

5-DIGIT DUAL-LINE EXPLOSION-PROOF PULSE INPUT RATE/TOTALIZER

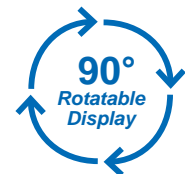
ProtEX™
RTP



SAFE TOUCH®
Through-Glass
Button Programming

ProtEX-RTP • Model PD6830

- Pulse, Open Collector, NPN, PNP, TTL, Switch Contact, Sine Wave (Coil), Square Wave, Opto-Isolated Inputs
- Modern, Sleek and Practical Enclosure
- Isolated 4-20 mA Output for Either Rate or Total
- 5-Digit Rate, 0.7" (17.8 mm)
- 7 Alphanumeric Character Total/Tag, 0.4" (10.2 mm)
- 7-Digit Totalizer
- SafeTouch® Through-Glass Button Programming
- Battery, DC, or Output Loop-Powered Models
- Gate Function for Rate Display of Slow Pulse Rates
- K-Factor, Scaling, or Live Input Calibration
- 32-Point Linearization
- Password Protection
- Backlight Standard on All Models
- Explosion-Proof, IP68, NEMA 4X Enclosure
- Flanges for Wall or Pipe Mounting
- Operates from -40 to 75°C (-20 to 75°C on Battery Models)



**PRECISION
DIGITAL**

www.predig.com

PRECISION DIGITAL CORPORATION

PD6830 Pulse Input Rate/Totalizer

Mounts directly to flowmeter

Explosion-Proof
Die-Cast Aluminum
NEMA 4X Enclosure

Three 3/4" NPT
Conduit Holes

SafeTouch®
Menu Button

0.7" (17.8 mm)
5-Digit

0.4" (10.2 mm)
7-Character
(Alphanumeric)

Eng. Units, Total, or
Alternate Both

SafeTouch®
Reset or Right Arrow

Mounting Flanges
(Up to 2 1/2" Pipe)



SafeTouch®

Enter or
Acknowledge Button

Rate/Process Variable

Backlight Standard

Alarm Indicator

Password Protection

SafeTouch®
Max/Min or Up Arrow

Mechanical Buttons
(4 Places)

3/4" NPT Flowmeter
Connection

Rate/Totalizer Displays



Flow Rate Indicator



Flow Totalizer



Rate & Total

Easy to Setup



Programming



Through-Glass Button Programming

OVERVIEW

The new ProtEX-RTP PD6830 explosion-proof rate/totalizer brings modern design, easy readability, and enhanced functionality to hazardous areas around the world in a way never seen before. Competitors have lost sight of the fact that the primary thing customers want to do with meters such as these is to look at them. Customers want a meter that looks nice so they can be proud to install it in their facility. And they want a meter with a display that provides the important information about their process, can be seen under varied lighting conditions, from wide angles, and from a distance. The PD6830 delivers all these and more. Spend a few minutes reviewing the features described in the graphic above and you will see how!

KEY FEATURES

Informative & Easy to Read Display

The high contrast, backlight LCD display is easy to read from far away and under various lighting conditions. The upper display is 0.7" high and shows 5 digits of flow rate. The lower display is 0.4" high and shows either flow total or a tag with 7 alphanumeric characters. And best of all, the display is mounted right up against the glass so it can be seen from a wide viewing angle.

Through-Glass SafeTouch® Buttons

The PD6830 is equipped with four sensors that operate as through-glass buttons so that it can be programmed and operated without removing the cover (and exposing the electronics) in a hazardous area. These buttons can be disabled for security by selecting the LOCK setting on the switch located on the connector board in the base of the enclosure. To actuate a button, press one finger to the glass directly over the marked button area. When the cover is removed, four mechanical buttons located next to the sensors are used.

Modern, Sleek and Practical Enclosure

The first thing customers notice about a product is its enclosure and the ProtEX-RTP really shines here. The copper-free (0.30%), smooth, die-cast aluminum NEMA 4X (IP68) enclosure is finished with a corrosion resistant epoxy coating that literally does make the ProtEX-RTP shine. The built-in mounting flanges make for convenient wall or pipe mounting and there is even a slot on the back of the enclosure for centering on the pipe. There are two 3/4" NPT conduit holes for wiring and one 3/4" NPT hole for flowmeter connection.

Wide Viewing Angle

Customers can't always look at the display from straight on, so the window and display module have been optimized to provide a wide viewing angle of approximately +/- 40°; nearly twice the competition! Remember, the PD6830 is designed to be looked at.

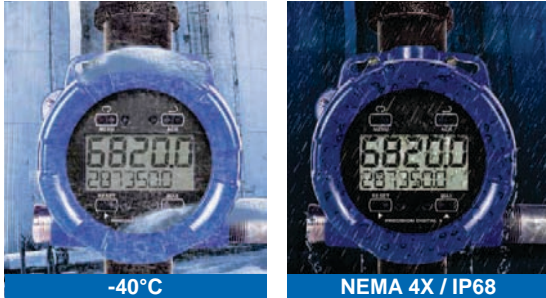


Perfect & Secure Fit Every Time

The internal cast rails ensure the ProtEX assemblies together perfectly, quickly and securely; and everything lines up for optimal viewing every time. There are no standoffs to worry about breaking or getting out of alignment. Two spring-loaded, self-retaining, thumbscrews make the assembly a snap, while pressing the LCD as close to the glass as possible to improve wide angle viewing.

Environmentally Tough

The ProtEX™ Series not only looks great with their modern, smooth die cast aluminum enclosures, but they can be installed virtually anywhere. The NEMA 4X / IP68 enclosure provides serious protection from the elements, high impact, corrosion and electrical interference and the extensive, worldwide agency approvals means they can be installed virtually anywhere.



TOTALIZER CAPABILITIES

Gate Function for Slow Pulses

The gate function provides for rate display of slow pulse rates. Using the programmable gate, the meter is able to display pulse rates as slow as 1 pulse every 999 seconds (0.001 Hz). The gate function can also be used to obtain a steady display reading with a fluctuating input signal. There are two settings for the Gate, low gate (L \bar{G}) and high gate (H \bar{G}).

Totalizer Conversion Factor

Total Conversion Factor is used to convert to a different unit of measure for the total display. For example, to display rate in gallons and total in liters, enter a Conversion Factor of 3.7854. When rate and total units are the same, the Conversion Factor should be 1.0000.



Total Reset

The total can be reset either manually via the front panel RESET button or external contact; or automatically using a programmed setpoint and delay time. Total reset can also be disabled.

Wide Input Signal Selection

The PD6830 is designed to handle a wide variety of inputs, including: pulse, open collector, NPN, PNP, TTL, or switch contact up to a 30 kHz rate without degradation. It can readily discern inputs with pulse widths as small as 16 μ s. Inputs are conveniently set up on the display module by simply moving switches to the desired options. The voltage input offers up to 500 V of isolation.



METER CONFIGURATION

K-Factor Scaling

The meter may be scaled using the K-Factor function. Most flowmeter manufacturers provide this information with the device. Enter the K-Factor (F_Kct_r) menu and select the decimal point with highest resolution possible and program the K-Factor value (i.e. pulses/gal). The meter will automatically calculate the flow rate using the K-Factor and the time base selected.

Custom Meter Scaling

In lieu of K-Factor scaling, the meter can be scaled to any span relative to the input pulse rate span (i.e. if you knew the pulse input span for gallons but wanted to display the rate and total in liters). No external signal is required.

Live Input Calibration

In lieu of K-Factor and Custom Meter Scaling, the meter can be calibrated with a precision signal source. While applying a precision signal, the relative scale value is entered via the front panel. This is done at any two points along the scale. Using this method, an operator can set a "best fit straight line" for non-linear input spans.

Multi-Point Linearizer

Up to 32 linearization points can be selected under the Linear function. The multi-point linearization can be used to linearize the display for non-linear signals such as non-linear flows, and for end-point correction on flow meters. These points are established via direct entry (S_{CR}L_E) or with an external calibration signal (E_{CR}L).

Alternating Total/Tag Display

The meter can be configured so that the lower display automatically toggles between displaying the assigned tag name and total every 10 seconds.



PD6830 Displaying Total

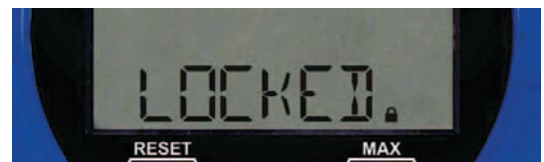


PD6830 Displaying Tag Name

ADDITIONAL FEATURES

Password Protection

A 5-digit password prevents unauthorized changes to the programmed parameter settings. The lock symbol is displayed to show that settings are protected. If the meter is password protected, the meter will display the message LOCKED when the Menu button is pressed.



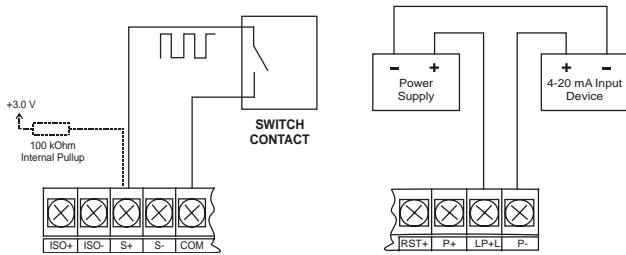
Alarm Indication

The PD6830 can be configured to have a high or low rate alarm indicator, or a total alarm set point indicator. When in alarm mode, the display will flash, and a HI or LO symbol is displayed. The alarm is acknowledged by pressing the ENTER/ACK button.



Pulse to 4-20 mA Retransmission

Use the analog output to retransmit the pulse input signal to the commonly used 4-20 mA form. Available on the PD6830's -ATA, -BTA, and -CTB models. Output can be scaled to represent all, or part, of the actual input span. Shown below with switch contact input on a PD6830-APA. See manual for details.



INSTALLATION

Direct Mounting

The PD6830 is designed to easily mount directly to a flowmeter. The example below shows it mounted to a turbine flowmeter. This particular ProtEX-RTP model (BM0) is battery-powered. Even though battery-powered, it does have a backlight; but to conserve battery power, it only turns on while SafeTouch® buttons are in use.



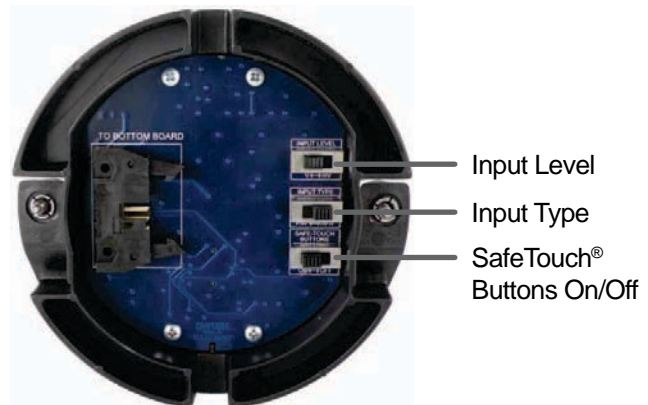
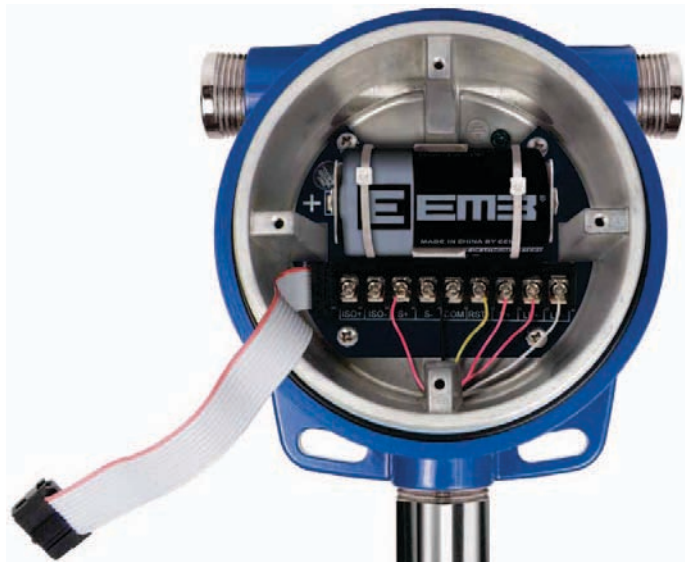
Installation Flexibility

The PD6830's rotatable display/meter along with three available conduit connections provide for numerous installation options. The display can be rotated in 90° increments. Rotate it 90° for horizontal mounting. Wiring can be routed to the most convenient conduit connection(s). One metal conduit plug is supplied per unit. Additional plugs are available (PDA75PLUG) if needed.



Easy Wiring & Service

Field wiring is made to an easily accessible screw terminal block at the base of the enclosure and there is plenty of room inside the enclosure to do the wiring. The terminal block is clearly marked to ensure proper wiring. The meter module connects to a detachable ribbon cable so it can be easily removed for service, while keep all the field wiring intact.

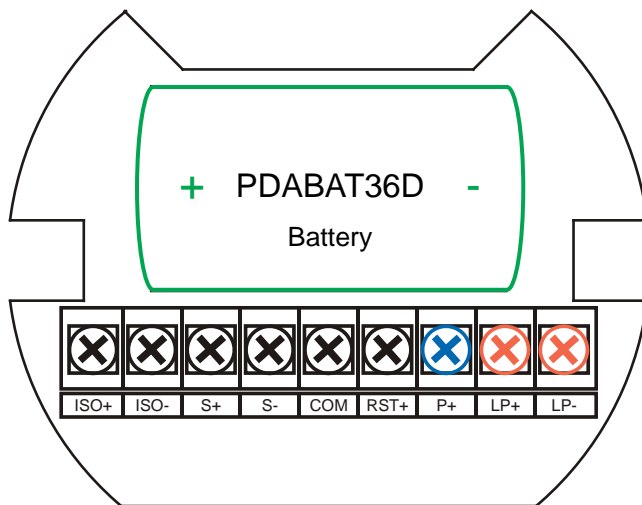


FLEXI-POWERED

There are ProtEX-RTP models that can be powered by battery, DC with battery back-up, DC only, or the output-loop. Under nominal battery operating conditions, the battery life is approximately 5 years. As an unused back-up, the life is the shelf-life of the battery (up to 20 years). When powering the PD6830-CTB by the output loop, the output load impedance must not exceed 700 Ω @ 24 VDC excitation (See Specifications for details).

CONNECTIONS

To access the wiring connections, remove the enclosure cover and unscrew the two captive screws that fasten the display module. Disconnect the ribbon cable and remove the display module. Power and signal connections are made to a terminal block at the base of the enclosure. Grounding connections are made to the two ground screws provided on the base – one internal and one external.

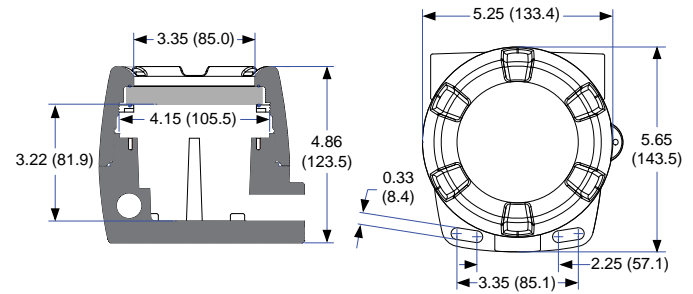


Model	Power	
PD6830-BM0	Battery (or DC) Powered*	■ Battery, only for models: PD6830-BM0 & PD6830-BTA ■ Not present on models: PD6830-BM0 & PD6830-APA ■ Not present on model: PD6830-CTB
PD6830-BTA	Battery (or DC) Powered*	
PD6830-AP0	DC Powered	
PD6830-APA	DC Powered	
PD6830-CTB	Output Loop Powered	
* When DC powered, battery will provide backup power when DC power is lost.		

Code	Description
ISO+	Isolated signal input positive terminal connection.
ISO-	Isolated signal return/negative terminal connection.
S+	Signal input positive terminal connection.
S-	Magnetic pickup (coil) signal return/negative terminal connection.
COM	Signal return/negative, DC power return/negative, Contact closure reset return/negative terminal connection.
RST+	Contact closure reset pullup to 3 VDC.
P+	DC Power positive terminal connection.
LP+	4-20 mA transmitter DC power positive terminal connection.
LP-	4-20 mA transmitter regulated current output terminal connection.

DIMENSIONS

Units: Inch (mm)



SPECIFICATIONS

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

General

Display: Upper: Five digits (-9,999 to 99,999) 0.70" (17.8 mm) high, 7-segment, automatic lead zero blanking. Lower: Seven characters 0.4" (10.2 mm) high, 14 segment alphanumeric. Symbols: for high & low alarm, password lock. Backlight: white

Backlight: White LED, 10 sec auto-off for battery powered models.

Display Update Rate: Ambient > -25°C: 2 Updates/Second.

Ambient < -25°C: 1 Update/5 Seconds

Display Orientation: Display may be mounted at 90° increments up to 270° from default orientation

Overrange: Display flashes 99,999

Underrange: Display flashes -9,999

Programming Method: Four SafeTouch® through-glass buttons when cover is installed. Four internal pushbuttons when cover is removed.

Recalibration: Calibrated at the factory to read frequency in Hz. No recalibration required.

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

Password: Programmable password restricts modification of programmed settings and manual total reset via button interface.

Alarm Indication: Flashing display plus HI/LO indicators

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

Power Options: 9-30 VDC, 2.2 W max, 4-20 mA transmitter output power, 30 VDC max, battery power, or DC power with battery backup.

Battery: 3.6 V Primary Lithium (Li-SOCl₂), non-rechargeable.

Expected service life is approximately 5 years. Recommended replacement interval: 3 years when exclusive source, up to 20 years in backup configuration. Part number PDABAT36D.

Isolation: All models: 500 V opto-isolated input-to-power/output.

PD6830-BTA: 500 V input-to-output.

PD6830-APA: 500 V input/power-to-output

Note: Requires separate output supply

Operating Temperature Range: -40 to 75°C. (-20 to 75°C on battery powered models).

Storage Temperature Range: -40 to 75°C.

Relative Humidity: 0 to 90% non-condensing

Connections: Screw terminals accept 12 to 22 AWG wire

Enclosure: Explosion-proof die-cast aluminum with glass window, corrosion resistant epoxy coating, color: blue. NEMA 4X, 7, & 9, IP68. Copper-free (0.3%). Three ¾" NPT threaded conduit openings. One ¾" NPT metal plug with 12 mm hex key fitting installed.

Mounting: May be mounted directly to conduit. Two slotted flanges for wall mounting or NPS 1½" to 2½" or DN 40 to 65 mm pipe mounting.

Overall Dimensions: 5.65" x 5.25" x 4.86" (W x H x D)
(144 mm x 133 mm x 124 mm)

Weight: 5.00 lbs (80 oz, 2.27 kg)

Warranty: 3 years parts and labor

Rate Input

Pulse Input: Field selectable; Sourcing or sinking pulse or square wave 0-5 V, 0-12 V, or 0-24 V; TTL; NPN or PNP transistor; Open collector 100 kΩ pull-up to 3 V; Switch contact 100 kΩ pull-up to 3 V; PNP transistor 100 kΩ pull-down to ground (COM). Maximum Frequency: 30 kHz. Minimum Pulse Width: 16 μs

Opto-Isolated Input: Sourcing pulse or square wave 0-5 V, 0-12 V, or 0-24 V; Logic High: 4-30 V, Logic Low: < 1 V. Maximum Frequency: 10 kHz Minimum Pulse Width: 50 μs. Input Current: 1 mA @ 5 V, 2.5 mA @ 12 V, 5 mA @ 24 V

Low Voltage Mag Pickup Input: Sensitivity: 40 mVp-p to 24 Vp-p. Maximum Frequency: 30 kHz

Minimum Input Frequency: 0.001 Hz. Minimum frequency is dependent on high gate setting (rate display).

Input Impedance: Pulse input: Greater than 300 kΩ @ 1 kHz.

Open collector/switch input: 100 kΩ pull-up to 3 V.

Accuracy: ±0.03% of calibrated span ±1 count

Temperature Drift: Rate display is not affected by changes in temperature.

Low-Flow Cutoff: 0-99,999 (0 disables cutoff function)

Decimal Point: Up to five decimal places or none: d.dddd, d.ddd, d.dd, d.d, or ddddd

Calibration: May be calibrated using K-Factor, scale without signal source, or by applying an external calibration signal.

K-Factor: Field programmable K-Factor converts input pulses to rate in engineering units. May be programmed from 0.00001 to 9,999,999 pulses/unit.

Calibration Range: Input 1 signal may be set anywhere in the range of the meter; input 2 signal may be set anywhere above or below input 1 setting. Minimum input span is 10 Hz. An error message will appear if the input 1 and input 2 signals are too close together.

Contact Debounce Filter: Select low speed: 40 Hz maximum input frequency

Time Base: Second, minute, hour, or day

Gate: Low gate: 1-99 seconds; High gate: 2-999 seconds

Rate/Totalizer

Display Assignment: The upper display is assigned to rate. The lower display is programmable to alternate between total for 10 seconds, then the tag for 1 second or to show only the total or to show only the tag.

Total Decimal Point: Up to six decimal places or none: d.ddddd, d.ddddd, d.ddd, d.ddd, d.dd, d.d or ddddd. Total decimal point is independent of rate decimal point.

Totalizer: Calculates total based on pulse input rate and field programmable multiplier to display total in engineering units. Time base must be selected according to the time units in which the rate is displayed.

Total Reset: Via SafeTouch® RESET button, mechanical button (cover off), external contact closure, or automatically via user selectable preset value and time delay. Manual reset may be disabled or protected by password.

Totalizer Rollover: Totalizer rolls over when display exceeds 9,999,999.

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Looking for a Process Meter?

Please consider Precision Digital's
ProtEX-Pro PD6800.

4-20 mA Transmitter Output

Output Source: Rate/process or total

Scaling Range: 4.000 to 20.000 mA for any display range.

Calibration: Factory calibrated: 0.0 to 1000.0 = 4-20 mA output

Underrange: 3.8 mA

Overrange: 20.5 mA

Accuracy: ± 0.1% FS ± 0.004 mA

Temperature Drift: 0.4 μA/°C max from 0 to 65°C ambient, 0.8 μA/°C max from -40 to 0°C ambient

External Loop Power Supply: 30 VDC maximum

Output Loop Resistance:

Power Supply	Minimum	
24 VDC	10 Ω	700 Ω
30 VDC	100 Ω	1200 Ω

Note: loop-powered backlight subtracts 150 Ω from maximum resistance figures above.

Product Ratings & Approvals

FM: Explosion-proof for use in Class I, Division 1, Groups B, C, D. Class II, Division 1, Groups E, F, G. Class III, Division 1; T6. Class I, Zone 1, AEx d IIC T6 Gb. Zone 21, AEx tb IIIC T85°C. Ta = -40 to 75°C.

Enclosure: Type 4X & IP66. Certificate number: 3040391

ATEX: II 2 G D. Ex d IIC T6 Gb. Ex tb IIIC T85°C Db IP68.

Ta = -40 to 75°C. Certificate number: Sira 10ATEX1116X

IECEX: IECEX SIR 10.0056X. Ex d IIC T6 Gb. Ex tb IIIC T85°C Db IP68. Ta = -40 to 75°C

CSA: Class I, Division 1, Groups B, C, D. Class II, Division 1, Groups E, F, G. Class III, Division 1; T6. Class I, Zone 1, Ex d IIC T6.

Ta = -40 to 75°C. Enclosure: Type 4X & IP66.

Certificate number: 11 2325749

ORDERING INFORMATION

ProtEX-RTP PD6830 • Pulse Input Rate/Totalizer		
Model	Options Installed	Power
PD6830-BM0	Backlight	Battery (& 9-30 VDC)
PD6830-BTA	Output Loop-Powered Backlight + Loop Output	Battery (& 9-30 VDC)
PD6830-AP0	Backlight	9-30 VDC
PD6830-APA	Backlight + Loop Output	9-30 VDC
PD6830-CTB	Backlight + Loop Output	Output Loop



Your Local Distributor is: