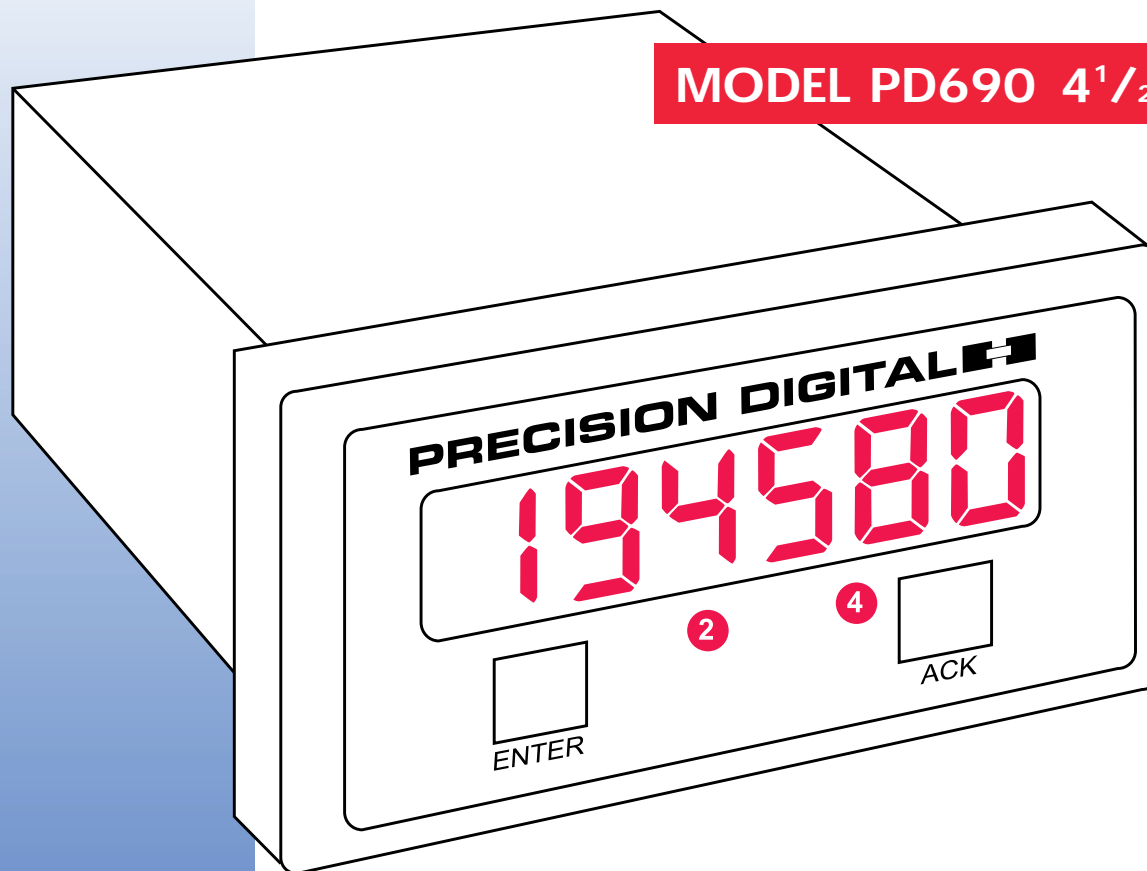


UNIVERSAL PROCESS METER

MODEL PD690 4¹/₂ DIGIT



- 4-20 mA, 1-5 V, 0-5 V, or 0-10 V Field Selectable Inputs
- 4 ¹/₂ Digits + Extra Zero Display
- Easy Single Button Scaling (SBS)
- Stand Alone Scaling (SAS)
- Calibration and Programming Lockout
- 11-Point Linearization
- Square Root Extraction
- Type 4X, NEMA 4X Front Panel
- Isolated 24 V Transmitter Power Supply
- 4 Visual Alarm Points with LED Status Indication
- 2 or 4 Relays + 4-20 mA Output Options
- Green Display Available



GENERAL FEATURES

The Model PD690 puts the power of microprocessor technology to work in a high performance, easy to use, industrial grade digital process meter with the features customers want:

- Single Button Scaling
- Isolated 24 V Transmitter Power Supply
- Type 4X, NEMA 4X Front Panel
- Steady, Accurate 4½ Digit + Extra Zero Display
- Linearization with Square Root Extraction
- Powerful Options



Single Button Scaling (SBS) Makes Setup a Snap

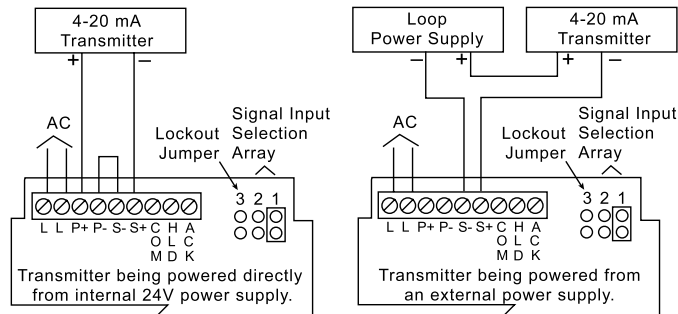
Single Button Scaling means the PD690 can be completely programmed using only one button. And you only do one thing with that one button: press it once when the meter displays what you want. For example, press the **ENTER** button to initiate automatic scan of the various programming routines: *SCALE*, *dEC Pt*, *ALArS*, *outPut*, and *no PtS*. To enter one of these routines, press the **ENTER** button as the routine name is displayed. Once in the routine, press the **ENTER** button when the meter reads the desired value. It's that simple!

Stand Alone Scaling (SAS) for Quick Setup

The PD690 may be calibrated using an external signal source such as a calibrator or scaled using the internal source with the Stand Alone Scaling feature. With Stand Alone Scaling, a 4-20 mA input can be scaled for any display range without applying a signal. No calibrator is necessary to program the unit for a desired display range. Simply select Internal Calibration mode and set desired display for the 4 mA and 20 mA values. 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.

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.



Type 4X, NEMA 4X Front Panel Protection for Hostile Environments

Wet, dirty and dusty environment don't bother the PD690 Type 4X, NEMA 4X front panel so it can be installed in almost any panel in the plant. That means plant operators can have the important process information right where they need it most, on the shop floor. And the Type 4X, NEMA 4X front panel does not restrict access to the setup buttons.

Big Bright Steady Display for Big Numbers

The PD690 4½ digit plus extra zero display is great for displaying big numbers; like the volume in a 100,000 gallon tank. And the PD690 large display does not sacrifice stability for resolution. Even when displaying large numbers, the PD690 display is steady and quick responding. Operators will appreciate being able to display process variables with such stability and resolution and they'll have confidence in the smooth, steady display.

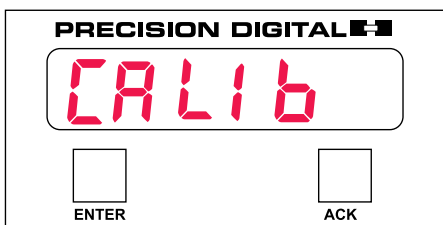
4 Visual Alarm Points Standard

The PD690 comes with 4 visual independent alarms. Each alarm is easily programmed for high or low set point and 0-100% deadband. Front panel LEDs indicate alarm status and assist in set point/reset point programming. Options are available for 2 and 4 relays.

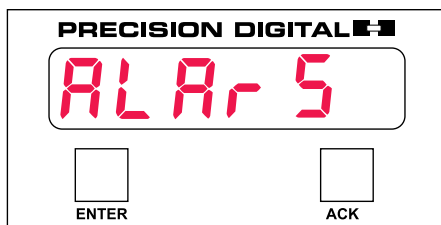
Alarm/Relay Programming

Pressing the **ENTER** button when the display reads *ALArS* initiates a scan of the alarm set and reset points. First, the display flashes Alarm #1 Set Point and indicates this by lighting up the #1 LED and the "S"

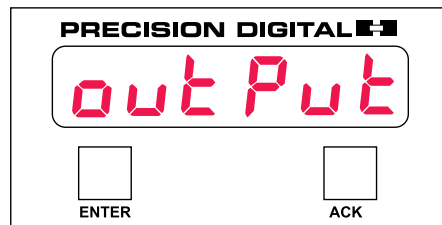
(continued on next page)



To Calibrate: Press **ENTER** when meter reads *CALIB*.

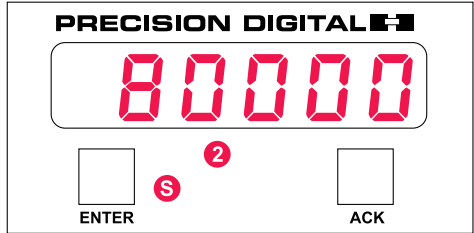


To Program Alarms: Press **ENTER** when meter reads *ALArS*.

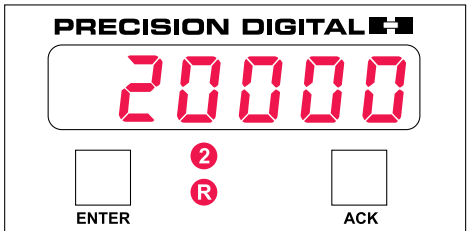


To Program 4-20 mA Output: Press **ENTER** when meter reads *outPut*.

LED. This Set Point may be changed using the ENTER button. Next the display flashes Alarm #1 Reset Point and indicates this by lighting up the #1 LED and the "R" LED. This Reset Point may also be changed using the ENTER button. The remaining Set and Reset Points are programmed in a similar fashion.



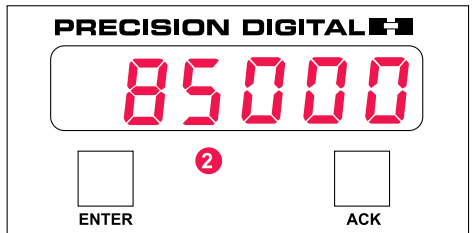
PD690 Alarm #2
Set Point is
adjusted to 80000.



PD690 Alarm #2
Reset Point is
adjusted to 20000.

Alarm Status Indication

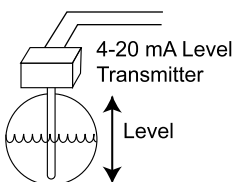
When an alarm occurs, an LED will illuminate to indicate which alarm has tripped. This LED will stay illuminated until the meter returns to the non-alarm state.



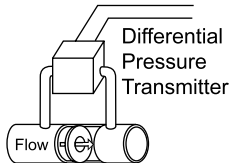
PD690 indicating
that Alarm #2
is in alarm condition.

Linearization Feature

The linearization feature has two modes of operation. The 11-point user calibration will display non-linear signals like volume in a round horizontal tank by allowing the user to input up to 11 calibration points and corresponding displays. The square root extraction feature displays flow rate by extracting the square root of a signal from a differential pressure transmitter. This feature also has a user selectable low flow cutoff feature to give a reading of zero when the flow rate drops below a user-set point.



The PD690 can be used to display volume in a round horizontal tank.



The PD690 can display flow rate by extracting the square root of a signal from a differential pressure transmitter.

OPTIONS

The PD690's wide array of options satisfy even the most demanding applications. And, unlike many competitors, there are no restrictions on the combination of options a meter can have! A fully loaded Model PD690-3-18 has a 24 V transmitter power supply (standard), NEMA 4X front panel (standard), 11-point linearization (standard), 4 relays, and isolated 4-20 mA output.

Relay Options

The PD690 is available with 2 or 4 relays. The SPDT relays are rated 2 Amp at 250 VAC and can be programmed for automatic or automatic plus manual reset. The relays can also be programmed for 0-100% deadband.

Isolated 4-20 mA Output Option

The PD690 can be equipped with an isolated 4-20 mA output signal option that can be programmed to produce a 4-20 mA output for virtually any input. The 4-20 mA output signal can be powered either by the internal or an external power supply. If the internal power supply is used for the 4-20 mA output, it is not available to power the transmitter input. The 4-20 mA output provides 500 VDC or peak AC, input-to-output or input/output-to-power isolation.

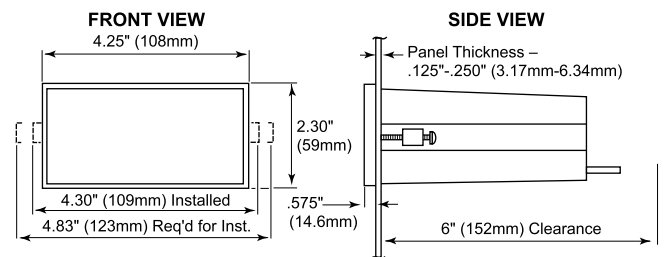
Option Card Pin-Outs

Pin:	Function:	
J1 { 1	Transmitter +] PD175
2	Transmitter -	
J2 { 1	Relay #1 Common] PD176
2	Relay #1 NC	
3	Relay #1 NO] PD174
4	Relay #2 Common	
5	Relay #2 NC] PD178
6	Relay #2 NO	
J3 { 1	Relay #3 Common] PD177
2	Relay #3 NC	
3	Relay #3 NO] PD177
4	Relay #4 Common	
5	Relay #4 NC] PD177
6	Relay #4 NO	

Notes:

1. Alarm acknowledgement terminals (ACK and COM) are located on the meter main board.
2. In the alarm condition, the NC contact is connected to common in the fail-safe mode.

Mounting Dimensions



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: 16 oz (454g)

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: Bright, Large, 0.56" (14.2mm) high efficiency red or green LED. 4 1/2 digits + extra zero; $\pm 19999(0)$, (0) may be switched on to display 199,990. Lead zeros blanked.

FRONT PANEL: Type 4X, NEMA 4X, panel gasket provided.

CALIBRATION: May be calibrated using internal calibration (I-CL) or by applying an external calibration signal (E-CL). 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 $\pm 5\%$ at 20 mA regulated. Maximum loop resistance of 1200 Ω . Available for either signal input or 4-20 mA output option, but not both.

HOLD READING: Connect terminals HLD and COM.

ACCURACY: $\pm 0.05\%$ of calibrated span \pm one count.

INPUT IMPEDANCE: Voltage ranges, greater than 300 K Ω ; Current range, 100 Ω .

POWER: AC power: 115 VAC $\pm 10\%$, 50/60 Hz, 10 VA.

230 VAC $\pm 10\%$, 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

WARRANTY: 1 year parts and labor

EXTENDED WARRANTY: Warranty may be extended an additional 12 months by returning the Product Registration Form within 2 months from date of purchase. Go to www.predig.com for online registration.

Relays

RATING: 2 or 4 SPDT (form C); rated 2 Amp @ 30 VDC or 2 Amp @ 250 VAC resistive load; 1/14 HP @ 125/250 VAC for inductive loads

RESET: User Select.

1. Automatically plus manually (via user supplied switch or front panel ACK button).

2. Automatically when the input passes the reset point.

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:

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

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

ACCURACY: $\pm 0.1\%$ F.S., $\pm .004$ mA

EXTERNAL LOOP POWER SUPPLY: 35 V Maximum.

DISCLAIMER: The information contained in this document is subject to change without notice. Precision Digital makes no representations or warranties with respect to the contents hereof, and specifically disclaims any implied warranties of merchantability or fitness for a particular purpose.

ORDERING INFORMATION

Model PD690

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.

YOUR LOCAL DISTRIBUTOR IS:

Please visit the Precision Digital website at
www.predig.com
for complete information on the entire line of Precision Digital products, technical information and much more.

LDS690 Rev A 02/02