P03 Series Pressure Sensor

The P03 series pressure sensor is ideal choice for demanding air conditioning and refrigeration applications where long-term reliability and accuracy is a must. The P03 series provides proven reliability at a competitive price.

Features

- Ceremic sensing element
- Output voltage proportional to pressure
- Max. measuring range 60 bar
- RoHs compliance (Lead-Free)

Advantages

- Working temperature range -40°C ...105°C
- Compatible with R22, R407C, R410A, R32, R290, R454B
- 1500V insulation voltage for isolation, 50Hz, 1 min
- Overvoltage and short circuit protected

Applications

- Air conditioners
- Refrigeration systems
- Heat pump

Standards

- EN 61326-1: 2021
- IEC 60068-2-6: 2007
- IEC 60068-2-30: 2005
- IEC 60068-2-2: 2007
- IEC 60068-2-1: 2007
- IEC 60068-2-52: 2017

Performance Specifications

Symbol	Characteristic	Test condition	Parameter	Unit
$V_{DD\ max.}$	Overvoltage and reverse protection		-20...20	VDC
P_n	Pressure range (Sealed gage*2)*1		-1...1-60	bar
P_m	Prove pressure		2.5 times P_n or customized	bar
P_B	Burst pressure		3 times P_n or customized	bar
T_A	Ambient operating temperature		-40...105	°C
T_C	Compensated temperature range		-10...80	°C
T_m	Media temperature Range (Air and liquid)	CR	-35...105	°C
		HNBR	-32...125	
$V_{ESD-HBM}$	ESD sensitivity HBM (Human Body Model)		8	kV
V_{DD}	Supply voltage		4.75...5.25	VDC
I_C	Current consumption	P_p=0 without load	<5	mA
V_{OUT}	Ratiometric output voltage	@P_n	0.5...4.5	VDC
C_L	Output load capacitive		1,000	pf
R_L	Output resistance pull down	V_{OUT} to GND	10	kΩ
ε_L	Accuracy include linearity, hysteresis and repeatability errors		0.5	%
T_R	Response time		2...3	mS
TEB	Total error band	@P_n, T_A = -20°C ...105°C	2.5	%
		@P_n, T_A = -10°C ...80°C	2	
T_C	Compensated temperature range		-10...80	°C
LTS	Long term stability	Per year under reference conditions	<±0.3	% F.S

*1 Pressure range can be customized according to requirements
*2 Sealed gage pressure reference: Output is proportional to the difference between applied pressure and a built-in fixed reference to 1 atmA, where the minimum operating pressure is set to 14.7 psiA (1 atmA)

Insulation characteristics

Symbol	Parameter	Value	Unit	Comment
V_D	Insulation voltage for isolation, 50Hz, 1 min	1,500	VDC	
R_{ISO}	Isolation resistance @500VDC	>100	MΩ	

Pressure connection

Connector	Type	Comment
Female	7/16- 20 UNF	
Male	7/16 - 20 UNF	
	Straight tube	
	L type tube	

Materials

Symbol	Parameter	Value	Unit	Comment
m-PC	Pressure connection material	Brass or AISI 304		Brass for screw connection; AISI 304 for tube connection
m-S	Sensor material	Ceramic Al_2O_3		
m-PLUG	RK03FB material	PPS		
IP	Sealing grade	IP67		
F_m	Mounting torgue	20	Nm	±10%
SHORT	Short circuit protected	Yes		
m	Mass	50	grams	

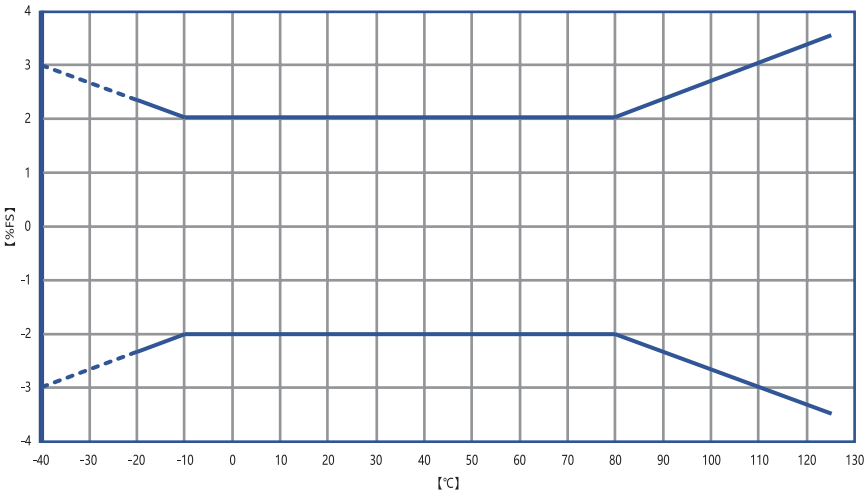
Environmental and mechanical characteristcs

Test	Standard
Electromagnetic compatibility	EN 61326-1: 2021
Damp heat, cyclic acc. IEC60068-2-30: 2005	Place the pressure sensor at 40°C ± 2°C and 93% ± 3% relative humidity environment for 48h. Remove the sensor and return it to room temperature.
Dry heat acc. IEC60068-2-2: 2007	Place the sensor in the test chamber at 85°C±2°C, connect the power supply and reading device in accordance with the specified circuit connection, keep the power on throughout the test and apply the maximum pressure specified in the drawings., test time: 168h.
Low temperature acc. IEC60068-2-1: 2007	Place the sensor in the test chamber at -30°C±2°C, connect the power supply and reading device in accordance with the specified circuit connection, keep the power on throughout the test and apply the maximum pressure specified in the drawings., test time: 168h.
Salt mist acc. IEC 60068-2-52: 2017	Place the pressure sensor at 35°C ± 2°C environment, continuous atomisation , 48h.
Vibration acc. IEC 60068-2-6	10~55 Hz with amplitude 1 mm, all 3 directions total duration 3 hours, 1h/direction, 10gt

Total error band

The chart illustrates the maximum deviation across the entire medium temperature range (-40...125 °C) for the P03 series.

In the defined pressure and temperature parameters, the maximum total error remains consistently at ± 2.5 %FS (-20...105 °C) or ± 2 %FS (-10...80 °C).



Name Guide Description

P03 XXXB X XX X X

Series

P03: Sealed gage pressure sensor

Pressure in bar

Sealed gage
004B: 0 - 4bar
006B: 0 - 6 bar
010B: 0 - 10bar
016B: 0 - 16bar
020B: 0 - 20bar
030B: 0 - 30bar
042B: 0 - 42bar
050B: 0 - 50bar
Customized

Output

A: 0.5-4.5 VDC ratio output from 5 VDC excitation
Customized

Electrical connector

01: RK03FB
Customized

Pressure connector

A: 7/16"-20 UNF 45° Flare Male
B: 7/16"-20 UNF 45° Flare Female
C: Straight tube
D: L type tube
Customized

Sealing ring

0: CR
1: HNBR

Notes

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Name Guide Description

P03 XXXP X XX X X

Series

P03: Sealed gage pressure sensor

Pressure in psi

Sealed gage

060P: 0 - 60psi	250P: 0 - 250psi
100P: 0 - 100psi	375P: 0 - 375psi
150P: 0 - 150psi	525P: 0 - 525psi
200P: 0 - 200psi	625P: 0 - 625psi

Customized

Output

A: 0.5-4.5 VDC ratio output from 5 VDC excitation
Customized

Electrical connector

01: RK03FB
Customized

Pressure connector

A: 7/16"-20 UNF male
B: 7/16"-20 UNF female
C: Straight tube
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Customized

Sealing ring

0: CR
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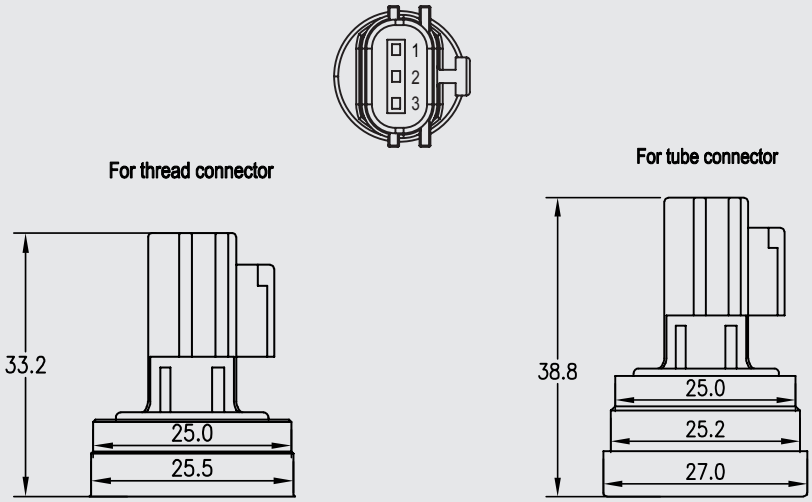
Dimensions (mm)

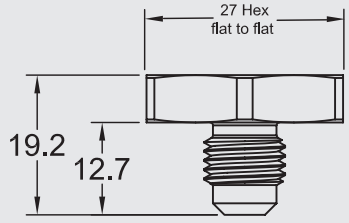
Electrical connector type dimension

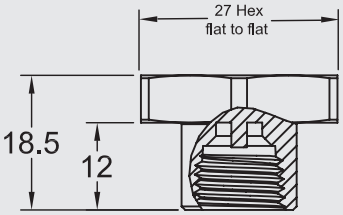
01 RK03FB	
Sealing grade: IP67 **Material:** PPS	
Pin	**Voltage output** **(0.5 – 4.5 V, 1 – 5 V, 0 – 10 V)**
1	GND
2	V_{OUT}
3	V_{DD}



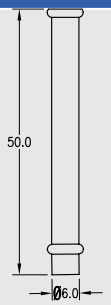
Pressure connector type dimensions

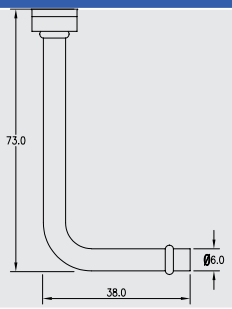
A 7/16"-20 UNF 45° Flare Male	B 7/16"-20 UNF 45° Flare Female
Seal: 45° cone	**Seal:** 45° cone





C Straight tube	D L type tube





Accessories

- Code: 20115-002
- RK03FB socket
- Cable: 1m standard (customization available)

Safety and Environment

The product is to be installed by manufacturer trained personnel or competent person trained in accordance with manufacturer installation instructions.

With respect to applicable standards IEC 61010-1/ EN 61010-1 *safety requirements for electrical equipment for measurement, control and laboratory use part 1 general requirements*, the product should be used in limited energy secondary circuits.

Risk of electrical shock

Certain parts of the module can carry hazardous voltage during the operation process of the product because hazardous live voltage of primary conductor, power supply occurs, injury and/or serious damage will be caused if this warning is ignored.

Conducting parts must be inaccessible after installation of the product. Additional protection including shield or protective housing could be used according to IEC 60664 Insulation coordination for equipment within low-voltage supply systems.

Disconnection of the main supply will protect against possible injury and serious damage.

ESD protection

Damage from an ESD event will occur if the personnel is not well grounded when handling.

Important notice

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