Series P299
Electronic pressure Transmitter

Introduction

The P299 Series Electronic Pressure Transmitter is a compact, economical, rugged pressure transmitter designed to produce a linear analogue signal based on the sensed pressure. They are designed for use in commercial and industrial refrigeration and air-conditioning applications.

The P299 transmitter features a welded stainless steel construction with environmentally sealed electronics. It is resistant to the effects of wide temperature swings, high humidity, condensation, and icing. It is suitable for use with all non-corrosive refrigerants as well as ammonia.

P299 Transmitters are available in several pressure ranges (up to 50 bar), covering most common refrigeration and air conditioning applications.

P299 Electronic Pressure Transmitters

Features and Benefits	
❑ **Rugged Stainless Steel Construction**	Provides a durable assembly, eliminates potential of refrigerant loss due to O-ring failures.
❑ **Environmentally Sealed Electronics**	Withstands the effects of adverse conditions found in typical equipment rooms
❑ **Reliable, Repeatable Performance and Long Operating Life**	Minimises service and replacement costs
❑ **Available in Several Pressure Ranges (up to 50 bar)**	Provides a single line of transmitters for all refrigeration and air conditioning application needs
❑ **Sensor contains a minimum of components.**	Increases lifetime and reliability
❑ **All functions, including sensor conditioning and signal processing are included in one chip**	Allows digital calibration of sensor which increases accuracy and stability

Order No. PD-P299-E

Application

IMPORTANT:
P299 Electronic Pressure Transmitters are intended for use in conjunction with operating controls. An operating control is intended to control equipment under normal operating conditions. Where failure or malfunction of the P299 Electronic Pressure Transmitter could lead to an abnormal operating condition that could cause personal injury or damage to the equipment or other property, other devices (limit or safety controls) or systems (alarm or supervisory systems) intended to warn of or protect against failure or malfunction of the P299 Electronic Pressure Transmitter must be incorporated into and maintained as part of the control system.

P299 transmitters are available in several pressure ranges, 3 different output signals and 2 pressure connection styles.

A selection of the following output signals can be made:
- 0 to 10Vdc signal
- 4 to 20mA signal
- Ratiometric analogue signal (0.5 to 4.5 VDC). At this model the output signal is proportional to the excitation voltage.

The pressure connection is 7/16-20 UNF (1/4" flare) male or female. Female models have a built-in valve core depressor.

The stainless steel housing is suitable for use with all non-corrosive refrigerants, and may also be used with other non-corrosive fluid applications. They are also ammonia compatible.

Operation

The pressure port includes a diaphragm, which deflects when a pressure is applied. Piezo resistive sensing elements, positioned on the diaphragm, convert this deflection into an electrical signal. An Application-Specific Integrated Circuit (ASIC) conditions and amplifies the signal to produce a proportional output signal linear with the sensed pressure. The pressure port is one stainless steel single component, without o-ring seals, which are susceptible to leakage.
The P299 transmitter measures pressure compared to a sealed reference pressure. It means that a change in gauge pressure will not affect the pressure read out.

Repair and Replacement

Repair is not possible. In case of an improperly functioning sensor, please check with your nearest supplier.

When contacting the supplier for a replacement you should state the type-model number of the control. This number can be found on the dataplate.

Mounting

CAUTION:
Mount the pressure control upright. Pressure tap points must be located on the topside of the refrigerant lines. This reduces the possibility of oil, liquids, or sediment accumulating in the pressure connection line or sensor, which could cause malfunction.

CAUTION:
Take care of maximum operation pressure when testing the installation. Exceeding the max. overpressure will permanently damage the sensor

Avoid severe pressure pulsation on pressure connections by positioning transmitter away from compressor discharge. When there are no severe pulsation and/or vibrations the sensor may be mounted directly to the compressor.

Wiring

For P299 sensors having 2m shielded cable, the shield has to be connected to the ground (earth) of the installation.

Wire colour / terminal identification

DIN 43650 connector	Cable	P299xVx P299xRx	P299xAx
1	Brown	Vdc (+)	Vdc (+)
2	Green	Common (-)	Common (-)
3	White	Sensor output	
Earth		Not connected	Not connected

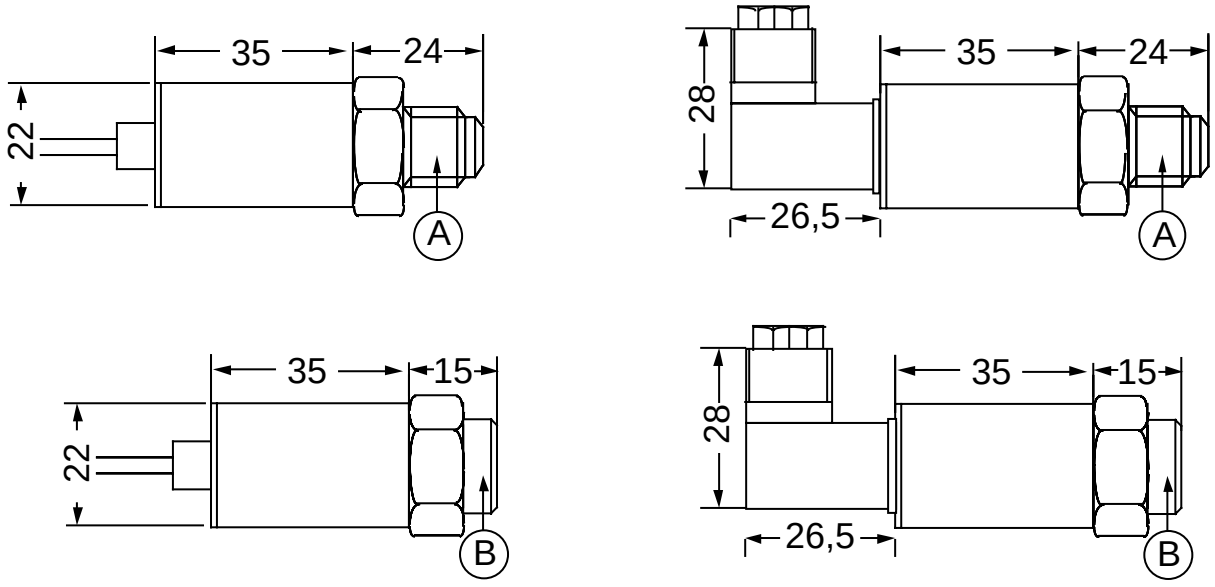
- The wiring harness leads may be extended up to 75m using min. 0.35mm^2, 3-wire, shielded cable.
- Avoid running low voltage cable in conduit or wiring troughs with high voltage wires.

The output is short circuit protected to both supply and common. Also, the sensor is protected against reverse polarity. In general, when within voltage limits miswiring does not cause any damage.

Ordering Information

Product Code	Range (bar)	Output	Connection style	Remarks
P299DRC-1C	–1 to 8 bar	0,5 to 4,5V	¼" SAE, female	2 m cable
P299DAB-1C	–1 to 8 bar	4 to 20mA	¼" SAE, male	
P299DAC-1C	–1 to 8 bar	4 to 20mA	¼" SAE, female	
P299DVB-1C	–1 to 8 bar	0 to 10V	¼" SAE, male	
P299DVC-1C	–1 to 8 bar	0 to 10V	¼" SAE, female	
P299ERC-1C	0 to 30	0,5 to 4,5V	¼" SAE, female	
P299EAB-1C	0 to 30	4 to 20mA	¼" SAE, male	
P299EAC-1C	0 to 30	4 to 20mA	¼" SAE, female	
P299EVB-1C	0 to 30	0 to 10V	¼" SAE, male	
P299EVC-1C	0 to 30	0 to 10V	¼" SAE, female	
P299FRC-1C	0 to 50	0,5 to 4,5V	¼" SAE, female	
P299FAB-1C	0 to 50	4 to 20mA	¼" SAE, male	
P299FAC-1C	0 to 50	4 to 20mA	¼" SAE, female	
P299FVB-1C	0 to 50	0 to 10V	¼" SAE, male	
P299FVC-1C	0 to 50	0 to 10V	¼" SAE, female	
P299DVB-2C	-1 to 8 bar	0 to 10 V	¼" SAE, male	DIN 43650 connector
P299EVB-2C	0 to 30 bar	0 to 10 V	¼" SAE, male	
P299DAB-2C	-1 to 8 bar	4 to 20mA	¼" SAE, male	
P299EAB-2C	0 to 30 bar	4 to 20mA	¼" SAE, male	
P299DAC-2C	-1 to 8 bar	4 to 20mA	¼" SAE, female	
P299EAC-2C	0 to 30 bar	4 to 20mA	¼" SAE, female	
P299HVC-2C	-1 to 15	0 to 10V	¼" SAE, female	

Dimensions



A: Pressure connection male 7/16"-20UNF

B: Pressure connection female 7/16"-20UNF

Specifications

Product	P299 Series Electronic Pressure Transmitter	
Pressure Ranges	See Table “Ordering Information”	
Max. continuous overpressure	1,5 x Upper Range Limit	
Burst Pressure	5X Upper Range Limit	
Vacuum	30 microns max (0.03 mm Hg) short term	
Media Compatibility	Non-corrosive refrigerants, lubricating oils, ammonia	
Supply Voltage	P299xRx (ratiometric) models:	5.00 ± 0.25 Vdc
	P299xAx (current) models:	11 to 32Vdc
	P299xVx (voltage) models:	14 to 32Vdc
	Note: Sensor is protected against reverse polarity	
Output Signal	P299xRx (ratiometric) models:	10% to 90% of supply voltage (0.5 to 4.5 Vdc nominal)
	P299xAx (current) models:	4 to 20mA (2-wire)
	P299xVx (voltage) models:	0 to 10Vdc
Output load	P299xAx (current) models:	R < (power supply –12V)/20mA
	P299xVx (voltage) models:	R > 5 kΩ
	P299xRx (ratiometric) models:	R > 5 kΩ
Pressure Connections	7/16” –20UNF (1/4” flare) female, with Schräder valve depressor	
	7/16” –20UNF (1/4” flare) male	
Electrical connection	P299xRx (ratiometric) models:	2m shielded cable 3 x 0,15mm^2
	P299xAx (current) models:	2m shielded cable 2 x 0,15mm^2
	P299xVx (voltage) models:	2m shielded cable 3 x 0,15mm^2 or DIN 43650 connector (see Ordering Inf.)
Storage conditions	-40 to 125^{o}C; 0 to 100% RH	
Ambient temperature	-20 to 65°C	
Media temperature	-40 to 125°C	
Accuracy	±1% For linearity, hysteresis, repeatability, and offset	
	±1% For thermal effects on gain and offset (within –20 to 65°C)	
Material	Stainless steel all welded construction (1.4301)	
Vibration	10G, 20-2000 Hz maximum	
IP class	IP67 (female connector as supplied with models having DIN 43650 connector have IP65)	
CE conformity	EMC 89/336/EEC	

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office or representative. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products.

JOHNSON CONTROLS

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Printed in Europe