



Temperature measurement

Pressure switch for general applications
Monitoring of absolute or relative pressure
in gases, vapors, liquids and dust



Type:
Thermocont® TS4S

In brief



Application

- General applications in
 - Machinery and plant engineering
 - Air-conditioning and refrigeration plant engineering
 - Hydraulic and pneumatic systems
 - Process industry
 - Environmental technology

Your benefits

- **Wide range of applications**
- Wide process temperature range $-99,9^{\circ}\text{C}$ to $+500^{\circ}\text{C}$
- High process pressure tightness up to 100 bar
- Wide variety of process connections
- High protection class IP65 / IP67
- Wide environmental temperature range -40°C to $+85^{\circ}\text{C}$
- Long term stable temperature sensor platinum Pt100 class A – DIN EN60751
- Increased process safety and cost saving by self-supervising measuring system
- High accuracy – characteristic deviation $\leq 0,5\%$ of measuring range
- Integrated evaluation electronic: Digital display, function LED's, keyboard / 2x PNP switch output / 1x current output 4...20mA / Connector plug M12
- **High operating comfort:** enclosure and display rotatable for *optimal operability* in each installation position
- Robust high brightness LED display for *best readability*
- 3-key operation without additional assistance with tactile feedback

Description

The device is an electronic temperature switch for monitoring, control as well as continuous measurement of temperatures in gases, vapors, liquids and dusts. Due to the device construction with porocess temperature from up to $-99,9^{\circ}\text{C}$ to $+500^{\circ}\text{C}$, process pressures up to 100 bar, process contacting material stainless steel V4A as well as the availability of a variety of process connections like connection for compression fitting, thread connections ISO 228-1, thread connection ISO 228-1 with front-flush O-ring gasket the device is especially suitable for the use for machinery and plant engineering, air-conditioning and refrigeration plant engineering, hydraulic and pneumatic systems, process industry, environmental technology and paint and coating industry. The temperature switch is suitable for demanding measuring requirements.

Due to its high accuracy and the high flexibility of configuration, the device can be suited a wide variety of applications.

Compared with temperature sensors, which are calibrated cyclic, the process safety increases when using the temperature switch with self-supervision. At cyclic calibration an occurring drift will be also detected, but an undefined time it has been produced with a drift affected sensor. Because the device generates a signal immediately at exceedance of the set drift limit, it must not be waited until to the end of the calibration interval. Thus the process safety and with this the product quality will be improved significantly.

Besides the increased process safety, the use of the temperature switch with self-supervision allows substantial cost savings. Due to the use of two redundantly working sensors, which are mutually monitored, the calibration intervals can be increased



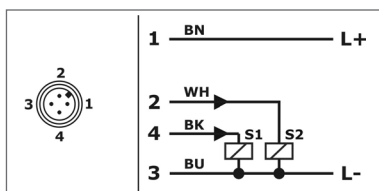
und thus calibrations can be saved. The pressure switch with front-flush O-ring gasket has been specifically designed for the measurement of viscous, paste-like, adhesive, crystallizing, particle-laden and contaminated media. The process connection is supplied with a positive seal. A reliable, dead-space free sealing between the process connection and the process adapter resp. measuring medium is thus assured.

The robust design and the high-quality workmanship turns the device into a very high quality product, which even the most adverse environmental conditions cannot affect, whether the lowest temperatures when used outdoors, extreme shock and vibration or aggressive media.

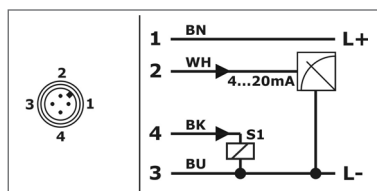
A captive laser marking of the type label ensures the identifiability throughout the entire lifetime of the device.

Technical Data	
Supply voltage:	10,5...35VDC, reverse polarity protected
Supply current:	≤ 60mA Analogue output max. 22,5mA Switch output with no load
Switch output S1 / S2	
Function:	PNP switch to +L
Output current:	0... ≤ 200mA current limited, short circuit protected
Analogue output 4...20mA	
Operating range:	3,9...21mA, min. 3,8mA, max. 22mA
Permitted load:	≤ (US - 10,5V) / 20mA
Start-up time:	≤ 1 ms
Measuring accuracy	
Characteristic deviation:	Display / Switch output: ≤ ±0,6% FS Current output: ≤ ±0,9K at ±100°C Type self-supervision: Display / Switch output: ≤ ±0,2K / Current output: ≤ ±0,4K / Drift monitoring: ≤ ±0,2K
Long term drift:	≤ ± 0,1% FS / year
Temperature deviation	Display / Switch output: ≤ ±0,003% FS/ K Current output: ≤ ±0,008% FS/ K
Materials	
Sensor tube: (process wetted)	Steel 1.4404/316L / Steel 1.4571/316Ti
Process connection: (process wetted)	Steel 1.4404/316L / Steel 1.4571/316Ti
Surface quality:	Ra < 0,8µm
Neck tube:	CrNi-Steel
Terminal enclosure:	CrNi-Steel
Control panel surface:	PES
Electrical connection part:	Device plug PUR
Pressure compensation element:	Acrylic copolymer
Gaskets:	FPM – fluorelastomere (e.g. Viton®) / Type 4 / type 5 process wetted: FPM – fluorelastomere (e.g. Viton®) , EPDM – ethylene-propylene-dienmonomere, FDA-listet
Environmental conditions	
Environmental temperature:	-40°C...+85°C
Process temperature:	depending on type: -99,9°C...+200°C / -99,9°C...+500°C / -50°C...+175°C
Process pressure:	depending on type: ≤ 20 bar / ≤ 100 bar / ≤ 50 bar
Protection:	IP65/IP67 EN/IEC 60529

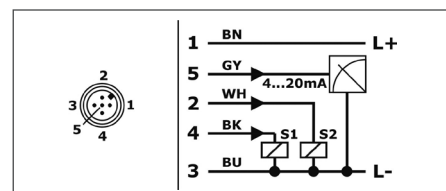
Electrical connection



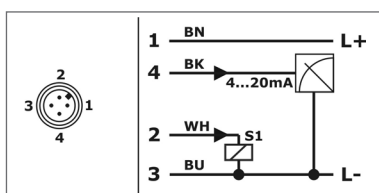
Type A – 4-wire – output 2x switch PNP
Conductor color standard connection cable M12
– A-coded: BN = brown, WH = white, BU = blue, BK = black



Type B – 4-wire – output 1x switch PNP / 1x current 4...20mA
Conductor color standard connection cable M12
– A-coded: BN = brown, WH = white, BU = blue, BK = black

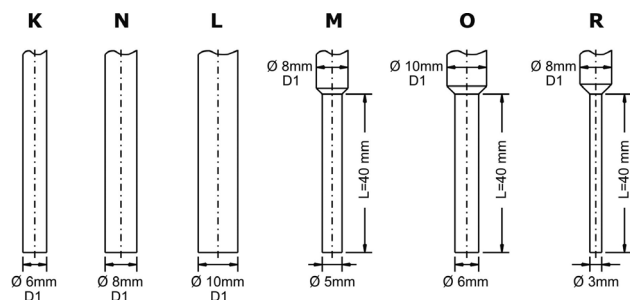


Type C – 5-wire – output 2x switch PNP / 1x current 4...20mA
Conductor color standard connection cable M12 – A-coded:
BN = brown, WH = white, BU = blue, BK = black, GY = grey

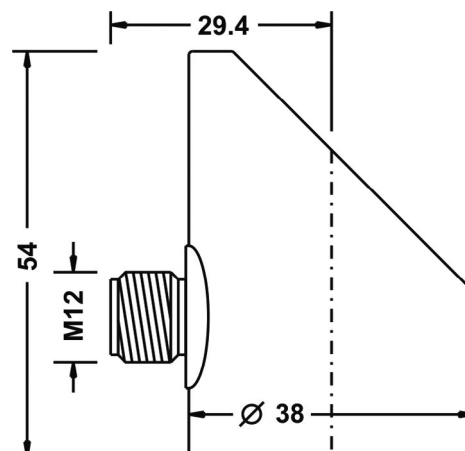


Type D – 4-wire – output 1x switch PNP / 1x current 4...20mA / Desina conformal
Conductor color standard connection cable M12
– A-coded: BN = brown, WH = white, BU = blue, BK = black

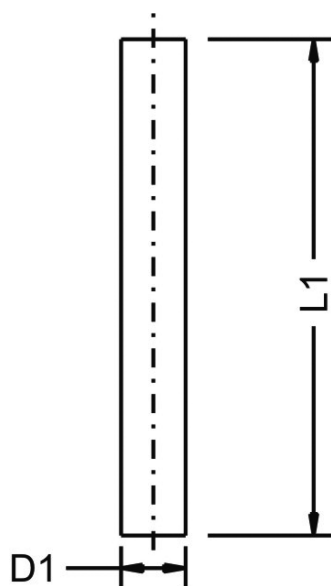
Sensor tube



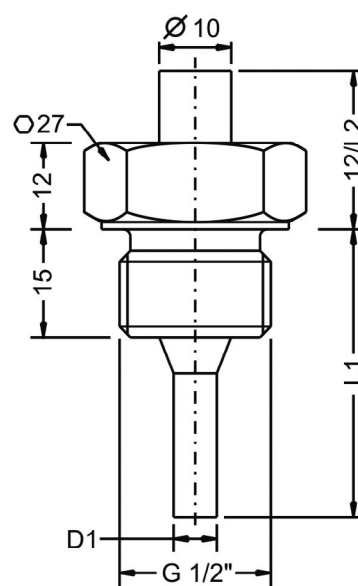
Terminal enclosure



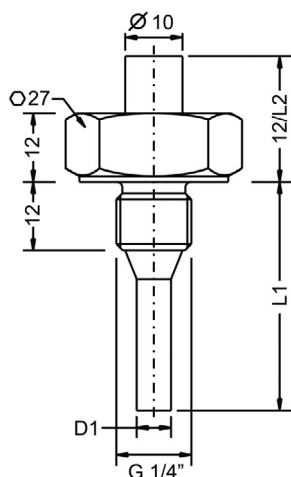
Type 0 – without thread



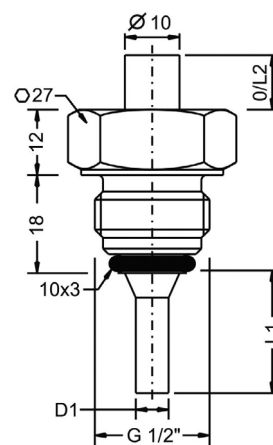
Type 1 – Thread ISO 228-1 – G 1/2"



Type 3 – Thread ISO 228-1 – G 1/4" B



Type 4 / type 5 – Thread ISO 228-1 – G 1/2" B – front-flush gasket



Order code

Type

TS4S Standard

Measuring system

S Resistance sensor Pt100-A
D Resistance sensor Pt100-A / semiconductor sensor, self-supervision function

Approval

S Standard

Process connection

0 without thread, for compression fitting
1 Thread ISO 228-1 – G½" B
3 Thread ISO 228-1 – G¼" B
4 Thread ISO 228-1 – G½", front-flush gasket FPM (e.g. Viton®) (socket SEM-12/SEM-32)
5 Thread ISO 228-1 – G½", front-flush gasket EPDM (FDA-listed) (socket SEM-12/SEM-32)
Y others

Sensor tube material / diameter (process wetted)

K CrNi-steel, Ø6mm
N CrNi-steel, Ø8mm
L CrNi-steel, Ø10mm
M CrNi-steel, Ø8mm, Tip Ø5mm / L 40mm – only measuring system type S
O CrNi-steel, Ø10mm, Tip Ø6mm
R CrNi-steel, Ø8mm, Tip Ø3mm / L 40mm – only measuring system type S
Y others

Neck tube

0 without
1 Neck tube, Standard L2 = 100mm
Y Neck tube, other length L2

Material terminal enclosure

C CrNi-steel

Measuring range

2 –99,9°C ... +200°C – Measuring system type S
3 –99,9°C ... +500°C – Measuring system type S
4 –50°C ... +175°C – Measuring system type D
Y Special measuring range

Electronic – output

A 2x switch PNP, supply 24VDC
B 1x switch PNP, 1x signal 4...20mA, supply 24VDC
C 2x switch PNP, 1x signal 4...20mA, supply 24VDC
D 1x switch PNP, 1x signal 4...20mA, supply 24VDC, Desina

Electronic – function

S Standard

Electrical connection

S Plug M12x1

Length L1 – Sensor tube / mm (L1 ≤ 2000mm)

Length L2 – Neck tube / mm (L2 ≤ 200mm)

Order code

Thermocont®

TS4S

S

C

S

S

Equipment

Ordering information	Model
BKZ0412-VA	matching cable socket, VA-nut
BKZ0512-VA	matching cable socket, VA-nut (at 0...10 V)
LKZ0405PUR-AS	connection cable 5 m, 4-pole, shielded
LKZ0505PUR-AS	connection cable 5 m, 5-pole, shielded