



## Applications




- Household appliances
- Electronics
- Machinery

## Benefits

- Up to 100,000 cycles
- Various terminals on-hand
- Small tolerances and hysteresis available
- Response temperatures from 0°C up to 260°C


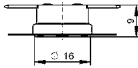



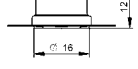

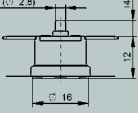

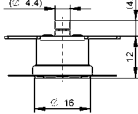

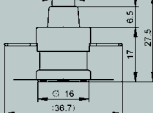

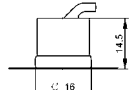


# Technical data

ratings		control type		11EN	03EN	52N	60EN <sup>1)</sup>	05EN	15N	23EN
		automatic				manual				
function		normally closed / normally open						normally closed		
version		normally closed / normally open						normally closed		
VDE	rated current at 250 Vac ( cos φ 0,95 )	16 A	10 A	10 A	10 A	16 A	16 A	16 A	16 A	16 A
	switching cycles	10,000	100,000	100,000	100,000	6,000	6,000	6,000	6,000	3,000
	max. temperature T <sub>a</sub> ( steps in 5 K )	150°C	150°C	230°C <sup>2)</sup>	150°C	150°C	250°C	150°C	150°C	150°C
UL	rated current at 250 Vac ( cos φ 1,0 )	10 A	10 A	10 A	—	10 A	10 A	10 A	10 A	10 A
	switching cycles	100,000	100,000	100,000	—	6,000	6,000	6,000	6,000	6,000
	temperature range T <sub>a</sub> ( steps in 5 K )	0°C ... 150°C	0°C ... 150°C	0°C ... 230°C	—	0°C ... 150°C	0°C ... 250°C	0°C ... 150°C	0°C ... 250°C	0°C ... 150°C
tolerance		T <sub>a</sub> <100°C: ± 3 K / T <sub>a</sub> >100°C: ± 4 K / T <sub>a</sub> >140°C: ± 5 K								
contact resistance		< 30 mΩ								
hysteresis / reset temperature		T <sub>a</sub> <100°C: 10 K ± 4 K / T <sub>a</sub> >100°C: 15 K ± 5 K / T <sub>a</sub> >140°C: 20 K ± 5 K						customer-specific		
degrees of protection provided by enclosures (EN 60529)		IP00 ( R28 60EN IP54)								
suitable for use in protection class		I, II								
Certifications	VDE 	EN 60730-1 / -2-9								
	UL 	UL 873 / UL 60730-1A / -2-9 <sup>4)</sup>								
	CSA 	C22.2 No. 24 <sup>3)</sup>								

<sup>1)</sup> no certification    <sup>2)</sup> type 55H up to 260°C    <sup>3)</sup> different ratings    <sup>4)</sup> type 15N

# Standard types

type	nc	no	code	illustration	drawing dimensions ( mm )	technical description
R28 11EN	1	3	standard dielectric strength 2,000 Vac			terminals 6.3 x 0.8, housing thermosetting plastic 9mm, moving bracket small, cap aluminium
R28 03EN	1	3	standard dielectric strength 2,000 Vac			terminals 6.3 x 0.8, housing thermosetting plastic 12mm, moving bracket small, cap aluminium
R28 52N	1	3	standard dielectric strength 2,000 Vac			terminals 6.3 x 0.8, housing ceramic 12mm, moving bracket small, cap aluminium
R27 05EN	1		manual dielectric strength 1,800 Vac			terminals 6.3 x 0.8, housing thermosetting plastic, moving bracket small, cap aluminium, reset pin
R27 15N	1		manual dielectric strength 1,800 Vac			terminals 6.3 x 0.8, housing ceramic, moving bracket small, cap aluminium, reset pin ceramic
R29 23EN	1		manual dielectric strength 2,000 Vac			terminals 6.3 x 0.8, housing thermosetting plastic, moving bracket small, cap aluminium, reset pin
R28 60EN	1	3	tight against humidity dielectric strength 1,800 Vac			lead wire 1.25mm <sup>2</sup> , housing thermosetting plastic, fix bracket, cap aluminium, degree of protection IP54

code	used in type	illustration	drawing dimensions ( mm )	technical description
4	R27, R28, R29			moving bracket, small
3	R27, R28, R29			moving bracket
S	R27, R28, R29			stud of M5 x 6 brass, SW17 (also other variations available)
B (+A)	R27, R28, R29			fix bracket possible angles: 0 / 45 / 90 / 135 deg

# Terminals

code	used in type	illustration	drawing dimensions ( mm )	technical description
brass: 05 (0 deg) brass: 10 (45 deg) brass: 06 (90 deg) steel: 95 (0 deg)	R27, R28, R29			terminals 4.8 x 0.5 brass nickel plated up to T <sub>a</sub> max. 150°C >150°C steel nickel plated also available: angle 45 / 90 deg
brass: 45 (0 deg) brass: 46 (90 deg)	R27, R28, R29			terminals 4.8 x 0.8 brass nickel plated up to T <sub>a</sub> max. 150°C also available: angle 90 deg
brass: 03 (0 deg) brass: 09 (45 deg) brass: 04 (90 deg) steel: 93 (0 deg) steel: 94 (90 deg)	R27, R28, R29			terminals 6.3 x 0.8 brass nickel plated up to T <sub>a</sub> max. 150°C >150°C steel nickel plated also available: angle 45 / 90 deg
00	R27, R28			solder terminals
41 (0 deg) 42 (90 deg)	R27, R28, R29			solder terminals, nickel plated, also available: angle 90 deg
SA	R27, R28			PCB terminals solder terminals

# Caps



Cap Code 1 in standard execution ( $T_a$  50°C – 199°C), material aluminium



Cap Code T ( $T_a$  0°C – 50°C and  $T_a \geq 200^\circ\text{C}$  and all normally open types), material aluminium

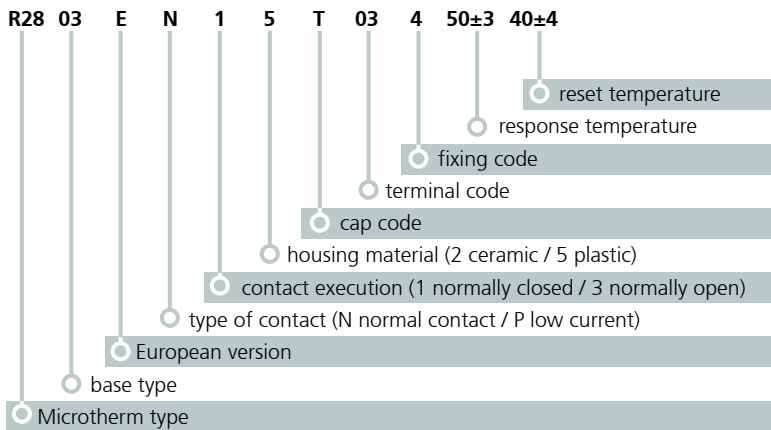
Deviations from standard controls (caps, terminals, fixings) on request.

Especially for electronic applications with voltage 6...120 Vac / 6...30 Vdc and current 10...100 mA, there are switches with crossbar- contacts available.

Controls as single operation device (SOD) up to 150°C and reset temperature -35°C are available (type 81ES).

## Ordering and marking example

### Ordering example



### Marking example

<b>A100</b>	norm. closed (B norm. open) response temperature
<b>03EN XXXX</b>	type manufacture code
<b>XXXX</b>	date of manufacture



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Deviations from standard controls on request.

**MICROTHERM**

