PD6928 Hazardous Area Loop-Powered Totalizer
Quick Start Guide

This quick start guide briefly describes some of the common setup procedures for this totalizer. The totalizer is programmed using four easy to access front panel buttons.

For additional information about this totalizer not covered in this quick start guide, please consult the instruction manual available at www.predig.com.

Front Panel Buttons Operation

Button Symbol	Description
MENU	Press to enter or exit Programming Mode, view settings, or exit max/min readings
F1 RESET	Press to display max/min readings.
F2 MAX	Press to reset max/min readings.
F3 ENTER	Press to acknowledge all manually resettable relays or open collectors. Press to lock/unlock the display value after pressing the F1 key.

⚠ CAUTION
- Read complete instructions prior to installation and operation of the meter.
- Avoid touching more than one button at a time, otherwise the buttons become unresponsive and enter into a self-calibrating routine. This is indicated by the flashing hand symbol:

⚠ WARNINGS
- This product is not recommended for life support applications or applications where malfunctioning could result in personal injury or property loss. Anyone using this product for such applications does so at his/her own risk. Precision Digital Corporation shall not be held liable for damages resulting from such improper use.
- Failure to follow installation guidelines could result in death or serious injury. Make sure only qualified personnel perform the installation.
- For Explosion-Proof / Dust-Ignition Proof / Flame-Proof applications, never remove the meter cover in explosive environments when the circuit is live.
- Cover must be fully engaged to meet for Explosion-Proof / Dust-Ignition Proof / Flame-Proof requirements.
- Hazardous voltages exist within enclosure. Installation and service should be performed only by trained service personnel.
- Service requiring replacement of internal components must be performed at the factory.
- Control room equipment must not use or generate more than 250 VRMS or VDC.
- Hazardous location installation instructions for associated apparatus (barrier) must be followed when installing this equipment.
- For safe installation of an ATEX approved transmitter in series with PD6928 loop-powered flow rate/totalizers, the hazardous location installation instructions for the transmitter, PD6928 loop-powered flow rate/totalizer, and associated apparatus (barrier) must be compatible.
- PD6928 loop-powered flow rate/totalizers do not add capacitance or inductance to the loop under normal or fault conditions.
- Substitution of components may impair hazardous location safety.
- Equipment contains non-metallic materials and therefore special care and consideration should be made to the performance of these materials with respect to chemicals which may be present in a hazardous environment.

⚠ WARNING
Cancer and Reproductive Harm
www.P65Warnings.ca.gov

Program Meter with MeterView XL Software

The fastest and easiest way to program the totalizer is using the free Meterview XL programming software. This software greatly simplifies the programming process and allows the user to save configuration files for later use.

The totalizer connects to the PC via a provided micro-USB cable and is powered by the USB connection, so no additional power is needed during programming.

To download the latest MeterView XL programming software and manual, please visit predig.com/meterviewxl.

⚠ WARNING
- The totalizer should only be connected to a computer while it is located in a safe area.

⚠ CAUTION
- Care should be exercised to avoid ground loops when connecting the USB to an active loop (e.g. power supply, transmitter, loop-powered meter, etc.). It is recommended to connect the (mA+) terminal of the meter to the (-) terminal of a two-wire transmitter and the (mA-) to the (+) of the next device in the loop or to the (-) terminal of the power supply.

Installation

To access the connectors, remove the enclosure cover and unclip the display module by pulling it from the enclosure. The display module may be disconnected from the options module to facilitate wiring to the options module.

Refer to Control Drawing (DW2636 - Contained within the LIM6928-2) for details related to intrinsically safe field wiring.

⚠ WARNING
Explosion-Proof / Dust-Ignition Proof / Flame-Proof
- Disconnect from supply before opening enclosure. Keep cover tight while circuits are live. Conduit seals must be installed within 18" (450mm) of the enclosure.

Unpacking

Remove the meter from box. Inspect the packaging and contents for damage. Report damages, if any, to the carrier. If any part is missing or the meter malfunctions, please contact your supplier or the factory for assistance.

Mounting

The meter has a slotted mounting flange that may be used for pipe mounting or wall mounting. Alternatively, the unit may be supported by the conduit using the conduit holes provided. Refer to Figure 1 and Figure 2.

⚠ WARNING
- Do not attempt to loosen or remove flange bolts while the meter is in service.

Cover Jam Screw

The cover jam screw should be properly installed once the meter has been wired and tested in a safe environment. The cover jam screw is intended to prevent the removal of the meter cover in a hazardous environment without the use of tools. Using a M2 hex wrench, turn the screw clockwise until the screw contacts the enclosure base. Turn the screw an additional ¼ to ½ turn to secure the cover.

⚠ CAUTION
- Excess torque may damage the threads, screw head, and wrench.

Dimensions

All units: inches (mm)

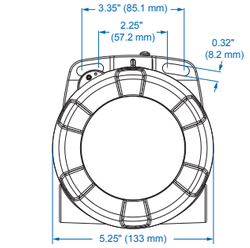


Figure 1. Enclosure Dimensions - Front View

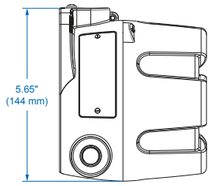


Figure 2. Enclosure Dimensions - Side View

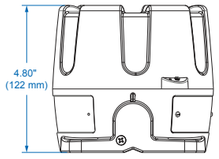


Figure 3. Enclosure Dimensions - Top View

Wiring Diagrams

⚠ IMPORTANT
- Refer to Control Drawing (DW2636 - Contained within the LIM6928-2) for details related to intrinsically safe field wiring.

Current Loop (4-20) mA Connections

Signal connections are made to a three-terminal connector (see *Connectors Labeling*). The meter and the backlight are powered by the 4-20 mA current loop.

There are no switches or jumpers to set up for the input. Setup and programming are performed through the CapTouch buttons or PC-based software.

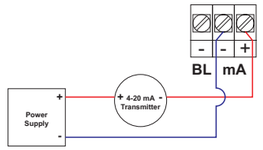


Figure 8. 4-20 mA Input Connection without Backlight

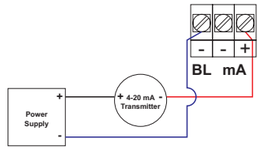


Figure 9. 4-20 mA Input Connection with Backlight

The current input is protected against current overload up to 1 amp. The display may or may not show a fault condition depending on the nature of the overload.

Digital Input Connections

A digital input is standard on the meter. This digital input is connected with a normally open contact across DI+ and DI-, or with an active low signal applied to DI+ and DI-.

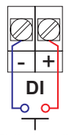
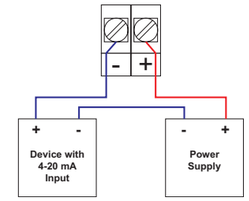


Figure 10. Digital Input Connections

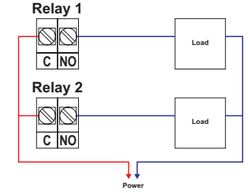
4-20 mA Output Connections

Connections for the 4-20 mA transmitter output are made to the connector terminals labeled 4-20 mA Output on Figures 6 and 7. The 4-20 mA output must be powered from an external power supply.



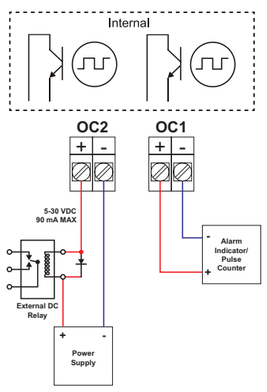
Solid-State Relay Connections

Relay connections are made to two-terminal connectors. Each relay's C terminal is common only to the normally open (NO) contact of the corresponding relay.



Open Collector Output Connections

Open collector output 1 and 2 connections are made to terminals labeled OC1 and OC2. Connect the alarm or pulse input device as shown below.



Setup and Programming

The meter is factory calibrated prior to shipment to display 0.00 to 100.00, which corresponds to the 4-20 mA input. The calibration equipment is traceable to NIST standards.

Overview

There are no jumpers to set; setup and programming is done through the CapTouch buttons or the free MeterView XL PC based software.

The meter may be powered via the micro-USB connection located on the display module for the purpose of programming only. The backlight will not work while the meter is powered via the USB connection.

⚠ IMPORTANT
- CapTouch buttons will not work if two or more buttons are detected as being pressed simultaneously. Be careful to avoid triggering multiple buttons or reaching across one button location to press another.

CapTouch Buttons

The meter is equipped with four capacitive sensors that operate as through-glass buttons so that it can be programmed and operated without removing the cover.

These buttons can be turned off for security by selecting the *Off* setting on the switch located on the side of the display module, close to the Menu button.

To actuate a button, press one finger to the window directly over the marked button area. When the cover is removed, the CapTouch buttons can be used after the meter completes a self-calibrating routine (hand symbol flashes). The sensors are disabled when more than one button is pressed, and they will automatically re-enable after a few seconds (hand symbol off).

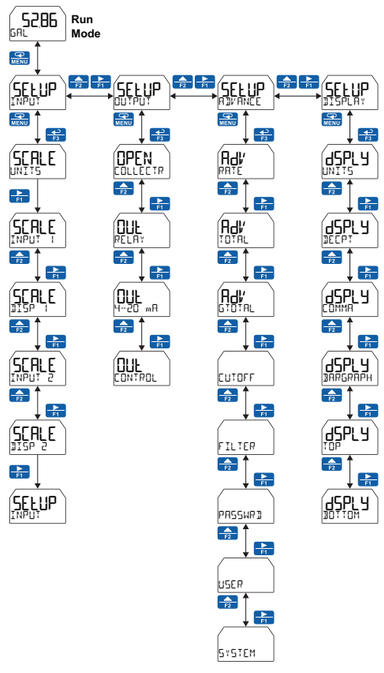
Buttons and Display

MENU RIGHT/F1 UP/F2 ENTER/F3

Main Menu

The main menu consists of all the meter's programmable functions: *Input*, *Output*, *Advanced*, and *Display*.

- Press ***Menu*** button to enter *Programming Mode* then press the ***Right-Arrow*** button to move forward through the menu and the ***Up-Arrow*** button to move back.
- Press ***Menu*** at any time to go back one level or press & hold to exit and return to *Run Mode*. Changes made to settings prior to pressing ***Enter*** are not saved.
- Changes to the settings are saved to memory only after pressing ***Enter/F3*** to confirm the setting or pressing ***Enter/F3*** at the SAVE? screen when available.



Connections

To access the connectors, remove the enclosure cover and unclip the display module by pulling it from the enclosure. Signal, backlight, open collector, and digital input connections are made to removable connectors on the display module. Relays and 4-20 mA output connections (if installed) are made to removable connectors on the options module mounted in the base of the enclosure. The display module may be disconnected from the options module to facilitate wiring to the options module. Grounding connections are made to the two ground screws provided on the base of the enclosure, one internal and one external.

⚠ WARNING
- Observe all safety regulations. Electrical wiring should be performed in accordance with all agency requirements and applicable national, state, and local codes to prevent damage to the meter and ensure personnel safety.
- Static electricity can damage sensitive components.
- Observe safe handling precautions for static-sensitive components.
- Use proper grounding procedures/codes.
- If the meter is installed in a high voltage environment and a fault or installation error occurs, high voltage may be present on any lead or terminal.

Connectors Labeling

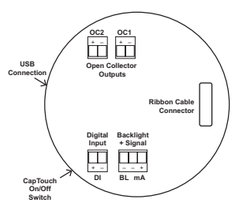


Figure 4. Connector Labeling for PD6928-HA-##-LNN

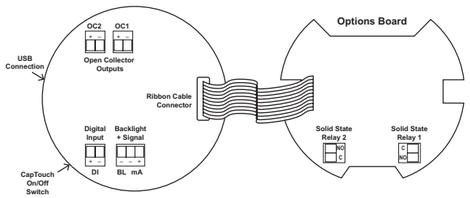


Figure 5. Connector Labeling for PD6928-HA-##-L2N

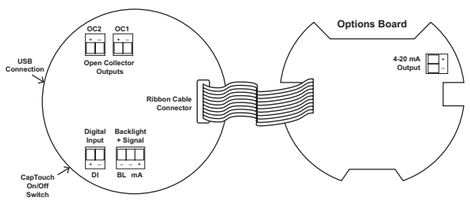


Figure 6. Connector Labeling for PD6928-HA-##-L3N

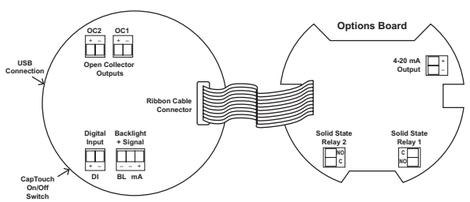


Figure 7. Connector Labeling for PD6928-HA-##-L5N

PD6928 Hazardous Area Loop-Powered Totalizer

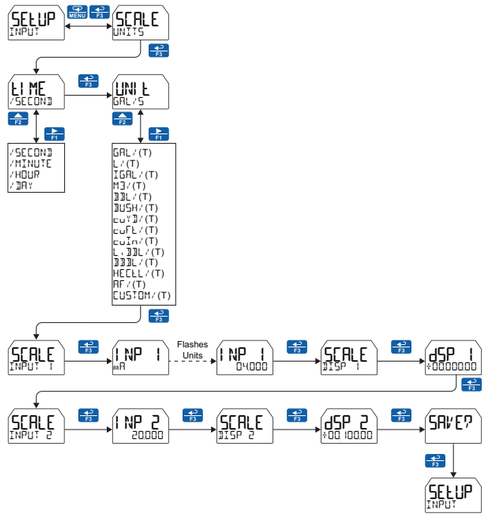
Quick Start Guide *Continued*

Scaling the 4-20 mA Input

It is **very important** to read the following information before proceeding to program the meter:

- The meter is factory calibrated prior to shipment to display 0.00 to 100.00 gal/sec, which corresponds to the 4-20 mA input. The calibration equipment is traceable to NIST standards.
- A calibrated signal source is not needed to scale the meter.

Enter the *Input* menu to scale the meter to display the 4-20 mA input. The input can accept any signal from 4 to 20 mA.



Available Engineering Units

The meter has preprogrammed rate and time base units. The following are the available units to choose from:

IMPORTANT

- For access to additional predefined units, you must disable the totalizer.

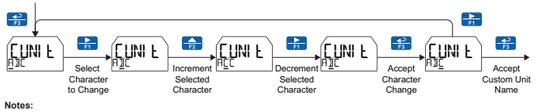
Rate Time Bases (TIME)	
/SECOND	Units per second
/MINUTE	Units per minute
/HOUR	Units per hour
/DAY	Units per day

Rate Units (RATE)	
L/(T)	Liters per time unit (T)
IGAL/(T)	Imperial gallons per time unit (T)
M3/(T)	Cubic meters per time unit (T)
BBL/(T)	Barrels per time unit (T)
BUSH/(T)	Bushels per time unit (T)
CUYD/(T)	Cubic Yards per time unit (T)
CUFL/(T)	Cubic Feet per time unit (T)
CUIN/(T)	Cubic Inches per time unit (T)
L.BBL/(T)	Liquid barrels per time unit (T)
BBBL/(T)	Beer barrels per time unit (T)
HCCLL/(T)	Hectoliter per time unit (T)
AF/(T)	Acre-Foot per time unit (T)
CUSTOM/	Custom unit per time unit (T)

Setting Custom Units

When the desired unit class or unit of measure within a class is not available, a custom unit may be programmed. Select the *Custom* menu (or CUSTOM unit within a unit class) to enter a custom unit name.

Text values are set using the ***Right*** and ***Up-Arrow*** buttons. Press ***Right-Arrow*** to select next character and ***Up-Arrow*** to increment character value. The selected character will flash. Press and hold the ***Up*** or ***Right-Arrow*** buttons to auto-increment or decrement the character. Press ***Enter*** to accept the character.

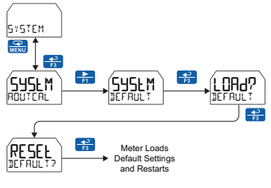


Notes:

- Press and hold the ***Right-Arrow*** while no character is being edited to erase all characters to the right of the flashing character
- Press and hold ***Up*** or ***Right-Arrow*** to auto-increment or decrement a selected character.
- All text values, including tags and alarm messages, are set in a similar fashion.

Reset Meter to Factory Defaults

When the parameters have been changed in a way that is difficult to determine what's happening, it might be better to start the setup process from the factory defaults. This can be accomplished using MeterView XL software or with the CapTouch buttons.

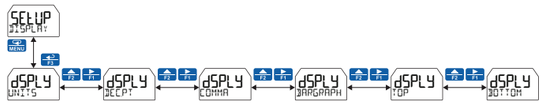


Instructions to load factory defaults:

1. Press the ***Menu*** button to enter *Programming Mode*.
2. Press the ***Right-Arrow*** button twice and press ***Enter*** to access the *Advanced* menu.
3. Press the ***Up-Arrow*** button and press ***Enter*** to access the *System* menu.
4. Press the ***Right-Arrow*** button and press ***Enter*** to access the *Default* menu.
5. Press ***Enter*** twice in quick succession. The meter will load default settings and restart.

Setting the Display Features

The meter's display functions may be programmed using the *Display* menu. This menu consists of the following submenus: *Units, Decimal Point, Comma, Bargraph, Top,* and *Bottom*.



Changing the Engineering Units

It is possible to change the engineering units within the selected unit class without the need to re-scale the meter. When selecting a new unit from within the *Display* menu (e.g. changing from gallons (GAL) to liters (L)), the meter will automatically convert the display values to display the new unit. Enter the *Units* menu, select a new unit of measure from the list of predefined units, and press the ***Enter*** button. If entering a custom unit (CUSTOM), a custom conversion factor will need to be entered.

Changing the Decimal Point

The decimal point may be set with up to seven decimal places or with no decimal point at all. Pressing the ***Right-Arrow*** moves the decimal point one place to the right until no decimal point is displayed, and then it moves to the left most position. Pressing the ***Up-Arrow*** moves the decimal point one place to the left.

Configuring the Display (TOP and BOTTOM)

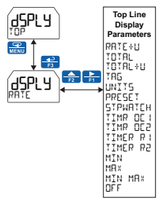
The display is configured using the *Top* and *Bottom* menus in the *Display* menu. If the totalizer is disabled and PV2 is enabled, additional options will be available for displaying the second PV on the bottom display.

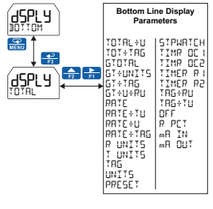
The top display (TOP) can display:

- Rate
- Rate and its units alternating
- Total
- Total and its units alternating
- Grand Total
- Tag
- Units
- Preset batch value
- Stopwatch
- Open Collector 1 or 2 Timer
- Relay 1 or 2 Timer
- Minimum Value, Maximum Value, or Both
- Off (Blank)

The bottom display (BOTTOM) can display:

- Total (with units or tag alternating)
- Total, its units, and the rate units alternating
- Grand total (with units or tag alternating)
- Grand total, units, and rate units alternating
- Rate (with units or tag alternating)
- Rate and the total's units alternating
- Rate or total units
- Tag
- Units
- Preset batch value
- Stopwatch
- Open Collector 1 or 2 Timer
- Relay 1 or 2 Timer
- Tag and rate units alternating
- Tag and total units alternating
- Off (Blank)
- Rate's percentage of max scale
- mA input value
- mA output value

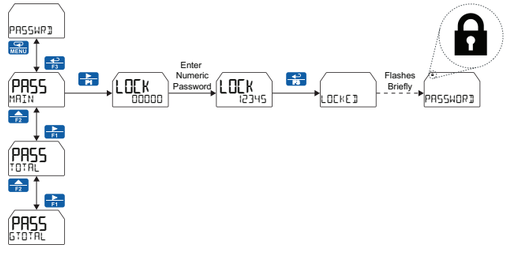




Enabling Password Protection

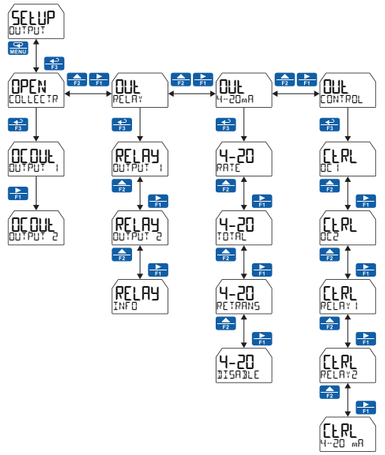
The Password menu is used for programming security to prevent unauthorized changes to the programmed parameter settings or undesired resetting of the total or grand total. There are three separate passwords available that can be set independently of each other: *Main*, *Total*, and *Grand Total*. The *Main*, *Total*, and *Grand Total* passwords prevent access to the meter *Programming Mode*. *Total* and *Grand Total* passwords prevent resetting of the total and grand total, respectively.

To set a password, enter the *Password* menu and program a five-digit password. When a password has been enabled, the lock icon will display in the upper-left side of the display.



Programming the Outputs

All models come with two open collectors. Depending on the model purchased, the meter may include two solid-state relays, and one 4-20 mA output. The *Output* menu will only show options for the available outputs.



Open Collector Outputs

The meter is equipped with two NPN open collector outputs that may be set up for pulse outputs, alarms, timed pulses, total reset, or disabled.

Pulse outputs can be set to transmit the rate, total, or grand total. Output 2 may be used to generate a quadrature output based on the other open collector output. An output test mode is also selectable to generate pulses at a constant programmable frequency.

Alarms are available based on the rate value or the digital input. The alarm status will show on the display even if the output is not wired.

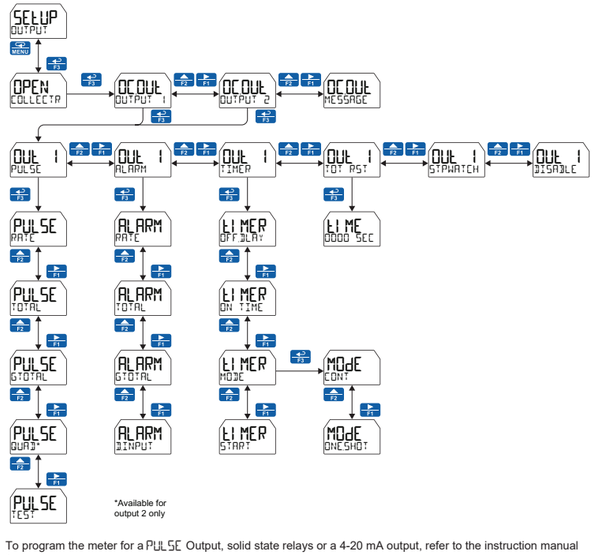
A timer output (TIMER) turns the open collector on and off at the specified time intervals. The timer can be set as single-shot or continuous timer.

A total reset output generates a pulse whenever the total is reset, regardless of the reset method used. The On time is programmable between 0 and 9,999 seconds.

The stopwatch output (STPWATCH) allows the open collector to be manually activated by starting the stopwatch. The stopwatch count can be displayed on the top or bottom display.

The output may be disabled by selecting DISABLE.

The Open Collector Outputs are programmed in the following manner:



To program the meter for a PULSE Output, solid state relays or a 4-20 mA output, refer to the instruction manual found at predig.com.

Advanced Features Menu

For features and capabilities not commonly used during setup, see the complete instruction manual found at www.predig.com for details on the *Advanced Features* menu.

Compliance Information

Hazardous Area Approvals

CSA	Explosion-proof for use in: Class I, Division 1, Groups B, C and D Dust-ignition proof for use in: Class II/III, Division 1, Groups E, F and G; T6 Flame-proof for use in: Zone 1, Ex d IIC T6 Ta = -55 to 75°C. Enclosure: Type 4X & IP66/IP68. Certificate number: CSA 11 2325749
ATEX	Intrinsically safe for use in: Ⓔ II 1 G D Ex ia IIC T4 Ga Ex ia IIIC T200°C Da Ta = -55 to 75°C Enclosure: Type 4X & IP66/IP68 Install per Control Drawing DW2636 (contained within LIM6928-2) Certificate number: CML 18ATEX2089X Explosion-proof for use in: Ⓔ II 2 G D Ex db IIC T6 Gb Ex tb IIIC T85°C Db IP68 Ta = -55 to 75°C Certificate number: Sira 10ATEX1116X
IECEx	Intrinsically safe for use in: Ex ia IIC T4 Ga Ex ia IIIC T200°C Da Ta = -55 to 75°C Enclosure: Type 4X & IP66/IP68 Install per Control Drawing DW2636 (contained within LIM6928-2) Certificate number: IECEx CML 18.0050X Explosion-proof for use in: Ex db IIC T6 Gb Ex tb IIIC T85°C Db IP68 Ta = -55 to 75°C Certificate number: IECEx SIR 10.0056X

ATEX/IECEx Special Conditions for Safe Use

The following conditions relate to safe installation and/or use of the equipment.

- The equipment loop/power port shall be connected to an intrinsically safe barrier with Uo ≥ 5.8V
- The 4-20 mA input port shall be connected to an intrinsically safe barrier with Uo ≥ 5.1V
- The PD6928-HA-AL enclosure is manufactured from aluminum. In rare cases, ignition sources due to impact and friction sparks could occur. This shall be considered during installation, particularly if the equipment is installed in a Zone 0 location.
- All cable entries into the equipment shall be via cable glands or conduit which provide a minimum degree of protection of IP54.
- The equipment may not have 500V isolation between the circuit and earth. This shall be taken into account when installing the equipment.
- The equipment label and epoxy coating may generate an ignition-capable level of electrostatic charges under certain extreme conditions. The user should ensure that the equipment is not installed in a location where it may be subjected to external conditions (such as high-pressure steam) which might cause a buildup of electrostatic charges on non-conducting surfaces. Additionally, cleaning of the equipment should be done only with a damp cloth.
- Flameproof joints are not intended to be repaired.
- All entry closure devices shall be suitably certified as "Ex d", "Ex t" and "IP66/68" as applicable. Suitable thread sealing compound (non-setting, non-insulating, non-corrosive, not solvent based, suitable for the ambient rating) must be used at the NPT conduit entries to achieve the IPx8 rating while maintaining the Ex protection concept.

Year of Construction

This information is contained within the serial number with the first four digits representing the year and month in the YYMM format.

For European Community:

The PD69XX Series must be installed in accordance with the ATEX directive 2014/34/EU, the product certificates CML 18ATEX2089X, Sira 10ATEX1116X, IECEx CML 18.0050X, IECEx SIR 10.0056X and the product manual.

Electromagnetic Compatibility

EMC Emissions	• CFR 47 FCC Part 15 Subpart B Class A emissions requirements (USA) • ICES-003 Information Technology emissions requirements (Canada) • AS/NZS CISPR 11 Group 1 Class A ISM emissions requirements (Australia/ New Zealand) • EN 55011 Group 1 Class A ISM emissions requirements (EU) • EN 61000-6-4 Emissions requirements for Heavy Industrial Environments - Generic
EMC Emissions and Immunity	EN 61326-1 EMC requirements for Electrical equipment for measurement, control, and laboratory use – industrial use

EU Declaration of Conformity

For shipments to the EU and UK, a Declaration of Conformity was printed and included with the product. For reference, a Declaration of Conformity is also available on our website at www.predig.com/docs.

Troubleshooting Tips

The rugged design and the user-friendly interface of the meter should make it unusual for the installer or operator to refer to this section of the manual. If the meter is not working as expected, refer to the recommendations below.

Symptom	Check/Action
No display at all	Check: 1. The 4-20 mA current loop is providing at least 3.5 mA to the meter. 2. The voltage drop of all devices connected to the 4-20 mA current loop does not exceed the max rating of the loop power supply.
Not able to change setup or programming, LOCKED is displayed	Meter is password-protected. Enter correct five-digit password to unlock or Master Password of 50865.
Meter display flashes: 1. 99999 2. -9999	Check that the number of digits required for the scaled value does not exceed the maximum digits for the display. If it does, try adjusting the decimal point location for less precision or changing the PV display to the bottom display.
Display is unstable	Check: 1. Input signal stability and value. 2. Display scaling vs. input signal. 3. Filter and bypass values (increase).
Display response is too slow	Check filter and bypass values
Display reading is not accurate	Check: 1. Input signal conditioner selected: Linear, square root, etc. 2. Scaling or calibration
Display does not respond to input changes, reading a fixed number	Check display assignment. It might be displaying max, min, or set point.
Display shows: 1. MAX and a number 2. MIN and a number	Press Menu to exit max/min display readings.
Relay operation is reversed	Check fail-safe settings in Output menu
Relays do not respond to signal	Check: 1. Relay action in Output menu 2. Set and reset points 3. Check manual control menu
If the display locks up or the meter does not respond at all	Cycle the power to reboot the microprocessor.
CapTouch buttons do not respond	1. If hand-symbol is flashing, multiple buttons were touched at the same time, wait a few seconds until the hand symbol goes off. 2. If Delayed mode has been set, press & hold any button for 5 seconds, the buttons should respond normally. 3. If the slide switch on the display module is in the Lock position, move the switch to the Unlock position.
Other symptoms not described above	Call Technical Support for assistance.

LIM6928HA-QS_B
SFT125 Ver 1.000 & up
03/23

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