

pressure

JOFRA™

Pressure ranges

| | |
|------------|----------------------------|
| HPC600-2A | 0 to 2 bara / 30 psia |
| HPC600-2C | Vacuum to 2 bar / 30 psi |
| HPC600-10A | 0 to 10 bara / 150 psia |
| HPC600-10C | Vacuum to 10 bar / 150 psi |

High accuracy

±0.020% of reading +0.015% F.S.

True field calibration

Fully temperature compensated

Unique built-in electrical pump

HPC600 has a built-in automatic pressure system, based on an electrical pressure and vacuum pump.

Complete 4-20 mA loop calibrator

HPC600 features a complete mA loop calibrator with all common loop calibrator features: measure, source & sink mA, and supply 24 volt for transmitters.

Comprehensive set of features

Wide selection of useful functions and features. Damping, leak test, error calculation, min/max, switch test, etc.

Thermometer

High accuracy thermometer, Pt100 sensor.

External pressure modules

More than 60 different pressure modules, accuracy up to 0.01% F.S.

ISO 9001 Manufacturer

Specification Sheet
SS-HPC600

Handheld Pressure Calibrator HPC600

Built-in
electric pump



The JOFRA HPC600 calibrator features a built-in electrical pump system for generation of pressure and vacuum by a touch of a single key!

Besides the unique pump system, the HPC600 offers a complete choice of features and functions making it an ideal tool and calibrator.

A true multifunction solution designed to save time, money and space... HPC600 is a pressure indicator, a pressure calibrator, a complete mA loop calibrator, including 24 volt supply, a voltmeter, a thermometer and a pressure/vacuum generator. All supplied in a ruggedized housing with an easy intuitive operating system in the palm of your hand.

The HPC600 is delivered as a ready-to-test system, complete with hose, fittings, and a padded soft case, equipped to meet any need for pressure calibration. An international traceable calibration certificate, including vacuum and electrical parameters is part of the standard delivery to make the HPC600 a truly ready-to-use solution.

The HPC600 can be used in a very wide range of applications from simple tool type jobs to complex calibration jobs in custody transfer systems. A time and money saver!

HPC600 is a multifunction tool designed to meet high accuracy pressure calibration applications. The HPC600 offers features such as a user configurable information display, 15 different pressure units, transmitter supply, mA input/output, % error calculation, voltage measurement, serial communication, and an external pressure module capability. The accuracy of the HPC600 calibrator is specified in % of reading to ensure an even better accuracy and more applicable pressure range. The HPC600 is temperature compensated from -10 to 50°C / 14 to 122°F for on-site operations. It is a truly superior pressure calibrator for laboratory and field use, bringing laboratory accuracy into the field.

The JOFRA APM series of pressure modules extends the application base of the HPC calibrators by allowing calibrations in additional ranges. The APM modules are compatible with several other JOFRA calibrators.

AMETEK®
CALIBRATION INSTRUMENTS

Temperature measurement

High accuracy temperature measurement port by use of the optional Pt100 sensor. A superb instrument for easy and convenient temperature measurement.

Intuitive menu system

Combination of “soft keys” and cursor keypad ensures an easy operation.

ON / OFF

Auto shut-off to expand battery life time (user programmable).

Serial interface

RS232 connection for JOFRA APM pressure module or computer.

Pressure connections

1/8" combined NPT/BSP female. 300 series stainless steel. 1/4" NPT male and 1/4" BSP female adapters are supplied as standard.

Units

15 different pressure engineering units.

Clear graphical display

Large backlit graphical display shows current status and mode, 1, 2 or 3 measurement windows, to suit your applications and demands.



Vent valve / pressure vacuum selector

Pressure venier adjuster (Volume adjuster)

To fine tune pressure or vacuum output.

Full set of features

Perform semi-automatic pressure switch test, leak test, % error calculation, switch in HART resistor or other calibration tasks through the outstanding functions and features of the HPC600.

Electrical connections

HPC calibrators are well equipped and include inputs for mA, voltage, including 24 VDC supply for mA transmitters, and source & sink for mA loop calibration and test.



JOFRACAL CALIBRATION SOFTWARE

Compatible with 2010 software release

JOFRACAL calibration software ensures easy calibration of RTD's, thermocouples, transmitters, thermowithes, pressure gauges and pressure switches. JOFRACAL can be used with JOFRA DPC-500, HPC600, HPC500, HPC502 and IPI pressure calibrators, all JOFRA temperature calibrators, as well as JOFRA AMC910, ASC300 multi signal calibrator and ASM-800 signal multi scanner. When used with JOFRA ASM-800 signal multi scanner, JOFRACAL can perform a simultaneous semiautomatic calibration of up to 24 pressure and/or temperature devices under test in any combination.

JOFRACAL software controls the complete calibration procedure, stores the results and provides a calibration audit trail through hard-copy certificates. All calibration data are stored for each sensor to monitor drift and optimize recalibration intervals. A scheduler feature allows planning of future calibrations.

The JOFRACAL temperature calibration software may be downloaded free of charge from our website.

REQUIREMENTS JOFRACAL

Minimum hardware requirements:

- Intel® Pentium® II 1.4 GHz processor
- 64MB RAM (128MB recommended)
- 400MB free disk space on hard disk (500MB recommended) prior to installation
- Standard VGA (800x600, 256 colours). 1024x768 recommended
- CD-ROM drive or USB port for installation of program
- 1 or 2 free RS-232 serial ports, depending on configuration

Minimum software requirements:

- Microsoft Windows® XP, Vista
- System fonts: MS Sans Serif and Arial

JOFRA APM pressure module

The JOFRA APM external pressure modules extend the range of the JOFRA HPC. There are more than 60 models available with gauge, absolute, differential, and vacuum pressure references, in metric and imperial engineering units.

The modules are engineered for on-site or laboratory use. They are ready-to-use with the JOFRA HPC and the protocol allows for immediate recognition and use of the module once it is plugged into the calibrator.



FUNCTIONAL SPECIFICATIONS

Pressure; gauge / compound ranges

bar -0.82 to 2 or 10
psi..... -12 to 30 or 150

Pressure; absolute ranges (available Q2, 2010)

bara 0.2 to 2 or 10
psia..... 3 to 30 or 150

Engineering units (built-in)

User selectable..... 15 units
(bar, mbar, MPa, kPa, inHg@0°C, mmHg@0°C, kg/cm², mmH₂O@4°C, mmH₂O@20°C, psi, inH₂O@4°C, inH₂O@20°C, inH₂O@60°F, cmH₂O@4°C, cmH₂O@20°C)

Pressure accuracy reference temp. (18 to 28°C / 65 to 82°F)

All pressure ranges±0.020% RDG + 0.015% F.S.
Vacuum ±0.025% F.S.
F.S. (full scale) is the numerical value of the positive pressure range.
Accuracy includes hysteresis, nonlinearity, repeatability, reference standard uncertainty and typically 1-year long-term stability, operated inside the rated temperature span and pressure range. Frequently zeroing (gauge/compound) or entering of reference pressure (absolute) is required.

Pressure accuracy ambient temp. (-10 to 50°C / 14 to 122°F)

All pressure ranges±0.030% RDG + 0.015% F.S.
Vacuum ±0.035% F.S.
F.S. (full scale) is the numerical value of the positive pressure range.
Temperature effect -10 to 0°C / 14 to 32°F ±0.005% F.S./°C.
Accuracy includes hysteresis, nonlinearity, repeatability, reference standard uncertainty and typically 1-year long-term stability, operated inside the rated temperature span and pressure range. Frequently zeroing (gauge/compound) or entering of reference pressure (absolute) is required.

Display

LCD Graphical (with light)
Display resolution..... 5 digits
Display update 3 times per second

RS232 communication interface

Connector..... LEMO
Serial..... 0-5 VDC, 9600 baud, 8 data, no parity, 1 stop
Protocol..... ASCII command language

Input / output (18 to 28°C / 65 to 82°F)

mA range, input, output and sink 0 to 24 mA
mA accuracy, input ±0.015% RDG + 2 µA
mA accuracy, output/sink ±0.015% RDG + 2 µA
Transmitter supply..... 24 VDC ±10%
Voltage measurement 0 to 30 VDC
Voltage accuracy..... ±0.015% RDG + 2mV
RTD range (ohms) 84 to 140 Ω
RTC accuracy ±0.015% RDG + 0.02 Ω
RTD range (temp.)..... -40 to 155°C / -40 to 311°F
RTD accuracy @ 0°C/32°F (temp.)..... ±0.10°C/0.18°F
HART® resistor 250 Ω
Peak hold capture 50 milliseconds
Switch test input 5V (<1mA)
Temperature effect outside 18 to 28°C / 65 to 82°F ±0.001% F.S./°C.

Media compatibility

Dry, clean, non corrosive gasses

Environmental

Operating temperature..... -10 to 50°C / 14 to 122°F
Storage temperature -20 to 60°C / -4 to 140°F
Ingress protection rating IP56

Pressure connection

All calibrators 1/8" BSP/NPT female (combined)
Adapters to 1/4" NPT female and 1/4" BSP female are included as standard.

Pressure overload

Overload alarm..... "OL" in display at approx. +20% F.S.

Power supply

Battery 8 x 1.5 VDC Alkaline
Battery type..... AA, LR6, MN1500, AM3
Battery lifetime..More than 300 pump cycles to 10 bar/150 psi
Low battery indicator Yes

Instrument dimensions (LxWxH)

Calibrator..... 203x102x61 mm / 8x4x2.4 in
HPC600 weight (incl. battery) 920 g / 32.5 oz
Calibrator, shipping 560x350x180 mm / 22x13.8x7 in
Calibrator weight, shipping 3,2 kg / 113 oz

Miscellaneous

Compliance: EN 61326 : 2006 & CISPR 11, Edition 5.0 -
2009 Class "B"

ORDERING INFORMATION

| Order number | Description |
|--------------------|---|
| HPC | Type |
| 600 | Model |
| | Pressure range |
| 002A | 0 to 2 bar / 30 psi absolute (available Q2, 2010) |
| 002C | Vacuum to 2 bar / 30 psi gauge/compound |
| 010A | 0 to 10 bar / 150 psi absolute (available Q2, 2010) |
| 010C | Vacuum to 10 bar / 150 psi gauge/compound |
| | Calibration certificate |
| G | NIST traceable calibration certificate |
| | Accessories (Optional) |
| B | Rechargeable battery pack |
| I | Interface kit LEMO to RS232 |
| T | Temperature sensor Pt100 |
| | Sample order number |
| HPC 600 010C G BIT | HPC600, vacuum to 10 bar, NIST traceable certificate, rechargeable battery package, interface kit, temperature sensor |



ETM



Pump system B



mAcal



APC

HPC600 PRESSURE RANGES

This table shows the resolutions that can be obtained by the HPC calibrators throughout all engineering units.

| HPC600 Ranges and Resolutions | | | |
|-------------------------------|------------|------------------|------------------|
| Range (bar/psi) | | 2.0 bar / 30 psi | 10 bar / 150 psi |
| Burst pressure (bar/psi) | | 20 bar / 300 psi | 20 bar / 300 psi |
| Proof pressure (bar/psi) | | 4 bar / 60 psi | 14 bar / 200 psi |
| Engineering unit | Factor | | |
| psi | 1 | 30.000 | 150.00 |
| bar | 0.06894757 | 2.0684 | 10.3421 |
| mbar | 68.94757 | 2068.4 | 10342.1 |
| kPa | 6.894757 | 206.84 | 1034.21 |
| MPa | .00689476 | 0.2068 | 1.03421 |
| kg/cm ² | 0.07030697 | 2.1092 | 10.5460 |
| cmH ₂ O@4°C | 70.3089 | 2109.3 | 10546.3 |
| cmH ₂ O@20°C | 70.4336 | 2113.0 | 10565.0 |
| mmH ₂ O@4°C | 703.089 | 21093 | n/a |
| mmH ₂ O@20°C | 704.336 | 21130 | n/a |
| inH ₂ O@4°C | 27.68067 | 830.42 | 4152.1 |
| inH ₂ O@20°C | 27.72977 | 831.89 | 4159.5 |
| inH ₂ O@60°F | 27.70759 | 831.23 | 4156.1 |
| mmHg@0°C | 51.71508 | 1551.5 | 7757.3 |
| inHg@0°C | 2.03602 | 61.081 | 305.40 |

Proof pressure - maximum allowable pressure without a shift in calibration

Burst pressure - sensor damaged or destroyed, some risk of personal injury

Absolute ranges - the data for the 2 bar / 30 psi and 10 bar / 50 psi ranges also applies to the absolute pressure versions of those ranges

STANDARD DELIVERY (HPC Calibrator)

- HPC600 calibrator
- Padded soft carrying case
- Traceable calibration certificate (NIST) with pressure vacuum and electrical performance
- 8 x 1.5 volt batteries
- Adapter to 1/4" NPT female from 1/8" NPT male*
- Adapter to 1/4" BSP female from 1/8" NPT male*
- Quick connector set and 1 meter / 3 feet hose
- Test leads: red and black
- User manual



| Function / Feature | HPC600 |
|---|--------|
| Single sensor high accuracy pressure calibrator | Yes |
| Automatic electrical pressure / vacuum pump system | Yes |
| mA measurement | Yes |
| mA output / source & sink | Yes |
| Voltage measurement | Yes |
| 24 VDC transmitter supply | Yes |
| High speed pressure switch test | Yes |
| Temperature measurement with external RTD sensor | Yes |
| JOFRA APM pressure module connection | Yes |
| RS232 communication | Yes |
| On-line calculation of sensor error % | Yes |
| Automatic leak test timer function | Yes |
| High speed min./max. hold | Yes |
| Display contrast adjustment | Yes |
| Instrument setup lock | Yes |
| Storage of 5 setups | Yes |
| Setup of number of display windows / measurement channels | Yes |
| Setup of temperature sensor RTD type | Yes |
| Select display high or low resolution | Yes |
| Setup of backlight timer | Yes |
| HART resistor on/off | Yes |
| Normal or dampened display update rate | Yes |



ACCESSORIES

Rechargeable battery kit - Option B

The HPC600 is available with a set of 8 rechargeable AA batteries and a charger for 4 batteries.

Interface kit - Option I

Special LEMO to Sub D, RS232 interface cable for HPC600.

Temperature sensor - Option T

To utilize the thermometer utility of the HPC600, a ruggedized handheld temperature sensor is available. The sensor comes as a ready-to-use probe with handle and coiled cable with LEMO connector for HPC600. The sensor is built with a high accuracy Pt100 element, accuracy $\pm 0.15^\circ\text{C}$ / $\pm 0.27^\circ\text{F}$. Sensor dimensions, without handle and cable, $\text{Ø}4 \times 200$ mm/stainless steel.

Complete calibration systems

The HPC600 is delivered as a ready-to-test system, complete and equipped to meet your pressure calibration needs.



AMETEK Calibration Instruments

is 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: 5 series, with more than 25 models and temperature ranges from -90° to 1205°C / -130° to 2200°F . All featuring speed, portability, accuracy and advanced documenting functions with JOFRACAL calibration software.

JOFRA Pressure Instruments

Convenient electronic systems ranging from -25 mbar to 1000 bar (0.4 to $15,000$ psi) - 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 / JF 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 ($15,000$ psi).

*...because calibration is
a matter of confidence*

AMETEK[®]
CALIBRATION INSTRUMENTS

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

Sales & Service:
Europe, Asia, Africa, Middle East and South America

Information in this document is subject to change without notice. ©2009, by AMETEK, Inc., www.ametek.com. All rights reserved.

AMETEK Mansfield & Green (North America)
T: +1 800 527 9999 | cal.info@ametek.com

AMETEK Singapore Pte. Ltd. (Singapore)
T: +65 6 484 2388 | aspl@ametek.com.sg

AMETEK Inc. Beijing Rep. Office (China)
T: +86 10 8526 2111 | jofra@ametek.com.cn

AMETEK GmbH (Germany)
T: +49 2159 9136 510 | info.mct-de@ametek.de

AMETEK Calibration Instruments (UK)
T: +44 (0) 1243 833 302 | jofra@ametek.co.uk

www.jofra.com