

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).

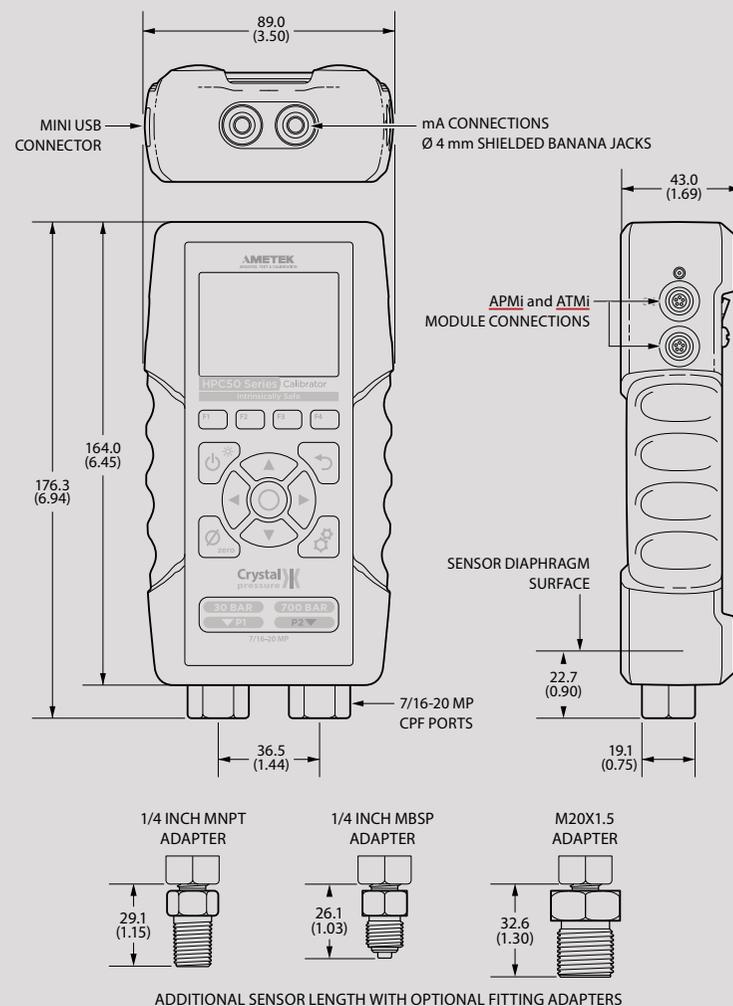
barA (Absolute Pressure with BARO Option)

► 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 bar	The Greater of (+/-)				% of DP Reading
	psi	mbar	inH ₂ O	mmH ₂ 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	

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 or M20 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

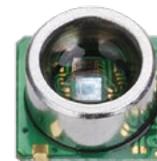
- HPC51 or HPC52
- ISO 17025 Accredited Calibration Certificate, NIST Traceable
- 3 x AA batteries
- Your choice of adapters (1/4" NPT, 1/4" BSP, or 1/4" M20)
- Protective Boot—required for Intrinsic Safety
- Test Leads, red and black with clips
- Velcro strap
- User manual
- Mini-USB Cable

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 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 Ω**

Voltage Burden @ 20mA: **< 0.10 V**

Voltage Burden @ 50mA: **< 0.250 V**

HART Resistor: **250 Ω**

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**

Voltage (VDC) Input

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

Range: **0 to 28 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 Ω**

Open State Resistance: **> 100K Ω**

Sample Rate: **10 Hz**

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



ATEX and IECEx Scheme Entity Parameters



The HPC50 has these specific entity parameters:

mA/V port

U_i = 28 V

I_i = 94 mA

P_i = 654 mW

C_i = 3 nF

L_i = 0

APMi/ATMi ports

U_o = 4.95 V

I_o = 731 mA

P_o = 880 mW

C_i = 83.5 μ F

L_i = 32.2 μ H

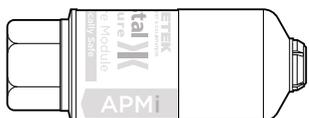
C_o = 9.2 μ F

L_o = 12 μ H

EXTERNAL MODULES

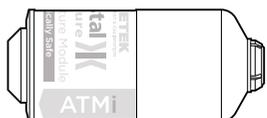
The HPC50 Series has two identical ports to connect external pressure or temperature modules. For details on the modules, see the links below.

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

No External Modules: **40 Hours**

All hours are based on operation without the use of the backlight.

One External Module: **25 Hours**

Use of the backlight will decrease battery life.

Two External Modules: **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



Exia Intrinsically Safe and Non-Incendive for Hazardous Locations: Class I, Division 1, Groups A, B, C, and D; Temperature Code T4/T3. Class I, Zone 0, AEx ia IIC T4/T3 Ga.



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



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



This HPC50 is approved for use as a portable test instrument for Marine use and complies with DNV GL Rules for Classification of Ships, High Speed & Light Craft, and Offshore Units.

RANGE & RESOLUTION TABLE

P/N	Range (bar)	Over-pressure	Display Resolution										
			bar	mbar	kPa	MPa	psi	in H ₂ O	in Hg	mm Hg	mm H ₂ O	kg/cm ²	
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

(Add one digit of resolution for differential mode.)

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	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	The Waterproof Case is the only option for Systems G and H.
					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	

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.

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.

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.

► 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.

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)	■			■	■