

**ACCURACY • PRESSURE MEASUREMENT**

**bar (Gauge Pressure)**

► **18 to 28° C**

0 to 30% of Range: **±(0.01% of Full Scale)**

30 to 110% of Range: **±(0.035% of Reading)**

Vacuum\*: **±(0.05% of Full Scale\*\*)**

► **-20 to 50° C**

0 to 30% of Range: **±(0.015% of Full Scale)**

30 to 110% of Range: **±(0.050% of Reading)**

Vacuum\*: **±(0.05% of Full Scale\*\*)**

\* Applies to 30 bar and lower ranges only.

Vacuum Range = -1.0 bar.

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

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

*All models indicate vacuum, but vacuum specification applies to 1, 3, 10, and 30 bar 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.*

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

*HPC50 modules must be exercised and re-zeroed whenever exposed to significant changes in environmental conditions to achieve these specifications. To exercise a module, cycle the module between zero (ambient barometric pressure) and the pressure of interest. A properly exercised module will return to a zero reading (or return to the same ambient barometric reading).*

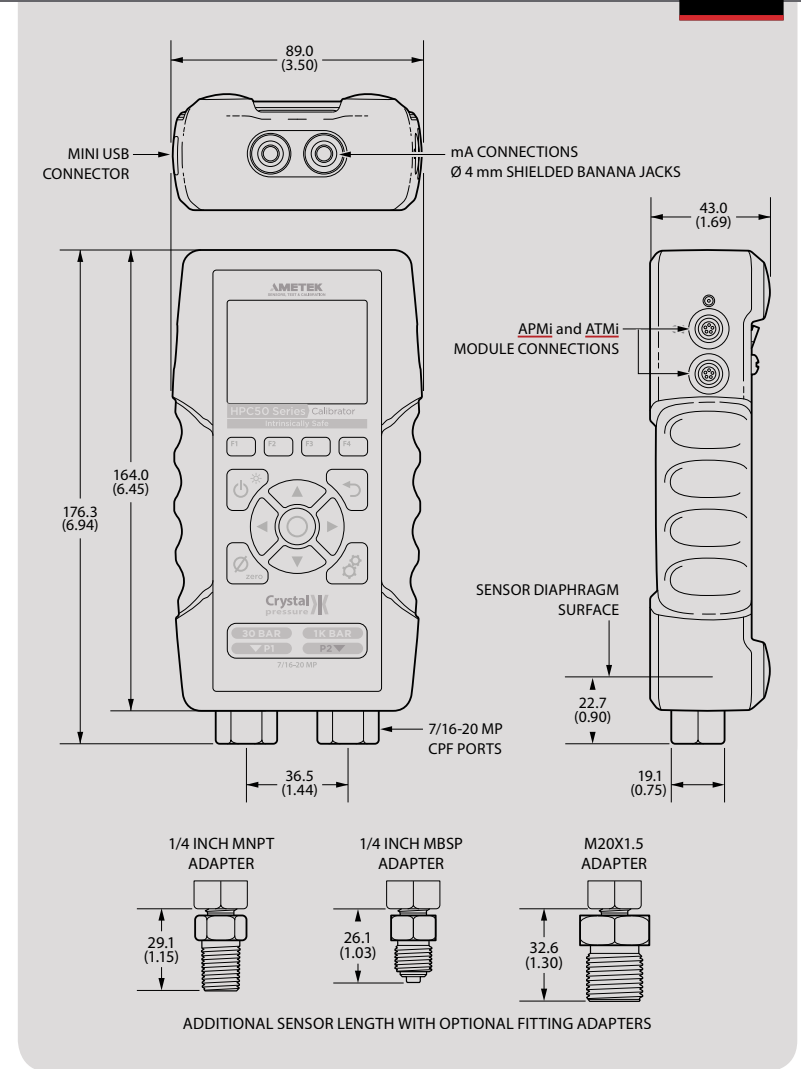
**barA (Absolute Pressure with BARO Option)**

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

1 bar Range: **Gauge Accuracy + 0.0003 barA**

3 bar Range: **Gauge Accuracy + 0.0003 barA**

10 bar Range: **Gauge Accuracy + 0.0001 barA**



**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
	bar	psi	mbar	inH <sub>2</sub> O / mmH <sub>2</sub> O	
1	0.00015	0.01	0.004	0.1	} or 0.035%
3	0.0005	0.04	0.014	0.4	
10	0.0015	0.10	0.04	1.0	
30	0.005	0.4	0.14	4.0	
100	0.02	1.0	0.4	10.0	
300	0.05	4.0	1.4	n/a	
700	0.2	10.0	4.0	n/a	
1000	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® with internal o-ring**

**(15 psi / 1 bar / 100 kPa) 316 stainless steel and Viton®**

Diaphragm Seal Fluid: **Silicone Oil**

Connection: **Crystal CPF Female**

*All welded construction on sensors above 3 bar. (The 1 bar sensor may have Viton o-ring 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 1KBAR is specified.*

**BAROMETRIC REFERENCE (BARO)**

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

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

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

*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**

- HPC51 or HPC52
- ISO 17025 Accredited Calibration Certificate, NIST Traceable
- 3 x AA batteries
- Your choice of adapters (1/4" NPT, 1/4" BSP, or 1/4" M20)
- Protective Boot—required for Intrinsic Safety
- 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 HPC50 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](#)

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



**CURRENT & VOLTAGE MEASUREMENT**

Connection: **4 mm jacks**

**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: **93.3 mA**  
 Resolution: **0.001 mA or 0.01%**  
 Units: **mA, scaling, % error, and % flow**  
 Input Resistance: **< 4.99  $\Omega$**   
 Voltage Burden @ 20mA: **< 0.10 V**  
 Voltage Burden @ 50mA: **< 0.250 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) Sink**

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.*

**Voltage (VDC) Input**

Accuracy:  **$\pm(0.015 \% \text{ of rdg} + 2 \text{ mV})$**   
 Range: **0 to 28 VDC**  
 Max. Allowable Voltage: **30 VDC**  
 Resolution: **0.001 VDC**

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

**Switch Test**

Switch Type: **Dry Contact**  
 Closed State Resistance: **< 1K  $\Omega$**   
 Open State Resistance: **> 100K  $\Omega$**   
 Sample Rate: **10 Hz**

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



**ATEX IEC IECEx ATEX and IECEx Scheme Entity Parameters**

The HPC50 has these specific entity parameters:

mA/V port	APMi/ATMi ports
U <sub>i</sub> = 28 V	U <sub>o</sub> = 4.95 V
I <sub>i</sub> = 94 mA	I <sub>o</sub> = 731 mA
P <sub>i</sub> = 654 mW	P <sub>o</sub> = 880 mW
C <sub>i</sub> = 3 nF	C <sub>i</sub> = 83.5 $\mu$ F
L <sub>i</sub> = 0	L <sub>i</sub> = 32.2 $\mu$ H
	C <sub>o</sub> = 9.2 $\mu$ F
	L <sub>o</sub> = 12 $\mu$ H

## EXTERNAL MODULES

The HPC50 Series has two identical ports to connect external pressure or temperature modules. For details on the modules, see the links below.

### Pressure Measurement



- [See the APMi datasheet.](#)

### Temperature Measurement



- [See the ATMi datasheet.](#)

## DATA/COMMUNICATION

Digital Interface: **mini-USB**

*The mini USB will power the HPC50 Series with or without the batteries installed.*

*Do not use mini USB connection in a hazardous area.*

*For hazardous location product warnings, refer to the operation manual.*

## DISPLAY

Screen: **320 x 240 pixel graphical display**

*LCD readable in sunlight.*

Display Rate: **3 readings/second (standard)**

*Switch test and peak hi/lo modes are captured at 10 readings/second.*



## POWER

Cell Voltage: **1.5 V (Alkaline Batteries)**

*Uses 3 alkaline AA (LR6) batteries.*

Battery Life: **>12 hours**

## ENCLOSURE

Weight: **567 g (20.0 oz)**

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

Rating: **IP66/67**

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

Housing: **PC/PBT plastic**

Keypad and Labels: **UV Resistant Silicone**

## 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 except as noted in the accuracy specifications.*

*Gauge must be zeroed to achieve rated specification.*

## 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



**II 1G IEx ia IIC T4/T3 Ga**  
**FTZU 18 ATEX 0043X**



**Ex ia IIC T4/T3 Ga**  
**IECEX FTZU 18.0012X**



HPC50 Series complies with the Electromagnetic Compatibility and the Pressure Equipment Directives.



HPC50 Series complies with the Australian Radiocommunications (Electromagnetic Compatibility) Standard 2008.

**RANGE & RESOLUTION TABLE**

P/N	Range (bar)	Over-pressure	Display Resolution										
			bar	mbar	kPa	MPa	psi	in H <sub>2</sub> O	in Hg	mm Hg	mm H <sub>2</sub> O	kg/cm <sup>2</sup>	
1BAR	1	3.0 x	0.00001	0.01	0.001			0.0001	0.01	0.001	0.01	0.1	0.00001
3BAR	3	3.0 x	0.0001	0.1	0.01	0.00001		0.001	0.01	0.001	0.01	1	0.0001
10BAR	10	2.0 x	0.0001	0.1	0.01	0.00001		0.001	0.1	0.01	0.1	1	0.0001
30BAR	30	2.0 x	0.001	1	0.1	0.0001		0.01	0.1	0.01	0.1		0.001
100BAR	100	2.0 x	0.001		0.1	0.0001		0.1		0.1			0.001
300BAR	300	1.5 x	0.01		1	0.001		0.1		0.1			0.01
700BAR	700	1.5 x	0.01		1	0.001		1					0.01
1KBAR	1000	1.3 x	0.01		1	0.001		1					0.01

(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~
HPC51 ... (Single)			No .... (omit)	1/4 NPT .... (omit)	No Pump.... (omit)	
HPC52 .... (Dual)			Yes... -BARO	G 1/4 B. .... -BSP M20x1.5 ... -M20	System A.... -AXX System A.... -AHX System B.... -BXX System B.... -BHX System C.... -CXX System C.... -CHX System D.... -DOX System D.... -DWX System E.... -EOX System F.... -FOV System F.... -FWV System G.... -GOX System G.... -GWX System H ... -HOX	Aluminum ... (omit) Waterproof..... -W

**SAMPLE PART NUMBERS**

HPC51-100BAR ..... Single Sensor (100 bar) HPC50 with a 1/4" male NPT pressure fitting.

HPC52-300BAR-700BAR-BARO-BSP ... Dual Sensor (300 bar/700 bar) HPC50 with the BARO option and a 1/4" male BSP pressure fitting.

HPC52-100BAR-700BAR-GWX-W ..... Dual Sensor (100 bar/700 bar) HPC50 with a 1/4" male 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 HPC50 Series calibrator may be ordered separately from the gauge. Enter HPC50-NONE followed by the Pump System part number and the Carrying Case option code.

**SAMPLE PART NUMBERS**

HPC50-NONE-GWX-W ..... System G pump system with a waterproof carrying case.






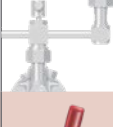

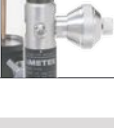
AMETEK offers a variety of solutions for pressure generation and measurement. Our line of products for pressure generation includes everything from small pneumatic hand pumps to a precision, hydraulic pressure comparator capable of generating up to 15 000 psi / 1000 bar / 100 MPa.

All of our pumps may be ordered as part of a Pump System, complete with an HPC50 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.

~ The Waterproof Case is an **option** for Systems A, B, and C only.  
The Waterproof Case is **the only option** for Systems G and H.

**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	■		■			■	■
	AHX	0 to 580 psi /40 bar	■		■			T-970-CPF	■
System B	BXX	-25 inHg to 30 psi /-0.85 to 2 bar	■		■			■	■
	BHX	-27 inHg to 580 psi /-0.91 to 40 bar	■		■			T-975-CPF	■
System C	CXX	0 to 3000 psi /200 bar		■ (Oil)	■			■	■
	CHX	0 to 5000 psi /350 bar		■ (Oil)	■			T-620H-CPF	■
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)	■			T-620H-CPF	