P598 Series Electronic Pressure Transducers Product Bulletin

Introduction

The P598 Series Electronic Pressure Transducers are compact, economical, rugged, direct-mount pressure transducers designed for use in commercial and industrial refrigeration and air conditioning applications. P598 Series Transducers provide a proportional, analog signal based on the sensed pressure.

P598 Series Transducers feature environmentally protected electronics with stainless steel construction. The digitally compensated P598 Series Transducers with microelectromechanical system (MEMS) pressure sensor technology provides a high level of accuracy over a broad temperature range, and resists the effects of wide ambient-temperature swings, high humidity, condensation, and ice accumulation.

The pressure port is made from grade 303 stainless steel, except models with a copper tube port. A neoprene rubber O-ring seals the MEMS sensor internally, which makes the MEMS sensor suitable for the refrigerant types in Table 1.

The P598 Series Transducers have a variety of pressure ranges for common refrigeration and air conditioning applications.

Table 1: P598 approved refrigerants

Approved refrigerants	R22, R134A, R404A, R407A, R407C, R407F, R410A, R417A, R422A, R422D, R427A, R438A, R448A, R449A, R450A, R507A, R513A, and ammonia

ⓘ **Note:** The P598 Series Transducers are not suitable for water applications, or water and glycol applications.

Figure 1: P598 Series Electronic Pressure Transducers

Features and benefits

Innovative cavity-side MEMS pressure sensing

Highly accurate over a wide temperature range.

Unique sensor circuitry

Protects the transducer from over-voltage and short-circuiting.

Rugged design

Established through life cycle testing of over 10 million cycles for proven reliability.

Approved for today’s refrigerants

The P598 Series Transducers are approved for new refrigerants with low global warming potential (GWP) such as R449A and ammonia NH3.

Application

- **Important:** The P598 Series Electronic Pressure Transducer is intended to provide an input to equipment under normal operating conditions. Where failure or malfunction of the P598 Series Transducer could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the P598 Series Transducer.
- **Important:** Le P598 Series Electronic Pressure Transducer est destiné à transmettre des données entrantes à un équipement dans des conditions normales de fonctionnement. Lorsqu'une défaillance ou un dysfonctionnement du P598 Series Transducer risque de provoquer des blessures ou d'endommager l'équipement contrôlé ou un autre équipement, la conception du système de contrôle doit intégrer des dispositifs de protection supplémentaires. Veiller dans ce cas à intégrer de façon permanente d'autres dispositifs, tels que des systèmes de supervision ou d'alarme, ou des dispositifs de sécurité ou de limitation, ayant une fonction d'avertissement ou de protection en cas de défaillance ou de dysfonctionnement du P598 Series Transducer.

P598 Series Transducers provide a proportional analog signal, based on the sensed fluid input, to a variety of controls.

Standard P598 Series Transducers provide several output options: 0.5 VDC to 4.5 VDC ratiometric, 0 VDC to 10 VDC, and 4 mA to 20 mA. These output signals plus 0 VDC to 5 VDC are also available on non-standard, bulk order purchases. See *Ordering bulk quantities of non-standard P598 Series Transducers* for more information on non-standard models.

Typical applications include the following:

- HVAC and refrigeration applications
- Chillers
- Agricultural applications
- Heat pumps
- Fan speed controls

Installation

See *Mounting* and *Wiring* for information about installing the P598 Series Transducers.

Mounting

The compact, lightweight P598 Series Transducer mounts directly to most refrigeration equipment pressure tap ports.

NOTICE

Risk of Property Damage
Mount the pressure control separately from the electrical cabinet and seal all electrical piping to prevent ammonia from migrating to electrical components. Where there may be exposure to ammonia, use only ammonia-compatible control modules and pressure connections. System shutdown due to improper adjustment may cause property damage.

NOTICE

Risque de dégâts matériels
Installer le régulateur de pression séparément de l'armoire électrique et étanchéifier tous les conduits électriques afin d'éviter que de l'ammoniac n'entre en contact avec des composants électriques. En cas d'exposition potentielle à de l'ammoniac, utiliser uniquement des modules de régulation et des raccords de pression compatibles avec la présence d'ammoniac.- L'arrêt du système en raison d'un réglage inapproprié risque de provoquer des dégâts matériels.

- **Important:** When you install the P598 Series Transducers, observe all regulations governing the handling and containment of hazardous or regulated materials (refrigerants or lubricants).
- **Important:** Locate pressure tap points on the top side of the refrigerant lines to reduce risk of equipment damage or malfunction caused by accumulation of oil, liquids, or sediment at the transducer-to-refrigeration port pressure connection.
- **Important:** Avoid severe pressure pulsations on high-side pressure connections by positioning the transducer away from compressor discharge.

To mount the P598 Series Transducer, complete the following steps:

1. Hand thread the P598 Series Transducer to the pressure tap point.
2. To avoid damaging the transducer, use the wrench flats provided to tighten the connection. See *Technical specifications* for assembly torque values.
3. Perform a leak test on the connection before you put the system into operation.

Wiring

Observe the following guidelines when you wire the P598 Series Transducer:

- Ensure wiring conforms to the regional, national, and local electrical codes and regulations.
- Do not exceed the transducer's electrical ratings. See the *Technical specifications* table for more information.
- Do not extend the wiring harness leads more than 76 m (250 ft). To extend wiring harness leads, use a 22 AWG stranded, twisted, 3-wire shielded cable.
- Do not run low-voltage cable in conduit or wiring troughs with high-voltage wires.
- Ensure that the shielded cable terminates according to code and the control’s instructions.

Checking transducer operation

Important: The P598 Series Transducer is a precision sensing device and testing accuracy is typically beyond the capability of field diagnostic tools.

Before you apply power, check all the wiring connections. After you apply power, operate the controlled equipment under normal conditions. Use a reliable set of pressure gauges to verify that the transducer and the associated control are operating properly.

0.5 VDC to 4.5 VDC ratiometric versions

The ratiometric versions of the P598 Series Transducer receive a constant 5 VDC nominal supply voltage and vary the output signal voltage, based on the sensed pressure. The output voltage varies from 10% to 90% of the supply voltage, and provides a 0.5 VDC to 4.5 VDC nominal signal.

Note: The 0.5 VDC to 4.5 VDC ratiometric transducers are rated for 5.0 ±0.25 VDC, safety extra-low voltage (SELV), or Class 2. Exceeding the supply voltage rating can damage the transducer and void any warranties.

To verify that the transducer is functioning correctly, complete the following steps:

1. Ensure that the transducer is in place and the controlled system pressure is stable. Measure the pressure at the transducer with an accurate pressure meter. The resulting value is the measured pressure (P).
2. Determine the maximum (Pmax) and minimum (Pmin) pressure values for the transducer's pressure range. See Table 2 and Table 6 for more information.
3. Measure the voltage between the red supply wire and the black common wire. Use this value in Step 4 as the measured supply voltage (Vs).
4. Use the following equation to determine the calculated output voltage for the ratiometric transducer:

$$Vo = Vs\left[0.1 + 0.8\left(\frac{P-(Pmin)}{Pmax-(Pmin)}\right)\right]VDC$$

   - Vo = Calculated output voltage
   - Vs = Measured supply voltage
   - P = Measured pressure
   - Pmax = Max span
   - Pmin = Min span

5. Use your multimeter to measure the DC voltage between the transducer output and common (-) pins. This value is the measured output voltage. See Table 11 for the pin out configuration.
6. Compare the output voltage calculated in Step 4 and the output voltage measured in Step 5. If the measured output voltage differs greatly from the calculated output voltage, replace the transducer.

   Note: Under normal conditions, the transducer reading differs from pressure meter readings due to voltmeter and pressure meter tolerance.

0 VDC to 5 VDC and 0 VDC to 10 VDC versions

To verify that the transducer is functioning correctly, complete the following steps:

1. Ensure that the transducer is in place and the controlled system pressure is stable. Measure the pressure at the transducer with an accurate gauge. The resulting value is the measured pressure (P).
2. Determine the maximum (Pmax) and minimum (Pmin) pressure values for the transducer's pressure range. See Table 4 and Table 7 for more information.
3. Use the following equations to determine the calculated output voltage for the 0 VDC to 10 VDC and for the 0 VDC to 5 VDC transducers:

0 VDC to 10 VDC

$$Vo = 10\left(\frac{P-(Pmin)}{Pmax-(Pmin)}\right)VDC$$

0 VDC to 5 VDC

$$Vo = 5\left(\frac{P-(Pmin)}{Pmax-(Pmin)}\right)VDC$$

   - Vo = Calculated output voltage
   - P = Measured pressure
   - Pmax = Max span
   - Pmin = Min span

4. Measure the voltage between the transducer output and common (-) pins. See Table 11 for the pin out configuration. The resulting value is the measured output voltage.
5. Compare the output voltage calculated in Step 3 and the output voltage measured in Step 4. If the measured output voltage differs greatly from the calculated output voltage, replace the transducer.

   ⓘ **Note:** Under normal conditions, the transducer reading can differ from pressure meter readings due to voltmeter and pressure meter tolerances.

4 mA to 20 mA versions

To verify that the P598 Series Transducer is working properly, complete the following steps:

1. Ensure that the transducer is in place and the controlled system pressure is stabilized. Measure the pressure at the transducer with an accurate gauge. The resulting value is the measured pressure (P).
2. Determine the maximum (Pmax) and minimum (Pmin) pressure values for the transducer's pressure range. See Table 5 and Table 8 for more information.
3. Use the following equation to determine the calculated output current for the 4 mA to 20 mA transducers:

$$I = 4 + 16\left(\frac{P-(Pmin)}{Pmax-(Pmin)}\right)mA$$

   - I = Calculated output current
   - P = Measured pressure
   - Pmax = Max span
   - Pmin = Min span

4. Measure the transducer output current:

a. Disconnect the common (-) wire.

b. Set your multimeter to milliamperes (mA).

c. Connect the multimeter's red test-lead to the transducer output common (-) PIN wire and the multimeter's black test-lead to the common (-) wire.
The milliamperes (mA) reading on your multimeter is the measured output current. See Table 11 for the pin out configuration.

5. Compare the output current calculated in Step 3 to the output current measured in Step 4.
If the current from the measured output current differs greatly from the calculated output current, replace the transducer.

ⓘ **Note:** Under normal conditions, the transducer reading differs somewhat from pressure meter readings due to multimeter and pressure meter tolerances.

Repair information

Do not attempt to repair or recalibrate the P598 Series Electronic Pressure Transducers. If a P598 Series Transducer does not perform according to specifications, contact your nearest authorized Johnson Controls® and PENN® distributor or sales representative.

Ordering information

The standard P598 Series Transducers listed in Table 2 to Table 8 are for sale as single piece items. P598 Series Transducer product code numbers that end in -xxxC are transducers only. P598 Series Transducer product code numbers that end in -xxxK are kits, and include a transducer and a 2 m (6.6 ft) wire harness with a Packard® connector.

Use the product code numbers in Table 9 when you order wiring harnesses separately for P598 Series Transducers with integral Packard connectors.

See *Ordering bulk quantities of non-standard P598 Series Transducers* for more information about non-standard P598 Series Transducer model variations that are not included in the following tables.

Figure 2: Standard North American P598 Series Transducer examples

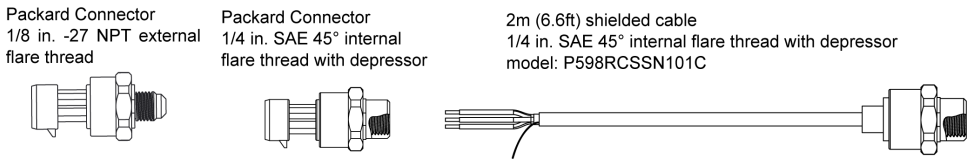


Table 2: P598 Transducer standard models, 0.5 VDC to 4.5 VDC ratiometric with Packard Connectors for psi applications

Product code number	Pressure range		Pressure port	Individual or kit
	Minimum pressure (Pmin)	Maximum pressure (Pmax)		
P598RAPSN100C	-10 psi (20 in. Hg)	100 psi	1/8 in. -27 NPT external flare thread	Individual
P598RAPSN100K				Kit
P598RAPSN101C	0 psi	100 psi		Individual
P598RAPSN101K				Kit
P598RAPSN102C		200 psi		Individual
P598RAPSN102K				Kit
P598RAPSN105C		500 psi		Individual
P598RAPSN105K				Kit
P598RAPSN107C		750 psi		Individual
P598RAPSN107K				Kit
P598RCPSN100C	-10 psi (20 in. Hg)	100 psi	1/4 in. SAE International 45° internal flare thread with depressor	Individual
P598RCPSN100K				Kit
P598RCPSN101C	0 psi	100 psi		Individual
P598RCPSN101K				Kit
P598RCPSN102C		200 psi		Individual
P598RCPSN102K				Kit
P598RCPSN105C		500 psi		Individual
P598RCPSN105K				Kit
P598RCPSN107C		750 psi		Individual
P598RCPSN107K				Kit
P598RCSSN101C[1]		100 psi		Individual

1 The P598RCSSN101C model has an integral three-wire, 2 m (6.6 ft.) cable with a cable shield attached to the transducer.

Table 3: P598 Transducer standard models, 0 VDC to 5 VDC with Packard Connectors for psi applications

Product code number	Pressure range		Pressure port	Individual or kit
	Minimum pressure (Pmin)	Maximum pressure (Pmax)		
P598BCPSN101C	0 psi	100 psi	1/4 in. SAE International 45° internal flare thread with depressor	Individual
P598BCPSN101K				Kit
P598BCPSN105C		500 psi		Individual
P598BCPSN105K				Kit
P598BCPSN107C		750 psi		Individual
P598BCPSN107K				Kit

Table 4: P598 Transducer standard models, 0 VDC to 10 VDC with Packard Connectors for psi applications

Product code number	Pressure range		Pressure port	Individual or kit
	Minimum pressure (Pmin)	Maximum pressure (Pmax)		
P598VAPSN101C	0 psi	100 psi	1/8 in. -27 NPT external flare thread	Individual
P598VAPSN101K				Kit
P598VAPSN105C		500 psi		Individual
P598VAPSN105K				Kit
P598VAPSN107C		750 psi		Individual
P598VAPSN107K				Kit
P598VCPSN101C		100 psi	1/4 in. SAE International 45° internal flare thread with depressor	Individual
P598VCPSN101K				Kit
P598VCPSN105C		500 psi		Individual
P598VCPSN105K				Kit
P598VCPSN107C		750 psi		Individual
P598VCPSN107K				Kit

Table 5: P598 Transducer standard models, 4 mA to 20 mA with Packard Connectors for psi applications

Product code number	Pressure range		Pressure port	Individual or kit
	Minimum pressure (Pmin)	Maximum pressure (Pmax)		
P598AAPSN101C	0 psi	100 psi	1/8 in. -27 NPT external flare thread	Individual
P598AAPSN101K				Kit
P598AAPSN105C	0 psi	500 psi		Individual
P598AAPSN105K				Kit
P598AAPSN107C	0 psi	750 psi		Individual
P598AAPSN107K				Kit
P598ACPSN101C	0 psi	100 psi	1/4 in. SAE International 45° internal flare thread with depressor	Individual
P598ACPSN101K				Kit
P598ACPSN105C	0 psi	500 psi		Individual
P598ACPSN105K				Kit
P598ACPSN107C	0 psi	750 psi		Individual
P598ACPSN107K				Kit

Figure 3: Standard European P598 Series Transducer examples

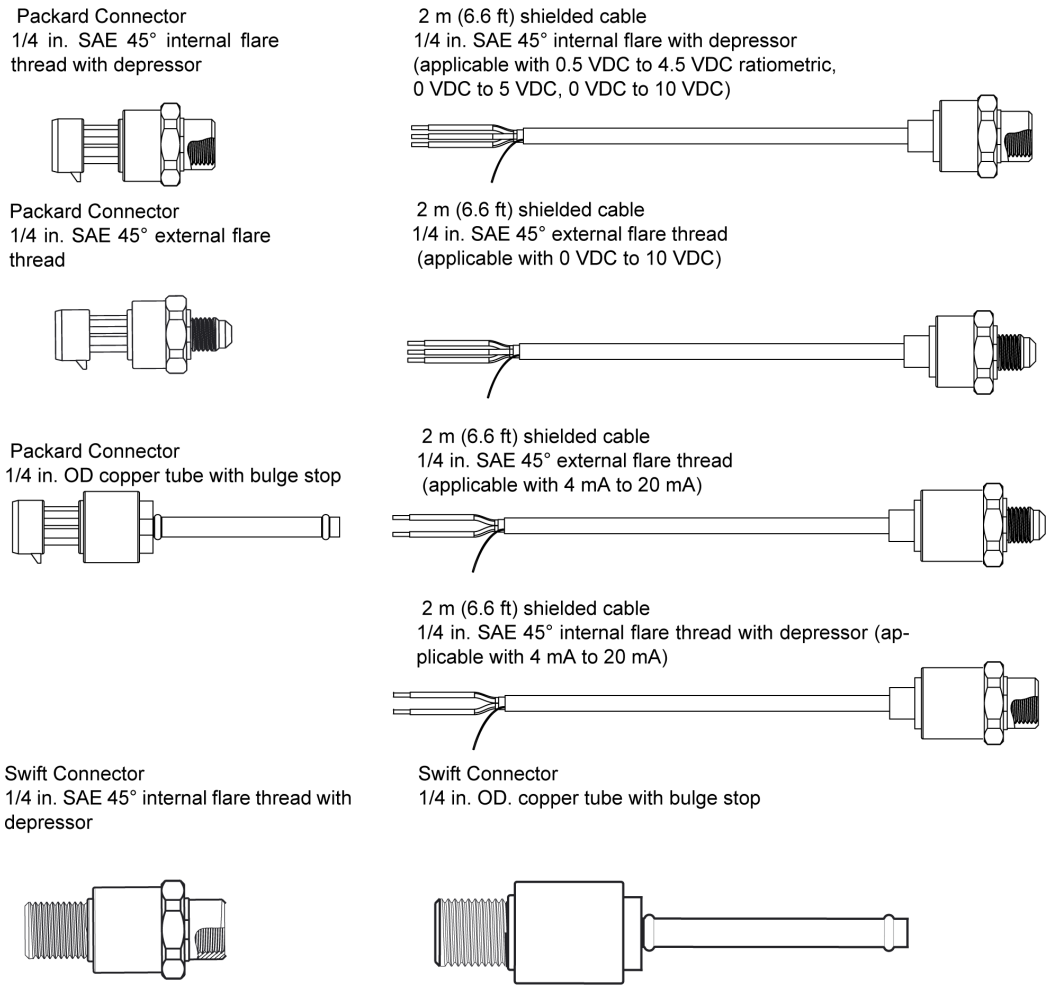


Table 6: P598 Series Transducer standard models, 0.5 VDC to 4.5 VDC for bar applications

Product code number	Pressure range		Pressure port	Electrical connector
	Minimum pressure (Pmin)	Maximum pressure (Pmax)		
P598RAPSN401C	-1 bar	8 bar	1/8 in. – 27 NPT external flare thread	Packard
P598RCFSN401C			1/4 in. SAE International 45° internal flare thread port with depressor	Swift connector
P598RCFSN404C	0 bar	30 bar		
P598RCPSN401C	-1 bar	8 bar		Packard
P598RCPSN402C		15 bar		
P598RCPSN404C	0 bar	30 bar		
P598RCPSN405C		50 bar		
P598RCSSN409C		35 bar		Shielded cable
P598RCSSN411C		52 bar		

Table 7: P598 Series Transducer standard models, 0 VDC to 10 VDC for bar applications

Product code number	Pressure range		Pressure port	Electrical connector
	Minimum pressure (Pmin)	Maximum pressure (Pmax)		
P598VBPSN401C	-1 bar	8 bar	1/4 in. SAE International 45° external flare thread	Packard
P598VBPSN404C	0 bar	30 bar		
P598VBSSN401C	-1 bar	8 bar		Shielded cable
P598VBSSN402C	-1 bar	15 bar		
P598VBSSN404C	0 bar	30 bar		
P598VCPSN401C	-1 bar	8 bar	1/4 in. SAE International 45° internal flare thread with depressor	Packard
P598VCPSN404C	0 bar	30 bar		
P598VCPSN406C	-1 bar	9 bar		
P598VCPSN407C		39 bar		
P598VCSSN401C	-1 bar	8 bar		Shielded cable
P598VCSSN404C	0 bar	30 bar		
P598VCSSN405C	0 bar	50 bar		
P598VPPSN401C	-1 bar	8 bar	1/4 in. O.D. copper tube with bulge stop	Packard
P598VPPSN404C	0 bar	30 bar		

Table 8: P598 Series Transducer standard models, 4 mA to 20 mA for bar applications

Product code number	Pressure range		Pressure port	Electrical connector
	Minimum pressure (Pmin)	Maximum pressure (Pmax)		
P598ABPSN404C	0 bar	30 bar	1/4 in. SAE International 45° external flare thread	Packard
P598ABSSN401C	-1 bar	8 bar		Shielded cable
P598ABSSN404C	0 bar	30 bar		
P598ACPSN401C	-1 bar	8 bar	1/4 in. SAE International 45° internal flare thread with depressor	Packard
P598ACPSN402C		15 bar		
P598ACPSN403C	0 bar			
P598ACPSN404C		30 bar		
P598ACPSN405C		50 bar		
P598ACSSN401C	-1 bar	8 bar		Shielded cable
P598ACSSN404C	0 bar	30 bar		
P598ACSSN405C		50 bar		
P598APFSN404C		30 bar	1/4 in. OD copper tube with bulge stop	Swift connector
P598APPSN401C	-1 bar	8 bar		Packard
P598APPSN404C	0 bar	30 bar		

Table 9: Wire harnesses for use with Packard Connectors

Product code number	Length
WHA-PKD3-200C	2.0 m (6.6 ft)
WHA-PKD3-400C	4.0 m (13 ft)
WHA-PKD3-600C	6.0 m (19.6 ft)

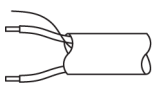
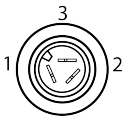
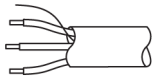
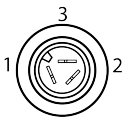
Ordering bulk quantities of non-standard P598 Series Transducers

Table 10 shows the P598 Series Transducer models and product code numbers, the P598 Series Transducer product code matrix, and the potential non-standard transducer models that you can build. Not all non-standard models are available. Non-standard models are only sold in bulk quantity orders of 100 or more. Contact your Johnson Controls sales representative for more information about the bulk purchase of non-standard P598 Series Transducers.

Table 10: P598 Series Transducers product code matrix

Feature	Code letter or number and description	Product code number example: P598RCPSN101C
Transducer series number	P598	P598
Output signal	A = 4 mA to 20 mA	R
	B = 0 VDC to 5 VDC	
	R = Ratiometric: 0.5 VDC to 4.5 VDC	
	V = 0 VDC to 10 VDC	
Pressure port connection	A = 1/8 in. -27 NPT external flare thread port	C
	B = 1/4 in. SAE International 45° external flare thread port	
	C = 1/4 in. SAE International 45° internal flare thread with depressor port	
	D = 1/4 in. -18 NPT external flare thread port	
	P = 1/4 in. O.D copper tube with bulge stop	
Electrical connection	P = Packard	P
	S = Shielded cable	
	F = Swift connector	
Pressure mode units	A = Absolute	S
	S = Sealed gage	
O-ring material	N = Neoprene	N
Pressure suffix	000-099 = TBD	101
	100-199 = Johnson Controls North America general application	
	200-299 = OEM or restricted	
	300-399 = TBD	
	400-499 = Johnson Controls Europe	
	500-999 = Restricted models	
Packaging	C = Individual	C
	D = Bulk	
	K = Kit: transducer, cable, and documents	

Table 11: P598 Series Transducer output signal and electrical connection chart

Electrical connection code	**P**	**S**	**F**
Output signal	**Packard**	**Cable 2 m shielded 22 AWG**	**Swift**
4 mA to 20 mA	 FIG:p598_op_sig6 Pin A: Common (-) Pin B: Supply (+) Pin C: Not used	 FIG:p598_op_sig2 Red: Supply (+) Black: Common (-) Bare: Drain	 Pin 1: Supply (+) Pin 2: Common (-) Pin 3: Not used
0 VDC to 5 VDC Ratiometric 0.5 VDC to 4.5 VDC 0 VDC to 10 VDC	 FIG:p598_op_sig6 Pin A: Common (-) Pin B: Supply (+) Pin C: Output	 p598_op_sig7 Red: Supply (+) Black: Common (-) White: Output Bare: Drain	 Pin 1: Supply (+) Pin 2: Common (-) Pin 3: Drain

Technical specifications

Table 12: P598 Series Electronic Pressure Transducers

Output signal types	0.5 VDC to 4.5 VDC ratiometric 0 VDC to 10 VDC 4 mA to 20 mA 0 VDC to 5 VDC
Pressure port type (suggested assembly torque)	1/8 in. -27 NPT, external thread ANSI B1.20.1 (16.3 N•m [12 lb•ft]) 1/4 in. SAE International 45° flare, external thread (16.3 N•m [12 lb•ft]) 1/4 in. SAE International 45° flare with Schrader® valve depressor, internal thread (16.3 N•m [12 lb•ft]) 1/4 in. -18 NPT, external thread ANSI B1.20.1 (20.3 N•m [15 lb•ft]) Solder pipe, 1/4 in. OD copper tube (not applicable)
Electrical connector	Packard, Metri-Pack 150 series, P2S Shielded cable; shield not connected to the sensor body Swift connector; suggested assembly torque between 1.8 N•m [1.3 lb•ft] and 2.0 N•m [1.4 lb•ft]
Units of measurement	bars or psis bara or psia
Approved refrigerants (for use with N neoprene O-ring construction)	R22, R134A, R404A, R407A, R407C, R407F, R410A, R417A, R422A, R422D, R427A, R438A, R448A, R449A, R450A, R507A, R513A, ammonia ⓘ **Note:** The P598 Series Transducers are not suitable for water applications, or water and glycol applications.
Temperature range	Compensated temperature: -40°C to 125°C (-40°F to 257°F) Media temperature (pressure side): -40°C to 125°C (-40°F to 257°F) Operating temperature (ambient air): -40°C to 125°C (-40°F to 257°F) Storage temperature: -40°C to 150°C (-40°F to 302°F)
Accuracy total error % span	+/-1.0% from 0°C to 80°C (32°F to 176°F) +/-1.5% from -20°C to 120°C (-4°F to 248°F) +/-2.0% from -40°C to 125°C (-40°F to 257°F)
% Best fit straight line (BFSL)	+/- 1.0%
Required supply voltage	0.5 VDC to 4.5 VDC ratiometric: 4.75 VDC to 5.25 VDC 0 VDC to 10 VDC: 12 VDC to 33 VDC 4 mA to 20 mA: 12 VDC to 33 VDC 0 VDC to 5 VDC: 9 VDC to 33 VDC
Maximum input current	0.5 VDC to 4.5 VDC ratiometric: 8 mA 0 VDC to 10 VDC: 24 mA 4 mA to 20 mA: 24 mA 0 VDC to 5 VDC: 24 mA
Electrical protection	Standard response time, 5 mS, ±4 mS Output impedance greater than 25 ohm Output load shall be greater than 10K ohm (resistance signal out can support 0 VDC to 5 VDC, 0 VDC to 10 VDC, and ratiometric) for volt signal models Maximum R load = (Vsupply - 9 V)/20 mA for 4 mA to 20 mA models Reverse wiring protection (+ and common) (+ and signal out) (common and signal out) Short circuit protected (signal out at maximum span to earth) Minimum ohms (body to term) 100 M ohm at 500 VDC for 1 minute

Table 12: P598 Series Electronic Pressure Transducers

Physical	Burst pressure, 5 times rated pressure (Pmax), maximum 2500 psi Proof pressure 3 times rated pressure (Pmax) 1 minute, maximum 1500 psi Minimum pressure, 0 bar (0 psia), indefinitely Vibration IEC 60068-8-6 FC 5 G at 33 Hz, XYZ directions Mechanical shock EN 60068-2-27 (980 m/s^2 [38,582.6 in/s^2], 100 g [3.5 oz]) Shock or drop (1 meter [39.4 in.] one time any axis) Piezoresistive MEMS sensing
Field installed electrical connection IP ratings	Packard, IP67 Cable, IP67 Swift connector, IP67 Factory assembled environmental protection, IP67 stainless steel sensor body to plastic seal
Compliance CE	**North America:** **United States:** XACN2 File No. E27734; Miscellaneous Controls - Component **Canada:** XACN8 File No. E27734; Miscellaneous Controls - Component
	Europe: CE Mark – Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive.
	Australia and New Zealand: RCM, Emissions Compliant

Points of Single Contact

APAC	Europe	NA/SA
JOHNSON CONTROLS	JOHNSON CONTROLS	JOHNSON CONTROLS
C/O CONTROLS PRODUCT MANAGEMENT	WESTENDHOF 3	507 E MICHIGAN ST
NO. 32 CHANGJIJANG RD NEW DISTRICT	45143 ESSEN	MILWAUKEE WI 53202
WUXI JIANGSU PROVINCE 214028	GERMANY	USA
CHINA		