Special-Sensors

for

Automation

Temperature Sensors

- ■ **Monitor temperatures in the best possible manner**
- ■ **Compact model**
- ■ **Temperature sensors with threaded sleeve**
- ■ **Programmable, switching points, analog output**

ISO 9001 certfied

Functionality

The compact models TN 552 GPP and TN 552/1 GPP have two independent adjustable switching points. The compact models TN 552 GAPP and TN 552/1 GAPP have one independent adjustable switching point and one scalable 4...20 mA analog output.

The detecting range for fluids is from −40 °C to +120 °C, the tolerance is 0.3 °C (0...80 °C).

The compact models TN 552... offer a window function as an alternative to the standard limit monitoring. Additionally, the NO/NC output function is programmable. Transient temperature changes can be bridget with a switch-on / switch-off time delay.

The push-buttons on the front of the sensor are used for programming the sensor functions. The programmed switching point and parameters are displayed and set by keyboard request. This function is possible while the sensor is measuring.

Temperature sensor with threaded sleeve allowing for exchange during ongoing operations

The temperature sensor TN 553 can easily be exchanged during ongoing operations. This is made possible through the use of a special stainless steel (AISI 316 Ti) threaded sleeve that is mounted in the tank or pipe. In this way the compact device can at any time be removed without compromising the seal of the tank or pipe. The temperature sensor measures temperatures from −40 °C to +120 °C and offers, among other features, two programmable switching points, freely selectable hysteresis and a temperature window function. The device is available as a 24 V DC device with PNP or analog output as well as a 230 V and 115 V AC model with Opto-MOS. Various cable lengths and optional plug-in or hardwire connections allow the device to be installed in various configurations. The thread is a G1/2 gauge.

Installation

EGE temperature sensors can be installed in standard T-pieces or welded T-pieces. The packing is made with an additional flat seal or with other suitable materials. Please note the temperature and pressure resistance of the seals for increased process conditions. Fixing the sensor in the T-pieces is only allowed on the screw head of the sensor. After the installation the display can be turned through an angle of 330° for best reading. In applications with temperature over +80 °C the sensor should be mounted from the side into the pipe.

Application

The hysteresis function is for controlling a temperature value. A limiting value can be programmed in this mode. As soon as the measured temperature is higher than the programmed limiting value, the output signals are switched as programmed (NC or NO). The hysteresis value is the difference temperature for the switch-on and switch-off signal of the limiting value. An additional time delay for the switching signals can be programmed for each switching point.

In the frame function mode the switching function is set depending of a programmed temperature range. The temperature range starts with the programmed lower value and end with programmed upper frame value.
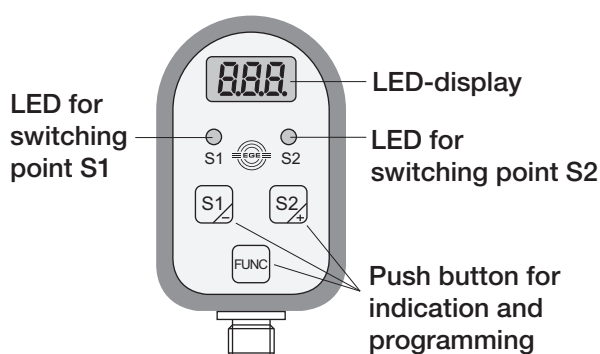
The time delay for the switching signal can also be used in this switching mode.

The analog output can be use for transmitting the temperature and getting the proportional current. For that you assign one temperature for the 4 mA first-value and one temperature for the 20 mA last-value in the programming mode. Between the temperature values it is permissible to have a minimal difference of 16 °C.

Color code:
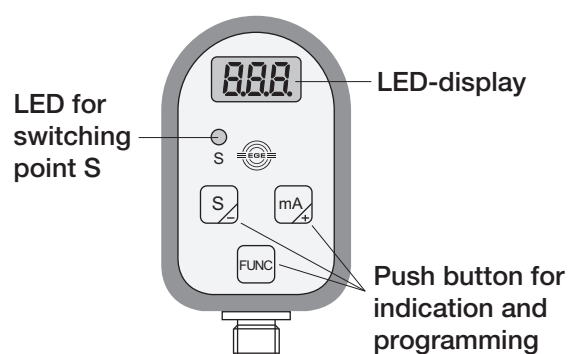BK = black   BN = brown   BU = blue   WH = white

TN 552... GPP
TN 553... GPP/WP

LED for switching point S1 — LED-display — LED for switching point S2 — Push button for indication and programming

S1 S2
S1 S2
FUNC

TN 552... GAPP
TN 553... GAPP

LED for switching point S — LED-display — Push button for indication and programming

S
S mA
FUNC

Temperature Sensors

Technology and application

Monitor temperatures in the best possible manner

EGE features standard measuring elements for temperature in a robust and easy-to-install design which is best suitable for the respective industrial application or automation task - available for ATEX Zone 22 or with GL certificates as well.

Examples are the TGM 025-03 for monitoring of hot gases up to 1000 °C (available with evaluation unit as an option) or the TGM 050-TS for monitoring of threshold temperatures for overheat protection.

Our temperature sensors TGB in standard enclosures with resistance- or analog signal exit complement our range of products.

Compact temperature sensors with integrated evaluation electronics Series TGBA

The temperature sensor TGBA 050 GI with a type B connection head according to DIN 43729 cover a − 50...+400 °C temperature range and transmit measured data via an analog 4...20 mA output. Sensors are as well available with resistance output. The accuracy is ±1%. Available with lengths of 50, 100, 200 or 400 mm, the device are mounted via a G1/2 thread. The aluminium connection head, which is suitable for temperatures between −25 and 70 °C, reaches protection ratings of IP 54 on the connection side and IP 68 on the sensor side. TGBA sensors are pressure-proof up to 40 bar. If requires, EGE also provides customized sensors models.

Monitoring of temperature thresholds under extreme environmental conditions Series TGM...-TS

The TGM 050-TS series of temperature sensors provides a robust solution for the monitoring of temperature thresholds. Designed for a temperature range between +60 and +100 °C, TGM 05 sensors open a contact if a pre-set temperature is exceeded. The threshold is set by the manufacturer in 5 °C increments according to customer specifications. Thanks to IP68 / IP69K protection on the medium side and a stainless steel housing, the sensors provide excellent media resistance. Additionally, they withstand pressures up to 30 bar. They are installed by means of a G1/2 thread and are suitable for switching voltages up to 230 V AC.

Reliable temperature monitoring: Sensors for hot gases up to 1000 °C Series TGM...-03

Suitable for media temperatures between − 50 and +1000 °C, the stainless steel temperature sensor TGM 025-03 is designed to monitor hot gases. The very compact unit is integrated by means of a G1/4 thread ans uses a type K thermocouple to register temperatures. The TGM 025-03 sensor can be connected to any standard amplifier for type K thermocouples.
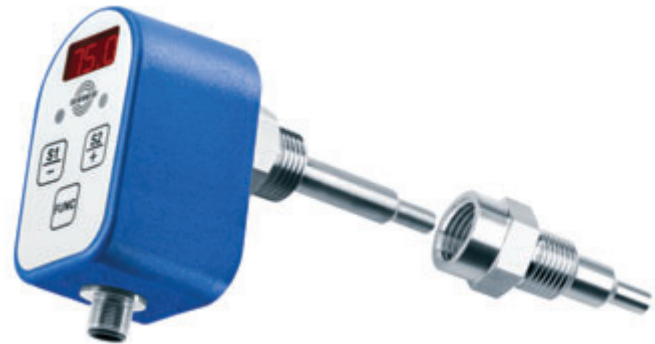
Temperature Sensors

Two switching points and analog output

EGE

Series TN 553

Exchangeable during ongoing operations through use of threaded sleeve

Measuring range –40...+120 °C

Hysteresis and temperature window easily programmable

Design	DC • G1/2		AC • G1/2
Dimensions			threaded sleeve
Detection range [°C]	–40...+120		
Output	2x PNP NC / NO	PNP NC / NO + 4...20 mA	2x NC / NO, progr.
ID-No.	**P71021**	**P71022**	**P71023**
Type	TN 553/1 GPP	TN 553/1 GAPP	TN 553/1 WP
Supply voltage [V]	24 DC ±10%	24 DC ±10%	230 AC ±10%
Current consumption [mA]	60	60	20
Voltage drop [V]	<2.5	<2.5	<10
Ambient temperature [°C]	–20...+60		
Medium temperature [°C]	–40...+120		
Response time [s]	typ. 10...30		
Resolution display [°C]	0.1		
Range limit values [°C]	–39...+120 (0.5 / 1 Step)		
Range hysteresis [°C]	0.5...99 (0.5 / 1 Step)		
Range window [°C]	0.5...99 (0.5 / 1 Step)		
Time delay [s]	0...50 (0.5 / 1 Step)		
Programmable functions	two switching points, hysteresis / window, switching output NC / NO, MIN- / MAX- memory function		
Compressive strength [bar]	20		
Housing material	housing: PBT sensor and sleeve: AISI 316 Ti		
Protection [EN 60529]	IP 65		
Connection	M12 connector		1/2"-20UNF, 5-pol.
Accessories	2x flat gasket, threaded sleeve, heat conducting paste		

Temperature Sensors

Two switching points
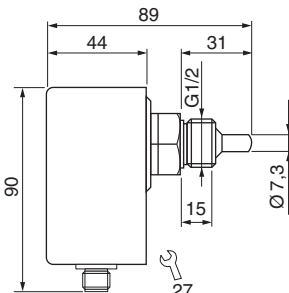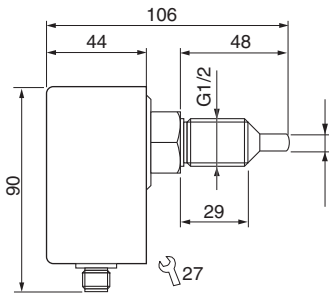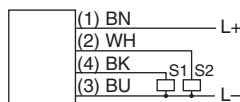
Series TN 552

Measuring range
– 40 °C...+120 °C / – 40 °F...+248 °F

Two switching points, hysteresis and temperature window easily programmable

Rotable display
Switch-over °C - °F

Design	DC • G1/2 • L= 31 mm	DC • G1/2 • L= 48 mm
Dimensions		

Detection range		−40...+120 °C (−40...+248 °F)	
Output		2x ⟋ PNP NC / NO	

ID-No.		P71017	P71018
Type		TN 552 GPP	TN 552/1 GPP
Supply voltage	[V]	24 DC ±10%	
Current consumption	[mA]	<100	
Voltage drop	[V]	<2.5	
Switching current	[mA]	200	
Ambient temperature	[°C]	−20...+60	
Medium temperature	[°C]	−40...+120	
Response time	[s]	typ. 10	
Resolution display	[°C/°F]	0.1 / 0.5	
Range limit values	[°C/°F]	−39...+120 / −39...248	(0.5 / 1 Step)
Range hysteresis	[°C/°F]	0.5...99 / 1...179	(0.5 / 1 Step)
Range window	[°C/°F]	0.5...99 / 1...179	(0.5 / 1 Step)
Time delay	[s]	0...50	(0.5 / 1 Step)
Programmable functions		two switching points, hysteresis / window, switching output NC / NO, MIN- / MAX- memory function	
Compressive strength	[bar]	100	
Housing material		housing: PBT sensor: AISI 316 Ti	
Protection	[EN 60529]	IP 65	
Connection		M12 connector	

(1) BN	L+
(2) WH	
(4) BK	S1 S2
(3) BU	L−

Accessories	see page 7.06

Temperature Sensors

Switching point and analog output

EGE

Series TN 552

**Measuring range
−40 °C...+120 °C / −40 °F...+248 °F**

*Switching point and analog output,
hysteresis and temperature window
easily programmable*

*Rotable display
Switch-over °C - °F*

Design	DC • G1/2 • L= 31 mm	DC • G1/2 • L= 48 mm
Dimensions		

Detection range		−40...+120 °C (−40...+248 °F)	
Output		⟋L⟍ PNP NC/NO + ⊙⊙ 4...20 mA	
ID-No.		**P71019**	**P71020**
Type		TN 552 GAPP	TN 552/1 GAPP
Supply voltage	**[V]**	24 DC ±10%	
Current consumption	[mA]	<200	
Voltage drop	**[V]**	<2.5	
Analog output	[mA]	4...20, scalable, Detection range min. 16 °C / 29 °F	
Switching current	**[mA]**	200	
Ambient temperature	[°C]	−20...+60	
Medium temperature	**[°C]**	−40...+120	
Response time	[s]	typ. 10	
Resolution display	**[°C/°F]**	0.1 / 0.5	
Range limit values	[°C/°F]	−39...+120 / −39...248	(0.5 / 1 Step)
Range hysteresis	**[°C/°F]**	0.5...99 / 1...179	(0.5 / 1 Step)
Range window	[°C/°F]	0.5...99 / 1...179	(0.5 / 1 Step)
Time delay	**[s]**	0...50	(0.5 / 1 Step)
Programmable functions		one switching point, hysteresis / window, switching output NC/NO, MIN- / MAX- memory function	
Compressive strength	**[bar]**	100	
Housing material		housing: PBT sensor: AISI 316 Ti	
Protection	**[EN 60529]**	IP 65	
Connection		M12 connector	
Accessories		see page 7.06	

Temperature Sensors

Compact model with analog output

Series TGBA

Analog output

Up to 400 °C

Temperature range according to customer specification

As well available with resistance output

Design	G1/2
Dimensions	

Supply voltage **[V]**	12...30 DC

ID-No.	**P.....**
Type-sensor length L **[mm]**	TGBA 050 GI-Lxxx
Temperature range medium **[°C]**	min. −50...+375 max. −25...+400 △ between min. and max. has to be minimum 25 °C
Ambient temperature **[°C]**	−25...+70
Output **[mA]**	4...20
Turn on delay **[s]**	approx. 4 (output < 4 mA)
Protection **[EN 60529]**	housing: IP 67 / sensor tip: IP 68 / IP 69K
Housing material	Aluminium, form B terminal head
Material sensor probe	AISI 316 Ti
Sealing material	NBR, AFM 34, different material on request
Compressive strength **[bar]**	40 (25 °C)
Diameter connecting cable	Ø 7 mm up to Ø 12 mm
Connection	terminal screws, max. 1 mm²

Sensor length

The total length L of the sensor is specified by appending "Lxxx" to the type.

xxx: Length in mm

Preferred lengths		ID-No.
50 mm:	L050	P71028
100 mm:	L100	P71029
200 mm:	L200	P71030
400 mm:	L400	P71031

$R_L \text{ max } [\Omega] = (U_b - 10) : 0,021$

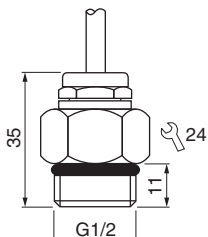(4...20 mA)

BN
BK
L+
L−

Temperature Sensors

Compact switch

Series TGM

For the monitoring of temperature thresholds

Sensor tip pressure resistant up to 30 bar

IP 68 / IP 69K

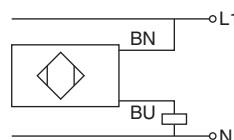| Design	G1/2
Dimensions	

Sensing temperature	[°C]	+60 °C...100 °C (5 °C step)
Output		

ID-No.		P.....
Type		TGM 050-TSxxx
Tolerance	[K]	±5
Reset		30 ±15 K
temperature range	[K]	below temperature threshold
Medium temperature	[°C]	−10...+120
Temperature range		
cable	[°C]	−10...+80
Switching voltage	[V]	max. 230 AC
Switching current	[A]	max. 2,5 cos φ = 1
		max. 1,6 cos φ = 0,6
Protection	[EN 60529]	
Housing		IP 67
Sensor tip		IP 68 / IP 69K
Housing material		AISI 316 Ti, Br-Ni
Compressive strength	[bar]	30
Sealing		O-Ring, 16x2.5 NBR
Connection		2 m PVC-cable 2x0.5 mm²

The temperature threshold of the sensor is specified by "TSxxx" in the type designation.

xxx: °C

Temperature threshold		ID-No.
60 °C:	TS060	P71033
65 °C:	TS065	P71034
70 °C:	TS070	P71035
75 °C:	TS075	P71036
80 °C:	TS080	P71037
85 °C:	TS085	P71038
90 °C:	TS090	P71039
95 °C:	TS095	P71040
100 °C:	TS100	P71041

Temperature Sensors
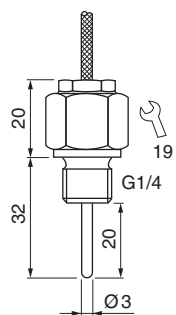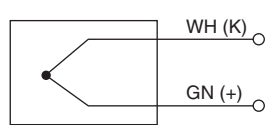
Probe

Series TGM

**For hot gases
up to 1000 °C**

Thermocouple type K

Design	G1/4
Dimensions	
Thermocouple	NiCr-Ni (type K)

ID-No.	P71032
Type [mm]	TGM 025-03
Medium temperature [°C]	−50...+1000
Ambient temperature [°C]	−25...+350
Housing material	AISI 316 Ti
Compressive strength [bar]	40 (25 °C)
Protection [EN 60529]	
Housing	IP 60
Sensor tip	IP 68 / IP 69K

Connection	2 m NiCr-Ni connection cable with stainless steel braided hose

WH (K)
GN (+)

Temperature Sensors

Accessories • M12 connector

System SL

Finished cable plug housing
Self locking screw plug
Protection IP 67
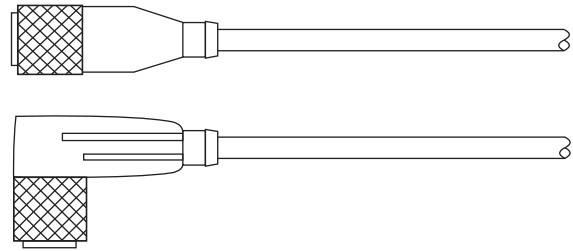
Cable plug housing		Pin-assignment	Plug-lock
straight	**angular**		

Cable plug housing

straight — 42

angular — 26,5 — 38,5

Pin-assignment

DC

3-wire
1: BN
2: -
3: BU
4: BK

4-wire
1: BN
2: WH
3: BU
4: BK

DC

5-wire
1: BN
2: WH
3: BU
4: BK
5: GY

DC

6-wire
1: BN
2: WH
3: BU
4: BK
5: GY
6: PK

SLG...	SLW...	DC	PL-M12

TYPE	ID-NO.	DESIGN
SLG 3-2	Z01076	Cable plug housing straight, 2 m cable 3x0.34 mm² max. 250 V / 4 A
SLG 3-5	Z01077	Cable plug housing straight, 5 m cable 3x0.34 mm² max. 250 V / 4 A
SLW 3-2	Z01078	Cable plug housing angular, 2 m cable 3x0.34 mm² max. 250 V / 4 A
SLW 3-5	Z01079	Cable plug housing angular, 5 m cable 3x0.34 mm² max. 250 V / 4 A
SLW 3-2-LED	Z00052	Cable plug housing angular, 2 m cable 3x0.34 mm² max. 250 V / 4 A PNP with LED
SLG 4-2	Z00445	Cable plug housing straight, 2 m cable 4x0.25 mm² max. 250 V / 4 A
SLG 4-5	Z00449	Cable plug housing straight, 5 m cable 4x0.25 mm² max. 250 V / 4 A
SLW 4-2	Z00446	Cable plug housing angular, 2 m cable 4x0.25 mm² max. 250 V / 4 A
SLW 4-5	Z00450	Cable plug housing angular, 5 m cable 4x0.25 mm² max. 250 V / 4 A
SLW 4-2-LED	Z01157	Cable plug housing angular, 2 m cable 4x0.25 mm² max. 250 V / 4 A PNP with LED
SLG 5-2	Z01150	Cable plug housing straight, 2 m cable 5x0.34 mm² max. 60 V / 2 A
SLW 5-2	Z01151	Cable plug housing angular, 2 m cable 5x0.34 mm² max. 60 V / 2 A
SLG 6-2	Z01197	Cable plug housing straight, 2 m cable 6x0.25 mm² max. 36 V / 2 A
SLW 6-2	Z01198	Cable plug housing angular, 2 m cable 6x0.25 mm² max. 36 V / 2 A
PL-M12	Z01182	Plug-lock for sensors in Ex areas

DATA

Thread	M12x1	Contact resistance	≤ 5 mΩ
Material	PVC	Insulation resistance	>10^9
Protection	IP 67	Testing voltage	2.0 KV eff. / 5 and 6 pol. 1.5 KV eff.
Temperature range	–25...+80 °C		

Note

Sensors with NC output are connected to 4 pole cable plug housings. In this case, the break output is connected to the white lead (connection 2).

Process Sensors

A selection

Flow sensors
- Electronical monitoring of flow
- Lubrication monitoring
- Measuring range 0.1 ml/min...100 l/min
- Detection range 1...300 cm/s
- Reaction time 0.5 s

Level sensors for Ex-applications
- For level monitoring in Ex areas
- For temperatures –35...+200 °C
- With PTFE connector cable
- Sensors for connection to amplifiers

Level sensors
- For level monitoring –230...+230 °C
- Steam proof at a pressure of up to 30 bar
- For hot motor oil
- For liquid nitrogen
- For chemically aggressive media

Ultrasonic sensors
- Switching distance up to 6000 mm
- Level monitoring
- Watertight housing
- Teach-in functions

Pressure sensors
- Monitoring in pipes and containers
- Pressure up to 16 bar
- Level up to 10 m (±1 cm)
- Compact models
- Programmable

Infrared detectors
- Measurement of temperature
- Monitoring of hot media
- Position control