TSA20

Electronic Temperature Sensor with LED-display (optional)

- **Pt100 resistance thermometer measuring range: -50...+250 °C**
- **analogue output 4...20 mA (current loop, HART®)**
- **optional with display and additional switching points**
- **accuracy class A, B, AA (B 1/3 DIN)**
- **universe useable as temperature switch, temperature sensor and/or temperature indication**
- **material of wetted parts: stainless steel 1.4571**
- **easy programming of switching points and analogue output with keys**
- **display 330° rotatable and 180° mirror-inverted**

Description:
The electronic temperature sensor of the series TSA20 measures the medium temperature with a Pt100 resistance thermometer. The analogue output continuously indicates the current temperature; the optional switching outputs are used for electronic limit control.
In the version with display, the temperature is displayed and the setting can be made directly on the device. The programming of the device without display is done by the factory or via HART® communication.
At higher temperatures, a neck pipe protects the electronics from overheating. Due to the large measuring range from -50 to + 250 °C, the different process connections and installation lengths, a very flexible application is possible in almost all industrial processes.

Typical applications:
Due to its versatility, the temperature sensor TSA20 is very universally applicable. It is mainly used in cooling and heating circuits, plants, compressors and motors.

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Materials:

Housing:	PBT GF30, Display-Top: Polycarbonate
Wetted parts:	stainless steel, 1.4571
neck tube (optional):	stainless steel, 1.4571

Technical data:

Process connection:	different, see ordering code
Media temperature:	-50...+250 °C
Ambient temp.:	-20...+80 °C
Storage temp.:	-40...+100 °C
Accuracy:	
Sensor:	Accuracy class A, B, AA (B1/3 DIN)
Transmitter:	+/- 0,3% of measured range
Indication:	+/- 0,2 % of measured range, +/-1 Digit
Resolution:	16 Bit
Measuring rate:	10 measurements/s
Filter settings:	0...99 s
Adjustments:	Per Software (HART® Communication) or via display (optional)
Transmission behaviour:	temperature linear
Mounting position:	any
Pressure:	PN 25
Weight:	ca. 140 g (150 g with display)
Protection class:	IP65 (electronic)

Electrical Data:

Sensor:	Pt100, class A, B, AA (B 1/3 DIN)
Power supply:	12…40 VDC
electr. connection:	different, see ordering code
Analogue output:	4...20 mA current loop, HART® (2-wire)
Current range:	3,8...20,5 mA
Signal on error:	3,6 mA (sensor short circuit, underflow) 21 mA (sensor break, sensor open circuit, overflow)
Load:	$R=(U_B-12\ V)\ /\ 22\ mA$

Display (optional):

Display:	7-segment-LED , red, 8,5 mm, representation mirror-inverted 180°
Head of display:	rotatable approx. 330°
Memory:	minimum / maximum values
Indication:	measuring value / unit of measurement / control menu
Decimal point:	automatically or manually, dependent on measuring range / unit
Resolution:	-9999...9999 digit
Error of measurement:	+/- 0,2 % of range, +/- 1 digit
Temperature drift:	100 ppm/K

Limit contacts (optional):

Electronically:	1 or 2 NPN or PNP
Max. switching capacity:	200 mA (optional 1000 mA), 30 VDC
Indication:	1 LED red for each limit value LED lights up: transistor conductive LED dark: transistor locked
Voltage across:	<1 V
Settings:	with 3 keys (TouchM-Technology)
Setting range:	switch point and hysteresis: any value within measuring range
Switching delay:	0,0...999,9 s
Failsafe-function:	adjustable
Galvanical insulation:	switching outputs are separated from measuring amplifier

Programmable Features (via keys):

Measuring amplifier:	measuring range start (LRV) measuring range end (URV) adjustment, simulation of output current, filter function linear output signal HART®-address 2-point calibration
Display (optional):	range of indication time of indication decimal point units stabilisation of zero point locking of programming calibration points TAG number
Limit value contacts: (optional)	limit value 1 and 2 limit value 1 and 2 delay times 1 and 2

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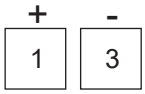
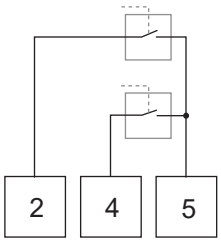
Connection Example:

Assignment plug M12 x 1, 8 pole:

Current loop 4… 20 mA, HART®:



Electronical limit value contacts (optional):



Shield:

HART®-Communication:

The HART-Tool is a graphical user interface with menu-driven program for configuration. It can be used for putting into operation, configuration, analysis of signals, data backup and documentation of the device.

Operating systems:	Windows2000, Windows XP, Windows 7, Windows 8.1
Connection:	HART® Interface PC-USB interface hand-held HART®-Communicator
Settings:	Adjustment of output current Limits of measuring range 2-point calibration Simulation of output current Linear output signal Filter function HART® address with option switching contacts: limit value 1 and 2 hysteresis value 1 and 2 delay times 1 and 2

Please note:
When using communication via a HART modem, a communication resistance of 250 Ω has to be taken into account.

Ordering code:

Ordering code: **TSA20.** **S. 1. 6S. A. 1. 4. W. 0. 0.**

Electronic temperature sensor

Version:
S = without display (no limit contact)
A = with indication and keys

Model of sensor:
1 = Class A (Standard)
2 = Class B
3 = Class AA (B1/3 DIN)

Protective tube:
6S = Ø 6 mm
1X = others (please specify)
6H = Ø 6 mm with neck tube
1H = others with neck tube (please specify)

Installation length:
A = 50 mm
B = 100 mm
C = 200 mm
D = 250 mm
E = 400 mm
F = 600 mm
G = 1000 mm
S = other length (please specify)

Process connection:
1 = G 1/4 male thread
2 = G 3/8 male thread
3 = G 1/2 male thread
4 = G 3/4 male thread
5 = G 1 male thread
6 = 1/4“ NPT
7 = 3/8“ NPT
8 = 1/2“ NPT

Electrical connection:
4 = M12x1, 4-pole (max. 1 limit switch)
5 = M12x1, 5-pole (for 2 limit switches)
8 = M12x1, 8-pole
1 = Valve connection, 4-pole (max. 1 limit switch)

Output signal:
(limit switches only at version A):
0 = 4...20 mA, without limit switches
1 = 4...20 mA and 1 x PNP, 30 VDC, 200 mA
2 = 4...20 mA and 2 x PNP, 30 VDC, 200 mA (standard)
3 = 4...20 mA and 1 x NPN, 30 VDC, 200 mA
4 = 4...20 mA and 2 x NPN, 30 VDC, 200 mA
5 = 4...20 mA and 1 x PNP, 30 VDC, 1000 mA
6 = 4...20 mA and 2 x PNP, 30 VDC, 1000 mA
7 = 4...20 mA and 1 x NPN, 30 VDC, 1000 mA
8 = 4...20 mA and 2 x NPN, 30 VDC, 1000 mA

Configuration output signal:
W = 0...200 °C (factory setting)
K = customised, minimum range 50 K (please specify)

Options:
0 = without
1 = please specify in writing

Accessories:

PVC-cable **SM12** with M12 plug, 4-or 5 pole
HART®-tool: modem with HART®-cable, USB-cable, software

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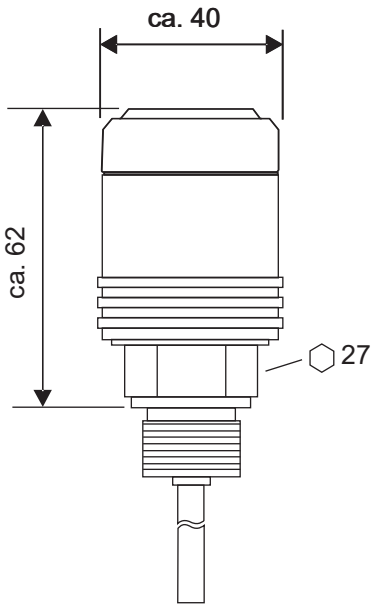
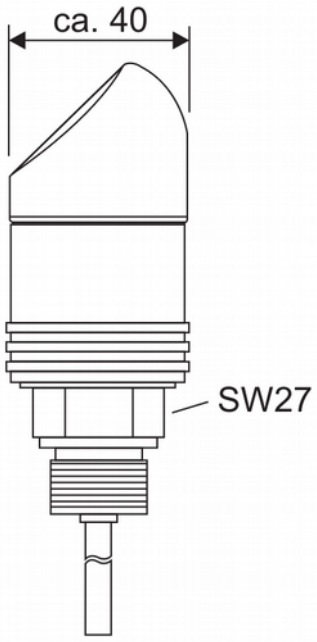
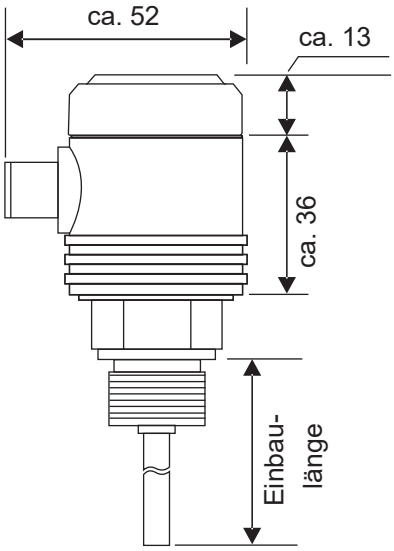
Dimensions:

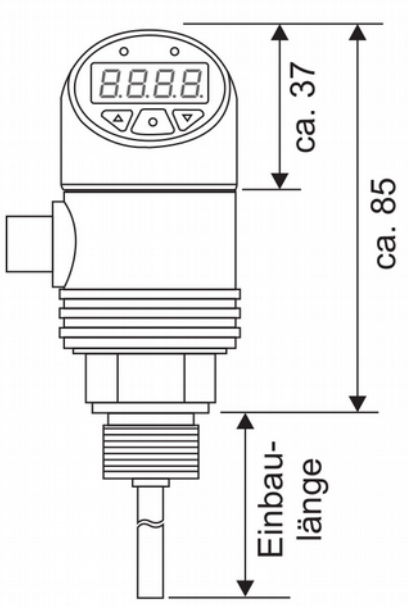
TSA20-S, without Display:



TSA20-A, with Display:







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