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# Contact Thermometer

## Transformer and industrial versions

### Particularities

- Electromechanical temperature controller, with indication of actual value
- Class 1.5
- One or two switches; Performance of 5 or 10 A
- Case size: Ø 80 mm
- high-quality ochwertiges polyamide (PA6) case

### Brief description

The contact thermometer is a universally applicable instrument with indication of the actual value, for temperature measurement, control and monitoring.

The temperature-dependent change in volume of a liquid-filled measuring system (or the temperature-dependent change of pressure in a gas-filled system) is converted into a rotary movement of the pointer by a Bourdon tube, without any intermediate gearing. The rotary movement of the pointer spindle operates the microswitch through a lever system.



Type 608540/1080

### Stock versions

(delivery within 3 working days after receipt of order)

#### Transformer version

Sales No.	Type	Display range °C / °F	Switching output (SA)	Temperature probe Process connection	Immersion tube "S"
60/00491256	608540/1080-643-00-0-874-8-106-26-46-150-21/430, 522, 477 with fly back	-20...+120°C	21 2 switches	TA 24, G1" CuZn	150 mm
60/00512083	608540/1080-643-00-0-874-8-106-26-46-150-20/430, 522, 477 with fly back		20 1 switch		

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## Technical data

<b>Housing, bezel and protective cap</b>	plastic (PA 6), gray UV-stabilized	
<b>Enclosure protection</b>	IP54 to EN 60 529	
<b>Window</b>	PMMA (Plexiglas)	
<b>Scale</b>	white, black lettering	
<b>Accuracy class</b>	Class 1.5 similar to EN 13 190	
	<b>liquid-filled</b>	<b>gas-filled</b>
<b>Measuring system</b>	indication range (AB) $\leq 350^{\circ}\text{C}$	indication range (AB) $\geq 400^{\circ}\text{C}$
<b>Time constant <math>t_{0.632}</math></b>	approx. 12 sec, measured in a water bath, with a 6 mm dia. copper probe	approx. 4 sec, measured in an oil bath, with a 10 mm dia. stainless steel probe
<b>Ambient temperature effect</b>	in % of indication range (referred to the deviation from the reference value $+23^{\circ}\text{C}$ )	
<b>on housing</b>	0.15% of indication range per $^{\circ}\text{C}$ change in ambient temperature	0.05% of indication range per $^{\circ}\text{C}$ change in ambient temperature
<b>on capillary (per meter)</b>	0.03% of indication range per $^{\circ}\text{C}$ change in ambient temperature	no effect
	higher ambient temperature – higher temperature indication – lower switching point	
	standard	extra code (TZ) 650
<b>Electrical contact</b>	single-pole microswitch with a mechanically operated changeover contact	
<b>Contact type</b>		
<b>Contact rating</b>	230V AC $+10/-15\%$ , 48 – 63Hz, p.f = 1 (0.6)	
	5 (1.5) A	10 (3) A
<b>Switching differential</b>	approx. 1.5% of indication range	1.5 to 3% of indication range
<b>Switching point accuracy</b>	$\pm 0.5\%$ of indication range referred to the switch-off point with rising temperature	
<b>Switching reliability</b>	To ensure maximum switching reliability, we recommend a minimum voltage of 24 V and a minimum current of 20 mA.	
<b>Electrical connection</b>	screw terminals: for conductor cross-section up to 2.5 mm <sup>2</sup> , protected by cap with cable gland Suitable for cable diameters from 6.5 to 16 mm.	
<b>Setpoint adjustment</b>	with screwdriver, protected by cap.	
<b>Limit temperatures</b>	$-30$ to $+70^{\circ}\text{C}$ (storage and transport $-30$ to $+70^{\circ}\text{C}$ )	
<b>Nominal position (NL)</b>	NL90, symbol $\perp$	

### Note

Physical and toxicological properties of the expansion fluid which may escape in the event of a system fracture.

Control range with end of scale $^{\circ}\text{C}$	Dangerous reactions	Fire and explosion hazard		Water contamination	irritant	Toxicological data	
		Ignition temp. $^{\circ}\text{C}$	Explosion limit % v/v			danger to health	toxic
$< +200$	no	+ 355	0.6 – 8	yes	yes	1	no
$\geq 200^{\circ}\text{C} \leq +350$	no	+ 490	--	yes	yes	1	no
$> 350^{\circ}\text{C} \leq +500$	no	no	no	no	no	no	no

<sup>1</sup> At present there is no restrictive statement from the health authorities concerning any danger to health over short periods and at low concentrations, e.g. after a fracture of the measuring system.

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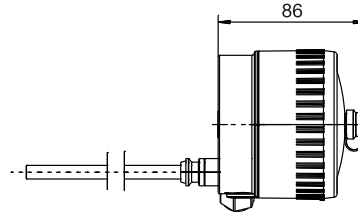
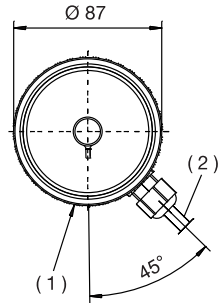
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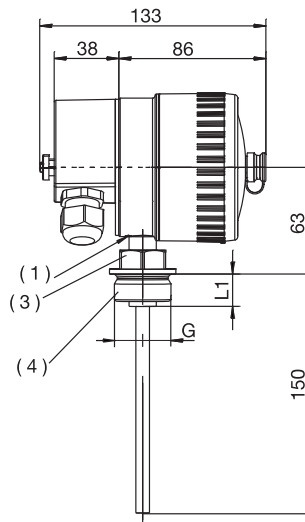
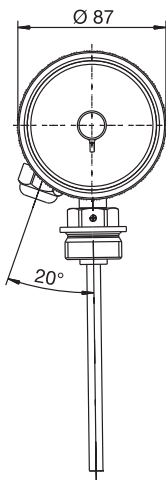
## Dimensions

Type 608540/0280



- (1) Vent opening
- (2) Connecting cable, 0.5 m long

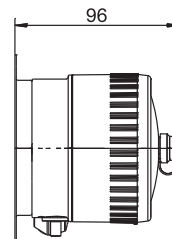
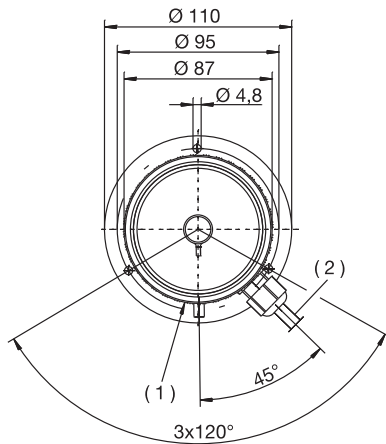
Type 608540/1080  
 (transformer version)



G 1/2A	27	14
G 3/4A	32	16
G 1A	27	16
G	a/f	L1

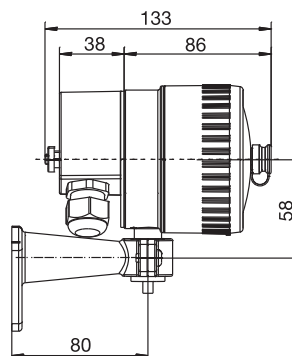
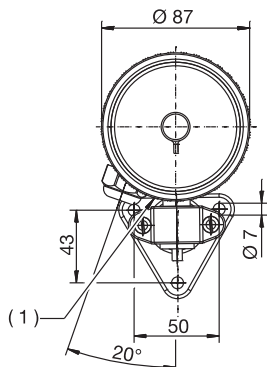
- (1) Vent opening
- (3) a/f
- (4) Screw-in spigot DIN 3852 Form A

Type 608540/2280



- (1) Vent opening
- (2) Connecting cable, 0.5 m long

Type 608540/2380



- (1) Vent opening

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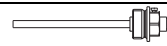
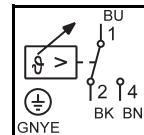
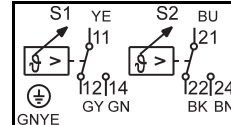
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### Order details: Transformer version

Contact thermometer, type 608540

Order code	(1) Basic type
608540	Mechanical contact thermometer, transformer version
(2) Basic type extensions	
1080	Style: 10; housing size: Ø 80 mm dia. 
(3) Indication range (AB)	
643	-20 to +120°C; range 0 to +100°C accuracy 3.0°C
818	0 to +120°C; range +20 to +100°C accuracy 3.0°C
921	+20 to +120°C; range +38 to +104°C accuracy 3.0°C
(4) Capillary type (FL) <sup>1</sup>	none (with rigid connection)
00	
(5) Capillary length <sup>1</sup>	none (with rigid connection)
0	
(6) Process connection (PA) <sup>1</sup>	
874	TA 24; Immersion tube (CrNi) with screw connection (CuZn), O ring sealing and clamping screw 
(7) Diameter of process connection (PA) <sup>1</sup>	
8	8 mm dia.
(8) Thread for process connection (PA) <sup>1</sup>	
104	G <sup>1</sup> / <sub>2</sub> (1/2" pipe) thread
105	G <sup>3</sup> / <sub>4</sub> (3/4" pipe) thread
106	G 1 (1" pipe) thread
(9) Material of probe / support tube <sup>1</sup>	stainless steel (CrNi 1.4571)
26	
(10) Material of process connection (PA) <sup>1</sup>	brass (CuZn)
46	
(11) Fitting length of process connection (PA) <sup>1</sup> (dimension S)	150 mm
150	
(12) Switching output (SA)	
20	one switch 
21	two switches 
(11) Extra codes	
000	no extra code
430	peak-reading pointer
522	customized scale

Order code	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)					
608540	/	...	-	...	-	..	-	.	-	...	-	..	-	..	-	..	/	..

Order example	608540	/	1080	-	921	-	00	-	0	-	874	-	8	-	106	-	26	-	46	-	150	-	20	/	000 <sup>3</sup>
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<sup>1</sup> See data sheet 608730 for description and features.

<sup>3</sup> List extra codes in sequence, separated by commas.

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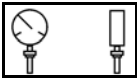



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**Order details: Industrial version**

**Contact thermometer, type 608540**

Order code	(1) Basic type	
608540	Mechanical contact thermometer, industrial version	
<b>(2) Basic type extensions</b>		
1080	Style: 10; housing size: Ø 80 mm dia.	
0280	Style: 02; housing size: Ø 80 mm dia.	
2280	Style: 22; housing size: Ø 80 mm dia.	
2380	Style: 23; housing size: Ø 80 mm dia.	
<b>(3) Indication range (AB)</b>		
469	-40 to + 40°C; range -30 to + 30°C	accuracy 1.5°C
566	-30 to + 50°C; range -20 to + 40°C	accuracy 1.5°C
643	-20 to +120°C; range 0 to +100°C	accuracy 3.0°C
807	0 to + 60°C; range +10 to + 50°C	accuracy 1.5°C
810	0 to + 80°C; range +10 to + 70°C	accuracy 1.5°C
814	0 to +100°C; range +10 to + 90°C	accuracy 1.5°C
818	0 to +120°C; range +20 to +100°C	accuracy 3.0°C
921	+20 to +120°C; range +38 to +104°C	accuracy 3.0°C
826	0 to +160°C; range +20 to +140°C	accuracy 3.0°C
832	0 to +200°C; range +20 to +180°C	accuracy 3.0°C <sup>4</sup>
834	0 to +250°C; range +30 to +220°C	accuracy 4.0°C <sup>4</sup>
926	+50 to +250°C; range +70 to +230°C	accuracy 3.0°C <sup>4</sup>
840	0 to +300°C; range +30 to +270°C	accuracy 6.0°C <sup>4</sup>
927	+50 to +300°C; range +80 to +270°C	accuracy 4.0°C <sup>4</sup>
843	0 to +350°C; range +50 to +300°C	accuracy 6.0°C <sup>4</sup>
932	+50 to +350°C; range +80 to +320°C	accuracy 6.0°C <sup>4</sup>
848	0 to +400°C; range +50 to +350°C	accuracy 6.0°C <sup>4</sup>
851	0 to +450°C; range +50 to +400°C	accuracy 6.0°C <sup>4</sup>
854	0 to +500°C; range +50 to +450°C	accuracy 8.0°C <sup>4</sup>
858	0 to +600°C; range +100 to +500°C	accuracy 10.0°C <sup>4</sup>
<b>(4) Capillary type (FL)<sup>1</sup></b>		
00	none (with rigid connection)	
02	FL02 copper capillary with copper braiding, approx. 2.5 mm dia. (up to +300°C top of indication range)	
11	FL11 copper capillary with PE sleeve, approx. 3.5 mm dia. (up to +120°C top of indication range)	
17	FL17 stainless steel capillary, 1.5 mm dia.	
21	FL21 copper capillary, 1.0 mm dia. (up to +300°C top of indication range)	
<b>(5) Capillary length<sup>1</sup></b>		
0	none (with rigid connection)	
1000	1000 mm	
2000	2000 mm	
3000	3000 mm	
4000	4000 mm	
5000	5000 mm	
...	special length (specify in plain text: in 1000 mm steps, maximum length: 10000 mm)	

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**Order details: Industrial version**

**Contact thermometer, type 608540**

Order code	(6) Process connection (PA) <sup>1</sup>	
750	TF 01; temperature probe with stepped support tube	
752	TF 11; temperature probe without support tube	
843	TA 02; immersion tube with union nut and loose nipple <sup>2</sup>	
161	TA 03; immersion tube with loose union nut	
847	TA 06; sliding clamp fitting on support tube <sup>2</sup>	
311	TA 20; immersion tube with loose nipple and shoulder <sup>2</sup>	
872	TA 21; immersion tube with loose plug and conical seal	
873	TA 22; immersion tube with loose plug, conical seal and loose nipple <sup>2</sup>	
401	TA 23; immersion tube with plug and spring clip	
874	TA 24; Immersion tube (CrNi) with screw connection (CuZn), O ring sealing and clamping screw <sup>2,5</sup>	
913	SH 07; screw-in pocket, assembled, with clamping clip and fixing screw <sup>2</sup> (with TF 01)	
820	SH 09; weld-in pocket, assembled, with clamping clip and fixing screw (not with FL21 - welding shoulder with steel 1.4515) (with TF 01)	
876	SH10; screw-in pocket, assembled <sup>2</sup>	
871	SH11; screw-in pocket, assembled <sup>2</sup>	
<b>(7) Diameter of process connection (PA)<sup>1</sup></b>		
6	6 mm dia.	
8	8 mm dia.	
10	10 mm dia.	
12	12 mm dia.	
<b>(8) Thread for process connection (PA)<sup>1</sup></b>		
000	no thread (with TF 01 and TF 11)	
103	G <sup>3</sup> / <sub>8</sub> (3/8" pipe) thread	
104	G <sup>1</sup> / <sub>2</sub> (1/2" pipe) thread	
105	G <sup>3</sup> / <sub>4</sub> (3/4" pipe) thread	
106	G1 (1" pipe) thread	
114	M 10 x 1 thread (with TA 23 and SH 11 only)	

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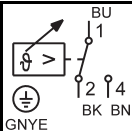
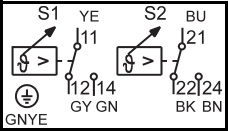
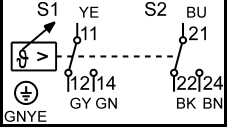
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## Order details: Industrial version

### Contact thermometer, type 608540

<b>Order code</b>	<b>(9) Material of probe / support tube<sup>1</sup></b>
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 (above 250°C)
	<b>(10) Material of process connection (PA)<sup>1</sup></b>
00	none (TF01 and TF11 only)
26	stainless steel (CrNi, 1.4571)
46	brass (CuZn)
	<b>(11) Fitting length of process connection (PA)<sup>1</sup> (dimension EL or S)</b>
0	minimum fitting length TF 11 (active probe dimension)
100	100 mm
150	150 mm
200	200 mm
...	special length (specify in plain text, in 50 mm steps)

	<b>(12) Switching output (SA)</b>
20	one switch 
21	two switches 
22	two switches - sequential switch 

	<b>(13) Extra codes (TZ)</b>
000	no extra code
430	peak-reading pointer
650	microswitch 10 (3) A ( 230 V AC/DC +10/-15%, 48 – 63 Hz, p.f. = 1 (0.6))
518	stop for upper or lower limit of setpoint adjustment, factory-set
522	customized scale
426	Plastic cap for protecting the flat plugs or terminal screws from human contact and from splashed water IP 54, with screwed cable glands, suitable for cable-Ø from 6-8 mm

**Order code**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
608540	/	...	-	...	-	...	-	...	-	...	-	...

**Order example**

608540	/	2280	-	818	-	02	-	2000	-	843	-	8	-	104	-	96	-	46	-	100	-	20	/	000 <sup>3</sup>
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<sup>1</sup> See data sheet 608730 for description and features.  
<sup>2</sup> Screw-in spigot to DIN 3852 Form A.  
<sup>3</sup> List extra codes in sequence, separated by commas.  
<sup>4</sup> Not on styles 02 and 10.  
<sup>5</sup> Material of probe / support tube: styles 02 and 10: stainless steel  
 styles 22 and 23: brass