600 A	2.5 @ 600 A	3 @ 500 A 2.5 @ 600 A	3 @ 500 A 1.42 @ 1000 A	3 @ 500 A 1.42 @ 1000 A
Flexible current probe	-	compatible	compatible	included	included
AC amps (probe)	-	2500 A	2500 A	2500 A	2500 A
Accuracy	-	3% ± 5 counts (5-500 Hz)	3% ± 5 counts (5-500 Hz)	3% ± 5 counts (5-500 Hz)	3% ± 5 counts (45-500 Hz)
AC volts	600.0 V	600.0 V	600.0 V	1000 V	1000 V
Accuracy	1% ± 5 counts (48-62 Hz)	1.5% ± 5 counts (20-500 Hz)	1.5% ± 5 counts (20-500 Hz)	1.5% ± 5 counts (20-500 Hz)	1.5% ± 5 counts (20-500 Hz)
DC amps	-	600.0 A	600.0 A	999.9 A	999.9 A
Accuracy	2% ± 5 counts	2% ± 5 counts	2% ± 5 counts	2% ± 5 counts	2% ± 5 counts
DC volts	600.0 V	600.0 V	600.0 V	1000 V	1000 V
Accuracy	1% ± 5 counts	1% ± 5 counts	1% ± 5 counts	1% ± 5 counts	1% ± 5 counts
mV range	-	-	500.0 mV	500.0 mV	-
Resistance	6000 Ω	6000 Ω	60k Ω	60k Ω	60k Ω
Accuracy	1% ± 5 counts	1% ± 5 counts	1% ± 5 counts	1% ± 5 counts	1% ± 5 counts
Continuity Beeper	<30 Ω	<30 Ω	<30 Ω	<30 Ω	<30 Ω
Capacitance	10-1000 μF	1-1000 μF	1-1000 μF	1-1000 μF	-
Frequency	-	-	5-500 Hz	5-500 Hz	5-500 Hz
Remote Display	-	-	-	-	yes
Max Wire Diameter (jaw)	750 MCM	750 MCM	750 MCM	750 MCM	750 MCM
Inrush	-	yes	yes	yes	yes
MIN/MAX/AVG	-	yes	yes	yes	yes
Backlight	yes	yes	yes	yes	yes
Display Hold	yes	yes	yes	yes	yes
Size HxWxD (mm)	232 x 85 x 45	248 x 85 x 45	248 x 85 x 45	248 x 85 x 45	280 x 88 x 50
Rating	CAT III 600V CAT IV 300V	CAT III 1000V CAT IV 600V	CAT III 1000V CAT IV 600V	CAT III 1000V CAT IV 600V	CAT III 1000V CAT IV 600V



Operating Temperature: -10°C to 50°C (14 °F to 122 °F)
Warranty: 3 years

OPTIONAL ACCESSORIES

- i2500-10 iFlex Flexible Current Probe 10"
- i2500-18 iFlex Flexible Current Probe 18"

ORDERING INFORMATION

- Fluke 373 600A True RMS AC Clamp Meter
- Fluke 374 600A True RMS AC/DC Clamp Meter
- Fluke 375 600A True RMS AC/DC Clamp Meter
- Fluke 376 1000A TRMS Clamp Meter with 18" iFlex probe
- Fluke 381 Remote Display TRMS Clamp Meter with 18" iFlex probe

New Model	Changes from Old Fluke Model
Fluke 376	Includes all 337 features plus: • CAT IV 600 V, CAT III 1000 V • iFlex™ 2500 A ac • 1000 V ac/dc • mV dc • 60 kΩ • 1000 μF
Fluke 375	Includes all 336 features plus: • CAT IV 600 V, CAT III 1000 V • Optional iFlex™ 2500 A ac • mV dc • 60 kΩ • 1000 μF • Min/Max/Avg
Fluke 374	Includes all 335 features plus: • CAT IV 600 V, CAT III 1000 V • Optional iFlex™ 2500 A ac • 600 A ac/dc • 1000 μF • Min/Max/Avg
Fluke 374	Includes all 334 features plus: • CAT IV 600 V, CAT III 1000 V • Optional iFlex™ 2500 A ac • True-rms • 600 A ac/dc • 1000 μF • Min/Max/Avg
Fluke 373	Includes all 333 features plus: • CAT IV 300 V, CAT III 600 V • True-rms • 600 A ac • 6000 Ω • 1000 μF

Yokogawa Clamp-On Testers

AC Current CL100 Series

- AC Current to 2000A
- AC Voltage Measurement
- Resistance / Continuity (CL130 & CL150)
- Data Hold
- IEC CAT III

CL130 ▶



AC/DC Current CL200 Series

- AC & DC Current to 2000A
- AC & DC Voltage Measurements
- Resistance / Continuity
- TRMS & Frequency (CL235 & CL255)
- Peak / Data Hold

CL250 ▶



AC Leakage Current CL300 Series

- AC Current to 1000A
- AC Leakage with 10µA Resolution
- Wide Jaw Opening
- AC & DC Recorder Outputs (CL360)
- Peak / Data Hold

CL360 ▶



ORDERING INFORMATION

YE/CL120	200A AC Clamp-On Tester
YE/CL130	600A AC Multi-Function Clamp-On Tester
YE/CL135	600A AC TRMS Multi-Function Clamp-On Tester*
YE/CL150	2000A AC Multi-Function Clamp-On Tester
YE/CL220	300A AC/DC Clamp-On Tester
YE/CL235	600A AC/DC TRMS Multi-Function Clamp-On Tester
YE/CL250	2000A AC/DC Multi-Function Clamp-On Tester
YE/CL255	2000A AC/DC TRMS Multi-Function Clamp-On Tester
YE/CL320	200A AC Clamp-On Leakage Tester
YE/CL340	400A AC Clamp-On Leakage Tester
YE/CL360	1000A AC Clamp-On Leakage Tester

*same features as CL130, except TRMS

Limited Lifetime Warranty on all Models

Model No.	Display	DC Current	AC Current	DC Voltage	AC Voltage	Resistance	Functions						Jaw opening capacity	Rating	
							TRMS	Frequency	Continuity Check	Peak Hold	Data Hold	Recorder Output			
CL120	2000	-	20/200A (2 ranges)	-	300V (1 range)	-	-	-	-	-	-	24mm 0.95"	CAT III 300V		
CL130	2000	-	200/600A (2 ranges)	-	200/600V (2 ranges)	200Ω (1 range)	-	-	•	-	•	33mm 1.30"	CAT III 600V		
CL150	4000	-	400/2000A (2 ranges)	40/400/750V (3 ranges)	40/400/750V (3 ranges)	400/4000/40k/400kΩ (4 ranges)	-	-	•	-	•	55mm 2.16"	CAT III 600V CAT II 1000V		
CL220	4000	40/300A (2 ranges)	40/300A (2 ranges)	-	-	-	-	-	-	-	•	24mm 0.95"	CAT III 300V		
CL235	4000	400/1000A (2 ranges)	400/600A (2 ranges)	40/400/600V (3 ranges)	40/400/600V (3 ranges)	400/4000Ω (2 ranges)	•	•	•	•	•	33mm 1.30"	CAT III 600V		
CL250	4000	400/2000A (2 ranges)	400/2000A (2 ranges)	40/400/1000V (3 ranges)	40/400/750V (3 ranges)	400/4000Ω (2 ranges)	-	-	•	•	-	•	55mm 2.16"	CAT III 600V CAT II 1000V	
CL255	4000	400/2000A (2 ranges)	400/2000A (2 ranges)	40/400/1000V (3 ranges)	40/400/750V (3 ranges)	400/4000Ω (2 ranges)	•	•	•	•	•	•	55mm 2.16"	CAT III 600V CAT II 1000V	
CL320	2000	-	20/200mA 200A (3 ranges)	-	-	-	-	-	-	-	-	•	24mm 0.95"	CAT III 300V	
CL340	4000	-	40/400mA 40/400A (4 ranges)	-	-	-	-	-	-	-	•	•	-	40mm 1.57"	CAT III 300V
CL360	2000	-	200mA 2/20/200/1000A (5 ranges)	-	-	-	-	-	-	-	•	•	•	68mm 2.68"	CAT III 300V

Flir Imaging Clamp Meter

NEW

- Measure to 600A TRMS AC/DC
- Built-in thermal imager to visually identify problems
- Laser & crosshair to pin point image location
- Center point temperature measurement
- Narrow jaw fits tight spaces
- Built-in work light
- VFD mode for testing variable frequency drives
- LoZ voltage mode
- Inrush current check
- Frequency, capacitance, resistance functions
- Continuity & diode test
- Expandable to 3000A AC
- 10 year warranty


CM174

ORDERING INFORMATION

FLIR CM174	Imaging 600A AC/DC Clamp Meter
FLIR TA72	Universal Flex Current Probe 10"(25cm)
FLIR TA74	Universal Flex Current Probe 18"(45cm)
FLIR TA15	Soft Sided Carrying Case
FLIR TA55	Line Splitter
FLIR TA52	Magnet Mount

SPECIFICATIONS

Imaging Detector:	FLIR Lepton® microbolometer, 4800 pixels (60 × 80)	
Field of View (V x H):	38.6° x 50.0°	
Color Palettes:	Iron, Rainbow, Grayscale	
Image Frame Rate:	9Hz	
Temperature Measurement:	Center point of thermal image	
Temperature Range:	-13°F to 302°F (-25°C to 150°C)	
Distance to Spot Ratio:	30:1	
Temperature Accuracy:	±5.4°F (3°C) or ±3% of rdg	
Spectral Response:	8 to 14μm	
Temperature Targeting:	Class 1 Laser Pointer and Crosshair on display	
Emissivity Settings:	4 Presets with Custom Adjustment	
Electrical Measurements	Range	Basic Accuracy
AC/DC Voltage:	1000V	±1.0%
VFD AC Voltage:	1000V	±1.0%
LoZ Mode AC Voltage:	1000V	±1.0%
LoZ Mode DC Voltage:	1000V	±1.0%
DC Current:	600.0A	±2.0%
AC Current:	600.0A	±2.0%
VFD AC Current:	600.0A	±2.0%
Inrush AC Current:	600.0A	±3.0%
Frequency:	60.00kHz	±0.1%
Resistance:	6000Ω	±1.0%
Continuity:	600.0Ω	±1.0%
Capacitance:	1000μF	±1.0%
Diode Test:	1.5V	±1.5%
Inrush Threshold:	0.5A min, 100ms integration time	
Display:	6000 count, 2.0" (50mm) Color TFT	
Jaw Opening:	1.38" (35mm), 1250MCM	
Category Rating:	CAT IV-600V, CAT III-1000V	
Certifications:	UL	
Dimensions:	61 x 111 x 40 mm; Probe: 104 x 34 x 20 mm w/ 700 mm cable	
Accessories Included:	4 AAA batteries, silicone test leads, quick start guide, user manual	

Amprobe Clamp Multimeter

NEW

- Dual display shows volts and amps concurrently
- True-RMS AC for accurate measurements
- Low pass filter for current & voltage measurements on variable frequency drives
- Amp-Tip function for precise low current measurement down to 0.1 amp
- HVAC applications with temperature, DC micro-amps & capacitance
- Non-contact voltage detection
- In-rush current
- Audible continuity & diode test
- Type K thermocouple
- Data hold
- Auto ranging
- Auto power off
- Low battery indicator


ACD-14-PRO

SPECIFICATIONS

	Range	Accuracy
AC Voltage (True-RMS):	0.0 to 600.0 V	±1.0% + 5LSD (50 to 60 Hz)
DC Voltage:	0.0 to 600.0 V	±1.0% + 5LSD
AC Current (True-RMS):	0.00 to 600.0 A	±1.8% + 5LSD (50 to <100 Hz) ±2.0% + 5LSD (100 to 400 Hz)
Amp-Tip AC:	0.00 to 60.00 A	±1.5% + 5LSD (50 to 60 Hz)
DC Microamps:	0.0 to 2000 μA	±1.0% + 5LSD
Frequency:	5.00 to 999.9 Hz	±1.0% + 5LSD (600 V range)
Resistance:	0.0 Ω to 60.00 kΩ 60.01 kΩ to 6000 kΩ	±1.0% + 5LSD ±1.2% + 5LSD
Capacitance:	200.0 μF, 2500 μF	± 2.0% + 4LSD
Diode Test:	0.0 to 3.000 V	± 1.5% + 5LSD
Type K thermocouple*:	-40.0 to 752°F -40.0 to 400°C	±1.0% + 1.5°F (-40.0 to 99.9°F) ±1.0% + 2°F (100 to 752°F) ±1.0% + 0.8°C (-40.0 to 99.9°C) ±1.0% + 1°C (100 to 400°C)
Non-Contact Voltage:	10 to 550 V, 50/60 Hz	
Continuity Beeper:	On < 10 Ω, Off > 250 Ω	
Jaw Opening:	1.18 in (30 mm)	
Update Rate:	5 per second nominal	
Operating Temperature:	32 to 104°F (0 to 40°C), <80% RH up to 88°F (31°C) decreasing linearly to 50% RH at 104°F (40°C)	
Display:	Dual backlit LCD with annunciators	
Certification:	cULus, CE	
Dimensions (L x W x H):	8.62 x 3.03 x 1.46 in (219 x 77 x 37 mm)	
Safety Rating:	CAT III 600 V	
Accessories Included:	Manual, test leads, 2 AAA batteries, carry case, Type K thermocouple	

*thermocouple accuracy tolerances not included

ORDERING INFORMATION

ACD-14-Pro	600 A TRMS Clamp Multimeter
------------	-----------------------------

Extech Clamp Meters

NEW

Model EX623

400A Dual Input Clamp Meters + IR Thermometer + Non-Contact Voltage Detect

- TRMS AC Voltage & Current measurements
- Dual type K thermocouple input with Differential Temperature function
- Non-contact Voltage detector with LED alert
- Non-contact IR Thermometer with laser pointer for locating hot spots
- DC Voltage, DC Current, Resistance, Capacitance, Frequency & Duty Cycle functions
- Autoranging with manual override
- Data Hold plus fast Peak Hold for surges
- Complete with test leads, 9V battery, two Type K bead wire probes and case



▲ Model EX623

Model MA640

600A True RMS Clamp Meters + Non-Contact Voltage Detect

- TRMS AC Voltage & Current measurements
- Non-contact Voltage detector with LED alert
- DC Voltage, DC Current, Resistance, Capacitance, Frequency, Temperature, Duty Cycle
- Relative Mode for Capacitance Zero and Offset Adjustment
- Data Hold and MIN/MAX
- Complete with test leads, Type K bead wire probe, 9V battery and carrying case



▲ Model MA640

800A Clamp Meters

- AC/DC Current, AC/DC Voltage, Resistance, Frequency, Capacitance, Temperature, Diode Test and Continuity
- True RMS models
- 1.2" (30mm) circular jaw opening
- Backlit LCD
- Peak, Data Hold, Auto power off
- DC Current with Zero (EX730)
- Complete with test leads, 9V battery, Type K bead wire probe (EX720, EX730) and carrying case



▲ Model EX730

200A AC/DC Mini Clamp plus MultiMeter

- High resolution to 10mA
- Measures voltage, resistance and frequency
- Fast 40 segment bargraph
- One touch auto zero for DC current measurements
- Min/Max
- Data hold and auto power off
- Complete with test leads, wrist strap, 2 AA batteries and carrying case



▲ Model 380941

30A True RMS AC/DC Mini Clamp

- Measure low AC/DC current with resolution to 1mA DC and 0.1mA AC
- Also measures voltage
- Fast 40 segment bargraph
- One touch auto zero for DC current measurements
- Min/Max
- Data hold and auto power off
- Complete with test leads, wrist strap, 2 AA batteries and carrying case



▲ Model 380942

SPECIFICATIONS

Model	EX623	MA640	380941	380942	EX710	EX720	EX730
AC Sensing:	TRMS	TRMS	Averaging	TRMS	Averaging	TRMS	TRMS
Display counts:	4000	6000	4000	4000	4000, backlit	4000, backlit	4000, backlit
Jaw size/ Cable size:	1.4" (36mm)	1.5" (40mm)	0.9" (23mm); 4/0 AWG	0.9" (23mm); 4/0 AWG	1.2" (30mm): 500MCM	1.2" (30mm): 500MCM	1.2" (30mm): 500MCM
AC Current:	400μA, 40A, 400A	60A, 600A	40A, 200A	400mA, 4A, 30A	800A	800A	800A
DC Current:	400μA, 40A, 400A	60A, 600A	40A, 200A	4A, 30A	---	---	800A
Max resolution:	0.1μA, 0.01A	0.01A	0.01A	AC: 0.1mA, DC: 0.001A	0.01A	0.01A	AC: 0.01A, DC: 0.1A
Basic AC/DC Accuracy:	±1.5%	±2.8%	±1.0%	±1.5%	±2.8%	±3%	AC: ±3%, DC: ±2.5%
AC/DC Voltage (Max. Res.):	AC: 600V (0.1V) DC: 600V (0.01mV)	AC: 600V (1mV) DC: 600V (0.01mV)	400V (0.1V)	400V (1V)	600V (0.1mV)	600V (0.1mV)	600V (0.1mV)
Resistance (Max Res.):	40MΩ (0.01Ω)	60MΩ (0.1Ω)	400Ω (0.1Ω)	---	40MΩ (0.01Ω)	40MΩ (0.01Ω)	40MΩ (0.01Ω)
Capacitance (Max Res.):	40mF (0.01nF)	4000μF (0.01nF)	---	---	40mF (0.001nF)	40mF (0.001nF)	40mF (0.001nF)
Frequency (Max. Res.):	100MHz (0.01Hz)	10kHz (0.01Hz)	1000kHz (0.01Hz)	---	4kHz (1Hz)	4kHz (1Hz)	4kHz (1Hz)
Temperatures (Type K):	-58 to 1832°F	-4 to 1400°F	---	---	---	-4 to 1832°F / -20 to 1000°C	-4 to 1832°F / -20 to 1000°C
IR Temperature:	-58 to 518°F	---	---	---	---	---	---
Diode/Continuity:	Yes	Yes	Continuity	---	Yes	Yes	Yes
Data Hold:	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Min/Max/Peak:	Yes	Yes	Min/Max	Min/Max	Peak	Peak	Peak
Safety Rating:	CAT III-600V	CAT III-600V	CAT III-300V	CAT III-300V	CAT III-600V	CAT III-600V	CAT III-600V

AEMC Clamp-On Power Meters

- Use on single & 3-phase power to 3MW
- Measure to 1000V AC, DC or AC+DC
- Automatic AC or DC selection
- Ω, Hz & THD measurements
- 10,000 count electroluminescent display
- Fast (1msec) inrush current capture
- 1000V CAT IV & IP54 rated
- Data storage & Bluetooth communication
- 1.89" or 2.36" jaw opening



ORDERING INFORMATION

AE/2139.50	Model 405 (TRMS, 1000Vac/dc, 1000Aac/1500Adc, Power, THD)
AE/2139.51	Model 407 (TRMS, 1000Vac/dc, 1000Aac/1500Adc, Energy, Harmonics, Power, THD, Recording)
AE/2139.60	Model 605 (TRMS, 1000Vac/dc, 2000Aac/3000Adc, Power, THD)
AE/2139.61	Model 607 (TRMS, 1000Vac/dc, 2000Aac/3000Adc, Energy, Harmonics, Power, THD, Recording)

SPECIFICATIONS

MODEL	405	407	605	607
Measurement Method	TRMS AC/AC+DC/DC		TRMS AC/AC+DC/DC	
Automatic AC/DC Detection	-	Yes	Yes	
A AC	0.15 to 1000A (1500A peak)		0.15 to 2000A (3000A peak)	
A DC	0.15 to 1500A		0.15 to 3000A	
A AC+DC	0.15 to 1000A (1500A peak)		0.15 to 2000A (3000A peak)	
Best A Accuracy	1% of Reading + 3 cts			
V AC	0.15 to 1000V (1400V peak)			
V DC	0.15 to 1400V			
V AC+DC	0.15 to 1000V (1400V peak)			
Best V Accuracy	1% of Reading + 3 cts			
Hz Current	5.0 to 2000Hz			
Hz Voltage	5.0 to 20.00kHz			
Ohm	0.1Ω to 99.99kΩ			
Audible Continuity	Adjustable	Fixed <40Ω	Adjustable	Fixed <40Ω
Diode Test	Yes	-	Yes	-
Power Values	Single Phase & Total 3-phase		Single Phase & Total 3-phase	
Active Power	5W to 1000kW		5W to 2000kW	
Reactive Power	5var to 1000kvar		5var to 2000kvar	
Apparent Power	5VA to 1000kVA		5VA to 2000kVA	
FP / DPF	Yes / No	Yes / Yes	Yes / No	Yes / Yes
THDf / THDr	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes
Frequency Analysis	-	25th order	-	25th order
Phase Rotation (2-wire)	Yes	-	Yes	-
True InRush® current	Yes	Yes	Yes	Yes
Hold, Min/Max, +/-Peak	Yes	Yes	Yes	Yes
REL ΔX / Diff. ΔX/X (%)	-	Yes / Yes	-	Yes / Yes
Jaw Opening	1.89" (48mm)		2.36" (60mm)	
Number of Values Displayed	1	3	1	3
Data Recording	-	Yes	-	Yes
Communication Interface	-	Bluetooth	-	Bluetooth
Dimensions	10.70 x 3.62 x 1.61" (272x92x41mm)		11.65 x 4.37 x 1.61" (296x111x41mm)	

Megger Clampmeters

FORK MULTIMETER



- Open jaw AC current to 200A
- 0.1V to 1000V AC/DC
- Resistance to 20MΩ
- Continuity buzzer & diode check
- Autoranging
- Non-contact AC voltage detection

Current measurements and the non-contact voltage sensor do not need the supplied test leads. The voltage detection function can identify the presence of live AC voltage from 50-1000 V at 50-500 Hz.

SPECIFICATIONS

Function	Range	Accuracy
AC Current	200.0 A	±3% ±3d, 50/60 Hz, Avg responding
AC Volts	200.0 / 1000 V	±1.5% ±5d, 50-500 Hz, Avg responding
DC Volts	200.0 / 1000 V	±1% ±2d
Resistance:	200.0Ω - 20.00MΩ (6 ranges)	±1% ±2d (2k-2MΩ ranges)
Continuity:	<50Ω	Buzzer sounds
Overload Protection:	400 Arms on AC current, 600 Vrms on ohms	
Conductor Size:	0.63" (16mm) max.	
Display:	3½ digit, 2000 count	
Operating Temp.:	0°C to 30°C, <80% RH; 40°C to 50°C, <45% RH	
Battery:	2 AAA Alkaline	
Battery Life:	250hrs typical (auto power off after 10 minutes)	
Dimensions:	4.7" x 2.1" x 1.2" (193 x 54 x 21mm)	
Safety:	IEC61010-1, CAT III 1000V, CATIV 600V	

LEAKAGE CLAMPMETER



- 0.01mA resolution for measuring earth leakage currents
- Amp ranges for standard current measurements
- Analog bargraph display for trending
- 40mm jaw opening

DCM300E

SPECIFICATIONS

Ranges:	30mA/300mA/30A/300A (50/60Hz)
Accuracy:	
30/300mA:	±1.2% rdg ±5d
0-200A:	±1.2% rdg ±5d
200-250A:	±3.0% rdg ±5d
250-300A:	±5.0% rdg ±5d
Circuit Voltage:	600V AC max.
Jaw Capability:	40mm (1.57")
Display:	3½ digit, 3200 count
Data Hold:	Indicated by DH in display
Operating Temp.:	0°C to +40°C, <80% RH
Storage Temp.:	-20°C to +60°C, <70% RH
Battery:	2 LR44 button cells
Dimensions:	2.5" x 7" x 0.9" (64 x 176 x 23mm)
Safety:	300V phase to earth, 500V phase to phase CAT III or 600V CAT II

ORDERING INFORMATION

ME/DCM330	Fork Multimeter
ME/DCM300E	Leakage Clampmeter with carrying case

Fluke Leakage Clamp Meter

- Measure leakage current with 1 μ A resolution, for monitoring of insulation erosion
- Measure to 60 A, for general installation needs
- Perform tests without powering down the installation or disconnecting equipment
- Advanced shielding ensures accurate results when measuring near other conductors
- Easy-to-carry, pocket-sized clamp with 40 mm (1.5") jaw size
- Handy "Display-Hold" button for capturing readings in hard-to-reach places
- Auto power-off, with warning buzzer, saves battery life
- Meets safety standard VDE0404-4 and VDE0702 for leakage current and differential current measurement of electrical appliances



360

SPECIFICATIONS

Ranges:	3 ma, 30 mA, 30 A, 60 A
Resolution:	0.001 mA, 0.01 mA, 0.01 A, 0.1 A
Accuracy:	$\pm 1\%$ rdg $\pm 5d$ (≤ 50 A) $\pm 5\%$ rdg $\pm 5d$ (>50 A)
Frequency range:	15-150 Hz
Maximum current:	60 A rms
Digital display:	3200 count LCD
Bargraph display:	32 segment LCD
Measurement cycle:	2/sec. (digital display), 12 /sec. (bargraph display)
Range switching:	Auto-range
Environment:	0-50 °C, <80 % RH (non-condensing)
Temperature coefficient:	<0.05 % of range/°C (0-18 °C & 28-50 °C, <50 A)
Influence of external magnetic field:	0.0005 % typical (on current value of adjacent cable)
Influence of conductor position:	Within accuracy
Circuit voltage:	≤ 300 Vrms
Safety standard:	EN 61010-1, EN 61010-2-032. 300 V CAT II, Pollution Degree 2
Battery type:	3 V Lithium battery (CR2032)
Battery life:	Approx. 90 hours (continuous use)
Conductor diameter:	40 mm (1.57") max.
Dimensions:	176 x 70 x 25 mm (6.9" x 2.8" x 1")

ORDERING INFORMATION

Fluke-360 Leakage Current Clamp Meter

Hioki AC Power Monitors

NEW

Clamp-On Power HiTester

- Measure up to two 3 \emptyset , 3-wire systems
- Measure up to four 1 \emptyset , 2-wire systems
- 5A to 5000A range
- Simultaneous recording of demand values and harmonics
- Ideal for troubleshooting & energy management



3169

3169 SPECIFICATIONS

Systems:	1 \emptyset 2-wire, 1 \emptyset 3-wire, 3 \emptyset 3-wire, 3 \emptyset 4-wire (50/60 Hz)	Accuracy:	$\pm 0.2\%$ rdg $\pm 0.1\%$ f.s. + Clamp accuracy (for active power)
Functions:	ACV, ACA, W, VA, VAR, PF, integrated power, Frequency, Harmonics	With 9660:	$\pm 0.3\%$ rdg $\pm 0.02\%$ FS
Ranges:	150/300/600V With 9660: 5-100A, 4 ranges With 9661: 5-500A, 5 ranges With 9669: 100A-1kA, 3 ranges With 9667: 500A-5kA, 2 ranges With 9694: 0.5A-5A, 3 ranges	With 9661:	$\pm 0.3\%$ rdg $\pm 0.01\%$ FS
Power:	75W to 9MW, 108 combination patterns	With 9667:	$\pm 2.0\%$ rdg ± 1.5 mV
		With 9694:	$\pm 0.3\%$ rdg $\pm 0.02\%$ FS
		Harmonics:	Up to the 50th order, $\pm 3\%$ FS + measurement accuracy
		Power:	100 to 240VAC, 50/60 Hz
		Dimensions:	8.3"W x 6.3H x 2.4"D

Order clamp-on current sensors separately

Power Logger

- Capture voltage & current wave forms, power & energy use
- Measure to 780V, 5000A
- Harmonics to the 40th order (-21)
- Display demand and trend graphs
- Store months of data on SD card
- 3 current and 3 voltage channels



PW3360

PW3360 SPECIFICATIONS

Systems:	1 \emptyset 2-wire, 1 \emptyset 3-wire, 3 \emptyset 3-wire, 3 \emptyset 4-wire (50/60 Hz)
Range:	Voltage: 90-780V AC, peak: ± 1400 V Current: 5-130% of sensor rating Power: 300.00 W to 9.0000 MW
Measurements:	RMS voltage & current, peak, phase angle, frequency, active power, reactive power, apparent power, power factor, active energy, reactive energy, demand value, demand quality
Harmonics:	Voltage, current & power to 40th order plus THD (PW3360-21 only)
Memory:	132kB internal, optional SD card up to 2GB
Pulse Input:	Use to record power data & production volume counts simultaneously
Pulse Output:	When power consumption exceeds a set output rate (1Wh to 100kWh)
Sampling:	14 bits, 10.24kHz
Display:	3.5" color LCD (320x240)
Interface:	10Base-T/100 Ethernet with HTTP, USB2.0
Rating:	CAT III 600V, CAT IV 300V
Power:	AC adapter; Rechargeable Ni-MH battery optional
Temperature:	-10 to +50 °C, <80% RH
Dimensions:	7.1"W x 4.0"H x 1.9"D
Free Software:	Setup and Data Download, Excel Graph Auto-Creation

ORDERING INFORMATION

HK/3169-20	Clamp-On Power HiTester, with voltage leads (order CTs below)
HK/PW3360-20	Power Logger, with voltage leads & AC adapter
HK/PW3360-20-01/5000	PW3360-20 w/ 3 5kA Flex CTs, battery, case, 2GB SD card, software
HK/PW3360-21	Power & Harmonic Logger, with voltage leads & AC adapter
HK/PW3360-21-01-5000	PW3360-21 w/ 3 5kA Flex CTs, battery, case, 2GB SD card, software
HK/9660	100A Clamp-On Sensor
HK/9669	1000A Clamp-On Sensor
HK/9667	5000A Flexible Clamp-On Sensor
HK/9694	5A Clamp-On Sensor

Extech AC Power Clamp Meter

NEW

- Dual LCD display (9999 count)
- Measures 1Ø/3Ø True Power (kW), Apparent Power (kVA), Reactive Power (kVAR), plus Horsepower (HP), Power Factor and Phase Angle with Lead/Lag indicator
- AC+DC μ A current with 10nA resolution for flame rod tests
- Insulation Resistance tests to 100M Ω
- Type K temperature to 1000°F (900°C)
- 1.6" (40mm) clamp jaw opening
- Max/Min recording with elapsed time indication
- Auto Detect AC/DC Voltage measurements with simultaneous frequency display
- Diode and Continuity tests
- Category III 600V rating



▲
380976

Complete with deluxe test lead kit, general purpose Type K thermocouple probe, carrying case and 9V battery.

SPECIFICATIONS

Function	Max Range / Resolution	Basic Accuracy
True Power (W):	600kW / 10W	$\pm 5\%$
Apparent Power (kVA):	600kVA / 100VA	$\pm 2\%$
Reactive Power (kVAR):	600kVAR/10VAR	$\pm 5\%$
Horsepower (HP):	800HP / 0.01HP	$\pm 5\%$
Phase Angle:	-60 to +60° / 0.1°	$\pm 6^\circ$
AC Current (Trms):	1000A / 10mA	$\pm 2\%$
μ A Current (AC+DC Trms):	1000 μ A / 10nA	$\pm 1\%$
AC/DC Voltage (Trms):	600V / 0.1mV	$\pm 1\%$
Resistance:	1000k Ω / 0.1 Ω	$\pm 1\%$
Resistance (M Ω):	100M Ω / 1k Ω	$\pm 5\%$
Capacitance:	7000 μ F / 1nF	$\pm 1.5\%$
Frequency:	40Hz to 1kHz / 0.1Hz	$\pm 0.5\%$
Temperature (Type K):	-58 to 1000°F / 0.1°F -50 to 900°C / 0.1°C	$\pm 1\%$
Dimensions:	9" x 3" x 1.6" (228 x 76 x 39mm)	

ORDERING INFORMATION

EX/380976-K 1000A 1Ø 3Ø AC Power Clamp Meter

Yokogawa AC/DC Clamp-On Power Meter

- AC & DC Power up to 600 kW
- True RMS for AC
- Harmonics 1st to 25th order
- Power fluctuation using the ACA Inrush and Peak Hold functions
- AC & DC Voltage to 1000 V
- AC & DC Current to 600 A
- Frequency, Resistance, Continuity, Diode check, Power factor
- White LED automatically illuminates front of jaw when clamping
- Category IV 600V & CAT III 1000V compliant



▲
CW10

Complete with test leads, carrying case and 9V battery.

SPECIFICATIONS

Function	Range	Accuracy
AC Current:	99.99 / 600.0	$\pm(1.5\% \text{ Rdg} + 5 \text{ LSD}) @ 50/60\text{Hz}$
AC Voltage:	99.99 / 999.9	$\pm(1\% \text{ Rdg} + 5 \text{ LSD}), 50\text{-}500\text{Hz}$
DC Current:	99.99 / 600.0	$\pm(1.5\% \text{ Rdg} + 5 \text{ LSD})$
DC Voltage:	99.99 / 999.9	$\pm(0.7\% \text{ Rdg} + 2 \text{ LSD})$
Active Power (kW):	9.999 / 99.99 / 600.0	$\pm(2.5\% \text{ Rdg} + 11 \text{ LSD}) \text{ AC}$ $\pm(2.2\% \text{ Rdg} + 22 \text{ LSD}) \text{ DC}$
Inrush Current:	99.99 / 600.0	$\pm(2.5\% \text{ Rdg} + 20 \text{ LSD})$
Resistance:	1k / 10k / 100k	$\pm(1.0\% \text{ Rdg} + 5 \text{ LSD})$
Frequency:	100 / 1000 / 10k	$\pm(0.5\% \text{ Rdg} + 3 \text{ LSD})$
Harmonics:	99.99%	1-12: $\pm(5\% \text{ Rdg} + 10 \text{ LSD})$ 13-25: $\pm(10\% \text{ Rdg} + 10 \text{ LSD})$
Power Factor:	-1.00 to 1.00	$\pm(3^\circ + 2 \text{ LSD})$
Peak Hold (ACV, ACA):	40% overrange	$\pm(3\% \text{ Rdg} + 15 \text{ LSD})$
Dimensions:	9.6" x 7" x 2.0" (242 x 87 x 51mm)	

ORDERING INFORMATION

YE/CW10 AC/DC Clamp-on Power Meter

Amprobe Compact Power Quality Clamp

- AC/DC Voltage up to 600V, AC Current up to 600A, Resistance, Frequency; Active (W), Reactive (VAR) and Apparent (VA) Power with dual display Power Factor readout, kWh Recording
- Slim jaws fit in tight spaces & accommodate conductors up to 1.02" (26mm) diameter
- Auto Selection of AC Volts, DC Volts or AC Amps
- 3 phase unbalanced load measurement by calculation of discrete single phase measurements
- Overload protection for all functions to 600V AC and DC
- Peak hold, data hold, audible continuity test
- Optional PC interface capability
- Safety CAT III 600V



▲
ACD-45PQ

Supplied with test leads & battery.

SPECIFICATIONS

Function	Range	Accuracy
AC Current:	40.00 / 400.0 / 600A	$\pm(1.0\% \text{ Rdg} + 5 \text{ LSD}) @ 50/60\text{Hz}$
AC Voltage:	600.0V	$\pm(0.5\% \text{ Rdg} + 5 \text{ LSD}) @ 50/60\text{Hz}$
DC Voltage:	600.0V	$\pm(0.5\% \text{ Rdg} + 5 \text{ LSD})$
Resistance:	999.9 Ω	$\pm(1.0\% \text{ Rdg} + 6 \text{ LSD})$
Frequency:	5.00Hz to 500.0Hz	$\pm(0.5\% \text{ Rdg} + 4 \text{ LSD})$
Active Power (W):	0 to 360.0 kW	$\pm(2.0\% \text{ Rdg} + 6 \text{ LSD}) @$ Harmonics to 10th & PF 0.1 to 0.99
Reactive Power (VAR):	0 to 360.0 kVAR	$\pm(2.0\% \text{ Rdg} + 6 \text{ LSD}) @$ Harmonics to 10th & PF > 0.7
Apparent Power (VA):	0 to 360.0 kVA	$\pm(2.0\% \text{ Rdg} + 6 \text{ LSD}) @$ Harmonics to 10th
Power Factor:	0.10 to 0.99	$\pm 3 \text{ LSD} @$ Harmonics to 21th
Dimensions:	10.5" x 7" x 3.2" (267 x 178 x 82mm)	

ORDERING INFORMATION

AB/ACD-45PQ 600A Power Quality Clamp

Yokogawa Power Quality Analyzer

NEW

Power Measuring & Logging

- Simultaneously measures 3 CH Voltage input, 4 CH current clamp-on probe input, 2 CH DCV input.
- Displays value list or trend graph screen of Instantaneous/Average/Maximum/Minimum of Voltage/Current/Power/Power factor/Phase Angle/Phase Advanced Capacitance Calculation and DCV input.
- Integration Value of Active/Reactive/Apparent Energy is each displayed by consumption and generation.
- Demand value can be monitored by screens of present power consumption compared to aimed demand power value.

Power Quality Measuring

Measure Temporary Malfunction of Power Line

- Captures temporary malfunction phenomena of power line which causes malfunction or destruction of devices by types (Voltage swell, Voltage dip, Voltage interruption, Transient overvoltage, Inrush current) as an event by high sampling rate of 24 μ s and RMS calculation.
- Event data contains the type of malfunction, occurred time or occurrence finish time, measured value and waveform of voltage and current of all channels for approx. 200 ms period.
- Measurement conforms to IEC standard 61000-4-30 Class S

Measure Continuous Malfunction of Power Line

- Measure and display graphs and list of up to the 50th Harmonic components of voltage, current & power for each phase and in total.
- Displays with up to 10 or 12 waveforms of voltage and current for each CH.
- Measures, 1 minute flicker (Pst, 1 min), short flicker (Pst) and long flicker (Plt).
- Displays voltage and current unbalance rate on 3 phase wiring.

Data Analysis & Report Generation Software

- Automatically generates graph and report by simply clicking on file data displayed on screen.
- Reports Power data, Power quality event data, Main Unit Setting data, Screen capture data.

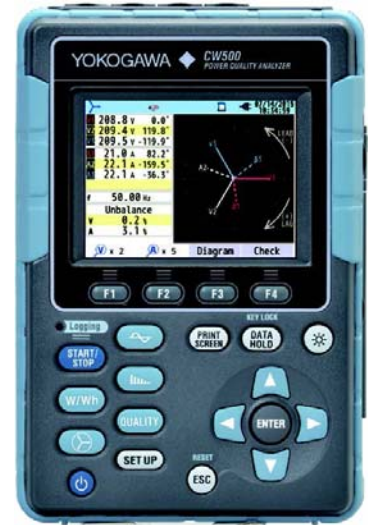
CW500 includes 4 voltage probes, six AA batteries, carrying case, 2G SD memory card & PC software. Order current probes separately.



Vector Display indicates voltage and current phase difference and values between input channels of voltage and current. It also checks whether the wiring is appropriate.

CW500

CW500 Viewer software provides management of main unit settings and realtime measurements via USB.



SPECIFICATIONS

Wiring connections:	1P2W (max. 4 systems), 1P3W (max. 2 systems), 3P3W (max. 2 systems), 3P3W3 current, 3P4W
Measurements:	Voltage, Current, Frequency, Active power, Reactive power, Apparent power, Active energy, Reactive energy, Apparent energy, Power factor, Phase Advancing Condenser, Neutral current, Demand, Harmonics, Inrush current, Power Quality (Swell/Dip/Interrupt/Transient overvoltage, Unbalance rate, IEC flicker)
Other functions:	Digital output, Analog DCV input function
Voltage range:	600.0/1000 V RMS
Accuracy:	$\pm 0.2\%$ rdg $\pm 0.2\%$ rng. (sine wave, 40-70 Hz)
Allowable input:	1 to 120% (rms) of each range, 200% for peak of each range
Display range:	0.15 to 130% of each range
Crest factor:	3 or less
Sampling speed	24 μ s for voltage transient
Current range:	manual or auto, see probe table (below)
Accuracy:	$\pm 0.2\%$ rdg $\pm 0.2\%$ rng. + accuracy of clamp-on probe (sine wave, 40-70 Hz)
Allowable input:	1 to 110% (rms) of each range, 200% for peak of each range
Display range:	0.15 to 130% of each range
Crest factor:	3 or less
Active power range:	See probe table (below)
Accuracy:	$\pm 0.3\%$ rdg $\pm 0.2\%$ rng. + accuracy of clamp-on probe (Power factor 1, sine wave, 40-70 Hz)
Effect of Power Factor:	$\pm 1.0\%$ rdg (40-70 Hz, reading at power factor 0.5 ref. 1.0)
Frequency meter:	40 to 70 Hz
Power supply (AC Line):	100-240 V/50-60 Hz/7 VA max.
Power supply (Battery):	Alkaline size AA battery LR6 or Ni-Mh (HR15-51) \times 6 pcs
Battery life:	3 hours typical (LR6, Backlight OFF)
Internal memory:	Flash memory (4 MB)
External memory card:	SD Card (2 GB)
PC communication:	USB Ver. 2.0, Bluetooth Ver. 2.1 + EDR Class2
Display:	320 \times 240 (RGB) Pixel, 3.5 inch color TFT, 1 s update rate
Operating temperature:	0 to 45°C, less than 85% RH (without condensation)
Dimensions:	120 (W) \times 175 (H) \times 68 (D) mm

ORDERING INFO

YE/CW500-B0-D	Power Quality Analyzer, 120VAC cord, no Bluetooth
YE/CW500-B1-D	Power Quality Analyzer, 120VAC cord, with Bluetooth
Current Probes	
YE/96060	Clamp-on Probe 40mm AC 2A for leakage current
YE/96061	Clamp-on Probe 18mm AC 50A for load current
YE/96062	Clamp-on Probe 24mm AC 100A for load current
YE/96063	Clamp-on Probe 30mm AC 200A for load current
YE/96064	Clamp-on Probe 40mm AC 500A for load current
YE/96065	Clamp-on Probe ~110mm AC 1000A flexible type for load current
YE/96066	Clamp-on Probe ~150mm AC 3000A flexible type for 3ch load current

Power Ranges for Clamp-on Probes - in 1P2W configuration (multiply x2 for 1P3W and 3P3W, x3 for 3P4W)

Voltage range:	Clamp-on Probe Model & Current ranges											
	96061		96062		96063		96064		96065		96066	
	5000 mA	50.00 A	10.00 A	100.0 A	20.00 A	200.0 A	50.00 A	500.0 A	100.0 A	1000 A	300.0 A	3000 A
600.0 V	3000 W	30.00 kW	6000 W	60.00 kW	12.00 kW	120.0 kW	30.00 kW	300.0 kW	60.00 kW	600.0 kW	180.0 kW	1800 kW
1000 V	5000 W	50.00 kW	10.00 kW	100.0 kW	20.00 kW	200.0 kW	50.00 kW	500.0 kW	100.0 kW	1000 kW	300.0 kW	3000 kW

Hioki Power Quality Analyzer

Catch power quality problems on the fly.

- Monitor Inrush Current, Voltage Swells, Voltage Dips, Transient Over-Voltage, Interruptions
- Measure and Record: Power and Power Factor, Active/Reactive Energy, Demand, Load Changes (with graph display), Voltage and Current
- Large 4.7" Color LCD with Backlight

3197
▶
& three
9661
sensors



ORDERING INFORMATION

HK/3197	Power Quality Analyzer
HK/9660	100A Clamp-on Sensor (300V, Ø15mm jaw)
HK/9661	500A Clamp-on Sensor (300V, Ø46mm jaw)
HK/9667	5000A Flexible Clamp-on Sensor (1000V, Ø254mm jaw)
HK/9669	1000A Clamp-on Sensor (600V, Ø55mm jaw)
HK/9694	5A Clamp-on Sensor (300V, Ø15mm jaw)
HK/9624-50	Deluxe PQA Analysis Software

Includes: voltage cord set, 6 hour battery pack (rechargeable), AC adapter, USB cable, basic PC software, carrying case & strap. Order current sensors separately.

SPECIFICATIONS

Measurement lines:	Single-phase 2-wire (1P2W), single-phase 3-wire (1P3W), three-phase 3-wire (3P3W2M & 3P3W3M), three-phase four-wire (3P4W and 3P4W2.5E)
Measurement line frequency:	Auto-detect (50Hz/60Hz)
Voltage range:	600.0V AC (crest factor 2 or less)
Current ranges:	500.0mA, 5.000A, 50.00A, 10.00A, 100.0A, 500.0A, 1.000kA, 5.000 kA (manually switchable in 2 range sets according to clamp sensor)
Measurement items:	
Impulsive voltage quality:	Transient overvoltage (Impulse)
RMS voltage quality:	Voltage swell, Voltage dips, Voltage interruption
Power quality:	Frequency, Voltage, Current, Current peak, Active/Reactive/Apparent power, Power factor (displaced power factor)
Three phase quality:	Voltage unbalance ratio, Current unbalance ratio
Harmonic quality:	Harmonic voltage, Harmonic current, Harmonic power, Harmonic voltage/current phase angle, Total harmonic voltage distortion, Total harmonic current distortion (THD-F, THD-R), (to 50th harmonic)
Measurement method:	Simultaneous digital sampling of voltage and current (sampling frequency 10.24 kHz per channel)
Interval settings:	Auto / 1 / 5 / 10 / 15 / 30 / 60 minutes
Recordable period:	125 days maximum; partition memory into four segments for maximum 31 days of recording each
Internal memory:	4 MB non-volatile
PC Interface:	USB 2.0
Dimensions:	5.1" W x 9.7" H x 2.5" D (128 x 246x 63 mm)

Hioki AC/DC Current Monitor



◀ **3290**

Choice of measurement mode:

- DC (for battery measurement)
- AC+DC RMS (for full-/half-wave rectification measurement)
- AC RMS (for current distortion measurement)
- PEAK (for peak value measurement of inrush current, etc.)
- Selectable recorder output and response time
- Current integral, operating time/duty measurements (3290-10)

ORDERING INFORMATION

HK/3290	Clamp-On AC/DC HiTester
HK/3290-10	Deluxe Clamp-On AC/DC HiTester
HK/9691	100A AC/DC Clamp-on Sensor (600V, Ø35 mm jaw)
HK/9692	200A AC/DC Clamp-on Sensor (600V, Ø33 mm jaw)
HK/9693	2000A AC/DC Clamp-on Sensor (600V, Ø55 mm jaw)
HK/9445-02	AC Adapter
HK/9400	Carrying Case

Includes: carry strap, 4 AA batteries. Order clamp-on sensor separately.

SPECIFICATIONS

Current measurement:	AC RMS, AC MEAN, AC+DC, DC
Current ranges:	20 to 100A with 9661 clamp 20 to 200A with 9662 clamp 200 to 2000A with 9663 clamp
Frequency:	10 to 1000 Hz
Analog outputs:	DC or AC Current: 2V f.s. Level output with REC mode Waveform output with MON mode Integ./Frequency: 1V/f.s.
Accuracy:	Current: ± 1.3 % rdg. ± 3 digits. (typical) Frequency: ± 0.3 % rdg. ± 1 dgt. (typical at 50/60Hz)
Frequency response:	± 2.3 % rdg. ± 8 dgt. (DC to 1 kHz)
Digital display:	4 digit, maximum 3000 counts (9999 counts on 3290-10)
Bar display:	20 segments
Sampling rate:	Fast: 4 times / sec (3290-10: 10times/sec), Normal: 2 times / sec, Slow: 1 time / 3sec
Crest factor:	2.5 or less
Max. circuit voltage:	600 V AC rms. (insulated wire)
Dimensions:	6.1" W x 3.6" H x 1.9" D (155 x 98 x 47 mm)

3290-10: Polarity specific integral function measures battery charging and discharging. Peak current display shows peak charge and discharge.

AEMC Three-Phase Power Quality Analyzers



**PowerPad™
3945B**



- True RMS single-, two- and three-phase measurements at 256 samples/cycle, plus DC
- Real-time color waveforms
- Easy-to-use on-screen setup
- Automatic current probe recognition and scaling
- True RMS voltage and current measurement
- Measures DC volts, amps and power
- Display and capture voltage, current and power harmonics to 50th order, including direction, in real time
- Capture transients down to 1/256th of a cycle
- Phasor diagram display
- VA, VAR and W per phase and total
- kVAh, VARh and kWh per phase and total
- Neutral current display for three-phase
- Transformer K-factor display
- Power Factor, displacement PF display
- Captures up to 50 transients
- Short-term flicker display
- Phase unbalance (current and voltage)
- Harmonic Distortion (total and individual) from 1st to 50th
- Alarms, surges and sags
- Screen snapshot function captures waveforms or other information on the display
- Includes DataView® software for data storage, real-time display, analysis and report generation

SPECIFICATIONS

Electrical

Sampling Frequency	256 samples/cycle
Data Storage	3945B: 4MB 8335: 2GB SD card
Voltage (TRMS)	3945B: 960V Ø-Ø, 480V Ø-N 8335: 10-1000V Ø-Ø & Ø-N
Current (TRMS)	MN Clamp: 5mA to 100mA/ 120A or 2 to 240A MR Clamp: 10 to 1000Aac, 10 to 1400Adc SR Clamp: 3 to 1200A AmpFlex™: 10 to 6500A (Crest factor at 6500 = 1)
Frequency	40 to 69Hz
Other Measurements	kW, kVAR, kWh, kVARh, kVAh, K-Factor, Flicker 3945B: PF, DPF 8335: INrush
Harmonics	1st to 50th, Direction, Sequence
Power Source	9.6V NiMH rechargeable battery pack AC Supply: 110/230VAC ±20% (50/60Hz)
Battery Life	≥8 hrs with display on; ≥35 hours with display off (record mode)

Mechanical

Communication	Port Optically coupled RS-232
Display	1/4 VGA (320 x 240) color LCD
Dimensions	9.5 x 7 x 2" (240 x 180 x 55mm)
Weight	4.6 lbs (2.1 kg)
Safety Rating	3945B: 600V CAT III 8335: 1000V, CAT IV



All models include three color-coded current probes with 10 ft leads (MN93 example shown), four* color-coded 10 ft voltage leads, four* color-coded alligator clips, RS-232 DB9F optically coupled serial cable, NiMH battery, US 120V power cord, DataView® software, carrying bag, soft carrying pouch and user manual.
*Five in 8335 Kits

ORDERING INFORMATION

AE/2130.75	PowerPad™ Model 3945B w/MN93 (240A)
AE/2130.76	PowerPad™ Model 3945B w/SR193 (1200A)
AE/2130.77	PowerPad™ Model 3945B w/24" AmpFlex™ 193-24 (6500A)
AE/2130.78	PowerPad™ Model 3945B w/36" AmpFlex™ 193-36 (6500A)
AE/2130.79	PowerPad™ Model 3945B w/MR193 (1000Aac/1400Aac)
AE/2130.80	PowerPad™ Model 3945B w/MN193 (6A/120Aac)
AE/2136.21	PowerPad® Model 8335 w/MN93 (240A)
AE/2136.22	PowerPad® Model 8335 w/SR193 (1200A)
AE/2136.23	PowerPad® Model 8335 w/24" AmpFlex® 193-24 (6500A)
AE/2136.24	PowerPad® Model 8335 w/36" AmpFlex® 193-36 (6500A)
AE/2136.25	PowerPad® Model 8335 w/MR193 (1000AAC/1400ADC)
AE/2136.26	PowerPad® Model 8335 w/MN193 (5A/120AAC)

Accessories (Optional)

AE/2140.14	Set of three color-coded MN193 probes (6A/120A) with 10 ft leads
AE/2140.17	5A Adapter box
AE/2140.61	Set of four color-coded 30 ft voltage leads
AE/2140.24	Set of three color-coded MN93-30 probes (240A) with 30 ft leads
AE/2140.25	Set of three color-coded SR193-30 probes (1200A) with 30 ft leads
AE/2140.26	Set of three color-coded 24" AmpFlex™ 193-24-30 probes (6500A) with 30 ft leads
AE/2140.27	Set of three color-coded 36" AmpFlex™ 193-36-30 probes (6500A) with 30 ft leads
AE/2140.28	One AC/DC Current Probe Model MR193-BK (black connector) (1000Aac/1400Aac)
AE/2140.29	Set of three color-coded MN193-30 probes (6A/120A) with 30 ft leads
AE/2140.30	Set of three color-coded MR193-30 probes (1000Aac/1400Aac) with 30 ft leads

AEMC Single-Phase Power Quality Analyzer



8230 PowerPad® Jr.

DataView® Software included with Model 8230

- Display and analyze real-time or recorded data on the PC
- Configure all PowerPad® Jr. functions & parameters
- Customize views, templates and reports
- Create and store a complete library of configurations
- Zoom in and out and pan through sections of the graph
- Display waveforms, trend graphs, harmonic spectrums, text summaries, transients, event logs & stored alarms

All models include current probe with 10 ft lead and black connector, black & red 10 ft voltage leads and alligator clips, optical USB cable, NiMH battery, US 120V power cord, DataView® software, carrying bag, soft carrying pouch and user manual.

- Displays Min, Max and Average Volts and Amps, Crest Factor, Peak value and K-Factor
- Calculates and displays Watts, VARs and VA, Power Factor and Displacement Power Factor for single-phase and balanced three-phase
- Displays total harmonic distortion (THD-F and THD-R) for voltage and current
- Displays individual harmonic values and % for Volts and Amps through the 50th harmonic
- Captures, displays and stores inrush current waveforms and statistics
- Stores up to eight screen captures
- Stores up to 1MB of trend recorded data
- Configurable from DataView® software or front panel
- Captures up to 4096 alarm events using up to 10 different thresholds
- Displays and records up to 17 different power quality parameters
- Includes DataView® software for data storage, real-time waveform display, analysis and report generation

SPECIFICATIONS

Electrical	
Voltage (TRMS)	660V Phase-to-Phase, 600V Phase-to-Neutral
Current (TRMS)	MN Clamp: 5mA to 120A or 2 to 240A MR Clamp: 10 to 1000AAC, 10 to 1400ADC SR Clamp: 3 to 1200A AmpFlex®: 10 to 6500A (Crest factor at 6500 = 1)
Frequency	40 to 70Hz
Other Measurements	kW, kVAR, PF, DPF, kWh, kVARh, kVAh, K-Factor, Flicker, Harmonic Phase Shift, Phase Rotation
Harmonics	THD-R, THD-F, V, A, VA 1st to 50th, Direction, Sequence
Sampling Frequency	256 samples/cycle
Data Storage	1.5MB partitioned for waveforms, alarms & trend
Power Source	NiMH AA rechargeable battery pack AC Supply: 120/230VAC (50/60Hz)
Battery Life	>Eight hrs with display on, >40 hrs with display off (recording mode)
Mechanical	
Communication Port	Optically isolated USB
Display	1/4 VGA (320 x 240) color LCD
Dimensions	8.3 x 4.3 x 2.4" (211 x 108 x 60mm)
Safety Rating	EN 61010, 600V Cat. III, Pollution Degree 2

ORDERING INFORMATION

AE/2130.82	PowerPad® Jr. Model 8230 w/MN93-BK (240A)
AE/2130.83	PowerPad® Jr. Model 8230 w/SR193-BK (1200A)
AE/2130.84	PowerPad® Jr. Model 8230 w/24" AmpFlex® 193-24-BK (6500A)
AE/2130.85	PowerPad® Jr. Model 8230 w/36" AmpFlex® 193-36-BK (6500A)
AE/2130.86	PowerPad® Jr. Model 8230 w/MR193-BK (1000AAC/1400ADC)
AE/2130.87	PowerPad® Jr. Model 8230 w/MN193-BK (6A/120AAC)

AEMC Power Quality Meter



8220

- Displays Min, Max and Average Volts and Amps, Crest Factor, Peak value and K-Factor
- Calculates and displays Watts, VARs and VA, Power Factor and Displacement Power Factor for single-phase and balanced three-phase
- Displays total harmonic distortion (THD-F and THD-R) for voltage and current
- Displays individual harmonic values and % for Volts and Amps through the 50th harmonic
- Captures and displays inrush current
- Calculates & displays phase rotation & RPM
- Displays °F or °C & resistance to 2000Ω
- Conducts continuity and diode tests
- Stores up to nine complete sets of readings for all volt, amp, power, harmonics and other measurements
- Configurable from DataView® software or front panel
- Operates off batteries or optional AC adapter
- Includes DataView® software for data storage, real-time waveform display, analysis and report generation

All models include current probe with 10 ft lead & black connector, black & red 10 ft voltage leads and alligator clips, optical USB cable, six 1.5V batteries, two safety test probes, DataView® software, carrying bag, soft carrying pouch and user manual.

Three-line backlit digital display with custom icons

ORDERING INFORMATION

AE/2130.91	Power Quality Meter Model 8220 w/MN93-BK (240A)
AE/2130.92	Power Quality Meter Model 8220 w/SR193-BK (1200A)
AE/2130.93	Power Quality Meter Model 8220 w/24" AmpFlex® 193-24-BK (6500A)
AE/2130.94	Power Quality Meter Model 8220 w/36" AmpFlex® 193-36-BK (6500A)
AE/2130.95	Power Quality Meter Model 8220 w/MR193-BK (1000AAC/1400ADC)
AE/2130.96	Power Quality Meter Model 8220 w/MN193-BK (6A/120AAC)

SPECIFICATIONS

Electrical	
Voltage (TRMS)	660V Phase-to-Phase, 600V Phase-to-Neutral
Current (TRMS)	MN Clamp: 5mA to 120A or 2 to 240A MR Clamp: 10 to 1000AAC, 10 to 1400ADC SR Clamp: 3 to 1200A AmpFlex®: 10 to 6500A (Crest factor at 6500 = 1)
Frequency	40 to 70Hz
Other Measurements	kW, kVAR, PF, DPF, VA, Harmonics, Phase Rotation, Temperature, RPM, Resistance, Continuity, Diode Test
Sampling Frequency	256 samples/cycle
Data Storage	Stores nine sets of readings
Power Source	Six 1.5V AA Alkaline batteries (>8hr life with display on) AC Supply: 120/230VAC (50/60Hz) – optional
Communication Port	Optically isolated USB
Dimensions	8.3 x 4.3 x 2.4" (211 x 108 x 60mm)

Fluke Three Phase Power Quality Analyzers



The Fluke 435 and 434 three-phase power quality analyzers help locate, predict, prevent and troubleshoot problems in three-phase and single-phase power distribution systems. The new IEC standards for flicker, harmonics and power quality are built in.

- Analyzer trends using cursor & zoom tools even while background recording
- Seven hours operating time per charge on NiMH battery pack
- Transfer data files to your PC for reporting and analysis using FlukeView® software

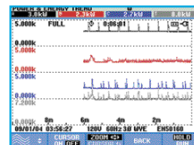
435 Includes: Hard carrying case with rollers, four flexible current probes (i430-flex), five test leads and clips, battery charger, FlukeView software, Power Log software, optical USB cable, color localization set, Getting Started manual, Users manual.

434 Includes: Hard carrying case, four current probes (i400s), five test leads and clips, battery charger, FlukeView software, optical USB cable, color localization set, Getting Started manual, Users manual.

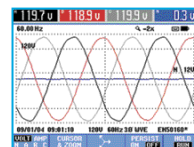
3 Year warranty

ORDERING INFORMATION

Fluke 435	3Ø Power Quality Analyzer
Fluke 434	3Ø Power Quality Analyzer



- Automatic transient capture: never miss an event
- Auto Trends: don't waste time setting up recordings



- Four voltage and four current channels capture waveform data on all phases simultaneously
- Meter display of phase readings

Feature	435	434
Measure voltage, current, dips, swells, interruptions, harmonics, inter-harmonics, flicker, power, energy, transients, frequency, unbalance, inrush, EN50160 overview	•	•
Logger function with multiple parameters	•	Optional*
Mains signalling	•	Optional*
Current probes	3000A flexible (4)	40/400A clamp (4)
Memory	16MB	8MB
Software	Power Log & FlukeView	FlukeView
IEC61000-4-30 Class A compliance	•	•
Safety rating	CAT IV 600 V/CAT III 1000 V	
Battery life	Up to 7 hours/charge	

*Optional function can be added with upgrade kit.

SPECIFICATIONS

System Configuration	1Ø+neutral, 1Ø split phase, 1Ø IT no neutral, 3Ø WYE, 3Ø Δ, 3Ø IT, 3Ø hi leg, 3Ø open leg, 3Ø 2-element, 3Ø 2½-element
Voltage Inputs	Four (3 phases + neutral), dc coupled
Maximum	1000V rms, 6kV maximum peak measured
Bandwidth	>10kHz, up to 100kHz for transient display
Accuracy (ac+dc)	435: ±0.1% of nominal voltage, 434: ±0.5% of nominal
Current Inputs	Four ((3 phases + neutral), dc coupled
Range	Determined by clamp-on probes used
Nominal Frequency	40-70Hz, BW >10kHz
Accuracy (ac+dc)	435: ±0.5%±20d, 434: ±1%±5d (with supplied probes)
Watts (VA, VAR)	1.0-20.00MW (resolution 0.1 to 1 kW)
Accuracy	435: ±1%±10d, 434: ±1.5%±10d
Sampling	16 bit resolution. 200k samples/second max
Logger Function	Captures up to 10000 events, 100 parameters/phase
Display	4.5" x 3.4" Color LCD, 320x240 pixel
Power	115/230V ac or battery, built-in battery charger

Fluke Power Quality Analyzer



- Voltage, current and power harmonics up to 51st
- Total harmonic distortion (THD)
- Phase angle of individual harmonics
- Watts, power factor, displacement power factor, VA and VAR
- Voltage and current waveforms
- Calculates 3Ø Power on Balanced Load from 1Ø Measurement
- Use cursors to read time and date of sags and swells.
- Catch voltage transients and waveform distortion
- See current at the instant of voltage events
- Catch and save up to 40 transients
- Correlate the cause of distortion with time and date stamps
- 3 Year Warranty

The Fluke 43B includes a hard case, voltage and current probes, FlukeView® PC software and cable, line voltage adapter/battery charger, applications manual, power quality video and user's manuals.

ORDERING INFORMATION

Fluke 43B	Power Quality Analyzer
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The Fluke 43B Power Quality Analyzer performs the measurements you need to maintain power systems, troubleshoot power problems and diagnose equipment failures. All in a rugged handheld package.

Function	Measurement	Accuracy/Selection
Volts	5.000V-600V RMS (AC & DC)	
Amps	50.00A-50.00kA RMS (AC & DC)	±(1%+10d)
Mains Frequency	40.0-70.0Hz	±(0.5%+2d)
Watts, VAR, VA	250W-2.5MW	±(4%+4d)
PF, DPF	0.25-1.00	±0.04
Sags & Swells	Voltage and Current	4 min-16 days selectable
Transient Capture	40 ns pulse width Up to 40 transients	Select 20/50/100/200% above or below line voltage
Thrush Current	1A to 1000A	1s to 5 min selectable
Ohms	500.0Ω to 30.00MΩ	±(0.6%+5d)
Capacitance	50.00nF to 500.0μF	±(2%+10d)
Scope	Dc, ac, ac+dc, peak, peak-peak, Hz, duty cycle, phase, pulse width, crest factor	Sampling rate: 25MS/sec Bandwidth: Voltage BW (Channel 1): 20MHz Current BW (Channel 2): 15kHz
Screen Saves	All functions	10 screens
Recording	V/A/Hz, Power, Harmonics, Ω/Cap, Temperature, Scope	4 min-16 days selectable parameters in each display mode

Battery life: Rechargeable Ni-Cd pack (charger included), 6 hrs typical (continuous)

OPTIONAL ACCESSORIES

i200s	240A AC current probe
80i-1000s	1000A AC current probe
i2000flex	2000A flexible AC current probe
80TK	Thermocouple module
80T-IR	Non-contact infrared temperature probe
PAC91	Parallel printer adapter

Extech Infrared Thermometers

Mini IR Thermometers

Compact thermometers with choice of 500°F or 1200°F maximum reading

- Model 42500 measures -4 to 500°F (-20 to 260°C) with 1° resolution
- Model 42510A measures -25 to 1200°F (-50 to 650°C) with 0.1° resolution up to 1000°
- Built-in laser pointer and backlit LCD display
- Adjustable emissivity (42510A)
- Field of view: 42500 6:1, 42510A 12:1
- Complete with 9V battery and carrying case



▲ **Model 42510A**

High Temperature IR Thermometer

Measures surface temperature to 1832°F with 50:1 distance to target ratio

- Measures small surface areas at greater distances
- Adjustable emissivity increases accuracy for different surfaces
- Displays MAX, MIN, average and difference (MAX-MIN) values
- Audible high/low alarm alerts user when temperature exceeds set limits
- Large, backlit LCD display with automatic Data Hold feature
- Complete with 9V battery and hard carrying case



▲ **Model 42545**

Dual Laser IR Thermometers

Two laser pointers converge to 1" target spot

- Measure to 1800°F (1000°C) with 1° resolution
- 12" or 30" laser convergence distance
- Fast 0.15 second response time
- White backlit dual LCD display
- Adjustable emissivity increases accuracy
- Lock function for continuous readings
- Adjustable high/low setpoints with audible alarm alerts
- Complete with 9V battery and carrying case



▲ **Model 42512**

Dual Laser IR Thermal Scanner

Tilt-adjustable LCD display with white backlight and dual bargraphs

- Measures -58 to 500°F / -50 to 260°C
- Dual laser converges at 20" distance for ideal 1" target spot
- Fast 150ms sample rate
- 5 user programmable threshold settings
- Audible alarm volume increases as temperature increases or decreases
- 3 color LED indicates High (red), Normal (green) or Low (blue) when scanning
- Min/Max storage & Trigger Lock
- Complete with 9V battery & case



▲ **Model IRT500**

ORDERING INFORMATION

EX/42500	500° Mini IR Thermometer
EX/42510A	1200° Mini IR Thermometer
EX/42511	Dual Laser IR Thermometer - 12" Convergence
EX/42512	Dual Laser IR Thermometer - 30" Convergence
EX/42545	High Temperature IR Thermometer
EX/IRT500	Dual Laser IR Thermal Scanner
EX/IR201A	Pocket IR Thermometer

Pocket IR Thermometer

Handy troubleshooting thermometer with laser pointer

- Measures from -4°F to 518°F (-20° to 270°C)
- Built-in laser pointer to improve aim
- Adjustable emissivity
- Data Hold & Max Hold
- 6:1 field of view
- Complete with two AAA batteries and carrying case



▲ **Model IR201A**

SPECIFICATIONS

Model	42500	42510A	42511	42512	42545	IRT500	IR201A
Temperature: (non-contact)	-4 to 500°F -20 to 260°C	-25 to 1200°F -50 to 650°C	-58 to 1100°F -50 to 600°C	-58 to 1832°F -50 to 1000°C	-58 to 1832°F -50 to 1000°C	-58 to 500°F -50 to 260°C	-4 to 518°F -20 to 270°C
Laser Pointer:	Single	Single	Dual	Dual	Single	Dual	Single
Basic Accuracy: (non-contact)	±2.5% of reading or ±4°F / 2°C (whichever is greater)	±1% of reading ± 2°F / 1°C	±1% of reading ± 2°F / 1°C	±1% of reading ± 2°F / 1°C	±2% of reading ± 4°F / 2°C <932°F (500°C)	±(1% of reading + 3.3°F / 1.5°C)	±(2.5% of rdg + 3.6°F / 2°C)
Max. Resolution:	1°	0.1° up to 999.9°	0.1°	0.1°	0.1° up to 199.9°	0.1°	0.1°
Emissivity	0.95 fixed	0.1-1.00 adjust	0.1-1.00 adjust	0.1-1.00 adjust	0.1-1.00 adjust	0.95 fixed	0.1-1.0 adjust
Field of View: (Distance to Target)	6:1	12:1	12:1	30:1	50:1	20:1	6:1
Dimensions:	3.2 x 1.7 x 6.7" 82x44x170mm	3.2 x 1.6 x 6.3" 82x42x160mm	5.7 x 4.1 x 1.6" 146x104x43mm	5.7 x 4.1 x 1.6" 146x104x43mm	3.9 x 2.2 x 9" 100x56x230mm	6.6 x 3.2 x 2.3" 168x82x58mm	3.7 x 2 x 1" 94x51x25mm
Weight	4.9oz (140g)	6.4oz (180g)	5.7oz (163g)	5.7oz (163g)	10.2oz (290g)	5.7oz (163g)	2.7oz (76g)
Warranty:	3 years	3 years	3 years	3 years	3 years	1 year	1 year

Yokogawa Insulation Testers

2406E Analog Insulation Tester

- 3 Ranges
- Discharge Function
- Portable Case for Hanging Tester from Neck
- Sky-Blue EL Illumination


2406E


MY10 Analog Insulation Tester

- Single Range Models
- AC Voltage Measurement Function (needle and LED)
- Automatic Discharge Function (LED)
- Easy to Use Pull-Up Switch


MY10


MY40 Digital Insulation Tester

- Four Voltage Ranges
- Memory Function
- Comparator Function with Sound Alert
- Auto Discharge Function
- Large LCD Display with Stable Indication
- AC Voltage/Resistance Measuring Functions
- Conductor Resistance Measurement


MY40


Model	Rating	Measure	Display	Illumination					
YE/2406	31	50V / 10M 125V / 20M	300V AC	Analog Meter	Back-lit EL display (41/42/43/44/45)				
	41								
	32	125V / 20M 250V / 50M							
	42								
	33	125V / 20M 250V / 50M 500V / 100M							
	43								
	44								
	YE/MY10	01				125V / 20M	250VAC	Analog Meter	Phosphorescent scale
		02				250V / 50M	300VAC		
03		500V / 100M	500VAC						
04		500V / 1000M							
05		1000V / 2000M							
YE/MY40	01	125V / 200M 250V / 200M 500V / 2000M 1000V / 2000M	600VAC	3.5 digit & 400Ω	LED Lighting bargraph LCD				

Lifetime Warranty on All Models
Dimensions:

2406	4.7"x4.3"x2.4" (120x110x60mm)
MY10, MY40	4.9"x4.1"x2.1" (125x103x53mm)

Power:

2406	6 AA Batteries (included)
MY10, MY40	4 AA Batteries (included)

Fluke Infrared Thermometers

- Dot Laser Sighting
- Comfortable Pistol Grip
- Large Backlit Display
- Hi/Lo Alarms
- Displays Difference Between Two Measurements
- Small Size Easily Fits in Toolbox or Clips to Belt Loop
- 3-Meter (9.8-Foot) Drop Tested
- IP54 Dust & Water Resistance

62 MAX

SPECIFICATIONS

MODEL	62 MAX	62 MAX+
Range °C	-30 to 500	-30 to 650
Range °F	-22 to 932	-22 to 1202
Spot Distance	10:1	12:1
Emissivity	0.10-1.00	0.10-1.00
Min/Max/Avg/Diff	Yes	Yes
Hi/Lo Alarms	Yes	Yes
Display Resolution	0.1°C (0.2°F)	0.1°C (0.2°F)
Basic Accuracy	1.5% or 1.5°C	1.0% or 1.0°C
Response Time (95%)	<500 ms	<300ms
Laser Sighting	Single	Dual

Battery: One AA (included)

Size: 6.88x3.34x2.95" (175x85x75mm)

Weight: 9 oz (255g)

Operating Temp: 0 to 50°C, <90% RH non-condensing

ORDERING INFORMATION

62 MAX Single Laser Infrared Thermometer

62 MAX+ Dual Laser Infrared Thermometer

Yokogawa Thermometers

TM10 Thermistor Data Collecting Thermometer



- Switch Between External Probe, Infra-Red Sensor and Built-In Sensor
- Measure from -30 to 200 °C

TM20 TC Data Collecting Thermometer



- Two Channel Simultaneous Measurement
- Measure Type K/J/E/T Thermocouples, mV Inputs & Infra-Red Sensors
- Display Channel Readings, Min, Max, Average & Difference

TX10 Series

- Measure J/K/T/E Thermocouples
- 3 ½ Digit Display for Resolution to 0.1 °C
- IP54 Drip Proof Case
- Two Channel Measurement (TX10-03)
- 10 Measurement Storage (TX10-02/03)
- Min & Max Storage (TX10-02/03)
- Temperature Difference Display (TX10-03)



SPECIFICATIONS

	TM10	TM20	TX10
Range	-30 to 200 °C (-22 to 392 °F)	K -200 to 1372 °C (-328 to 2501 °F) J 200 to 1000 °C (-328 to 1832 °F) E -200 to 700 °C (-328 to 1292 °F) T -200 to 400 °C (-328 to 752 °F)	TC same as TM20
Accuracy	±0.3 °C (0-100 °C)	TC ±0.3% rdg ±0.3 °C (>-100 °C) V ±0.1% rdg ±0.2% range	±0.3% rdg ±0.7 °C (-100 to 200 °C)
Resolution	0.1 °C	TC 0.1 °C V 0.001V mV 0.1mV	0.1 °C (below 200 °C)
Operating Temp	-20 to 50 °C	0 to 50 °C	0 to 50 °C

TM10 & TM20 Common Features

- Backlit LCD Display
- IP54 Drip Proof Case
- 1 Second to 24 Hour Measuring Intervals
- Data Capacity up to 20000 Readings
- Hi/Lo Alarms
- RS232 Port for PC Interfacing
- Easy PC Data Management (Automatic Layout in Excel)

Collector mode records the measured temperature along with the measured item, operator name, date/time of measurement in response to a key action. Test comments can also be recorded. Logging mode continuously records the measured temperature at a preset time interval.

ORDERING INFORMATION

YE/TM10	Thermistor Data Collecting Thermometer
YE/TM20	TC Data Collecting Thermometer
YE/TX10-01	Single function, 1 channel Thermometer
YE/TX10-02	Multi-function, 1 channel Thermometer
YE/TX10-03	Multi-function, 2 channel Thermometer

Order probes and carrying case separately

ACCESSORIES

TM10 Accessories

YE/90010	150mm needle probe
YE/90011	120mm sharp needle probe
YE/90012	Surface probe
YE/90013	Rounded probe (for liquids)
YE/93010	Soft case

TM10 & TM20 Accessories

YE/90003	Non-contact probe
YE/91011	RS-232 PC cable

TX10 & TM20 Accessories

YE/90020	Type K rounded probe
YE/90023	Type K needle probe
YE/90030	Type K surface probe
YE/245907	Type K bead
YE/93012	Soft case

Hioki Megohm Testers



3455

- Tests insulation on transformers, cables & motors
- Calculates PI (Polarization Index) and DAR (Dielectric Absorption Ratio)
- Temperature measurement & compensation
- Step voltage testing
- Leakage current display



- 5 test ranges to 1000V
- Insulation readings to 4000MΩ
- Pass/Fail indicator
- AC/DC voltage measurements
- Live wire warning
- Continuity check at 200mA
- Drop proof from 1m (3.3ft)

IR4056

SPECIFICATIONS

Insulation Resistance:	
Test voltage:	250V, 500V, 1kV, 2.5kV, 5kV DC
Manual adjust:	25V step (<1kV), 100V step (>1kV)
Resistance:	0.00MΩ - 5TΩ in 7 ranges (±5% rdg, ±5d for test current >100nA)
Leakage current:	1.00nA-1.2mA in 6 ranges (±2.5% rdg, ±5d above 100nA)
Voltage Measure:	50-750V AC, 50/60Hz; 50-1000V DC (±5% rdg, ±5d)
Temperature:	-10.0 to 70.0°C (±1.5°C)
PI, DAR test:	Times are user programmable.
Step voltage test:	500V-2.5kV in 500V steps, 1kV-5kV in 1kV steps
Compensation:	Displays the resistance based on reference temperature. Compatible to 10 insulation materials
Timer:	30s to 30min
Data memory:	Manual recording: 100 data Interval recording: 360 times x 10 data
Energy discharge:	Automatic discharge after measurement
Display LCD:	Digital and bargraph display, with backlight
Display Info:	Time, date, test voltage, timer, battery level
PC software:	For USB data transfer and report editing
Power supply:	6 AA batteries
Standards:	CAT IV 600V, CAT III 1000V
Dimensions:	10.2"W x 9.9"H x 4.7"D (260 x 251 x 119mm)

SPECIFICATIONS

Insulation Resistance:	
50 / 125 / 250 / 500 / 1000V DC test voltage	
Ranges:	100 / 250 / 500 / 2000 / 4000MΩ
Accuracy:	±4% rdg.
Low Resistance:	10.00 / 100.0 / 1000Ω ranges
Accuracy:	±3% rdg, ±2d
AC Volts Measure:	420.0 & 600V ranges, 50/60Hz
Accuracy:	±2.3% rdg, ±8d
DC Volts Measure:	4.200 to 600V in 4 ranges
Accuracy:	±1.3% rdg, ±4d
Response time:	0.8 sec for Pass/Fail decision
Other functions:	Live wire warning, automatic discharge, DC/AC detection
Power Supply:	4 AA batteries (20 hr life)
Dimensions:	6.3"W x 7.0"H x 2.1"D (159 x 177 x 53mm)

ORDERING INFORMATION

HK/3455-01	5kV MΩ HiTester with 3m leads, USB cable, PC software
HK/IR4056-20	1kV MΩ HiTester with test leads & neck strap
HK/L9787-91	Breaker pin for IR4056
HK/L9788-11	Test lead set with remote switch for IR4056
HK/9631-01	Temperature sensor for 3455 (1m)
HK/9750	10m Test Leads for 3455
HK/9459	Rechargeable Battery pack for 3455
HK/9753	AC adapter for 3455

Fluke MegOhmMeters



1507

Handheld MegOhmMeter

- Insulation resistance to 10GΩ (1507)
- Test voltages to 1000V
- Calculates Polarization Index & Dielectric Absorption Ratio (1507)
- AC/DC voltage measure to 600V
- Pass/Fail function for repetitive tests (1507)
- Remote probe for hard-to-reach tests

SPECIFICATIONS

Insulation Resistance:	
Ranges:	0.01 MΩ to 10 GΩ (1507); 0.01 MΩ to 4000 MΩ (1503)
Test Current:	1mA max.
Test Voltage:	50, 100, 250, 500, 1000 V (500 & 1000 V on 1503)
Basic Accuracy:	±(1.5% rdg + 5d) up to 2000 MΩ
Resistance:	0.01 Ω to 20.00 kΩ
Basic Accuracy:	±(1.5% rdg + 3d)
Voltage:	0 - 600.0 V DC or AC (50-400Hz)
Live Circuit Indicator:	Inhibits insulation resistance test if >30V AC/DC present
Operating Temperature:	-20 to 55°C
Rating:	CAT IV 600V

Includes test leads, test probes, alligator clips, protective holster & batteries.

ORDERING INFORMATION

Fluke 1503	1kV Handheld Insulation Resistance Tester
Fluke 1507	Deluxe 1kV Handheld Insulation Resistance Tester
Fluke 1550C-KIT	5kV Insulation Tester Kit
Fluke 1555-KIT	10kV Insulation Tester Kit



1550C

5kV & 10kV Insulation Testers

- Resistance to 2TΩ
- Ramp function
- DAR & PI calculations
- Auto-discharge
- 99 memory storage
- Live circuit voltage warning
- PC interface

SPECIFICATIONS

Insulation Resistance:	
250V	200 kΩ - 50 GΩ
500V	200 kΩ - 100 GΩ
1000V	200 kΩ - 200 GΩ
2500V	200 kΩ - 500 GΩ
5000V	200 kΩ - 1 TΩ
10000V	200 kΩ - 2 TΩ (1555 only)
Step Size:	50V up to 1000V, then 100V
Leakage Current:	1 nA - 2 mA
Capacitance:	0.01 μF - 15.00 μF
Timer:	0 - 99 minutes
Power:	12V rechargeable battery, >750 tests per charge
Charger:	85-250VAC
Operating Temperature:	-20 to 50°C

Kit includes test cables, ac power cord/charger, infrared USB cable, hard carry case, FlukeView® Forms PC software

Megger® Insulation Resistance Testers



▲ MJ15

MJ15 and BM15

The BM15 and MJ15 are compact 5-kV insulation testers that are simple to use and provide a quick, accurate reading of insulation resistance. Both instruments offer four test voltages (500 V, 1 kV, 2.5 kV, 5 kV), analog scales and measurement sensitivity to 20 GΩ.

These models include “pass/fail” display overlays for a rapid “go/no go” testing and trend analysis.

The BM15 is powered by 8 “AA” or rechargeable alkaline batteries while the MJ15 includes a hand-crank generator in addition to battery power.

MIT515 and MIT525 5kV Testers

NEW

This new generation of insulation testers offers increased measurement range, better accuracy, longer battery life, additional functionality and improved safety features.

MIT515

A rugged, portable tester designed for years of trouble free operation:

- Three industry standard tests can be programmed and run automatically
 - Insulation resistance (IR)
 - Dielectric absorption (DAR)
 - Polarization index (PI)
- Resistance measurements to 10 TΩ with 5% accuracy up to 1 TΩ
- Voltage, capacitance & leakage current measurements
- Test voltage can be set in 10 V increments from 50 V to 1 kV, and in 25 V increments above 1 kV
- Timer control, timer display and alarm limit modes
- Test lockout when an external voltage is present, for redundant safety
- Dual operation from AC line or rechargeable batteries



▲ MIT515

MIT525

All the features of the MIT515 plus expanded capabilities to afford the skilled operator more flexibility in analyzing and reporting the condition of capital equipment:

- Ramp test, auto step voltage (SV) test, auto dielectric discharge (DD) test
- Advanced memory functions with recall to screen, real time clock, time/date stamped results and data downloaded via RS232 or USB ports
- Includes PowerDB Lite software for documenting test results

MIT1025 10kV Insulation Tester

NEW

Same features and functions as the MIT525, but with 10kV maximum output:

- Test voltage range from 50 V to 10 kV, in 10 V increments to 1 kV and 25 V increments above 1 kV
- Increased measurement range to 20 TΩ, for testing the best insulating materials
- Automatic performance of standardized tests, including Step Voltage, Dielectric Absorption Ratio and Dielectric Discharge
- Capacitance measurements from 1 nF to 25 μF, providing additional equipment diagnostic information
- RS232 & USB ports for downloading test results
- A 'quick start' guide in the lid to make field operation simple and user-friendly



▲ MIT1025

IEEE43:2000 "IEEE Recommended Practices for Testing Insulation Resistance of Rotating Machinery" recommends testing machines rated above 12kV at 10kV.

The Polarisation Index test is performed on equipment and cables to assess the general condition of the insulation before applying potentially destructive test voltages.

The new MIT 5kV & 10kV models easily perform both these tests.

ORDERING INFORMATION

Catalog No.	Test Voltage (V dc)	Resistance
ME/MJ15	500	100 kΩ - 20GΩ
	1000	
ME/BM15	2500	10 kΩ - 10 TΩ
	5 kV	
	1000	
ME/MIT515	250	10 kΩ - 10 TΩ
	500	
	1000	
	2500	
ME/MIT525	5 kV	10 kΩ - 20 TΩ
	250	
	500	
	1000	
ME/MIT1025	2500	10 kΩ - 20 TΩ
	5 kV	
	1000	
	500	

Megger® Insulation Resistance Testers

MJ Series

The MJ159 is the recognized industry standard, upgraded with modern circuitry. This analog meter allows the trained operator to determine much more from the needle movement than just a MΩ reading. Available in line, battery or hand cranked models.

Other features include:

- IR measurements to 2000MΩ
- Four test voltages to 1kV
- Guard terminal
- Continuity and kΩ functions for troubleshooting

MJ159 ▶



MIT400/2 Series

The MIT400/2 Series Insulation Testers offer outstanding performance and ease of use. Dual digital displays show test results and test voltage or current simultaneously. The hands free, autoranging continuity function ensures the accurate measurement of circuit conductors and bonding. An audible continuity alarm speeds testing. These models offer improved test voltage accuracy, plus:

- Insulation resistance measurements to 200GΩ; selectable test voltages to 1000V
- Backlit LCD with dual digital and analog arc displays
- Leakage current readout
- Live circuit detection & protection
- PI/DAR and Timer functions (except MIT400/2)
- IP54 & CAT IV 600V rating

The MIT series offers TRMS & DC Voltage measurements from 10mV to 600V. The MIT420/2 and MIT430/2 add capacitance (100pf to 10uF), and test result storage/recall. MIT430/2 has Bluetooth for wireless data transfer (including download software). All models except the MIT400/2 include frequency measurement (15-400Hz).

Every unit comes with carrying case, test leads, and battery. All models except the MIT400/2 also include a remote switch probe for "hands free" testing.

◀ **MIT410/2**



▶ **MIT310**



MIT300 Series

The new MIT300 Series features a large display and hands-free operation. The tough, rubber armored case is designed for rough handling and weatherproof to IP54. A rigid cover folds up to protect the front panel when not in use. Intelligent safety features include:

- Safety Interlock – prevents unsafe connection of test leads
- Safe contact detectors – the tester will remain safe and not be damaged if connected to a live circuit while on continuity setting.
- Live voltage warning – alerts when circuit voltage is >25V.
- Safety lockout – inhibits test when circuit voltage is >50V.
- Continuity check – prevents a continuity test on a live circuit.

Each model includes a 200mA continuity test function and continuity buzzer. All models except the MIT300 measure DCV & ACV (50/60Hz) to 600V. The MIT330 adds memory for storing 1000 test results and a USB interface. The MIT310A has an analog meter display for those who prefer a moving needle.

ORDERING INFORMATION

Catalog No.	Model No.	Test Voltage (V dc)	Insulation Resistance	Resistance Range	Display	Power Source
ME/212159	MJ159	100, 250, 500, 1000	0 to 2000 MΩ	0 to 5000 Ω	Analog	Hand-Cranked
ME/212559	MJ559	100, 250, 500, 1000	0 to 2000 MΩ	0 to 5000 Ω	Analog	Line or Rech. Batt.
ME/MIT400/2	MIT400/2	250, 500, 1000	0.01 MΩ to 200 GΩ	0.01 Ω to 999 kΩ	Analog/ Dual Digital	Alkaline or Rechargeable NIMH Battery (6 x AA)
ME/MIT410/2	MIT410/2	50, 100, 250, 500, 1000	0.01 MΩ to 200 GΩ	0.01 Ω to 999 kΩ	Analog/ Dual Digital	
ME/MIT420/2	MIT420/2	50, 100, 250, 500, 1000, variable	0.01 MΩ to 200 GΩ	0.01 Ω to 999 kΩ	Analog/ Dual Digital	
ME/MIT430/2	MIT430/2	50, 100, 250, 500, 1000, variable	0.01 MΩ to 200 GΩ	0.01 Ω to 999 kΩ	Analog/ Dual Digital	
ME/MIT300	MIT300	250, 500	10 kΩ – 999 MΩ	-	Digital/Analog	Alkaline or Rechargeable NIMH Battery (8 x AA)
ME/MIT310	MIT310	250,	10kΩ –	-	Digital/Analog	
ME/MIT310A	MIT310A	500, 1000	999 MΩ	10 Ω – 2 kΩ	Analog	NICD/NIMH
ME/MIT320	MIT320	250,	10 kΩ – 999 MΩ	0.01 – 99.9 Ω	Digital/Analog	Battery
ME/MIT330	MIT330	500, 1000	with limit alarm	10 Ω – 999 kΩ	w/backlight	(8 x AA)

AEMC Megohmmeters

1000V Digital/Analog Megohmmeter Models 1050 & 1060

- True Megohmmeter®
- Test voltage combinations of 50V, 100V, 250V, 500V and 1000V
- Insulation measurements to 4000GΩ (4TΩ)
- Direct measurement of DAR and PI values
- Direct measurement of sample Capacitance
- Display of test voltage and run time
- Programmable test run times and PI times
- Smooth and Alarm functions
- Automatic test inhibition (if live sample >25V)
- Automatic discharge after use with voltage display
- Large dual display with time, voltage and measurement
- Bright blue electroluminescent backlight
- Battery powered (Model 1050)
- Auto power-down when not in use
- Remote operation with optional test probe
- Rugged dual wall field case with detachable lead/accessory pouch
- EN 61010-1, 600V Cat III, IEC 61557 and CE rated



▲ 1060
CE □

Model 1060 includes the following additional features:

- AC rechargeable NiMH batteries
- RS-232 interface for direct printing of results (serial output)
- 128k memory to store measurements in specific files
- Remote operation of megohmmeter through PC
- Includes DataView® software to configure instrument and generate reports

5000V Digital/Analog Megohmmeter Models 5050, 5060 & 5070

- True Megohmmeter®
- Test voltage combinations of 500V, 1000V, 2500V and 5000V
- Insulation measurements from 30kΩ to 10,000GΩ (10TΩ)
- Selectable and programmable test voltage (40 to 5100V)
- Automatic calculation of DAR, PI and DD ratios
- Direct measurement and display of Capacitance and Leakage Current
- Display resistance, test voltage and run time
- Programmable test run times and PI ratio times
- Smooth and Alarm functions
- Automatic test inhibition (if live sample >25V)
- Automatic discharge and display of discharge voltage
- Large dual display with time, voltage and measurements shown (Models 5050 and 5060)
- Graphic and digital display of test voltage, resistance and more (Model 5070)
- Bright blue electroluminescent backlight
- Programmable test voltage lock-out
- Programmable alarm setting
- Auto power-down when not in use
- AC or DC powered with rechargeable NiMH batteries
- Rugged, weatherproof field case
- Designed and built to IEC safety standards
- EN 61010-1, 1000V Cat. III



▲ 5070
CE □



DataView® is included with the Models 1060, 5060 and 5070

DataView® Software for Models 1060, 5060 & 5070

- Configure all functions and run tests from your PC
- Retrieve and display data in real time
- Retrieve data from memory in real time
- Display plots & print reports

ORDERING INFORMATION

AE/2130.01	Megohmmeter Model 1050 (Digital, with Analog Bargraph, Backlight, Alarm, Timer, 50V, 100V, 250V, 500V, 1000V, Auto DAR/PI, Res., Continuity)
AE/2130.03	Megohmmeter Model 1060 (Digital, with Analog Bargraph, Alarm, Timer, 50V, 100V, 250V, 500V, 1000V, Auto DAR/PI, Res., Continuity, RS-232 with DataView® software, 128kB Memory)
AE/2130.20	Megohmmeter Model 5050 (Digital, with Analog Bargraph, Backlight, Alarm, Timer, 500V, 1000V, 2500V, 5000V, Auto DAR/PI/DD)
AE/2130.21	Megohmmeter Model 5060 (Digital, with Analog Bargraph, Backlight, Alarm, Timer, 500V, 1000V, 2500V, 5000V, Auto DAR/PI/DD, RS-232 w/DataView® software)
AE/2130.30	Megohmmeter Model 5070 (Graphical, Analog Bargraph, Backlight, Alarm, Timer, 500V, 1000V, 2500V, 5000V, Ramp, Auto DAR/PI/DD, RS-232 w/DataView® software)

AEMC Flexible Current Probe



▲ 24-3001
CE □

- 24" flexible sensor fits around conductors up to 7.6" in diameter
- Reads Amps directly on DMM or Scope
- mV output directly proportional to AC current (10mV/A on 300A range and 1mV/A on 3000A range)
- Accuracy 1% of Reading ± 500mA
- 4% influence of conductor position in jaw
- 300 hour battery life
- EN 61010, 1000V Cat. III

ORDERING INFORMATION

AE/2120.81	FlexProbe® Model 24-3001 (300/3000A, 24", 10mV/A/1mV/A, with lead)
AE/2118.46	Banana (Female) - BNC (Male) Adapter (XM-BB) for use with scopes

AEMC Megohmmeters

Digital/Analog Megohmmeters

1040
&
1045



For motors, cables, switchgear and general applications

- True Megohmmeter*
- Test voltage combinations of 250V, 500V and 1000V
- Insulation measurements to 2000MΩ (2GΩ)
- Automatic test inhibition (if live sample >25V)
- Automatic discharge for operator safety
- Multi-line 4000-count backlit digital display with analog bargraph
- Resistance measurements to 400kΩ
- Continuity with 200mA test current
- Timer function for easy DAR and PI (Model 1045)
- Over-molded slip-proof holster for rugged field use
- EN 61010-1, 300V Cat. II, EN 61557 and CE rated
- Supplied with a soft carrying case

Analog Megohmmeters

1015



1005



Ideal for acceptance testing and preventive maintenance

- Compact and lightweight
- Test voltage to 500V (Model 1005) or 1000V (Model 1015)
- Insulation measurements to 1000MΩ
- 600VAC voltage measurement range (safety check)
- 0 to 10Ω+ and 0 to 10Ω - continuity ranges
- Continuity measurements with 200mA test current
- Resistance range to 1000Ω (Model 1015)
- Push button for battery check
- Large, direct-reading, colored scale
- Rugged construction for heavy duty field use
- Includes test leads, shockproof rubber housing & soft carrying case

1000V Megohmmeter



6527



- Test voltage combinations of 250V, 500V and 1000V
- Insulation measurements to 4000MΩ
- Resistance measurements to 400kΩ
- Continuity meter, up to 200mA test current
- Voltmeter measures to 600VAC/1000VDC
- Large, dual, backlit digital display
- Auto HOLD function to freeze readings
- TEST LOCK feature for time sensitive measurements up to 15 minutes
- Automatic discharge after insulation test
- Auto power off
- CAT IV 600V rating
- Supplied with a soft carrying case and test leads

Hand-Cranked Megohmmeters

- True Megohmmeter*
- Test voltages of 250V, 500V and 1000V
- Insulation measurements to 200MΩ and 5000MΩ
- LED indicates constant voltage output and proper cranked speed
- Automatic discharge when measurement is finished
- Auto-Ranging with dual scale operation for better sensitivity and easier readings
- Voltage display prior to, during and at end of test
- Compact self-contained package; folding crank
- Large direct-reading scale
- CAT III 300V rating



6501



ORDERING INFORMATION

AE/2116.92	Megohmmeter Model 1040 (Digital, with Analog Bargraph, Alarm, Backlight, 500V, 1000V, 400kΩ, Continuity)
AE/2116.93	Megohmmeter Model 1045 (Digital, with Analog Bargraph, Alarm, Timer, Backlight, 250V, 500V, 1000V, 400kΩ, Continuity)
AE/2117.30	Megohmmeter Field Kit, Model 1040
AE/2117.31	Megohmmeter Field Kit, Model 1045
AE/2126.53	Megohmmeter Model 6527 (Digital, 250V, 500V, 1000V, 400kΩ, 600VAC/1000VDC measure)
AE/2126.51	Megohmmeter Model 6501 (Hand-cranked, 500V, 500kΩ, Continuity)
AE/2126.52	Megohmmeter Model 6503 (Hand-cranked, 250V, 500V, 1000V)
AE/1402.01	Megohmmeter Model 1005 (Analog, 500V, Continuity)
AE/1403.01	Megohmmeter Model 1015 (Analog, 500/1000V, Resistance, Continuity)

AEMC Ground Resistance Testers

Digital Ground Resistance Tester Models 4620 & 4630



▲ 4630 CE □

- Measures soil resistivity (4-Point) method
- Measures ground resistance (2- and 3-Point) Fall-of-Potential method
- Step voltage tests and touch potential measurements
- Auto-Ranging: automatically selects the optimum range
- Designed to reject high levels of noise and interference
- Extremely simple to operate: connect – press – read
- LED on faceplate informs operator of high input noise, high auxiliary rod resistance and fault connections
- Large easy-to-read backlit display
- Battery powered (Model 4620)
- AC powered with rechargeable NiMH batteries (Model 4630)
- Rugged dustproof and rainproof field case
- Can also be used for continuity tests on bonding
- Color-coded terminals

Also available as full kits



Clamp-On Ground Resistance Tester Models 6416 & 6417



▲ 6416



- Ground voltage indication (warns of possible unsafe conditions)
- Large multi-function bright yellow organic LED display (OLED)
- Selectable test frequency improves accuracy in inductive environments
- Large jaw with 35mm clamping diameter
- Storage of up to 300 measurements, Ω & A with time-stamp (Model 6417: up to 2000 measurements stored)
- View stored measurements on the OLED display (also on PC or Android phone via Bluetooth for Model 6417)
- Alarm function with adjustable set point & buzzer for quick field checks of volts, amps and ohms
- Alarm settings and stored memory information saved during shutdown
- Includes DataView® software for data storage, real-time display, analysis, report generation and system configuration (Model 6417)
- Noise icon and buzzer alert user to presence of dangerous voltage and current levels
- Designed to EN 61010-1, 600V CAT IV safety standards

Multi-Function Ground Resistance Tester Models 6470B & 6472

- 2- and 4-Wire Bond Resistance/Continuity measurement
- 3-Point Fall-of-Potential measurement with manual/automatic frequency selection
- 4-Point soil resistivity measurement with automatic calculation of Rho & user selection of Wenner or Schlumberger method
- 3-Point earth coupling measurement
- Frequency scan 40-513Hz for testing in electrically noisy environments
- Selectable test voltage of 16 or 32V up to 250mA of test current
- Automatic recognition of all electrode connections & resistance
- Stores up to 512 complete test results
- Optically isolated USB communication
- Rechargeable NiMH batteries from wall charger or vehicle power
- Rugged dustproof and rainproof field case
- Includes DataView® software for remote operation, data storage, real-time display, analysis, report generation & system configuration

Model 6472 adds:

- Manual and automatic frequency scan to 5078Hz
- Measures Ground Resistance using the 2 clamp method (selective ground testing)
- Measures Ground Impedance up to 5kHz to test lightning strike protection

Tester includes meter, NiMH batteries, optical USB cable, DataView® software, external battery charger, power cord, user manual.

Kit includes Tester, test leads, 30 ft ground lead (green), auxiliary ground electrodes, spaded lugs, 100 ft tape measure, ground tester workbook CD, carrying bag for meter, carrying bag for kit.

6470B ▶



ORDERING INFORMATION

AE/2130.43 Ground Resistance Tester Model 4620 (4-Point, Digital, Battery Powered)

AE/2130.44 Ground Resistance Tester Model 4630 (4-Point, Digital, Rechargeable Battery)

AE/2135.20 Model 4620 Kit with 300/100 ft leads

AE/2135.23 Model 4630 Kit with 300/100 ft leads

AE/2141.01 Ground Resistance Tester Model 6416 (Clamp-On)

AE/2141.02 Ground Resistance Tester Model 6417 (Clamp-On with Bluetooth)

AE/2135.01 Ground Resistance Tester Model 6470B

AE/2135.03 Ground Resistance Tester Model 6470B 4-point Kit – 300/100 ft leads

AE/2135.04 Ground Resistance Tester Model 6470B 4-point Kit – 500/100 ft leads

AE/2135.51 Ground Resistance Tester Model 6472

AE/2135.53 Ground Resistance Tester Model 6472 4-point Kit – 300/100 ft leads

AE/2135.54 Ground Resistance Tester Model 6472 4-point Kit – 500/100 ft leads

AE/2135.71* AC Current Probe Model MN82 for use with Model 6472

AE/2135.72* AC Current Probe Model SR182 for use with Model 6472

*2 probes required for two clamp testing method.

Megger® Ground Resistance Testers

Three-Terminal Ground Resistance Testers

BIDDLE® Model 250260 is the tried and proven analog tester. It is a simple, three-terminal model that will tolerate 2V peak-to-peak voltage interference.

The MEGGER® DET3TD is a digital tester with an expanded resistance range and selectable 25/50V test voltage. It rejects noise up to 40V p-p and measures earth voltages up to 100V. The DET3TC adds an ART (Attached Rod Technique) resistance measurement and earth current measurements from 0.5mA to 19.9A with the optional current clamp.

All DET3 and DET4 models are CAT IV 100V and IP54 rated. Test leads and carrying case are included.

Four-Terminal Ground Resistance Testers

Addition of a fourth terminal permits soil resistivity testing as well as more precise resistance (installed ground) measurements.

The new DET4TD2 offers the same features as the DET3TD, but with 4-terminal capability and a 20kΩ upper resistance limit. The DET4TC2 increases this to 200kΩ. The DET4TCR2 has rechargeable batteries that can be charged from the AC mains or a vehicle battery (with optional adapter). The DET4TC2 and DET4TCR2 offer 4 test frequencies for testing in noisy environments. Both models can be ordered with clamps to perform the stakeless test method, like a clamp style earth tester. A backlit LCD provides improved visibility in dark locations.

For testing in extreme electrical environments, the DET2/2 offers full autoranging, 0.001Ω resolution, adjustable test frequency and additional interference filtering.



ORDERING INFORMATION

Model No.	Measurement	Resistance	Voltage	Gnd Current	Power Source	Display	Test Leads
250260	2/3 Term.	0.5 - 500Ω			Battery	Analog	250560
DET2/2	2/3/4 Term.	0.010Ω - 20kΩ			Rechargeable Battery	Digital	250581
DET3TD	2/3 Term.	0.01 - 2000Ω	0 - 100V		Battery	Digital	included
DET3TC	2/3 Term. + ART*	0.01 - 2000Ω	0 - 100V	0.5mA - 19.9A*	Battery	Digital	included
DET4TD2	2/3/4 Term.	0.01Ω - 20kΩ	0 - 100V		Battery	Digital	included
DET4TC2	2/3/4 Term.	0.01Ω - 200kΩ	0 - 100V		Battery	Digital	included
DET4TC2+Clamps	2/3/4 Term. + stakeless	0.01Ω - 200kΩ	0 - 100V	0.5mA - 19.9A	Battery	Digital	included
DET4TCR2	2/3/4 Term.	0.01Ω - 200kΩ	0 - 100V		Rechargeable Battery	Digital	included
DET4TCR2 +Clamps	2/3/4 Term. + stakeless	0.01Ω - 200kΩ	0 - 100V	0.5mA - 19.9A	Rechargeable Battery	Digital	included

* Attached Rod Technique (ART) requires optional current measuring clamp.

Megger® Clamp-on Testers

NEW


Ground Resistance Testers

- Easy, fast clamp-on operation – No rods or cables needed
- Measure ground resistance from 0.05Ω to 1500Ω
- Measure ground leakage or phase current from 0.5mA to 35A
- Auto ranging with high & low alarms
- Automatic self calibration
- Data storage & USB interface

DET24C

APPLICATIONS

- Measure resistance and continuity of grounding loops around pads, poles and buildings.
- Check multi-grounded systems without disconnecting the ground rod/stake under test.
- Measure leakage current flowing to ground or circulating in ground systems.
- Use on cell towers, RF transmitters and telecom sites.
- Inspect and verify lightning protection systems.
- Test consumer installations, including pools, spas, etc.

FEATURES

- Backlit LCD display can be read in bright sunlight.
- Large 39 x 55mm jaw with 39mm (1.5") opening.
- Noise filter for stable readings in noisy environments.
- Hold function for difficult to reach installations.
- 24 hour battery life with auto-off to save on battery power.
- Two alarms with adjustable threshold & audible indication.
- Stores 2000 test results (DET24C).
- Calibration check loop insures proper operation.
- CAT IV 600V safety rating.

Range	Resolution	Accuracy	Range	Resolution
0.05 - 0.99Ω	0.01Ω	±1.5% ± 0.05Ω	0.5 - 0.99mA	0.01mA
1.00 - 9.99Ω	0.01Ω	±1.5% ± 0.1Ω	1.00 - 9.99mA	0.01mA
10.0 - 99.9Ω	0.1Ω	±2% ± 0.5Ω	10.0 - 99.9mA	0.1mA
100.0 - 199.9Ω	0.1Ω	±5% ± 1Ω	100 - 999mA	1mA
200 - 400Ω	1Ω	±6% ± 5Ω	1.00 - 9.99A	0.01A
400 - 600Ω	1Ω	±10% ± 10Ω	10.0 - 35.0A	0.1A
600 - 1200Ω	10Ω	±20%		
1200 - 1500Ω	10Ω	±35%		

TRMS reading, CF<5, 50-400Hz
Basic Accuracy 2% @ 50/60Hz

Model DET24C includes USB interface, IrDA dongle and software for downloading test data. Both models include batteries, carrying case, carrying strap & calibration loop.

ORDERING INFORMATION

ME/DET14C	Digital Earth Test Clamp-on Meter
ME/DET24C	Digital Earth Test Clamp-on Meter with USB

Hioki Battery Testers


3554

- Test without disconnecting the batteries
- Three level indication: Pass, Warning, Fail
- Audible beeper (3555)
- PC Interface & software (3554)

Get an instantaneous check of battery condition based on internal resistance and voltage.

Model 3554 for medium and high capacity lead-acid batteries. Model 3555 for compact storage batteries used in portable telephones and similar applications.

SPECIFICATIONS

	3554	3555
Measurement Ranges:		
Ohms:	3μΩ-3Ω	300μΩ-30Ω
# Ranges	4	3
Best resolution	1μΩ	100μΩ
Accuracy	0.8% rdg +6d	0.8% rdg +6d
Test Current	150mA-1.5mA	5mA-50μA
DC Volts	±6V, ±60V	±3V, ±30V
Best resolution	1mV	1mV
Accuracy	0.08% rdg +6d	0.1% rdg +6d
Temperature	-10 to +60°C	--
Resolution	0.1°C	--
Test Frequency	1kHz	1kHz
Max. Input	60V DC	50V DC
Comparator	Hi & low ohm limit, low volt limit (both models)	
# Limit Sets	200 stored	10 stored
Data Memory	4800 data/limit sets	--
Alert	LCD icon	LED & Beeper
Batteries	9 x AA	6 x AA
Life	up to 10 hrs	up to 18 hrs
PC Interface	USB	--
Operating Temp.	0-40°C, <80% RH non-condensing	
Dimensions	7.7 x 5.1 x 2.2" (196x130x55mm)	

SUPPLIED ACCESSORIES

3554	Pin-type test leads, USB cable, data management software, carrying case, zero adjust board, batteries, spare fuse
3555	Pin-type test leads, batteries.

ORDERING INFORMATION

HK/3554	Battery Tester (lead-acid batteries)
HK/3555	Battery Tester (portable batteries)
HK/9382	Carry case for 3555
HK/9453	4-terminal lead set
HK/9466	Remote Control Switch for 3554

Megger® High-Pot Testers

Production Line High-Pot Testers

BIDDLE® High-Pot Testers are designed for ease of operation and readily adapt to development, maintenance or production testing. These instruments are supplied with 4-ft removable probes.

Available in one AC/DC and two AC models; the AC units feature a front-panel, NEMA-5-15R three-prong output receptacle.

The BIDDLE high-pot testers are packed with features for safety and convenience, including:

- Ground continuity check of 3-wire devices with high voltage interlock
- Visual and audible alarms
- Leakage current adjustable on front-panel from 0.3 to 12.3 mA
- One-second or continuous testing
- Automatic failure shutdown
- Recessed high-voltage connections

Catalog No.	Model	Applied Test Voltage	Adjustable Leakage Current Trip Level
ME/230315	AC	0-3 kV ac	0.3 to 12 mA
ME/230415	AC	0-4 kV ac	0.3 to 12 mA
ME/230425	AC/DC	0-4 kV ac 0-5 kV dc	AC: 0.3 to 12 mA DC: 0.43 to 17 mA

230415



Megger® Digital Low Resistance Ohmmeters

NEW

DLRO-10

- Accurate results in under three seconds
- Auto current reversal cancels standing emfs
- Fuse protected to 600 V
- NiMH battery reduces weight
- 250 mW power limit avoids heating the test sample
- Autoranging with high/low limits (DLRO 10X)

Range	Resolution	Current
1.9999 mΩ	0.1 μΩ	10 A
19.999 mΩ	1 μΩ	1 A
199.99 mΩ	10 μΩ	100 mA
1999.9 mΩ	100 μΩ	10 mA
19.999 Ω	1 mΩ	1 mA
199.99 Ω	10 mΩ	0.1 mA
1999.9 Ω	100 mΩ	0.1 mA

Test Leads & Battery Charger Included

ME/DLRO-10	DLRO with LED display
ME/DLRO-10X	DLRO with LCD display
ME/DLRO10HD	Heavy Duty DLRO (LCD display)

DLRO10HD

- Delivers up to 10A into 250mΩ (25W)
- Operates from rechargeable battery or line power
- Input protected to 600V
- Heavy duty IP65 case
- 5 test modes, including auto-start on connection
- Simple to use rotary switches

Range	Resolution	Current
250.00 mΩ	10 mΩ	10 A
2500.0 mΩ	100 mΩ	1 A
2500.0 μΩ	0.1 μΩ	10A
25.000 mΩ	1 μΩ	1 A
250.00 mΩ	10 μΩ	100 mA
2500.0 mΩ	100 μΩ	10 mA
25.000 Ω	1 mΩ	1 mA
250.00 Ω	10 mΩ	0.1 mA
2500.0 Ω	100 mΩ	0.1 mA

DLRO10HD



DLRO 200

- Test currents from 10A to 200A DC
- Filtered DC output eliminates magnetic transients
- 0.1μΩ best resolution
- Full QWERTY keyboard
- On board memory for up to 300 test results and notes
- RS232 port to download stored results or for real time output to a printer

Measurement Range: 0.1μΩ to 999.9mΩ
 Test Modes: Normal, Continuous, Auto. Use continuous mode for long duration tests, Auto mode for rapid sequential testing.
 Test Time: 10 seconds
 Display: Large backlit LCD
 Dimensions: 16.4" x 9.9" x 10.7" (410x250x270mm)
 Weight: 32 lbs (14.5kg)
 Power: 100-130VAC, 50/60Hz

DLRO 200



Supplied with 16 ft. (5m) test leads and download software. A variety of C-clamp, Kelvin clips, fixed point and spring point leads are available in various lengths.

ME/DLRO200-115E	High Current Digital Low Resistance Ohmmeter
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TEST EQUIPMENT

Megger® Handheld Micro-ohmmeter

NEW

- Battery operated
- Auto range: 1 $\mu\Omega$ to 1000 m Ω
- Test current up to 220 Amps
- Safe test – DualGround™
- Stores up to 190 test records
- Bluetooth® PC communication
- Ultra capacitor technology (patent pending)

MOM2



The MOM2 Micro-ohmmeter is a lightweight, handheld unit designed to deliver up to 220 Amps and measure the resistance of circuit breaker contacts, bus-bar joints and other high-current links. Measurements are made using the DualGround™ method, where the test object is grounded on both sides throughout the test for a safer, faster and easier workflow. The conventional test method, with one side grounded, is also supported (optional cable kit required).

SPECIFICATIONS

Application:	High-voltage substations & industrial environments	
Resistance Ranges:	Autorangeing from 0 - 1000 m Ω	
Resolution:	0 - 999 $\mu\Omega$	1 $\mu\Omega$
	1.0 - 9.99 m Ω	0.01 m Ω
	10.0 - 99.9 m Ω	0.1 m Ω
	100 - 1000 m Ω	1 m Ω
Accuracy:	0 - 1999 $\mu\Omega$	± 1 % of reading ± 1 digit
	2 - 1000 m Ω	± 2 % of reading ± 1 digit
Pass / Fail:	Settable from 1 $\mu\Omega$ to 1999 m Ω	
Output Current:	Selectable minimum of 50 A or 100 A (100A valid at resistance <2m Ω)	
Output Voltage:	2.5 V DC max	
Output Duration:	Selectable: 0.1 s, 0.6 s, 3 s	
Recovery Time:	10-130 sec	
Voltage In:	± 3 V DC	
Trigger In:	Threshold 8 V DC	
DC Power In:	12 - 24 V DC, 2 A max	
Operating Temp.:*	-20°C to +50°C (-4°F to +122°F)	
Relative Humidity:	5%-95%, non condensing	
Battery:	Five AA, 2700 mAh NiMH cells	
Capacity:	Typ. 2200 measurements at 50 A and 0.1 s from fully charged batteries	
Battery Charger:	100-250 V AC, 50/60 Hz, 60 W	
Recharge Time:	< 12 hr; < 3 hr typical at 25°C	
Real-time Clock:	Battery life >10 years	
Audible Feedback:	Different buzzer sounds	
User Presets:	3	
Data Logger:	Label, Timestamp, I max, I min, I Limit, Resistance, Meas. time, P/F limit	
Data Capacity:	190 measurements	
Wireless:	Bluetooth headset & PC communication	
Encapsulation:	IP54	
Dimensions:	8.5"H x 3.6"W x 2.8"D, excl. binding posts (217 x 92 x 72 mm)	
Weight:	1.0 kg (2.2 lbs) instrument only	

*Battery operation temperature 0°C to +50° (32°F to +122°F)

*Battery charging temperature +10°C to +40° (50°F to +104°F)

Transport case, charger, rubber holster, carrying strap, belt clip, PC software included.

Megger® High Current Loop Tester



LT300

- Single and 3 phase testing
- 16 Hz to 400 Hz operation
- Simple 2 wire operation
- CAT IV 300V applications
- 0.01 Ω resolution on 20 Ω range

The LT300 offers high current loop testing over a wide range of frequencies and supply voltages with simple, fast, two wire operation.

SPECIFICATIONS

Voltage Measure:	0-550V (400V @ 16 Hz); Accuracy 5% ± 2 V
Frequency:	Supply frequency indicated upon connection (16, 50/60, 400 Hz). Test frequency automatically set
Loop Resistance:	0-19.99 Ω and 0-199.9 Ω ; Accuracy 5% ± 5 d
Test Current:	3-27A on 20 Ω range, 0.3-2.7A on 200 Ω range
Operating Temp.:	-10°C to 60°C, < 90% RH @ 40°C
Power:	Eight standard AA alkaline batteries
Dimensions:	8"H x 5.8"W x 3"D (203 x 148 x 78 mm)

Megger® Cable Height Meter



CHM600

- Measures the height of up to six overhead cables
- Dramatically reduces measuring time
- No physical connection to cables or wires
- Designed for portability & ease-of-use
- Readout in feet/inches or meters

The CHM Series utilize ultrasonic techniques to determine the height of up to the six overhead cables and wires. The meter displays the height of the lowest cable and the spacings between the next five cables.

SPECIFICATIONS

Min. Cable Size:	CHM2000: 0.125" @ 7-32 ft, 0.5" @ 35 ft. (@ 68° F)
	CHM600: 0.125" @ 10-32 ft, 0.5" @ 50 ft.
	CHM600E: 0.5" @ 10-50 ft, 1" @ 75 ft.
Resolution:	1/4 in. (5 mm) if < 10 m 1/2 in. (10 mm) if > 10 m
Accuracy:	Typically less than 0.5% error ± 2 digits
Power Source:	9 volt alkaline battery (included)
Operating Temp.:	14° F to 104° F (-10° C to 40° C), reading compensated over the full range
Battery Life:	> 50,000 measurements
Dimensions:	3"H x 4"W x 8.5"D (70 x 100 x 205 mm)

ORDERING INFORMATION

ME/BD-59090	MOM2 Micro-ohmmeter with 2 x 1.3 m (4 ft) test cables Kelvin probes (one with trig button)
ME/BD-59092	MOM2 Micro-ohmmeter with 1.3 m (4 ft) test cable red & Kelvin clamp 3 m (10 ft) test cable black with Kelvin clamp (Cat #GA-90001)
ME/GA-00384	15 meter Cable Kit
ME/LT300-EN-00	High Current Loop Tester with red/green leads & carry case
ME/LT300-EN-FS	High Current Loop Tester with fused leads & carry case
ME/CHM2000	Telecom Cable Height Meter; 6 lines; 7-35 ft.
ME/659600	CHM600 Power Cable Height Meter, 6 lines; 10-50 ft.
ME/659600E	CHM600E Power Cable Height Meter, 6 lines; 10-75 ft.

Altek Process Calibrators

Milliamp Calibrator

- Source and Read 0-24mA
- Simulate 2-wire Transmitters
- Quik-Chek Pushbuttons

Use the PocketCal 134-2 to simultaneously power and measure two-wire transmitters up to 12V. Simulate the transmitter in circuits from 3 to 45V.



MILLIAMP CALIBRATOR SPECIFICATIONS

Ranges	0.00 to 24.00mA, -25.0 to 125.0% of 4 to 20mA
Accuracy	0.03mA
Burden	0.9V @4mA, 1.9V @24mA
Drive	700Ω @20mA with fresh batteries
Battery Life	40hr simulate, 20hr source from 9V batteries (supplied)

134-2

Loop Calibrator

- Source to 24mA, Read to 52mA
- Measure to ±99.9V DC
- Quickly Simulate 2-wire Transmitters

The versatile 334A will check, calibrate and troubleshoot all the signals in a 4-20mA process control loop. Simultaneously power and measure two-wire transmitters up to 27V. Simulate the transmitter in circuits from 3 to 45V. Overload protected to 135VAC.



LOOP CALIBRATOR SPECIFICATIONS

Source/Simulate	0.00 to 24.00mA, -25.0 to 125.0% of 4 to 20mA
Read	0.00 to 52.00mA, -25.0 to 300.0% of 4 to 20mA
Accuracy	0-24mA: ±0.05% of reading ± 1 digit Quik-Chek: ±0.03% of reading ± 0.01mA
Drive	1200Ω @20mA with fresh batteries
Battery Life	100hr simulate, 20hr source from 9V batteries (supplied)

334A



820E

MULTIFUNCTION CALIBRATOR SPECIFICATIONS

FUNCTION	RANGE	ACCURACY
mA Source/Measure	0.00 to 24.00mA, -18.8 to 125.0% of 4 to 20mA	±0.05% of FS ± 1d
mV	0.00 to 110.00mV DC (20mA max source/sink)	±0.05% of FS ± 1d
V	0.00 to 10.25V DC (20mA max source/sink)	±0.05% of FS ± 1d
V (measure only)	0.0 to 200.0V DC	±2% of FS ± 1d
VAC (measure only)	0.0 to 250.0V AC TRMS	±2% of FS ± 1d
TC	J, K, T, E	±2% typical
RTD	100Ω Pt, 385 alpha (2mA max)	±1°C
Ohms	0 to 400.0Ω source, 0 to 1000.0Ω measure	±0.06Ω
Frequency	1-1000 CPM, 1-1000 Hz, 0.01-10.00 kHz	±0.05% of FS ± 1d
Simulate Range	3 to 45V	
ma Compliance	25V (max 1.9V burden at 24mA)	
Transmitter Drive	1200Ω @20mA typical, Power & Measure mode	
Battery Life	50hr simulate, 20hr source (AA batteries supplied)	

Multifunction Calibrator

- Calibrate Milliamps, Volts & Frequency
- Check Thermocouple & RTD Sensors
- Use in Place of a DMM for ACV & Ohms
- Simulate 2-Wire Transmitters

The deluxe Model 820E combines the functions of the 111, 322-1, 334A and voltage calibration in one compact unit. It also performs frequency calibration and extended voltage measurements.

ORDERING INFORMATION

(Batteries & three year warranty included)

AL/134-2	PocketCal Milliamp Calibrator
AL/334A	Milliamp Loop Calibrator with Carrying Case
AL/820E	TechChek Multifunction Calibrator with Carrying Case
AL/3331E	Carrying Case with Belt Clip for 134-2

Altek Temperature Calibrators

RTD Calibrators

- Source and Read Pt RTDs
- 8 RTD Types Plus Ohms (Model 211)
- 0.1° and 0.01Ω Resolution
- °C/°F Display
- Easy Dial Setting
- Small and Lightweight

111 ▶



The Model 111 simulates and measures 3-wire, 100Ω Platinum RTDs over the full industrial temperature range. The Model 211 handles multiple RTD types in either 3 or 4 wire configurations, plus extended ohms range.

Thermocouple Calibrators

- Source and Read Modes
- 0.1° and 0.001mV Resolution
- °C/°F Display
- Easy Dial Setting
- Small and Lightweight

322-1 ▶



Simulate and measure the most popular thermocouple types with the Model 322-1. Use the Model 422 with 14 different types. Three output memories for each TC type facilitate repetitive testing. Each model accepts miniature thermocouple connectors and direct thermocouple wires.

SPECIFICATIONS

MODEL 111		
RTD Type	100Ω Pt (DIN/IEC/JIS), 385 alpha	
Accuracy	-200.0 to 200.0°C (-328.0 to 212.0°F)	±0.5°C (±0.9°F)
	200.0 to 700.0°C (212.0 to 750.0°F)	±0.6°C (±1.0°F)
	700.0 to 850.0°C (750.0 to 1562.0°F)	±0.7°C (±1.2°F)

MODEL 211		
RTD Type	Alpha	Range
Pt100 (DIN/IEC/JIS)	3850	-200.0 to 850.0°C (-328.0 to 1562.0°F)
Pt100 (JIS 1981)	3916	-200.0 to 648.9°C (-328.0 to 1200.0°F)
Pt100 (Burns)	3902	-195.6 to 648.9°C (-328.0 to 1200.0°F)
Pt100 (US lab)	3926	-200.0 to 862.0°C (-328.0 to 1584.0°F)
Pt1000 (HVAC)	3750	-184 to 275°C (-300 to 527°F)
Cu10 (Minco)	4274	-200 to 260°C (-328 to 500°F)
Ni120	6720	-80.0 to 273.0°C (-112.0 to 524.0°F)
Ni110	5801	-106.7 to 315.6°C (-160.0 to 600.0°F)
Accuracy (typical)	Pt100	±0.15°C (±0.25°F)
	Pt1000, Ni	±0.10°C (±0.2°F)
	Cu10	±1.1°C (±2.0°F)

MODEL 111 & 211		
Ohms	0.00 to 410.00	±0.2Ω accuracy
	0.0 to 2010.0	±0.5Ω accuracy (211 only)
Excitation Current	0.09 to 5.80 mA source, 1mA read	
Temperature Drift	<0.01%/°C change in ambient	
Battery Life	Approx. 50 hrs from 9V alkaline battery (supplied)	
Size	5.2" x 2.6" x 2.5" (130x67x64 mm)	

SPECIFICATIONS

Input/Output (322-1)	Type J, K, T, E and mV
Input/Output (422)	Type J, K, T, E, R, S, B, N, G, C, P, L, U, D and mV
Ranges	J: -210.0 to 1200.0°C (-346.0 to 2192.0°F)
	K: -230.0 to 1371.1°C (-382.0 to 2500.0°F)
	T: -260.0 to 400.0°C (-436.0 to 752.0°F)
	E: -240.0 to 1000.0°C (-400.0 to 1832.0°F)
	R, S: -18.3 to 1767.8°C (-1.0 to 3214.0°F)
	B: 315.6 to 1820.0°C (600.0 to 3308.0°F)
	N: -230.0 to 1300.0°C (-382.0 to 2372.0°F)
	G: 100.0 to 2320.0°C (212.0 to 4208.0°F)
	C, D: -1.1 to 2320.0°C (30.0 to 4208.0°F)
	P: -217.8 to 1395.0°C (-360.0 to 2543.0°F)
	mV: ±99.999mV
	Accuracy
Cold Junction Effect	<0.05°/°C change in ambient
Battery Life	Approx. 40 hrs from 9V alkaline battery (supplied)
Size	5.2" x 2.6" x 2.5" (130x67x64 mm)

ORDERING INFORMATION

(Batteries, carrying case and three year warranty included)	
AL/111	RTD Calibrator (100Ω Pt, 385)
AL/211	RTD Calibrator (8 types)
AL/322-1	Thermocouple Calibrator (type J, K, T, E)
AL/422	Thermocouple Calibrator (14 types)

Yokogawa Calibrators

CA11E Voltage/Current Calibrator

- Source and Measure Voltage and Current
- 4-20mA and 1-5V DC Step-up/down Function
- 20mA SINK Function
- Sweep Function
- 0.05% Basic Accuracy



SPECIFICATIONS

Source/Measure Functions

Range	Span
30V	0 to 30.00V DC
10V	0 to 11.000V DC
1-5V (source only)	1/2/3/4/5V DC
1V	0 to 1.1000V DC
100mV	0 to 110.00mV DC
20mA	0 to 24.000mA DC
4-20mA (source only)	4/8/12/16/20mA
20mA SINK (source only)	0.1 to 24.000mA

CA71/SP1 Multi-function Calibrator

- Simultaneous Source & Measure Capability
- Separate Source & Measure Switches for Easy Setup
- Autostep, Sweep & Memory Functions
- 0.025% Measure Accuracy (DCV)



Each CA71/SP1 includes: 120VAC adapter, source & measure cables, terminal adaptor for temperature measurements, input fuse, magnetic instrument case, accessory case for input cables, carrying case, 9 pin RS232 communications cable & data logging software.

SPECIFICATIONS

SOURCE FUNCTIONS	RANGES	BEST RESOLUTION	BEST ACCURACY
DCV	100mV/1V/10V/30V	10mV	0.02%+15µV
DCA	20mA/4-20mA	1µA	0.025%+3µA
mA sink	20mA	1µA	0.05%+3µA
Resistance	400Ω	0.01Ω	0.02%+0.1Ω
RTD	Pt100 (-200 to +850°C)	0.1°C	0.025%+0.3°C
TC	J K T E L U N	0.1°C	0.02%+0.5°C
TC	R S B	1°C	0.02%+1.5°C
Frequency	500/1000/10kHz	0.2Hz	0.2Hz
Pulse	99999 cycles	1	--

MEASURE FUNCTIONS	RANGES	BEST RESOLUTION	BEST ACCURACY
DCV	100mV/1V/10V/100V	10mV	0.025%+20µV
DCA	20mA/4-20mA	1mA	0.025%+4µA
Resistance	400Ω	0.01Ω	0.05%+0.1Ω
ACV	1/10/100/300V	1mV	0.5%+5 digits
RTD	Pt100 (-200 to +850°C)	0.1°C	0.05%+0.6°C
TC	J K T E L U N	0.1°C	0.05%+1.5°C
TC	R S B	1°C	0.05%+2°C
Frequency	100/1000/10kHz	0.01Hz	2 digits
Pulse	99999 counts/min, /hr	1	--

CA12E Temperature Calibrator

- Simulate Thermocouples and RTDs
- Multi-range RTD Thermometer
- °C/°F Selection
- Built-in Sensor for Reference Junction Compensation
- 0.05% Basic Accuracy
- Binding Post Terminal Adapter



SPECIFICATIONS

Source/Measurement Functions

Selection	Source/Measure
Type K	-200.0 to 1372.0°C -328 to 2498°F
Type E	-200.0 to 1000.0°C -328 to 1832°F
Type J	-200.0 to 1200.0°C -328 to 2192°F
Type T	-200.0 to 400.0°C -328 to 752°F
Type N	-200.0 to 1300.0°C -328 to 2372°F
Type R, Type S	0 to 1768°C 32 to 3214°F
Type B	600 to 1800°C 1112 to 3272°F
Type L	-200 to 900°C -328 to 1652°F
Type U	-200 to 400°C -328 to 752°F
RTD Pt100 (3 wire)	-200.0 to 850.0°C -328 to 1562°F
100mV	-10.00 to 110.00mV
400Ω	0 to 400.0Ω

CA150/SP1 Multi-function Calibrator

- Simultaneous Source & Measure Capability
- Large LCD Display
- Step, Linear & Programmed Sweeps
- Loop Power Supply
- DC Voltage and Current Generation
- Settings and Data Memory
- 0.02% Measure Accuracy (DCV)



Each CA150/SP1 includes: 120VAC adapter, source & measure cables, terminal adaptor for temperature measurements, input fuse, NiMH battery, accessory case for input cables & carrying case

SPECIFICATIONS

SOURCE FUNCTIONS	RANGES	BEST RESOLUTION	BEST ACCURACY
DCV	100mV/1V/10V/30V	1µV	0.02%+10µV
DCA	20mA	1µA	0.02%+3µA
mA sink	20mA	1µA	0.025%+6µA
Resistance	500/5k/50kΩ	0.01Ω	0.02%+1.5Ω
RTD	Pt100 (-200 to +850°C)	0.1°C	0.025%+0.3°C
TC	J K T E L U N	0.1°C	0.02%+0.4°C
TC	R S B	1°C	0.02%+1.2°C
Frequency	100/1000/10k/50kHz	0.01Hz	0.05Hz
Pulse	1100 CPM	0.1 CPM	0.5 CPM

MEASURE FUNCTIONS	RANGES	BEST RESOLUTION	BEST ACCURACY
DCV	500mV/5V/35V	10µV	0.02%+50µV
DCA	20mA/100mA	1µA	0.025%+4µA
Resistance	500/5k/50kΩ	0.01Ω	0.055%+0.075Ω
RTD	Pt100 (-200 to +850°C)	0.1°C	0.05%+0.6°C
TC	J K T E L U N	0.1°C	0.05%+1.5°C
TC	R S B	1°C	0.05%+2°C
Frequency	100/1000/10kHz	0.01Hz	2 digits
Pulse	100000 CPM, CPH	1	--

Yokogawa Process Calibrators

NEW

VOLTAGE/CURRENT

- Source to 24mA, ±33V
- Measure to ±60mA, ±55V
- Step, ramp & sweep
- 24V loop power supply
- Simulate (sink) function



CA310

SPECIFICATIONS

Source:	0 to 24.000mA, <1kΩ load 0 to 550.00mV/5.5000V/±33.000V
Measure:	0 to ±24.000mA/±60.000mA; 0 to ±550.00mV/±5.5000V/ ±33.000V/±55.000V
Simulate:	0 to 24.000mA, 5-28V external supply
Input R:	mA source: <10Ω V measure: >1MΩ
Loop Supply:	24V ±1V (@24mA, comm R OFF) 24V ±6V (@20mA, comm R ON)
Accuracy:	0.015% +3 digit (+5 digits on volts)
Dimensions:	7.5" x 3.6" x 1.65" (192 x 90 x 42mm)

Includes test leads, batteries & carrying case. AC adapter sold separately (P/N 94013).

ORDERING INFORMATION

YE/CA310	Volts & mA Calibrator
YE/CA320	Thermocouple Calibrator
YE/CA330	RTD Calibrator

THERMOCOUPLE

- Measure & source (simulate) 16 T/C types
- 0.5° C basic accuracy, including internal reference junction
- Step, ramp & sweep
- Dual display (° & mV or %)



CA320

SPECIFICATIONS

Type K	-200.0 to 1372.0°C
Type E	-250.0 to 1000.0°C
Type J	-210.0 to 1200.0°C
Type T	-250.0 to 400.0°C
Type N	-200.0 to 1300.0°C
Type L	-200 to 900.0°C
Type U	-200.0 to 600.0°C
Type R, S	-20.0 to 1767.0°C
Type B	600.0 to 1820.0°C
Type C	0.0 to 2315.0°C
Type XK	-200.0 to 800.0°C
Type A	0.0 to 2500.0°C
Voltage:	-11.000 to ±99.999mV
Accuracy:	Type K, E, T, L, U: 0.5°C for 0<t<500° mV: 0.015% +10μV (max 10mA out)
Dimensions:	7.5" x 3.6" x 1.65" (192 x 90 x 42mm)

Includes test leads, batteries & carrying case. AC adapter sold separately (P/N 94013).

RTD

- Source/Measure 16 RTD types
- 0.3° C basic accuracy
- 2/3/4-wire
- Step, ramp & sweep
- Dual display (° & Ω or %)



CA330

SPECIFICATIONS

Pt100 (3851)	-200.0 to 800.0°C
Pt100 (3850)	-200.0 to 630.0°C
Pt100 (3916)	-200.0 to 510.0°C
Pt100 (3926)	-200.0 to 630.0°C
Pt200 (3851)	-200.0 to 630.0°C
Pt500 (3851)	-200.0 to 630.0°C
Pt1000 (3851)	-200.0 to 630.0°C
Cu10 (427)	-100.0 to 260.0°C
Ni120 (627)	-80.0 to 260.0°C
Pt50 (3851)	-200.0 to 630.0°C
Pt50G	-200.0 to 800.0°C
Pt100G	-200.0 to 630.0°C
Cu50M	-180.0 to 200.0°C
Cu100M	-180.0 to 200.0°C
500Ω	0.00 to 550.00Ω
3000Ω	0.0 to 3300.0Ω
Accuracy:	Pt100, Pt200: 0.033% +0.3°C Ω: 0.025% +0.5Ω
Dimensions:	7.5" x 3.6" x 1.65" (192 x 90 x 42mm)

Includes test leads, binding posts, batteries & carrying case. AC adapter sold separately (P/N 94013).

Extech Process Calibrators

VOLTAGE/CURRENT

- Source to 24mA, 20V
- Measure to 50mA, 20V
- 5 user adjustable presets
- Banana connections
- Battery or AC power



PRC15

SPECIFICATIONS

Source:	0 to 24mA (-25% to 125%), <1kΩ load 0 to 20V										
Measure:	0 to 50mA (-25 to 230%); 0 to 19.99V										
Input/Output:	<table border="1"> <thead> <tr> <th>Range</th> <th>Resolution</th> </tr> </thead> <tbody> <tr> <td>0 to 19.99mA</td> <td>0.01mA</td> </tr> <tr> <td>0 to 24.0mA</td> <td>0.1mA</td> </tr> <tr> <td>0 to 1999mV</td> <td>1mV</td> </tr> <tr> <td>0 to 20.00V</td> <td>10mV</td> </tr> </tbody> </table>	Range	Resolution	0 to 19.99mA	0.01mA	0 to 24.0mA	0.1mA	0 to 1999mV	1mV	0 to 20.00V	10mV
Range	Resolution										
0 to 19.99mA	0.01mA										
0 to 24.0mA	0.1mA										
0 to 1999mV	1mV										
0 to 20.00V	10mV										
Accuracy:	0.01% +1 digit										
Dimensions:	6.3" x 3.2" x 1.7" (159 x 80 x 44mm)										

Includes test leads, AC power adapter, batteries & hard carrying case

THERMOCOUPLE

- Measure & source (simulate) 8 T/C types
- Display °C, °F or mV
- 5 user adjustable presets
- Miniature thermocouple connector
- Battery or AC power



PRC20

SPECIFICATIONS

Type J	-58 to 1832°F (-50 to 1000°C)
Type K	-58 to 2498°F (-50 to 1370°C)
Type T	-184 to 752°F (-120 to 400°C)
Type E	-58 to 1382°F (-50 to 750°C)
Type C	32 to 3182°F (0 to 1750°C)
Type R/S	32 to 3182°F (0 to 1750°C)
Type N	-58 to 2372°F (-50 to 1300°C)
Voltage:	-10.00mV to +60.00mV
Resolution:	0.1° (up to 999.9) or 1° (over 999.9°) for J, K, T, E: ±1° for R, N; 0.5° for C, S
Accuracy:	0.05% rdg +1° 0.015% ±3 digit or 10μV +1d
Input Z:	10 MΩ
Dimensions:	6.3" x 3.2" x 1.7" (159 x 80 x 44mm)

Includes calibration cables, AC power adapter, batteries

MULTIFUNCTION

- Source/Measure Voltage, Current, mV & Thermocouples
- Combines functions of the PRC15 & PRC20
- 24V loop power source



PRC30

SPECIFICATIONS

DC Source:	<table border="1"> <tr> <td>Current</td> <td>0 to 24mA (-25% to 125%), <1kΩ load</td> </tr> <tr> <td>Voltage</td> <td>0 to 2000mV, 0 to 20V</td> </tr> <tr> <td>mV/Temp</td> <td>-5 to 55mV</td> </tr> </table>	Current	0 to 24mA (-25% to 125%), <1kΩ load	Voltage	0 to 2000mV, 0 to 20V	mV/Temp	-5 to 55mV						
Current	0 to 24mA (-25% to 125%), <1kΩ load												
Voltage	0 to 2000mV, 0 to 20V												
mV/Temp	-5 to 55mV												
DC Measure:	<table border="1"> <tr> <td>Current</td> <td>0 to 50mA, -25% to +230%</td> </tr> <tr> <td>Voltage</td> <td>0 to 1999mV / 2 to 20V</td> </tr> <tr> <td>mV/Temp</td> <td>-10 to 60mV</td> </tr> </table>	Current	0 to 50mA, -25% to +230%	Voltage	0 to 1999mV / 2 to 20V	mV/Temp	-10 to 60mV						
Current	0 to 50mA, -25% to +230%												
Voltage	0 to 1999mV / 2 to 20V												
mV/Temp	-10 to 60mV												
Thermocouple Source/Measure:	<table border="1"> <tr> <td>Type J</td> <td>-58 to 1832°F (-50 to 1000°C)</td> </tr> <tr> <td>Type K</td> <td>-58 to 2498°F (-50 to 1370°C)</td> </tr> <tr> <td>Type T</td> <td>-184 to 752°F (-120 to 400°C)</td> </tr> <tr> <td>Type E</td> <td>-58 to 1382°F (-50 to 750°C)</td> </tr> <tr> <td>Type C, R, S</td> <td>32 to 3182°F (0 to 1750°C)</td> </tr> <tr> <td>Type N</td> <td>-58 to 2372°F (-50 to 1300°C)</td> </tr> </table>	Type J	-58 to 1832°F (-50 to 1000°C)	Type K	-58 to 2498°F (-50 to 1370°C)	Type T	-184 to 752°F (-120 to 400°C)	Type E	-58 to 1382°F (-50 to 750°C)	Type C, R, S	32 to 3182°F (0 to 1750°C)	Type N	-58 to 2372°F (-50 to 1300°C)
Type J	-58 to 1832°F (-50 to 1000°C)												
Type K	-58 to 2498°F (-50 to 1370°C)												
Type T	-184 to 752°F (-120 to 400°C)												
Type E	-58 to 1382°F (-50 to 750°C)												
Type C, R, S	32 to 3182°F (0 to 1750°C)												
Type N	-58 to 2372°F (-50 to 1300°C)												
Accuracy:	V/I/mV: 0.01% + 1 digit T/C: 0.05% + 2°F or 1°C												
Loop Power:	24V												
Dimensions:	6.3" x 3.2" x 1.7" (159 x 80 x 44mm)												

Includes test leads, calibration cables, AC power adapter, batteries & hard carrying case

ORDERING INFORMATION

EX/PRC15	Voltage/Current Calibrator	
EX/PRC20	Thermocouple Calibrator with Cold Junction Compensation	add -NIST to P/N for NIST traceable Certificate of Calibration
EX/PRC30	Multifunction Calibrator with Cold Junction Compensation	

Martel Beta Process Calibrators

Multi-Function

MC-1210 ▶



- Measure and source T/Cs, RTDs, ohms, current, voltage, frequency; source pulse trains
- Isolated mA/V read-back for complete transmitter calibration
- Dual display (volts/mA, source/measure)
- Automatic cold junction compensation
- Tests pressure & temperature switches
- Auto step & ramp with setpoints
- Complete serial interface for remote control
- Rugged IP54 case

SPECIFICATIONS

Read and Source	Voltage	Current (mA)
Source	0.000 to 20.000 VDC	0.000 to 24.000 mA
Read Isolated	0.000 to 30.000 VDC	0.000 to 24.000 mA
Read Non-isolated	0.000 to 20.000 VDC	0.000 to 24.000 mA
Accuracy	±0.015% of rdg ±2 mV	±0.015% of rdg ±2 µA
Frequency	Millivolts (mV)	
CPM Source & Read	2.0 to 600.0 CPM	Read & Source -10.000 to +75.000 mV
Hz Source & Read	1.0 to 1000.0 Hz	Accuracy ±0.02% of rdg, ±10 µV
kHz Source & Read	1.0 to 10.00 kHz	Ohms
Accuracy	0.05% ±1d	Source 5.0 to 4000Ω
		Read 0.00 to 4000.0Ω
		Accuracy 0.025% ±5d
Read and Source	Range (Accuracy) * °C	Read and Source Range (Accuracy) °C
J	-210.0 to +1200.0 (0.2)	Ni120 -80.0 to +260.0 (0.2)
K	-200.0 to +1370.0 (0.3)	Pt100 (385) -200.0 to +800.0 (0.2)
T	-250.0 to +400.0 (0.2)	Pt100 (3926) -200.0 to +630.0 (0.2)
E	-250.0 to +1000.0 (0.2)	Pt100 (3916) -200.0 to +630.0 (0.2)
R	-20.0 to +1767.0 (1.2)	Pt200 (385) -200.0 to +630.0 (0.7)
S	-20.0 to +1767.0 (1.2)	Pt500 (385) -200.0 to +630.0 (0.3)
B	+600.0 to +1820.0 (1.2)	Pt1000 (385) -200.0 to +630.0 (0.2)
C	0 to +2316.0 (0.6)	Cu10 -100.0 to +260.0 (1.3)
XK	-200.0 to +800.0 (0.2)	YSI400 +15.00 to +50.00 (0.1)
BP	0 to +2500.0 (0.9)	Cu50 -180 to +200 (0.3)
L	-200.0 to +900.0 (0.2)	Cu100 -180 to +200 (0.1)
U	-200.0 to +600.0 (0.25)	Pt10 (385) -200 to +800.0 (1.4)
N	-200.0 to +1300.0 (0.4)	Pt50 (385) -200 to +800.0 (0.4)

*T/C basic accuracy with CJC off; same as PTC-8010 with CJC on

Operating Temperature: -10 °C to +50 °C
 Protection: Protected against misconnection to 250V AC/DC
 Dimensions: 8.5" H x 4.8" W x 2.1" D (22x12x5.3cm)

Universal Temperature

PTC-8010 ▶



- Calibrates thermocouples, RTDs, transmitters & meters
- Displays cold junction & mV equivalent
- Direct keyboard entry or scroll control
- ASCII RS-232 & USB interface
- Rugged IP54 case
- High accuracy: ±0.4°C Type J T/C, ±0.2°C Pt100 RTD
- Auto step & ramp

SPECIFICATIONS

Read/Source	Range °C	Accy*	Ni120	-80.0 to 260.0	0.1°
J	-210.0 to 1200.0	0.4°	Pt 100 (385)	-200.0 to 800.0	0.2°
K	-200.0 to 1370.0	0.5°	Pt 100 (3926)	-200.0 to 630.0	0.2°
T	-250.0 to 400.0	0.4°	Pt 100 (3916)	-200.0 to 630.0	0.2°
E	-250.0 to 1000.0	0.4°	Pt 200 (385)	-200.0 to 630.0	0.7°
R	-20.0 to 1767.0	1.4°	Pt 500 (385)	-200.0 to 630.0	0.3°
S	-20.0 to 1767.0	1.4°	Pt 1000 (385)	-200.0 to 680.0	0.2°
B	600.0 to 1820.0	1.5°	Cu100	-180.0 to 200.0	0.1°
L	-200.0 to 900.0	0.4°	YSI400	15.0 to 50.0	0.1°
U	-200.0 to 600.0	0.5°	Ohms	0.00 to 400.00,	0.025%
N	-200.0 to 1300.0	0.6°		401.0 to 4000.0	
mV	-10.000 to 75.000	0.02%	plus Pt10/50, Cu10/50 RTDs; C, XK, BP T/Cs		

Connectors: Standard mini-plug for T/C, banana jack for RTDs
 Operating Temp.: -10 to +50 °C
 Dimensions: 8.5" H x 4.8" W x 2.1" D (22x12x5.3cm)

*Basic Accuracy with thermocouple CJC on or 4-wire RTD connection

ORDERING INFORMATION

MA/MC-1210	Multi-Function Calibrator with test leads, carrying case, 4 AA batteries, NIST certificate
MA/PTC-8010	Universal Temperature Calibrator with test leads, carrying case, 4 AA batteries, NIST certificate
MA/IVC-222	HP11 Voltage/Current Calibrator with test leads, carrying case, 9V battery, NIST certificate
MA/TC-100	Thermocouple Calibrator with 9V battery, NIST certificate
MA/LC-110	Loop Calibrator with test leads, 6 AAA batteries, NIST certificate

A variety of temperature probes, test leads, cables and software are available.

Loop Calibrator



LC-110 ▶

- Simulate, power & measure two-wire transmitters
- Five preset outputs (4, 8, 12, 16, 20 mA)
- 0.001 mA resolution
- Adjustment level knob
- Variable step and ramp time
- Measures loop power
- Hart protocol (LC-110H)

SPECIFICATIONS

Current Source & Measure	
Range:	0.000 to 24.000 mA, -25 to +125 %
Voltage (Reading):	0 to 30 VDC
Protection:	240 VAC, 28mA DC
Valve Test:	Simulates defined mA values with % keys
Loop Supply:	24 VDC @ 20mA
Data Storage:	9800 records or 99 sessions, 1 to 60 second interval
Resolution:	1 µA, 1mV
Accuracy:	±0.01% of reading ± 2 digits
Operating Temp.:	-10 to +55 °C
Dimensions:	6" x 3.6" x 1.3"

Thermocouple Calibrator



TC-100 ▶

- 10 T/C types plus mV
- ±0.3°C accuracy (type J)
- Accepts T/C mini-plug & bare T/C wires
- 3 setpoints for each T/C type
- MIN/MAX recall in measure mode
- Input protection to 240 VAC

SPECIFICATIONS

Voltage Source & Measure	
Range:	-10 to +75.000 mV
Resolution:	1 µV
Accuracy:	±0.007% of reading, ±10 µV
Output Impedance:	≤1 Ω
Input Impedance:	>1 MΩ
Thermocouple Source/Measure	
Types:	J, K, T, E, R, S, B, L, U, C
Resolution:	0.1°C or °F source
	0.01°C or °F measure
Operating Temp.:	-10 °C to +55 °C
Dimensions:	5.7" x 3.15" x 1.43"

Voltage/Current Calibrator



IVC-222HP11 ▶

- 0.015% of reading accuracy
- 200 mV, 2 V, 20 V and 24 mA ranges
- 24 V supply can drive 4-20 mA loops
- 2 stored setpoint values
- Intuitive, easy-to-use controls

SPECIFICATIONS

Resolution	
Voltage:	0.01 mV, 0.0001 V, 0.001V
Current:	0.001 mA
Accuracy:	±0.015% of reading, ±2 count; 18 °C to 28 °C
Temp. Stability:	±0.005% FS/°C
Load Capability	
Voltage:	±1 mA for rated accuracy
Current:	1kΩ
Output Protection:	Current limited internal RESET
Operating Temp.:	-10 °C to +55 °C
Dimensions:	1.43" x 3.15" x 5.7"

Fluke Process Loop Calibrators

Fluke 705 Loop Calibrator

- Simultaneous mA and % Readout
- Fast "Span Check"
- Selectable Slow Ramp, Fast Ramp & Step
- 24V Internal Loop Supply

Fluke 707 Loop Calibrator

705 Features, Plus:

- Output Adjustment Dial
- HART™ Mode
- 0.015% Accuracy

Fluke 787 Process Meter

- DMM and Loop Calibrator
- Backlit LCD
- 1000V Overload Protection on V, Ohms, Frequency

Fluke 789 Process Meter

787 Features, Plus:

- 24V Loop Power Supply
- HART™ Mode
- Fast "Span Check"

Fluke 715 Volt/mA Calibrator

- Measure loop Currents and Process Voltages
- Source Loop Currents to 24mA
- Source Voltage to 10V

787 ▼

SPECIFICATIONS				
Functions	Fluke 705 and 707	Fluke 715	Fluke 787 and 789	
Voltage measurement				
Range	0-28 V dc	0-100 mV 0-10 V	0-1000 V ac or dc	
Resolution	0.001V	10 μ V 1 mV	0.1mV to 1.0V	
Accuracy	705: 0.025% Rdg + 1 LSD 707: 0.015% Rdg + 2 LSD	0.02% Rdg + 2 LSD	0.1% Rdg + 1 LSD (VDC)	
Current measurement				
Range	0-24 mA	0-24 mA	0-1A dc	0-30 mA dc
Resolution	0.001 mA	0.001 mA	1mA dc	0.001 mA dc
Accuracy	705: 0.02% Rdg + 2 LSD 707: 0.015% Rdg + 2 LSD	0.015% + 2 LSD	0.2%+2 LSD	0.05%+2 LSD
Current sourcing				
Range	0-20 mA or 4-20 mA ¹	0-20 mA or 4-20 mA ¹	0-20 mA or 4-20 mA ¹	
Accuracy	705: 0.025% Rdg + 2 LSD 707: 0.015% Rdg + 2 LSD	0.015% Rdg + 2 LSD	0.05% of span	
Drive capability	705: 1000 Ω @ 24 mA 707: 1200 Ω @ 24 mA	1000 Ω @ 24 mA	787: 500 Ω @ 24 mA 789: 1200 Ω @ 24 mA	
Loop power while measuring mA	24V	24V	24V (789 only)	
Voltage sourcing	N/A	0-100 mV or 0-10V	N/A	
Resistance measurement	N/A	N/A	to 40M Ω , 0.2% + 1 LSD	
Frequency	N/A	N/A	to 19.999 kHz, 0.005% + 1 LSD	
Diode test	N/A	N/A	2.4 V shows diode voltage drop	
Continuity	N/A	N/A	Beeps for resistance <100 ohms	
Display current and % of span	Yes	mA or %	Yes	
Auto step, auto ramp	Yes	No	Yes	
Span Check	Yes	No	789 only	

¹Will over-range to 24 mA



705 ▲



Fluke Temperature Calibrators



Fluke 712B RTD Calibrator

- Measure & simulate 13 RTD types & resistance
- Measure 4-20mA signals while sourcing an RTD signal
- Configurable 0% to 100% source for quick 25% linearity checks
- Linear ramp & 25% auto ramp
- Power down settings remembered at power up
- Dual inputs & backlit display
- Hanging tool built into case
- 1 and 2 year specs plus traceable certificate of calibration



Fluke 714B Thermocouple Calibrator

- Measure & simulate 17 TC types
- Measure 4-20mA signals while sourcing a thermocouple signal
- Configurable 0% to 100% source for quick 25% linearity checks
- Linear ramp & 25% auto ramp
- Power down settings remembered at power up for easy restart of tests
- Dual inputs & backlit display
- Hanging tool built into case
- 1 and 2 year specs plus calibration certificate

SPECIFICATIONS

Model	Function	Range	Resolution	1 yr Accuracy	Types
Fluke-712B	Measure/simulate RTD	-200 to 800°C, depending on type	0.1°C	0.015%+0.18°C (Pt 100, 100-800°)	Pt 10 50 100 200 500 1000 (385); Pt 100 (3916 3926); Ni 120 (672); Cu 10 50 100 (427); YSI400
	Measure/simulate Resistance	0 to 400 Ω 40 to 4000 Ω	0.01 Ω 0.1 Ω	0.015% + 5d	
Fluke-714B	Measure/simulate Thermocouple	-250 to 2500°C, depending on type	0.1°C	0.3°C (Type K -100 to 400°)	J K T E N R S B C L U G D P B P X K M (K range = -200 to 1372°C)
	Measure/source mV	-10 to 75 mV	0.01 mV	0.015% + 1d	
Both Models	Measure DC mA	0 to 24 mA	0.001 mA	0.010% + 2d	

Simpson Analog VOM

- Industry Standard Model 260
- Mirrored Scale
- 10A AC (260-95)
- 36 Measurement Ranges
- CAT III-600V (260-95)
- 1000V AC/DC Max (260-8)

ORDERING INFORMATION

(Test Leads Included)			ACCESSORIES		
Cat. #	Model #	Description	Cat. #	for Model	Description
SI/12388	260-8	General Purpose, Phenolic Case	SI/00043	260-8, 8P	Probe Set, threaded w/clips
SI/12391	260-8P	Relay Protected	SI/00125	260-8XI, 8XPI	Probe Leads w/Screw-On Alligator Clips
SI/12389	260-8RT	Roll Top Case			
SI/12392	260-8PRT	Relay-Protected, w/Roll Top Case	SI/00834	Any 260-8	Black nylon padded case
SI/12395	260-8XI	Yellow ABS Plastic Case	SI/00805	Any 260-8	Black Leatherette case
SI/12396	260-8XPI	Yellow Case, Relay-Protected	SI/00541	260-8XI, 260-8XPI, 9S, 9SP	250A AC Clamp
SI/12397	260-9S	Safety VOM Orange, with Case	SI/00545	260-8, 8P, 8RT, 8PRT, 95, 95P	250A AC Clamp
SI/12398	260-9SP	Safety VOM Protected, with Case	SI/00425	260-8X, 9	Screw-on alligator Clips



▲ 260-8

▼ 260-9S



Triplet Analog VOM

- 58 Ranges & Functions (Model 60-NA)
- Withstands 5 Foot Drop
- 3 Year Warranty
- Mirrored Scale

60 ▶



ORDERING INFORMATION

TR/3145	Model 60 VOM (Orange Case)	Test Leads
TR/3151	Model 60-NA (Gray Case)	TR/79-373 Miniature Clip Leads (female jack)
Carrying Cases		TR/79-374 48" Test Leads w/ Screw-On Alligator Clips (female jack)
TR/10-823	639 Carrying Case (Top Opening)	AC Amps Clamp-On
TR/10-2739	639-A Carrying Case (Snap back Cover)	TR/3264 Model 101-G Line Separator
TR/4152	639-C Padded Cordura Carrying Case	TR/60-211 Model 10 Clamp-On AC AMP Adaptor (60, 60-NA)
		TR/79-417 6' Attachment Leads (60/ 60-NA to Model 10)

Weschler Columbia AC/DC Clamp-On Tong Test Ammeters

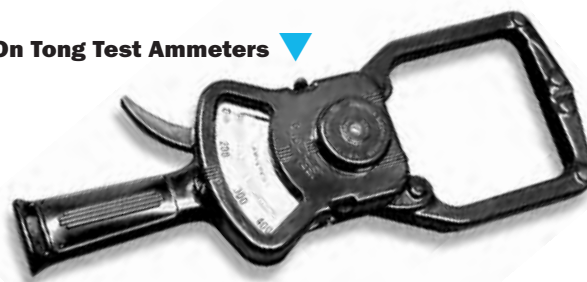
Ideal for verifying current in plating tanks, coating systems, welding equipment, motors, generators & transformers

- Instant Readings
- One Hand Operation
- No Transformers or Shunts Needed

The Tong Test Ammeter reads the true RMS (heating) value, regardless of wave shape. It contains no batteries, rectifiers, switches or electrical windings to overheat or burn out. Currents in lines up to 2300V can be measured if the cables are properly insulated. DC accuracy is 5% of full scale, AC accuracy (25-100Hz) is 2%, except 5% on ranges above 500A. Add 1% for 100-400Hz.

Plug-in Range modules: 0-100A, 0-150A, 0-200A, 0-300A, 0-400A, 0-500A, 0-600A, 0-800A, 0-1000A. The effective range can be lowered by winding two or more turns of the conductor around the tongs.

▼ Clamp-On Tong Test Ammeters



ORDERING INFORMATION

Columbia AX	for conductors up to 1 1/2" dia.
Columbia C	for conductors up to 2 1/2" dia.
Columbia D	for conductors up to 3" dia. or bus bars to 4"x1" or 4 1/2"x 1/2"

Specify range model(s) when ordering.

Yokogawa Test Standards

Decade Resistance Boxes

2793 6-Dial Decade Resistance Box

- Resistance value ranges:
0.100 to 1111.210 Ω (2793 01)
0 to 111.1110M Ω (2793 03)
- Accurate, highly stable
- High reproducibility
- Resolution 0.001 Ω
- Well-suited for resistance temperature detector calibration (2793 01)
- Well-suited for insulation resistance tester calibration (2793 03)

2786 Decade Resistance Box

- Resistance ranges: 0.1 to 111,111 Ω (2786 10)
1 to 1,111,110 Ω (2786 20)
- Small temperature coefficient, little temporal variation
- Small residual resistance
- Metal casing resists external influences



Wheatstone Bridges

2768 Precision Wheatstone Bridge

- Measurement range 0.1 Ω to 111M Ω
- High precision $\pm 0.01\%$
- Does not require accessories
- Built-in power source, current detector; external plug
- Highly stable measurement over long periods
- Also functions as a variable resistor

2755-97 Portable Wheatstone Bridge

- Measurement range 1 Ω to 10M Ω
- Does not require accessories
- Simple operation
- Current detector with built-in protection circuit
- Compact, light-weight



Double Bridges

2752 Precision Double Bridge

- Measurement range 0.1 Ω to 111M Ω
- High precision $\pm 0.03\%$
- Stable over long periods
- Standard resistor built-in
- Allows testing of cylindrical resistors using clamp device

2769 Portable Double Bridge

- Measurement range 0.1 Ω to 110M Ω
- Rapidly performs reliable, accurate measurements
- Easy to handle and store
- Does not require accessories
- Built-in high sensitivity current sensor



Portable Meters

Portable AC Ammeters and Voltmeters

- Superior product line
- Highly reliable, incorporating 80 years of meter manufacturing technology
- Low friction, withstands impact, tautband technology
- Compact, light-weight

Miniature Portable Ammeters and Voltmeters

- Superior product line
- Highly reliable, incorporating 80 years of meter manufacturing technology
- Low friction, withstands impact, tautband technology



Monarch Optical Tachometers

- Operating Range up to 25 Feet
- Accepts Remote Contact Assembly (optional)
- Accepts Remote Sensors (optional)
- TTL Pulse Output
- Auto Ranging or Fixed Decimal
- English and Metric Rates
- Tripod Mounting Bushing
- On-Target and Low Battery Indicators
- Rugged Rubberized Housing
- N.I.S.T. traceable Certificate of Calibration

PLT200 ▶



PLT200 SPECIFICATIONS

Display:	5 digit alpha-numeric LCD
Optical Range:	5 to 200,000 RPM
Contact Range*:	0.5 to 20,000 RPM (other ranges: inches, yds, miles, cm, m per hour or per second)
Optical Accuracy:	±0.01% of reading
Contact Accuracy*:	±0.05% of reading (RPM)
Resolution:	0.001 to 10 RPM (range dependent)
Operating Range:	2 inches to 25 feet
Light Source:	Class 3R visible laser
Memory:	Maximum, Minimum and Last
Power:	(2) AA batteries
Environmental:	5° to 40°C (0° to 100°F) 80% RH up to 31°C (88°F)
Dimensions:	6.92 "H x 2.4" W x 1.6" D
Weight:	7 oz. (210 g)

* with optional Remote Contact Assembly (RCA).

PLT200 is a 32 function Laser Tachometer and Ratemeter/Totalizer/Counter/Timer (stopwatch). The unit is program-able in both English and Metric rates. Support is built-in for the optional Remote Contact Assembly (RCA) and plug-in remote sensors. A TTL compatible pulse output can trigger devices like data collectors or stroboscopes. The ergonomic design allows safe, direct line-of-sight viewing of both the target and the display at the same time. The case has a non-slip rubber surface for single hand operation.

PT99 SPECIFICATIONS

Display:	5 digit alpha-numeric LCD
Range:	5 to 99,999 RPM
Accuracy:	0.01% of reading or ±1 Digit
Resolution:	Autoranging: 0.001 to 1.0 RPM Fixed: 1 RPM
Operating Range:	2 to 36 inches
Light Source:	Red LED
Memory:	Maximum, Minimum & Last
Power:	(2) AA 1.5 VDC batteries
Environmental:	5° to 40°C (0° to 100°F) 80% RH up to 31°C (88°F)
Dimensions:	6.92 "H x 2.4" W x 1.6" D
Weight:	7 oz. (210 g)

PT99 ▶



- Non-Contact Optical Measurement
- Operating Range up to 36 Inches
- Rugged, Ergonomic Rubberized Housing
- Tripod Mounting for Hands Free Operation
- Autoranging or Fixed Decimal

Direct line-of-sight viewing of both the rotating target and the display at the same time.

ORDERING INFORMATION

Catalog No.	MODEL	DESCRIPTION
MN/6125-010	PLT200	Pocket Laser: Tachometer/Timer/Totalizer with N.I.S.T. traceable certificate of calibration and 12" of reflective tape.
MN/6125-011	PLT200 KIT	Pocket Laser Tachometer Kit includes: Tach, RCA, Carrying Case, N.I.S.T. certificate and 5 ft roll of T-5 reflective tape.
MN/6109-010	PT99	Pocket Tachometer with 12" of reflective tape
Accessories for PLT200		
MN/6180-057	ROS-P	Remote Optical Sensor with 8-foot cable, mounting bracket and 12" of reflective tape.
MN/6180-057-25	ROS-P-25	Remote Optical Sensor with 25-foot cable, mounting bracket and 12" of reflective tape.
MN/6180-017	MT-190P	Magnetic trigger Sensor/Amplifier with 8 foot cable
MN/6180-020	IRS-P	Infrared Sensor with 8 foot cable, 3.5 mm plug and mounting bracket
MN/6180-028	EC-25P	25 foot extension cable for all sensors
MN/6280-037	CA-4044-6	6 foot input/output cable, 1/8 inch mono phone plug to BNC connector
MN/6180-074	RCA	Remote Contact Assembly includes contact tips (concave and convex) and 10 cm linear contact wheel.
MN/6580-010	CTE	Rubber concave, convex tips and 10 cm contact wheel
MN/6580-011	12" Contact Wheel	Linear Contact Wheel with 12-inch circumference for use with RCA.
Accessories for both models		
MN/6180-047	CC-10	Padded Pouch
MN/6180-048	CC-11	Latching Plastic Carrying Case.
MN/6180-070	T-5	Reflective Tape 5 foot roll, 0.5" wide

Monarch LED Stroboscopes

NEW

Nova-Strobe

- Brightest portable LED strobes available
- For diagnostic inspection and RPM checks
- Digital LCD backlit display (DBL, PBL models)
- Lightweight design with tripod mount bushing (¼-20) in handle
- 12 button keypad for quick entry of flash rates (DBL, PBL)
- NIST certificate included with DBL and PBL models
- Continuous, 24/7 operation (PBL)



Nova-Strobe DBL



NOVA-STROBE SPECIFICATIONS

	BBL Basic	DBL Deluxe	PBL Phaser
Flash Range (FPM/RPM):		30-500,000	
Display:	6 digit numeric and 5 digit alphanumeric LCD		
Accuracy/Resolution:	0.002% of setting or ±1 least significant digit/ 0.01 FPM		
Light Output:	3000 Lux @ 6000 FPM, 8 inches (20cm), 2% duty cycle		
Flash Duration:	Adjustable to 14 degrees /3000µsecs max		
Light Source:	12 LED Array		
Color Temperature:	6300°K		
External Triggers in/out:	N/A	TTL (24Vdc Max) Input. Provides 3.3 Vdc TTL output	
Tachometer Mode:	N/A	0-500,000 RPM (Use with optional remote sensor)	
Programmable Memory:	N/A	Yes	
Internal Phase Shift:	N/A	Yes	
Phase Delay - Degrees:	N/A	0.1 to 359.9 degrees	
Time Delay (milliseconds):	N/A	0.01 to 1000 msec.	
Virtual RPM (Slow Motion):	N/A	0-200 VRPM	
Operating Time (AC power):	N/A	continuous	
Operating Time (battery power):	8-10 hours typical @ 1800 FPM		
Batteries:	Internal NiMH rechargeable (120/240V charger included)		
Size (L x W x H)/Weight:	Body: 9" x 3.66" x 3.56" (229 x 93 x 90 mm); Reflector Housing: 4.8" (122mm) dia.; Handle: 4.254" (108 mm long) / 1.9 Lbs (860g)		

Nova-Strobe industrial stroboscopes provide a bright, uniform light output. The twelve LED source is extremely efficient, which means long battery life & continuous cool operation. A wide operating range of 30-500,000 flashes per minute covers all applications. The Basic BBL is designed for simple stop motion inspection and RPM measurements. The Deluxe DBL adds internal phase shifting, memory for 5 preset flash rates, NIST calibration certificate and tachometer mode for speed measurements up to 500,000 RPM using optional remote sensors or TTL pulse input. The top of the line Phaser PBL has all the features of the DBL plus external phase delay, time delay & virtual RPM mode. The PBL will also run continuously with the power supply/recharger.

Pocket LED Strobe

- Intuitive one hand operation
- Extremely bright, uniform light
- Quiet/Cool operation
- Digital LCD backlit display
- Compact size, long battery life
- Tripod mounting bushing (¼-20)
- No lamp replacements
- NIST Certificate included

PLS



ORDERING INFORMATION

Catalog No.	MODEL	DESCRIPTION
MN/6230-010	Nova-Strobe BBL	BBL Strobe, universal 115/230 recharger with interchangeable wall plugs & manual
MN/6230-011	Nova-Strobe BBL Kit	Same as above with plastic latching carry case
MN/6231-010	Nova-Strobe DBL	DBL Strobe, universal 115/230 recharger with interchangeable wall plugs, manual & NIST Cert
MN/6231-011	Nova-Strobe DBL Kit	Same as above with plastic latching carry case
MN/6232-010	Nova-Strobe PBL	PBL Strobe, 115/230 power supply/recharger with USA and Euro cables, manual & NIST Cert
MN/6232-011	Nova-Strobe PBL Kit	Same as above with Deluxe water tight plastic carry case
MN/6235-010	PLS	Pocket LED Strobe, 115/230 VAC recharger with interchangeable wall plugs, manual & NIST Cert
MN/6235-011	PLS Kit	Same as above with latching carry case
Accessories		
MN/6180-029	ROLS-P	Remote optical laser sensor with 8 ft cable, 1/8" phone plug & 12" reflective tape
MN/6280-048		Protective rubber cover for Nova-Strobes
MN/6280-040		Standard latching carry case for Nova-Strobes
MN/6280-073		Protective carry pouch with belt hook for PLS
MN/6180-070	T-5	Reflective Tape 5 foot roll, 0.5" wide

PLS SPECIFICATIONS

Light Source:	7 LED Array
Avg. Light Output:	1800 Lumens at 6000 FPM 8" from lens
Color Temp:	5600°K
Power:	Li-Ion rechargeable batteries 3.6Vdc
Run Time:	5-6 hours typical at 6000 FPM
Charge Time:	4-5 hours typical with supplied charger
Memory:	5 user settable memory locations
Flash Duration:	Adjustable 0.5 to 2500 µsec or 0.1 to 18 deg. of rotation (auto adjusts with flash rate)
Internal Mode:	
Flash Range:	30-300,000 FPM (Flashes per minute), 0.5 to 5000Hz
Accuracy:	0.005% of setting or ± last digit
Resolution:	0.01 to 1 FPM (menu selectable), 0.1 FPM resolution above 9,999.99 FPM, 1 FPM resolution above 99,999.9
External Modes:	
Flash Range:	0-300,000 FPM, 0 to 5000Hz
Tachometer Mode:	30 to 300,000 RPM
Accuracy:	±0.005% of reading or ± last digit
Display Update:	0.5 second typical above 120 RPM
Trigger to Flash:	~15 µsec delay
External Input:	2.5-12V peak pulse, 500ns min pulse width, pos. or neg. edge triggered (menu selectable)
Pulse In to Out Delay:	<0.2µsec
Output Pulse:	3V pulse. One pulse per flash in internal mode. Mimics input pulse in external mode
LCD Display:	6 digit numeric plus 5 digit alpha-numeric
Indicators:	Battery level, On Target, Select, TACH, EXT icons
Dimensions:	7.75" x 2.75" x 2.3" (197 x 70 x 58 mm)

Amprobe Tachometers

- Measures rotational and surface speed
- Contact and non-contact measurement
- Select rpm using infrared beam or adapter: m/min, m/sec, ft/min, ft/sec, in/min, m, ft, in
- Stores maximum, minimum, average & last measurement
- Auto power off function

Includes 6 adapters, carrying case, reflective tapes, 2 AA batteries and user manual

TACH20


SPECIFICATIONS

Measuring Ranges:			
Optical	1 - 99999 RPM		
Mechanical	1 - 19999 RPM		
Speed	\varnothing 01 m	\varnothing 6"	\varnothing 12"
m/min	0.10 - 1999	0.10 - 1524	0.40 - 609.6
ft/min	0.40 - 6550	0.40 - 5000	0.40 - 2000
in/min	4.00 - 78700	4.00 - 60000	4.00 - 24000
m/sec	0.10 - 33.30	0.10 - 25.40	0.10 - 10.16
ft/sec	0.10 - 109	0.10 - 83.33	0.10 - 33.30
Length	0 - 99999 m / 0 - 99999 ft / 0 - 99999 in		
Accuracy	$\pm 0.02\%$ of reading ± 1 digit		
Sensing Distance	600 mm / 24 in max. (optical)		
Operating Temp.	0 to 50°C (32 to 122°F)		
Housing Material	ABS		
Dimensions	175 x 60 x 28 mm (7 x 2.5 x 1 in)		

- Measures rotational & surface speed
- Non-contact measurement in RPM
- Contact measurement in RPM, m/min, ft/min, yd/min (user selectable)
- 5 digit display
- Auto power off function

Includes cone & funnel contact tips, reflective tape, 9V battery, user manual

SPECIFICATIONS

Measuring Ranges:	
Rotation	10.0 - 99999 RPM (Non-contact) 10.0 - 19999 RPM (Contact)
Surface Speed (Contact)	1.0000 - 9999.9 m/min 3.0000 - 30,000 ft/min 1.0 - 10,000 yd/min
Resolution:	
RPM	0.001/0.01/0.1/1
M/Min	0.0001/0.001/0.01/0.1
Ft/Min	0.0001/0.001/0.01/0.1
Yd/Min	0.0001/0.001/0.01/0.1
Accuracy	$\pm(0.1\%$ of rdg. +2 digit)
Measure Distance	5-30 cm / 2-13 inches (non-contact)
Sampling Time	1 second (>60RPM), >1 second (10~60RPM)
Operating Temp.	0 to 50°C (32 to 122°F), < 80% RH
Dimensions	267 x 178 x 82 mm (10.5 x 7 x 3.2 in)


TACH-10

ORDERING INFORMATION

AB/TACH20	Combo Tachometer
AB/TACH-10	Contact / Non-Contact Tachometer

Monarch Palm Strobe

- One touch tuning
- Flash rates to 12500 FPM
- Tachometer mode
- TTL compatible input/output
- Memory recall
- Rechargeable battery

Four quadrant joystick button adjusts flash rate, x2, +2.



SPECIFICATIONS

Operating Modes	Internal 100-12500 FPM External 5-12500 FPM Tach 5-250000 RPM
Battery Run Time	1 hour typical
Display	6 digit backlit LCD

ORDERING INFORMATION

MN/6205-050	Palm Strobe, with charger & NIST certificate
MN/6205-053	Palm Strobe Kit (Strobe, charger, NIST cert., spare battery, spare lamp, holster & case)
MN/6280-044	Protective Rubber Boot

Exttech Tachometer

NEW

- Measures RPM & surface speed
- Pocket size
- Laser guided non-contact measurements to 4.9 ft
- Reversible 5 digit LCD display
- Min/Max/Last reading memory

Complete with cone tip and wheel for rpm or linear surface speed, four AAA batteries, and reflective tape.



SPECIFICATIONS

Range	5 to 99,999 rpm (photo mode) 0.5 to 19,999 rpm (contact mode)
Surface Speed (Contact mode)	2.0 to 78,740 inches/min 0.2 to 6560 ft/min 0.05 to 1999.9 m/min
Accuracy	$\pm(0.1\%$ rdg +1 digit)
Sampling Time	1 sec
Resolution	0.1rpm (<1000 rpm); 1rpm (>1000 rpm)

ORDERING INFORMATION

EX/RPM40	Pocket Laser Photo/Contact Tachometer
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Extech Tachometers

Combination Laser Tach & IR Thermometer

- Built-in laser thermometer measures surface temperature of moving parts
- Fixed 0.95 emissivity, 6:1 distance to target ratio
- Non-contact photo tach measures to 6.5ft (2m)
- Contact tach for RPM & linear speed
- Min/Max/Last memory
- Complete with tips/wheel, AA batteries, reflective tape, carrying case

RPM10 ▶


Contact/Laser Photo Tachometer

- Laser guided non-contact measurements to 6.5ft (2m)
- Characters on display reverse for easy reading (photo/contact mode)
- Hold button stores last reading for 5 minutes
- Min/Max memory
- Complete with wheels, AA batteries, reflective tape, carrying case

461995 ▶


SPECIFICATIONS

Display	99999 counts
Range	
rpm	10 to 99999 photo 0.5 to 20000 contact
ft/min	0.2 to 6560
m/min	0.05 to 1999.9
Accuracy	±0.05% ±1d
Resolution	0.1 rpm
Laser	-4 to 650 °F / -20 to 315 °C (RPM10 only)
Dimensions	8.5 x 6.1 x 1.5" (216x66x38mm)

ORDERING INFORMATION

EX/RPM10	Combination Tachometer + IR Thermometer
EX/461995	Contact/Laser Tachometer
EX/461937	Reflective Tape 10pcs 1/4"x23"
EX/461990	Contact Wheels (cone tip, flat tip)

Extech Light Meters


Model EA30 Wide Range Light Meter

- Measures up to 40,000Fc & 400,000Lux
- Large display with bargraph
- Relative function for zero or difference from reference value
- Peak captures light pulses to 100ms
- Data hold & Min/Max store
- Complete with AAA batteries, light sensor and protective cover with 39" (1m) cable, built-in stand, protective holster & carrying case


Model EA31 EasyView® Big Digit Light Meter

- Measures up to 20,000Fc/20,000 Lux
- 0.01Fc / 0.01Lux resolution
- 2000 count display with bargraph
- Data hold & Min/Max store
- Complete with AAA batteries, light sensor and protective cover with 39" (1m) cable, built-in stand, protective holster & carrying case


Model 407026 Heavy Duty Light Meter with PC Interface

Enhance accuracy by selecting one of four lighting types plus PC interface

- % displays differential from reference point
- "ZERO" Re-Calibration
- Selectable lighting type Tungsten/Daylight, Fluorescent, Sodium, Mercury
- Data hold, Min/Max/Avg readings
- Auto power off
- Optional Data Acquisition software (407001) and Datalogger (380340)
- Complete with 9V battery, light sensor and protective cover with 3.8ft 1.2m cable, and protective holster with stand. Optional 117V or 220V AC adaptors.

SPECIFICATIONS

Model	EA30	407026
Display counts:	4000 (LCD)	2000 (LCD)
Range: Fc	40, 400, 4000, 40000	200, 2000, 5000
Lux	40, 400, 4000, 40000, 400000	2000, 20000, 50000
Max. Resolution:	0.01Fc/0.01Lux	0.1Fc/Lux
Basic Accuracy:	±3% rdg ±0.5% FS	±4% FS
Cosine & Color Corrected:	Yes	Yes
RS-232 Interface:	—	Optional 407001
Datalogging:	—	Optional 380340
Dimensions:	5.9 x 2.8 x 1.4" (150x72x33mm)	7 x 2.9 x 1.3" (178x74x33mm)

ORDERING INFORMATION

EX/EA30	Wide Range Big Digit Lightmeter
EX/EA31	Big Digit Lightmeter
EX/407026	Heavy Duty Lightmeter
EX/407001	Data Acquisition Software & Serial Cable for 407026
EX/156119	117VAC Adaptor for 407026
EX/409997	Large Soft Vinyl Pouch Carrying Case for 407026
EX/407001	Data Acquisition Software & PC Serial Cable
EX/380340	Data Logger w/8000 Reading Storage, PC Software, Serial Cable

Yokogawa Clamp-on Process Meter

Measure 4 to 20mA DC signals without breaking the loop

- 0.2% Accuracy, 0.01mA Resolution
- Dual Display with Backlight
- LED Spot Light
- Analog Output



SPECIFICATIONS

Measurable Conductor:	6mm diameter max.		
DC Current:	Measuring Range	Measuring Accuracy	
	20.00 mA Range:	0.00 to ±21.49mA	±(0.2%rdg +5dgt)
	100.0 mA Range:	±21.0 to ±126.0mA	±(1.0%rdg +5dgt)
Analog Output:	Output Range	Output Accuracy	
	20.00 mA Range:	0.0 to ±214.9mV DC	Measuring Accuracy +0.5mV
	100.0 mA Range:	±210 to ±1260mV DC	Measuring Accuracy +3mV
Display:	4-digit LCD numeric display		
Response Time	Approx. 1.5 seconds (2.5 seconds when across the range)		
Range Switching:	Auto range		
Operating Temperature:	-10°C to +50°C, <80% RH (non-condensing)		
Safety Standards:	EN61010-1, EN61010-2-030, EN61010-2-032		
Withstanding Voltage:	2.21kV AC for 5 seconds (between the core and the case)		
Power:	Four AA-size alkaline batteries (1.5V LR6)		
Battery Life:	Approx. 60hrs (continuous) with backlight off and LED light off		
Other Functions:	Data hold, Zero adjust function, Auto power off, LED spot light, Back light display, Illuminant panel		
Dimensions:	Meter: 61 x 111 x 40 mm; Probe: 104 x 34 x 20 mm w/ 700 mm cable		

ORDERING INFORMATION

YE/CL420	Clamp-on Process Meter with batteries, manual & soft case
YE/98076	Analog Output Cable (banana plugs)
YE/98077	Analog Output Cable (for screw terminals)

Yokogawa Light Meters

Model 51011 & 51012 Digital Light Meters

- Measure to 999,000 lux
- Wide measurement range, high accuracy
- Spectral response characteristics for visible range
- Good oblique incident light characteristics
- Recorder output & USB digital output

51011
51012 ▶



◀ **51021**

Model 51021 Multi Function Light Meter

Model 51012 Features plus:

- Color correction coefficient setting
- Light source brightness measurement
- Mean brightness calculation

ORDERING INFORMATION

YE/51011	Digital Light Meter (5 ranges)
YE/51012	High Accuracy Digital Light Meter (5 ranges)
YE/51021	Multi Function Light Meter (6 ranges)

SPECIFICATIONS

Measuring Range:	51011& 51012:	0.0 to 99.9/999/9,990/99,900/999,000lx
	51021:	0.00 to 9.99/99.9/999/9,990/99,900/999,000lx
Standard Conformance:	510011, 51012:	JIS C1609-1 2006 class A
	51021:	JIS C1609-1 2006 class AA
Functions	51011, 51012:	Response switching, Range Hold, Timer Hold, Deviation display, Auto off.
	51021:	Response switching, Range Hold, Timer Hold, Deviation display, Auto off, Color correction factor setting, Average illuminance computation, Ripple measurement, Light source luminous intensity measurement, Measurement of totalized intensity of illumination.

Model	51011	51012, 51021
Accuracy:	±4% rdg ±1dgt (under 3000lx) ±6% rdg ±1dgt (over 3000lx)	±2% rdg ±1dgt (under 3000lx) ±3% rdg ±1dgt (over 3000lx)
Fatigue Characteristics:	±2%	±1%
Temperature Characteristics:	±5%	±3%
Characteristics of Oblique Incident Light: (deviation from cosine law)	Angle of: 10° ±1.5%	Angle of: 10° ±1%
	30° ±3%	30° ±2%
	60° ±10%	50° ±6%
	80° ±30%	60° ±7% 80° ±25%

Visible-Spectrum Response: (deviation from standard spectral luminous efficiency)	f1' within 9 %	f1' within 6 %
---	----------------	----------------

General Specifications (all models):

Photoelectric Element:	Silicon photodiode
Display:	7 digit liquid crystal display; maximum effective display: 999
Measurement Rate:	Twice per second
Response Time:	Automatic range: 5 sec; Manual range: 2 sec
Operating Temperature:	-10 to 40°C, <80% RH, non-condensing
Communication:	USB (Mini-b 5pin)
Output:	DC 1V ±5% (fixed range); 100kΩ min. load resistance
Dimensions:	67 x 177 x 38 mm
Power:	Two AA (LR6) batteries or USB supply (5VDC ±5%)
Accessories Included:	Instruction manual, battery, soft case, recorder output plug

Bacharach Combustion Analyzers & Leak Detectors

Carbon Monoxide Analyzer

- Measures CO with 1ppm resolution
- Highly visible digital display with backlight
- Probe and hose assembly for flue gas testing
- Optional IrDA printer

Monoxor III



SPECIFICATIONS

Range:	0 - 2000 ppm
Accuracy:	± 5% of reading or 10 ppm, whichever is greater
Probe:	1000°F (538°C) max at 5" insertion
Warm Up:	60 seconds
Display:	Four-digit LCD display w/backlight
Power:	4 AA Alkaline batteries (18 hour life)
Printer Port:	Wireless, IrDA or HP protocol
Size & Wgt:	7.5 x 3.1 x 2.1" (16 oz. with batteries)
Warranty:	2 years, including sensor

Combustible Gas Leak Detector

- Visual & audible indicators
- 2 sensitivity levels
- 12" probe with plug-in sensor
- Automatic calibration
- UL913 classification

Leakator Jr.



SPECIFICATIONS

Indicators:	Variable rate flashing red, variable speed audible ticking
Sensitivity:	20ppm in high mode, 50ppm in low mode
Warm-up:	60 seconds, flashes green when ready
Power:	4 AA alkaline batteries (14 hours life)
Temperature:	0-40°C operating
Size & Wgt:	Handheld, 6 x 2 x 1.5" (6oz)
Safety:	UL913 Class I, Div 2, Group A,B,C,D locations

Refrigerant Leak Detector

- Detects all CFC, HFC & HCFC refrigerants
- Patented heated diode sensor
- Visual & audible indicators
- Automatic zero & background correction
- 2 sensitivity levels



Tru Pointe

SPECIFICATIONS

Indicators:	Variable intensity audible & visual
Sensitivity:	0.1 oz/yr for R134a (hardest to detect)
Sensor Life:	1 yr of normal use (150 hours)
Probe:	14" flexible, with plug-in sensor
Power:	2 D alkaline batteries (8-13 hr life)
Size & Wgt:	2 x 9.4 x 2.5" (1.2 lbs with batteries)
Approvals:	UL listed to SAE J1627

Combustion Analyzer

- Measures CO, O₂, stack temperature, ambient temperature
- Calculates CO₂, combustion efficiency, excess air, CO free air
- 10 record data storage
- Easy to use, quick sensor replacement
- 2 year warranty (1 year on O₂ probe)

Fyrite InTech



SPECIFICATIONS

Measurement Ranges

Flue Gas:	-4 to 1202°F (-20 to 650°C)
Ambient:	23 to 113°F (-5 to 45°C)
Oxygen:	0.0 to 20.9% O ₂
Carbon Monoxide:	0 to 2000 ppm CO

Calculated Ranges

Combustion Efficiency:	0.1 to 99.9%
Carbon Dioxide:	0.1 to a fuel dependent maximum (in %)
CO Air Free:	0 to 9,999 ppm
Excess Air:	0 to 250%

Selectable Fuels:	Natural Gas, Oil #2, Oil #6, Propane, Kerosene
Power:	4 AA alkaline (20 hours life)
Size & Wgt:	8.0 x 3.6 x 2.3" (16 oz. with batteries)

Includes angled probe/hose, batteries & soft carrying case.

Dual Purpose Leak Detector

- Detects refrigerants & combustible gases
- Swap sensors in seconds
- Sensitivity automatically adjusted
- 0.2" probe tip fits into tight spaces
- Filter prevents moisture contamination
- Dual LED displays for easy viewing
- Optional rubber boot holds flashlight



Informant 2

SPECIFICATIONS

Indicators:	Audible, sequential LEDs & flashing probe tip
Detection:	All CFC, HCFC & HFC refrigerants, all combustible gases & vapors
Sensor:	Located at probe tip for fast response & quick changeover
Sensitivity:	0.25 oz/yr of R134a (hardest to detect), 50ppm of methane
Warm-up:	10 seconds
Power:	4 AA alkaline batteries (5 hr life)
Size & Wgt:	1.8 x 9.7 x 2.3" with 20" probe
Approvals:	UL listed to SAE J1627, MET lab certified to UL913, intrinsically safe for Class 1, Div. 1, Group D hazardous locations

Includes batteries, refrigerant & gas sensors, sensor tips, filters and carrying case.

ORDERING INFORMATION

BA/19-8104	Monoxor III CO Analyzer
BA/24-8511	Fyrite InTech CO, O ₂ Combustion Analyzer
BA/19-7075	Leakator Jr. Combustible Gas Leak Detector
BA/19-8038	Informant 2 Dual Detector Contractor Kit
BA/19-8106	Tru Pointe Refrigerant Leak Detector

Megger® Hand-Held TDR / Cable Length Meter

- Measures length of power, telephony, CATV & LAN cables
- Determines distance to an open or short
- Automatic impedance control (25, 50, 75, 100, 125, 150W)
- Internal library of 39 standard cable types
- Memory for 20 custom cable settings
- Tone generator for cable tracing
- Large, high resolution backlit LCD display

Additional Features:

Cable Calibration function allows measurement of V.O.P. (Velocity Of Propagation) in a known cable length. Requires at least a 30ft (10m) sample.

Line Voltage Detection feature displays "OUCH" message and stops operation if voltage exceeds 6.5V.


TDR-900

Supplied with soft carrying case and alligator clip adapter.

SPECIFICATIONS

Range:	12000 ft (3.7km) at 99.9 V.O.P. 9800 ft (3.0km) at 80.0 V.O.P. 8000 ft (2.4km) at 66.0 V.O.P. 6200 ft (1.9km) at 50.0 V.O.P.
Accuracy*:	±2% of rdg ±20" at <300 ft ±2% of rdg at >300 ft
Resolution:	20 inches (50cm)
V.O.P.:	adjustable from 1.0% to 99.9% of the speed of light
Connector:	BNC
Power:	4 AA batteries
Battery Life:	5000 tests
Operating Temperature:	-18°C to 60°C

* at 20°C for coax cables <8000 ft, telephony cables <6000 ft, wiring <3000 ft

ORDERING INFORMATION

ME/TDR900 Hand-Held TDR/Cable Length Meter

Megger® Hand-Held TTR


TTR20

SPECIFICATIONS

Excitation Voltage:	8 V rms for testing distribution or power transformers & PTs; 0.5, 1.5, or 8 V ac rms for testing CTs (switched automatically if current exceeds a preset value)
Test Frequency:	55 Hz
Excitation Current:	Range 0 to 100 mA, 4-digit resolution
Turns Ratio Range:	0.8 to 10000, 5-digit resolution
Transformer Polarity:	Normal or reversed
Current Accuracy:	2% of reading ±1 digit
Turns Ratio Accuracy:	0.1% (0.8 to 2000) 0.15% (2001 to 4000) 0.25% (4001 to 10,000)
Measuring Time:	Less than 5 seconds
Measurement Method:	ANSI/IEEE C57.12.90
Phase Relationship:	ANSI C57.12.70-1978
Display:	Graphic LCD, adjustable back-lighting
Safety/EMC/Vibration:	IEC-1010-1, CE and ASTM D999.75
Operating Temperature:	-20° C to 55° C (-5° F to 130° F), < 90% RH non-condensing
Power:	Six standard AA alkaline batteries
Battery Life:	12 hours of field operation
Dimensions:	9.5" H x 4.5" W x 1.9" D (240x115x50 mm)

ORDERING INFORMATION

ME/TTR20	Handheld TTR with 6ft (1.8m) test leads
Optional Accessories	
ME/35942	Test leads, X/H winding, 12ft (3.6m)
ME/36013	Test leads, X/H winding, 20ft (6m)
ME/35755-1	Battery/line power thermal printer with paper, battery pack, charger, interface cable
ME/35788	Semi-hard fabric transport case

- Single- and three-phase transformer testing
- Fully automatic; fast; easy-to-use; robust; lightweight
- Battery powered
- Tests turns ratio, excitation current and polarity
- Simple, one-button operation
- Quick-start guide on front panel

Megger Time Domain Reflectometers

Dual Cursor Hand-Held TDR

- Single trace display with dual cursors
- Auto set-up for instant use
- 2 ns pulse width virtually eliminates dead zones
- Trace HOLD with live trace overlay
- Designed for use on all metallic cable pairs
- Last setting memory
- IP54 rating
- Three-year warranty

CFL510G ▶



Hand-Held TDR

- Simple handheld operation
- AUTO selection of gain & pulse width
- Ultra fast pulse for near end fault identification
- Trace HOLD feature
- IP54 rating
- Designed for use on all metallic cable pairs
- Three-year warranty

TDR500/3 ▶



SELECTION GUIDE

Model	TDR900 *	TDR500/3	CFL510G
Measurement Ranges (ft):	6200-12000 4 ranges	30-15000 7 ranges	
Display:	Numeric	Graphic LCD	
Dual Cursors:	----	----	✓
Fault Location Modes:	1	1	3
Accuracy:	±2 %	±1 %	
Resolution:	20 in. (50 cm)	1% of range	
Gain:	----	3 steps	
Velocity Factor	1.0 to 99.9%	0.2 to 0.99	
Output Impedance (Ω):	25, 50, 75, 100, 125, 150	25, 50, 75, 100	
Output Pulse:	7 ns - 3 μs	25 ns - 3 μs	2 ns for near fault
Pulse Amplitude:	5 V pk-pk	5 V pk-pk	5 V pk-pk
Low Battery Warning	✓	✓	✓
Backlight	✓	✓	✓
TX Null	----	✓	✓
Channels	1	1	1
Rating:	IP42	IP54	IP54

* see page 173 for specifications and ordering information

ORDERING INFORMATION

ME/CFL510G	Dual Cursor Hand-Held TDR w/ battery, case & test leads
ME/TCDR500/3	Hand-Held TDR with battery, case & test leads
ME/1002-015	Fused test lead set

SPECIFICATIONS

Range:	10/25/100/250/1000/2500/5000 m (30/75/300/750/3000/7500/15000 ft)
Accuracy:	±1% of range ± pixel at 0.67 VF *
Resolution:	1% of range
Input protection:	Complies with IEC61010-1 for connection to live systems up to 150 V CAT IV when used with the optional fused test lead set.
Output pulse:	5 volts pk-pk into open circuit. Pulse widths determined by range and cable.
Gain:	Set for each range with three user selectable steps (in manual operating mode)
Velocity factor:	Variable from 0.2 to 0.99 in steps of 0.01
TX null:	Automatic
Power down:	Automatic after 5 minutes with no key press
Backlight:	Stays on for 1 minute with no key press
Battery:	Five LR6 (AA), Manganese alkali or nickel metal-hydride cells
Battery life:	Up to 14 hours (typical)
IP rating:	IP54 for use indoors or outdoors
Dimensions:	230 x 115 x 48 mm (9 x 0 x 4.5 x 2.0 inches)
Connectors:	Two 4 mm-safety terminals
Test lead:	1.5 meter long consisting of 2 x 4 mm shrouded connector to miniature crocodile clips
Display:	256 x 128 pixel Graphics LCD
Temperature range:	-15 °C to +50 °C (5 °F to 122 °F) operating

* Measurement accuracy is for the indicated cursor position only and is conditional on the velocity factor being correct.

Megger Irradiance Meter & Photovoltaic Kit

NEW



- Optimal incident angle & positioning of solar panels
- Measure solar power for panel short calculation
- 3¾ digit LCD display with 1999 W/m² range
- Mini pocket size with built-in detector
- One hand use, with Display Hold
- Standard camera mount

◀ **PVM210**

PVK330 ▶



The Megger PVK330 Photovoltaic Kit features the PVM210 with the DCM340 AC/DC Clampmeter. The kit includes a set of 4 ft. red and black test leads (4mm instrument plugs to MC4 solar connectors) and MC4 to MC3 adapters. Leads are rated 19A 1000V. A zipped pouch is provided to store the instruments and leads.

SPECIFICATIONS

Display:	3¾ digits LCD with maximum reading 3999
Range:	1999 W/m ² / 634 BTU / (ft ² *h)
Accuracy:	Typically within ± 10 W/m ² (±3 BTU / (ft ² *h)) or ±5%, whichever is greater in sunlight;
Temperature coefficient:	±0.38 W/m ² /°C (±0.12 BTU/(ft ² *h)/°C) from 25 °C
Angular accuracy:	Cosine corrected <5% for angles <60 °C
Accuracy:	<±3% per year
Resolution:	0.1 W/m ² / 0.1 BTU / (ft ² *h).
Sampling time:	Approx. 0.25 second
Over input:	Display shows "OL"
Operating temperature:	5 °C~40 °C, below 80% RH
Dimensions:	134 mm (H) x 48 mm (W) x 27 mm (D)
Battery life:	50 hr approx from 2 x 1.5 V AAA / MN2400
Auto off:	15 min.

Includes test leads, test probes, alligator clips, protective holster & batteries.

ORDERING INFORMATION

ME/PVM210	Irradiance Meter
ME/PVK330	Photovoltaic Kit

TEST
EQUIPMENT

Extech Sound Level Meters

- Two range meter with backlit LCD display
- Measures 35 to 130dB
- Meets ANSI & IEC 651 Type 2 standards
- Data Hold & Max Hold functions
- NIST certification available

Applications:

- Product noise testing
- Installing audio system
- Meeting OSHA safety issues
- Enforcing community noise ordinances

407732 ▶



SPECIFICATIONS

Basic Accuracy	±1.5dB
Display	2000 count backlit LCD
Microphone	0.5" condenser type
Power	9V battery
Dimensions	8.2 x 2.1 x 1.25" (210x55x32mm)

ORDERING INFORMATION

EX/407732	Digital Sound Level Meter
EX/407732-NIST	Digital Sound Level Meter with NIST Cert

- Easy to use analog meter
- Measures 54 to 126dB in 7 ranges
- Selectable A or C weighting
- Fast or slow response
- Analog output for recorder or datalogger
- Battery check
- Tripod mount

407730 ▶



CE

SPECIFICATIONS

Basic Accuracy	±2dB @94db, 1000Hz
Analog Output	AC: 0.707V rms
Microphone	Built-in 0.5" Electret condenser type
Power	9V battery
Dimensions	7.1 x 2.7 x 1.4" (180x68x36mm)

ORDERING INFORMATION

EX/407703A	Analog Sound Level Meter
EX/407703A-NIST	Analog Sound Level Meter with NIST Cert

Extech Testers

Battery Powered Milliohm Meter

- Four terminal Kelvin measurements
- Resolution to 100μΩ
- 20V test voltage
- Large LCD display
- Invalid test indicators
- Auto-Hold and Auto-Off features
- Built-in water resistant case with shoulder strap

Complete with AA batteries, leads with 4 alligator clips, leads with 2 Kelvin alligator clips

▶ **380580**



SPECIFICATIONS

Range	Resolution	Current	Accuracy
200mΩ	0.1mΩ	100mA	±(0.5% +2d)
2000mΩ	1mΩ	100mA	±(0.5% +2d)
20Ω	0.01Ω	10mA	±(0.5% +2d)
200Ω	0.1Ω	10mA	±(0.5% +2d)
2000Ω	1Ω	100mA	±(0.5% +2d)

Dimensions: 9.8 x 7.5 x 4.3" (250x19x110mm)

Battery Capacity Tester

- Checks battery condition in seconds while the battery is in service
- Simultaneously measures battery resistance and voltage
- Built-in datalogger stores up to 999 tests

Includes PC interface cable, software, test leads and AAA batteries

▶ **BT100**



SPECIFICATIONS

Resistance Ranges:	40mΩ, 400mΩ, 4Ω, 40Ω
Resistance Accuracy:	±(1% reading + 8 digits)
Voltage Ranges:	4V, 40V
Voltage Accuracy:	±(0.1% reading + 6 digits)
Display:	4000 count LCD, dual readout
Input Voltage:	50VDC max.
Battery Life:	7 hours
Dimensions:	9.75" x 4" x 1.75" (250 x 100 x 45 mm)

ORDERING INFORMATION

EX/380580	Battery Powered Milliohm Meter
EX/BT100	Battery Capacity Tester
EX/BT102	120V AC Adapter for BT100

Amprobe Testers

SOLAR POWER METER



- Measures Solar Power and Transmission
- Reads up to 2000 W/m² or 634 BTU/(ft² x h)
- Large Display & Separate Sensor
- Displays Transmission Percentage
- MAX/MIN & Data Hold

◀ **SOLAR-100** CE

Optimize the placement of solar systems and verify window efficiency.

SPECIFICATIONS

Measurement Range:	1999 W/m ² , 634 BTU/(ft ² x h)
Display:	3½ digits, 2000 counts
Sampling Time:	Approx 0.25 second
Accuracy:	Typically within ±10W/m ² [±3 BTU/(ft ² x h)] or ±5%, whichever is greater in sunlight
Angular Accuracy:	Cosine corrected < 5% for angles < 60°
Battery:	9V alkaline included
Operating Temperature:	5-40°C (41-104°F), <80%RH (non-condensing)
Dimensions:	5.2" x 2.4" x 1.5" (132x60x38 mm)

PSYCHROMETER

- Temperature, RH, Dew Point & Wet Bulb Measurements
- Extended Flex Probe
- Dual Display with Backlight
- MAX/MIN & Data Hold
- Tripod Mountable

CE

▶ **THWD-5**



SPECIFICATIONS

Range:	RH: 0 to 100% Temperature: -10 to 60°C (14 to 140°F) DP: -73.4 to 59.9°C (-100 to 139.8°F) WB: -13.4 to 59.9°C (7.88 to 139.8°F)
Accuracy:	RH: ±3% from 10 to 90% at 25°C and ±5% for others Temperature: ±0.6°C (±1°F)
Response Time:	60 seconds
Resolution:	0.1°C / 0.1°F
Temperature:	0 to 50°C (32 to 122°F) operating, up to 100% RH
Battery (Life):	Four AAA (100 hrs w/o backlight, 50 hrs w. backlight)
Dimensions:	6.9" x 2.8" x 1.3" (175x70x33 mm)
Included:	Hard carrying case, batteries, probe

NON-CONTACT AC VOLTAGE DETECTOR

- Visual & Audible Indication
- Measure to 122kV
- Self-test Verification
- Drop Proof to 6 ft



▶ **TIC 300 PRO** CE

SPECIFICATIONS

Voltage Range:	30-1500 VAC 1500- 122,000 VAC (with Hot Stick TIC 410A)
Detection Range (typical):	2.7" @ 30 V, 18" @ 120 V, 28" @ 220 V, 50" @ 500 V, 75" @ 1000 V, 93" @ 1500 V
with Hot Stick:	1' 2" @ 1.5 kV, 2' 5" @ 2 kV, 6' 3" @ 10 kV, 9' 4" @ 25 kV, 14' 8" @ 75 kV, 22' @ 122 kV

NEW

SWIVEL CLAMP METERS

- 180° Rotating Head
- Measure to 400A AC, 600V AC/DC
- Resistance, Capacitance, Continuity
- One Hand Operation
- Auto & Manual Ranging
- Non-Contact Voltage Detection



▶ **ACD-20SW**

SPECIFICATIONS

DC Volts Ranges:	400mV, 4V, 40V, 400V, 600V
Accuracy:	±(0.5% rdg + 2 dgts)
AC Volts Ranges:	4V, 40V, 400V, 600V (50-500Hz)
Accuracy:	±(1.2% rdg + 5 dgts), [1.5% on 600V range]
AC Current Ranges:	40A, 400A (50-60Hz)
Accuracy:	±(2.0% rdg + 6 dgts)
Resistance Ranges:	400Ω, 4kΩ, 40kΩ, 400kΩ, 4MΩ, 40MΩ
Accuracy:	±(1.0% rdg + 4 dgts) on 400Ω to 400kΩ ranges
Continuity:	Audible indication less than 25Ω
Non-Contact Voltage:	Beeper & red LED for 70V to 600VAC (50-60Hz)
Other Features:	Diode test, display hold, auto power off, noise filter
Display:	3¾ digit LCD, maximum reading 3999
Temperature:	0 to 50°C (32 to 122°F) operating, <70% RH
Power (Life):	2 AAA batteries (alkaline 400 hrs)
Wire Diameter:	1.18" (30mm) max.
Dimensions:	12" x 5.3" x 1.2" (306x135x30 mm)
Rating:	CAT III 600V
Included:	Battery, test leads, carrying case

CAT IV ANALOG CLAMP METERS

- Measure to 1000A & 600V AC
- Resistance & Continuity
- Pointer Lock for Data Hold
- Operates Down to 5° F
- No Batteries Needed for Volts & Amps



▶ **RS-3 PRO** CE

SPECIFICATIONS

Display:	Analog scales with clamping needle
AC Voltage Ranges:	150 / 300 / 600 Vrms
Input Impedance:	1.5 MΩ
AC Amp Ranges:	6 / 15 / 40 / 100 / 600 Arms [1000 A on RS-1007 PRO]
Accuracy:	± 3% of Full Scale for Volts & Amps (50/60 Hz)
Ohms Range:	1000Ω, 25Ω mid-scale
Accuracy:	± 3 degrees of arc
Max. Wire Diameter:	1.64" (41mm) [1.88" (47mm) on RS-1007 PRO]
Power:	One AAA battery for resistance & continuity
Temperature:	-15 to 50°C (-5 to 122°F) operating, <80% RH
Dimensions:	RS-3 PRO: 10.3" x 4.0" x 1.6" (243x102x41 mm)
Safety LVD Rating:	CAT IV 600V AC

ORDERING INFORMATION

AB/SOLAR-100	Solar Power Meter
AB/THWD-5	Temperature, RH, Dew Point & Wet Bulb Meter
AB/TIC 300 PRO	Non-Contact AC Voltage Detector
AB/TIC 410A	Hot Stick Accessory for TIC 300 Pro (1.5-122 kV)
AB/ACD-20SW	400A Swivel Clamp Meter
AB/ACD-21SW	400A Swivel Clamp Meter w/ Temperature & Capacitance
AB/RS-3 PRO	CAT IV 600A Analog Clamp Meter
AB/RS-1007 PRO	CAT IV 1000A Analog Clamp Meter

Hioki Testers

MULTI-FUNCTION DMMS

- AC/DC Voltage & Current
- Resistance & Continuity
- 9999 count LCD display
- Min/Max, Average & Relative values
- 4-20 mA measurement converts to 0-100% display
- Optional RS-232C package for PC data transfer



SPECIFICATIONS

DC Volts:	4 ranges, 999.9mV to 999.9V ($\pm 0.3\%$ rdg $\pm 2d$)
AC Volts:	4 ranges, 999.9mV to 999.9V ($\pm 1.2\%$ rdg $\pm 5d$) 40-500Hz
Ohms:	6 ranges, 400.0 Ω to 40.00M Ω ($\pm 0.6\%$ rdg, $\pm 3d$)
DC Current:	6 ranges, 400.0 μ A to 10.00A ($\pm 0.2\%$ rdg, $\pm 3d$)
AC Current:	6 ranges, 400.0 μ A to 10.00A ($\pm 1.2\%$ rdg, $\pm 5d$) 50-2kHz
Other Functions:	Capacitance, Data hold, continuity ($<10\Omega$), diode check 3805: TRMS AC, freq to 50kHz, J&K thermocouples
Ranging:	Auto or Manual
Bar Display:	41 segment
Sample Rate:	3/sec (digital), 13/sec (bar)
Dimensions:	3" x 6.6" x 1.3" (76x167x33mm)
Accessories:	Test leads 3851-10, holster, battery

ORDERING INFORMATION

HK/3804-50	4-Digit DMM
HK/3805-50	4-Digit TRMS DMM

PHASE DETECTOR



- LED & Buzzer Indicate Phase Direction
- No Electrical Connection
- Live Wire Check (R-S, S-T)
- Battery Check & Auto Shut Off

3129

SPECIFICATIONS

Detection Method:	Electrostatic induction
Voltage Range:	70-600VAC, 50/60Hz
Max. Wire Size:	0.67" (17mm) dia., insulated wire
Standards:	Cat III, 600V
Dimensions:	2.76"W x 2.95"H x 1.18"D
Lead Length:	27" (0.7mm)

ORDERING INFORMATION

HK/3120	Voltage Detector, batteries included
HK/3129	Phase Detector, with carrying case & AA batteries
HK/3246	Pencil HiTester, battery included
HK/3280-10	Clamp-On HiTester, with leads, battery & carrying case
HK/3280-20	TRMS Clamp-On HiTester, with leads, battery & carrying case

VOLTAGE DETECTOR



3120



- Detect AC Voltage in Insulated Wires

SPECIFICATIONS

Voltage Range:	70-600VAC, 50/60Hz
Indication:	Red LED and continuous beep
Battery Check:	Green LED
Operating Temperature:	0 to 40 °C, <80%RH (non-condensing)
Standards:	CAT IV 600V, indoor use
Dimensions:	5.9" L x 0.7" dia (149 x 18.5mm)

CLAMP-ON HITESTERS



3280-20

- Slim Body for Easy Clamping in Narrow Spaces
- Independent-opening Double-lever Jaw
- Right or Left Hand Operation
- 4199 Count LCD
- True RMS Measurement (3280-20)



SPECIFICATIONS

Function	Range (Accuracy)
AC Amps:	3280-10: 42 / 420 / 1000A (50/60Hz; $\pm 1.5\%$ rdg $\pm 5d$), 3280-20: 42 / 420 / 1000A (45-66Hz: $\pm 1.5\%$ rdg $\pm 5d$) (40-45Hz or 66Hz-1kHz: $\pm 2.0\%$ rdg $\pm 5d$)
DC Volts:	420m / 4.2 / 42 / 420 / 600V ($\pm 1.3\%$ rdg $\pm 4d$)
AC Volts:	4.2 / 42 / 420 / 600V (50-500Hz, $\pm 2.3\%$ rdg $\pm 8d$)
Ohms:	420 / 4.2k / 42k / 420k Ω ($\pm 2.0\%$ rdg $\pm 4d$), 4.2M Ω (± 5.0 rdg $\pm 4d$), 42M Ω ($\pm 10.0\%$ rdg $\pm 4d$)
Continuity:	420 Ω ($\pm 2.0\%$ rdg $\pm 6d$), buzzer $<50\Omega$
Wire Size:	1.3" (33mm) max diameter
Allowable Current:	2000A AC rms max continuous
Overload Protection:	DCV/ACV: 600V DC/AC rms; Ω /Continuity: 250V DC/AC rms
Operating Temperature:	0 to 40 °C, <80%RH (non-condensing)
Standards:	CAT III 600V(AC A), CAT II 600V(AC/DC V)
Dimensions:	2.2"W x 6.9"H x 0.6"D

Hioki Testers

INFRARED THERMO HITESTER



Also in
HPK-1 Kit

- Pistol Style with Backlit LCD
- Laser Aiming Marker
- Selectable °F/°C
- Min/Max Function
- Upper/Lower Alarm Settings
- Stores 50 Measurements

3419-20

CE

SPECIFICATIONS

Measurement Range:	-35 to 500 °C (-31 to 932 °F)
Display Resolution:	0.1 °C (0.2 °F)
Wavelength:	6 to 14 μm
Emissivity:	0.17 to 1.00 by steps of 0.01
Field of View:	8 : 1 distance to spot
Sighting:	Red laser marker, 1 mW (class 2)
Accuracy:	-35.0 to -0.1°C : ± 10 % rdg. ± 2 °C 0.0 to 100.0°C : ± 2 °C 100.1 to 500.0°C : ± 2 % rdg.
Battery (Life):	9V alkaline (80 hrs with laser & backlight off)
Operating Temperature:	0-50°C (32-122°F), <80%RH (non-condensating)
Dimensions:	1.81" × 6.77" × 4.65" (46×172×118 mm)

LAN TESTER



- Verify Wire Destinations
- Detect Split Pairs
- Measure Cable Length
- Check Wire & Shield Condition

3665-10

CE

SPECIFICATIONS

Cable Types:	Twisted-pair, 100Ω shielded/unshielded, CAT 3, 4, 5, 5e, 6
Connectors:	RJ-45 plugs
Errors Detected:	Open, short, reversed, transposed, split pairs & miswires
Cable Length:	2-300 m, (6.6-984 ft) with 0.1 m (0.3 ft) resolution
Direction Check:	Up to 21 cables can be identified using the supplied 9690 terminator & optional 9690-01 to 9690-04
Display:	LCD with backlight & beeper
Switch:	Select between meters or feet
Battery (Life):	Two AA (50 hours)
Dimensions:	3.4" × 5.2" × 1.3" (85×130×33 mm)

PENCIL DMM

CE

3246



- Backlit 4199 Count LCD
- Data Hold, Continuity Beeper
- Auto or Manual Ranging
- Pushbutton Penlight

SPECIFICATIONS

DC Volts:	420m / 4.2 / 42 / 420 / 600V (±1.3 % rdg ± 4d)
AC Volts (50-500Hz):	4.2 / 42 / 420 / 600V (±2.3 % rdg ±8d)
Ohms:	420 / 4.2k / 42k / 420k / 4.2M / 42MΩ (±2.0 % rdg ±4d), plus diode check
Rating:	CAT III 600 V
Dimensions:	1.2" × 1.0" × 7.2" (31×26×84 mm)

NEW

TRMS AC CLAMP METER WITH LEAKAGE



- Measure to 200A TRMS AC
- Leakage with 10μA Resolution
- Recorder/Waveform Output
- Min/Max & Display Hold
- Switchable Filter

3283

CE

SPECIFICATIONS

AC Amps:	10.00 mA to 200 A, 5 ranges
Accuracy (50/60Hz):	±1.0 % rdg. ±5 dgt. (1.5 % on 200 A range)
Frequency Response:	40 Hz to 2 kHz (on AC Amps)
Frequency Measure:	100.0 or 1000 Hz, 2 ranges (±0.3 % rdg. ±1 dgt.)
Switchable Filter:	180 Hz ±30 Hz /-3 dB
Analog Output:	1 V /f.s, DC or AC mode
Display:	1000 count digital, 35 segment bargraph
Sampling Rate:	2 or 4 times/sec (Slow: 1 time/3 sec)
Crest Factor:	2.5 (1.5 on 200 A range)
Circuit Voltage:	300 V AC rms max. (insulated wire)
Power:	9V battery or AC adapter
Wire Dia.:	Ø 40 mm (1.57") max.
Dimensions:	2.44" × 8.86" × 1.54" (62×225×39 mm)
Rating:	CAT III 300V

TRMS AC CLAMP METER



- 1000A & 600V TRMS AC
- Ohms, Frequency & Continuity
- Waveform Distortion Check
- Inrush Peak Capture
- Min/Max & Display Hold

3282

CE

SPECIFICATIONS

AC Amps:	30.00 / 300.0 / 1000 A (±1.0% rdg. ±5 dgt)
AC Volts (50/60Hz):	300.0 / 600 V (±1.0 % rdg. ±3 dgt.)
Frequency Response:	40 Hz to 1 kHz (on AC Amps/Volts)
Frequency Measure:	100.0 or 1000 Hz (±0.3 % rdg. ±1 dgt.)
Resistance Measure:	1k & 10k ranges
Temperature Measure:	-50 to 150 °C (with Probe 9462, sold separately)
Display:	3000 count digital, 35 segment bargraph
Sampling Rate:	2 or 4 times/sec (Slow: 1 time/3 sec)
Crest Factor:	2.5 (1.7 on 1000 A or 600 V range)
Circuit Voltage:	300 V AC rms max. (insulated wire)
Power:	9V battery (45 hours)
Wire Dia.:	Ø 46 mm (1.8") max.
Dimensions:	2.44" × 9.06" × 1.54" (62×230×39 mm)
Rating:	CAT III 1000V, CAT IV 600V

ORDERING INFORMATION

HK/3246	Pencil DMM, battery included
HK/3282	TRMS AC Clamp Meter
HK/3283	TRMS AC Clamp Meter & Leakage Tester, with case & strap
HK/3419-20	Infrared Thermo Hitester, with carrying case
HK/3665-10	LAN Tester, with carrying case & 9690 Terminator
HK/HPK-1	HVAC/Electrical Contractor Kit (includes 3120 Voltage Probe, 3280-10 Clamp-on Meter, 3419-20 IR Tester, 3804 DMM)

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Weschler General Terms

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Corporate Office
 Weschler Instruments
 16900 Foltz Parkway
 Cleveland OH 44149
 phone: 440-238-2550
 toll free: 800-557-0064
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 web: www.weschler.com

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