

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 CM 20 2TT, UK
 Phone: +44 1279 635533
 Fax: +44 1279 635262
 e-mail: sales@jumo.co.uk
 Internet: www.jumo.co.uk

JUMO Process Control, Inc.
 8 Technology Boulevard
 Canastota, NY 13032, USA
 Phone: 315-697-JUMO
 1-800-554-JUMO
 Fax: 315-697-5867
 e-mail: info@jumo.us
 Internet: www.jumo.us



Panel-mounting Thermostats

EM Series

- for limiting operating temperatures
- limit range up to +650°C
- with temperature compensation

EM panel-mounting thermostats monitor thermal processes. The thermostats are available as temperature monitors (TW), temperature limiters (TB) and protection temperature limiters (STB). If a fault occurs, the STB sets the system being monitored to a safe operational state. Panel-mounting thermostats operate on the principle of liquid expansion, with a microswitch serving as the electrical switching device.



Types	EM-2-TK	EM-5-TK	EM-50-TK
	Temperature monitor (TW)	Temperature limiter (TB)	Protection temperature limiter (STB)

Switching action	TW	Lock-out on the TB and STB	Self-monitoring on the STB
	When the temperature at the probe rises above the set limit, the circuit is opened by a snap-action switch. When the temperature has fallen below the set limit (by the amount of the switching differential), the switch returns to its initial position.	When the temperature at the probe rises above the set limit, a snap-action switch is actuated and mechanically locked out. When the temperature has fallen below the limit by about 100 °C, the snap-action switch can be manually reset.	When the temperature probe cools down to below -20°C, the snap-action switch will also be actuated. After the temperature has risen above -10°C, the circuit will be reclosed automatically. In the event of a measurement system break (leak), the snap-action switch will be permanently operated and will remain locked out mechanically.

Technical data

Limit ranges	Control/limit range °C	Switching differential °C	Scale span ° Δ
TW and TB	+230 to +650	50 – 80 (TB)	250
STB	+500 to +650	-	70

Capillary and temperature probe

Capillary	Length	Diameter	Min. bending radius	Material
	standard: 1 m maximum: 3 m	1.5 mm	5 mm	stainless steel, Mat. Ref. 1.4571
Temperature probe	Process connection*	Probe length x diameter	Material	
	plain cylindrical probe A (standard)	115 x 8 mm	high-temperature-resistant stainless steel, welded	

*see Data Sheet 60.6710 for other process connections (B, C and D only).

Electrical data

Switching device: single-pole snap-action switch	EM-2-TK	EM-5-TK EM-50-TK	EM-5-TK/U EM-50-TK/U
	microswitch with changeover contact	microswitch with (n.c.) break contact and lockout	microswitch with (n.c.) break contact, lockout and additional signal contact
Contact rating	Switching action	Break contact terminal 2	Make contact terminal 4
	TW	16 (3) A, 230 V AC +10%, p.f. = 1 (0.6) 0.25A, 230 V DC +10%	8 (1.5) A, 230 V AC +10%, p.f. = 1 (0.6) 0.25A, 230 V DC +10%
	TB, STB		2 (1) A, 230 V AC +10%, p.f. = 1 (0.6) 0.25A, 230 V DC +10%
Contact reliability	To ensure the highest possible switching reliability, we recommend a minimum loading of: AC / DC = 24 V, 20 mA		
Rated surge voltage	1500 V (via switching contacts: 400 V)		
Overvoltage category	II		
Fusing required	see Contact rating		
Electrical connection	standard	faston connector A 6.3 x 0.6 DIN 46244	
	extra code X	screw connection up to 2.5mm ² conductor cross-section (at extra cost) –also suitable for retrofitting –	

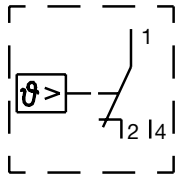
Operating data

Switching point accuracy	(in % of scale span, referred to setpoint or limit value at T _a +22°C, with rising temperature)		
	Switching action	Type	Accuracy in upper third of scale or at limit
	TW	EM-2-TK	+0 °C -18 °C
	TB	EM-5-TK, EM-5-TK/U	+0 °C -48 °C
Mean ambient temperature effect (referred to limit)	Any deviation of the ambient temperature [Δt] at the switch head and capillary from the +22°C calibration ambient temperature will result in a shift of the switching point t _v : higher ambient temperature = lower switching point lower ambient temperature = higher switching point		
	on switch head: t _v = 0.06 · Δt		on capillary: t _v = 0.33 · Δt · m
	If the operating temperature at the switch head and capillary deviates appreciably from the +22°C calibration ambient temperature, this can, on request, be taken into account during the calibration (at extra cost).		
Permissible ambient temperature	in operation		Permissible storage temperature
	at the switch head and capillary max. +100°C / min. -40°C	at the probe max. +750°C / min. -40°C	
Nominal position (NL)	unrestricted		

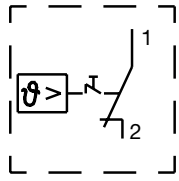
Housing

Material	galvanized steel
Fixing	standard: with two M3 screws, 22 mm spacing
	extra code b1: with two M4 screws, 28 mm spacing
	extra code b2: with two M3 screws, 33 mm spacing
	extra code b7: central fixing M10 x 1 with cap nut (TB and STB only)
Limit setting	switching point adjustable with screwdriver
Protection	EN 60 529-IP00
Weight	approx. 0.3 kg

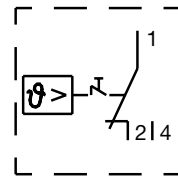
Connection diagrams



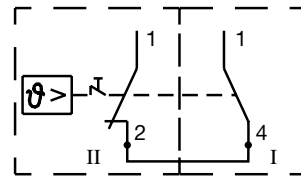
EM-2-TK



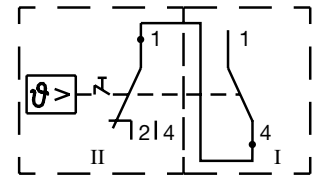
EM-5-TK



EM-5-TK/U

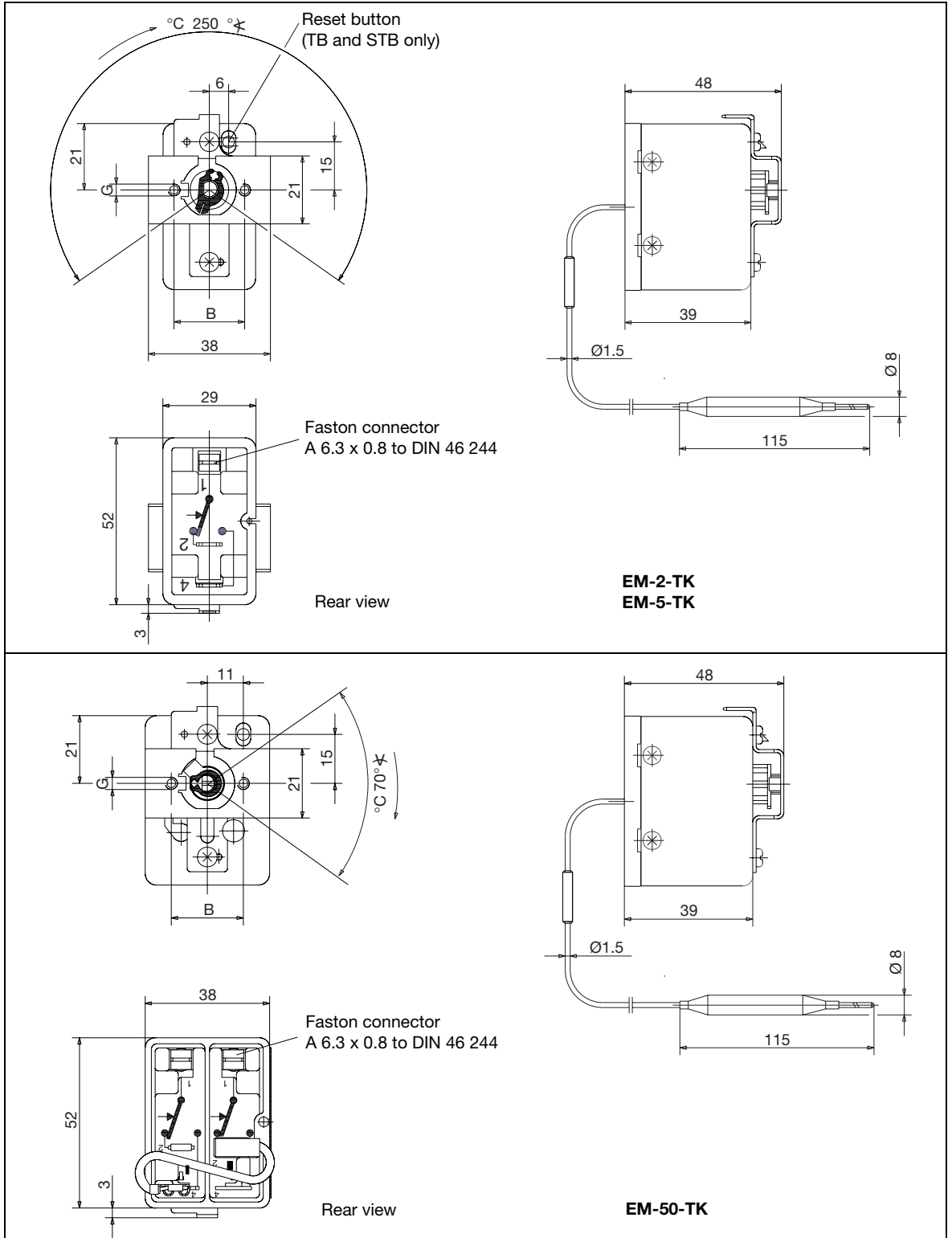


EM-50-TK



EM-50-TK/U

Dimensions



Extra code	B	G
standard	22 mm	M3
b1	28 mm	M4
b2	33 mm	M3

Order details for EM Series

Stock items

delivery 3 working days after receipt of order

Sales No.	Type	Limit °C	Capillary mm	Process connection	Probe dia. x length mm
60/60003016	EM-2-TK	+230 to +650	2000	A	8 x 115

Non-stock items

Order code	(1) Basic type
602025	Panel-mounting thermostat, EM Series up to +650°C
	(2) Basic type extension
0002	EM-2-TK temperature monitor
0005	EM-5-TK temperature limiter
0050	EM-50-TK protection temperatur limiter
	(3) Control / limit ranges
093	+230 to +650°C (TW and TB only)
097	+500 to +650°C (STB only)
	(4) Capillary length (details in mm)
1000	1000 mm
2000	2000 mm
3000	3000 mm
...	special length, details in mm (3000 mm max.)
	(5) Process connection *
10	A = plain cylindrical probe * see Data Sheet 60.6710 for other process connections and pockets (B, C and D only)
	(6) Diameter d (probe diameter)
8	8 mm
	(7) Extra codes**
000	no extra code
574	U TB / STB with break contact, lock-out and additional signal contact
699	X screw connection up to 2.5 mm ² conductor cross-section
704	b1 switch head mounting by 2 M4 screws, 28 mm spacing
705	b2 switch head mounting by 2 M3 screws, 33 mm spacing
710	b7 central fixing with cap nut (TB and STB only)

** List extra codes in sequence, separated by commas

Order code

(1)	(2)	(3)	(4)	(5)	(6)	(7)
602025	/	..	-	...	-
				-	..	-
					.	/
						...

Order example

602025	/	0050	-	097	-	1000	-	10	-	8	/	710
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