

pressure

# JOFRA<sup>®</sup>

## calibration

### » Pressure ranges

HPC600-2A	2 bara / 30 psia
HPC600-2C	2 bar / 30 psi
HPC600-10A	10 bara / 150 psia
HPC600-10C	10 bar / 150 psi
HPC600-020C	20 bar / 300 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, measure, source, sink and 24 volt loop supply.

### » 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

Many different pressure modules, accuracy up to 0.01% F.S.

ISO 9001 Manufacturer

Specification Sheet  
SS-HPC600

## Handheld Pressure Calibrator HPC600

Electric pump  
to 20 bar / 300 psi



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

Besides the unique pump system, the HPC600 offers a complete suite 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 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 padded soft case, equipped to meet any need for pressure calibration. International traceable calibration certificate, including vacuum and electrical parameters are a part of the standard delivery, to make the HPC600 solution truly ready-to-use.

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

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

**AMETEK<sup>®</sup>**  
TEST & 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).

**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.

**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.

**Electrical connections**

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

**Serial interface**

RS232 connection for JOFRA APM pressure module or a computer.

**Units**

15 different pressure engineering units.

**JOFRA APM pressure module**

The JOFRA APM external pressure modules extend the range of the JOFRA HPC. There are more than 35 models available with gauge, absolute, differential, and vacuum pressure references, in metric and imperial engineering units.

The modules are engineered for in-plant, field, 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.



**Full set of features**

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

APM Mk.II Type	Pressure range				12 month accuracy	
	Bar		PSI		%rdg	%FS
	From	To	From	To		
<b>Differential</b>						
025MD	-0.025	0.025	-0.4	0.4	-	0.100%
075MD	-0.070	0.07	-1	1	-	0.050%
350MD	-0.350	0.35	-5	5	-	0.050%
<b>Compound</b>						
001C	-0.960	1	-14	15	0.025%	0.010%
002C	-0.960	2	-14	30	0.025%	0.010%
007C*	-0.820	7	-12	100	0.025%	0.010%
020C*	-0.820	20	-12	300	0.025%	0.010%
035C*	-0.820	35	-12	500	0.025%	0.010%
<b>Gauge</b>						
001G*	0	1	0	15	0.025%	0.010%
002G*	0	2	0	30	0.025%	0.010%
007G*	0	7	0	100	0.025%	0.010%
020G*	0	20	0	300	0.025%	0.010%
035G*	0	35	0	500	0.025%	0.010%
070G*	0	70	0	1000	0.025%	0.010%
100G*	0	100	0	1500	0.025%	0.010%
200G*	0	200	0	3000	0.025%	0.010%
350G*	0	350	0	5000	0.025%	0.010%
400G*	0	400	0	6000	0.025%	0.010%
700G*	0	700	0	10000	0.025%	0.015%
<b>Absolute</b>						
001A	0.025	1.1	0.35	16	0.025%	0.010%
003A	0.025	3.5	0.35	50	0.025%	0.010%
007A*	0.070	7	1	100	0.025%	0.010%
020A*	0.070	20	1	300	0.025%	0.010%

\* Stainless steel isolated pressure sensor

Specified temperature range 18°C to 28°C / 65°F to 82°F

F.S. (full scale) is the numerical value of the positive pressure range. Accuracy includes hysteresis, nonlinearity, repeatability and reference standard uncertainty, 1 Year typical long-term stability, operated inside the rated temperature span and pressure range. Requiring frequently zeroing (Gauge/diff.) or entering of reference pressure (Absolute).

## FUNCTIONAL SPECIFICATIONS

### Pressure; gauge / compound ranges

bar ..... -0.82 to 2, 10 or 20  
psi..... -12 to 30, 150 or 300

### Pressure; absolute ranges

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/cm<sup>2</sup>, mmH<sub>2</sub>O@4°C, mmH<sub>2</sub>O@20°C, psi, inH<sub>2</sub>O@4°C, inH<sub>2</sub>O@20°C, inH<sub>2</sub>O@60°F, cmH<sub>2</sub>O@4°C, cmH<sub>2</sub>O@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 and reference standard uncertainty, 1 Year typical long-term stability, operated inside the rated temperature span and pressure range. Requiring frequently zeroing (gauge/compound) or entering of reference pressure (absolute).

### 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.  
Accuracy includes hysteresis, nonlinearity, repeatability and reference standard uncertainty, 1 Year typical long-term stability, operated inside the rated temperature span and pressure range. Requiring frequently zeroing (gauge/compound) or entering of reference pressure (absolute).

### 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  
RTD 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 male 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"

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



**4 instruments combines into 1  
HPC600 a true multi function calibrator**

**HPC600 PRESSURE RANGES**

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

<b>HPC600 Ranges and Display Resolution</b>				
Range		2.0 bar / 30 psi	10 bar / 150 psi	20 bar / 300 psi
Engineering unit	Factor	FS value	FS value	FS value
psi	1	30.000	150.00	300.00
bar	0.06894757	2.0684	10.3421	20.684
mbar	68.94757	2068.4	10342.1	20684
kPa	6.894757	206.84	1034.21	2068.4
MPa	.00689476	0.2068	1.03421	2.0684
kg/cm <sup>2</sup>	0.07030697	2.1092	10.5460	21.092
cmH <sub>2</sub> O@4°C	70.3089	2109.3	10546.3	21093
cmH <sub>2</sub> O@20°C	70.4336	2113.0	10565.0	21130
mmH <sub>2</sub> O@4°C	703.089	21093	n/a	n/a
mmH <sub>2</sub> O@20°C	704.336	21130	n/a	n/a
inH <sub>2</sub> O@4°C	27.68067	830.42	4152.1	8304.2
inH <sub>2</sub> O@20°C	27.72977	831.89	4159.5	8318.9
inH <sub>2</sub> O@60°F	27.70759	831.23	4156.1	8312.3
mmHg@0°C	51.71508	1551.5	7757.3	15515
inHg@0°C	2.03602	61.081	305.40	610.81
Burst pressure		20 bar / 300 psi	20 bar / 300 psi	40 bar / 600 psi
Proof pressure		4 bar / 60psi	14 bar / 200 psi	28 bar / 400 psi

Proof pressure - maximum allowable pressure without a shift in calibration

Burst pressure - sensor damaged or destroyed, some risk of personnel 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



**ORDERING INFORMATION**

Order number	Description
HPC	Type
600	Model
	Pressure range
002A	0.2 bar / 3 psi to 2 bar / 30 psi absolute
002C	-0.82 bar / -12 psi to 2 bar / 30 psi gauge/compound
010A	0.2 bar / 3 psi to 10 bar / 150 psi absolute
010C	-0.82 bar / -12 psi to 10 bar / 150 psi gauge/compound
020C	-0.82 bar / -12 psi to 20 bar / 300 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, 10 bar, NIST traceable certificate, rechargeable battery package, interface kit, temperature sensor

**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 male 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

**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 ±0.15°C / ±0.27°F. Sensor dimensions, without handle and cable, Ø4x200 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.



## JOFRACAL calibration software

JOFRACAL calibration software ensures easy calibration of RTD's, thermocouples, transmitters, thermoswitches, pressure gauges and pressure switches. JOFRACAL can be used with all JOFRA calibration instruments. JOFRACAL does not support the 20 bar version. For date of availability contact your local representative. When used with ASM-800 signal multi scanner, JOFRACAL can perform a simultaneous semi automatic calibration on 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 optimise recalibration intervals. A scheduler feature allows planning of future calibrations.

## Dirt, moisture or liquid?

If particles or liquid is expected in the system to be calibrated, we recommend using our "cleaning filter". The filter is attached with out use of tools, the build in o-rings ensure a tight system. The clear see-through design, makes it easy to see when cleaning is needed. Part number 127887



### AMETEK Test & Calibration Instruments

A business unit of AMETEK Measurement & Calibration Technologies Division offering the following industry leading brands for test and calibration instrumentation.

### JOFRA Calibration Instruments

#### Temperature Calibrators

Portable dry-block calibrators, precision thermometers and liquid baths. Temperature ranges from -90°C(-130°F) to 1205°C(2200°F). Temperature sensors for industrial and marine use.

#### Pressure Calibrators

Convenient electronic systems ranging from -25 mbar to 1000 bar - fully temperature-compensated for problem-free and accurate field use.

#### Signal Instruments

Process signal measurement and simulation for easy control loop calibration and measurement tasks.

### M&G Pressure Testers & Pumps

Pneumatic floating-ball or hydraulic piston dead weight testers with accuracies to 0.015% of reading. Pressure generators delivering up to 1,000 bar.

### Lloyd Instruments

Materials testing machines and software from Lloyd Instruments guarantees expert materials testing solutions. The comprehensive program also covers Texture Analysers to perform rapid, general food testing and detailed texture analysis on a diverse range of foods and cosmetics.

### Davenport Polymer Test Equipment

Allows measurement and characterization of moisture-sensitive PET polymers and polymer density.

### Chatillon Force Measurement

The hand held force gauges and motorized testers have earned their reputation for quality, reliability and accuracy and they represent the de facto standard for force measurement.

### Newage Testing Instruments

Hardness testers, durometers, optical systems and software for data acquisition and analysis.

**AMETEK**<sup>®</sup>  
TEST & CALIBRATION INSTRUMENTS

**UK**  
AMETEK Calibration Instruments  
Tel +44 (0)1243 833 302  
jofra@ametek.co.uk

**France**  
AMETEK S.A.S.  
Tel +33 (0)1 30 68 89 40  
general.lloyd-instruments@ametek.fr

**Germany**  
AMETEK GmbH  
Tel +49 (0)2159 9136 510  
info.mct-de@ametek.de

**Denmark**  
AMETEK Denmark  
Tel +45 4816 8000  
jofra@ametek.com

**USA**  
AMETEK Mansfield & Green  
Tel +1 (800) 527 9999  
cal.info@ametek.com

**India**  
AMETEK Instruments India Pvt Ltd.  
Tel +91 22 2836 4750  
jofra@ametek.com

**Singapore**  
AMETEK Singapore Pte Ltd  
Tel +65 6484 2388  
jofra@ametek.com

**China**  
AMETEK Inc. - Shanghai  
Tel +86 21 5868 5111  
AMETEK Inc. - Beijing  
Tel +86 10 8526 2111

AMETEK Inc. - Guangzhou  
Tel +86 20 8363 4768  
jofra.sales@ametek.com.cn

[www.jofra.com](http://www.jofra.com)

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