

**ACCURACY • PRESSURE MEASUREMENT**

**psi (Gauge Pressure)**

► **18 to 28° C**

0 to 30% of Range:  $\pm(0.01\%$  of Full Scale)

30 to 110% of Range:  $\pm(0.035\%$  of Reading)

Vacuum\*:  $\pm(0.05\%$  of Full Scale\*\*)

► **-20 to 50° C**

0 to 30% of Range:  $\pm(0.015\%$  of Full Scale)

30 to 110% of Range:  $\pm(0.050\%$  of Reading)

Vacuum\*:  $\pm(0.05\%$  of Full Scale\*\*)

\* Applies to 300 psi and lower ranges only. Vacuum Range = -14.5 psi.

\*\* Full Scale is the numerical value of the positive pressure range.

**psiA (Absolute Pressure with BARO Option)**

► All absolute accuracies are equivalent to the gauge pressure accuracies, except as noted below.

30 psi Range: **Gauge Accuracy + 0.005 psiA**

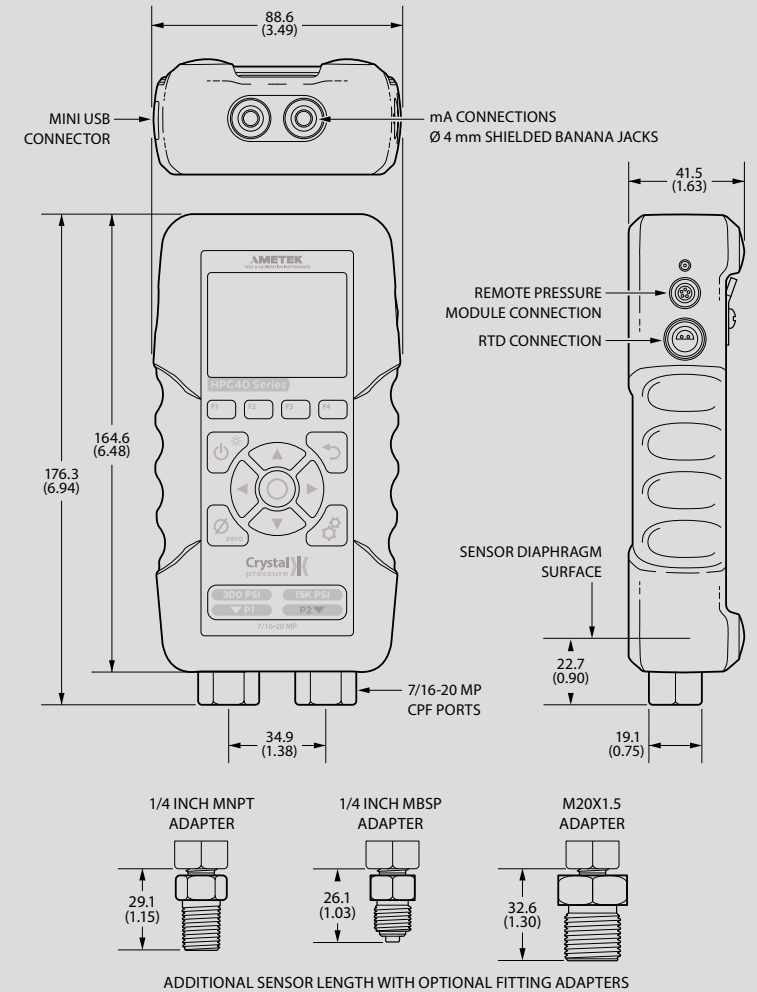
100 psi Range: **Gauge Accuracy + 0.002 psiA**

*Includes all effects of linearity, hysteresis, repeatability, temperature, and stability for one year.*

*All models indicate vacuum, but vacuum specification applies to 30, 100, and 300 psi models only.*

*Not recommended for continuous use at high vacuum. Refer to [XP2i-DP data sheet](#) for gauges that are intended for continuous high vacuum use.*

*The BARO option allows you to toggle between gauge and absolute pressure.*



**DIFFERENTIAL PRESSURE**

The Tare function can improve differential pressure measurement uncertainties. Requires the use of an equalizing valve.

| Full Scale Range of Both Sensors | The Greater of (+/-) |      |                    |                    | % of DP Reading |
|----------------------------------|----------------------|------|--------------------|--------------------|-----------------|
|                                  | psi                  | mbar | inH <sub>2</sub> O | mmH <sub>2</sub> O |                 |
| 30                               | 0.0005               | 0.04 | 0.014              | 0.4                | 0.035%          |
| 100                              | 0.0015               | 0.10 | 0.04               | 1.0                |                 |
| 300                              | 0.005                | 0.4  | 0.14               | 4.0                |                 |
| 1000                             | 0.02                 | 1.0  | 0.4                | 10.0               |                 |
| 3000                             | 0.05                 | 4.0  | 1.4                | n/a                |                 |
| 10000                            | 0.2                  | 10.0 | 4.0                | n/a                |                 |
| 15000                            | 0.3                  | 15.0 | 6.0                | n/a                |                 |

Unit is enabled in CrystalControl

► **Without tare function:**

±(0.05% of static line pressure reading)

**PRESSURE SENSOR**

Wetted Materials: (WRENCH TIGHT) **316 stainless steel**

(FINGER TIGHT) **316 stainless steel  
and Viton® (internal o-ring)**

Diaphragm Seal Fluid: **Silicone Oil**

Connection: **Crystal CPF Female**

*All welded, with a permanently filled diaphragm seal.*

*Metal to metal cone seal; O-ring can be removed if necessary.*

*1/4" medium pressure tube system compatible with HIP LM4 and LF4 Series, Autoclave Engr SF250CX Male and Female Series.*

*1/4" male NPT adapter included unless BSP, M20, or 15KPSI is specified.*

**BAROMETRIC REFERENCE (BARO)**

Accuracy: **± 0.00725 psi, ± 0.5 mbar**

Range: **10.153 to 15.954 psiA,  
700.0 to 1100.0 mbarA**

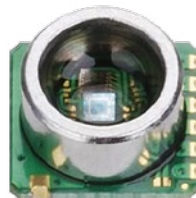
Units and Resolution: **psi ..... 0.001  
inHg ..... 0.001  
mmHg ..... 0.01  
mbar ..... 0.1**

Pressure Connection: **Cylindrical sensor fitting of 5.8mm OD. A flexible 4.8 mm [3/16"] ID tube is recommended to connect for calibration.**

*Includes all effects of linearity, hysteresis, repeatability, temperature, and stability for one year.*

*Exposure to environmental extremes of temperature, shock, and/or vibration may warrant a more frequent recertification period.*

*Other units available depending on the installed modules.*



**STANDARD DELIVERY**

- HPC41 or HPC42
- Traceable calibration certificate with data at five temperatures
- 4 x AA batteries
- Your choice of adapters (NPT, BSP, and M20)
- Protective Boot
- Test Leads, red and black with clips
- Velcro strap
- User manual
- Mini-USB Cable

**COMPLEMENTARY PRODUCTS**

**Crystal Engineering offers a wide range of products that work with the HPC40 Series:**

- [Fittings that connect without tools, safely and without leaks](#)
- [Lightweight, super flexible high pressure hoses](#)
- [Fitting kits and adapters](#)
- [Pneumatic hand pumps](#)
- [Hydraulic hand pumps](#)
- [Portable pressure comparators](#)

**CURRENT & VOLTAGE MEASUREMENT**

Connection: **4 mm jacks**

Maximum Voltage: **45 VDC**

**Current (mA) Input**

Accuracy:  **$\pm(0.015\% \text{ of rdg} + 0.002 \text{ mA})$**

mA Range: **0 to 55 mA**

Percent Range: **0-20, 4-20, 10-50**

Max Allowable Current: **60 mA**

Resolution: **0.001 mA or 0.01%**

Units: **mA and %**

Input Resistance: **< 17.2  $\Omega$**

Voltage Burden @ 20mA: **< 0.35 V**

Voltage Burden @ 50mA: **< 0.86 V**

HART Resistor: **250  $\Omega$**

*Includes all effects of linearity, hysteresis, repeatability, temperature, and stability for one year.*

*Inputs protected by a resettable fuse.*

*mA can be displayed as a percentage, where 0 to 100% corresponds to either 0 to 20, 4 to 20, or 10 to 50 mA.*

*Jacks are compatible with safety sheathed banana plugs.*

**Current (mA) Output**

Accuracy:  **$\pm(0.015 \text{ of rdg} + 0.002 \text{ mA})$**

Range: **0 to 25 mA\***

Step Time: **1 to 999 seconds**

Ramp Time: **5 to 999 seconds**

*\* From 0.001 to 0.05 mA, add 0.02 mA to accuracy.*

*With internal or external loop supply.*

**Voltage (VDC) Input**

Accuracy:  **$\pm(0.015 \% \text{ of rdg} + 2 \text{ mV})$**

Range: **0 to 30 VDC**

Resolution: **0.001 VDC**

Input Impedance: **> 1 MOhm**

*Includes all effects of linearity, hysteresis, repeatability, temperature, and stability for one year.*

**Loop Power**

Fixed Output: **24 VDC**

Voltage Output Accuracy:  **$\pm 10\%$**

Maximum Output Current: **25 mA**

**Switch Test**

Switch Type: **Dry Contact**

Closed State Resistance: **< 1K  $\Omega$**

Open State Resistance: **> 100K  $\Omega$**

Sample Rate: **10 Hz**

mA CONNECTIONS  
Ø 4 mm SHIELDED BANANA JACKS



*Switch test screen reports switch open, close, and deadband values.*

**TEMPERATURE MEASUREMENT**

Accuracy:  $\pm(0.015\% \text{ of rdg}) + 0.02 \text{ Ohm}$

Range: **0 – 400 Ohms**

Resolution: **0.01 on all scales**

Units: **°C, K, °F, R,  $\Omega$**

TCR: **0.003850  $\Omega/\Omega/^\circ\text{C}$  (IEC 60751)**

Wiring: **2-, 3-, and 4-wire support**

Connection: **Lemo Plug, 1S Series, 304 insert configuration**

*Includes all effects of linearity, hysteresis, repeatability, temperature, and stability for one year.*

*Combine with part number 127387 for a -45 to 150°C temperature sensor. Contact us to add a calibration certificate.*

The proper selection of the RTD sensing element is very important as the error associated with this device is the majority of the overall system measurement uncertainty. IEC 751 is the standard that defines the temperature versus resistance for 100 $\Omega$ , 0.00385  $\Omega/\Omega/^\circ\text{C}$  platinum RTDs. IEC 751 defines two classes of RTDs: Class A and B. Class A RTDs operate over the -200 to 630°C range versus -200 to 800°C for the Class B elements. For example, the Class A uncertainty is about half that of the Class B elements as illustrated in the following table.

| Temperature<br>°C | HPC40 Series<br>Uncertainty |                     | Class A                        |                     |                        |                     | Class B                        |                     |             |                     |
|-------------------|-----------------------------|---------------------|--------------------------------|---------------------|------------------------|---------------------|--------------------------------|---------------------|-------------|---------------------|
|                   | Class A<br>Uncertainty      |                     | HPC40 + Class A<br>Uncertainty |                     | Class B<br>Uncertainty |                     | HPC40 + Class B<br>Uncertainty |                     |             |                     |
|                   | $\pm\Omega$                 | $\pm^\circ\text{C}$ | $\pm\Omega$                    | $\pm^\circ\text{C}$ | $\pm\Omega$            | $\pm^\circ\text{C}$ | $\pm\Omega$                    | $\pm^\circ\text{C}$ | $\pm\Omega$ | $\pm^\circ\text{C}$ |
| -200              | 0.02                        | 0.05                | 0.24                           | 0.55                | 0.24                   | 0.55                | 0.56                           | 1.30                | 0.56        | 1.30                |
| 0                 | 0.04                        | 0.09                | 0.06                           | 0.15                | 0.07                   | 0.17                | 0.12                           | 0.30                | 0.12        | 0.31                |
| 200               | 0.05                        | 0.13                | 0.2                            | 0.55                | 0.21                   | 0.56                | 0.48                           | 1.30                | 0.48        | 1.31                |
| 400               | 0.06                        | 0.17                | 0.33                           | 0.95                | 0.33                   | 0.96                | 0.79                           | 2.30                | 0.79        | 2.31                |
| 600               | 0.07                        | 0.21                | 0.43                           | 1.35                | 0.44                   | 1.37                | 1.06                           | 3.30                | 1.06        | 3.31                |
| 800               | 0.08                        | 0.25                | 0.52                           | 1.75                | 0.53                   | 1.77                | 1.28                           | 4.30                | 1.28        | 4.31                |

**OPERATING TEMPERATURE**

Temperature Range: **-20 to 50° C (-4 to 122° F)**

*< 95% RH, non-condensing. No change in pressure, electrical, or temperature accuracy over operating temperature range. Gauge must be zeroed to achieve rated specification.*

**DISPLAY**

Screen: **320 x 240 pixel graphical display** *LCD readable in sunlight.*

Display Rate: **3 readings/second (standard)**  
**10 readings/second (switch test and peak hi/lo modes)**



**POWER**

| Type     | Cell Voltage |
|----------|--------------|
| Alkaline | 1.5 V        |
| NiMH     | 1.2 V        |
| Lithium  | 1.5 V        |

Battery Life: **>12 hours non-sourcing**  
**>8 hours when sourcing 12 mA**

*Uses 4 alkaline AA (LR6) batteries.*

Recharge Time: **16 hours\*** (Using Eneloop 2100 mA hr)

\* Charging is done through USB.

**DATA/COMMUNICATION**

Digital Interface: **mini-USB**

*The mini USB will power the HPC40 Series with or without the batteries installed.*

**ENCLOSURE**

Weight: **689 g (24.3 oz)**

*Weight is for dual sensor model with protective boot installed.*

Rating: **IP65**

*LCD protected from impact damage by 0.5 mm (0.02") thick polycarbonate lens.*

Housing: **Machined Aluminum**

Keypad and Labels: **UV Resistant Silicone**

**STORAGE TEMPERATURE**

Temperature Range: **-40 to 75° C (-40 to 167° F)**

*Batteries should be removed if stored for more than one month.*

**SPECIAL FEATURES**

The following requires the use of our free [CrystalControl](#) software

Remove: **Unwanted pressure units.**

Auto Off: **Adjust automatic shutoff settings.**

Calibration: **Calibrate the modules and enter new Calibrated On and Calibration Due dates.**

User Defined Unit: **Define and display any pressure units not included, or to use the gauge to display force, level or other pressure related parameters.**

**CERTIFICATIONS**

HPC40 Series complies with the Electromagnetic Compatibility and the Pressure Equipment Directives.



HPC40 Series complies with the Australian Radiocommunications (Electromagnetic Compatibility) Standard 2008.

**RANGE & RESOLUTION TABLE**

| P/N    | Range (psi) | Over-pressure | Display Resolution |                     |       |       |                     |                    |        |      |      |         |
|--------|-------------|---------------|--------------------|---------------------|-------|-------|---------------------|--------------------|--------|------|------|---------|
|        |             |               | psi                | in H <sub>2</sub> O | in Hg | mm Hg | mm H <sub>2</sub> O | kg/cm <sup>2</sup> | bar    | mbar | kPa  | MPa     |
| 30PSI  | 30          | 3.0 x         | 0.001              | 0.01                | 0.001 | 0.01  | 1                   | 0.0001             | 0.0001 | 0.1  | 0.01 |         |
| 100PSI | 100         | 2.0 x         | 0.001              | 0.1                 | 0.01  | 0.1   | 1                   | 0.0001             | 0.0001 | 0.1  | 0.01 | 0.00001 |
| 300PSI | 300         | 2.0 x         | 0.01               | 0.1                 | 0.01  | 0.1   |                     | 0.001              | 0.001  | 1    | 0.1  | 0.0001  |
| 1KPSI  | 1000        | 2.0 x         | 0.01               |                     | 0.1   |       |                     | 0.001              | 0.001  |      | 0.1  | 0.0001  |
| 3KPSI  | 3000        | 1.5 x         | 0.1                |                     | 0.1   |       |                     | 0.01               | 0.01   |      | 1    | 0.001   |
| 10KPSI | 10000       | 1.5 x         | 0.1                |                     |       |       |                     | 0.01               | 0.01   |      | 1    | 0.001   |
| 15KPSI | 15000       | 1.3 x         | 0.1                |                     |       |       |                     | 0.01               | 0.01   |      | 1    | 0.001   |

(Add one digit of resolution for differential mode.)

CPF Adapter Fitting is not included.

**ORDERING INFORMATION**

| Number of Sensors  | 1st Pressure Range P/N | 2nd Pressure Range P/N | BARO Option    | Adapter             | Pump System*       | Carrying Case~   |
|--------------------|------------------------|------------------------|----------------|---------------------|--------------------|--|
| HPC41 ... (Single) |                        |                        | No .... (omit) | 1/4 NPT .... (omit) | No Pump.... (omit) |  |
| HPC42 .... (Dual)  |                        |                        | Yes... -BARO   | G 1/4 B. .... -BSP  | System A.... -AXX  | Aluminum ... (omit)  |
|                    |                        |                        |                | M20x1.5 ... -M20    | System A.... -AHX  | Waterproof..... -W   |
|                    |                        |                        |                |                     | System B.... -BXX  |  |
|                    |                        |                        |                |                     | System B.... -BHX  | ~ The Waterproof Case is an option for Systems A, B, and C only. |
|                    |                        |                        |                |                     | System C.... -CXX  |  |
|                    |                        |                        |                |                     | System C.... -CHX  | The Waterproof Case is the only option for Systems G and H.      |
|                    |                        |                        |                |                     | System D.... -DOX  |  |
|                    |                        |                        |                |                     | System D.... -DWX  |  |
|                    |                        |                        |                |                     | System E.... -EOX  |  |
|                    |                        |                        |                |                     | System F.... -FOV  |  |
|                    |                        |                        |                |                     | System F.... -FWV  |  |
|                    |                        |                        |                |                     | System G.... -GOX  |  |
|                    |                        |                        |                |                     | System G.... -GWX  |  |
|                    |                        |                        |                |                     | System H ... -HOX  |  |

AMETEK offers a variety of solutions for pressure generation and measurement. Our line of products for pressure generation includes everything from small pneumatic hand pumps to a precision, hydraulic pressure comparator capable of generating up to 15 000 psi / 1000 bar / 100 MPa.

All of our pumps may be ordered as part of a Pump System, complete with an HPC40 Series and delivered in a sturdy carrying case with custom insert.

\* Refer to the following page for a more detailed description of each pump system.

**SAMPLE PART NUMBERS**

- HPC41-1KPSI ..... Single Sensor (1000 psi) HPC40 with a 1/4" NPT pressure fitting.
- HPC42-3KPSI-10KPSI-BARO-BSP ... Dual Sensor (3000 psi/10 000 psi) HPC40 with the BARO option and a 1/4" BSP pressure fitting.
- HPC42-1KPSI-10KPSI-GWX-W ..... Dual Sensor (1000 psi/10 000 psi) HPC40 with a 1/4" NPT pressure fitting; a System G pump system; and a waterproof carrying case.






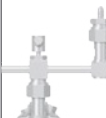


**Ordering a Pump System Only**

Any pump system, carrying case, and connection fittings for an HPC40 Series calibrator may be ordered separately from the gauge. Enter HPC40-NONE followed by the Pump System part number and the Carrying Case option code.

**SAMPLE PART NUMBERS**

- HPC40-NONE-GWX-W ..... System G pump system with a waterproof carrying case.

**PUMP SYSTEMS OVERVIEW**

| Pump System | Part Number | Pressure Range                       | Pneumatic | Hydraulic | Hand Pump | Bench Top | Included Pump   | Case Options |                           |
|-------------|-------------|--------------------------------------|-----------|-----------|-----------|-----------|---|--------------|---------------------------|
|             |             |                                      |           |           |           |           |   | Aluminum     | Waterproof (Pelican Case) |
| System A    | AXX         | 0 to 30psi /2 bar                    | ■         |           | ■         |           |    | ■            | (or)                      |
|             | AHX         | 0 to 580 psi /40 bar                 | ■         |           | ■         |           |   | ■            |                           |
| System B    | BXX         | -25 inHg to 30 psi /-0.85 to 2 bar   | ■         |           | ■         |           |    | ■            | (or)                      |
|             | BHX         | -27 inHg to 580 psi /-0.91 to 40 bar | ■         |           | ■         |           |   | ■            |                           |
| System C    | CXX         | 0 to 3000 psi /200 bar               |           | ■ (Oil)   | ■         |           |    | ■            | (or)                      |
|             | CHX         | 0 to 5000 psi /350 bar               |           | ■ (Oil)   | ■         |           |   | ■            |                           |
| System D    | DOX         | 0 to 5000 psi /350 bar               |           | ■ (Oil)   |           | ■         |    | ■            |                           |
|             | DWX         | 0 to 5000 psi /350 bar               |           | ■ (Water) |           | ■         |   | ■            |                           |
| System E    | EOX         | 0 to 10 000 psi /700 bar             |           | ■ (Oil)   |           | ■         |   | ■            |                           |
| System F    | FOV         | 0 to 15 000 psi /1000 bar            |           | ■ (Oil)   |           | ■         |  | ■            |                           |
|             | FWV         | 0 to 15 000 psi /1000 bar            |           | ■ (Water) |           | ■         |   | ■            |                           |
| System G    | GOX         | 0 to 15 000 psi /1000 bar            |           | ■ (Oil)   |           | ■         |  |              | ■                         |
|             | GWX         | 0 to 15 000 psi /1000 bar            |           | ■ (Water) |           | ■         |   |              | ■                         |
| System H    | HOX         | -27 inHg to 580 psi /-0.91 to 40 bar | ■         |           | ■         |           |  |              | ■                         |
|             |             | 0 to 5000 psi /350 bar               |           | ■ (Oil)   | ■         |           |   | ■            | ■                         |