EPHY MESS
Gesellschaft für Elektro-Physikalische Meßgeräte mbH

1. Bimetallic switches

General

Bimetallic temperature controllers are used in the electrical industry for automatic temperature control. They limit the temperature of the units or their parts: if overheating occurs they close or open the (load) circuit, i.e. to connect a ventilator or trigger an alarm. Usually heat is exchanged from all sides by convection, radiation or conduction in gaseous or solid media. After a substantial temperature drop the bimetallic switches return to their starting position.

The EPHY-MESS bimetallic switches offer, depending on their design, the following advantages:

- switching points between +60°C ... +200°C
- switching tolerances:$\Delta\ \vartheta$ = ±5 K... ±2.5 K
- switching currents up to 25 A
- low transition resistance
- high responsiveness
- switches with or without current sensitivity
- shock-proof up to 100 m/s² (10 - 60 Hz)
- all built-in switches also available as double or triple switches
- suitable for (vacuum) impregnating processes in end windings
- excellent long-time stability

1.1 Built-in switches of the C*0x* and *S0x* type series

Built-in switches of the *C0x* and *S0x* type series are available with two different maximum breaking capacities (5 A / 25 A), either as break or make contact, as single, double or triple sensor. The wire of the switches consists of a radiation cross-linked synthetic material with a 5 mm insulation bared at the ends. Depending on the maximum switching current they can be delivered in 0.25 mm² or 0.75 mm².

1.1.1 C*0x* bimetallic switches

Built-in switch type **C**, non-insulated metal case, hot. Bimetallic switches of this type series can be used in areas in which sufficient insulation is already available or if case insulation is not required - insensitive to current, available as break or make contact.

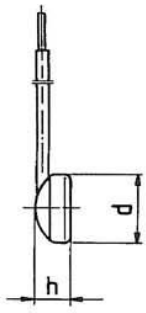


***Fig. 1**,C0x*

technical data of C0*x* bimetallic switches		
design	***01*: break contact *02*: make contact**	***06*: break contact *08*: make contact**
standard temperature range ϑ -in steps of 5K -standard tolerance Δ ϑ ±5K**	60° ... 200°C	70° ... 200°C
switch back temperature Δ ϑ_R	ϑR>35°C	ϑR>35°C
operating voltage[1] U_B / V AC	max. 500 V	max. 500 V
nominal voltage[2] U_N / V	250 V	250 V
nominal current I_N / A cos φ = 1 cos φ = 0,6	2.5 A 1.6 A	10.0 A 6.3 A
insulation / dielectric strength	-/-	-/-
max. switching current I_S / A	6.3 A	25 A
dimensions	d = 9.0 mm h = 4.3 mm	d = 9.3 mm h = 7.2 mm
wire (cross-linked synthetic) for standard length see 4.1.3	0.25 mm²	0.75 mm²
approval		
UL 873	*01 / 02*	*06 / 08*
VDE 0631 (EN 60730)	*01 / 02*	*06 / 08*

**) selective special tolerance with ±2.5 K available against surcharge
1) DC values upon request
2) values according to VDE specification

1.1.2 S*0x* bimetallic switches

Built-in switch, **type S**, with insulation (Mylar® cap), suitable for installation in windings of engines, transformers and coils, maximum high voltage resistance: 2 kV / AC 50 Hz / 1 min., protection type I VDE, non-sensitive to current, available as break and make contact.

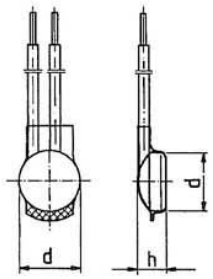


***Fig. 2**, S0x*

technical data of S0*x* bimetallic switches		
design	***01*: break contact *02*: make contact**	***06*: break contact *08*: make contact**
standard temperature range ϑ -in steps of 5K -standard tolerance∆ ϑ ±5K**	60° ... 200°C	70° ... 200°C
switch back temperature ∆ ϑR	ϑ R >35°C	ϑ R >35°C
operating voltage[1] U_B / V AC	max. 500 V	max. 500 V
nominal voltage[2] U_N / V	250 V	250 V
nominal current I_N / A cos φ = 1 cos φ = 0,6	2.5 A 1.6 A	10 A 6.3 A
insulation / dielectric strength	Mylar® cap 2 kV	Mylar® cap 2 kV
max. switching current I_S / A	6.3 A	25 A
dimensions	d = 9.45 mm h = 4.70 mm	d = 9.45 mm h = 6.85 mm
wire (cross-linked synthetic) for standard length see 4.1.3	0.25 mm²	0.75 mm²
approval		
UL 873	*01/ 02*	*06 / 08*
VDE 0631 (EN 60730)	*01 / 02*	*06 / 08*

**) selective special tolerance with ±2,5 K available against surcharge
1) DC values upon request
2) values according to VDE specification

1.1.3 Order names of the type series C*0x* and S*0x*

S	01.	145.	05.	300	/100	/100	/300	
type								cable length L4 / mm1)
	model							cable length L3 / mm2)
		nominal switching temp.						cable length L2 / mm
			tolerance / ±K					cable length L1 / mm

1)indicated only for switches with triple wiring

2)indicated only for switches with twin and triple wiring

standard lengths

- single switch:	300 / 300 mm
- twin switch:	300 / 100 / 300mm
- triple switch:	300 / 100 / 100 / 300 mm

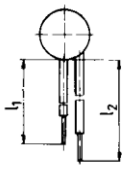
Example for orders of built-in switches

S01.155.05.300/300 single switch, type S (insulated), break contact, I_N =2.5A, NST=155°C, tolerance ±5 K, length of wire 300 mm each

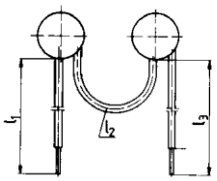
C06.080.05.300/100/300 twin switch, type C (not insulated), make contact, I_N =10A, NST=80°C, tolerance ±5K, length of wire 300 mm, length of interior connection: 100 mm

Wiring examples for built-in switches (not insulated)

Single switch



twin switch



triple switch

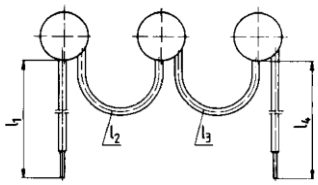


***Fig. 3**, wiring examples for built-in switches*

1.2 Switches of the L*0x* Type

The switches of the L0x type are temperature controllers seated in aluminum casing with epoxy casting on the connection side. Suitable for fastening to cooling elements, transformer plates and so on. Maximum high voltage resistance: 2 kV / AC 50 Hz / 1 min., protection category I VDE, non sensitive to current. Available as make and break contact.

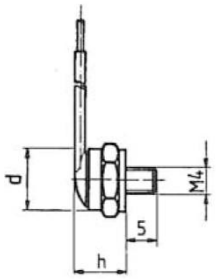


Fig.: *L0x*

technical data of L*0x* bimetallic switches		
design	***01*: break contact *02*: make contact**	***06*: break contact *08*: make contact**
standard temperature range ϑ -in steps of 5K -standard tolerance Δ ϑ ±5K*	60°C ... 200°C	70°C ... 200°C
switch back temperature $\Delta \vartheta_R$	ϑ R >35°C	ϑ R >35°C
operating voltage[1] U_B / V AC	max. 500 V	max. 500 V
nominal voltage[2] U_N / V	250 V	250 V
nominal current I_N / A cos φ = 1 cos φ = 0.6	2.5 A 1.6 A	10.0 A 6.3 A
insulation / dielectric strength	2 kV	2 kV
max. switching current I_S / A	6.3 A	25 A
dimensions	d = 10.0 mm h = 8.3 mm	d = 10.0 mm h = 8.0 mm
wire cross section standard length	0.25 mm²/AWG22 300 mm	0.75 mm²/AWG18 300 mm
approval		
UL 873 / UL 2111	*01 / 02*	*06 / 08*
VDE 0631 (EN 60730)	*01 / 02*	*06 / 08*

*) selective special tolerance with ±2.5 K available against surcharge
1) < 12 V upon request
2) values according to VDE specification

1.2.1 Order names of the type series L*0x*

L	01.	090.	05.	100	/100
type					
	model				
		nominal switch temperature			wire length L_2 / mm
			tolerance / ±K		wire length L_1 / mm