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Contact Dial Thermometers

- temperature controller with indication for panel or surface mounting
- Class 1
- protection up to IP65
- housing sizes: 100 mm and 160 mm diameter, bezel 96 x 96 mm

Brief description

Contact dial thermometers are universally applicable instruments 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 measuring system) is converted into a rotary movement of the pointer by a Bourdon tube, without any intermediate gearing. The rotary movement of the pointer shaft is used to operate the switched output.

The pointer is directly linked to the measuring system, which makes the overall system extremely torsionally rigid. Vibrations are transmitted to the pointer only to a minor extent.

The switched output can be implemented as a slow-break, magnetic snap-action or inductive contact. The slow-break or magnetic snap-action contact is an auxiliary circuit switch that, depending on the direction of movement, opens or closes an electrical circuit at the set limits, by means of a contact arm that is attached to the moving pointer.

The inductive contact is an electronic limit detector operated by a contactless position sensor (proximity switch).



Type 608425/2316



Type 608425/2496

Technical data



	Type 608425 round panel- or surface-mounting housing	Typ 608425 square panel-mounting instrument
Housing	housing with bayonet lock in stainless steel (1.4301)	galvanized sheet steel housing, fixed at back by a bracket; front bezel in stainless steel (1.4301)
Enclosure protection	IP65 as per EN 60 529	front: IP51 as per EN 60 529 back: IP00 as per EN 60 529
Electrical connection	terminal box: conductor cross-section up to 2.5mm ² cable gland suitable for cable dia. 6.5 – 13 mm	screw terminals: conductor cross-section up to 2.5mm ²
Glass window	polycarbonate	plexiglas (PMMA)
Scale	white, black lettering	
Accuracy class	Class 1 to EN 13190	
Anti-kink spring	for capillary instruments, at the housing and probe	
Setpoint adjustment	through setpoint adjuster on the glass window	
Indication correction	at the back, no indication correction for styles 01 and 20 (100 mm dia.)	
Temperature limits	for transport and storage -20°C to +70°C (with a 0 to +60°C range: max. 65°C)	
Operating position (NL)	unrestricted	
	Liquid filling	Gas filling
Measuring system	range (AB) ≤350°C	range (AB) ≤400°C
Time constant t _{0.632}	approx. 12 sec, measured in water bath, with a 6 mm dia. copper probe	approx. 4 sec, measured in oil bath, with a 10 mm dia. stainless steel probe
Ambient temperature error at housing	in % of indication range (referred to the deviation from the reference value at +23°C)	
on capillary (per meter)	0.15% of indication range per °C change of ambient temperature	0.05% of indication range per °C change of ambient temperature
	0.03% of indication range per °C change of ambient temperature	no effect
	At higher ambient temperatures – higher temperature indication – lower switching point	

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	Standard	Extra code (TZ) 442
Electrical contact		
Contact type	electromechanical slow-break contact with single-pole make contacts	electromechanical magnetic snap-action contact with single-pole make contacts
Contact rating	230 V AC/DC, +10/-15%, 48 – 63Hz, p.f = 1 (0.6)	
	max. 18 VA / 10 W	max. 50 VA / 30 W
Switching differential	≤0.5% of indication range	approx.2% of indication range
Switching point accuracy	±0.5% of indication range (referred to the switching point for rising temperature)	
Switching reliability	To ensure maximum switching reliability, we recommend a minimum voltage of 24 V and a minimum current of 20 mA	
	Electromechanical limit contact	Inductive limit contact
Switching output (SA)	SA 01 to SA 11	SA 30 and SA 31 The inductive limit contact is operated by a contactless proximity switch. The sensor is a slot-type initiator attached to the setpoint indicator. The control flag is activated by the pointer. If the control flag moves into the sensor gap, the internal resistance increases (active area is damped: initiator is high-resistance, relay is de-energized). The switching amplifier of the control device responds to the resulting change in current. Switching action according to the "active current principle". Control flag is not within the sensor air gap, relay is energized:  Current drawn ≥ 3mA (active area is clear, the oscillator is active). Control flag is within the sensor air gap, Relay is de-energized:  Current drawn ≤1mA (active area is damped, no oscillation). Inductive limit contact as per Directive 94/9 EC (ATEX), suitable for II 2 G EEx ia IIC T6
	for switching sequence and diagrams: see order details	
Secondary switched devices	For electromechanical limit detectors we recommend using Type MSR multi-function relays from:Wiebrock Mess- und Regeltechnik GmbH, www.wiebrock.de. These switching amplifiers increase the switching reliability and switching capacity of slow-break and magnetic snap-action contacts, and reduce their contact loading. Unintended switching of the limit contact (caused by vibration) can be considerably reduced by using a drop-out delay. With inductive limit detectors, you can use the transistor relay: Type KFA6-SR2-Ex...W (II (1) G D [EEx ia] IIC) from Pepperl & Fuchs (www.pepperlfuchs.de). Intrinsic safety II 2 G EEx ia IIC T6 can only be ensured if this transistor relay is used.	

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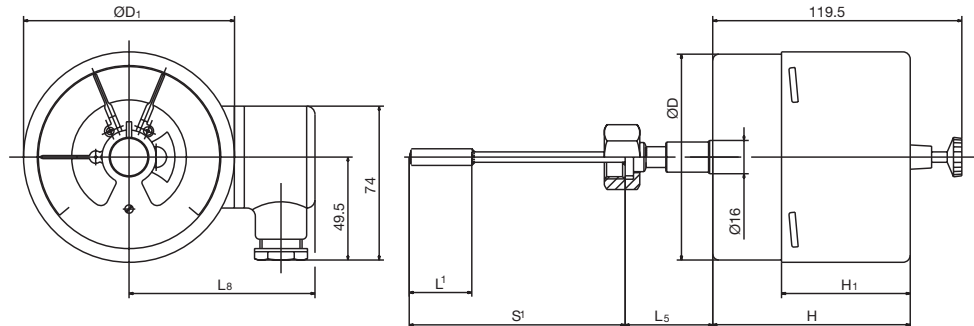
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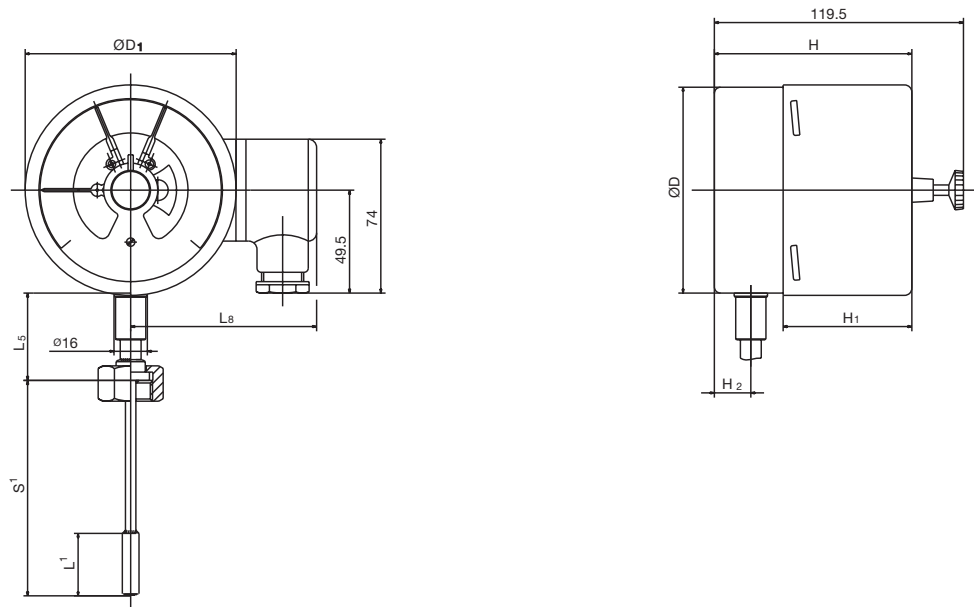


Dimensions

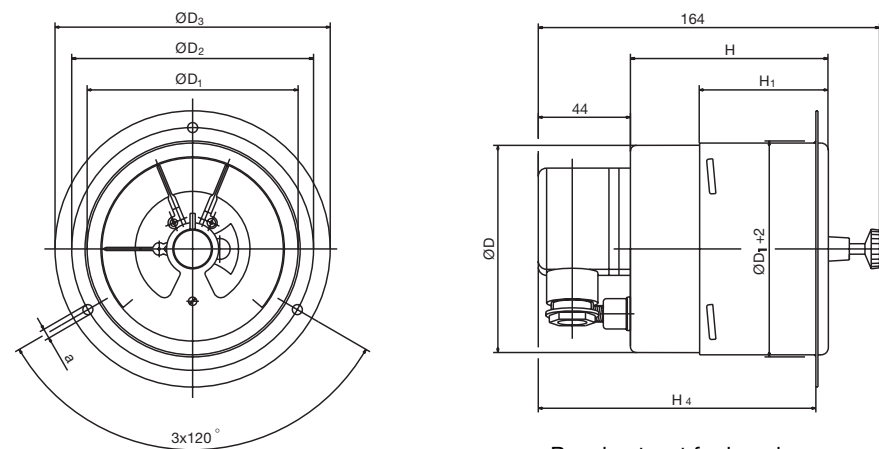
Types: 608425/0110
 608425/0116



Types: 608425/1010
 608425/1016



Types: 608425/2010
 608425/2016



Panel cut-out for housing
 diameter 100mm = $105.5^{+0.5}$ mm
 diameter 160mm = $165.5^{+0.5}$ mm

¹ for lengths, see Data Sheet 60.8730

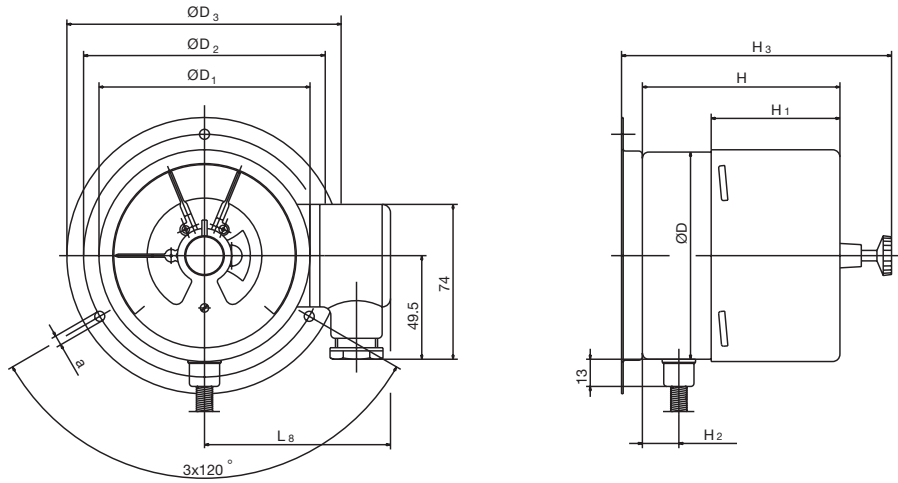
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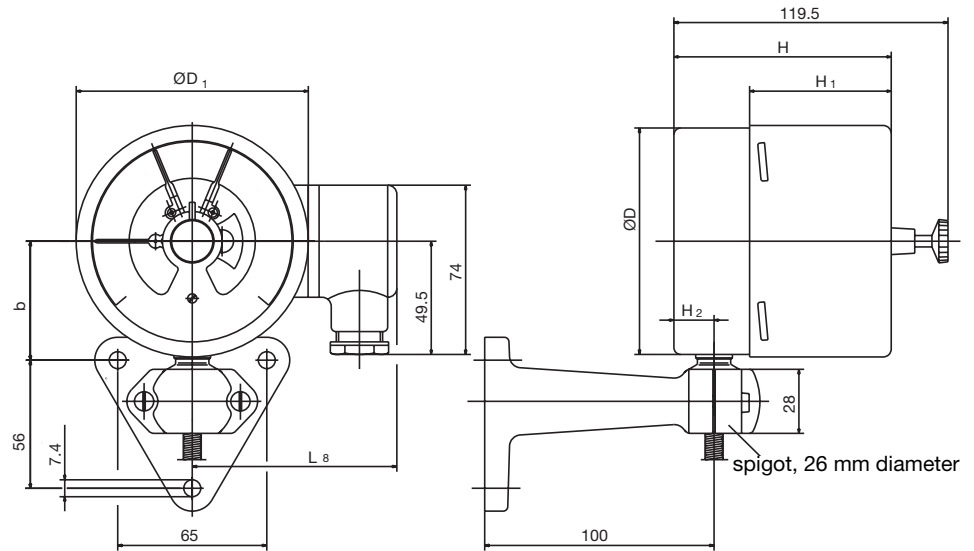
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Types: 608425/2210
 608425/2216



Types: 608425/2310
 608425/2316

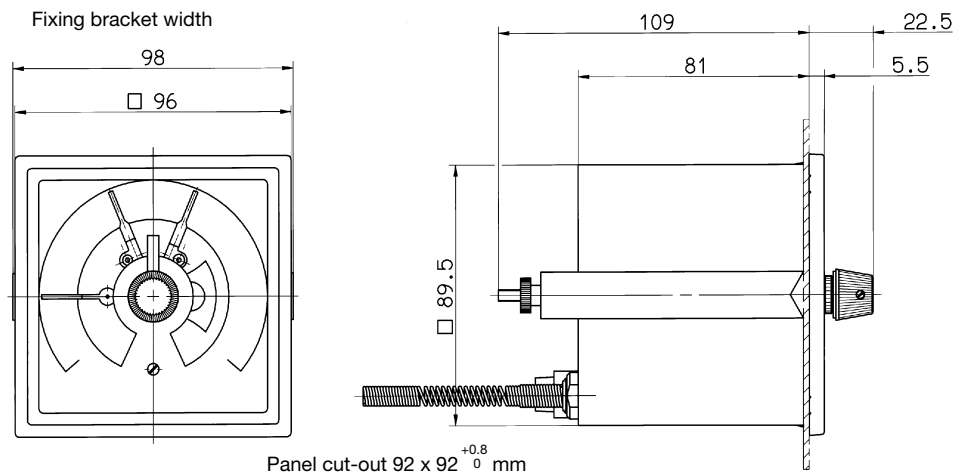


instrument mounting to DIN 16281

Housing diameter	H	H ₁	H ₂	H ₃	H ₄	D	D ₁	D ₂	D ₃	a	b	L ₅	L ₈
100	95	62	17.5	129.5	129	99	101.5	116	132	4.8	52	40 ¹	90
160	96	63		121	130	159	161.5	178	196	5.8	82		120

¹ for probe mounting TA 02, L₅ is ≤69 mm.

Type: 608425/2496



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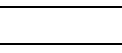
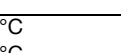
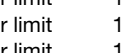




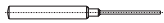






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Order details

Contact dial thermometers, Class 1, Type 608425

		(1) Basic type	
		608425	Mechanical contact dial thermometer, Class 1 (round, panel- or surface-mounting instrument)
		608425	Mechanical contact dial thermometer, Class 1 (square, panel-mounting instrument)
		(2) Basic type extensions	
X		0110	Style: 01; housing size: diameter 100 mm 
X		0116	Style: 01; housing size: diameter 160 mm 
X		1010	Style: 10; housing size: diameter 100 mm 
X		1016	Style: 10; housing size: diameter 160 mm 
X		2010	Style: 20; housing size: diameter 100 mm 
X		2016	Style: 20; housing size: diameter 160 mm 
X		2210	Style: 22; housing size: diameter 100 mm 
X		2216	Style: 22; housing size: diameter 160 mm 
X		2310	Style: 23; housing size: diameter 100 mm 
X		2316	Style: 23; housing size: diameter 160 mm 
X		2496	Style: 24; housing size: 96 x 96 mm 
		(3) Indication range (AB)	
X	X	469	-40 to +40°C; range -30 to + 30°C Error limit 1.0°C
X	X	566	-30 to +50°C; range -20 to + 40°C Error limit 1.0°C
X	X	807	0 to +60°C; range +10 to + 50°C Error limit 1.0°C
X	X	810	0 to +80°C; range +10 to + 70°C Error limit 1.0°C
X	X	814	0 to +100°C; range +10 to + 90°C Error limit 1.0°C
X	X	818	0 to +120°C; range +20 to +100°C Error limit 2.0°C
X	X	826	0 to +160°C; range +20 to +140°C Error limit 2.0°C
X	X	832	0 to +200°C; range +20 to +180°C Error limit 2.0°C
X	X	834	0 to +250°C; range +30 to +220°C Error limit 2.5°C
X	X	840	0 to +300°C; range +30 to +270°C Error limit 5.0°C
X	X	843	0 to +350°C; range +50 to +300°C Error limit 5.0°C
X	X	848	0 to +400°C; range +50 to +350°C Error limit 5.0°C
X	X	854	0 to +500°C; range +50 to +450°C Error limit 5.0°C
		(4) Capillary type (FL)¹	
X		00	none (with rigid stem)
X	X	04	FL04 capillary, stainless steel (1.4571), diameter 2.2 mm
		(5) Capillary length¹	
X	X	0000	none (rigid connection)
X	X	1000	1000 mm
X	X	2000	2000 mm
X	X	3000	3000 mm
X	X	4000	4000 mm
X	X	5000	5000 mm
X	X	special length (specify in plain text: 1000 mm steps, maximum length 10000 mm)
		(6) Process connection (PA)¹	
X	X	750	TF01 temperature probe with shoulder on support tube 
X	X	753	TF05 temperature probe with plain support tube 
X	X	752	TF11 temperature probe without support tube 
X	X	843	TA02 stem with union nut and loose nipple (only TF01) ² 
X	X	161	TA03/01 stem with loose union nut (with TF01) 
X	X	846	TA04 stem with fixed hexagon screw-in spigot (only TF01) ² 
X	X	847	TA06 sliding clamp fitting on support tube ² 
X	X	891	SH05 screw-in pocket, assembled ² (with 14 mm dia. only) 
X	X	913	SH07 screw-in pocket, assembled, with clamping clip and fixing screw ² 

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		(7) Diameter of process connection (PA)¹			
X	X	6	diameter 6 mm		
X	X	8	diameter 8 mm		
X	X	100	diameter 10 mm		
X	X	140	diameter 14 mm (only SH05)		
		(8) Thread for process connection (PA)¹			
X	X	000	no thread (with TF01, TF05 and TF11)		
X	X	103	thread G 3/8		
X	X	104	thread G 1/2		
X	X	105	thread G 3/4		
		(9) Process connection (PA) material¹			
X	X	26	stainless steel (CrNi, 1.4571)		
X	X	97	stainless steel (CrNi, 1.4571)-TF / brass (CuZn)-TA, SH		
		(10) Fitting length of process connection (PA)¹ (dimension "EL" or "S")			
X	X	0	minimum fitting length TF 11 (active probe dimension)		
X	X	50	50 mm		
X	X	100	100 mm		
X	X	150	150 mm		
X	X	200	200 mm		
X	X	...	special length (specify in plain text, steps of 50 mm)		
		(11) Switching output (SA)			
X	X	01	SA01 (2) ³ With rising temperature: contact 1 opens (2) ³		
X	X	02	SA02 (1) ³ With rising temperature: contact 1 closes (1) ³		
X	X	03	SA03 (21) ³ With rising temperature: contact 1 opens and contact 2 closes (21) ³		
X	X	04	SA04 (11) ³ With rising temperature: contact 1 and contact 2 close (11) ³		
X	X	05	SA05 (22) ³ With rising temperature: contact 1 opens and contact 2 opens (22) ³		
X		10	SA10 (21) ³ With rising temperature: contact 1 opens and contact 2 closes (with separate circuit) (21) ³		
X		11	SA11 (11) ³ With rising temperature: contact 1 and contact 2 close (with separate circuits) (11) ³		
X	X	30	SA30 (2) ³ With rising temperature: flag moves in, break action (2) ³		
X	X	31	SA31 (1) ³ With rising temperature: flag moves out, make action (1) ³		
		(12) Extra codes (TZ)			
X	X	000	no extra code		
X	X	410	metal front bezel, black		
X	X	442	electromechanical magnetic snap-action contact		
X		509	setpoint adjustment with key		
X	X	522	customized scale		

Special versions on request !

Order code

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12)
 608425 / [] - [] - [] - [] - [] - [] - [] - [] - [] - [] - [] / [] , ...

Order example

608425 / 2010 - 818 - 04 - 2000 - 750 - 8 - 000 - 26 - 100 - 01 / 000⁴ , ...

¹ for description and features, see Data Sheet 60.8730

² screw-in spigot to DIN 3852 Form A

³ figures in brackets (. .) correspond to the designation of the switching function code as per DIN 16196

⁴ list extra codes in sequence, separated by a comma