

# PT4 Pressure Transmitters Technical Data



The PT4 Pressure Transmitters convert a pressure into a linear electrical output signal. At the heart of the transmitter there is a piezo resistive chip enclosed in an oil capsule.

**With even greater enhancement to the performance characteristics and a new easy to install pre-fabricated M12 cable assembly, the PT4 is the designers choice when selecting transmitters for refrigeration and air conditioning applications.**

### Features

- Pressure sensitive piezo-based cell with strong primary output signal for precise operation
- Sealed gauge absolute pressure reference principle provides the regulation accuracy independent from atmospheric pressure variation
- Output signal 4 to 20 mA
- Reduced Full Scale Error characteristics over the complete temperature range
- Calibrated for specific temperature and pressure ranges to fulfill application demands in air conditioning and refrigeration systems
- Easy install M12 electrical connection with pre-assembled cable assemblies available in various lengths
- Vibration, shock and pulsation resistant
- Protection class IP 65
- Compact dimensions
- Pressure connector 7/16-20 UNF with Schrader valve opener
- Standard pressure ranges compatible with former PT3 Emerson pressure transmitters
- CE-mark under EC EMC-Directive



**PT4-xxM  
Pressure  
Transmitter**

**PT4-Mxx  
Cable Assembly**

### Options

- Other pressure ranges and calibrations upon request and quantity
- Plug without cable upon request and quantity

### Selection Chart, Pressure Transmitters

Type	Emerson PCN	Part No.	Pressure range for signal output psi*	Output signal	Fluid temperature range	PS: Max. working pressure (psi*)	PT: Test pressure (psi*)	Burst pressure psi *	Pressure Connection
PT4-07M	097715	802 332	-12 to 102	4 to 20 mA	-58 to +275	363	399	2176	7/16" – 20 UNF (with Schrader valve opener)
PT4-18M	097716	802 333	0 to 261			479	522		
PT4-30M	097728	802 334	0 to 435			479	522		

\*) Gauge/relative pressure

### Selection Chart, Plug/Cable Assemblies

Type	Emerson PCN	Part No.	Length	Weight (ounces/pcs)	Temperature range
PT4-M60	097717	804 805	6.0 m	4.9	-58 to +176°C static application -13 to +176°C mobile application

Note: Longer length of the electrical connection cable beyond 6.0m must be verified by user in term of output signal as well as EMC within installed system.

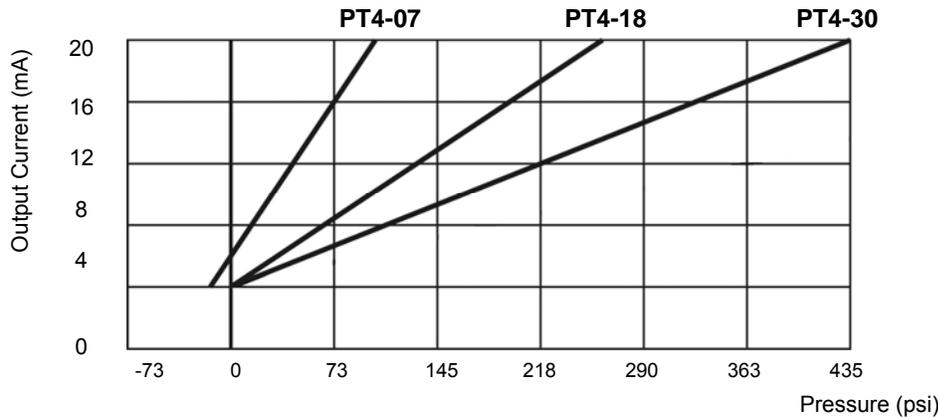
# PT4 Pressure Transmitters



## Introduction

The Emerson pressure transmitters PT4 are designed for pressure sensing and the generation of a linear electrical output signal. They are specifically aimed at applications in refrigeration and air conditioning systems. The PT4 standard 4 - 20 mA current output enables easy interfacing with most common signal processing

equipment. Various pressure ranges are available to match the operating pressures commonly encountered in refrigeration systems. The PT4 meet the requirements of the European EMC directive and are labelled with the CE-mark.

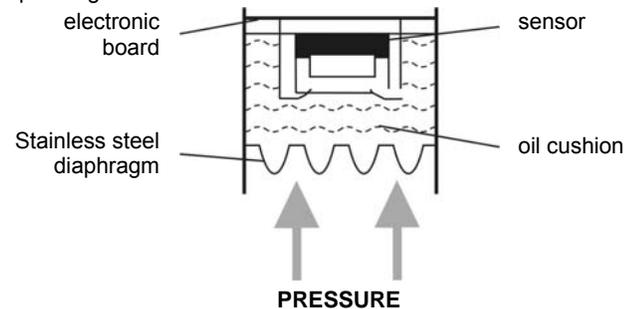


## Description

The heart of the transmitter is a pressure sensitive piezo resistive cell. This is surrounded by an *oil cushion* enclosed by a stainless steel diaphragm. The integrated electronic module conditions the output of the pressure cell to produce a temperature compensated signal of 4...20 mA.

The pressure cell consists of a silicon diaphragm with strain gauges diffused into it. A particular advantage of using silicon is its good hysteresis and creeping behavior. The direct integration of the strain gauges means that no additional errors can be introduced between the location where the pressure acts and where it is measured.

Separation of the pressure sensitive element by the oil cushion protects the sensor cell against external mechanical loads such as vibrations, pressure pulsations. This ensures reliable operation and a long life-time expectation even under severe operating conditions.



The protective stainless steel diaphragm ensures compatibility with the media frequently encountered in refrigeration systems. The outside of the PT4 consists of a corrosion resistant stainless steel enclosure. It is sealed at the electrical connector socket and at the pressure connector joint. This way, the PT4 meets the requirements of IP65.

The sensor works internally as an absolute measuring device. However, it is calibrated to produce a relative output signal assuming an ambient pressure of 14.5 psi. When using PT4 in heights significantly above sea level the output signal deviation must be taken into account. i.e. at a height of 1000m the signal reads approximately 1 psi lower than the actual pressure.

Short-term protection against wrong polarity is provided by an internal diode, up to 33 Vdc for the 4...20 mA output version PT4.

PT4 is compliant with the present electromagnetic compatibility legislation and in particular with the EMC directives 89/336/EC complying with EN-61000-6-2, EN-61000-6-3, EN-61000-6-4.

Pressure transmitters PT4 with current output (two wire connection) offer the following advantages:

- More suitable for signal transmission over long distance
- Higher immunity to electro-magnetic interference
- Open circuit detection enables fail-safe operation

## Cross Reference

PT4 series is a one for one replacement for Emerson transmitter series PT3.

PT3 series with 6.5 ft fixed cable	PT4 series with cable and plug assembly	
PT3-07A	PT4-07S and PT4-L30	PT4-07M and PT4-M30
PT3-18A	PT4-18S and PT4-L30	PT4-18M and PT4-M30
PT3-30A	PT4-30S and PT4-L30	PT4-30M and PT4-M30

# PT4 Pressure Transmitters



## Technical data

Supply voltage	
Nominal	24 Vdc
Range (polarity protected)	8 ... 30 Vdc
Permissible noise & ripple	< 1 V <sub>p-p</sub>
Influence of supply voltage	< 0.02 %FS/V
Operating current	4 to 20 mA output Maximum ≤ 24 mA
Load resistance	$R_L \leq \frac{U_b - 8.0V}{0.02A}$
Mounting position	Non position sensitive
Response time	1 ms
Temperatures	
Operating ambient housing	-40 ... +176 °F
Medium	-58 ... +275 °F
Transport and storage	-40 ... +185 °F

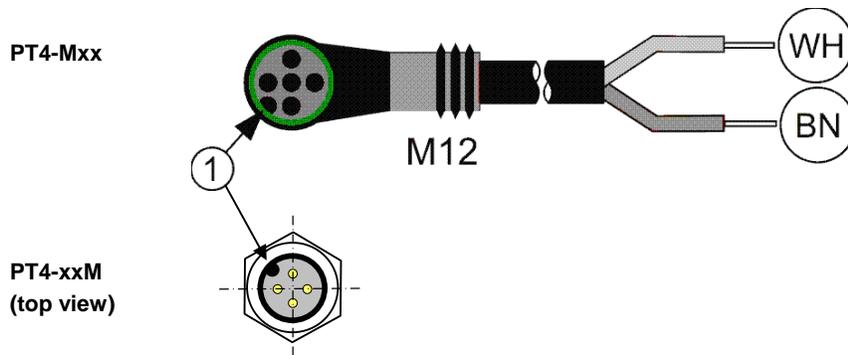
Sensor lifetime PT4 -07 /-18 /-30	≥ 5,000,000 cycles at full stroke at +77°F
Burst pressure	≥ 2176 psi
Electrical connection PT4-xxM Transmitters PT4-Mxx Cable Assemblies	M12 connection to EN61076-2-101 part 2 Pre-fabricated with various cable lengths
Approvals: CE marking according to PED CE marking according to EMC	Not allowed (SEP) CE marked
Medium compatibility not suitable for ammonia and inflammable refrigerants !	HFC, HCFC, CFC
Vibration at 10 ... 2000 Hz	max. 4 g
Protection class	IP65 (acc. to EN 60529)
Materials:	
Housing, pressure connector and diaphragm with medium contact	Stainless steel 1.4435 / AISI 316L
Weight approx. (without plug and cable assembly)	1.31 ounces

## Accuracy performance

Type	Total error *	Temperature range
PT4-07M	≤ ±1% FS	-40 ... +176 °F
PT4-18M	≤ ±1% FS	-4 ... +176 °F
PT4-30M	≤ ±1% FS	32 ... +104 °F
	≤ ±2% FS	-4 ... +140 °F
	Typically ≤ ±2% FS	-40 ... +176 °F

\*) Total error includes non-linearity, hysteresis, repeatability as well as offset and span drift due to the temperature changes.  
Note: %FS is related to Percentage of Full sensor Scale.

## Mechanical connection



The PT4-Mxx cable assembly can only be fitted onto the PT4 Pressure Transmitter one way.

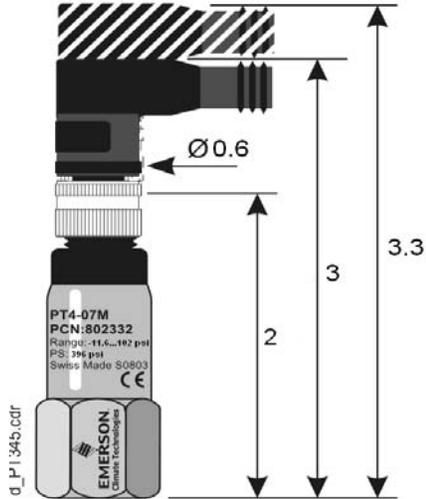
Locate the corresponding lug shown as (1) opposite.

# PT4 Pressure Transmitters

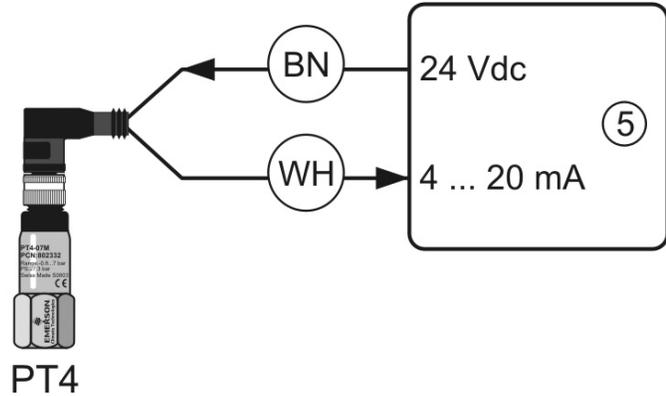


## Dimensions (in)

### PT4-xxM Series



### PT4-xxM Series Electrical Connections



(5) = Electronic Controller e.g. EC2 & EC3 Series

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