

Temperature switch



Product description

Trafag's Temperature Switch with Display DTP 8180 offers precise temperature monitoring with an adjustable measuring range of 50 - 100 % of the nominal range. Featuring NFC-smartphone app parameterization, a rotatable display and electrical connection, and a switchable analogue output, it ensures flexible and user-friendly operation. Parameterization using the display buttons is also possible.

Applications

- Machine tools
- Hydraulic power units
- Cooling and lubrication systems
- HVAC
- Process technology

Features

- Parameterization also via NFC-smartphone App (Android)
- Display and electrical connection are independently rotatable 335°/343°
- Analogue output switchable mA or V
- Integrated datalogger
- Measuring range adjustable, 50 ... 100 % of the nominal range

 EMC: 2014/30/EU

 S.I. 2016 No. 1091

 RoHS/Reach compliant

Technical Data

Measuring principle	PT 1000, DIN EN 60751 class A, 2 conductors
Measuring range	-50°C ... +150°C / -58°F ... 302°F, adjustable 50 ... 100 % FS
Output signal	4 ... 20 mA, 0 ... 5 VDC, 1 ... 6 VDC, 0 ... 10 VDC, switchable mA or V
Ambient temperature	-25°C ... +85°C
Temperature unit for display	°C, °F, K, user scale
Logger	Ring buffer: 3518 data points Sampling time: 0.1 ... 999.9 s, Off (0)

Additional information

Data sheet	www.trafag.com/H72352
Instructions	www.trafag.com/H73352
Accessories	www.trafag.com/H72258
Video	https://youtu.be/tDY3QiMtT2Q

DTP 8180

Ordering information/Type code

		8180	XX	XX	XX	XX	XX	XX
Measuring range	50°C ... +150°C (-58°F ... 302°F)		50					
Sensor	Sensor DIN EN 60751, class 1, wetted parts 1.4404 (AISI 316L)			21				
	Sensor DIN EN 60751, class 1, wetted parts 1.4404 (AISI 316L), shorter response time ¹⁾			22				
Process connections	See table: Ordering no. for process connections							
Electrical connection	Male electrical plug M12x1, 4-pole, Mat. PA (Accessories P3, P4)						32	
	Male electrical plug M12x1, 5-pole, Mat. PA (Accessories P1, P2)						35	
Output signal	Switching output PNP, current output 4 ... 20 mA, switchable to 0 ... 10 VDC; output detail see accessories P1, P2, P3							PA
	Switching output PNP, voltage output 1 ... 6 VDC; output detail see accessories P1, P2, P3							PU
	Switching output PNP, voltage output 0 ... 10 VDC; output detail see accessories P1, P2, P3							PV
	Switching output PNP, voltage output 0 ... 5 VDC; output detail see accessories P1, P2, P3							PW
	Switching output PNP; output detail see accessory P4							PS
Accessories	Female electrical plug M12x1, 5-pole							33
	Parametrisation standard, see table: Parameter							Z5
	Parametrisation according to customer specifications, see table: Parameter							ZC
	Function package 1: Temperature offset correction / Measuring range zero point adjustment (included as basic function)							Z1
	Function package 2: User scale unit / analogue output adjustment							Z2
	Pin configuration, see table: Electrical connection							
	Protective cap, 1 pc. F89051, package of 5 pcs. F89052, package of 25 pcs. F89075							

¹⁾ Upon request, whereas minimum order quantities may apply

Ordering-no. for process connections

Sensor length	50 mm	100 mm	150 mm	200 mm ¹⁾	250 mm ¹⁾	300 mm ¹⁾	400 mm ¹⁾
G1/8" male	11	21	31	41	51		
G1/4" male	12	22	32	42	52		
G1/2" male	13	23	33	43	53		
G1/8" male, compression fitting	14	24	34	44	54		
G1/4" male, compression fitting	15	25	35	45	55		
G1/2" male, compression fitting	16	26	36	46	56	66	86
M20 x 1.5 mm, compression fitting	¹⁾	¹⁾	¹⁾	¹⁾	57		
1/4" NPT male	1B	2B	3B	4B	5B		
1/2" NPT male	1C	2C	3C	4C	5C		
1/4" NPT male, compression fitting	1D	2D	3D	4D	5D		
1/2" NPT male, compression fitting	1E	2E	3E	4E	5E		
Tri-Clamp DIN 32676, DN25/DN40 ¹⁾	1G	2G	3G	4G	5G		
Tri-Clamp DIN 32676, DN50 ¹⁾	1J	2J	3J	4J	5J		
Sanitary fitting DIN 11851, DN25 ¹⁾	1L	2L	3L	4L	5L		
Sanitary fitting DIN 11851, DN40 ¹⁾	1M	2M	3M	4M	5M		
Sanitary fitting DIN 11851, DN50 ¹⁾	1N	2N	3N	4N	5N		

¹⁾ Upon request, whereas minimum order quantities may apply

Parameters

Name	Standard setting (Accessory ZS)	Value range	Short name	Customer adjustment (Accessory ZC)
Switch point SP1 (hysteresis mode) Upper switch point FH1 (window mode)	75 % Measuring range	SP1 > RP1 FH1 > FL1 Hysteresis ≥ 1 % FS	SP1	
Reset point RP1 (hysteresis mode) Lower switch point FL1 (window mode)	25 % Measuring range	RP1 < SP1 FL1 < FH1 Hysteresis ≥ 1 % FS	RP1	
Switch point SP2 (hysteresis mode) Upper switch point FH2 (window mode)	75 % Measuring range	SP2 > RP2 FH2 > FL2 Hysteresis ≥ 1 % FS	SP2	
Reset point RP2 (hysteresis mode) Lower switch point FL2 (window mode)	25 % Measuring range	RP2 < SP2 FL2 < FH2 Hysteresis ≥ 1 % FS	RP2	
Switch point delay time SP1 (hysteresis mode) Switch point delay time FH1 (window mode)	0	0 ... 99.99 s	dS1	
Switch point delay time RP1 (hysteresis mode) Switch point delay time FL1 (window mode)	0	0 ... 99.99 s	dR1	
Switch point delay time SP2 (hysteresis mode) Switch point delay time FH2 (window mode)	0	0 ... 99.99 s	dS2	
Switch point delay time RP2 (hysteresis mode) Switch point delay time FL2 (window mode)	0	0 ... 99.99 s	dR2	
Functions switching output 1	Hysteresis, closer (Hno)	Hysteresis NO (Hno) Hysteresis NC (Hnc) Window NO (Fno) Window NC (Fnc)	ou1	
Functions switching output 2	Hysteresis, closer (Hno)	Hysteresis NO (Hno) Hysteresis NC (Hnc) Window NO (Fno) Window NC (Fnc)	ou2	
Temperature units	°C	°C, °F, K	uni	
Measuring range adjustment	100 % Nominal temperature	50 ... 100 % Nominal	T_EP	
Damping (analogue output)	0.01 s	0.01 ... 3.00 s (time constant)	dAA	
Display rotation	No	no, yes (180°)	disr	
Display mode	Current measuring value	Measuring value: current, highest, lowest, display off Current value: decimal places selectable (max. 3)	dis	
Display actualisation	2	1, 2, 5, 20 Hz	duTd	

Specifications

Electrical data	Output / supply voltage	4 ... 20 mA: 24 (15 ... 30) VDC 0 ... 5 VDC: 24 (15 ... 30) VDC 1 ... 6 VDC: 24 (15 ... 30) VDC 0 ... 10 VDC: 24 (15 ... 30) VDC
	Power-on delay time	typ. 200 ms
	Inverse-polarity protection, short-circuit strength @ 25°C during 5 min.	Integrated
	Current consumption / power consumption	≤ 30 mA
	Resistance of insulation	> 10 MΩ, 100 VDC
	Dielectric strength	100 VAC, 50 Hz
	Current limiting output signal	4 ... 20mA: appr. 25 mA max.
Environmental conditions	Ambient temperature	-25°C ... +85°C
	Storage temperature	-20°C ... +40°C
	Protection ¹⁾	IP67
	Humidity	max. 95 % relative
	Vibration	10 g (10 ... 2000 Hz) for sensor length ≤ 150 mm
	Shock	50 g/3 ms
EMC protection	Emission	EN/IEC 61000-6-3
	Immunity	EN/IEC 61000-6-2
Mechanical data	Sensor (wetted parts)	1.4404/1.4435 (AISI 316L)
	Housing	Steel, die cast metal galvanised display housing plastic
	Sealing	FKM, EPDM
	Male electrical connector	See ordering information
	Weight	~ 189 g, depending on process connector
	Mounting torque	20 Nm
	Housing alignment	Display 335° rotatable, max. 2.5 Nm Electrical connection 343° rotatable, max. 5 Nm

¹⁾ See table: Electrical connection

Accuracy

Analogue output	± 0.5 % FS typ. + Temperature sensor error
Switch point	± 0.3 % FS typ. + Temperature sensor error
Display	± 0.3 % FS typ. + Temperature sensor error + 1 digit
Temperature sensor error	For °C: ± (0.15 K + 0.002 t) according to EN 60751 For °F: ± [1.8*(0.15 + 0.002 (t - 32) / 1.8)]
Time constant	T ₆₀ = 12.5 s, in air T ₉₀ = 33 s, in air

Analogue output

Output signal	Switchable 4 ... 20 mA or voltage
Current limiting output signal	4 ... 20 mA: 25 mA (overload) 0 ... 10 VDC: < 40 mA (short-circuit)
Damping (rise time)	0.01 ... 3.00 s / 10 ... 90 % Nominal temperature
Offset correction of analogue output and display indication	± 5°C
Measuring range zero point adjustment (T_nP)	0 ... 50 % FS ²⁾
Measuring range end point adjustment (T_EP)	50 ... 100 % FS ²⁾
Zero point adjustment analogue output (o_nP) ¹⁾	Voltage output: 0 ... 2 VDC Current output: 3.9 ... o_EP - 8 mA
End point adjustment analogue output (o_EP) ¹⁾	Voltage output: o_nP + 4 ... 10.5 VDC Current output: o_nP + 8 ... 20.1 mA

¹⁾ Available with optional function package, see Accessories

²⁾ T_EP - T_nP ≥ 50 % FS

Switching output

Setting range of switchpoints	0 ... 100 % FS
Switching hysteresis	≥ 1 % FS Switchpoint > Reset point
Switching resistance	≤ 3 Ω
Output function	Hysteresis, Window; normally closed (NO), normally open (NC)
Switching current	≤ 0.5 A each switching output
Life time	> 100 x 10 ⁶ cycles
Current limiting	≤ 2 A each switching output
Delay time	0 ... 99.99 s

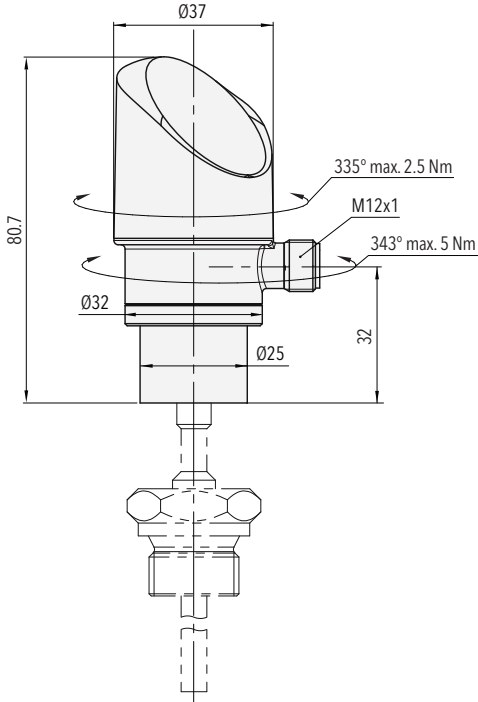
Display

Display	4-digit 7-segment display 180° flippable with disable function, Decimal place: 1
Switching status indication	2 LED, red
Operation	With 3 buttons and menu navigation according to VDMA 24574-1
Display resolution	0.1 K
Display range	-3 ... 103 % FS
Setting parameters	See table: Parameters
User scale unit; User defined values for display indication zero point and end point ¹⁾	Display zero point: -999 ... 9998 Display end point: -998 ... 9999

¹⁾ Available with optional function package, see Accessories

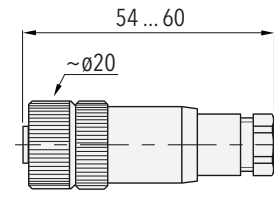
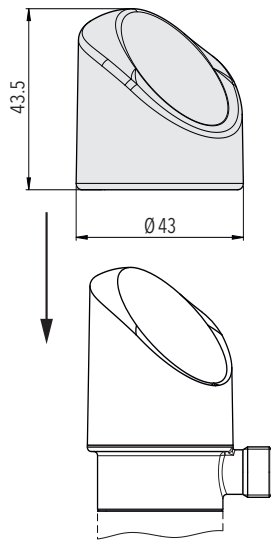
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Dimensions



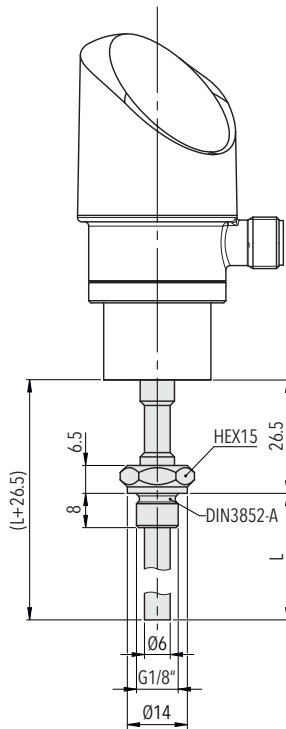
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Protective cap

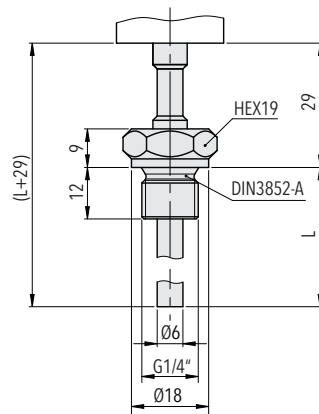


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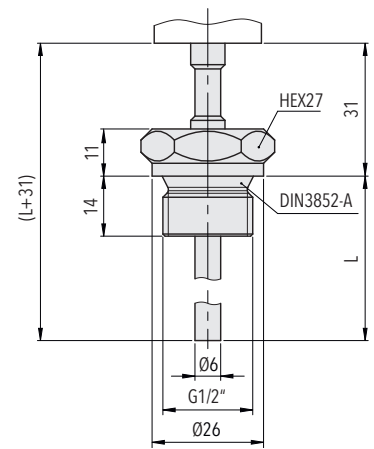
Standard process connections



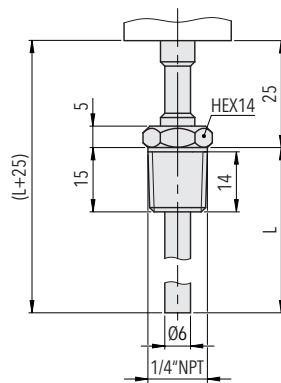
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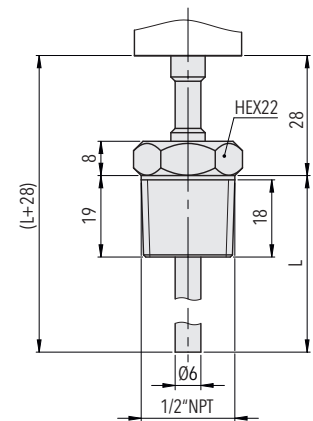
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8180.XX.XX13/23/33/43/53.XX...



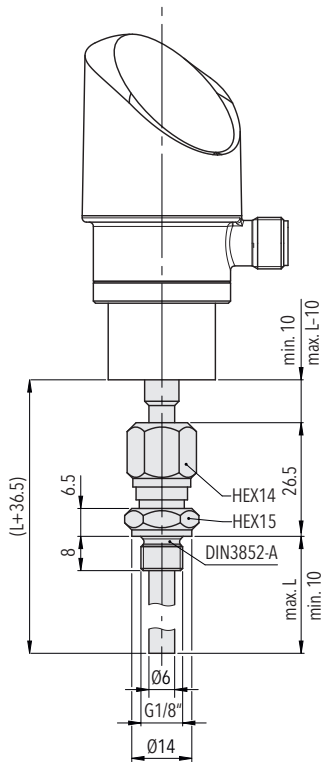
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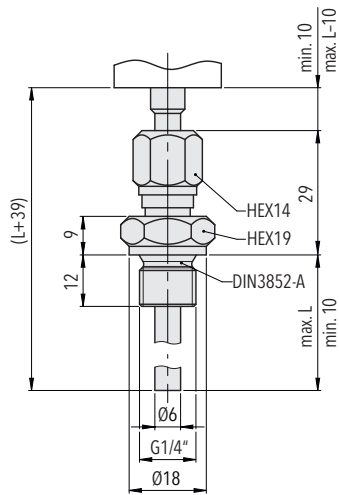
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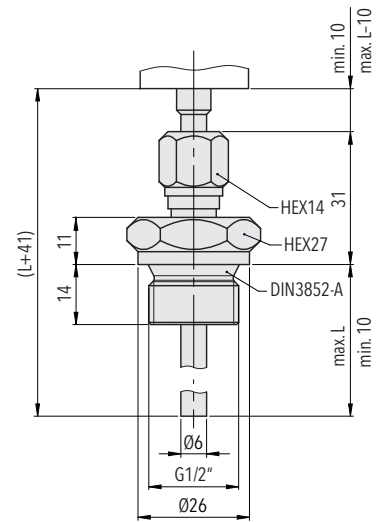
Adjustable process connections



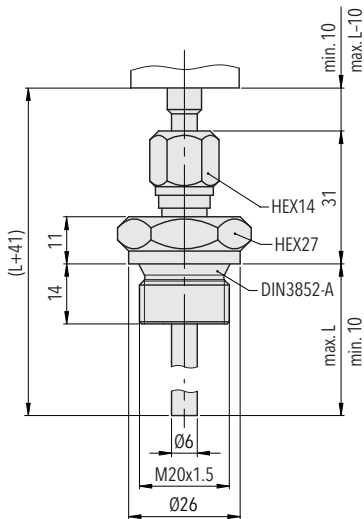
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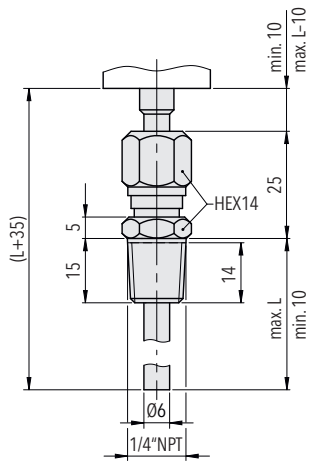
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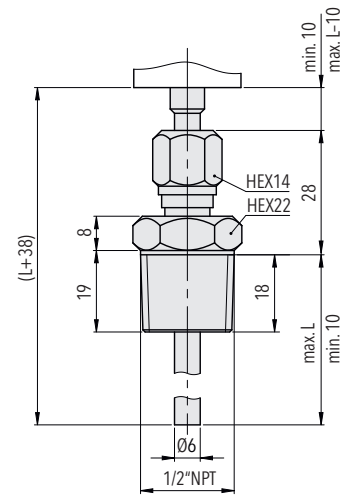
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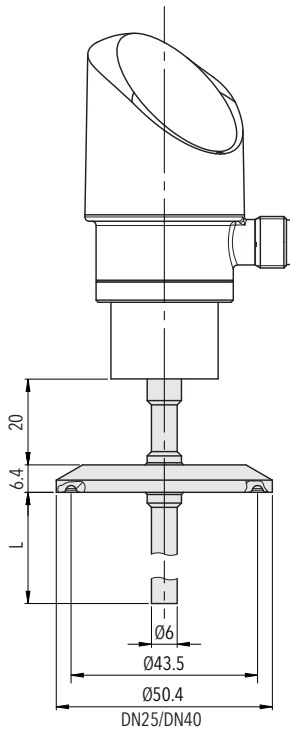
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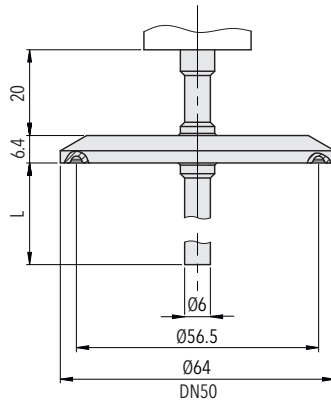
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Tri-Clamp Process connections

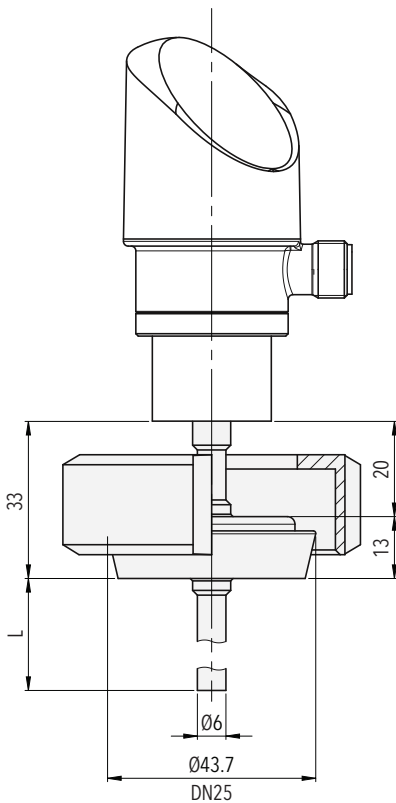


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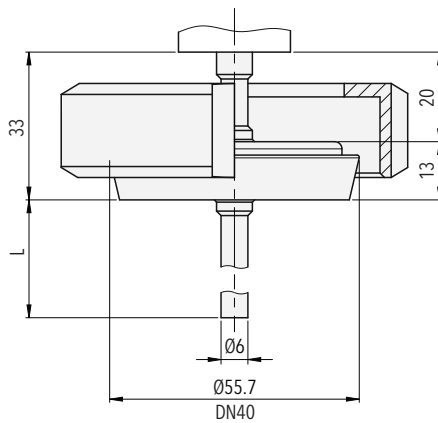


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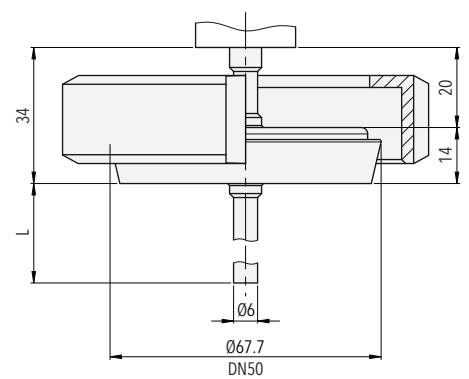
Sanitary fittings



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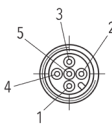
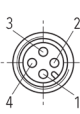
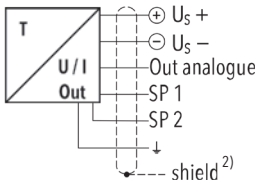
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8180.XX.XX1N/2N/3N/4N/5N.XX...

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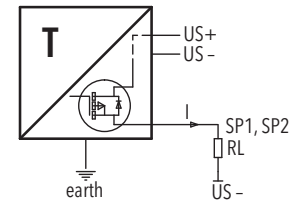
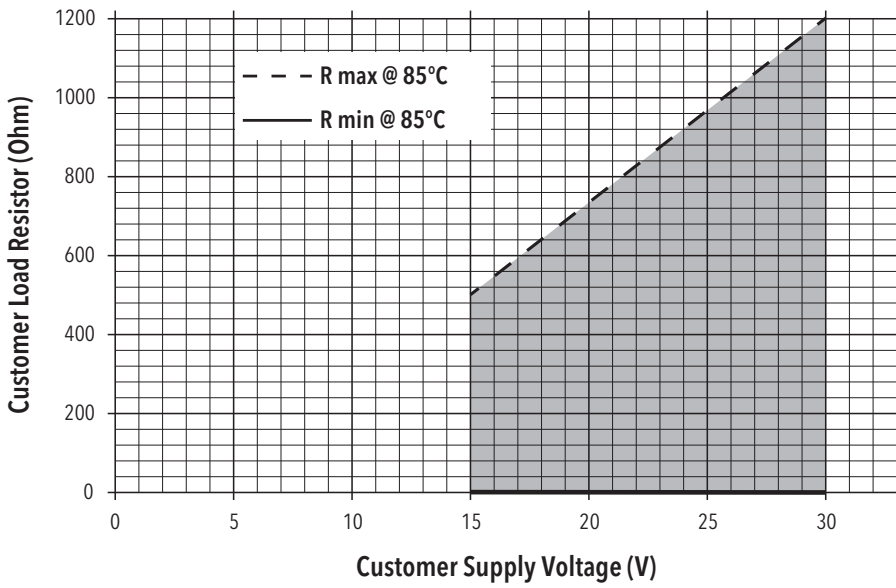
Electrical connection

	M12x1, 5-pole		M12x1, 4-pole	
				
Electrical connection type code	35		32	
IP protection	IP67 ¹⁾		IP67 ¹⁾	
Pin assignment type code	P1	P2	P3	P4
PA	✓	✓	✓	
PU	✓	✓	✓	
PV	✓	✓	✓	
PW	✓	✓	✓	
PS				✓
Pin assignment type code	P1	P2	P3	P4
Output signal 8180.xx.xxxx.xx.PA/PU/PV/PW/PS				
	1 3 2 4 5 Shield ²⁾	1 3 5 4 2 Shield ²⁾	1 3 2 4 Shield ²⁾	1 3 - 4 2 Shield ²⁾

¹⁾ Provided female connector is mounted according to instructions

²⁾ The use of a shielded cable is recommended

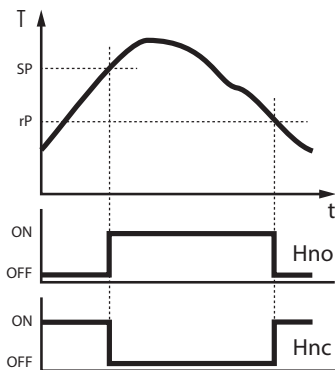
4...20mA: min./max resistor vs. supply voltage @ Pmax = 100%



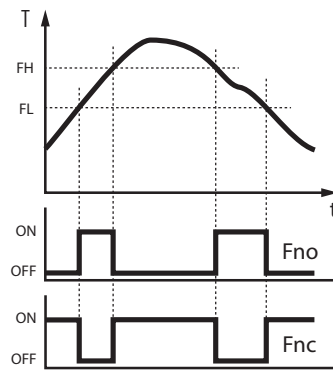
Connection of loads to switching output

Functions switching output

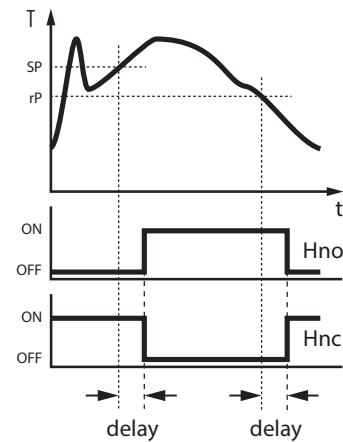
Hysteresis



Window



Delay



Reliable quality

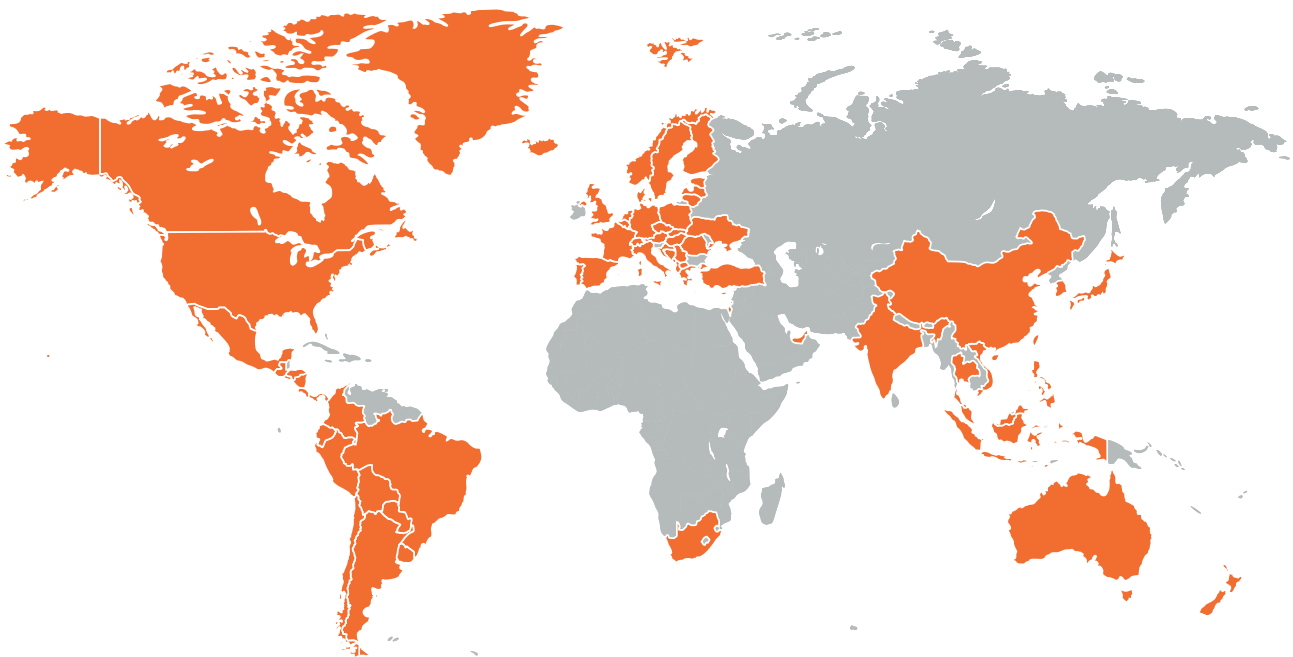
Worldwide represented, globally trusted, Swiss based

Trafag develops, produces and distributes robust, reliable and precise instruments for monitoring pressure, temperature and gas density.

The broad portfolio of pressure and temperature measuring instruments is tailored for use in test benches through to applications in harsh environments. The research and development departments in Switzerland and Germany develop all important components from the sensor to the application-specific microchip, which are

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Pressure transmitters



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Pressure gauge



Thermostats



Temperature transmitters



Gas density