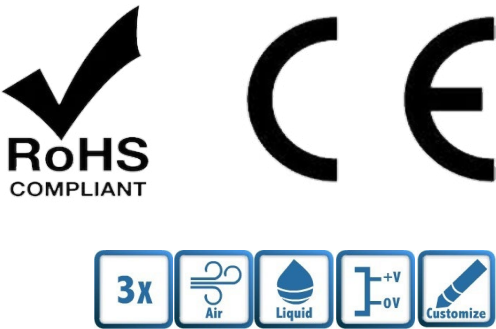


# PA Series Pressure Sensor

The PA series pressure transducer combines the latest Application Specific Integrated Circuit (ASIC) technology with proven piezoresistive sensors. The measuring bridge is printed directly on one side of the diaphragm by means of Thick-Film technology. The rear part of the diaphragm can be exposed directly to the medium to be measured. The 304 housing surrounds a pressure transducer designed for general use wherever a rugged, reliable pressure transducer is required.



### Features

- Ceramic piezoresistive principle
- Max. measuring range 50 bar
- RoHs compliance (Lead-Free)

### Applications

- Industrial air compressors
- Water supply and drainage systems
- Mechanical and plant engineering
- Coffee machine

### Advantages

- Working temperature range -40°C ...125°C
- Compatible for nearly all aggressive media
- Impact and vibration resistance
- Temperature compensated

### 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	Charateristic	Test condition	Parameter	Unit
<b>P<sub>n</sub></b>	Pressure range (Absolute*2)*1		0..5-50	bar
	Pressure range (Sealed gage*3)*1		-1..5-50	
<b>P<sub>m</sub></b>	Prove pressure		3 times P <sub>n</sub>	bar
<b>P<sub>b</sub></b>	Burst pressure		5 times P <sub>n</sub>	bar
<b>T<sub>a</sub></b>	Ambient operating temperature		-40..125	°C
<b>T<sub>m</sub></b>	Media temperature Range (Air and liquid)	FPM	-26..125	°C
		EPDM	-40..125	
		nBR	-20..100	
		MVQ	-40..125	
		CR	-35..105	
		HNBR	-32..125	
<b>I<sub>c</sub></b>	Current consumption		<10	mA
	Overvoltage and reverse polarity protection		-24...30	VDC
<b>T<sub>R</sub></b>	Response time		4..10	mS
<b>ε<sub>L</sub></b>	Accuracy include linearity, hysteresis and repeatability errors	T <sub>a</sub> = 25°C	0.5	% F.S
<b>TEB</b>	Total error band	@P <sub>n</sub> , T <sub>a</sub> = -20°C ...85°C	2	%
		@P <sub>n</sub> , T <sub>a</sub> = -40°C ...125°C	3	
<b>LTS</b>	Long term stability	Per year under reference conditions	<±0.3	% F.S
<b>T<sub>c</sub></b>	Compensated temperature range		-20...85	°C

\*1 Pressure range can be customized according to requirements

\*2 Absolute pressure reference: Output is proportional to the difference between applied pressure and a built-in fixed reference to vacuum (zero pressure), where the minimum operating pressure is set to absolute zero pressure (perfect vacuum)

\*3 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)

## Electrical Specifications

Charateristic	Ratiometric output		Current output	Regulated output	
	A	H	B	C	D
<b>Output value</b>	0.5..4.5 VDC	0.5..2.5 VDC	4...20 mA	0..10 VDC	1..5 VDC
<b>Operating supply voltage</b>	5±0.25 VDC	5±0.25 VDC	12...30 VDC	14...30 VDC	12...30 VDC

\*1 Transducer will not produce valid output when supply voltage is outside of operating range.

\*2 Short circuit protection between output pin and ground, and output pin and supply pin.

## Pressure connection

Connector	Type	Comment
Female	7/16"-20 UNF	45° Flare Female
	1/8"-27 NPT male	
Male	1/4"-18 NPT male	
	7/16"-20 UNF	45° Flare Male
	G1/8"A Male	
	G1/4"A male	
	G1/8"A male	male with O ring
	G1/4"A male	male with O ring
	G3/8"A male	male with O ring
	G1/2"A male	male with O ring
	G1/2"B male	
	R1/4" male	
	M20x1.5	45° Flare Male
	G1/4" male	
	G3/8" male	

\*2 Pressure connection can be customized according to requirements

## Materials

Symbol	Parameter	Value	Unit	Comment
<b>m-PC</b>	Pressure connection material	AISI 304		AISI 316L optional
<b>m-S</b>	Sensor material	Ceramic Al <sub>2</sub> O <sub>3</sub>		
<b>m-PLUG</b>	RK03FB material	PPS		IP67
	Packard Metri-Pack 150 material	PA66		IP65
	DIN 175301-803C PG7 material	PA6		IP65
	M12 material	AISI 304		IP65
	Direct cable	AISI 304		IP67
	Direct cable (compact)	AISI 304 or AISI 316		IP67
<b>IP</b>	Sealing grade	IP65 - IP67		Depending on the electrical connector
<b>F<sub>m</sub></b>	Mounting torque	≤ 30	Nm	±10%
<b>SHORT</b>	Short circuit protected	Yes		
<b>m</b>	Mass	50	grams	

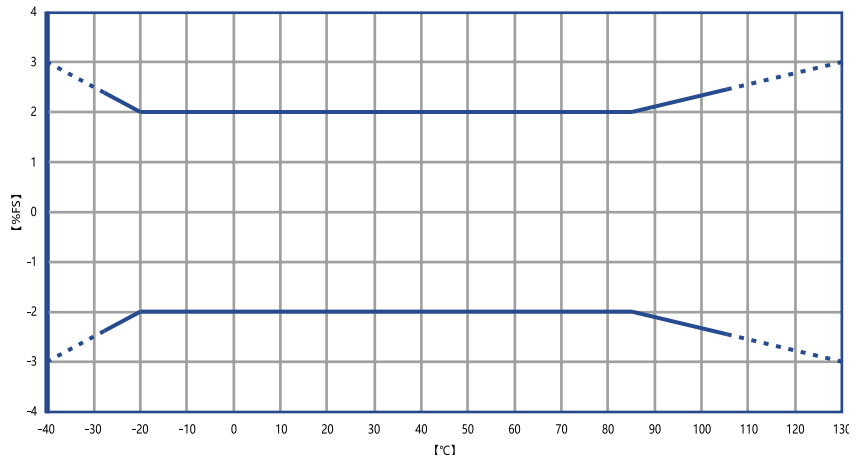
# Environmental and mechanical characteristics

Test	Standard
<b>Electromagnetic compatibility</b>	EN 61326-1: 2021
<b>Damp heat, cyclic acc. IEC60068-2-30: 2005</b>	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.
<b>Dry heat acc. IEC60068-2-2: 2007</b>	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.
<b>Low temperature acc. IEC60068-2-1: 2007</b>	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.
<b>Salt mist acc. IEC 60068-2-52: 2017</b>	Place the pressure sensor at 35°C ± 2°C environment, continuous atomisation , 48h.
<b>Vibration acc. IEC 60068-2-6</b>	10~55 Hz with amplitude 1 mm, all 3 directions total duration 3 hours, 1h/direction, 10g

## Total error band

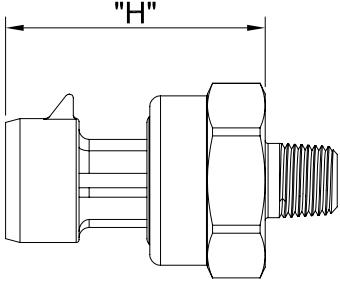
The chart illustrates the maximum deviation across the entire medium temperature range (-40...125 °C) for the PA series.

In the defined pressure and temperature parameters, the maximum total error remains consistently at ± 2 %FS (-20...85 °C).



# Dimensions (mm)

## Electrical connector type dimensions

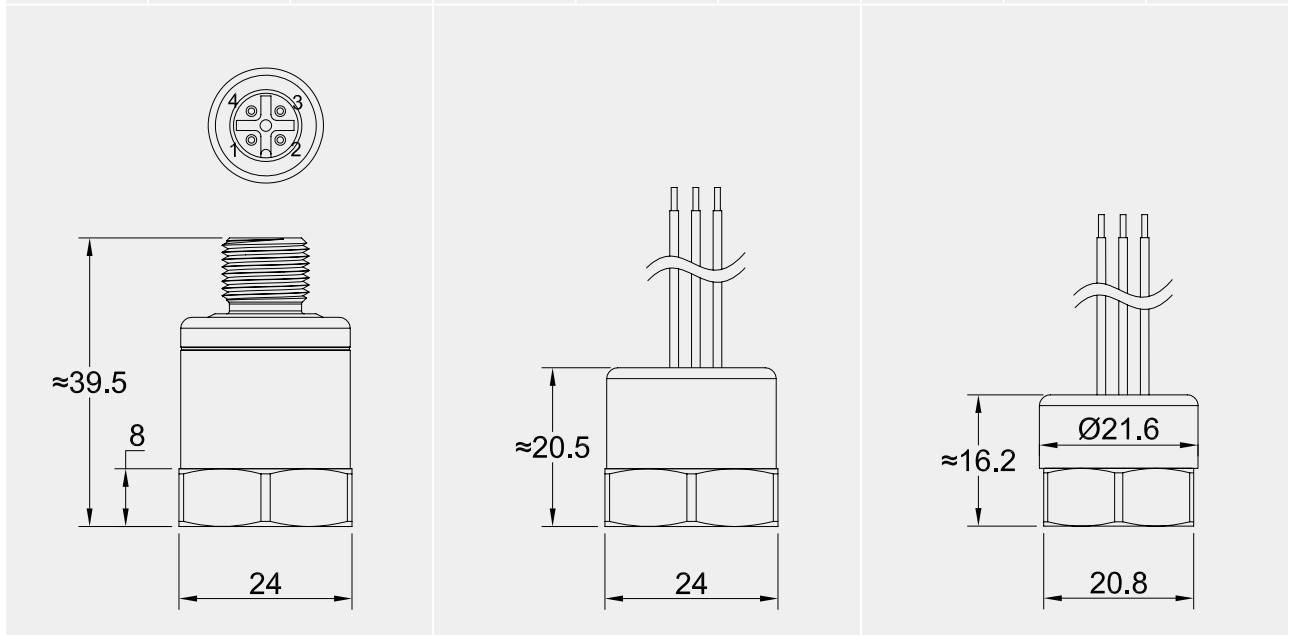


01 RK03FB			02 Packard Metri-Pack 150			03 DIN 175301-803C PG7		
Sealing grade: IP67			Sealing grade: IP65			Sealing grade: IP65		
Material: PPS			Material: PA66			Material: PA6		
Pin	Voltage output (0.5 – 4.5 V, 1 – 5 V, 0 – 10 V)	Current output (4-20mA)	Pin	Voltage output (0.5 – 4.5 V, 1 – 5 V, 0 – 10 V)	Current output (4-20mA)	Pin	Voltage output (0.5 – 4.5 V, 1 – 5 V, 0 – 10 V)	Current output (4-20mA)
1	GND	-	1	V <sub>OUT</sub>	NULL	1	V <sub>DD</sub>	+
2	V <sub>OUT</sub>	NULL	2	GND	-	2	V <sub>OUT</sub>	-
3	V <sub>DD</sub>	+	3	V <sub>DD</sub>	+	3	GND	NULL
						4	NULL	NULL


### Electrical connector type dimensions

04 M12			05 Direct cable			06 Direct cable (compact)		
Sealing grade: IP65			Sealing grade: IP67			Sealing grade: IP67		
Material: AISI 304			Material: AISI 304			Material: AISI 304 or AISI 316		
Pin	Voltage output (0.5 – 4.5 V, 1 – 5 V, 0 – 10 V)	Current output (4-20mA)	Pin	Voltage output (0.5 – 4.5 V, 1 – 5 V, 0 – 10 V)	Current output (4-20mA)	Pin	Voltage output (0.5 – 2.5V, 0.5 – 4.5 V, 1 – 5 V, 0 – 10 V)	Current output (4-20mA)
1	V <sub>DD</sub>	+	1 RED	V <sub>DD</sub>	+	1 RED	V <sub>DD</sub>	+
2	NULL	NULL	2 WHITE	V <sub>OUT</sub>	-	2 WHITE	V <sub>OUT</sub>	-
3	GND	-	3 BLACK	GND	NULL	3 BLACK	GND	NULL
4	V <sub>OUT</sub>	NULL						



### Electrical connector type dimensions

07 Bayonet		
Sealing grade: IP65		
Material: PPE/PA6		
Pin	Voltage output (0.5 – 4.5 V, 1 – 5 V, 0 – 10 V)	Current output (4-20mA)
1	V <sub>DD</sub>	+
2	GND	-
3	V <sub>OUT</sub>	NULL
4	NULL	NULL

The technical drawing includes a top view of the connector showing four pins arranged in a circle, labeled 1, 2, 3, and 4. Below this is a side view showing the connector's profile. Dimension lines indicate a total height of approximately 38.2 units, a specific section height of 8 units, and a diameter of 24 units.

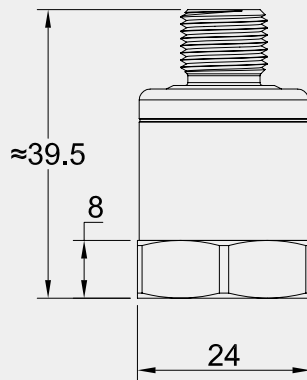
### Electrical connector type dimensions

41 M12 B1			42 M12 B2			43 M12 B3		
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Sealing grade: IP65

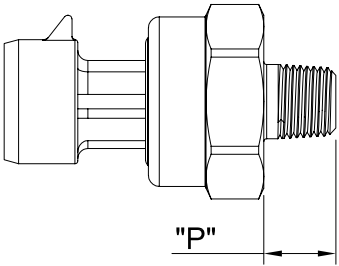
Material: AISI 304

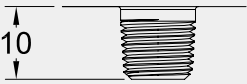
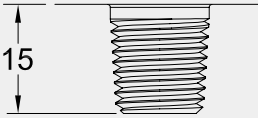
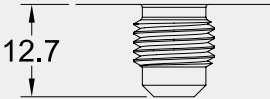
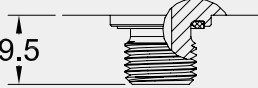
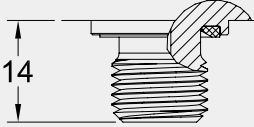
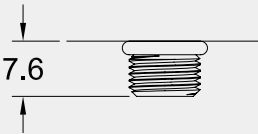
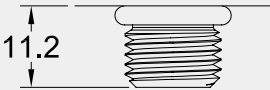
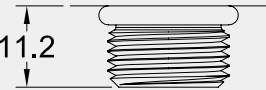
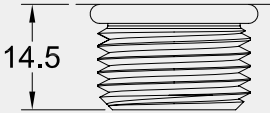
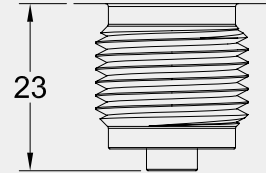
Pin	Voltage output (0.5 – 4.5 V, 1 – 5 V, 0 – 10 V)	Current output (4-20mA)	Pin	Voltage output (0.5 – 4.5 V, 1 – 5 V, 0 – 10 V)	Current output (4-20mA)	Pin	Voltage output (0.5 – 4.5 V, 1 – 5 V, 0 – 10 V)	Current output (4-20mA)
1	V <sub>DD</sub>	+	1	V <sub>DD</sub>	+	1	V <sub>DD</sub>	+
2	NULL	NULL	2	V <sub>OUT</sub>	NULL	2	GND	-
3	V <sub>OUT</sub>	NULL	3	GND	-	3	V <sub>OUT</sub>	NULL
4	GND	-	4	NULL	NULL	4	NULL	NULL

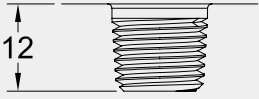
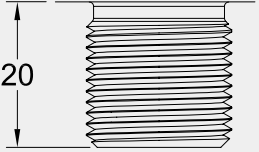


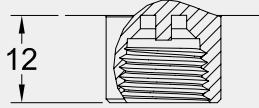




Pressure connector type dimensions



<b>A</b> 1/8"-27 NPT male	<b>B</b> 1/4"-18 NPT male
Seal: Pipe thread Standard: ANSI B1.20.1 	Seal: Pipe thread Standard: ANSI B1.20.1 
<b>C</b> 7/16"-20 UNF	<b>D</b> G1/8"A Male
Seal: 45° Flare male Standard: SAE J513 	Seal: O ring $d_{in} 8.4^*$ , $d_{od} 11.9^*$ , TH 1.0-0.5 Standard: ISO 1179-2 
<b>E</b> G1/4"A male	<b>F</b> G1/8"A male male with O ring
Seal: O ring $d_{in} 11.6^*$ , $d_{od} 16.5^*$ , TH 1.5-0.8 Standard: ISO 1179-2 	Seal: O ring $d_{in} 7.97^*$ , d 1.88 Standard: ISO 1179-3 
<b>G</b> G1/4"A male male with O ring	<b>H</b> G3/8"A male male with O ring
Seal: O ring $d_{in} 10.77^*$ , d 2.62 Standard: ISO 1179-3 	Seal: O ring $d_{in} 13.94^*$ , d 2.62 Standard: ISO 1179-3 
<b>I</b> G1/2"A male male with O ring	<b>J</b> G1/2"B male
Seal: O ring $d_{in} 17.86^*$ , d 2.62 Standard: ISO 1179-3 	Standard: DIN EN 873-1 

<p><b>K</b> R1/4" male</p> <p><b>Standard:</b> DIN 3582-2</p> 	<p><b>L</b> M20x1.5 male</p> 
<p><b>M</b> G1/4" male</p> <p><b>Seal:</b> O ring d<sub>in</sub> 11*, d 2</p> 	<p><b>N</b> G3/8" male</p> <p><b>Seal:</b> O ring d<sub>in</sub> 14*, d 1.78</p> 
<p><b>R</b> 7/16"-20 UNF</p> <p><b>Seal:</b> 1/4 in 45° Flare Female</p> <p><b>Standard:</b> SAE J512</p> 	

## Accessories



- Code: 20114-001
- Packard Metri-Pack 150 connector
- Cable: 1m standard (customization available)



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

# Name Guide Description

	<b>PA</b>	<b>XXX</b>	<b>X</b>	<b>X</b>	<b>XX</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
<b>Series</b>	PA: PA series pressure sensor										
<b>Pressure range</b>	001V: -1...1      01D6: 0...1.6 02D5: 0...2.5      004: 0...4 006V: -1...6      010: 0...10 016: 0...16      020V: -1...20 030: 0...30      042: 0...42 050: 0...50      100: 0...100 200: 0...200      300: 0...300 Customized										
<b>Unit</b>	P: Psi    B: Bar    K = KPa										
<b>Reference</b>	S: Sealed gage      A: Absolute										
<b>Electrical connector</b>	01: RK03FB      02: Packard Metri-Pack 150 03: DIN 175301-803C PG7      04: M12 05: 1m direct cable      06: 1m direct cable (compact) 07: Bayonet      41: M12 B1 42: M12 B2      43: M12 B3										
<b>Output</b>	A: 0.5-4.5 VDC ratio output from 5 VDC excitation B: 4-20mA from 12 to 30 VDC excitation C: 0-10VDC output from 14 to 30 VDC excitation D: 1 to 5 VDC output from 12 to 30 VDC excitation H: 0.5-2.5 VDC ratio output from 5 VDC excitation Customized										
<b>Pressure connector</b>	A: 1/8"-27 NPT male      B: 1/4"-18 NPT male C: 7/16"-20 UNF      D: G1/8"A Male E: G1/4"A male      F: G1/8"A male male with O ring G: G1/4"A male male with O ring      H: G3/8"A male male with O ring I: G1/2"A male male with O ring      J: G1/2"B male K: R1/4"A male      L: M20x1.5 male M: G1/4" male      N: G3/8" male R: 7/16"-20 UNF Customized										
<b>Sealing ring</b>	0: FPM      1: EPDM 2: NBR      3: MVQ 4: CR      5: HNBR										
<b>Pressure orifice</b>	Null: without D: with										
<b>Safe for drinking water system</b>	Null: No S: Yes										
<b>Extra code</b>											

## Notes

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# 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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