Welcome to the *Weschler Instruments* **Product Catalog.**

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 additional products, new products and reference information.

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.

79 Years of Power and Process Measurements

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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

UM33A

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.

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

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.

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 kpbs, 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

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

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	–
Ladder Sequence (max. steps)	✓ (500)	✓ (500)	✓ (300)	✓ (300)	✓ (500)	✓ (300)	–
Control Scan Period (msec)	50/100/200		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.

Extech PID Controllers

48VFL ▶

- 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 · 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

Sifam Tinsley Dual Loop Controller

- Universal measuring inputs
- Binary input control
- Set point value: fixed value, programmed or from Input 3
- On/Off, PID, PID step-by-step control (valve control) or PID of heating-cooling type
- Soft start
- 8 types of alarms
- Timer function
- Measurement of heater current and heater burning control

RE92 ▲

SPECIFICATIONS

Inputs 1 & 2:	Universal RTD, T/C, DCV, DCmA
Thermocouple:	J, K, T, B, E, R, S, N
RTD:	Pt100, Pt500, Pt1000, Cu100, Ni100
DC Process:	0/4–20 mA or 0–5/10 VDC
Error:	V & mA: 0.2% ±1 digit RTD: 0.2% J, K, T, E, N: 0.3% R, S, B: 0.5% T/C Cold Junction: <2°C
Control Source:	Input 1, Input 2, sum or difference
Control Action:	Auto-tuning PID, On/Off, three-step heating/cooling, step-by-step
Alarms:	6 types with programmable hysteresis & latch
Logic Inputs:	Three voltageless binary
Display:	3.5" TFT color, 320x240 pixels
Relay Outputs:	Six Form A (2A@230VAC) standard
Transistor Outputs:	Two 0-5V optional (20mA max.) Replaces 2 relay outputs
Analog Outputs: (optional)	Two, 0-10V (1kΩ load min.) or 0/4 - 20mA (500Ω max.)
Digital Interface:	RS-485 Modbus RTU slave, 2.4-115.2 kbps
Power:	85 to 253 VDC/AC (40-440 Hz)
Operating Temperature:	0 to 50°C, <85% RH non-condensing
Protection:	IP65 front
Operating V to Earth:	Supply circuits and relays: 300V Inputs, interface & analog outputs: 50V
Dimensions:	96x96x100mm; 92.5x92.5 panel cutout

ORDERING INFORMATION

To Order—Insert Code for Each Letter to Select Catalog Number.
Order Example: RE92-1-2-0-1-1-00E

RE92 - [A] - [B] - [C] - [D] - [E] - OOE

A	Input 3 (for remote setpoint value)	
	0	None
	1	0-20 or 4-20 mA
	2	0-5 or 0-10 V
	3	Pot transmitter 100 or 1000 ohm
B	Output 1 & 2	
	1	2 relays
	2	2 binary (transistor) outputs 0-5V, isolated
C	Analog Outputs	
	0	None
	1	Two 0/4-20 mA or 0-10 V, isolated
D	Ethernet	
	0	None
	1	Ethernet Modbus TCP Slave
E	Transducer Supply	
	0	None
	1	24 VDC @ 30 mA

ATC Temperature Controller

- 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°	Resolution 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
	°F	-328 to 1382	-199 to 999
K	°C	-199 to 1350	-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

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 Derivitive (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)

ORDERING INFORMATION

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

Sifam Tinsley Temperature Controller

- Universal measuring inputs
- Binary input control
- Set point value: fixed value, programmed or from Input 2
- On/Off, PID, PID step-by-step control (valve control) or PID of heating-cooling type
- Soft start
- 8 alarms modes
- Timer function
- Measurement of heater current and heater burning control

RE72

SPECIFICATIONS

Input:	Universal RTD, T/C, DCV, DCmA
Thermocouple:	J, K, T, B, E, R, S, N, L
RTD:	Pt100, Pt1000
DC Process:	0/4–20 mA or 0–5/10 VDC
Error:	V & mA: 0.2% ±1 digit RTD: 0.2% J, K, T, E, N, L: 0.3% R, S, B: 0.5% T/C Cold Junction: <2°C
Control Action:	Auto-tuning PID, On/Off, three-step heating/cooling, step-by-step
Alarms:	6 types with programmable hysteresis & latch
Logic Input:	One voltageless binary
Display:	Dual 4 digit; 10mm digit height
Relay Outputs:	Form A (NO) contacts
Transistor Outputs:	One or two 0/5V optional (20mA max.)
Analog Outputs: (optional)	One or two, 0-10V (1kΩ load min.) or 0/4 - 20mA (500Ω max.)
Digital Interface:	RS-485 Modbus RTU slave, 2.4-115.2 kbps
Operating Temperature:	0 to 50°C, <85% RH non-condensing
Protection:	IP65 front
Operating V to Earth:	Supply circuits and relays: 300V Inputs, interface & analog outputs: 50V
Dimensions:	48x48x93mm

ORDERING INFORMATION

To Order—Insert Code for Each Letter to Select Catalog Number.
Order Example: RE72-1-2-4-1-00E

RE72 - [A] – [B] – [C] – [D] - 00E

A	Output 1	
	1	Relay (2A@230VAC)
	2	Binary voltage (transistor) 0/5V, 40mA max.
	3	Analog current 0/4-20mA
	4	Analog voltage 0-10V
B	Output 2	
	1	Relay (2A@230VAC)
	2	Binary voltage (transistor) 0/5V, 40mA max.
	3	Analog current 0/4-20mA
	4	Analog voltage 0-10V
C	Option	
	0	None
	1	Output 3 relay (1A@230VAC)
	2	Binary input
	3	Current transformer input
	4	Additional input (Input 2) 0/4-20mA
	5	Transducer supply 24VDC 1W
E	Supply	
	0	85-253V AC/DC (50/60Hz)
	1	20-40V AC/DC

West Temperature Controllers

- 1/32 & 1/16 DIN sizes
- Thermocouple, Pt100 & mV input
- Simple menu setup
- Relay & SS drive outputs
- Single ramp/soak (dwell) program
- Heat/cool operation
- Auto-tuning PID
- RS-232 or RS-485 Modbus option
- CE, UL, cUL, CSA & FM

▲ CAL3300

◀ CAL9300

CAL9400 ▶

SPECIFICATIONS

Input:	Thermocouple: B, E, J, K, L, N, R, S, T; Pt100: 2 wire; Linear: 0 to 50mV
Output Function:	Heat, Cool, Alarm
Output Type:	Relay (rly1 2A, rly2 1A resistive); SSD (5Vdc +0/-15%, 15mA non-isolated)
Control Type:	PID heat only, PID heat cool , ON/OFF
Power Supply:	100–240Vac, 50–60Hz ±10% 12-24V (AC/DC) ±20%, 4.5VA
Panel Sealing:	IP66
Certifications:	CE, UL, CSA
Other Functions:	Auto-tuning PID; Single ramp soak program; dAC (derivative Approach Control) to minimize overshoot
Dimensions:	24 x 48 x 107mm (HxWxD), 1/32 DIN 48 x 48 x 107mm (HxWxD), 1/16 DIN
Software Tools:	CALgrafix for configuration & datalogging

ORDERING INFORMATION

Comm	Power	Output	1/32 DIN	1/16 DIN	1/16 DIN Dual Display
None	100-240V	SSD/Relay	CAL330000000	CAL930000000	CAL940000000
None	100-240V	SSD/SSD	CAL332200000	CAL932200000	CAL942200000
None	100-240V	Relay/Relay	CAL331100000	CAL931100000	CAL941100000
RS-232	100-240V	SSD/Relay	CAL330000200	CAL930000200	CAL940000200
RS-232	100-240V	SSD/SSD	CAL332200200	CAL932200200	CAL942200200
RS-232	100-240V	Relay/Relay	CAL331100200	CAL931100200	CAL941100200
RS-485	100-240V	SSD/Relay	CAL330000400	CAL930000400	CAL940000400
RS-485	100-240V	SSD/SSD	CAL332200400	CAL932200400	CAL942200400
RS-485	100-240V	Relay/Relay	CAL331100400	CAL931100400	CAL941100400
None	12-24V	SSD/Relay	CAL330000030	CAL930000030	---
None	12-24V	SSD/SSD	CAL332200030	CAL932200030	---
RS-232	12-24V	SSD/Relay	CAL330000230	CAL930000230	---
RS-232	12-24V	SSD/SSD	CAL332200230	CAL932200230	---
RS-485	12-24V	SSD/Relay	CAL330000430	CAL930000430	---
RS-485	12-24V	SSD/SSD	CAL332200430	CAL932200430	---

Fuji Temperature Controllers

NEW

- 7 Control Methods including Self Tuning and Fuzzy PID
- Universal Input (T/C, RTD, V, mA)
- High Speed Sampling (50ms)
- Large, Bright LCD Display
- Up to 64 Ramp/Soak Segments in 15 Patterns
- Two Control Outputs Plus Alarm Outputs
- Motorized Valve Control Versions
- Digital Input Option
- Heater Current Monitoring CT
- RS485 Modbus Option
- Setup via USB without External Power
- Compact 58mm Depth
- Multidrop Master Option

PXF5

PXF9

PXF4

Functions

- On/Off control
- PID control with auto tuning
- Fuzzy control with auto tuning
- Self tuning
- 2-degrees-of-freedom PID control with auto tuning
- Open-loop supported PID2 control
- Ramp soak function (simple program control)
- 1 Heating/cooling control with auto tuning
- Motorized SV control

SPECIFICATIONS

Process value input:	One
Input signal:	T/C: J, K, R, B, S, T, E, L, U, N, PL2. RTD: Pt100. Voltage: 0-5, 1-5, 0-10, 2-10 V DC Current: 0 to 20 mA, 4 to 20 mA DC
Indication accuracy: (at 23°C)	TC R (0 to 500°C): ±3°C ±1 digit TC B (0 to 400°C): not specified All other T/C: greater of ±0.3% ±1 digit or ±1°C ±1 digit RTD: greater of ±0.8°C ±1 digit or ±0.2% FS ±1 digit mV input, voltage input, current input: ±0.3%FS ±1 digit
Input setting:	Programmable scale
All thermocouples:	-200 to -100°C: ±2°C ±1 digit
Temperature effect:	±0.3%FS/10°C
Sampling rate:	50 ms
Input impedance:	Thermocouple, mV input: 1 MΩ or more Current input: 150Ω or less (built-in diode) Voltage input: About 1 MΩ
Wiring resistance:	RTD: 10Ω max. per wire
Allowable input:	DC voltage input: within ±35 V Current input: within ±25 mA Thermocouple, RTD, mV input: within ±5 V
Noise reduction ratio:	Normal mode: 40 dB (50/60 Hz) Common mode: 120 dB (50/60 Hz)
Remote SV input:	1 optional
Input signal:	Voltage: 0 to 5 V DC/1 to 5 V DC/0 to 10 V DC
	Current: 0 to 20 mA DC/4 to 20 mA DC
Input impedance:	Approx. 1MΩ
Sampling rate:	50 ms
CT input:	Optional single phase current transformer, 1 point
Range/Resolution:	1 A to 100A / 0.1A
Accuracy:	Setpoint ±5%FS
On time:	>300 ms necessary for detection
Digital input (DI):	Up to 5 (PXF4: up to 3)
Type:	Dry contact or transistor input
Contact capacity:	5 V DC, about 2 mA (per point)
Input threshold:	ON voltage: ≤2 V DC, OFF voltage: ≥3 V DC
Sampling pulse width:	50 ms min.
Function:	Remote mode selection, SV changeover, control standby, AT startup, timer startup, alarm unlatch, program selection, start/stop/reset, PID switching (normal/reverse), etc.

Valve position feedback:	Potentiometer input option (PXF5, PXF9 only)
Resistance range:	100Ω to 2.5kΩ (three-wire)
Accuracy:	±1.0%FS; Resolution 0.5%FS
Control outputs:	Up to 2 (2 points: Heating/cooling control)
Relay contact:	SPST or SPDT, 250 V AC/30 V DC, 3 A resistive
SSR/SSC drive output:	ON: 10.7-13.2 V DC, OFF: ≤0.5 V DC; 20 mA DC max.; 600Ω min.
Current output:	0 to 20 mA DC, 4 to 20 mA DC, 600Ω max. load; Accuracy: ±5%FS
Voltage output:	0 to 5 V DC, 1 to 5 V DC, 0 to 10 V DC, 2 to 10 V DC 10kΩ min. load; Accuracy: ±5%FS
Motorized valve control:	Uses 2 SPST contacts without interlock circuit
Retransmit output:	1 optional
Output level (scalable):	Voltage: 0 to 5 V DC/1 to 5 V DC/0 to 10 V DC Current: 0 to 20 mA DC/4 to 20 mA DC
Accuracy:	±0.2%FS
Load resistance:	500Ω max. (current), 10kΩ min. (voltage)
Output contents:	PV, SV, DV, MV
Alarm output (DO):	up to 5 relay contacts optional (model dependent)
Contact capacity:	250 V AC/30 V DC, 1A (resistive load)
Output cycle:	100 ms
Control parameters:	
Proportional band (P):	0.1% to 999.9%
Integration time (I):	0 to 3200 s (invalidated when I = 0)
Differential time (D):	0.0 to 999.9 s (invalidated when D = 0)
Control cycle:	100 to 900 ms (in 100 ms), 1 to 99 s (in seconds)
Anti-reset windup:	0 to 100% of measurement range
Hysteresis band:	50% of measurement range (at 2-position control only)
SV & PID patterns:	up to 8: Changed by any of parameter setting, digital input, communication, user function keying, zone change.
Control mode:	Auto/Manual/Remote
Mode changeover:	Auto ↔ Manual: Balanceless bumpless Auto/Manual → Remote: Balance bumpless
Alarm function:	Up to 5 (depends on the number of DO)
Alarm type:	Process value (upper limit/lower limit, absolute/deviation, range), main unit error, etc. (non-excitation, delay, latch, timer function option provided)
Heater current alarm:	Detectable range 1 A to 100 A, Hysteresis 0.0 to 100.0 A

Fuji Temperature Controllers

SPECIFICATIONS, CONTINUED

RS-485:	Optional, half-duplex, Modbus-RTU protocol
Baud rate:	9600 bps, 19200 bps, 38.4 kbps, 115.2 kbps
Additional functions:	Cooperative operation (master or slave)
Password protection:	3 levels
Memory protection:	Non-volatile EEPROM
Operating temperature:	-10 to 50°C, <90% RH non condensing
Power supply voltage:	100 (-15%) to 240V (+10%) AC, 50/60Hz; 24V (±10%) AC/DC
Power consumption:	100 to 240 V AC: 13 VA max. (10VA max. on PXF4), 24 V DC/AC: 8 VA max. (3VA max. on PXF4)
Case material:	UL94V-0 ABS, PPO
Environmental protection:	IP66, NEMA 4X front
Terminals:	M3 screws, terminal strip cover optional
Dimensions (HxWxD):	PXF4: 1/16 DIN (48 x 48 x 58 mm). PXF5: 1/8 DIN (96 x 48 x 58 mm). PXF9: 1/4 DIN (96 x 96 x 58 mm)

ORDERING INFORMATION

TEMPERATURE CONTROLLERS

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

Example: PX4AAA2 - 1VMA1

A	B	C	-	D	E	F	A1

A	Front Panel Size	
	PXF4A	1/16 DIN (48x48mm)
	PXF5A	1/8 DIN (48x96mm)
	PXF9A	1/4 DIN (96x96mm)
B	Control Output 1	
	A	Relay contact SPST*
	B	Relay contact SPDT*
	C	SSR drive
	E	Current linear
	P	Voltage linear
C	Control Output 2	
	Y2	None
	A2	Relay contact SPST
	C2	SSR drive
	E2	Current linear
	P2	Voltage linear
	R2	Retransmit (current)
	S2	Retransmit (voltage)
D	Alarm Output	
	0	None
	1	1 point
	2	2 points
	M	3 points
	J	2 points, independent common
E	Power Supply	
	V	Standard (100-240 VAC, 50/60Hz)
	B	24V AC/DC (50/60Hz)
F	Additional Functions	
	Y	None
	S	1 Digital input (DI) †
	T	2 Digital inputs (DI x 2) ‡
	M	RS485 communication (Modbus)
	G	CT input + DI §‡
	V	RS485 communications + DI 1 point
	H	Remote SV input + DI #‡
	J	RS485 communications + CT input §†
	C	RS485 communications + DI x 3 + aux alarm out x 2 ‡
	K	RS485 communications + remote SV input #†

* not available if Control Output 2 = C, E or P

§ CT input as a heater burnout alarm requires Additional Function C.

Current RSV input requires additional 250ohm resistor.

† PXF4 only.

‡ PXF5, PXF9 only.

ORDERING INFORMATION

MOTORIZED VALVE CONTROLLERS

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

Example: PXF4ATY2-1VYA1

A	B	-	C	D	E	A1

A	Front Panel Size	
	PXF4A	1/16 DIN (48x48mm)
	PXF5A	1/8 DIN (48x96mm)
	PXF9A	1/4 DIN (96x96mm)
B	Control Output 1	
	TY2	Motorized valve control (PXF4 only)
	SY2	Motorized valve control (PXF5, PXF9 only)
	VY2	Motorized valve control with FEB input (PFX5, PXF9 only)
C	Alarm Output	
	0	None
	1	1 point
	2	2 points
	M	3 points
	J	2 points, independent common
D	Power Supply	
	V	Standard (100-240V AC, 50/60Hz)
	B	24V AC/DC (50/60Hz)
E	Additional Functions	
	Y	None
	D	3 Digital inputs (DI x 3) (PXF4 only)
	V	RS485 communications (PXF4 only)
	U	RS485 communications + DI x 3 (PXF5, PXF9 only)

ACCESSORIES

CTL-6-S-H	Current transformer for 1-30A
CTL-12-S36-8	Current transformer for 20-100A
PXR1-A230	Terminal Cover
TQ501923C3	USB Parameter Loader Cable
PXR1-A190	250 ohm shunt resistor (±0.1%)

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

C	Controller
U	Controller with USB
D	Controller/Recorder (Datalogger)
R	Controller/Recorder w/USB

B Profiler

0	None
P	Profiler

C Power Supply

0	100-240V AC
2	24-48V AC/DC

D Control Loops

1	One
A	One + Auxiliary
2	Two

E Base Option 1

1	Relay Output SPST
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

H, I Plug-in Module Slot 2 & 3

0	None
1	Relay Output SPDT
2	DC SSR Drive
Y	Dual DC SSR Drive Output
8	Triac Output
9	Dual relay Output SPST
T	24VDC Transmitter Supply

J Plug-in Slot A

0	None
1	RS485 Modbus RTU
3	1 Digital Input
4	Auxiliary Input
5	Ethernet Modbus TCP

K Option C

0	None
1	8 Digital Inputs

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	24V Transmitter power supply*
	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 resisitive 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	
	1	Relay Output
C	Option Slot 2	
	0	None
	1	Relay Output
	2	DC drive output for SSR
	3	Linear DC output
	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*
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 display
	8	Digital input
	9	Digital input & green upper display
	A	Digital input & green lower display
	B	Digital input & two green displays
F	Power Supply	
	00	100–240VAC
	02	24–48V AC/DC

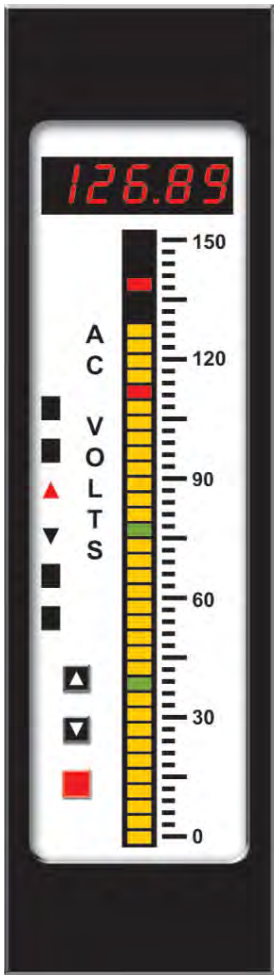
*One transmitter supply per unit

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 resoluton
- 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.

BG261TC



BD101TC

CONFIGURATION OPTIONS

SIZE	
BG252	6" Vertical BarGraph
BH252	6" Horizontal BarGraph
BV5A	7 ½" Vertical BarGraph
BD101	10" Vertical BarGraph
BG241	4 ½" Square BarGraph
BG261	8 ½" 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	

Over 10,000 combinations available.

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

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

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 ½, 4 ½ or 5 ½ 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	
BG252	6" Vertical BarGraph
BH252	6" Horizontal BarGraph
PC101	DIN Size Vertical BarGraph
PH101	DIN Size Horizontal BarGraph
PC202	DIN Size Dual BarGraph
PG101	Single BarGraph
PG202	Dual BarGraph
BI1251	6" Vertical BarGraph
BW1316	6" Vertical BarGraph
BV5A	7 ½" Vertical BarGraph
BD101	10" Vertical BarGraph
BG241	4 ½" Square BarGraph
BG261	8 ½" Square BarGraph
BG281	8" Circle BarGraph
BG251	6" 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
5V DC
12V DC
24V DC
28V DC
48V DC
125V DC
250V DC
120V AC / 125V DC

SETPOINTS
Hi/Lo
Hi/Hi-Hi
Lo/Lo-Lo
Hi-Hi/Hi/Lo/Lo-Lo

COMMUNICATION
RS232
RS485
Ethernet
ModBus

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

LED COLOR
Green
Amber
Red

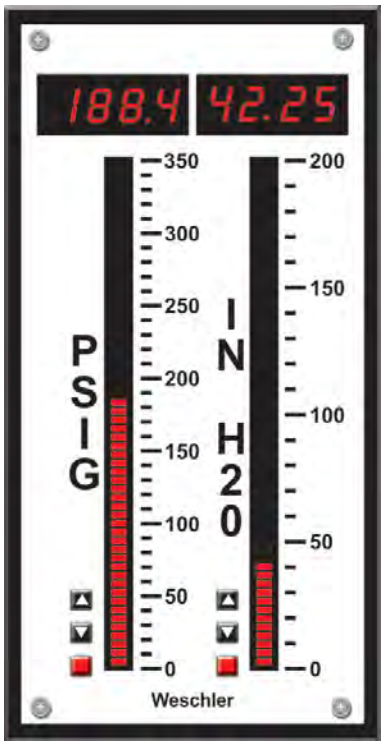
BAR COLOR
Green
Amber
Red

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

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"

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 Segements 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			

*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

c UL us LISTED

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 ±0.0001% of reading for analog inputs. Stop - Start time resolution from ±1sec to ±0.7nsec. Digital input and pulse counts ±1 count.

A/D Convertors: 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 convertors that utilize the internal I^2C 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 J**K**RSTBN Thermocouple	IDT5	T
DC 2V and J**K**RSTBN 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 J**K**RSTBN T/C	ITT6	T
DC 50mV and 2V and J**K**RSTBN T/C	ITT9	T
DC 2V and 2V and J**K**RSTBN T/C	ITT7	T
DC 50mV and two J**K**RSTBN T/C	ITT5	T
DC 2V and two J**K**RSTBN 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)	IGYY	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	ISD8**	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,L,Ly
Process Loop 4-20mA w/ Ext. Lin Table	IP09	T,L,Ly
Process Loop 4-20mA w/ 24V Exc. & AutoCal	IP06	T
Process Loop 4-20mA w/ 24V Exc.	IP02	T,L,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	IR02	T,L,Ly
Linear Potentiometer 1kΩ min	IR03	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,L,Ly
Direct Pressure with 2 Digital Inputs	IGYX	T
Dual Direct Pressure (Abs. or Differential/Gage)	IGYY	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,L,Ly
Pressure/Load Cell Ext Exc., 20/2mV/V, 4-wire	IS06	T,L,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
PROCESS LOOP		
Dual Process Loop	IDP1	T
Process Loop 4-20mA	IP01	T,L,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,L,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	IR01	T
Resistance 2kΩ	IR04	L
Resistance 2kΩ	IR05	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, 10Ω 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,L,Ly
RTD, 100Ω Pt. 2/3/4-wire (-199.9 to 199.9°F)	IT05	T,L,Ly
RTD, 100Ω Pt. 2/3/4-wire (-200 to 800°C)	IT03	T,L,Ly
RTD, 100Ω Pt. 2/3/4-wire (-200 to 1470°F)	IT04	T,L,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
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 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	ITD2	T
Triple DC 2V	ITD1	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

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

Obsolete - call for suitable replacement

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-35ACI5RMS....AC Amps, RMS, 5A (built-in shunt), 3.5-Digit

DU-40ACI5.....AC Amps, Average, 5A (built-in shunt), 4-Digit
DU-40ACI1RMS....AC Amps, RMS, 1A (built-in shunt), 4-Digit
DU-40ACI5RMS....AC Amps, RMS, 5A (built-in shunt), 4-Digit

AC Voltage

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

AC Line Frequency

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

DC Voltage

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

Process 4 to 20 mA

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

Temperature

DU-35KF.....Thermocouple K, °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.
Sandard 0.56" red, optional green or super bright red LED display.

DC Voltage

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

BCD Remote Display

BN-35BCD . ....Remote 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-35 .....DC Volts Selectable from 2V/20V/200V
MU-35CL. .....Process 4 to 20 mA

UM-SERIES—NEMA CASE LOW-COST UTILITY METERS

Optional 0.8" display

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-35ACI1. ....AC Amps, Average, 1A , 3.5-Digit Display
UM-35ACI5. ....AC Amps, Average, 5A, 3.5-Digit Display

AC Voltage

UM-35AC . .....700 VAC and 199.9 VAC Full Scale, 3.5-Digit Display
UM-40AC . .....700.0 VAC FS, 0.1V Resolution, 4-Digit Display

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-35CL . .....1.4V Loop Drop, Scalable in Engineering Units from -1999 to +1999, 3.5-Digit
UM-35CLE . ....Built-In 24 VDC Loop Excitation
UM-45CL . .....4.5-Digit Version of UM-35CL as Above

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

UM-35K . .....K Thermocouple Input, 1° Resolution

Continued on next page

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-50X .....5-Digit 0.5" LCD. 3.5-27.5mA input span, -19999 to 30000 count display. 6th digit displays F, C, inactive 0 or blank.

SM SERIES 3-WIRE DC INPUT

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

SM-35 .....2 to 20 VDC, 0.56" LED, Display Hold
SM-35X.....2 to 20 VDC, 0.48" LCD, Display Hold
SM-35MV.....20 mV to 2 VDC LED 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-35XT .....Economical 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-35XMV .....50 mV shunt/10 to 100 VDC Power

Low Cost DC Bargraph, 5 VDC Power

AM-20 .....20 Segment, 200 mV to 200 VDC, 5 VDC Power

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

PM-45X/45X.....200 mV to 1200V BCD Output Option, LCD
PM-45L .....200 mV to 1200 VDC and BCD Output Option, LED

RP AND PM SERIES METERS

DC Input, 110/230 VAC Power

RP-35A.....Precision Differential DC Input, 3.5-Digit, 0.56" LED

DC Input, 5 VDC Power

PM-35U .....Low Cost, 3.5-Digit, 0.3" LED Display
PM-35A .....Differential Inputs, 3.5-Digit, 0.56" LED Display

PM-45LU .....Differential Input, 4.5-Digit, 0.4" LED Display
PM-45XU .....Differential Input, 4.5-Digit, LCD Display

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

Process 4 to 20 mA

DVM-5/4-20 .....3.5-Digits, 0.276" LED Display, 4-20mA input, 5V power
DVM-5/CL .....3.5-Digits, 0.276" LED Display, Loop powered

Volt and RTD, 5 VDC Power

DVM-5 .....2/20/200 VDC, 0.276" LED Display
DVM-5/G .....2/20/200 VDC, 0.276" Green LED 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-30.....6 Header Selectable DC Ranges Plus 4 to 20 mA
AM-30R1 .....6 DC + 4 to 20 mA w/One 2A/120 VAC Relay
AM-30R2 .....6 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-B31 . .....4-20mA Loop Powered Bargraph

ACCESSORIES

OP-N4X/96x48.....NEMA-4X Clear, Lockable Dustproof & Waterproof Cover (for DU & SD series only)
OP-PSA/96x48.... ....NEMA-4X Panel to Case Seal Adapter
PS-2405.....120V AC Adapter, 24VDC @ 0.5A
PS-505..... ...120V AC Adapter, 5VDC @ 0.5A
PS-520.....120V AC Adapter, 5VDC @ 2A

Simpson Digital Meters/Controllers

▲ H345

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

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:	⅛ 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	51	200mV AC TRMS
	12	2V DC	52	2V AC TRMS
	13	20 VDC	53	20V AC TRMS
	14	200V DC	54	200V AC TRMS
	15	600V DC	55	600 AC TRMS
	21	200µA DC	61	200µA AC TRMS
	22	2m ADC	62	2mA AC TRMS
	23	20mA DC	63	20mA AC TRMS
	24	200mA DC	64	200mA AC TRMS
	25	2A DC	65	2A AC TRMS
	26	5A DC	66	5A AC TRMS
	31	200mV AC	71	4-20mA DC Process
	32	2V AC	72	0-10V DC Process
	33	20V AC		
	34	200V AC	81	200 Ohm
	35	600V AC	82	2k Ohm
			83	20k Ohm
	41	200µA AC	84	200k Ohm
	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 (4 ½ 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

- Case Size: Standard 1/8 DIN
- Accuracy: ±0.1% (F35); ±0.02% (F45DCV); ±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	3½-Digit Meter
F45	4½-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 µA	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

M235

- Case Size: Standard 3/64 DIN Dimensions
- Accuracy: ±0.1% (M235); ±0.04% (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, 3½ and 4½ 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	3½-Digit Meter
M245	4½-Digit Meter

B — Display

0	Non-Backlit LCD
1	Negative Red LCD Backlight
2	Red LED

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
15	600 VDC (LED only)	35	600 VAC TRMS (LED only)
21	200 µADC	36	270 VAC TRMS (LCD only)
22	2 mADC	41	200 µAAC 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**
		83	20–199.9 Hz Sq. Wave**
		84	20–1999 Hz Sq. Wave**

E — Excitation Output (NA with Frequency)

0	None
1	12 VDC (M235 only)
2	24 VDC (M235 only)

* Not Available on Frequency (Hz) Meters ** M235 LCD Meters only

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

c UL us LISTED CE

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

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

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

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

	Process		Dual Input		AC/DC		Temperature	
Options Installed	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 Digital Panel Meters

- Universal input: DC V/A, AC RMS V/A, process, temperature, resistance, potentiometer
- 65 user selectable function/range combinations
- 18-265V AC/DC power
- 0.2% basic DC accuracy
- Relay & analog output options
- RS-485 Modbus option

L40

CE

ORDERING INFORMATION

L40	Low cost DPM with factory default settings
L40-FS	Low cost DPM with custom setup
L40-FS-A1	Low cost DPM with 1 form C relay & custom setup
L40-FS-M1	Low cost DPM with isolated 4-20mA output & custom setup
L40-FS-S1	Low cost DPM with isolated RS485 Modbus output & custom setup
L40-FS-A1A2	Low cost DPM with 2 form C relays & custom setup
L40-FS-M1A2	Low cost DPM with isolated 4-20mA output, 1 form C relay & custom setup
L40-FS-S1A2	Low cost DPM with isolated RS485 Modbus output, 1 form C relay & custom setup
Accessories	
IPC	Front panel cover, seals front of meter case to NEMA 4X
BOX1	Wall mount polycarbonate enclosure sealed to NEMA 4X
BOX2	Wall mount polycarbonate enclosure sealed to NEMA 4X, plus IPC cover

SPECIFICATIONS

DC ranges:	±60.0mV, ±200.0mV, ±2.000V, ±20.00V, ±200.0V, ±400V, ±20.00mA, ±5.00A
AC ranges:	60.0mV, 200.0mV, 2.000V, 20.00V, 200.0V, 400V, 20.00mA, 5.00A
Process signals:	4-20mA DC, 0-10V DC
Resistance:	9999Ω, 99.99kΩ
Potentiometer:	50Ω to 100.00kΩ
Thermocouple:	J, K, E, N, L, C, R, S, B, T
RTD:	Pt100, Pt500, Pt1000, Ni100, Ni200, Ni1000
NTC thermistor:	100Ω to 50.00kΩ
PTC thermistor:	KTY-121, KTY-210, KTY-220 series
Basic accuracy (FS):	0.2% DC/process, 0.3% AC, 0.5% resistance/pot, 3°C T/C, 1°C RTD, 1% reading NTC thermistor, 1°C PTC thermistor
Display:	4 digit LED, -1999 to 9999, 5 brightness levels
Analog output:	4-20mA, active or passive with adjustable scaling; Max load: 350Ω active, 700Ω passive; Accuracy 0.5%, 1000V DC isolation
Relay output:	Form C (NO/NC), 8A @250VAC, 2500Vrms isolation
RS-485:	Modbus RTU, 4800/9600 baud, 1000V DC isolation
Power:	18 to 265V AC/DC, <2.5W, 2500Veff isolation
Environment:	0 to 50°C operating
Protection:	IP50 (standard), IP54 (NEMA-12) with optional gasket
Dimensions:	1/8 DIN: 48 x 96 x 100 mm; 44 x 92 panel cutout

Custom setup includes option installation, jumper settings and front panel programming. Specify the signal type and range. For DC, AC, process and resistance signals which require scaling, specify min input, min reading, and max input, max reading. For temperature, specify 1° or 0.1° resolution and °C or °F. For NTC thermistors, specify R25 and beta. For relays, specify setpoint, hi or lo action & hysteresis.

Laurel High Performance DPMs

- ±99999 Display Span
- 60 Readings Per Second
- 10 Input Types Available
- Adaptive Digital Filter
- 1/8 DIN, NEMA-4X Front
- 5, 10, 24V DC Excitation Out
- All Outputs Isolated
- 2 or 4 Setpoint Relay Outputs
- Linearized Analog Output
- USB, RS-232, RS-485 or Ethernet Data I/O
- Custom Curve Linearization
- Jumper Selectable Input Range
- 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 ±1 count
Strain, Load	< 0.01% FS ±1 count
True RMS	< 0.1% 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
Relay Output (optional)	
Contact relays .	8A @ 250 Vac or 24 Vdc
Solid state relays	0.12A @ 140 Vac or 180 Vdc
Linerarized Analog Output (optional)	
Level	0-20 mA, 4-20 mA, 0-10 Vdc, ±10 V
Resolution	16 bits (0.0015%)
Environmental	
Operating temperature	0 – 55°C, <95% RH at 40°C, non-condensing
Data Communications (optional)	
Type	USB, RS-232, RS-485 (2- or 4-wire), Ethernet
Protocol	Modbus RTU, Modbus ASCII, Laurel ASCII, Modbus TCP (Ethernet)

ACCESSORIES

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

ORDERING INFORMATION

Select Code for each category to build part number. Example: L10010DCV1

☐ Laureate Series	L	Laureate Panel Meter
	LW	Laureate Weight Meter
☐ Main Board	1	Extended DPM with green LEDs
	2	Extended DPM with red LEDs
☐ Power	0	85-264 Vac/90-370 Vdc
	1	10-48Vdc/12-30 Vac
☐ Setpoint Output	0	None
	1	Two 8 A form C relays
	2	Two 120mA solid state relays
	3	Four 8 A form A relays
	4	Four 120mA solid state relays
☐ Analog Output	0	None
	1	0-20 mA, 4-20 mA, 0-10 V, -10 to +10 V
☐ Digital Interface	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

DC Volts*	DCV1	200.00 mV	DCV2	2.0000 V
	DCV3	20.000 V	DCV4	200.00 V
	DCV5	600.0 V**	DCV6	300.0 V
DC Amperes*	DCA1	2.0000 mA	DCA2	20.000 mA
	DCA3	200.00 mA	DCA4	5.000 A

RTD*	P385C	Pt100, -202 to 850°C	N672C	Ni120, -100 to 260°C
	P385F	Pt100, -331 to 1562°F	N672F	Ni120, -148 to 500°F
	P392C	PT100, -202 to 850°C	C427C	Cu10, -100 to 260°C
	P392F	Pt100, -331 to 1562°F	C427F	Cu10, -148 to 500°F

Thermocouple*			
	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	20.000 V	RMV4	200.00 V
	RMV5	600.0 V**	RMV6	300.0 V
TRMS Amperes*	RMA1	2.0000 mA	RMA2	20.000 mA
	RMA3	200.00 mA	RMA4	5.000 A

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

Process Signals		
(4-20 mA, 0-5 V, etc.)	P	4-20 mA = 0-100.00 display
	P1	Custom Scaling
Strain Gage, Potentiometer		
(4-wire ratio)	SG	0-200 mV = 0-100.00 display
	SG1	Custom Scaling

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

Load Cells (6-wire ratio)	WM1	-99,999 to +99,999

Note: Excitation is 10V DC for up to four 350Ω load cells in parallel.

Ohms	R0	0-2.000 Ω, fixed range
	R1	0-20.000 Ω*
	R2	0-200.00 Ω*
	R3	0-2.0000 kΩ*
	R4	0-20.000 kΩ*
	R5	0-200.00 kΩ*
	R6	0-2.0000 MΩ, fixed range

* Input range user jumper selectable.
** Not ETL Listed.

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 c UL us LISTED CE 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 uA, 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)
CBPR0007	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 µADC	10 nA	1.111 kΩ	15 mA
2 mADC	0.1 µA	111 Ω	50 mA
20 mADC	1 µA	11 Ω	150 mA
200 mADC	10 µA	1 Ω	500 mA
CUB5V:			
200 mVDC	10 µV	1.027 MΩ	75 VDC
2 VDC	0.1 mV	1.027 MΩ	75 VDC
20 VDC	1 mV	1.027 MΩ	250 VDC
200 VDC	10 mV	1.027 MΩ	250 VDC
CUB5P:			
20 / 50 mADC	1 µA	10 Ω	150 mA
10 VDC	1 mV	538 kΩ	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, 10Ω max lead res. (3Ω 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)
PAXLA0U0	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
PAXLT000	TC/RTD Temperature Meter with Dual Relays (not UL)
PAXLT0U0	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)

PAX ▶

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] [B] [C]

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 @ 50 V)
PAXCDS40	4 Setpoint Sourcing Open Collector Outputs (0.1 A @ 30 V)
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.

SPECIFICATIONS

Range	Resolution	Input R	Max. Input	Basic Accy.
PAXD:				(%rdg@23°C)
±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:	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
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

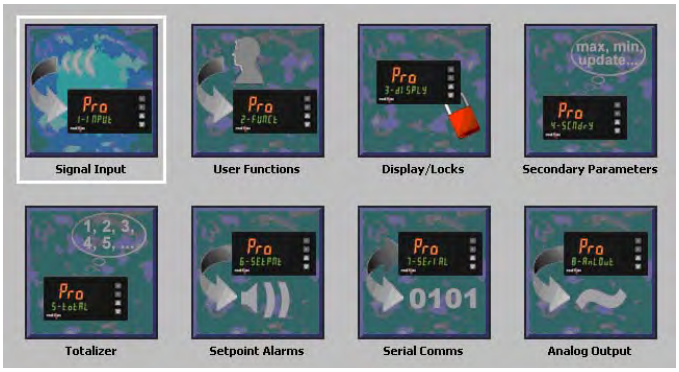
PAX2A

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.



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 @ 50 V)
PAXCDS40	4 Setpoint Sourcing Open Collector Outputs (0.1 A @ 30 V)
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.

SPECIFICATIONS

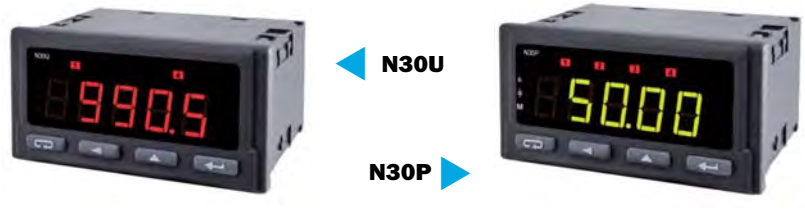
Display:	Positive image LCD
Top Line:	6 digit, 0.71" (18 mm) tri-color backlight (red/green/orange) -199,999 to 999,999 display range
Bottom Line:	9 digit, 0.35" (8.9 mm) green backlight -199,999,999 to 999,999,999 display range
Power:	50 to 250 VAC, 50/60 Hz, 14 VA 21.6 to 250 VDC, 8 W
Annunciators:	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)

Sifam Tinsley Digital Panel Meters

N30 Series

- 3-color, 5-digit LED Display
- AC or DC Operation
- Min/Max Storage
- Up to 4 Alarm Outputs with 6 Alarm Modes
- RS-485 Modbus & Analog Output Options
- Galvanic Isolation - Inputs/Outputs/Power
- Real Time Clock
- IP65 Front

CE



N30P Power Meter

- Measure Single Phase Network Parameters: Voltage, Current, Reactive & Apparent Power, cosφ, tanφ, φ, Frequency, Active, Reactive and Apparent Energy, 15 minutes Active Power, 10 minutes Voltage, 10 seconds Frequency
- Energy Pulse Output
- Direct Connect up to 5A & 400V AC

N30P Input	Measuring Range	Rating	Ratio Values
Voltage	0-100 V or 0-400 V	0.05-1.2 Vn	0.1-4000.0
Current	0-1 A or 0-5 A	0.005-1.2 In	1-100000
Input Signal	**Indication Range**	**Measure Range**	**Basic Error**
Voltage	0.0-1.92 MV	2.0-480 V	±0.2%
Current	0.000-60 kA	0.025-6.000 A	±0.2%
Frequency	45.00-100.00 Hz	45.00-100.00 Hz	±0.2%
Active Power	-19999 to 9999 MW	±2.88 kW	±0.5%
Reactive Power	-19999 to 9999 Mvar	±2.88 kvar	±0.5%
Apparent Power	-19999 to 9999 MVA	±2.88 kVA	±0.5%
cosφ	-1 to 1	-1 to 1	±0.5%
tanφ	-1.2 to 1.2	-1.2 to 1.2	±1%
φ	0 to 359	0 to 359	±1%
Active Energy	0-9999999.9 kWh	0-9999999.9 kWh	±0.5%
Reactive Energy	0-9999999.9 kVarh	0-9999999.9 kVarh	±0.5%
Current Time	00.00 to 23.59	00.00 to 23.59	1 sec/24h

SPECIFICATIONS

Display:	Three color 5 digit LED, -19999 to 99999; Color changes red/green/orange depending on reading
Serial Communication:	Modbus RTU protocol, 4.8-115 kbits/sec.
Operating Environment:	-25 to 55°C, 25-95% RH, non-condensing
Supply Voltage:	85-253 V dc/ac or 20-40 V dc/ac (40-400 Hz), <6VA
Protection:	IP65 front, IP10 case
Working Voltage (max):	N30H, N30P input to earth: 600V CAT II, 300V CAT III; N30U input to earth: 50V; All models: Power line to earth: 300V; all other circuits: 50V
Isolation:	Galvanic separation between terminals: alarm, supply, inputs, analog output, auxiliary supply, RS-485
Connections:	Plug-in screw terminal blocks
Dimensions:	96 x 48 x 93 mm, 92 x 45 mm panel cutout
Analog Output:	0-20mA /4-20mA (load resistance <500Ω); 0-10V (load resistance >500Ω); Accuracy 0.2% of set range
Auxiliary Power:	Internal 24Vdc @30mA (N30U with 85-265V supply only)
Relay Outputs:	Standard: 2 SPST (form A), 0.5A @ 250VAC Optional: 2 additinal SPDT (form C), 0.5A @ 250VAC
OC Voltage Output:	N30U, N30H: Passive NPN, 30V dc @30mA
Energy Pulse Output:	N30P: 5000 imp/kWh, independent of Ku & Ki settings; passive OC, 18-27V dc supply, 10-27mA

N30H DC Volt/Amp Meter

- Measure to 600V DC or 5A DC
- 21-point Table Function

N30H Input Signal	Measuring Range	Class
±500 V dc	±600 V dc	0.1
±100 V dc	±130 V dc	0.1
±5 A dc	±6 A dc	0.1
±1 A dc	±2 A dc	0.1
Current Time	00.00 to 23.59	0.5 sec/24h

N30U Temperature/Process Meter

- Measure Temperature, Resistance, Process Voltage & Current
- 21-point Table Function

N30U Input Signal	Measuring Range	Class
Pt100	-205 to 855°C	0.1 (+0.5°C)
Pt500	-205 to 855°C	0.1 (+0.5°C)
Pt1000	-205 to 855°C	0.1 (+0.5°C)
400 ohm	0 to 410Ω	0.1 (+0.2Ω)
4000 ohm	0 to 4010Ω	0.1 (+0.2Ω)
Thermocouple Type J	-200 to 1200°C	0.1 (+1°C)
Thermocouple Type K	-200 to 1370°C	0.1 (+1°C)
Thermocouple Type N	-200 to 1300°C	0.1 (+1°C)
Thermocouple Type E	-200 to 1000°C	0.1 (+1°C)
Thermocouple Type R	-50 to 1768°C	0.1 (+1°C)
Thermocouple Type S	-50 to 1768°C	0.1 (+1°C)
Voltage 0-10V	±13 V	0.1
Current	±24 mA	0.1
mV	-10 to 63 mV	0.1
Current Time	00.00 to 23.59	0.5 sec/24h

ORDERING INFORMATION

To Order–Insert Code for Each Letter to Select Catalog Number.
Example: N30H-110000U0

A - B - C - D

A	Model	
	N30H	DC Volt/Amp Meter
	N30U	Temperature/Process Meter
	N30P	Single Phase Power Meter
B	Operating Voltage	
	1	85-253 V ac/dc
	2	20-40 V ac, 20-60 V dc*
C	Options	
	0	None
	1	RS-485, 2 OC outputs, analog output
	2	RS-485, 2 OC outputs, analog output, 2 additional SPDT (form C) relay outputs
D	Version	
	0000U0	USA

*40V dc max on N30P

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	0~9999999.99kWh

Voltage Input Range	Direct Input 0~1000V; Via Hall Effect Sensor 0~1200V
Input Impedence / 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

Byram Digital Synchroscope

- Measure Voltage Difference, Phase Angle Difference, Frequency Difference
- True RMS Measurements
- Relay Output
- ANSI Case
- Touch Screen Graphic Display

Applications

- Synchronizing alternator & BUS inputs.
- Synchronizing two different BUS inputs.
- Synchronizing two different alternator inputs.

The Byram Digital Synchroscope displays actual difference of voltage, frequency & phase angle between the BUS (Reference) voltage & generator (Incoming) voltage. When two alternators or sources are to be parallelled it is necessary that their frequency & amplitude should be equal and phase difference be near to zero. When all these 3 parameters are within the required limits, the meter indicates that the two sources can be parallelled.

SPECIFICATIONS

Input Voltage (nominal):	100-500V Line-Line
Input Voltage Burden:	0.2 VA nominal
Max Input Voltage:	600V Line-Line
Overload Withstand:	2x nominal voltage for 1 sec., repeated 10 times at 10 second intervals
Frequency Range:	45 to 66 Hz
Response Time:	Approx. 1 second for step input
Isolation:	2kV rms for 1 minute, between running & incoming circuits
Accuracy	
Voltage Difference:	±1% of nominal value
Phase Angle Difference:	±2 degrees
Temperature Coefficient:	0.05%/degC
Output	
Relay Contacts:	Form A (NO)
Contact Rating:	240V AC, 5 Amp
General	
Operating Temperature:	-10 to +55°C, <95% RH non-condensing
Storage Temperature:	-20 to +65°C
Warmup Time:	3 minutes minimum
Rating:	CAT III, pollution degree 2
Protection:	IP54 front
Enclosure:	Polycarbonate front and case
Dimensions:	4.31" x 4.31" x 1.55" depth (114x114x39mm)
Panel Cut Out:	4.06" (103mm) diameter, 4 stud positions

ORDERING INFORMATION

MCS106452-DIGITAL	Digital Synchroscope with Relay

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

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, Vlnavg
- Line Voltage V12, V23, V31, Vllavg
- 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	0~9999999.99h

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

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] – [B] – [C] – [D]

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

Ri3

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

Button	Screen	Parameter Displayed
V/Hz	1	Volts L1-N
		Volts L2-N
		Volts L3-N
	2	Volts L1-L2
		Volts L2-L3
		Volts L3-L1
	3	Frequency
	4	Volts L1-N THD%
		Volts L2-N THD%
		Volts L3-N THD%
	5	Volts L1-L2 THD%
		Volts L2-L3 THD%
		Volts L3-L1 THD%
E	1	Import kWh
	2	Export kWh
	3	Import kVArh
	4	Export kVArh

Button	Screen	Parameter Displayed
A	1	Current 1
		Current 2
		Current 3
	2	Neutral Current
	3	L1 Current Max Demand
		L2 Current Max Demand
		L3 Current Max Demand
	4	Neutral Current Max Demand
	5	Current L1 THD%
		Current L2 THD%
		Current L3 THD%
P/PF	1	kW
		kVAr
		kVA
	2	kW Max Demand
	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 (kVArh):	±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:	ULk94V0 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

Weschler AC Switchboard Meters (formerly Yokogawa)

Single, dual, and triple displays

- Field Configurable
- Measures True RMS Current and Voltage
- Accuracy: ±0.2% of Rdg. ±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 ANSI Panel Cutouts
- Non-Volatile Memory Stores All Setup Parameters
- Options Include Modbus Communications, Analog Output, DC Auxiliary Power Supply

▲ 2491

▲ 2492

2493 ▶

AC AMP/VOLT/FREQUENCY SINGLE FUNCTION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: 2491-21-01-1-AHD-1-1

A	–	B	–	C	–	D	–	E	–	F	–	G

A	2491	Single Function
B	Function	
	11	Amp AC
	21	Volts AC
	81	Frequency
C	AC Input Rating	
	01	1 Amp
	05	5 Amp
	10	150 Volt
	20	300 Volt
	30	600 Volt
D	Frequency	
	1	50/60 Hz
	2	400 Hz
E	Analog Output	
	AAA	None
	AFA	0 to 1 mA
	AHD	4 to 20 mA
F	RS-485 Protocol	
	1	Yokogawa ASCII
	2	Modbus
G	Auxiliary Power	
	1	120/240 VAC
	3	24 VDC
	4	48 VDC
	5	125 VDC

AC WATT/VAR SINGLE FUNCTION

To Order—Insert Number Code for Each Letter to Select Catalog Number.
Order Example: 2491-53-11-1-AHD-1-3

A	–	B	–	C	–	D	–	E	–	F	–	G

A	2491	Single Function
B	Function & Connection	
	51	Watt 1P2W
	52	Watt 1P3W
	53	Watt 3P3W
	54	Watt 3P4W ($2^1/_2$ Element)
	55	Watt 3P4W (3 Element)
	61	Vars 1P2W
	62	Vars 1P3W
	63	Vars 3P3W
	64	Vars 3P4W ($2^1/_2$ Element)
	65	Vars 3P4W (3 Element)
	71	Power Factor 1P2W
	72	Power Factor 1P3W
	73	Power Factor 3P3W
	74	Power Factor 3P4W ($2^1/_2$ Element)
	75	Power Factor 3P4W (3 Element)
	91	Phase Angle 1P2W
	92	Phase Angle 1P3W
	93	Phase Angle 3P3W
	94	Phase Angle 3P4W ($2^1/_2$ 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
	31	480 Volt/1 Amp
	35	480 Volt/5 Amp
D	Frequency	
	1	50/60 Hz
E	Analog Output	
	AAA	None
	AFA	0 to 1 mA
	AHD	4 to 20 mA
	AHF	12 ±8 mA
F	RS-485 Protocol	
	1	Yokogawa ASCII
	2	Modbus
G	Auxiliary Power	
	1	120/240 VAC
	3	24 VDC
	4	48 VDC
	5	125 VDC

DIGITAL METERS

Weschler AC Switchboard Meters (formerly Yokogawa)

TRIPLE AC VOLT OR AMP

To Order–Insert Number Code for Each Letter to Select Catalog Number.
Order Example: 2493-02-01-1-AFA-1-1

A – B – C – D – E – F – G

A	2493	Triple Display
B	Connections	
	01	3P3W Volts AC
	02	3P4W Volts AC
	05	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	RS-485 Protocol	
	1	Yokogawa ASCII
	2	Modbus
G	Auxiliary Power	
	1	120/240 VAC
	3	24 VDC
	4	48 VDC
	5	125 VDC

TRIPLE 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	RS-485 Protocol	
	1	Yokogawa ASCII
	2	Modbus
G	Auxiliary Power	
	1	120/240 VAC
	3	24 VDC
	4	48 VDC
	5	125 VDC

DUAL AC VOLT/AMP AND VOLT/FREQUENCY

To Order–Insert Number Code for Each Letter to Select Catalog Number.
Order Example: 2492-12-51-1-AHD-1-1

A – B – C – D – E – F – G

A	2492	Dual Display		
B	Function			
	12	Volt/Amp AC	22	Volt/Hz
C	Input Rating			
	51	150 Volt/1 Amp AC	10	150 Volt AC
	55	150 Volt/5 Amp AC	20	300 Volt AC
	61	300 Volt/1 Amp AC	30	600 Volt AC
	65	300 Volt/5 Amp AC		
	75	600 Volt/5 Amp AC		
D	Frequency			
	1	50/60 Hz		
	2	400 Hz		
E	Analog Output			
	AAA	None		
	AFA	0 to 1 mA		
	AHD	4 to 20 mA		
F	RS-485 Protocol			
	1	Yokogawa ASCII		
	2	Modbus		
G	Auxiliary Power Supply			
	1	120/240 VAC		
	3	24 VDC		
	4	48 VDC		
	5	125 VDC		

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	
	11	120 Volt/1 Amp
	15	120 Volt/5 Amp
	21	240 Volt/1 Amp
	25	240 Volt/5 Amp
D	Frequency	
	1	50/60 Hz
E	Analog Output	
	AAA	None
	AFA	0 to 1 mA
	AHD	4 to 20 mA
F	RS-485 Protocol	
	1	Yokogawa ASCII
	2	Modbus
G	Aux. Power Supply	
	1	120/240 VAC
	3	24 VDC
	4	48 VDC
	5	125 VDC

	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
	31	480 Volt/1 Amp
	35	480 Volt/5 Amp
D	Frequency	
	1	50/60 Hz
E	Analog Output	
	AAA	None
	AFA	0 to 1 mA
	AHD	4 to 20 mA
F	RS-485 Protocol	
	1	Yokogawa ASCII
	2	Modbus
G	Aux. Power Supply	
	1	120/240 VAC
	3	24 VDC
	4	48 VDC
	5	125 VDC

Sifam Tinsley Synchronizing Units

- For synchronizing three-phase generators to 50/60Hz power networks
- Connect to 400V direct, 400kV thru potential transformer
- Display phase, frequency and voltage difference
- Signal generator or network voltage outside 80-120% of range
- Programmable settings of synchronizing parameter values for relay activation
- Measure min/max voltage and frequency
- RS-485 Modbus option

KS3-2 ▶

◀ KS3-1

CE

SPECIFICATIONS

Measured Value:	Range	Basic Error
Input Voltage:	100.0/110.0/240.0/400.0V	±(0.2% rdg + 0.1% range)*
Input with PT:	400kV max., 4000 count	
Frequency:	5.0-500.0 Hz;	±(0.5% rdg + 2d)*
Voltage difference:	±20%;	KS3-1: ±(0.5% rdg. + 2d) KS3-2: ±(0.5% range + 1 segment)
Frequency difference:	±10%	KS3-1: ±(0.5% rdg. + 2d) KS3-2: ±(0.2% range + 1 segment)
Phase shift:	0-360°;	±1°
KS3-2 resolution:	Phase shift: 5° for the circle, ±2° for zero indication; Frequency difference: 0.3%; Voltage difference 0.6%	
Relay:	Form A (NO) contacts, load capacity: 0.5A/250V AC	
RS-485 Interface:	MODBUS RTU and ASCII; 4.8, 9.6 & 19.2 kbit/s	
Display:	KS3-1: 4 x 5 LED digits, 14 mm, red color. KS3-2: synchroscope circle with 72 diodes; voltage & differential frequency bargraphs (68 diodes, zero center)	
Protection:	Front: IP40; from terminal side: IP10	
Supply voltage:	18-30V DC/AC 40-400Hz or 85-250V DC/AC 40-400Hz	
Input power:	Supply circuit: ≤12 VA; Voltage circuit: ≤0.5 VA	
Input overload:	Continuous: 1.2x rated for voltage & frequency Short duration (5 sec): 2x rated (max. 1000V)	
Voltage peak:	Crest factor 2 max.	
Frequency:	15-500 Hz, sinusoidal (THD <8%)	
Operating temperature:	0-55°C, 25-95% RH non-condensing	
Installation:	Category III, 600V AC maximum phase-to-earth operating voltage	
Dimensions:	144 x 144 x 77 mm (panel cut-out: 138+0.5 x 138+0.5 mm)	

*in KS3-2, monitored values available through interface.

ORDERING INFORMATION

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

KS3- [A] [B] [C] [D] 008 Example: KS3-10310008

A	Display	
	1	LED digits
	2	Bargraphs
B	Input Voltage	
	01	100V
	02	110V
	03	240V
	04	400V
C	Digital Output	
	0	None
	1	RS-485 Modbus
D	Supply Voltage	
	0	85 - 250V AC/DC
	1	24V AC/DC

Sifam Tinsley Synchroscope

- Rotating LEDs indicate frequency & phase difference between generator & bus voltages
- Green SYNC LEDs indicate frequency & phase match

CE

SQ94 ▶

SPECIFICATIONS

Measured quantity:	Frequency & Phase difference
Power consumption:	6 VA max.
Insulation class:	Group A according to VDE 0110
Insulation voltage:	660V; 2kV Proof voltage
Frequency range:	35-70 Hz
Pull in / drop out:	±9 Hz
Installation catogory:	300V CAT III (IEC1010)
Insulation resistance:	>50 Mohm at 500V DC
Enclosure code:	IP52 case, IP00 for terminals
Temperature:	-10 to 50°C operating; <75% average RH, non-condensing
Case material:	Glass filled polycarbonate UL94 V-0 housing; Glass front
Connections:	Hexagonal studs, M4 screws & wire clamps E3
Protection:	IP 52 case (IEC 529), IP 00 for terminals
Dimensions:	SQ94: 96 x 96 x 112 mm; SQ14: 144 x 144 x 120 mm

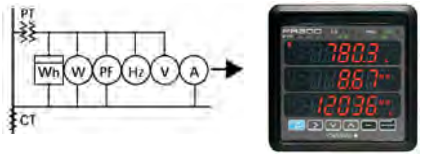
ORDERING INFORMATION

For Meter size 96x96:	
SQ94-V02XXNXWAW0ST	Synchroscope 100V or 127V
SQ94-V03XXNXWAW0ST	Synchroscope 110V or 100V
SQ94-V04XXNXWAW0ST	Synchroscope 127V or 120V
SQ94-V05XXNXWAW0ST	Synchroscope 240V or 220V
SQ94-V06XXNXWAW0ST	Synchroscope 380V or 415V
SQ94-V07XXNXWAW0ST	Synchroscope 380V or 440V
SQ94-V08XXNXWAW0ST	Synchroscope 400V
SQ94-V12XXNXWAW0ST	Synchroscope 480V or 415V
SQ94-V13XXNXWAW0ST	Synchroscope 57.8V
SQ94-V14XXNXWAW0ST	Synchroscope 63.5V
For Meter size 144x144:	
SQ14-V01XXNXWAW0ST	Synchroscope 100V or 120V
SQ14-V02XXNXWAW0ST	Synchroscope 100V or 127V
SQ14-V03XXNXWAW0ST	Synchroscope 110V or 100V
SQ14-V04XXNXWAW0ST	Synchroscope 127V or 120V
SQ14-V05XXNXWAW0ST	Synchroscope 240V or 220V
SQ14-V06XXNXWAW0ST	Synchroscope 380V or 415V
SQ14-V07XXNXWAW0ST	Synchroscope 380V or 440V
SQ14-V08XXNXWAW0ST	Synchroscope 400V
SQ14-V12XXNXWAW0ST	Synchroscope 480V or 415V
SQ14-V13XXNXWAW0ST	Synchroscope 57.8V
SQ14-V14XXNXWAW0ST	Synchroscope 63.5V

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.

PR300 POWERCERT

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

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.)	
Buad 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 Utility Billing Meter

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

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

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

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 I/O options
EI/PSIO	I/O Power Supply } req'd for 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 mutli-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.

AcuRev ▶

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.

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

Sifam Digital ANSI/DIN Switchboard Meters

Field programmable, multi-function power and energy meters that fit standard switchboard or 1/4 DIN mounting.

Alpha 20A+ 3 Line LED Display

» TRMS measurement
» 1 phase & 3 phase (3/4 wire), on-site selection
» Fully programmable CT & PT ratios
» 3 phase V (L-L) / V (L-N), 3 phase current, Hz.
» Power Factor per phase, Phase Angle
» Active / Reactive / Apparent Power per phase
» Active / Reactive / Apparent Energy per phase
» RPM, Run Hour, On Hour, Number of interrupts

Alpha 30A+ 3 Line LED Display with Annunciators

» 3 phase V (L-L) / V (L-N)
» 3 phase Currents
» Frequency, Power Factor
» Power (active, reactive, apparent)
» Energy (active, reactive, apparent)
» Phase Angle (L1, L2, L3)
» Run hour, On hour, Number of interruptions
» KW / KVA (import/export, demand)
» Phase Reversal indication, Max. Demand
» % THD measurement for V & I
» Accuracy: 0.2 class for Energy

Alpha 50A+ LCD Touch Screen, Power & Energy

» 3 phase V (L-L) / V (L-N), 3 phase Currents
» Frequency, Power Factor
» Power (active, reactive, apparent)
» Energy (active, reactive, apparent)
» Phase Angle (L1, L2, L3)
» Run hour, On hour, Number of interruptions
» kW / kVA (import/export, demand)
» Phase Reversal indication, Max. Demand
» % THD measurement for V & I
» Waveform & Phasor Diagram display
» Accuracy: 0.5 class for Energy

Alpha 40A+ LCD Energy Meter

» Unit with LCD displaying 3 parameters
» TRMS measurement
» THD measurement
» Energy measurement as per IEC 62053
» Import / Export kWh, Phase Reversal, kW, PF
» RUN hour, ON hour, RPM
» RS-485 Modbus option
» Class 1 for Active, Apparent; Class 2 for Reactive

Alpha 70A+ LCD Touch Screen, Power Quality

» Measures more than 80 electrical parameters.
» TRMS measurement up to 56th harmonic
» Time stamping of Sag / Swell
» Graphical presentation
» Energy class 0.5S as per IEC 62053
» Impulse for energy verification
» Time of Day

ORDERING INFORMATION

To Order: Select Model, Power & Option. Example: A30A+-1-Q-R1

Model	
A20A+-111	1 phase Alpha 20A+
A20A+-311	3 phase Alpha 20A+
Power	
-EA	20-60VDC/20-40VAC 50/60Hz
-LA	60-300 VDC/AC 50/60Hz
Option	
-P	One Pulse output (limit switch)
-R	RS-485 Modbus RTU protocol (2 wire)

Model	
A30A+-1	1 phase Alpha 30A+
A30A+-3	3 phase Alpha 30A+
A50A+-1	1 phase Alpha 50A+
A50A+-3	3 phase Alpha 50A+
Power	
-D	20-60VDC/20-40VAC 50/60Hz (Alpha 30A+ only)
-Q	20-60VDC/20-40VAC 50/60Hz (Alpha 50A+ only)
-H	60-300 VDC/AC 50/60Hz
Option	
-S	One Pulse output for Energy
-D	Two Pulse output for Energy
-R	RS-485 Modbus RTU protocol (2 wire) integer or floating
-E	Ethernet output Add-on Card
-1	2 Analog outputs 0-1mADC
-2	2 Analog outputs 4-20mADC
-RS	1 Pulse output for Energy + RS-485 Modbus
-S1	1 Pulse output for Energy + 2 Analog outputs 0-1mADC
-S2	1 Pulse output for Energy + 2 Analog outputs 4-20mADC
-RD	2 Pulse output for Active and Reactive Energy + RS-485
-R1	RS-485 Modbus + 2 Analog outputs 0-1mADC
-R2	RS-485 Modbus + 2 Analog outputs 4-20mADC
-RS1	RS-485 Modbus + 1 Pulse out + 2 Analog out 0-1mA
-RS2	RS-485 Modbus + 1 Pulse out + 2 Analog out 4-20mA

Model	
A40A+-1	1 phase Alpha 40A+
A40A+-3	3 phase Alpha 40A+
Power	
-L	20-60VDC/20-40VAC 50/60Hz
-U	60-300 VDC/AC 50/60Hz
Option	
-P	One Pulse output for utility/generator
-R	RS-485 Modbus RTU protocol (2 wire)
-RP	1 Pulse output for Energy + RS-485 Modbus

Model	
A70A+-18F75	1 phase Alpha 70A+
A40A+-38F75	3 phase Alpha 70A+
Power	
-Q	20-60VDC/20-40VAC 50/60Hz
-H	60-300 VDC/AC 50/60Hz
Option	
-L	Impulse LED
-R	RS-485 Modbus RTU protocol (2 wire)
-D	2 Pulse outputs

Accuenergy Basic kWh Meter

- TRMS Power measurement
- 4-Quadrant Energy
- 3-line LCD display with backlight
- Multiple current transformer (CT) options
- 0.5% accuracy
- 5 year warranty
- Built-in Modbus RTU

Acuvim-KL

The Acuvim-KL is a simple, effective and low-cost energy monitor. It displays clear use data, allowing energy saving opportunities to become apparent. Modbus communications easily interfaces to a data collection network. The Acuvim-KL fits 92mm DIN or 4" round ANSI panel cutouts. DIN rail mount is optional.

ORDERING INFORMATION

Part Number	CT Input	Power Supply
Acuvim-KL-D-5A-P1	5A	100-415Vac (50/60Hz) / 100-300Vdc
Acuvim-KL-D-5A-P2	5A	20-60Vdc
Acuvim-KL-D-1A-P1	1A	100-415Vac (50/60Hz) / 100-300Vdc
Acuvim-KL-D-1A-P2	1A	20-60Vdc
Acuvim-KL-D-333-P1	333mV	100-415Vac (50/60Hz) / 100-300Vdc
Acuvim-KL-D-333-P2	333mV	20-60Vdc

SPECIFICATIONS

Function	Parameters	Resolution	Range
Current	I1, I2, I3	0.001A	0-50000A
Power	P1, P2, P3, Psum	1W	±9999MW
Reactive Power	Q1, Q2, Q3, Qsum	1var	±9999Mvar
Apparent Power	S1, S2, S3, Ssum	1VA	0-9999MVA
Energy	Ep_imp, Ep_exp	0.1kWh	0-99999999.9kWh
Reactive Energy	Eq_imp, Eq_exp	0.1kvarh	0-99999999.9kvarh
Apparent Energy	Es	0.1VAh	0-99999999.9kVAh
Run Time	Hours	0.1hrs	0-999999999.9hrs
Load Run Time	Hours	0.1hrs	0-999999999.9hrs

Current Inputs (Each Channel)	
Nominal Current:	5A/1Aac
Metering Range:	0-6Aac
Withstand:	20Arms continuous, 100Arms for 1s, non-recurring
Burden:	0.05VA (typical) @ 5Arms
Pickup Current:	0.1% of nominal
Voltage Inputs (Each Channel)	
Nominal Full Scale:	400Vac L-N, 690Vac L-L (+20%)
Withstand:	1500Vac continuous, 2500Vac, 50/60Hz for 1min
Input Impedance:	2Mohm per phase
Metering Frequency:	45Hz~65Hz
Pickup Voltage:	10Vac
Accuracy:	0.5% (Class 0.5s)
Communications:	RS-485 2-wire, isolated, 1200-38400 baud
Operating Temperature:	-20°C to +70°C, 5-95% RH non-condensing
Power Supply:	3W burden
Withstand:	3250Vac (50/60Hz) for 1 minute
Dimensions:	96 x 96 mm front, 51 mm depth

Trumeter AC Mains Powered Meters

- Measure Volts, Amps or Frequency
- Large 4 digit main display
- 4 character alphanumeric for units, alarm or custom message
- 40 segment curved bargraph
- Dynamic backlight color
- Digital & analog outputs
- USB setup software

Negative LCD

APM-M2-APO

The APM-M2 can be programmed (using the free setup software) to measure volts, amps or frequency. It auto-detects AC or DC on the input, and measures up to 600V with an accuracy of 1%. The dynamic display can change color, flash and/or change annunciator message depending on signal level. Digital outputs can be set to activate when input is above, below, between or outside the setpoints.

ORDERING INFORMATION

APM-M2-APO	Volts/Amps/Freq. Meter, 100-240VAC power, Positive LCD
APM-M2-ANO	Volts/Amps/Freq. Meter, 100-240VAC power, Negative LCD
022128-01	USB Cable (for setup)

SPECIFICATIONS

Input Range:	
Volts:	0 - 600V DC or AC rms (30-400Hz)
Amps:	0 - 5A DC or AC rms direct (30-400Hz)
Amps with CT:	0 - 10,000A AC
Frequency:	2 - 400Hz
Accuracy:	1% (volts & amps); 0.1% (frequency)
Input Impedance:	1.5MΩ (volts & frequency); 2mΩ (amps)
Sample Rate:	62kHz
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
Viewing Angle:	±70°
Programmable Items:	Function; digital display offset, gain, range; Bargraph span; Custom annunciators; Backlight color & intensity; Two alarm setpoints; Digital & analog outputs
Setup:	USB 2.0 port using the free Windows based APM Configurator software
Temperature:	-10 to +60°C operating
Front Protection:	IP65, NEMA 4, NEMA 12
Power Supply:	100-240VAC ±10%, 47-63Hz, 1.6W
Isolation:	3.6kV, 1 minute
Digital Outputs:	One or two open collector sinking
Rating:	34VDC, 500mA max.
Analog Output:	4-20mA
Accuracy:	0.5%
Resolution:	0.02mA
Connections:	Screw terminals
Certification:	UL and cUL, CE
Dimensions:	72x72x53mm. Panel cutout 68x68mm

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

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

Input range (Volts):	0 - 600V DC; 0 - 528V AC
Input range (Amps): with CT or Shunt:	0 - 5A DC; 0 - 5A AC, 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

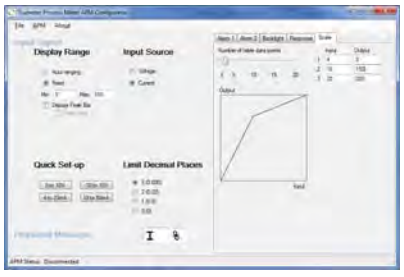
Trumeter Process Meters

NEW

- 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

APM-PROC

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.



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

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

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

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: with CT or Shunt:	0 - 1V DC 10,000A	0 - 5A AC 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 Rate Meter

NEW

- User selectable scale & gain
- 1% basic accuracy
- Large 4 digit numeric display
- 40 segment bargraph display
- Alphanumeric annunciator
- Dynamic backlight color
- 2 user configurable alarms
- 2 independent outputs
- 4-20mA analog output
- Front panel or USB setup
- Free setup software

APM-RATE

The Advanced Panel Meter (APM) Rate Meter was developed for use in flow applications, production lines and motor speed monitoring. It combines the instant visual representation of an analog meter with the speed and accuracy of a digital meter. The unique display is viewable in most environmental conditions and features a programmable scale and color changing backlight for instant recognition and precision measurement.

The APM improves safety and efficiency through user programmable alarm set-points, dynamic backlighting and starburst messaging that alerts operators of changing conditions instantly. It features digital and analog outputs to communicate with other components in a system, IP65 and NEMA type 4 and 12 ratings and an industry leading three-year warranty.

SPECIFICATIONS

Measurement Input:	
Max Frequency:	0 - 60 kHz
Min Frequency:	0.001 Hz
Logic 0:	< 1.2V
Logic 1:	> 2.0V
Accuracy:	±0.01%
Working Voltage:	36 VDC max. (input-COM)
Temperature:	-10 to +60°C operating
IP Rating (front):	NEMA 4X & 12 with IP65
Power Supply:	12-24VDC (nominal)
Display Update Time:	0.1 to 999.9 seconds
Scaling Factor:	-100 to 1990x10
Bar Display:	40 segment
Display Digits:	4 Numeric, 12mm [0.47"] high
Annunciator Digits:	4 Alphanumeric, 6mm [0.23"] high
Backlight Colors:	Red, Green, White
LCD Display:	Positive or Negative
Digital Output:	34V max, 500mA max
Analog Output:	4-20mA
Certification:	UL and cUL, CE
Connections:	Plug-on screw terminals
Dimensions:	72x72x53mm. Panel cutout 68x68mm

ORDERING INFORMATION

APM-RATE-APO	APM Rate Meter, positive LCD
APM-RATE-ANO	APM Rate Meter, negative LCD
022128-01	USB Cable

NLS Panel Meters

MINIATURE PANEL METERS

PM349

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

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

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	Dislay 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
- Presettable 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	Dislay 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	Dislay Option	
	–	Standard
	L	0.8" LED (RM350 only)
D	Display Color	
	R	Red LED
	Y	Yellow LED
	G	Greeen 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

▲ **DPM950S**

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

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)

▲ **SP400**

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

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

▲ **DPM3AS**

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

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

DPM950

DPM950S-EB-W

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 K TC)	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^

DPM750S-BL

DPM750S-EB-W

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

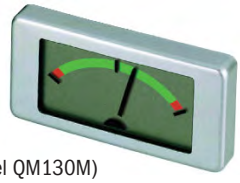
EM32-1B	Circular LCD DPM
EM32-1B-LED	Circular LED DPM

*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 Hour

(Martel QM120C)

Supply:	5-27 VDC @ 1.5 mA

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 EMC1500
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
- FM and CSA Approved Versions
- Wall Mount or 2" Pipe Mount

MLD ▶

SPECIFICATIONS

Input Resistance:	100Ω
Standard Scale:	0-100.0%
Accuracy:	±0.05% of full scale [1999] ±1 digit
Operating Temperature:	0 to 60°C
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:	½" NPT

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**	
	MLD	Loop Indicator (Digital)
B	**Input Signal**	
	-A	4 to 20 mA DC
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	3½ Digit Loop Powered Meter

Extech Panel Tachometer

- Measure rpm from 5 to 99,990rpm with microprocessor quartz crystal accuracy of 0.05%
- Large LED display updates 1/sec (> 60rpm)
- Unique design permits rpm measurements of a one hole gear or disk, eliminating the need for special gears
- A pulse is measured when a ferrous object (stud) passes by sensor
- Optional proximity and photo sensors

Proximity sensor is designed for target distance of 0.1" (3mm), covers range to 36,000rpm (600Hz).
Photoelectric sensor has target distance of 0.4" (10mm) and range to 6,000rpm (100Hz).
Both encapsulated sensors include 6 ft. (1.8m) cable.

SPECIFICATIONS	
Range:	5 to 99,990rpm
Basic accuracy:	±0.05%
Resolution:	0.1rpm (5 to 1000rpm), 1rpm (1000 to 9999rpm), 10rpm (10,000rpm to 99,990rpm)
Power:	115V or 230V AC; 50/60Hz
Dimensions:	Bezel 3.8x1.9x2.4" (96x48x60mm); Meter 3.6x3.5x1.7"
Panel Cutout:	3.6x1.8" (92x45mm) (92x90x42mm)
Sampling Time:	1sec for > 60rpm, > 1sec for 10 to 60rpm
Dimensions:	4.9x2x1.3" (124x50x33mm)

461950 ▲

461955

461957

ORDERING INFORMATION	
461950	1/8 DIN Panel Tachometer
461955	Proximity Sensor, 36,000 rpm max
461957	Photoelectric Sensor, 6000 rpm max

London Electronics Large Display Meters

Fusion

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

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;		direct or inverse
	NPN, PNP pulses <24V;		250VAC isolation
	100mV inductive pickup;	Relays:	SPST 2A@250VAC resistive
	Contact closure		Selectable NO or NC
Range:	0-40kHz		Selectable energize or deenergize
Excitation:	24V 60mA	Temperature:	0-50°C operating
Loadcell Input:	4 or 6 wire	Connectors:	detachable screw terminals
Resistance:	>10MΩ	Power:	50VA max.
Excitation	10V 120mA	Case:	Black uPVC, 75mm depth

ORDERING INFORMATION

Fusion2 - [A] – [B] – [C] – [D] – [E] – [F] – [G] – [H] – [I] - 0

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

A	Digit Height	
	F2	2" (57mm)
	F4	4" (102mm)
	F6	6" (150mm)
	F8	8" (200mm)
	F12	12" (300mm)
	F16	16" (400mm)

B	Digit Format	
	4N	4 digit numeric
	4C	4 digit clock
	6N	6 digit numeric
	6C	6 digit clock
	8N	8 digit numeric

C	Function	
	C	Counter
	H	Clock/timer
	L	Loadcell
	P	Process
	S2	RS232 slave
	S4	RS485 slave
	T	Temperature

D	Analog Output	
	0	None
	ANI	4-20mA
	ANV	0-10V
	ANB	±10V

E	Alarm Outputs	
	0	None
	AL2	2 alarms
	AL4	4 alarms
	SPCO	2 SPDT relays
	DSS	2 solid state relays
	QSS	4 solid state relays

F	Serial Output	
	0	None
	232	RS232
	485	RS485
	RTU	RS485 Modbus

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

H	Supply	
	AC	95-265VAC 50/60Hz
	DC	11-30VDC
	48VAC	48VAC

I	Mounting	
	1	Panel, IP65 front
	2	Wall, IP65
	3	Top Suspension, IP65
	4	Wall, IP54
	5	Top Suspension, IP54
	6	Rear Suspension IP54

Easy Reader

ER ▶

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-O-O

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	$\pm 10^{-10}$ to $\pm 10^{6}$
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

❑ **L** — Laureate™ with plug-in screw terminal connectors

❑ **Main Board**
- **5** — Meter with green LEDs
- **6** — Meter with red LEDs
- **7** — Extended, green LEDs
- **8** — Extended, red LEDs

❑ **Power**
- **0** — 85-264 Vac/90-300 Vdc
- **1** — 10-48 Vdc/12-30 Vac

❑ **Setpoint Output**
- **0** — None
- **1** — Dual 8 A relays (250 Vac/24 Vdc)
- **2** — Dual 130mA solid state relays (140 Vac/180 Vdc)

❑ **Analog Output** (isolated, 16 bit)
- **0** — None
- **1** — 0-20 mA, 4-20 mA, 0-10 V, ±10 V

❑ **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** (isolated)

FR — **Frequency**
With main boards 5 & 6: Scalable to ±999,999 for frequency, perioup/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 µA 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 µA 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

CUB7CCS0	CUB7 Counter, Low Voltage Input, Reflective Display
CUB7CCG0	CUB7 Counter, Low Voltage Input, Green Display
CUB7CCR0	CUB7 Counter, Low Voltage Input, Red Display
CUB7CVS0	CUB7 Counter, High Voltage Input, Reflective Display
CUB7CVG0	CUB7 Counter, High Voltage Input, Green Display
CUB7CVR0	CUB7 Counter, High Voltage Input, Red Display
CUB7TCS0	CUB7 Timer, Low Voltage Input, Reflective Display
CUB7TCG0	CUB7 Timer, Low Voltage Input, Green Display
CUB7TCR0	CUB7 Timer, Low Voltage Input, Red Display
CUB7TVS0	CUB7 Timer, High Voltage Input, Reflective Display
CUB7TVG0	CUB7 Timer, High Voltage Input, Green Display
CUB7TVR0	CUB7 Timer, High Voltage Input, Red Display
	(Call for cross reference to old CUB7 model numbers)
Accessories:	
TB100003	3 Position Terminal Block for CUB7CCS0, CUB7TCS0
TB100004	4 Position Terminal Block for CUB7CCG0, CUB7TCG0, CUB7CCR0, CUB7TCR0, CUB7CVS0, CUB7TVS0
TB100005	5 Position Terminal Block for CUB7CVG0, CUB7TVG0, CUB7CVR0, CUB7TVR0
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 kΩ pull-up to +12 VDC, 1.9 mA max.
Current Sourcing:	Internal 3.9 kΩ pull-down, 8 mA max. @ 30 VDC.
Magnetic Pick-up (Rate Meter only):	
Sensitivity:	200 mV peak
Hysteresis:	100 mV
Input Impedance:	3.9kΩ @ 60 Hz
Maximum Input:	±40 V peak, 30 Vrms
Rate Meter Accuracy:	±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 kΩ pull-up to +12 V,
Logic Levels:	Active: V_{in} < 0.9 VDC; Inactive: V_{in} > 3.6 VDC
Response Time:	25 µsec 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

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**

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CE

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)
CBPR0007	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**

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CE

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
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

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

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

Trumeter Counters & Timers (formerly KEP)

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

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

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

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

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:	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

Sifam Tinsley Counter

Measure Frequency, Rotational Speed, Period, Pulse Count, Elapsed Time

N30 Series

N30

- Two Counter Inputs
- Count Actual & Total Values
- 3-color, 5-digit LED Display
- AC or DC Operation
- Min/Max Storage
- Math Functions
- Up to 4 Alarm Outputs with 6 Alarm Modes
- RS-485 & Analog Output Options
- Galvanic Isolation - Inputs/Outputs/Power
- 21-point Table Function
- 24 VDC to Power Peripherals

SPECIFICATIONS

Inputs:	Two, 5-36 V dc, galvanically separated
Display:	Three color 5 digit LED, -19999 to 99999; Color changes red/green/orange depending on reading
Serial Communication:	Modbus RTU protocol, 4.8-115 kbits/sec.
Operating Environment:	-25 to 55°C, 25-95% RH, non-condensing
Power Supply:	Line Voltage: 85-253 V dc/ac (40-400 Hz), <6VA Low Voltage: 20-40 V dc/a.c. (40-400 Hz), <6VA
Protection:	IP65 front, IP10 case
Working Voltage (max):	Input to earth: 50V; Power line to earth: 300V; All other circuits: 50V
Isolation:	Galvanic separation between terminals: alarm, supply, inputs, analog output, auxiliary supply, RS-485
Connections:	Plug-in screw terminal blocks
Dimensions:	96 x 48 x 93 mm, 92 x 45 mm panel cutout
Analog Output:	0-20mA /4-20mA (load resistance <500Ω); 0-10V (load resistance >500Ω); Accuracy 0.2% of set range
Relay Outputs:	Standard: 2 SPST (form A), 0.5A @ 250VAC Optional: 2 additional SPDT (form C), 0.5A @ 250VAC
Auxiliary Supply:	24V DC @ 30mA
OC Output:	Passive NPN or PNP, 30V dc max @30mA

Input Signal	Indication Range	Max. f
Number of pulses Cntr1, Cntr2	-19 999 to 99 999	10 kHz/8 kHz
Frequency <10 kHz	0.05 to 99 999 Hz	100 kHz
Frequency >10 kHz	1 to 99 999 kHz	1 MHz
Rotational speed	0.05 to 99 999 rpm	100 kHz
Period t < 10s	0.0001 to 11 sec	100 kHz
Period t > 10s	0.0001 to 3600 sec	100 kHz
Worktime counter	0 to 99 999 hr	---
Current time	00.00 to 23.59	---
Encoder	-19 999 to 99 999	10 kHz

ORDERING INFORMATION

N300-10000U0	5-digit Counter, line voltage supply
N300-11000U0	5-digit Counter, line voltage supply, RS-485, 2 OC outputs, analog output
N300-12000U0	5-digit Counter, line voltage supply, RS-485, 2 OC outputs, analog output, 2 form C relay outputs
N300-20000U0	5-digit Counter, low voltage supply
N300-21000U0	5-digit Counter, low voltage supply, RS-485, 2 OC outputs, analog output
N300-22000U0	5-digit Counter, low voltage supply, RS-485, 2 OC outputs, analog output, 2 form C relay outputs

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 Code for Each Letter to Select Catalog Number.
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 -19999 to +49999)
	INT69T	Totalizer Only
B	Operating Voltage	
	A	110 VAC ±15% or 12 to 24 VDC
	B	220 VAC ±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

MINItrol Series

▲ **MRT**

- 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 Output	
	1	RS-232 Communications
	2	RS-422 Communications
	3	Modbus RTU RS-232
	4	Modbus RTU RS-422/RS-485
	A	Analog Output (4–20/0–20 mA)

Trumeter Time Relays

- 8 or 18 Non-Signal and Signal Based Functions
- 3 Digit LCD for Easy Programming
- Wide Timing Range: 0.1 sec to 999 hours
- Tamper Proof with Key Lock
- Multi-Voltage: 24 – 240VAC/VDC
- Option to Select Up/Down Counting
- Compact 17.5mm DIN Rail Mountable
- CE & UL Recognized

7957 ▶

The 795X are DIN rail mountable digital time relays, available with either 8 operating modes (7954) or 18 operating modes (7957). They are easily configured using the 3 digit LCD display. These relays give a wide timing range of 0.1s – 999Hr and provide a clear indication of the changeover relay status via the front panel LED. The compact 17.5mm wide housing is snap-in DIN rail mountable, making it simple to install. These modules accept a wide range of operating voltages, feature 8 amp Form C (SPDT) relay outputs and allow key-locking to prevent unauthorised settings tampering.

OPERATING MODES

7954	7957
– ON Delay	– ON Delay
– Cyclic OFF/ON	– Cyclic OFF/ON
– Cyclic ON/OFF	– Cyclic ON/OFF
– Signal ON/OFF	– Impulse on Energising
– Signal OFF Delay	– Accumulative Delay on Signal
– Interval	– Accumulative Delay on Inverted Signal
– Signal OFF/ON	– Accumulative Impulse on Signal
– One Shot Output	– Signal ON Delay
	– Inverted Signal ON Delay
	– Signal OFF Delay
	– Impulse ON/OFF
	– Signal OFF/ON
	– Leading Edge Impulse 1
	– Leading Edge Impulse 2
	– Trailing Edge Impulse 1
	– Trailing Edge Impulse 2
	– Delayed Impulse
	– Inverted Signal ON Delay (Type 2)

ORDERING INFORMATION

7954	8 Function Digital Timer, 1 C/O, 24-240VAC/DC
7957	18 Function Digital Timer, 1 C/O, 24-240VAC/DC

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 Milliameter	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 coi
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

Hoyt Analog Switchboard Meters

- Measure Amps, Volts, Hz, Watts, VARs, or Power Factor
- Mini Size: 3.25" Square
- Meets ANSI C39.1
- 1% Accuracy (Amps & Volts)
- 250° Scale

HLS-80

SPECIFICATIONS

Accuracy:	DC: ±1.0% of Full Scale AC rectifier type: ±1.0% of Full Scale Frequency: ±0.15Hz Power: ±1.0% of Full Scale
Overload:	Voltmeters: 50% momentary / 20% prolonged Ammeters: 50% momentary / 20% prolonged Frequency meters: 20% maximum Power meters: 20% maximum
Burden:	5A AC input: 0.5VA maximum
Construction:	Black plastic case, terminal strip connections
Dimensions:	3.23" x 3.23" front, 3.33" behind panel
Panel Cutout:	2.64" dia
Mounting:	Four studs (0.16" dia holes)

Standard Ranges

DC	1, 4-20mA 50mV shunt rated (specify scale) 30, 50, 100, 150, 300V
AC	1, 2, 5, 10, 15, 20, 30A 5A CT rated (10, 15, 20, 25, 50, 100, 250, 500, 1000, 2500, 5000A scale) 150, 300, 600V 150V PT rated (300, 600, 750, 3000, 6000V scale)
Hz	45-55, 45-65, 55-65Hz (specify 120 or 240V)
kW	1 phase, 2 wire, 120VAC, 5AAC (specify scale, CT ratio, PT ratio) 3 phase, 3 wire, 120VAC, 5AAC (specify scale, CT ratio, PT ratio) 3 phase 4 wire 120VAC, 5AAC (specify scale, CT ratio, PT ratio)
kVAR	1 phase, 2 wire, 120VAC, 5AAC (specify scale, CT ratio, PT ratio) 3 phase, 3 wire, 120VAC, 5AAC (specify scale, CT ratio, PT ratio) 3 phase 4 wire 120VAC, 5AAC (specify scale, CT ratio, PT ratio)
PF	0.5 lag - 0.5 lead; 1 phase, 2 wire, 120VAC, 5AAC (also 4 wire balance) 0.5 lag - 0.5 lead; 3 phase, 3 wire, 120VAC, 5AAC (also 4 wire balance)

Options:

- Custom Ranges
- Custom Scales
- Special Legends
- Custom Logos
- Anti-glare Window

- Measure Amps, Volts, Hz, Watts, VARs, or Power Factor
- Standard Size: 4.5" Square
- Meets ANSI C39.1
- 1% Accuracy (Amps & Volts)
- 250° Scale

HLS-110

SPECIFICATIONS

Accuracy:	DC: ±1.0% of Full Scale AC rectifier type: ±1.0% of Full Scale Frequency: ±0.15Hz Power: ±1.0% of Full Scale
Overload:	Voltmeters: 50% momentary / 20% prolonged Ammeters: 50% momentary / 20% prolonged Frequency meters: 20% maximum Power meters: 20% maximum
Burden:	5A AC input: 0.5VA maximum
Construction:	Black plastic case, terminal strip connections
Dimensions:	4.33" x 4.33" front, 3.70" behind panel
Panel Cutout:	4.055" dia
Mounting:	Four studs (0.26" dia holes)

Standard Ranges

DC	1, 4-20mA 50mV shunt rated (specify scale) 30, 50, 100, 150, 300V
AC	1, 2, 5, 10, 15, 20, 30A 5A CT rated (10, 15, 20, 25, 50, 100, 250, 500, 1000, 2500, 5000A scale) 150, 300, 600V 150V PT rated (300, 600, 750, 3000, 6000V scale)
Hz	45-55, 45-65, 55-65Hz (specify 120 or 240V)
kW	1 phase, 2 wire, 120VAC, 5AAC (specify scale, CT ratio, PT ratio) 3 phase, 3 wire, 120VAC, 5AAC (specify scale, CT ratio, PT ratio) 3 phase 4 wire 120VAC, 5AAC (specify scale, CT ratio, PT ratio)
kVAR	1 phase, 2 wire, 120VAC, 5AAC (specify scale, CT ratio, PT ratio) 3 phase, 3 wire, 120VAC, 5AAC (specify scale, CT ratio, PT ratio) 3 phase 4 wire 120VAC, 5AAC (specify scale, CT ratio, PT ratio)
PF	0.5 lag - 0.5 lead; 1 phase, 2 wire, 120VAC, 5AAC (also 4 wire balance) 0.5 lag - 0.5 lead; 3 phase, 3 wire, 120VAC, 5AAC (also 4 wire balance)

Options:

- Custom Ranges
- Custom Scales
- Special Legends
- Custom Logos
- Anti-glare Window
- NEMA4, IP65 Gasket
- Metal Case
- Illumination

DC Current and Voltage Switchboard Meters Yokogawa DB40 Replacements

MCS Series

- No Shadows on Scale
- Accurate to Within ±1% FS
- Metal Case
- Zero Left, Zero Center & Ground Type Voltmeters
- Zero Left, Suppressed Zero & Shunt Rated Ammeters
- UL Recognition (optional)

MCS ▶

SPECIFICATIONS

In accordance with ANSI Specifications C39.1	
Input	±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 continous; Current coils -1.2x continuous, 10x for 0.5 second
Sensitivity	Zero Left Voltmeters: 1000Ω/V Zero Center Voltmeters: 2000Ω/V
Response Time	3 seconds maximum
Position of Use	Vertical (Scale)
Full Scale Deflection Angle	250°
Case	Drawn steel with black powder coat
Mounting/Terminal Studs	1/4"x28 thread / 10-32 thread
Size (H x W x Depth)	4.33" x 4.33" x 3.25"
Barrel (cutout)	4.03"
Full Scale Length	6.9"

DC VOLTMETERS

Scale and Rating (V)	Cat. No.
0-15	103 011 NDND
0-30	103 011 NLNL
0-50	103 011 NTNT
0-75	103 011 PBPB
0-150	103 011 PZPZ
0-300	103 011 RXRX
0-400	103 011 SCSC
0-500	103 011 SFSF
0-600	103 011 FJFJ
150-0-150	103 012 PZPZ
300-0-300	103 012 RXRX
500-0-500	103 012 SFSF
600-0-600	103 012 SJSJ

OPTIONS

Custom Scaling
Non-standard Ranges
White Zero Corrector (Black Standard)
Color Bands
UL Recognition

** Specify scale values

DC AMMETERS

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

DC AMMETERS - SHUNT RATED (50mVDC)

Scale (Amps)	Cat. No.
0-15	103 121 CAND
0-20	103 121 CANG
0-30	103 121 CANL
0-40	103 121 CANP
0-50	103 121 CANT
0-75	103 121 CAPB
0-100	103 121 CAPK
0-150	103 121 CAPZ
0-200	103 121 CARL
0-300	103 121 CARX
0-400	103 121 CASC
0-500	103 121 CASF
0-750	103 121 CASM
0-1000	103 121 CASS
0-1200	103 121 CASV
0-1500	103 121 CATC
0-2000	103 121 CATM
0-3000	103 121 CAUA

AC Current Switchboard Meters

Yokogawa AB40 Replacements

MCS Series

- Rectifier Type
- Readable Even from Sharp Angles
- Accurate to Within ±1% of Full Scale
- Metal Case
- Self-Contained & Transformer-Rated Ammeters
- UL Recognition (optional)

MCS

OPTIONS

Custom Scaling
Nonstandard Ranges
Color Bands
White Zero Corrector (Black standard)
UL Recognition

SPECIFICATIONS

In accordance with ANSI Specifications C39.1	
Accuracy	±1% of FS basic accuracy class
Burden	<0.5 VA
Operating Temperature Range	0–40°C (32°F–104°F)
Dielectric Level	2,300 VAC for 1 minute between circuit & case
Overload Rating	1.2x continuous, 10x for 0.5 seconds
Response Time	3 seconds maximum
Position of Use	Vertical (scale)
Full Scale Deflection Angle	250°
Case	Drawn Steel with black powder coat
Mounting/Terminal Studs	1/4"x28 thread / 10-32 thread
Size (H x W x Depth)	4.33" x 4.33" x 3.25"
Barrel (cutout)	4.03"
Full Scale Length	6.9"

ORDERING INFORMATION

Self-Contained, 40/70 Hz Rating (amperes)	Scale (amperes)	Cat. No.
1	0-1	103 131 LALA
1.5	0-1.5	103 131 LCLC
2	0-2	103 131 LELE
3	0-3	103 131 LJLJ
5	0-5	103 131 LSLS
7.5	0-7.5	103 131 MFMF
10	0-10	103 131 MTMT
15	0-15	103 131 NDND
20	0-20	103 131 NGNG
30	0-30	103 131 NLNL
Transformer-Rated, 40/70 Hz		
5	0-10	103 131 LSMT
5	0-15	103 131 LSND
5	0-20	103 131 LSNG
5	0-25	103 131 LSNJ
5	0-30	103 131 LSNL
5	0-40	103 131 LSNP
5	0-50	103 131 LSNT
5	0-75	103 131 LSPB
5	0-100	103 131 LSPK
5	0-150	103 131 LSPZ
5	0-200	103 131 LSRL
5	0-250	103 131 LSRS
5	0-300	103 131 LSRX
5	0-400	103 131 LSSC
5	0-500	103 131 LSSF
5	0-600	103 131 LSSJ
5	0-800	103 131 LSSN
5	0-1000	103 131 LSSS
5	0-1200	103 131 LSSV
5	0-1500	103 131 LSTC
5	0-2000	103 131 LSTM
5	0-2500	103 131 LSTV
5	0-3000	103 131 LSUA
5	0-4000	103 131 LSUE
5	0-5000	103 131 LSUJ
5	0-6000	103 131 LSUP
5	0-7000	103 131 LSUS
5	0-8000	103 131 LSUW

AC Voltage Switchboard Meters

Yokogawa AB40 Replacements

MCS Series

- Rectifier Type
- Readable Even from Sharp Angles
- Accurate to Within ±1% of Full Scale
- Metal Case
- Self-Contained, Expanded Scale, Transformer-Rated & Ground Detector Voltmeters
- UL Recognition (optional)

MCS

ORDERING INFORMATION

Rating (volts)	Scale Volts	Cat. No.
Self-Contained, 50/60 Hz		
150	0-150	103 021 PZPZ
250	0-250	103 021 RSRS
300	0-300	103 021 RXRX
500	0-500	103 021 SFSF
600	0-600	103 021 SJSJ
750	0-750	103 021 SMSM
Transformer-Rated, 50/60 Hz		
150	0-300	103 021 PZRX
150	0-600	103 021 PZSJ
150	0-750	103 021 PZSM
150	0-3000	103 021 PZUA
150	0-5250	103 021 PZUL
150	0-9000	103 021 PZUY
150	0-15kV	103 021 PZWZ
150	0-18kV	103 021 PZXE
150	0-45kV	103 021 PZXU
150	0-150kV	103 021 PZYR
250	0-600	103 021 RSS
Expanded Scale Self-Contained, 50/60 Hz		
110-130	110-130	103 071 PNPN
Expanded Scale Transformer-Rated, 50/60 Hz		
110-130	+	103 071 PN..+
Ground-Detector Type-Single-Phase 50/60 Hz		
150	0-150	103 021 PZPZ
150	+	103 021 PZ..+
300	0-300	103 021 RXRX
600	0-600	103 021 SJSJ

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

SPECIFICATIONS

In accordance with ANSI Specifications C39.1	
Accuracy	±1% of FS basic accuracy class
Burden	<0.8 VA @ 150V
Operating Temperature Range	0–40°C (32°F–104°F)
Dielectric Level	2,300VAC for 1 minute between circuit & case
Overload Rating	1.2x continuous
Response Time	3 seconds maximum
Position of Use	Vertical (scale)
Full Scale Deflection Angle	250°
Case	Drawn steel with black power coat
Mounting Studs	1/4"x28 thread / 10-32 thread
Size (H x W x Depth)	4.33" x 4.33" x 3.25"
Barrel (cutout)	4.03"
Full Scale Length	6.9"

OPTIONS

- Custom Scaling
- Nonstandard Ranges
- Color Bands
- White Zero Corrector (black is standard)
- UL Recognition

AC Watt & VAR Switchboard Meters Yokogawa AB40 Replacements

MCS Series

- Rugged, Durable Construction
- Readable Even from Sharp Angles
- Accurate to Within ±1% of Full Scale
- Transformer Rated
- UL Recognition (optional)

MCS

SPECIFICATIONS

In accordance with ANSI Specifications C39.1	
Accuracy	±1% of FS basic accuracy class
Burden	Voltage circuit: <4.5 VA; Current circuit: <2 VA
Operating Temperature Range	0–40°C (32°F–104°F)
Dielectric Level	2,300VAC for 1 minute between circuit & case
Overload Rating	Voltage circuits—1.2x continuous; Current circuits—1.2x continuous, 10x for 0.5 seconds
Response Time	3 seconds maximum
Position of Use	Vertical (scale)
Full Scale Deflection	250°
Case	Drawn steel with black powder coat
Mounting/Terminal Studs	1/4"x28 thread / 10-32 thread
Size (H x W x Depth)	4.33" x 4.33" x 4.5"
Barrel (cutout)	4.03"
Full Scale Length	6.9"

Varmeters are usually zero-centered and scaled for half the scale value of the accompanying wattmeters. Example: If the Wattmeter is scaled 0-100 kilowatts, the Varmeter is scaled 50-0-50 kilovars.

VAR METER ORDERING INFORMATION

Amperes	Volts	Scale	Cat. No.
Single Phase/2-Wire, 1-Element, Transformer Rated, 60 Hz			
5	120	†	103 31❑A...
3-Phase/3-Wire, 2-Element, Transformer Rated, 50/60 Hz (Cannot Use with External Phase Shifter)			
5	120	†	103 28❑A...
3-Phase/4-Wire, 3-Element, Transformer-Rated, 50/60 Hz (Cannot Use External Phase Shifter)			
5	69	†	103 29❑F...
5	120	†	103 29❑A...
5	208	†	103 29❑R...
5	277	†	103 29❑Y...

† Order by description. Specify CT (Current Transformer) and/or PT (Potential Transformer) ratios if used and scale desired.

❑ Sixth digit signifies pointer deflection (1-zero left, 2-zero center).

WATT METER ORDERING INFORMATION

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

Amperes	Volts	Scale	Cat. No.
Single-Phase/2-Wire, 1-Element, Transformer-Rated, 50/60 Hz			
5	120	+	103 21❑A.....
3-Phase/3-Wire, 2-Element, Transformer-Rated, 50/60 Hz			
5	120		103 22❑A.....
5	240	+	103 22❑C.....
5	480		103 22❑D.....
3-Phase/4-Wire, 3-Element, Transformer-Rated, 50/60 Hz (voltage balanced)			
5	69		103 25❑F.....
5	120	+	103 25❑A.....
5	208		103 25❑R.....
5	277		103 25❑Y.....

+ Order by Description. Specify CT (Current Transformer) and/or PT (Potential Transformer) Ratios if Used, and Scale Desired.

❑ Sixth Digit Signifies Pointer Deflection (1-Zero Left, 2-Zero Center)

OPTIONS (WHERE APPLICABLE)

Custom Scaling

Nonstandard Ranges

Power Factor, Frequency & Synchroscope Meters

Yokogawa AB40 Replacements

MCS Series

- Rugged, Durable Construction
- Readable Even from Sharp Angles
- 1% Accuracy Class
- Metal Case
- UL Recognition (optional)

MCS

ORDERING INFORMATION

Power Factor

Amperes	Volts (L-L)	Scale	Cat. No.
Single-Phase 2 Wire 60 Hz			
5	120	.5-1-.5	103 412 FCAD
3-Phase 3 & 4 Wire, 50 & 60 Hz, Balanced System Only			
5	120	.5-1-.5	103 402 FCAD
5	208	.5-1-.5	103 402 FDAD
5	240	.5-1-.5	103 402 FEAD
5	480	.5-1-.5	103 402 FFAD
5	600	.5-1-.5	103 402 FGAD

Frequency Meters, 120V Rated

Scale (Hz)	Center Freq, Hz	Cat. No.	Accuracy
45-55	50	103 372 AGAG	±0.15 Hz
45-65	55	103 372 AJAJ	±0.25 Hz
48-52	50	103 372 AKAK	±0.08 Hz
50-70	60	103 372 ALAL	±0.25 Hz
55-65	60	103 372 ANAN	±0.15 Hz
58-62	60	103 372 ATAT	±0.08 Hz
59-61	60	103 372 ASAS	±0.047 Hz
350-450	400	103 372 BHBH	±1.3 Hz
390-410	400	103 372 BLBL	±0.492 Hz

Synchroscopes

Scale	Normal Freq, Hz	VAC	Cat. No.
Slow-Fast	50	120	106 452 ABAA
Slow-Fast	60	120	106 452 AAAA

SPECIFICATIONS

In accordance with ANSI Specifications C39.1

Accuracy	
Power Factor Meters	±1% of fiducial value from 40-120% of rated current
Frequency Meters	see table
Synchroscopes	±1% of scale length
Operating Temperature Range	0–40°C (32°F–104°F)
Dielectric Level	2,300 VAC for 1 minute between circuit and case
Overload Rating	Voltage coils: 1.2x continuous. Current coils: 1.2x continuous, 10x for 0.5 seconds. Frequency meters: 1.2x continuous
Response Time	3 seconds maximum
Position of Use	Vertical (scale)
Full Scale Deflection Angle	250° (360° for synchroscopes)
Barrel (cutout)	4.03"
Full Scale Length	6.9" (except synchroscopes)
Size (H x W x Depth)	
Power Factor	4.33" x 4.33" x 3.25"
Frequency	4.33" x 4.33" x 4.5"
Synchroscope	4.33" x 4.33" x 4.5"

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): (Add 1"D for terminal studs)	4.3" x 4.3" x 2.4" (007 case) 4.3" x 4.3" x 3.4" (078 case)

007 ▶

AC AMMETERS - RMS READING SELF CONTAINED

Rating	Scale	Standard Case Catalog Number	4 ½" 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 ½" 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-RXRX-C7	078-05GJ-RXRX-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	4½" 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	Standard Case Catalog Number	4½" Square Flange 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	Standard Case Catalog Number	4½" Square Flange 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	Standard Case Catalog Number	4½" Square Flange 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

DC VOLTMETERS (SENSITIVITY 1000 OHMS PER VOLTS)

Rating	Scale	Standard Case Catalog Number	4½" Square Flange 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-RXRX	078-05VJ-RXRX
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	Standard Case Catalog Number	4½" Square Flange Hi-Shock Case Catalog Number
150-0-150V	007-05NA-RXRX	078-05NJ-RXRX
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	007-31LA-QQ-C7	078-31LJ-QQ-C6
3 / 3	5/208	To Suit	007-31LA-QR-C7	078-31LJ-QR-C6
3 / 3	5/240	To Suit	007-31LA-QS-C7	078-31LJ-QS-C6
3 / 3	5/380	To Suit	007-31LA-QX-C7	078-31LJ-QX-C6
3 / 3	5/480	To Suit	007-31LA-QT-C7	078-31LJ-QT-C6
2½ element, transformer rated, 50/60 Hz, taut band, integral transducer				
3 / 4	5/120	To Suit	007-31UA-QL-C7	078-31UJ-QL-C6
3 / 4	5/208	To Suit	007-31UA-QR-C7	078-31UJ-QR-C6
3 / 4	5/480	To Suit	007-31UA-QT-C7	078-31UJ-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.

AC SYNCHROSCOPES 360°

Scale: SLOW FAST

Volts	Hz	Type	Standard Case Catalog Number	Hi-Shock Case Catalog Number
120	50	Pivot & Jewel	007-145A-PRAE-C5	078-145J-QQAB-C5
120	60	Pivot & Jewel	007-146A-PRAE-C6	078-146J-QQAB-C6
240	50	Pivot & Jewel	007-145A-RRAE-C5	-----
240	60	Pivot & Jewel	007-146A-RRAE-C6	-----
120	400	Pivot & Jewel	------	078-144J-QQAB-C4
120	40-65	LED	077-14AU-PQYY-FQ	
240	40-65	LED	077-14AU-RRYY-FQ	
480	40-65	LED	077-14AU-SEYY-FQ	

▲ 007-12PA

▲ 007-145A

▲ 077-14A

AC PHASE SEQUENCE INDICATORS

Features three neon bulbs for phase indication and two neon bulbs to indicate either correct or incorrrect phase sequence. Burden 2.5VA

Volts	Hz	Standard Case Catalog Number
100-150V	50/60 Hz	077-12PA-P2C6
151-300V	50/60 Hz	077-12PA-P3C6
301-500V	50/60 Hz	077-12PA-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 ½% 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 ½ 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.

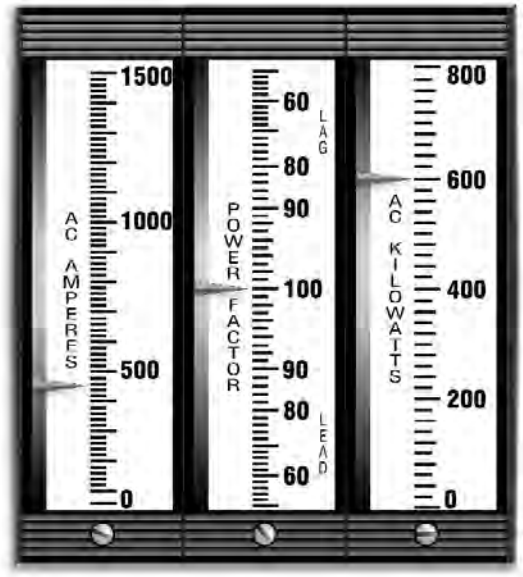
CONSTRUCTION

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 paralax 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



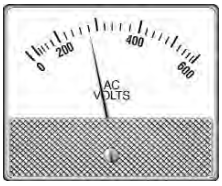
252 Edgewise

ALSO AVAILABLE:

351/371 panel

Airpax panel

20/20 panel



International Instruments Edgewise Panel Meters

3 ½" and 6" Switchboard Meters

- Accuracy: ±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 ½ 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/E Dual A-B-C-D/E-C-D/E

A – B – C – D / E

A	Model			
	1151	6" Single		
	1251	6" Dual		
	1146	3 ½" Single		
	1246	3 ½" 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 V	ACA	ACmA
0-10, 0-15, 0-25, 0-50, 0-150, 0-300, 0-500	0-5	0-10, 0-100, 0-500

DCV	DCA	DCuA	DCmA
0-1, 0-5, 0-10, 0-15, 0-20, 0-25, 0-30, 0-50, 0-100, 0-150, 0-150, 0-200, 0-300, 0-500	0-1, 0-2, 0-5, 0-10, 0-15, 0-25, 0-50, 0-100*, 0-200* 0-500*	0-100, 0-200, 0-300, 0-400, 0-500	0-1, 0-2, 0-3, 0-4, 0-5, 0-10, 0-20, 0-50, 0-100, 0-200, 0-500, 4-20, 10-50

E Scale
List scale values if different from Range

*=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 ½", 2 ½" & 3 ½" 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 reqest
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, 25, 30, 50, 100, 150, 200, 300, 500	0-1, 2, 5, 10, 15, 25, 50, 100*, 200*	0-50, 100, 200, 300, 400, 500	0-1, 2, 3, 4, 5, 10, 20, 50, 100, 200, 500, 4-20

E Scale

No entry: Scale matches meter range
Custom: Specify scale and legend

*=50mV shunt rated

AC Voltmeters and Ammeters also available

Simpson Round Voltage & Current Meters

- UL Recognized
- 2½" and 3½" Sizes
- Black Plastic Case with Glass Window
- Precise Spade Pointer
- Custom Scales & Ranges Available

55

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:	Front	Depth Behind Panel*	Body
125 & 155	2.69" dia.	2.09"	2.18" dia.
25 & 55	3.50" dia.	2.01"	2.75" dia.

*including connection studs

AC Voltage & Current (iron vane movement)

AC Voltmeters		Model 155 2½"	Model 55 3½"
Range	Scale	Catalog #	Catalog #
0-5	0-5	–	08410
0-10	0-10	–	08420
0-15	0-15	–	08430
0-25	0-25	–	08440
0-50	0-50	09290	08450
0-100	0-100	–	08460
0-150	0-150	09310	08470
0-250	0-200	09320	08480
0-300	0-300	09330	08490
0-500**	0-500	09340	08500
0-750**	0-750	–	08510

AC Milliammeters		Model 155 2½"	Model 55 3½"
Range	Scale	Catalog #	Catalog #
0-15	0-15	–	05380
0-50	0-50	–	05400
0-100	0-100	–	05410
0-150	0-150	–	35069
0-250	0-250	06080	05420
0-500	0-500	–	05430

AC Ammeters		Model 155 2½"	Model 55 3½"
Range	Scale	Catalog #	Catalog #
0-1	0-1	02100	00950
0-1.5	0-1.5	–	00960
0-2	0-2	02120	00970
0-3	0-3	02130	00980
0-5	0-5	02140	00990
0-10	0-10	02150	01001
0-15	0-15	02160	01010
0-25	0-25	02170	01020
0-30	0-30	02180	01030
0-50	0-50	02190	01040
0-75	0-75	–	03432
0-5A*	0-75	02200	–
0-5A*	0-100	02210	01060
0-5A*	0-150	02220	01070
0-5A*	0-200	–	01080
0-5A*	0-250	02240	01090
0-5A*	0-300	–	01100
0-5A*	0-500	02260	01110

* external current transformer required. **external dropping resistor included.

See page 68 for round frequency meters.

DC Voltage & Current (self-shielding movement)

DC Millivoltmeters		Model 125 2½"	Model 25 3½"
Range	Scale	Catalog #	Catalog #
0-50	0-50	06970	06910
0-100	0-100	–	35093

DC Voltmeters		Model 125 2½"	Model 25 3½"
Range	Scale	Catalog #	Catalog #
0-1.5	0-1.5	08850	–
0-3	0-3	–	07070
0-5	0-5	08870	07080
0-10	0-10	08890	07100
0-15	0-30	08900	07110
0-25	0-50	08910	07120
0-30	0-100	08920	07130
0-50	0-150	08930	07140
0-100	0-200	08940	07150
0-150	0-250	08950	07160
0-200	0-300	08960	07170
0-250	0-300	08970	07180
0-300	0-300	–	07190
0-500	0-300	–	07200
0-750	0-300	–	07210
0-1000**	0-1000	–	07220
0-2000**	0-2000	–	07240
0-3000**	0-3000	–	07260
0-5000**	0-5000	–	07280

DC Microammeters		Model 125 2½"	Model 25 3½"
Range	Scale	Catalog #	Catalog #
0-50	0-50	04210	03760
0-100	0-100	04220	03770
0-200	0-200	04230	03780
0-500	0-500	04240	03790
50-0-50	50-0-50	04194	03810
100-0-100	100-0-100	04196	03820
500-0-500	500-0-500	–	03830

DC Milliammeters		Model 125 2½"	Model 25 3½"
Range	Scale	Catalog #	Catalog #
0-1	0-1	05580	04610
0-1.5	0-1.5	–	04620
0-5	0-5	05610	04640
0-10	0-10	05620	04650
0-15	0-15	05630	04660
0-25	0-25	05650	04680
0-50	0-50	–	04690
0-75	0-75	05670	–
0-100	0-100	05680	04710
0-150	0-150	05690	04720
0-200	0-200	05700	04730
0-250	0-250	05710	–
0-300	0-300	–	04750
0-500	0-500	05730	04760
0-1000	0-1000	–	04780
4-20	0-100%	–	35022

DC Ammeters		Model 125 2½"	Model 25 3½"
Range	Scale	Catalog #	Catalog #
0-1	0-1	01460	00005
0-2	0-2	–	00030
0-3	0-3	01490	00040
0-5	0-5	01500	00050
0-10	0-10	01510	00060
0-15	0-15	01520	00070
0-25	0-25	01530	00080
0-30	0-30	01540	00090
0-50	0-50	01550	00099
0-50mV*	0-75	01560	00110
0-50mV*	0-100	01570	00120
0-50mV*	0-150	01580	00130
0-50mV*	0-200	01590	00140
0-50mV*	0-250	–	00151
0-50mV*	0-300	01610	00160
0-50mV*	0-500	01620	00170
0-50mV*	0-750	–	00177
0-50mV*	0-1000	–	00188
15-0-15	15-0-15	–	00200
30-0-30	30-0-30	01660	00210
50-0-50	50-0-50	01670	00220
50-0-50mV*	75-0-75	35066	35037

* external shunt required. **external dropping resistor included.

Crompton DC Current & Voltage Meters

Challenger and Saxon

- Accuracy: ±2% of Full Scale
- Meets ANSI C39.1
- Four Display Sizes: 1½", 2½", 3½", and 4½"
- Pivot & Jewel Movement
- Replacements for Yokogawa Horizon & Big Look

Challenger 363

Saxon 013

MODEL CODE

[1] Insert Model Number:

361	Challenger 1½"
362	Challenger 2½"
363	Challenger 3½"
364	Challenger 4½"
012	Saxon 2½"
013	Saxon 3½"

ORDERING INFORMATION

DC Ammeters—Zero Left

100 µA	[1] -01AA-DRDR
200 µA	[1] -01AA-EAEA
1 mA	[1] -01AA-FAFA
10 mA	[1] -01AA-GZGZ
20 mA	[1] -01AA-HFHF
4-20 mA	[1] -01RA-HGHG
25 mA	[1] -01AA-HJHJ
30 mA	[1] -01AA-HMHM
50 mA	[1] -01AA-HYHY
100 mA	[1] -01AA-JRJR
250 mA	[1] -01AA-KDKD
500 mA	[1] -01AA-KMKM
600 mA	[1] -01AA-KPKP
1 Amp	[1] -01AA-LALA
1.5 Amp	[1] -01AA-LCLC
2 Amp	[1] -01AA-LELE
3 Amp	[1] -01AA-LJLJ
5 Amp	[1] -01AA-LSLS
10 Amp	[1] -01AA-MTMT
15 Amp	[1] -01AA-NDND**
20 Amp	[1] -01AA-NGNG**
30 Amp	[1] -01AA-NLNL**

DC Ammeters—Zero Left, 50mV, Shunt Rated Scale Only

20 Amp	[1] -01AA-ECNG
30 Amp	[1] -01AA-ECNL
50 Amp	[1] -01AA-ECNT
75 Amp	[1] -01AA-ECPB
100 Amp	[1] -01AA-ECPK
150 Amp	[1] -01AA-ECPZ
200 Amp	[1] -01AA-ECRL
250 Amp	[1] -01AA-ECRS
300 Amp	[1] -01AA-ECRX
400 Amp	[1] -01AA-ECSC
500 Amp	[1] -01AA-ECSF
600 Amp	[1] -01AA-ECSJ
800 Amp	[1] -01AA-ECSN
1000 Amp	[1] -01AA-ECSS

ORDERING INFORMATION

DC Ammeters—Zero Center**

100-0-100 µA	[1] -01CA-EAEA
200-0-200 µA	[1] -01CA-EIEI
500-0-500 µA	[1] -01CA-FAFA
1-0-1 mA	[1] -01CA-FGFG
2-0-2 mA	[1] -01CA-FSFS
5-0-5 mA	[1] -01CA-GZGZ
10-0-10 mA	[1] -01CA-HFHF
20-0-20 mA	[1] -01CA-HSHS
30-0-30 mA	[1] -01CA-JCJC
50-0-50 mA	[1] -01CA-JRJR
100-0-100 mA	[1] -01CA-KAKA
200-0-200 mA	[1] -01CA-KJKJ
500-0-500 mA	[1] -01CA-LALA
1-0-1 Amp	[1] -01CA-LELE
2-0-2 Amp	[1] -01CA-LLLL
5-0-5 Amp	[1] -01CA-MTMT
10-0-10 Amp	[1] -01CA-NGNG
15-0-15 Amp	[1] -01CA-NLNL**
20-0-20 Amp	[1] -01CA-NPNP**
30-0-30 Amp	[1] -01CA-NWNW**

DC Millivoltmeters—Zero Left

50 mV	[1] -01VA-HYHY
60 mV	[1] -01VA-JCJC
75 mV	[1] -01VA-JDJD
100 mV	[1] -01VA-JRJR
150 mV	[1] -01VA-JXJX
200 mV	[1] -01VA-KAKA
300 mV	[1] -01VA-KGKG
500 mV	[1] -01VA-KMKM

** Not available in 1½"

OPTIONS

Custom Scaling
Custom Legends/Logos
Non-standard Ranges
Color Bands
2 or 4 stud mounting (Saxon only)

ORDERING INFORMATION

DC Voltmeters—Zero Left

1.0 Volts	[1] -01VA-LALA
1.5 Volts	[1] -01VA-LCLC
3 Volts	[1] -01VA-LJLJ
5 Volts	[1] -01VA-LSLS
6 Volts	[1] -01VA-LWLW
8 Volts	[1] -01VA-MJMJ
10 Volts	[1] -01VA-MTMT
15 Volts	[1] -01VA-NDND
20 Volts	[1] -01VA-NSNS
30 Volts	[1] -01VA-NLNL
40 Volts	[1] -01VA-NPNP
50 Volts	[1] -01VA-NTNT
60 Volts	[1] -01VA-NWNW
80 Volts	[1] -01VA-PDPD
100 Volts	[1] -01VA-PKPK
120 Volts	[1] -01VA-PQPQ
150 Volts	[1] -01VA-PZPZ
200 Volts	[1] -01VA-RLRL
250 Volts	[1] -01VA-RSRS
300 Volts	[1] -01VA-RXRX
500 Volts	[1] -01VA-SFSF**
600 Volts	[1] -01VA-SJSJ**

DC Voltmeters—Zero Center**

5-0-5 Volts	[1] -01NA-LSLS
10-0-10 Volts	[1] -01NA-MTMT
15-0-15 Volts	[1] -01NA-NDND
25-0-25 Volts	[1] -01NA-NJNJ
30-0-30 Volts	[1] -01NA-NLNL
50-0-50 Volts	[1] -01NA-NTNT
80-0-80 Volts	[1] -01NA-PDPD
150-0-150 V	[1] -01NA-PZPZ
300-0-300 V	[1] -01NA-RXRX
500-0-500 V	[1] -01NA-SFSF**
600-0-600 V	[1] -01NA-SJSJ**

Note:
Add suffix -B3 to Saxon P/N for 3 stud mounting.

DIMENSIONS

Model	361	362	363	364	012	013
Case Size	1½"	2½"	3½"	4½"	2½"	3½"
Size (H x W x D)	1.8" x 2.3" x 1.8"	2.66" x 3.12" x 1.81"	3.32" x 3.89" x 1.83"	4.18" x 4.73" x 1.83"	2.7" x 2.7" x 1.85"	3.5" x 3.5" x 2.0"
Barrel (cutout)	1.56"	2.16"	2.16"	2.70"	2.20"	2.75"
Window (cutout)	0.94" x 2.17"	1.28" x 2.92"	1.61" x 3.63"	2.36" x 5.05"	---	---

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 #	Catalog #
0-50	0-50	07010	07020	07030
50-0-50	50-0-50	–	07021	07031

DC Millivoltmeters		Model 2122 2½"	Model 2123 3½"	Model 2124 4½"
Range	Scale	Catalog #	Catalog #	Catalog #
0-50	0-50	17472	17540	17636
50-0-50	50-0-50	–	17541	17635

DC Voltmeters		Model 1227 2½"	Model 1327 3½"	Model 1329 4½"
Range	Scale	Catalog #	Catalog #	Catalog #
0-5	0-5	09550	09720	09870
0-10	0-10	09560	09740	09890
0-15	0-15	09570	09750	09900
0-25	0-25	09580	09760	09910
0-30	0-30	09590	09770	09920
0-50	0-50	09600	09780	09930
0-100	0-100	09610	09790	09940
0-150	0-150	09620	09800	09950
0-200	0-200	09622	09810	09960
0-250	0-250	09623	09820	09970
0-300	0-300	09630	09830	09980
0-500	0-500	09640	09840	09990
0-750	0-750	09650**	09850	10000

DC Voltmeters		Model 2122 2½"	Model 2123 3½"	Model 2124 4½"
Range	Scale	Catalog #	Catalog #	Catalog #
0-5	0-5	17445	17525	17618
0-10	0-10	17446	17527	17620
0-15	0-15	17447	17528	17621
0-25	0-25	17448	17529	17622
0-30	0-30	17449	17530	17623
0-50	0-50	17450	17531	17624
0-100	0-100	17451	17532	17625
0-150	0-150	17452	17533	17626
0-200	0-200	–	17534	17627
0-250	0-250	–	17535	17628
0-300	0-300	17455	17536	17629
0-500	0-500	17456	17537	17630
0-750	0-750	–	17538	17631

DC Milliammeters		Model 1227 2½"	Model 1327 3½"	Model 1329 4½"
Range	Scale	Catalog #	Catalog #	Catalog #
0-1	0-1	06175	06310	06470
0-3	0-3	06180	06320	06480
0-5	0-5	06190	06330	06490
0-10	0-10	06200	06340	06495
0-25	0-25	06220	06370	06530
0-50	0-50	06230	06380	06540

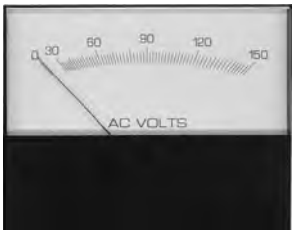
DC Milliammeters		Model 2122 2½"	Model 2123 3½"	Model 2124 4½"
Range	Scale	Catalog #	Catalog #	Catalog #
0-1	0-1	17430	17510	17600
0-3	0-3	17431	17511	17601
0-5	0-5	17432	17512	17602
0-10	0-10	17433	17513	17603
0-25	0-25	17436	17516	17606
0-50	0-50	17437	17517	17607

**External Multiplier furnished

Jewell DC Current & Voltage Meters

Modutec S & W Series

- Five Display Sizes: 1½", 2½", 3½", 4½" and 5½"
- Shielded Taut-Band Movement
- Surface-Mount or Window-Mount Models



S Series

W Series

SPECIFICATIONS

Model			W Series		
Case Size	1½"	2½"	3½"	4½"	5½"
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	1½"	2½"	3½"	4½"	5½"
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 ≤50µA full scale)				

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 *

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	1½"
	2	2½"
	3	3½"
	4	4½"
	5	5½"
[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 1½" 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**

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

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 *

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

Crompton AC Current and Voltage Meters

Challenger and Saxon

- Accuracy: ±1.5% of Full Scale (±2% for Saxon)
- Meets ANSI C39.1
- Four Display Sizes: 1½", 2½", 3½", and 4½"
- Replacements for Yokogawa Horizon & Big Look

Saxon 013

Challenger 363

Rectifier Type - Challenger Series

ORDERING INFORMATION

[1] Insert Model Number:

361	Challenger 1½"
362	Challenger 2½"
363	Challenger 3½"
364	Challenger 4½"

AC Milliammeters, Moving Coil, 50/60 Hz	
5 mA	[1] -01BA-FXFX-C7
10 mA	[1] -01BA-GZGZ-C7
20 mA	[1] -01BA-HFHF-C7
30 mA	[1] -01BA-GZGZ-C7
50 mA	[1] -01BA-HYHY-C7
75 mA	[1] -01BA-JDJD-C7
80 mA	[1] -01BA-JJJJ-C7
100 mA	[1] -01BA-JRJR-C7
150 mA	[1] -01BA-JXJX-C7
200 mA	[1] -01BA-KAKA-C7
500 mA	[1] -01BA-KMKM-C7

AC Voltmeters, Moving Coil, 50/60 Hz	
10 Volts	[1] -01WA-MTMT-C7
15 Volts	[1] -01WA-NDND-C7
20 Volts	[1] -01WA-NGNG-C7
25 Volts	[1] -01WA-NJNJ-C7
30 Volts	[1] -01WA-NLNL-C7
50 Volts	[1] -01WA-NTNT-C7
80 Volts	[1] -01WA-PDPD-C7
100 Volts	[1] -01WA-PKPK-C7
150 Volts	[1] -01WA-PZPZ-C7
200 Volts	[1] -01WA-RLRL-C7
250 Volts	[1] -01WA-RSRS-C7
300 Volts	[1] -01WA-RXRX-C7

TRMS Reading - Challenger Series

ORDERING INFORMATION

[1] Insert Model Number:

362	Challenger 2½"
363	Challenger 3½"
364	Challenger 4½"

AC Ammeters, Moving Iron, 50/60 Hz	
1 Amp	[1] -02AA-LALA-C7
3 Amp	[1] -02AA-LJLJ-C7
5 Amp	[1] -02AA-LSLS-C7
8 Amp	[1] -02AA-MJMJ-C7
10 Amp	[1] -02AA-MTMT-C7
15 Amp	[1] -02AA-NDND-C7
20 Amp	[1] -02AA-NGNG-C7
30 Amp	[1] -02AA-NLNL-C7
50 Amp	[1] -02AA-NTNT-C7
AC Ammeters-Transformer Rated, 0-5 Amp, Scale Only	
10 Amp	[1] -02AA-LSMT-C7
15 Amp	[1] -02AA-LSND-C7
20 Amp	[1] -02AA-LSNG-C7
30 Amp	[1] -02AA-LSNL-C7
40 Amp	[1] -02AA-LSNP-C7
50 Amp	[1] -02AA-LSNT-C7
75 Amp	[1] -02AA-LSPB-C7
80 Amp	[1] -02AA-LSPD-C7
100 Amp	[1] -02AA-LSPK-C7
150 Amp	[1] -02AA-LSPZ-C7
200 Amp	[1] -02AA-LSRL-C7
300 Amp	[1] -02AA-LSRX-C7
400 Amp	[1] -02AA-LSSC-C7
500 Amp	[1] -02AA-LSSF-C7
600 Amp	[1] -02AA-LSSJ-C7
800 Amp	[1] -02AA-LSSN-C7
1000 Amp	[1] -02AA-LSSS-C7
AC Voltmeter, Moving Iron, 50/60 Hz	
10 Volts	[1] -02VA-MTMT-C7
15 Volts	[1] -02VA-NDND-C7
30 Volts	[1] -02VA-NLNL-C7
50 Volts	[1] -02VA-NTNT-C7
100 Volts	[1] -02VA-PKPK-C7
150 Volts	[1] -02VA-PZPZ-C7
300 Volts	[1] -02VA-RXRX-C7
500 Volts	[1] -02VA-SFSF-C7
600 Volts	[1] -02VA-SJSJ-C7
AC Voltmeter, Transformer Rated, Iron Vane, 0-150V, 50/60 Hz Scale:	
150 Volts	[1] -02VA-PZPZJ-C7
300 Volts	[1] -02VA-PZRXJ-C7
600 Volts	[1] -02VA-PZSJJ-C7
750 Volts	[1] -02VA-PZSMJ-C7
3 kV	[1] -02VA-PZUA-C7

Notes:
1. For 400Hz, change C7 in part number to C4.
2. Add suffix -B3 to Saxon P/N for 3 stud mounting.

TRMS Reading - Saxon Series

ORDERING INFORMATION

[1] Insert Model Number:

012	Saxon 2½"
013	Saxon 3½"

AC Ammeters, Moving Iron, 50/60 Hz	
1 Amp	[1] -75AA-LALA-C7
3 Amp	[1] -75AA-LJLJ-C7
5 Amp	[1] -75AA-LSLS-C7
8 Amp	[1] -75AA-MJMJ-C7
10 Amp	[1] -75AA-MTMT-C7
15 Amp	[1] -75AA-NDND-C7
20 Amp	[1] -75AA-NGNG-C7
30 Amp	[1] -75AA-NLNL-C7
50 Amp	[1] -75AA-NTNT-C7
AC Ammeters-Transformer Rated, 0-5 Amp, Scale Only	
10 Amp	[1] -75AA-LSMT-C7
15 Amp	[1] -75AA-LSND-C7
20 Amp	[1] -75AA-LSNG-C7
30 Amp	[1] -75AA-LSNL-C7
40 Amp	[1] -75AA-LSNP-C7
50 Amp	[1] -75AA-LSNT-C7
75 Amp	[1] -75AA-LSPB-C7
80 Amp	[1] -75AA-LSPD-C7
100 Amp	[1] -75AA-LSPK-C7
150 Amp	[1] -75AA-LSPZ-C7
200 Amp	[1] -75AA-LSRL-C7
300 Amp	[1] -75AA-LSRX-C7
400 Amp	[1] -75AA-LSSC-C7
500 Amp	[1] -75AA-LSSF-C7
600 Amp	[1] -75AA-LSSJ-C7
800 Amp	[1] -75AA-LSSN-C7
1000 Amp	[1] -75AA-LSSS-C7
AC Voltmeter, Moving Iron, 50/60 Hz	
10 Volts	[1] -75VA-MTMT-C7
15 Volts	[1] -75VA-NDND-C7
30 Volts	[1] -75VA-NLNL-C7
50 Volts	[1] -75VA-NTNT-C7
100 Volts	[1] -75VA-PKPK-C7
150 Volts	[1] -75VA-PZPZ-C7
300 Volts	[1] -75VA-RXRX-C7
500 Volts	[1] -75VA-SFSF-C7
600 Volts	[1] -75VA-SJSJ-C7
AC Voltmeter, Transformer Rated, Iron Vane, 0-150V, 50/60 Hz Scale:	
150 Volts	[1] -75VA-PZPZJ-C7
300 Volts	[1] -75VA-PZRXJ-C7
600 Volts	[1] -75VA-PZSJJ-C7
750 Volts	[1] -75VA-PZSMJ-C7
3 kV	[1] -75VA-PZUA-C7

OPTIONS

Custom Scaling
Custom Legends/Logos
Non-standard Ranges
Color Bands
2 or 4 stud mounting (Saxon only)

DIMENSIONS

Model	361	362	363	364	012	013
Case Size	1½"	2½"	3½"	4½"	2½"	3½"
Size (H x W x D)	1.8" x 2.3" x 1.8"	2.66" x 3.12" x 1.81"	3.32" x 3.89" x 1.83"	4.18" x 4.73" x 1.83"	2.7" x 2.7" x 1.85"	3.5" x 3.5" x 2.0"
Barrel (cutout)	1.56"	2.16"	2.16"	2.70"	2.20"	2.75"
Window (cutout)	0.94" x 2.17"	1.28" x 2.92"	1.61" x 3.63"	2.36" x 5.05"	---	---

Simpson Analog Panel Meters AC Voltage/Current

Century Style ▶

◀ Wide Vue

Wide Vue Style: Models 1247, 1257, 1347, 1357, 1349 & 1359

- UL Recognized
- Wide Angle Visibility
- Phenolic Case with Acrylic Window
- Additional Ranges Upon Request

Century Style: Models 2142, 2143, 2152, 2153, 2144 & 2154

- UL Recognized
- Phenolic Case and Glass Window
- Additional Ranges Upon Request

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 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

AC Voltmeters-Rectified		Model 1247 2½"	Model 1347 3½"	Model 1349 4½"
Range	Scale	Catalog #	Catalog #	Catalog #
0-5	0-5	10015	10020	10090
0-10	0-10	10016	10030	10100
0-15	0-15	–	10040	10110
0-50	0-50	–	10050	10120
0-150	0-150	10017	10060	10130
0-300	0-300	10018	10070	10140

AC Voltmeters-Rectified		Model 2142 2½"	Model 2143 3½"-	Model 2144 4½"
Range	Scale	Catalog #	Catalog #	Catalog #
0-5	0-5	17460	17542	17640
0-10	0-10	–	17543	17641
0-15	0-15	–	17544	17642
0-50	0-50	–	17545	17643
0-150	0-150	17462	17546	17644

Voltmeters-Iron Vane		Model 1257 2½"	Model 1357 3½"	Model 1359 4½"
Range	Scale	Catalog #	Catalog #	Catalog #
0-5	0-5	–	10160	10260
0-10	0-10	09670	10170	10270
0-15	0-15	09675	10180	10280
0-25	0-25	09680	10190	10290
0-50	0-50	09690	10200	10300
0-100	0-100	09695	10210	10310
0-150	0-150	09700	10220	10320
0-250	0-250	09705	10230	10330
0-300	0-300	09710	10240	10340
0-500	0-500	09715*	10250*	10350*

Voltmeters-Iron Vane		Model 2152 2½"	Model 2153 3½"	Model 2154 4½"
Range	Scale	Catalog #	Catalog #	Catalog #
0-10	0-10	17685	17726	17771
0-15	0-15	17686	17727	17772
0-25	0-25	17687	17728	17773
0-50	0-50	17688	17729	17774
0-100	0-100	–	17730	17775
0-150	0-150	17690	17731	17776
0-250	0-250	17691	17732	17777
0-300	0-300	17692	17733	17778
0-500	0-500	–	17734*	17779*

AC Milliammeters		Model 1257 2½"	Model 1357 3½"	Model 1359 4½"
Range	Scale	Catalog #	Catalog #	Catalog #
0-10	0-10	06294	06625	06665
0-50	0-50	06295	06630	06670
0-100	0-100	06296	06640	06680
0-250	0-250	06297	06650	06690
0-500	0-500	06300	06660	06699

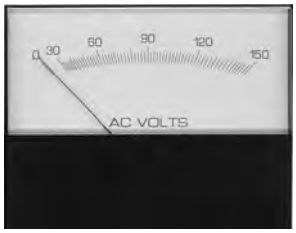
AC Millammeters		Model 2152 2½"	Model 2153 3½"	Model 2154 4½"
Range	Scale	Catalog #	Catalog #	Catalog #
0-10	0-10	17680	–	17760
0-50	0-50	17681	17716	17761
0-100	0-100	17682	17717	17762
0-250	0-250	17683	17718	17763
0-500	0-500	17684	17719	17764

* 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: 1½", 2½", 3½", 4½" and 5½"
- 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	1½"	2½"	3½"	4½"	5½"
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	1½"	2½"	3½"	4½"	5½"
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 sinewave)				
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	1½"
2	2½"
3	3½"
4	4½"
5	5½"

[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 1½" size
**not available in 1½" or 5½" 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-AVVX-750
0-1500	[1]	PB-AVVX-1500
0-3000	[1]	PB-AVVX-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-AMA-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

Crompton Frequency Meters

Challenger 363

Saxon 013

Challenger and Saxon

- Accuracy Class 0.5
- Meets ANSI C39.1
- Three Display Sizes: 2½", 3½", and 4½"
- Replacements for Yokogawa Horizon & Big Look

MODEL CODE

[1] Insert Model Number:

362	Challenger 2½"
363	Challenger 3½"
364	Challenger 4½"
012	Saxon 2½"
013	Saxon 3½"

ORDERING INFORMATION

AC Frequency Meters, Self Contained, Accuracy Class 0.5

Voltage Input	Center Frequency	Scale (Hz)	Part Number
110/130 VAC	50	45-55	[1] -41SA-PNAG-AG
110/130 VAC	55	45-65	[1] -41SA-PNAJ-AJ
110/130 VAC	60	55-65	[1] -41SA-PNAN-AN
110/130 VAC**	400	380-420	[1] -41SA-PNBI-BI
200/250 VAC	50	45-55	[1] -41SA-RNAG-AG
200/250 VAC	55	45-65	[1] -41SA-RNAJ-AJ
200/250 VAC	60	55-65	[1] -41SA-RNAN-AN
200/250 VAC**	400	380-420	[1] -41SA-RNBI-BI

**Saxon Only

Note: Add suffix -B3 to Saxon P/N for 3 stud mounting.

DIMENSIONS

Model	362	363	364	012	013
Case Size	2½"	3½"	4½"	2½"	3½"
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"	2.7" x 2.7" x 1.85"	3.5" x 3.5" x 2.0"
Barrel (cutout)	2.16"	2.16"	2.70"	2.20"	2.75"
Window (cutout)	1.28" x 2.92"	1.61" x 3.63"	2.36" x 5.05"	---	---

Options:

- Custom Scales
- Special Legends
- Custom Logos
- Color Bands
- 2 or 4 stud mounting (Saxon only)

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

Cat #	Frequency	Voltage
35100	45-55 HZ	120V
35101	45-55 HZ	240V
35102	55-65 HZ	120V
35103	55-65 HZ	240V
35104	380-420 HZ	120V
35105	380-420 HZ	240V

Model: 1387, 3½" WIDEVUE

Cat #	Frequency	Voltage
35106	45-55 HZ	120V
35107	45-55 HZ	240V
35108	55-65 HZ	120V
35109	55-65 HZ	240V
35110	380-420 HZ	120V
35111	380-420 HZ	240V

Model: 1389, 4½" WIDEVUE

Cat #	Frequency	Voltage
35112	45-55 HZ	120V
35113	45-55 HZ	240V
35114	55-65 HZ	120V
35115	55-65 HZ	240V
35116	380-420 HZ	120V
35117	380-420 HZ	240V

Model: 2182, 2½" CENTURY

Cat #	Frequency	Voltage
35118	45-55 HZ	120V
35119	45-55 HZ	240V
35120	55-65 HZ	120V
35121	55-65 HZ	240V
35122	380-420 HZ	120V
35123	380-420 HZ	240V

Model: 2183, 3½" CENTURY

Cat #	Frequency	Voltage
35124	45-55 HZ	120V
35125	45-55 HZ	240V
35126	55-65 HZ	120V
35127	55-65 HZ	240V
35128	380-420 HZ	120V
35129	380-420 HZ	240V

Model: 2184, 4½" CENTURY

Cat #	Frequency	Voltage
35130	45-55 HZ	120V
35131	45-55 HZ	240V
35132	55-65 HZ	120V
35133	55-65 HZ	240V
35134	380-420 HZ	120V
35135	380-420 HZ	240V

Model: 187, 2½" RECTANGULAR

Cat #	Frequency	Voltage
35136	45-55 HZ	120V
35137	45-55 HZ	240V
35138	55-65 HZ	120V
35139	55-65 HZ	240V
35140	380-420 HZ	120V
35141	380-420 HZ	240V

Model: 87, 3½" RECTANGULAR

Cat #	Frequency	Voltage
35142	45-55 HZ	120V
35143	45-55 HZ	240V
35144	55-65 HZ	120V
35145	55-65 HZ	240V
35146	380-420 HZ	120V
35147	380-420 HZ	240V

Model: 89, 4½" RECTANGULAR

Cat #	Frequency	Voltage
35148	45-55 HZ	120V
35149	45-55 HZ	240V
35150	55-65 HZ	120V
35151	55-65 HZ	240V
35152	380-420 HZ	120V
35153	380-420 HZ	240V

Model: 185, 2½" ROUND

Cat #	Frequency	Voltage
35154	45-55 HZ	120V
35155	45-55 HZ	240V
35156	55-65 HZ	120V
35157	55-65 HZ	240V
35158	380-420 HZ	120V
35159	380-420 HZ	240V

Model: 85, 3½" ROUND

Cat #	Frequency	Voltage
35160	45-55 HZ	120V
35161	45-55 HZ	240V
35162	55-65 HZ	120V
35163	55-65 HZ	240V
35164	380-420 HZ	120V
35165	380-420 HZ	240V

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-LSLS
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-RXRX
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-RXRX
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.

Hoyt Analog Panel Meters

HST-94

- Ammeters, Voltmeters & Frequency Meters
- 2½", 3½" and 4½" Sizes
- Meets ANSI C39.1
- Available in Pivot & Jewel and Taut Band Movements
- Equivalent to Yokogawa **Stylist** Series

SPECIFICATIONS

Accuracy:	±2.0% of Full Scale
Temperature:	0-40° operating
Construction:	Black case, white dial scale, black pointer
Protection:	IP42 front
Scale:	90 degree

Model	HST-75	HST-94	HST-125
Case Size	2½"	3½"	4½"
Size (H x W x D)	3.0" x 2.28" x 2.11"	3.70" x 2.88" x 2.24"	5.08" x 3.96" x 2.24"
Barrel (cutout)	2.11"	2.68"	2.68"
Mounting	4 stud	4 stud	4 stud

1½" Stylist replacement also available.

Standard Ranges

DC	50, 100, 150, 200, 250, 300, 500µA
	1, 5, 10, 20, 50, 100, 150, 200, 250, 300, 500mA
	1, 1.5, 5, 10, 20A
	50, 60, 80, 100, 500mV
	3, 5, 10, 20, 30, 50, 100, 150, 200, 300, 500V
AC	30, 50, 100, 150, 200, 300, 500V (rectifier type)
Hz	45-55, 45-65, 55-65Hz (specify 120 or 240V)

Options:

- Custom Ranges
- Custom Scales
- Special Legends
- Custom Logos
- Illumination

HST-98

- Ammeters, Voltmeters & Frequency Meters
- 2½" and 3½" Sizes
- Panel or Window Mounting
- Meets ANSI C39.1
- Equivalent to Yokogawa **Horizon** Series

SPECIFICATIONS

Accuracy:	±2.0% of Full Scale
Construction:	ABS case, polycarbonate cover, black pointer

Model	HST-78	HST-98
Case Size	2½"	3½"
Size (H x W x D)	3.15" x 2.68" x 2.35"	3.90" x 3.31" x 2.50"
Barrel (cutout)	2.25"	2.78"
Window (cutout)	3.11" x 1.49"	3.84" x 1.84"

Standard Ranges

DC	50, 100, 150, 200, 250, 300, 500µA
	1, 5, 10, 20, 80, 100, 150, 200, 250, 300, 500mA
	1.5, 5, 6, 10, 20A
	60, 80, 150, 500mV
	3, 5, 15, 20, 30, 50, 100, 150, 200, 300, 600V
AC	1, 1.5, 5, 10 20A
	2, 5, 10, 50, 100, 150, 200, 300, 500, 600V
AC	50, 100, 150, 200, 300, 500, 600V (rectifier type)
Hz	45-65Hz (specify 120, 240 or 380V)

Options:

- Custom Ranges
- Custom Scales
- Special Legends
- Custom Logos
- Illumination

HST-70u

CE c UL us LISTED

1½" Big Look replacement also available.

- Ammeters, Voltmeters & Frequency Meters
- 2½" and 3½" Sizes
- Meets ANSI C39.1
- Replacement for Yokogawa **Big Look**

SPECIFICATIONS

Accuracy:	AC & DC iron vane: ±2.0% of Full Scale AC rectifier type: ±3.0% of Full Scale Frequency type: ±0.3
Overload:	Voltmeters: 50% momentary / 20% prolonged Ammeters: 50% momentary / 20% prolonged Frequency meters: 20% Maximum
Burden:	AC Ammeters - 0.5VA Maximum
Construction:	Acrylic resin front and black bakelite case

Model	HST-70u	HST-90u
Case Size	2½"	3½"
Size (H x W x D)	2.76" x 2.76" x 2.32"	3.54" x 3.54" x 2.36"
Barrel (cutout)	2.17"	2.17"
Mounting	3 or 4 stud	4 stud

Standard Ranges

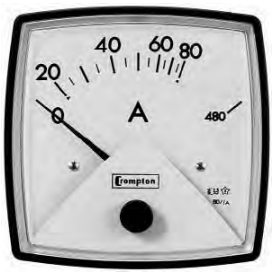
DC	50, 100, 200, 300, 500µA
	1, 5, 10, 20mA
	1, 10, 20, 50A
	50, 100mV
	30, 50, 100, 150, 300V
AC	5A for CT with 50, 100, 150 or 200A scale
	30, 50, 150, 300, 600V
Hz	45-55, 45-65, 55-65Hz (specify 120 or 240V)

Options:

- Custom Ranges
- Custom Scales
- Special Legends
- Custom Logos
- Rectifier Movement (25-1000Hz)
- NEMA4 front

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

Obsolete - call for suitable replacement

- 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.

$$\text{Calibration watts or vars} = \frac{\text{MAX. full scale value}}{\text{PT ratio x CT ratio}}$$

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

Crompton DIN Panel Meters

- 48, 72, 96 & 144mm Case Sizes
- 1.5% Accuracy Class
- 90° & 240° Versions

DIN Short Scale ▶

◀ DIN Long Scale

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
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	AC Rect
Range	Code			
200 µA	EAEA	●		
250 µA	EBEB	●		
400 µA	EIEI	●		
600 µA	EQEQ	●		
1 mA	FAFA	●		●
1.5 mA	FDFD	●		●
2.5 mA	FKFK	●		●
5 mA	FXFX	●		●
6 mA	GCGC	●		●
10 mA	GZGZ	●		●
15 mA	HCHC	●		●
20 mA	HFHF	●		●
25 mA	HJHJ	●		●
40 mA	HSHS	●		●
100 mA	HZHZ	●		●
250 mA	KDKD	●		●
400 mA	KJKJ	●		●
600 mA	KPKP	●		●
1 A	LALA	●	●	●
1.5 A	LCLC	●	●	
2.5 A	LFLF	●	●	
4 A	LLLL	●	●	
5 A	LSLS	●	●	
6 A	LWLW	●	●	
10 A	MTMT	●	●	
15 A	NDND	●	●	
20 A	NGNG		●	
25 A	NJNJ	●	●	
30 A	NLNL	●	●	
40 A	NPNP	●	●	

Voltmeter		DC	AC TRMS	AC Rect
Range	Code			
50 mV	HYHY	●		
60 mV	JCJC	●		
75 mV	JDJD	●		
100 mV	JRJR	●		
150 mV	JXJX	●		
250 mV	KDKD	●		
400 mV	KJKJ	●		
600 mV	KPKP	●		
1 V	LALA	●		
1.5 V	LCLC	●		
2.5 V	LFLF	●		
4 V	LLLL	●		
5 V	LSLS	●		
6 V	LWLW	●		
10 V	MTMT	●		●
15 V	NDND	●		●
20 V	NGNG	●		
25 V	NJNJ	●		●
40 V	NPNP	●		●
60 V	NWNW	●	●	●
100 V	PKPK	●	●	●
150 V	PZPZ	●	●	●
250 V	RSRS	●	●	●
300 V	RXRX		●	●
400 V	SCSC	●	●	●
500 V	SFSF	●	●	●
600 V	SJSJ	●	●	●

● Available Range

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
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
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
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:	UL94VO 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
- $2^1/_2$" - $4^1/_2$" Sizes
- DC & AC Types
- Wide Variety of Options
- Military Qualified Versions ($2^1/_2$" & $3^1/_2$")

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 $3^1/_2$" Metal Case Sealed Meters for extreme duty applications.

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 10, 15, 30, 50, 100, 150, 300, 600V
D	**Scale**	
		Specify range and legend
E	**Options**	

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: 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

2½"	7025
3½"	7035
4½"	7045
5½"	7055

Panelist Series
Black phenolic case, glass window

3½"	303
4½"	503
5½"	603

Clear plastic case & window

2½"	202
3½"	302
4½"	502
5½"	602

Round Series
Polycarbonate case, plastic or glass window

3½"	1235

Meteor Series
Plastic window & case

2½"	204
3½"	304
4½"	504
5½"	604

Obsolete - call for suitable alternatives

Edgewise Series
Plastic window & case

1½"	1015
2½"	1025
3½"	1035
3½" shielded	371

Ruggedized Series
Sealed metal case

2½"	255
3½"	355
4½"	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		
2½"	263	AC Rectifier Type
	264	RF Core Magnet
	265	DC Core Magnet
	266	AC Iron Vane
3½"	363	AC Rectifier Type
	364	RF Core Magnet
	365	DC Core Magnet
	366	AC Iron Vane
90° Square		
1½"	133	AC Rectifier Type
	135	DC Core Magnet
2½"	233	AC Rectifier Type
	235	DC Core Magnet
	236	AC Iron Vane
250° Round		
2½"	2432	AC Rectifier Type
	2452	RF Core Magnet
3½"	3432	AC Rectifier Type
	3452	DC Self-shielding
4½"	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
1½"	3115	DC Moving Coil
	3116R	AC Rectifier Type
2½"	3125	DC Moving Coil
	3126	AC Repulsion
3½"	3135	DC Moving Coil
	3136	AC Repulsion
4½"	3145	DC Moving Coil
	3146	AC Repulsion

ELumination Lighting (Optional on 3100 & 5000 series meters)

Light Intensity: 10–13 ft-L
Power Required: 3–18VDC, 60mA max.

5000 Series

- Vibration & Harsh Environment Resistant
- Many Voltage & Current Ranges
- UL Recognition Optional
- Accuracy 2%, except Rectifier Type 3%

Size	Model	Type
1½"	5015	DC Moving Coil
	5016R	AC Rectifier Type
2½"	5025	DC Moving Coil
	5026	AC Repulsion
3½"	5035	DC Moving Coil
	5036	AC Repulsion

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

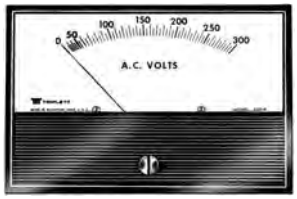
Plastic window & case

1½"	120-G
2½"	220-G, 230-G
3½"	320-G, 330-G
4½"	420-G, 430-G
5½"	520-G, 530-G

R Series

Plastic window & case

4½"	420-R, 430-R



GL Series

Glass window, plastic case

2½"	220-GL, 230-GL
3½"	320-GL, 330-GL
4½"	420-GL, 430-GL
5½"	520-GL, 530-GL

Phenolic Series

Glass window, phenolic case

2½" rectangular	227-T, 237-S
3½" rectangular	327-T, 337-S
4½" rectangular	420, 430
6½" rectangular	626, 636
2½" round	221-T, 231-S
3½" round	321-T, 331-S

GL/B Series

Glass window, plastic case, integral bezel

3½"	320-GL/B, 330-GL/B
4½"	420-GL/B, 430-GL/B
5½"	520-GL/B, 530-GL/B

Ruggedized Series

Plastic window, steel case, sealed

1½" rectangular	127-HR
2½" round	221-HR
3½" 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.

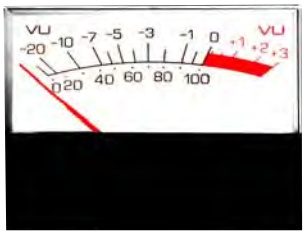
The VU meter is the standard level indicator for audio frequency transmission systems. VU meters are used to measure sound or noise levels in broadcast monitoring, public address systems and anywhere volume level measurements are to be made. The VU also is useful for the measurement of noise level and 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
	4025	Rectangular, phenolic & glass
3 1/2"	2035	Rectangular, panel or bezel mount
	2135	Rectangular, low profile phenolic
	582	Round, phenolic
	597	Rectangular, phenolic
	3135	Rectangular, surface or window mount
	4035	Rectangular, phenolic & glass
4 1/2"	2045	Rectangular, panel or bezel mount
	2145	Rectangular, low profile phenolic
	647	Rectangular, phenolic
	3145	Rectangular, surface or window mount
	4045	Rectangular, phenolic & glass

Prime Instruments 5% Accuracy Panel Meters

- Made in USA
- AC & DC models
- 5% accuracy
- Wide selection of sizes & styles
- Custom ranges & artwork available

Available Ranges:
DC volts: 0-1 to 0-500
DC milliamps: 0-1 to 0-500
DC amps: 0-1 to 0-100
AC volts: 0-5 to 0-600
AC millamps: 0-25 to 0-500
AC amps: 0-1 to 0-30
Frequency: 45-65 or 55-65Hz (Models 21 & 37)

Terminals: #6-32 studs (≤10A), except 1/4" quick-connects on Model 21

Model 37

Lexan bezel.
Rugged moving magnet construction.
Case: Zinc plated steel (ABS cycolac available for marine applications).

2.375" x 2.375" x 1.75" deep.
Clamp mounting in 2.032" hole.

Model 21

Rugged steel case.
Black ABS bezel.

2.50" x 3.25" x 1.71" deep.
Clamp mounting in 2.032" hole.

Model 42

High impact plastic case.
Glass or acrylic lens.
Bezel: black or anodized aluminum, chrome, stainless steel.

2.32" dia. x 2.10" deep.
Clamp mounting in 2.032" hole.

Model 90

Moving magnet construction.
Rugged, efficient mechanism.
Zero adjuster.

2.48" x 2.36" x 1.25" deep.
Flush or surface mounting in rectangular hole.

Many other styles and sizes available. Custom ranges and artwork also available on request.

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

33 Series

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.

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					
		Model 3323 3½" SSP	Model 3323 3½" DSP	Model 3324 4½" SSP	Model 3324 4½" DSP
Range	**Scale**	**Cat. #**	**Cat. #**	**Cat. #**	**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
		Model 3343 3½" SSP	**Model 3343 3½" DSP**	**Model 3344 4½" SSP**	**Model 3344 4½" DSP**
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.

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 and125V 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.

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

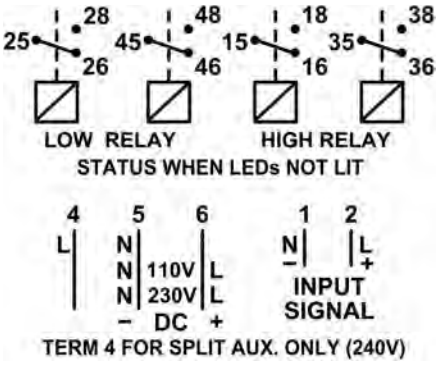
007 ▶

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)

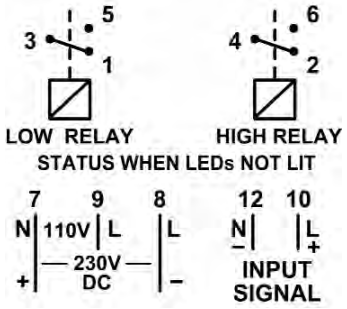


239 Terminal Diagram

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)



007 Terminal Diagram

OPTIONAL EXTRAS

Description	Code
4-20 mADC 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 Poewer	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

Low relay activates when signal is below setpoint.

High relay activates when signal is above high setpoint.

Weschler Meter Relays

NEW

- 3½" & 4½" 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

Economical replacement for 3.5" and 4.5" meter relays from Beede, LFE and Simpson. Also replaces the Crompton 4.5" meter relays.

▲ CMT-Y

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
Movement	Core type, self-shielding with taut band suspension
Tracking	±3%
Repeatablility	Within 0.5% of full scale
Relay	DPDT per setpoint 5A @ 120/240VAC resistive
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
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
Switching	Within 2% of indication
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.
Operating Temperature	+41°F to 122°F (5°C to +50°C)
Dial	90° flattened arc

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, excpet 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% >100V 200%	150% 150%	150%
	Continuous	150%	120%	150%	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 High Setpoint Models	Same as Single High Setpoint Models Except Change digit #3 from 1 to 2	Same as Single High Setpoint Models
Double Setpoint		
Same as Single High Setpoint Models	Same as Single High Setpoint Models Except Change Digit #3 from 1 to 3	Single High Setpoint

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 ▶

c UL us

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 conditon)
All Models	
D	9-30 VDC,10-32 VAC power (UL pending)
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), 0-1 mADC to 0-20 mADC, 4-20 mADC (20V compliance, 1000Ω @ 20 mA)
APD 6010	0-40 mVAC to 0-300 VAC TRMS, 0-1 mAAC to 0-1000 mAAC TRMS	
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.
** not UL recognized.

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.

API Universal Isolated Transmitters, Field Configurable

TEMPERATURE to DC

- Suports Thermocouple, RTDs and Thermistors
- Zero & Span for Output
- 1200V Isolation
- Input Loop Tracker LED
- 20VDC Supply for Sink/Source Output
- Made in USA, Lifetime Warranty

APD4000

The APD4000 provides an optically isolated & linearized DC voltage or current output. Sensor type, temperature range and output range are field configurable. Linearization uses 41-55 segments or up to a 14th order polynomial. Full 3-way isolation (input, output, power) make this module useful for ground loop elimination, common mode signal rejection, and noise pickup reduction. The low noise 18 bit analog output is isolated and can be set up for common voltage and milliamp output types. A 20 VDC loop excitation supply for the milliamp output can be selectively wired for sinking or sourcing allowing use with a powered or unpowered milliamp device.

SPECIFICATIONS

LoopTracker®:	Variable brightness green LED indicate input level
Test Button:	Front push button switch enables/disables test level output. Adjustable 0-100% of span via front buttons
Response Time:	300 msec typical
Accuracy:	±0.1°C accuracy; 0.001°C resolution (18 bit)
Isolation:	1200 Vrms power/input, power/output, input/output 600 VACp or 600 VDC common mode protection
Temperature:	-10°C to +60°C operating
Power:	85-265 VAC (50/60 Hz), 60-300 VDC standard (3W max); 9-30 VDC,10-32 VAC optional
Dimensions:	0.89" W x 4.62" H x 4.81" D (22.5x117x122 mm)
Thermocouple Input:	J, K, T, E, R, S, N, B, C, D, G, M, P Full ANSI temperature ranges with Automatic CJC
T/C burnout:	Upscale, downscale or last valid output
RTD Input:	2, 3, or 4 wire, 10Ω to 8000Ω RTDs, (4 wire with/without current rotation) Cu-10, Cu-100, Ni-100, Ni-120, Ni-Fe-500, Ni-Fe-1000, Ni-Fe-2000, Pt-10, Pt-25, Pt-50, Pt-100, Pt-200, Pt-470, Pt-500, Pt-1000
Thermistor Input:	44004/44033 2.252kΩ at 25°C 44005/44030 3.000kΩ at 25°C 44007/44034 5.000kΩ at 25°C 44006/44031 10.00kΩ at 25°C 44008/44032 30.00kΩ at 25°C YSI 400 2.252kΩ at 25°C Spectrum 1003k 1kΩ
DC Output:	Voltage: 0-1 V, 0-2 V, 0-4 V, 0-5 V, 1-5 V, 0-8 V, 0-10 V, 2-10 V, ±5 VDC, ±10 VDC Current: 0-2 mA, 0-4 mA, 0-8 mA, 0-10 mA, 2-10 mA, 0-16 mA, 0-20 mA, 4-20 mA 20 V compliance, 1000Ω at 20 mA
Output Adjust:	Zero & span adjustable ±10% via front panel buttons
Output Loop Supply:	20 VDC nom., regulated, 25 mA max.

ORDERING INFORMATION

APD4000	Temperature to DC Transmitter, 85-265VAC/60-300VDC
APD4000D	Temeprature to DC Transmitter, 9-30VDC/10-32VAC
OPTIONS—add to end of model number	
U	Conformal coating for moisture resistance
R	Reverse acting output (factory set only)
NC5	5 point NIST traceable calibration
NC11	11 point NIST traceable calibration
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

PROCESS & TEMPERATURE to DC

- One Model for All Common Sensors
- Zero & Span for Output
- 1200V Isolation
- Input Loop Tracker LED
- Output Test Function
- Loop Supply for Sink/Source Output
- Made in USA, Lifetime Warranty

APD8000

The APD 8000 accepts a DC, potentiometer, thermocouple, RTD or thermistor input and provides an optically isolated & linearized DC voltage or current output. Sensor type, temperature range and output range are field configurable. Linearization uses 41-55 segments or up to a 14th order polynomial. Full 3-way isolation (input, output, power) make this module useful for ground loop elimination, common mode signal rejection, and noise pickup reduction. The low noise 18 bit analog output is isolated and can be set up for common voltage and milliamp output types. A 20 VDC loop excitation supply for the milliamp output can be selectively wired for sinking or sourcing allowing use with a powered or unpowered milliamp device. An API exclusive feature includes a green LoopTracker LED that varies in intensity with the process input signal.

SPECIFICATIONS

LoopTracker®:	Variable brightness green LED indicate input level
Test Button:	Front push button switch enables/disables test level output. Adjustable 0-100% of span via front buttons
Response Time:	300 msec typical
Accuracy:	Temperature In: ±0.1°C accuracy; 0.001°C resolution (18 bit) DC or Pot. Inputs: ±0.1% span accuracy (18 bit resolution)
Isolation:	1200 Vrms power/input, power/output, input/output 600 VACp or 600 VDC common mode protection
Temperature:	-10°C to +60°C operating
Power:	85-265 VAC (50/60 Hz), 60-300 VDC standard (3W max); 9-30 VDC,10-32 VAC optional
Dimensions:	0.89" W x 4.62" H x 4.81" D (22.5x117x122 mm)
DC Volts Input:	35 ranges from ±25 mVDC to ±10 VDC
DC mA Input:	20 ranges from ±0.5 mADC to ±20 mADC
Potentiometer In:	100Ω to 1 MΩ; 1, 2, or 4 volt excitation
Thermocouple Input:	J, K, T, E, R, S, N, B, C, D, G, M, P Full ANSI temperature ranges with Automatic CJC
T/C burnout:	Upscale, downscale or last valid output
RTD Input:	2, 3, or 4 wire, 10Ω to 8000Ω RTDs, (4 wire with/without current rotation) Cu-10, Cu-100, Ni-100, Ni-120, Ni-Fe-500, Ni-Fe-1000, Ni-Fe-2000, Pt-10, Pt-25, Pt-50, Pt-100, Pt-200, Pt-470, Pt-500, Pt-1000
Thermistor Input:	44004/44033 2.252kΩ at 25°C 44005/44030 3.000kΩ at 25°C 44007/44034 5.000kΩ at 25°C 44006/44031 10.00kΩ at 25°C 44008/44032 30.00kΩ at 25°C YSI 400 2.252kΩ at 25°C Spectrum 1003k 1kΩ
DC Output:	Voltage: 0-1 V, 0-2 V, 0-4 V, 0-5 V, 1-5 V, 0-8 V, 0-10 V, 2-10 V, ±5 VDC, ±10 VDC Current: 0-2 mA, 0-4 mA, 0-8 mA, 0-10 mA, 2-10 mA, 0-16 mA, 0-20 mA, 4-20 mA 20 V compliance, 1000Ω at 20 mA
Output Adjust:	Zero & span adjustable ±10% via front panel buttons
Output Loop Supply:	20 VDC nom., regulated, 25 mA max.

ORDERING INFORMATION

APD8000	Universal Input to DC Transmitter, 85-265VAC/60-300VDC
APD8000D	Universal Input to DC Transmitter, 9-30VDC/10-32VAC
Options & Accessories - See API4000 Ordering Information	

API DC to DC Splitter/Isolator/Transmitter

- One Input to Two Outputs with Full Isolation
- Zero and Span for Each Output
- 1200V Input/Output /Power Isolation
- Output LoopTracker LEDs
- Output Test/Manual Override for Each Channel
- Built-In Loop Power Supply for Sink/Source Input

CE

APD4930

The APD4930 IsoSplitter accepts a DC voltage or current input and provides two optically isolated DC voltage or current outputs that are linearly related to the input. The input range and each output range are independent and can be specified as required. This provides an economical solution when one signal must be sent to two different devices. The input signal is filtered, amplified, split, and then passed through an opto-coupler to the output stages. Full 4-way isolation (input, output 1, output 2, power) make this module useful for ground loop elimination, common mode signal rejection, and noise pickup reduction. Two LoopTracker LEDs (one for each output channel) vary in intensity with changes in the process output signals. These save time during initial startup and/or troubleshooting.

ORDERING INFORMATION

To Order: Specify model number, signal and range for input and each output.	
APD4390	Splitter/Isolator/Transmitter 85-265VAC/60-300VDC power
APD4390D	Splitter/Isolator/Transmitter 9-30VDC/10-32VAC power

SPECIFICATIONS

DC Input:	Factory ranged, please specify
Voltage:	0-10 mVDC to 0-100 VDC
Bipolar Volatge:	±50 mVDC to ±10 VDC
Current:	0-1 mADC to 0-50 mADC, 4-20 mADC
Input Impedance:	Voltage: 200 kΩ minimum; Current: 50Ω typical
Voltage Burden:	1.25 VDC max. at 20 mA current input
DC Output:	Factory ranged, please specify each channel
Voltage:	0-1 VDC to 0-10 VDC, 10 mA max (20 VDC available)
Bipolar Voltage:	±1 VDC to ±10 VDC
Current:	0-1 mADC to 0-20 mADC, 4-20 mADC 20 V compliance, 1000Ω at 20 mA
Response Time:	70 msec typical
Accuracy:	±0.1of span (includes adjustment resolution & linearity). Output ripple & noise < 10 mV RMS
Isolation:	Full 4-way, 1200V RMS minimum
Temperature:	-10°C to +60°C operating
Power:	85-265 VAC (50/60 Hz), 60-300 VDC standard (6W max); 9-30 VDC,10-32 VAC optional (D version)
Dimensions:	0.89" W x 4.62" H x 4.81" D (22.5x117x122 mm)
Mounting:	DIN rail
Connectors:	For 4-terminal removable connectors, 14AWG wire max.
LoopTracker®:	Variable brightness LED indicate output level for each channel
Output Adjust:	Each channel zero & span adjustable ±15% via pots
Output Test:	Terminals for external contacts to manually set output levels for each channel. Output test level factory set at 50% of span.
Output Loop Supply:	20 VDC nominal, regulated, 25 mA max for each channel.
Input Loop Supply:	15 VDC ±10%, regulated, 25 mA max.

API Compact Converters/Isolators

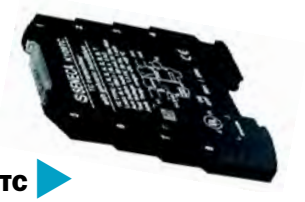
NEW

- Only 1/4" (6.2mm) wide
- 0.1% Accuracy
- 1500V RMS Isolation
- -20 to +65°C Operation
- DIN Rail Mount
- Hot Swappable*

CE

c UL us

K109TC



ORDERING INFORMATION

K109TC	Thermocouple transmitter. User configurable thermocouple type, temperature range and mA or voltage output. 19.2-30 VDC powered
K109UI	DC current/voltage to DC current/voltage isolator/converter. User configurable mA or voltage output. 19.2-30 VDC powered
K121	Universal input transmitter. User configurable V, mA, RTD, potentiometer, T/C. 4-20 mA output. 7-30 VDC loop powered. (not UL)
K121-C-420	K121 transmitter pre-set for 4-20 mA input and output
EASY USB	USB↔UART TTL converter required to set up K121
Other K Line Transmitters	
K109PT	100 Ohm RTD to DC
K107A	RS485 - RS485 serial amplifier/isolator
K107B	RS232 - RS485 serial isolator/converter
K107USB	USB - RS485 isolator/converter

* Hot swappable when using the optional K-Bus backplane power connectors which snap into DIN rail.

K109TC Thermocouple to DC Isolated Transmitter

- DIP Switch Configuration
- 3-way Isolation (Input/Output/Power)
- Alarm Relay

Input: Thermocouples J, K, T, E, R, S, N, or B
Output: 0-5 V, 1-5 V, 0-10 V, 10-0 V, 20-0 mA, 0-20 mA, 20-4 mA, 4-20 mA

K109UI DC to DC Isolated Transmitter

- DIP Switch Configuration
- 3-way Isolation (Input/Output/Power)
- Square Root Function
- Horizontal Cylindrical Tank Linearization

Input: 0-20 mA, 4-20 mA, 0-5 VDC, 1-5 VDC, 0-10 VDC, 2-10 VDC, 0-15 VDC, 0-30 VDC
Output: 0-5 V, 1-5 V, 0-10 V, 10-0 V, 20-0 mA, 0-20 mA, 20-4 mA, 4-20 mA

K121 Universal Input to DC Isolated Transmitter

- Loop Powered
- 2-way Isolation (Input/Output)
- V, mA, RTD, Potentiometer, Thermocouple Input
- 4-20mA Output

V/mA Input: ±150 mV, ±30 V, ±24 mA
RTD: Pt100, Pt500, Pt1000, Ni100; 2, 3, or 4-wire
Thermocouple: Type J, K, T, E, R, S, B, N
Potentiometer: 500 Ω to 10 kΩ

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

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.

LT

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 solid state relays
LTE	4-20mA, Ethernet, 2 solid state relays

B — Main Board Type

2	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

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 (not ETL)	RMV5	600.0V AC Trms (not ETL)
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
R0	0-2.0000Ω (fixed)	R4	0-20.000kΩ
R1	0-20.000Ω	R5	0-200.00kΩ
R2	0-200.00Ω	R6	0-2.000MΩ (fixed)
R3	0-2.000kΩ		

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	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] Includes 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 AC Voltage	7, from 0-0.8 to 0-5 A (<0.5VA burden) 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

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)	

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

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.

LPI 25

LPI 30

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

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

8000-1-1 ▶

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.

8

continued on page 86

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^{th} Power
42	N^{th} 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 / Input 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 Class1, 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

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 ±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.

10AI

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:	±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

2800T

SPECIFICATIONS

Input Types	
Thermocouple:	Types J, K, T, E, R, S, N, B
RTD:	Pt DIN 43760 (50, 100, 200, 500Ω); Pt JIS C 1604 (100Ω); Pt Burns 0.003902α (100, 200, 500Ω); Ni Bristol's 7NA (110Ω); Ni Minco (120Ω); Cu Minco (10Ω); Cu China 0.00428α (50Ω)
mV:	-100 to + 100 mV
Resistance:	0 to 1000Ω
Accuracy:	±0.05% of span ±1 digit
Input Span Limits:	Any span within range limits
Input Resolution:	0.1°, 1 µV, 0.005Ω
Output Range:	4 to 20 mA, calibrated; 3.7 to 22 mA, maximum
Output Resolution:	0.002 mA
RTD Excitation Current:	200 µA, typical
Temperature Effect	
T/C and mV:	±0.2 µV/°C max ±0.005% of input reading/°C
RTD and Ω:	±0.002 Ω/°C max ±0.005% of input reading/°C
Loop Supply Voltage:	13V + (load resistance x 20 mA), min; 48V, max
Size	3.10 x 1.75 x 3.77" HWD

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 ±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

SPECIFICATIONS

Input Signal:	4-20mA, 1-5V, 0-5V, 0-10V (jumper selectable)
Input Resistance:	4-20mA: 50Ω, 1-5V: 412kΩ, 0-5V: 464kΩ, 0-10V: 935kΩ
Transmitter Excitation:	24Vdc, 30mA max
Signal Outputs:	4-20mA
Signal Isolation:	Input and output grounds can be the same or differ up to ±10V from each other (input/output, output/output)
Voltage Compliance:	12V (600Ω per loop at 20mA)
Zero & Span Adjust:	±10% for each output with 25-turn potentiometers
Load Regulation:	±0.005% of span from 0 to 600Ω
Accuracy:	±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
- DIN Rail Mounting
- Screw Terminal Connections
- Low Input Resistance
- Flexible and Simple Scaling
- Excitation Output
- Wide Power Supply Range
- 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, mADC, 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

LTS ▶

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:	RS-232, RS-485 (2- or 4-wire) or Ethernet
Baud Rate:	300-19200
Analog Out:	4-20mA, 0-20mA, 0-10VDC, ±10V (user selectable)
Compliance (mA):	10V (0-500Ω load)
Compliance (V):	2mA (>5kΩ load)
Accuracy:	±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 [A] [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

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 ±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

[A] [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 ±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-pinoctal socket
API TK36	35mm DIN rail, 39" long, aluminum

Plug-in API Transmitters and Isolators are available for most sensors and process signals.

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):	10kΩ (7580), 100kΩ (7010)
Input Sensitivity:	25mV to 2.5V (pot adjustable)
Output Ranges:	0-1V min, 0-10V max, ±1V min, ±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, 1000Ω
Output Zero Adjust:	±15% of span
Output Span Adjust:	±10% of span
Accuracy:	Better than ±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 ±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)

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

API1600

API1080
with API011

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/HI 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 DIN rail mounting
API 011 FS	11-pin finger safe socket	
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 mADC to 4-20 mADC, 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 mADC to 4-20 mADC, 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 0-1 mADC to 0-900 mADC (specify on order)	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				80-265 VAC, 48-300 VDC
API 1000 G D				9-30 VDC
API 1000 G 5A	>0-900 mADC to 0-5 ADC (specify on order) Includes API 011 socket w/0.1Ω 25W shunt			115 VAC
API 1000 G A230 5A				230 VAC
API 1000 G P 5A				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 0-1 mADC to 0-900 mADC (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				230 VAC
API 1020 G P				80-265 VAC, 48-300 VDC
API 1020 G D				9-30 VDC
API 1020 G 5A	>0-900 mADC to 0-5 ADC (specify on order) Includes API 011 socket w/0.1Ω 25W shunt			115 VAC
API 1020 G A230 5A				230 VAC
API 1020 G P 5A				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 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	115 VAC
API 1600 G A230				230 VAC
API 1600 G P				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) Includes API 011 socket w/0.1Ω 25W shunt			115 VAC
API 1600 G A230 5A				230 VAC
API 1600 G P 5A				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 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	115 VAC
API 1620 G A230				230 VAC
API 1620 G P				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) Includes API 011 socket w/0.1Ω 25W shunt			115 VAC
API 1620 G A230 5A				230 VAC
API 1620 G P 5A				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 ▲

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 DIN rail mounting
API 008 FS	8-pin finger safe socket	
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 mADC to 0-20 mADC	16 switch selectable, 0-1 VDC to 0-10 VDC ±1 VDC to ±10 VDC (10mA max), 0-2 mADC to 0-20 mADC (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		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 mADC		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 mADC to 0-20 mADC (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		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		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		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 mADC to 0-20 mADC	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 mADC to 0-20 mADC	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 mADC to 0-900 mADC	0-1 VDC to 0-10 VDC ±1 VDC to ±10 VDC (10mA max), 0-1 mADC to 0-20 mADC (20V compliance, 1000Ω @ 20 mA) suffix HC = 20-50 mADC	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 mADC		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 mADC 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 mADC to 0-20 mADC	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 mADC to 0-20 mADC	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 mADC to 0-20 mADC	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 mADC to 0-50 mADC	**Square root of input** 0-1 VDC to 0-10 VDC ±1 VDC to ±10 VDC 0-1 mADC to 0-20 mADC	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

Accuracy: 1/4%
Recommended continuous operation: <2/3 rated current

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 Length	Width	Order Code	Type Lab — 100 mV 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

Lightweight Types

MLA

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

c UL us DT4

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

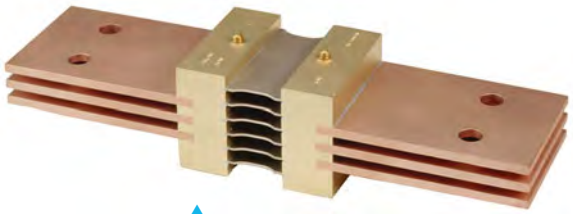
Accuracy: 1/4%
Recommended continuous operation: <2/3 rated current

Type A ▲

Type B ▲

Type C ▲

Type E ▲



Type WT ▲

Type A — 20 Through 600 Amperes

ORDERING INFORMATION

	Type A – 50 mV			Type A – 100 mV		
Amp	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

	Type B – 50 mV			Type B – 100 mV		
Amp	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

	Type C – 50 mV			Type C – 100 mV		
Amp	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

	Type E – 50 mV			Type E – 100 mV		
Amp	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

	Type WT – 50 mV			Type WT – 100 mV		
Amp	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

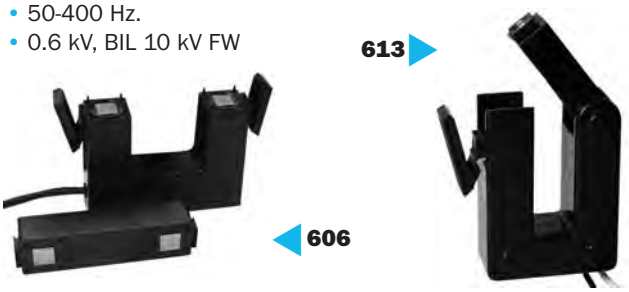
Model 600 – Window 2 x 5.5"
Model 601 – Window 4.5 x 4.5"
Model 604 – Window 1.42 x 1.53"

- 50-400 Hz
- 0.6kV, BIL 10kV FW

Leads (600, 601, 604) #16 AWG, 24"

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 600

Order Code	Current Ratio	ANSI Metering Class @ 60 Hz B0.1	B0.2	B0.5	VA @ 1% Class
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 B0.1	B0.2	B0.5	VA @ 1% Class
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%

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 Accuracy @60 Hz	Model 2S, 2R Burden VA@60 Hz	Model 2DRL Accuracy @60 Hz	Model 2DRL 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**-500	50:5	±2%	1.0
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

See CT Application Note in Technical Reference Section.

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**-101	100:5	±2%	2.5
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**-201	200:5	±1%	5.0
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

Weschler AC Current Transformers

3P3 ▶

Model 8 — Window Dia. 3.25"

ORDERING INFORMATION

Model 8SHT, 8RL

Catalog #	Current Ratio Amperes	V.A. for ±1% Class	ANSI Metering Class @ 60 Hz 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 Amperes	V.A. for ±1% Class	ANSI Metering Class @ 60 Hz 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 Amperes	V.A. for ±1% Class	ANSI Metering Class @ 60 Hz 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

c UL us
E238872

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)


CV2SHT


CV7SHT


CV8SHT


CV19SHT


CV125SHT
CV126SHT

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.

Texmate AC Transducers

- Voltage, Current & Frequency input
- Single phase & 3 phase models
- Average or TRMS sensing
- Direct connect up to 5A or 600V
- ±0.2% or ±0.1% accuracy
- Panel or DIN rail mounting


SCREW MOUNT METAL CASE A


SCREW MOUNT METAL CASE B
ABS DIN RAIL MOUNT CASE D
ABS DIN RAIL MOUNT CASE C

Texmate Transducers convert AC voltage, AC current and frequency signals to a DC value for easy readout or input to a SCADA system. Use these transducers with direct signals up to 5A or 600V. For higher signal levels, connect using a current transformer (CT) or potential transformer (PT). Both average and TRMS sensing models are available. TRMS sensing is recommended for input signals with distortion.

Two case styles provide mounting flexibility. The metal case versions with screw flanges easily attach to a plate or panel, Two plastic case sizes mount on a 35mm DIN rail. All Texmate transducers offer 2kV isolation and high immunity to external noise. Standard accuracy is ±0.2%, with ±0.1% also available. In addition to the standard input/output ranges shown below, custom ranges can be special ordered.

SPECIFICATIONS

Accuracy:	±0.2% of rated output standard (for 10-100% of rated output); ±0.1% on special order
Voltage Input:	
Burden:	≤0.1VA
Response:	≤0.5% of measuring range to max input
Input Overload:	1.25x rated input (600Vrms max) continuous, 2x for 10 sec, 4x for 5 sec
Current Input:	
Burden:	≤0.2VA
Response:	≤0.5% of measuring range to max input
Input Overload:	3x rated input continuous, 10x for 10 sec, 50x for 5 sec, 80x for 0.5 sec
Output:	DC mA or DC Volts
Ripple:	<0.5% of rated output, peak-to-peak (max)
Response Time:	<400ms from 0 to 99% of output
Zero Adjust:	±5% of rated output (min)
Span Adjust:	±10% of rated output (min)
Load Resistance:	500Ω max, except 10kΩ max for 0-1mA output
Operating Temperature:	0 to 50°C (32 to 122°F)
Humidity:	<95% RH, non-condensing
Temp. Coefficient:	≤100ppm/°C of span ≤60ppm/°C for ambient of 25°C ±10°C
Isolation:	Between Input/Output/Power/Case
Dielectric Test: (DIN-IEC 688)	2kVrms/1 min, terminal to terminal; 2.8kVrms/1 min, terminal to case
Insulation Resistance:	>100MΩ at 500V DC
Housing:	ABS resin (94V-0) or metal
Mounting:	Screw mount metal case or plastic DIN rail 35mm
Auxiliary Power:	AC: 115/230V ±15%, 50/60Hz, 3VA DC: 24V ±20% or 125V ±20%
Dimensions (Single phase V & A):	
Metal "A" Case*:	4.06"W x 4.84"H x 2.28"D (103x123x58mm)
Plastic "C" Case:	3.15"W x 2.36"H x 4.95"D (80x60x126mm)
Dimensions (3 phase & Frequency):	
Metal "B" Case*:	5.35"W x 5.55"H x 3.74"D (136x95x141mm)
Plastic "D" Case:	4.45"W x 3.74"H x 5.74"D (113x95x146mm)

*including mounting flanges

ORDERING INFORMATION

To Order—Insert Code for Each Letter to Select Catalog Number. [A] [B] [C] [D] [E] [F] Example: TA-1T11212

VOLTAGE TRANSDUCERS

A	Model	
	TV-1	Single phase, Average sensing
	TV-1T	Single phase, TRMS sensing
	TV-3	Three phase, Average sensing
	TV-3T	Three phase, TRMS sensing
B	Input	
	1	0-150V AC
	2	0-300V AC
	3	0-600V AC
C	Frequency	
	1	45-65Hz
	2	400Hz
D	Output	
	1	0 to 1mA DC
	2	4 to 20mA DC
	3	0 to 10V DC
E	Power	
	1	115/230V AC
	2	24V DC
	3	125V DC
F	Mounting	
	1	DIN rail plastic case
	2	Screw mount metal case

CURRENT TRANSDUCERS

A	Model	
	TA-1	Single phase, Average sensing
	TA-1T	Single phase, TRMS sensing
	TA-3	Three phase, Average sensing
	TA-3T	Three phase, TRMS sensing
B	Input	
	1	0-5A AC
	2	0-1A AC
C	Frequency	
	1	45-65Hz
	2	400Hz
D	Output	
	1	0 to 1mA DC
	2	4 to 20mA DC
	3	0 to 10V DC
E	Power	
	1	115/230V AC
	2	24V DC
	3	125V DC
F	Mounting	
	1	DIN rail plastic case
	2	Screw mount metal case

FREQUENCY TRANSDUCERS

A	Model	
	TF-1	Frequency
B	Input	
	1	80 to 600V AC
	2	2 to 30V AC
C	Frequency*	
	1	55-65Hz
	2	45-55Hz
D	Output	
	1	0 to 1mA DC
	2	4 to 20mA DC
	3	0 to 10V DC
E	Power	
	1	115/230V AC
	2	24V DC
	3	125V DC
F	Mounting	
	1	DIN rail plastic case
	2	Screw mount metal case

*400Hz on special order

Texmate Power Transducers

- Watt, VAR, Power factor, Watt Hour & VAR Hour
- Single phase & 3 phase models
- Measures distorted signals using time division multiplication
- Direct connect up to 5A or 600V
- ±0.2% or ±0.1% accuracy
- High noise immunity
- Panel or DIN rail mounting

These Texmate Power transducers provide an accurate measurement of active & reactive power for balanced or unbalanced loads. Additional models measure active & reactive energy (as either watt hours or VAR hours). Dual function units combine watts with VARs, watts with watt hours, and VARs with VAR hours. Power factor transducers are also available.

Each transducer output is an isolated, load independent DC signal (V or mA) for power and a pulse (relay or open collector) for energy. External power choices are 115/230V AC, 24V DC, or 125V DC. Two case styles provide mounting flexibility.

SPECIFICATIONS

Accuracy:	±0.2% of rated output standard; ±0.1% on request
AC Input:	120V or 240V & 5A standard; custom to 600V, 10A
Burden:	≤0.1VA on voltage input, ≤0.2VA on current input
Response:	≤0.5% of measuring range to max input
Voltage Overload:	1.25x rated input (600Vrms max) continuous, 2x for 10 sec, 4x for 5 sec
Current Overload:	3x rated input continuous, 10x for 10 sec, 50x for 5 sec, 80x for 0.5 sec
Output:	Pulses for watt hour, VAR hour; DC mA or DC Volts for watt, VAR, power factor
Ripple:	<0.5% of rated output, peak-to-peak (max)
Response Time:	<400ms from 0 to 99% of output
Zero Adjust:	±5% of rated output (min)
Span Adjust:	±10% of rated output (min)
Load Resistance:	500Ω max, except 10kΩ max for 0-1mA output
Operating Temperature:	0 to 50°C (32 to 122°F)
Humidity:	<95% RH, non-condensing
Temp. Coefficient:	≤100ppm/°C of span ≤60ppm/°C for ambient of 25°C ±10°C
Isolation:	Between Input/Output/Power/Case
Dielectric Test: (DIN-IEC 688)	2kVrms/1 min, terminal to terminal; 2.8kVrms/1 min, terminal to case
Insulation Resistance:	>100MΩ at 500V DC
Housing:	ABS resin (94V-0) or metal
Mounting:	Screw mount metal case or plastic DIN rail 35mm
Auxiliary Power:	AC: 115/230V ±15%, 50/60Hz, 3VA DC: 24V ±20% or 125V ±20%
Dimensions:	
Metal "B" Case*:	5.35"W x 5.55"H x 3.74"D (136x95x141mm)
Plastic "D" Case:	4.45"W x 3.74"H x 5.74"D (113x95x146mm)

*including mounting flanges

ORDERING INFORMATION

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

A	B	C	D	E	F	G

Example: TW-3311212

WATT, VAR, POWER FACTOR TRANSDUCERS

A	Model	
	TW-12	Watts, Single phase, 2 wire, 1 element
	TW-13	Watts, Single phase, 3 wire, 2 element
	TW-33	Watts, Three phase, 3 wire, 2 element
	TW-34	Watts, Three phase, 4 wire, 3 element
	TQ-12	VARs, Single phase, 2 wire, 1 element
	TQ-13	VARs, Single phase, 3 wire, 2 element
	TQ-33	VARs, Three phase, 3 wire, 2 element
	TQ-34	VARs, Three phase, 4 wire, 3 element
	TWQ-12	Watts + VARs, Single phase, 2 wire, 1 element
	TWQ-13	Watts + VARs, Single phase, 3 wire, 2 element
	TWQ-33	Watts + VARs, Three phase, 3 wire, 2 element
	TWQ-34	Watts + VARs, Three phase, 4 wire, 3 element
	TPF-12	Power Factor, Single phase, 2 wire, 1 element
	TPF-13	Power Factor, Single phase, 3 wire, 2 element
	TPF-33	Power Factor, Three phase, 3 wire, 2 element
	TPF-34	Power Factor, Three phase, 4 wire, 3 element
B	Input	
	1	120V & 5A AC (30-600V & 5A for Power Factor models)
	2	240V & 5A AC (N/A for Power Factor models)
	Y	Custom, up to 600V & 10A AC
C	Frequency	
	1	60Hz ±3Hz
	2	50Hz ±3Hz
	Y	Custom (400Hz)
D	Output	
	1	0 to 1mA DC
	2	4 to 20mA DC
	3	0 to 10V DC
E	Power	
	1	115/230V AC
	2	24V DC
	3	125V DC
F	Mounting	
	1	DIN rail plastic case
	2	Screw mount metal case

WATT-HOUR, VAR-HOUR TRANSDUCERS

A	Model	
	TWH-12	Watt Hours, Single phase, 2 wire, 1 element
	TWH-13	Watt Hours, Single phase, 3 wire, 2 element
	TWH-33	Watt Hours, Three phase, 3 wire, 2 element
	TWH-34	Watt Hours, Three phase, 4 wire, 3 element
	TQH-12	VAR Hours, Single phase, 2 wire, 1 element
	TQH-13	VAR Hours, Single phase, 3 wire, 2 element
	TQH-33	VAR Hours, Three phase, 3 wire, 2 element
	TQH-34	VAR Hours, Three phase, 4 wire, 3 element
	TWWH-12	Watts + Watt Hours, Single phase, 2 wire, 1 element
	TWWH-13	Watts + Watt Hours, Single phase, 3 wire, 2 element
	TWWH-33	Watts + Watt Hours, Three phase, 3 wire, 2 element
	TWWH-34	Watts + Watt Hours, Three phase, 4 wire, 3 element
	TQQH-12	VARs + VAR Hours, Single phase, 2 wire, 1 element
	TQQH-13	VARs + VAR Hours, Single phase, 3 wire, 2 element
	TQQH-33	VARs + VAR Hours, Three phase, 3 wire, 2 element
	TQQH-34	VARs + VAR Hours, Three phase, 4 wire, 3 element
B	Input	
	1	120V & 5A AC
	2	240V & 5A AC
	Y	Custom (up to 600V, 10A AC)
C	Frequency	
	1	60Hz ±3Hz
	2	50Hz ±3Hz
	Y	Custom (400Hz)
D	Frequency Output	
	1	Reed relay, forward only
	2	Reed relay, forward & reverse
	3	Open colector, forward only
	4	Open Collector, forward & reverse
E	Pulse Output	
	1	1 pulse per watt hour or VAR hour
	2	10 pulses per watt hour or VAR hour
	3	100 pulses per watt hour or VAR hour
F	Power	
	1	115/230V AC
	2	24V DC
	3	125V DC
G	Mounting	
	1	DIN rail plastic case
	2	Screw mount metal case

Sifam Tinsley AC Transducers

NEW

VOLTAGE & CURRENT TRANSDUCERS

- TRMS sensing
- Field programmable input range
- Single or dual output
- Direct connect up to 5A or 500V
- Accuracy class 0.2
- Wall or DIN rail mounting

Theta 20

c UL us LISTED

FREQUENCY TRANSDUCERS

- Programmable input range
- Single or dual output
- Selectable DC V or DC mA output
- Accuracy class 0.2
- RS-485 Modbus option
- Wall or DIN rail mounting

Theta Hz

c UL us LISTED

POWER TRANSDUCERS

- TRMS measurement of active power, reactive power, appaprent power, power factor or phase angle
- Field programmable function
- Programmable V & I input ranges
- Single or dual output
- Selectable DC V or DC mA output
- Accuracy class 0.2 for power
- RS-485 Modbus option

c UL us LISTED

Theta 30P

SPECIFICATIONS

VOLTAGE & CURRENT TRANSDUCERS	
Current Input:	1-5A AC rms
CT Primary Range:	1 to 9999A
Input Burden:	<0.2VA at rated input current, nominal
Overload:	1.2x rated input continuous, 10x for 3s
Voltage Input:	57 to 500V L-L
PT Primary Range:	57V to 400kV L-L
Input Burden:	<0.6 VA at Vin, nominal
Overload:	1.2x rated input continuous, 2x for 1s; 300V max if powered from input
Frequency:	45-66Hz
Accuracy:	Class 0.2
Tempco:	±0.2%/10°C
DC Output:	V or mA selected via internal DIP switch
Ranges:	0-10V/0-20mA/4-20mA/0-1mA
Load Resistance:	I: <600Ω @24mA, <15kΩ @1mA; V: >5000Ω @10V
Response Time:	<400ms
Temperature:	0 to 45°C operating, <75% RH
Isolation:	5200VDC, input to power & outputs
Setup:	Thru front panel, RS-232 port using PBKAB601 cable, or RS-485 option
Dimensions:	66 x 44 x 107 mm (H x W X D)

FREQUENCY TRANSDUCERS	
Voltage Input:	100-500V
Frequency:	55-65/45-65/45-55 Hz
Accuracy:	Class 0.2
Tempco:	±0.2%/10°C
DC Output:	V or mA selected via internal DIP switch
Ranges:	0-10V/0-20mA/4-20mA/0-1mA
Load Resistance:	I: <600Ω @24mA, <15kΩ @1mA; V: >5000Ω @10V
Response Time:	<400ms
Temperature:	0 to 45°C operating, <75% RH
Isolation:	5200VDC, input to power & outputs
Setup:	Thru front panel, RS-232 port using PBKAB601 cable, or RS-485 option
Dimensions:	66 x 44 x 107 mm (H x W X D)

POWER TRANSDUCERS	
Current Input:	1-5A AC rms
CT Primary Range:	1 to 9999A
Frequency:	25-60Hz nominal
Input Burden:	<0.2VA per phase at rated input current, nominal
Overload:	1.2x rated input continuous, 10x for 3 sec, 50x for 1 sec
Voltage Input:	100 to 500V L-L
PT Primary Range:	100V to 692kV L-L
Frequency:	25-60Hz nominal
Input Burden:	<0.6 VA per phase at Vin, nominal
Overload:	1.2x rated input continuous, 2x for 1s; 300V max if powered from input
Measuring Span:	20° to 360° for PF or phase angle
Accuracy Class:	0.2 for power, 0.5 for PF or phase angle
Tempco:	±0.2%/10°C
Output:	V or mA selected via internal DIP switch
Ranges:	0-10V/0-20mA/4-20mA/0-1mA; ±10V/±20mA
Load Resistance:	I: <600Ω @24mA, <15kΩ @1mA; V: >5000Ω @10V
Response Time:	<750ms
Temperature:	0 to 45°C operating, <75% RH
Isolation:	5200VDC, input to power & outputs
Setup:	Thru front panel, RS-232 port using PBKAB601 cable, or RS-485 option
Dimensions:	66 x 79 x 107 mm (H x W X D)

ORDERING INFORMATION

Insert Code for Each Letter to Build Part Number.

VOLTAGE & CURRENT TRANSDUCERS		
A	Model	
	TT20-I74	1-5A, programmable
	TT20-V8E	57-500V, programmable
B	Power Supply	
	H	60-300V AC/DC ±5%, 10VA max.
	F	24-60V AC/DC ±10%, 6VA max.
C	Output	
	1	One, DC V/mA
	2	Two, DC V/mA
D	Display	
	D	backlit LCD display & keypad
	Z	no display or keypad
E	Communications	
	R	RS-485 Modbus
	Z	no communications
F	Programming Cable	
	C	with PBKAB601 RS-232 cable
	Z	no cable

FREQUENCY TRANSDUCERS		
A	Model	
	TT25-B8F	100-500V, 55-65Hz
	TT25-78F	100-500V, 45-65Hz
	TT25-68F	100-500V, 45-55Hz
B	Power Supply	
	H	60-300V AC/DC ±5%, 10VA max.
	F	24-60V AC/DC ±10%, 6VA max.
C	Output	
	1	One, DC V/mA
	2	Two, DC V/mA
D	Display	
	D	backlit LCD display & keypad
	Z	no display or keypad
E	Communications	
	R	RS-485 Modbus
	Z	no communications
F	Programming Cable	
	C	with PBKAB601 RS-232 cable
	Z	no cable

POWER TRANSDUCERS		
A	Model	
	TT30-P	Active Power
	TT30-Q	Reactive Power
	TT30-S	Apparent Power
B	System Type	
	1	1P2W
	2	3P3W unbalanced (no PF or ϕ)
	3	3P4W unbalanced (no PF or ϕ)
	4	3P4W balanced
	5	3P3W balanced
	6	3P3W balanced V1-2, I1
	7	3P3W balanced V1-3, I1
	8	3P3W balanced V2-3, I1
C	Input	
	8F75	1-5A, 100-500V
D	Power Supply	
	H	60-300V AC/DC ±5%, 10VA max.
	F	24-60V AC/DC ±10%, 6VA max.
E	Output	
	1	One, DC V/mA
	2	Two, DC V/mA
F	Display	
	D	backlit LCD display & keypad
	Z	no display or keypad
G	Communications	
	R	RS-485 Modbus
	Z	no communications
H	Programming Cable	
	C	with PBKAB601 RS-232 cable
	Z	no cable

Sifam Tinsley Programmable Multi-Transducers

Theta 40

- Monitor single and 3-phase power systems
- Input voltage up to 693 V (phase-to-phase)
- Up to 4 analog outputs
- Up to 4 digital outputs (meter transmit, limit)
- High accuracy: 0.2% V/I, 0.25% P
- Wide range auxiliary power AC/DC
- RS-232 setup port
- RS-485 Modbus communication (optional)
- Windows software with password protection for programming, data acquisition, analysis and simulation

Theta 40

Simultaneously measure several variables of an electric power system and process them to produce 2, 3 or 4 analog output signals. Two or four digital outputs are available for signaling limits or power metering. For two of the limit outputs, up to 3 measurands can be logically combined.

ORDERING INFORMATION

TT40-1J00000000000	Theta 40 with 4 analog out, 2 digital out
TT40-2J00000000000	Theta 40 with 2 analog out, 4 digital out
TT40-3J00000000000	Theta 40 with 2 analog out
TT40-4J00000000000	Theta 40 with 4 analog out, RS-485
TT40-5J00000000000	Theta 40 with 3 analog out
TT40-6J00000000000	Theta 40 with RS-485

Change J to F for 24-60V AC/DC aux. power

SPECIFICATIONS

System:	Single phase; 3 phase, 3 wire balanced; 3 phase, 3 wire unbalanced, 3 phase 4 wire balanced, 3 phase 4 wire unbalanced, open Y
Measured Values:	System: active, reactive, apparent power, frequency Phase: active, reactive, apparent power, AC voltage rms, AC current rms, current average, cos, sin, power factor (active & reactive)
Input:	400V, 5A nominal, 50/60Hz
Input Burden:	Current: 0.3VA; Voltage: $Vin^2/400kW$
Accuracy Class:	Power: 0.25, Voltage: 0.2, Current: 0.2, Frequency: 0.15
Max. Current In:	10A continuous, 100A for 3s, 250A for 1s
Max. Voltage In:	1-phase: 480V continuous, 600V for 10s 3-phase: 831V continuous, 1040V for 10s
Measure Cycle:	0.25 to 0.5s at 50Hz
Response Time:	1-2 measure cycles
Analog Outputs:	±20mA or 4-20mA, 750Ω max load
Digital Outputs:	Open collector, pulse width >100ms; 8-40V, 27mA max.
Isolation Test (AC):	3250V input to input, 5550V input to output/power, 490V output to output
Auxiliary Power:	Standard: 85-230V AC (±10%, 50/60Hz) or DC (-15+33%) Optional: 24-60V AC (±10%, 50/60Hz) or DC (-15+33%)
Mounting:	Panel, wall or top-hat rail
Connections:	Screw terminals with wire guards
Environment:	0 to 45°C operating, <75% RH, non-condensing
Protection:	IP40 housing, IP20 terminals
Dimensions:	87.5 x 181 x 124 mm (WxHxD)

Theta M

- Power & Energy measurement
- Onsite programmable PT & CT ratio
- THD measurement
- Selectable analog output range (0-20mA / 4-20mA / ±20mA)

Theta M

- Detection and signaling of incorrect phase sequence
- RS-485 & USB communications, free configuration software
- LED indicators for Power On, Alarm Status, Tx/Rx
- Galvanic isolation, input to output

Measure parameters of a 3-phase, 3W/4W AC power system, balanced or unbalanced. Convert the measured values into standard analog current signals. Relay outputs flag the overflow of the selected quantities. The pulse output can be used for consumption monitoring of active energy.

ORDERING INFORMATION

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

Theta-M [A] [B] [C] [D] [E] Example: Theta-M22122

A	Current Input:	
	1	1A
	2	5A
B	Voltage Input	
	1	57.7V L-N, 100V L-L
	2	230V L-N, 400V L-L
C	Supply Voltage	
	1	85-253VAC / 90-320VDC
	2	20-40VAC / 20-60VDC
D	Outputs	
	1	4 relays (no analog outputs)
	2	2 relays, 2 analog outputs
	3	4 analog outputs (no relays)
E	Load Resistance	
	1	250 ohm
	2	750 ohm

Parameter	Measurement range	Line	Basic error
Current	0.02-6 A	L1,L2,L3	±0.2%
Voltage L-N	2.9-69.2/11.5-276 V	L1,L2,L3	±0.2%
Voltage L-L	5.0-120/20-480 V	L1,L2,L3	±0.5%
Frequency	47.0 to 63.0 Hz	L1,L2,L3	±0.2%
Active power	-1.65 to 1.65 kW	L1,L2,L3,Σ	±0.5%
Reactive power	-1.65 to 1.65 kvar	L1,L2,L3,Σ	±0.5%
Apparent power	1.4 VA to 1.65 kVA	L1,L2,L3,Σ	±0.5%
PF factor	-1 to 1	L1,L2,L3,Σ	±0.5%
Tangens φ	-1.2 to 1.2	L1,L2,L3,Σ	±1%
Cosines φ	-1 to 1	L1,L2,L3,Σ	±1%
Angle U to I	-180 to 180 deg	L1,L2,L3	±0.5%
Input active energy	0-99999999.9 kWh	Σ	±0.5%
Devel. active energy	0-99999999.9 kvarh	Σ	±0.5%
Reactive ind. energy	0-99999999.9 kWh	Σ	±0.5%
Reactive cap. energy	0-99999999.9 kvarh	Σ	±0.5%
THD (10-120% V,I)	0 to 100%	L1,L2,L3,Σ	±5%

SPECIFICATIONS

Measurement:	TRMS, max crest factor 2
CT Ratio:	1 to 10000
PT Ratio:	0.1 to 4000.0
Input Burden:	Current: <0.1VA; Voltage: <0.05VA
Input Overload:	10x Irated for 5s; 2x Vrated for 5s, 1000V max.
Communications:	2-wire RS-485 (4.8-38.4kb); USB 2.0
Protocol:	Modbus RTU
Analog Outputs:	±20mA, 0-20mA or 4-20mA; accuracy 0.2%, τ=3s
Relay Outputs:	Voltage less NO contacts, 250VAC/0.5A
Pulse Output:	Open collector, passive per EN62053-31
Isolation Test (AC):	3110V input/output/supply (no ch-ch analog out isolation)
Auxiliary Power:	Standard: 85-253VAC (40-400Hz) / 90-320VDC , <10VA Optional: 24-40VAC (40-400Hz) / 20-60VDC
Mounting:	Panel, wall or DIN rail
Connections:	Screw terminals with wire guards
Environment:	-10 to 55°C operating, <95% RH, non-condensing
Protection:	IP40 housing, IP20 terminals
Dimensions:	122.5 x 66.5 x 106.5 mm (WxHxD)

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 <500Ω
External Power:	R_L >50kΩ
Self Powered:	Accuracy for R_L >1MΩ, add 1.3% for R_L = 100 kΩ

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

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 mm2)
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)

H822

c UL us LISTED

CE

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 mm2)
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

NK Technologies Voltage Transducers

AC Volts

- TRMS measurement
- Loop-powered output
- Input and output isolation
- DIN rail mount

VTR ▶

ORDERING INFORMATION

VTR1-420-24L-DIN	0-120V in	4-20mA out	24V loop powered
VTR2-420-24L-DIN	0-150V in	4-20mA out	24V loop powered
VTR3-420-24L-DIN	0-240V in	4-20mA out	24V loop powered
VTR4-420-24L-DIN	0-480V in	4-20mA out	24V loop powered
VTR5-420-24L-DIN	0-500V in	4-20mA out	24V loop powered
VTR6-420-24L-DIN	0-600V in	4-20mA out	24V loop powered

VTR SPECIFICATIONS

Power Supply:	24 V DC loop-powered (12–40 VDC)
Input:	120 V, 150 V, 240 V, 480 V, 500 V, 600 V
Output:	4–20 mA proportional; capped at 24 mA max.
Load Impedance:	<500Ω
Input Maximum:	130% of range
Response Time:	250 ms (to 90% value)
Accuracy:	1.0% FS at 60 Hz, 2.5% at 50 Hz (10–100% of range)
Linearity:	<0.5%
Isolation Voltage:	UL listed to 2500 VAC, tested to 5 kV
Frequency Range:	40–100 Hz
Mounting:	DIN rail compatible
Case:	UL94 V0 flammability rated; noncorrosive thermoplastic
Environmental:	-22 to 140°F (-30 to 60°C), <95% RH, non-condensing
Ripple:	<1% (peak to peak)
Listings:	UL508 Industrial Control Equipment (USA & Canada), CE
Dimensions:	3.53" x 2.4" x 1.4" (90x61x36mm)

DC Volts

- Input up to 600V, in 6 ranges
- V or mA output
- Input and output isolation
- DIN rail mount

VTD ▶

ORDERING INFORMATION

VTD0-005-24U-DIN	0-15V in	0-5V out	24V AC/DC supply
VTD0-010-24U-DIN	0-15V in	0-10V out	24V AC/DC supply
VTD0-420-24U-DIN	0-15V in	4-20mA out	24V AC/DC supply
VTD1-005-24U-DIN	0-25V in	0-5V out	24V AC/DC supply
VTD1-010-24U-DIN	0-25V in	0-10V out	24V AC/DC supply
VTD1-420-24U-DIN	0-25V in	4-20mA out	24V AC/DC supply
VTD2-005-24U-DIN	0-50V in	0-5V out	24V AC/DC supply
VTD2-010-24U-DIN	0-50V in	0-10V out	24V AC/DC supply
VTD2-420-24U-DIN	0-50V in	4-20mA out	24V AC/DC supply
VTD3-005-24U-DIN	0-150V in	0-5V out	24V AC/DC supply
VTD3-010-24U-DIN	0-150V in	0-10V out	24V AC/DC supply
VTD3-420-24U-DIN	0-150V in	4-20mA out	24V AC/DC supply
VTD4-005-24U-DIN	0-300V in	0-5V out	24V AC/DC supply
VTD4-010-24U-DIN	0-300V in	0-10V out	24V AC/DC supply
VTD4-420-24U-DIN	0-300V in	4-20mA out	24V AC/DC supply
VTD5-005-24U-DIN	0-600V in	0-5V out	24V AC/DC supply
VTD5-010-24U-DIN	0-600V in	0-10V out	24V AC/DC supply
VTD5-420-24U-DIN	0-600V in	4-20mA out	24V AC/DC supply

VTD SPECIFICATIONS

Power Supply:	24 V AC/DC (20–45 DC, 22–38 VAC)
Input:	15 V, 25 V, 50 V, 150 V, 300 V, 600 VDC
Output:	4–20 mA (capped at 24 mA max.) 0–5 VDC (capped at 5.75 VDC), 0–10 VDC (capped at 11.5 VDC)
Load Impedance:	4–20 mA: <500Ω; 0–5/10 VDC: >10kΩ
Response Time:	250 ms (to 90% value)
Accuracy:	<1%
Linearity:	<0.5%
Isolation Voltage:	UL listed to 2500 VAC, tested to 5 kV
Frequency Range:	DC
Mounting:	DIN rail compatible
Case:	UL94 V0 flammability rated; noncorrosive thermoplastic
Ripple:	<1% (peak to peak)
Environmental:	-4 to 122°F (-20 to 50°C), <95% RH, non-condensing
Listings:	UL508 Industrial Control Equipment (USA & Canada), CE
Dimensions:	3.53" x 2.4" x 1.4" (90x61x36mm)

High Voltage AC/DC

- Input up to 1200V AC/DC
- Externally powered from 24V AC/DC
- DIN rail or panel mount
- Input/Output/Power isolation

VTU ▶

ORDERING INFORMATION

VTU8-005-24U-OS	0-800V in	0-5V out	24V AC/DC supply
VTU8-010-24U-OS	0-800V in	0-10V out	24V AC/DC supply
VTU8-420-24U-OS	0-800V in	4-20mA out	24V AC/DC supply
VTU10-005-24U-OS	0-1000V in	0-5V out	24V AC/DC supply
VTU10-010-24U-OS	0-1000V in	0-10V out	24V AC/DC supply
VTU10-420-24U-OS	0-1000V in	4-20mA out	24V AC/DC supply
VTU12-005-24U-OS	0-1200V in	0-5V out	24V AC/DC supply
VTU12-010-24U-OS	0-1200V in	0-10V out	24V AC/DC supply
VTU12-420-24U-OS	0-1200V in	4-20mA out	24V AC/DC supply

VTU SPECIFICATIONS

Power Supply:	24 V AC/DC (22-26 VAC or DC), <4 VA
Output:	4–20mA, 0–5 VDC, 0–10 VDC
Load Impedance:	4–20mA: <400Ω; 0–5/10 VDC: >100Ω
Input:	0–800, 1000 or 1200 V, AC or DC
Response Time:	100 ms
Accuracy:	<1% FS
Isolation Voltage:	Tested to 5000 VAC primary to output. Power supply isolated from primary and output circuits
Frequency Range:	0–400 Hz
Mounting:	DIN rail or panel mounted
Case:	UL94 V0 flammability rated; noncorrosive thermoplastic
Environmental:	-4° to 122°F (-20° to 50°C), <95% RH, non-condensing
Listings:	UL508 Industrial Control Equipment (USA & Canada), CE
Dimensions:	4.39" x 4.37" x 2.6" (111.5x111x66mm)

NK Technologies DC Current Transducers

SPLIT CORE

- Fits over bus bar or wire
- Ranges up to 400A
- 5V, 10V or 4-20mA output
- 24V AC or DC powered
- 1500V working voltage
- Bus bar, panel or DIN rail mount

DT-BB

SPECIFICATIONS

SPLIT CORE CURRENT TRANSDUCERS	
Power Supply:	24 VAC/DC (20–26 V) Power and signal are not isolated
Consumption:	<2 VA
Output:	0–5 VDC, 0–10 VDC or 4–20 mA; Bidirectional models: +/-5 or +/-10 VDC
Output Limits:	4–20 mA: 23 mA 0–5 VDC: 5.75 VDC 0–10 VDC: 11.5 VDC
Accuracy:	1.0% FS
Response Time:	40 ms (90% step change)
Isolation:	Working voltage to 1500 VDC
Frequency:	DC
Case:	UL94 V0 flammability rated
Environmental:	-4 to 122°F (-20 to 50°C) 0–95% RH, non-condensing
Listings:	Designed for UL/cUL and CE approval
Aperture:	1" (25.4mm) dia. 1.33" x 0.33" slot (33x8.4mm)
Dimensions:	3.92"W x 3.65"H x 2.0"D (100x93x48mm)

ORDERING INFORMATION

Use Code for Each Letter to Build Part Number.
Example: DT1-005-24U-BP-BB

A	Range	
	DT1	0-100 A
	DT2	0-200 A
	DT3	0-300 A
	DT4	0-400 A
B	Output	
	-005	0-5 VDC
	-010	0-10 VDC
	-420	4-20 mA
C	Power Supply	
	-24U	24 VAC/DC
D	Output Type*	
	-U	Unipolar
	-BP	Bipolar
	-BD	Bidirectional (VDC output only)
E	Case	
	-BB	Split core, busbar or panel mount

HIGH VOLTAGE

- Ranges up to 400A
- 5V, 10V or 4-20mA output
- 24V AC or DC powered
- 1500V working voltage
- 1.31" window
- Panel or DIN rail mounting

DT-FD

SPECIFICATIONS

HIGH VOLTAGE CURRENT TRANSDUCERS	
Power Supply:	24 VAC/DC (22–26 V) Power and signal are not isolated
Consumption:	<3 VA
Output:	0–5 VDC, 0–10 VDC or 4–20 mA; Bidirectional models: +/-5 or +/-10 VDC
Output Limits:	4–20 mA: 20.8 mA 0–5 VDC: 5.25 VDC 0–10 VDC: 10.5 VDC
Accuracy:	1.0% FS
Response Time:	150 ms
Isolation:	Working voltage to 1500 VDC
Frequency:	DC
Case:	UL94 V0 flammability rated
Environmental:	-4 to 122°F (-20 to 50°C) 0–95% RH, non-condensing
Listings:	UL/cUL and CE approval
Aperture:	1.31" (33.3mm) dia.
Dimensions:	3.0"W x 3.26"H x 2.77"D (77x83x71mm)

ORDERING INFORMATION

Use Code for Each Letter to Build Part Number.

A	Range	
	DT2	0-200 A
	DT3	0-300 A
	DT4	0-400 A
B	Output	
	-005	0-5 VDC
	-010	0-10 VDC
	-420	4-20 mA
C	Power Supply	
	-24U	24 VAC/DC
D	Output Type*	
	-U	Unipolar
	-BP	Bipolar
	-BD	Bidirectional (VDC output only)
E	Case	
	-FD	Large, solid core, DIN rail or panel mount

LARGE APERTURE

- 1.81" window
- Ranges up to 1200A
- 5V, 10V or 4-20mA output
- 120VAC or 24V AC/DC powered
- Fixed factory calibration
- DIN rail mount
- 5 year warranty

DT-DL

SPECIFICATIONS

LARGE APERTURE CURRENT TRANSDUCERS	
Power Supply:	24 VAC/DC (22–26 V) 120 VAC (108-132 V)
Consumption:	2 VA
Output:	0–5 VDC, 0–10 VDC or 4–20 mA;
Output Limits:	4–20 mA: 23 mA (650Ω max.) 0–5 VDC: 5.75 VDC (25kΩ min.) 0–10 VDC: 11.5 VDC (50kΩ min.)
Accuracy:	2.0% FS
Repeatability:	1.0% FS
Response Time:	100 ms (90% step change)
Isolation:	UL listed to 1270VAC (line to output)
Frequency:	DC
Case:	UL94 V0 flammability rated
Environmental:	-4 to 122°F (-20 to 50°C) 0–95% RH, non-condensing
Listings:	UL/cUL and CE approval
Aperture:	1.81" (46mm) dia.
Dimensions:	3.0"W x 4.13"H x 3.25"D (77x105x83mm)

ORDERING INFORMATION

Use Code for Each Letter to Build Part Number.

A	Range	
	DT5	0-300 A
	DT6	0-500 A
	DT7	0-7500 A
	DT8	0-1000 A
	DT9	0-1200 A
B	Output	
	-005	0-5 VDC
	-010	0-10 VDC
	-420	4-20 mA
C	Power Supply	
	-24U	24 VAC/DC
	-120	120 VAC
D	Output Type*	
	-U	Unipolar
	-BP	Bipolar
E	Case	
	-DL	Solid core, DIN rail mount

*** OUTPUT TYPE**: **Unipolar**: Positive output for current flowing in either direction. **Bipolar**: Full output for full range current in one direction, minimum output for full range current in the opposite direction (e.g. 0-5-10V). **Bidirectional**: Output is positive for current in one direction, negative for current in the opposite direction (e.g. ±10V).

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-TWKU-QQFA-C6-**
1 Ph, 3 Wire	240V/10A	1 Element	0-1 mADC	256-TWKU-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-TXKU-QQFA-C6-**
1 Ph, 3 Wire	240V/10A	1 Element	0-1 mADC	256-TXKU-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-TYKU-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

NK Technologies Power Transducers

Single Phase

▲ APS

- Also measures 3Ø balanced loads
- Direct connect to 120–600 VAC
- Input current to 180A
- 4-20 mA output
- Loop powered
- Easy two-wire installation
- 5 year warranty

The APS Series measures true power (HP or kW) on balanced loads. They account for voltage and power factor fluctuations and improve sensitivity to load changes. These transducers offer an inexpensive way to measure kWH on single- and three-phase balanced loads. The APS Series constantly measures motor power consumption, which is proportional to the amount of work being done and an indication of the motor load. Ideal for mixing, grinding, machining and pumping applications where power measurement is needed, the APS Series includes a CT, voltage sensor and output signal conditioner in a single package designed for easy installation.

SPECIFICATIONS

Power Supply:	24 VDC loop-powered (12–40 V)
Output:	4–20 mA proportional to max. kW; 25 mA limit
Input Range:	120, 240, 480 or 600 VAC
Response Time:	100 ms (to 90% of step change)
Accuracy:	1% FS
Indication:	Power on LED
Max. Inrush Current:	300% FS (6 sec. duration)
Input Range:	0.5 KW to 100 KW; 1/4 HP @ 120 VAC to 150 HP @ 480 VAC
Frequency Range:	50–60 Hz
Case:	UL94 V0 Flammability Rated
Environmental:	-4 to 122°F (-20 to 50°C), 0–95% RH, non-condensing
Listings:	UL 508 Industrial Control Equipment
Dimensions:	3.9" x 3.1" x 1.5" (98x80x38mm), including mounting feet. Window is 0.74" (19mm)

ORDERING INFORMATION

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

APS [A] – [B] – [C] – [D] Example: APS1-420-24L-5.0

A	Input Voltage	
	1	120 VAC
	2	240 VAC
	4	480 VAC
	6	600 VAC (not UL listed)
B	Output Signal	
	420	4-20 mA
C	Power Supply	
	24L	24 VDC loop-powered
D	Input Range	
	0.5	0.5 kW
	0.75	0.75 kW
	1.0	1.0 kW
	5.0	5.0 kW
	10.0	10 kW
	20.0	20 kW
	50.0	50 kW
	75.0	75 kW
	100	100 kW

Three Phase

▲ APT

- Direct connect to 120–600 V
- Works with 5 A or 333 mV CTs
- 4-20 mA, 5 V & 10 V outputs
- Externally powered
- DIN rail or panel mount
- 5 year warranty

APT Power Transducers produce full range output when the current transformer is producing its maximum signal, the primary voltage is at the range maximum and power factor is at unity. For example, using the APT-480-5A-120-420 with 400:5 current transformers, the transducer will produce 20 mA when there is 400 A through the CT and the primary voltage is 480. If the transducer is used to monitor a three-phase circuit using three CTs, 20 mA represents 332,544 watts. The equation for three phase wattage is voltage times amperage, times the square root of three (1.732) times power factor. If this transducer is used to monitor a three-phase load using two CTs, the transducer will produce 14.67 mA, or the output will represent 2/3 of the actual watts being used under the same conditions: 480 V primary voltage, 400 A through 400:5 CTs and unity power factor.

SPECIFICATIONS

Power Supply:	24 VAC/DC (21–26 V) 120 VAC (108–132 V) 240 VAC (216–264 V)
Power Consumption:	<2 VA
Output:	4–20 mA, 0–5 or 0–10 VDC
Voltage Range:	0–600 VAC, direct connect
Response Time:	120 ms
Accuracy:	>1%
Isolation Voltage:	2200 VAC
Frequency Range:	6–100 Hz
Case:	UL94 V0 flammability rated
Mounting:	DIN rail or panel
Environmental:	-4 to 122°F (-20 to 50°C), 0–95% RH, non-condensing
Listings:	Designed to meet UL 508 Industrial Control Equipment
Dimensions:	6.8125" x 4.37" x 2.6" (189x111x66mm)

ORDERING INFORMATION

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

APT– [A] – [B] – [C] – [D] Example: APT-120-5A-24U-010

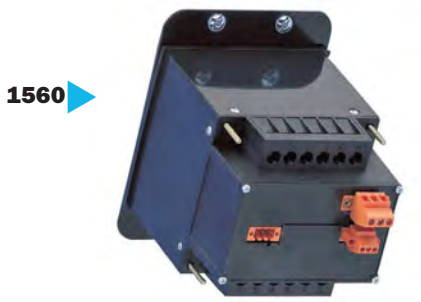
A	Primary Voltage	
	120	120 VAC
	240	240 VAC
	480	480 VAC
	600	600 VAC
B	Current Input	
	MV	ProteCT current transformers, 333 mVAC secondary
	5A	5 A secondary current transformer
C	Power Supply	
	24U	24 VAC/DC
	120	120 VAC
	240	240 VAC
D	Output	
	420	4-20 mA proportional to wattage
	005	0-5 VDC
	010	0-10 VDC

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

ORDERING INFORMATION

To Order: Insert Code for Each Letter to Select Catalog Number.
Example INT-1563-M-5-M-013-1

INT- [A] – [B] – [C] – [D] – [E] – [F]

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.

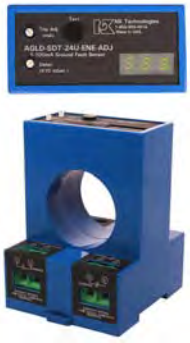
* Resistive load (inductive load).

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.

FF Case Style

FT Case Style

SP Case Style

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-O Flammability Rated	UL 94V-O Flammability Rated	UL 94V-O 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	
	AS1	AC Sensing, Single Range
	AS3, ASX	AC Sensing, 3 Ranges
B	Output	
	NOU	AS1 Normally Open
	NCU	AS1 Normally Closed
	NOAC	AS3, ASX, Normally Open
	NCAC	AS3, ASX, Normally Closed

C	Case and Connection	
	FF	Fixed Core, Front Connection
	FT	Fixed Core, Top Connection (AS1, ASX only)
	SP	Split Core
D	Options	
	GO	Fixed GO/No-GO Setpoint (AS1 only)
	(blank)	Adjustable Setpoint
	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

ASL ▲

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 x2.7"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

ASD ▲

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

DS3 ▲

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 √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

AS1 Compact

ORDERING INFORMATION

P/N	Description
AS1-NOU-CC	Compact AC Current Switch with N.O. Ouput
AS1-NCU-CC	Compact AC Current Switch with N.C. Ouput

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

ASM

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).

ORDERING INFORMATION

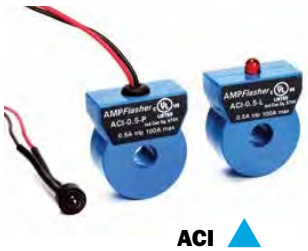
P/N	Output	Operation	Case
ASM-NOU-OL-FT	N.O.	Overload	Solid-core
ASM-NOU-UL-FT	N.O.	Underload	Solid-core
ASM-NOU-OU-FT	N.O.	Over/Underload	Solid-core
ASM-NCU-OL-FT	N.C.	Overload	Solid-core
ASM-NCU-UL-FT	N.C.	Underload	Solid-core
ASM-NCU-OU-FT	N.C.	Over/Underload	Solid-core
ASM-NOU-OL-SP	N.O.	Overload	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

SPECIFICATIONS

Power Supply:	None—Self-powered
Output:	Magnetically isolated solid-state relay
Output Rating: (Not polarity sensitive)	N.O. Version: 0.30 A @ 135 VAC or VDC N.C. Version: 0.20 A @ 135 VAC or VDC
Off-state Leakage:	<10 μA
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

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



ACI

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 º to 175 ºF/0 to 80 ºC Effect ±0.01%/ ºF of zero and span Medium: 20 º to 212 ºF/-30 º to 100 ºC Ambient: 15 º to 175 ºF/-10 º to 80 ºC
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 mAdc 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.

◀ 100

CE

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		

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 º to 175 ºF/-16 to 80ºC Effect ±0.02% FS/ ºF for zero and span Medium -22 º to 212 ºF/-30 º to 100 ºC Ambient -40 º to 185 ºF/-40 º to 85 ºC
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 Campatibility 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

Ashcroft Digital Pressure Gauges

- 5 Digit Display, 1/2" Character Height
- 20 Segment Bar Graph
- Selectable Engineering Units
- Min/Max Memory
- IP67 Case, Optional Boot

Laser-welded stainless steel sensor and socket make this product ideal for use with a wide variety of pressure media in demanding industrial applications. The optional 0.25% accuracy is suitable for many test and measurement uses.

DG25

SPECIFICATIONS

Case Size:	2.73" dia.x 1.61" deep
Material:	Polycarbonate window, polycarbonate/ABS case & back
Wetted Parts:	17-4PH sensor & 316L socket/tube, laser welded
Power:	2 AA alkaline batteries, >2000 hour life
Temperature:	-20°C to 60°C (-4 to 140°F) operating ambient
Proof Pressure:	200%, up to 2000psi 150%, 3000 & 5000psi 120%, >5000 psi
Accuracy:	0.5% of span or 0.25% of span Includes linearity, hysteresis, repeatability
Approvals:	UL 61010, cUL, CE, RoHs
Display:	5 digit numeric top line, 5 alpha character lower line, 4 level battery indicator, 20 segment bar graph
Display Icons:	Gauge timer, backlight timer, tare, min, max
Keypad:	3 keys with multi press functionality
Hard Keys:	on/off; Power Symbol and Enter zero; Zero, Tare, and Up Arrow menu Access, Backlight, Down Arrow

ORDERING INFORMATION

To Order - Insert Code for Each Letter to Select Catalog Number.
Example: AS/DG2551L0NAM02100#

AS/DG25 [A] [B] [C] [D] [E]

A	Accuracy	
	3	0.25% of span
	5	0.5% of span
B	Backlight	
	1L	Backlight
	1N	No backlight
C	Protective Boot	
	0NA	None
	1NA	Black
	2NA	Orange

D	Connection	
	M01	1/8 NPT male
	M02	1/4 NPT male
	M04	1/2 NPT male
	F09	9/16 -18 UNF-2B int thread
E	Range	
		See table below

15#	15 psi	3000#	3000 psi
30#	30 psi	5000#	5000 psi
50#	50 psi	7500#	7500 psi
60#	60 psi	10000#	10,000 psi
100#	100 psi	15000#	15,000 psi
150#	150 psi	20000#	20,000 psi
200#	200 psi	25000#	25,000 psi
300#	300 psi	0#&V	Vacuum -14.7psi
500#	500 psi	15#&V	15 psi/-14.7psi
750#	750 psi	30#&V	30 psi/-14.7psi
1000#	1000 psi	60#&V	60 psi/-14.7psi
2000#	2000 psi	100#&V	100psi/-14.7psi

- 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

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.

2174

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/302274SD02L100#XU1BL

AS/ [A] [B] [C] [D] [E] [F] [G]

A	Case	
	30	3" stainless steel
	45	4 1/2" thermoplastic
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 (316 SS)	
	02	1/4 NPT
	04	1/2 NPT (4 1/2" case only)
E	Location	
	L	Lower
	E	Left
	D	Right
	T	Top

F	Range (include units suffix)	
		See table below
G	Options	
	X followed by one or more 2 digit codes:	
	AY	Black aluminum case for 4 1/2" size
	U1	One SPDT switch (2274 only)
	U2	Two SPDT switch (2274 only)
	AO	4-20mA output for 2274
	EN	3ft cable for 4 1/2" case (terminal blocks std for 4 1/2" case, 3ft cable std for 3" case)
	BL	Display backlight
	BK	Battery backup
	B1	Black rubber boot (3" only)
	B2	Orange rubber boot (3" only)
	FF	Front flange (welded)
	PP	Protective front cover (3" only)

15#	15 psi	2000#	2000 psi
30#	30 psi	3000#	3000 psi
50#	50 psi	5000#	5000 psi
60#	60 psi	6000#	6000 psi
100#	100 psi	8000#	8000 psi
150#	150 psi	10000#	10,000 psi
200#	200 psi	15000#	15,000 psi
300#	300 psi	15#&V	15 psi/-14.7psi
500#	500 psi	30#&V	30 psi/-14.7psi
750#	750 psi	60#&V	60 psi/-14.7psi
1000#	1000 psi	100#&V	100psi/-14.7psi

Ranges in inHg, cmHg, mmHg, kPa, mPa, bar, kg/cm^2, ftH_2O also available

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)

1279 Duragauge®

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.

ORDERING INFORMATION

To Order - Insert Code for Each Letter to Select Catalog Number.
Example: AS/1279BS02LXLLSG3000#

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)
	R	316 stainless/1019 steel (30000)
	S	316SS/ 316SS (30000)
	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
15#	800#	V/15#	30IMV
30#	1000#	V/30#	
60#	1500#	V/60#	
100#	2000#	V/100#	
160#	3000#		
200#	5000#		
300#	10000#		
400#	20000#		
600#	30000#		

*Case material: phenolic, ring: polypropylene, back cover: polypropylene- hermetically sealed or liquid filled: polycarbonate.

- 4" Dial, Grade 2A (±0.5% FS)
- 4-20 mA, 2-Wire Output
- IP65 Stainless Steel Construciton
- Glass Window
- Welded Socket & Case

T5500E

The T5500E combines the operation of a process gauge and pressure transmitter. Utilizing rugged polysilicon thin film technology, it can be integrated into safety and data acquisition systems.

SPECIFICATIONS

Operating Temperature:	-13°F to 185°F (-40 to 85°C)
Power Supply:	12-30VDC, 20mA max.
Loop Resistance:	</= (UB – 9.5 V)/0.02 A
Adjustments:	Transmitter span & zero
Isolation Voltage:	350V AC
Case:	304L SS with top vent plug
Lens:	Safety glass (acrylic optional)
Wetted Parts:	17-4PH sensor & 316L socket/tube

ORDERING INFORMATION

To Order - Insert Code for Each Letter to Select Catalog Number.
Example AS/10T5500E02LF3160#XNHPD

AS/10T5500E [A] [B] [C] [D]

A	Process Connection	
	02L	1/4 NPT, bottom
	04L	1/2 NPT, bottom
B	Electrical Connection	
	F3	Type B Univ. box cable conn., left mount
	M1	DIN EN175301-803 angle conn., back mount
	M2	DIN EN175301-803 angle conn., left mount
C	Pressure Range	
		See table below (include units suffix)
D	Options (X followed by 1 or more 2 digit codes)	
	FF	Front flange with M1 connection
	SH	Red stationary set hand
	PD	Acrylic window
	NH	Stainless steel tag
	LL	PLUS! performance (dynamic dampening)

psi		Compound	Vacuum
15#	800#	V/15#	30IMV
20#	1000#	V/30#	
30#	1500#	V/60#	
60#	2000#	V/100#	
100#	3000#		
120#	4000#		
160#	5000#		
200#	6000#		
300#	8000#		
400#	10000#		
500#	15000#		

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)

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, repeatibility 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, "H_2O, ftSW, Bar, mBar, kPa, mPa, mmHg, cmH_2O, mmH_2O, kg/cm^2
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 dispalyed
Zero/Clear:	Zeroes 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/302089SD0L100#XB1

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 $^1/_4$ NPT, lower
- 02E $^1/_4$ NPT, left
- 02D $^1/_4$ NPT, right
- 02T $^1/_4$ NPT, top

D Range (include units suffix)
See table below

E Options (X followed by 2 digit codes)
- B1 Black rubber boot
- B2 Orange rubber boot
- NH Metal Tag wired to case
- NN Paper Tag bonded to case
- FF Flange for panel mounting
- C4 Certified Calibration data (standard w. 2089)

psi		Compound	psi (absolute)
10#	600#		
15#	800#		
30#	1000#	15#&V	15#
60#	1500#	30#&V	25#
100#	2000#	60#&V	50#
160#	2500#	100#&V	
200#	3000#		
300#	5000#		
500#	7000#		

Temperature options 4°C, 20°C, 60°F. Metric units available on request.

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
Wetted Parts:	17-4 PH stainless steel diaphragm 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/NPAN7DCS02100#

AS/ [A] [B] [C] [D] [E] [F] [G]

A Function
- NPA Single setpoint, adjustable deadband
- NPI Single setpoint, adjustable deadband, process and setpoint display

B Enclosure
- N4 Watertight NEMA 3,4, 4X, 13 & IP66

C Output
- D SPDT Relay
- I SPDT Relay & 4-20mA output

D Power Equipment
- L 110VAC, 50/60Hz
- C 24VDC
- V 250VAC, 50/60Hz

E Pressure Port
- S01 $^1/_8$ NPT Male
- S02 $^1/_4$ NPT Male
- S03 $^1/_8$ NPT Female
- S04 $^1/_4$ NPT Female
- S05 $^7/_{16}$–20 SAE – $^1/_4$ SAE
- S06 $^1/_2$ NPT Male, $^1/_4$ NPT Female
- S07 $^1/_4$ AMINCO Female

F Option
- XEA External Setpoint Adjustment
- None —

G Range

psi	Setpoint Limits	psi Proof	psi Burst
60#	3-60	120	480
100#	5-100	200	800
200#	10-200	400	1600
300#	15-300	600	2400
500#	25-500	1000	4000
750#	35-750	1500	6000
1000#	50-1000	2000	8000
2000#	100-2000	4000	16000
3000#	150-3000	4500	20000
5000#	250-5000	7500	22500
7500#	375-7500	9000	25000
10000#	500-10000	12000	30000
15000#	750-15000	18000	45000
20000#	1000-20000	24000	60000

Kobold Temperature Transmitters

- 4-20mA Output
- Hermetically Sealed Electronics
- Easily Re-Programmable via PC
- Low Cost and Easy Installation

TST

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.

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

ORDERING INFORMATION

To Order - Insert Code for Each Letter to Select Catalog Number.
Example KO/TST-A4040PV06C

KO/TST - [A] [B] [C] [D] [E]

A Fitting

00	¼" probe diameter, smooth shank
A2	¼" NPT, adjustable immersion depth
A4	½" NPT, adjustable immersion depth
F2	¼" NPT, fixed immersion depth
F4	½" NPT, fixed immersion depth
T15	1½" Tri-clamp
T2	2" Tri-clamp
T25	2½" 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 Connection

PV	PVC jacket cable, 6 ft (220°C process max)
TF	Teflon jacket cable, 6 ft
TA	316 SS armored cable, 6 ft
TB	316 SS braided cable, 6 ft
H	DIN43650 Hirshmann Plug
M12	Micro DC 5 pin male Plug

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
18	-58 to 120°F	E	Custom scaling (specify)

E Options

C	1/2" NPT conduit hub
V1	0-5 VDC output in place of 4-20mA
V2	1-5 VDC output in place of 4-20mA
V3	0-10 VDC output in place of 4-20mA
EC	Extended cable length, specify length

KO/TST-PKIT Field calibration kit includes 9pin serial cable, 110VAC power pack & Windows software

- 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

Ambient Temperature:	-40°C to +70°C
Max. Pressure:	1450 PSIG
Probe:	316 SS, ¼"/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/TMA-S2514A02505

KO/TMA - [A] [B] [C]

A Fitting Style

S2514F	¼"NPT, fixed immersion depth
S2512F	½"NPT, fixed immersion depth
S2514F	¼"NPT, adjustable immersion depth
S2512F	½"NPT, adjustable immersion 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:	±0.25% full scale (0.45 °F + 0.40% of reading) max. with default calibration; ±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	±0.25% full scale		
	2	±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	6 mm

- 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 +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

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 94VO)
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
Ci, 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 Trasmitter with LED display & relay output

Kobold Pressure Sensor

LED Display with Switch & Analog Outputs

- Full Scale Ranges from 30 to 7500 PSI
- Analog Output Switchable V or mA
- Two PNP Transistor Switch Outputs
- ±0.5% Accuracy
- Display & Connector Independently Rotatable
- Adjustable Hysteresis, Window & Delay
- Easy Button Setup
- 1/4" NPT Connection

PSD

SPECIFICATIONS	
Measuring Principle:	Thin film
Measuring Range:	0-30 to 0-7500 PSI, adjustable 50-100% FS
Accuracy @ 77°F:	±0.5% FS typ.
Media Temperature:	-13 to 185°F
Ambient Temperature:	-13 to 185°F, 95% RH max.
Display Units:	psi, bar, MPa, kPa, m WC, mm WC
Output/Supply Voltage:	4-20 mA or 0-10 VDC /24 (15-30) VDC
Current Consumption:	<30 mA
Analog Output:	4-20 mA or 0-10 VDC, switchable mA or V
Current Limiting:	4-20 mA: 25 mA (Overload) 0-10 V: < 40 mA (Short-circuit)
Damping (Rise Time):	0.01-3.00 s / 10-90% nominal pressure
Switching Output:	2 PNP transistors
Switchpoints:	Adjustable 0-100% FS
Switchpoint Accuracy:	±0.5% FS typ. @ 77°F
Switching Hysteresis:	≥1% FS Switchpoint > Reset Point
Switching Resistance:	≤3 ohms
Output Functions:	Hysteresis, Window; Normally Closed (NC), Normally Open (NO)
Switching Current:	≤0.5 A each switching output
Switching Frequency:	200 Hz max.
Delay Time:	0-99.99 s
Display:	4-digit, 7-segment, 180° flippable, with disable
Display Resolution:	0.1% FS
Display Range:	-3 to 103% FS
Switching Indication:	2 red LEDs
Controls:	3 buttons and menu
Wetted Parts:	1.4542 (AISI630) sensor & pressure conn.
Housing:	Steel, die cast metal galvanized
Display Housing:	Plastic
Connection:	1/4" NPT
Male Electrical Plug:	PA-plug M12x1.5-pin
Protection:	IP65

ORDERING INFORMATION

Part Number	Range
KO/PSD-433N2P045	0 to 30 psi
KO/PSD-433N2P055	0 to 50 psi
KO/PSD-433N2P065	0 to 100 psi
KO/PSD-433N2P075	0 to 150 psi
KO/PSD-433N2P085	0 to 200 psi
KO/PSD-433N2P090	0 to 300 psi
KO/PSD-433N2P100	0 to 500 psi
KO/PSD-433N2P115	0 to 1000 psi
KO/PSD-433N2P126	0 to 1500 psi
KO/PSD-433N2P130	0 to 2000 psi
KO/PSD-433N2P140	0 to 3000 psi
KO/PSD-433N2P150	0 to 5000 psi
KO/PSD-433N2P170	0 to 7500 psi

Option: add suffix 40 to Part Number for surge damping orifice 0.4mm dia.

Accessories:

KO/807.007	2m (6ft) Accessory Cable
KO/807.007/5M	5m (16ft) Accessory Cable

Kobold Low Flow Sensor

- 0.4 to 400 GPH sizes
- Square Wave Pulse, Analog, or Switch Outputs
- Resistant to Aggressive Media


LED

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 or analog output proportional to flow. Sapphire bearings assure long service life.


DPL

No readout


Pointer

SPECIFICATIONS		
Accuracy:	±2.5% of full scale	
Linearity:	±1% of full scale	
Wetted Parts:	Polypropylene, sapphire, polysulfone	
Max. Pressure:	145 PSIG	
Temperature:	-40°F to 158°F media, -22°F to 140°F ambient	
Protection:	IP65	
Connection:	M12x1 plug connector (no connector on K000 style)	
Frequency Output	**F300 style**	**K000 style**
Power Supply:	24 VDC ± 20%, 40-50 mA	4.5-12 VDC, 7 mA
Pulse Output:	PNP, 20 mA max.	NPN, 10 mA max.
Signal Amplitude:	High: approx. Power Supply V, Low: < 0.2 V	
Analog Output		
Power Supply:	24 VDC ± 20%	
Output:	4-20 mA, 3-wire, 500Ω max. load	
LED Readout		
Display:	3-Digit, LED	
Analog Output:	4-20 mA, adjustable via 2 buttons, 500Ω max. load	
Switching Outputs:	1 or 2 PNP (NPN on request)	
Contact Operation:	N/C or N/O, set via 2 buttons	
Power Supply:	24 VDC ± 20%, approx. 100 mA, 3-wire	
Pointer Readout		
Display:	240° moving coil instrument in aluminum housing	
Power Supply:	24 VDC ± 20%	
Output:	4-20 mA, 3-wire, factory set, 250Ω max. load	

ORDERING INFORMATION

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

KO/DPL- [A] [B] [C] [D] Example: KO/DPL-1PU1G4F300

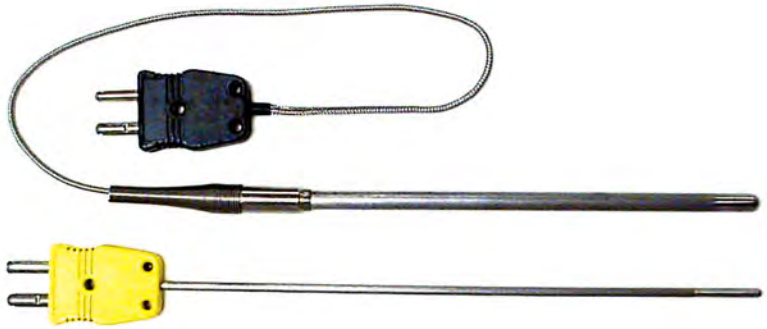
A	Gasket Material			
	1PU	NBR		
	1VU	FKM		
	1EU	EPDM		
B	Range	GPH	Freq at max flow	Max diff PSI
	1	0.4 - 8.0	272	11
	2	0.8 - 28	471	11
	3	3.0 - 95	528	10
	4	6.0 - 190	300	15
	5	16 - 400	399	19
C	Fluid Connection			
	G4	G 1/2 male		
	S4	Hose barbs, 1/2" PVC		
D	Electronics			
	K000	Frequency output, open collector NPN, 5 ft cable		
	F300	Frequency output, open collector PNP		
	L343	4-20 mA output		
	C30R	LED display, 2 open collector PNP		
	C34P	LED display, 4-20 mA, 1 open collector PNP		
	Z340	240° pointer, 4-20 mA		

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	Limits of Error 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	Limits of Error 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

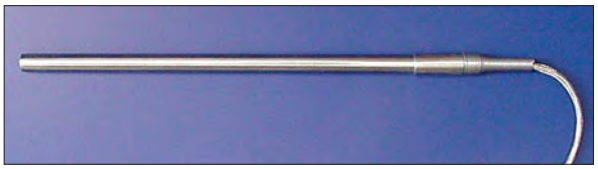
ABCDE-F-G-H-I-J-K

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 α=0.00385 and accuracy of ±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**		
	nnn	Three 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

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

TDA ▶

Programmable Features

- Lockout Code
- Transmitter Span
- Dampening

SPECIFICATIONS

Display Type:	3-digit red LED
Display Resolution:	1° up to 212°F, 2° above 212°F
Accuracy:	14 to 185°F: ±1.0°F -58 to 14°F & 185 to 250°F: ±3.6°F
Switch Output:	Optional PNP or NPN Adjustable setpoint, hysteresis & delay (0.5-99.5s)
Pressure:	1150 PSIG max.
Temperature:	120°F max ambient, 250°F max process
Material:	316L Stainless Steel housing & probe
Remote Probe Cable:	Teflon, 8ft. std.
Power:	24 VDC ±20% @ 20 mA
Signal 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 M12 micro-DC male plug
Electrical Protection:	NEMA 4/IP 65

ORDERING INFORMATION

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

TDA -15 [A] [B] [C] [D] Example TDA-15N4F20L3M

A	**Process Connection**			
	N4	1/2" NPT	N5	3/4" NPT
	R4	1/2" BSPP (G 1/2)	R5	3/4" BSPP (G 3/4)
			D6	Remote Probe (Smooth Shank)
B	**Measuring Range**			
	F2	0 to 250°F (not available with Remote Probe)		
	H2	-20 to 120°C (not available with Remote Probe)		
	F3	-58 to 250°F (only available with Remote Probe)		
	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	**Output**			
	L3M	4-20mA		
	P3M	4-20mA + PNP switch (300mA max)		
	N3M	4-20mA + NPN switch (300mA max)		

TRANSDUCERS/ ENSORS

Kobold Magneto-Inductive Flowmeters

- 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

MIK-C34 ▶

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- [A] [B] [C] [D] 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**	**R**
	U1 U2	0.013-0.26 0.04-0.8	1/4	1/2	--	1/2
	U4 U5	0.13-2.6 0.2-4.0	3/8	3/4	3/8	1/2
	U7 U8	0.4-8.0 0.65-13	1/2	1	1/2	1
	UA UB	0.8-16 1.3-26	1	--	1	1-1/2
	UD UE	2.0-40 4.0-80	1-1/2	--	1-1/2	2
	UG UH	6.5-130 9.0-180	2	--	2	2-3/4
C	**Fitting Set***					
	N	NPT female PVC				
	P	PVC hose barb				
	M	PVC glue socket				
	R	NPT female polypropylene				
D	**Output**					
	F300	Frequency 0-500Hz				
	F390	User Specified 50-1000Hz full scale				
	L343	4-20mA				
	C34N	4-20mA & NPN switch, open collector				
	C34P	4-20mA & PNP switch, open collector				

* PVDF butt weld tube 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, ½" NPT
10GN4	2-11.2 GPM, ½" NPT
15GN5	2-17.6 GPM, ¾" NPT
20GN5	2.5-22.5 GPM, ¾" NPT
25GN6	5-35 GPM, 1" NPT
30GN6	8-44.5 GPM, 1" NPT
35GN8	10-73 GPM, 1 ½" NPT
40GN8	20-114 GPM, 1 ½" 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
0R	2 PNP switches
0M	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 (Al) 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, ½" NPT fitting
KO/KAL-7315	316-Ti SS Sensor, ½"" NPT fitting
KO/KAL-7320	316-Ti SS Sensor, ¾" NPT fitting
KO/KAL-7340S	316-Ti SS Sensor, 1 ½" 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

Standard Ranges (specify bronze or stainless body):

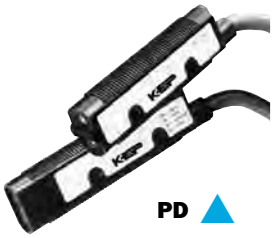
Fitting	GPM water
3/8" NPT	1.5-8
	3-12.5
1/2" NPT	1.5-8
	3-18
3/4" NPT	1.7-15
	5-25
1" NPT	5-20
	20-35
1 1/2" NPT	15-45
	25-60
2" NPT	25-120
	40-200
3" NPT	175-400
	225-500

DPT-C

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 proected, 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

A J2/M2 K3 W/E

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

AB JB2 KB3

Type AB	758-9901000	**Type KBF6**	758-0136522-902
Type ABF	758-9901001	**Type KB30**	758-0134277-901
Type JB2	758-9905000	**Type KBF30**	758-0134277-903
Type JBF2	758-0133477-902	**Type W**	758-9910002
Type JB5	758-9905001	**Type WF**	758-0133484-902
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		

NK Technologies Analog to Modbus Converter

ADC

- Convert any standard sensor output to Modbus RTU digital format
- Convert up to eight 4–20 mA sensor outputs using a single network address
- Sensor loop power is supplied by the converter: No DC power supply is required
- Models for 8 loop-powered (2-wire) and 8 externallypowered (4-wire) or 4 of each type
- Can be factory set for 120 VAC, 240 VAC or 24 VDC power supplies
- Field-selectable 9600 or 19200 baud rate speeds

SPECIFICATIONS

Power Supply:	24 VDC, 120 VAC 50–60 Hz, 240 VAC optional
Output:	Modbus RTU Slave 8 Channels (RS485)
Output Protocol:	1 start bit, 8 data bits (LSB first), 1 bit for even parity, 1 stop bit
Output Functions:	Function 04, "Read Input Registers"
Input Range(s):	4–20 mA, 0-5V, 0-10V
Accuracy:	1.0% FS
LED Indicators:	Green Power On, Yellow Busy, Red Fault
Addressing:	8 wide binary switch (1 to 247)
Output Range:	0–120% (4 mA = 0, 20 mA = 100%)
Dimensions:	3.7"H x 5.0"W x 2.5"D (94 x 127 x 64 mm)
Environmental:	-4 to 122°F (-20 to 50°C), 0–95% RH, non-condensing
Listings:	UL/cUL

ORDERING INFORMATION

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

ADC [A] – [B] – [C] – [D] Example: ADC1-420-120-MOD-DIN

A	Input Channels	
	1	Eight 4-20 mA loop-powered
	2	Four loop-powered, four external-powered (4-wire)
	3	Eight external-powered
B	Input Range	
	420	4-20 mA inputs (power from converter or external)
	005	0-5 VDC (externally powered)
	010	0-10 VDC (externally powered)
C	Power Supply	
	120	120 VAC (108-130 V, <50 mA)
	240	240 VAC (216-264 V, <25 mA)
	24D	24 VAC/DC (22-26 V, <200 mA)
D	Output & Case Style	
	MOD-DIN	Modbus RTU & DIN rail mounting

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

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.

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.

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, SNTP client, SNTP 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: with /UH option:	SD memory card, up to 32GB (FAT32 or FAT16), 1GB incl. 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, Pt200 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

Extech 3-Channel Dataloggers

- Measures mV or mA
- Triple LCD simultaneously displays three channels
- Selectable data sampling rate: 2, 5, 10, 30, 60, 120, 300, 600 seconds or Auto
- Records time and date with each reading
- Readings stored on an SD card in Excel® format for easy transfer to a PC

CE **SD900**

SPECIFICATIONS

	Range	Max. Resolution
SD900	0 to 20mA	0.01mA
SD910	300.0mV, 3000mV	0.1mV, 1mV
Basic accuracy:	±(0.5% + 2 digits)	
Memory:	Approx. 2.7M readings using 4GB SD memory card	
Power:	6 AA batteries or AC adapter	
Dimensions (WxHxD):	5.2 x 3.1 x 1.3" (132 x 80 x 32mm)	

Complete with six AAA batteries, SD memory card, Univeral AC Adaptor, 3 input connect sockets, and mounting bracket.

ORDERING INFORMATION

EX/SD900	3-Channel DC Current Datalogger
EX/SD910	3-Channel DC Voltage Datalogger

Extech Vibration Dataloggers

- Remote vibration sensor with magnetic adapter on 47.2" (1.2m) cable
- Wide frequency range of 10Hz to 1kHz
- RMS, Peak Value or Max Hold modes
- Adjustable data sampling rate 1-3600 seconds
- Offset adjustment used for zero function to make relative measurements
- Large backlit LCD
- Stores 99 readings manually and continuous datalogging via SD memory card
- Min, Max, Max Hold, Data Hold
- Auto power off with disable

SDL800

CE

SPECIFICATIONS

Acceleration:	656ft/s2 , 200m/s2 , 20.39g
Velocity:	7.87in/s, 200mm/s, 19.99cm/s
Displacement:	0.078in, 2mm (peak-to-peak)
Resolution:	1ft/s2 , 0.1m/s2 , 0.01g; 0.01in/s, 0.1mm/s, 0.01cm/s; 0.001in, 0.001mm
Basic accuracy:	±(5%+2 digits)
Memory:	20M data records using 2G SD card
Dimensions	7.2 x 2.9 x 1.9" (182 x 73 x 47.5mm)

Complete with remote sensor, magnetic mount, AA batteries, SD card, and hard carrying case. VB500 includes 3 additional sensors and AC adapter.

ORDERING INFORMATION

EX/SDL800	Single Channel Vibration Meter/Datalogger
EX/VB500	4-Channel Vibration Meter/Datalogger

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

PHE

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

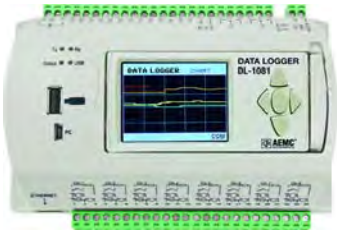
To Order–Insert Number Code for Each Letter to Select Catalog Number.
Order Example: PHE1-X-Y-32-5Y-OEV

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	
	0EV	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

AEMC Eight Channel Data Loggers

- 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

IP 20 Rated

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 a 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

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)

AEMC Four Channel AC Current/Voltage Data Loggers

- TRMS **current** recording up to 1000A 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

ML914 SPECIFICATIONS

Channels	Four current channels
Input Connection	6" captive AC MiniFlex flexible sensors
Conductor Size	1.77" (45mm) dia max.
Input Range	1-100A / 5-1000A
Accuracy	1-100A (50/60Hz): ±(1% of Reading + 0.5A) 5-1000A (50/60Hz): ±(1% of Reading + 1A)
Resolution	0.1A
Sample Rate	64 samples/cycle
Storage Rate	Programmable from 125ms to 1 per day
Storage Modes	Start/Stop, FIFO, Extended Recording Mode (XRM™)
Recording Length	15 minutes to 8 weeks, programmable using DataView®
Memory	1,000,000 measurement (2MB), non-volatile
Communication	Bluetooth (communicates up to 30 ft)
Battery Life	Up to 180 days (dependent on storage rate/recording length)
Protection	IP 50 with cover closed
Dimensions	5.904 x 5.904 x 3.568" (150 x 150 x 91mm)

ORDERING INFORMATION

AE/2126.40	Simple Logger® II Model ML914 (4 channel, TRMS AC Current, Bluetooth, with 4 miniflex probes, 4 C batteries & Dataview software)

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 (communicates up to 30 ft)
Battery Life	Up to 180 days (dependent on storage rate/recording length)
Protection	IP 50 with cover closed
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, TRMS Voltage, Bluetooth, with 5ft test lead set, 4 C batteries & Dataview software

Simple Logger® II models include Dataview software for real-time display, storage, analysis & reporting.

AEMC Two Channel Process Data Logger

NEW

- Bluetooth enabled logger & event counter
- Records DC voltage, DC current, 4-20mA and pulse counts
- Two independent inputs
- 32MB internal flash memory
- Alphanumeric LCD screen
- Menu-based front panel setup
- Powered by batteries or USB cable
- DataView software for data download, display, analysis & report generation

L452

Two input channels allow the user to connect to various types of sensors in order to record data such as pressure, temperature, flow, humidity and more. This logger can also record machine run time or other events. Each channel's real-time measurement is displayed on the LCD screen.
The L452 communicates via USB or Bluetooth for configuration & data transfer to a PC. It can also be configured using the front panel. The keypad can be locked out from the PC software. Alarms can be set on various measurements.

Includes 6 ft USB cable, 120V wall-to-USB plug, 6-pin screw terminal block, 2 x AA rechargeable NiMH batteries, quick start guide, DataView® software, user manual.

ORDERING INFO

AE/2153.51	Model L452 2-channel Data Logger with DataView software

SPECIFICATIONS

Channels	Two
Input	Six-pin terminal strip
Measurements	DC Current, DC Voltage, Event, Pulse
Range	4 to 20mA, 100mV, 1V, 10V
Resolution	0.01mA, 0.1mV, 1mV, 10mV
Accuracy (% of rdg)	mA: ±(0.25% + 5cts); V: ±(0.5% + 1cts)
Input Impedance	mA: 100Ω; V: 1MΩ; Event: 1MΩ
Sample Rate	mA & V: 5 samples/s; Event: 16 samples/s; Pulse: 100 samples/s
Sample Period	mA & V: 200, 400, 600, or 800ms; or from 1 to 60 sec.
Pulse Detection	10ms
Storage Modes	Start/Stop (ends when memory is full or when the recording stop time is reached, whichever comes first)
Recording Length	10 minutes to 1 year, set via instrument front panel or through DataView®software
Memory	32MB internal Flash memory (up to 1024 logging sessions, 16M samples)
Communication	Bluetooth 2.1, Class 1 or USB 2.0
Power Source	Internal: 2 x AA NiMH rechargeable batteries (charges through USB port); External: via USB connector
Battery Life	Up to 180 days (dependent on storage rate/recording length)
Dimensions	1.275" x 2.578" x 5.413" (32.4 x 65.5 x 137.5mm)
Operating Temp.	32 to 122°F (0 to 50°C), 16 to 85% RH
Protection	IP 40 (instrument); IP 20 (instrument & terminal strip)

AEMC Indoor Air Quality Monitor/Logger

- Simultaneously monitors and displays CO_2, Temperature and Humidity
- Stores up to 1,000,000 measurements
- Easy-to-read comfort indicators
- Simple data download via USB cable or wireless Bluetooth
- Wall mount or stand-alone use
- Selectable operating modes/log rates

CA1510

The CA1510 is compliant with the latest standards for measuring CO_2 to assess ventilation system indoor air quality. It is also an accurate preliminary diagnostic indicator, with alarms set at 1000 ppm or 1700 ppm of CO_2. The display blinks with red backlight when any of the measured parameters exceeds the user-selected threshold. The red backlight is solid when levels exceed the upper limit values.

ORDERING INFORMATION

AE/2138.08	Air Quality Logger Model C.A 1510 (Gray)
AE/2138.09	Air Quality Logger Model C.A 1510 (White)
Accessories (Optional)	
AE/2126.45	Bluetooth / Adapter USB
AE/2138.61	Wall Mount Holster (Gray)
AE/2138.62	Desk Stand (White)
AE/2138.63	Calibration Kit
AE/2138.67	Wall Mount Holster (White)
AE/2154.71	Small carrying pouch

Android Compatible Application available FREE at the Google play store.

SPECIFICATIONS

CO_2 Measurement	
Type of Sensor	Double-beam infrared cell sensor
Measurement Range	0 to 5000 ppm
Accuracy	±50 ppm ± 3% of value measured
Response time	<200 seconds to 63%
Resolution	1 ppm
Temperature Measurement	
Temperature Sensor	CMOS
Measurement Range	14° to +140°F or -10° to +60°C, selectable
Accuracy	±0.9°F (0.5°C), with 0.1° resolution
Humidity Measurement	
Type of Sensor	Capacitive
Measurement Range	5 to 95% RH
Accuracy	±2% RH, with 0.1% resolution
General	
Recording Interval	Programmable from 1 minute to 2 hours
Storage	Up to 1 million measurements
Features	Alarm, Backlighting, Display Hold, Min-Max, Auto Power-Off
Operating Range	14° to +140°F (-10° to +60°C), 5 to 95% RH
Dimensions	4.92 x 2.58 x 1.26" (125 x 65.5 x 32 mm)
Protection	IP40
Compliance	IEC 61010-1, 50V CAT II – IEC 61326-1
Power Supply	2AA Alkaline batteries, USB to wall adapter
Communication	Bluetooth Class 2 wireless communication / USB link;
Mounting	Embedded magnets on backside, tear drop wall hook, optional wall mount and desktop stand
AQR PC Software (included)	Graphic representation or as table of values, data export, real-time mode calculation of the confinement index with selection of presence periods & report generation

AEMC Power & Energy Logger

NEW

- 1ϕ, dual (split-phase) & 3ϕ (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)

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 f / DPF
PT Ratios	Programmable from 50V to 65,0000V
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, ≈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	±(2% rdg ± 1A), ±(2% rdg ± 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	± 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

- 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 (LCD readout on L452)
- Choice of data storage modes
- Stores >240k measurements in non-volatile memory
- DataView software displays & analyzes real-time data on a PC

L452 ▶

L562 ▶

◀ L642

MODEL	L101	L102	L261	L481	L452			
Channels	One	Two	One	One	Two, with user selectable function & range			
Input Connector	BNC		Recessed banana jacks		Removeable screw terminal strip			
Measurement Range	0-1V AC (probe dependent)		0-600V AC/DC	±850V DC	4-20mA DC	100mV/1V/10V DC	Event	Pulse
Resolution	0.1mV		0.1V	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		5-50V: ±0.5% of Rdg ±1V 50-600V: ±0.5% of Rdg ±0.5V	5-50V: ±0.5% of Rdg ±1V 50-850V: ±0.5% of Rdg ±0.5V	±0.25% ±5 counts	±0.5% ±1 count	---	---
Sample Rate	64 samples/cycle			Max. 8 /sec	5 /sec		16 /sec	100 /sec
Storage Rate	Programmable from 125ms to 1 day				DC in: 200/400/600/800ms or 1-60 sec; Pulse in: 10ms			
CAT III Rating	50V		600V		---			

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
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); 16M samples (32MB) in L452
Recording Length	15 minutes to 8 weeks, programmable using DataView®; L452: 10 min to 1 year, set via front panel or Dataview®
Storage Modes	Start/Stop, FIFO and Extended Recording Mode (XRM™)
Communication	USB 2.0 optically isolated; also Bluetooth on L452
Power	2 x 1.5V AA Alkaline batteries; USB rechargeable NiMH in L452
Battery Life	100 hrs to >45 days, depending on storage rate
Dimensions	5.4 x 2.8 x 1.28" (138 x 70 x 33mm)
Temperature	-10 to 50°C operating; 0 to 50°C for L452

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/2126.05	Simple Logger ® II Model L261 (TRMS, 0 to 600VAC/DC, 1 channel)
AE/2126.25	Simple Logger ® II Model L481 (±800VDC, 1 channel)
AE/2153.51	Simple Logger ® II Model L452 (2-Channel, w/LCD, 100mV/1V/10Vdc, 4 to 20mAdc, Event & Pulse
AE/2126.35	Simple Logger ® II Model L562 (TRMS Voltage & Current)
AE/2126.08	Simple Logger ® II Model L642 (Thermocouple Temperature, 2 channel)
AE/2126.01	Simple Logger® II Model CL601 (Clamp-On, TRMS Current, 0 to 600A, 1.65" jaw)

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.

Lascar Data Loggers

NEW

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

EL-USB-4

- Store More than 32,000 Readings
- High and Low Alarm Thresholds with LED Indicators
- 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

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

USB TEMPERATURE DATA LOGGERS

EL-USB-1

EL-USB-1-LCD

- –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
- 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

EL-USB-2-LCD

- –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
- 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

EL-USB-TC-LCD

- –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
- 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 4 1/2 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

EA25

- 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

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

RH520A

- Graphical & digital data display plus date & time
- 49000 reading memory
- Programmable resolution
- Audible & visual alarms
- Wall or benchtop mounting
- RS232 & USB communications

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

42275

- 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

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

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

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

Weschler AC Elapsed Time Meters (formerly Yokogawa)

Type 240

- Meets ANSI C-39.1
- Five Case Styles
- Wide Selection of Ranges
- Weather Resistance
- UL Recognized

Round Case

New Big Look Panel Mounted

Square Case

Back of Panel Unmounted

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] AAAE	24073 [1] AAAE
120V-50 Hz	24063 [1] ADAE	24073 [1] ADAE
208/240V-60 Hz	24063 [1] ABAE	24073 [1] ABAE
208/240V-50 Hz	24063 [1] AEAE	24073 [1] AEAE
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

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

T41F

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

Misc.

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

Crompton Protector Trip Relays

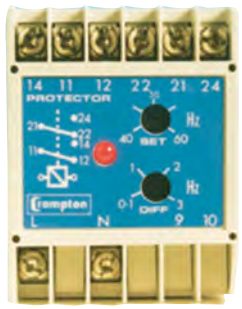
- Phase Loss, Reversal or Sequence
- Under and Over Current or Voltage Protection
- Load Detection
- Monitoring of Systems

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.

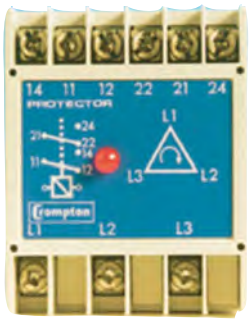
Standard overcurrent relays will energize on trip when the nominal input current plus the user adjustable "over nominal value" is exceeded, after the preset additional delay period if set. The relay will automatically reset to de-energize when the input current is lowered past the setpoint minus the 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	BUS	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

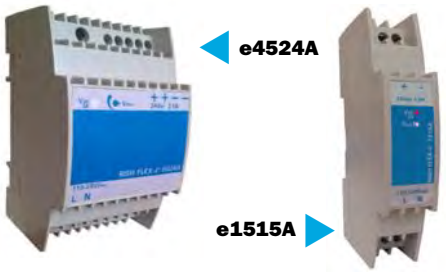
** Specify TC Type and Temperature Range

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)

Sifam Tinsley Power Supplies

- 24V, 15V or 12V DC Output
- Wide Input Range AC/DC
- High Efficiency
- Isolation Class II
- DIN Rail Mounting
- Free Air Convection Cooled



ORDERING INFORMATION	
FLEX-e6024A	24V, 2.5A Power Supply
FLEX-e4524A	24V, 1.75A Power Supply
FLEX-e3024A	24V, 1.5A Power Supply
FLEX-e1515A	15V, 1.0A Power Supply
Also available:	
FLEX-e1512A	12V, 1.2A Power Supply
FLEX-e9024A	24V, 3.75A Power Supply
FLEX-e17024A	24V, 7.0A Power Supply

SPECIFICATIONS

Model	e6024	e4524	e3024	e1515
Output Voltage:	24V ±3%	24V ±3%	24V ±3%	15V ±3%
Adjustment Range:	22 to 27V	22 to 27V	22 to 27V	10 to 15V
Output Current: @ 40°C:	2.5A	---	---	1.0A
Output Current: @ 50°C:	2.0A	1.75A	1.5A	0.9A
Output Current @ 60°C:	1.5A	1.4A	1.2A	0.8A
Power Boost @ 60°C (<3min):	2.5A	1.75A	1.5A	1.0A
Input Current @ 115VAC:	1.4A	0.95A	0.88A	0.4A
Input Current @ 230VAC:	0.8A	0.55A	0.48A	0.3A
Inrush Current (typical):	<36A	<36A	<36A	<18A
Power Dissipation:	8.9W	6.2W	5.3W	2.24W
Line Regulation:	<±1.0%	<±1.0%	<±1.0%	<±0.5%
Load Regulation (10-90%):	<±1.0%	<±1.0%	<±1.0%	<±0.5%
Ripple (p-p):	<150mV	<150mV	<150mV	<120mV
Rise Time:	30msec	30msec	20msec	50msec
Reverse Feed Resistance:	35V	35V	35V	16V
Dimensions (W x H x D mm):	54 x 90 x 62	54 x 90 x 62	54 x 90 x 62	18 x 90 x 62

General:	
AC Input Voltage:	90-265VAC
DC Input Voltage:	124-370VDC
Frequency:	45-65Hz
Efficiency:	>87%
Turn on Delay:	2 seconds
Parallel Connection:	No
Series Connnection:	Yes
Protection:	Overload, overvoltage, short circuit
Hold up Time:	>20msec (230VAC)
In/Out Isolation:	3000VAC
Environment:	IP20, Class II
Housing:	Lexan PC
Connections:	Screw terminals
Operating Temperature:	-25 to 60°C
Rel. Humidity @25°C:	<95%, non-condensing

Extech DC Power Supplies

- Single or Quad Outputs
- Constant Voltage & Constant Current Modes
- 5 Models, up to 300W Out
- Digital Display

ORDERING INFORMATION	
EX/382202	Digital 0-18V / 0-3A
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 (2 adjustable & 2 fixed current)
EX/382280	Precision 200W triple output supply with RS-232 interface

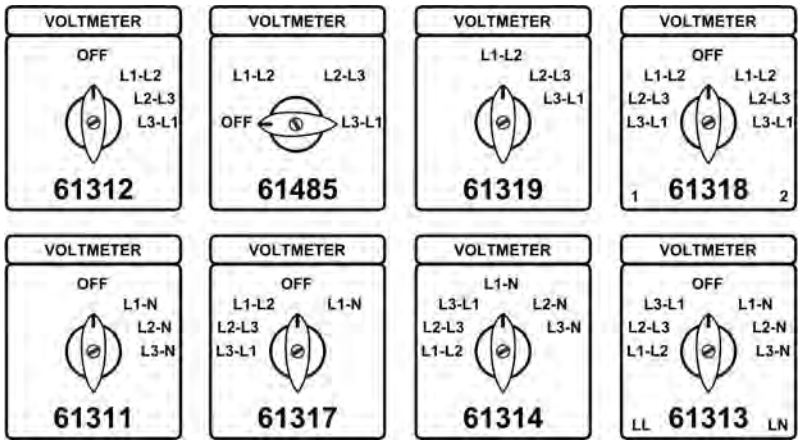
SPECIFICATIONS

Model	382202	382213	382260	382270	382280
Adjustable Outputs:	One	One	One	Two	One
DC Voltage & Current Output	0-18V 0-3A	0-30V 0-3A	0-16.4V/0-5.1A 0-27.6V/0-3.1A 0-36.8V/0-2.3A	dual 0-30V / 0-5A	0-40V / 0-5A
Resolution:	-0.1V / 10mA	0.1V / 10mA	10mV / 1mA	0.1V / 1mA	10mV / 1mA
Basic Accuracy:	±1.5%rdg	±1.5%rdg	±1%	±(0.5%+2d)	±(0.05%+9mV), ±(0.2%+9mA)
Ripple and Noise:	<0.5mV	<5mV	<30mV	<0.5mV	<1mV
Line Regulation:	<0.01%+3mV	<0.05%+10mV	<4mV	<0.02%+3mV	---
Load Regulation:	<0.01%+2mV	<0.05%+10mV	<20mV	<0.02%+3mV	1mV/A
Aux Outputs:		5V/0.5A & 12V/1A	---	3A@3-6.5V & 1A@8-15V	5V/2A , 3.3V/3A
Display:	dual LCD	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

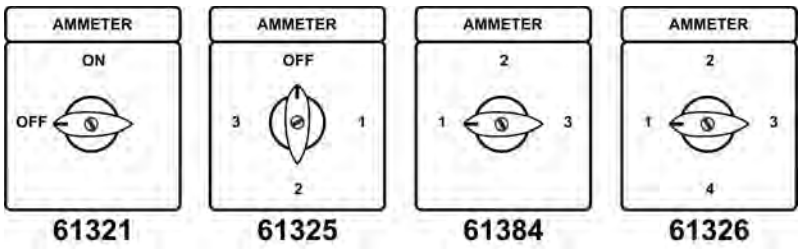
Switch current transformer and potential transformer secondaries to AC ammeters and voltmeters.

VOLTMETER SWITCHES



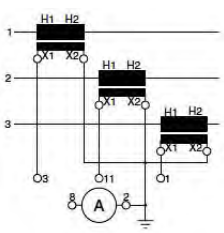
Voltmeter switches are non-shorting (break before make). Ammeter switches are shorting type (make before break).

AMMETER SWITCHES - grounded CT, grounded ammeter

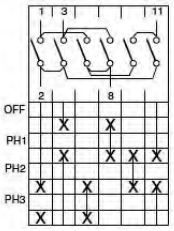


1 CT | 3 CTs | 3 CTs | 4 CTs

61325

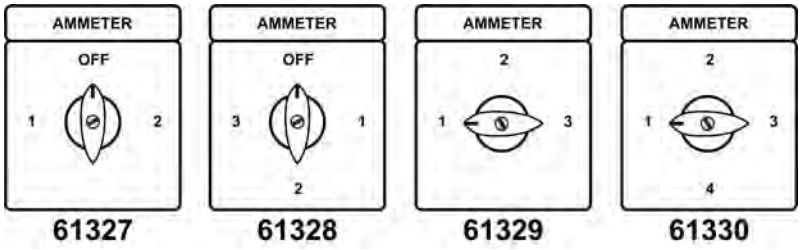


Wiring Diagram



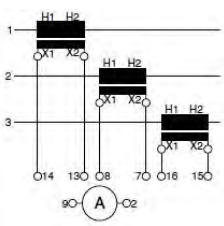
Schematic

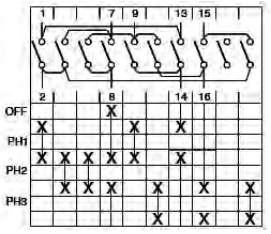
AMMETER SWITCHES - 2 pole for floating ammeter



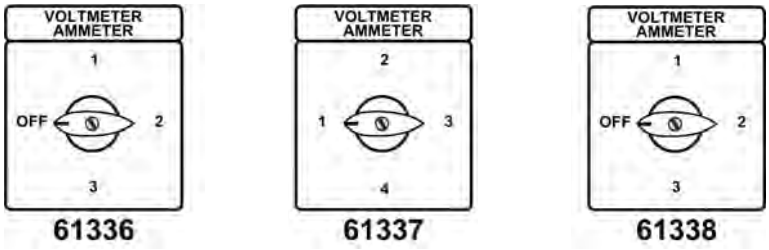
2 CTs | 3 CTs | 3 CTs | 4 CTs

61328





VOLTMETER / AMMETER SWITCHES - grounded CT, grounded ammeter



3 CTs | 3 CTs | 3 CTs

Position
1 = L1-L2, PH1
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

Misc.

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)

	Box Size			Cover*		Window	Panel
Part No.	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

Misc.

Weschler Polycarbonate Enclosures

- Indoor & Outdor 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

AMP ▶

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]

		H	W	D
A	Inside Size			
	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 ▶

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 #	Panel Dimensions		Clearance
	H *	W	D	H	W		(painted steel)	H	W	Panel to Door
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

c UL us

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] [B] [C]

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

XJS ▶

XJM ▶

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. 9109697-	Orifice Size (in.)	Use
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

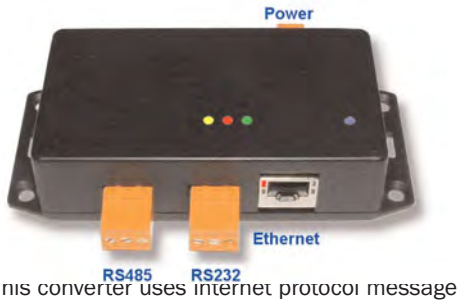
New enhanced features:
- 3 winding temperatures
- Cooling stage monitor
- Auxiliary inputs
- RS-485 & Ethernet communications
- DNP-3 & Modbus protocols

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 adaper 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).

UPA100

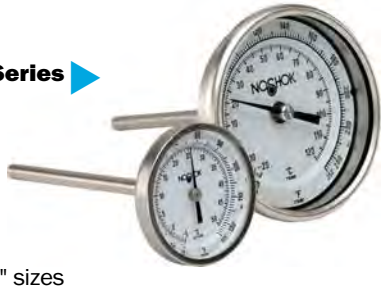
SPECIFICATIONS

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
- 2½" 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/¼" NPT fitting		
	30	3" w/½" 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

Extech Video Borescope Inspection Cameras

BR150

BR80

- 9mm or 17mm camera head
- 4 LED illumination lamps with dimmer
- 45° or 72° viewing angle
- 2.4" TFT color display
- 1m (39") gooseneck cable retains configured shape
- IP67 waterproof camera head
- Optional extension cables

SPECIFICATIONS

	BR80	BR150
Camera Viewing Angle:	72°	45°
Focus Distance:	2 to 6" (5 to 15cm)	5.9" to 9.8" (15 to 25cm)
Camera Shaft Diameter:	0.66" (17mm)	0.35" (9mm)
Minimum Bend Radius:	2.6" (63.5mm)	2.36" (60mm)
LCD Screen:	2.4" TFT	2.4" TFT
Screen Resolution:	480 x 234 pixels	480 x 234 pixels
Batteries:	4 AA	4 AA
Operating Time:	approx. 1.5 hours	approx. 1.5 hours
Dimensions:	8.3 x 3.3 x 2.4" (211 x 83 x 61mm)	Handle: 7.3 x 5.7 x 1.6" (186 x 145 x 41mm) Detachable Monitor: 3.9 x 2.8 x 1.2" (100 x 70 x 30mm)

BR80 includes 17mm camera head with cable, batteries, extension tools (mirror, hook, magnet).

BR150 includes 9mm camera head with cable, batteries, extension tools (mirror, hook, magnet), video output jack, and hard case.

ORDERING INFORMATION

EX/BR80	Flexible Video Borescope (17mm diameter/1m cable)
EX/BR150	Flexible Video Borescope (9mm diameter/1m cable)
EX/BRC-EXT	Borescope Extension Cable for BR80 (19mm diameter/0.9m cable)
EX/BR200-EXT	Borescope Extension Cable for BR150 (19mm diameter/0.9m cable)

Fluke Handheld Oscilloscopes

124

190

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, paperless recording and WiFi connectivity.

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 troubleshoting 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			Industrial ScopeMeters		
Model	190-202	190-102	190-062	Fluke 123B	Fluke 124B	Fluke 125B
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.			20 ns/div. to 1 min/div.	10 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, Hz, DPF
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 IV		
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 battery)			0-50°C operating (0-40°C w/battery)		
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 µs
- 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 µA, 5.000 µA, 50.000 mA, 400.00 mA, 5.0000 A, 10.000 A*	0.15% (0.7% AC)
Resistance	500.00Ω - 500.0 MΩ (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°C, -328 to 2462°F	1.0%

Battery life: 100 hours minimum, 200 hours in logging mode
Environment: -20°C to 55°C, <90% RH up to 37°C
*10A continuous, 20A for up to 30 seconds.
Size: 222x102x60 mm (8.75 x 4.03 x2.38")

Fluke 289 adds 50Ω 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 10,000µF
- 30% larger display
- 2 level backlight
- 4x faster (250µS) 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 µA, 6000 µA, 60.00 mA, 600.0 mA, 6.000 A, 10.00 A	0.2 %
AC Current	600.0 µA, 6000 µA, 60.00 mA, 600.0 mA, 6.000 A, 10.00 A	1.0 % (True-rms)
Temperature (excl. probe)	-200 to 1090 °C (-328 to 1994 °F)	1.0 %
80BK Temperature Probe	-40 to 260 °C (-40 to 500 °F)	2.2 °C or 2 %
Resistance	600.0 Ω, 6.000 kΩ, 60.00 kΩ, 600.0 kΩ, 6.000 MΩ, 50.00 MΩ	0.2 %
Capacitance	10.00 nF, 100.0 nF, 1.000 µF, 10.00 µF, 100.0 µF, 9,999 µF	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)

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

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 Compact Digital Multimeters

Fluke 117

Every Fluke 110 Series meter comes with a protective holster, TL75 test leads, 9V battery (installed) and manual.

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

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

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

[1] All AC voltage and AC current ranges are specified from 5% of range to 100% of range.
[2] 10 A continuous, 20 A for up to 30 seconds.
[3] Voltage 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

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.

- 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

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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

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

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)

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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 EX505: 5Hz to 1kHz EX520: 10Hz to 400Hz EX530: 40Hz to 400Hz	Electronic 0.001Hz to 10MHz 0.001Hz to 40MHz 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)

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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

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CE

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	10Hz - 20kHz	5 ranges, 600mV - 1000V (best resolution 0.1mV) 40Hz - 1kHz		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	10Hz - 1kHz	6 ranges, 600µA - 10A (best resolution 0.1µA) 40Hz - 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

CE

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

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)
- Integrated VFD low pass filter
- Datalogging & wireless data transfer (FC models)
- Frequency to 500Hz
- Large, backlit display with data hold
- In-rush current function for measuring starting current
- Auto shut-off maximizes battery life

SPECIFICATIONS

	Fluke 373	Fluke 374FC	Fluke 375FC	Fluke 376FC	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	1000 V	1000 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	1000V	1000 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
VFD Low Pass Filter	–	–	yes	yes	yes
Datalogging	–	yes	yes	yes	–
Fluke Connect	–	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

New Model	Changes from Older Fluke Model	
Fluke 376FC	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 375FC	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 374FC	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 374FC	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

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 374FC	600A True RMS AC/DC Clamp Meter
Fluke 375FC	600A True RMS AC/DC Clamp Meter
Fluke 376FC	1000A TRMS Clamp Meter with 18" iFlex probe
Fluke 381	Remote Display TRMS Clamp Meter with 18" iFlex probe

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

ORDERING INFORMATION

ACD-14-Pro	600 A TRMS Clamp Multimeter

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

Extech Clamp Meters

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
- 40,000 count multimeter functions
- Data Hold plus fast Peak Hold for surges
- Complete with test leads, 9V battery, two Type K bead wire probes and case

▲ EX623

Model EX655

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, Diode Check
- Relative function & DC Zero mode
- Data Hold, MIN/MAX, Inrush capture
- Low pass filter for VFD drives
- LCD bargraph
- Complete with test leads, Type K bead wire probe, AAA batteries, 3 year warranty

c UL us LISTED

▲ EX655

1000A Clamp Meters with IR Thermometer

- AC/DC Current, AC/DC Voltage, Resistance, Frequency, Capacitance, Temperature, Diode Test and Continuity
- True RMS models (EX820, EX830)
- 1.7" (43mm) jaw opening
- Backlit LCD
- Laser pointer for IR measurements
- Peak, Data Hold, Auto power off
- DC Current with zero (EX830)
- Complete with test leads, 9V battery, Type K bead probe (EX820, EX830) and case

c UL us LISTED

▲ EX830

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

▲ 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

▲ 380942

SPECIFICATIONS

Model	EX623	EX655	380941	380942	EX810	EX820	EX830
AC Sensing:	TRMS	TRMS	Averaging	TRMS	Averaging	TRMS	TRMS
Display counts:	4000	6000, backlit	4000	4000	4000, backlit	4000, backlit	4000, backlit
Jaw size/ Cable size:	1.25" (32mm)	1.18" (30mm)	0.9" (23mm); 4/0 AWG	0.9" (23mm); 4/0 AWG	1.7" (43mm): 750MCM	1.7" (43mm): 750MCM	1.7" (43mm): 750MCM
AC Current:	400µA , 40A, 400A	600µA, 60A, 600A	40A, 200A	400mA, 4A, 30A	1000A	1000A	1000A
DC Current:	400µA , 40A, 400A	600µA, 60A, 600A	40A, 200A	4A, 30A	–-	–-	1000A
Max resolution:	0.1µA, 0.01A	0.1µA, 0.01A	0.01A	AC: 0.1mA, DC: 0.001A	0.01A	0.01A	AC: 0.01A, DC: 0.1A
Basic AC/DCA Accuracy:	±1.5%	2.5%	±1.0%	±1.5%	±2.8%	±2.5%	±2.5%
AC/DC Voltage (Max. Res.):	AC: 600V (0.1V) DC: 600V (0.1mV)	AC: 750V (1mV) DC: 1000V (0.1mV)	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 (0.1Ω)	40MΩ (0.1Ω)	40MΩ (0.1Ω)
Capaciatance (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 / -50 to 1000°C	-40 to 1832°F / -40 to 1000°C	–-	–-	–-	-4 to 1400°F / -20 to 760°C	-4 to 1400°F / -20 to 760°C
IR Temperature:	-58 to 518°F	–-	–-	–-	-58 to 518°F	-58 to 518°F	-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	Yes	Yes	Yes
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 TRMS Meters

- Measure to 1000V AC/DC
- Current measurement to 2000A AC, 3000A DC
- Automatic AC or DC selection (203/403/603)
- Ω, Hz, Diode test & Continuity buzzer
- °C/°F function (203/403/603)
- Fast (1msec) inrush current capture
- Relative & Hold functions
- CAT IV rated
- Jaw opening to 2.36" (60mm)

SPECIFICATIONS

MODEL	512	514	203	403	603
Current AC rms	1000A	1000A	600A	1000A	2000A
Current DC	---	1000A	900A	1500A	3000A
Voltage AC rms	750V	750V	1000V	1000V	1000V
Voltage DC	1000V	1000V	1000V	1000V	1000V
Ohms	4kΩ	4kΩ	60kΩ	100kΩ	100kΩ
Temperature	---	---	Type K	Type K	Type K
Voltage Frequency	10kHz	10kHz	20kHz	20kHz	20kHz
Current Frequency	4kHz	10kHz	3kHz	2kHz	2kHz
Max. Counts	4000	4000	6000	10000	10000
Display Backlight	---	---	Yes	Yes	Yes
Analog Bar Display	Yes	Yes	---	---	---
Min/Max Button	---	---	Yes	Yes	Yes
Adapter Input (AC/DC)	---	---	0 - 10V	0 - 10V	0 - 10V
Auto AC/DC	---	---	V & A	V & A	V & A
Rating CAT IV	300V	300V	600V	1000V	1000V
Jaw Opening	1.57"	1.57"	1.33"	1.89"	2.36"

ORDERING INFORMATION

AE/2117.68	Model 512 Clamp-On (TRMS, 750Vac/1000Vdc, 1000Aac, Ohms, Continuity, Hz)
AE/2117.70	Model 514 Clamp-On (TRMS, 750Vac/1000Vdc, 1000Aac/dc, Ohms, Continuity, Hz)
AE/2139.12	Model 203 Clamp-On (TRMS, 1000Vac/dc, 600Aac/900Adc, Ohms, Continuity, Hz, Temperature)
AE/2139.21	Model 403 Clamp-On (TRMS, 1000Vac/dc, 1000Aac/1500Adc, Ohms, Continuity, Hz, Temperature)
AE/2139.31	Model 603 Clamp-On (TRMS, 1000Vac/dc, 2000Aac/3000Adc, Ohms, Continuity, Hz, Temperature)

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

607 ▶

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

DCM330 ▶

- 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 Meters

- True-rms measurements for accuracy when measuring complex, non-sinusoidal waveforms
- Highest resolution of 1 µA, measure up to 60 A
- Selectable filter function removes unwanted noise
- Max/Min/Average readings and Hold function
- Fully shielded jaw with 40 mm or 61 mm jaw opening
- Forward-facing LED worklight for use in dark wiring cabinets
- Backlit display; auto backlight off and auto power off for extended battery life
- CAT III 600V safety rating
- Wireless data connectivity via Fluke Connect

368

ORDERING INFORMATION

Fluke-368 FC	TRMS Leakage Current Clamp Meter, 40mm jaw
Fluke-369 FC	TRMS Leakage Current Clamp Meter, 61mm jaw

SPECIFICATIONS

TRMS AC Ranges:	3 ma, 30 mA, 300 mA, 3 A, 30 A, 60 A
Resolution:	0.001 mA, 0.01 mA, 0.1 mA, 0.001 A, 0.01 A, 0.1 A
Accuracy: (40-70 Hz with filter)	368: ± 1% rdg ± 5d (3 mA - 30 A ranges) 369: ± 1.5% rdg ± 5d (3 mA - 30 A ranges) Both models: ± 2% rdg ± 5d (60 A range)
Frequency range:	40-1000 Hz
Crest factor:	3
Digital display:	3300 count backlit LCD
Measurement cycle:	4/sec.
Range switching:	Manual for mA/A; auto-ranging for 3/30/300 mA & 3/30/60 A
Environment:	-10 to 50 °C, non-condensing <10 °C <90% RH 10-30 °C; <75% RH 30-40 °C <45% RH 40-50 °C
Temperature coefficient:	<0.02 % of rdg/°C (-10 to 18 °C & 28 to 50 °C)
Auto power off:	15 minutes
Protection:	IP30 with jaw closed
Safety:	EN 61010-2-032: CAT III 600 V, CAT IV 300 V EN 61010-1: Pollution level 2
Battery type:	2 AA alkaline
Battery life:	>150 hours, w/o backlight or spotlight
Conductor diameter:	40 mm (1.57") or 61 mm (2.40") max.
Dimensions:	368: 101 x 234 x 46 mm (4.0" x 9.3" x 1.8") 369: 116 x 257 x 46 mm (4.6" x 10.1" x 1.8")

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 µA current with 10nA resolution for flame rod tests
- Insulation Resistance tests to 100MΩ
- 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

c UL us LISTED

Complete with deluxe test lead kit, general purpose Type K thermocouple probe, carrying case and 9V battery.

380976

SPECIFICATIONS

Function	Max Range / Resolution	Basic Accuracy
True Power (W):	600kW / 10W	±5%
Apparent Power (kVA):	600kVA / 100VA	±2%
Reactive Power (kVAR):	600kVAR/10VAR	±5%
Horsepower (HP):	800HP / 0.01HP	±5%
Phase Angle:	-60 to +60° / 0.1°	±6°
AC Current (Trms):	1000A / 10mA	±2%
uA Current (AC+DC Trms):	1000µA / 10nA	±1%
AC/DC Voltage (Trms):	600V / 0.1mV	±1%
Resistance:	1000kΩ / 0.1Ω	±1%
Resistance (MΩ):	100MΩ / 1kΩ	±5%
Capacitance:	7000µF / 1nF	±1.5%
Frequency:	40Hz to 1kHz / 0.1Hz	±0.5%
Temperature (Type K):	-58 to 1000°F / 0.1°F	±1%
	-50 to 900°C / 0.1°C	±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

Complete with test leads, carrying case and 9V battery.

CW10

SPECIFICATIONS

Function	Range	Accuracy
AC Current:	99.99 / 600.0	±(1.5% Rdg + 5 LSD) @ 50/60Hz
AC Voltage:	99.99 / 999.9	±(1% Rdg + 5 LSD), 50-500Hz
DC Current:	99.99 / 600.0	±(1.5% Rdg + 5 LSD)
DC Voltage:	99.99 / 999.9	±(0.7% Rdg + 2 LSD)
Active Power (kW):	9.999 / 99.99 / 600.0	±(2.5% Rdg + 11 LSD) AC ±(2.2% Rdg + 22 LSD) DC
Inrush Current:	99.99 / 600.0	±(2.5% Rdg + 20 LSD)
Resistance:	1k / 10k / 100k	±(1.0% Rdg + 5 LSD)
Frequency:	100 / 1000 / 10k	±(0.5% Rdg + 3 LSD)
Harmonics:	99.99%	1-12: ±(5% Rdg + 10 LSD) 13-25: ±(10% Rdg + 10 LSD)
Power Factor:	-1.00 to 1.00	±(3° + 2 LSD)
Peak Hold (ACV, ACA):	40% overrange	±(3% Rdg + 15 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

UL

Supplied with test leads & battery.

ACD-45PQ

SPECIFICATIONS

Function	Range	Accuracy
AC Current:	40.00 / 400.0 / 600A	±(1.0% Rdg + 5 LSD) @ 50/60Hz
AC Voltage:	600.0V	±(0.5% Rdg + 5 LSD) @ 50/60Hz
DC Voltage:	600.0V	±(0.5% Rdg + 5 LSD)
Resistance:	999.9Ω	±(1.0% Rdg + 6 LSD)
Frequency:	5.00Hz to 500.0Hz	±(0.5% Rdg + 4 LSD)
Active Power (W):	0 to 360.0 kW	±(2.0% Rdg + 6 LSD) @ Harmonics to 10th & PF 0.1 to 0.99
Reactive Power (VAR):	0 to 360.0 kVAR	±(2.0% Rdg + 6 LSD) @ Harmonics to 10th & PF > 0.7
Apparent Power (VA):	0 to 360.0 kVA	±(2.0% Rdg + 6 LSD) @ Harmonics to 10th
Power Factor:	0.10 to 0.99	± 3 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 µs 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.

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.

CW500 includes 4 voltage probes, six AA batteries, carrying case, 2G SD memory card & PC software. Order current probes separately.

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

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 Condensor, 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:	±0.2% rdg ±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 µs for voltage transient
Current range:	manual or auto, see probe table (below)
Accuracy:	±0.2% rdg ±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:	±0.3% rdg ±0.2% rng. + accuracy of clamp-on probe (Power factor 1, sine wave, 40-70 Hz)
Effect of Power Factor:	±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) × 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 × 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) × 175 (H) × 68 (D) mm

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

AEMC Three-Phase Power Quality Analyzers

PowerPad III™ 8333

Captures & records transients, events & waveforms simultaneously

SD card for trend recordings, and up to 12 snapshot, 51 captured transients and 4000 alarm events.

- 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 calculated & displayed for three-phase
- Transformer K-factor display
- Power Factor, displacement PF display
- Captures up to 51 transients
- Short-term flicker display
- Phase unbalance (current and voltage)
- Harmonic Distortion (total and individual) from 1st to 50th
- Alarms, surges and sags
- Stores comprehensive data base of logged data
- 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

Input Terminals:	4 voltage / 3 current
Voltage:	(TRMS AC+DC) 2 to 1000V
Voltage Ratio:	up to 500kV
Current (TRMS AC+DC):	MN93: 500mA to 200Aac; MN193: 0.005 to 100Aac SR193 Clamp: 1A to 1000Aac AmpFlex® or MA193 Clamps: 100mA to 10000Aac MR193 Clamp: 1A to 1300Aac/dc SL261 Clamp: 50mA to 100Aac/dc J93: 50 to 3500Aac/dc
Current Ratio:	up to 60kA
Frequency (Hz):	40 to 69Hz
Distribution Systems:	1P 2W, 1P 3W, 2P 2W, 2P 3W, 2P 4W, 3P 3W, 3P 4W, Split-Phase 2W & 3W & Aron meters
Power Values:	W, VA, var, VAD, PF, DPF, cos φ, tan φ
Energy Values:	Wh, varh, VAh, VADh
Harmonics:	1st to 50th, Direction, Sequence; THD: 0 to 50, phase
Transients:	up to 51
Flicker (Pst):	Yes
Unbalance:	Yes
Recording:	Yes
Alarm Mode:	10 types; 4000 recorded
Peak:	Yes
Phasor Display:	Automatic
Display Color:	¼ VGA TFT screen (320 x 240) diagonal 148mm
Snapshots:	12
Electrical Safety:	IEC 61010, 1000V CAT III / 600V CAT IV
Protection:	IP53
Communication Interface:	USB
Battery Life:	>13 hrs, 25 hrs in Record Mode
Power Supply:	9.6V NiMH rechargeable battery pack (included)
External AC supply:	110/230Vac ±10% (50/60Hz)
Dimensions:	9.8 x 7.8 x 2.6" (240 x 180 x 55mm)
Warranty:	3 years

ORDERING INFORMATION

AE/2136.10	PowerPad® III Model 8333 (no probes)
AE/2136.11	PowerPad® III Model 8333 w/3 193-24-BK AmpFlex® Sensors (6500A)
AE/2136.12	PowerPad® III Model 8333 w/3 MN193-BK Probes (5A/100A)
AE/2136.30	PowerPad® III Model 8336 (no probes) *Replacement for Model 8335*
AE/2136.31	PowerPad® III Model 8336 w/4 193-24-BK AmpFlex® Sensors (6500A)
AE/2136.32	PowerPad® III Model 8336 w/4 MN193-BK Probes (5A/100A)

The 8333 Kit includes three current probes, four black 10 ft voltage leads, four black alligator clips, twelve color-coded input ID markers, NiMH battery, 110/240V power adapter with US power cord, carrying bag, soft carrying pouch, and USB stick supplied with product user manual and DataView® software.

ACCESSORIES

AE/2140.28	AC Current Probe Model MR193-BK
AE/2140.32	AC Current Probe Model MN93-BK
AE/2140.33	AC Current Probe Model SR193-BK
AE/2140.34	AmpFlex® Sensor 24" Model 193-24-BK
AE/2140.35	AmpFlex® Sensor 36" Model 193-36-BK
AE/2140.36	AC Current Probe Model MN193-BK
AE/2140.48	MiniFlex® Sensor 10" Model MA193-10-BK
AE/2140.49	AC/DC Current Probe Model J93-BK
AE/2140.50	MiniFlex® Sensor 14" Model MA193-14-BK

AEMC Single-Phase Power Quality Analyzer

8230 PowerPad®Jr.

- 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

All models (except 2130.81) 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 & user manual.

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

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/2130.80	PowerPad® Jr. Model 8230 (no probes)
AE/2130.82	PowerPad® Jr. Model 8230 w/MN93-BK (240A)
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 (except 2130.90) 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 & user manual.

Three-line backlit digital display with custom icons

SPECIFICATIONS

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)

ORDERING INFORMATION

AE/2130.90	Power Quality Meter Model 8220 (no probes)
AE/2130.93	Power Quality Meter Model 8220 w/24" AmpFlex® 193-24-BK (6500A)
AE/2130.96	Power Quality Meter Model 8220 w/MN193-BK (6A/120AAC)

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

Dual Laser IR Thermometer

Two laser pointers converge to 1" target spot

- Measure to 1800°F (1000°C) with 1° resolution
- 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

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 Waterproof IR Thermometer

Waterproof to IP65 with 3m drop protection

- Measures -40 to 1202°F / -20 to 650°C
- Dual laser converges at 12" distance for ideal 1" target spot
- Programmable alarms with flashing blue/red LEDs for visual alert
- Adjustable emissivity
- Automatic data hold
- MIN/MAX/AVG/DIF functions
- Fitting for tripod mounting
- Complete with 9V battery & case

Model IR320

ORDERING INFORMATION

EX/42500	500° Mini IR Thermometer
EX/42510A	1200° Mini IR Thermometer
EX/42509	Dual Laser IR Thermometer with Color Alert
EX/42512	Dual Laser High Temperature IR Thermometer
EX/42545	High Temperature IR Thermometer
EX/IR270	IR Thermometer with Color Alert
EX/IR320	Waterproof Dual Laser Thermometer

IR Thermometer with Color Alert

Display changes to blue below low setpoint and red above high setpoint

- Measures from -40°F to 1202°F (-20° to 650°C)
- Built-in laser pointer to improve aim
- Adjustable emissivity
- Data Hold, Max Hold, & audible alarm
- 12:1 field of view
- Complete with 9V battery and soft pouch

Model IR270

SPECIFICATIONS

Model	42500	42510A	42509	42512	42545	IR270	IR320
Temperature: (non-contact)	-4 to 500°F -20 to 260°C	-25 to 1200°F -50 to 650°C	-4 to 950°F -20 to 510°C	-58 to 1832°F -50 to 1000°C	-58 to 1832°F -50 to 1000°C	-40 to 1202°F -20 to 650°C	-40 to 1202°F -20 to 650°C
Laser Pointer:	Single	Single	Dual	Dual	Single	Single	Dual
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 + 1°C	±1% of reading ± 2°F / 1°C	±2% of reading ±4°F / 2°C <932°F (500°C)	±(1% of reading +2°F / 1°C)	±(1% of rdg +2°F / 1°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	0.1-1.00 adjust	0.1-1.00 adjust
Field of View: (Distance to Target)	6:1	12:1	12:1 (12")	30:1	50:1	12:1	12:1
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 1.7" 146x104x43mm	5.7 x 4.1 x 1.7" 146x104x43mm	3.9 x 2.2 x 9" 100x56x230mm	7.1 x 4.2 x 1.6" 180x107x40mm	7.4 x 4.6 x 2.2" 189x118x55mm
Weight	4.9oz (140g)	6.4oz (180g)	5.7oz (163g)	5.7oz (163g)	10.2oz (290g)	5.3oz (150g)	10.3oz (292g)
Warranty:	3 years	3 years	3 years	3 years	3 years	3 years	3 years

Fluke MegOhmMeters

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

1507

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

5kV & 10kV Insulation Testers

- Resistance to 2TΩ
- Ramp function
- DAR & PI calculations
- Auto-discharge
- 99 memory storage
- Live circuit voltage warning
- PC interface

1550C

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:

▲ MIT515

- 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

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 1000	100 kΩ – 20GΩ
ME/BM15	2500 5 kV	
ME/MIT515	250 500 1000 2500 5 kV	10 kΩ – 10 TΩ
ME/MIT525	250 500 1000 2500 5 kV	10 kΩ – 10 TΩ
ME/MIT1025	500 1000 2500 5 kV 10 kV	10 kΩ – 20 TΩ

Megger® Insulation Resistance Testers

NEW

MIT200 Series Compact Testers

The MIT200 series of insulation and continuity testers are ideal for testing transformers, motors, generators, switchgear, instrument panels, domestic appliances, power tools etc., as well as fixed electrical wiring systems. Their small size and light weight make them ideal for those who need to carry the meter for extended periods. The display offers a combination of digital readout and analog display, using Megger's patented DART display technology, which include the benefits of a precise LCD display plus an analog pointer response for evaluating circuit charge and discharge characteristics. Each tester includes test leads and a carrying case.

Features include:

- IR measurements to 1000MΩ
- Test voltages to 1kV
- Live circuit warning and test inhibit
- Digital & analog (bar) display
- Continuity testing at 200mA down to 0.01Ω
- IP54 CAT III 600V rating
- -10 to +55°C operating temperature

MIT200

MIT2500 2.5kV CAT IV Tester

The MIT2500 Insulation and Continuity Tester is designed for electrical and industrial test applications where operation voltages exceed 1000 V and higher insulation test voltages are needed. It offers both fixed range voltages of 50 V, 100V, 250 V, 500 V, 1000 V and 2500 V, as well as a variable range that allows any voltage between 50 V and 2500 V to be selected in 1 or 10V steps. This feature is supported by a new test voltage feedback control, which maintains the output test voltage to within 2% of the selected range, even under test. Dual digital displays show test results and test voltage simultaneously. Hands free 200 & 20mA continuity test ranges ensure the accurate measurement of circuit conductors and bonding. An audible continuity alarm speeds testing.

- Insulation resistance measurements to 200GΩ
- Fixed & variable test voltages to 2500V
- Large LCD with dual digital and analog arc displays
- Live circuit warning & test inhibit for voltage > 25-100V (user selectable)
- PI/DAR and Timer functions
- IP54 & CAT IV 600V rating

MIT2500

The MIT2500 offers TRMS & DC Voltage measurements to 600V, capacitance (to 10uF), frequency (to 400Hz) and test result storage. It also has Bluetooth for wireless data transfer using free Megger download software.

Hard carrying case, test leads & alkaline batteries are included. Optional accessories include a remote switch probe for "hands free" testing, AC charger, 12V DC car charger, NIMH batteries.

BM5200 5kV Tester

The Megger BM5200 tester is a battery powered instrument with digital and analogue arc display, designed for high voltage insulation resistance testing in the maintenance and servicing of cables, rotating plant machinery, transformers, switchgear and industrial installations. It features:

- 1 TΩ, 1.4 mA, 5 kV digital insulation tester with digital and analogue display
- Insulation (InS), Polarisation Index (PI) and variable timed test (t) modes
- Selectable DC or AC (incl. frequency) voltmeter functions
- Guard terminal to shunt surface leakage currents
- CATIII 600 V safety rating

Automatic discharge for capacitive circuits under test is provided and decaying voltage displayed. Design safety features include high voltage warning indicator, external voltage display after IR test, & automatic discharge of reactive loads. Carrying case, test leads & alkaline batteries are included.

BM5200

APPLICATION

Electrical insulating materials deteriorate with time, leading to breakdowns and costly repair bills. Insulation resistance testers apply a regulated DC voltage across the insulation and measure current flow through it, applying Ohm's law to calculate insulation resistance (current flows because no insulation material is perfect). IR tester uses include product test and qualification, equipment intallation, routine maintenance, troubleshooting.

For repeatable results, care should be taken to always employ the same test process and record temperature of the insulation as well as IR & voltage values.

ORDERING INFORMATION

Catalog No.	Model No.	Test Voltage (V dc)	Insulation Resistance	Resistance Range	Other Features	Power Source
ME/MIT200-EN	MIT200	500	0.01 to 1000 MΩ	0.01 to 100 Ω	Continuity buzzer	6 AA alkaline or NiMH batteries
ME/MIT210-EN	MIT210	1000				
ME/MIT220-EN	MIT220	250, 500				
ME/MIT230-EN	MIT230	250, 500, 1000				
ME/1006-764	MIT2500	50, 100, 250, 500, 1000, 2500, variable	0.01 MΩ to 200 GΩ	0.01 Ω to 1 MΩ	Voltage, capacitance & frequency measurement, Continuity buzzer, Test timer, PI & DAR tests, Bluetooth data transfer	6 AA alkaline or rechargeable NIMH battery (charger optional)
ME/1001-289	BM5200	250, 500, 1000, 2500, 5000	0.1 MΩ to 1 TΩ	----	Voltage & frequency measurement, Test timer, PI test	8 AA alkaline batteries

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 & protecton
- PI/DAR and Timer functions (except MIT400/2)
- IP54 & CAT IV 600V rating

◀ MIT410/2

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.

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/212359	212359	100, 250, 500, 1000	0 to 2000 MΩ	0 to 5000 Ω	Analog	Line or Hand-Crank
ME/MIT400/2	MIT400/2	250, 500, 1000	0.01 MΩ to 200 GΩ	0.01 Ω to 999 kΩ	Analog/ Dual Digital	
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	Alkaline or Rechargeable NIMH Battery (6 x AA)
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 NICD/NIMH Battery (8 x AA)
ME/MIT310	MIT310	250, 500, 1000	10kΩ – 999 MΩ	–	Digital/Analog	
ME/MIT310A	MIT310A			10 Ω – 2 kΩ	Analog	
ME/MIT320	MIT320	250, 500, 1000	10 kΩ – 999 MΩ with limit alarm	0.01 – 99.9 Ω 10 Ω – 999 kΩ	Digital/Analog w/backlight	
ME/MIT330	MIT330					

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 electrolumenescent 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

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

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

- 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

6527

- Test voltage 250V, 500V & 1000V
- Insulation measurements to 4000MΩ
- Resistance measurements to 400kΩ
- Continuity test with up to 200mA test current
- Voltage measure to 600VAC/1000VDC
- Large, backlit digital display
- HOLD function to freeze reading
- LOCK feature for time sensitive tests
- Automatic discharge after test
- CAT IV 600V rating
- Supplied with soft carrying case and leads

Analog

1015

- Compact and lightweight
- Test voltage 500V & 1000V
- Insulation measurements to 1000MΩ
- 600VAC test voltage range (safety check)
- 0 to 10Ω+ and 0 to 10Ω- continuity ranges
- Continuity measurements with 200mA test current
- Resistance range to 1000Ω
- Push button for battery check
- Large, direct-reading, colored scale
- Rugged construction for heavy duty field use
- Supplied with test leads, shockproof rubber housing & soft carrying case

Hand-Cranked

6503

- Test voltage 250V, 500V & 1000V (Model 6503) or 500V (Model 6501)
- Insulation measurements to 200MΩ & 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

Multi-Function

6536

- Insulation resistance & DMM functions
- Dual digital & analog bar display
- 4000 count backlit LCD
- TRMS ACV measurements
- IP54 protection
- CAT IV 600V safety rating
- Data memory & Bluetooth on some models

MODEL	6524	6526	6532	6534	6536
INSULATION TESTS					
Test Voltages	50/100/250/ 500/1000V	50/100/250 500/1000V	50/100V	10/25/100/ 250/500V	Variable 10 to 100V (1V steps)
Insulation Resistance	200GΩ	200GΩ	20GΩ	50GΩ	20GΩ
PI/DAR Ratios	Yes	Yes	Yes	–	–
Timer	0 to 40min	0 to 40min	0 to 40min	0 to 40min	0 to 40min
Automatic Test Inhibit	>25V	>25V	>25V	>25V	>25V
DMM FUNCTIONS					
Voltage	700Vac/dc	700Vac/dc	700Vac/dc	700Vac/dc	700Vac/dc
Resistance	1000kΩ	1000kΩ	1000kΩ	1000kΩ	1000kΩ
Continuity	10Ω, 100Ω	10Ω, 100Ω	10Ω, 100Ω	10Ω, 100Ω	10Ω, 100Ω
Test Current	200mA/20mA	200mA/20mA	200mA/20mA	200mA/20mA	200mA/20mA
Capacitance Measure	–	0.1n to 10µF	0.1n to 10µF	–	–
Frequency	15.3 to 800Hz	15.3 to 800Hz	15.3 to 800Hz	–	–
GENERAL FUNCTIONS					
Memory	300 measurements	1300 measurements	1300 measurements	1300 measurements	–
Bluetooth	–	2.1 Class II	2.1 Class II	2.1 Class II	–
DataView® Software	–	Included	Included	Included	–
Additional Features	–	Pass/Fail Indicator	Cable length measure	–	–

All Models have Δrel measurement, auto discharge, test lock, alarm, auto power off, data hold, test lead compensation, magnetic mount, and optional remote probe. Each unit comes with soft carrying pouch, two 1.5m test leads (red/black), two alligator clips (red/black), 1 black test probe, 6 AA batteries and user manual.

ORDERING INFORMATION

AE/2116.53	Megohmmeter Model 6527 (Digital, 250V, 500V, 1000V, 400kΩ, 600VAC/1000VDC measure)
AE/1403.01	Megohmmeter Model 1015 (Analog, 500/1000V, Resistance, Continuity)
AE/2126.51	Megohmmeter Model 6501 (Hand-cranked, 500V, 500kΩ, Continuity)
AE/2126.52	Megohmmeter Model 6503 (Hand-cranked, 250V, 500V, 1000V)
AE/2155.52	Megohmmeter Model 6524 (Digital w/Analog Bargraph, Alarm, 50V, 100V, 250V, 500V, 1000V, IR, Continuity, V, kΩ, Mem)
AE/2155.53	Megohmmeter Model 6526 (Digital w/Analog Bargraph, Alarm, 50V, 100V, 250V, 500V, 1000V, IR, Continuity, V, kΩ, Cap, Mem, Bluetooth, DataView® software)
AE/2155.54	Megohmmeter Model 6532 (Digital w/Analog Bargraph, Alarm, 50V, 100V, IR, Continuity, V, kΩ, Cap, Mem, Bluetooth, DataView® software)
AE/2155.55	Megohmmeter Model 6534 (Digital w/Analog Bargraph, Alarm, 10V, 25V, 100V, 250V, 500V, IR, Continuity, V, kΩ, Mem, Bluetooth, DataView® software)
AE/2155.56	Megohmmeter Model 6536 (Digital w/Analog Bargraph, Alarm, Variable 10V to 100V, IR, Continuity, V, kΩ)

AEMC Ground Resistance Testers

Digital Ground Resistance Tester Models 4620 & 4630

- 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

▲ 4630

Also available as full kits

Clamp-On Ground Resistance Tester Models 6416 & 6417

- 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

▲ 6416

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 6742 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

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.

DET3TC

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.

DET2/3

DET4TCR2+Clamps

DET4TCR2

ORDERING INFORMATION

Model No.	Measurement	Resistance	Voltage	Gnd Current	Power Source	Display	Test Leads
DET2/3	2/3/4 Term.	0.001Ω - 20kΩ	50V max.		Rechargeable Battery	Graphic	P/N 1008-969 includes 50m leads
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			

* Attached Rod Technique (ART) requires optional current measuring clamp.

Megger® Clamp-on Testers

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
0.05 - 0.99Ω	0.01Ω	±1.5% ± 0.05Ω
1.00 - 9.99Ω	0.01Ω	±1.5% ± 0.1Ω
10.0 - 99.9Ω	0.1Ω	±2% ± 0.5Ω
100.0 - 199.9Ω	0.1Ω	±5% ± 1Ω
200 - 400Ω	1Ω	±6% ± 5Ω
400 - 600Ω	1Ω	±10% ± 10Ω
600 - 1200Ω	10Ω	±20%
1200 - 1500Ω	10Ω	±35%

Range	Resolution
0.5 - 0.99mA	0.01mA
1.00 - 9.99mA	0.01mA
10.0- 99.9mA	0.1mA
100 - 999mA	1mA
1.00 - 9.99A	0.01A
10.0 - 35.0A	0.1A

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

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

230415

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

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	0.1μΩ	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	0.1μΩ	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

Megger® Handheld Micro-ohmmeter

NEW

- Battery operated
- Auto range: 1 μΩ to 1000 mΩ
- 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:	Autoranging from 0 - 1000 mΩ	
Resolution:	0 – 999 μΩ	1 μΩ
	1.0 – 9.99 mΩ	0.01 mΩ
	10.0 – 99.9 mΩ	0.1 mΩ
	100 – 1000 mΩ	1 mΩ
Accuracy:	0 – 1999 μΩ	±1 % of reading ±1 digit
	2 – 1000 mΩ	±2 % of reading ±1 digit
Pass / Fail:	Settable from 1 μΩ to 1999 mΩ	
Output Current:	Selectable minimum of 50 A or 100 A (100A valid at resistance <2mΩ)	
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
- 0.01Ω resolution on 20Ω 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% ±2V
Frequency:	Supply frequency indicated upon connection (16, 50/60, 400 Hz). Test frequency automatically set
Loop Resistance:	0-19.99Ω and 0-199.9Ω; Accuracy 5% ±5d
Test Current:	3-27A on 20Ω range, 0.3-2.7A on 200Ω 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

- 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

CHM600

The CHM Series utilize ultrasonic techniques to determine the height of up to 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: (@ 68° F)	CHM2000: 0.125" @ 7-32 ft, 0.5" @ 35 ft. 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.

PIE Process Calibrators

PIE (Practical Instrument Electronics) offers replacements for discontinued Altek models

Loop Calibrators

- Source to 24mA, Read to 52mA
- Measure to ±99.99V DC
- Quickly Simulate 2-wire Transmitters
- Dial Knob for Easy Adjustment
- Large Backlit Display
- Tilt Stand & Protective Rubber Boot

PIECAL 334

The versatile **PIECAL 334** will check, calibrate and troubleshoot all the signals in a 4-20mA process loop. Simultaneously power and measure two-wire transmitters up to 24V. Simulate the transmitter in circuits from 2 to 100V. Overload protected to 135VAC.

The **PIECAL 334Plus** adds automatic output stepping and ramping. Patented loop diagnostic technology helps troubleshoot ground faults and current leakage. A built-in 250Ω resistor can be used to power HART transmitters.

LOOP CALIBRATOR SPECIFICATIONS

mA Read	
Range:	0.00 to 52.00mA or -25.0 to 300.0% of 4-20mA
Accuracy:	±0.01mA below 24.01mA; ±0.03mA above 24.01mA
Burden:	≤2V at 50mA
Voltage Read	
Range:	-99.99 to 99.99VDC
Accuracy:	±0.05% of full span
Input Resistance:	≥2MΩ
Source/Measure 2-Wire Transmitter	
Ranges:	0.00 to 24.00mA or -25.0 to 125.0% of 4-20mA
Accuracy:	±0.012mA (0-24mA)
EZ-Check Accuracy:	±0.005mA at 4mA & 20mA
Loop Compliance:	≥24V at 20mA
Loop Drive:	1200Ω at 20mA
Transmitter Simulation	
Accuracy:	Same as Source/Measure mode
Burden:	≤2V at 20mA
Current Limit:	24mA nominal overload protetion
Loop Voltage Limit:	2-100VDC (fuse-less protection from polarity reversal)
Overvoltage Protection:	135Vrms for 30 seconds; 240Vrms for 15 seconds
Display:	Backlit LCD with 0.315" digits
Operating Temperature:	-20 to 60°C (<90% RH up to 35°C)
Battery / Life (nominal):	4 AA alkaline / 125 hrs reading, 15 hours sourcing 20mA
Dimensions:	5.63" x 3.0" x 1.6" (143x76x41mm)

AC adapter & NiMH batteries/charger available.

Milliamp Calibrator

- Source and Read 0-24mA
- Simulate 2-wire Transmitters
- Bargraph Display 0-100%
- Hi/Lo Power Modes

PIECAL 134

Use the **PIECAL 134** to check, calibrate and measure all devices in a 4-20mA loop. Quickly dial-in the desired value with the large adjustment knob. Simultaneously power a 2-wire transmitter and measure its output. Use with existing loop power from 2 to 42VDC to check loop wiring and receivers.

MILLIAMP CALIBRATOR SPECIFICATIONS

Ranges:	0.00 to 24.00mA or -25.0 to 125.0% of 4-20mA
Accuracy:	±0.05% of reading ±0.01mA
Burden @ 20mA:	<1V when reading mA; <2V for transmitter simulation
Loop Compliance:	Hi Power; ≥24V@20mA, Lo Power: ≥15V@20mA
Loop Drive:	Hi Power: 1200Ω @20mA (950W with Hart resistor enabled) Lo Power: 600Ω @20mA (350W with Hart resistor enabled)
Overvoltage Protection:	135Vrms for 30 seconds
Display:	Graphic LCD with 0.45" digits and 100 segment bar
Operating Temperature:	-20 to 60°C (<90% RH up to 35°C)
Battery Life (nominal):	220 hrs reading mA, 8 hours sourcing 20mA at hi power
Dimensions:	4.75" x 2.6" x 1.5" (120x66x38mm)

Carry case & NiMH batteries/charger available.

Voltage Calibrator

- Source to 20V, Measure to 60V DC
- Power Loops up to 24V & 1000Ω
- Check Live mA Loops
- Store 3 Output Settings
- Automatic Stepping & Ramping

PIECAL 235

The **PIE235** easily checks DC voltage instrumentation, even in live loops. Use the EZ-Chek switch to recall saved settings. Simulate pH probes from 0 to 14 pH (±414.12mV).

VOLTAGE CALIBRATOR SPECIFICATIONS

Range/Accuracy: (source & read)	-500.00 to 999.00mV / ±0.02% of reading ±0.01% of FS 1.000 to 5.000V / ±0.02% of reading ±0.002V 0.000 to 20.000V / ±0.02% of reading ±0.01% of FS -25.0 to 125.0% of 1-5V / ±0.1% Read only: 0.00 to 60.00V / ±0.02% of reading ±0.02V
Impedance:	Input: >1MΩ; Output: <0.3Ω at 20mA load
Source/Sink:	≥20mA / >16mA
Protection:	Overvoltage to 60Vrms for 30 seconds (audible & flashing alarm)
Display:	Backlit LCD with 0.35" digits (0.2" digits for mA display)
Operating Temperature:	-20 to 60°C (<90% RH up to 35°C)
Battery Life (nominal):	>50 hours from 4 AA alkaline batteries
Dimensions:	5.63" x 3.0" x 1.6" (143x76x41mm)

ORDERING INFORMATION

PIECAL334	Milliamp Loop Calibrator
PIECAL334plus	Automated Milliamp Loop Calibrator
PIECAL134	PocketMate Milliamp Calibrator (no boot or carrying case)
PIECAL235	Process Voltage Calibrator

All models (except PIECAL134) include batteries, rubber boot, tilt stand, carrying case, Certificate of Calibration and 3 year warranty. Made in U.S.A.

PIE Temperature Calibrators

PIE (Practical Instrument Electronics) offers replacements for discontinued Altek models

RTD Calibrators

- Simulate and Read 9 RTD Types Plus Ohms
- 0.1° and 0.01Ω Resolution
- Calibrate Directly in °C/°F
- Easy Dial Setting
- Automatic Output Stepping
- Automatic Configuration Detection
- Backlit Graphical LCD

PIECAL 311

PIECAL RTD Calibrators handle 9 RTD types. Calibrate directly in temperature (°C/°F) or use like a decade box to 410.00 or 2001.0 ohms. Connect a 2, 3 or 4 wire RTD and the calibrator automatically detects the configuration and measures the RTD. For automatic verification, choose 2, 3, 5, 11 or 21 steps and select a step time of 5-60 seconds to match the system response.

Choose the **PIECAL 211** for ±0.25% basic acuracy or the **PIECAL 311** for ±0.15% basic accuracy.

SPECIFICATIONS

RTD Type	Alpha	Range
Pt100 (ITS-90)	3850	-200.0 to 850.0°C (-328.0 to 1562.0°F)
Pt100 (Burns)	3902	-195.6 to 648.9°C (-320.0 to 1200.0°F)
Pt100 (JIS 1981)	3916	-200.0 to 648.9°C (-328.0 to 1200.0°F)
Pt100 (US lab)	3926	-200.0 to 850.0°C (-328.0 to 1584.0°F)
Pt1000 (DIN/IEC 1989)	3850	-200.0 to 850.0°C (-328.0 to 1562.0°F)
Pt1000 (HVAC)	3750	-184 to 275°C (-300 to 527°F)
Cu10 (Minco)	4274	-200 to 260°C (-328 to 500°F)
Cu50	4280	-50.0 to 150°C (-58 to 302°F)
Ni120	6720	-80.0 to 273.0°C (-112.0 to 524.0°F)
Ohms		0.00 to 410.00, 0.0 to 2010.0

Basic Accuracy	PIECAL 211	PIECAL 311
Pt100	±0.2°C (±0.4°F)	±0.1°C (±0.2°F)
Pt1000 (1989)	±0.1°C (±0.3°F)	±0.1°C (±0.2°F)
Pt1000 (HVAC), Cu50	±0.3°C (±0.6°F)	±0.2°C (±0.4°F)
Cu10	±1.2°C (±2.2°F)	±1.2°C (±2.2°F)
Ni120	±0.1°C (±0.2°F)	±0.1°C (±0.2°F)
Ohms (3 or 4 wire)	±0.025% rdg ±0.05Ω	±0.015% rdg ±0.05Ω
	Add 0.1Ω for 2 wire configuration	

Read Current:	0.9mA to 401Ω, 0.4mA to 2010Ω. nominal
External Excitation (max):	400Ω range: 10.2mA, 2000Ω range: 1mA (steady or pulsed)
Pulsed Excitation:	DC to 0.01 second pulse width
Overvoltage Protection:	60VDC for 30 seconds
Operating Temperature:	-25 to 60°C (<90% RH up to 35°C)
Battery / Life (nominal):	4 AA alkaline / 50 hrs (NiMH batteries & charger available)
Dimensions:	5.63" x 3.0" x 1.6" (143x76x41mm)

Thermocouple Calibrators

- Source and Read Modes
- 0.1° and 0.001mV Resolution
- Calibrate Directly in °C/°F
- Automatic Output Stepping
- Easy Dial Setting
- Large Backlit LCD

PIECAL 322

Simulate and measure the most popular thermocouple types with the **PIECAL 322**. Use the PIECAL 422 with 14 different types. Each model accepts miniature thermocouple connectors and direct thermocouple wires.

Use automatic output stepping to speed tests. Choose 2, 3, 5, 11 or 21 steps and a step time of 5, 6, 7, 8, 9, 10, 15, 20, 25, 30 or 60 seconds

The **PIECAL 422plus** adds the functions of a diagnostic mA calibrator in one compact unit. Source and measure to 24mA with 1mA resolution. Quickly diagnose ground faults and current leakage.

PIECAL 422plus

All models include batteries, tilt stand, rubber boot, hands-free carying case, test leads, Certificate of Calibration and 3 year warranty. Made in U.S.A.

SPECIFICATIONS

Input/Output (PIE 322):	Type J, K, T, E and mV
Input/Output (PIE 422):	Type J, K, T, E, R, S, B, N, G, C, P, L, U, D and mV

Ranges:		Best Accuracy
J	-210.0 to 1200.0°C (-328.0 to 2192.0°F)	±0.1°C (±0.2°F)
K	-230.0 to 1371.1°C (-382.0 to 2500.0°F)	±0.2°C (±0.4°F)
T	-260.0 to 400.0°C (-436.0 to 752.0°F)	±0.1°C (±0.2°F)
E	-240.0 to 1000.0°C (-400.0 to 1832.0°F)	±0.1°C (±0.2°F)
R, S	-18.3 to 1767.8°C (-1.0 to 3214.0°F)	±0.6°C (±1.1°F)
B	315.6 to 1820.0°C (600.0 to 3308.0°F)	±0.6°C (±1.1°F)
N	-230.0 to 1300.0°C (-382.0 to 2372.0°F)	±0.2°C (±0.4°F)
G	100.0 to 2320.0°C (212.0 to 4208.0°F)	±0.4°C (±0.7°F)
C, D	-1.1 to 2320.0°C (30.0 to 4208.0°F)	±0.5°C (±0.9°F)
P	0.0 to 1395.0°C (32.0 to 2543.0°F)	±0.2°C (±0.4°F)
L	-200.0 to 900.0°C (-328.0 to 1652.0°F)	±0.1°C (±0.2°F)
U	-200.0 to 600.0°C (-328.0 to 1112.0°F)	±0.1°C (±0.2°F)
mV	-13.000 to 80.000mV	±0.008% rdg ±0.006mV

Cold Junction Error:	±0.1°C for PIECAL 311, ±0.05°C for PIECAL 422
Impedance:	Input Read >10MΩ, Output Source <0.3Ω
Open Thermocouple:	10kΩ threshold, pulse <10µA for 400msec
Source Current:	>20mA (drives 80mV into 10Ω)
Overvoltage Protection:	60VDC for 30 seconds
Operating Temperature:	-25 to 60°C (<90% RH up to 35°C)
Battery / Life (nominal):	4 AA alkaline / 50 hrs (NiMH batteries & charger available)
Dimensions:	5.63" x 3.0" x 1.6" (143x76x41mm)

ORDERING INFORMATION

PIECAL211	RTD Calibrator (9 types)
PIECAL311	High Accuracy RTD Calibrator (9 types)
PIECAL322	Thermocouple Calibrator (Type J, K, T, E)
PIECAL422	Automated Thermocouple Calibrator (14 types)
PIECAL422plus	Automated Thermocouple & mA Calibrator (14 types)

PIE Multifunction Calibrators

PIE (Practical Instrument Electronics) offers replacements for discontinued Altek models

PIECAL 820

Multifunction Calibrator

- 6 Functions: Milliamps, Volts, Frequency, Thermocouples, RTDs, Ohms
- Calibrate Directly in °C/°F
- Power Transmitters & Loops
- Check Loop & Wiring Continuity
- Calibrate Flow Meters & Speed Sensors
- Simulate 2-Wire Transmitters
- 3 Saved Settings + MIN/MAX Recall
- Automatic Step & Ramp
- Easy Dial Operation & Backlit LCD

The rugged **PIECAL 820** combines the functions of RTD, thermocouple, process voltage & loop calibrators in one handheld instrument. It will also source and measure resistance to 4kohms and frequency to 20kHz. Continuity check and DC voltage measurements aid system troubleshooting. The intuitive EZ-DIAL Double Click Menu makes it simple to setup. Icons on the display indicate where to plug in the test leads. Store any three output settings for instant recall with the EZ Check switch. Choose between 2, 3, 5 & 11 steps to automatically increment the output in 100%, 50%, 25% or 10% of span. Select RAMP to smoothly increase and decrease the output between Zero and Span. Set a step/ramp time of 5-60sec to match the system response. HART™ resistor included.

PIECAL 830

High Accuracy Calibrator

- 8 Functions
- 0.02% Basic Accuracy
- Diagnose Ground Faults & Current Leakage
- Simulate pH Probes
- Check Pressure with Optional Modules

Two Channel Calibrator

- 8 Functions + 5 Troubleshooting Tools
- Diagnose Ground Faults & Current Leakage
- Simultaneously Display Loop Current, Voltage & Resistance
- Isolated Transmitter for Millivolts, Temperature, Frequency, or Pressure
- 3 Saved Settings plus Step & Ramp

The **PIECAL 820Elite** adds pH sourcing and pressure calibration to the PIECAL 820 capabilities. It features an extra decade of resolution on mA, Volts & ohms, plus tighter accuracies on all functions. Loop problems are easier to troubleshoot with patented diagnostics for ground fault and current leakage detection.

The deluxe **PIECAL 830** expands the cababilities of the 820Elite by adding sophisticated troubleshooting tools. It displays the condition of a live loop by showing current, voltage & resistance on one screen. The isolated universal transmitter channel can substitute for a faulty transmitter to verify loop operation. The 830 will simultaneously simulate the temperature, frequency, pH or pressure input to a transmitter while outputting 24V DC to power the transmitter & displaying the 2 Wire Transmitter output.

MULTIFUNCTION CALIBRATOR SPECIFICATIONS

FUNCTION	RANGE	ACCURACY 820	820Elite & 830
mA Source/Read	0.00 to 24.00mA, -25.0 to 125.0% of 4-20mA *	±0.03% of FS	±0.02% of rdg ± 0.003mA
V Source DC	-10.00 to 80.00mV, 0.00 to 10.25V	±0.03% of FS	----
V Read	0.00 to 80.00mV, 0.00 to 10.25V, 0.0 to 60.0V	±0.03% of FS	----
V Source DC	-20.000 to 99.99mV, -500.00 to 999.99mV, 0.000 to 10.250V	----	±0.02% of rdg ± 0.01% of FS
V Read	±99.999mV, ±999.99mV, 0.000 to 10.250V, 0.00 to 60.00V	----	±0.02% of rdg ± 0.01% of FS
TC Source/Read	J, K, T, E, R, S, B, N, G, C, D, P, L, U (14 types)	Type J ±0.5°C	Type J ±0.2°C
Cold Junction		±0.1°C	±0.05°C
RTD Source/Read	Pt100, Pt1000, Cu10, Cu50, Ni120, Ni110 (9 types)	Pt100/385 ±0.5°C	Pt100/385 ±0.3°C
Ohms Source/Read	0.0 to 401.0Ω, 0 to 4010Ω *	±0.03% of FS ±0.075Ω	±0.025% of FS ±0.075Ω
Frequency Source/Read	1-2000 CPM, 0.01-999.99Hz, 0.1-9999.9Hz, 0.001-20.000kHz	±0.03% of FS	±0.02% of rdg ± 0.01% of FS
pH Source	0.000 to 14.000 pH (-414.12 to 414.12V)	----	±0.003 pH

* Extra digit of resolution provided on 820Elite and 830 (24.000mA, 125.00%, 401.00Ω, 4010.0Ω)

mA Current Limit:	25mA nominal current limit protection
ma Compliance:	≥24VDC @20mA (max 2V burden at 24mA)
Loop Drive:	1200Ω @20mA (950Ω with Hart resistor or leak detect)
V Source Current:	≥20mA source / >16mA sink
Frequency Source:	Square wave, zero crossing, -1 to 5V p-p, >1mA rms @20kHz Optical coupling Green LED flashes at output frequency
Frequency Read:	Trigger Level 1V rms, DC coupled

Impedance:	Input Read >10MΩ, Output Source <1Ω
Open Thermocouple:	10kΩ threshold, pulse <5µA for 300msec
Isolation (830 only):	60Vrms from mA/Vread to Vsource/TC/RTD/Ω/freq/pressure
Overvoltage Protection:	60VDC for 30 seconds
Operating Temperature:	-20 to 60°C (<90% RH up to 35°C)
Battery / Life (nominal):	4 AA alkaline / 20 hrs (NiMH batteries & charger available)
Dimensions:	5.63" x 3.0" x 1.6" (143x76x41mm)

ORDERING INFORMATION

Includes batteries, rubber boot, tilt stand, carrying case, test leads, Certificate of Calibration, 3 year warranty. Made in U.S.A.

PIECAL820	Multifunction Process Calibrator
PIECAL820Elite	High Accuracy Multifunction Process Calibrator
PIECAL830	Two Channel Multifunction Process Calibrator

Extech Calibrator/Meters

- Large LCD Display & Touch Keypad
- Compact Size (3.8" x 4.5" x 2")
- Flip-Open Cover for Protection
- Battery or AC Operation

433201

Supplied with battery, test leads or calibration cable, AC adapter, and carrying case. NIST Calibration Certificate optional.

412400 Multifunction Calibrator/Meter

- Source 0 to 24mA with 0.01mA resolution
- Measure 0 to 50mA (0.1mA resolution)
- Select Type J, K, or T thermocouple for calibrations in °F/°C or mV
- Output 0 to 1999mV or 0 to 10.00V
- Measure 0 to 19.99V
- Single/continuous step function for Voltage and Current
- 24V loop power supply drives current loads up to 1000Ω
- Memory for 5 user settable output values
- Accuracy 0.075% ± 1 digit for V & mA (0.15% + 1°C for T/C)

433201 Thermocouple Calibrator/Meter

- Source & Measure Type J, K, T, E, C, R, S, N
- Source & Measure -5.00mV to 55.00mV
- 0.1°/1° Resolution for J, K, T, E (1° for C, R, S, N)
- Output Displayed as mV or °C/°F
- Five Stored Calibration Values
- 0.15% + 1° Accuracy

412355A Voltage & Current Calibrator/Meter

- Source 0–24mA (<1000Ω) or 0-20V
- Measure 0–50mA or 0–19.99V
- Displays mA or % (-25.0 to 125.0%)
- 0.1mA Resolution up to 19.99mA
- 0.1mV Resolution to 1999mV
- Accuracy 0.075% ± 1 digit

412300A Current Calibrator/Meter

- Source 0 to 24mA for loads up to 1000Ω
- Measure 0 to 50mA
- Displays mA or % (-25.0 to 125.0%)
- 0.1mA Resolution up to 19.99mA
- Supplies 24VDC Loop Power
- Accuracy 0.075% ± 1 digit

Yokogawa Calibrators

CA71/SP1 Multifunction Calibrator

- Simultaneous Source & Measure Capability
- 0.025% Accuracy (DCV)
- Separate Source & Measure Switches for Easy Setup
- Autostep, Sweep & Memory Functions

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	--

CA150/SP1 Multifunction 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

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 ±99.999.mV
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).

ORDERING INFORMATION

YE/CA320	Thermocouple Calibrator

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:	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 digitor 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:	
Current	0 to 24mA (-25% to 125%), <1kΩ load
Voltage	0 to 2000mV, 0 to 20V
mV/Temp	-5 to 55mV
DC Measure:	
Current	0 to 50mA, -25% to +230%
Voltage	0 to 1999mV / 2 to 20V
mV/Temp	-10 to 60mV
Thermocouple Source/Measure:	
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
EX/PRC30	Multifunction Calibrator with Cold Junction Compensation

add -NIST to P/N for NIST traceable Certificate of Calibration

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 µV 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% Rgd + 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: 1000Ω @ 24 mA 707: 1200Ω @ 24 mA	1000Ω @ 24 mA	787: 500Ω @ 24 mA 789: 1200Ω @ 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 40MΩ, 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	

[1]Will 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 400Ω 40 to 4000Ω	0.01Ω 0.1Ω	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 BP XK 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	

Yokogawa Test Standards

Decade Resistance Boxes

2793 6-Dial Decade Resistance Box

- Resistance value ranges:
  0.100 to 1111.210Ω (2793 01)
  0 to 111.1110MΩ (2793 03)
- Accurate, highly stable
- High reproducibility
- Resolution 0.001Ω
- 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 111,111Ω (2786 10)
  1 to 1,111,110Ω (2786 20)
- Small temperature coefficient, little temporal variation
- Small residual resistance
- Metal casing resists external influences

Wheatstone Bridges

2768 Precision Wheatstone Bridge

- Measurement range 0.1Ω to 111MΩ
- High precision ±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 1Ω to 10MΩ
- Does not require accessories
- Simple operation
- Current detector with built-in protection circuit
- Compact, light-weight

Double Bridges

2752 Precision Double Bridge

- Measurement range 0.1Ω to 111MΩ
- High precision ±0.03%
- Stable over long periods
- Standard resistor built-in
- Allows testing of cylindrical resistors using clamp device

2769 Portable Double Bridge

- Measurement range 0.1Ω to 110MΩ
- Rapidly performs reliable, accurate measurements
- Easy to handle and store
- Does not require accessories
- Built-in high sensitivity current sensor

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	Ø 01 m	Ø 6"	Ø 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	±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

TACH-10

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	±(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)

ORDERING INFORMATION

AB/TACH20	Combo Tachometer
AB/TACH-10	Contact / Non-Contact Tachometer

Extech Tachometer

- 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	±(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

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

CL420

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 Ouput:	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% 30° ±3% 60° ±10% 80° ±30%	Angle of: 10° ±1% 30° ±2% 50° ±6% 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	

Bierer Meters High Voltage Detectors & Indicators

Analog Voltage Detectors

- 40, 300 & 450 kV models
- For Overhead and URD applications
- Easy to read analog scale
- Indicates Line to Ground values for nominal or induced voltage
- Rugged, water resistant construction
- Hold & Backlight features (VDAH models)
- No voltage selector or multiplier (VDA300 & VDA450)

VDAH300

The **VDA040C** tests capacitive test points and direct contact voltages to 40kV line to ground (0-69kV phase to phase). The **VDA040P** detects 0-40kV line to ground using proximity or direct contact. It also tests capacitive test points & secondary voltage on bare or insulated cables.

Both VDA040 models have a 5-position selector switch which is calibrated for height above ground to compensate for capacitive coupling effects. These detectors include overload protection to 500kV.

The **VDA0300** reads 2.4-300kV line to ground (4-500kV phase to phase). The **VDA0450** reads 2.4-450kV line to ground (4-765kV phase to phase). Both meters use a single range Linear/Log scale for better resolution from distribution to transmission systems. They are passive reading; the 9V battery is only required for the test position. Models with the "H" suffix come with Hold and Backlight features.

ORDERING INFORMATION	
BR/VDA040C	Analog Voltage Detector 0-40kV, Capacitive/Direct Contact
BR/VDA040P	Analog Voltage Detector 0-40kV, Proximity/Direct Contact
BR/VDAL40P	Analog Voltage Detector 0-40kV, Proximity/Direct Contact with Backlight
BR/VDAL40PBPA	Analog Voltage Detector 0-40kV, Proximity/Direct Contact, Backlight & Horn
BR/VDA0300	Analog Voltage Detector 0-300kV, Direct Contact
BR/VDAH300	Analog Voltage Detector 0-300kV, Direct Contact, with Hold & Backlight
BR/VDA0450	Analog Voltage Detector 0-450kV, Direct Contact
BR/VDAH450	Analog Voltage Detector 0-450kV, Direct Contact, with Hold & Backlight

Each unit includes straight probe, hook probe, universal/grip-all adapter, manual, carrying case.

Digital Voltage Detectors

- Large 3 digit LED display
- Backlit continuous for nighttime use
- LED segment and battery test
- Standard 9 Volt battery
- Water tight construction with sunshield
- Rated for indoor and outdoor use
- Shotgun & Hot Stick compatible (Universal Grip All accessory)

VD1000

The **VD1000** Digital Voltage Detector is designed to easily indicate AC voltage on underground primary, overhead primary and transmission conductors up to 999 kV. The large digital display can be seen and read at distances up to 50'. Unit indicates line-to-ground value and is perfect for system voltages from 4kV to 765kV phase to phase.

VD1000 ranges: 01.0-99.9 kV URD, 01.0-99.9 kV OH, 001-999 kV OHT.
VD1000P: VD1000 ranges plus non-contact voltage sensing on overhead lines.
VD1000T: VD1000 ranges plus voltage detection on capacitive test points 01.0-99.9 kV.

ORDERING INFORMATION	
BR/VD1000	Digital Voltage Detector 0-1000kV, Direct Contact
BR/VD1000P	Digital Voltage Detector 0-1000kV, Direct & Non-Contact
BR/VD1000T	Digital Voltage Detector 0-1000kV, Direct Contact & Capacitive Test Points

Each unit includes straight probe, hook probe, universal/grip-all adapter, manual, carrying case.

Voltage Indicators

- Super bright LEDs & ultra loud horn
- Detects line to ground voltage
- Activation threshold meets ASTM requirement
- Standard 9 Volt battery
- Test position (except VBI-15)

VIAV300

VBI-15 Voltage Break Indicator is activated when voltage level drops below 2.5kV line to ground. It is overload protected to 115kV.

AV40 indicates on direct contact to capacitive test points or 120-600V secondaries. It also does non-contact sensing on 7.2/14.4/20 kV URD and 2.4/7.2/ 14.4/20/40 kV OH. A 12-position rotary switch selects function & range.

VIAV300 is a proximity & direct contact voltage indicator with 240V & 2.5/7.5/15/30/40/70/140/300 kV ranges selected by a 12-position rotary switch.

ORDERING INFORMATION	
BR/VBI-15	Voltage Break Indicator for 7.2-20kV line to ground, Direct Contact. Includes special hook probe, universal/grip-all adapter, manual, storage bag
BR/VBI-15C	Voltage Break Indicator for 7.2-20kV line to ground, Direct Contact. Includes c-clamp adapter & clamp, universal/grip-all adapter, manual, bag
BR/AV40	Voltage Indicator 0-40kV, Proximity/Direct Contact. Includes universal/grip-all adapter, manual, storage bag
BR/VIAV300	Voltage Indicator 0-300kV, Proximity/Direct Contact. Includes straight probe, hook probe, universal/grip-all adapter, manual, bag.

OPTIONS	
Add suffix to the Detector or Indicator Part Number:	
S	One 15-25kV Bushing Adapter
E	One 15-25kV Elbow Adapter

Bierer Meters High Voltage Phase Meters

Analog Phasing Voltmeters

- For Overhead and URD applications
- Phase Capacitive Test Points
- Shielded to minimize stray field indications
- Impact and water resistant

83280

Bierer analog voltmeters are used for voltage sensing and phasing on overhead and underground systems to 35kV. They are also suitable for voltage sensing and phasing at capacitive test points. A 5-position switch selects the function. The meter probe can also be used as stand-alone voltage detector without the second probe. Both probes are shielded, water resistant and impact resistant. Probes, cables and adapters fit conveniently in the padded carrying case. Each unit includes a separate 3kV power supply to verify meter operation.

ORDERING INFORMATION	
BR/81280	300V – 25kV Analog Phasing Voltmeter/Detector, 8 ft. regular cable, 8 ft. extension cable, hook probe, straight probe, 3kV power supply, manual, carrying case
BR/83280	300V– 35kV Analog Phasing Voltmeter/Detector, 8 ft. regular cable, 8 ft. extension cable, hook probe, straight probe, 3kV power supply, manual, carrying case

Digital Phasing Voltmeters

- Use on primary or secondary voltages or capacitive test points
- Large (3/4") LCD digital meter with backlight
- Shielded housing and interconnect cables
- Impact and water resistant probes

PD50

These conventional type phasing voltmeters are rated for overhead and URD systems to 50kV phase to phase. Measure DC or AC voltage to 400Hz with accuracy to 1%. Check primary or secondary voltages or capacitive test points. The **PD25** has 2, 20 & 25kV ranges. The **PD50** has 2, 20 & 50kV ranges. The **PD25A** & **PD50A** do not include the extension cable, 3kV power supply or hard case. The **RMV25** has a 30 ft cable and 2 universal adapters.

ORDERING INFORMATION	
BR/PD25	0 – 25kV All-purpose Utility Meter, 8 ft. regular cable, 8 ft. extension cable, hook probe, straight probe, 3kV power supply, manual, carrying case
BR/PD25A	0 – 25kV All-purpose Utility Meter, 8 ft. regular cable, hook probe, straight probe, manual, standard bag
BR/RMV25	0 – 25kV All-purpose Utility Meter, 30 ft. regular cable, magnetic base, hook probe, straight probe, pair of metal universals, carrying case
BR/PD50	0 – 50kV All-purpose Utility Meter, 8 ft. regular cable, 8 ft. extension cable, hook probe, straight probe, 3kV power supply, manual, carrying case
BR/PD50A	0 – 50kV All-purpose Utility Meter, 8 ft. regular cable, hook probe, straight probe, manual, standard bag

Wireless Digital Phasing Testers

- Large easy-to-read digital display with backlight
- High intensity color coded LED phase indicators
- Requires no interconnecting cable
- Operating range of 100ft
- Direct contact phasing from 120V - 69kV
- Non-contact phasing from 69kV - 800kV
- Shows phase angle relationship in degrees
- Direct contact voltage from 4kV - 69kV
- Automatically alerts for Delta/Wye transformation

PD800W

The **PD800W** Cordless Phasing Tester accurately and easily operates in multiple applications including phasing, voltage detection, phase sequencing and phase angle indication. One kit rapidly tests three-phase secondary systems, capacitive test points, URD systems as well as overhead and transmission/substation systems. This unique tester operates like a conventional phasing tester, but does not require an interconnecting cable or extension resistors. Each probe is water resistant, designed to withstand wear and is completely shielded to minimize stray field interference. Both the Reference Probe and the Meter Probe have a five-position selector switch that controls different operating modes.

ORDERING INFORMATION	
BR/PD800W	120 volt – 800,000 volt Cordless Phasing Tester, hook probe, straight probe, universal/grip-all adapter, manual, case
BR/PD8H2W	120 volt – 800,000 volt Cordless Phasing Tester, 2ft. transmission hook, hook probe, straight probe, universal/grip-all adapter, manual, 26" case

OPTIONS	
Add suffix to the Voltmeter or Tester part number:	
U	Pair of Universal metal or grip-all adapters (specify which)
S	Pair of 15-25kV Bushing Adapters
E	Pair of 15-25kV Elbow Adapters
V	Pair of Low Voltage Adapters
H2	Two pair of regular 2 ft. handles
H6	Two pair of 2 ft. extension handles and one pair of 2 ft. regular handles
D	DC hi-pot adapter (for voltmeters only)

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

- 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

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:	-20º 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

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/m^2 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/m2 / 0.1 BTU /(ft2*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

AEMC Cable Tester & Locator

Detects and locates faults in electrical cables, telecommunication cables, live & de-energized conductors buried or in walls

- Locates and traces hidden cables
- Detects opens and short
- Detects circuit breakers/fuses
- Single pole & two pole modes
- Backlight & flashlight functions
- 300V CAT III Rating

6681

ORDERING INFORMATION

AE/2127.85	Model 6681 Cable Tester & Locator

Includes soft carrying case, red & black test leads, 2 alligator clips, 2 test probes, ground rod, 9V battery, 6 AAA batteries and manual.

SPECIFICATIONS

Transmitter:	
Display:	LCD screen with display of functions & bargraph
Output Signal:	125kHz
Voltage Range:	Measures 12 to 300V ac/dc
Functions:	Digital coding of signals for easy identification, selection of transmission signal code, flashlight
Dimensions:	7.48 x 3.5 x 1.67" (190 x 89 x 42.5mm)
Receiver:	
Display:	Backlit LCD with display of functions & bargraph, transmission code, receiver & transmitter battery status
Detection Depth:	Single-Pole Application 0 to 6ft (0 to 2m) Two-Pole Application 0 to 1.6ft (0 to 0.5m) Simple Looping Line Up to 8.2ft (2.5m)
Line Voltage Detect:	Approximately 0 to 1.3ft (0 to 0.4m)
Functions:	Automatic shutdown, automatic or manual adjustment of reception sensitivity, flashlight
Dimensions:	9.5 x 3.07 x 1.5" (241.5 x 78 x 38.5mm)

AEMC Voltage Testers

An essential tool to ensure no voltage is present before working on any electrical installation

- Detects live & de-energized AC or DC circuits
- Verifies phase rotation
- Checks continuity
- Verifies GFCI operation
- Full autotest
- 1000V CAT IV & IP65 Ratings

C.A773

ORDERING INFORMATION

AE/2121.14	C.A771 Voltage Tester with LED indicators
AE/2121.15	C.A773 Voltage Tester with LEDs and digital display

Includes 2 AA batteries, velcro strap, set of removable test probes Ø 2mm with crystal safety cover, probe-tip protection, and manual.

SPECIFICATIONS

Redundant Hazardous Voltage Indication: The ELV (Extra-Low Voltage) LED indicates that the voltage is higher than the SELV (Safety Extra-Low Voltage) with the rate at which it flashes proportional to the voltage level

Voltage Absence Test (VAT):	12-1000Vac; 12-1400Vdc
Voltage:	C.A771: 8 to 1000Vac/1400Vdc C.A773: 1 to 1000Vac/1400Vdc
Frequency:	DC, 16.67 to 800Hz
Impedance:	>500kΩ (Max. Peak Current 3.5mA RMS)
Stray Voltage Detection:	By low-impedance load switching
GFI Tripping:	Up to 30mΩ
Phase/Neutral Identification:	Above 50V (45-65Hz); Above 150V (16.67-45Hz)
Continuity Test:	Buzzer threshold 100Ω typical (150Ω max.)
Resistance Test: (<0.1mA/<3.3V)	C.A771: 2kΩ, 60kΩ, 300kΩ C.A773: 0.5Ω to 2999kΩ
Phase Rotation:	Ph/Ph Voltage 50 to 1000Vac (45 to 400Hz)
Buzzer:	Intermittent beep for Voltage Detection; Continuous beep for continuity
Operating Temperature:	C.A771: -25.6° to 140°F (-30° to 60°C) C.A773: 5° to 113°F(-15° to 45°C)
Dimensions:	7.72 x 3.54 x 1.85" (196 x 90 x 47.1mm)

Extech Ultrasonic Thickness Gauges

Compact, handheld instrument for non-destructive thickness measurements of primarily steel structures

- Measure 0.040" to 20" steel
- Sunlight readable LCD display
- Color graphic display (TKG250)

TKG150 & TKG250 add:

- 100k Datalogger
- Echo-Echo test to reduce coating error
- B-scan (visual cross section)

TKG150

ORDERING INFORMATION

EX/TKG100	Digital Ultrasonic Thickness Gauge
EX/TKG150	Digital Ultrasonic Thickness Gauge/Datalogger
EX/TKG250	Ultrasonic Thickness Gauge/Datalogger with Color Numeric & Waveform Display

includes 2oz bottle of couplant, 2 AA batteries, Transducer (5MHz, 0.375" diameter), hard case, certificate of calibration to NIST. TKG150 & TKG250 also include protective holster, USB cable, XPorter software.

SPECIFICATIONS

Material Velocity:	Calibration range 0.200 to 0.7362 in/µS (0.508 to 18.699mm/µS)
Units:	Inches/Millimeters/Microseconds
Modes:	Hold, freeze, fast min/max
Alarms:	Audible beep; flashing display & keypad
Protection:	IP54
Battery Life:	Up to 50 hrs (20hrs w/backlighting) TKG250: Up to 14hrs
Gain Adjustment:	TKG150: Low, Standard, High TKG250: 20-90dB in 1dB steps or Automatic
B-Scan: (TKG150 &250)	Displays a visual cross section of inspection with no correlation to distance.
Echo to Echo: (TKG150 &250)	Measures metal thickness only. Paint & coatings do not affect base material thickness value.
Differential Mode: (TKG150 &250)	Displays the difference from the actual thickness measurement and a user entered reference value.
Velocity Mode: (TKG150 &250)	Displays acoustic sound speed to measure thickness of unknown materials.
Datalogger: (TKG150 &250)	Stores 50k readings (expandable to 100k) plus 5,000 waveforms

TKG250 also includes color graphic display, vibrating alarm, adjustable range control, selectable Rectification Modes, & Live Waveform (A-Scan) adjustments.

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/m^2 or 634 BTU/(ft^2 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" × 2.4" × 1.5" (132×60×38 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" × 2.8" × 1.3" (175×70×33 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

SWIVEL CLAMP METERS

NEW

- 180° Rotating Head
- Measure to 400A AC, 600V AC/DC
- Resistance, Capacitance, Continuity
- One Hand Operation
- Auto & Manual Ranging
- Non-Contact Voltage Detection

CE

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" × 5.3" × 1.2" (306×135×30 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" × 4.0" × 1.6" (243×102×41 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

Manufacturer Index

Only a few products from each manufacturer are listed in this catalog. Call for information on any products not shown.

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Weschler General Terms

Where to Order

Corporate Office

Weschler Instruments
16900 Foltz Parkway
Cleveland OH 44149
phone: 440-238-2550
toll free: 800-557-0064
fax: 440-238-0660
email: sales@weschler.com
web: www.weschler.com

Sales Offices in NJ, FL, SC, TX & OH.
Any of these offices can be reached through our main phone system.
phone: 440-378-6580
toll free: 800-903-9870

toll free fax: 800-903-9590
email: info@weschler.com

How to Order

Orders may be placed to the corporate office or any of our local sales offices. Our customer service hours are 8:00 AM to 7:00 PM Eastern time. For customers with established credit accounts, invoices are due in full in 30 days. New accounts are invited, with suitable bank and vendor references. MasterCard, Discover, Visa or American Express credit cards may also be used, or payment may be made on wire transfer. Minimum order is $50.

All prices are quoted in US$. We will be pleased to furnish quotations by mail, email, telephone or fax. Quantity discounts are available on many of the items shown in this catalog. To avoid duplication of telephone orders, please mark confirming orders clearly.

Prices are FOB shipping point. Unless other arrangements are made, freight and handling charges will be prepaid and added to the invoice. Regardless of shipping method, title passes at point of shipment. Claims for loss or damage must be made to the carrier.

Warranty

The warranty period and coverage varies by product. Weschler manufactured items are warranted against defects in material and workmanship. We will, at our option, repair or replace an item we verify to be defective during the warranty period. For items we distribute, the manufacturer's warranty applies.

Returns

Authorization must be obtained from Customer Service before returning items for any reason. Please provide reason for return, date of purchase, and our order number. Returns may be subject to a restocking charge.