

Electronic temperature switch with display Model TSD-30

WIKA data sheet TE 67.03

Applications

- Machine tools
- Hydraulic aggregates
- Coolant and lubrication systems
- Machine building

Special features

- Easily-readable, robust display
- Intuitive and fast setup
- Easy and flexible mounting configurations

Description

Award-winning in design and functionality

The successful design and the excellent functionality of the WIKA switch family were already confirmed by winning the "iF product design award 2009" for the pressure switch model PSD-30.

The robust LED display has been designed using 9 mm high characters (the largest possible) and with a slight incline in order to make reading the temperature as easy as possible from a long way off. A 14-segment display has been used, since it represents text very well.

The 3-key operation makes simple, intuitive menu navigation possible, with no need for additional assistance. The menu navigation is designed in accordance with the latest VDMA standard. The VDMA standard for fluid sensors (24574-2, part 2 temperature switches) has the aim of considerably simplifying the use of temperature switches by standardising menu navigation and display.

The control keys have been designed as large as possible and are arranged ergonomically to ensure fast and easy adjustments. Operation without any additional assistance is made easier through the tactile feedback.



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Customised installation

The installation of the model TSD-30 temperature switch can be flexibly adapted to the individual mounting situation. Due to the almost unlimited rotation of the display and case by more than 300°, the display can be adjusted independently of the electrical connection. The display can thus always be aligned to face the operator, and the M12 x 1 connection positioned to suit the desired cable routing.

High quality

During development of the WIKA switch family a high value was placed on a robust design and the selection of appropriate materials suited to machine-building applications. For this reason the case and the threaded connection of the electrical connector are made from stainless steel. Overwinding or tearing off the connector is therefore virtually impossible.

Measuring ranges

Temperature	°C	°F
Standard	-20 ... +80	-4 ... +176
Option ^{1) 2)}	-20 ... +120	-4 ... +248

1) Only for process connections with compression fitting.
2) Installation instructions under "Operating conditions" must be observed.

Display

14-segment LED, red, 4-digit, 9 mm character size
Display can be turned electronically through 180°

Update

200 ms

Output signal

Switching output		Analogue signal
SP1	SP2	
PNP	-	4 ... 20 mA (3-wire)
PNP	-	DC 0 ... 10 V (3-wire)
PNP	PNP	-
PNP	PNP	4 ... 20 mA (3-wire)
PNP	PNP	DC 0 ... 10 V (3-wire)

Optionally also available with an NPN instead of a PNP switching output.

Switching thresholds

Switch point 1 and switch point 2 are individually adjustable

Switching functions

Normally open, normally closed, window, hysteresis
Freely adjustable

Switching voltage

Power supply - 1 V

Switching current

max. 250 mA per switching output

Adjustment accuracy

≤ 0.5 % of span

Temperature offset adjustment

±3 % of span

Scale setting

Zero point: max. +25 % of span

Full scale: max. -25 % of span

Load

Analogue signal 4 ... 20 mA: ≤ 0.5 kΩ

Analogue signal DC 0 ... 10 V: > 10 kΩ

Service life

100 million switching cycles

Voltage supply

Power supply U₊

DC 15 ... 35 V

Current consumption

Switching outputs with

- Analogue signal 4 ... 20 mA: 70 mA
- Analogue signal DC 0 ... 10 V: 45 mA
- without analogue signal: 45 mA

Total current consumption

max. 600 mA (incl. switching current)

Reference conditions

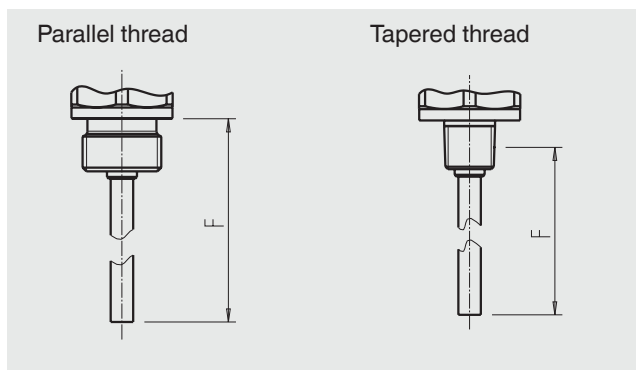
Temperature: 15 ... 25 °C
Atmospheric pressure: 950 ... 1,050 mbar
Humidity: 45 ... 75 % r. h.
Nominal position: Process connection lower mount (LM)
Power supply: DC 24 V
Load: see "Output signal"

Measuring element

Model

Pt1000, 2-wire, DIN EN 60751 / class A

Insertion length (F)



F in mm

25 ¹⁾ 50 ¹⁾ 100 150 250 350

1) Not available with compression fitting or measuring range -20 ... +120 °C, respectively.

Response time

T05 < 5 s (per DIN EN 60751)

T09 < 10 s (per DIN EN 60751)

Maximum operating pressure

150 bar

When using a compression fitting: max. 50 bar at 120 °C

Accuracy data

Analogue signal

≤ ±0.5 % of span

Switching output

≤ ±0.8 % of span

Display

≤ ±0.8 % of span ±1 digit

Temperature sensor

±(0.15 K + 0.002 | t |)

| t | is the value of the temperature in °C without consideration of the sign.

The actually achievable accuracy is significantly determined by the mounting situation (immersion depth, sensor length, operating conditions). This is especially the case for large temperature gradients between the environment and the medium.

Operating conditions

Permissible temperature ranges

Medium: see measuring ranges

Ambient: -20 ... +80 °C ¹⁾

Storage: -20 ... +80 °C

¹⁾ The permissible ambient temperature is limited to 20 ... 40 °C at the measuring range of -20 ... +120 °C.

At high medium or ambient temperatures, ensure by suitable measures that the instrument case temperature does not exceed 80 °C in continuous operation (the temperature is measured at the hexagon of the process connection).

At medium temperatures above 80 °C the thread must not be immersed into the medium.

Humidity

45 ... 75 % r. h.

Ingress protection

IP 65 and IP 67

The stated ingress protection (per IEC 60529) only applies when plugged in using mating connectors that have the appropriate ingress protection.

Mounting position

any

Process connections

Available connections

Standard	Thread
DIN 3852-E (parallel thread)	G ¼ A
	G ¼ A with compression fitting
	G ½ A
	G ½ A with compression fitting
ANSI / ASME B1.20.1 (tapered thread)	¼ NPT
	¼ NPT with compression fitting
	½ NPT
	½ NPT with compression fitting

Other connections on request.

Details on the sensor dimensions see "Dimensions in mm".

Sealings

For connections per DIN 3852-E

Standard	NBR ¹⁾
Option	FPM/FKM

¹⁾ At -20 ... +120 °C standard FPM/FKM

Electrical connections

Connections

- Circular connector M12 x 1 (4-pin)
- Circular connector M12 x 1 (5-pin) ¹⁾

¹⁾ Only for version with two switching outputs and additional analogue signal

Electrical safety

Short-circuit resistance: S₊ / SP1 / SP2 vs. U-

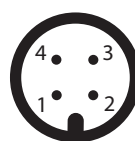
Reverse polarity protection: U₊ vs. U-

Insulation voltage: DC 500 V

Overvoltage protection: DC 40 V

Connection diagram

Circular connector M12 x 1 (4-pin)



U ₊	1
U-	3
S ₊	2
SP1	4
SP2	2

Circular connector M12 x 1 (5-pin)



U ₊	1
U-	3
S ₊	5
SP1	4
SP2	2

Legend:

- U₊ Positive supply voltage
- U- Reference potential
- SP1 Switching output 1
- SP2 Switching output 2
- S₊ Analogue output

Materials

Wetted parts

Temperature sensor: Stainless steel 316Ti

Non-wetted parts

Case: Stainless steel 304

Keyboard: TPE-E

Display window: PC

Display head: PC + ABS-Blend

CE conformity

EMC directive

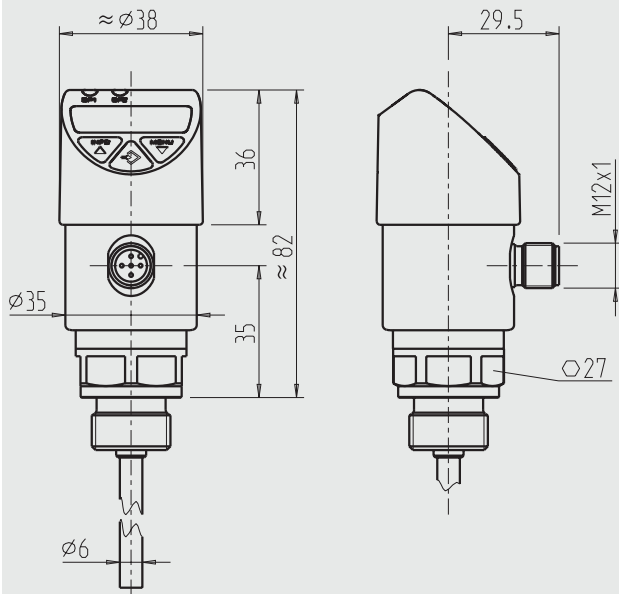
2004/108/EC, EN 61326 emission (group 1, class B) and interference immunity (industrial application)

RoHS conformity

2011/65/EU

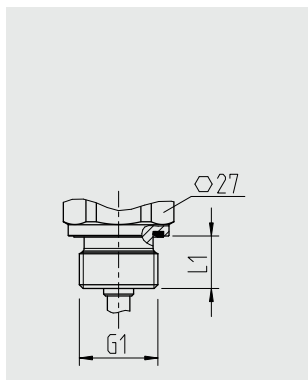
Dimensions in mm

Temperature switch with circular connector M12 x 1 (4-/5-pin)

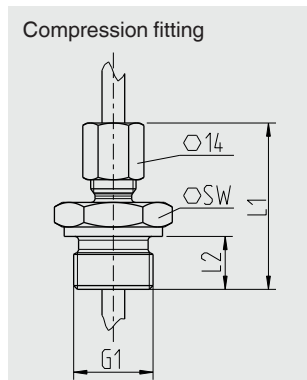


Weight: approx. 0.3 kg

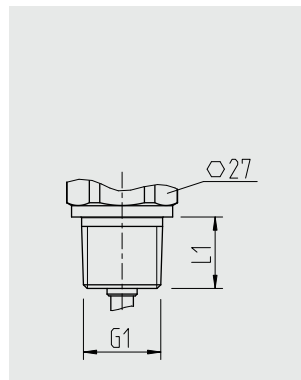
Process connections



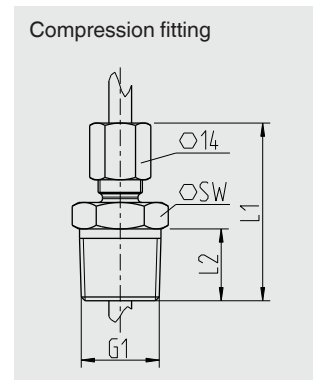
G1	L1
G ¼ A	12
G ½ A	14



G1	L1	L2	SW
G ¼ A	40	12	19
G ½ A	44	14	27




G1	L1
¼ NPT	13
½ NPT	19

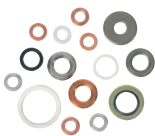




G1	L1	L2	SW
¼ NPT	41	15.1	17
½ NPT	41	19.7	22

Accessories and spare parts

Compression fittings		
	Description	Order no.
	G ¼ A, stainless steel	11160136
	G ½ A, stainless steel	3221555
	¼ NPT, stainless steel	3232905
	½ NPT, stainless steel	14043934

When using a compression fitting, a limited pressure strength of max. 50 bar at 120 °C medium temperature applies.

Sealings		
	Description	Order no.
	NBR profile sealing G ¼ A DIN 3852-E	1537857
	FPM/FKM profile sealing G ¼ A DIN 3852-E	1576534
	NBR profile sealing G ½ A DIN 3852-E	1039067
	FPM/FKM profile sealing G ½ A DIN 3852-E	1039075

Connectors with moulded cable				
	Description	Temperature range	Cable diameter	Order no.
	Straight version, cut to length, 4-pin, 2 m PUR cable, UL listed, IP 67	-20 ... +80 °C	4.5 mm	14086880
	Straight version, cut to length, 4-pin, 5 m PUR cable, UL listed, IP 67	-20 ... +80 °C	4.5 mm	14086883
	Straight version, cut to length, 4-pin, 10 m PUR cable, UL listed, IP 67	-20 ... +80 °C	4.5 mm	14086884
	Straight version, cut to length, 5-pin, 2 m PUR cable, UL listed, IP 67	-20 ... +80 °C	5.5 mm	14086886
	Straight version, cut to length, 5-pin, 5 m PUR cable, UL listed, IP 67	-20 ... +80 °C	5.5 mm	14086887
	Straight version, cut to length, 5-pin, 10 m PUR cable, UL listed, IP 67	-20 ... +80 °C	5.5 mm	14086888
		Angled version, cut to length, 4-pin, 2 m PUR cable, UL listed, IP 67	-20 ... +80 °C	4.5 mm
Angled version, cut to length, 4-pin, 5 m PUR cable, UL listed, IP 67		-20 ... +80 °C	4.5 mm	14086891
Angled version, cut to length, 4-pin, 10 m PUR cable, UL listed, IP 67		-20 ... +80 °C	4.5 mm	14086892
Angled version, cut to length, 5-pin, 2 m PUR cable, UL listed, IP 67		-20 ... +80 °C	5.5 mm	14086893
Angled version, cut to length, 5-pin, 5 m PUR cable, UL listed, IP 67		-20 ... +80 °C	5.5 mm	14086894
Angled version, cut to length, 5-pin, 10 m PUR cable, UL listed, IP 67		-20 ... +80 °C	5.5 mm	14086896

Ordering information

Model / Measuring range / Output signal / Insertion length / Process connection / Sealing / Accessories and spare parts

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