

Pressure transmitter PT03

Digital pressure transmitter for universal use.



Low cost pressure transmitter with body in stainless steel for pressure and level measurement.

INNOVATIVE AND FLEXIBLE DESIGN. KEY FEATURES:

- Digital electronics. 4-20 mA signal. Pressure and temperature values via MODBUS communication (PT03RS).
- MODBUS communication via RS485 (PT03RS). Registry based for all needs (transfer of values, configuration and maintenance).
- Innovative Autozero function as standard. Just shorten two pins.
- Fixed or adjustable ranges (can on PT03RS be readjusted via MODBUS communication).
- Accuracy 0,35 % (option 0,15 %).
- Small diameter, only 20 mm (except key grip 22 mm), to fit in narrow applications.
- Withstands media temperatures up to 80 °C continuously.
- Stainless steel IP67 body with a 316L stainless steel diaphragm.
- Well protected diaphragm.
- Completely casted electronics for highest possible reliability.
- Well tested and approved for CE (EMC and PED), ATEX (pending).



Types and order codes:

The transmitters order codes for different configurations can be found from the table below.

PT03xxx - x x x x

	Description	Suffix	Figure 1	Figure 2	Figure 3	Figure 4
Electronics	Fixed digital	FD				
	Modbus communication	RS				
	Intrinsic safe Exia	RSE				
Diaphragm	Stainless steel 316L		3			
Connection	G 1/4" external			00		
	G 1/2" external			1		
	NPT 1/2" external			2		
Span min.-max.	35 kPa				2	
	200 kPa				4	
	2 MPa				6	
	3,5 MPa				7	
Design	Atmospheric pressure					0
	Absolute pressure					2

Ordering example

Pressure transmitter with G 1/4" connection, Modbus communication and Autozero, calibrated range 0-35 kPa and relative pressure will have the order code: **PT03RS-30020**

Description

PT03 is a pressure transmitter for universal applications.

PT03 has a house with diameter 20 mm (except key grip that is 22 mm) to fit in narrow applications.

The transmitter has a 316L stainless steel measuring diaphragm for high corrosion resistance.

PT03 can as an option also be delivered in intrinsic safe design, Exia (Pending).

PT03FD have fixed measuring ranges and no communication. PT03RS can communicate via MODBUS. Range etc. can be set by the user.

Function

PT03 has a piezoresistive sensor connected to the media by means of a diaphragm. The media pressure acts on the diaphragm and is transferred to the sensor through a pressure intermediate oil. Since this oil completely fills the volume between the diaphragm and the sensor the diaphragm movement is very small when the pressure changes. To obtain atmospheric pressure on the back side of the

sensor (for reference pressure) it is connected to the surrounding through a capillary tube inside the probe cable (absolute pressure versions have no tube).

PT03 has microcomputer-based electronics, which communicate with the outside world with 4 to 20 mA signal as well as MODBUS communication (PT03RS). The electronics measure and converts the output signal from the pressure dependent sensor bridge to digital values.

The digital value is converted to analogue for the 4 to 20 mA current loop.

The digital value can also be read via MODBUS communication (PT03RS) in optional engineering units, percentage or current. PT03RS can be configured/calibrated fully by means of a PC via MODBUS communication.

MODBUS Communication

MODBUS communication can be used for transfer of measured values, for example the level and the media temperature (etc.). The communication can also be used for configuration of all PT03RS parameters direct from a suited

control system or from a PC (with appropriate software).

The MODBUS communication is fully registry based (see the manual for PT03 for more information).

Physical interface for MODBUS is RS485, 4 lines.

Supply voltage (8-36 VDC) use the 4-20 mA lines and the communication use two separate lines A and B.

A standard RS485 dongle can be use (it is recommended to use an optoisolated RS485 dongle).

A specially designed communication box, PI200PS, with battery supply and USB connection to the computer can be delivered. This package include drivers and the configuration PC program MEP7 Modbus Tool.

NOTE! RS485 connection can not be used in Ex zone!



Autozero function

PT03RS and PT03FD has an innovative solution to eliminate the problem of zero shift (due to for example orientation, covering or mechanical damage of the diaphragm). Just place PT03 in free air (zero pressure on the diaphragm) and shorten M12 connector pin 3 and 4 for ten seconds. This action resets the 4 mA to zero pressure (and also makes the communication to send zero level in engineering units).

Approvals

PT03 is CE approved according to the EU directives for pressure equipment, PED, and EMC. PT03RSE is explosionproof approved, ATEX Exia IIB T4, by NEMKO (Pending).

Intrinsic safety, Exia (pending)

PT03RS can as an option be delivered in intrinsic safe design, Exia IIB T4, according to ATEX. The transmitter will then have the code PT03RSE where E indicates "Exia".
NOTE! RS485 connection can not be used in Ex zone!

PI MEP7 Modbus Tool

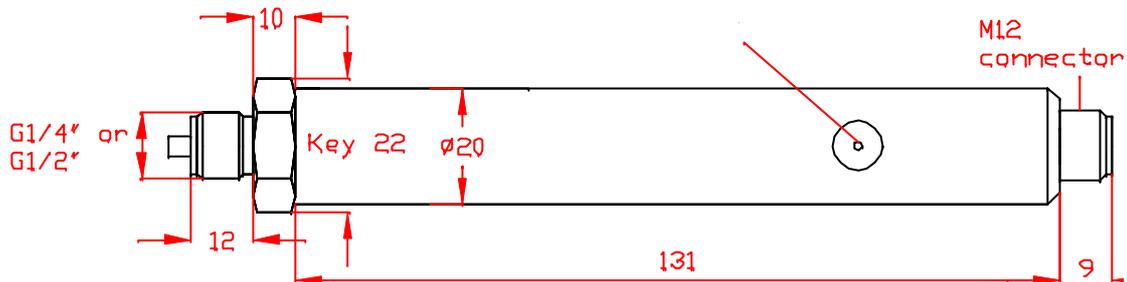
PI MEP7 Modbus Tool is a software tool on CD-ROM for Windows for reading of values, configuration, calibration and documentation. The program can configure transmitter specific values and perform maintenance, output signal and factory calibration.

Connection box with display, BOX100D

A specially designed connection box with display can be delivered as an accessory. The display can show the signal in optional engineering units, for example mA, kPa or mH₂O. Unit and limits is made to order.

The display is connected in series with the signal/supply cable and is feed by the current loop. The box is equipped with cable glands and terminals for connection of the transmitter cable and the signal/supply cable.

The box can also be equipped with reinforced lightning protection. Protection class IP67.



Connection and adjustment

Connection

The transmitter is connected via a M12 4 pin connector:

1	Signal/supply +
2	Signal/supply -
3	RS485A/Autozero 1
4	RS485B/Autozero 2
Shield	Ground
Vent hole	Atmosphere pressure (Absolute pressure version has no vent hole)

Adjustment

Adjustments can be done through MODBUS communication (for PT03RS) and with the Autozero function.

Size

Size:	
Diameter	20 mm
Key grip	22 mm
Length	150 mm (+ thread)

To consider

Highest media temperature is +80°C.
Make sure that the vent hole is connected to the surrounding atmosphere without the risk for plugging. If possible place vent hole downwards.
Make sure there is no free hydrogen ions in the media!
Make sure that the diaphragm withstands the media!

Behind the Vent hole there is a Fluid Filter mounted to prevent moisture to enter. DO NOT COVER!

Technical specification PT03:

Type:	Electronic pressure transmitter with digital electronics	Supply voltage dependance:	Better than +/- 0,1%
Function:	Directly connected transmitter with piezoresistive sensor	Temperature dependance:	From 0 to 80 degrees C.
Operating range:	From 0% to 100% of upper sensorlimit	Zero:	Max +/-0,01% per degree C*2
Span:	Fixed or adjustable ranges see page 2	Span:	Max +/-0,02% per degree C*2
Zero:	0 mH2O fixed or adjustable (4 mA+/-0,35%)	Long time stability:	Better than 0,1 % per year.
Overload:	35 kPa: Max 110 kPa	Vibration dependance:	
	200 kPa: Max 300 kPa	Perpendicular to the diaphragm:	Max +0,3 kPa/G
	2 MPa: Max 6 MPa	Parallell to the diaphragm:	Max +0,02 kPa/G
	3,5 MPa: Max 6 MPa	Repeatability:	Better than +/- 0,1% of max range.
Material:	Diaphragm: Stainless steel 316L	Accuracy:	Better than +/- 0,35% of max range (including nonlinearity, hysteresis and repeatability).*1
	Other media touched parts: Stainless steel SS2353	Electrical connection:	M12 4 pin
Ambient temperature:	-20 to +80 degrees C	Intrinsic safety (option):	Exia IIB T4 according to ATEX (by NEMKO)*3
Damping:	1 s fixed or adjustable	Encapsulation:	Better than IP67
Media temperature:	Max 80 degrees C	Electrical safety:	According to EN 60204-1
Output:	4-20 mA, two wire connection, signal proportional to the pressure. Max current at overload 24 mA. MODBUS communication.	EMC:	According to EN 61326-1-2-3
Supply:	6-36 V DC (for Ex version 6-27 V DC)	PED:	According to 97/23/EG
Filling liquid:	Silicon oil	Lightning protection (with option BOX100):	Class 1 testing according to IEC61643-1. 5kA (10/350 uS).
Series resistance:	$R_{kohm} = (Supply\ voltage - 6)/20$.	Weight:	150 g
Series resistance dependance:	Better than +/- 0,1%		

*1 Option accuracy 0,15% (for 35 kPa range 0,25%)

*2 Span and zero temperature dependance for 35 kPa range max +/-0,06 per degree C.

*3 Pending

MODBUS is a registred trademark for Modbus Organisation.

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