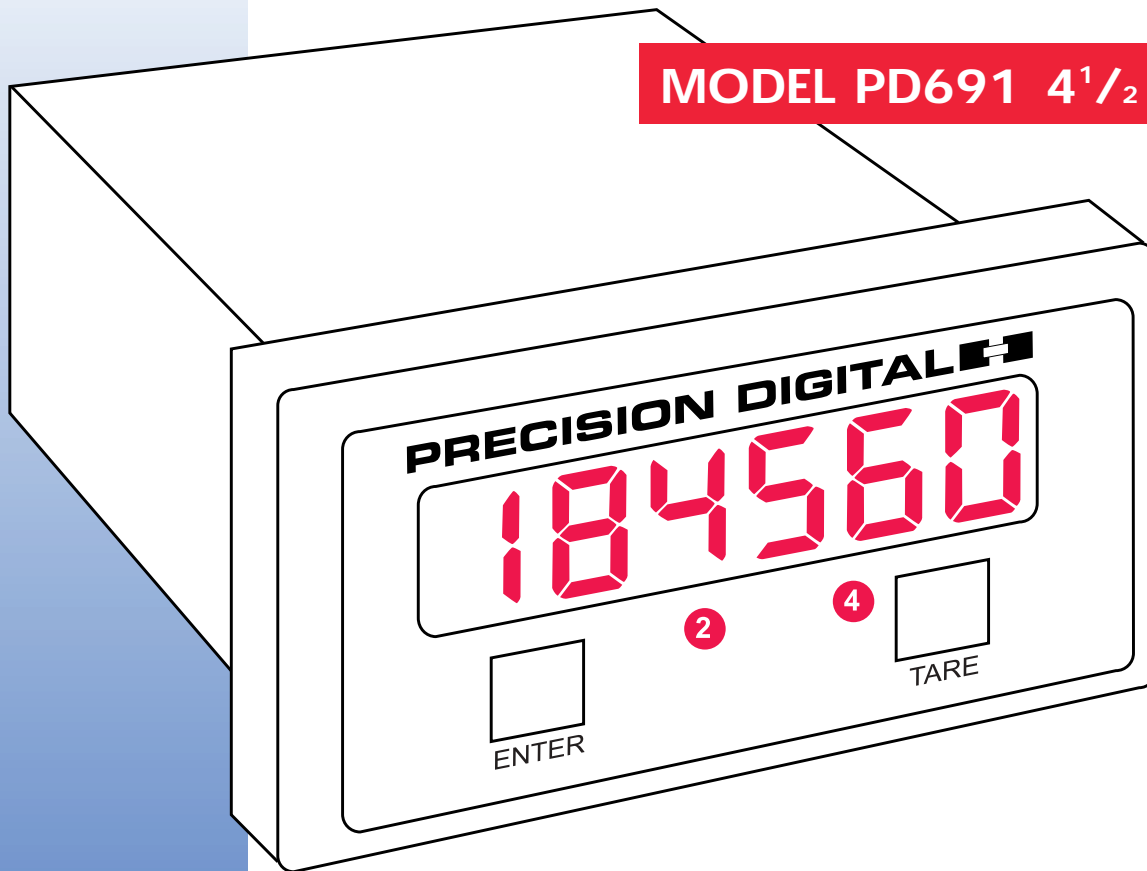


# UNIVERSAL STRAIN GAUGE METER

MODEL PD691 4<sup>1</sup>/<sub>2</sub> DIGIT



- 0-30 mV, 0-200 mV,  $\pm 15$  mV,  $\pm 100$  mV Field Selectable Inputs
- Field Selectable 5, 10, or 24 VDC Excitation Power Supply
- 4 <sup>1</sup>/<sub>2</sub> Digits + Extra Zero Display
- Steady, Accurate Display to  $\pm 199,990$
- Easy Single Button Scaling
- Calibration and Programming Lockout
- 11-Point Linearization
- Peak Hold
- Capture or Programmable Tare
- Type 4X, NEMA 4X Front Panel
- 4 Visual Alarm Points with Front Panel LED Status Indication
- 2 or 4 Relays + 4-20 mA Output Options
- Green Display Available

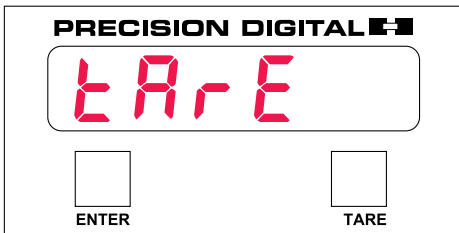


## GENERAL FEATURES

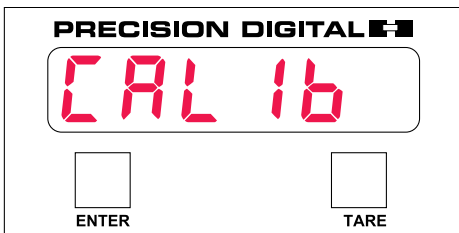
The PD691 is a high performance, industrial-grade Universal Strain Gauge Meter. It accepts all the standard strain gauge and load cell signals: 0-30 mV, 0-200 mV,  $\pm 15$  mV and  $\pm 100$  mV and displays these signals in engineering units on a 4 1/2 digit display. The display also includes an extra zero which may be used to handle numbers up to  $\pm 199,99(0)$ .

## Single Button Scaling

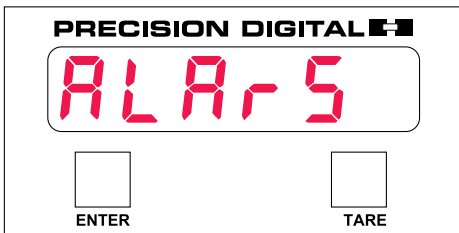
Single Button Scaling means the PD691 can be completely programmed using only one button. There are no complicated menu trees to navigate or button-pushing sequences to memorize. Simply press the **ENTER** button to initiate the automatic menu scan. When the desired routine appears press **ENTER** again. Once in a routine, press the **ENTER** button when the display reads the desired value. It's that simple!



**To Set Tare:**  
Press **ENTER**  
when meter  
reads **TARE**.



**To Calibrate:**  
Press **ENTER**  
when meter  
reads **CAL 16**.



**To Program Alarms:**  
Press **ENTER**  
when meter  
reads **ALAR 5**.

## Type 4X, NEMA 4X Front Panel

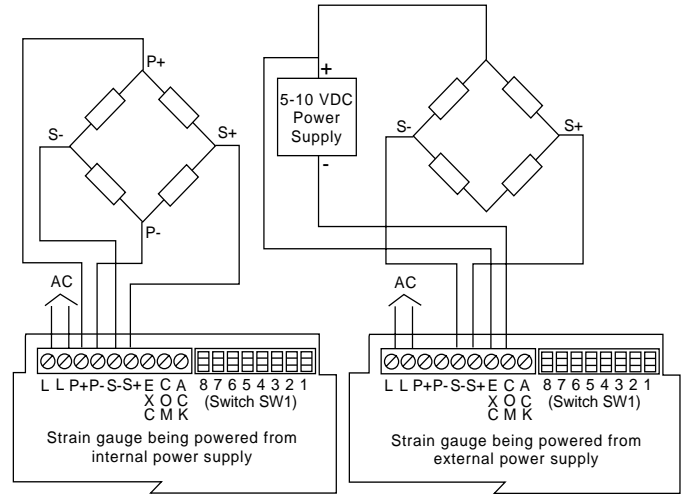
Wet, dirty and dusty environments don't bother the PD691 Type 4X, NEMA 4X front panel so it can be installed in almost any panel in the plant. That means plant operators can have the important information right where they need it most, on the shop floor.

## Big Bright Steady Display for Big Numbers

The PD691 4 1/2 digit + extra zero display is great for displaying big numbers. Even when displaying large numbers, the PD691 display is steady and quick responding. The 0.56" high efficiency LED display is available in either red or green. The extra zero may be switched on to display  $\pm 199,99(0)$ .

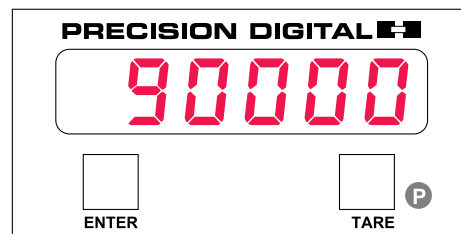
## Field Selectable Excitation Power Supply

The internal power supply can provide either 5, 10, or 24 VDC power, (field select). Typical use for the 5 or 10 VDC supply is to power a strain gauge. The 24 VDC supply may be used to power the 4-20 mA output option. This standard feature saves time and money by simplifying wiring and eliminating the cost of an external power supply.



## Peak Hold

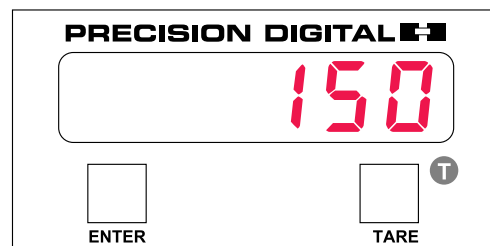
The peak-hold feature captures the highest displayed value and stores it in memory for later viewing. By entering the **dSPY P** routine the operator can display the peak value. A green LED labeled "P" will illuminate indicating the display is showing the peak value. Pressing the enter button again and entering the **rSEt P** routine will cause the last stored peak value to be erased from memory and a new peak value to be captured.



PD691  
indicating  
a Peak Value.

## Tare

The PD691 can be set for either Capture or Programmable Tare. Capture Tare sets a currently displayed reading to zero via front panel **TARE** button. The operator may reset Capture Tare at any time in the field. Programmable Tare will automatically subtract a set tare value from the actual reading. A green LED labeled "T" will illuminate indicating the display is showing a tared value.



PD691  
indicating  
a Tared Value.

## Ratiometric Operation

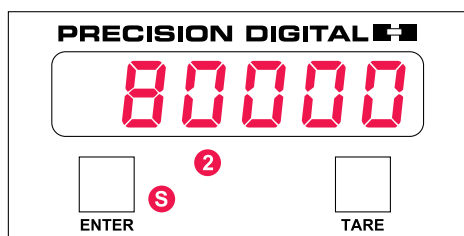
Ratiometric operation allows the meter to compensate for small fluctuations in the excitation power supply. A voltage drift of  $\pm 10\%$  will not affect the display value of the PD691 when in Ratiometric mode. Selecting normal operation results in the unit not compensating for voltage fluctuations. The display value will shift as the voltage changes.

## 4 Visual Alarms Standard

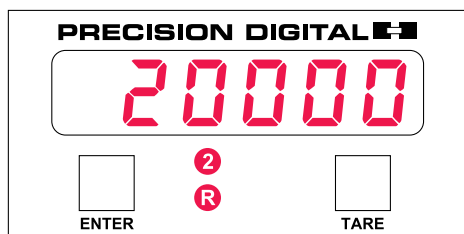
Every PD691 comes with 4 independent alarms standard. Each alarm is easily programmed for high or low set point and 0-100% deadband. Front panel alarm status LEDs assist in set/reset point programming and are perfect for visual-indication-only applications. Options are available for 2 and 4 relays.

## Alarm/Relay Programming

Pressing the ENTER button when the display reads **AL R-5** initiates a scan of the alarm set and reset points. First, the display flashes Alarm #1 Set Point and indicates this by illuminating the #1 LED and the "S" LED. This Set Point may be changed using the ENTER button. Next the display flashes Alarm #1 Reset Point and indicates this by illuminating 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.



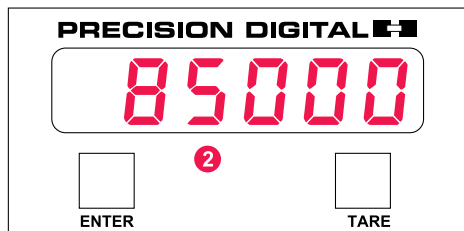
PD691  
Alarm #2  
Set Point  
is set at  
80000.



PD691  
Alarm #2  
Reset Point is  
set at 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.



PD691  
indicating  
that Alarm #2  
is in alarm  
condition.

## Linearization Feature

Displaying non-linear signals is a snap with the linearization feature. The user can input up to 11 calibration points and corresponding displays to handle a wide variety of non-linear signal applications.

## OPTIONS

The PD691 Universal Strain Gauge Meter can be equipped with options for 2 or 4 relay contacts and isolated 4-20 mA transmitter output. These options may be combined in any configuration to satisfy a wide variety of applications. In fact, a fully loaded model PD691-3-18 includes linearization, 4 relays and isolated 4-20 mA transmitter output.

## Relay Options

The PD691 is available with 2 or 4 relays. The SPDT relays are rated 2 Amp @ 250 VAC and can be programmed for automatic or automatic + manual reset. The relays can be programmed for 0-100% deadband.

## Isolated 4-20 mA Output Option

The PD691 can be equipped with an isolated 4-20 mA output signal option that can be programmed to produce a 4-20 mA output signal 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 a strain gauge. The 4-20 mA output provides 500 VDC or peak AC, input-to-output or input/output-to-power isolation.

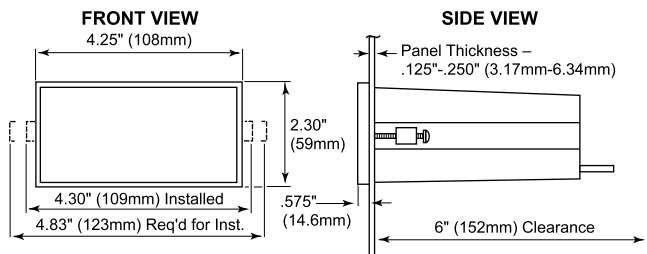
### Option Card Pin-Outs

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: 0-30 mV, 0-200 mV,  $\pm 15$  mV  $\pm 100$  mV

**RATIOMETRIC:** Deviation less than 0.1% of full scale,  $\pm 1$  count, with  $\pm 10\%$  variation in excitation voltage

**DISPLAY:** Bright, large, 0.56" (14.2mm) high efficiency red or green LED. 4 1/2 digits + extra zero may be switched on to display +/-19,999(0). Leading zeros blanked.

**CALIBRATION RANGE:** 0 mV input may be set anywhere in range of the meter. 200 mV may be set anywhere above or below 0 mV input.

**ISOLATED POWER SUPPLY:** Selectable 5 VDC or 10 VDC  $\pm 5\%$  @ 50 mA; or 24 VDC  $\pm 5\%$  @ 20 mA. Available for either strain gauge or 4-20 mA output option.

**PEAK HOLD:** Captures the peak reading and displays it via the front panel ENTER button.

**PEAK HOLD INDICATION:** Front panel LED

**TARE:** Capture- Sets current display to Zero via front panel TARE button. Programmable- Automatically sets TARE to a preset value.

**TARE INDICATION:** Front panel LED

**ACCURACY:** 0.05% of full scale,  $\pm 1$  count.

**NON-VOLATILE MEMORY:** All programming values are stored in non-volatile memory for ten years after power is lost.

**ZERO STABILITY:** 0.5  $\mu$ V/°C

**SPAN STABILITY:** 0.005% of full scale /°C

**LOCKOUT:** Switch 8 at rear of instrument restricts modification of calibration values.

**INPUT IMPEDANCE:** 20 K $\Omega$

**POWER:** 115 VAC or 230 VAC  $\pm 10\%$ , 50/60 Hz, 10 VA.

**ISOLATION:** 1500 VAC

**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.

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

**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% of full scale, 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](http://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 when the input passes the reset point.

2. Automatically + manually (via user supplied switch). Manual reset resets all manually resettable relays.

**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. Fail-safe 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 Transmitter Output

**CALIBRATION RANGE:** The transmitter output can be calibrated so that a 4 mA output is produced for any number displayed on the meter. The 20 mA output may correspond to any number displayed on the meter that is at least 501 counts greater or smaller than the 4 mA output display. (Ex. 4 mA = 0, 20 mA = 501)

**OUTPUT LOOP RESISTANCE:**

Power supply	Loop Resistance	
	minimum	maximum
24 VDC	10 $\Omega$	600 $\Omega$
35 VDC (external)	600 $\Omega$	1000 $\Omega$

**ACCURACY:**  $\pm 0.1\%$  FS,  $\pm .004$  mA

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

**EXTERNAL LOOP POWER SUPPLY:** 35 V max.

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#### 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.

### ORDERING INFORMATION

### Model PD691

115 VAC	230 VAC	Description	Option Card**
PD691-3-N	PD691-4-N	No Options	
PD691-3-14	PD691-4-14	2 Relays	PD174
PD691-3-15	PD691-4-15	4-20 mA Output	PD175
PD691-3-16	PD691-4-16	2 Relays + 4-20 mA Output	PD176
PD691-3-17	PD691-4-17	4 Relays	PD177
PD691-3-18	PD691-4-18	4 Relays + 4-20 mA Output	PD178

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