

Model 610 Digital Pressure Gauge

- Built for harsh process environments
- Selectable units: psi, KPa, Bar, mBar, mm Hg, inches Hg, mm H₂O, inches H₂O, kgF/cm²
- Front panel keys for fast, easy use
- Powered by long-life 9V alkaline batteries
- Min/Max recording feature built-in
- Stainless steel isolated sensor



The Altek Model 610 Digital Pressure Gauge is a precision electronic instrument designed to accurately and reliably measure and display pressure in all popular engineering units.

The Model 610 was engineered for the real world. The 300 Series stainless steel body is designed to survive harsh process environments. An isolated sensor ensures reliable operation with any gas or liquid compatible with 17-4 PH stainless steel. A 1/4" NPT fitting allows simple installation to all common process connections. The rotatable front panel always displays correctly, regardless of gauge orientation. Easily replaceable 9V alkaline batteries provide extended service life with minimal downtime.

Selectable engineering units eliminate the need to purchase a variety of gauges. Five front panel keys provide fast, simple operation and calibration. Pressure values are displayed on a four-digit LCD located on the front of the gauge. The full-function display automatically indicates the pressure mode, pressure units, and error conditions (low battery or overrange).

The Model 610 is one of Altek's growing family of pressure and electrical measurement instruments. For information on the complete line of Altek equipment, consult your local distributor or contact the Factory directly.

Range and Resolution

Model Number	Range	Resolution	Full Scale Pressure						
			PSI	Kpa	BAR	mBAR	kgf/cm ²	mm Hg	in Hg
610-VAC	-15.00 to +15.00	0.02	103.4	±1.034	±1034	±1.055	±775.7	±30.54	±415.2
610-0	-15.00 to 0.00	0.02	206.8	-1.034 to 0	-1034 to 0	-1.055 to 0	-775.7 to 0	-30.54 to 0	-415.2 to 0
610-15	0.00 to 15.00	0.01	344.7	1.034	1034	1.055	775.7	30.54	415.2
610-30	0.00 to 30.00	0.01	689.5	2.068	2068	2.109	1551	61.08	830.4
610-50	0.00 to 50.00	0.01	1379	3.447	3447	3.515	2586	101.8	1384
610-100	0.0 to 100.0	0.1	2068	6.895	6895	7.031	5171	203.6	2768
610-200	0.0 to 200.0	0.1	3447	13.79	NA	14.06	NA	407.2	5536
610-300	0.0 to 300.0	0.1	5171	20.68	NA	21.09	NA	610.8	8304
610-500	0.0 to 500.0	0.1	6895	34.47	NA	35.15	NA	1018	NA
610-750	0.0 to 750.0	0.1	NA	51.71	NA	52.73	NA	1527	NA
610-1000	0 to 1000	1	NA	68.95	NA	70.31	NA	2036	NA
610-1500	0 to 1500	1	NA	103.4	NA	105.5	NA	3054	NA
610-2000	0 to 2000	1	NA	137.9	NA	140.6	NA	4072	NA
610-3000	0 to 3000	1	NA	206.8	NA	210.9	NA	6108	NA
610-5000	0 to 5000	1	NA	344.7	NA	351.5	NA	NA	NA
610-10K	0 to 9999	1	NA	689.5	NA	703.1	NA	NA	NA

Model 610 Digital Pressure Gauge

DO NOT DISCARD THESE INSTRUCTIONS. THE INFORMATION PROVIDED IN THIS DOCUMENT IS ESSENTIAL TO SAFE, PROPER EQUIPMENT OPERATION AND MAINTENANCE.

Safety Precautions

- It is imperative that all system pressure be relieved prior to making any connections or disconnections. Failure to relieve system pressure could result in serious personal injury and/or equipment damage.
- Always exercise standard physical protection practices (i.e., eye protection, gloves, protective clothing, etc.) when working around pressure devices.

Installation

Installing the Model 610

The Model 610 is provided with a 1/4" NPT fitting. To install a Model 610:

1. Remove all pressure from the system.
2. Apply an appropriate pipe sealant to the gauge fitting threads, then carefully install the gauge into the process connection.
3. Securely tighten the gauge fitting.
4. Apply system pressure and check for leaks.

Orienting the Faceplate

Since the Model 610 can be installed in virtually any position, the faceplate can be rotated 360° to facilitate reading the display. To orient the faceplate:

1. Loosen the screw on the rear of the gauge (see Figure 1).
2. Rotate the faceplate to the desired position.
3. Tighten the screw on the rear of the gauge.

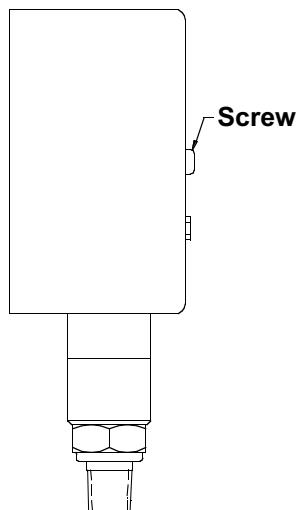


Figure 1

Operation

Operating Modes

The Model 610 features five operating modes:

- **Pressure Measurement mode:** In this mode, pressure is measured and displayed. This is the default mode when the gauge is turned on unless another mode is specified.
- **Peak Pressure Display mode:** In this mode, the peak (maximum) pressure is displayed. The peak pressure is updated whenever the measured pressure exceeds the current peak pressure.

This mode is enabled by pressing the **Peak/Valley** key until the HIGH legend appears on the display, and disabled by pressing the **Peak/Valley** key until the HIGH legend disappears from the display.

- **Valley Pressure Display mode:** In this mode, the valley (minimum) pressure is displayed. The valley pressure is updated whenever the measured pressure is less than the current valley pressure.

This mode is enabled by pressing the **Peak/Valley** key until the LOW legend appears on the display, and disabled by pressing the **Peak/Valley** key until the LOW legend disappears from the display.

- **Setup mode:** This mode is enabled by pressing and holding the **Reset** key while turning on the gauge. Release the **Reset** key when the SETUP legend appears on the display. To exit the Setup mode and return to the Pressure Measurement mode, press the **Reset** key.

This mode permits the Battery Save and Zero Key Enable features to be turned on or off (the factory default is ON for both). When the Setup mode is enabled, the current state of the Battery Save feature (AUTO ON or AUTO OFF) will be displayed. Press the **Peak/Valley** key to toggle the Battery Save feature on or off. Press the **Reset** key to save the displayed Battery Save state and return to the Pressure Measurement mode. Alternately, press the **Zero** key to save the displayed Battery Save state and display the current state of the Zero Key Enable feature (0 ON or 0 OFF). Press the **Zero** key to toggle the Zero Key Enable feature on or off. Press the **Reset** key to save the displayed Zero Key Enable state and return to the Pressure Measurement mode.

- **Calibration mode:** This mode allows the Model 610 to be field calibrated. This mode is enabled by

pressing and holding the **Units** key while turning on the gauge. CAL will appear on the display. Refer to the **Calibration** section for detailed instructions.

Function Keys

The Model 610 keypad contains five function keys:

■ **On/Off key:** This key turns the gauge on or off. When the gauge is turned on, the measured pressure will be displayed. The engineering units that were in use when the gauge was turned off will be indicated.

If the Battery Save feature is enabled via the Setup mode, the gauge will turn itself off approximately 15 minutes after the last key is pressed.

■ **Zero key:** This key performs a variety of functions.

If this key is pressed while the Pressure Measurement mode is enabled, the current pressure is stored as the “zero” value. This value is then subtracted from all subsequent display readings. This value is retained even when gauge power is turned off.

If this key is pressed immediately after pressing the **Reset** key, the Factory “zero” value is recalled.

If this key is pressed while the Setup mode is enabled, the Zero Key Enable feature will toggle on and off. If the Zero Key Enable feature is turned off via the Setup mode, this key is disabled.

■ **Peak/Valley key:** This key changes between displaying the current pressure, the peak (HIGH) recorded pressure value, and the valley (LOW) recorded pressure value. The appropriate legend will be indicated on the display.

If this key is pressed immediately after pressing the **Reset** key, the peak and valley pressure values are cleared. The peak/valley values are automatically cleared each time the gauge is turned off. To continuously monitor pressure and peak/valley readings, turn off the Battery Save feature.

■ **Reset key:** This key is used in conjunction with the **Zero** and **Peak/Valley** keys.

■ **Units key:** This key scrolls through the list of available engineering units. The display will update to indicate the selected units and the displayed pressure value will be converted to the selected engineering units. If the selected engineering units are not appropriate for the gauge’s range (i.e., mm H₂O on a 0-5000 psi gauge), five dashes will appear on the display. The selected engineering unit will

(Continued on page 4)

Calibration

To ensure optimum gauge operation and accuracy, annual calibration is recommended. All calibration equipment should have an accuracy of $\pm 0.06\%$ or better. To field calibrate a Model 610:

1. Press the **On/Off** key to turn off the gauge.
2. Press and hold the **Units** key, then press the **On/Off** key.
3. When CAL appears on the display (indicating that the Calibration mode is enabled), release the **Units** key.
4. 0% will appear on the display. Apply the appropriate Zero Scale Calibration Pressure (refer to the Calibration Table below).
5. When the applied pressure is correct, press the **Units** key.
6. 50% will appear on the display. Apply the appropriate Mid Scale Calibration Pressure (refer to the Calibration Table below).
7. When the applied pressure is correct, press the **Units** key.
8. 100 will appear on the display. Apply the appropriate Full Scale Calibration Pressure (refer to the Calibration Table below).
9. When the applied pressure is correct, press the **Units** key.
10. The Pressure Measurement mode will be enabled, indicating that calibration is complete.

Model 610 Calibration Table

Gauge Pressure Range	Zero Scale Calibration Pressure	Mid Scale Calibration Pressure	Full Scale Calibration Pressure
-15 to +15 psi	-10 psi	0 psi	15 psi
-15 to 0 psi	-10 psi	-5 psi	0 psi
0-15 psi	0 psi	7 psi	15 psi
0-30 psi	0 psi	15 psi	30 psi
0-50 psi	0 psi	25 psi	50 psi
0-100 psi	0 psi	50 psi	100 psi
0-200 psi	0 psi	100 psi	200 psi
0-300 psi	0 psi	150 psi	300 psi
0-500 psi	0 psi	250 psi	500 psi
0-750 psi	0 psi	375 psi	750 psi
0-1000 psi	0 psi	500 psi	1000 psi
0-1500 psi	0 psi	750 psi	1500 psi
0-2000 psi	0 psi	1000 psi	2000 psi
0-3000 psi	0 psi	1500 psi	3000 psi
0-5000 psi	0 psi	2500 psi	5000 psi
0-10,000 psi	0 psi	5000 psi	10,000 psi

MODEL 610 INSTRUCTION GUIDE

(Continued from page 3)

remain in use until a new one is selected, even when gauge power is turned off.

Display

The display indicates the pressure value, various operating legends, and error messages.

In Pressure Measurement mode, the measured pressure value and the selected engineering units will be displayed. In Peak Pressure Display mode, the peak pressure value and the HIGH legend will be displayed. In Valley Pressure Display mode, the low pressure value and the LOW legend will be displayed. When in Setup mode, SETUP will be displayed. In Calibration mode, CAL will be displayed.

When an error condition is detected, a fault legend will be displayed. BATTERY will be displayed if the battery voltage is low. OVR will appear on the display instead of the engineering units if the input pressure is outside the range of the gauge. ERROR will be displayed if the input pressure is too large to be displayed (greater than 9999 counts). If the selected engineering units are inappropriate for the gauge's range (i.e., mm H₂O on a 0-5000 psi gauge), "-----" will be displayed.

Basic Maintenance

Replacing the Batteries

The Model 610 is powered by two 9V batteries. When battery voltage is low, BATTERY will be indicated on the display. To replace the batteries:

1. Remove the screw from the rear of the gauge (see Figure 1).
2. Remove the faceplate. Use care not to damage the lead connecting the faceplate to the gauge body.
3. Disconnect the power leads from the batteries, then remove the batteries from the battery clips.
4. Install fresh 9V batteries in the battery clips, then connect the power leads. (Alkaline batteries provide the longest service life.)
5. Install the faceplate and position it in the desired orientation.
6. Replace the screw on the rear of the gauge.

ALTEK INDUSTRIES CORP
A TRANSMATION COMPANY

35 Vantage Point Drive Rochester,
New York 14624 U.S.A.
(716) 349-3500 • Fax: (716) 349-3510
E-Mail: altekales@altekcalibrators.com
<http://www.altekcalibrators.com>

Specifications

Unless otherwise indicated, all specifications are referred to an ambient temperature of 25°C ± 1°C (77°F ± 2°F).

Accuracy:	±0.25% of span
Maximum Pressure:	2 times full scale or 15,000 psi, whichever is smaller
Operating Temperature:	-1°C to 71°C (30°F to 160°F)
Storage Temperature:	-28°C to 85°C (-20°F to 185°F)
Media Compatibility:	Any gas or liquid compatible with 17-4 PH stainless steel
Engineering Units:	psi, KPa, Bar, mBar, kgF/cm ² , mm Hg, inches Hg, mm H ₂ O, inches H ₂ O
Display:	4-digit LCD with status indicators
Pressure Connection:	1/4" NPT male fitting
Power:	Two 9V alkaline batteries
Battery Life:	450 powered hours, typical
Size:	94 mm (3.7") face diameter with 58 mm (2.3") stem
Weight:	0.5 kg (1 lb.)

Factory Service and Warranty

If repair is required and field service is inconvenient or undesirable, the Model 610 may be returned to the Factory for repair or replacement (at our discretion).

No Model 610 will be accepted for service unless all process materials have been completely removed from all components by the customer. Contaminated units will be returned to the customer for proper cleaning.

Altek warrants all equipment manufactured by it and bearing its nameplate and all repairs made by Altek to be free from defects in material or workmanship under normal use and service for a period of one year from the date of delivery to the Purchaser. Expendable items such as fuses, batteries, test leads, and carrying cases are not warranted. Altek will repair, at its option, without charge, F.O.B. Altek's factory, any equipment or part thereof found to be defective in material or workmanship if such item is returned to Altek's factory, transportation postpaid. The liability of Altek is restricted to that given under our guarantee. No responsibility is accepted for damage, loss, or other expense incurred through the use or sale of our equipment. Under no condition shall Altek be held liable for any special, incidental, or consequential damage.

Available from: