Crystal pressure

ATMi Series

Intrinsically Safe

Advanced Temperature Module

AMETEK®
SENSORS, TEST & CALIBRATION

Expand Your HPC50 Pressure Calibrator

Now Measure Temperature!

THE CRYSTAL ATMi intrinsically safe temperature modules, with flexible cable lengths, offer the functionality and flexibility to read up to 2 temperature inputs with a single HPC50 calibrator. In addition to the two installed pressure modules in the HPC50 Series, two ATMi temperature modules can be connected to the device. This provides the flexibility to read pressure with ambient and process temperature in the same instrument.

The ATMi is engineered to deliver the same high level of accuracy whether in the lab or in the field. When combined with the ATMi temperature module, the HPC50 is a powerful calibration tool.

Key Features

- **Accuracies to 0.015% of Reading.**
  Performance to meet almost any calibration and measurement task.
- **Supports Pt100 RTDs.**
  With readouts in °C, °F, K, R, and Ω.
- **Rugged Construction.**
  Machined stainless steel housing. Engineered for rough field use — almost unbreakable.
- **Self-Contained, Intelligent Module.**
  Calibration data is stored in the module, so any module can be combined with any HPC50 calibrator. No need to "calibrate" the module to an indicator.

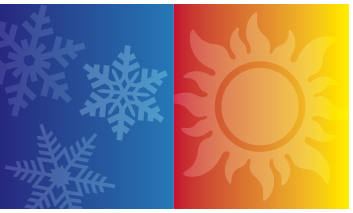
Crystal ATMi offers seamless integration with the Crystal HPC50 Series.

"When combined with the ATMi temperature module, the HPC50 Series Calibrator is a powerful calibration tool."

Lab Accuracy in the Field

Crystal pressure

Active Temperature Compensation



Count on the same accuracy at any temperature, between -20 and 50°C.

Calibrate with Confidence Anywhere

Take measurements with up to 0.015% of reading accuracy.
Crystal Engineering calibration facilities are A2LA accredited, (#2601.01) which is internationally recognized by ILAC.

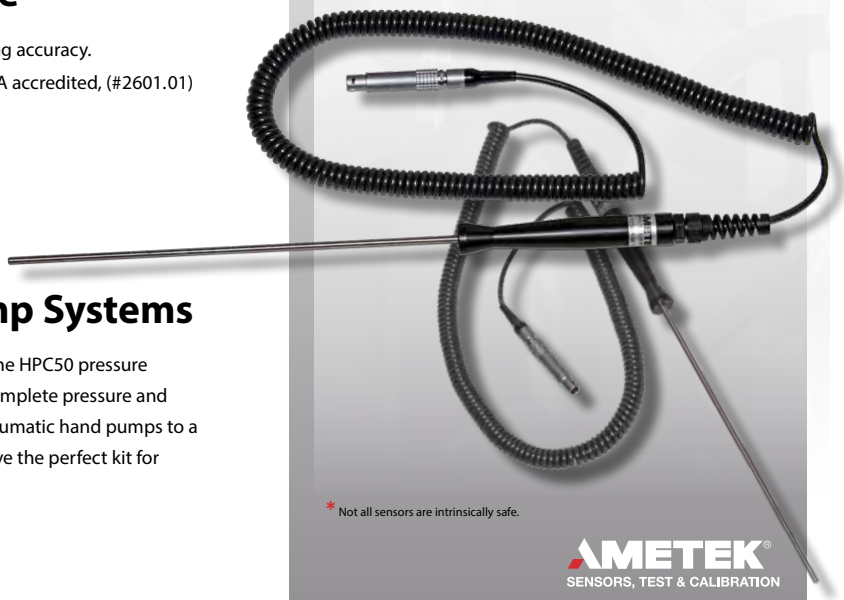
Combine with Our Ready To Go Pump Systems

Combine the ATMi temperature modules with the HPC50 pressure calibrator and any of our pump systems for a complete pressure and temperature calibration system. From small pneumatic hand pumps to a precision, hydraulic pressure comparator we have the perfect kit for your application.

Reference Sensors

The ATMi combines with JOFRA reference sensors to provide high accuracy temperature measurement on the HPC50 Series.

An intrinsically safe Pt100 temperature sensor with a special non-conductive handle is available with or without a calibration certificate. Other sensors sizes, temperature ranges, and accuracies are available from JOFRA*.



* Not all sensors are intrinsically safe.

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ATMi Specifications

Temperature Measurement

Accuracy . . . . . **±(0.015% of rdg) + 0.02 Ohm**
Range . . . . . **0 to 400 Ohms**
Resolution . . . . . **0.01 on all scales**
Units . . . . . **°C, K, °F, R, Ω**
TCR . . . . . **0.003850 Ω/Ω/°C (IEC 60751)**
Wiring . . . . . **4-wire support**

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

Output

Temperature Resolution **0.01**
Display Update . . . . . **up to 10 per second**

Temperature resolution and Display Update are the maximum values available.

The resolution of your Crystal device may be different.

Operating Temperature

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

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

Applies to all modules.

Storage Temperature

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

Enclosure

Dimensions . . . . . **2.5 x 1.1 in (63.3 x 27.0 mm)**
Weight . . . . . **0.31 lbs (141.0 g)**

Intrinsic Safety Approvals

Ex 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.

Entity Parameters

Ui = 5.0 V
Ii = 740 mA
Pi = 880 mW
Ci = 8.8 µF
Li = 0

Certifications

We declare that the APMi is in accordance with the Electromagnetic Compatibility Directive per our declaration(s).

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.

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 100Ω, 0.00385 Ω/Ω/°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 °C	HPC50/ATMi Uncertainty		Class A Uncertainty		HPC50/ATMi + Class A Uncertainty		Class B Uncertainty		HPC50/ATMi + Class B Uncertainty	
	±Ω	±°C	±Ω	±°C	±Ω	±°C	±Ω	±°C	±Ω	±°C
-200	0.02	0.05	0.24	0.55	0.24	0.55	0.56	1.30	0.56	1.30
-40	0.03	0.08	0.09	0.23	0.10	0.24	0.20	0.50	0.20	0.51
0	0.04	0.09	0.06	0.15	0.07	0.17	0.12	0.30	0.12	0.31
50	0.04	0.10	0.10	0.25	0.10	0.27	0.21	0.55	0.22	0.56
100	0.04	0.11	0.13	0.35	0.14	0.37	0.30	0.80	0.31	0.81
150	0.04	0.12	0.17	0.45	0.17	0.46	0.39	1.05	0.39	1.06
200	0.05	0.13	0.20	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

AMETEK® SENSORS, TEST & CALIBRATION

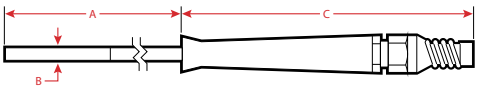
PT100 Type T Specifications

JOFRA Reference Sensors

JOFRA PT100 probes are designed for fast and accurate, traceable calibration of temperature.

Dimensions

Reference **A** ..... **200 mm (7.87 in)**
Reference **B** ..... **4 mm (0.16 in)**
Reference **C** ..... **172 mm (6.77 in)**



Accuracy

Hysteresis [1] @ 0° C (32° F) ..... **0.01° C (0.02° F)**
Long Term Stability [2] ..... **typical 0.014° C (0.025° F)** @ 0° C (32° F)
Repeatability [1] @ 0° C (32° F) ..... **0.005° C (0.009° F)**

(1) When used in the range -50 to 400° C (-58 to 752° F).

(2) When exposed to 400° C (752° F) for 100 hours. Stability will depend on actual use of the sensor.

Temperature Range

All Sensors ..... **-40 to 150° C (-58 to 302° F)**

Sensing Element

Type **Pt100**
Nominal Resistance @ 0° C (32° F) ..... **100 Ω**
Temperature Coefficient ..... **α100 =0.00385 1/°C**

Self-Heating Effect

0.06 °C/mW (0.108 °F/mW)

Response Time

τ0.5 (50%) ..... **7 seconds**
τ0.9 (90%) ..... **17 seconds**

Liquid in motion v = 0.4 m/s.

Electrical Connections

Cable **4-wire**
Connection ..... **LEMO connector for HPC50**

Insulation Resistance

@ 23° C (73° F) ..... **100 Gohm**
@ 400° C (752° F) ..... **70 Mohm**

Outer Tube

Inconel 600

Operating Conditions

Sensor, Connection, and Cable ..... **Max. 70° C (158° F)**
Storage Temperature ..... **-20 to 70° C (-4 to 158° F)**
Humidity ..... **0 to 90% RH**
Protection Class ..... **DIN 40050 IP-50**

STS-050A* Specifications

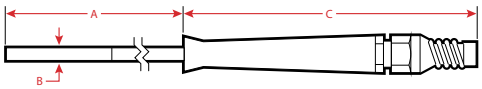
Crystal pressure

JOFRA Reference Sensors

JOFRA STS-050 A probes are designed for fast and accurate, traceable calibration of temperature.

Dimensions

Reference **A** ..... **250 mm (9.84 in)**
350 mm (13.78 in)
Reference **B** ..... **4 mm (0.16 in)**
Reference **C** ..... **140 mm (5.51 in)**



Accuracy

Hysteresis [1] @ 0° C (32° F) ..... **0.01° C (0.02° F)**
Long Term Stability [2] ..... **typical 0.014° C (0.025° F)**
@ 0° C (32° F)
Repeatability [1] @ 0° C (32° F) ..... **0.005° C (0.009° F)**

(1) When used in the range -50 to 400° C (-58 to 752° F).

(2) When exposed to 400° C (752° F) for 100 hours. Stability will depend on actual use of the sensor.

Temperature Range

All Sensors ..... **-50 to 400° C (-58 to 752° F)**

Sensing Element

Type **Pt100**
Nominal Resistance @ 0° C (32° F) ..... **100 Ω**
Temperature Coefficient ..... **α100 =0.00385 1/°C**

Self-Heating Effect

0.06 °C/mW (0.11 °F/mW)

Response Time

STS-050 A – 4 mm (0.16 in): τ0.5 (50%) ..... **8 seconds**
STS-050 A – 4 mm (0.16 in): τ0.9 (90%) ..... **26 seconds**

Liquid in motion v = 0.4 m/s.

Electrical Connections

Cable **4-wire**
Connection ..... **See "Cable Length and Termination" options below**

Insulation Resistance

@ 23° C (73° F) ..... **100 Gohm**
@ 400° C (752° F) ..... **70 Mohm**

Outer Tube

Inconel 600

Operating Conditions

Sensor, Connection, and Cable ..... **Max. 70° C (158° F)**
Storage Temperature ..... **-20 to 70° C (-4 to 158° F)**
Humidity ..... **0 to 90% RH**
Protection Class ..... **DIN 40050 IP-50**

* STS-050A probes **are not** intrinsically safe.

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Ordering Information

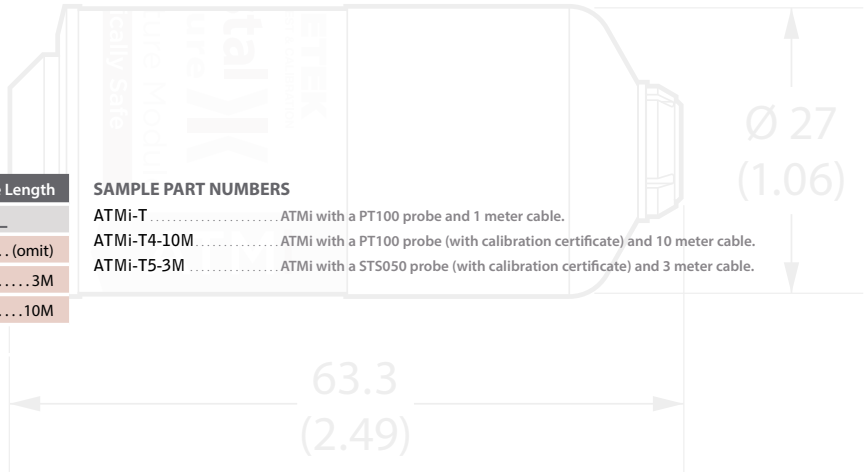
Model		Temperature Sensor		Interface Cable Length
ATMi	–	_____	–	_____
		No Probe ..... (omit)		1 m / 3.3 ft ..... (omit)
		PT100 Probe, IS certified, -40 to 150° C w/o cert. ..... **T**		3 m / 10 ft 3M
		PT100 Probe, IS certified, -40 to 150° C w cert **T4**		10 m / 33 ft. 10M
		STS050 Probe*, -45 to 400° C w/ cert **T5**		

* STS-050A probes **are not** intrinsically safe.

Note: Options T / T4 / T5 include a large padded soft carrying case with shoulder strap (p/n SPK-HHC-003).

SAMPLE PART NUMBERS

ATMi-T ..... ATMi with a PT100 probe and 1 meter cable.
ATMi-T4-10M ..... ATMi with a PT100 probe (with calibration certificate) and 10 meter cable.
ATMi-T5-3M ..... ATMi with a STS050 probe (with calibration certificate) and 3 meter cable.



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*ISO 17025 accredited calibration lab, (A2LA #2601.01).

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