



JUMO Panel-mounted thermostats

EM series

Special features

- Safety temperature monitor STW (STB)
- Safety temperature limiter STB
- Tested according to DIN EN 14597 and PED 2014/68/EU

Description

Panel-mounted thermostats are used to monitor thermal processes. The devices are available as safety temperature monitors STW (STB) and safety temperature limiters STB. In the event of a malfunction the STB places the system being monitored in a safe operating status.

Panel-mounted thermostats operate according to the liquid expansion principle. The electrical switching element is a microswitch.

Switching functions

Safety temperature monitor STW (STB)

If the temperature on the temperature probe exceeds the setpoint value, the microswitch is activated by the transmission mechanics and the electrical circuit is opened or closed. If the temperature falls below the selected setpoint value (by the amount of the switching differential), the microswitch is reset to its initial position.

Restart lock on the safety temperature limiter STB

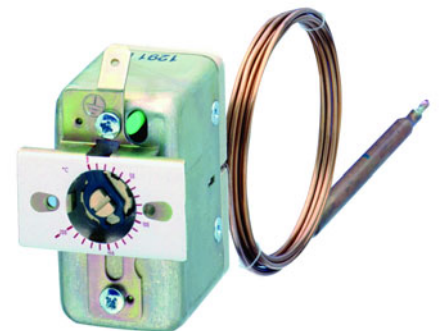
If the temperature on the temperature probe exceeds the set limit value, the electrical circuit is opened and the microswitch is mechanically locked. The microswitch can be manually unlocked once the temperature has dropped by approx. 10 K.

Self-monitoring on the safety temperature limiter STB and the safety temperature monitor STW (STB)

If the measuring system is destroyed, that is, if the expansion fluid emerges, the pressure in the membrane drops and permanently opens the electrical circuit of the STB. Unlocking is then no longer possible. The electrical circuit 1-2 opens when the probe of STW (STB) and STB cools down to the negative temperature range, but it closes again automatically if the temperature rises.

Using the safety temperature monitor STW as a safety temperature limiter STB

The activation lock required by DIN EN 14597 must be warranted by the following circuit diagram. The switching diagram must comply with DIN EN 50156.



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Approval marks and certificates

	Designation	DIN
	Test facility	DIN CERTCO/TÜV Süd
	Certificate no.	STB782
	Inspection basis	DIN EN 14597
	Valid for	Type 602026/80 (EM-80)
	Designation	DIN
	Test facility	DIN CERTCO/TÜV Süd
	Certificate no.	STW(STB)775S
	Inspection basis	DIN EN 14597
	Valid for	Type 602026/20 (EM-20-E), Type 602026/30 (EM-30-E)
	Designation	DIN
	Test facility	TÜV Süd
	Certificate no.	C-T 1370-01/11, B _{10d} = 250.000 ^a
	Inspection basis	DIN EN 14597, DIN EN ISO 13849-1, draft DIN EN 13611 A2
	Valid for	Type 602026/...
	Designation	PED
	Test facility	TÜV Süd
	Certificate no.	Z-IS-TAF-MUC-18-06-2652099-07102504
	Inspection basis	Directive 2014/68/EU, DIN EN 14597
	Valid for	Type 602026/...
	Designation	UL
	Test facility	Underwriter Laboratories
	Certificate no.	E66358
	Inspection basis	UL 873, CSA-C22.2 No. 24
	Valid for	Type 602026/80 (EM-80)
	Designation	UL
	Test facility	Underwriter Laboratories
	Certificate no.	MH45736
	Inspection basis	UL 353, CSA-C22.2 No. 24
	Valid for	Type 602026/80 (EM-80)

^a For further details see: Safety manual JUMO EM 602021, 602026.

Russian documentation upon request.

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Technical data

Limit value range, limit value range setting and temperature probe

	Limit value range, Limit value setting ^a °C	Max. admissible probe tempera- ture °C	Limit value toler- ance K	Probe length "L", for probe Ø "d" = 6 mm
Type EM-20-E	40 to 110 100 to 150 110 to 170 180 to 250 230 to 300	135 173 195 288 345	0/-9 0/-8 0/-9 0/-13 0/-14	72 85 72 60 60
Type EM-30-E	Optional limit value 20 to 300 permanently factory-set	limit value 15 %	-	-
Type EM-80	Optional limit value 60 to 180 permanently factory- set	limit value 15 %	0/-5	84

^a Set the limit value with a screwdriver on the limit value adjuster before installation.

Capillary and temperature probe

	Scale limit value	Capillary	Temperature probe
Type EM-..	Up to 200 °C	Copper (Cu) Ø 1.5 mm Material-no. Cu-DHP	Copper (Cu) Material-no. Cu-DHP Hard soldered
	Up to 300 °C	Copper (Cu) Ø 1.5 mm Material-no. Cu-DHP	Stainless steel (CrNi) Material no. 1.4571 Hard soldered
	Up to 300 °C	Stainless steel (CrNi) Ø 1.5 mm	Stainless steel (CrNi) Material no. 1.4571 Welded
Capillary length	Standard 1000 mm, max. 5000 mm		
Min. bending radius of the capillary	5 mm		

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Electrical data

Switching element	Snap-action switch with single-pole changeover contact
Max. switching capacity On the NC contact (contact deck 1 to 2) STW (STB), STB On the NO contact (contact deck 1 to 4) STW (STB) STB STW (STB), STB for microswitches with gold-plating	AC 400 V +10 %, 10 A, AC 230 V +10 %, 16 (2.5) ^a A, cos φ = 1 (0.6), DC 230 V +10 %, 0,25 A AC 400 V +10 %, 6.3 A, AC 230 V +10 %, 6.3 (2.5) ^b A, cos φ = 1 (0.6), DC 230 V +10 %, 0.25 A AC 230 V +10 %, 2 (0.4) A, cos φ = 1 (0.6), DC 230 V +10 %, 0.25 A, (only with extra code 574) AC/DC 24 V, 0.1 A
Switching reliability	Minimum load for maximum switching reliability
For silver contacts	AC/DC 24 V, 100 mA
With gold-plating	AC/DC = 10 V, 5 mA
Rated surge voltage	2500 V (via the switching contacts 400 V)
Overvoltage category	II
Electrical connection	
Standard	Tab connector A 6.3 – 0.8 DIN 46244
Extra code 699	Screw connection up to 2.5 mm ² cable cross-section (can be retrofitted)

^a Inductive loads

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**Operating data**

Switching differential in % from the control range/limit value range	Nominal value	Possible actual value
Switching function STW (STB)	7	7-8
Medium ambient temperature influence	When the ambient temperature on the switching head and/or the capillary deviates from the calibration ambient temperature of +22 °C, a switching point offset occurs. Higher ambient temperature = lower switching point Lower ambient temperature = higher switching point	
	STW (STB)	STB
For temperatures with scale limit value/limit value	< 200 °C	≥ 200 °C ≤ 350 °C
Switching differential in %	7	7
Ambient temperature influence on the switching head in %/K	0.43	0.35
Ambient temperature influence on the capillary in %/m	0.09 · K · m	0.07 · K · m
Temperature compensation (TK)	For detailed information see diagram.	
Temperatures		
Admissible storage temperature	-50 to 50 °C	
Admissible ambient temperature for use	T80	
Nominal position (NL)	Any	
Operating medium	Water, oil, air, superheated steam	
Time constant $t_{0.632}$		
In water	≤ 45 s	
In oil	≤ 60 s	
In air or superheated steam	≤ 120 s	
Mode of operation	EN 60730, DIN EN 60730-2-9, DIN EN 14597	
STW (STB)	2 BKLNP	
STB	2 BFHKLNPV	

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Mechanical features

Housing

Material	Galvanized sheet steel
Fastening	
Extra code 704	With 2 M4 screws, spacing 28 mm
Extra code 705	With 2 M3 screws, spacing 33 mm
Extra code 706	With 2 M3 screws, spacing 22 mm
Extra code 710	Central mounting M10 × 1 with acorn nut (for STB only)
Protection type	IP00, according to EN 60 529, pollution degree 2
Weight	Approx. 200 g

Process connection

Material	
Protection tube up to 150 °C	CuZn (standard)
Protection tube above 150 °C	CrNi
Capillary	Plain cylindrical probe (standard) Screw-in protection tube (upon request) Screw-in sleeve with screw-in spigot G 1/2, form A, according to DIN 3852/2 and clamping piece with fixing screw for securing the probe
Insertion length S	
Standard	100, 120, 150, 200, or 300 mm (other lengths upon request)
Protection tube Ø	D = 8 mm

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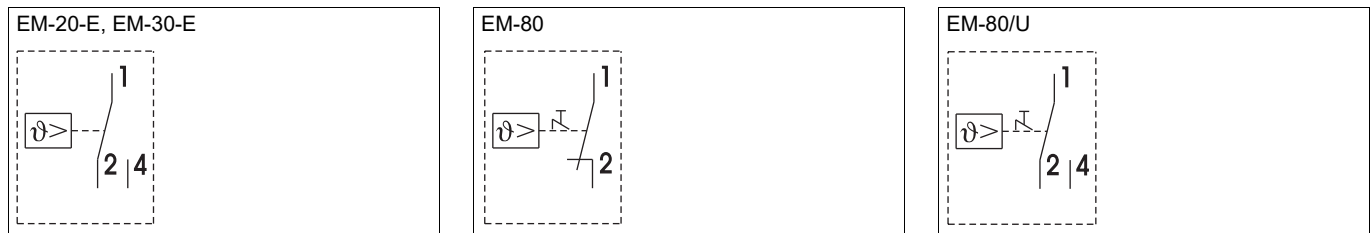
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Connection diagram

The connection diagram in the data sheet provides information on product selection.

For the electrical connection, only use the installation instructions or the operating manual.



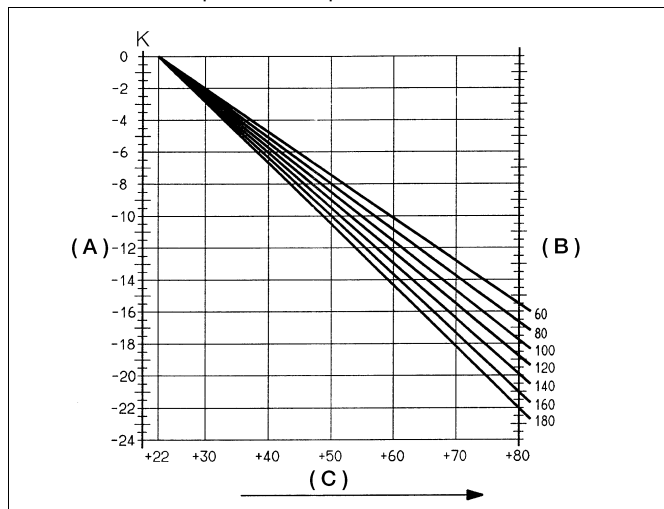
Temperature compensation

Any change in the temperature at the switching head from the 22 °C calibration ambient temperature will produce a deviation of the switching point. For highly fluctuating ambient temperatures, we recommend to use thermostats with temperature compensation (extra code 707).

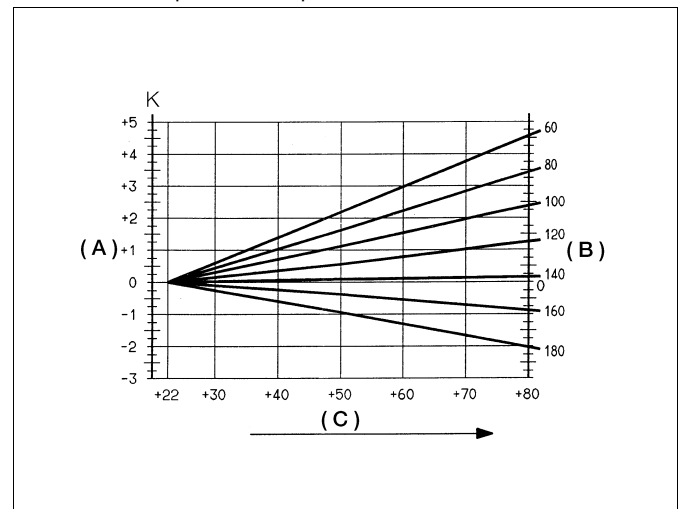
Switching point deviation depends on the ambient temperature at the switching head taking the probe temperature into account.

The temperature influence on the capillary is not yet taken into account and can result in an additional error of approx. 0.07 K/K·m.

Version **without** temperature compensation



Version **with** temperature compensation



- A Switching point deviation
- B Probe temperature in °C
- C Ambient temperature in °C

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Order details

	(1) Basic type
602026	JUMO Panel-mounted thermostat, EM series
	(2) Basic type extension
20	EM-20-E Safety temperature monitor STW
30	EM-30-E Safety temperature monitor STW, limit value permanently set
80	EM-80 Safety temperature limiter STB, limit value permanently set
	(3) Control range (TW)
000	With permanently set limit value
040	20 to 80 °C
055	40 to 110 °C
061	50 to 150 °C
063	50 to 250 °C
081	80 to 200 °C
095	300 to 400 °C
096	300 to 500 °C
374	45 to 70 °C
461	95 to 120 °C
506	100 to 150 °C
508	110 to 170 °C
540	145 to 170 °C
551	150 to 190 °C
552	150 to 250 °C
554	150 to 350 °C
575	180 to 250 °C
591	190 to 230 °C
606	230 to 300 °C
	(4) Limit value (STW/STB)
000	With adjustable control range
95	95 °C
100	100 °C
	(5) Capillary length
1000	1000 mm
2000	2000 mm
3000	3000 mm
4000	4000 mm
5000	5000 mm
	(6) Capillary material
20	CrNi (stainless steel 1.4571)
40	Copper (Cu)
	(7) Process connection
10	Plain cylindrical probe
20	Screw-in thermowell
	(8) Process connection
00	None
13	G 1/2
	(9) Process connection material
00	None
20	CrNi (stainless steel)
46	CuZn (brass)

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(10)	Insertion length
000	None
100	100 mm
120	120 mm
150	150 mm
200	200 mm
300	300 mm
(11)	Immersion tube diameter
00	None
8	8 mm
(12)	Probe diameter
6	6 mm
(13)	Extra codes
000	None
025	Central mounting M10 × 1, metall
574	Microswitch with N/C contact, restart lock, and additional signal contact (only for STB)
699	Screw connection up to 2.5 mm ²
702	Snap action contact with gold-plating
704	Switching head mounting with 2 M4 screws, spaced 28 mm
705	Switching head mounting with 2 M3 screws, spaced 33 mm
706	Switching head mounting with 2 M3 screws, spaced 22 mm
707	Temperature compensation
710	Central mounting M10 × 1

Order code

Order example

(1)

602026

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(2)

80

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(3)

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(4)

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(5)

1000

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(12)

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(13)

000

, ...^a

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

Stock versions

Order code	limit value	Probe diameter	Part no.
602026/80-000-95-1000-40-10-00-00-000-00-6/710	95 °C	6 mm	60000753
602026/80-000-110-1000-40-10-00-00-000-00-6/710	110 °C		60000775