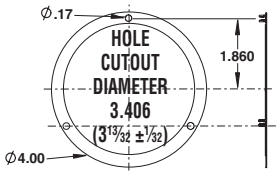
GAUGE INSTALLATION

Pipe Mount – The digital test gauge comes standard with a ¼ NPT connection. Good piping practices recommend using teflon tape or a pipe sealant on the gauge threads. Utilize a 7/16″ wrench on the wrench flat of the gauge to tighten the gauge to the process.

NEVER TIGHTEN GAUGE THREADS BY HOLDING THE BODY OF THE GAUGE. DOING SO MAY DAMAGE THE GAUGE AND MAKE THE GAUGE INOPERABLE.

Panel Mount – The lower connected digital test gauge is available with an optional flange for panel mounting. Please refer to illustration and dimensions below.



Battery Installation and Replacement:

The gauge comes standard with a quantity of three AAA alkaline batteries (installed). Use either Duracell MN2400, MX2400 or Energizer E92BP, X92RP AAA alkaline, non-rechargeable batteries.

Batteries have a life of approximately 1000 hours. Battery life is dependent on gauge usage, backlite settings and power off settings. When the display flashes LOW BAT, batteries should be replaced.

To replace the batteries:

1) Remove the single screw on the back of the gauge case.
2) Hold the keypad in the palm of hand.
3) Carefully remove the three batteries from the holder and replace the batteries. Use only AAA alkaline non-rechargeable batteries.

Pipe to which gauge is attached must be properly grounded.

PRECISION DIGITAL

Precision Digital Corporation
19 Strathmore Road
Natick, MA 01760-2418
Tel: 800-343-1001
Fax: 508-655-8990

I&M008-10135-9/05 dwg. 83B234-01 Rev. A

Precision Digital Test Gauge

Model PD233, PD243,PD253

Operating Instructions

I&M008-10135-9/05

PRECISION DIGITAL

Congratulations on your purchase of the Precision Digital Test Gauge with total error band full-scale accuracy and the largest display readout in the industry of .66˝ high. Other industry-leading features include twelve selectable engineering units, seven languages, and password-protected disable and calibration functions. With the range printed on the keypad, this digital gauge meets the ASME B40.7 digital gauge specification. See a complete listing of product features and specifications on pages 14 & 15.

PRECISION DIGITAL

Precision Digital Corporation
19 Strathmore Road
Natick, MA 01760-2418
Tel: 800-343-1001
Fax: 508-655-8990

SPECIFICATIONS

Config Mode	Allows Scrolling Through CONFIG Menus
Engineering Units	Psi, ˝Hg, ˝H_2O (with three temperature options, 60°F, 4°C and 20°C), ft.SW, bar, mbar, kPa, MPa, mmHg, cmH_2O, mmH_2O, kg/cm^2
Update Rate	4 Options: 10x/sec, 5x/sec, 2x/sec, 1x/sec
Auto Off	6 Options: Never, 2 Min., 5 Min., 15 Min., 30 Min.,
Dampening	6 Options: None, Average 2, 4, 6, 8 x update rate
Languages	7 Languages: English, Spanish, French, Italian, German, Portuguese, Dutch
Backlite	5 Options: On/Off, 10 Sec., 30 Sec., 5 Min., 15 Min.
Field Recalibration	Zero & Span (password protected)
Contrast	7 Available Options
Disable Config Options	Allows disabling of Config Options (password protected)
Calibration Chart	10 Point Individual NIST Traceable Calibration Chart, Standard
Standard Accessories	300 Series SS Protective Cover Nylon Protective Carrying Pouch

WARNING AND ERROR MESSAGES

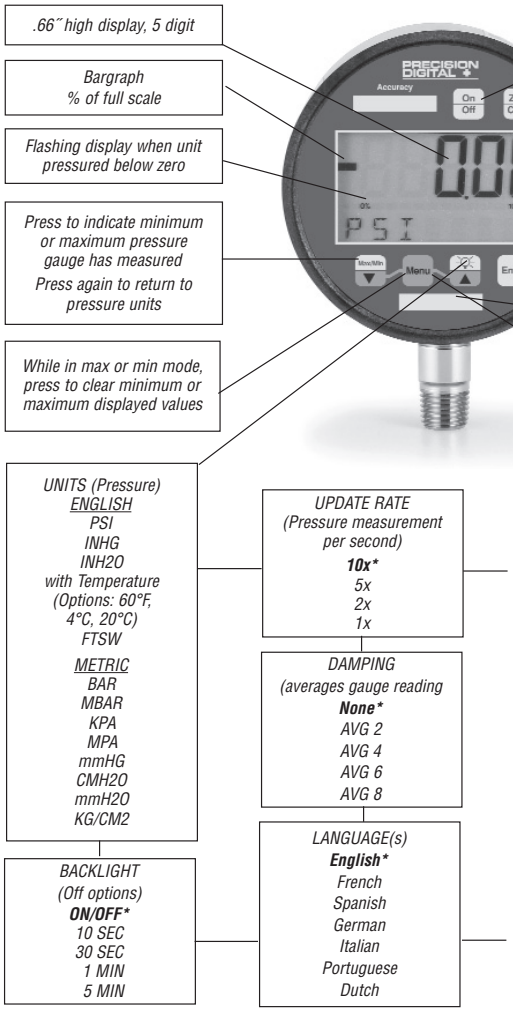
Display	Description
Flashing 0% or 100%	Gauge over/underpressured beyond 105% of range
LOW BAT	Low battery, replace
ERROR	Internal error, call customer service (203) 378-8281
RES ERROR	Pressure unit conversion exceeds display resolution or gauge pressured beyond resolution

SPECIFICATIONS

Model	PD233, PD243, PD253
Accuracy	0.05%, (PD253), 0.10% (PD243), 0.25% (PD233) Full Scale Terminal Point Total Error Band (TEB) Accuracy Including Hysteresis, Linearity, Repeatablilty & Temperature (–18/65°C) (0/150°F)
Dial Size	3"
Case Material	300 Series SS
Case Finish	Electropolished
Case Enclosure Rating	Weatherproof, IP65
Socket Material	316 SS
Socket Size	¼ NPT Male (others on application)
Socket Location	Lower connection, 6:00 o'clock
Ranges	Vac thru 7000 psi (see other engineering units below for other units of measurement)
Operating Temperature	0/150°F
Storage Temperature	–40/180°F
DISPLAY:	
Type	LCD
Display Digits	5
Character Height	.66˝
Backlit	Off By Default
Bargraph	Yes
Battery Life	1000 Hrs.
Agency Approvals	CE, FM & CSA (Intrinsically Safe Class I, Div 1)
KEYPAD FUNCTIONS:	
On/Off	Manually Turns Unit On & Off (auto off options in config menu)
Backlit	Manually Turns Backlit On & Off (auto off options in config menu)
Min/Max	Stores Min & Max Values
Zero/Clear	Zeros Display or Clears Min/Max Values When Displayed
Enter	Selects Items In CONFIG Menu

TABLE OF CONTENTS

QUICK REFER



PRESURE RANGES:

psi	Compound (psi)	kPa	Bar/ KSC	Compound (bar)
vac.	15# & vac.	–100/0	1	–1 to 0
5	30# & vac.	25	1.6	–1 to 1
10	60# & vac.	40	2.5	–1 to 2
15	100# & vac.	60	4	–1 to 3
30		100	6	–1 to 30
60		160	10	
100		250	16	
160		400	25	
200		600	40	
300		1000	60	
500			100	
600			160	
800			250	
1000			400	
1500			500	
2000				
2500				
3000				
5000				
7000				

mmH_2O	MPa	mBar/ cmH_2O	Absolute (psia)
3000	1	250	15
5000	1.6	300	25
10,000	2.5	400	50
	6	500	
	10	600	
	40	1000	
		1600	
		2000[2]	
		2500[1]	
		4000	
		5000	
		6000	
		10,000	

Step 3: Enter user five digit password (PW). This is the same password established to access the CONFIG mode in the menu.

Step 4: Press the CONFIG key to select the desired option.

Step 5: Press ENTER to finalize the selection.

Notes:
Selecting the DISAB feature does not disable the CLEAR button on the keypad for the MAX/MIN feature. If the DISAB feature is selected, pressing the ZERO button on the keypad will cause the display to read DISAB for two seconds. The gauge will then revert back to the unit of measure of the gauge. The DISAB feature disables the zero feature of the gauge.

Zero Disable Feature:
This feature allows disabling the Zero/Clear button on the keypad. It also allows for a zero tolerance of either 5% (default) or 10% of the gauge range.

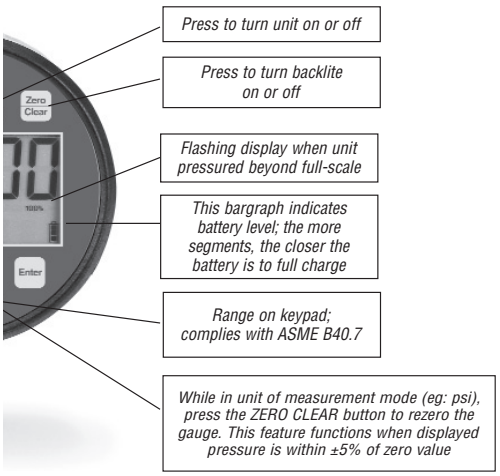
Step 1: *Press the CONFIG key until the word ZERO SP appears.*

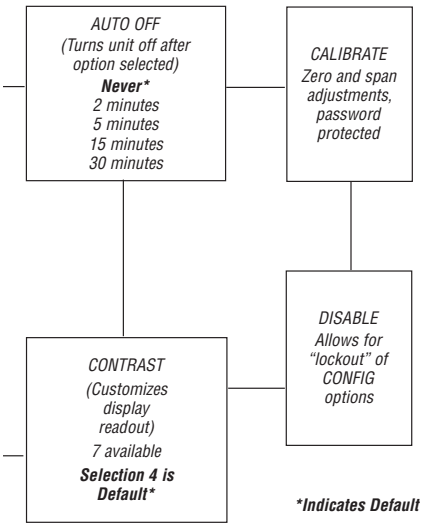
Step 2: *Press ENTER.*

Step 3: *A prompt appears to enter PW (enter password). The ZERO SP password is the same password as discussed on page 10 and the heading CALIBRAT:, Gauge Calibration. Follow the instructions on page 10 to enter a password.*

Step 4: *Press the CONFIG key to select the zero tolerance, either 5% or 10% of range, or press the CONFIG key again and the word DISAB appears. Press ENTER to select the new default setting.*

RENCE





KEYPAD FUNCTIONS

ON/OFF — Turns the gauge on and off. When pressing the ON/OFF key while in the off position, gauge start-up display first indicates the software version followed by the gauge pressure range. The gauge will then display indicated pressure and be ready for use.

BACK LITE — Manually turns backlite on and off. (See **CONFIG** mode for options).

MAX MIN — Allows review of minimum and maximum pressure values since unit start-up or last push of the clear button. Press key to:

1) Indicate maximum pressure.
2) Indicate minimum pressure.
3) Exit MAX/MIN mode and return to unit of pressure measurement mode. To clear minimum and maximum values press ZERO/CLR button.

Must be in MAX/MIN mode.

Note: MIN/MAX data is lost when unit is turned off.

ZERO CLR — Press this key prior to gauge usage to rezero any initial offset less than ±5% of the rated gauge range. If indicated pressure is greater than 5% of range, the rezero feature becomes inoperable. This prevents accidental tare of a pressurized gauge.

To clear minimum and maximum values, press ZERO/CLR button (when min/max values are indicated.

ENTER — Used in conjunction with CONFIG key, see next page.

CONFIG — This key allows for customization of the gauge.

Pressing the CONFIG key allows cycling through the main menu items; UNITS, UPDATE, AUTO OFF, BACKLITE, LANGUAGE, DAMPING, CONTRAST & CALIBRAT.

Zero Calibration:
Step 14: Press the CONFIG key once and the word CALIBRA appears. Press ENTER. (This mode allows for 0 and full- scale adjustment of span.) The gauge will now display 0.00. Ensure the gauge is not pressurized[1], then press ENTER to zero the gauge. Zero calibration is now complete.

Full Scale Calibration
Step 15: The gauge will now display full-scale range (e.g. 100.00 psi). Pressurize the gauge to 100% of the range (which is equal to the displayed value) utilizing a pressure standard with accuracy four times greater than the unit being calibrated[2]. Press ENTER. Full-scale calibration is now complete.

Notes:

1. If the digital gauge under test is not pressurized while in span adjustment of full-scale range, an ERROR message will be displayed when the ENTER button is pressed. If this occurs, press the ZERO CLEAR button on the keypad to return to the previous screen.
2. ASME B40.7-1998, section 6.1.1.1 recommends the working standard for the gauge being tested is 4X better than the digital gauge under test. This means the pressure standard measuring the full-scale pressure being applied to the gauge should have an accuracy four times greater than the unit being spanned.

Zero SP (span):
This feature allows setting *the % of span in which the zero button will operate. Span is limited to prevent accidental tare of process pressures.* Options are *5%,* 10% or DISAB *(5% is the factory default and means the unit can be rezeroed between ±5% of span). If DISAB is selected, the zero button is deactivated and no display change will occur when the zero button is pushed.*

Step 1: Press the CONFIG key until the word ZERO SP appears.

Step 2: Press ENTER.

Step 1: Press the CONFIG key until the word CALIBRAT appears.

Step 2: Press the ENTER key.

Step 3: The letters/asterisks… PW***** appear.

Step 4: Press the CONFIG key. An Ø appears in the first position.

Step 5: Press the ENTER key once.

Step 6: Press the CONFIG key until Ø appears. Ø will appear in the second position.

Step 7: Press ENTER.

Step 8: Use this format until all the asterisks are replaced with Ø.

There now should be a total of five Ø's on the keyboard display. The zero in the fifth position should be blinking.

Step 9: Press the ENTER key. You are now prompted to SET PW (or set password).

Step 10: Press the ENTER key.

Step 11: Decide on a five number user password, then follow the procedure above inserting a number in the flashing display until all five numbers are inserted.

Step 12: A SAVE prompt will then appear. If the selected user password is acceptable, press ENTER. If the selected user password is not acceptable press ZERO CLEAR to refigure the user password.

After the password is configured, the default factory password will be replaced with the user password. Once configured, the factory password is no longer accessible.

If an incorrect password is entered, the system will display WRONG. Press the CONFIG key to reenter the correct password.

Step 13: Press ENTER again to begin calibration.

Note: Calibration feature allows recalibration of zero and span.

*Indicates default.

UNITS: 12 units of measurement are available, both English and metric, by cycling through the UNITS key; psi, ″Hg, ″H_2O (with three temperature options, 60°F, 4°C and 20°C), ftSw, Bar, mBar, kPa, MPa, mmHg, cmH_2O, mmH_2O, kg/cm^2.

Step 1: Press the CONFIG key until the word UNITS appears.

Step 2: Press the ENTER key.

Step 3: Press the CONFIG key once to select ENGLISH or again to select METRIC.

Step 4: Press the ENTER key with selection of ENGLISH or METRIC.

Step 5: Press CONFIG key to select unit of measurement.

Step 6: Press ENTER key to finalize unit of measurement.

UPDATE: this option allows for changing the rate at which pressure is updated on the display screen. The default rate measures pressure at the maximum rate of **10*** updates per second or 100 milli-seconds. Optional rates of measurement are measured in updates per second. The options are **10*,** 5, 2 or 1 update of pressure measurement per second.

Since customer processes vary, update rates should be selected based on the application.

To use the UPDATE option:

Step 1: Press the CONFIG key until the word UPDATE appears.

Step 2: Press the ENTER key.

Step 3: Press the CONFIG key to select the desired update rate.

Step 4: Press ENTER key to finalize **UPDATE** rate.

AUTO OFF: this option sets the amount of time before the gauge will turn itself off after no activity.

*Indicates default.

Offerings are **Never*,** 2, 5, 15, or 30 minutes.

To use the AUTO OFF option:
Step 1: Press the CONFIG key until the word AUTO OFF appears.

Step 2: Press the ENTER key.

Step 3: Press the CONFIG key to select the desired AUTO OFF rate.

Step 4 Press the ENTER key to finalize the AUTO OFF rate.

BACKLITE: 5 options are available. They include **ON/OFF*,** 10 seconds, 30 seconds 1 or 5 minutes. With the ON option pressed, the gauge backlite will remain lit whenever the gauge is in the ON mode or until the backlite button is pushed again. Options allow the backlite to automatically turn-off after a selected period of time. **Note:** leaving backlite button on will decrease battery life.

To use the BACKLITE option:

Step 1: Press the CONFIG key until the word BACKLITE appears.

Step 2: Press the ENTER key.

Step 3: Press the CONFIG key to select one of the available time options.

Step 4: Press the ENTER key to finalize your choice of BACKLITE options.

LANGUAGE: available in seven different languages, this option allows the user to change the default language in the CONFIG mode. The languages include **English*,** French, Spanish, German, Italian, Portuguese and Dutch.

Step 1: Press the CONFIG key until the word LANGUAGE appears.

Step 2: Press the Enter key.

Step 3: Press the CONFIG key to select one of the

*Indicates default.

available LANGUAGE options.

Step 4: Press the ENTER key to finalize your LANGUAGE option.

DAMPING: with six different options, this mode allows for taking process pressure readings and averaging them. This option is particularly useful when there is pulsation in the process. The options are **NONE*,** AVG 2, 4, 6 or 8.

Step 1: Press the CONFIG key until the word DAMPING appears.

Step 2: Press the ENTER key.

Step 3: Press the CONFIG key to select one of the available DAMPING options.

Step 4: Press the ENTER key to finalize your DAMPING option.

CONTRAST: this mode allows for BACKLITE contrast level. Seven options are available, 1, 2, 3, **4*,** 5, 6 and 7.

Step 1: Press the CONFIG key until the word CONTRAST appears.

Step 2: Press the ENTER key.

Step 3: Press the CONFIG key to select one of the available CONTRAST options.

Step 4: Press the ENTER key to finalize your CONTRAST selection.

Note: setting high contrast levels will decrease battery life.

CALIBRAT.:

Gauge Calibration: Both zero and span adjustments are available. This gauge has been configured with a default password of ØØØØØ. This factory password does not allow access to calibration. To access the calibration mode, it is necessary to configure a *user password.* Once the user password is configured, it will become the default password that allows access to gauge calibration.

To access the factory default password:

*Indicates default.