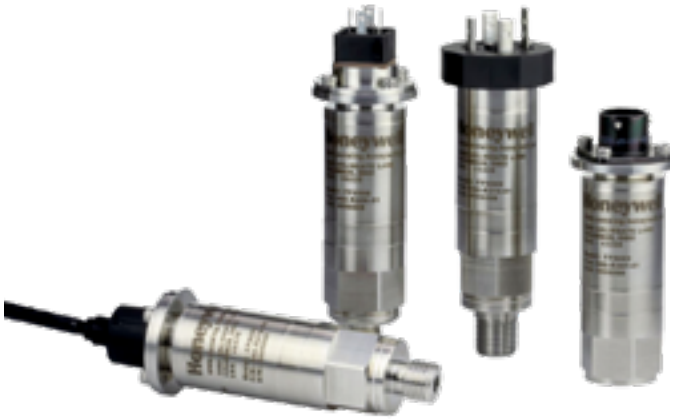
bar

FP5000
Configurable Pressure Transducer

The Model FP5000 Series is a media-isolated piezoresistive silicon pressure sensor offering multiple output options (0 V to 5 V, 0 V to 10 V or 4 mA to 20 mA) for reading pressure over the specified full-scale pressure span and temperature range. It is compensated for sensor offset, sensitivity, temperature effects, and non-linearity to offer improved thermal stability and accuracy. Hastelloy® C276 and 316L stainless steel wetted parts provide durability with abrasive or corrosive media.



FEATURES

- Pressure ranges from 10 in-H2O [0.36 psi] up to 5000 psi
- Gage and absolute pressure types
- Higher accuracy to 0.1 %FSS BFSL
- Multiple output types: 0 Vdc to 5 Vdc, 0 Vdc to 10 Vdc, 4 mA to 20 mA
- Multiple electrical and pressure connection options
- Zero adjustment through potentiometer
- Operating temperature ranges from -40°C to 125°C [-40°F to 250°F]
- Multiple compensation temperature ranges
- Faster response and higher resolution
- Fully analog reduced-noise signal path provides continuous output resolution
- Stainless steel construction
- Ha C276 and 316L stainless steel wetted parts offer more enhanced durability with abrasive or corrosive media
- CE approved

VALUE TO CUSTOMERS

- Higher-quality pressure sensing technologies
- Next-gen design of the popular FP2000 pressure sensor
- Offers more repeatable, reliable, and accurate pressure measurements over time
- Rugged, stainless steel pressure sensors are built and tested to perform and survive in many demanding environments
- Configurable platform creates a wide range of standard configurations
- Stocked components enable shipping within 10 business days on most configurations

DIFFERENTIATION

- Offers improved accuracy and reliability
- Configurable platform enables a sensor to be built to customer requirements. Simplified nomenclature and order codes makes ordering easier
- Many pressure and operating temperature range options
- Built from stocked components; most configurations are shipped within 10 business days
- Extensive history of pressure measurement know-how

POTENTIAL APPLICATIONS

- Test stands (Automotive, Aerospace, Industrial, and Medical)
- R&D test labs
- Hydraulic and pneumatic system monitoring
- Leak detection
- Manufacturing mold pressure control
- Pump and compressor control
- Liquid level measurement

Version | 01.2019

CONFIGURABLE PRESSURE TRANSDUCER, MODEL FP5000

Table 1. Performance Specifications

Characteristic	Measure
Operating pressure ranges	Gage: 10 in-H_2O [0.36 psi] to 5000 psi Absolute: 5 psi to 5000 psi Equivalent ranges are available in other pressure units also: kPa, bar, mm-Hg, in-Hg, mbar, torr, in-H_2O
Accuracy [1]	0.2 %FSS BFSL (Standard accuracy) 0.1 %FSS BFSL (High accuracy)
Output (selectable)	0 Vdc to 5 Vdc, 0 Vdc to 10 Vdc, or 4 mA to 20 mA (two wire)
Resolution	Continuous (Fully analog signal path)

Table 2. Environmental Specifications

Characteristic	Measure
Temperature, operating	See Table 3 (Electrical connectors)
Temperature, compensated	See Table 4 (Temperature error band)
Temperature error band (TEB) [2,3]	See Table 4 (Temperature error band)
Sealing	See Table 3 (Electrical connectors)

Notes:
1. Accuracies stated are with respect to best fit straight line (BFSL) for all errors including linearity, hysteresis, and non-repeatability through zero.
2. Temperature error band (TEB) includes shift in output (zero and full scale) across compensated temperature range with respect to output observed at room temperature.
3. Temperature error band (TEB) increases pro-rata for pressure ranges below 5 psi [0.35 bar].

Table 3. Electrical Connectors

Connector	Temperature, operating	Sealing
PT-02A-10-6P	-40°C to 125°C [-40°F to 250°F]	IP67
DIN FORM A	-40°C to 125°C [-40°F to 250°F]	IP65
DIN FORM C	-40°C to 90°C [-40°F to 194°F]	IP65
Integral cable	-40°C to 80°C [-40°F to 176°F]	IP67

Table 4. Temperature Error Band (TEB)

Compensated Temperature (Temp Comp) Range	TEB for standard accuracy	TEB for high accuracy
0°C to 60°C [40°F to 140°F]	< ±0.75 %FSS	< ±0.5 %FSS
-20°C to 80°C [0°F to 180°F]	< ±1.5 %FSS	< ±1 %FSS
-40°C to 85°C [-40°F to 185°F]	< ±2.25 %FSS	< ±1.5 %FSS
-40°C to 125°C [-40°F to 250°F]	< ±2.25 %FSS	< ±1.5 %FSS

Table 5. Mechanical Specifications

Characteristic	Measure
Media	Gas, liquid
Overload – safe	
Operating ranges ≤ 15 psi (1 bar):	6X FS
15 psi (1 bar) < Operating ranges ≤ 1000 psi (70 bar):	4X FS
1000 psi (70 bar) < Operating ranges ≤ 5000 psi (350 bar):	3X FS or 10000 psi (700 bar) whichever is less
Overload – burst	
Operating ranges ≤ 15 psi (1 bar):	10X FS
15 psi (1 bar) < Operating ranges ≤ 1000 psi (70 bar):	6X FS
1000 psi (70 bar) < Operating ranges ≤ 5000 psi (350 bar):	4X FS or 10000 psi (700 bar) whichever is less
Weight (approx.)	5.3 oz [150 g]
Wetted parts material	Ha C276 and 316L stainless steel
Labels	Laser engraved

Table 6. Electrical Specifications

Specifications	4 mA to 20 mA (2 wire)	0 V to 5 V (3 wire) [4]	0 V to 10 V (3 wire) [4]
Input power (Voltage)	9 Vdc to 28 Vdc	9 Vdc to 28 Vdc	14 Vdc to 28 Vdc
Input power (Current)	4 mA to 24 mA	< 6 mA	< 6 mA
Output at null pressure	4 mA ±0.5 %FSS	0 V ±0.5 %FSS	0 V ±0.5 %FSS
Full scale span (FSS)	16 mA ±1 %FSS	5 V ±1 %FSS	10 V ±1 %FSS
Frequency response	3500 Hz	3500 Hz	3500 Hz
Reverse voltage protection	Yes, 28 V	Yes, 28 V	Yes, 28 V
Load impedance	< 950 Ohm @ 28 V decreasing linearly to 0 Ohm @ 9 V	> 10K Ohms	> 10K Ohms
Insulation resistance	>500 MOhm to case GND	>500 MOhm to case GND	>500 MOhm to case GND
Overvoltage protection	>32 V	>32 V	>32 V
Power up time	< 1 sec	< 1 sec	< 1 sec
Zero adjustment potentiometer	Yes, > ±5 %FS adjustment, accessible from top after demounting connector	Yes, > ±5 %FS adjustment, accessible from top after demounting connector	Yes, > ±5 %FS adjustment, accessible from top after demounting connector

4. **True Zero Output:** The voltage output versions have onboard circuitry that allows the output signal to swing all the way to ground (True Zero) and even a little below (~-0.2 V). This mitigates increased error at lower voltage measurements.

Version | 012019

CONFIGURABLE PRESSURE TRANSDUCER, MODEL FP5000

Table 7. DIN Form A, DIN Form C Wiring

	STANDARD		ALTERNATIVE	
	4 mA to 20mA	0 V to 5 V/0 V to 10 V	4 mA to 20mA	0 V to 5 V/0 V to 10 V
PIN	Designation	Designation	Designation	Designation
1	(+) Supply	(+) Supply	(+) Supply	(+) Supply
2	(+) Output	(+) Output	(+) Output	Supply return/ (-) Output
3	No connection	Supply return/ (-) Output	No connection	(+) Output
E	No connection	No connection	Case GND	Case GND

Table 8. PT02A-10-6P, 6-Pin Wiring

	STANDARD		ALTERNATIVE	
	4 mA to 20mA	0 V to 5 V/0 V to 10 V	4 mA to 20mA	0 V to 5 V/0 V to 10 V
PIN	Designation	Designation	Designation	Designation
A	(+) Supply	(+) Supply	(+) Supply	(+) Supply
B	No connection	Supply return	(+) Output	(+) Output
C	No connection	(-) Output	No connection	No connection
D	(+) Output	(+) Output	No connection	Supply return/ (-) Output
E	No connection	No connection	No connection	No connection
F	No connection	No connection	No connection	No connection

Table 9. Integral Cable Wiring

	STANDARD		ALTERNATIVE	
	4 mA to 20mA	0 V to 5 V/0 V to 10 V	4 mA to 20mA	0 V to 5 V/0 V to 10 V
WIRE COLOR	Designation	Designation	Designation	Designation
Red	(+) Supply	(+) Supply	(+) Supply	(+) Supply
Black	(+) Output	Supply return	Not available	Supply return/ (-) Output
Green	Not available	(-) Output	Not available	Not available
White	Not available	(+) Output	(+) Output	(+) Output

Version | 01.2019

CONFIGURABLE PRESSURE TRANSDUCER, MODEL FP5000

Figure 1. Product Nomenclature

NF G 1 BR 1AK 2AM 5F 6M 7BA

Product Series

NF	FP5000 pressure transducer

Type

G	Gage
A	Absolute

Accuracy

1	0.10 %
2	0.20 %

Range

kPa		bar		psi	
KD	35 kPa	ME	1 bar	AN*	0.5 psi
KF	100 kPa	MF	2 bar	AP *	1 psi
KG	200 kPa	NA	3.5 bar	AT	5 psi
KH	300 kPa	MG	5 bar	AV	10 psi
KJ	700 kPa	NB	7 bar	BJ	15 psi
KL	1000 kPa	MH	10 bar	BL	25 psi
KM	1500 kPa	MI	20 bar	BM	30 psi
KQ	3000 kPa	MJ	30 bar	BN	50 psi
KR	5000 kPa	NC	35 bar	BP	75 psi
KS	7000 kPa	MK	50 bar	BR	100 psi
KT	10000 kPa	ND	70 bar	CJ	150 psi
		ML	100 bar	CL	200 psi
in-H_2O		NE	135 bar	CN	250 psi
WA*	10 in- H_2O	MY	200 bar	CP	300 psi
WC*	20 in- H_2O	NG	350 bar	CQ	400 psi
WE*	30 in- H_2O			CR	500 psi
WG*	50 in- H_2O	in-Hg		CS	600 psi
		UG	30 in-Hg	CT	750 psi
				CV	1000 psi
				DJ	1500 psi
				DL	2000 psi
				DM	2500 psi
				DN	3000 psi
				DR	5000 psi

* Not available in absolute pressure type

Calibration

	5-point calibration at 77°F
9A	9-point calibration at 77°F

Wiring

7BA	Standard
7BB	Alternative

Electrical Connection

6A	PT02A-10-6P, 6-pin
6M	DIN A 43650, 4-pin
6BO [1]	DIN C, 4-pin
6Q	Integral cable, 5 feet

[1] Option not available yet. Coming soon.

Pressure Port (others available)

5A	1/4-18 NPT female
5B	1/4-18 NPT male
5D	7/16-20 UNF male
5F	G1/4 B female
5G	G1/4 B male

Output

2AM	4 mA to 20 mA
2AN	0 Vdc to 5 Vdc
2AP	0 Vdc to 10 Vdc

Temperature Compensation

1AK	0°C to 60°C [40°F to 140°F]
1Y [1]	-20°C to 80°C [0°F to 180° F]
1AP [1]	-40°C to 85°C [-40°F to 185° F]
1BA [2]	-40°C to 125°C [-40°F to 250°F]

[1] 1Y and 1AP not available for pressure ranges below 5 psi [0.35 bar]
[2] 1BA not available for pressure ranges below 50 psi [3.5 bar]

Sample Catalog Listings

Order Code	Description
NFA1BM,1AK,2AP,5A,6A,7BA	Model FP5000; 0.10 % accuracy; 30 psi absolute; compensated across 0°C to 60°C [40°F to 140°F]; 0 Vdc to 10 Vdc output; 1/4-18 NPT female port; PT02A-10-6P 6-pin electrical connector; standard wiring
NFG2DR,1Y,2AM,5G, 6Q,7BB	Model FP5000; 0.20 % accuracy; 5000 psi gage; compensated across -20°C to 80°C [0°F to 180°F]; 4 mA to 20mA output; G 1/4 B male port; 5-ft long integral cable; alternative wiring

Version | 012019

CONFIGURABLE PRESSURE TRANSDUCER, MODEL FP5000

Figure 2. Mounting Dimensions