	<p style="text-align: center;">PT4</p> <p style="text-align: center;">Pressure Transmitters</p> <p style="text-align: center;">Technical Data</p>	<p>Document Nr.: A3.5.052/E -</p> <p>Replaces doc.: -</p> <p>Date: 01.10.2004</p>
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The PT4 Pressure Transmitters convert a pressure into a linear electrical output signal. The heart of the transmitters is a piezo resistive chip enclosed in an oil capsule. PT4 is designed specially for air conditioning and refrigeration 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
- Vibration, shock and pulsation resistant
- Protection class IP 65
- Compact dimensions
- Calibrated for specific temperature and pressure ranges to fulfill application demands in air conditioning and refrigeration systems
- Excellent performance within wide band of temperature variations
- Pressure connector 7/16-20 UNF with Schrader valve opener
- Electrical connection via various plug/cable assemblies
- Standard pressure ranges compatible with former PT3 ALCO pressure transmitters
- CE-mark under EC EMC-Directive
- UL LISTED

Options

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



PT4

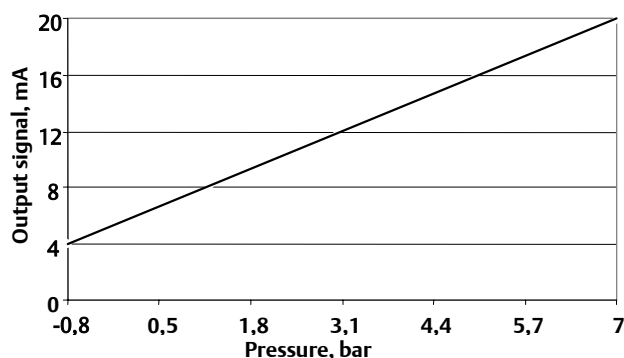
PT4-Lxx

Pressure Transmitter and Plug/Cable Assembly

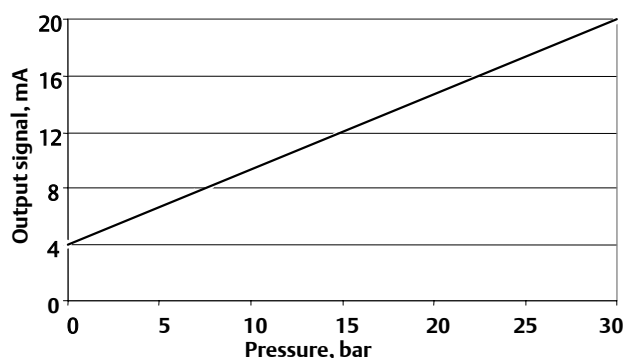
Introduction

The ALCO 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 the 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.



PT4-07S



PT4-30S



PT4 Pressure Transmitters

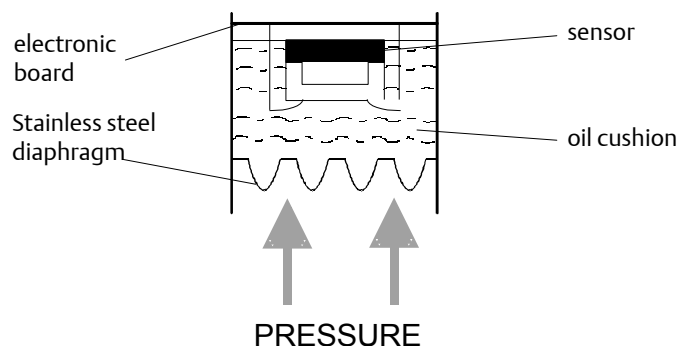
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Description

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 behaviour. 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 1.0 bar. When using PT4 in heights significantly above sea level the output signal deviation must be taken into account. I.e. at a height of 1.000 m the signal reads approximately 0.1 bar 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

Selection Chart, Pressure Transmitters

Type	Part Code number	Pressure range for signal output bar *	Output signal	Fluid temperature range	PS: Max. working pressure (bar) *	PT: Test pressure (bar) *	Burst pressure Bar *	Pressure connection
PT4-07S	802 320	-0.8 to 7	4 to 20 mA	-50 to + 135	25	27.5	150	7/16" -20 UNF (with schrader valve opener)
PT4-18S	802 322	0 to 18			33	36		
PT4-30S	802 324	0 to 30			33	36		
PT4-50S	802 326	0 to 50			50	55		

*) Gauge/relative pressure

Selection Chart, Plug/Cable Assemblies

Type	Part Code Number	Length	Weight (grams)	Temperature range
PT4-L15	804 593	1.5 m	70	-50 to +80°C
PT4-L30	804 594	3.0 m	130	
PT4-L60	804 595	6.0 m	240	

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.

Cross Reference

PT4 series is a one by one replacement for ALCO transmitter series PT3.

PT3 series with 2 meter fixed cable	PT4 series with cable and plug assembly
PT3-07A	PT4-07S and PT4-L30
PT3-18A	PT4-18S and PT4-L30
PT3-30A	PT4-30S and PT4-L30



PT4 Pressure Transmitters

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Technical data

Supply voltage	
Nominal	24 Vdc
Range (polarity protected)	8 ... 30 Vdc
Permissible noise & ripple	< 1 V _{p-p}
Influence of supply voltage	< 0,02 %FS/V
Operating current	4 to 20 mA output Maximum ≤ 28 mA
Load resistance	$R_L \leq \frac{U_b - 8.0V}{0.02A}$
Mounting position	Non position sensitive
Response time	0.16 ms
Temperatures	
Operating ambient housing	-40.....+80 °C
Medium ¹	-50...+135 °C
Transport and storage	-40.....+85 °C

Sensor lifetime	≥ 5.000.000 cycles at full stroke at 25°C
PT4 -07 /-18 /-30 /-50	
Burst pressure	≥ 150 bar
Electrical connection	Spades for plug according to: EN175301-803, form "C", <u>Industrial version</u>
Approvals:	
CE marking according to PED	Not allowed (SEP)
CE marking according to EMC	CE marked
UL LISTED SDFY2/SDFY8.E258370	UL marked
Medium compatibility	HFC, HCFC, CFC
not suitable for ammonia and inflammable refrigerants !	
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)	42 grams

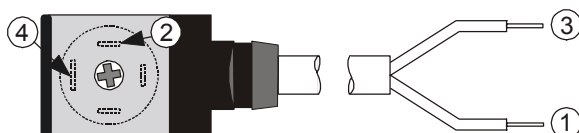
Accuracy performance

Type	Total error *	Temperature range
PT4-07S	≤ ±1% FS ≤ ±2% FS Typically ≤ ±2% FS	-40 0 °C 0 +60 °C -40 +80 °C
PT4-18S	≤ ±1% FS ≤ ±2% FS Typically ≤ ±2% FS	-20 +20 °C -40 +60 °C -40 +80 °C
PT4-30S	≤ ±1% FS ≤ ±2% FS Typically ≤ ±2% FS	0 +40 °C -20 +60 °C -40 +80 °C
PT4-50S	≤ ±1% FS ≤ ±2% FS Typically ≤ ±2% FS	0 +40 °C -20 +60 °C -30 +80 °C

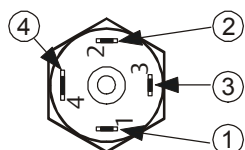
*) Total error includes non-linearity, hysteresis, repeatability as well as offset and span drift due to the temperature changes.
Note: %FS is related to **P**ercentage of **F**ull sensor **S**cale.

Electrical connection

PT4-Lxx (top view)



PT4-xxS (top view)

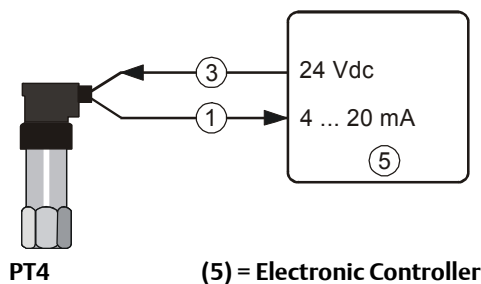


- (1) = Pin 1 connected to white wire; 4 ... 20mA signal output
- (2) = Pin 2 not connected; used for mechanical stability only.
- (3) = Pin 3 connected to brown wire: 24V dc input
- (4) = Pin 4 not connected. Pin 4 and slot 4 have wider size than the other pins. Plug can only be inserted in one position.



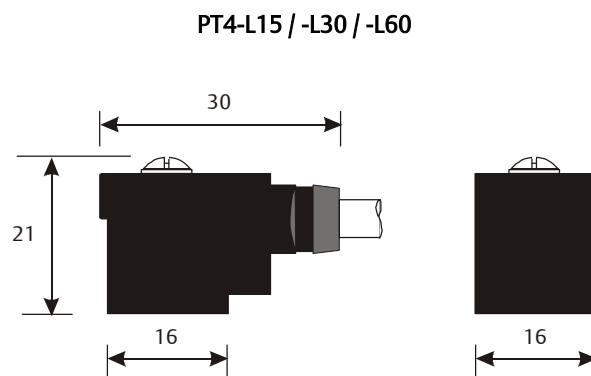
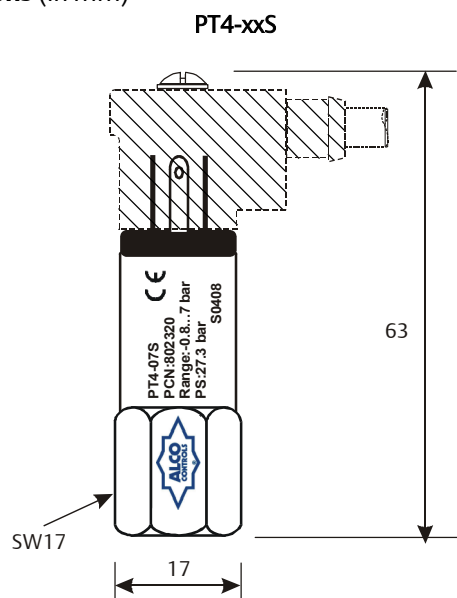
PT4 Pressure Transmitters

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Part	Supply, +24Vdc	Signal, 4-20mA
PT4-xxS (Pressure transmitter)	Pin (terminal) 3	Pin (terminal) 1
PT4-Lxx (Plug/Cable)	Brown wire	White wire
Former PT3 (Transmitter with fixed cable)	Brown wire	White wire

Dimensions (in mm)



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