FLUKE®

Pressure Calibration

APPLICATIONS AND SOLUTIONS

INTRODUCTION

Process pressure devices provide critical process measurement information to process plant's control systems. The performance of process pressure instruments are often critical to optimizing operation of the plant or proper functioning of the plant's safety systems.

Process pressure instruments are often installed in harsh operating environments causing their performance to shift or change over time. To keep these devices operating within expected limits requires periodic verification, maintenance and calibration.

There is no one size fits all pressure test tool that meets the requirements of all users performing pressure instrument maintenance. This brochure illustrates a number of methods and differentiated tools for calibrating and testing the most common process pressure instruments.

APPLICATION SELECTION GUIDE

Model number	754	721/ 721Ex	719 Pro	719	718	717	700G	3130	2700G	Dead-weight Testers
Application										
Calibrating pressure transmitters (field)	•	•	Ideal	•	•	•		•		
Calibrating pressure transmitters (bench)	•	•	•	•	•	•		Ideal		•
Calibrating HART Smart transmitters	Ideal									
Documenting pressure transmitter calibrations	Ideal									
Testing pressure switches in the field	Ideal	•	•	•	•	•		•		
Testing pressure switches on the bench	•	•	•	•	•	•		Ideal		
Documenting pressure switch tests	Ideal									
Testing pressure switches with live (voltage) contacts	Ideal									
Gas custody transfer computer tests	•	Ideal	•							
Verifying process pressure gauges (field)	Ideal	•	•	•	•	•	•			
Verifying process pressure gauges (bench)	•	•	•	•	•	•		•	•	Ideal
Logging pressure measurements	•						Ideal		•	
Testing pressure devices using a reference gauge									Ideal	
Hydrostatic vessel testing							Ideal			
Leak testing (pressure measurement logging)	•						Ideal			

Products noted as "Ideal" are those best suited to a specific task.
Model 754 requires the correct range 750P pressure module for pressure testing.
Model 753 can be used for the same applications as model 754 except for HART device calibration.
Model 725 and 726 can be used for the same applications as model 753 except for documenting and live contact testing of switches.

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Calibrating a HART Smart Pressure Transmitter

Pressure transmitter manufacturers have improved the accuracy and technology designed into these smart pressure measurement devices. Many conventional calibration tools have become inadequate or simply unable to test and calibrate these high accuracy pressure transmitters. Better test solutions are required.

Verifying and documenting the performance and adjusting a HART smart pressure transmitter can require a bucket full of tools. Performing this task with a HART enabled calibrator like the Fluke 754 simplifies the task and reduces what you need to carry.

Before going to the field: install the pressure module adapter to the hand pump with thread seal. Once the adapter is properly installed on the pump, changing modules to different pressure ranges is a snap, no tools required.

To get the accuracy needed: to test these new high accuracy transmitters match the pressure measurement standard range closely to the device tested. For example, use a 100 psi pressure module to calibrate and test a transmitter ranged at 100 psi. Industry standards suggest the measurement standard should be 4–10 times more accurate than the device being tested so best-in-class accuracy is required.

The Fluke 754 utilizes the 750P series pressure modules and has built-in HART functionality to enable smart trims on transmitters. It can also document transmitter performance before and after adjustment and calculate pass/fail errors.

Suggested test tools

Fluke 754 Documenting Process Calibrator-HART

See pg 23

Fluke 700G Precision Pressure Gauge Calibrator

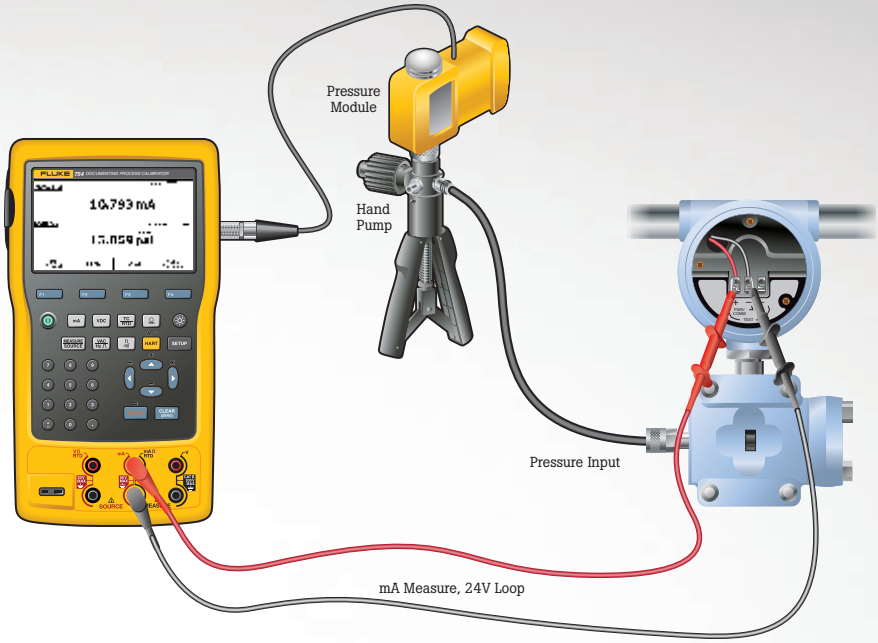
See pg 26

Fluke 750P Series Pressure Modules

See pg 23

Fluke 700PTP-1 Pneumatic Test Pump

See pg 31



To perform the test:

STEP 1 Isolate the transmitter from the process being measured and its loop wiring. If measuring the mA signal across the transmitter test diode leave the wires intact, but note this method does not give the best mA measurement accuracy.

STEP 2 Connect the mA measurement jacks of the 754 to the transmitter.

STEP 3 Connect the pressure module cable to the 754 and connect the transmitter test hose from the hand pump to the transmitter.

STEP 4 Press the HART button on the calibrator to see the configuration of the transmitter.

STEP 5 Press HART again and the calibrator will offer the correct measure/source combination for the test. If documenting the calibration press As-Found, input the test tolerance and follow the prompts. If the measured mA signal at the test points is found within tolerance the test is complete. If not, adjustment is required.

STEP 6 Select adjust and trim the transmitter's pressure zero, mA output signal and input sensor.

STEP 7 After adjustment select As-Left, document the condition of the transmitter after adjustment and if the test passes, it is complete.

TECH TIPS

Sometimes it is necessary to trim the input sensor of the transmitter more than once. It is critical that the pressure module be zeroed before test and adjustment. For best ßadjustment success:

- After pressing Fetch for the pressure measurement, select the trim button quickly before the pressure measurement changes.
- Give the measured mA and pressure time to settle for best measurement results.
- Always de-bug the pressure test setup for leaks in the shop before going to the field, including installing the pressure module connection adapter to the hand pump.
- If the full scale value of the transmitter is less than 25 % of the full scale of the pressure module, select a lower range pressure module for best results.
- If performing higher pressure calibrations with a hydraulic pump, use the correct fluid such as mineral oil or de-ionized water. Standard tap water will leave deposits in the pump and cause erratic operation, leaks or difficulty priming.
- If the pass/fail accuracy is set at the limits for the transmitter, adjust the transmitter if the errors are greater than 25 % of limits.
- If the errors are less than 25 % of limits, it might be best to not adjust the transmitter as adjusting might make it less accurate.

Additional resources

For more in depth information about this application check out these videos and application notes from Fluke.

See the smart pressure calibration video at:
www.fluke.com/pressurevideo

HART Smart Transmitter calibration application note at:
www.fluke.com/smarttranappnote

Pressure transmitter calibration – at the bench

Technicians calibrate at the bench to ensure calibrations are effective and don't result in degradation of performance. They ensure that all components are in good working order prior to installation, and can evaluate them when component failure is suspected. The bench provides a stable ambient environment for calibration, an opportunity to use the most accurate equipment, and protection from factory conditions during the commissioning, testing, and calibration of pressure transmitters.

Suggested test tools

Fluke 3130
Portable Pressure
Calibrator

See pg 24

Fluke 754
Documenting
Process
Calibrator-HART

See pg 23

Fluke 719Pro
Electric Pressure
Calibrator

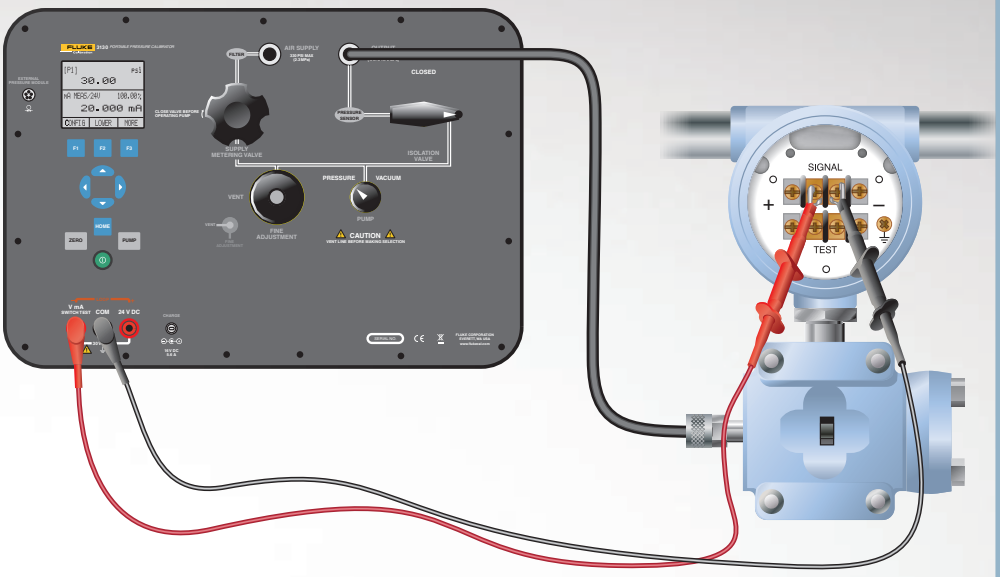
See pg 24

P3000 Hydraulic
Deadweight Testers

See pg 29

Fluke 700PTP-1
Pneumatic
Test Pump

See pg 31



To perform the test:

STEP 1 Connect the transmitter test hose from the calibrator to the transmitter

STEP 2 Connect the mA measurement jacks of the calibrator to the transmitter

STEP 3 Set the pressure/vacuum selection knob to the necessary function

STEP 4 Close the vent knob and supply metering valve

STEP 5 Apply pressure or vacuum from the pump by holding down the pump button and release when the necessary pressure is reached

STEP 6 Correct the pressure with the fine pressure adjustment

STEP 7 Read the reference pressure and the current output of the transmitter from the display

STEP 8 Repeat for all test points. If the measured mA signal at the test points is found within tolerance the test is complete. If not, then adjustment is required.

TECH TIPS

- Inaccurate calibration equipment will only degrade the performance of the transmitter.
- Manufacturers recommend using precise calibration equipment under stable, ambient conditions for best results.
- Commission transmitters at the bench so security settings and protection for failure modes can be set before exposing transmitter electronics to factory conditions.

Additional resources

For more in depth information about this application check out these videos and application notes from Fluke.

How to use a deadweight tester
Fluke 719 electric pressure calibrator demonstration

Transmitter Calibration with the Fluke 750 Series DPC
HART transmitter calibration

Pressure switch testing– manual approach

Accurate calibration of pressure switches is a critical step in ensuring process quality and the safe operation of equipment. The setup is similar to pressure gauge calibration except now a voltage or continuity across a set of switch contacts needs to be read either by a (Digital Multimeter) DMM or the calibrator. The purpose of the calibration is to detect and correct errors in the set point and deadband of the pressure switch. Calibrators can save you time by reducing steps and reducing the amount of equipment you have to bring to the job. With the right calibrator the entire process can be automated.

Suggested test tools

Fluke 754 Documenting Process Calibrator-HART

See pg 23

Fluke 719Pro Electric Pressure Calibrator

See pg 24

Fluke 3130-G2M Portable Pressure Calibrator

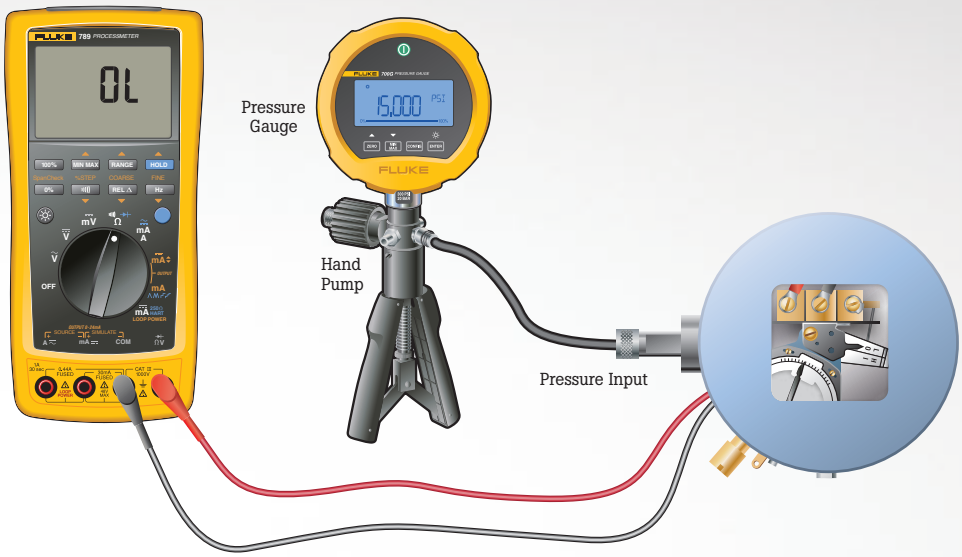
See pg 24

Fluke 750P Series Pressure Modules

See pg 23

Fluke 700PTP-1 Pneumatic Test Pump

See pg 31



To perform the test:

Setup

STEP 1 Safely disconnect the device from the process it controls.

STEP 2 Connect the calibrator or DMM to the common and NO (normally open) output terminals of the switch. The DMM or calibrator will measure an "open circuit". if measuring continuity. If measuring V ac be sure the tool is properly rated for the voltage being measured.

STEP 3 Connect the pressure switch to a pressure source such as a hand pump connected to a gauge.

Rising pressure

STEP 4 Increase the source pressure to the setpoint of the switch until the switch changes state from open to close. Manually record the pressure value when the DMM indicates a "short circuit" or if using a calibrator it will record the value for you.

Falling pressure

STEP 5 Continue to increase the pressure until the maximum rated pressure. Slowly reduce the pressure until the switch changes state again, and resets from closed to open, then record the pressure.

Calculation

STEP 6 The setpoint pressure was recorded when the pressure was rising. The deadband value is the difference between the rising setpoint pressure and the falling pressure reset point.

TECH TIPS

When you use a Fluke 754 or 3130 to automate the pressure switch calibration, vary the applied pressure slowly, back and forth across the setpoint and reset points. The display will make it apparent that the set/reset has changed and the actuals will be logged.

Additional resources
For more in depth information about this application check out these videos and application notes from Fluke.

See the pressure switch test video at:
www.fluke.com/pressureswitch

Calibrating pressure switches with a DPC

Pressure switch testing—documented

Classic methods for pressure switch testing have been superseded with the introduction of new pressure test tools. Today most pressure switches are tested with a pressure gauge mounted to a pump to supply and measure pressure, and a DMM set to continuity to verify the opening and closing of the switch. The technician or electrician making the test is required to interpret the pressure applied to the switch when the continuity beeper sounds indicating contact closure of the switch. A workable solution but new tools can make this task easier.

Modern calibrators can automatically record the pressure applied when a pressure switch changes from open to closed and from closed to open. In doing so the switch set point and reset point and deadband are much easier to determine.

Suggested test tools

Fluke 754 Documenting Process Calibrator–HART

See pg 23

Fluke 750P Series Pressure Modules

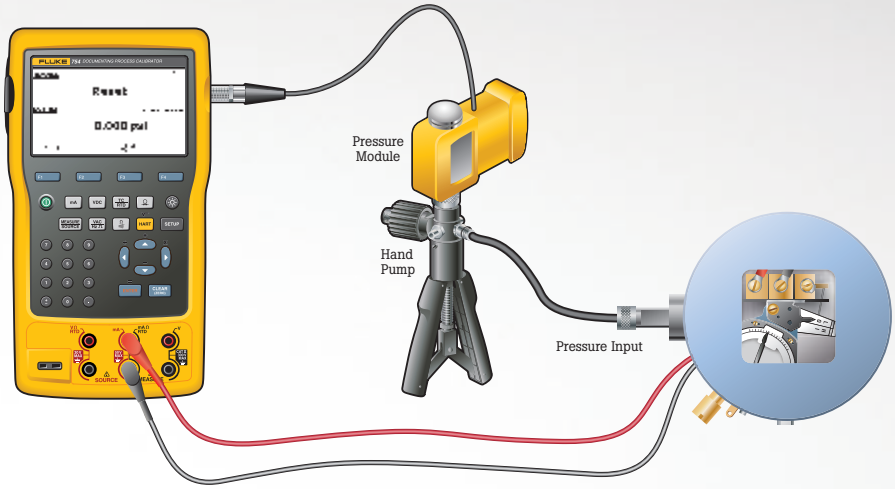
See pg 23

Fluke 700PTP–1 Pneumatic Test Pump

See pg 31

Fluke 71X Hose Kit Accessory

See pg 31



To perform the test:

With a modern documenting calibrator you can test for dry contacts opening and closing on the switch or if you are using the Fluke 753 or 754 you can leave the switch connected to the live voltage and the calibrator will measure the changing AC voltage and interpret it as opening and closing of the switch.

One cautionary note: it is always safer to test a de-energized circuit, but this is not always possible. Also, do not measure AC voltages above 300 V ac as that is the maximum rating of the 75X family. 480 V ac 3-phase voltages must be de-energized and disconnected from the switch if testing with the 75X family.

STEP 1 To get started testing the switch, connect as shown above. In this example we will test dry contacts and continuity. To measure continuity for the test select resistance measurement. Then toggle to the source screen mode and select pressure to display the pressure generated by the hand pump and measured by the pressure module. Advance the calibrator mode to the split screen test mode.

STEP 2 The next step is to describe the switch and whether it is normally open or closed at ambient pressure. The relaxed state of the switch is the reset state. The set state is the condition of the switch it changes to with applied pressure or vacuum. In this example the switch is normally open and is expected to close when the pressure applied exceeds 10 psi. Next the allowable pressure variance of the switch set state and deadband size needs to be defined. In this example the ideal switch set value is 10 psi and is allowed +/- 1 psi of deviation. The allowable reset pressure is described in the deadband tolerance. In this instance the reset state must be more than 1 psi less than the found set pressure but not greater than 3 psi less than the found set pressure.

STEP 3 Once the test tolerances are fully defined start the test. Increase the pressure until the calibrator captures the set state pressure value. Then decrease the pressure until the reset pressure is found. Repeat increasing and decreasing the pressure across the switch looking for repeatability in your set and reset pressure measurements. Once satisfied with the result press done to get the pass/fail evaluation of the switch. If the switch fails the test adjustment or replacement of the switch may be required. If the switch is adjusted repeat the test to document the As-Left condition of the switch before putting back into service. The test result is now documented and ready for upload to calibration management software.

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TECH TIPS

- The key to a good switch test is repeatability. Repeatability is best achieved by applying a slow change in pressure to the switch as it approaches its set or reset pressure.
- When performing the test find out where the switch sets and make sure the vernier/fine adjustment of your test pump has enough adjustment to vary the pressure up to the set point. In this way the pressure can be changed slowly capturing an accurate switch set point pressure. Repeat this procedure for the reset point.
- With practice you can get the vernier of the pump within range of the set and reset point pressure and get excellent repeatability of your tests (within the limitations of the switch being tested).

Additional resources

For more in depth information about this application check out these videos and application notes from Fluke.

Pressure switch video

Pressure switch application note

Pressure calibration application note

Gas custody transfer flow computer calibration

Gas custody transfer flow computers that calculate flow in pipelines by measuring the differential pressure across a flow restriction, such as an orifice plate or other differential pressure flow device, require special calibration to perform at optimum accuracy. Gas flow computers make three primary measurements to calculate flow: volumetric flow (difference in pressure across the orifice plate), static pressure in a pipeline and gas temperature. A calculation is performed using this data to determine the actual mass and volume of the gas flowing through the pipeline.

These calibrations can be made with three separate calibrators, a low pressure, high pressure and a temperature calibrator or use a multifunction calibration tool designed for this specific task.

An example of a calibrator purposed for this task is the Fluke 721 or 721Ex. It has two built-in pressure ranges and the ability to measure temperature. The most popular configuration is 16 psi/1 bar on the low pressure (P1) sensor side and 1500/100 bar or 3000 psi/200 bar on the high pressure (P2) sensor side. It measures temperature using a precision RTD accessory and can display all three measurements at once if desired.

Suggested test tools

Fluke 721 Precision Dual Range Pressure Calibrator

See pg 25

Fluke 700G Precision Pressure Gauge Calibrator

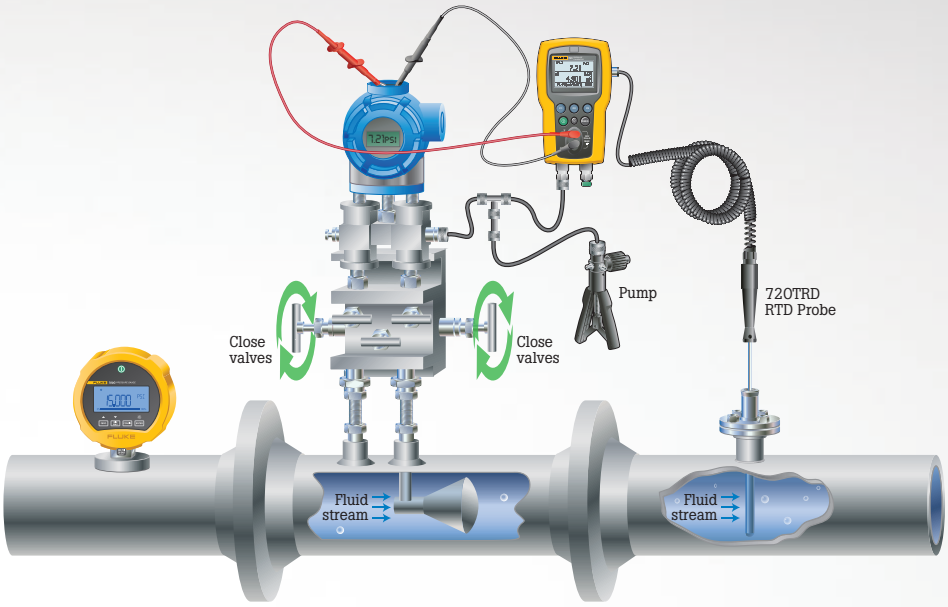
See pg 26

Fluke 754 Documenting Process Calibrator–HART

See pg 23

Fluke 750P Series Pressure Modules

See pg 23



To perform the test:

To get started, isolate the flow computer from the pipeline. It is normally installed with a 5 valve manifold. If so, closing the valves on the pipeline side of the manifold should isolate it. Be sure to follow local policy and safety procedures when performing this isolation step. Set the P1 sensor of the 721 to measure inH20 and the P2 sensor to measure PSI and the temperature sensor to measure degrees Celsius or Fahrenheit as needed.

STEP 1 **Low pressure differential pressure calibration** is performed using atmospheric pressure as a low side reference. Vent the low connection of the flow computer or pressure transmitter and connect the high pressure connection of the flow computer or transmitter to the low pressure port (P1) on the calibrator.

Connect the computer (PC) to the flow computer serial or USB port. The PC will instruct the user to apply one or more test pressures to the flow computer or transmitter. For example, 0, 100 and 200 inH20. Squeeze the pump to get close to the test pressure and use the vernier or fine pressure adjust to dial in.

STEP 2 **Static pressure calibration** will normally be applied to either the same high pressure port of the flow computer or both the high and low pressure ports. Refer to the manufacturer's instructions for details. Connect the high pressure sensor input (P2) to the appropriate port on the flow computer or transmitter and to the high pressure test source. The PC will instruct the pressures for the user to apply from the pressure source.

STEP 3 **Temperature calibration** of the temperature measurement on the flow computer is done with a single temperature point at the pipeline operating temperature. Insert the RTD probe into the test thermowell and allow time for the measurement to stabilize.

The PC will prompt the user to enter the temperature measured by the calibrator. Remove the RTD from the test thermowell and the calibration is complete.

STEP 4 **Flow Computers with 4 to 20 mA inputs:** Many flow computers utilize a low pressure, static and temperature transmitter to convert the measured parameters into 4 to 20 mA signals. In this instance these transmitters may need individual calibration if the test results are not satisfactory (see HART Transmitter Calibration application note or video for more details). Another source for errors in this configuration is the input A/D cards of the flow computer. These can be independently tested using a mA signal source from a loop calibrator.

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TECH TIPS

- Always center the vernier of your hand pump before starting any pressure calibration. This will allow you to increase or decrease the pressure when making fine adjustments.
- Store the temperature probe in a protective case such as the built in slot of the 721 soft case. Exposing the RTD probe to mechanical stress can reduce the measurement accuracy of the probe.
- **Be careful to not connect the P1 low pressure side of the calibrator when doing high pressure calibrations or measurement or the sensor will be damaged and possibly rupture creating a dangerous condition.**
- Inserting the RTD probe prior to the pressure calibrations typically allows sufficient time to reach a stable temperature measurement.

Additional resources

For more in depth information about this application check out these videos and application notes from Fluke.

HART pressure and HART smart RTD transmitter 754 videos

Custody Transfer calibration application note

HART transmitter calibration

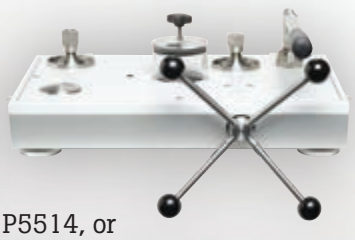
Verifying process gauges, analog and digital

Both analog and digital process gauges need to be verified to detect errors related to drift, environment, electrical supply, addition of components to the output loop, and other process changes. Pressure gauges may be verified in the field or at the bench. Field calibration may save time, and allows for troubleshooting in the process environment. Multifunction calibrators make it easier to do this with one tool, and documenting calibrators make it easier to follow procedures, capture data and document results. Bench calibration provides an environment where the gauge can be cleaned, inspected, tested, and recertified under reference conditions for the best possible accuracy.

Suggested test tools

Traditional and Electronic Dead-weight Testers

See pg 29–30



P5514, or P5515 Hydraulic Pressure Comparator

See pg 30

2700G Series Reference Pressure Gauges

See pg 26

Fluke 3130 Portable Pressure Calibrator

See pg 24

To perform the test:

STEP 1 Isolate the pressure gauge from the process using valves, or by removing the gauge from the process.

STEP 2 Connect the gauge to the calibrator or reference gauge. For hydraulic pressure gauges it's important to remove any gas that might be trapped in the fluid in the gauge, calibrator, and connections by priming the system. When generating pressure allow a few moments for stability. Compare the reading of the gauge under test with the master gauge or calibrator.

STEP 3 For hydraulic pressure gauges it's important prime the system. This will remove any gas that might be trapped in the fluid in the gauge, calibrator or connections.

STEP 4 When generating pressure allow a few moments for the measurement to stabilize. When using a hydraulic hand pump as a source it can take several minutes for the pressure to stabilize due to the thermodynamic effect of fluids.

STEP 5 Compare the reading of the gauge under test with the master gauge or calibrator.

TECH TIPS

- Safety First! Check all fittings, adapters and connecting tubing ratings for pressures used.
- Remember to tap analog gauges at each point due to friction in mechanical parts.
- Gas is preferred for cleanliness requirements but use caution when generating pressures above 2,000 psi.
- Industry standards usually desire calibration equipment to be 4–10 times more accurate than the device under test.
- When in the field, connect pressure gauges through a manifold or "tee" connector.
- Use adapter fittings when workloads require calibrating a wide variety of gauges.
- Consider first, the in-use orientation of a device and use an angle adapter at the bench to achieve similar orientation.
- Use a liquid-to-liquid separator to prevent contamination in hydraulic applications.

Additional resources

For more in depth information about this application check out these videos and application notes from Fluke.

How to use a deadweight tester
Fluke 719 electric pressure calibrator demonstration

Transmitter Calibration with the Fluke 750 Series DPC
HART transmitter calibration

Calibrating at the bench with a deadweight tester

A deadweight tester is a proven method of pressure calibration that is usually chosen for bench applications when accuracy and reliability are the top requirements. Calibrations are performed at the bench for convenience and to maintain reference conditions. The bench is a convenient location to clean, inspect, calibrate and repair with all the necessary equipment available. Reference conditions are necessary to achieve the reference accuracy of the device under test and the calibration standards. Reference accuracy may be required to maintain the necessary test uncertainty ratios (TUR).

Suggested test tools

Using liquid:

P3100, P3200, or P3800 Series Hydraulic Deadweight Tester

See pg 29–30

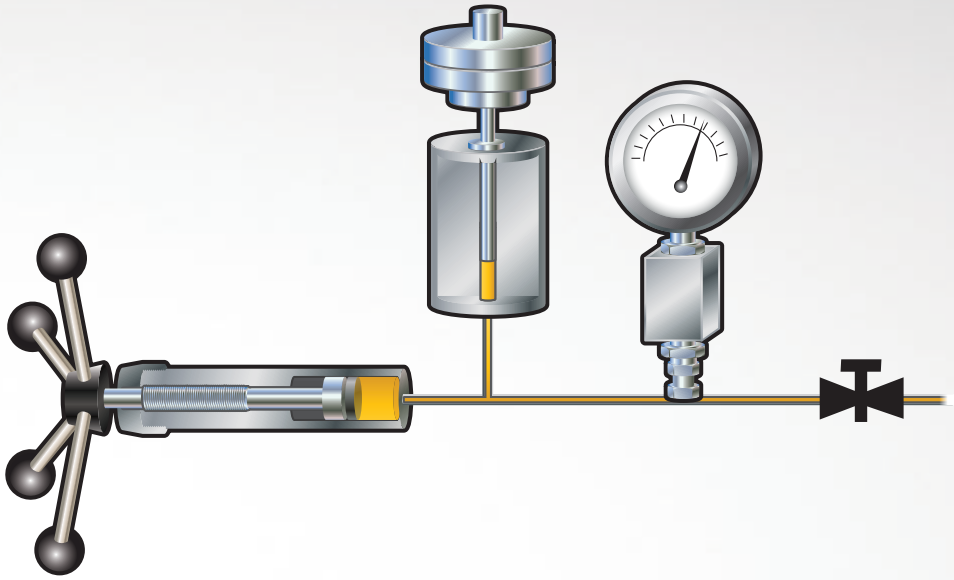
6531, 6532 Electronic Deadweight Tester

See pg 30

Using gas:

P3000 Series Pneumatic Deadweight Tester

See pg 29



To perform the test:

STEP 1 The pressure gauge should be mounted in the same orientation (vertical or horizontal) as in the process.

STEP 2 Measurement points should be distributed uniformly over the calibration range.

STEP 3 Calibrated weights are placed on the instrument corresponding to the measurement points.

STEP 4 Pressure is added with an internal pump or screw press until the piston holding the weights begins to float.

STEP 5 The piston and weight are spun by hand to minimize friction.

STEP 6 While the piston is floating the reading on the device under test is compared to the pressure corresponding to the sum of the selected weights.

TECH TIPS

- Deadweight tester weights are calibrated to match a wide range of pressure units.
- Local gravity often is the largest factor affecting accuracy. Use Fluke PRESSCAL software to achieve accuracy of +/- 0.008%.
- To increase the number of available set points, use incremental weight sets.
- Forgo wrenches or PTFE tape by using adapters to fit multiple sizes and types of devices with leak tight seals to 20,000 psi.
- Safety First! Choose fittings, tubing and seals with pressure ratings above the full scale of the instrument.
- Hydraulic systems are preferable to gas systems for pressures above 2000 psi due to safety and ease of use.
- Consider achieving cleanliness using distilled water as a media or use a liquid separator from Fluke instead of gas.
- Lubrication can improve performance by using oil when it is allowed.

Additional resources
For more in depth information about this application check out these videos and application notes from Fluke.

Check out the 700G videos.

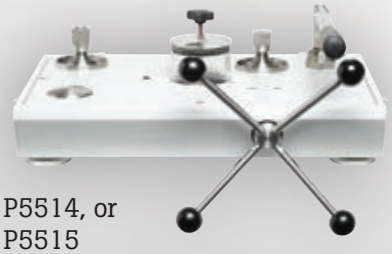
700G Data Sheet.
Interpreting Specifications for Process Calibrators, Application Note

Calibrating at the bench with a pressure comparator

A pressure comparator is a convenient instrument for bench pressure calibration. Bench calibrations are performed to maintain reference conditions and to obtain the lowest possible uncertainties. The bench is also a convenient place to inspect, adjust, and repair the devices under test.

Suggested test tools

Using liquid:



P5514, or
P5515
Hydraulic Pressure Comparator

See pg 30

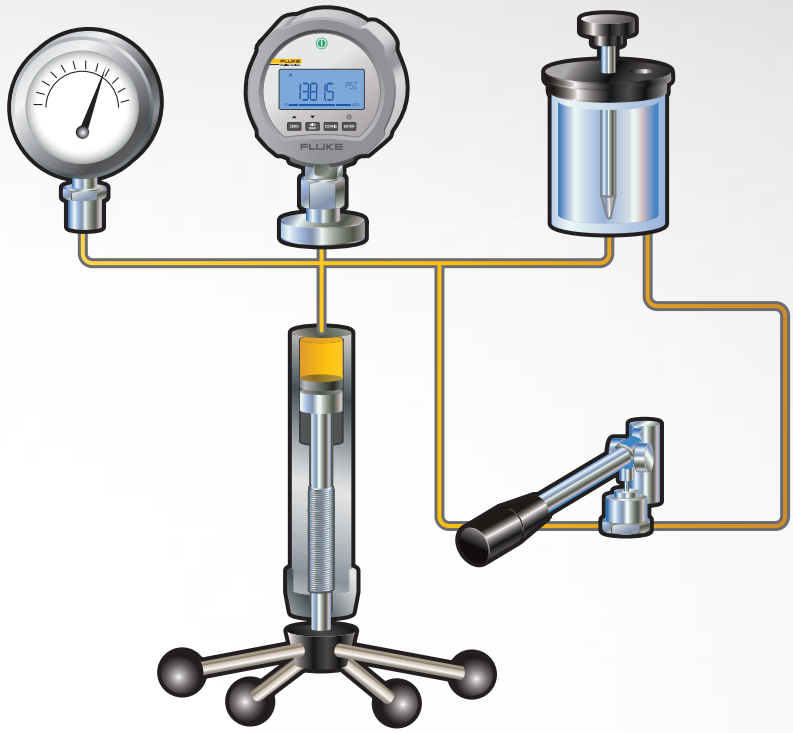
Using gas:

P5510, or P5513
Gas Pressure Comparator

See pg 30

2700G Series
Reference Pressure Gauges

See pg 26



To perform the test:

STEP 1 The pressure gauge should be mounted in the same orientation (vertical or horizontal) as in the process. An angle adapter such as the P5543 may be used.

STEP 2 The reference pressure gauge (2700G) should be mounted such that the display is easily seen.

STEP 3 For hydraulic comparators prime the fluid with the priming pump, to remove any bubbles.

STEP 4 Measurement points should be distributed uniformly over the calibration range. Conveniently source pressure with a manual pump up to 300 psi, after that use an external pressure supply.

STEP 5 For gas comparators use the fine needle valve or fine adjustment screw press to precisely meter the pressure.

STEP 6 With hydraulic models use the screw press to source and fine adjust the pressure.

STEP 7 The source pressure can be adjusted until the device under test is reading a nominal pressure or until the reference gauge reads the nominal pressure.

TECH TIPS

- Use a reference gauge with better accuracy to meet test uncertainty ratios over a wider range of pressures.
- Forgo wrenches or PTFE tape by using adapters to fit multiple sizes and types of devices with leak tight seals to 20,000 psi.
- Safety first! Always use fittings, tubing, and seals with pressure ratings above full scale of the instrument.
- If possible use oil for better lubrication.
- Use gas to improve cleanliness or a liquid-to-liquid separator available from Fluke.
- Hydraulic systems are preferable to gas systems for pressures above 2000 psi due to safety and ease of use.

Additional resources
For more in depth information about this application check out these videos and application notes from Fluke.

Check out the 700G videos.

700G Data Sheet.
Interpreting Specifications for Process Calibrators, Application Note

Use and selection of hand pumps and pressure test gauges for field pressure testing

It's important to select the proper pump and gauge to match the testing application at hand—a good guideline is the testing device should be 4–10 times more accurate than the device being tested. To achieve this, match the measurement to be made as closely to the full scale value of the test gauge. This delivers the best accuracy from the gauge.

Suggested test tools

Fluke 700G Precision Pressure Gauge Calibrator

See pg 26

Fluke 700PTPK2 Pneumatic Test Pressure Kit

See pg 31

Fluke 700HTPK2 Hydraulic Test Pressure Kit

See pg 31

Fluke 700TTH 10K Transmitter Test Hose

See pg 31

To perform the test:

STEP 1 The pressure gauge should be mounted in the same orientation (vertical or horizontal) as in the process.

STEP 2 The reference pressure gauge (2700G) should be mounted vertically.

STEP 3 For hydraulic comparators prime the fluid with the priming pump, to remove any bubbles.

STEP 4 Measurement points should be distributed uniformly over the calibration range. Conveniently source pressure with a manual pump up to 300 psi, after that use an external pressure supply.

STEP 5 For gas comparators use the fine needle valve or fine adjustment screw press to precisely meter the pressure.

STEP 6 With hydraulic models use the screw press to source and fine adjust the pressure.

STEP 7 The source pressure can be adjusted until the device under test is reading a nominal pressure or until the reference gauge reads the nominal pressure.

Additional resources

For more in depth information about this application check out these videos and application notes from Fluke.

Check out the 700G videos.

700G Data Sheet.

Interpreting Specifications for Process Calibrators, Application Note

TECH TIPS

- The key to a good experience in using a hand pump, either pneumatic or hydraulic, is to test and debug your test setup in the shop before going to the field. Minimizing the number of pressure connections minimizes the probability for leaks. Mount the test gauge carefully to the test pump in the shop.
- Be sure to consider the hoses that connect from the hand pump to the device to be tested. There are a variety of specialty "no tools required" connectors to connect to the test hose to make this easy. If these connectors are not available be sure to have a variety of adapters, wrenches and PFTE sealing tape to be able to connect from the test hose to the input port of the device for testing. If using "push fit" hoses it is likely they will eventually leak. Each time – a push fit hose is connected, it leaves a mark on the test hose and eventually does not seal well. To eliminate the leak cut off the affected portion of the test hose so there is a clean surface to connect to. This process will need to be repeated with use.
- When attempting to get maximum pressure out of a pneumatic pump, adjust the fine adjust vernier all the way to down to the stop so turning the vernier increases the pressure. When approaching the target pressure use the vernier to increase to your target pressure.
- When using hydraulic hand pumps remember the thermodynamic effect. Once any fluid is compressed, the temperature increases and the fluid expands. This becomes obvious when pumping to a target pressure with a hydraulic pump. Once the target pressure is met the fluid has expanded. As the fluid cools and contracts the pressure quickly bleeds down until it reaches temperature equilibrium, this can take 5 minutes or more. Once the temperature stops changing, dial the desired pressure back in with the vernier adjuster.

TEST TOOLS

Pick the right pressure tool for you

PRESSURE TOOLS SELECTION GUIDE

	Models									
	754	721/ 721Ex	719 Pro	719	718	717	700G	3130	2700G	Deadweight Testers
Primary function										
Measure pressure to 10,000 psi/690Bar	With 750P	5000 psi	300 psi	100 psi	300 psi	•	•	300 psi	•	•
Measure and generate pressure from vacuum to 30,000 psi/4,137 Bar										•
Measure pressure with 0.015 % of reading accuracy										•
Generate pressure with internal manual pump					•					
Generate pressure with internal electric pump			•	•				•		
Measure mA and provide loop power	•	721 Only	•	•	•	•		•		
Source and simulate mA signals	•		•	•				•		
Measure continuity (for pressure switch contacts)	•	•	•	•	•	•		•		
Source and measure frequency	•									
Measure temperature with accessory RTD or TC Probe	•	•	•							
Documenting functionality for upload download	•									
HART Communication	•									
Measurement logging	•						•			
Error calculation for pass fail tests	•									
Measure voltage dc	•	721 Only	•					•		
Source voltage dc	•									
Measure volts ac for live voltage pressure switch tests	•									
Simulate thermocouple, RTDs for temperature tests	•									
Generate pressure with P55XX pressure comparator									•	
Ex rated models for testing in I.S. classified areas		721Ex Only			•		•			

Fluke 754 Documenting Process Calibrator-HART

The Fluke 754 Documenting Process Calibrator-HART does the work of several tools – sourcing, simulating and measuring pressure, temperature, and electrical signals in one rugged, hand-held device. HART communication capability is combined to deliver an integrated communicating calibrator. This rugged, reliable tool is ideal for calibrating, maintaining, and troubleshooting HART smart and other process instrumentation.

Key features:

- Add one or more (50) 750P series pressure modules to make the 754 a documenting pressure calibrator
- Simultaneous source/measure enables testing of almost any process device
- HART smart communication enables the 754 to take on nearly all the day-to-day tasks performed with a separate communicator.
- To create a seamless/paperless calibration management system add the Fluke DPCTrack2 Calibration Management software
- 3-year warranty

Summary specs

- Source: mA, DC voltage, frequency, resistance, thermocouples, RTDs
- Measure: mA, mA with loop power, AC voltage, DC voltage, frequency, thermocouples, RTDs
- CAT II 300V overvoltage protection, measure up to 300 V ac

Application coverage

- Pressure and temperature transmitter calibration
- Pressure and temperature switch test and calibration
- I/P transducers and control valves test and calibration
- Verify process I/O with mA and voltage source/simulate/measure
- Add a Fluke Calibration dry block for full loop temperature calibration
- Test results for upload/download for paperless calibration management

Fluke 750P Series Pressure Modules

The 750P Series Pressure Modules enable gage, differential and absolute pressure measurement with Fluke multifunction and documenting process calibrators. 50 pressure modules for wide pressure workload coverage. Best-in-class accuracies deliver high confidence pressure measurement.

Fluke 750P Series Module features:

- Compatible with 750 and 740 series DPCs and 725, 726 MPCs
- Pressure measurement from 0 to 1 inH20 to 10,000 psi (2.5 mbar to 690 bar).
- Pneumatic connection adapters require no tools to connect once adapter is mounted to test pump
- Specified for different temperature ranges to match your working environment
- Reference class total uncertainties of 0.015% for 6-months. Standard module accuracies of 0.045% 0-50 degrees C for one year
- 3 year warranty

Application coverage

- Differential modules measure differential pressure from 0-1 inH20 to 15 psi, 2.5 mbar to 1 bar
- Gage modules measure gage pressure from 30 to 2,000 psi, 2 to 140 bar
- High pressure modules measure pressure from 3,000 to 10,000 psi, 200 to 700 bar
- Absolute modules measure absolute pressure from 5 to 1,500 psia, 350 mbar to 100 bar absolute
- Vacuum modules measure gage vacuum pressure from -5 psi to -15 psi, -350 mbar to -1 bar
- Dual range modules measure pressure from -1 to + 1 psi to -15 to 300 psi -70 to + 70 mbar to -1 bar to 20 bar
- Reference class accuracy modules measure from 15 psi to 10,000 psi, 1 bar to 700 bar

Fluke 719Pro Electric Pressure Calibrator

The Fluke 719Pro Electric Pressure Calibrators with onboard electric pump makes pressure calibration easy; at the touch of a button. The 719Pro also includes a full functioning loop calibrator that sources, simulates and measures mA signals. Best-in-class accuracy makes the 719Pro the ideal tool for testing high accuracy pressure transmitters with high confidence.

Key features:

- Unique integrated electric pump for one handed pressure calibration
- Test pressure switches easily with easy-to-use switch test function
- The large backlit screen displays three measurement or source parameters at once
  - Pressure measurement from internal or external sensor
  - Sourced/simulated or measured mA values
  - Temperature measured by optional RTD probe
- Precision vernier for easy and accurate pressure adjustments
- Programmable pressure calibrator pump limit: eliminates over-pressurization
- Pump cleanout ports reduce pump failures from moisture and fluid damage
- Fluid trap included to mitigate fluid damage in at-risk applications
- 3-year warranty

Summary specifications:

- 30 psi, 150 psi and 300 psi pressure ranges
- 6-month total uncertainty of 0.025%, 0.035% for 1 year
- Temperature measurement from -50 to 150 °C (with optional 720 RTD probe)

Application coverage:

- High accuracy reference class pressure transmitters
- Pressure switches
- Pressure gauges
- I to P converters
- Measure or generate 4 to 20 mA
- Measure 0 to 30 V dc
- Compatible with Fluke 750P Series Pressure Modules

3130 Portable Pressure Calibrator

Everything you need to provide an accurate steady pressure, and read the output of the device under test at the bench or in the field.

Use the internal pump for easy pressure or vacuum generation or connect to an external pressure supply for fast calibration with larger volumes. Built-in electrical measurement capability and rugged carrying case makes it ideal for calibrating pressure transmitters, and pressure switches at the bench or in the field.

Key features:

- Button press to generate pressure and vacuum with internal pump
- Includes variable volume for fine adjustment of pressures
- Internal 24 V loop power supply can power a transmitter under test
- Measure or generate 4 to 20 mA signals
- Measure 0 to 30 V dc
- Powered by internal, high capacity, NiMH battery
- Compatible with Fluke 700P and 750P Series Pressure Modules

Summary specs

- Vacuum to -80 kPa (-12 psi, -0.8 bar)
- Pressure to 2 MPa (300 psi, 20 bar)
- Pressure measurement accuracy of 0.025 % reading ± 0.01 % FS

Application coverage

- Pressure gauge calibration
- Pressure transmitter calibration
- Pressure switch test and calibration

Each unit includes

Four 1/8-inch NPT quick connectors for calibration hoses, two 3-foot sections of 1/8-inch O.D hose. One, 1/8-inch NPT female on 1/4-inch NPT female fitting, One 1/8-inch BSP female fitting, Thread seal tape, Test cables (two, red, two black), Universal power supply, Traceable calibration certificate, Manual

Fluke 717, 718, 719, Pressure Calibrators

The Fluke 717 Pressure Calibrators deliver outstanding performance, durability and reliability. The Fluke 717 Pressure Calibrators are easy to use, compact and lightweight.

The Fluke 718 Pressure Calibrator provides a total pressure calibration solution for testing transmitters, gauges and switches. This compact pressure calibration solution is about a third of the size of comparable instruments and weighs just one kilogram (two pounds).

The Fluke 719 Electric Pressure Calibrator can calibrate and test pressure devices quickly and easily with the built-in electric pump. Programmable pump limit settings help eliminate accidental over-pressurization.

Key features:

- Dual display shows measured pressure and mA simultaneously
- Pressure switch test function for easy switch testing
- Extend pressure measurement range with any of (50) 750P Series pressure modules
- Unique cleanout port design reduces 718 and 719 pump failures
- 718Ex models have ATEx and CSA ratings for use in hazardous areas
- 24 V loop power (not included in 718Ex)
- 3-year warranty

Summary specifications:

- Fluke-717 available in 11 ranges, 1 to 10,000 psi (70 mbar to 690 bar)
- Fluke 718 available in (4) ranges, 1, 30, 100 and 300 psi (70 mbar to 20 bar)
- 718Ex (IS Rated) available in (3) ranges, 30, 100 and 300 psi (2 bar to 20 bar)
- Fluke 719 is available in (2) ranges, 30 and 100 psi (2 bar to 7 bar)
- Measure pressure with internal sensor to 0.025%
- Measure mA with 0.015% accuracy
- 719 models source mA with 0.015% accuracy

Fluke 721 Precision Dual Range Pressure Calibrators

The Fluke 721 Precision Pressure Calibrators with dual isolated pressure sensors are the ideal tool for gas custody transfer applications. Take simultaneous static and differential pressure measurements with a single tool and measure mA and temperature.

Key features:

- Ideal for gas flow calibration (custody transfer) applications
- Two isolated, stainless steel, pressure sensors with 0.025% accuracy
- Temperature measurement with the optional 720RTD Pt100 probe
- Measures 4 to 20 mA signals
- Measure DC voltage to 30 Vdc, check 24V power supplies and 1-5V signals
- Internal 24 V loop power supply can power a transmitter under test
- Extend pressure measurement range with connection to external 750P series pressure modules (50 ranges)
- Large backlit graphic display can show up to three measurements simultaneously
- 3-year warranty

Summary specifications

- Low pressure sensor (P1) 16 psi (1.1 bar) or 36 psi (2.48 bar)
- High pressure sensor (P2) 100, 300, 500, 1000, 1500, 3000 or 5000 psi (6.9, 20, 24.5, 69, 103.4, 200, 345 bar).
- mA measurement with 0.015% accuracy
- Temperature measurement from -40 to 150 C with optional 720RTD probe
- Measure V dc to 30V with 0.015% accuracy

Applications

- Transmitter calibration
- Flow computer calibration
- Switch testing
- Gauge testing

Fluke 700G Precision Pressure Gauge Calibrator

The 700G Series Pressure Gauges are high-accuracy digital pressure test gauges. Accurate to 0.04 %, the 700G series gauges can be used as a calibration reference or in any application where high-accuracy pressure measurement is required.

Key features:

- Precision pressure measurement from ±10 in H20/20 mbar to 10,000 psi/690 bar
- Absolute pressure measurement ranges 15, 30, 100, 300 psia
- Reference class gauge accuracies to 0.04 % of reading
- Easy to use, rugged construction with protective holster for reliable performance
- Bright backlit display
- Combine with the 700PTPK2 or 700HTPK2 pump kits for a complete pressure testing solution for up to 600 psi (40 bar) with the PTP-1 pneumatic pump and up to 10,000 psi (690 bar) with the HTP-2 hydraulic pump
- Log up to 8,493 pressure measurements to memory (requires 700G/TRACK software)
- Three-year warranty

Summary specifications

- Accuracy to 0.04 % of full scale
- IP-64 Ingress protection
- CSA; Class 1, Div 2, Groups A-D rating
- ATEX rating: II 3 G Ex nA IIB T6

Applications

- Transmitter calibration
- Gauge testing
- Process pressure measurements

2700G Series Reference Pressure Gauges

Best-in-class performance to calibrate more gauges with less equipment.

The 2700G Reference Pressure Gauges provide best-in-class measurement performance in a rugged, easy-to-use, economical package. Improved measurement accuracy allows it to be used for a wide variety of applications. Combine with the 700PTPK or 700HTPK pump kits for a complete portable pressure testing solution for up to 600 psi with the PTP-1 pneumatic pump and up to 10,000 psi with the HTP-2 hydraulic pump. Combine with the P5510, P5513, P5514, or P5515 Comparison Test Pumps for a complete bench top pressure calibration solution.

Key features:

- Easy-to-use, rugged construction for reliable performance
- Test port is 1/4 NPT Male.
- Compatible with 700G/Track software for easy display and export of remotely logged data

Summary specs

- Accuracy to 0.02% of full scale
- Precision pressure measurement from 100 kPa (15 psi, 1 bar) to 70 MPa (10 000 psi, 700 bar)

Application coverage

- Master gauge for comparison calibration
- Check standard
- Data logging

Each unit includes

USB power adapter, Three AA Alkaline batteries, USB interface cable, 1/4 BSP and M20 X 1.5 adaptors, Protective cover, Manual, Report of calibration

INTRINSICALLY SAFE PRESSURE CALIBRATORS

The **725Ex** is an intrinsically safe multifunction process calibrator for usage in areas where explosive gasses are known to be present. This calibration tool sources and measures almost all process parameters. Add any of (8) 700PEx pressure modules to make the 725Ex a pressure calibrator.

The **Fluke 718Ex** is a powerful intrinsically safe self-contained portable pressure calibrator for usage in explosion endangered areas. It provides a total pressure calibration solution for transmitters, gauges and switches. This compact pressure calibration solution is about a third of the size of comparable instruments and weighs just one kilogram (two pounds). The unique easy to clean pump helps protect the pump from damage and provides the ability to service the pump without disassembly, even in the field.

The **Fluke 700PEx Series Pressure Modules** allow you to measure pressure with Fluke intrinsically safe calibrators such as the 718Ex and the 725Ex. The pressure modules measure pressure using an internal microprocessor. They receive operating power from and send digital information to the intrinsically safe calibrators.

The Fluke-700G Series test gauges also have an IS rating. See previous page for more information on these gauges.

721Ex Dual range pressure calibrators.

- Same accurate pressure measurement and (14) ranges of the standard 721
- Add 720RTD accessory probe for temperature measurement
- Voltage measurement, loop power and pressure connectivity removed to achieve Ex rating.

Summary Specifications:

- 725Ex: ATEX II 1 G Ex ia IIB 171°C, CSA Class I, Division 1 Groups B-D
- 718Ex: ATEX II 1G Ex ia IIC T4, CSA Class I, Division 1 Groups A-D
- 700G: ATEX rating: II 3 G Ex nA IIB T6, CSA; Class 1, Div 2, Groups A-D
- 721Ex: ATEX: Ex ia IIB T3 Gb (Ta= -10… +45 °C) DEKRA 10 ATEX 0168X, IEC-Ex: Ex ia IIB T3 Gb (Ta= -10…+45 °C) II 2 G IECEX CSA 10.0013X

DEADWEIGHT TESTERS

Pick the right deadweight tester for you

DEADWEIGHT TESTER SELECTION GUIDE

Pneumatic deadweight testers

Model	Pressure range	Pressure range (bar)	Vacuum range	Internal pump	Minimum pressure Increment	Minimum vacuum increment	Engineering unit options	Optional pressure fine Increment
P3011	N/A	N/A	1 to 30 inHg	Optional	N/A	0.2 inHg	SI, bar, psi, kgf/cm²	N
P3012-P	5 to 400 inH20	15 to 1000 mbar	N/A	Standard	1 inH20	N/A	SI, bar, psi, kgf/cm²	N
P3013-P	12 to 800 inH20	30 to 2000 mbar	N/A	Standard	2 inH20	N/A	SI, bar, psi, kgf/cm²	N
P3014-P	3 to 150 psi	0.2 to 10 bar	N/A	Standard	1 psi	N/A	SI, bar, psi, kgf/cm²	Y
P3015	3 to 500 psi	0.2 to 35 bar	N/A	Optional	1 psi	N/A	SI, bar, psi, kgf/cm²	Y
P3022	5 to 400 inH20	15 to 1000 mbar	1 to 30 inHg	Optional	1 inH20	0.2 inHg	SI, bar, psi, kgf/cm²	N
P3023	12 to 800 inH20	30 to 2000 mbar	1 to 30 inHg	Optional	2 inH20	0.2 inHg	SI, bar, psi, kgf/cm²	N
P3025	3 to 500 psi	0.2 to 35 bar	1 to 30 inHg	Optional	1 psi	0.2 inHg	SI, bar, psi, kgf/cm²	Y
P3031	10 to 1000 psi	1 to 70 bar	N/A	N/A	1 psi	N/A	SI, bar, psi, kgf/cm²	N
P3032	10 to 2000 psi	1 to 140 bar	N/A	N/A	1 psi	N/A	SI, bar, psi, kgf/cm²	N

Hydraulic deadweight testers

Model(s)	Operating fluid	Pressure range (psi)	Pressure range (bar)	Ranges	Minimum pressure increment - high range	Minimum pressure increment - low range	Engineering unit options	Optional fine increment
P3123	Oil	10 to 5000 psi	1 to 350 bar	Dual	10 psi	1 psi	SI, bar, psi, kgf/cm²	Y
P3124	Oil	10 to 10,000 psi	1 to 700 bar	Dual	20 psi	1 psi	SI, bar, psi, kgf/cm²	Y
P3125	Oil	10 to 16,000 psi	1 to 1,200 bar	Dual	20 psi	1 psi	SI, bar, psi, kgf/cm²	Y
P3111	Oil	10 to 500 psi	1 to 35 bar	Single	1 psi	N/A	SI, bar, psi, kgf/cm²	Y
P3112	Oil	40 to 2000 psi	4 to 140 bar	Single	1 psi	N/A	SI, bar, psi, kgf/cm²	N
P3113	Oil	100 to 5000 psi	10 to 350 bar	Single	10 psi	N/A	SI, bar, psi, kgf/cm²	Y
P3114	Oil	200 to 10,000 psi	20 to 700 bar	Single	20 psi	N/A	SI, bar, psi, kgf/cm²	Y
P3115	Oil	200 to 16,000 psi	20 to 1100 bar	Single	20 psi	N/A	SI, bar, psi, kgf/cm²	Y
P3116	Oil	200 to 20,000 psi	20 to 1400 bar	Single	20 psi	N/A	SI, bar, psi, kgf/cm²	Y
P3223	Water	10 to 5000 psi	1 to 350 bar	Dual	10 psi	1 psi	SI, bar, psi, kgf/cm²	Y
P3224	Water	10 to 10,000 psi	1 to 700 bar	Dual	20 psi	1 psi	SI, bar, psi, kgf/cm²	Y
P3211	Water	10 to 500 psi	1 to 35 bar	Single	1 psi	N/A	SI, bar, psi, kgf/cm²	Y
P3212	Water	40 to 2000 psi	4 to 140 bar	Single	1 psi	N/A	SI, bar, psi, kgf/cm²	N
P3213	Water	100 to 5000 psi	10 to 350 bar	Single	10 psi	N/A	SI, bar, psi, kgf/cm²	Y
P3214	Water	200 to 10,000 psi	20 to 700 bar	Single	20 psi	N/A	SI, bar, psi, kgf/cm²	Y
P3830	Oil	500 to 30,000 psi	40 to 2,000 bar	Single	20 psi	N/A	SI, bar, psi	N
P3840	Oil	500 to 40,000 psi	40 to 2,600 bar	Single	20 psi	N/A	SI, bar, psi	N
P3860	Oil	500 to 60,000 psi	40 to 4,000 bar	Single	20 psi	N/A	SI, bar, psi	N

P3000 Pneumatic Deadweight Testers

Gas operated (pneumatic) deadweight testers provide a proven, traceable, clean, and easy way for checking accuracy of pressure gauges and transfer standards. Each instrument is supplied with a detachable lid that makes it neat, compact and easily portable. The weight masses are stored in a high-quality case with a self-locking mechanism to protect them during transit. Dual piston deadweight testers handle both vacuum and positive pressure in one instrument. Units can be supplied in a variety of pressure units, including psi, bar, kgf/cm², and MPa.

Key features

- Piston flotation indicator
- High quality needle valves provide optimum control
- Mounted spirit level and adjustable feet
- Test station design with O-rings eliminates the need for PTFE tape or wrenches
- Rugged case with spring loaded latches for hood
- Sturdy weight box with hinged lid and side handles for easy transport
- Weights trimmed to local gravity free of charge

Summary specs

- Accuracy better than 0.015 % of reading. (Increased accuracy option of 0.008 %)
- Pressure ranges from vacuum through 2 000 psi (140 bar)
- See deadweight tester selection page for specific models

Application coverage

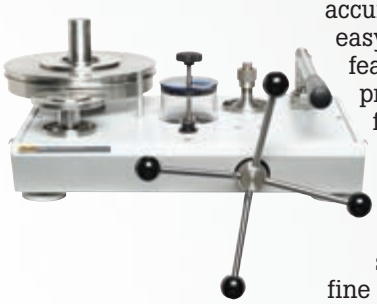
These high performance gas operated deadweight testers can be used to calibrate virtually any pressure sensing device, including transducers, transmitters, gauges or pressure switches while minimizing risk of liquid contamination.

Each unit includes:

Series 3 nonmagnetic austenitic stainless steel masses, Vacuum weights and the optional fractional weights are stainless steel and/or solution heat treated aluminum, Detachable lid, high quality case, Accredited calibration certificate, Operating fluid (where applicable), spare seals, adaptors for 1/8-inch 1/4-inch, 3/8-inch, 1/2-inch NPT and BSP and metric adaptors (M20 and M14)

P3100 and P3200 Hydraulic Deadweight Testers

Oil and water operated (hydraulic) deadweight testers provide a proven, traceable, safe and easy way for checking accuracy of pressure gauges and transfer standards up to very high pressures. The P3100 and P3200 models are available in single or dual piston formats for increased operating ranges. Units can be supplied in psi, bar, kgf/cm², and MPa. These robust instruments are highly accurate, quick and easy to use. Units feature a built-in priming pump for large volume applications, piston flotation indicators and a high quality screw press for fine pressure control.



Key features

- 0.015% of reading accuracy standard (0.008% optional)
- P3100: Oil operated
- P3200: Water operated
- Built-in hand pumps standard
- Mounted spirit level with adjustable feet
- Weights trimmed to local gravity free of charge

Summary specs

- Accuracy better than 0.015 % of reading. (Increased accuracy option of 0.008 %)
- Pressure ranges to 20,000 psi (1400 bar)
- See deadweight tester selection page for specific models

Application coverage

These high performance liquid operated deadweight testers can be used to safely calibrate virtually any pressure sensing device, including transducers, transmitters, gauges or pressure switches up to very high pressures.

Each unit includes:

Series 3 nonmagnetic austenitic stainless steel masses stored in a high-quality case with a self-locking mechanism, optional fractional weights are stainless steel and/or solution heat treated aluminum, Detachable lid, high quality carrying case, traceable certificate of calibration, weight mass details, 1/8-inch, 1/4-inch, 3/8-inch and 1/2-inch NPT or BSP female adaptors, operating fluid (where applicable) and spare seals.

6531 and 6532 Electronic Deadweight Testers

A powerful, complete hydraulic pressure calibration system to cover a wide workload. The 6531 and 6532 are electronic calibrators designed to replace mechanical, piston–cylinder and weight based deadweight testers. It's a lighter, easier-to-use deadweight tester calibration alternative that is at home in the lab or instrument shop, as well as in the field performing in-situ calibrations and tests. This complete hydraulic pressure calibration system combines the convenience and precision of continuous, real time electronic pressure measurement with the simple and direct operation of high quality operator controlled pressure generation hardware.

Key features

- Not dependent on local gravity or ambient temperature
- Sets and reads any pressure value directly in any unit of measure, without moving weights
- Built–in filling and priming system
- "Ready" indication based on pressure stability
- Electronic output allows automated data collection using calibration software
- Compact and transportable—rechargeable battery pack for 8 hours of field operation
- Selected by the US Air Force to replace conventional, mass/piston–cylinder based deadweight testers

Summary specs

- 0 MPa to 70 MPa (10 000 psi) range
- ± 0.02 % of reading measurement uncertainty from 10 % to 100 % of range on most models

Application coverage

These liquid operated electronic deadweight testers can be used to safely calibrate virtually any pressure sensing device, including transducers, transmitters, gauges or pressure switches up to very high pressures.

Each unit includes:

Liquid Fill Kit, Power Supply With Cord, Set Of Test Port Adapters, Unit Is Shipped Dry, Traceable Calibration Certificate

Pressure Comparators

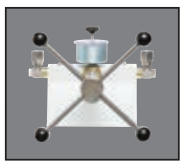
Pressure comparators are designed to test pressure measuring instruments against the 2700G Reference Pressure gauge for a complete calibration solution.

P5510 Pneumatic Pressure Comparator

- Dual pressure/vacuum capability
- Bench mount design
- Built–in handpump as pressure/vacuum source
- High quality needle valve for fine control
- Test port adapters that require no PTFE tape or wrenches

P5513 Pneumatic Pressure Comparator

- High pressure pneumatic operation
- Screw press for fine pressure adjustments
- High quality needle valves for fine control
- Test port adapters which require no PTFE tape or wrenches
- Sturdy carrying case with lid



P5514 Hydraulic Pressure Comparator

- Generates pressures to 10,000 psi (700 bar)
- Bench mounted design
- Operational with a wide range of fluids
- Screw press for fine pressure adjustments

P5515 Hydraulic Pressure Comparator

- Generates pressures to 20,000 psi (1400 bar)
- Operational with a wide range of fluids
- Built–in hand pump for system priming and large volume applications
- High quality screw press for fine pressure control
- Acrylic reservoir for visibility of fluid level and quality
- Portable

ACCESSORIES

700HTP-2 Hydraulic Test Pump
The 700HTP-2 is designed to generate pressures up to10,000 psi/700 bar. Use the Fluke 700PRV-1 adjustable relief valves to limit pressures from 1360 psi to 5450 psi. Use the 700HTH-1 test hose to connect from the pump to the device under test.

700PTP-1 Pneumatic Test Pump
The 700PTP-1 is a handheld pressure pump designed to generate either vacuum to -11.6 psi/-0.8 bar or pressure to 600 psi/40 bar.

700LTP-1 Low Pressure Test Pump
Hand operated pressure pump designed to generate either vacuum to -13 psi/-.90 bar or pressures to 100 psi/6.9 bar. Ideal for low pressure applications requiring accurate low pressure.

BP7235 NiMH Battery
Spare battery for 74X calibrators. Have the power to easily run the calibrator for a full day's work.

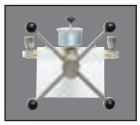
BP7240 Li-ion Battery
Spare battery for 75X calibrators. Have the power to easily run the calibrator for a full day's work.

700ILF In Line Filter
Trap fine particles from atmospheric air, compressed air, and instrument air. It is used with the Fluke 713, 717, or 718 Pressure Calibrators. Maximum working pressure 100 psi.

Fluke 71XTrap Liquid and Dirt Trap for 718 and 719Pro
Liquid and Dirt Trap for 718, 719 and 719Pro. Protects calibrator from accidental exposure to fluid and dirt. Standard with 719Pro, optional with 718 and 719. Working pressure to 300 psi.

Fluke 71X, Hose Kit Accessory
The Fluke 71X Hose Kit is compatible with the 717 and 718 calibrators 100 PSI and below. The translucent accessory hoses allow the technician to easily identify if there is oil or other contaminants in the hose before they get into the calibrator. The kit contains three translucent hoses, one meter long, with easy-to-connect push fit connectors to the calibrator and the device under test, and one 1/8" to 1/4" NPT female-female adapter.

P5543 Angle Adapter
To calibrate gauges with the pressure connection on the rear (for example, panel mount gauges) in their correct operating position, an angle adaptor should be used. The angle adapter uses the standard gauge adapters and positions the gauges at 90°. The maximum working pressure of this unit is 10,000 psi (700 bar).



P5544 Two Gauge Stand
This adapter mounts directly to the test port of the calibrator and allows for the calibration of two instruments at the same time, or the connection of a reference test instrument. Maximum working pressure is 10,000 psi (700 bar).

P5551 Pointer Remover/Punch
This tool is designed to quickly remove and consistently refit the pointer of a pressure gauge.

700PTPK2 Premium Pneumatic Test Pump Kit Adds premium hose kits to the standard 700PTPK. Includes "finger tight" no tools required connectors to connect both a gauge and connection to a transmitter.

700HTPK2 Premium Hydraulic Test Pump Kit Adds premium hose kits to the standard 700HTPK. Includes "finger tight" no tools required connectors to connect both a gauge and connection to a transmitter.

700TTH 5K and 700TTH 10K
Premium Transmitter Test hose kits. 5,000 and 10,000 psi models. Included 1/8" NPT connection for permanent mount to a calibrator or test pump and no tools required 1/4" NPT male connector for connection to a transmitter.

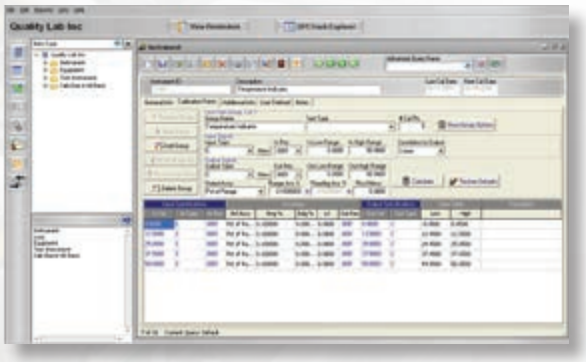
700M20TH
Premium M20 Test hose kit. 5,000 psi rating. Includes 1/8" NPT connection for permanent mount to a calibrator or test pump and male no tools required connector for connection to Female M20 connections.

700MTH
Premium Metric Test hose kit. 5,000 psi rating. Includes 1/8" NPT connection for permanent mount to a calibrator or test pump and no tools required male connector for connection to 1/4" female metric/BSP.

SOFTWARE

PressCal Software
PressCal is a menu-driven software program for pressure calculation and certificate generation using a deadweight tester as the pressure source. This software has been developed as a flexible working tool to make calibrations quicker, easier and more accurate. PressCal allows users to apply all necessary corrections (local gravity, pressure head, temperature, etc.) to enhance the performance of the deadweight tester. Calibration details are then stored and/or automatically inserted into a calibration certificate.

- Menu-driven, easy-to-use software
- Maintain multiple deadweight tester files
- Pressure equivalent calculations with all corrections applied
- Automatic generation of calibration certificates
- Pre-loaded calibration data
- Twelve pressure units



DPC/TRACK2™ Software
DPC/TRACK2 is a specialized calibration management database that can help you manage your instrumentation and address the documentation requirements of quality programs and regulations. With DPC/TRACK2 and a 754 DPC you can:

- Manage your inventory of tags and instruments, schedule for calibration
- Create tag specific procedures with instructions and comment
- Load those procedures to your DPC, and later upload the results to your PC
- Select and execute automated As-Found/As-Left procedures in the field, automatically capturing results
- Examine the calibration histories of your tags and instruments and print reports
- Import and export instrument data and procedures as ASCII text
- Import legacy DPC/TRACK database

700G/Track
Easy-to-use software for managing instruments and calibration data.

- Enables data log configuration download and logged data upload with the 700G Series gauges
- Configure logging event reading rate, duration and measurement units
- Upload measurements logged remotely and display or export measurements

www.fluke.com/700Gsoftware

Fluke. *Keeping your world up and running.*®

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Printed in U.S.A. 4/2015 6003978a

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Diensten van EURO-INDEX

EURO-INDEX is fabrikant, importeur en distributeur van diverse A-merken op het gebied van test- en meetinstrumenten. Daarnaast leveren wij een groot aantal diensten om het gebruik van deze instrumenten in uw bedrijfsvoering te optimaliseren. Dit omvat uiteraard onderhoud, reparatie en kalibratie van de instrumenten, maar ook kennisdeling via de EURO-INDEX Academy en verhuur van instrumenten.

Geautoriseerd Service Centrum

EURO-INDEX b.v. is van alle vertegenwoordigde merken een Geautoriseerd Service Centrum. Dit betekent dat uw instrumenten worden behandeld door technici die zijn opgeleid door de fabrikant en beschikken over de juiste gereedschappen en software. Er worden uitsluitend originele onderdelen toegepast en de garantie van uw instrument, evenals de certificering (ATEX, EN50379, etc.) blijven intact.

Kalibratielaboratorium

Ons moderne service- en kalibratielaboratorium beschikt over een RvA accreditatie naar NEN-EN-ISO/IEC 17025. Deze accreditatie geldt voor grootheden, zoals gespecificeerd in de scope bij accreditatienummer K105.

Meer info

Kijk voor een overzicht van al onze diensten op euro-index.nl/diensten

Mobiele Service

Naast de vaste kalibratielaboratoria in Capelle aan den IJssel en Zaventem beschikken wij ook over een laboratorium op wielen met de naam “Mobiele Service”. Dit biedt vertrouwde service en kwaliteit, bij u voor de deur!

Meer info

KWS®

KWS® is een uniek servicesysteem voor uw meetinstrumenten met periodiek onderhoud en kalibratie tegen vaste, lage kosten. Via een gratis webportal (mijnkws.nl) heeft u altijd en overal beschikking over uw kalibratiecertificaten.

Meer info

Verhuur van meetinstrumenten

- Uitgebreid assortiment
- Nauwkeurigheid aantoonbaar door actueel kalibratiecertificaat
- Deskundig advies
- Complete levering inclusief accessoires

Meer info

EURO-INDEX Academy

- Trainingen (individueel en klassikaal)
- Cursussen en workshops
- Demonstratie- en instructievideo’s
- Whitepapers

Meer info

Servicebalie

Onderhoud, reparatie en kalibratie

Cursussen en workshops

Mobiele Service

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