Crystal pressure

HPC50 Series Calibrator psi

ACCURACY • PRESSURE MEASUREMENT

psi (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 300 psi and lower ranges only.
Vacuum Range = -14.5 psi.

** 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 15, 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.

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

APMi 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).

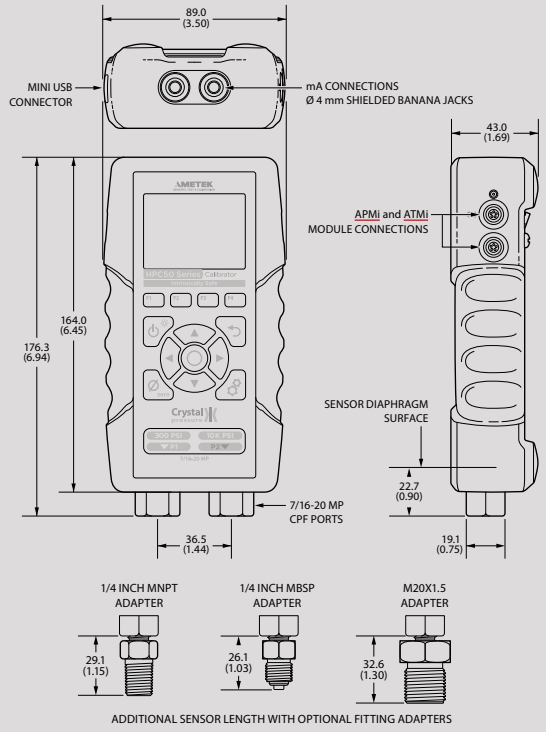
psiA (Absolute Pressure with BARO Option)

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

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

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

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



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 (+/–)				
psi	psi	mbar	inH_2O	mmH_2O	% of DP Reading
15	0.00015	0.01	0.004	0.1	0.035%
30	0.0005	0.04	0.014	0.4	
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	

or

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**

(10 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: **± 0.00725 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**

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.

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.**

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
- Velco 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

CURRENT & VOLTAGE MEASUREMENT

Connection: **4 mm jacks**

Current (mA) Input

Accuracy:	**±(0.015% of rdg + 0.002 mA)**	*Includes all effects of linearity, hysteresis, repeatability, temperature, and stability for one year.*
mA Range:	**0 to 55 mA**	
Percent Range:	**0-20, 4-20, 10-50**	*Inputs protected by a resettable fuse.*
Max Allowable Current:	**93.3 mA**	*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.*
Resolution:	**0.001 mA or 0.01%**	
Units:	**mA, scaling, % error, and % flow**	*Jacks are compatible with safety sheathed banana plugs.*
Input Resistance:	**< 4.99 Ω**	
Voltage Burden @ 20mA:	**< 0.10 V**	
Voltage Burden @ 50mA:	**< 0.250 V**	
HART Resistor:	**250 Ω**	

Current (mA) Sink

Accuracy:	**± (0.015 of rdg + 0.002 mA)**	* *From 0.001 to 0.05 mA, add 0.02 mA to accuracy.*
Range:	**0 to 25 mA***	
Step Time:	**1 to 999 seconds**	
Ramp Time:	**5 to 999 seconds**	

Voltage (VDC) Input

Accuracy:	**±(0.015 % of rdg + 2 mV)**	*Includes all effects of linearity, hysteresis, repeatability, temperature, and stability for one year.*
Range:	**0 to 28 VDC**	
Resolution:	**0.001 VDC**	

Switch Test

Switch Type:	**Dry Contact**	*Switch test screen reports switch open, close, and deadband values.*
Closed State Resistance:	**< 1K Ω**	
Open State Resistance:	**> 100K Ω**	
Sample Rate:	**10 Hz**	

ATEX and IECEx Scheme Entity Parameters

The HPC50 has these specific entity parameters:

mA/V port	APMi/ATMi ports
Ui = 28 V	Uo = 4.95 V
Ii = 94 mA	Io = 731 mA
Pi = 654 mW	Po = 880 mW
Ci = 3 nF	Ci = 83.5 µF
Li = 0	Li = 32.2 µH
	Co = 9.2 µF
	Lo = 12 µH

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: **35 Hours**

One External Module: **25 Hours**

Two External Modules: **12 Hours**

All hours are based on operation without the use of the backlight. Use of the backlight will decrease battery life.

ENCLOSURE

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

Rating: **IP66/67**

Housing: **PC/PBT plastic**

Keypad and Labels: **UV Resistant Silicone**

Weight is for dual sensor model with protective boot installed.

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

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 (psi)	Over-pressure	Display Resolution psi	in H_2O	in Hg	mm Hg	mm H_2O	kg/cm^2	bar	mbar	kPa	MPa
15PSI	15	3.0 x	0.0001	0.01	0.001	0.01	0.1	0.00001	0.00001	0.01	0.001	
30PSI	30	3.0 x	0.001	0.01	0.001	0.01	1	0.0001	0.0001	0.1	0.01	0.00001
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

(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
HPC51 . . .(Single)			No . . . . (omit)	1/4 NPT . . . . (omit)
HPC52 . . . . (Dual)			Yes. . . **-BARO**	G 1/4 B. . . . . **-BSP**
				M20x1.5 . . . **-M20**

Pump System*	Carrying Case~
No Pump. . . . (omit)	
System A. . . . **-AXX**	Aluminum . . . (omit)
System A. . . . **-AHX**	Waterproof. . . . . **-W**
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**	

~ 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.

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.

SAMPLE PART NUMBERS

HPC51-1KPSI . . . . . Single Sensor (1000 psi) HPC50 with a 1/4" male NPT pressure fitting.

HPC52-3KPSI-10KPSI-BARO-BSP . . . Dual Sensor (3000 psi/10 000 psi) HPC50 with the BARO option and a 1/4" male BSP pressure fitting.

HPC52-1KPSI-10KPSI-GWX-W . . . . . Dual Sensor (1000 psi/10 000 psi) 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-N0NE followed by the Pump System part number and the Carrying Case option code.

SAMPLE PART NUMBERS

HPC50-N0NE-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	Case Options: Waterproof (Pelican Case)
System A	AXX	0 to 30psi / 2 bar	■		■		 T-960-CPF	■	■
	AHX	0 to 580 psi / 40 bar	■		■		T-970-CPF	■	■
System B	BXX	-25 inHg to 30 psi / -0.85 to 2 bar	■		■		 T-965-CPF	■	■
	BHX	-27 inHg to 580 psi / -0.91 to 40 bar	■		■		T-975-CPF	■	■
System C	CXX	0 to 3000 psi / 200 bar		■ (Oil)	■		 T-620-CPF	■	■
	CHX	0 to 5000 psi / 350 bar		■ (Oil)	■		T-620H-CPF	■	■
System D	DOX	0 to 5000 psi / 350 bar		■ (Oil)		■	 P-018-CPF	■	
	DWX	0 to 5000 psi / 350 bar		■ (Water)		■		■	
System E	EOX	0 to 10 000 psi / 700 bar		■ (Oil)		■	 P014-CPF	■	
System F	FOV	0 to 15 000 psi / 1000 bar		■ (Oil)		■	 T-1-CPF	■	
	FWV	0 to 15 000 psi / 1000 bar		■ (Water)		■		■	
System G	GOX	0 to 15 000 psi / 1000 bar		■ (Oil)		■	 GaugeCalHP		■
	GWX	0 to 15 000 psi / 1000 bar		■ (Water)		■			■
System H	HOX	-27 inHg to 580 psi / -0.91 to 40 bar	■		■		 T-975-CPF (and)		■
		0 to 5000 psi / 350 bar		■ (Oil)	■		T-620H-CPF		■

(or) (or) (or)

Crystal pressure

HPC50 Series Calibrator bar

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).

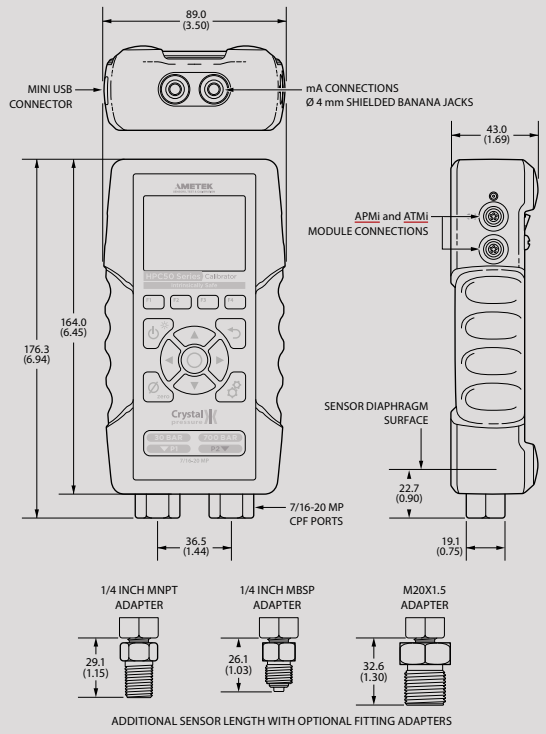
barA (Absolute Pressure with BARO Option)

▶ 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 (+/–)				
bar	psi	mbar	inH_2O	mmH_2O	% of DP Reading
1	0.00015	0.01	0.004	0.1	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	

or

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.

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.**

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
- Velco 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

CURRENT & VOLTAGE MEASUREMENT

Connection: **4 mm jacks**

Current (mA) Input

Accuracy:	**±(0.015% of rdg + 0.002 mA)**	*Includes all effects of linearity, hysteresis, repeatability, temperature, and stability for one year.*
mA Range:	**0 to 55 mA**	
Percent Range:	**0-20, 4-20, 10-50**	*Inputs protected by a resettable fuse.*
Max Allowable Current:	**93.3 mA**	*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.*
Resolution:	**0.001 mA or 0.01%**	
Units:	**mA, scaling, % error, and % flow**	*Jacks are compatible with safety sheathed banana plugs.*
Input Resistance:	**< 4.99 Ω**	
Voltage Burden @ 20mA:	**< 0.10 V**	
Voltage Burden @ 50mA:	**< 0.250 V**	
HART Resistor:	**250 Ω**	

Current (mA) Sink

Accuracy:	**± (0.015 of rdg + 0.002 mA)**
Range:	**0 to 25 mA**
Step Time:	**1 to 999 seconds**
Ramp Time:	**5 to 999 seconds**

Voltage (VDC) Input

Accuracy:	**±(0.015 % of rdg + 2 mV)**	*Includes all effects of linearity, hysteresis, repeatability, temperature, and stability for one year.*
Range:	**0 to 28 VDC**	
Resolution:	**0.001 VDC**	

Switch Test

Switch Type:	**Dry Contact**	*Switch test screen reports switch open, close, and deadband values.*
Closed State Resistance:	**< 1K Ω**	
Open State Resistance:	**> 100K Ω**	
Sample Rate:	**10 Hz**	

ATEX and IECEx Scheme Entity Parameters

The HPC50 has these specific entity parameters:

mA/V port	APMi/ATMi ports
Ui = 28 V	Uo = 4.95 V
Ii = 94 mA	Io = 731 mA
Pi = 654 mW	Po = 880 mW
Ci = 3 nF	Ci = 83.5 µF
Li = 0	Li = 32.2 µH
	Co = 9.2 µF
	Lo = 12 µH

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.

DATALOGGING OPTION

Capacity: **200 million data points or 50 files**

Storage Type: **Non-volatile flash memory**

Minimum Interval: **10 per second**

Maximum Interval: **1 minute**

Min. Event Duration: **100 mS**

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**
One External Module: **25 Hours**
Two External Modules: **12 Hours**

All hours are based on operation without the use of the backlight. Use of the backlight will decrease battery life.

ENCLOSURE

Weight: **567 g (20.0 oz)**
Rating: **IP66/67**
Housing: **PC/PBT plastic**
Keypad and Labels: **UV Resistant Silicone**

Weight is for dual sensor model with protective boot installed.

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

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_2O	in Hg	mm Hg	mm H_2O	kg/cm²
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
HPC51 . . .(Single)			No . . . . (omit)	1/4 NPT . . . . (omit)
HPC52 . . . . (Dual)			Yes. . . -**BARO**	G 1/4 B. . . . . -**BSP**
				M20x1.5 . . . -**M20**

SAMPLE PART NUMBERS

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

HPC52-300BAR-700BAR-BAR0-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.

Pump System*	Carrying Case~
No Pump. . . . (omit)	
System A. . . . -**AXX**	Aluminum . . . (omit)
System A. . . . -**AHX**	Waterproof. . . . . -**W**
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**	

~ 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.

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-N0NE followed by the Pump System part number and the Carrying Case option code.

SAMPLE PART NUMBERS

HPC50-N0NE-GWX-W . . . . . System G pump system with a waterproof carrying case.

HPC50-DL. . . . . One-time cost to add data logging functionality.

PUMP SYSTEMS OVERVIEW

Pump System	Part Number	Pressure Range	Pneumatic	Hydraulic	Hand Pump	Bench Top	Included Pump	Case Options: Aluminum	Case Options: Waterproof (Pelican Case)
System A	AXX	0 to 30psi / 2 bar	■		■		 T-960-CPF	■	■
	AHX	0 to 580 psi / 40 bar	■		■		T-970-CPF	■	■
System B	BXX	-25 inHg to 30 psi / -0.85 to 2 bar	■		■		 T-965-CPF	■	■
	BHX	-27 inHg to 580 psi / -0.91 to 40 bar	■		■		T-975-CPF	■	■
System C	CXX	0 to 3000 psi / 200 bar		■ (Oil)	■		 T-620-CPF	■	■
	CHX	0 to 5000 psi / 350 bar		■ (Oil)	■		T-620H-CPF	■	■
System D	DOX	0 to 5000 psi / 350 bar		■ (Oil)		■	 P-018-CPF	■	
	DWX	0 to 5000 psi / 350 bar		■ (Water)		■		■	
System E	EOX	0 to 10 000 psi / 700 bar		■ (Oil)		■	 P014-CPF	■	
System F	FOV	0 to 15 000 psi / 1000 bar		■ (Oil)		■	 T-1-CPF	■	
	FWV	0 to 15 000 psi / 1000 bar		■ (Water)		■		■	
System G	GOX	0 to 15 000 psi / 1000 bar		■ (Oil)		■	 GaugeCalHP		■
	GWX	0 to 15 000 psi / 1000 bar		■ (Water)		■			■
System H	HOX	-27 inHg to 580 psi / -0.91 to 40 bar	■		■		 T-975-CPF (and)		■
		0 to 5000 psi / 350 bar		■ (Oil)	■		T-620H-CPF		■

ACCURACY • PRESSURE MEASUREMENT

MPa (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 3 MPa and lower ranges only.
Vacuum Range = -1 MPa.

** 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 100 kPa, 300 kPa, 1 MPa, and 3 MPa 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.

APMi 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).

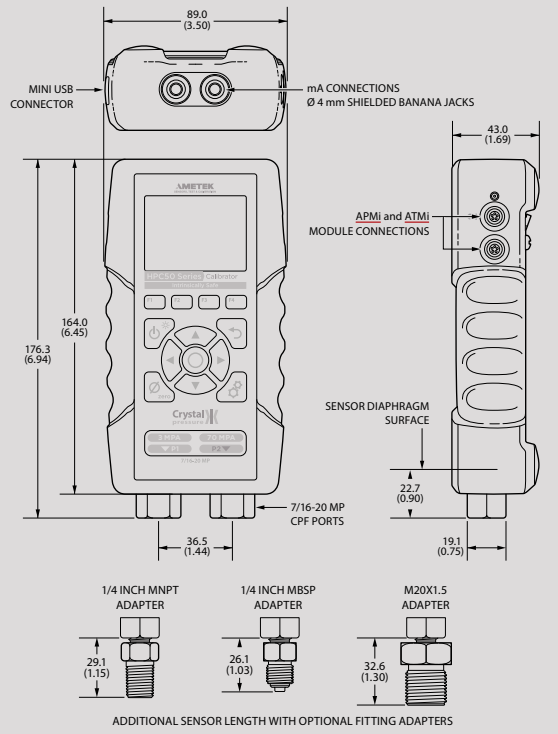
MPaA (Absolute Pressure with BARO Option)

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

100 kPa Range: **Gauge Accuracy + 0.03 kPaA**

300 kPa Range: **Gauge Accuracy + 0.03 kPaA**

1 MPa Range: **Gauge Accuracy +0.00001 MPaA**



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 (+/–)				
MPa	psi	mbar	inH_2O	mmH_2O	% of DP Reading
100 (kPa)	0.00015	0.01	0.004	0.1	
300 (kPa)	0.0005	0.04	0.014	0.4	
1	0.0015	0.10	0.04	1.0	
3	0.005	0.4	0.14	4.0	or 0.035%
10	0.02	1.0	0.4	10.0	
30	0.05	4.0	1.4	n/a	
70	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**

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

All welded construction on sensors above 300 kPa. (The 100 kPa 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.

Diaphragm Seal Fluid: **Silicone Oil**

Connection: **Crystal CPF Female**

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.

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.**

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
- Velco 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

CURRENT & VOLTAGE MEASUREMENT

Connection: **4 mm jacks**

Current (mA) Input

Accuracy:	**±(0.015% of rdg + 0.002 mA)**	*Includes all effects of linearity, hysteresis, repeatability, temperature, and stability for one year.*
mA Range:	**0 to 55 mA**	
Percent Range:	**0-20, 4-20, 10-50**	*Inputs protected by a resettable fuse.*
Max Allowable Current:	**93.3 mA**	*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.*
Resolution:	**0.001 mA or 0.01%**	
Units:	**mA, scaling, % error, and % flow**	*Jacks are compatible with safety sheathed banana plugs.*
Input Resistance:	**< 4.99 Ω**	
Voltage Burden @ 20mA:	**< 0.10 V**	
Voltage Burden @ 50mA:	**< 0.250 V**	
HART Resistor:	**250 Ω**	

Current (mA) Sink

Accuracy:	**± (0.015 of rdg + 0.002 mA)**
Range:	**0 to 25 mA**
Step Time:	**1 to 999 seconds**
Ramp Time:	**5 to 999 seconds**

Voltage (VDC) Input

Accuracy:	**±(0.015 % of rdg + 2 mV)**	*Includes all effects of linearity, hysteresis, repeatability, temperature, and stability for one year.*
Range:	**0 to 28 VDC**	
Resolution:	**0.001 VDC**	

Switch Test

Switch Type:	**Dry Contact**	*Switch test screen reports switch open, close, and deadband values.*
Closed State Resistance:	**< 1K Ω**	
Open State Resistance:	**> 100K Ω**	
Sample Rate:	**10 Hz**	

ATEX and IECEx Scheme Entity Parameters

The HPC50 has these specific entity parameters:

mA/V port	APMi/ATMi ports
Ui = 28 V	Uo = 4.95 V
Ii = 94 mA	Io = 731 mA
Pi = 654 mW	Po = 880 mW
Ci = 3 nF	Ci = 83.5 µF
Li = 0	Li = 32.2 µH
	Co = 9.2 µF
	Lo = 12 µH

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.

DATALOGGING OPTION

Capacity: **200 million data points or 50 files**

Storage Type: **Non-volatile flash memory**

Minimum Interval: **10 per second**

Maximum Interval: **1 minute**

Min. Event Duration: **100 mS**

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**
One External Module: **25 Hours**
Two External Modules: **12 Hours**

All hours are based on operation without the use of the backlight. Use of the backlight will decrease battery life.

ENCLOSURE

Weight: **567 g (20.0 oz)**
Rating: **IP66/67**
Housing: **PC/PBT plastic**
Keypad and Labels: **UV Resistant Silicone**

Weight is for dual sensor model with protective boot installed.

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

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 (MPa)	Over-pressure	Display Resolution MPa	kPa	bar	mbar
100KPA	100(kPa)	3.0 x		0.001	0.00001	0.01
300KPA	300(kPa)	3.0 x	0.00001	0.01	0.0001	0.1
1MPA	1	2.0 x	0.00001	0.01	0.0001	0.1
3MPA	3	2.0 x	0.0001	0.1	0.001	1
10MPA	10	2.0 x	0.0001	0.1	0.001	
30MPA	30	1.5 x	0.001	1	0.01	
70MPA	70	1.5 x	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
HPC51 . . .(Single)			No . . . . (omit)	1/4 NPT . . . . (omit)
HPC52 . . . . (Dual)			Yes. . . -**BARO**	G 1/4 B. . . . . -**BSP**
				M20x1.5 . . . -**M20**

SAMPLE PART NUMBERS

HPC51-10MPA . . . . . Single Sensor (10 MPa) HPC50 with a 1/4" male NPT pressure fitting.

HPC52-30MPA-70MPA-BARO-BSP . . . Dual Sensor (30 MPa/70 MPa) HPC50 with the BARO option and a 1/4" male BSP pressure fitting.

HPC52-10MPA-70MPA-GWX-W . . . . . Dual Sensor (10 MPa/70 MPa) HPC50 with a 1/4" male NPT pressure fitting; a System G pump system; and a waterproof carrying case.

Pump System*	Carrying Case~
No Pump. . . . (omit)	
System A. . . . -**AXX**	Aluminum . . . (omit)
System A. . . . -**AHX**	Waterproof. . . . . -**W**
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**	

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Any pump system, carrying case, and connection fittings for an HPC50 Series calibrator may be ordered separately from the gauge. Enter HPC50-N0NE followed by the Pump System part number and the Carrying Case option code.

SAMPLE PART NUMBERS

HPC50-N0NE-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	Case Options: Waterproof (Pelican Case)
System A	AXX	0 to 30psi / 2 bar	■		■		 T-960-CPF	■	■
	AHX	0 to 580 psi / 40 bar	■		■		T-970-CPF	■	■
System B	BXX	-25 inHg to 30 psi / -0.85 to 2 bar	■		■		 T-965-CPF	■	■
	BHX	-27 inHg to 580 psi / -0.91 to 40 bar	■		■		T-975-CPF	■	■
System C	CXX	0 to 3000 psi / 200 bar		■ (Oil)	■		 T-620-CPF	■	■
	CHX	0 to 5000 psi / 350 bar		■ (Oil)	■		T-620H-CPF	■	■
System D	DOX	0 to 5000 psi / 350 bar		■ (Oil)		■	 P-018-CPF	■	
	DWX	0 to 5000 psi / 350 bar		■ (Water)		■		■	
System E	EOX	0 to 10 000 psi / 700 bar		■ (Oil)		■	 P014-CPF	■	
System F	FOV	0 to 15 000 psi / 1000 bar		■ (Oil)		■	 T-1-CPF	■	
	FWV	0 to 15 000 psi / 1000 bar		■ (Water)		■		■	
System G	GOX	0 to 15 000 psi / 1000 bar		■ (Oil)		■	 GaugeCalHP		■
	GWX	0 to 15 000 psi / 1000 bar		■ (Water)		■			■
System H	HOX	-27 inHg to 580 psi / -0.91 to 40 bar	■		■		 T-975-CPF (and)		■
		0 to 5000 psi / 350 bar		■ (Oil)	■		T-620H-CPF		■