

Bimetal Cutouts Temperature Regulators Temperature Limiters

ADVANTAGES

- high pressure resistance
- high response sensitivity
- numerous applications
- various housings, connections and mounting styles

R 20
R 22
R 30
R 32
R 40

DESCRIPTION

Types R 20/R 22/R 40 are **bimetal detectors** and **temperature regulators**.

Types R 30/R 32 are **temperature limiters** (manual reset) without tripfree mechanism.

The thermal response works via a bimetal snap element electrically connected to the switch contact.

The switch system is current insensitive.

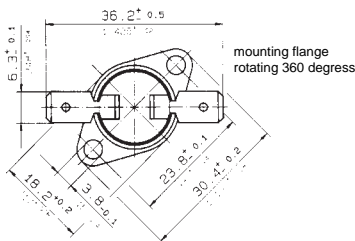
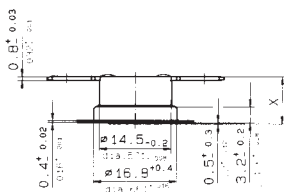
The thermal switches react only to external thermal effects. Double contacts ensure high switch performance and long service life.

The housing, base, and the mounting brackets are **voltage-free** (Standard version: base and mounting brackets are aluminium-plated steel).

Heat transfer occurs directly through the metallic base via convection, radiation and conduction in gaseous and solid media.

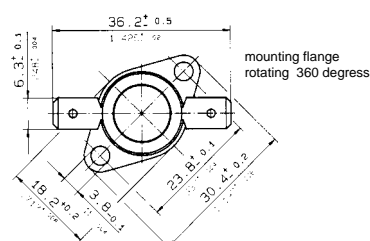
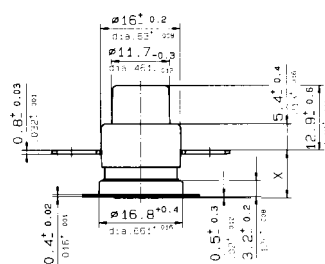
DIMENSIONS

R 20 / R 22 / R 40

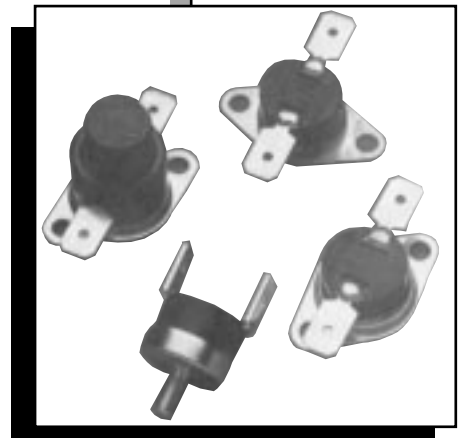


Standard version

R 30 / R 32



Standard version



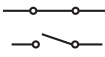

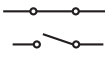
CANTHERM

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TECHNICAL DATA

Type	R 20 and R 22	R 30 and R 32	R 40
Voltage rating	* 250 V 50–60 Hz	250 V 50–60 Hz	* 250 V 50–60 Hz
Current rating at $\cos \varphi = 1.0$	* 10.0 A / * 16.0 A	16.0 A	* 10.0 A
Current rating at $\cos \varphi = 0.6$	6.3 A	6.3 A	* 6.3 A
Max. load at $\cos \varphi = 1.0$ 250 V 50–60 Hz 110 V 50–60 Hz 60 V DC 42 V DC 6, 12, 24 V DC	16.0 A / 20.0 A 6.0 A 7.2 A 8.5 A	20.0 A	16.0 A 6.0 A 7.2 A 8.5 A
Contacts Normally closed Normally open			
Switch operations at I_N	* 10 000 0–170 °C / 16 A — * 100 000 50–160 °C / 10 A	* 200	* 30 000
Contact resistance	< 50 mΩ	< 50 mΩ	< 50 mΩ
Nominal temperature range	0 °C to +170 °C	+30 °C to +160 °C	+50 °C to +160 °C
Tolerance but at least	±3% ±6% ±10% ±3 K ±5 K ±10 K	±3% ±6% ±10% ±3 K ±5 K ±10 K	±3% ±6% ±10% ±3 K ±5 K ±10 K
Max. permanent temperature	* 175 °C	* 175 °C	* 175 °C
Dielectric strength Housing to earth	R 20: 3000 V _{eff} 50–60 Hz R 22: 4000 V _{eff} 50–60 Hz	R 30: 3000 V _{eff} 50–60 Hz R 32: 4000 V _{eff} 50–60 Hz	3000 V _{eff} 50–60 Hz
Dielectric strength across open contacts	1500 V _{eff} 50/60 Hz	1500 V _{eff} 50/60 Hz	1500 V _{eff} 50/60 Hz
Housing material	Duroplast	Duroplast	Duroplast
Housing insulation	on request	on request	on request
Overall height (mm)	R 20 9.5 ^{+0.2} R 22 11.5 ^{+0.2}	R 30 9.5 ^{+0.2} R 32 11.5 ^{+0.2}	R 40 12.0 ^{+0.2}

Note: * Approved nominal values. Other specific values on request.

AREAS OF APPLICATION

Temperature regulation, temperature monitoring, temperature limiting and indication in electric appliances and industrial equipment, machinery and process engineering.

Examples:

Vacuum cleaners	Electrical house-
Ironing machines	hold appliances
Cooking equipment	Electronic circuits
Dampers	Machinery
Heat radiators	Process engineering
Hot water heaters	Industrial electric
Coffee machines	elements
Egg boilers	Electrical components
Electric appliances	

RESPONSE TEMPERATURE, TOLERANCE, CODE-NO.

Nominal temperatures between 50 and 160 °C in 5 °C steps.

Nominal temperatures in geometrical series as per DIN 323 in °C.

For tolerance, see above – Technical Data.

Temperature code – 3 digits

Minimum rate of temperature change

0.1 K/min., max. 1.0 K/min.

RESET TEMPERATURES

Reset temperature will be between 5 °C and 50 °C below the standard response temperatures.

INSTALLATION/MOUNTING INFORMATION

Incorporation of the thermo-switch directly in the heat source or attachment to it, is possible without additional insulation.

Slightest changes in temperature are conducted through the metallic housing cap directly to the bimetal snap disc of the thermo-switch. This ensures that time delays of thermal control systems are kept very small: insensitive to installation position. The dust-proof and damp-proof construction of the thermo-switch allows various methods of attachment to, and incorporation in appliances.

To ensure the best heat transition, the cap respectively the mounting bracket should be soldered, rivetted, screwed or spot-welded to the heat source.

OPTIONAL VARIATIONS Terminals, Fixings, Housings

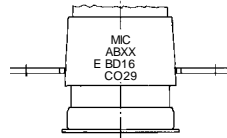
Type			Description old	Description new	Variations Terminals	
R 20/R 22	R 30/R 32	R 40	A 008	AA008	Flat terminal for screw connection	**
R 20/R 22	R 30/R 32	R 40	A 117	AB 117	6.3 x 0.8 mm terminal	**
R 20/R 22	R 30/R 32	R 40	A 118	AC118	4.8 x 0.8 mm terminal	**
R 20/R 22		R 40	A 119	AD119	6.3 x 0.8 mm terminal, angle 90°	*
R 20/R 22		R 40	A 120	AE120	4.8 x 0.8 mm terminal, angle 90°	**
R 20/R 22	R 30/R 32	R 40	A 121	AF121	solder connection	*
R 20/R 22		R 40	A 122	AG122	solder connection, angle 90°	**
R 20/R 22		R 40	A 123	AH123	flat conductors	**
R 20/R 22		R 40	A 125	AI125	connector pins 4.8 x 0.5 mm	**
R 20/R 22	R 30/R 32	R 40	A128	AK128	screw connection	**
R 20/R 22	R 30/R 32	R 40	A129	AL129	crimp connection	**
R 20/R 22		R 40	A 134	AM134	A119 with inside angled connection 6.3 x 0.8 mm	**
R 20/R 22		R 40	A 135	AN 135	A120 with inside angled connection 4.8 x 0.8 mm	**
R 20/R 22	R 30/R 32	R 40	A 137	AP137	crimp connection/ screw connection	**
R 20/R 22	R 30/R 32	R 40	A 138	AR138	crimp connection/flat terminal	**
R 20/R 22	R 30/R 32	R 40	A139	AS139	screw connection/flat terminal	**
Type			Description old	Description new	Variations Fixings	
R 20/R 22	R 30/R 32	R 40	B000	BX000	no mounting bracket	**
R 20/R 22	R 30/R 32	R 40	B 120	BA120	3 hole mounting flange	*
R 20/R 22	R 30/R 32	R 40	B 214	BB214	mounting bracket, narrow	*
R 20/R 22	R 30/R 32	R 40	B 215	BC215	mounting bracket-standard hole dia. 3.2 mm	**
R 20/R 22	R 30/R 32	R 40	B 217	BD217	brass central mounting M 5 x 6 mm	*
R 20/R 22	R 30/R 32	R 40	B 218	BE218	brass central mounting M 4 x 8 mm	**
R 20/R 22	R 30/R 32	R 40	B 220	BU220	fixed mounting flange, steel, hole distance 23 mm, angle 0°	**
R 20/R 22	R 30/R 32	R 40	B 221	BG221	fixed mounting flange, steel, hole distance 23 mm, angle 45°	**
R 20/R 22	R 30/R 32	R 40	B 222	BH222	fixed mounting flange, steel, hole distance 23 mm, angle 90°	**

Type			Description old	Description new	Variations Fixings	
R 20/R 22	R 30/R 32	R 40	B 223	BI223	fixed mounting flange, steel, hole distance 23 mm, angle 135°	*
R 20/R 22	R 30/R 32	R 40	B 225	BF225	fixed mounting flange, steel, hole distance 40 mm, narrow, angle 0°	**
R 20/R 22	R 30/R 32	R 40	B 226	BL226	fixed mounting flange, steel, hole distance 40 mm, narrow, angle 45°	**
R 20/R 22	R 30/R 32	R 40	B 227	BM227	fixed mounting flange, steel, hole distance 40 mm, narrow, angle 90°	**
R 20/R 22	R 30/R 32	R 40	B 228	BN228	fixed mounting flange, steel, hole distance 40 mm, narrow, angle 135°	*
R 20/R 22	R 30/R 32	R 40	B 235	BP235	raised flange, hole distance 23 mm, angle 0°	**
R 20/R 22	R 30/R 32	R 40	B 236	BR236	raised flange, hole distance 23 mm, angle 45°	**
R 20/R 22	R 30/R 32	R 40	B 237	BS237	raised flange, hole distance 23 mm, angle 90°	**
R 20/R 22	R 30/R 32	R 40	B 238	BT238	raised flange, hole distance 23 mm, angle 135°	**
R 20/R 22	R 30/R 32	R 40	B 250	BK250	with rotating mounting flange (Standard) hole dia. 3.8 mm	**
R 20/R 22	R 30/R 32	R 40	B 255	BV255	mounting element	*
Type			Description old	Description new	Variations Housings	
R 20/R 22		R 40	G 108	GA108	hexagon threaded sleeve, brass, with flat terminals 6.3 x 0.8 mm	*
	R 30		G128	GB128	without rubber cap, with reset pin	*
	R 32		G 129	GC129	without rubber cap, with reset pin	*
R 20/R 22		R 40	G 130	GD130	plastic cover horizontal, for leads and cable	**
	R 30/R 32		G 135	GE135	housing without reset pin	**
R 20/R 22		R 40	G 145	GF145	hexagon threaded sleeve, brass, with sensor and leads 300 mm	**
R 20/R 22		R 40	G 146	GG146	hard paper sleeve	**
R 20/R 22		R 40	G 147	GH147	voltage-free housing with flange, for leads	**
	R 30/R 32		G 408	GI408	cap silicone R 300019	**
	R 30/R 32		G 409	GK409	without reset cap	**

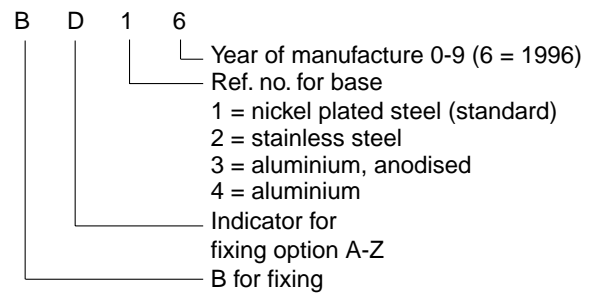
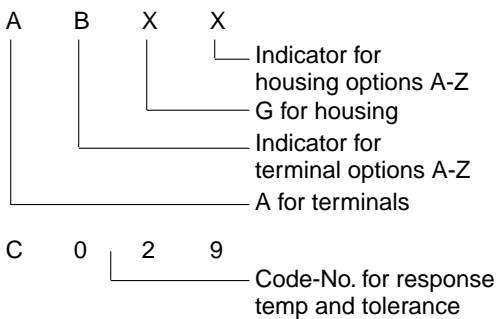
Reference to: page 4/5 · * see illustrations
** not illustrated

Marking (example)

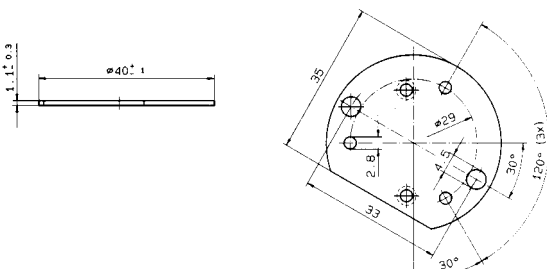
Manufacturer = MIC Version = ABXX
Version = BD16 Temperature = C029



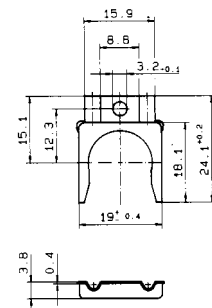
Type	Terminals	Ref. letter	Housing	Standard	Fixing	Code letter	Base	1996	60 °C ±5 K
R22	A	B	X	X	B	D	1	6	C029



R 20 / R 22 / R 30 / R 32 / R 40
B 120 3 hole mounting flange



R 20 / R 22 / R 30 / R 32 / R 40
B 255 Mounting element

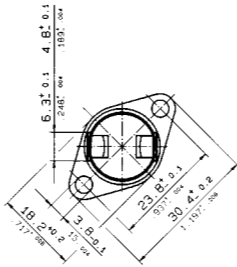
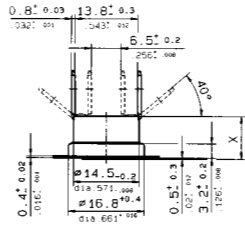


EXAMPLES
of Connectors, Mountings and Housing Types

R 20 / R 22 / R 40

A 119 with 6.3 x 0.8 mm push-on terminals,
angle 90°

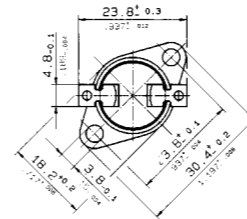
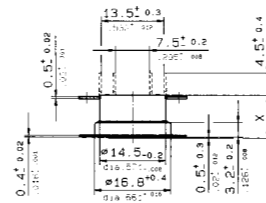
A 120 with 4.8 x 0.8 mm push-on terminals,
angle 90°



mounting flange
rotating 360°

R 20 / R 22 / R 40

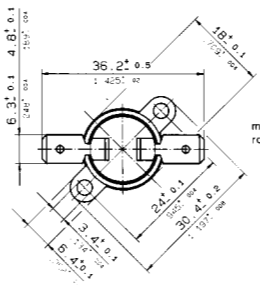
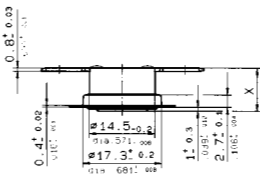
A 121 with solder connection



mounting flange
rotating 360°

R 20 / R 22 / R 40

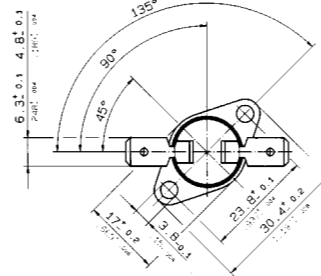
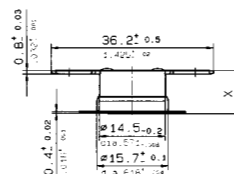
B 214 mounting bracket, narrow



mounting flange
rotating 360°

R 20 / R 22 / R 40

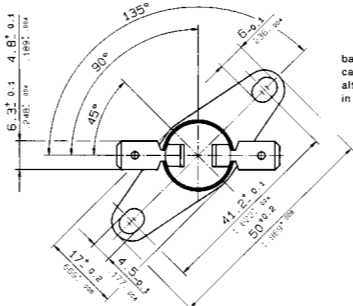
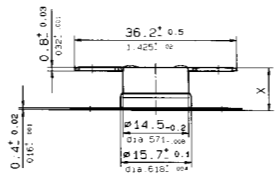
B 223 fixed mounting flange, steel



base of bracket
can be fixed
alternatively
in 3 directions

R 20 / R 22 / R 40

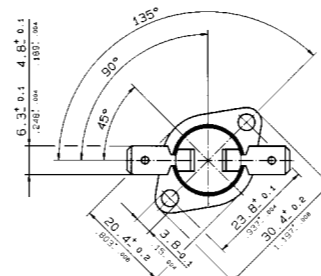
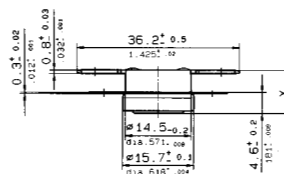
B 228 fixed mounting flange, steel
hole distance 40 mm, narrow,
angle 135°



base of bracket
can be fixed
alternatively
in 3 directions

R 20 / R 22 / R 40

B 238 raised flange, hole distance 23 mm,
angle 135°

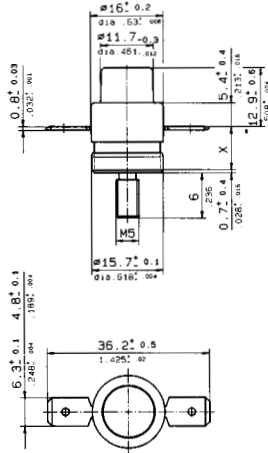


base of bracket
can be fixed
alternatively
in 3 directions

EXAMPLES
of Connectors, Mountings and Housing Types

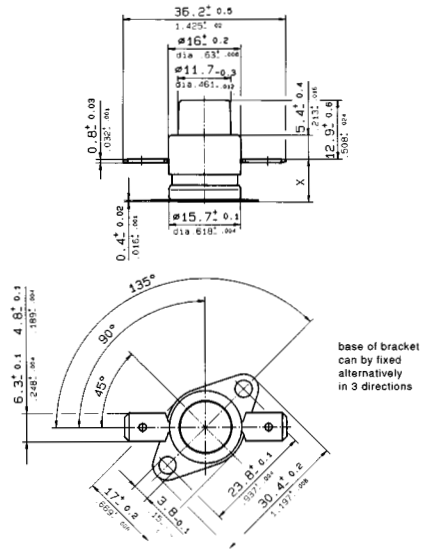
R 30 / R 32

B 217 brass central mounting
M 5 x 6 mm



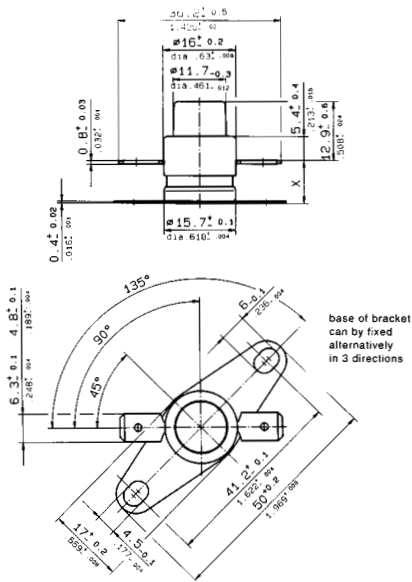
R 30 / R 32

B 223 fixed mounting flange, steel



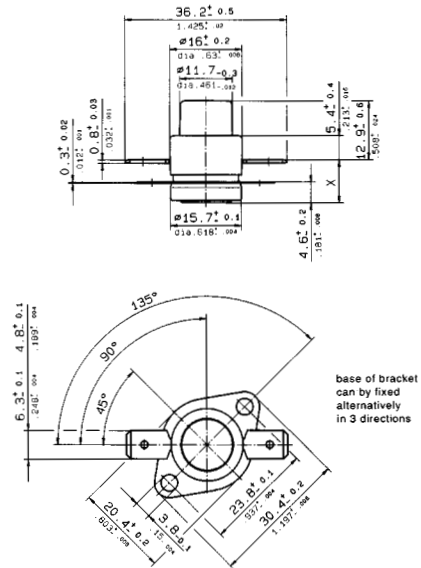
R 30 / R 32

B 228 fixed mounting flange, steel,
hole distance 40 mm, narrow,
angle 135°



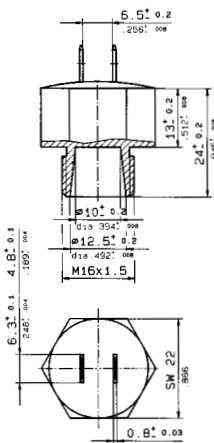
R 30 / R 32

B 238 raised flange, hole distance 23 mm,
angle 135°



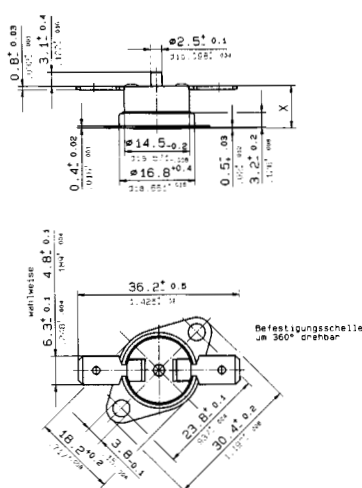
R 20 / R 22 / R 40

G 108 hexagonal head, threaded,
brass



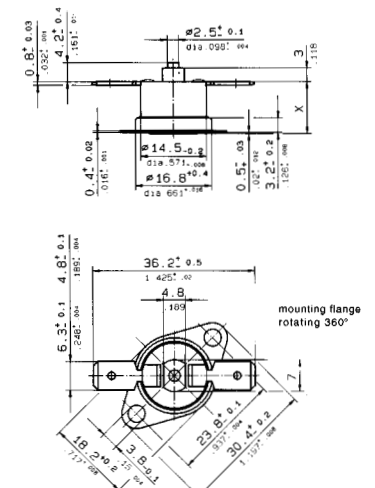
R 30

G 128 with reset pin





R 32

G 129 with reset knob



NOMINAL RESPONSE TEMPERATURE, TOLERANCE, CODE-NO.

Series 10 Tol. ± 10 %		Series 20 Tol. ± 6 %		Series 40 Tol. ± 3 %	
°C	Code No.	°C	Code No.	°C	Code No.
Normally closed 					
000	007	000	008	000	009
05	010	02	131	02	132
10	011	05	133	05	134
15	012	08	135	08	135
20	015	10	136	10	137
25	017	12	138	12	138
30	022	14	139	14	140
35	023	15	013	15	014
40	024	16	141	16	141
45	025	18	142	18	143
50	161	20	016	20	144
53	026	22	145	22	146
56	028	25	018	25	019
60	030	26	147	26	148
63	168	28	020	28	021
67	031	30	149	30	150
71	033	35	152	33	151
75	034	40	155	35	153
80	175	45	158	37	154
85	036	50	162	40	156
90	038	53	027	42	157
95	039	56	165	45	159
100	182	60	029	47	160
106	041	63	169	50	163
112	043	67	032	53	164
118	044	71	172	56	166
125	189	75	035	60	167
132	046	80	176	63	170
140	048	85	037	67	171
150	049	90	179	71	173
160	196	95	040	75	174
		100	183	80	177
		106	042	85	178
		112	186	90	180
		118	045	95	181
		125	190	100	184
		132	047	106	185
		140	193	112	187
		150	050	118	188
		160	197	125	191
				132	192
				140	194
				150	195
				160	198
				170	199

Series 10 Tol. ± 10 %		Series 20 Tol. ± 6 %		Series 40 Tol. ± 3 %	
°C	Code No.	°C	Code No.	°C	Code No.
Normally open 					
000	257	000	258	000	259
05	260	02	331	02	332
10	261	05	333	05	334
15	262	08	335	08	335
20	265	10	336	10	337
25	267	12	338	12	338
30	272	14	339	14	340
35	273	15	263	15	264
40	274	16	342	16	341
45	275	18	342	18	343
50	361	20	266	20	344
53	276	22	345	22	346
56	278	25	268	25	269
60	280	26	347	26	348
63	368	28	270	28	271
67	281	30	349	30	350
71	283	35	352	33	351
75	284	40	355	35	353
80	375	45	358	37	354
85	286	50	362	40	356
90	288	53	277	42	357
95	289	56	365	45	359
100	382	60	279	47	360
106	291	63	369	50	363
112	293	67	282	53	364
118	294	71	372	56	366
125	389	75	285	60	367
132	296	80	376	63	370
140	298	85	287	67	371
150	299	90	379	71	373
160	396	95	290	75	374
		100	383	80	377
		106	292	85	378
		112	386	90	380
		118	295	95	381
		125	390	100	384
		132	297	106	385
		140	393	112	387
		150	300	118	388
		160	397	125	391
				132	392
				140	394
				150	395
				160	398

SPECIAL TEMPERATURE SETTINGS

Response temperatures and reset temperatures with specific values and alternative tolerance can be supplied.

SPECIAL CONNECTIONS

Leads or solid wire from 0.25 mm² to 1.0 mm².
Lengths from 40 mm to 10 000 mm,
with or without stripping possible.
Lead ends with DIN connectors or shrouds.
Freon and oil resistant leads,
PTFE-, PVF², Nomex and Silicone leads
available from stock.

SPECIAL HOUSINGS

When selecting the switch-off temperatures of thermostats in special housings or with non-standard mounting, the time delay due to the thermal mass of the housing/mounting has to be considered.

Closer tolerances of nominal switch-off temperatures and reset temperatures, as well as small differentials, are also available **for small quantities** on request.

QUALITY STANDARD

Production item testing
Voltage test, switch function,
Nominal response temperature

APPROVALS

Life expectancy, voltage rating and current rating comply with VDE 0631 or EN 60730, see page 2.
Further approvals obtained for many countries.
Information on request.

ORDERING INFORMATION

Quantity	Type	Code	Temperature °C	Version	Tolerance
6000	R 22	C 183	100	A 119	± 6 %

Technical data and other specifications may be altered without prior notice.

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