

Adjustment Manual
Handheld Pressure Calibrator
JOFRA HPC600



Overview

The HPC 600 Pressure Calibrator has an electronic calibration. There are no mechanical adjustments and the calibration is done case closed. The calibration is done via a serial communications port by sending commands and receiving readings. The RS232 interface is used for the calibration of the HPC 600. The calibration can be done by using a terminal program or an automated calibration program can be written using programs like Visual Basic or Labview. In this manual only the serial terminal mode will be described.

Initiating Communication

The terminal communications can be setup using terminal communication software on a PC, such as Hyperterminal or PcPlus. Connect the RS232 cable to the LEMO RS232 connector on right side of the HPC600. (Cable part number 127403)The other end of the cable should be connected to the terminal/PC serial port. An adapter may be needed for terminals that use 25 pin 'D' serial connectors.

The terminal settings need to be set as follows:

- Bits per second: 9600
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow control: none
- Local echo: on

All calibrations commands are performed on the functions selected on the lower display. Use the following command sequence to turn off all but the lower display.

DISPLAY UPPER, OFF

DISPLAY MIDDLE, OFF

DISPLAY LOWER, ON

As long as the calibrator has been at a stable temperature, within the range of 20 to 26 degrees Celsius for an hour or more, the calibrator only needs 5 minutes to warm up. If temperature conditions were previously below 10 degrees Celsius or higher than 40 degrees Celsius, then the unit must be allowed to stabilize for a minimum of 3 hours prior to calibration.

Calibrating Voltage Input:

Test Equipment:

Table 1 List of Test Equipment For Calibrating Voltage Input

Quantity	Manufacturer	Model	Equipment
1	Pomona	2948-36-2 (red) 2948-36-0 (black)	Low Thermal EMF banana to banana leads
1	Fluke	5520A	Calibrator

Connections:

Use the test lead set to attach the voltage output of the 5520 to the input of the HPC 600.

Procedure:

1. After you have made your connections, send the following command to put the unit in Voltage mode.
2. FUNC LOWER,DCV
3. Use the 5520 to input 0V when the reading is stable send the following command: CAL_POINT[0][0]
4. Use the 5520 to input 15V, when the reading is stable send the following command: CAL_POINT[0][1]
5. Use the 5520 to input 30V, when the reading is stable send the following command: CAL_POINT[0][2]
6. The voltage range is now calibrated. Use the 5520 to verify the calibration.

Calibrating mA Input:

Test Equipment:

Table 2 List of Test Equipment For Calibrating mA Input

Quantity	Manufacturer	Model	Equipment
1	Pomona	2948-36-2 (red) 2948-36-0 (black)	Low Thermal EMF banana to banana leads
1	Fluke	5520A	Calibrator

Connections:

Use the test lead set to attach the milliamp output of the 5520 to the input of the HPC 600.

Procedure:

1. After you have made your connections, send the following commands to put the unit in current measure mode.
2. FUNC LOWER,DCI
3. IO_STATE MEASURE
4. Use the 5520 to input 0mA, when the reading is stable send the following command: CAL_POINT[0][0]
5. Use the 5520 to input 12mA, when the reading is stable send the following command: CAL_POINT[0][1]
6. Use the 5520 to input 24mA when the reading is stable send the following command: CAL_POINT[0][2]
7. The milliamp measure range is now calibrated. Use the 5520 to verify the calibration.

Calibrating mA Source:

Test Equipment:

Table 2 List of Test Equipment For Calibrating mA Input

Quantity	Manufacturer	Model	Equipment
1	Pomona	2948-36-2 (red) 2948-36-0 (black)	Low Thermal EMF banana to banana leads
1	HP	3458A	Calibrator

Connections:

Use a test lead to short the positive contact to the negative contact of the HPC 600.

Procedure:

1. After you have made your connection, send the following commands to put the unit in current source mode.
2. FUNC LOWER,DCI
3. IO_STATE SOURCE
4. Once the calibrator is in the current source mode, send the following command: CAL_MA_SRC
5. The calibrator will then calibrate the source side by comparison to the measure circuit. The process will take a minute or two.
6. The milliamp source range is now calibrated. Use the 3458A to verify the calibration.

Calibrating RTD:

Test Equipment:

Table 3 List of Test Equipment for Calibrating RTD

Quantity	Manufacturer	Model	Equipment
4	Pomona	2948-36-2 (red) 2948-36-0 (black)	Low Thermal EMF banana to banana leads
1	Martel	URA-1	RTD Adapter
1			Resistance Standard (w/ a 4:1 TUR)

Connections:

Connect HPC 600 to the Resistance Standard as follows:

Plug the URA-1 into the HPC 600. Connect HI side of the current output (ohms measure) jacks of the URA-1 to the high side of the current input of the Resistance Standard. Connect LO side of the current output (ohms measure) of the URA-1 to the low side of the current input of the Resistance Standard. Connect the HI side of sense jacks of the URA-1 to the high side of the sense output of the Resistance Standard. Connect the LO side of the sense jacks of the URA-1 sense input to the low side of the sense output of the Resistance Standard.

Procedure:

1. After you have made your connections, send the following command to put the unit in RTD mode.
2. FUNC LOWER,RTD
3. Use the Resistance Standard to input 90 Ohms when the reading is stable send the following command: CAL_POINT[0][0]
4. Use the Resistance Standard to input 140 Ohms when the reading is stable send the following command: CAL_POINT[0][1]
5. The RTD range is now calibrated, use the Resistance Standard to verify the calibration.

Calibrating Pressure:

Test Equipment:

Table 3 List of Test Equipment For Calibrating Pressure Input

Quantity	Manufacturer	Model	Equipment
1			Pressure/Vacuum Standard (w/ a 4:1 TUR)

Connections:

The HPC 600 uses a 1/8" NPT female connection in the pressure input port. Various adapters may be needed to connect to the pressure standard. Always make sure the hose, tubing, fittings etc have a rated working pressure at or above the pressure of the unit. Also it is important that there be no leaks, when trying to achieve a good calibration, use Teflon tape where appropriate. Insure that the Vent and Pressure/Vacuum switches are in the CLOSED and PRESSURE positions.

Procedure:

1. After all connections have been made send the following command to put the unit in pressure mode.
2. FUNC LOWER,P1
3. Send the OFFSET_ADJ? command. Note the value returned.
4. Use the pressure standard to input a value equal or close to the noted value.
When the pressure is stable send.
OFFSET_ADJ n
Where n is the entered pressure.
5. Send the GAIN_ADJ? command. Note the value returned.
6. Use the pressure standard to input a value equal or close to the noted value.
7. When the pressure is stable send.
GAIN_ADJ n
Where n is the entered pressure.



AMETEK Calibration Instruments

One of the world's leading manufacturers and developers of calibration instruments for temperature, pressure and process signals as well as for temperature sensors both from a commercial and a technological point of view.

JOFRA Temperature Instruments

Portable precision thermometers. Dry-block and liquid bath calibrators: 4 series, with more than 25 models and temperature ranges from -90° to 1205°C/-130° to 2200°F.

JOFRA Pressure Instruments

Convenient electronic systems ranging from -1 to 1000 bar - multiple choices of pressure ranges, pumps and accuracies, fully temperature-compensated for problem-free and accurate field use.

JOFRA Signal Instruments

Process signal measurement and simulation for easy control loop calibration and measurement tasks - from handheld field instruments to laboratory reference level bench top instruments.

JOFRA Marine Instruments

A complete range of calibration equipment for temperature, pressure and signal, approved for marine use.

FP Temperature Sensors

A complete range of temperature sensors for industrial and marine use.

M&G Pressure Testers

Pneumatic floating-ball or hydraulic piston dead weight testers with accuracies to 0.015% of reading.

M&G Pumps

Pressure generators from small pneumatic "bicycle" style pumps to hydraulic pumps generating up to 1,000 bar.

AMETEK[®]

TEST & CALIBRATION INSTRUMENTS

AMETEK Denmark A/S
Gydevang 32-34 • 3450 Allerød • Denmark
Tel: +45 4816 8000 • ametek@ametek.dk

Information in this document is subject to change without notice.
©2011, by AMETEK, Inc., www.ametek.com. All rights reserved.

www.jofra.com

AMETEK Mansfield & Green (North America)

Tel: +1 800 527 9999 • cal.info@ametek.com

AMETEK Singapore Pte. Ltd. (Singapore)

Tel: +65 6 484 2388 • aspl@ametek.com.sg

AMETEK Inc. Beijing Rep. Office (China)

Tel: +86 10 8526 2111 • jofra@ametek.com.cn

AMETEK GmbH (Germany)

Tel: +49 2159 9136 510 • info.mct-de@ametek.de

AMETEK Calibration Instruments (UK)

Tel: +44 (0) 1243 833 302 • jofra@ametek.co.uk