Digital Meters

SINCE 1974

2002
2003

CATALOG

Level
Flow
Temperature
Pressure

PRECISION DIGITAL

PRECISION DIGITAL CORPORATION

www.predig.com

Jeffrey L. Peters
President

The first section of our new 2002-2003 Catalog gives you a quick overview of the most important features of our products and services. The second section contains detailed specifications, drawings and ordering information to help you specify the exact product you need.

Now... ISO 9001 CERTIFIED

Table of Contents

Our Pledge to You!

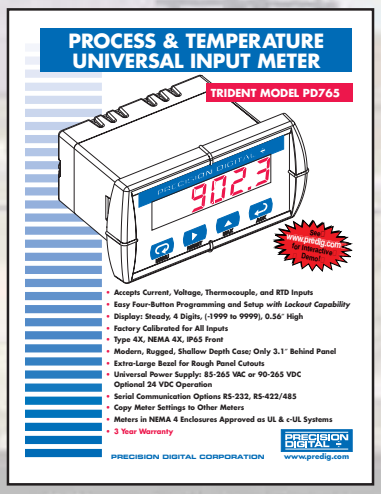
- **Quality Policy**
  Through the combined efforts of all employees, we will pursue quality leadership through error free results in our products, processes, and services. Our goal is complete customer satisfaction and our commitment is continuous improvement.
- **No Minimum Order Requirement**
- **Drop Shipment at No Extra Charge**
- **Fast Warranty Replacements**
- **Guaranteed Quick Shipment Products***
- **Fast, Courteous and Knowledgeable Customer Service**

*Please see last page for detailed information

Your Complete Source for Digital Meters www.predig.com

Instruction Manuals and Data Sheets

- 100% digitally generated
- Extra big drawings for easy reading
- Available 24 hours a day



VirtualMeter Demo Lets You Test Drive Before You Buy!

APPROVALS TO WORLDWIDE STANDARDS

Underwriters Laboratories Listed

Factory Mutual Approved

Canadian Standards Association

LCIE (CENELEC)

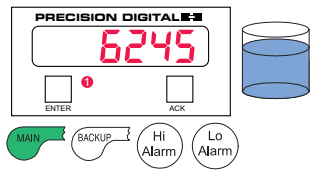
LEVEL

Applications

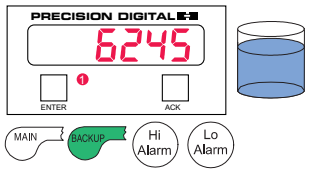
- Sump pump control
- Well-level monitoring
- Lift station level control
- Round horizontal tank
- Dam level
- Boiler drum level

Level Control with Pump Alternation

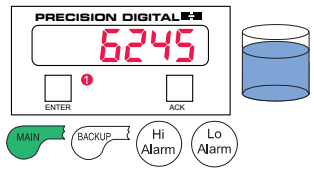
1 First Cycle: Main Pump



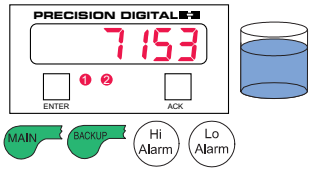
2 Second Cycle: Backup Pump



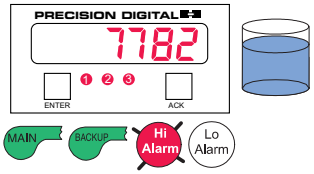
3 Third Cycle: Main Pump



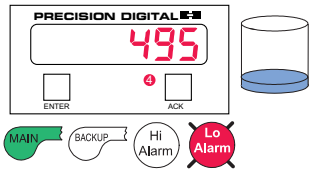
4 Both Pumps Operate when Needed



5 High Level Alarm

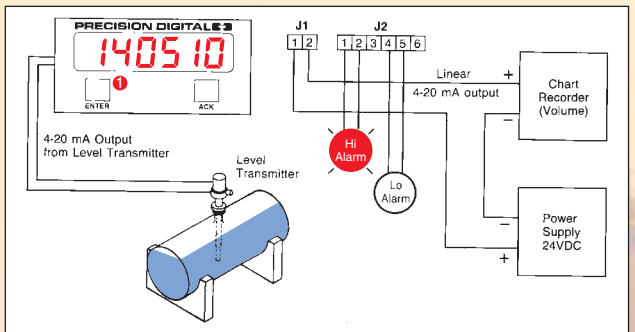


6 Low Level Alarm



Products: PD692, PD650, PD655, PD656

Volume of Non-Linear Tanks



OPERATION: The user may enter up to 11 calibration points into the Precision Digital meter to display volume in a non-linear tank. In this application, the Precision Digital meter's relays are used for HIGH and LOW level alarm. In addition, a linearized 4-20 mA output signal, representing volume, is re-transmitted to a chart recorder.

Products: PD690, PD692, PD650, PD655, PD656

Local & PC Monitoring

- Local level display
- Control room PC display & logging

Products: PD765 & MeterView Software

Point Level Monitoring

- Powers the level switch
- Built-in horn
- 2 A relay
- Free message labels

Product: PD141AFO VIGILANTE®

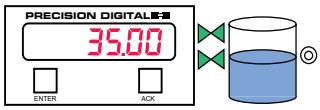
FLOW

Applications

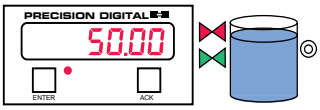
- Flow rate & integrating totalizer
- Automatic & manual batch
- Open channel flow
- Analog & pulse inputs

Manual Batch Control

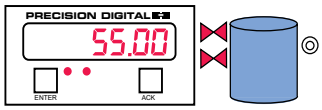
1 Both Valves Open: Container Filling



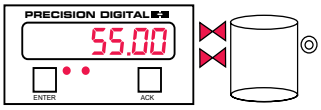
2 Main Valve Closes



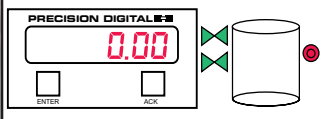
3 Dribble Valve Closes



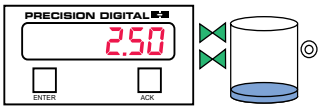
4 New Barrel is Positioned



5 Reset Button Pressed: Valves Open



6 Container Filling

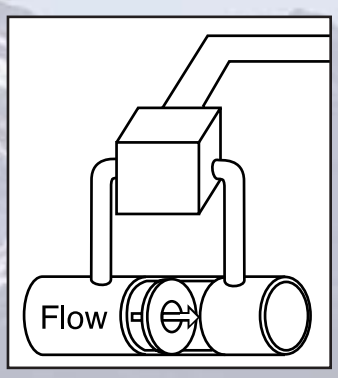


Products: PD692, PD650, PD655, PD656

Square Root Extraction

- Displays flow rates
- Low-flow cutoff
- Two-point calibration

Products: PD690, PD692, PD650, PD655, PD656, PD674, PD676, PD678, PD696-698



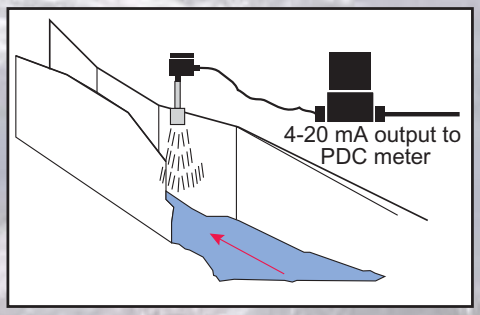
Local Display for Flowmeter…Even Those with Built-in Display!

- Easier to read
- Less confusing
- Backlit for night viewing

Products: PD696 -PD698

Open Channel Flow Rate & Total

- Programmable root function for weirs and flumes



Products: PD692, PD650, PD655, PD656

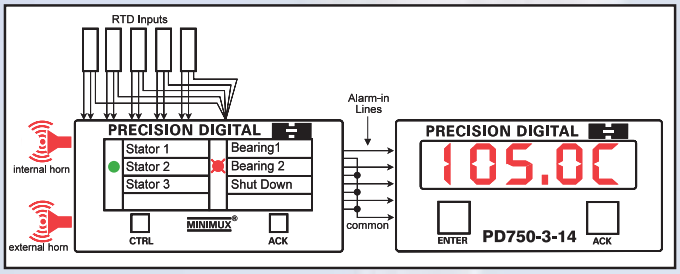
Take the Heat & Handle the Pressure with Precision Digital Meters

TEMP & PRESSURE

Temperature Applications

- Bearing temperature monitoring
- Thermocouples and RTDs
- High temperature alarms
- Temperature transmitting

Bearing Temperature Monitoring



Products: PD118, PD750

- PD118 scans up to 8 inputs
- Automatically switches them to PD750-3-14
- PD750-3-14 checks for alarm condition
- PD118 indicates alarm condition

Wax Reclaim Temperatures

- Enclosures with custom labels available
- Plastic, steel or stainless steel
- Up to six meters per enclosure

Products: PD765, Trident Enclosures

Exp-Proof Temperature Transmitter with Big Display

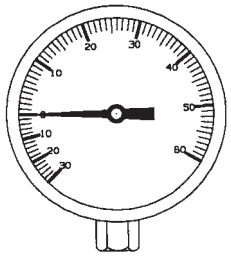
- TC or RTD input
- Isolated, linearized 4-20 mA output
- Big, 0.8˝ LEDs

Product: PD756

Pressure Applications

- Differential pressure display
- Compound pressure
- Submersible pressure transducers

Compound Pressure



One Precision Digital meter can be used to measure both vacuum and positive pressures. In this application, the meter is programmed for multi-point scaling (standard feature) and scaled as follows:

4.00	mA = -30.00
6.05	mA = 0.00
20.00	mA = 60.00

Products: PD690, PD692, PD650, PD655, PD656

Pressure Measurement in Div 2 Area

- Loop-powered
- FM
- Display up to 19,999
- Big display

Products: PD675, PD676, PD686

Boiler Pressure Monitoring

- First-out indication for troubleshooting
- Momentary & maintained alarms
- Free message labels

Product: PD141AFO VIGILANTE®

ACTUAL SIZE

ALL LARGE DISPLAY METERS

- Big displays for easy reading
- Rugged industrial enclosures
- 115 or 230 VAC power standard
- 24 VDC power optional
- 2 or 4 relays + 4-20 mA output
- Wall mount, panel mount, pipe mount

Large Display Process

- Field selectable 4-20 mA, 0-5 V, or 0-10 V inputs
- 4½ digit + extra zero display for rate
- 6 digit display for total
- Two 24 VDC transmitter power supplies
- Programmable root function for weirs and flumes
- Pump alternation function
- 200 mA transmitter power supply option
- Operating temp range: -20 to 65°C

Large Display Temperature

- Field Selectable J,K,T,E,R,S TCs and 100 Ω platinum RTD inputs
- Minimum display reading of -330.0 °F
- Maximum display reading of 3213 °F
- Field select display in Fahrenheit or Celsius
- Max/min temperature capture
- Use as temperature transmitter with big display
- Operating temp range: 0 to 65°C

2.3″ LED NEMA 4X

- Rugged die-cast aluminum enclosure
- 2.3″ (58 mm) high red LED display
- Wall mount standard
- Panel mount kit option
- Four ½″ conduit holes provided

➤ Model PD650 for process inputs
➤ Model PD757 for temperature inputs

See pages 20-24 for complete specifications

ACTUAL SIZE

1˝ LED NEMA 4X

- Rugged polycarbonate enclosure
- 1˝ (25.4 mm) high red LED display
- Wall mount standard
- Panel mount & pipe mount kits optional
- Two ½˝ conduit holes provided

➤ Model PD655 for process inputs
➤ Model PD755 for temperature inputs

0.8˝ LED Explosion-Proof

- Rugged sand-cast aluminum enclosure
- 0.8˝ (20.3 mm) high red LED display
- Wall mount standard
- Pipe mount kit optional
- Two ¾˝ conduit holes provided
- Explosion-proof control stations available

➤ Model PD656 for process inputs
➤ Model PD756 for temperature inputs

See pages 20-24 for complete specifications

(PDA-MAG Optional)

ACTUAL SIZE

See pages 20-24 for complete specifications

Trident Digital Panel Meter

- **Process, TC & RTD inputs**
- **NEMA 4X front**
- **Universal power supply**
- **Serial communication**
- **Shallow depth case**
- **3 Year warranty**

➤ **Model PD765**

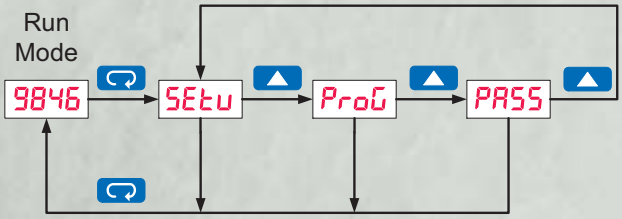
- **Two relays option**
- **Latching or non-latching**
- **Pump alternation control**
- **On & off time delays**
- **Fail-safe operation**
- **24 VDC @ 200 mA transmitter supply option**

User Friendly Menu Structure

• Two menus: Main & Advanced

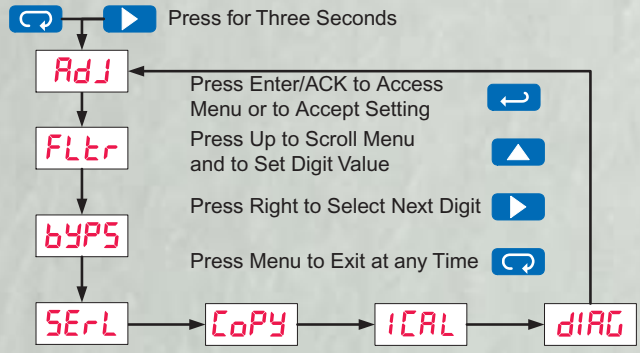
Main Menu

• Most common functions



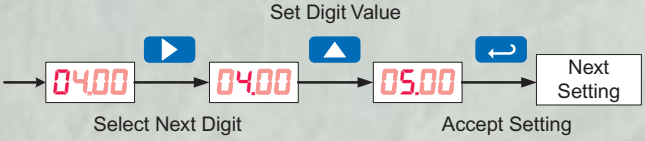
Advanced Features Menu

• Less common functions



Setting Numeric Values

• Right arrow button selects next digit
• Up arrow button increments digit value



Meter Copy (CoPY)

• Copy all settings to another meter — in 5 seconds!
• Standard feature — no serial adapter needed

VirtualMeter on the Web

See how to program Trident at **www.predig.com**

See pages 25-27 for complete specifications

NEMA 4 & NEMA 4X Enclosures

- Plastic, steel and stainless steel
- Up to six meters per enclosure
- 2″ pipe mounting brackets available
- Custom engraved labels

Low-Cost Plastic NEMA 4X

Plastic NEMA 4X

Stainless Steel NEMA 4X

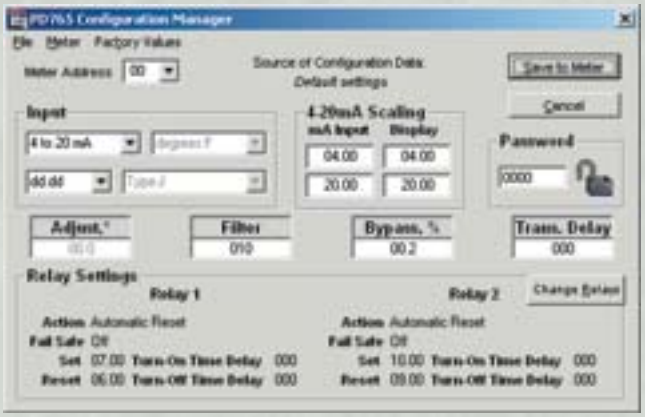
Steel NEMA 4

MeterView Software

- Program Trident from a computer and collect data

Remote Programming

- Program meter from a computer
- Save to file for reporting or programming other meters



Data Acquisition

- Collect data and write to file
- Select logging interval & engineering units

See page 44 for complete specifications

c UL us
LISTED
(Select Models)

ALL 1/8 DIN METERS

- Process, TC, RTD, AC & DC volts, strain gauge
- Type 4X, NEMA 4X front
- 2 or 4 relays + 4-20 mA output options
- 4½ digits
- 115 or 230 VAC & 24 VDC power
- 0.56˝ red or green display available

Process

- Field selectable 4-20 mA, 0-5 V, or 0-10 V
- 24 V transmitter power supply standard
- 11-point linearization
- Square root extraction

➤ Model PD690

One Button Does It All

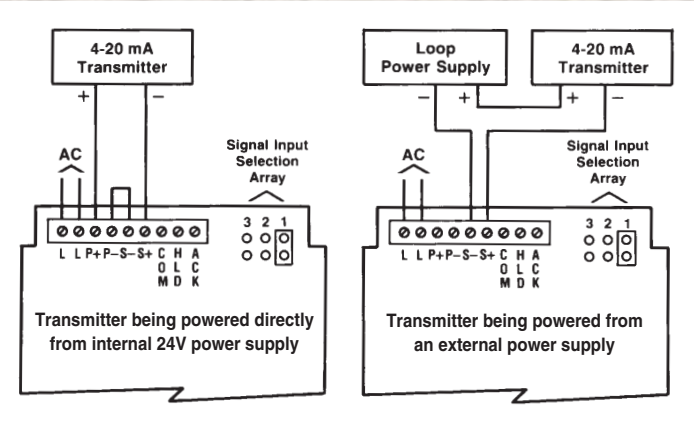
Scale the meter without applying an input

Program up to 4 alarms with 100% deadband

Program the isolated 4-20 mA output

Powers the Loop

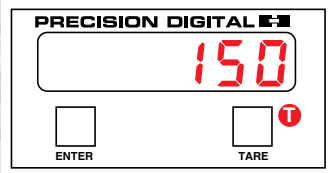
The 24 volt transmitter power supply is standard on most line-powered meters. This feature saves time and money by simplifying wiring and eliminating the cost of an external transmitter power supply.



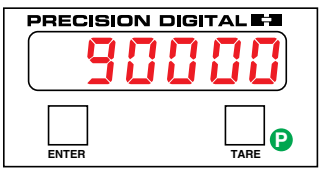
Strain Gauge

- Field selectable 0-30 mV, 0-200 mV, +/- 15 mV, +/- 100 mV inputs
- 5,10, or 24 VDC field selectable excitation
- Peak hold feature
- Capture or programmable tare function

➤ Model PD691



PD691
indicating a tared value



PD691
indicating a peak value

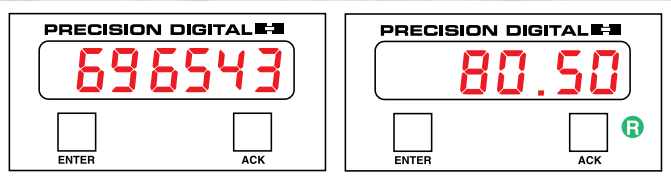
See pages 28-33 for complete specifications

1/8 DIN Digital Panel Meters

c UL us
LISTED
(Select Models)

Flow Rate/Totalizer/Batch Controller

- 4½ digit + extra zero display for rate
- 6 digit display for total
- Alternating rate/total display
- Any relay for rate or total
- Time base in seconds, minutes, hours, or days
- Easy batch setting



Meter displaying total flow

Meter displaying flow rate

Analog Inputs

- Field selectable 4-20 mA, 0-5 V, or 0-10 V inputs
- 24 V transmitter power supply standard
- 11-point linearization
- Square root extraction
- Programmable root function for weirs and flumes
- Pump alternation function

➤ Model PD692

Pulse Inputs

- Field selectable pulse, open collector, TTL, or square wave inputs
- 12 VDC @ 50 mA or 24 VDC @ 20 mA excitation
- Gate function for rate display of slow pulse rates
- K-Factor, internal or external calibration
- 4-20 mA output option converts the pulse input to an isolated 4-20 mA output

➤ Model PD693

DC Volts

- 0-200 VDC input
- 4½ digit + extra zero
- Steady, accurate display to 199,990

➤ Model PD694

AC Volts

- From 50 mV to 250 VAC inputs
- True RMS indication for greater accuracy
- Field selectable noise filtering
- Peak hold feature
- Steady, Accurate display to 299,990

➤ Model PD695

Temperature

- Field selectable TC & RTD inputs (PD750)
- J,K,T,E,R, & S TCs (PD750)
- 100 Ω platinum RTD (PD750)
- 10 Ω copper RTD (PD751)
- 120 Ω nickel RTD (PD752)
- Scan multiple inputs with the PD118 MINIMUX®

Shown here with optional green display

Set Up with One Button

Select J,K,T,E,R,S TC or 100 Ω platinum RTD

Select F or C

See pages 28-33 for complete specifications

3½ Digit

FM APPROVED

- 1 volt drop
- 0.5″ high LCD
- Easy two step non-interactive calibration
- Extra digit for display to 1999(0)
- Operating temp range: -40 to 70°C
- NEMA 4X faceplate option

➤ Model PD680 General purpose
➤ Model PD682 FM approved

4½ Digit

- 5.2 volt drop
- 0.4″ high LCD
- NEMA 4X front panel
- Full 4½ digit display to 19,999
- Operating temp range: -20 to 65°C
- High-alarm open collector output option

➤ Model PD673 Linear input
➤ Model PD674 Square root input

6 Digit Loop-Powered Rate/Totalizer

- 5.6 volt drop (7.0 V with backlighting)
- 0.5″ high LCD
- NEMA 4X front panel
- Rate: 4½ digits; Total: 6 digits
- Operating temp range: 0 to 65°C
- Linear or square root input
- Non-volatile memory — no battery needed
- Isolated open collector pulse output

➤ Model PD696

See pages 34-38 for complete specifications

HAZARDOUS AREA APPROVAL EXPLANATIONS

INTRINSIC SAFETY: This method of protection limits the energy passing into the hazardous area. The energy limitation is provided by the use of safety barriers which are mounted in the safe area. Because of the energy limitation, regardless of the fault in the hazardous area, sufficient energy cannot be released to ignite the explosive atmosphere.

Approval Methods: There are two methods used by approval authorities to assure an intrinsically safe system:
System Approval: The system approval method is one in which specific field devices are examined in combination with specific barriers. No other field device or barriers may be substituted unless specifically examined by the approval authority.
Entity Approval: The entity approval method is one in which each piece of equipment is evaluated separately and assigned a set of safety parameters. The field device may then be connected to a barrier with compatible safety parameters.
NON-INCENDIVE: A device may be installed in Division 2 locations if it has been approved as non-incendive. Non-incendive equipment is incapable of releasing sufficient electrical or thermal energy to ignite flammable gases or vapors under "NORMAL" operation and environmental conditions. Non-incendive devices need no special enclosure or other physical safeguard.
EXPLOSION-PROOF: This is the most popular method of protection. When an explosive gas enters an enclosure containing electrical equipment an explosion could occur. With the enclosure properly installed, and the tight tolerance between the enclosure and the cover, the flame will cool sufficiently by the time it reaches the outside atmosphere.

NEMA 4X Loop-Powered Meters

3½ Digit

- 1 volt drop
- 1.0″ high LCD display
- Display to 1,999
- Temp range: -40 to 85°C
- IS and Non-incendive

➤ Model PD686

3½ Digit (Low Cost)

- 1.5 volt drop
- 0.5″ high LCD
- Temp range: -40 to 80°C

➤ Model PD660

FM APPROVED

CSA

ACTUAL SIZE

Panel Mount and Pipe Mount Kits Available

6 Digit Loop-Powered Rate/Totalizer

- 5.6 volt drop (7.0 V with backlighting)
- 0.5″ high LCD display
- Rate: 4½ digits; Total: 6 digits
- Operating temp range: 0 to 65°C
- Linear or square root input
- Non-volatile memory—no battery needed
- Isolated open collector pulse output

➤ Model PD697

4½ Digit

- 5.2 volt drop
- 0.7″ high LCD display
- Operating temp range: -20 to 65°C
- High-alarm open collector output option
- Non-incendive

➤ Model PD675 Linear input
➤ Model PD676 Square root input

FM APPROVED

CSA

See pages 34-38 for complete specifications

Explosion-Proof Loop-Powered Meters

Available with these approvals

APPROVED

as complete products

3½ Digit (Low Cost)

- 1.5 volt drop (3.3 V with backlighting)
- 0.5″ high LCD display
- Operating temp range: -40 to 80°C

➤ Model PD661

4½ Digit

- 5.2 volt drop
- 0.7″ high LCD display
- Operating temp range: -20 to 65°C
- High-alarm open collector output option

➤ Model PD677 Linear input
➤ Model PD678 Square root input

6 Digit Loop-Powered Rate/Totalizer

- 5.6 volt drop (7.0 V with backlighting)
- 0.5″ high LCD display
- Rate: 4½ digits; Total: 6 digits
- Operating temp range: 0 to 65°C
- Linear or square root input
- Non-volatile memory — no battery needed
- Isolated open collector pulse output
- Program with a magnet

➤ Model PD698

Pipe Mount Kits Available

See pages 34-38 for complete specifications

ACTUAL SIZE

Available with these approvals

APPROVED

as complete product

3½ Digit

- 1 volt drop
- 1.0″ high LCD display
- Operating temp range: -40 to 80°C

➤ Model PD687

Pipe Mount Kits Available

See pages 34-38 for complete specifications

MINIMUX® 8 Channel Scanner

- TC, RTDs, process, AC & DC inputs
- Internally or externally controlled scanning
- Unlimited number of units per system
- Adjustable dwell time for each channel
- Independent alarm input for each channel
- Alarms indicated by LEDs, built-in horn, & relay
- Stop-on-alarmed channel (field select)
- FREE custom printed message labels

➤ Model PD118 MINIMUX®

- Eight inputs
- Free message labels
- Red, green, or yellow field installable LEDs
- Built-in horn

PLC Annunciator

- Powered from PLC
- Accepts common high or common low inputs
  - Logic level
  - Normally open switches
  - Open collector transistor
- FM & CSA option available

➤ Model PD128

AC/DC Input Annunciator

- 90 to 250 VAC/VDC inputs

➤ Model PD148

c UL us LISTED

VIGILANTE® 4 Point Annunciator

- Inputs
  - NO or NC switches
  - Open collector transistor
  - Logic level
- VIGILANTE® powers the switch
- Field selectable logic:
  - ISA sequence A
  - ISA sequence F2A (first-out)
- FREE laser-printed message labels
- NEMA 4X front panel
- Built-in horn
- 1 SPDT relay
- Front panel LED alarm and power indication
- First-out LED indication
- 115 VAC, 230 VAC, or 24 VDC power

➤ Model PD141AFO VIGILANTE®

Operation

ISA Sequence F2A (First-out):
Momentary alarm

Condition	LED		Horn
	1st Pt	Next Pt	
Normal	Off	Off	Off
Alert	Flash	Steady	On
Normal	Flash	Steady	On
Acknowledge	Off	Off	Off

Maintained alarm

Condition	LED		Horn
	1st Pt	Next Pt	
Normal	Off	Off	Off
Alert	Flash	Steady	On
Acknowledge	Steady	Steady	Off
Normal	Off	Off	Off

ISA Sequence A:
Momentary alarm

Condition	LED	Horn
Normal	Off	Off
Alert	Flash	On
Normal	Flash	On
Acknowledge	Off	Off

Maintained alarm

Condition	LED	Horn
Normal	Off	Off
Alert	Flash	On
Acknowledge	Steady	Off
Normal	Off	Off

See pages 39-43 for complete specifications

Table of Contents

Warranty & Extended Warranty

Precision Digital Corporation (PDC) warrants its products to be free from material or workmanship defects, when operated within published specifications, for a minimum of one year. Trident Series Meters come with a standard two year minimum warranty.

An additional year of Product Warranty is available, for PDC manufactured products, **at no added cost**, to any customer who completes a Product Registration Form within three months from the date of purchase. Product Registration Forms can be found on the PDC website at **www.predig.com.**

Product Returns

In order to ensure the best service, PDC products being returned for repair or credit must be preapproved by Technical Support. Please contact Precision Digital Technical Support at (800) 610-5239 or email at **support@predig.com** prior to any product return. If appropriate, a Return Material Authorization (RMA) number will be issued. All authorized returns are to be shipped freight prepaid. If it is determined that a product warranty action is appropriate (note: we have found most start-up problems to be the result of incorrect signal connections and/or programming errors), Precision Digital will repair or replace the instrument at no charge and return it via UPS ground. Other shipping options are available upon request for an additional charge.

Ship authorized product returns to:

PRECISION DIGITAL CORPORATION
19 Strathmore Road
Natick, MA 01760
USA

Please be sure to include the RMA number on the outside of the returned product package.

Please note: In many applications, instruments are exposed to hazardous materials.

- OSHA mandates that our employees be informed and protected from hazardous materials.
- Materials Safety Data Sheets (MSDS) listing the hazardous materials that our instrument(s) have been exposed to, **must** accompany any returned product.
- It is the customer's/end-user's responsibility to fully disclose exposure to all hazardous materials and decontaminate the instrument prior to return.

Restocking Policy

Precision Digital Corporation will accept products for return that meet the following conditions:

1. Products must be on the current price list and be of current design.
2. Products must be unused and in their original packaging.
3. Products must be in saleable condition as determined by Precision Digital Corporation.
4. Products must be returned freight prepaid.
5. Products must be standard stock items.

Please note: Non-standard, custom, or specially-modified products will not be accepted for return.

PDC Products returned for reasons other than repair may be subject to a restocking fee.

- The minimum restocking fee is $25 per unit.
- The amount of credit allowed for returned unused product will depend upon their age.
- A credit of 85% will be issued for product up to 60 days old.
- A credit of 50% will be issued for product up to 180 days old.
- No credit will be issued for product over 180 days old.

SPECIFICATIONS

Except where noted all specifications apply to operation at +25°C.

PD650 & PD757 NEMA 4X 2.3" Red LED

DISPLAY: 2.3∈ (58mm) red LED, 4½ digit, F or C can be selected on PD757 to indicate Fahrenheit or Celsius.
ENCLOSURE: Die-cast aluminum, NEMA 4X, IP 66/IP 67. Corrosion resistant, copper content under 0.1%, color: gray (RAL 7001) polyester powder paint. Four holes for ½∈ conduit provided at base, 3 plugs provided.
MOUNTING: Enclosure contains four ¼∈ (6.4 mm) holes for wall-mounting. Panel Mounting Kit available.
OVERALL DIMENSIONS: 4.9∈ x 14.3∈ x 3.2∈ (125 x 362 x 81 mm).
WEIGHT: 7.0 lbs (3.2 kg).

PD655 & PD755 NEMA 4X 1.0" Red LED

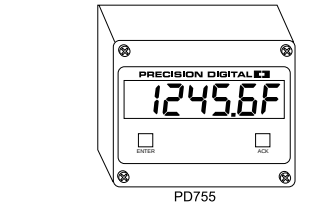
DISPLAY: 1.0∈ (25.4mm) red LED, 4½ digit, F or C can be selected on PD755 to indicate Fahrenheit or Celsius.
ENCLOSURE: Impact-resistant glass-filled polycarbonate, NEMA 4X, IP 67 (IEC 529), color: gray (RAL 7035). Two holes for ½∈ conduit provided at base.
MOUNTING: Enclosure contains four holes for wall-mounting. Panel Mounting and 2∈ Pipe Mounting Kits available.
OVERALL DIMENSIONS: 6.7∈ x 5.5∈ x 3.7∈ (170 x 140 x 95 mm).
WEIGHT: 3.8 lbs (1.73 kg).

PD656 & PD756 Explosion-Proof 0.8" Red LED

DISPLAY: 0.8∈ (20.3mm) red LED, 4½ digit, F or C can be selected on PD756 to indicate Fahrenheit or Celsius.
ENCLOSURE: Explosion-proof sand-cast aluminum, 0.3% max. copper content, NEMA 3, 4, 7, 9, IP 66. For use in hazardous locations Class I Groups C & D, Class II Groups E, F & G; UL Classified, Class I, Zone 1. Two ¾∈ NPT holes provided at opposite sides. Up to four holes can be provided for an additional charge.
MOUNTING: Enclosure contains four 7/16∈ (11.1 mm) holes for wall-mounting. 2∈ Pipe Mounting Kit available.
OVERALL DIMENSIONS: 8.0∈ x 8.0∈ x 5.7∈ (203 x 203 x 145 mm).
WEIGHT: 14.6 lbs (6.6 kg).

General

ALARM POINTS: Four, any combination of high or low alarms.
ALARM POINT DEADBAND: 0-100% of full scale, user selectable.
ALARM STATUS INDICATION: Front panel LED.
EXTERNAL PROGRAMMING: The Enter-button functions can be controlled externally by wiring a switch across terminals EN and CM.
NON-VOLATILE MEMORY: All programming values are stored in non-volatile memory for a minimum of ten years if power is lost.
NORMAL MODE REJECTION: 64 dB at 50/60 Hz.
POWER: AC Power: 115 or 230 VAC (field select) ±10%, 50/60 Hz, 12 VA. DC Power: 22-28 VDC; 12 watts maximum.
CONNECTIONS: Removable screw terminal blocks, accepts 22 to 12 AWG wire.



PD755

PD757

PD756

Temperature Meters

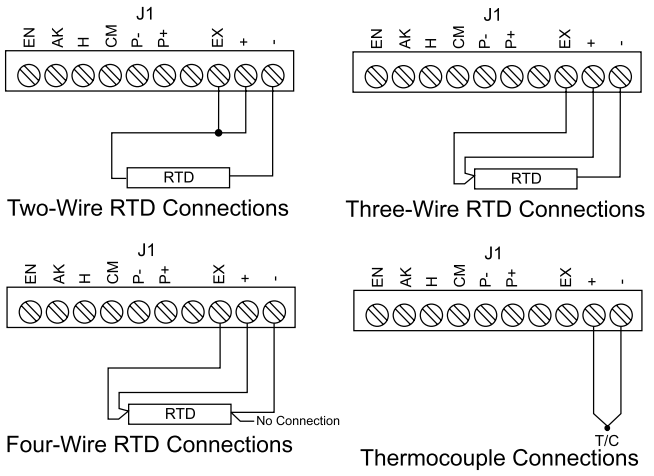
INPUTS: Field selectable: Type J,K,T,E,R, or S thermocouples with 1° resolution; type T to 0.1°; 100 Ý platinum RTD (0.00385 or 0.00392 curve) to 1° or 0.1° resolution.
COLD JUNCTION REFERENCE: Automatic, fixed, no user calibration needed.
INPUT OFFSET: Programmable to ±100% FS display. This parameter allows the user to apply an offset value to the input temperature being displayed.
SENSOR BREAK DETECTION: Open sensor circuit indicated by display flashing OPEn. All relays and alarm status LEDs go to alarm state.
MAX/MIN READINGS: Meter stores maximum and minimum readings until reset by user or power is turned off.
INPUT IMPEDANCE: Greater than 100 kÝ.
LOCKOUT: Jumper JP2, located on Main PCB, restricts modification of set values.
ENVIRONMENTAL: Operating temperature range: -20 to +65°C. Storage temperature range: -40 to +85°C. Relative humidity: 0 to 90% non-condensing.
For operation down to -40°C, see temperature drift data at **www.predig.com**, PD755-7 Web page.

Precalibrated Ranges

Input Type	Range	Accuracy
Type J T/C	-328° to 1382°F -200° to 750°C	±2°F ±1°C
Type K T/C	-328° to 2498°F -200° to 1330°C	±2°F ±1°C
Type T T/C	-330.0° to 760.0°F -200.0° to 404.0°C	±2°F ±1°C
Type E T/C	-328° to 1832°F -200° to 1000°C	±2°F ±1°C
Type R T/C	32° to 3214°F 0° to 1767°C	±5°F ±3°C
Type S T/C	40° to 1768°F 4° to 1768°C	±6°F ±3°C
100 Ý RTD	-328.0° to 1382.0°F -200.0° to 750.0°C	±0.7°F ±0.4°C

See page 23 for ordering information
See page 24 for mounting dimensions
See pages 6-9 for photographs

Temperature Signal Connections



Process Meters

INPUTS: Field selectable: 4-20 mA, 0-20 mA, 0-5 V, 1-5 V, 0-10 V
DISPLAY: 6 Digit red LED, -19,999(0) to 29,999(0) with selectable extra zero. Total: 0 to 999,999.
DECIMAL POINT: Process/rate: 2.9999, 29.999, 299.99, 2999.9 or 299990. Total: 9.99999, 99.9999, 999.999, 9999.99, 99999.9. Rate and total decimal points are independent.
CALIBRATION RANGE: 4 mA (1 V) input may be set anywhere in range of the meter. 20 mA (5 V) may be set anywhere in range of the meter above or below 4 mA input. An Error message will appear if Input 1 signal and Input 2 signal are too close together.

Input Range	**Minimum Difference Between Input 1 & Input 2**
0-5 V	0.16 V
0-10 V	0.32 V
4-20 mA	1.60 mA

INPUT IMPEDANCE: Voltage ranges, greater than 300 kÝ; current ranges, 100 Ý
LOOP POWER: Two isolated power supplies, 24 VDC ± 5% @ 20 mA each, regulated. Maximum loop resistance is 1200 Ý
OPTIONAL POWER SUPPLY: 18 VDC (nominal) @ 200 mA (maximum) unregulated power supply can be provided instead of the two 24 VDC supplies.
LINEAR INPUT ACCURACY: ±0.05% of calibrated span, ±1 count.
ROOT EXTRACTION ACCURACY: ±0.1% F.S. ± 2 counts.
PROGRAMMABLE EXPONENT: From 1.0001 to 2.9999.
11-POINT LINEARIZATION:

Input Range	**Minimum Span Between Inputs**
4-20 mA	(1.6 mA / (Number of points -1))
0-5 V	(0.16 V / (Number of points -1))
0-10 V	(0.32 V / (Number of points -1))

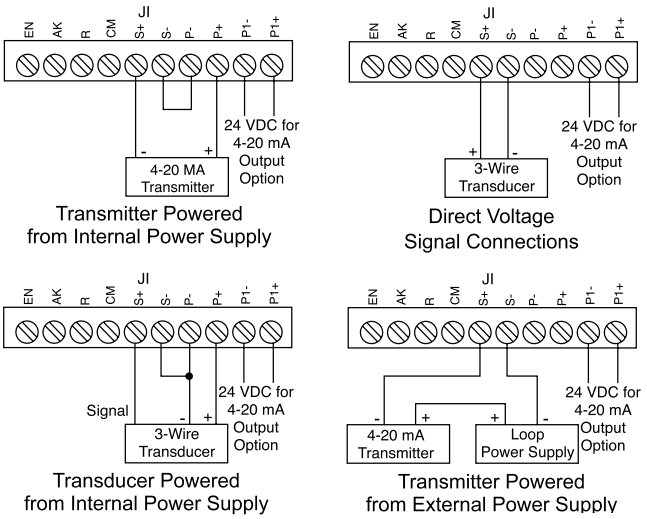
e.g. Minimum span for an 11-point, 4-20 mA calibration is 0.16 mA between inputs.
PEAK HOLD (DISPLAY PEAK): Captures the peak process/rate and displays it via the front panel **ENTER** button (dSPY P).
PEAK HOLD INDICATION: Front panel flashing "R" LED.
LOCKOUT: Jumper JP1 labeled "LOCK" restricts modification of calibration values.
ENVIRONMENTAL: Operating temperature range: -20 to +65°C. Storage temperature range: -40 to +85°C. Relative humidity: 0 to 90% non-condensing.

Rate/Totalizer/Batch Controller Features

RATE DISPLAY INDICATION: LED labeled "R" in lower right illuminates when meter is displaying rate, (or process input).
LOW- FLOW CUTOFF: Any input below the low-flow cutoff value will result in a display of zero. May be set from 1 count to 100% F.S., user selectable. To disable low-flow cutoff, program cutoff value to zero. Totalizer is based on rate display. So, inputs below the low-flow cutoff value will not affect the totalizer.
ALTERNATING DISPLAY: Display may be programmed to alternate between rate and total every 10 seconds.
TIME BASE: Second, minute, hour, or day
TOTAL DISPLAY: 0 to 999,999, automatic lead zero blanking.
TOTAL DECIMAL POINT: May be set in any of the following positions: 9.99999, 99.9999, 999.999, 9999.99, 99999.9. Total decimal point is independent of process/rate decimal point.
TOTAL CONVERSION FACTOR: Programmable from 0.00001 to 59999
TOTALIZER: Calculates total based on rate and field programmable multiplier to display total in any engineering unit.
TOTALIZER ROLLOVER: Totalizer "rolls over" when display exceeds 999,999. Relay status reflects display.
TOTALIZER PRESETS: Up to four, user selectable under Setup. Any set point can be assigned to total and may be programmed anywhere in the range of the meter. Relays assigned to total trip when total reaches the preset value and reset when total is reset to zero or when acknowledged manually. Can be programmed so when the highest preset value is reached the total automatically resets to zero.
PRESET OFFSET: Relays that are assigned to total can be programmed to trip at any point below the next relay's preset value. If preset offset mode is selected the corresponding relay will always trip at a programmed offset value before the next relay trips. Example: Set Point 1 and 2 are setup for total, with Offset selected (under Set Point 2). If the preset offset is set at 10, (during Set Points programming for Set Point 1), then relay 1 will trip 10 counts before relay 2.
PROGRAMMABLE DELAY ON RELEASE: If the meter is programmed to reset total to zero automatically when the highest preset is reached, then a delay will occur before the total relays reset. This delay can be programmed anywhere between 1 and 999 seconds
PRIORITY BATCH PROGRAMMING: This feature allows the user to quickly change preset values without going into the main menu by holding the ENTER button for more than 3 seconds.
TOTAL RESET: Via front panel ENTER button, external contact closure, or automatically via user selectable preset value.
TOTAL RESET LOCKOUT: Meter may be programmed so Total can not be reset from front panel.

Process Signal Connections

The PD650, PD655, and PD656 are ideal for loops that consist of a transmitter, a digital meter and a DCS or computer because they can provide isolated power to drive both the input and output loops.



Relay Options

RATING: 2 or 4 SPDT (form C); rated 2 A @ 30 VDC or 2 A @ 250 VAC resistive load; 1/14 HP @ 125 / 250 VAC for inductive loads. Built-in suppression.

ASSIGN TO PROCESS/RATE OR TOTAL: Any relay may be assigned to process/rate or total (process/rate meters).

BUILT-IN SUPPRESSION: Each relay contact is protected by a built-in suppressor (snubber) to prolong the life of the relays and provide a degree of protection against electrical noise caused by inductive loads.

Suppressors value, .01 µF/470 Ý, 250 VAC.

DEADBAND: 0-100% of full scale, user selectable.

HIGH OR LOW ALARM: User may program any alarm for a high or low trip point.

RELAY OPERATION: Latching or non-latching.

FAIL-SAFE OPERATION: Relay coils are energized in non-alarm condition. In case of power failure, relays will go to alarm state. Fail-safe operation may be disabled, by removing jumper J5 located on the Options PCB.

AUTO INITIALIZATION: When power is applied, relays assigned to total will reflect the state of the accumulated Total value in memory. Relays assigned to process/rate or temperature will reflect the state of the input to the meter.

TOTAL RELAYS RESET (process/rate meters)**:**

1. When total is reset to zero, if setup for external total reset.
2. After delay has elapsed, if setup for internal total reset.
3. Manual any time, if setup for external total reset. Manual reset resets all manually resetable relays.

PROCESS/RATE & TEMPERATURE RELAYS RESET: Relays assigned to process/rate or temperature may be programmed to reset in any of the following ways:

1. Automatic reset when the input passes the reset point.
2. Manual reset at any time (via user supplied external con tact closure at terminals AK and CM or front panel ACK button.) Manual reset resets all manually resetable relays.
3. Automatic plus manual reset at any time. Relays will auto matically reset when input passes the reset point. Relays can also be manually reset at any time (via user supplied external contact closure at terminals AK and CM or front panel ACK button.) Manual reset resets all manually resetable relays.
4. Manual reset only after alarm condition corrected. Relays can be manually reset only after alarm condition has been corrected (via user supplied external contact closure at terminals AK and CM or front panel ACK button.) Manual reset resets all manually resetable relays.

4-20 mA Transmitter Output Option

CALIBRATION RANGE: Anywhere in range of meter, 501 counts minimum span for process/rate meter.

EQUIPMENT NEEDED: The 4-20 mA output is calibrated without the use of a calibrator.

OUTPUT LOOP-POWER: 24 VDC ± 5% @ 20 mA, regulated. Maximum loop resistance is 1200 Ý. Isolated from input loop-power.

ACCURACY: ± 0.1% F.S., ± 0.004 mA.

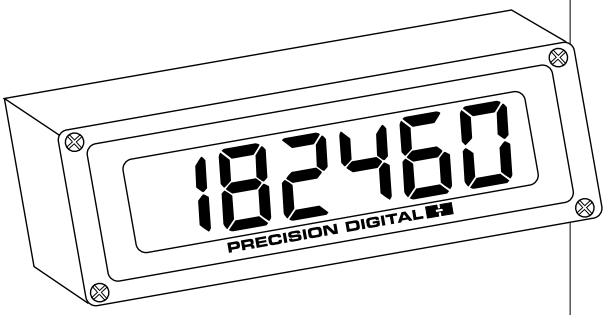
ISOLATION: 500 VDC or peak AC, input-to-output or input/output-to-power line.

EXTERNAL LOOP-POWER SUPPLY: 35 VDC maximum

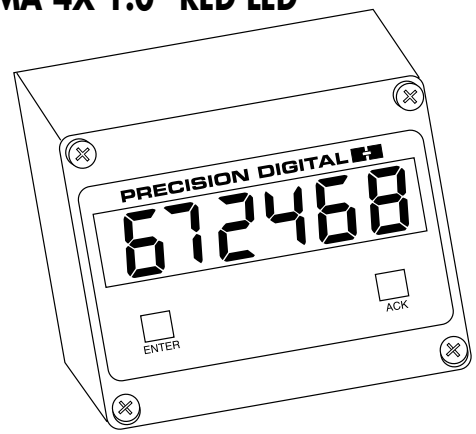
OUTPUT LOOP RESISTANCE:

	Loop Resistance	
Power supply	**minimum**	**maximum**
24 VDC	10 Ý	600 Ý
35 VDC (external)	600 Ý	1000 Ý

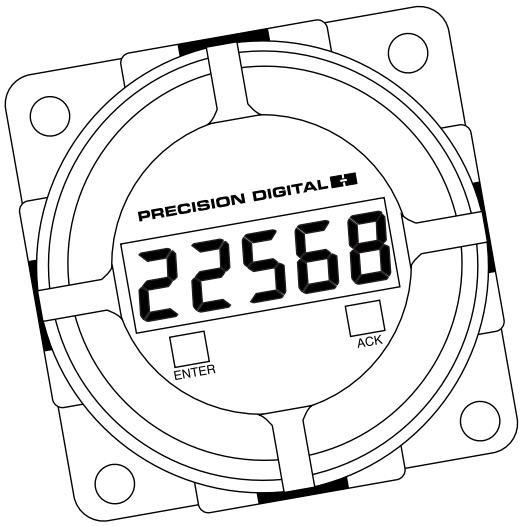
NEMA 4X 2.3" RED LED



NEMA 4X 1.0" RED LED



EXPLOSION-PROOF 0.8" RED LED



ORDERING INFORMATION				
	115/230 VAC Model	24 VDC Model	Description	Option Card*
PROCESS	PD650-N	PD650-2-N	No Options	
	PD650-34	PD650-2-34	2 Relays	PD374
	PD650-35	PD650-2-35	4-20 mA Output	PD375
	PD650-36	PD650-2-36	2 Relays + 4-20 mA Output	PD376
	PD650-37	PD650-2-37	4 Relays	PD377
	PD650-38	PD650-2-38	4 Relays + 4-20 mA Output	PD378
TEMPERATURE	PD757-N	PD757-2-N	No Options	
	PD757-34	PD757-2-34	2 Relays	PD374
	PD757-35	PD757-2-35	4-20 mA Output	PD375
	PD757-36	PD757-2-36	2 Relays + 4-20 mA Output	PD376
	PD757-37	PD757-2-37	4 Relays	PD377
	PD757-38	PD757-2-38	4 Relays + 4-20 mA Output	PD378

See page 49 for PDA6504 Panel Mounting Kit

PROCESS	PD655-N	PD655-2-N	No Options	
	PD655-44	PD655-2-44	2 Relays	PD474
	PD655-45	PD655-2-45	4-20 mA Output	PD475
	PD655-46	PD655-2-46	2 Relays + 4-20 mA Output	PD476
	PD655-47	PD655-2-47	4 Relays	PD477
	PD655-48	PD655-2-48	4 Relays + 4-20 mA Output	PD478
TEMPERATURE	PD755-N	PD755-2-N	No Options	
	PD755-44	PD755-2-44	2 Relays	PD474
	PD755-45	PD755-2-45	4-20 mA Output	PD475
	PD755-46	PD755-2-46	2 Relays + 4-20 mA Output	PD476
	PD755-47	PD755-2-47	4 Relays	PD477
	PD755-48	PD755-2-48	4 Relays + 4-20 mA Output	PD478

See pages 48-49 for Mounting Kits

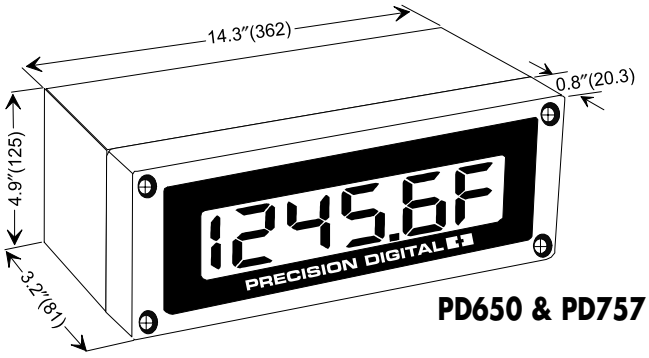
PROCESS	PD656-N	PD656-2-N	No Options	
	PD656-44	PD656-2-44	2 Relays	PD474
	PD656-45	PD656-2-45	4-20 mA Output	PD475
	PD656-46	PD656-2-46	2 Relays + 4-20 mA Output	PD476
	PD656-47	PD656-2-47	4 Relays	PD477
	PD656-48	PD656-2-48	4 Relays + 4-20 mA Output	PD478
TEMPERATURE	PD756-N	PD756-2-N	No Options	
	PD756-44	PD756-2-44	2 Relays	PD474
	PD756-45	PD756-2-45	4-20 mA Output	PD475
	PD756-46	PD756-2-46	2 Relays + 4-20 mA Output	PD476
	PD756-47	PD756-2-47	4 Relays	PD477
	PD756-48	PD756-2-48	4 Relays + 4-20 mA Output	PD478

Model	Description
PDA-MAG	Magnet Assembly for PD656 & PD756

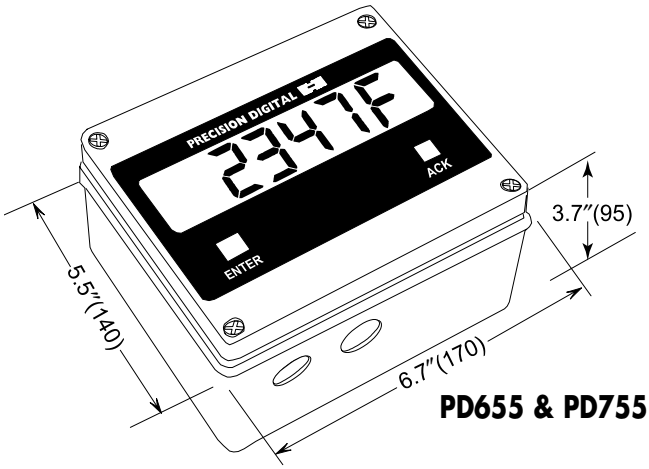
See pages 47-48 for Explosion-Proof Control Stations and Mounting Kits

*Part numbers for Option Cards when purchased separately

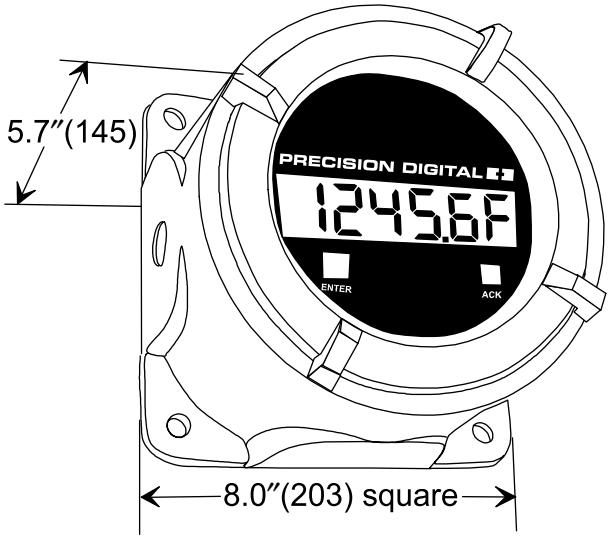
OVERALL DIMENSIONS



PD650 & PD757



PD655 & PD755



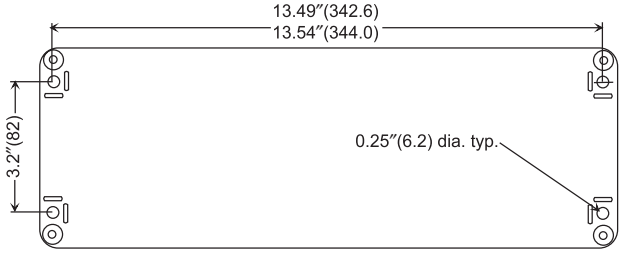
PD656 & PD756

NOTE: Millimeter dimensions ( ) are for reference only.

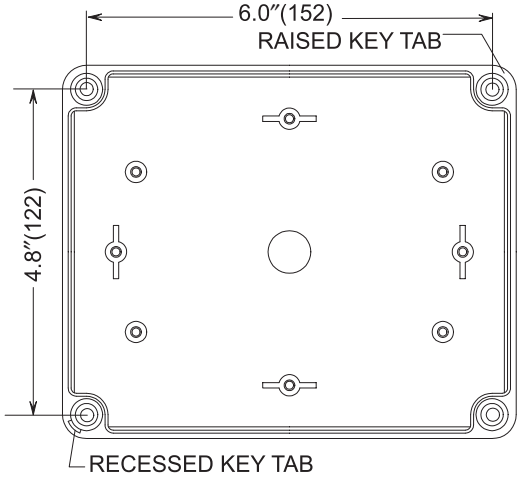
WALL MOUNTING

There are four mounting holes on the rear of the enclosure that are used to mount the instrument to a wall.

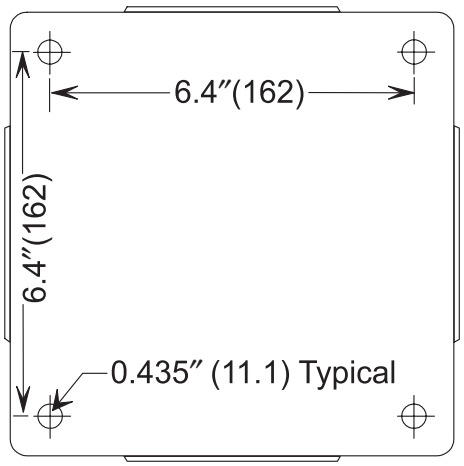
PD650 & PD757 Wall Mounting



PD655 & PD755 Wall Mounting



PD656 & PD756 Wall Mounting



Designed for vertical or horizontal conduit entry

SPECIFICATIONS

Except where noted all specifications apply to operation at +25°C.

General

DISPLAY: 0.56∈(14.2 mm) red LED. Four digits (-1999 to 9999)
FRONT PANEL: NEMA 4X, IP65. Panel gasket provided.
PROGRAMMING METHODS: Four front panel push buttons, PC and MeterView software, or cloning with Copy feature.
NOISE FILTER: Programmable between 2 and 199 (0 will disable filter).
DISPLAY UPDATE RATE: Process/RTD: 3.7-5/sec; T/C: 1.8-2.5/sec
OVERRANGE: Display flashes 9999
UNDERRANGE: Display flashes -1999
RECALIBRATION: All inputs are calibrated at the factory.
MAX/MIN DISPLAY: Stored until reset by user or meter is turned off.
NON-VOLATILE MEMORY: All programmed settings are stored in non-volatile memory for a minimum of ten years if power is lost.
POWER: AC: 85 - 265 VAC, 50/60 Hz, 20 VA; DC: 90-265 VDC, 20 W.
Option: 12-36 VDC or 12-24 VAC
FUSE: Recommended external fuse: 1 A, 250 V slow blow
NORMAL MODE REJECTION: 64 dB at 50/60 Hz
ISOLATION: 4 kV
ENVIRONMENTAL: Operating temperature range: 0 to +65°C
Storage temperature range: -40 to +85°C
Relative humidity: 0 to 90% non-condensing
CONNECTIONS: Power & Signal: removable screw terminal blocks accept 12 to 26 AWG. Serial: RJ11 header, standard on all meters.
ENCLOSURE: 1/8 DIN, high impact plastic, 94V-0, color; gray
WEIGHT: 8 oz (227 g) (no options)
WARRANTY: 2 years parts and labor

Process Inputs

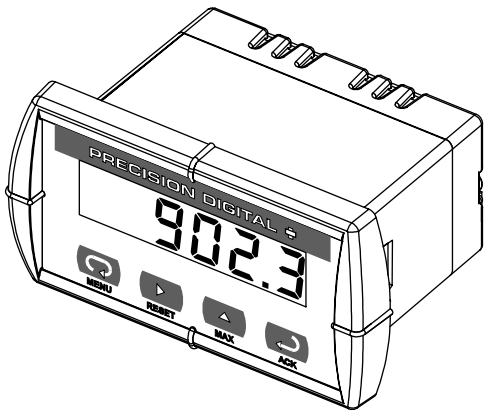
INPUTS: Field selectable: ±20 mA DC and ±10 VDC
ACCURACY: ±0.05% of calibrated span ±1 count
DECIMAL POINT: Up to three decimal places: d.ddd, dd.dd, ddd.d, or dddd
CALIBRATION: Internal or external signal or with PC
CALIBRATION RANGE: User Programmable over entire range of meter
INPUT IMPEDANCE: Voltage range: greater than 1 MÝ
Current range: 50-100 Ý
INPUT OVERLOAD: Protected by automatically resettable fuse
TEMPERATURE DRIFT: ±50 PPM/°C
TRANSMITTER SUPPLY: 24 VDC ±10% @ 200 mA max. (optional).

Temperature Inputs

INPUTS: Factory calibrated, field selectable: type J, K, T, or E thermocouples and 100 Ý platinum RTD (0.00385 or 0.00392 curve)
RESOLUTION: 1°; type T, 1° or 0.1°
COLD JUNCTION REFERENCE: Automatic

Type	Range	Accuracy	Range	Accuracy
J	–58° to 1382°F	±2°F	–50° to 750°C	±1°C
K	–58° to 2300°F	±2°F	–50° to 1260°C	±1°C
T	–292° to 700°F	±2°F	–180° to 371°C	±1°C
E	–58° to 1578°F	±2°F	–50° to 870°C	±1°C
RTD	–328° to 1382°F	±1°F	–200° to 750°C	±1°C

TEMPERATURE DRIFT: ±2°C maximum; 0 to 65°C ambient temperature
OFFSET ADJUSTMENT: Programmable to ±19.9°. This parameter allows the user to apply an offset value to the temperature being displayed.
INPUT IMPEDANCE: Greater than 100 kÝ
SENSOR BREAK: All relays and alarm status LEDs go to alarm state.



Relays

RATING: 2 SPDT (form C); rated 3 A @ 30 VDC or 3 A @ 250 VAC resistive load; 1/14 HP @ 125/250 VAC for inductive loads
DEADBAND: 0-100% of full scale, user selectable
HIGH OR LOW ALARM: User may program any alarm for high or low.
RELAY OPERATION:
1. Automatic (non-latching)
2. Latching
3. Pump alternation control

RELAY RESET: User selectable via front panel buttons or PC
1. Automatic reset only (non-latching)
2. Automatic + manual reset at any time (non-latching)
3. Manual reset only, at any time (latching)
4. Manual reset only after alarm condition has cleared (latching)

Automatic reset: Relays will automatically reset when the input passes the reset point.
Manual reset: Front panel ACK button.
TIME DELAY: 0 to 199 seconds, on and off delays; programmable.
FAIL-SAFE OPERATION: Programmable, independent for each relay.
AUTO INITIALIZATION: When power is applied to the meter, relays will reflect the state of the input to the meter.
FAIL-SAFE OPERATION: relay coils are energized in non-alarm condition. In case of power failure, relays will go to alarm state.

Serial Communication Adapters

COMPATIBILITY: Compatible with EIA-232 or EIA-422 & EIA-485
CONNECTORS: PC compatible 9-pin D subminiature connector (RS-232) or removable 5-pin screw terminal connector (RS-422/485) and RJ11 to meter
DISTANCE: Meter to adapter: 7' (2.1 m), RS-232 adapter to PC: 50' (15 m) maximum, RS-422/485 adapter to PC: 3,937' (1,200 m) maximum.

MeterView Software

REMOTE PROGRAMMING: MeterView software allows all setup parameters to be programmed from a PC and saved to a file for reporting or programming other meters.
DATA ACQUISITION: MeterView software provides a convenient way to collect the data generated by the Trident's serial output. The user can select the logging time interval. Data is written to a file that could then be imported into a spreadsheet or other application.
SYSTEM REQUIREMENTS: Windows® 95/98/ME/2000/XP
BAUD RATE: Fixed 2400 bps
REPORTS: Data logging: log to Comma Separated Values (CSV) or HTML file formats. Configuration: Save configuration in HTML file for printing, cloning, or restoring meter settings.

See page 10 for photographs

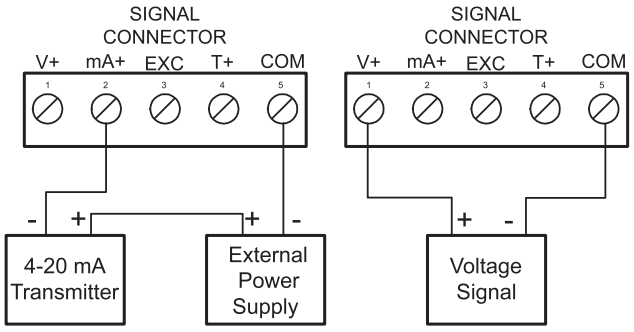
PROCESS & TEMPERATURE INPUTS

The Trident is factory calibrated to accept 4-20 mA, -10 to + 10 VDC, Types J,K,T,E thermocouples and 100 Ý platinum RTDs. Process inputs can be scaled with or without applying an input for virtually any engineering units. Temperature inputs can be programmed to display in degrees Fahrenheit or Celsius and the type K thermocouple can display up to 2300 °F.

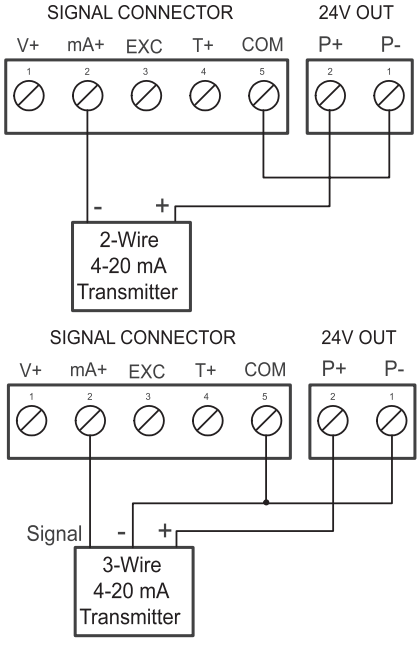
Current and Voltage Inputs

Setting up the meter to accept a current or voltage input could not be easier. All setup is performed through software and there are no switches or jumpers to deal with.

Transmitter Powered by External Supply



Transmitters Powered by Internal Supply (Optional)



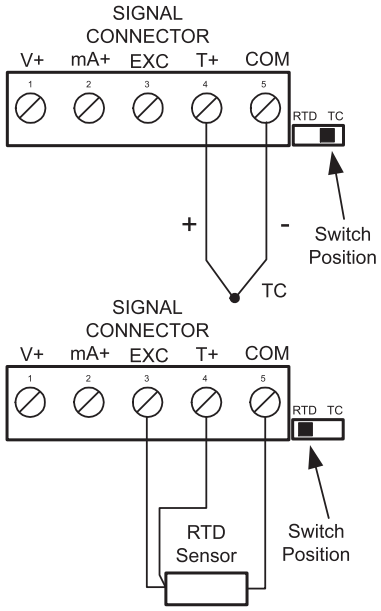
Current Overload Protection

To protect the instrument from unexpected current overload the current input circuit contains a resettable fuse. The fuse limits the current to a safe level when it detects a fault condition, and automatically resets itself when the fault condition is removed.

Thermocouple and RTD inputs

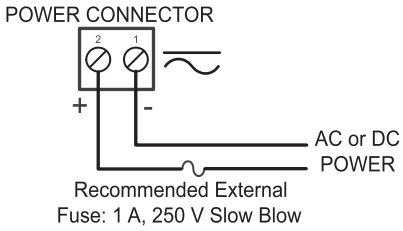
Setting up the Trident to accept a thermocouple or RTD input is simply a matter of setting a switch at the rear of the case and selecting the input type from the menu.

The meter accepts J,K,T, or E type thermocouples as well as two, three, or four-wire 100 Ý platinum RTDs.

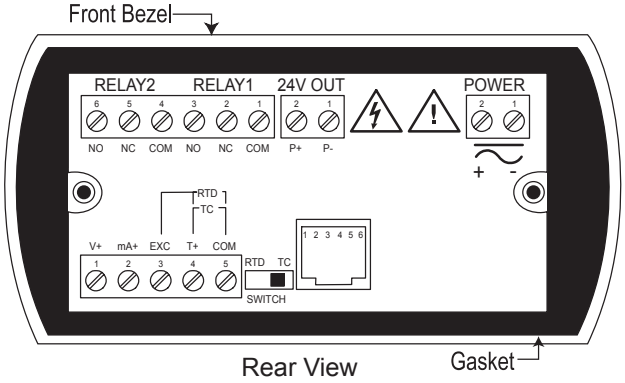


UNIVERSAL POWER SUPPLY

The Trident's universal power supply allows it to be powered from any voltage between 85 and 265 VAC or 90 and 265 VDC – without jumpers! The meter can also be powered from 12-36 VDC or 12-24 VAC as an option.



CONNECTORS LOCATION REPRESENTATION

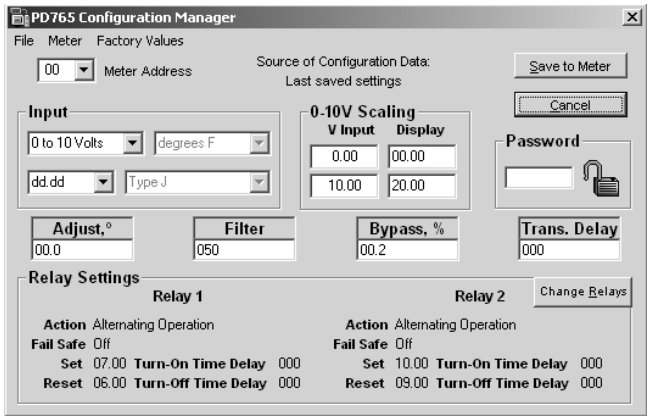


METERVIEW SOFTWARE

Precision Digital's MeterView software allows the Trident to be programmed from a PC and to act as a data logger.

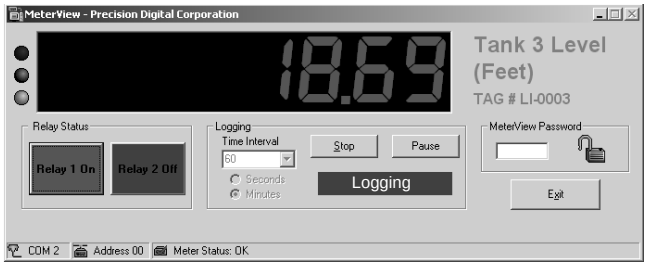
Remote Programming

MeterView software allows all setup parameters to be programmed from a PC and save the configuration settings to a file for reporting or programming other meters.



Data Acquisition

MeterView software provides a convenient way to collect the data generated by the Trident's serial output. The user can select the logging time interval and the engineering units that will be displayed on the computer screen. Data is written to a file that could then be imported into a spreadsheet or other application.



Sample File Generated by MeterView

PD765 Log File

Name: C:/MyDocuments/LogFile.htm **Created:** 2/21/2002 8:40:16 AM
Meter Address :00 **Connection :**2400 Baud on COM 2 **Logging rate:** 1 update every 10 seconds

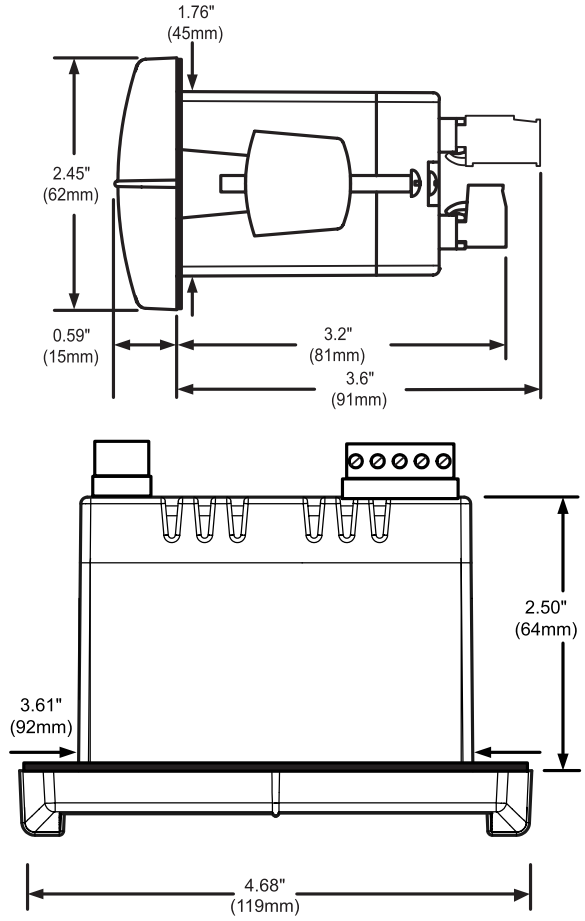
Date & Time	Display	Units	Relay 1	Relay 2
2/21/2002 8:40:26 AM	5:63	Tank 2 Level (Feet)	Pump 1 Off	Pump 2 Off
2/21/2002 8:40:36 AM	7:60	Tank 2 Level (Feet)	Pump 1 On	Pump 2 Off
2/21/2002 8:40:46 AM	5:35	Tank 2 Level(Feet)	Pump 1 Off	Pump 2 Off
2/21/2002 8:40:56 AM	7:22	Tank 2 Level(Feet)	Pump 1 Off	Pump 2 On
2/21/2002 8:41:06 AM	7:67	Tank 2 Level(Feet)	Pump 1 Off	Pump 2 On

ORDERING INFORMATION		
85-265 VAC Model**	**12-36 VDC** Model**	**Description**
PD765-6R0-0*	**PD765-7R0-0**	No Options
PD765-6R0-1*		24 VDC Output Option
PD765-6R2-0*	**PD765-7R2-0**	2 Relays Option
PD765-6R2-1		2 Relays + 24 VDC Output Option

Accessories	
Model	**Description**
PDA7420	Standard Modular Cable, 7∇(2.1 m)
PDA7232	RS-232 Serial Adapter with PDA7420 included
PDA7422	RS-422/485 Serial Adapter with PDA7420 included
PDA7502	MeterView Version 2.0 Software

*Quick Shipment Product, shipped within 2 working days.
**All models may be AC or DC powered, see power specifications for details.

MOUNTING DIMENSIONS



NOTES:

1. Panel cutout required: 1.772∈x 3.622∈(45mm x 92mm)
2. Panel thickness: 0.04∈– 0.25∈(1.0mm – 6.4mm)
3. Mounting brackets lock in place for easy mounting

SPECIFICATIONS

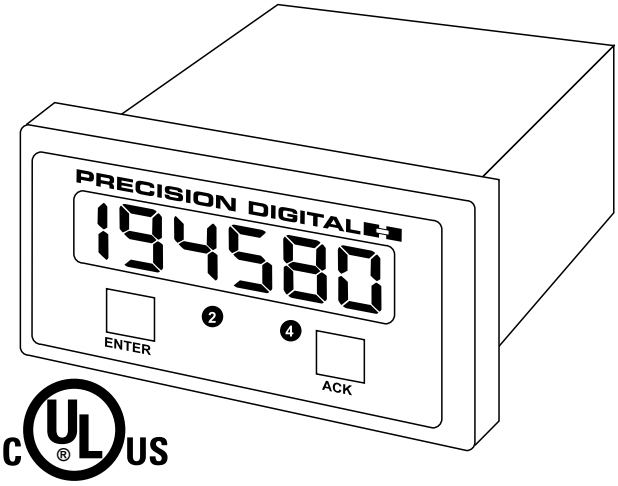
Except where noted all specifications apply to operation at +25°C.

General

INPUTS: Field selectable, 4-20 mA, 0-5 V, 1-5 V, 0-10 V.
DISPLAY: 0.56" (14.2mm) red or green LED. 4½ digits + extra zero; ± 19999(0), (0) may be switched on to display 199,990.
FRONT PANEL: Type 4X, NEMA 4X, panel gasket provided.
CALIBRATION: May be calibrated using internal calibration (i-CAL) or by applying an external calibration signal (E-CAL). To scale inputs such as 0-5 V, 1-5 V, or 0-10 V without applying a signal it is necessary to first complete an Initial Calibration.
CALIBRATION RANGE: 4 mA (1 V) input may be set to display anywhere in range of meter. 20 mA (5 V) may be set anywhere above or below 4 mA input.
NON-VOLATILE MEMORY: All programming values are stored in non-volatile memory for ten years if power is lost.
LOCKOUT: Jumper 3 at rear of instrument restricts modification of calibration values.
LOOP POWER: (AC powered units only) Isolated 24 VDC ± 5% at 20 mA regulated. Maximum loop resistance of 1200 Ý. Available for either signal input or 4-20 mA output option, but not both.
HOLD READING: Connect terminals HLD and COM.
ACCURACY: ± 0.05% of calibrated span ± one count.
INPUT IMPEDANCE: Voltage ranges, greater than 300 KÝ; Current range, 100 Ý.
POWER: AC power: 115 VAC ± 10%, 50/60 Hz, 10 VA.
230 VAC ± 10%, 50/60 Hz, 10 VA.
DC power: 18-36 VDC, 6 watts max.
ISOLATION: AC power: 1500 VAC; DC power: 500 VDC.
NORMAL MODE REJECTION: 64 dB at 50/60 Hz.
ENVIRONMENTAL: Operational ambient temperature range: 0 to 60°C. Storage temperature range: -40 to + 85°C.
Relative humidity: 0 to 90% non-condensing.
ENCLOSURE: 1/8 DIN, high impact plastic, UL 94V-0, color: black.
CONNECTIONS: Removable screw terminal block.
ALARM POINTS: 4, any combination of high or low alarms.
ALARM STATUS INDICATION: Front Panel LED.
ALARM DEADBAND: 0-100%, user selectable.
UL FILE NUMBER: E160849; 508 Industrial Control Equipment

Relays

RATING: 2 or 4 SPDT (form C); rated 2 A @ 30 VDC or 2 A @ 250 VAC resistive load; 1/14 HP @ 125/250 VAC for inductive loads
RESET: User selectable.
1. Automatically when the input passes the reset point.
2. Automatically plus manually (via user supplied switch or front panel ACK button). Manual reset resets all manually resettable relays.
FAIL-SAFE OPERATION: The relay coils are energized in the non-alarm condition. In the case of a power failure, the relays will go to the alarm state, (NC contact is connected to common). Fail-safe operation may be disabled with internal jumper.
AUTO INITIALIZATION: When power is applied to the meter, the relays will always reflect the state of the input to the meter.
DEADBAND: 0-100%, user selectable.



Isolated 4-20 mA Output Signal

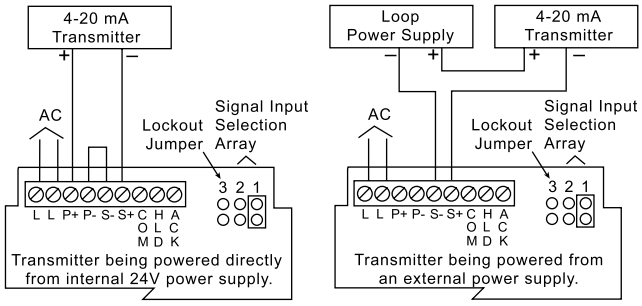
CALIBRATION RANGE: Anywhere in range of meter, 501 count minimum span.
OUTPUT LOOP RESISTANCE:

	Loop Resistance	
Power supply	**minimum**	**maximum**
24 VDC	10 Ý	600 Ý
35 VDC (external)	600 Ý	1000 Ý

ACCURACY: ± 0.1% F.S., ± .004 mA
ISOLATION: 500 VDC or peak AC, input-to-output or input/output-to-power.
EXTERNAL LOOP POWER SUPPLY: 35 V Maximum.

Simplify Loops with PD690 24 V Transmitter Power Supply

The PD690 is ideal for loops that consist of a transmitter and a digital display because the PD690 provides the 24 V to power the transmitter. This standard feature saves time and money by simplifying wiring and eliminating the cost of an external power supply. In addition, the isolated power supply can be used to power 3- and 4-wire transducers with either current or voltage output.



ORDERING INFORMATION				
115 VAC	**230 VAC**	**24 VDC**	**Description**	**Option Card****
PD690-3-N*	**PD690-4-N**	**PD690-2-N**	No Options	
PD690-3-14*	**PD690-4-14**	**PD690-2-14**	2 Relays	**PD174**
PD690-3-15*	**PD690-4-15**	**PD690-2-15**	4-20 mA Output	**PD175**
PD690-3-16*	**PD690-4-16**	**PD690-2-16**	2 Relays + 4-20 mA Output	**PD176**
PD690-3-17*	**PD690-4-17**	**PD690-2-17**	4 Relays	**PD177**
PD690-3-18*	**PD690-4-18**	**PD690-2-18**	4 Relays + 4-20 mA Output	**PD178**

NOTES:
*Quick Shipment Product, shipped within 2 working days.
**Part numbers for Option Cards when purchased separately.
G may be added after second field in the part number to call out meters with a green display for an additional charge; example: PD690-3G-14.

See page 50 for mounting dimensions

SPECIFICATIONS

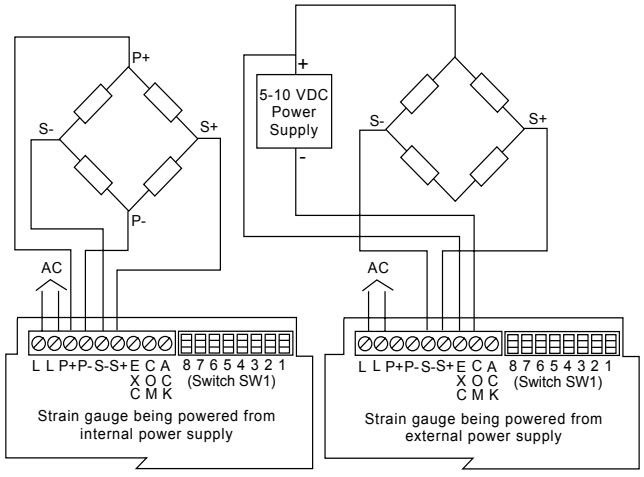
Except where noted all specifications apply to operation at +25°C.

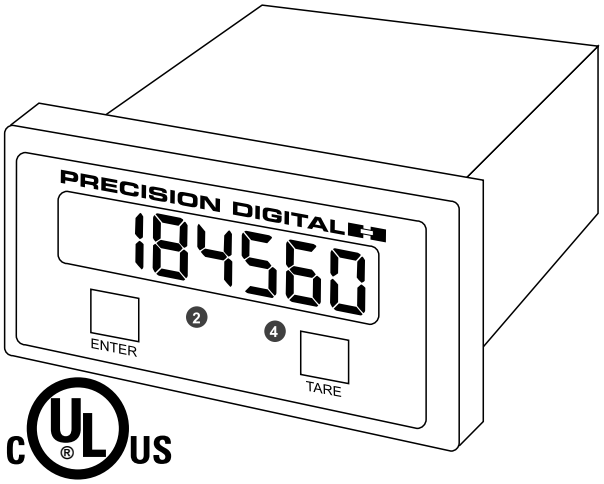
General

INPUTS: Field selectable: 0-30 mV, 0-200 mV, ± 15 mV ± 100 mV
RATIOMETRIC: Deviation less than 0.1% of full scale, ± 1 count, with ±10% variation in excitation voltage
DISPLAY: 0.56∈(14.2mm) red or green LED. 4$^{1}/_{2}$ digits + extra zero may be switched on to display +/-19,999(0).
CALIBRATION RANGE: 0 mV input may be set anywhere in range of the meter. 200 mV may be set anywhere above or below 0 mV input.
ISOLATED POWER SUPPLY: Selectable 5 VDC or 10 VDC ± 5% @ 50 mA; or 24 VDC ± 5% @ 20 mA. Available for either strain gauge or 4-20 mA output option.
PEAK HOLD: Captures the peak reading and displays it via the front panel ENTER button.
PEAK HOLD INDICATION: Front panel LED
TARE: Capture- Sets current display to Zero via front panel TARE button. Programmable- Automatically sets TARE to a preset value.
TARE INDICATION: Front panel LED
ACCURACY: 0.05% of full scale, ± 1 count.
NON-VOLATILE MEMORY: All programming values are stored in non-volatile memory for ten years if power is lost.
ZERO STABILITY: 0.5 µV/°C
SPAN STABILITY: 0.005% of full scale /°C
LOCKOUT: Switch 8 at rear of instrument restricts modification of calibration values.
INPUT IMPEDANCE: 20 KÝ
POWER: 115 VAC or 230 VAC ±10%, 50/60 Hz, 10 VA.
ISOLATION: 1500 VAC
NORMAL MODE REJECTION: 64 dB at 50/60 Hz.
ENVIRONMENTAL: Operational Ambient Temperature Range 0 to 60°C. Storage temperature range: -40 to 85°C. Relative Humidity: 0 to 90% non-condensing.
ENCLOSURE: 1/8 DIN, high impact plastic, UL 94V-0, color: black.
FRONT PANEL: Type 4X, NEMA 4X panel gasket provided.
CONNECTIONS: Removable screw terminal block.
ALARM POINTS: 4, any combination of high or low alarms
ALARM STATUS INDICATION: Front panel LED
ALARM DEADBAND: 0-100% of full scale, user selectable.
UL FILE NUMBER: E160849; 508 Industrial Control Equipment.

Field Selectable Excitation Power Supply

The internal power supply can provide either 5, 10, or 24 VDC power.





Relays

RATING: 2 or 4 SPDT (form C); rated 2 A @ 30 VDC or 2 A @ 250 VAC resistive load; 1/14 HP @ 125/250 VAC for inductive loads
RESET: User selectable.
1. Automatically when the input passes the reset point.
2. Automatically + manually (via user supplied switch). Manual reset resets all manually resettable relays.

FAIL-SAFE OPERATION: The relay coils are energized in the non-alarm condition. In the case of a power failure, the relays will go to the alarm state. Fail-safe may be disabled with internal jumper.
AUTO INITIALIZATION: When power is applied to the meter, the relays will always reflect the state of the input to the meter.
DEADBAND: 0-100%, user selectable.

Isolated 4-20 mA Transmitter Output

CALIBRATION RANGE: Anywhere in range of meter, 501 count minimum span.
OUTPUT LOOP RESISTANCE:

	Loop Resistance	
Power supply	**minimum**	**maximum**
24 VDC	10Ý	600Ý
35 VDC (external)	600Ý	1000Ý

ACCURACY: ± 0.1% FS, ± .004 mA
ISOLATION: 500 VDC or peak AC, input-to-output or input/output-to-power line.
EXTERNAL LOOP POWER SUPPLY: 35 V max.

ORDERING INFORMATION

115 VAC	230 VAC	Description	Option Card*
PD691-3-N	PD691-4-N	No Options	
PD691-3-14	PD691-4-14	2 Relays	PD174
PD691-3-15	PD691-4-15	4-20 mA Output	PD175
PD691-3-16	PD691-4-16	2 Relays + 4-20 mA Output	PD176
PD691-3-17	PD691-4-17	4 Relays	PD177
PD691-3-18	PD691-4-18	4 Relays + 4-20 mA Output	PD178

NOTES:

*Part numbers for Option Cards when purchased separately.

G may be added after second field in the part number to call out meters with a green display for an additional charge; example: PD691-3G-14.

See page 50 for mounting dimensions

SPECIFICATIONS

Except where noted all specifications apply to operation at +25°C.

PD692

INPUTS: Field selectable 4-20 mA, 0-20 mA, 0-5 V, 1-5 V, 0-10 V
CALIBRATION RANGE:

Input Range	Minimum Difference Between Input 1 & Input 2
0-5 V	0.16 V
0-10 V	0.32 V
4-20 mA	1.60 mA

INPUT IMPEDANCE: Voltage ranges greater than 300 KÝ; Current ranges 100 Ý
LOOP POWER (AC units only):
Isolated power supply, 24 VDC ± 5% @ 20 mA regulated
Maximum loop resistance is 1200 Ý
LINEAR INPUT ACCURACY: ± 0.05% of calibrated span ±1 count
ROOT EXTRACTION ACCURACY: ±0.1% F.S. ± 2 counts
PROGRAMMABLE EXPONENT: 1.0001 to 2.9999
11-POINT LINEARIZATION:

Input Range	Minimum Span Between Inputs
4-20 mA	(1.6 mA / (Number of points -1))
0-5 V	(0.16 V / (Number of points -1))
0-10 V	(0.32 V / (Number of points -1))

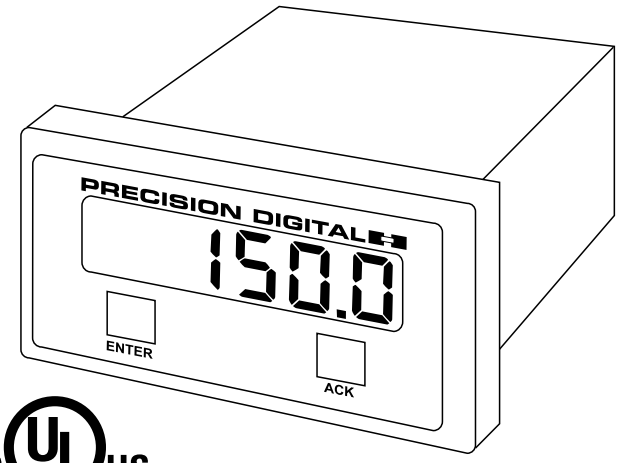
e.g. Minimum span for an 11-point, 4-20 mA calibration is 0.16 mA between inputs.
LOCKOUT: Jumper J3 restricts modification of calibration values

PD693

INPUTS: Field selectable: Pulse or square wave 0-5 V or 0-12 V @ 30 kHz; TTL; open collector 4.7 kÝ pull-up to 12V @ 30 kHz; switch contact 4.7 kÝ pull-up to 12 V @ 40 Hz.
CALIBRATION: May be calibrated using K-factor scaling, internal calibration or by applying an external calibration signal. Field programmable K-factor converts input pulses to rate in engineering units. May be programmed from 0.0001 to 999,999 pulses/unit.
INPUT IMPEDANCE: Pulse input: Greater than 300 kÝ @ 1 kHz. Open collector/switch input: 4.7 kÝ pull-up to 12 V.
EXCITATION (AC units only): Field selectable, isolated 12 VDC @ 50 mA for sensor supply or 24 VDC @ 20 mA regulated ± 5%. Maximum loop resistance of 1200 Ý.
ACCURACY: ± 0.1% of full scale
FILTER: Programmable contact debounce filter.
GATE: Low gate: 1-98 seconds; High gate: 2-99.9 seconds
LOCKOUT: Jumper JP2 restricts modification of calibration values.

General

DISPLAY: Six digit, 0.56∈(14.2 mm) red or green LED.
Rate: -19,999(0) to 29,999(0) with selectable extra zero. Total: 0 to 999,999
DECIMAL POINT: Process/rate: 2.9999, 29.999, 299.99, 2999.9, or extra zero may be turned on 299990. Total: 9.99999, 99.9999, 999.999, 9999.99, 99999.9. Rate and total decimal points are independent of each other.
PEAK HOLD (DISPLAY PEAK): Captures the peak process/rate and displays it via the front panel **ENTER** button (dSPY P)
PEAK HOLD INDICATION: Front panel flashing R LED
NON-VOLATILE MEMORY: All programming values are stored in non-volatile memory for a minimum of ten years if power is lost.
POWER: AC power, 115 or 230 VAC ±10%, 50/60 Hz, 12 VA
DC power, 18-36 VDC, 6 watts maximum
ISOLATION: AC powered 1500 VAC; DC powered 500 VDC
NORMAL MODE REJECTION: 64 dB at 50/60 Hz
ENCLOSURE: 1/8 DIN, high impact plastic, UL 94V-0, color: black
FRONT PANEL: Type 4X, NEMA 4X, Panel gasket provided
CONNECTIONS: Removable screw terminal blocks
ALARM POINTS: Four, any combination of high or low alarms
ALARM POINT DEADBAND: 0-100% of full scale, user selectable
ALARM STATUS INDICATION: Front panel LED
UL FILE NUMBER: E160849; 508 Industrial Control Equipment
PD693 DC powered units are not UL Listed



c UL us

Rate/Totalizer/Batch Controller

RATE DISPLAY INDICATION: LED labeled R on right illuminates when meter is displaying rate or process input.
LOW-FLOW CUTOFF: Any input below the low-flow cutoff value will result in a display of zero. May be set from 1 count to 100% F.S., user selectable. To disable low-flow cutoff, program cutoff value to zero. Totalizer is based on rate display. So, inputs below the low-flow cutoff value will not affect the totalizer (Low-flow cutoff ignored in PD693 K-factor mode).
ALTERNATING DISPLAY: Display may be programmed to alternate between rate and total every 10 seconds.
TOTAL DISPLAY: 0 to 999,999
TOTAL DECIMAL POINT: May be set in any of the following positions: 9.99999, 99.9999, 999.999, 9999.99, or 99999.9 Total decimal point is independent of process/rate decimal point.
TOTALIZER: Calculates total based on rate and field programmable multiplier to display total in engineering units. Time base available in seconds, minutes, hours, or days. Time base must be selected according to time units in which rate is displayed.
TOTALIZER ROLLOVER: Totalizer rolls over when display exceeds 999,999. Relay status reflects display.
TOTALIZER PRESETS: Up to four, user selectable under Setup menu. Any set point can be assigned to total and may be programmed anywhere in the range of the meter.
PRESET OFFSET: Relays assigned to total can be programmed to trip at any point below the next relay's preset value.
PROGRAMMABLE DELAY ON RELEASE: If the meter is programmed to reset total to zero automatically when the highest preset is reached, then a delay will occur before the total relays reset. This delay can be programmed anywhere between 1 and 999 seconds.
PRIORITY BATCH PROGRAMMING: This feature allows the user to quickly change preset values without going into the main menu by holding the **ENTER** button for more than 3 seconds.
TOTAL RESET: Via front panel **ENTER** button, external contact closure, or automatically via user selectable preset value
TOTAL RESET LOCKOUT: Meter may be programmed so total cannot be reset from the front panel

See page 50 for mounting dimensions
See page 13 for photograph

Relays

RATING: 2 or 4 SPDT (form C); rated 2 A @ 30 VDC or 2 A @ 250 VAC resistive load; 1/14 HP @ 125/250 VAC for inductive loads
ASSIGNED TO PROCESS/RATE OR TOTAL: Any relay may be assigned to process/rate or total.
ELECTRICAL NOISE SUPPRESSION: A suppressor (RC network) to prolong the life of the relays should be connected to each relay contact switching inductive loads. The suppressor provides a degree of protection against electrical noise caused by inductive loads. Recommended suppressor value, 0.01 µF/470 Ý, 250 VAC.
DEADBAND: 0-100% of full scale, user selectable
HIGH OR LOW ALARM: User may program any alarm for a high or low trip point
RELAY OPERATION: Latching or non-latching
FAIL-SAFE OPERATION: Relay coils are energized in non-alarm condition. In case of power failure, relays will go to alarm state. Fail-safe operation may be disabled, by removing jumper J2 located on the Options PCB.
AUTO INITIALIZATION: When power is applied to the meter, relays assigned to total will reflect the state of the accumulated total value in memory. Relays assigned to process/rate will reflect the state of the input to the meter.
RELAYS RESET: User select via JP3 jumper array and SEtuP menu
Total relays reset
1. When total is reset to zero, if set up for external total reset
2. After delay has elapsed, if set up for internal total reset
3. Manual any time, if set up for external total reset (via user supplied external contact closure at terminals AK and CM or front panel ACK button)
Manual reset resets all manually resettable relays.
Process/rate relays reset
1. Automatic reset only
2. Manual reset only, at any time
3. Automatic plus manual reset at any time
4. Manual reset only after alarm condition has been corrected
Automatic reset: Relays will automatically reset when the input passes the reset point.
Manual reset: It can be performed via user supplied external contact closure at terminals AK and CM or front panel ACK button. Manual reset resets all manually resettable relays.

Isolated 4-20 mA Transmitter Output

CALIBRATION RANGE: Anywhere in range of meter, 501 count minimum span.
NO EQUIPMENT NEEDED: The 4-20 mA output from the meter is calibrated without the use of a calibrator.
LOOP POWER: 24 VDC ± 5% @ 20 mA
ACCURACY: ± 0.1% F.S., ± 0.004 mA
ISOLATION: 500 VDC or peak AC, input-to-output or input/output-to-power line
OUTPUT LOOP RESISTANCE:

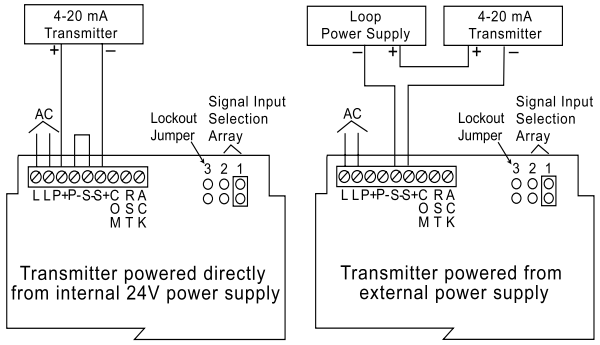
	Loop Resistance	
Power supply	**minimum**	**maximum**
24 VDC	10 Ý	600 Ý
35 VDC (external)	600 Ý	1000 Ý

EXTERNAL LOOP POWER SUPPLY: 35 VDC max

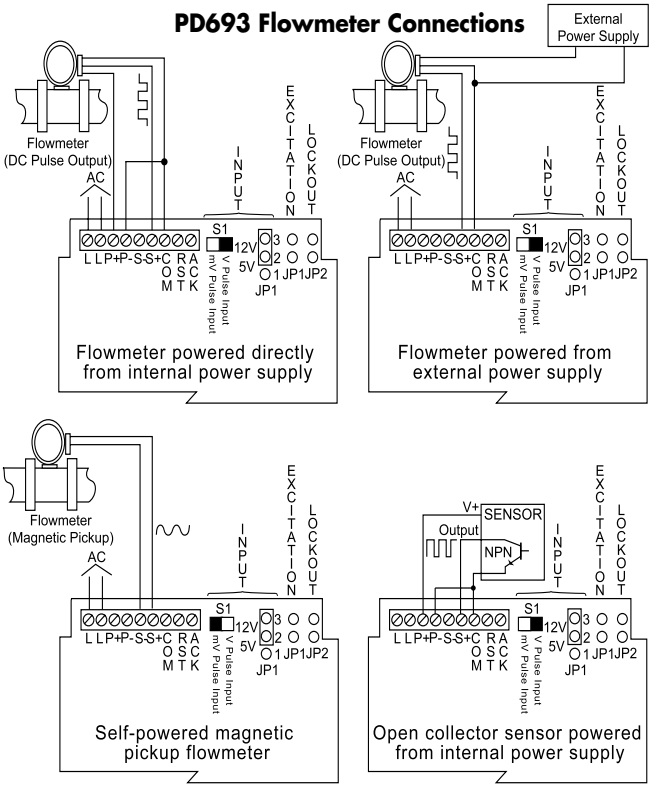
Connections

The PD692 internal power supply provides 24 VDC at 20 mA to drive either the 4-20 mA input or output loop. The PD693 provides 12 VDC at 50 mA or 24 VDC at 20 mA to power either the flowmeter input or the 4-20 mA output.

PD692 Loop Connections



PD693 Flowmeter Connections



ORDERING INFORMATION							
115 VAC		230 VAC		24 VDC		Description	Option Card **
PD692-3-N*	**PD693-3-N***	**PD692-4-N**	**PD693-4-N**	**PD692-2-N**	**PD693-2-N**	No Options	
PD692-3-14*	**PD693-3-14***	**PD692-4-14**	**PD693-4-14**	**PD692-2-14**	**PD693-2-14**	2 Relays	**PD174**
PD692-3-15	**PD693-3-15***	**PD692-4-15**	**PD693-4-15**	**PD692-2-15**	**PD693-2-15**	4-20 mA Output	**PD175**
PD692-3-16	**PD693-3-16**	**PD692-4-16**	**PD693-4-16**	**PD692-2-16**	**PD693-2-16**	2 Relays + 4-20 mA Output	**PD176**
PD692-3-17	**PD693-3-17**	**PD692-4-17**	**PD693-4-17**	**PD692-2-17**	**PD693-2-17**	4 Relays	**PD177**
PD692-3-18	**PD693-3-18**	**PD692-4-18**	**PD693-4-18**	**PD692-2-18**	**PD693-2-18**	4 Relays + 4-20 mA Output	**PD178**

Notes: *Quick Shipment Product, shipped within 2 working days. **Part numbers for Option Cards when purchased separately.
G may be added after second field in the part number to call out meters with a green display for an additional charge; example: PD692-3G-14.

SPECIFICATIONS

Except where noted all specifications apply to operation at +25°C.

PD694

INPUT: 0-200 VDC
DISPLAY: 0.56" (14.2mm) red or green LED. 4 1/2 digits + extra zero may be switched on to display ± 19,999(0).
CALIBRATION RANGE: 0 VDC input may be set anywhere in range of the meter. 200 VDC may be set anywhere above or below 0 VDC input.
ACCURACY: ±0.05% of calibrated span, ± 1 count.
LOCKOUT: Jumper J3 restricts modification of calibration values.
INPUT IMPEDANCE: Greater than 1 Mohms.
NORMAL MODE REJECTION: 64 dB at 50/60 Hz.
UL FILE NUMBER: E160849; 508 Industrial Control Equipment.
(AC Powered Units Only)

PD695

INPUTS: Field Selectable: 50 mV, 200 mV, 2 V, 20 V, 250 VAC
Calibration required for selected input.
INPUT FREQUENCY RESPONSE: 10 Hz to 30 KHz
DISPLAY: 0.56" (14.2mm) red LED. 4 1/2 digits + extra zero may be switched on to display 29,999(0).
DISPLAY UPDATE: 2 times per second
CREST FACTOR: up to 5:1
ACCURACY: ±0.25% of full scale @ 60 Hz
RESOLUTION: 0.025% of full scale
HOLD READING or EXTERNAL ACKNOWLEDGE: Connect ACK/HLD and COM terminals, and select jumper pins JP5 on rear.
LOCKOUT: Jumper JP6 restricts modification of calibration values.
INPUT IMPEDANCE: Greater than 1 MÝ

General

POWER: AC power: 115 VAC ± 10%, 50/60 Hz, 10VA.
230 VAC ± 10%, 50/60 Hz, 10VA.
PD694 DC power: 18-36 VDC, 6 watts max.
ISOLATION: AC power: 1500 VAC, DC power: 500 VDC.

ENVIRONMENTAL: Operational Ambient temperature range: 0 to 60°C. Storage temperature range: -40 to 85˚C.
Relative Humidity: 0 to 90% non-condensing.
ENCLOSURE: 1/8 DIN, high impact plastic, UL 94V-0, color: black.
FRONT PANEL: Type 4X, NEMA 4X, panel gasket provided.
CONNECTIONS: Removable screw terminal block.
ALARM POINTS: Four, any combination of high or low alarms.
ALARM STATUS INDICATION: Front panel LED.
ALARM DEADBAND: 0-100% F.S. user selectable.

Relays

RATING: 2 or 4 SPDT (form C); rated 2 A @ 30 VDC or 2 A @ 250 VAC resistance load; 1/14 HP @ 125/250 VAC for inductive loads.
Reset: User select.
1. Automatically when the input passes the reset point.
2. Automatically + manually (via user supplied push button or front panel ACK button). Manual reset resets all manually resetable relays,
FAIL-SAFE OPERATION: The relay coils are energized in the non-alarm condition. In the case of a power failure, the relays will go to the alarm state. Fail-safe may be disabled with internal jumper.
AUTO INITIALIZATION: When power is applied to the meter, the relays will always reflect the state of the input to the meter.
DEADBAND: 0-100%, user selectable.

Isolated 4-20 mA Transmitter Output

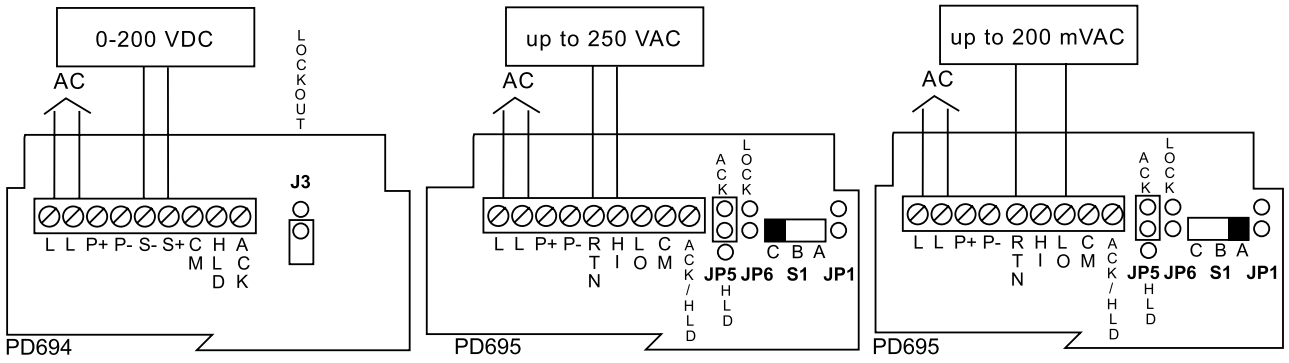
CALIBRATION RANGE: Anywhere in range of meter, 501 count minimum span.
LOOP POWER: Isolated 24 VDC ±5% @ 20 mA regulated (AC units only).
OUTPUT LOOP RESISTANCE:

	Loop Resistance	
Power supply	**minimum**	**maximum**
24 VDC	10 Ý	600 Ý
35 VDC (external)	600 Ý	1000 Ý

ACCURACY: ± 0.1% F.S., ± .004 mA.
ISOLATION: 500 VDC or peak AC, input-to-output or input/output-to-power line.
EXTERNAL LOOP POWER SUPPLY: 35 V max.

See page 50 for mounting dimensions

Signal & Power Connections



ORDERING INFORMATION						
115 VAC		230 VAC		24 VDC	Description	Option Card**
PD694-3-N	**PD695-3-N***	**PD694-4-N**	**PD695-4-N**	**PD694-2-N**	No Options	
PD694-3-14	**PD695-3-14**	**PD694-4-14**	**PD695-4-14**	**PD694-2-14**	2 Relays	**PD174**
PD694-3-15	**PD695-3-15**	**PD694-4-15**	**PD695-4-15**	**PD694-2-15**	4-20 mA Output	**PD175**
PD694-3-16	**PD695-3-16**	**PD694-4-16**	**PD695-4-16**	**PD694-2-16**	2 Relays + 4-20 mA Output	**PD176**
PD694-3-17	**PD695-3-17**	**PD694-4-17**	**PD695-4-17**	**PD694-2-17**	4 Relays	**PD177**
PD694-3-18	**PD695-3-18**	**PD694-4-18**	**PD695-4-18**	**PD694-2-18**	4 Relays + 4-20 mA Output	**PD178**

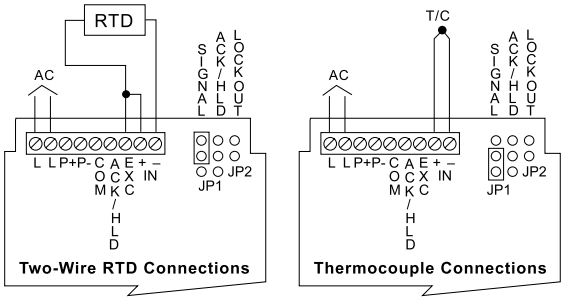
NOTES: *Quick Shipment Product, shipped within 2 working days. **Part numbers for Option Cards when purchased separately.
G may be added after second field in the part number to call out meters with a green display for an additional charge; example: PD694-3G-14. Green display is not available on PD695.

SPECIFICATIONS

Except where noted all specifications apply to operation at +25°C.

General

INPUTS: PD750: Field selectable: type J, K, T, E, R, or S Thermocouples with 1° resolution; type T to 0.1°; 100 Ý platinum RTD (.00385 or .00392 curve) to 1° or 0.1° resolution.
PD751: 10 Ý copper RTD
PD752: 120 Ý nickel RTD
DISPLAY: 0.56" (14.2mm) red or green LED, 4½ digits. F or C may be switched on to indicate Fahrenheit or Celsius.
COLD JUNCTION REFERENCE: Automatic, fixed.
T/C OPEN INDICATION: Indicated by display flashing "OPEN".
HOLD READING: Connect switch to ACK/HLD and COM terminals.
ACCURACY: See Precalibrated Ranges table
LOCKOUT: Jumper JP2 at rear of instrument restricts modification of calibration values.
INPUT IMPEDANCE: Greater than 100 kÝ.
POWER: AC power: 115 VAC ± 10%, 50/60 Hz, 10VA.
230 VAC ± 10%, 50/60 Hz, 10VA.
DC power: 18-36 VDC, 6 watts max.
ISOLATION: AC power: 1500 VAC; DC power: 500 VDC.
NORMAL MODE REJECTION: 64 dB at 50/60 Hz
ENVIRONMENTAL: Operational ambient temperature range: 0 to 60°C.
Storage temperature range: -40 to + 85°C.
Relative humidity: 0 to 90% non-condensing.
ENCLOSURE: 1/8 DIN, high impact plastic, UL 94V-0, color: black.
FRONT PANEL: Type 4X, NEMA 4X, panel gasket provided.
CONNECTIONS: Removable screw terminal block.
ALARM POINTS: 4, any combination of high or low alarms.
ALARM STATUS INDICATION: Front panel LED
ALARM DEADBAND: 0-100% of full scale, user selectable.
UL FILE NUMBER: E160849; 508 Industrial Control Equipment
(PD750 AC Powered Units Only).



See page 50 for mounting dimensions

Relays

RATING: 2 or 4 SPDT (form C); rated 2 A @ 30 VDC or 2 A @ 250 VAC resistive load; 1/14 HP @ 125 / 250 VAC for inductive loads.
RESET: User selectable.
1. Automatically when the input passes the reset point.
2. Automatically + manually (via user supplied switch or front panel ACK button). Manual reset resets all manually resettable relays.
FAIL-SAFE OPERATION: The relay coils are energized in the non-alarm condition. In the case of a power failure, the relays will go to the alarm state. To disable fail-safe operation remove jumper J2 located on the Options PCB.
AUTO INITIALIZATION: When power is applied to the meter, the relays will always reflect the state of the input to the meter.
DEADBAND: 0-100%, user selectable.

Isolated 4-20 mA Transmitter Output

CALIBRATION RANGE: Anywhere in range of meter.
LOOP POWER: 24 VDC ± 5% @ 20 mA
OUTPUT LOOP RESISTANCE:

	Loop Resistance	
Power supply	**minimum**	**maximum**
24 VDC	10 Ý	600 Ý
35 VDC (external)	600 Ý	1000 Ý

ACCURACY: ± 0.1% F.S., ± .004 mA.
ISOLATION: 500 VDC or peak AC, input-to-output or input/output-to-power line.
EXTERNAL LOOP POWER SUPPLY: 35 V max.

Precalibrated Ranges

PD750 Input	Range	Accuracy
Type J T/C	-328° to 1382°F -200° to 750°C	±2°F ±1°C
Type K T/C	-328° to 2498°F -200° to 1330°C	±2°F ±1°C
Type T T/C	-330° to 760°F -200° to 404°C	±2°F ±1°C
Type T T/C (0.1°)	-330.0° to 760.0°F -200.0° to 404.0°C	±2°F ±1°C
Type E T/C	-328° to 1832°F -200° to 1000°C	±2°F ±1°C
Type R T/C	32° to 3213°F 0° to 1767°C	±5°F ±3°C
Type S T/C	40° to 3214°F 4° to 1768°C	±6°F ±3°C
100 Ω Platinum RTD	-328.0° to 1382.0°F -200.0° to 750.0°C	±0.7°F ±0.4°C

PD751 Input	Range	Accuracy
10 Ω Cu RTD	-328° to 500°F -200° to 250°C	±0.2°F ±0.1°C

PD752 Input	Range	Accuracy
120 Ω Ni RTD	-112° to 608°F -80° to 320°C	±0.2°F ±0.1°C

ORDERING INFORMATION

	115 VAC	230 VAC	24 VDC	Description	Option Card**
Thermocouple 100 Ω RTD	**PD750-3-N***	**PD750-4-N**	**PD750-2-N**	No Options	
	PD750-3-14*	**PD750-4-14**	**PD750-2-14**	2 Relays	**PD174**
	PD750-3-15*	**PD750-4-15**	**PD750-2-15**	4-20 mA Output	**PD175**
	PD750-3-16	**PD750-4-16**	**PD750-2-16**	2 Relays + 4-20 mA Output	**PD176**
	PD750-3-17	**PD750-4-17**	**PD750-2-17**	4 Relays	**PD177**
	PD750-3-18	**PD750-4-18**	**PD750-2-18**	4 Relays + 4-20 mA Output	**PD178**
10 Ω Copper	**PD751-3-N**	**PD751-4-N**	**PD751-2-N**	No Options	
	PD751-3-14	**PD751-4-14**	**PD751-2-14**	2 Relays	**PD174**
	PD751-3-15	**PD751-4-15**	**PD751-2-15**	4-20 mA Output	**PD175**
	PD751-3-16	**PD751-4-16**	**PD751-2-16**	2 Relays + 4-20 mA Output	**PD176**
	PD751-3-17	**PD751-4-17**	**PD751-2-17**	4 Relays	**PD177**
	PD751-3-18	**PD751-4-18**	**PD751-2-18**	4 Relays + 4-20 mA Output	**PD178**
120 Ω Nickel	**PD752-3-N**	**PD752-4-N**	**PD752-2-N**	No Options	
	PD752-3-14	**PD752-4-14**	**PD752-2-14**	2 Relays	**PD174**
	PD752-3-15	**PD752-4-15**	**PD752-2-15**	4-20 mA Output	**PD175**
	PD752-3-16	**PD752-4-16**	**PD752-2-16**	2 Relays + 4-20 mA Output	**PD176**
	PD752-3-17	**PD752-4-17**	**PD752-2-17**	4 Relays	**PD177**
	PD752-3-18	**PD752-4-18**	**PD752-2-18**	4 Relays + 4-20 mA Output	**PD178**

NOTES:

*Quick Shipment Product, shipped within 2 working days.

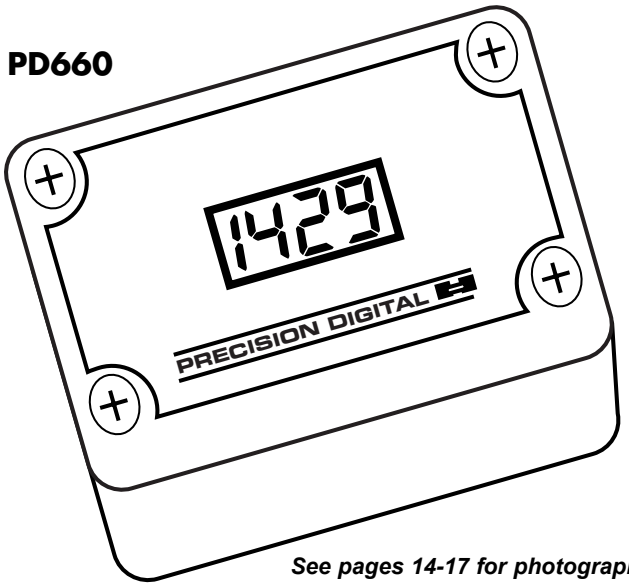
**Part numbers for Option Cards when purchased separately.

G may be added after second field in the part number to call out meters with a green display for an additional charge; example:

PD750-3G-14.

PD660 & PD661 3½ Digit Loop-Powered Meters

PD660



PD661

See pages 14-17 for photographs

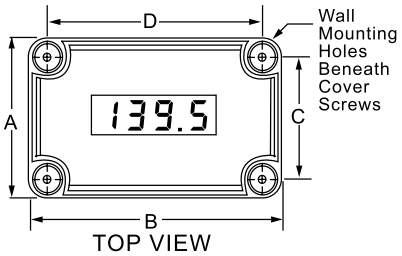
SPECIFICATIONS

Except where noted all specifications apply to operation at +25°C.

INPUT: 4-20 mA @ 24 VDC maximum.
DISPLAY: 0.5∈(12.7mm) high LCD, 3½ digit; 1999, user selectable decimal point.
CALIBRATION: 2 Step; non-interacting zero and span
CALIBRATION RANGE: 4 mA input: -500 to +500; 20 mA input: between 20 to 2000 above 4 mA display.
MAXIMUM VOLTAGE DROP: 1.5 VDC @ 20 mA; 3.5 VDC @ 20 mA with backlighting option.
ACCURACY: ±0.1% of span, ±1 count.
CONVERSION RATE: 2.5 conversions/second.
CONNECTIONS: Removable screw terminal block.
OPERATING TEMPERATURE RANGE: -40 to 80°C.
APPROVALS: The PD661-N-EX and PD661-B-EX are FM Approved and CSA Certified as explosion-proof for Class I, Division 1, Groups B, C, and D; dust-ignition proof for Class II, Division 1, Groups E, F, and G; and Class III hazardous (classified) locations. LCIE (CENELEC) certified as flame-proof, EEx d IIC T6.
PD660 ENCLOSURE: High impact-resistant ABS plastic body, color: gray, clear ABS plastic cover with blue faceplate; NEMA 4X, IP 67; ½∈conduit hole provided at base. Hole may be provided on back for panel mounting applications, call factory for details.
PD661 ENCLOSURE: Explosion-proof, cast aluminum, corrosion resistant, color: "safety blue" polyester powder coating. FM Approved and CSA Certified; NEMA 4X, 7 & 9; Class I, Division 1, Groups B, C, & D and Class II, Groups E, F, & G, Class III hazardous outdoor (Type 4X) locations. CENELEC: EEx d IIC + H2 IP 66. Two ½∈NPT holes provided. Mounts directly to conduit.
LOOP-POWERED BACKLIGHTING OPTION: Factory installed only. Powered directly off the 4-20 mA loop, no batteries required. The display brightness will increase as the input signal current increases.

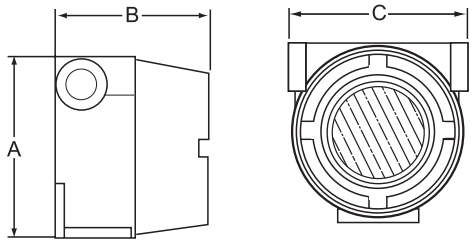
DIMENSIONS

PD660



A: 3.15∈(80 mm) C: 2.36∈(60 mm) E: 2.56∈(65 mm)
B: 4.33∈(110 mm) D: 3.54∈(90 mm) F: 0.79∈(20 mm)
Weight: 12 oz (340 g)

PD661



A: 4.75∈(121 mm) B: 3.75∈(95 mm) C: 4.5∈(114 mm)
Weight: 4 lbs (1.8 kg) FM Approved and CSA certified enclosure

ORDERING INFORMATION	
Model	**Description**
PD660-N*	NEMA 4X Loop-Powered Meter
PD660-B	NEMA 4X Loop-Powered Meter with Loop-Powered Backlighting
PD661-N*	Explosion-Proof Loop-Powered Meter
PD661-B	Explosion-Proof Loop-Powered Meter with Loop-Powered Backlighting
PD661-N-EX	FM, CSA, & CENELEC Explosion-Proof Meter
PD661-B-EX	FM, CSA, & CENELEC Explosion-Proof Meter with Loop-Powered Backlighting
PDA6604 (Panel Mounting Kit does not provide NEMA 4X seal to the panel)	Panel Mounting Kit for PD660
PDA6845	2∈Pipe Mounting Kit for PD660
*Quick Shipment Product, shipped within 2 working days	

SPECIFICATIONS

Except where noted all specifications apply to operation at +25°C.

General

INPUT: 4-20 mA @ 24 VDC maximum.
CALIBRATION RANGE: 4 mA input: -5000 to +5000; 20 mA input: between 200 to 20000 above 4 mA input.
MAXIMUM VOLTAGE DROP: 5.2 VDC @ 20 mA.
ACCURACY: ±0.05% of span, ±2 counts (linear input).
OPERATING TEMPERATURE RANGE: -20 to 65°C, meter with no alarm output option. 0 to 65˚C, meter with alarm output.
CONNECTIONS: Removable screw terminal block.

PD673 & PD674

DISPLAY: 0.4" high LCD, 4½ digit; 19999. User selectable decimal point.
FRONT PANEL: NEMA 4X, panel gasket provided.
ENCLOSURE: 1/8 DIN, high impact plastic, UL 94V-0 color: black.

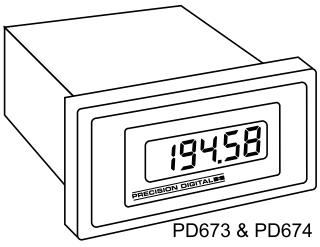
PD675 & PD676

DISPLAY: 0.7" high LCD, 4½ digit; 19999. User selectable decimal point.
APPROVALS: FM Approved and CSA Certified as non-incendive for Class I, Division 2, Groups A,B,C,D; suitable for Class II, Division 2, Groups F and G; suitable for Class III, Division 2, indoor and outdoor, hazardous (classified) NEMA 4X locations.
ENCLOSURE: Impact-resistant polycarbonate body, color: gray; clear polycarbonate cover; NEMA 4X, IP67. ½" conduit hole provided at base. Hole may be provided on back for panel mounting applications, call factory for details.

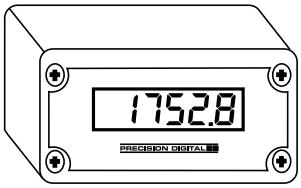
PD677 & PD678

DISPLAY: 0.7" high LCD, 4½ digit; 19999. User selectable decimal point.
APPROVALS: The PD677-A-EX, PD677-N-EX, PD678-A-EX, and PD678-N-EX are FM Approved and CSA Certified as explosion-proof for Class I, Division 1, Groups B, C, and D; dust-ignition proof for Class II, Division 1, Groups E, F, and G; and Class III hazardous (classified) locations.
LCIE (CENELEC) Certified as flameproof, EEx d IIC T6.
ENCLOSURE: Explosion-proof, cast aluminum, corrosion resistant, color: "safety blue" polyester powder coating.
FM Approved and CSA Certified; NEMA 4X, 7 & 9; Class I, Division 1, Groups B, C, & D and Class II, Groups E, F, & G, Class III hazardous outdoor (Type 4X) locations.
CENELEC: EEx d IIC + H2 IP 66.
Two 3/4" NPT holes provided.

See page 50 for mounting dimensions
See pages 14-17 for photographs



PD673 & PD674



PD675 & PD676

PD677 & PD678

Open Collector Alarm Output (Option)

HIGH-ALARM: Circuit closes above user selectable set point. Rating: 20 VDC @ 20 mA.
SET POINT ADJUSTMENT: 10-100% of full scale, user selectable.
RESET: Automatically when the input falls below the alarm set point by approximately 0.5% of full scale.
ALARM SET POINT ACCURACY: ±0.5% of full scale.
ALARM STATUS INDICATION: Flashing display, user selectable.

Square Root Extraction (Option)

SQUARE ROOT EXTRACTION ACCURACY: ±0.2% F.S. ±2 counts from 15-100% of flow.
LOW-FLOW CUTOFF: 10-22% of full scale, user selectable.

ORDERING INFORMATION	
Model	**Linear Input and**
PD673-N	Panel Mount, No Options
PD673-A	Panel Mount, Open Collector Alarm Output
PD675-N	NEMA 4X, No Options
PD675-A	NEMA 4X, Open Collector Alarm Output
PD677-N	Explosion-Proof, No Options
PD677-N-EX	FM, CSA, & CENELEC Explosion-Proof, No Options
PD677-A	Explosion-Proof, Open Collector Alarm Output
PD677-A-EX	FM, CSA, & CENELEC Explosion-Proof, Open Collector Alarm Output
Model	**Linear Input, Square Root Extraction and**
PD674-N	Panel Mount, No Options
PD674-A	Panel Mount, Open Collector Alarm Output
PD676-N	NEMA 4X, No Options
PD676-A	NEMA 4X, Open Collector Alarm Output
PD678-N	Explosion-Proof, No Options
PD678-N-EX	FM, CSA, & CENELEC Explosion-Proof, No Options
PD678-A	Explosion-Proof, Open Collector Alarm Output
PD678-A-EX	FM, CSA, & CENELEC Explosion-Proof, Open Collector Alarm Output
Model	**Description**
PDA6844	Panel Mounting Kit Panel Mounting Kit does not provide NEMA 4X seal to panel.
PDA6845	2∈ Pipe Mounting Kit

SPECIFICATIONS

Except where noted all specifications apply to operation at +25°C.

General

DISPLAY: 0.5∈(12.7 mm) high LCD. ±1999(0), (0) may be switched on to display to 19,990.
CALIBRATION: 4 mA input: -500(0) to +500(0); 20 mA input: between 20(0) to 2000(0) > 4 mA.
ACCURACY: ±0.1% of span, ±1 count.
CONVERSION RATE: 2.5 conversions/second.
MAXIMUM INPUT CURRENT: 30 mADC.
MAXIMUM VOLTAGE DROP: 1 V at 20 mA.
OPERATING TEMPERATURE RANGE: -40° to + 70°C.
ENCLOSURE: 1/8 DIN, high impact plastic, UL 94V-0, color: black.
CONNECTIONS: Removable screw terminal block.

PD680

INPUT: User selectable 4-20 mA or 1-5 V.
POWER: Two modes field selectable; loop-powered 4-20 mA with maximum voltage drop of 1 V; and separate DC supply, 5 to 25 VDC at 6 mA. Transformer isolation between signal and power inputs is 500 V in the separate supply mode.

PD682

FM APPROVED

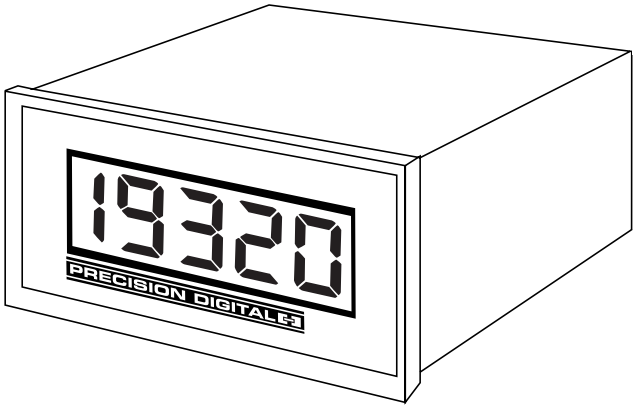
INPUT: 4-20 mA
POWER: Loop-powered
APPROVAL: FM Approved as intrinsically safe with entity, for use in Class I, Division 1, Groups A, B, C, D hazardous locations.

FM Approved as intrinsically safe with entity, for use in Class II and III, Division 1, Groups E, F, and G hazardous locations when installed in Precision Digital enclosures PDA2407, PDA2408, PDA2409, or PDA2410.

Non-incendive for use in Class I, Division 2, Groups A, B, C, and D hazardous locations when installed in an enclosure capable of accepting one of the Division 2 wiring methods specified in the National Electric Code (NFPA 70), including Precision Digital enclosures PDA2407, PDA2408, PDA2409, or PDA2410.

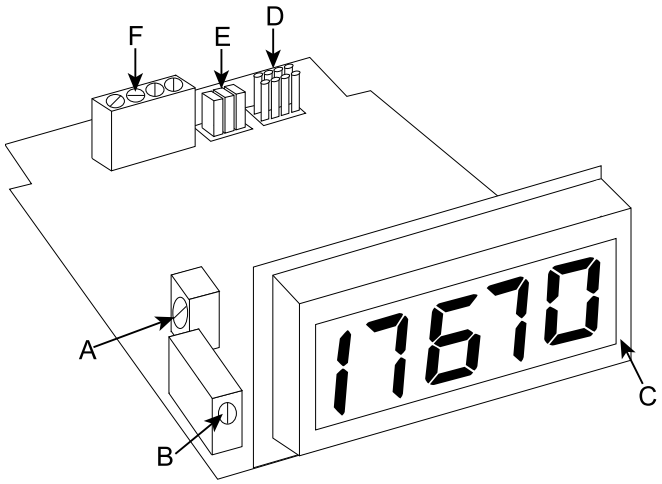
Suitable for use in Class II and III, Division 2, Group F and G hazardous locations when installed in Precision Digital enclosures PDA2407, PDA2408, PDA2409, or PDA2410.
MAX. ENTITY PARAMETERS: V_{max} = 30 V, I_{max} =175 mA, C_i = 0 µF, L_i = 0 µH.

See page 50 for mounting dimensions
See pages 14-17 for photographs



Calibration

Calibration of the meter is a two-step process involving two front panel controls located behind the faceplate.



A. Balance control; (factory adjust only)
B. HI calibration control
C. LO calibration control
D. Decimal point and extra zero pin array
E. All jumpers must be installed on PD682
F. Removable screw terminal block

ORDERING INFORMATION	
Model	**Description**
PD680	Loop-Powered Panel Meter
PD682*	FM Approved Loop-Powered Panel Meter
PDA2405	NEMA 4X Front Panel PDA2405 is not FM Approved as NEMA 4X
PDA2407	NEMA 4X Enclosure for 1 Meter
PDA2408	NEMA 4X Enclosure for 2 Meters
PDA2409	NEMA 4X Enclosure for 3 Meters
PDA2410	NEMA 4X Enclosure for 4 Meters
*Quick Shipment Product, shipped within 2 working days	

SPECIFICATIONS

Except where noted all specifications apply to operation at +25°C.

General

DISPLAY: 1.0∈(25.4 mm) high LCD, ±1999.
INPUT: 4-20 mA @ 24 VDC maximum.
CALIBRATION: Two-step; non-interacting zero and span.
CALIBRATION RANGE: 4 mA input: -1000 to +1000; 20 mA between 20 and 2000 counts > 4 mA display.
ACCURACY: ±0.1% of span, ±1 count.
CONVERSION RATE: 2.5 conversions/second.
MAXIMUM VOLTAGE DROP: 1 V at 20 mA.
CONNECTIONS: Screw terminal block.

PD686

APPROVALS: FM Approved and CSA Certified as intrinsically safe with entity, for use in Class I, II, III, Division 1, Groups A, B, C, D, E, F, G; T-codes: FMRC = T3A, CSA = T4; hazardous locations. Non-incendive for use in Class I, II, III, Division 2, Groups A, B, C, D, F, G.
MAX. ENTITY PARAMETERS: V_{max}= 30 V, I_{max} = 175 mA, C_i = 0 µF, L_i = 0 µH.
ENCLOSURE: Impact-resistant glass filled polycarbonate body, color: gray; impact-resistant clear polycarbonate cover; NEMA & CSA 4X, IEC 529, IP67; ½∈conduit hole provided at base. May be provided on back for panel mounting applications, call factory for details.
MAXIMUM INPUT CURRENT: 30 mADC.
OPERATING TEMPERATURE RANGE: -40 to 85°C (-40 to 185°F); -40 to 40°C (-40 to 104°F) for Canadian installations.

PD687

APPROVALS: The PD687-EX is FM Approved and CSA Certified as explosion-proof for Class I, Division 1, Groups C and D; dust-ignition proof for Class II, Division 1, Groups E, F, and G; and Class III hazardous (classified) locations.
LCIE (CENELEC) certified as flameproof, EEx d IIB + H2 T6.
ENCLOSURE: Explosion-proof cast aluminum, 0.3% max. copper content, NEMA 3, 4, 7, and 9, suitable for location in Class I, Division 1, Groups B, C, & D and Class II, Groups E, F, & G, Class III hazardous outdoor (Type 4X) locations.
CENELEC: EEx d IIB + H2 IP 66. One ¾∈NPT hole provided.
OPERATING TEMPERATURE RANGE: -40 to 80°C (-40 to 176°F)

Calibration

LO and HI calibration controls are located to the left of the display (see Figure 1). Apply a signal equal to 4 mA and adjust the LO control to display the desired reading. Apply a signal between 16 and 20 mA and adjust the HI control to display the desired reading. Complete the calibration procedure by making any minor adjustments to the LO and HI controls.F

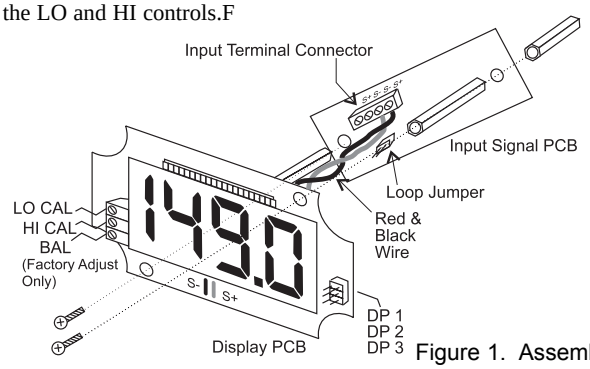
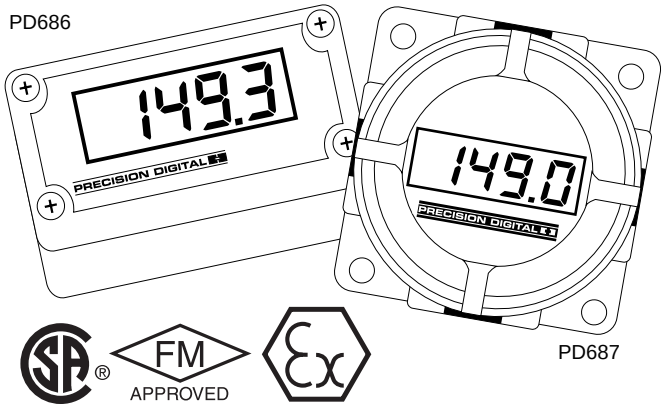
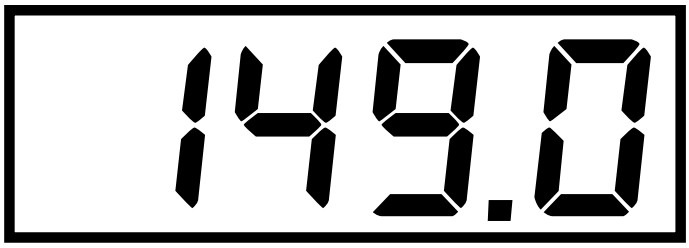


Figure 1. Assembly



FM APPROVED



ACTUAL SIZE DIGITS

ORDERING INFORMATION	
Model	**Description**
PD686*	FM & CSA Loop-Powered Meter in NEMA 4X Enclosure
PD687	Loop-Powered Meter in Explosion-Proof Enclosure
PD687-EX	FM, CSA, & CENELEC Explosion-Proof Meter
PDA6545	2∈Pipe Mounting Kit (4 mounting holes)
PDA6844**	Panel Mounting Kit for PD686
PDA6845	2∈Pipe Mounting Kit (2 mounting holes)

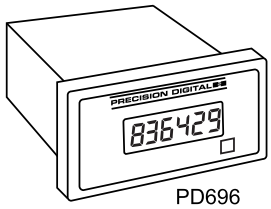
*Quick Shipment Product, shipped within 2 working days
**Panel Mounting Kit does not provide NEMA 4X seal to panel

See page 50 for mounting dimensions
See pages 14-17 for photographs

SPECIFICATIONS

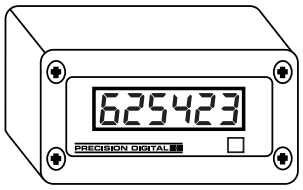
Except where noted all specifications apply to operation at +25°C.

INPUT: 4-20 mADC @ 24 VDC maximum, Linear or Square Root.
DISPLAY: 6 digit, 0.5" (12.7mm) high LCD.
Rate: 0 to 19,999. Total: 0 to 999,999.
User selectable decimal point.
DISPLAY UPDATE RATE: 1 per second.
ALTERNATING DISPLAY: Display may be programmed to alternate between rate and total every 10 seconds.
MINIMUM INPUT CURRENT: 3.5 mADC.
MAXIMUM VOLTAGE DROP: 5.6 VDC @ 20 mA.
Model with Backlighting: 7.0 VDC @ 20 mA.
CALIBRATION RANGE: Single Button Scaling. 4 mA input may be set anywhere in range of the meter. The 20 mA input may be set anywhere in range of the meter, above or below 4 mA input. An Error message will appear if Input 1 signal and Input 2 signal are too close together.
MINIMUM INPUT SPAN: 1.6 mA between Input 1 and Input 2.
LINEAR INPUT ACCURACY: ±0.05% of calibrated span, ±1 count.
SQUARE ROOT EXTRACTION ACCURACY: ± 0.1% F.S. ± 1 count from 10-100% of flow; ± 1% (0-10% flow).
NOISE FILTER: The field selectable noise filter allows the meter to be programmed so that an unsteady (noisy) input can be displayed with greater stability.
NON-VOLATILE MEMORY: All programming values are stored in non-volatile memory for a minimum of ten years if power is lost. No battery required.
PULSE OUTPUT RATING: Isolated open collector, 24 VDC @ 20 mA; maximum pulse output, 30 pulses per second; pulse width: 16 ms. If the pulse output exceeds the maximum pulse output (30 pulses per second), the total will flash and counts will be lost in the totalizer and the output.
LOCKOUT: Jumper JP1 restricts modification of calibration values.
TOTALIZER: Calculates total based on rate and field programmable totalizer conversion factor to display total in any engineering units.
TOTALIZER CONVERSION FACTOR: Any number between .00001 and 59999.
TOTAL RESET: Via front panel button, or external contact closure.
EXTERNAL TOTAL RESET: Connect terminals R and CM.
LOW-FLOW CUTOFF: 1 count to 100% F.S., user selectable. To disable low-flow cutoff, program cutoff value to zero. Meter does not totalize below low-flow cutoff value.
LOOP-POWERED BACKLIGHTING OPTION: Powered directly off the 4-20 mA loop, no batteries required. The display brightness will increase as the input signal current increases.
ENVIRONMENTAL:
Operating temperature range: 0 to +65°C.
Storage temperature range: -30 to +80°C.
Relative humidity: 0 to 90% non-condensing.
PD696 ENCLOSURE: 1/8 DIN, high impact plastic, UL 94V-0; color: black; Front panel, NEMA 4X, panel gasket provided.
PD697 ENCLOSURE: High impact-resistant glass filled polycarbonate, color: gray, NEMA 4X, IP 67; 1/2" conduit hole provided at base. May be provided on back for panel mounting applications, call factory for details.



PD696

PD698



PD697

PD698 ENCLOSURE: Explosion-proof, cast aluminum, corrosion resistant, color: "safety blue" polyester powder coating. FM Approved and CSA Certified; NEMA 4X, 7 & 9; Class I, Division 1, Groups B, C, & D and Class II, Groups E, F, & G, Class III hazardous outdoor (Type 4X) locations. CENELEC: EEx d IIC + H2 IP 66. Two 3/4∈ NPT holes provided.
APPROVALS: The PD698-N-EX and PD698-B-EX are FM Approved and CSA Certified as explosion-proof for use in Class I, Division 1, Groups B,C, and D; Dust-ignition proof in Class II, Division 1, Groups E, F, and G; Class III. LCIE (CENELEC), EEx d IIC T6.
CONNECTIONS: Removable screw terminal block, accepts 22 to 12 AWG wire.

ORDERING INFORMATION	
Model	**Description**
PD696-N	Panel Mount Loop-Powered Totalizer
PD696-B	Panel Mount Loop-Powered Totalizer with Loop-Powered Backlighting Option
Model	**Description**
PD697-N	NEMA 4X Loop-Powered Totalizer
PD697-B	NEMA 4X Loop-Powered Totalizer with Loop-Powered Backlighting Option
Model	**Description**
PD698-N	Explosion-Proof Loop-Powered Totalizer
PD698-N-EX	FM, CSA & CENELEC Certified Explosion-Proof
PD698-B	Explosion-Proof Loop-Powered Totalizer with Loop-Powered Backlighting Option
PD698-B-EX	FM, CSA & CENELEC Certified Explosion-Proof with Loop-Powered Backlighting Option

ACCESSORIES	
Model	**Description**
PDA6844	Panel Mounting Kit for PD697 Panel Mounting Kit does not provide NEMA 4X seal to panel.
PDA6845	2" Pipe Mounting Kit for PD697 & PD698
PDA-MAG	Reed Switch Magnet for PD698
PDA2451-R	Explosion-Proof Control Station for 1 Total Reset Switch

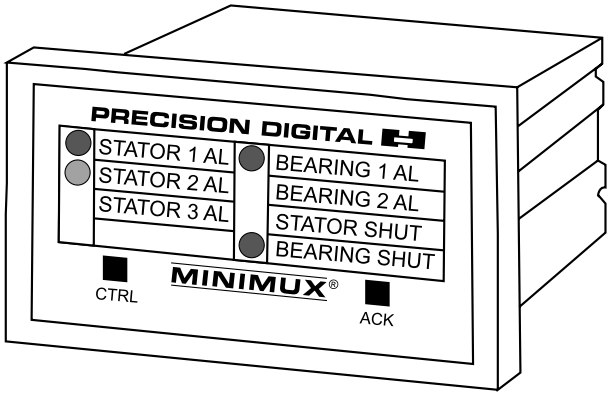
See page 50 for mounting dimensions
See pages 14-17 for photographs

The Minimux® is a microprocessor-based eight channel analog input scanner/multiplexer and annunciator that provides low cost automatic switching for multi-point display and alarm systems. Each Minimux® can automatically switch up to eight inputs to another device such as a digital panel meter, controller, or PLC. Signal switching is done with reed relays making the Minimux® ideal for switching thermocouples, RTDs, control loops, and AC & DC signals.

SPECIFICATIONS

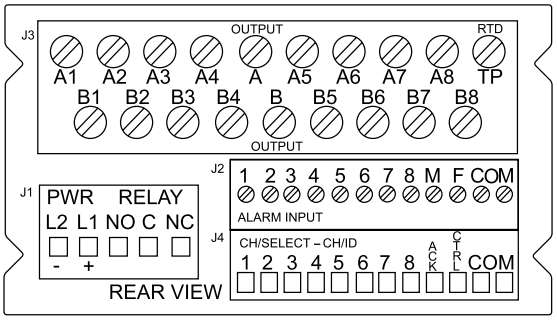
NUMBER OF CHANNELS PER MINIMUX®: 8 double-pole channels per unit.
NUMBER OF CHANNELS PER SYSTEM: Unlimited
SIGNAL SWITCHING: DPST reed relays
CONTACT RESISTANCE: 0.2 Ý maximum
MAXIMUM INPUT VOLTAGE: 200 V (switched or common mode)
MAXIMUM CURRENT SWITCHED: 0.5 A
MAXIMUM POWER SWITCHED: 10 W
DWELL TIME (Internal-scan): Adjustable from 0.6 to 30 seconds.
DWELL TIME (External-scan): Determined by external device such as a PLC or DCS, 1.5 seconds per channel minimum.
NON-VOLATILE MEMORY: All programming values are stored in non-volatile memory for ten years if power is lost.
SCAN METHOD: Internal or externally controlled (PLC, etc.)
CHANNEL SELECT/CHANNEL ID: Input Impedance; 10 KÝ pull-up to 5 V. Each channel on the Minimux® has a Channel Select/Channel ID line which is used to either select or identify a channel on the PD118. For instance, in External Scan Mode, an external device such as a PLC can drive the Channel Select/Channel ID line low for the channel it wants to see, the PD118 will then go to that channel. In Internal Scan Mode, the Channel Select/Channel ID line for the currently scanned channel goes low to provide identification of the current channel to an external device.
CHANNEL INDICATION: Green LED on front panel; Channel Select/ID line goes low.
DISABLING CHANNELS: Channels may be disabled during setup with front panel CTRL button.
SCAN STOP: The scan may be stopped by pressing and holding the CTRL button for more than 0.5 seconds. The scan may be resumed by pressing and releasing the CTRL button quickly (less than 0.5 seconds).
ALARM INPUT: Independent alarm input for each channel. Input Impedance; 25 KÝ, typical pull-up to 5V.
ALARM SEQUENCE: Sequence A or Sequence F2A (first out).
ALARM OUTPUTS: Alarm condition indicated by:
- Front panel red LED for each channel.
- Relay, 1 SPDT (form C); rated 2 A @ 30 VDC or 2 A @ 250 VAC resistive load; 1/14 HP @ 125 / 250 VAC for inductive loads. For fail-safe operation, the relay is energized in the non-alarm state. In the case of a power failure, the relay will go to the alarm state, (NC contact is connected to common).
- Built-in Horn, 75 dB
- Stop-on-alarmed-channel (user select).

ALARM ACKNOWLEDGMENT: Front panel ACK and rear connector.
EXTERNAL CTRL FUNCTION: The functions of the CTRL button are available at screw terminals at the rear of the instrument.
MESSAGE LABELS: Custom printed free of charge. Area available per message is 1.25∈x .22∈(32 mm x 6 mm); user may specify any size and length that will fit in this area. One line of 14 characters at 9 point type will fit.
CONNECTIONS: Removable screw terminal connectors provided.
OPERATING TEMPERATURE: -10°C to 65°C
POWER: 115 or 230 VAC (field select) ± 10%, 50/60 Hz, 4 VA; 24 VDC ± 10%, 4 watts.
LED TEST: All LEDs are tested on power-up.
ENCLOSURE: 1/8 DIN, high impact plastic, UL94V-0, color: black.
FRONT PANEL: NEMA 4X, panel gasket provided.



Connections Overview

All connections are made to removable screw terminal connectors which are supplied with each PD118.



Connector	Function
J1	Power Input and Alarm Relay
J2	Alarm-In, Master-Follower
J3	Signal Inputs and Output
J4	Channel Select/Channel ID with External ACK & CTRL

ORDERING INFORMATION

Model	Description
PD118*	8 Channel Scanner/Annunciator; 115 or 230 VAC (field select)
PD118-2	8 Channel Scanner/Annunciator; 24 VDC
PD118-CL	8 Channel Scanner/Annunciator; 115 or 230 VAC (field select) with current loop resistor network installed (for 4-20 mA inputs)
PD118-2-CL	8 Channel Scanner/Annunciator, 24 VDC with current loop resistor network installed (for 4-20 mA inputs)
PDA-CL	Current Loop Resistor Network (for 4-20 mA inputs)

NOTES:
1. All AC powered units are shipped from the factory set for 115 VAC power.
2. Message labels for the PD118 may be specified at time of order or later.
3. Removable screw terminal connectors are standard on the PD118.
4. There is no special cable required to connect multiple PD118s together.

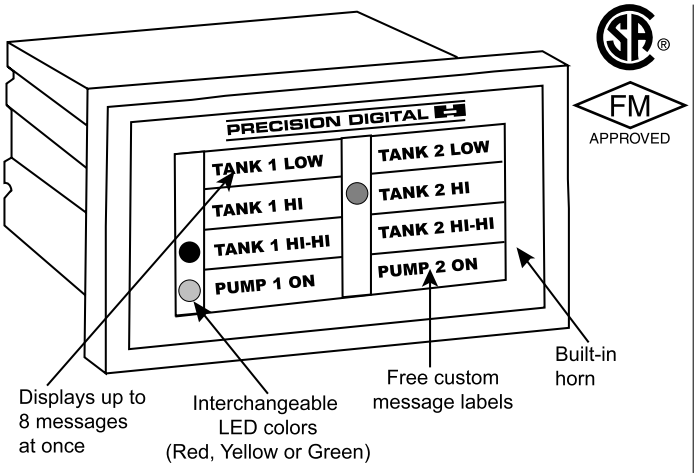
Ordering Example

A system to automatically scan and display eight type J thermocouples and check each one for alarm condition, powered from 115 VAC:

Model	Description	Quantity
PD118	8 Channel scanner/annunciator	1
PD750-3-14	Universal temperature meter with 2 relay alarm option, 115 VAC	1

*Quick Shipment Product, shipped within 2 working days.

See page 50 for mounting dimensions



The PD128 is a low-cost, easy-to-use PLC annunciator that displays up to 8 messages at once and features a built-in horn. Interchangeable LEDs (Red, Yellow, Green) allow for customized alarm messages. Powered directly from the PLC, the PD128 accepts standard digital output signals, requires no programming and can be connected in minutes.

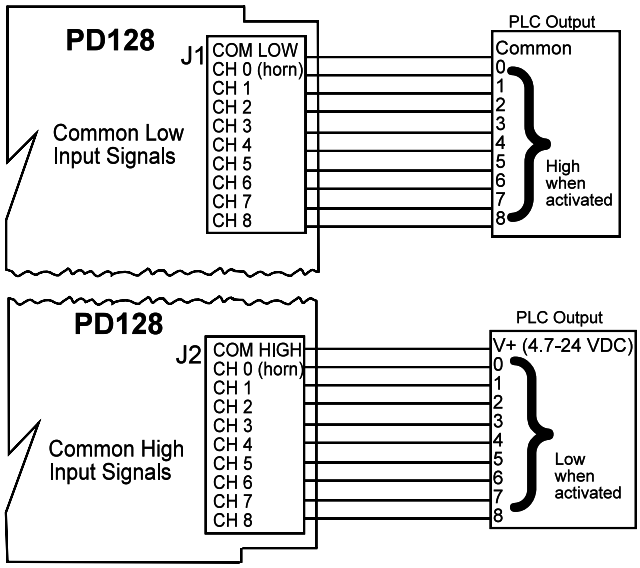
SPECIFICATIONS

NUMBER OF CHANNELS: 8 visual + 1 audio.
TYPE OF INPUTS:
1. Logic Levels: Low = 0 to .8 VDC; High = 4.7 to 24 VDC @ 12 mA.
   a. Common Low Input - activates when input goes high
   b. Common High Input - activates when input goes low
2. Normally Open Switches: External power required to power switch.
3. Open Collector Transistor: External power required to power transistor circuitry.

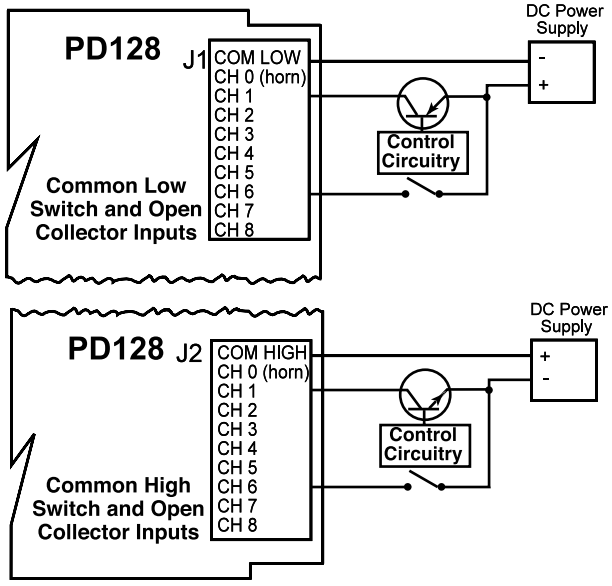
MAX INPUT SUPPLY: 24 VDC @ 12 mA per channel.
OUTPUTS:
1. Audible: Built-in horn.
2. Visual: Red LED next to alarm message. May be replaced with yellow or green.

ALARM MESSAGES: Custom printed free of charge. Area available per message is 1.25∈x .28∈(32 mm x 7 mm); user may specify any size and length that will fit in this area. Two lines of 14 characters each at 9 point type will fit.
APPROVALS: PD128-NI, Non-Incendive:
CSA Certified and FM Approved as Non-Incendive for use in Class I , Division 2, Groups A, B, C & D; T-code: T6.
ENVIRONMENTAL:
Operating temperature range: -20 to 70˚C.
Storage temperature range: -40 to 85˚C.
Relative humidity: 0 to 90% non-condensing.
ENCLOSURE: 1/8 DIN, high impact plastic, UL 94V-0, color: black.
FRONT PANEL: NEMA 4X, panel gasket provided.
PD128-NI is not approved as NEMA 4X by FM and CSA.
CONNECTIONS: Removable screw terminal block.

PLC Connections



Connections for Switch and Transistor Inputs

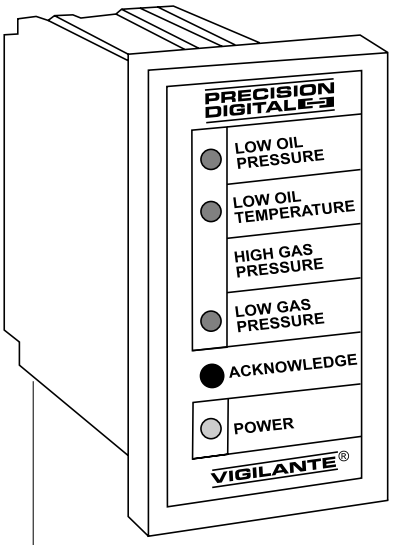


ORDERING INFORMATION	
Model	**Description**
PD128*	PLC Annunciator
PD128-6**	6-pack of PD128s
PD128-NI	Non-Incendive PLC Annunciator
PD128-NI-6**	6-Pack of PD128-NIs
PDX128G	Green LEDs (10)
PDX128Y	Yellow LEDs (10)

**Six-pack not for individual resale.
*Quick Shipment Product, shipped within 2 working days.

See page 50 for mounting dimensions
See page 18 for photographs

From urgent alarms to routine messages, the PD141AFO VIGILANTE® handles all types of operational messages with simplicity and economy. The VIGILANTE® delivers clear, eye catching (and ear catching) information to the plant operators. Alarm outputs from Precision Digital meters, alarm relays, logic levels from 5 to 28 VDC, and switches for parameters such as temperature, pressure, flow, level and proximity can all be fed directly into the VIGILANTE®.



- **ISA Sequence A**
- **ISA Sequence F2A**
- **FREE Message Labels**
- **NEMA 4X Front Panel**
- **Built-In Horn**
- **1 SPDT Relay**
- **8-Point System With First-Out**

SPECIFICATIONS

NUMBER OF INPUTS: 4 per VIGILANTE®; 8 per system
TYPE OF INPUTS: Momentary or maintained:
1. **NO or NC switches:** Each input circuit contains a pull-up resistor, so it is not necessary to provide external excitation to the switch.
2. **Open Collector Transistor:** Open circuit voltage is approximately 5 VDC.
3. **Logic Levels:** LO = 0 to .8 VDC, HI = 4.7 to 28 VDC; input impedance: 100 KÝ.

OPERATION: User field select: ISA Sequence A or ISA Sequence F2A (first-out).
TYPE OF OUTPUTS: Alarm condition indicated in three ways:
1. **Relay:** 1 SPDT relay (2 A @ 240 VAC) per PD141AFO. For fail-safe design, the relay is energized in the non-alarm state. In the case of a power failure, the relay will go to the alarm state (NC contact is connected to Common contact).
2. **Audible:** Built-in horn.
3. **Visual:** Red LED next to the alarm message.

ALARM MESSAGES: Custom printed free of charge. Area available per message is 1.25∈x .28∈(32 mm x 7 mm); user may specify any size and length that will fit in this area. Two lines of 14 characters each at 9 point type will fit.
POWER: AC: 115 VAC ± 10%, 50/60 Hz, 3 VA.
230 VAC ± 10%, 50/60 Hz, 3 VA.
DC: 24-48 VDC, 2 W max., 500 VDC isolation.
CONNECTIONS: Removable screw terminal block.
ENCLOSURE: 1/8 DIN, high impact plastic, UL 94V-0, color: black.
FRONT PANEL: NEMA 4X, panel gasket provided.
ENVIRONMENTAL:
Operating temperature range: -20 to 70˚C.
Storage temperature range: -40 to 85˚C.
Relative humidity: 0 to 90% non-condensing.

ORDERING INFORMATION	
Model	**Description**
PD141AFO-2	24-48 VDC Power
PD141AFO-3*	115 VAC Power
PD141AFO-4	230 VAC Power
*Quick Shipment Product, shipped within 2 working days.	

See page 50 for mounting dimensions
See page 18 for photographs

OPERATION

The VIGILANTE® can be field programmed for either ISA Sequence A or ISA Sequence F2A.

ISA Sequence F2A (First-Out)

MOMENTARY ALARM

CONDITION	LED		HORN
	1st Pt	Next Pt	
Normal	Off	Off	Off
Alert	Flash	Steady	On
Normal	Flash	Steady	On
Acknowledge	Off	Off	Off

MAINTAINED ALARM

CONDITION	LED		HORN
	1st Pt	Next Pt	
Normal	Off	Off	Off
Alert	Flash	Steady	On
Acknowledge	Steady	Steady	Off
Normal	Off	Off	Off

ISA Sequence A

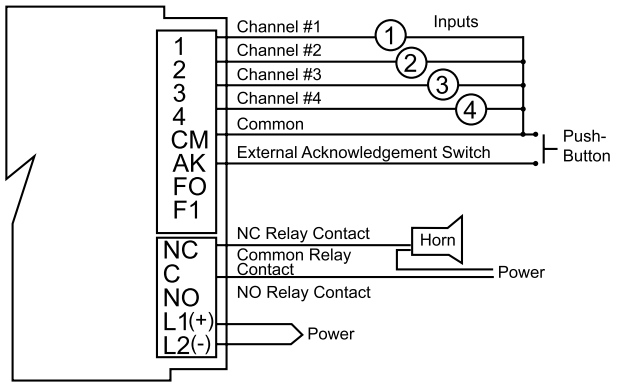
MOMENTARY ALARM

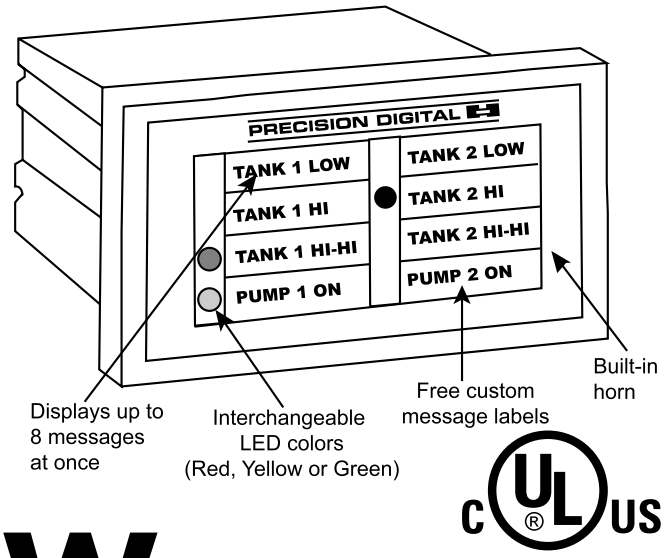
CONDITION	LED	HORN
Normal	Off	Off
Alert	Flash	On
Normal	Flash	On
Acknowledge	Off	Off

MAINTAINED ALARM

CONDITION	LED	HORN
Normal	Off	Off
Alert	Flash	On
Acknowledge	Steady	Off
Normal	Off	Off

SIGNAL & POWER CONNECTIONS





When it comes to low-cost, high efficiency and ease of use, the PD148 beats message centers and pilot lights hands down. The PD148 is a low-cost, easy-to-use AC/DC input annunciator that displays up to 8 messages at once and features a built-in horn. Acceptable voltage inputs range from 90 to 250 VAC/VDC. Each LED may be configured for either "Active ON" or "Active OFF" illumination. Interchangeable LEDs (Red, Yellow, or Green) allow for customized alarm messages. Precision Digital also prints custom message labels free of charge.

SPECIFICATIONS

NUMBER OF INPUTS: 8
TYPE OF INPUTS: 90 to 250 VAC/VDC; burden less than 1 mA.
ISOLATION: 1500 V RMS input to input and input to power.
NUMBER OF OUTPUTS: Eight.
TYPE OF OUTPUTS:
1. Audio: Input 1 drives a horn rated 75 dB @ 10 cm, in addition to driving channel 1 LED. Horn may be deactivated by removing JP1 jumper.
2. Visual: 8 Visual LEDs. LED color is Red. Yellow or Green LEDs are available.

ALARM MESSAGES: Custom printed free of charge. Area available per message is 1.25∈x .28∈(32 mm x 7 mm); user may specify any size and length that will fit in this area. Two lines of 14 characters each at 9 point type will fit.
POWER: 115 or 230 VAC (field selectable) ±10%, 50/60 Hz; 3 VA.
ENVIRONMENTAL:
Operating temperature range: -10 to 65˚C.
Storage temperature range: -40 to 85˚C.
Relative humidity: 0 to 90% non-condensing.
ENCLOSURE: 1/8 DIN, high impact plastic, UL 94V-0, black.
FRONT PANEL: Type 4X, NEMA 4X, panel gasket provided.
CONNECTIONS: Removable screw terminal block.
UL FILE NUMBER: E206095; 508 Industrial Control Equipment.

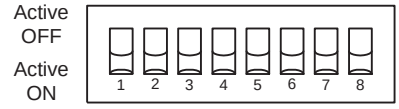
ORDERING INFORMATION	
Model	**Description**
PD148	AC/DC Input Annunciator
PDX128G	Green LEDs (10)
PDX128Y	Yellow LEDs (10)

OPERATION

The PD148 is factory set to 115 VAC operation.

The power supply operation voltage must be configured before any connections are made. From the front of the device, snap off the front cover, unscrew the two retaining screws, and slide out the PCB. Locate the voltage selector switch (S1) and switch to desired operating voltage (115 VAC or 230 VAC).

LED Active On and Active Off illumination may be configured by removing the snap off front cover and setting the DIP switch (S2) for each LED output. To program an LED for Active On operation, set the corresponding switch on S2 to the lower position. To program an LED for Active Off operation, set the corresponding switch on S2 to the upper position.



Active ON: LED ON with input voltage

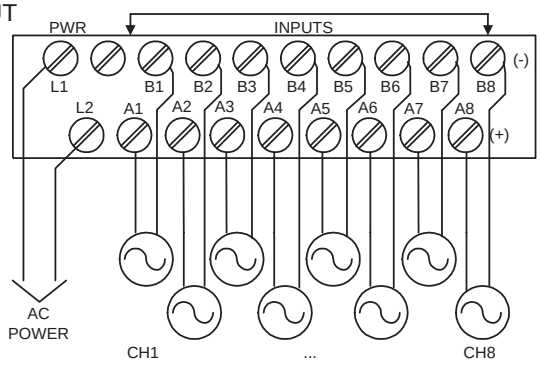
Active OFF: LED ON with no input voltage

The audio horn is connected to input channel 1 and may be de-activated by removing the snap off front cover and removing the JP1 jumper.

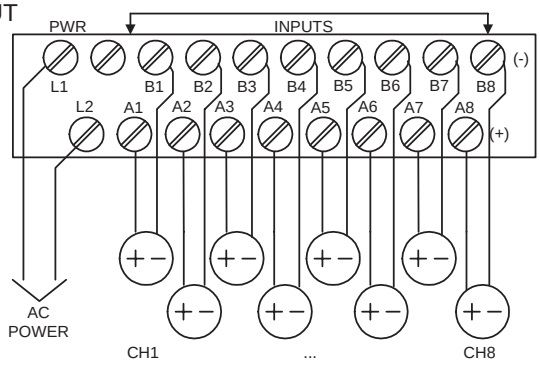
CONNECTIONS

All field wiring to be made using 600 volt 14-22 AWG wire. Using 60/75°C copper conductor only. Tighten all screw terminals to 7.0 lb-in (0.8 Nm).

AC INPUT



DC INPUT



NOTE: The PD148 will accept a combination of AC and DC signals.

See page 50 for mounting dimensions
See page 18 for photographs

FREE MESSAGE LABELS

Alarm message labels for the PD118, PD128, PD141 & PD148 may be factory printed at no charge, or field printed using a laser printer with clear self-adhesive labels.
Factory printed message labels may be ordered at any time by completing the corresponding form. (Note: message #1 is the top message on the left side and #2 is below it. #5 is the top message on the right side.) Make copies of this page for additional message labels.

_____ Please include label with my order

_____ I have the model PD_____, please send label ASAP

Quantity _____

Name _____

Title _____

Company _____

Mailing Address _____

City, St., Zip _____

Phone _____

Fax _____

EMail _____

PO# _____

PD118

Custom printed free of charge. Area available per message is 1.25∈ x .22∈ (32 mm x 6 mm); user may specify any size and length that will fit in this area. One line of 14 characters each at 9 point type will fit.

Message Number 1

Message Number 2

Message Number 3

Message Number 4

Message Number 5

Message Number 6

Message Number 7

Message Number 8

PD128 & PD148

Custom printed free of charge. Area available per message is 1.25∈ x .28∈ (32 mm x 7 mm); user may specify any size and length that will fit in this area. Two lines of 14 characters each at 9 point type will fit.

Message Number 1

Message Number 2

Message Number 3

Message Number 4

Message Number 5

Message Number 6

Message Number 7

Message Number 8

PD141AFO

Custom printed free of charge. Area available per message is 1.25∈ x .28∈ (32 mm x 7 mm); user may specify any size and length that will fit in this area. Two lines of 14 characters each at 9 point type will fit.

Message Number 1

Message Number 2

Message Number 3

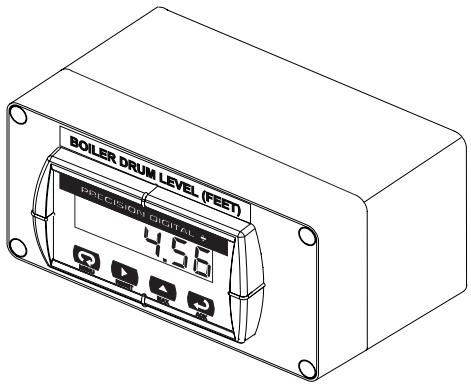
Message Number 4

Trident Enclosures & Message Labels

The Trident meter is available with a wide variety of NEMA 4 & 4X enclosures to help it withstand the harsh operating environment of an industrial plant. Meters are mounted in the enclosure door so all programming and operational functions are available without opening the enclosure.
The PD2501-PDA2706 enclosures feature a hinged door. The larger enclosures (e.g. PDA2504) will also house other Precision Digital meters. Enclosures and meters are ordered separately.

Low Cost NEMA 4X Enclosure

The PDA2801 is a low-cost, compact, NEMA 4X enclosure that will house one Trident meter. The cover is held in place with four screws. A hole is provided for a 1/2∈ conduit connection. A 2∈ pipe mounting kit is available, Model PDA6845.



See page 11 for photographs

ORDERING INFORMATION				
Model	**No. of Meters**	**Meter Type***	**Overall Outside Dimensions** (H x W x D)	**Weight**
PDA2801	1	C	3.1 x 6.3 x 3.7 (80 x 160 x 95)	0.58 (0.26)

Dimensions: inches (mm); weight: pounds (kg) **Rating:** NEMA 1, 4, 4X, 6, 12, and 13, IP66 **Color:** Gray
Material: Polycarbonate **Approvals:** UL & CSA

Plastic NEMA 4X Enclosures

ORDERING INFORMATION						
Model	**No. of Meters**	**Meter Type***	**Overall Outside Dimensions** (H x W x D)	**Inside Dimensions** (A x B x C)	**Mounting Dimensions** (F x E)	**Weight**
PDA2501	1	C	7.7 x 6.4 x 5.1 (196 x 163 x 130)	4.9 x 4.9 x 4.5 (124 x 124 x 114)	6.75 x 4.0 (171 x 102)	2.4 (1.1)
PDA2502	2	C	9.7 x 6.4 x 5.1 (246 x 163 x 130)	6.7 x 4.9 x 4.5 (170 x 124 x 114)	8.75 x 4.0 (222 x 102)	2.9 (1.3)
PDA2503	3	C	11.7 x 8.4 x 5.1 (297 x 213 x 130)	8.7 x 6.9 x 4.5 (221 x 175 x 114)	10.75 x 6.0 (273 x 152)	4.0 (1.8)
PDA2504	4	A,B,C	13.7 x 12.4 x 7.1 (297 x 213 x 130)	10.7 x 10.9 x 6.5 (272 x 277 x 165)	12.75 x 10.0 (324 x 254)	6.8 (3.1)
PDA2505	5					
PDA2506	6					
PDP2504	Sub Panel for Plastic NEMA 4X Enclosures (4-6 Meters)					

Dimensions: inches (mm); weight: pounds (kg) **Ratings:** NEMA 1, 3, 3S,4, 4X, 12 **Color:** Gray
Material: Thermoplastic **Approvals:** UL & CSA

NEMA 4 & NEMA 4X Steel & Stainless Steel Enclosures

ORDERING INFORMATION						
Model (Stainless)	**Model** (Steel)	**No. of Meters**	**Meter Type***	**Overall Outside Dimensions** (H x W x D)	**Mounting Dimensions** (F x E)	**Weight** (Est. for SS)
PDA2601	PDA2701	1	C	7.5 x 6.9 x 4.0 (191 x 176 x 102)	6.75 x 4.0 (171 x 102)	4.4 (2.0)
PDA2602	PDA2702	2	C	9.5 x 6.9 x 3.5 (241 x 176 x 89)	8.75 x 4.0 (222 x 102)	6.1 (2.8)
PDA2603	PDA2703	3	C	11.5 x 8.9 x 4.0 (292 x 227 x 102)	10.75 x 6.0 (273 x 152)	8.5 (3.9)
PDA2604	PDA2704	4	A,B,C	13.5 x 12.9 x 6.0 (343 x 329 x 152)	12.75 x 10.0 (324 x 254	15.5 (7.0)
PDA2605	PDA2705	5				
PDA2606	PDA2706	6				
PDP2604	PDP2704	Sub Panels for Steel and Stainless Steel Enclosures (4-6 Meters)				

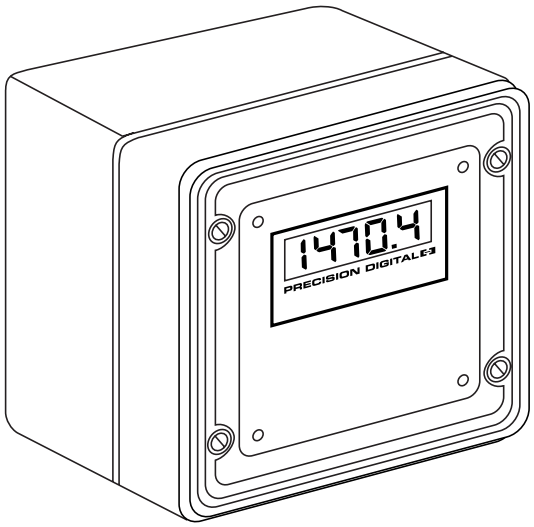
Material: Model PDA2701: 16-gauge steel; PDA2702-2706: 14-gauge steel
Model PDA2601: 16-gauge, Type 304 SS; PDA2602-2606: 14-gauge, Type 304 SS
Rating: Steel boxes: UL 50 Type 4, 12, 13; NEMA Type 4, 12, 13; CSA Type 4, 12; IEC529, IP66
Stainless Steel Boxes: UL 50 Type 4, 4X, 12; NEMA Type 4, 4X, 12, 13; CSA Type 4, 4X, 12; IEC529, IP66
Approval: UL & CSA
Color: Steel enclosures: Gray
Stainless steel: Unpainted, smooth, brushed finish.

Custom Engraved Labels

Custom engraved labels are available to identify individual meters; an overall enclosure label is also available for most of the enclosures. Labels are available in both plastic and stainless steel. Labels are supplied with self-adhesive backing for easy mounting.
Go to **www.predig.com** for Ordering Information.

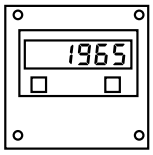
***Meter Types:**

1. **Type A** (e.g. PD690) meter bezel dimensions: 4.25∈x 2.3∈x 0.6∈(108 mm x 59 mm x 15 mm), depth behind panel: 4.7∈(119 mm) not including clearance for wiring.
2. **Type B** (e.g. PD682) meter bezel dimensions: 3.82∈x 1.88∈x 0.21∈(97 mm x 48 mm x 5 mm), depth behind panel: 5.1∈(130 mm) not including clearance for wiring.
3. **Type C** (e.g. PD765) meter bezel dimensions: 4.68∈x 2.45∈x 0.6∈(119 mm x 62 mm x 15 mm), depth behind panel: 3.6∈(91 mm) not including clearance for wiring.

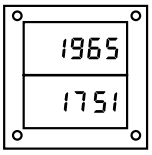


These NEMA 4X enclosures provide a high degree of protection against the harsh operating environment of an industrial plant. The Precision Digital meters are mounted inside the enclosure for maximum protection. The clear cover is held in place with four screws.

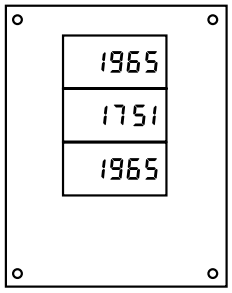
NEMA 4X ENCLOSURES



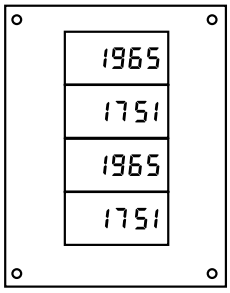
PDA2407



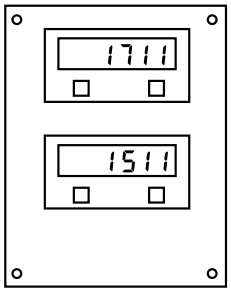
PDA2408



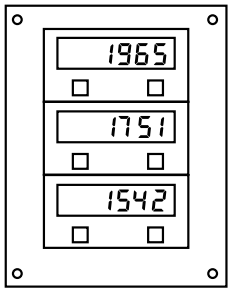
PDA2409



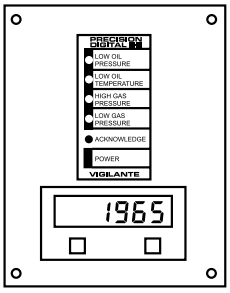
PDA2410



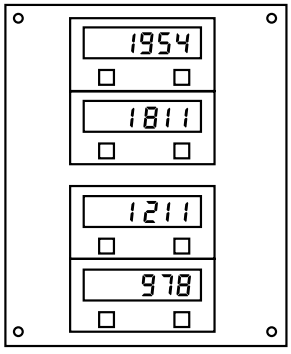
PDA2411



PDA2412



PDA2414



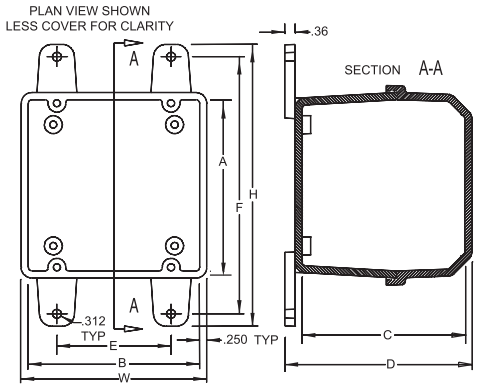
PDA2415

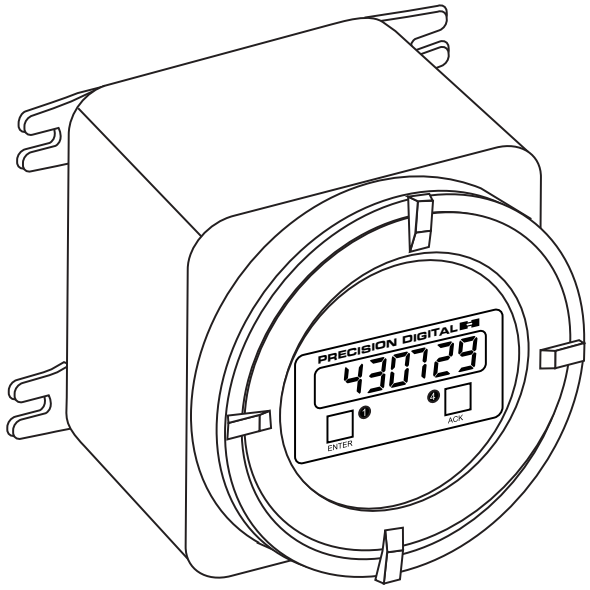
ORDERING INFORMATION						
Model	**No. of Meters**	**Type Style**	**Overall Outside Dimensions** (with brackets) (H x W x D)	**Inside Dimensions** (A x B x C)	**Mounting Dimensions** (F x E)	**Weight**
PDA2407	1	A, B or C	9.9 x 6.5 x 6.7 (251 x 165 x 170)	6.0 x 6.0 x 5.9 (152 x 152 x 151)	9.0 x 4.0 (228 x 102)	2.4 (1.1)
PDA2408	2	B				
PDA2409	3	B	13.9 x 8.5 x 6.7 (352 x 216 x 170)	10.0 x 8.0 x 5.9 (254 x 203 x 151)	13.0 x 6.0 (330 x 152)	4.1 (1.8)
PDA2410	4	B				
PDA2411	2	A, B or C				
PDA2412	3	A				
PDA2414	2	1 Type A , B or C; 1 PD141AFO				
PDA2415	4	A	15.9 x 10.5 x 7.7 (403 x 267 x 195)	12.0 x 10.0 x 6.9 (305 x 254 x 176)	15.0 x 8.0 (381 x 203)	5.6 (2.5)

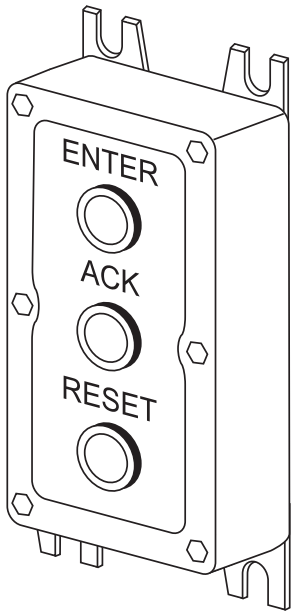
NOTES:

1. Dimensions are in inches (mm), weight is in pounds (kg)
2. **Type A** (e.g. PD690) meter bezel dimensions: 4.25∈x 2.3∈x 0.6∈(108 mm x 59 mm x 15 mm), depth behind panel: 4.7∈(119 mm) not including clearance for wiring.
3. **Type B** (e.g. PD682) meter bezel dimensions: 3.82∈x 1.88∈x 0.21∈(97 mm x 48 mm x 5 mm), depth behind panel: 5.1∈(130 mm) not including clearance for wiring.
4. **Type C** (e.g. PD765) meter bezel dimensions: 4.68∈x 2.45∈x 0.6∈(119 mm x 62 mm x 15 mm), depth behind panel: 3.6∈(90 mm) not including clearance for wiring.
5. UL, CSA Type 4X, NEMA 4X enclosures material:Thermoplastic with clear polycarbonate covers.
6. 2∈Pipe Mounting Kit available for the PDA2407 & PDA2408, see page 48 for details.

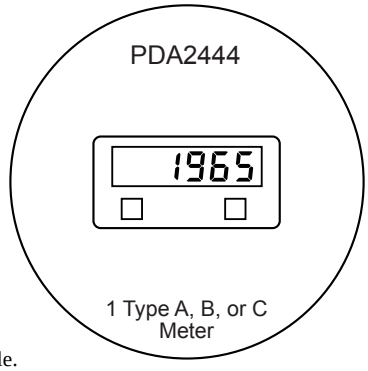
NEMA 4X ENCLOSURE DIMENSIONS

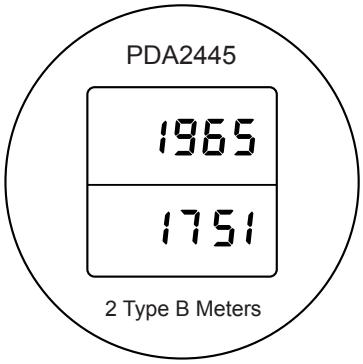


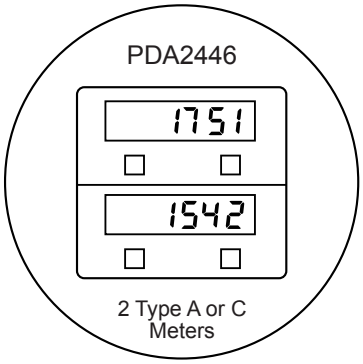




Explosion-Proof Enclosures



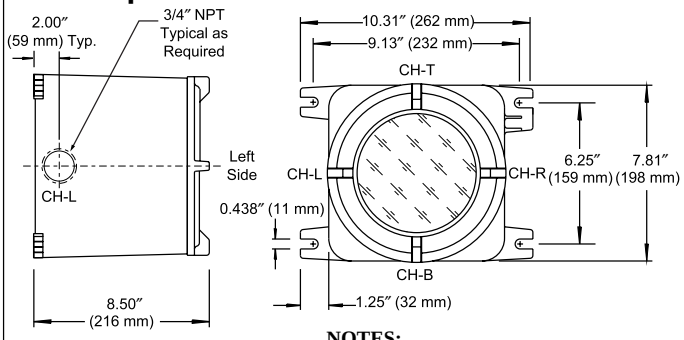




NOTES:

1. Enclosures with one 3/4∈ NPT conduit hole are standard (CH-L).
2. Enclosures with two or more conduit holes are special order. User to specify location of holes (see table). Special order enclosures are non-returnable.
3. **Type A** (e.g. PD690) meter bezel dimensions: 4.25∈ x 2.3∈ x 0.6∈ (108 mm x 59 mm x 15 mm), depth behind panel: 4.7∈ (119 mm) not including clearance for wiring.
4. **Type B** (e.g. PD682) meter bezel dimensions: 3.82∈ x 1.88∈ x 0.21∈ (97 mm x 48 mm x 5 mm), depth behind panel: 5.1∈ (130 mm) not including clearance for wiring.
5. **Type C** (e.g. PD765) meter bezel dimensions: 4.68∈ x 2.45∈ x 0.6∈ (119 mm x 62 mm x 15 mm), depth behind panel: 3.6∈ (91 mm) not including clearance for wiring.

Explosion-Proof Enclosures Dimensions



NOTES:

1. UL and C-UL Classified
2. NEMA 7 & 9, NEC Class I, Groups C & D; Class II, Groups E, F, & G; Class III
3. Weight: 17 lbs (7.7 kg)
4. Material: Cast aluminum. 0.3% max. copper content; glass window

ORDERING INFORMATION	
Model Number	**Conduit Hole Location (CH)**
PDA244(4,5, or 6)-1000	CH-L (Standard Product)
PDA244(4,5, or 6)-1010	CH-L & R
PDA244(4,5, or 6)-1110	CH-L, T, & R
PDA244(4,5, or 6)-1111	CH-L, T, R, & B
PDA244(4,5, or 6)-LTRB (A-Z)	Special (requires separate drawing & authorization form - please call)

PDA244 __ - L T R B _

- Specials (A-Z: non 3/4∈ or other than 2∈ from base)
- Number of 3/4∈ NPT holes on bottom side
- Number of 3/4∈ NPT holes on right side
- Number of 3/4∈ NPT holes on top side
- Number of 3/4∈ NPT holes on left side
- Either 4, 5, or 6 (See graphics above)

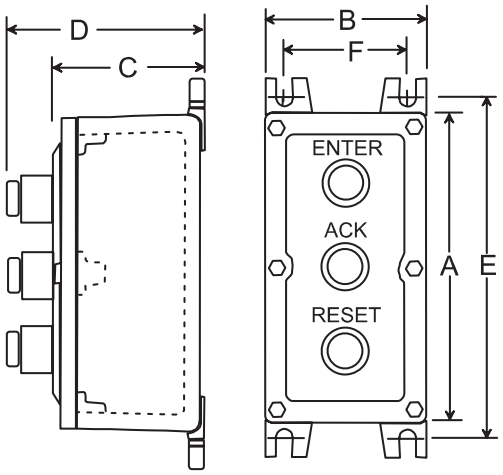
NOTES:

a. 2∈ Pipe Mounting Kit available, see page 48 for details.

b. Up to 4 conduit holes per side.

Precision Digital's Explosion-Proof Control Stations can be used with its Large Display Explosion-Proof Meters or with its digital panel meters that are mounted in explosion-proof enclosures. These separate Explosion-Proof Control Stations contain either 1, 2, or 3 switches that can be connected to terminals on Precision Digital meters to control various functions.

The ENTER button is used to program the meter. The ACK button is used to acknowledge the relays. The RESET button is used to reset the total.



NOTES:

1. UL Listed and CSA Certified
2. NEMA 7 & 9
3. NEC Class I, Groups C & D; Class II, Groups E, F & G
4. Material: Cast aluminum, 0.3% max. copper content

CLASSIFIED ENCLOSURES

WARNING - TO PREVENT IGNITION OF CLASS I GROUPS C ATMOSPHERES, ALL SIZE CONDUIT RUNS MUST HAVE A SEALING FITTING CONNECTED WITHIN 3 INCHES OF ENCLOSURE.

ATTENTION - LeSCELLEMENTS DOIT ÊNTRE INSTALLÉ Â MOINS DE 3 POUCES DU BOÎTIER.

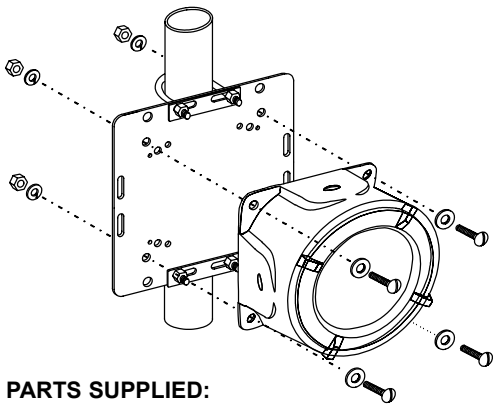
Explosion-Proof Control Stations Dimensions

Number of Switches	Dimensions in inches & (mm)						Wt lbs (Kg)	Std Cond Size
	A	B	C	D	E	F		
1	4.5 (114)	4.5 (114)	4.19 (106)	6.19 (157)	5.5 (140)	3.25 (83)	4.5 (2.0)	3/4∈
2	7.0 (178)	4.5 (114)	4.19 (106)	6.19 (157)	8.0 (203)	3.25 (83)	6.0 (2.7)	3/4∈
3	8.0 (203)	4.5 (114)	4.19 (106)	6.19 (157)	9.0 (229)	3.25 (83)	6.75 (3.1)	3/4∈
Control Stations have conduit openings centered on top and bottom.								

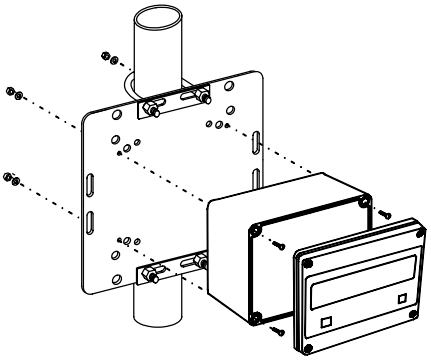
ORDERING INFORMATION		
Model	**# of Switches**	**Label**
PDA2451-E	1	ENTER
PDA2451-R	1	RESET
PDA2451-A	1	ACK
PDA2452-ER	2	ENTER & RESET
PDA2452-EA	2	ENTER & ACK
PDA2453-EAR	3	ENTER, ACK, & RESET

PDA6545 2∈ PIPE MOUNTING KIT

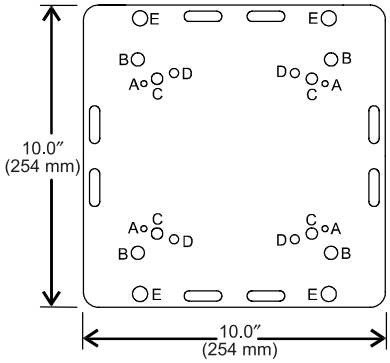
PD656, PD756 Example Shown Here



PD655, PD755 Example Shown Here



Mounting Plate Hole Pattern



PARTS SUPPLIED:

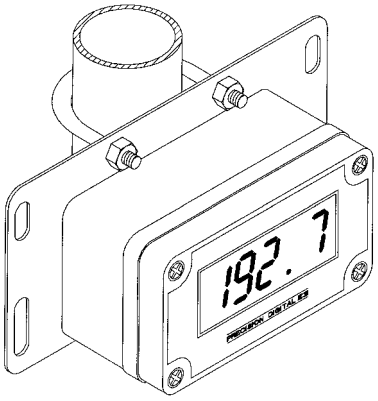
1. One mounting plate
2. Two 2∈ U-bolt kits
3. Four 5/16 - 18 x 1 1/4∈ screws
4. Four 5/16 - 18 hex nuts
5. Four 5/16∈ flat washers
6. Four 5/16∈ lockwashers
7. Four #6 - 32 x 3/4∈ screws
8. Four #6 - 32 hex nuts
9. Four #6 - 32 lockwashers

HARDWARE USAGE TABLE (Refer to PARTS SUPPLIED)

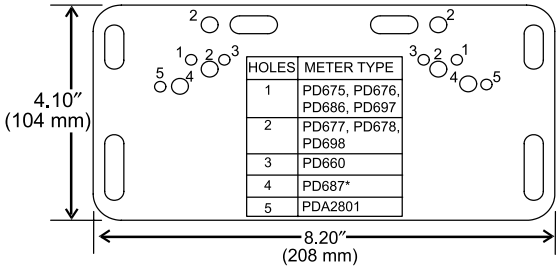
Meter Type	Holes	1.	2.	3.	4.	5.	6.	7.	8.	9.
PD655, PD755	A	X	X					X	X	X
PD656, PD756	B	X	X	X	X	X	X			
PD687*	C	X	X	X	X		X			
PDA2407, PDA2408	D	X	X	Hardware Supplied with Enclosure						
PDA2444-PDA2446	E	X	X	X	X	X	X			

***NOTE:** PDA6545 provides four mounting holes for PD687; PDA6845 provides two mounting holes.

PDA6845 2∈ PIPE MOUNTING KIT



Mounting Plate Hole Pattern



HOLES	METER TYPE
1	PD675, PD676, PD686, PD697
2	PD677, PD678, PD698
3	PD660
4	PD687*
5	PDA2801

PARTS SUPPLIED:

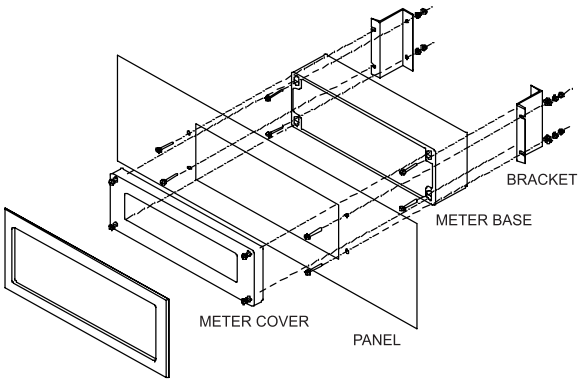
1. One mounting plate
2. One 2∈ U-bolt kit
3. Two 1/4 - 20 x 1∈ screws
4. Two 1/4 - 20 hex nuts
5. Two #6 - 32 hex nuts
6. Two #6 - 32 x 3/4∈ screws
7. Two #6 lockwashers
8. Two 1/4∈ lockwashers

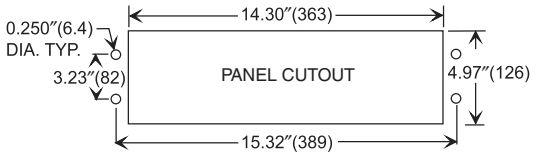
***Note:** PDA6845 provides two mounting holes for PD687; PDA6545 provides four mounting holes.

ORDERING INFORMATION

Model	Description	Mounting Holes
PDA6545	2∈ Pipe Mounting Kit Zinc Plated Steel	4
PDA6545-SS	2∈ Pipe Mounting Kit Stainless Steel	4
PDA6845	2∈ Pipe Mounting Kit Zinc Plated Steel	2
PDA6845-SS	2∈ Pipe Mounting Kit Stainless Steel	2

PDA6504 PANEL MOUNTING KIT FOR PD650 & PD757



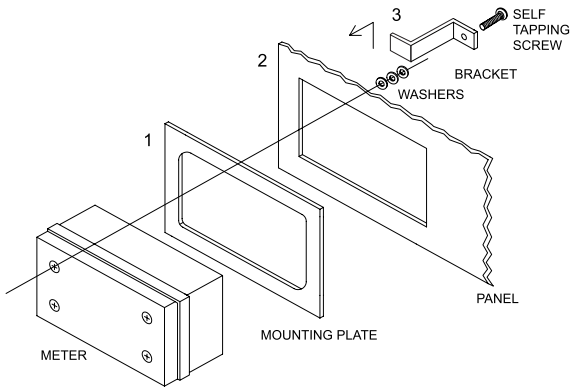


PARTS SUPPLIED:
1. Two angle brackets
2. One self-adhesive decorative bezel
3. Eight #12 - 24 x 3/4″ screws
4. Eight #12 lockwashers
5. Eight #12 - 24 hex nuts
6. Four #12 flat washers

INSTRUCTIONS:
1. Drill four holes in panel and make panel cutout as shown. Tolerance for all dimensions is ±0.01″ (0.25 mm).
2. Secure the two side mounting brackets to the meter base using the supplied hardware.
3. Mount this assembly to the rear of the panel using supplied hardware.
4. Secure the meter cover to the base.
5. Attach decorative bezel to the panel.

NOTES:
1. Allowable panel thickness: 0.06″ - 0.25″ (1.5 mm - 6.4 mm). Longer bracket screws may be used for panel thickness up to 0.5″ (12.7 mm).
2. Mounting space required: 7″ x 17.5″ x 4″ (178 mm x 445 mm x 102mm) (H x W x D). Meter cover extends 0.8″ (20 mm) - X from the surface of the panel, where X equals the thickness of the panel.
3. This panel mounting kit is not intended to provide waterproof protection to the panel.
4. All dimensions are in inches and millimeters ( ).

PDA6554, PDA6604, PDA6844 PANEL MOUNTING KITS



INSTRUCTIONS:
1. Insert the meter through the mounting plate.
2. Mount assembly on panel.
3. Secure with 4 brackets and 4 screws at corners of the meter. Use washers as needed to allow for panel thickness.

NOTES:
1. Mounting brackets require 0.8″ (20 mm) clearance on either top or side of meter for installation.
2. Tolerance for panel cutout dimensions are +.01″/Φ00″ (+.3/-.0 mm)
3. Panel mounting kits are not intended to provide waterproof protection to the panel.

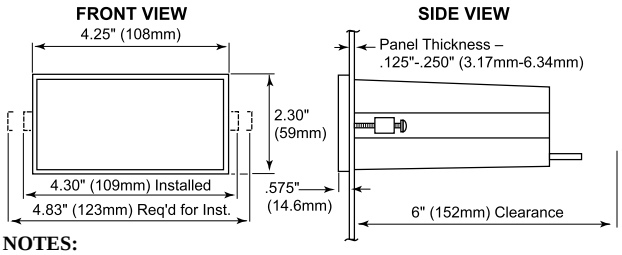
PARTS SUPPLIED:
1. One mounting plate (ABS plastic)
2. Four self tapping screws
3. Four mounting brackets
4. Twelve washers

MOUNTING KIT	PANEL CUTOUT REQUIRED	MOUNTING PLATE OVERALL DIMENSIONS	ALLOWABLE PANEL THICKNESS	METER TYPE
PDA6554	6.62″ x 5.43″ (168 x 138 mm)	7.57″ x 6.40″ x .125″ (192 x 163 x 3 mm)	.060″ - .125″ (1.5 - 3.2 mm)	PD655, PD755
PDA6604	4.25″ x 3.07″ (108 x 78 mm)	5.24″ x 4.05″ x .125″ (133 x 103 x 3 mm)		PD660
PDA6844	5.45″ x 3.08″ (138 x 78 mm)	6.43″ x 4.05″ x .125″ (163 x 103 x 3 mm)		PD675, PD676 PD686, PD697

Note: Millimeter dimensions ( ) are for reference only.

Mounting Dimensions

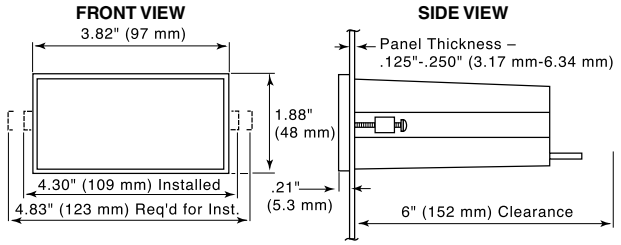
PD118, PD128, PD148, PD673, PD674, PD690-PD696, PD750-PD752



NOTES:

1. Panel cutout required: 1.772∈ x 3.622∈(45 mm x 92 mm) 1/8 DIN
2. Panel thickness: 0.125∈- 0.250" (3.17 mm - 6.34 mm)
3. Clearance: allow 6∈(152 mm) behind the panel
4. Weight: See data sheets

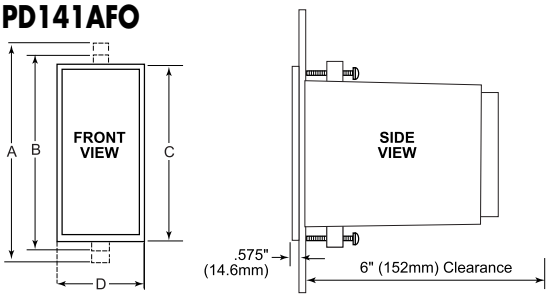
PD680, PD682



NOTES:

1. Panel cutout required: 1.772∈x 3.622∈(45 mm x 92 mm) 1/8 DIN
2. Panel thickness: 0.125∈- 0.250∈(3.17 mm - 6.34 mm)
3. Clearance: allow 6 inches (152 mm) behind the panel
4. Weight: 8 oz (227 g)

PD141AFO



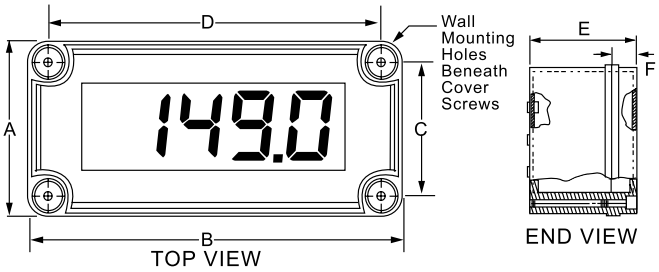
DIMENSIONS:

A: 4.83∈(123 mm) req'd for installation
B: 4.30∈(109 mm) installed
C: 4.25∈(108 mm)
D: 2.30∈(59 mm)

NOTES:

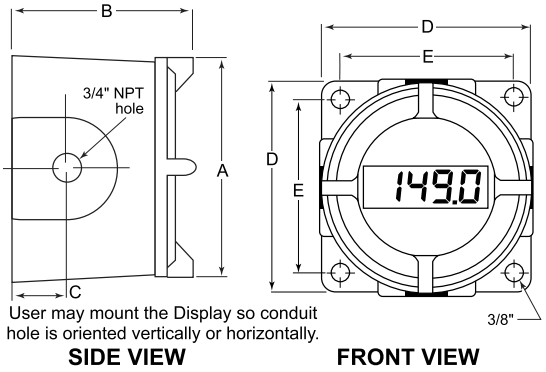
1. Panel cutout required- 3.622∈x 1.772∈(92 mm x 45 mm) 1/8 DIN
2. Panel thickness- .125∈-.250∈(3.17 mm-6.34 mm)
3. Clearance: allow 6 inches (152 mm) behind panel
4. Weight: 12 oz (340 g)

PD675, PD676, PD686, PD697



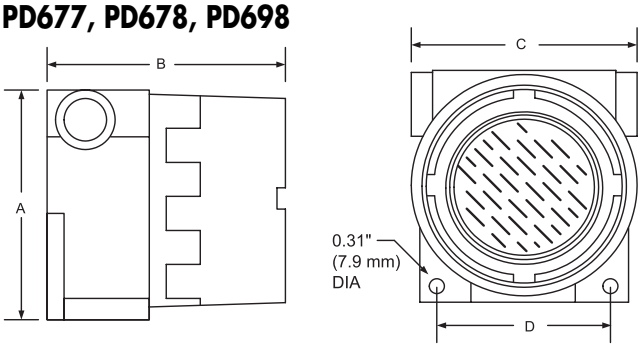
NOTES: A: 3.15∈(80 mm) D: 4.72∈(120 mm) F: 0.79∈(20 mm)
B: 5.51∈(140 mm) E: 2.56∈(65 mm) Weight: 12 oz (340 g)
C: 2.36∈(60 mm)

PD687



NOTES: A: 6.34∈(161 mm) D: 6.25∈ (159 mm)
B: 5.13∈ (130 mm) E: 5.13∈ (130 mm)
C: 1.5∈ (38 mm) Weight: 8 lb (3.64 kg)

PD677, PD678, PD698



NOTES: A: 5.63∈(143 mm) C: 5.44∈(138 mm)
B: 5.63∈(143 mm) D: 4.06∈(103 mm)
Weight: 6 lbs (2.72 kg)
FM Approved and CSA Certified enclosure

PROCESS AND TEMPERATURE METERS (LED DISPLAY)

Style	1/8 DIN Panel Meters				2.3˝ NEMA 4X		1.0˝ NEMA 4X		0.8˝ Explosion-Proof	
										
Model	**PD690**	**PD750**	**PD692**	**PD765**	**PD650**	**PD757**	**PD655**	**PD755**	**PD656**	**PD756**
Type	Process	Temperature	Process	Process & Temperature	Process	Temperature	Process	Temperature	Process	Temperature
Digit Height	0.56" (14.2mm)		0.56" (14.2mm)	0.56" (14.2mm)	2.3" (58mm)		1.0" (25.4mm)		0.8" (20.3mm)	
Input	4-20 mA 1-5 V 0-5 V 0-10 V	J,K,T,E,R,S TC 100 Ω RTD	4-20 mA 1-5 V 0-5 V 0-10 V	4-20 mA 1-5 V, 0-5 V, -10 to10 V J,K,T,E TC 100 Ω Platinum RTD	4-20 mA 1-5 V 0-5 V 0-10 V	J,K,T,E,R,S TC 100 Ω RTD	4-20 mA 1-5 V 0-5V 0-10V	J,K,T,E,R,S TC 100 Ω RTD	4-20 mA 1-5 V 0-5V 0-10V	J,K,T,E,R,S TC 100 Ω RTD
Multi-Point Linearization	11 Points	N/A	11 Points	N/A	11 Points	N/A	11 Points	N/A	11 Points	N/A
Root Extraction	Square Root	N/A	Square Root & Programmable	Square Root	Sq, Programmable	N/A	Sq, Programmable	N/A	Sq, Programmable	N/A
Display	199,99(0)	3214 °F	299,99(0)	9,999; 2300°F	299,99(0)	3214°F	299,99(0)	3214°F	299,99(0)	3214°F
Display (Total)	N/A	N/A	999,999	N/A	999,999	N/A	999,999	N/A	999,999	N/A
Max/Min Display	Not Available		Max	Max/Min	Max	Max/Min	Max	Max/Min	Max	Max/Min
Transmitter Power	24 VDC @ 20 mA (Standard)		24 VDC @ 20 mA (Standard)	24 VDC @ 200 mA (Option)	24 VDC @ 20 mA (Standard) 200 mA Unregulated (Option)		24 VDC @ 20 mA (Standard) 200 mA Unregulated (Option)		24 VDC @ 20 mA (Standard) 200 mA Unregulated (Option)	
Programming Method	Push Buttons		Push Buttons	Push Buttons Automatic Copy Computer	Push Buttons		Push Buttons		Push Buttons Magnet	
Relays (Optional)	2 or 4 (2 A SPDT)		2 or 4 (2 A SPDT)	2 (3 A SPDT)	2 or 4 (2 A SPDT)		2 or 4 (2 A SPDT)		2 or 4 (2 A SPDT)	
Relays Operation	High or Low 100% Deadband Auto & Manual Reset		High or Low 100% Deadband Auto & Manual Reset Latch & Non-Latch Auto & Manual Batch Pump Alternation	High or Low 100% Deadband Auto & Manual Reset Latch & Non-Latch Pump Alternation Time Delay	High or Low 100% Deadband Auto & Manual Reset Latch & Non-Latch Auto & Manual Batch Pump Alternation		High or Low 100% Deadband Auto & Manual Reset Latch & Non-Latch Auto & Manual Batch Pump Alternation		High or Low 100% Deadband Auto & Manual Reset Latch & Non-Latch Auto & Manual Batch Pump Alternation	
4-20 mA Output	Option		Option	Option	Option		Option		Option	
Communications	None		None	RS232, RS422, RS485	None		None		None	
Power (AC)	115 or 230 (Factory)		115 or 230 (Factory)	85-265 (Universal)	115 or 230 (Field)		115 or 230 (Field)		115 or 230 (Field)	
Power (DC)	24		24	24 & 90-265	24		24		24	
Environmental	0 to 60°C		0 to 60°C	0 to 65°C	-20 to 65°C	0 to 65°C	-20 to 65°C	0 to 65°C	-20 to 65°C	0 to 65°C
Mounting	Panel		Panel	Panel	Panel, Wall		Panel, Wall, Pipe		Wall, Pipe	
Approvals	UL & C-UL		UL & C-UL	None	None		None		None	

LOOP-POWERED METERS

Case	# of Digits	Digit Size (inches)	Voltage Drop	Input	Options	Approvals	Temperature Range (°C)	Model
 Panel Mount	3½ + 0	0.5	1.0V	Linear	N/A	None	-40 to 70°C	**PD680**
	3½ + 0	0.5	1.0V	Linear	N/A	FM	-40 to 70°C	**PD682**
	4½	0.4	5.2V	Linear	HI Alarm	None	-20 to 65°C	**PD673**
	4½	0.4	5.2V	Sq Root	HI Alarm	None	-20 to 65°C	**PD674**
 NEMA 4X	3½	0.5	1.5V	Linear	*Backlight	None	-40 to 80°C	**PD660**
	3½	1.0	1.0V	Linear	N/A	FM & CSA	-40 to 85°C	**PD686**
	4½	0.7	5.2V	Linear	HI Alarm	FM & CSA	-20 to 65°C	**PD675**
	4½	0.7	5.2V	Sq Root	HI Alarm	FM & CSA	-20 to 65°C	**PD676**
 Exp-proof	3½	0.5	1.5V	Linear	*Backlight	FM, CSA & CENELEC (-EX)	-40 to 80°C	**PD661**
	3½	1.0	1.0V	Linear	N/A	FM, CSA & CENELEC (-EX)	-40 to 80°C	**PD687**
	4½	0.7	5.2V	Linear	HI Alarm	FM, CSA & CENELEC (-EX)	-20 to 65°C	**PD677**
	4½	0.7	5.2V	Sq Root	HI Alarm	FM, CSA & CENELEC (-EX)	-20 to 65°C	**PD678**

* Voltage drop = 3.3 V with backlighting

LOOP-POWERED TOTALIZERS

Case	# of Digits	Digit Size (inches)	Voltage Drop	Input	Options	Approvals	Temperature Range (°C)	Model
 Panel Mnt	6	0.5	5.6V	Linear & Sq Rt	**Backlight	None	0 to 65°C	**PD696**
NEMA 4X	6	0.5	5.6V	Linear & Sq Rt	**Backlight	None	0 to 65°C	**PD697**
Exp-proof	6	0.5	5.6V	Linear & Sq Rt	**Backlight	FM, CSA & CENELEC (-EX)	0 to 65°C	**PD698**

**Voltage drop = 7 V with backlighting

OTHER PRECISION DIGITAL PRODUCTS

Model	Description
PD118	MINIMUX® 8 Channel Scanner
PD128	PLC Annunciator
PD141AFO	VIGILANTE® 4 Point Annunciator
PD148	AC/DC Annunciator
PD691	Strain Gauge 1/8 DIN Panel Meter
PD693	Pulse Input 1/8 DIN Panel Meter
PD694	DC Voltage Input Panel Meter
PD695	AC Voltage Input Panel Meter

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QUICK SHIPMENT PRODUCTS (QSP)

Model	Description	Power	Input	Options
PD118	MINIMUX®	115/230 VAC	Analog	None
PD128	PLC Annunciator	PLC provided	Digital	None
PD141AFO-3	VIGILANTE® Annunciator	115 VAC	Switch Logic Level	None
PD660-N	NEMA 4X Loop-Powered Meter	Loop	4-20 mA	None
PD661-N	Exp-proof Loop-Powered Meter	Loop	4-20 mA	None
PD682	1/8 DIN Loop-Powered Meter	Loop	4-20 mA	None
PD686	NEMA 4X Loop-Powered Meter	Loop	4-20 mA	None
PD690-3-N	1/8 DIN Meter	115 VAC	Process	None
PD690-3-14	1/8 DIN Meter	115 VAC	Process	2 Relays
PD690-3-15	1/8 DIN Meter	115 VAC	Process	4-20 mA Output
PD690-3-16	1/8 DIN Meter	115 VAC	Process	2 Relays & 4-20 mA Output
PD690-3-17	1/8 DIN Meter	115 VAC	Process	4 Relays
PD690-3-18	1/8 DIN Meter	115 VAC	Process	4 Relays & 4-20 mA Output
PD692-3-N	1/8 DIN Meter	115 VAC	Analog Flow	None
PD692-3-14	1/8 DIN Meter	115 VAC	Analog Flow	2 Relays
PD693-3-N	1/8 DIN Meter	115 VAC	Pulse Flow	None
PD693-3-14	1/8 DIN Meter	115 VAC	Pulse Flow	2 Relays
PD693-3-15	1/8 DIN Meter	115 VAC	Pulse Flow	4-20 mA Output
PD695-3-N	1/8 DIN Meter	115 VAC	AC Volts	None
PD750-3-N	1/8 DIN Meter	115 VAC	Temperature	None
PD750-3-14	1/8 DIN Meter	115 VAC	Temperature	2 Relays
PD750-3-15	1/8 DIN Meter	115 VAC	Temperature	4-20 mA Output
PD765-6R0-0	Trident Meter	85-265 VAC	Proc & Temp	None
PD765-6R0-1	Trident Meter	85-265 VAC	Proc & Temp	24 V Transmitter Power
PD765-6R2-0	Trident Meter	85-265 VAC	Proc & Temp	2 Relays

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