

JUMO GmbH & Co. KG
 Delivery address: Mackenrodtstraße 14
 36039 Fulda, Germany
 Postal address: 36035 Fulda, Germany
 Phone: +49 661 6003-0
 Fax: +49 661 6003-607
 E-mail: mail@jumo.net
 Internet: www.jumo.net

JUMO Instrument Co. Ltd.
 JUMO House
 Temple Bank, Riverway
 Harlow, Essex CM20 2DY, UK
 Phone: +44 1279 635533
 Fax: +44 1279 635262
 E-mail: sales@jumo.co.uk
 Internet: www.jumo.co.uk

JUMO Process Control, Inc.
 6733 Myers Road
 East Syracuse, NY 13057, USA
 Phone: 315-437-5866
 1-800-554-5866
 Fax: 315-437-5860
 E-mail: info.us@jumo.net
 Internet: www.jumousa.com



Contact Dial Thermometers

Special features

- Class 1.5
- Display range -40° C to +600° C
- Temperature controller with actual value display as built-in or add-on device in a stainless steel case
- with 1 or 2 microswitches
- Case sizes Ø: 60 mm, 80 mm, and 100 mm
 Front panel: 72x72 mm and 96x96 mm

Brief description

Contact dial thermometers are devices with an actual value display for temperature measurement, control, and monitoring and can be used universally.

The temperature-dependent volume change in a measuring system filled with liquid or the temperature-dependent pressure change in a measuring system filled with gas is converted to a rotational movement of the actual value indicator by a bourdon tube; no transmission gear is required. The microswitch is actuated by the rotational movement of the indicator shaft via a tap system.

Contact dial thermometers in the series 608520 are RoHS-compliant and cadmium-free.



Technical data

Case and front panel	Stainless steel (1.4301)
Cover cap	Plastic (PA6), gray, UV-stabilized
Protection type	IP 54 according to DIN EN 60529
Front pane	Acrylic glass (PMMA)
Chassis	Aluminum (3.2582.05)
Scale	White, with black lettering
Display	Class 1.5 similar to DIN EN 13190
Strain relief spring	For capillary devices on the case and the temperature probe
Setpoint value adjustment	By setpoint adjuster in the front pane
Display correction	On the rear
Limit value temperatures	For transport and storage -30°C to +70°C (for display range -40 to +40°C up to max. 50°C; -30 to +50°C up to max. 60°C)
Rated position (NL)	Any

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Technical data

Display range (AB)	Display range in °C	Measuring range in °C	Tolerance in °C (+/-)
469	-40 to +40	-30 to +30	1.5
643	-20 to +120	0 to +100	3.0
807	0 to +60	+10 to +50	1.5
814	0 to +100	+10 to +90	1.5
818	0 to +120	+20 to +100	3.0
832	0 to +200	+20 to +180	3.0
840	0 to +300	+30 to +270	6.0
848	0 to +400	+50 to +350	6.0
854	0 to +500	+50 to +450	8.0
858	0 to +600	+100 to +500	10.0

	Liquid filling	Gas filling
Measuring system	Display range (AB) ≤ 350°C	Display range (AB) ≥ 400°C
Time constant 0.632	Approx. 12 s, measured in water, with a probe Ø of 6 mm made of copper.	Approx. 4 s, measured in oil, with a probe Ø of 10 mm made of stainless steel.
Ambient temperature influence effect	In % of the display range (referring to the deviation from the reference value +23°C)	
On case	0.15% of the display range per K ambient temperature change	0.05% of the display range per K ambient temperature change
On capillary (per m)	0.03% of the display range per K ambient temperature change	No influence
	At higher ambient temperature – higher temperature display – lower switching point	

	Standard	Extra code (TZ) 650
Electrical contact	Single-pole microswitch with mechanically actuated changeover contact	
Contact type		
Switching capacity	AC 230V, +10/-15%, 48 to 63Hz, cos φ = 1 (0.6) 5 (1.5) A	10 (3) A
Switching differential	Approx. 1.5% of the display range	1.5 to 3% of the display range
Switching point accuracy	± 0.5% of the display range referring to the switch-off point with rising temperature	
Switching reliability	To ensure a high switching reliability, we recommend a minimum voltage of 24 V and a minimum current of 100 mA	

	Standard	Design type 02 and 22	Design type 10, 23, and TZ 426	Case Ø 60 mm
Electrical connection	Screw terminals, connection cross-section up to 2.5 mm ²	Connection cable 0.5 m with screw terminals	Cover cap with cable fitting, suitable for cable Ø from 6.5 to 13 mm	Cover cap with cable fitting, suitable for cable Ø from 8 to 10 mm

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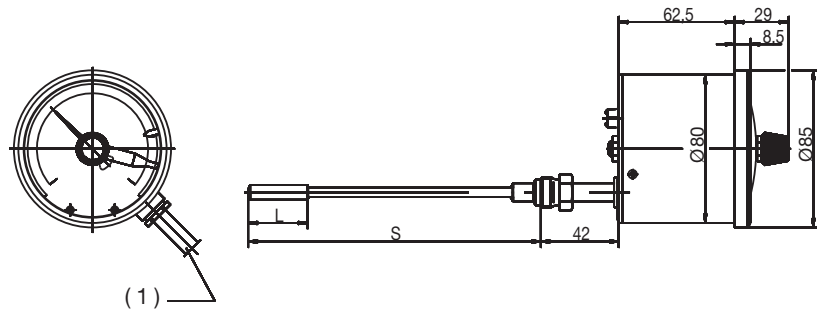
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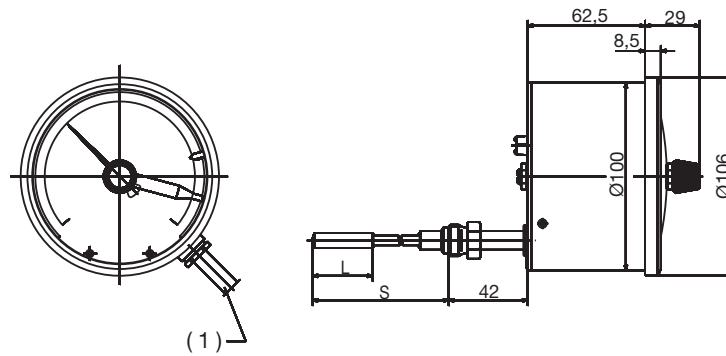
Dimensions

Type:
 608520/0280



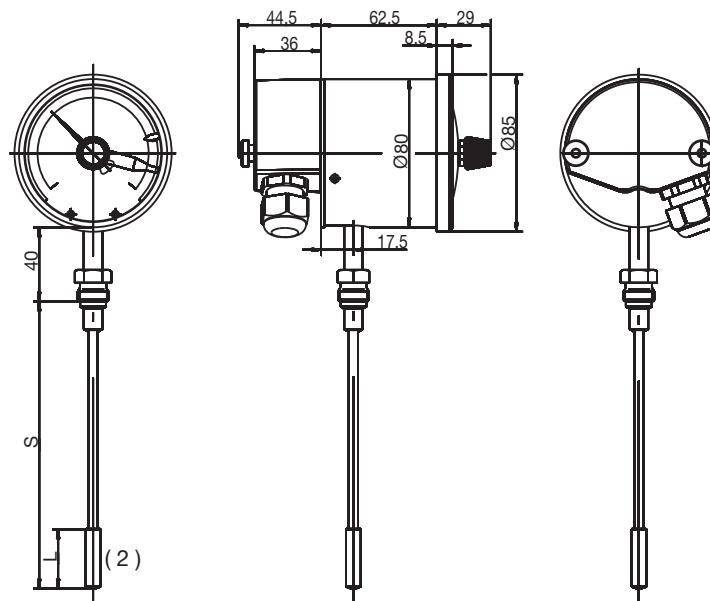
(1) Connecting cable 0.6 m long with screw terminal

Type:
 608520/0210



(1) Connecting cable 0.6 m long with screw terminal

Type:
 608520/1080



(2) Active probe dimension

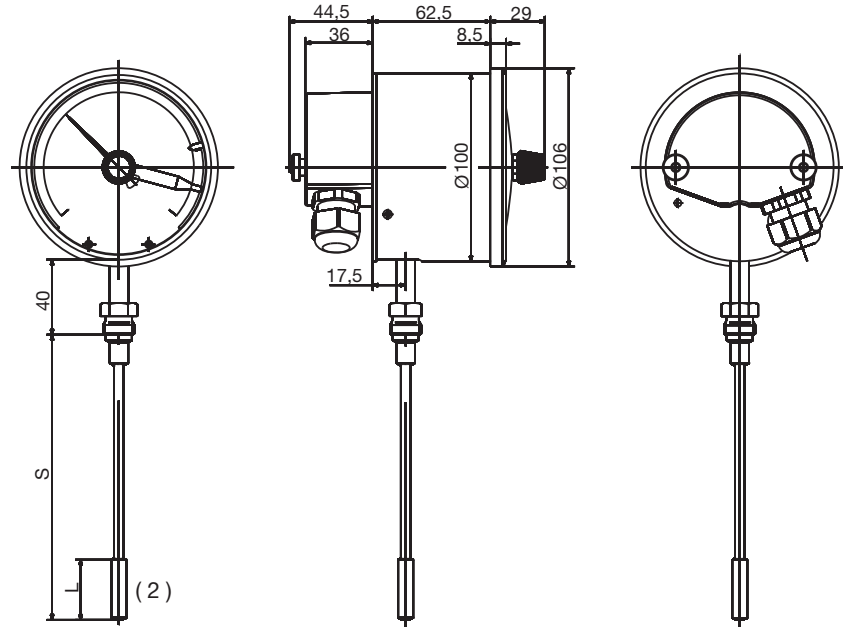
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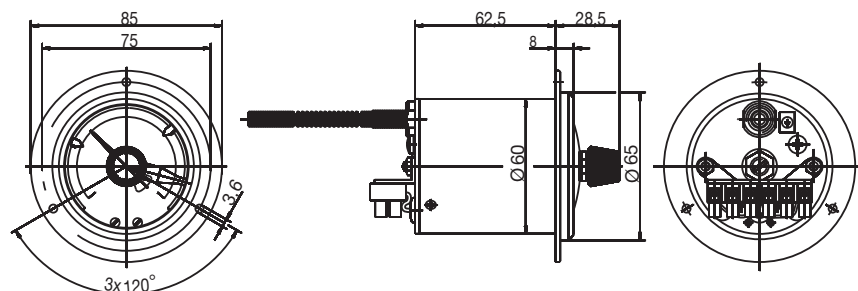


Type:
 608520/1010



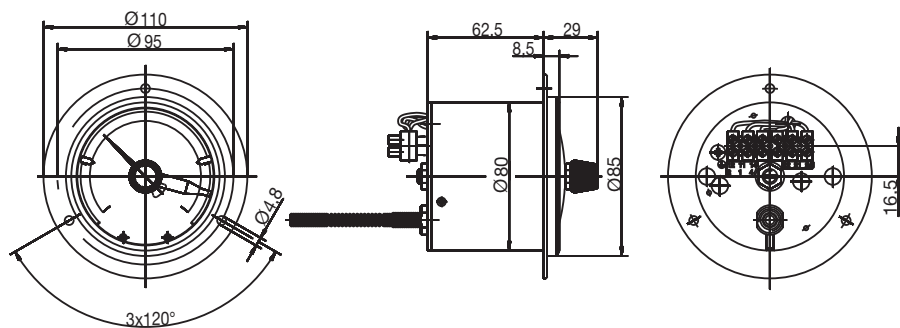
(2) Active probe dimension

Type:
 608520/2060



Panel cut-out for case
 $\varnothing 60 \text{ mm} = 62^{+0.5} \text{ mm}$

Type:
 608520/2080



Panel cut-out for case
 $\varnothing 80 \text{ mm} = 62^{+0.5} \text{ mm}$

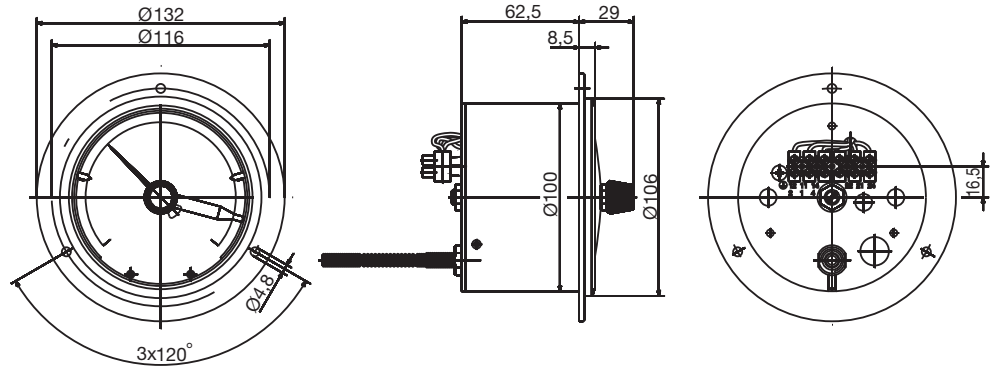
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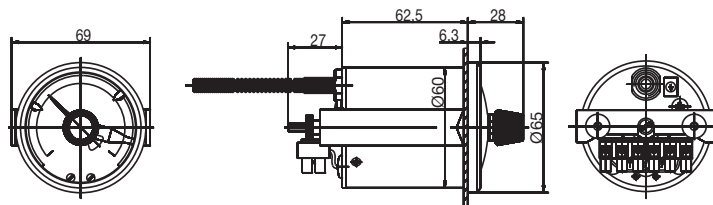


Type:
 608520/2010



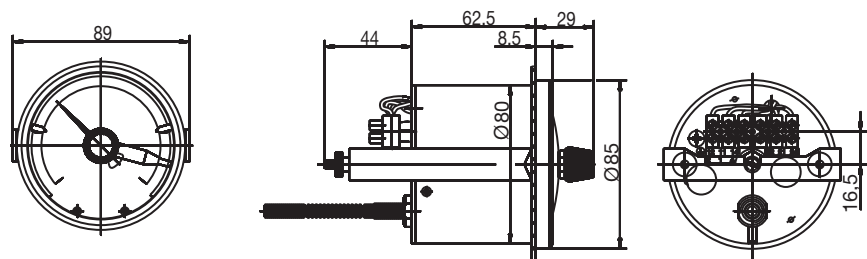
Panel cut-out for case
 $\varnothing 100 \text{ mm} = 100^{+0.5} \text{ mm}$

Type:
 608520/2160



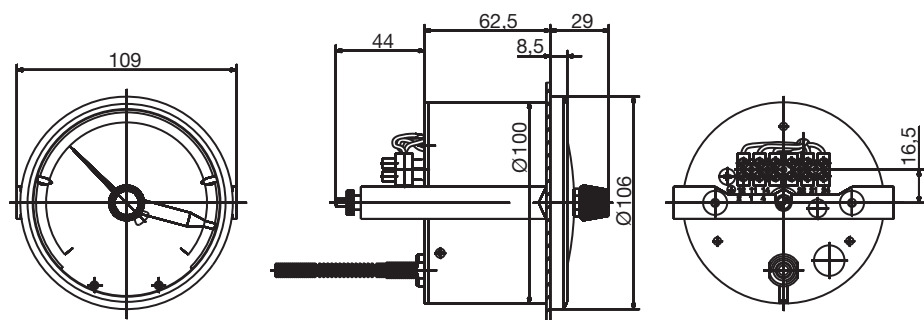
Panel cut-out for case
 $\varnothing 60 \text{ mm} = 62^{+0.5} \text{ mm}$

Type:
 608520/2180



Panel cut-out for case
 $\varnothing 80 \text{ mm} = 82^{+0.5} \text{ mm}$

Type:
 608520/2110



Panel cut-out for case
 $\varnothing 100 \text{ mm} = 100^{+0.5} \text{ mm}$

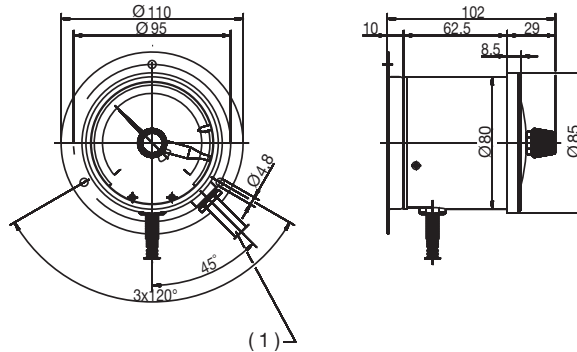
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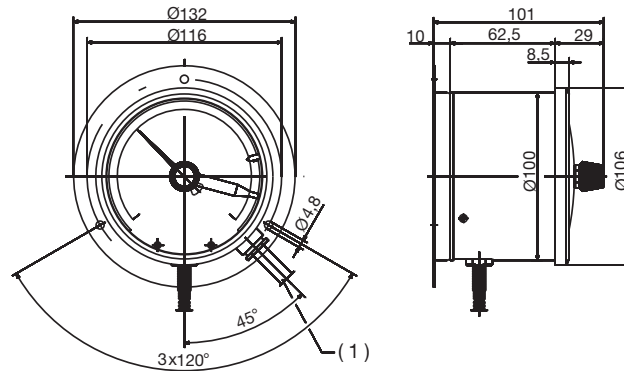


Type:
 608520/2280



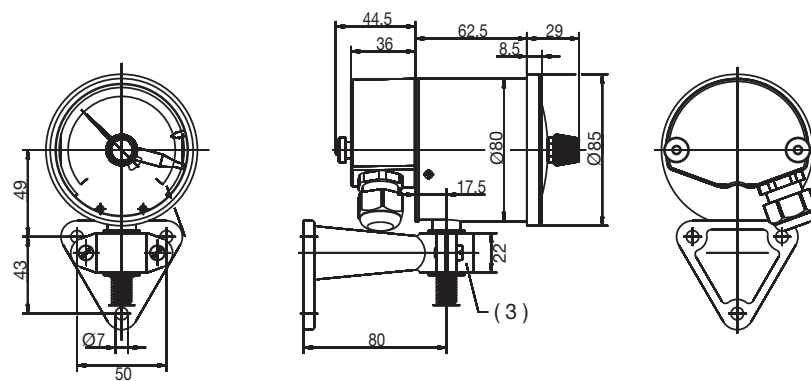
(1) Connecting cable 0.6 m long, ferrule

Type:
 608520/2210



(1) Connecting cable 0.6 m long, ferrule

Type:
 608520/2380



(3) Spigot Ø 20 mm

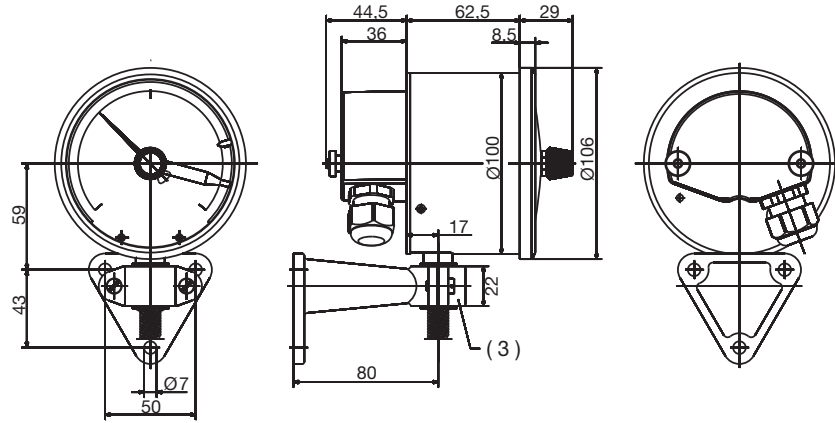
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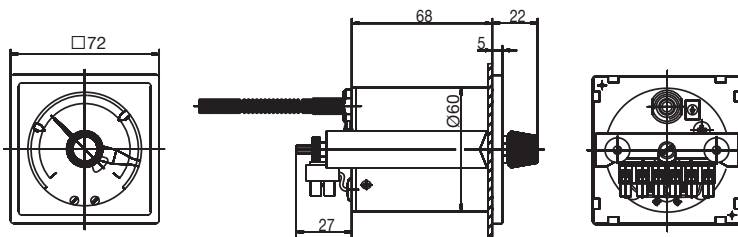


Type:
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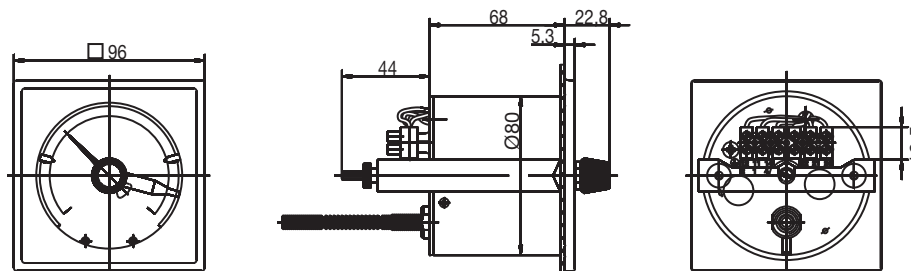
(3) Spigot Ø 20 mm

Type:
 608520/2572



Panel cut-out for front panel
 72 x 72 mm = Ø 62^{+0,5} mm

Type:
 608520/2596



Panel cut-out for front panel
 96 x 96 mm = Ø 82^{+0,5} mm oder
 96 x 96 mm = 92 x 92^{+0,5} mm (TZ 460)

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Order details

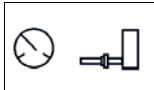

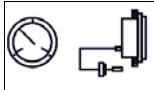
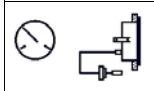
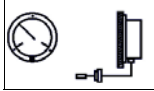
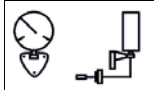
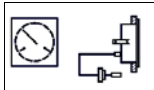
Order code

(1) Basic type

608520	Mechanical contact dial thermometer, class 1.5
608550	Mechanical contact dial thermometer, class 1.5, transformer version (only basic type extension 1080)

(2) Basic type extension

Case size Ø

0280	Design type 02		80 mm
0210			100 mm
1080	Design type 10		80 mm
1010			100 mm
2060	Design type 20		60 mm
2080			80 mm
2010			100 mm
2160	Design type 21		60 mm
2180			80 mm
2110			100 mm
2280	Design type 22		80 mm
2210			100 mm
2380	Design type 23		80 mm
2310			100 mm
2572	Design type 25		Case size □
2596			72 x 72 mm 96 x 96 mm

(3) Display range in °C

469	-40 to +40
643	-20 to +120
807	0 to +60
814	0 to +100
818	0 to +120
832	0 to +200
840	0 to +300
848	0 to +400
854	0 to +500
858	0 to +600

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Order code

(4) Capillary type (FL)^a

00	Without (with rigid connection)
02	FL 02 Cu capillary with Cu textile braiding, approx. Ø 2.5 mm (up to AB end value +300°C)
11	FL 11 Cu capillary with PE coating, approx. ø 3.5 mm (up to AB end value +120°C)
17	FL 17 Stainless steel capillary, approx. Ø 1.5 mm
21	FL 21 Cu capillary, approx. Ø 1.0 mm (up to AB end value +300°C)

(5) Capillary length^b

0	Without (with rigid connection)
1000	1000 mm
2000	2000 mm
3000	3000 mm
4000	4000 mm
5000	5000 mm
...	Special length (specifications in plain text: 1,000 mm increments, maximum length 6,000 mm), additional lengths upon request

(6) Process connection (PC)^a

750	TF 01	Temperature probe with stepped support tube	
752	TF 11	Temperature probe without support tube	
843	TA 02	Protection tube with union nut and loose screw connection ^b	
161	TA 03	Protection tube with loose screw connection	
847	TA 06	Protection tube with displaceable threaded fitting on support tube ^b	
311	TA 20	Protection tube with loose screw connection and connection collar ^b	
872	TA 21	Protection tube with loose pressure screw and conical seal (only G 3/8 possible)	
873	TA 22	Protection tube with loose pressure screw, conical seal, and loose screw connection ^b	
874	TA 24	Protection tube (CuNi) with screw connection (CuZn), O ring seal and clamping screw ^{a b}	
401	TA 23	Protection tube with pressure screw and contact pressure spring (only M 10x1 possible)	
913	SH 07	Screw-in protection tube, multi-sectional, with clamping piece and fixing screw (suitable for TF 01 and TF 11)	
820	SH 09	Weld-in protection tube, multi-sectional, with clamping piece and fixing screw ^b (not for FL 21 – welding collar with steel 1.4515)	
876	SH 10	Screw-in protection tube, multi-sectional ^b (suitable for TA 21)	
871	SH 11	Screw-in protection tube, multi-sectional ^b (suitable for TA 23)	

^a For the description and special features refer to data sheet 608730.

^b Screw-in spigot according to DIN 3852, form A.

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**Order code**

(7)	Ø Process connection (PC) ^a
6	6 mm
8	8 mm
10	10 mm
11	11 mm
12	12 mm
<hr/>	
(8)	Thread type of process connection (PC) ^a
000	Without thread (for TA 01 and TF 11)
103	Screw connection G 3/8
104	Screw connection G 1/2
105	Screw connection G 3/4
114	Screw connection M 10 x 1 (only with TA 23)
<hr/>	
(9)	Material, probe / support tube ^a
26	Stainless steel (CrNi, 1.4571)
96	Copper (Cu) / Brass (CuZn) (up to 200°C)
95	Stainless steel (CrNi, 1.4571) – probe / brass (CuZn) – support tube (from 250°C)
<hr/>	
(10)	Material of process connection (PC) ^a
00	Without (only TF 01 and TF 11)
26	Stainless steel (CrNi, 1.4571)
46	Brass (CuZn)
<hr/>	
(11)	Insertion length, process connection (PC) ^a (dimension "EL" or "S")
0	Minimum insertion length TF 11 (active probe dimension)
50	50 mm
100	100 mm
150	150 mm
200	200 mm
...	Special length (specifications in plain text – 50 mm increments)

^a For the description and special features refer to data sheet 608730.

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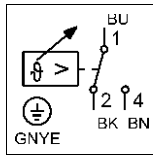
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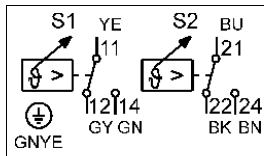
Order code

(12) Switching output

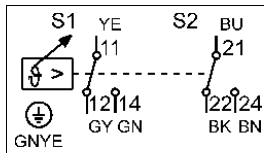
20 1 changeover switch



21 2 changeover switches



22 2 changeover switches in fixed sequence



(13) Extra codes (TZ)

- 000 Without extra code
- 426 Cover cap to protect the screw terminals against contact and spray water (standard for design types 10 and 23; not for design type 22; not in connection with TZ 460)
- 430 Drag indicator (includes TZ 477)
- 460 Device centering for panel cut-out 92 × 92 mm (only for basic type extension 2596)
- 477 Setpoint adjustment protected by the bolted cover. Adjustment with screwdriver.
- 518 Stop for Min. — or Max. — setpoint value limitation, default setting
- 522 Customized scale
- 650 Microswitch 10 (3) A (AC/DC 230 V, +10/-15%, 48 to 63 Hz, cos φ = 1 (0.6))

Special versions upon request!

Order code

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13)
 608520 / [] - [] - [] - [] - [] - [] - [] - [] - [] - [] - [] - [] / [] , ...

Order example

608520 / 2010 - 818 - 21 - 2000 - 104 - 10 - 000 - 26 - 00 - 100 - 20 / 650^a , ...

^a List extra codes in sequence, separated by commas.

Stock versions

Part no.	Type	Display range °C	Switching output	Temperature probe, process connection	Protection tube mm
00455918	608550/0180-643-874-8-106-50-150-20/434-522 with drag indicator	-20 to +120	20 (1 contact)	TF 05 d = 8 mm TA 24, G 1", CuZn	150
00455919	608550/0180-643-874-8-106-50-150-21/434-522 with drag indicator		21 (2 contacts)		

Delivery within 3 working days after receipt of order