

**FLUKE®**

# 718 Series

Pressure Calibrator

**Product Overview (E)**

PN 1549632

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## LIMITED WARRANTY & LIMITATION OF LIABILITY

This Fluke product will be free from defects in material and workmanship for three years (one year for pump assembly) from the date of purchase. This warranty does not cover fuses, disposable batteries or damage from accident, neglect, misuse or abnormal conditions of operation or handling. Resellers are not authorized to extend any other warranty on Fluke's behalf. To obtain service during the warranty period, send your defective Calibrator to the nearest Fluke Authorized Service Center with a description of the problem.

THIS WARRANTY IS YOUR ONLY REMEDY. NO OTHER WARRANTIES, SUCH AS FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSED OR IMPLIED. FLUKE IS NOT LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, ARISING FROM ANY CAUSE OR THEORY. Since some states or countries do not allow the exclusion or limitation of an implied warranty or of incidental or consequential damages, this limitation of liability may not apply to you.

## ***Accessing the Users Manual***

The *718 Series Pressure Calibrator Users Manual* is available on the 718 CD included with your calibrator.

## ***Contacting Fluke***

To order accessories, receive operating assistance, or get the location of the nearest Fluke distributor or Service Center, call:

USA: 1-888-99-FLUKE (1-888-993-5853)

Canada: 1-800-363-5853

Europe: +31 402-675-200

Japan: +81-3-3434-0181

Singapore: +65-738-5655

Anywhere in the world: +1-425-446-5500

Or, visit Fluke's Web site at [www.fluke.com](http://www.fluke.com).

# ***Pressure Calibrator***

## ***Introduction***

The Fluke 718 Series Pressure Calibrators (hereafter called “Calibrator”) can do the following:

- Calibrate P/I (pressure to current) transmitters
- Measure pressure via a 1/8-inch NPT pressure fitting and an internal pressure sensor or via a Fluke 700 Series Pressure Module
- Source Pressure
- Measure current up to 24 mA
- Simultaneously display pressure and current measurements.
- Supply loop voltage
- Calculates percentage in Percent Mode
- Calculates mA error in Percent Error Mode

The 718 Pressure Calibrators (hereafter, “the Calibrator”) include:

- 718 1G
- 718 30G
- 718 100G
- 718 300G

The Calibrator takes 5-digit pressure readings in the following units: psi, inH<sub>2</sub>O at 4 °C, inH<sub>2</sub>O at 20 °C, kPa, cmH<sub>2</sub>O at 4 °C, cmH<sub>2</sub>O at 20 °C, bar, mbar, kg/cm<sup>2</sup>, inHg, and mmHg.

Pressure sensor specifications are as listed under “Pressure Sensor Input”.

The Calibrator measures pressure in the units shown in Table 1.

For Pressure Modules, full scale readings for all pressure ranges can be made in psi, kPa, and inHg units. To avoid display overflow, full scale readings are limited to 1000 psi in cmH<sub>2</sub>O, mbar, and mmHg units, and 3000 psi in inH<sub>2</sub>O units. Pressures of at least 15 psi must be measured for meaningful readings in bar and kg/cm<sup>2</sup> units.

**Table 1. Input Units**

<b>Displayed Pressure Units</b>
psi
inH <sub>2</sub> O at 4°C
inH <sub>2</sub> O at 20°C
cmH <sub>2</sub> O at 4°C
cmH <sub>2</sub> O at 20°C
bar
mbar
kPa
inHg
mmHg
kg/cm <sup>2</sup>

### **Standard Equipment**

The items listed below are included with your Calibrator. If the Calibrator is damaged or something is missing, contact

the place of purchase immediately. To order replacement parts or spares, see the user-replaceable parts list near the end of this manual.

- TL75 test leads (one set)
- AC72 Alligator clips (one set)
- Holster
- *718 Series Product Overview Manual*
- *718 Series CD-ROM* (contains Users Manual)

### **Safety Information**

Use the Calibrator only as specified in the Users Manual, otherwise the protection provided by the Calibrator may be impaired.


A **Warning** identifies conditions and actions that pose hazard(s) to the user; a **Caution** identifies conditions and actions that may damage the Calibrator or the equipment under test.

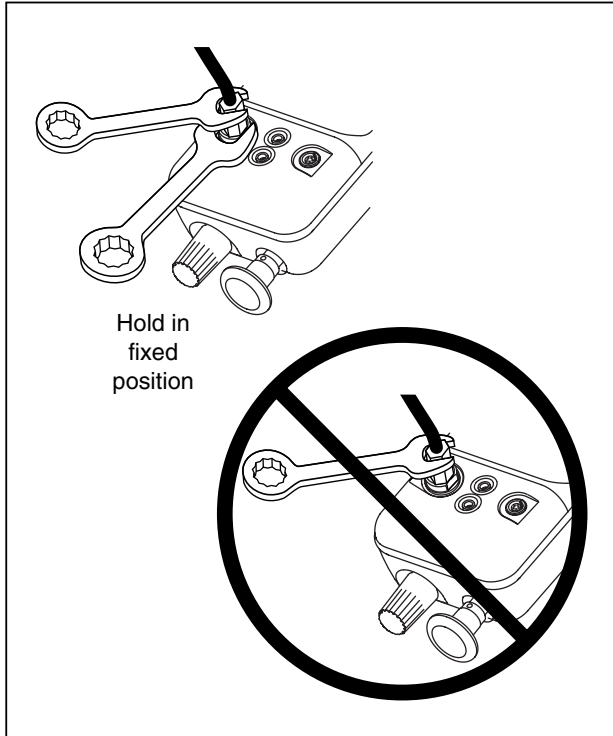
**⚠⚠ Warning**

To avoid possible electric shock or personal injury:

- Never apply more than 30 V between the mA terminals, or between either of the mA terminals and earth ground.
- Do not use the Calibrator to make measurements in a CAT II, CAT III, or a CAT IV environment.  
    CAT I equipment is designed to protect against transient from high-voltage, low-energy sources, such as electronic circuits or a copy machine
- Remove the test leads from the Calibrator before you open the battery door.
- Make sure the battery door is closed and latched before you operate the Calibrator.
- Do not operate the Calibrator if it is damaged.
- Do not operate the Calibrator around explosive gas, vapor, or dust.
- When using probes, keep fingers behind the finger guards on the probes.
- Use only two 9 V batteries, properly installed in the Calibrator case, to power the Calibrator.
- Follow all equipment safety procedures.
- Turn off circuit power before connecting the Calibrator mA and COM terminals in the circuit. Place Calibrator in series with the circuit.
- When servicing the Calibrator, use only specified replacement parts.
- Do not allow water inside the case.

**⚠ ⚠ Warning**

- To avoid false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the battery indicator  appears.
- To avoid a violent release of pressure in a pressurized system, shut off the valve and slowly bleed off the pressure before you attach or detach the internal pressure sensor or Pressure Module fitting to the pressure line.
- To avoid over pressure damages, do not apply pressure that exceeds the limits listed in the Pressure Specifications table in the “Specifications” section.
- To avoid mechanically damaging the Calibrator, do not apply torque between the pressure fitting and the Calibrator case. See Figure 1 for the proper use of tools.
- To avoid misleading readings, disconnect the Pressure Module connector at the Calibrator.
- To avoid damage to the Pressure Module, refer to the related Instruction Sheet.
- To avoid damage to the pump, use with dry air and non-corrosive gases only.
- Check test leads for continuity before using. Inspect Calibrator for cracks or damage, do not use the probes if they are damaged or show high resistance.



**Figure 1. Connection Technique**

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**Table 2. International Electrical Symbols**

Symbol	Meaning
	Earth ground
	Fuse
	Battery
	Refer to the manual for information about this feature.
	Hazardous voltage. Risk of electric shock.
	Double insulated
	Conforms to relevant Canadian Standards Association directives.
	Conforms to relevant European Union directives
	Pressure

## Getting Acquainted with the Calibrator

Press **Ⓢ** to turn the Calibrator on and off. The Calibrator displays pressure and current measurements simultaneously. See Figure 2.

The upper part of the display shows the applied pressure or vacuum. (Vacuum is shown as a negative value.) Press **UNITS** to select a different unit. When you cycle the power off and on, the Calibrator retains the unit you last used.

The lower part of the display shows the current (up to 24 mA) applied to the current (mA) inputs.

To source loop voltage, press **UNITS** while pressing **Ⓢ** on.

## Power Saver

The Calibrator automatically turns off after 30 minutes of inactivity. To reduce this time or disable this feature:

1. With the Calibrator OFF, press **Ⓢ**.
2. **P.S. xx** is displayed, where **xx** is the turn-off time in minutes. **OFF** means the power saver is disabled.
3. Press **HOLD** to decrease or **mA MODE** to increase the turn-off time.
4. To disable, press **HOLD** until the display shows **OFF**. The Calibrator resumes normal operation after 2 seconds.

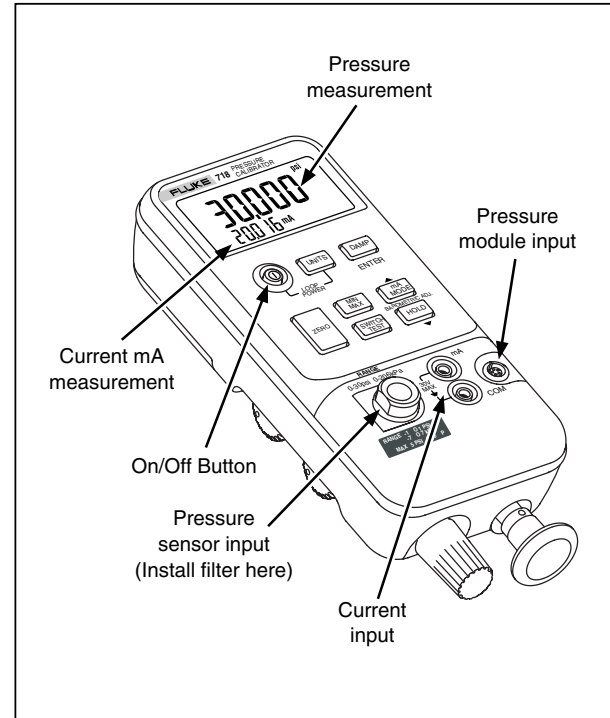


Figure 2. Front Panel Features












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## Pushbuttons

Pushbutton operation is described in Table 3.

**Table 3. Pushbutton Functions**

Pushbutton	Description
	Press to select a different pressure unit. All units are available when the pressure sensor input is used. For higher pressure module inputs, inappropriate (out-of-range) units are not available. Press  on while pressing  to source loop voltage.
	Turns pressure reading damping on and off. With damping on, the Calibrator averages several measurements before displaying a reading. Press to confirm selection of 0 % and 100 % output parameters.
	Press to zero the pressure display. Vent pressure to atmosphere before you press this pushbutton. With an Absolute Pressure Module, see special instructions below.
	Press to read the minimum pressure and current readings since power was turned on or the registers were cleared. Press again to read the maximum pressure and current readings since power was turned on. Press and hold for 3 seconds to clear the MIN/MAX registers.
	Press to perform switch test.
	Press to toggle the mA display mode between mA, mA Percent, and mA Percent Error.
	Press  to freeze the display. The <b>HOLD</b> symbol appears on the display. Press  again to resume normal operation.

## Switch Test

To perform a switch test follow these steps:


### Note

*This example used a normally closed switch.  
The procedure is the same for an open switch  
but the display reads OPEN instead of CLOSE.*

1. Connect the Calibrator mA and COM terminals to the switch using the pressure switch terminals and connect the pump from the Calibrator to the pressure switch. The polarity of the terminals does not matter.


### Note



*If using an external pump, connect the pump to the Calibrator and to the input of the switch using a tee fitting.*

2. Make sure the vent on the pump is open and zero the Calibrator if necessary. Close the vent after Zeroing the Calibrator.
3. Press  to enter pressure switch test mode. The Calibrator will display **CLOSE** instead of a mA measurement.
4. Apply pressure with the pump slowly until the switch opens.

### Note

*In the switch test mode, the display update rate is increased to help capture changing pressure inputs. Even with this enhanced sample rate, pressuring the device under test should be done slowly to ensure accurate readings.*

5. **OPEN** is displayed once the switch is open. Bleed the pump slowly until the pressure switch closes. **RCL** appears on the display.
6. Press  to read the pressure values for when the switch opened, for when it closed, and for the deadband.

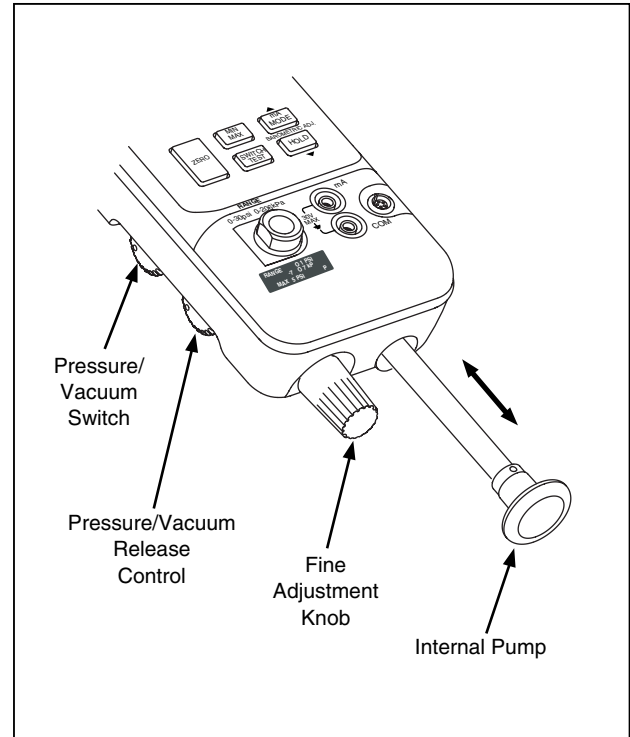
Hold  for three seconds to exit the switch test or press  to reset the switch test.

**Pump Features**

Refer to Table 4 and Figure 3.

**Table 4. Pump Features**


Item	Description
Pressure Vacuum Switch	Rotate forward (clockwise) for pressure, backward (counter-clockwise) for vacuum.
Pressure Vacuum Release Valve	Rotate fully backward (counter-clockwise) to release all pressure or vacuum. (Rotate slightly for partial release.) Rotate fully forward (clockwise) to close valve.
Fine Adjustment Knob	Rotate either direction for precise adjustment of applied pressure or vacuum. Full rotation is about 30 turns.
Internal Pump	Increase pressure on the inward stroke. In vacuum mode, decrease pressure on the outward stroke.




**Figure 3. Pump Features**

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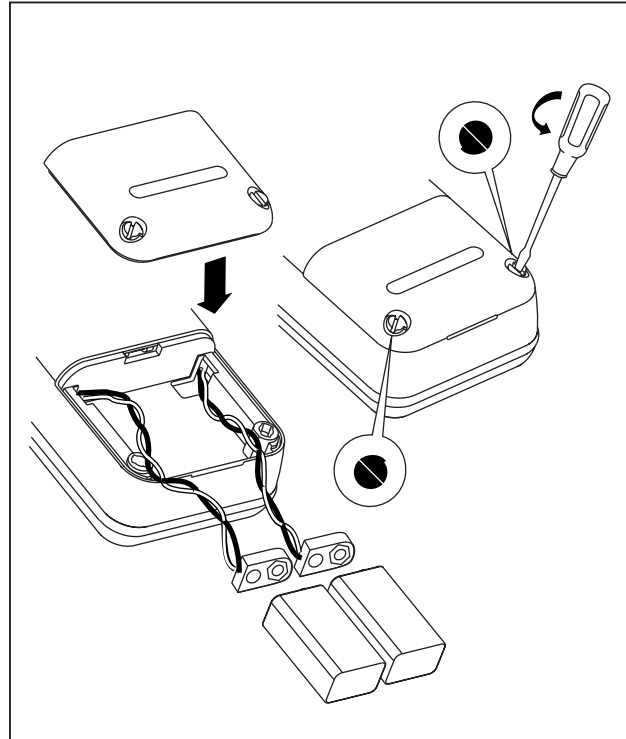
## Replacing the Batteries

When the  symbol appears on the display, replace the two 9 V alkaline batteries. Refer to Figure 4.

### Warning

To avoid false readings, which could lead to possible electric shock or personal injury, replace the batteries as soon as the battery indicator  appears.

Disconnect test leads before opening battery door.



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Figure 4. Battery Replacement

## Specifications

Specifications are based on a one year calibration cycle and apply for ambient temperature from +18 °C to +28 °C unless stated otherwise. “Counts” are the number of increments or decrements of the least significant digit.

### Pressure Sensor Input

Model	Range	Accuracy	Max Non-destructive Pressure
1G	-1 to 1 PSI (-7 to 8 kPa)	± 0.05 % of Range	5 PSI (34.5 kPa)
30G	-12 to 30 PSI (-83 to 207 kPa)		60 PSI (413 kPa)
100G	-12 to 100 PSI (-83 to 690 kPa)		200 PSI (1.4 mPa)
300G	-12 to 300 PSI (-83 to 2068 kPa)		375 PSI (2.6 mPa)
<i>Temperature coefficient: 0.01 % of range per °C for temperature ranges -10 °C to 18 °C and 28 °C to 55 °C</i>			

### Pressure Module Input

Range	Resolution	Accuracy
(determined by Pressure Module)		

### DC mA Input

Range	Resolution	Accuracy, ±(% of Reading + Counts)
24 mA	0.001 mA	0.015 + 2
<i>Fusless overvoltage protection</i>  <i>Temperature coefficient: 0.005 % of range per °C for temperature ranges -10 °C to 18 °C and 28 °C to 55 °C</i>		

### Loop Supply

24 V dc nominal

### General Specifications

**Maximum voltage applied between either mA terminal and earth ground or between the mA terminals: 30 V**

**Maximum transient overvoltage: 240 V ac for 10 seconds**

**Storage temperature: -40 °C to 60 °C**

## 718 Series

### Product Overview

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**Operating temperature:** -10 °C to 55 °C

**Operating altitude:** 3000 meters maximum

**Relative humidity:** 95 % up to 30 °C, 75 % up to 40 °C, 45 % up to 50 °C, and 35 % up to 55 °C

**Vibration:** Random 2 g, 5 Hz to 500 Hz per MIL-PRF-28800F Class 2

**Shock:** 1 meter drop test, per IEC 61010-1

**Safety:** Certified as compliant to ISA-82.02.01 (IEC 61010-1 Mod) CSA C22.2 No. 1010.1

**Protection Class:** Class 2, Double insulated

**Power requirements:** Two 9 V batteries (ANSI/NEDA 1604A or IEC 6LR61)

**Size:** 60 mm H x 87 mm W x 210 mm L (2.38 in H x 3.41 in W x 8.28 in L); with holster: 66 mm H x 94 mm W x 216 mm L (2.61 in H x 3.72 in W x 8.5 in L)

**Weight:** 737 g (26 oz); with holster: 992 g (35 oz)

## Parts

Replacement parts are listed in Table 5. These parts can be ordered by contacting Fluke. Refer to the Users Manual for a complete list of user-replaceable parts.

**Table 5. Parts**

Item	Description	Part/ Mod. No.	Qty
AC72	Alligator clip red	1670641	1
	Alligator clip black	1670652	1
BT1, BT2	9 V battery, ANSI/NEDA 1604A or IEC 6LR61	614487	2
Holster	Holster, Yellow	664182	1
H2, 3, 4	Case screw	832246	3
H5, 6	Battery door fasteners	948609	2
H7, 8	Bracket screw	641131	2
MP1	LCD bezel, 718 30G	664158	1
MP1	LCD bezel, 718 100G	664169	1
MP1	LCD bezel, 718 1G	2545047	1
MP1	LCD bezel, 718 300G	2545058	1
MP2	LCD	686482	1
MP3, 4	Pump retainer bracket	664201	2
MP5	Gasket	664208	1
MP6	1G pump	2571725	1
	30G, 100G and 300G pump	2558508	1

**Table 5. Parts (cont.)**

<b>Item</b>	<b>Description</b>	<b>Part/ Mod. No.</b>	<b>Qty</b>
MP7, 8	Selector knob	664193	2
MP9	Vernier adjust knob	664190	1
MP10	Pump handle knob	664185	1
MP11, 12, 13	O-ring	146688	3
MP14	Spacer	687449	1
MP85	Case top/connector, 718 1G, 30G, 100G, 300G	2546299	1
MP86	Case bottom	664174	1
MP89, 90	Non-skid foot	885884	2
MP92	Battery door	664177	1
S1	Keypad	2113087	1
TL20	Industrial test lead set	1639457	Opt
TL75	Test lead set	855742	1
TM1	718 Product Overview Manual	1549632	1
-	718 CD-ROM (contains Users Manual)	1574463	1
-	71X Series Calibration Manual	686540	Opt
-	Pump (with cleanout) rebuild kit	2553919	Opt
-	718 1G Top Case Decal	2546993	1
-	718 30G Top Case Decal	2547000	1
-	718 100G Top Case Decal	2547017	1
-	718 300G Top Case Decal	2547021	1