Mounting instructions TST-SMH

High pressure transmitter

This product must be installed and taken into operation in accordance with these Operating Instructions and by authorized personnel only!

Function

The pressure transmitter of the **TST-SMH** series are suited for measuring pressure in plants and systems with gaseous or liquid process media.

Standard pressure ranges					
Measuring range	**P(bar)**	**1600**	**2000**	**2500**	**4000**
Overload pressure	P(bar)	2400	2400	3600	4800
Bursting Pressure	P(bar)	3000	3000	4500	6000

Technical data	Type: TST-SMH high pressure transmitter	
Electrical parameters		
Output signal*	4 … 20 mA (2- or 3-wire)	0 … 10 V DC (3-wire)
Operating voltage U_B	9 … 32 V DC	12 … 32 V DC
Permitted max. load R_A	$R_A \leq (U_B - 9\ V) / 20\ mA$	
Recommended max. load resistor R_L		$R_L > 5\ k\Omega$
Response time* (10 … 90%)	< 1 ms	< 1 ms
Electric strength	350 V DC	350 V DC
Accuracy specifications	**pressure ranges ≤ 2000 bar**	**pressure ranges > 2000 bar**
BFSL (Best Fit Straight Line)	≤± 0,15 % of range	≤± 0,25 % of range
Total error at RT	**≤± 0,50 % of range** including nonlinearity, hysteresis, zero point and full scale error (according to IEC 61298-2). Optional ≤± 0,25 % of range or	**≤± 1,00 % of range** ≤± 0,50 % of range available
Stability per year	≤± 0,10 % of range	≤± 0,20 % of range

* Other output signals (e. g. 0 … 5 V DC; 0,5 … 4,5 V DC ratiometric) and other response times upon request.

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Technical data	Type: TST-SMH high pressure transmitter
Temperature ranges	
Media temperature	-40 … +125 °C
Ambient temperature	-40 … +105 °C
Storage temperature	-40 … +125 °C
Compensated temperature range	-20 … +85 °C
Temperature coefficient zero point	≤± 0,15 / 10K (% of range)
Temperature coefficient range	≤± 0,15 / 10K (% of range)
Total Error	at -40 °C – 2,00 % of range
	at +105 °C – 2,00 % of range
Mechanical parameters	
Sensor element	stainless steel on media side
Material of parts with contact to measuring medium	stainless steel (316L)
Housing	stainless steel
Process connection*	M 18x1,5; M16x1,5, others on request
Gasket	double seal cone
Electrical connection	connector M12x1, MVS / A, MVS / C, others on request
Weight	120 …150 g according to layout
Shock resistance	1000 g according to IEC 68-2-32
Vibration resistance	20 g according to IEC 68-2-6 and IEC 68-2-36
CE conformity	EMC directive 2004 / 108 / EC
IP protection class	corresponding to the used and connected mating connector

* Pressure connection is sealed by double seal cone. The screw connection must be tightened using the specified torque.

2. Important information before installation

Observe the notes and warnings of these operating instructions by all means.

Install and start the pressure transmitter only if you are familiar with the relevant regulations and directives of your country and if you have the qualification required. You have to be acquainted with the rules and regulations on measurement and control technology and electric circuits, since the pressure transmitter of the **TST –SMH** series are „electrical equipment“ as defined by EN 50178.
Depending on the operating conditions of your application you must have the corresponding knowledge, e.g. of very high pressures or aggressive media.

Please observe the limit values defined in these Operating Instructions or the technical specification sheets, such as maximum pressure, force and temperature.

Please consider the prevailing ambient conditions (temperature, air pressure, humidity, etc.).

Use the pressure transmitter in its original state only. Do not tamper with the product.
The device contains no components that would require any maintenance.

3. Safety instructions

Ensure that the pressure transmitter is only operated in accordance with the provisions i.e. as described in the following instructions.

Select the appropriate pressure transmitter with regard to scale range, performance and specific measurement conditions prior to installing and starting the instrument.
Observe the ambient and working conditions according to the technical data sheet. In case of a deviation from the ambient conditions specified above (i.e. temperature ranges) the pressure transmitter of the **TST –SMH** series might be seriously damaged.

Observe the technical data for the use of the pressure transmitter in connection with aggressive / corrosive media and for the avoidance of mechanical hazards.

The values given in the technical data sheet according to overrange protection (overload range and bursting pressure) refer to the pressure-exposed parts of the pressure transmitter.

Please make sure that the pressure transmitter is only used within the overload threshold limit all the time!

Observe the relevant national regulations (e.g.: EN 50178) and observe the applicable standards and directives for special applications (e.g. with dangerous media such as acetylene, flammable gases or liquids and toxic gases or liquids and with refrigeration plants or compressors).

If you do not observe the appropriate regulations, serious injuries and/or damage can occur!

Open pressure connections only after the system is without pressure!

Do not interfere with or change the pressure transmitter in any way.

Open circuit before removing connector / cover. If faults can not be rectified, the pressure transmitter must be taken out of service and secured against unintentional commissioning.

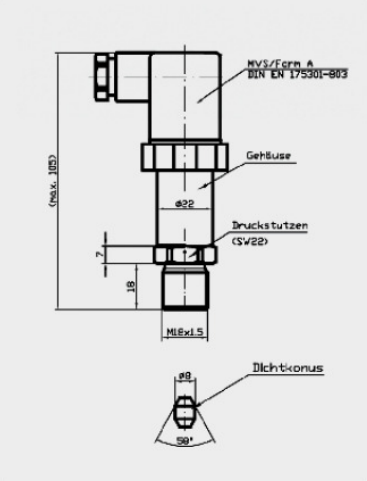
Take precautions with regard to remaining media in removed pressure transmitter. Remaining media in the pressure port may be hazardous or toxic!

4.1 Mounting mechanical connection

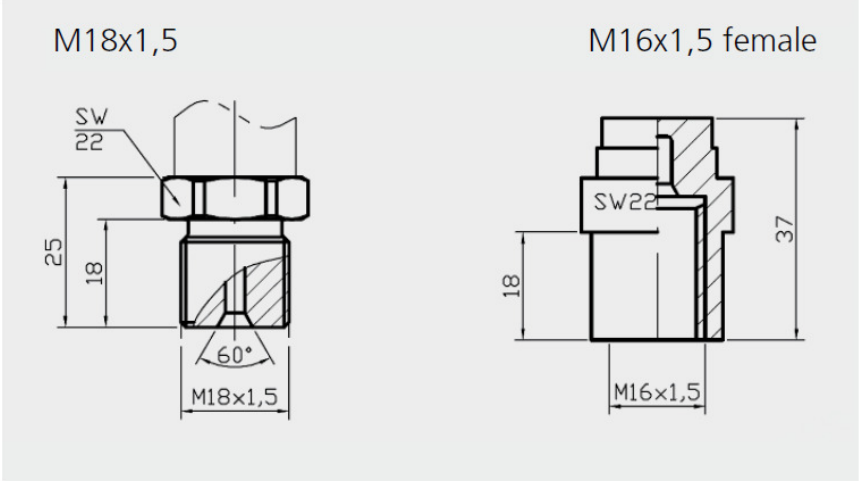
Use an appropriate wrench to insert the pressure transmitter into the respective pressure connection. Screw in or unscrew the instrument only via the flats using a suitable tool and the prescribed torque. The appropriate torque depends on the dimension of the pressure connection and on the sealing element used (form/material). Do not use the case as working surface for screwing in or unscrewing the instrument. When screwing the transmitter in, ensure that the threads are not jammed.

The torque is approximately 25 Nm

Dimensional drawing



Process connectors



For sealing the system, use the prescribed double seal cone or the prescribed sealing ring of the respective dimensions specified for this type of mechanical connection.

Verify the correct position of all necessary sealings and the appropriate assembly, otherwise the IP protection class of the mechanical connection can not be guaranteed.

When touching the pressure transmitter, keep in mind that the surfaces of the instrument components might get hot during operation.

4.2 Mounting electrical connection

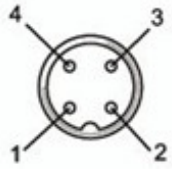
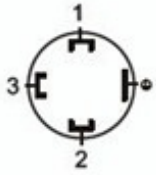
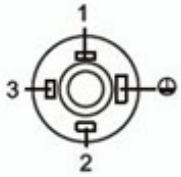
The entire wiring must meet local regulations and must be performed by authorized personnel only. High and low voltage lines are to be kept separate. Use cable that is appropriate to the installation environment. Electrical power must be connected in accordance with the respective connection diagram, **unless otherwise agreed upon.** Damage/destruction may result otherwise. Do not crush cables.

Connect the instrument to earth via the pressure connection.

Ingress protection per IEC 60529 (The ingress protection classes specified only apply while the pressure transmitter is connected with female connectors that provide the corresponding ingress protection).

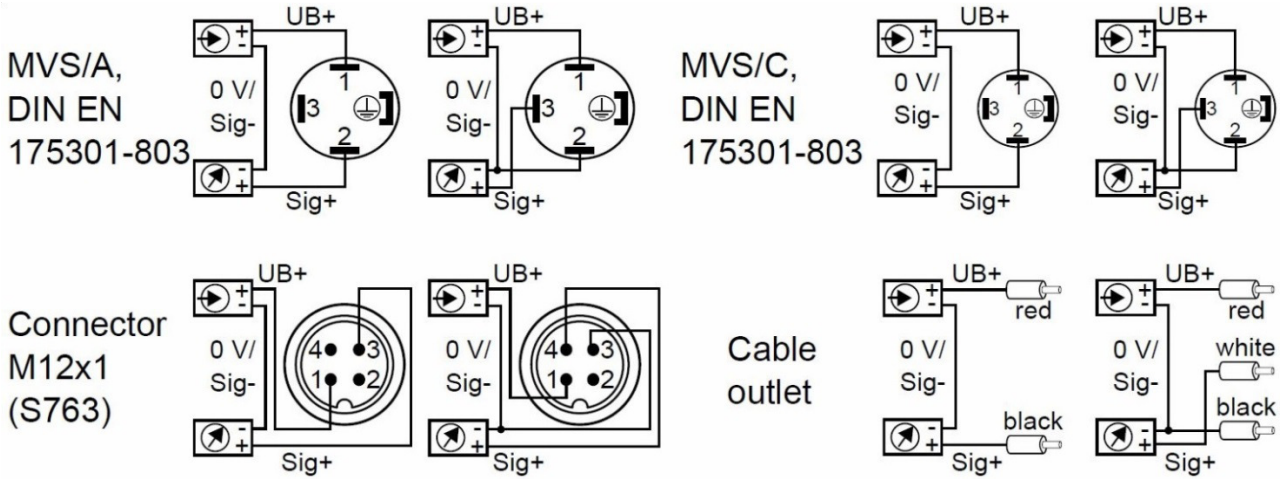
Ensure that the cable diameter you select fits to the cable gland of the connector. Ensure that the cable gland of the mounted connector is positioned correctly and that the sealings are available and undamaged. Tighten the threaded connection and check the correct position of the sealings in order to ensure the ingress protection. Please make sure that the ends of cables with flying leads do not allow any ingress of moisture.

4.3 Electrical connections

Plug M12x1	Cable port	DIN EN 175301-803-A	DIN EN 175301-803-C
			
Power 1: UB+ 2: nc 3: out 4: nc	Power red : UB+ black: out white: nc	Power 1: UB+ 2: out 3: nc	Power 1: UB+ 2: out 3: nc
Voltage 1: UB+ 2: nc 3: UB- 4: out	Voltage red: UB+ black: UB- white: out	Voltage 1: UB+ 2: UB- 3: out	Voltage 1: UB+ 2: UB- 3: out
Other pin assignments possible. Please see type plate!			

nc = not connected
The electrical connection must be made in accordance with the respective connection diagram unless otherwise agreed upon.

PIN assignment



5 function test

The output signal has to be proportional to the measured pressure.
Wherever this is not the case, it can be a sign for a damage of the membrane.

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