

MODEL PD686 3½ DIGIT NEMA 4X LOOP-POWERED METER



MODEL PD686



- **1 V Drop**
- **1" High Display**
- **Operates From -40 to 85°C**



APPROVED



SPECIFICATIONS

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

Input: 4-20 mA @ 30 VDC maximum

Display: 1.0" (25.4 mm) LCD, 3½ digits; 1999

Accuracy: ±0.1% FS ±1 count

Approvals: FM Approved & 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-code = T4; hazardous locations. Non-incendive for use in Class I, II, III, Division 2, Groups A, B, C, D, F, & G.

Entity Parameters: $V_{max} = 30$ V, $I_{max} = 175$ mA,

$C_i = 0$ μ F, $L_i = 0$ μ H, $P_i = 1.3$ W

FM Approved: Intrinsically Safe, Class I Zone 0

See Control Drawing LIM686-2 for complete installation instructions.

Decimal Point: User selectable

Calibration: Two-step; non-interacting zero and span

Calibration Range: 4 mA input: -1000 to +1000;
20 mA input: between 20 and 2000 counts > 4 mA display

Display Update Rate: 2.5/second

Maximum Input Current: 30 mA

Maximum Voltage Drop: 1 V @ 20 mA

Operating Temperature: PD686: -40 to 85°C
for Canadian installations -40 to 40°C.

Storage Temperature: -40 to 85°C

Relative Humidity: 0 to 90% non-condensing

Enclosure: Impact-resistant glass filled polycarbonate body, color: gray; impact-resistant clear polycarbonate cover; NEMA 4X, IP67

Connections: Removable screw terminals accept 12 to 26 AWG

Conduit Hole: One ½" conduit hole provided; refer to Ordering Information to specify conduit hole location; request models with rear conduit hole (-X) for panel mounting applications.

Weight: 12 oz (340 g)

Warranty: 2 years parts & labor

ORDERING INFORMATION

PD686 NEMA 4X Loop-Powered Meter		
Model	Description	½" Conduit Hole Location
PD686*	FM Approved & CSA Certified	Bottom
PD686-X	FM Approved & CSA Certified	Rear
PD686-Y	FM Approved & CSA Certified	Top
PD686-Z	FM Approved & CSA Certified	None

* Quick Shipment Product, shipped within 2 working days

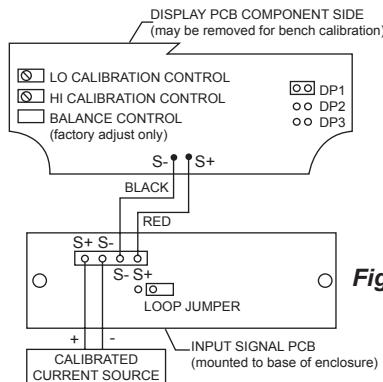
Accessories	
Model	Description
PDA6844	Panel Mount Kit (does not provide NEMA 4X seal to panel)
PDA6845	2" Pipe Mounting Kit (zinc plated steel)
PDA6845-SS	2" Pipe Mounting Kit (stainless steel)

Your Local Distributor is:

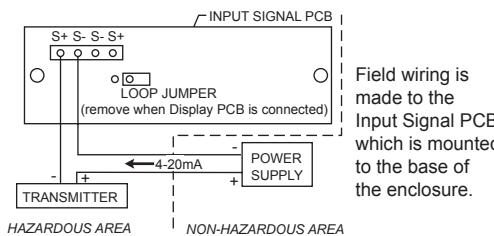
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MODEL PD686 3½ DIGIT NEMA 4X LOOP-POWERED METER

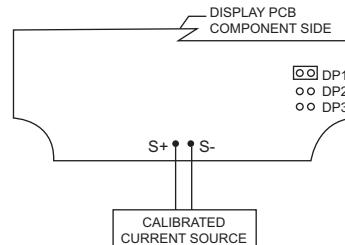
Calibrator Connected to Input Signal PCB



Control loop Connected to Input Signal PCB



Calibrator Connected to Display PCB



The Display PCB may be removed from the enclosure for bench calibration. Loop Jumper must be installed on Input Signal PCB to maintain loop, refer to procedures below.

Note: To maintain hazardous area protection, the input signal must always be connected to the Input Signal PCB, and not directly to the Display PCB.

Warning: Electrostatic hazard. Clean only with a moist cloth. Protect enclosure from exposure to chemical solvents and excessive ultraviolet (UV) light (e.g. sunlight).

NOTE 1: If any of the following operations are performed in the hazardous area, all appropriate hazardous area procedures must be followed.

NOTE 2: To prevent damage to electronic components caused by electrostatic discharge, a grounding strap should be worn when servicing the display.

SETUP

The only tools needed for calibration are a calibrated current source and a screwdriver.

Calibration Connections

To access the input terminals it is necessary to remove the enclosure cover and the Display PCB. This is done by loosening the four screws on the enclosure cover and removing the cover. Completely loosen the left screw that holds the Display PCB to the enclosure and loosen the right screw about four turns so the Display PCB remains attached to the enclosure. Rotate the Display PCB 90° to gain access to the Input Signal PCB. Next, connect a calibrated current source per Figure 1.

Decimal Point Selection

The decimal point jumper array is located in the lower right corner of the Display PCB next to the display. It is labeled DP1, DP2, DP3. Place a jumper over both pins of DP1 for a display of 199.9, DP2 for 19.99, or DP3 for 1.999.

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.

Installation

Installation of the meter involves removing the Display PCB from its enclosure and connecting a 1/2" conduit fitting to the hole provided. Refer to PD686 FM Approved & CSA Certified Loop-Powered Meter Intrinsic Safety Barrier Connections diagrams (LIM686-2) for further details. Wall mounting holes are located in each corner of the enclosure (see Figure 4).

Loop Connections

Disconnect power to the loop and install the meter as illustrated in Figure 2 and the PD686 FM Approved & CSA Certified Loop-Powered Meter Intrinsic Safety Barrier Connections diagrams (LIM686-2) supplied with the instrument. Replace the enclosure cover.

Removing Display PCB From the Loop

The Display PCB and Input Signal PCB are connected together with one black and one red wire. The wires are soldered to the Display PCB and connected to a screw terminal connector on the Input Signal PCB.

To remove Display PCB:

1. Loosen the four screws on the enclosure cover and remove the cover from the enclosure base.

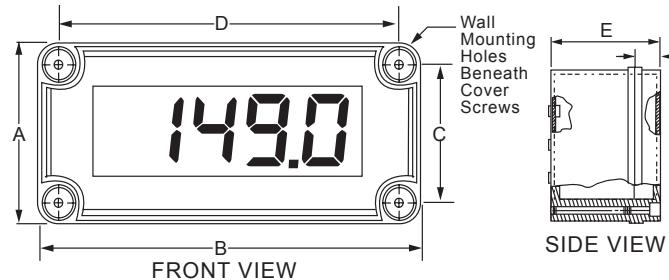
2. Completely loosen the left-side screw holding the Display PCB to the enclosure and loosen the right-side screw four turns so the Display PCB remains secure to the enclosure.
3. Rotate the Display PCB 90° to gain access to the Input Signal PCB.
4. Install Loop Jumper over both pins to bypass Display PCB and allow the signal to flow through the Loop Jumper. The display turns off when jumper is installed.
5. Disconnect the black and red signal wires from the screw terminal connector.
6. Loosen completely the right-side screw and lift Display PCB from enclosure. Care should be taken to prevent static electricity from damaging the electronic circuitry.
7. Restore enclosure cover to the base to prevent contamination of components.

Restoring Display PCB to the Loop

1. Remove enclosure cover as described above in step 1.
2. Secure Display PCB to enclosure using right-side screw; do not tighten screw to allow rotation of Display PCB while accessing Input Signal PCB.
3. Connect red wire to S+ terminal and black wire to S- terminal, as shown in Figure 1.
4. Remove Loop Jumper to allow the signal to flow through Display PCB (save push-on jumper by placing over one pin only).
5. Tighten screws holding Display PCB and install enclosure cover.

Servicing Display PCB Outside the Loop

Two modes of input signal allow the user to remove the Display PCB for service without interrupting the loop as indicated above and operate the Display PCB at another location in a non-hazardous area. The loop remains connected to the Input Signal PCB while the Display PCB is absent for service. The user may operate the Display PCB at another location by connecting a signal to "S+" and "S-" wires on the Display PCB. Refer to Figure 3.



Dimensions and Wall Mounting Information

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