5 DIGIT LOOP-POWERED PANEL METERS
WITH LOOP-POWERED BACKLIGHT

Model PD683 General Purpose
Model PD688 Hazardous Area

Loop Leader™ Series

• 4-20 mA Input
• 5 Digit LCD, 0.6” (15.2 mm) High
• FM Type 4X, IP65 Front
• Shallow Depth Case 3.2” Behind Panel
• 2 V Drop (5.7 V with Backlight)
• Loop-Powered Backlight Standard
• Custom Engineering Units & Bargraph
• Linear, Square Root, or Programmable Exponent
• Maximum & Minimum Display
• Operating Temperature Range -30 to 65°C
• Intrinsically Safe & Non-Incendive
• HART Protocol Transparent

Precision Digital Corporation
www.predig.com
KEY FEATURES
Through significant innovation in technology and design, we developed the Loop Leader™ Series of loop-powered indicators, which are loaded with standard features and built for tough industrial environments.

Full Featured
There’s nothing stripped down or bare bones about these indicators; they’re designed for demanding process control applications. Standard features include a full 5 digit backlit display with bargraph, on-screen custom engineering units, and max/min display capabilities.

Install Just About Anywhere
Indoors, outdoors, bright sunlight, dimly lit plant, wet, dirty, hot or cold- these indicators go just about anywhere. Their shallow-depth case, FM Type 4X front, loop-powered backlighting, and wide operating temperature range are all standard features. And the PD688 with its FM Approval and CSA Certification can be installed in just about any hazardous location.

4-20 mA Input Connections

Wiring with Backlight

![Wiring Diagram with Backlight](image1)

Wiring without Backlight

![Wiring Diagram without Backlight](image2)

Square Root Function
The square root extraction feature displays flow rate by extracting the square root from a differential pressure transmitter signal. The user selectable low-flow cutoff feature gives a reading of zero when the flow rate drops below a user selectable value.

- Displays Flow Rate
- User Selectable Low-Flow Cutoff
- Only 2 Calibration Points Required

Programmable Exponent
The programmable exponent function is used to linearize the level signal in open channel flow applications using weirs and flumes and display flow rate in engineering units.
**SETUP & PROGRAMMING**

**Easy Setup**
Even with all the features packed into these meters, they’re still easy to setup and get running. Everything is programmed from the front panel buttons with no pots or jumpers to deal with. In fact, these meters can be scaled without a signal source for even quicker setup.

**Main Menu**

```
Main Menu

Run Mode
92846  Set UP Pr oG PASS

Advanced Features Menu
To simplify the setup process, functions not needed for most applications are located in the Advanced Features menu. Press and hold the Menu button for five seconds to access the advanced features of the meter.
```

**PD688 Intrinsically Safe Wiring**
Installation must be performed in accordance with Control Drawing LIM688-2.

**Loop Input with Backlight**

```
HAZARDOUS AREA
\[ S+ S- B+ B- \]

Loop Input

NON-HAZARDOUS AREA
\[ <1 \text{ohm to Ground} \]

I.S. Barrier

I.S. GROUND

Transmitter
```

**Loop Input without Backlight**

```
HAZARDOUS AREA
\[ S+ S- B+ B- \]

Loop Input

NON-HAZARDOUS AREA
\[ <1 \text{ohm to Ground} \]

I.S. Barrier

I.S. GROUND

Transmitter
```

**OPTIONAL ENCLOSURES**

PDA2801 low-cost NEMA 4X enclosure for one PD683 meter

NEMA 4X enclosures are available in plastic, steel, & stainless steel for one to six PD683 meters

Go to www.predig.com for complete details

**INSTALLATION**
There is no need to remove the meter from its case to complete the installation, wiring, and setup of the meter.

**Mounting Dimensions**

Units: Inch (mm)

Notes:
1. Panel cutout required: 3.622 x 1.772 (92 x 45)
2. Panel thickness: 0.040 – 0.250 (1.0 – 6.4)
3. Mounting brackets lock in place for easy mounting
**SPECIFICATIONS**

**General**

**Display:** 5 digit LCD (-99999 to 99999), 0.60” (15.2 mm) high, 7-segment, automatic lead zero blanking.

**Engineering Units:** 0.25” (6.4 mm) high, 14-segment

**Bargraph:** 20-segment, 0-100% indication

**Trend Arrows:** Up and down trend indication

**Backlight:** Bright orange LED (intensity varies with signal)

**Front Panel:** FM Type 4X, IP65; panel gasket provided

**Display Update Rate:** 2.5/second

**Overrange:** Display flashes 99999

**Underrange:** Display flashes -99999

**Programming Method:** Four front panel buttons

**Noise Filter:** Programmable from 1 to 199

**Recalibration:** Recommended at least every 12 months

**Max/Min Display:** Max/min readings reached by the process are stored until reset by the user or until power to the meter is turned off.

**Password:** Programmable password restricts modification of programmed settings.

**Non-Volatile Memory:** All programmed settings are stored in non-volatile memory for a minimum of ten years if power is lost.

**Voltage Drop:** 2.0 V max w/o backlight, 5.7 V max with backlight

**Equivalent Resistance:** 125 Ω @ 20 mA without backlight, 315 Ω @ 20 mA with backlight.

**Normal Mode Rejection:** 64 dB at 50/60 Hz

**Operating Temperature Range:** -30 to 65°C

**Allowable Temperature Range:** -40 to 85°C* (see note below)

**Storage Temperature Range:** -40 to 85°C

**Relative Humidity:** 0 to 90% non-condensing

**Connections:** Screw terminals accept 12 to 22 AWG wire

**Enclosure:** 1/8 DIN, high impact plastic, UL 94V-0, color: gray

**Mounting:** 1/8 DIN panel cutout required. Two panel mounting bracket assemblies provided.

**Tightening Torque:** 4.5 lb-in (0.5 Nm) Screw terminal connectors

**Overall Dimensions:** 4.68” x 2.45” x 3.79” (119 x 62 x 96 mm)

**Weight:** 5.7 oz (162 g)

**Warranty:** 3 years parts and labor

**Extended Warranty:** 1 or 2 years, refer to Price List for details

* Below -30°C the LCD becomes less readable. See application note AN-1005.

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**Input**

**Input Range:** 4-20 mA

**Accuracy:** ±0.03% of span ±1 count, square root and programmable exponent: 10-100% FS

**Calibration:** Scale without signal or calibrate with signal source

**Calibration Range:** User programmable over entire range of meter

**Minimum Span:** 0.40 mA between input 1 and input 2

**Note:** An Error message will appear if input 1 and input 2 signals are too close together.

**Input Overload:** Over current protection to 2 A maximum

**Decimal Point:** Up to 4 places (d.ddd, d.ddd, d.ddd, dddd.d, or ddddd)

**Function:** Linear, square root, or programmable exponent

**Low-Flow Cutoff:** -99999 to 99999 (-99999 disables cutoff function)

**Temperature Drift:** 50 PPM/°C from -40 to 65°C ambient

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**PD688 Approvals for Hazardous Locations**

FM Approved & CSA Certified as intrinsically safe with entity for use in Class I, Div 1, Groups A-B-C-D; Class II, Div 1, Groups E-F-G; Class III, Div 1; Class I, Zone 0, Group IIC; T-code = T4.

Non-incendive: Suitable for use in Class I, Div 2, Groups ABCD; Class II, Div 2, Groups FG; Class III, Div 2.

**Entity Parameters:**

- **U:** 30 V
- **I:** 175 mA
- **C:** 0
- **L:** 0
- **P:** 1.0 W

**Note:** Installation must be performed in accordance with Control Drawing LIM688-2

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**ORDERING INFORMATION**

**Model** | **Description** | **Meters** | **Description** | **Mounting**
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PD683-0K0 | Loop Leader™ PIH | Panel Meter for Safe Area
PD688-0K0 | Loop Leader™ PIH | Panel Meter FM & CSA

**Enclosures**

**Model** | **Meters** | **Description** | **Mounting**
--- | --- | --- | ---
PDA24XX | 1 - 4 * | Plastic NEMA 4X
| | | Inside Cover
PDA26XX | 1 - 6 * | Stainless Steel NEMA 4X
| | | Through Door
PDA27XX | 1 - 6 * | Steel NEMA 4X
| | | Through Door
PDA2801 | 1 | Low-cost NEMA 4X
| | | Through Cover

**Note:** XX = the last two digits of the model number.

* Go to [www.predig.com](http://www.predig.com) to find individual model numbers

**Services**

**Model** | **Description**
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PDN-CAL | 2-Point Calibration
PDN-CERTCAL | Certificate of Calibration
PDN-CERTCAL2 | Certificate of Calibration with Data
PDN-LTICAL | Lifetime Annual Recertification (shipped back same day)
PDN-LTICAL2 | Lifetime Annual Recertification (shipped back next day)
PDN-LTICAL5 | Lifetime Annual Recertification (shipped back within 5 days)
PDN-CERTCON | Certificate of Conformance
PDN-CSETUP | Custom Setup
PDN-ONEWAYTN | One-Day Turnaround Service
PDN-EXTWRNTY1-0 | Extended Warranty 1 Year
PDN-EXTWRNTY2-0 | Extended Warranty 2 Years

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**LDS688_D** 11/06

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**YOUR LOCAL DISTRIBUTOR IS:**

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