

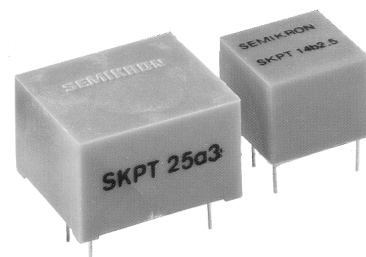
## 14.2 Pulse Transformers

### Range of preferred types

## Pulse Transformers

### SKPT 14 to SKPT 27

Absolute Maximum Ratings		
Symbol	Conditions	Values
$V_{ww}$	Crest working voltage	400 ... 650 V
$V_{isol}$	A.C. rms; 1 minute, see table below <sup>1)</sup>	2,5 ... 5 kV
$T_{op}$	Operating Temperature	- 40 ... + 85 °C
$T_{stg}$	Storage Temperature	- 50 ... + 90 °C



### Characteristics <sup>2)</sup>

Types	$N_p/N_s$	$\int V dt$	$R_p$	$R_s$	$L_p$	$L_{ss}$	$C_{ps}$	$I_M$	$t_r$	$R_L$	$V_{ww}$	$V_{isol}$	Winding
• New Type	s	$\mu Vs$	$\Omega$	$\Omega$	mH	$\mu H$	pF	mA	$\mu s$	$\Omega$	V	kV	conf
SKPT 14b2,5	1:1:1	250	0,86	0,86	1,8	85	10	150	2	80	500	4	B
SKPT 14k2,5	1:1:1	250	0,86	0,86	1,8	85	10	150	2	80	500	4	C
SKPT 14c2,5	2:1	250	1,6	0,86	7,5	400	12	150	2,5	80	500	4	D
SKPT 14a3	1:1	350	1,25	1,25	2,8	135	12	150	2,5	80	500	4	A
SKPT 14i3	1:1	350	1,25	1,25	2,8	135	12	150	2,5	80	500	4	D
SKPT 14g3	2:1:1	330	3,5	1,6	11	148	10	150	5	80	500	4	B
SKPT 14c3,5	2:1	350	3,5	2,4	13,5	82	9	150	2,5	80	500	4	D
SKPT 14i5	1:1	500	2,7	2,7	5,5	75	10	150	2,5	80	500	4	D
SKPT 14k6	1:1:1	600	2,8	2,8	9	290	10	150	2,5	80	500	4	C
SKPT 25j2	1:2:2	200	0,8	1,6	0,9/1,6	30/60	7	250	1,5	47	500	5	H
SKPT 25a3	1:1	300	0,55	0,55	2	45	8	250	1,5	47	500	4	A
SKPT 25b3	1:1:1	300	0,55	0,55	2	48	9	250	1,5	47	500	4	B
SKPT 25e3	3:1:1	300	1,7	0,55	15	300	10	250	1,5	47	500	4	B
SKPT 25h3	1:1:1:1	300	0,55	0,55	2	48	9	250	1,5	47	500	4	C
SKPT 25k3/650	1:1:1	300	0,55	0,55	2	38	9	250	1,5	47	650	4	F
SKPT 25m3	1:1	300	0,55	0,55	1,8	105	7	250	1,5	47	1000	6	G
SKPT 25n3	3:1	300	1,7	0,55	15	870	7	250	1,5	47	1000	6	G
SKPT 25p3/650	3:1:1	300	1,7	0,55	15	300	10	250	1,5	47	650	4	F
SKPT 25a4	1:1	400	0,6	0,6	4	50	10	250	2	47	500	4	A
SKPT 25b4	1:1:1	400	0,6	0,6	4	52	10	250	2	47	500	4	B
SKPT 25g4	2:1:1	400	2,3	1,1	9/15	260/490	7	250	1,5	47	500	5	H
SKPT 25a5	1:1	500	1	1	5,5	85	11	100 250	1,1 3	100 47	500	4	A

continued on next page

<sup>1)</sup> Material used is according to UL94-V0. Isolation test and pin distance according to IEC 60664-1(1992); (VDE 0110-1:1997-4)

<sup>2)</sup> Explanations see Chapter A, Section 14.2

## 14.2 Pulse Transformers (continued)

Types • New Type	$N_p/N_s$ s	$\int V dt$ $\mu Vs$	$R_p$ $\Omega$	$R_s$ $\Omega$	$L_p$ mH	$L_{ss}$ $\mu H$	$C_{ps}$ pF	$I_M$ mA	$t_r$ $\mu s$	$R_L$ $\Omega$	$V_{ww}$ V	$V_{isol}$ kV	Win- ding conf
SKPT 25b5	1:1:1	500	1	1	5,5	89	12	100 250	1,1 3	100 47	500	4	B
SKPT 25m5	1:1	500	1	1	5,5	170	7	250	1,5	47	1000	6	G
SKPT 25o5	2:1	500	2,1	1	32	830	7,5	250	1,5	47	1000	5	G
SKPT 25b8	1:1:1	800	1,6	1,6	14	220	14	25 250	1 6	470 47	500	4	B
SKPT 25b10	1:1:1	1000	1,8	1,8	18	260	13	25 250	1 6	470 47	500	4	B
SKPT 26a3	1:1	300	0,55	0,55	2	45	8	250	1,5	47	500	4	A
SKPT 26b3	1:1:1	300	0,55	0,55	2	48	8	250	1,5	47	500	4	B
SKPT 26e3	3:1:1	300	1,7	0,55	15	300	10	250	1,5	47	500	4	B
SKPT 26b10	1:1:1	1000	1,8	1,8	18	260	15	25 250	1 6	470 47	500	4	B
SKPT 21a3	1:1	270	0,6	0,6	3,5	3,5	55	800	0,8	15	650	4	A
SKPT 21b3	1:1:1	270	0,6	0,6	3,5	3,5	55	800	0,8	15	440	2,5	B
SKPT 21b3/650	1:1:1	270	0,6	0,5/0,7	3,5	2,7/3,2	30	800	0,8	15	650	4	B
SKPT 21c3	2:1	275	1,0	0,6	6,5	10	50	800	0,8	15	650	4	A
SKPT 21d3	3:1	270	1,5	0,6	30	20	65	800	0,8	15	650	4	A
SKPT 21e3	3:1:1	270	1,5	0,6	30	20	65	800	0,8	15	440	2,5	B
SKPT 21b4	1:1:1	370	0,7	0,7	6	3,5	65	800	0,8	15	440	2,5	B
SKPT 21b4/650	1:1:1	370	0,7	0,6/0,8	6	4,3/7	65	800	0,8	15	650	4	B
SKPT 21a5	1:1	450	1,0	1,0	10	10	65	800	0,8	15	650	4	A
SKPT 21b5	1:1:1	450	1,0	1,0	10	4,5	65	800	0,8	15	440	2,5	B
SKPT 21b5/650	1:1:1	450	1,0	1,0	10	10	65	800	0,8	15	650	4	B
SKPT 22e3/650	3:1:1	280	1,2	0,5	35	10	40	800	0,8	47	650	4	B
SKPT 27a3	1:1	300	0,3	0,3	2	3	76	1200	1	10	650	4	A
SKPT 27b3	1:1:1	300	0,3	0,3	2	3	95	1200	1	10	500	3	B
SKPT 27b3/650	1:1:1	300	0,3	0,2/0,4	2	3	65	1200	1	10	650	4	B
SKPT 27d3,5	3:1	350	0,6	0,3	20	22	100	2500	1	4,7	650	4	A
SKPT 27e3,5	3:1:1	350	0,6	0,3	20	25	110	2500	1	4,7	650	4	B
SKPT 27b4/1300	1:1:1	450	0,1	0,1	0,55	7,5	8,5	2000	0,5	10	1300	6	B
SKPT 27a5	1:1	500	0,4	0,4	5	5	105	2000	1	10	650	4	A

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<sup>1)</sup> Material used is according to UL94-V0. Isolation test and pin distance according to IEC 60664-1(1992); (VDE 0110-1:1997-4)

<sup>2)</sup> Explanations see Chapter A, Section 14.2

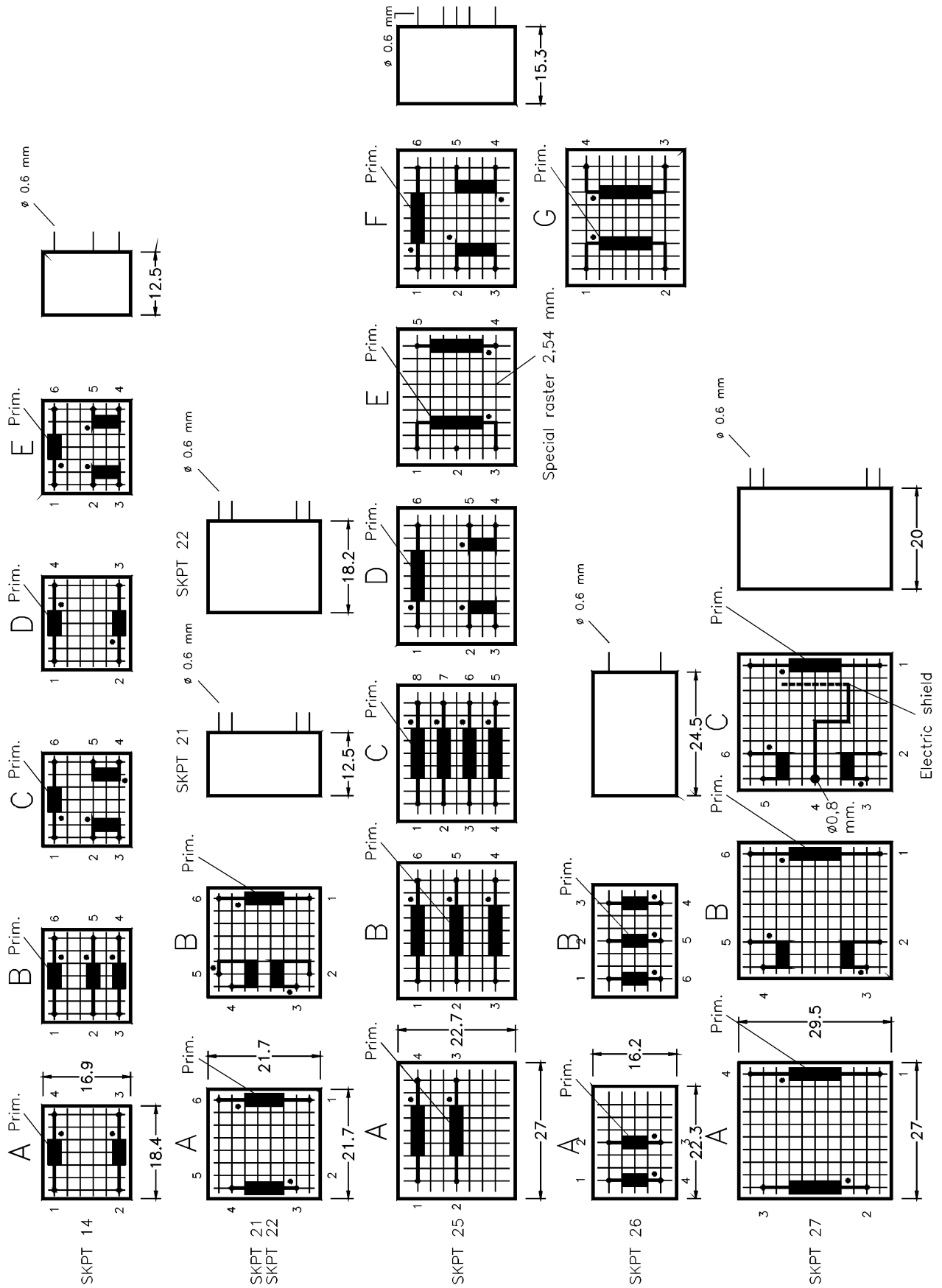
## 14.2 Pulse Transformers (continued)

Types • New Type	$N_p/N_s$ s	$\int V dt$ $\mu Vs$	$R_p$ $\Omega$	$R_s$ $\Omega$	$L_p$ mH	$L_{ss}$ $\mu H$	$C_{ps}$ pF	$I_M$ mA	$t_r$ $\mu s$	$R_L$ $\Omega$	$V_{ww}$ V	$V_{isol}$ kV	Winding conf
SKPT 27b5	1:1:1	500	0,4	0,4	5	5	117	2000	1	10	500	3	B
SKPT 27b5/650	1:1:1	500	0,4	0,3/0,5	5	5	100	2000	1	10	650	4	B
SKPT 27a10	1:1	1000	0,3	0,3	2,5	5	83	2000	1	10	650	4	A
SKPT 27b10	1:1:1	1000	0,3	0,3	2,5	5	97	2000	1	10	500	3	B
SKPT 27b10/650	1:1:1	1000	0,3	0,2/0,4	2,5	5	84	2000	1	10	650	4	B
SKPT 27b10ES	1:1:1	1000	0,3	0,3	2,5	5	97	2000	1	10	650	4	C
SKPT 27c10	2:1	1000	0,5	0,3	10	15	110	2000	1	10	650	4	A
SKPT HVb3	1:1:1	300	0,3	0,3	3	75	8,5	1000	1	50	3200	12	A
SKPT 25a3/s	1:1	300	0,55	0,55	2	12	20	250	0,8	47	440	3	A
SKPT 25b3/s	1:1:1	300	0,55	0,55	2	12	20	250	0,8	47	440	3	B
SKPT 25e3/s	3:1:1	300	1,8	0,8	15	80	28	250	0,8	47	440	3	B
SKPT 25h3/s	1:1:1:1	300	0,55	0,55	2	12	20	250	0,8	47	440	3	C
SKPT 25a4/s	1:1	400	0,8	0,9	4	17	28	250	0,8	47	440	3	A
SKPT 909	1:1	400	0,8	0,9	4	17	28	600	1	5	900	3	E
SKPT 25b4/s	1:1:1	400	0,8	0,9	4	17	28	250	0,8	47	500	3	B
SKPT 25b4/hs	1:1:1	400	0,8	0,9	1,8	15	28	250	0,8	400	700	4	D
SKPT 25a5/s	1:1	500	1	1,1	5,5	22	28	100 250	0,8 1	100 47	500	3	A
SKPT 25b5/s	1:1:1	500	1,1	1,2	5,5	25	30	100 250	0,8 1	100 47	500	3	B
SKPT 25b6/N	1:1:1	650	1,13	1,2	4,6	20	37	250	1	47	600	4	B
SKPT 25b8/s	1:1:1	800	1,8	2,1	14	40	35	25 250	0,8 1,5	470 47	500	3	B
SKPT 25b10/s	1:1:1	1000	2,2	2,4	18	50	40	25 250	0,8 1,5	470 47	500	3	B
SKPT 25b20/s	1:1:1	2000	6	6	55	100	45	250	3	47	500	3	B

<sup>1)</sup> Material used is according to UL94-V0. Isolation test and pin distance according to IEC 60664-1(1992); (VDE 0110-1:1997-4)

<sup>2)</sup> Explanations see Chapter A, Section 14.2

## Winding Configurations and Dimensions in mm 2,5 mm grid

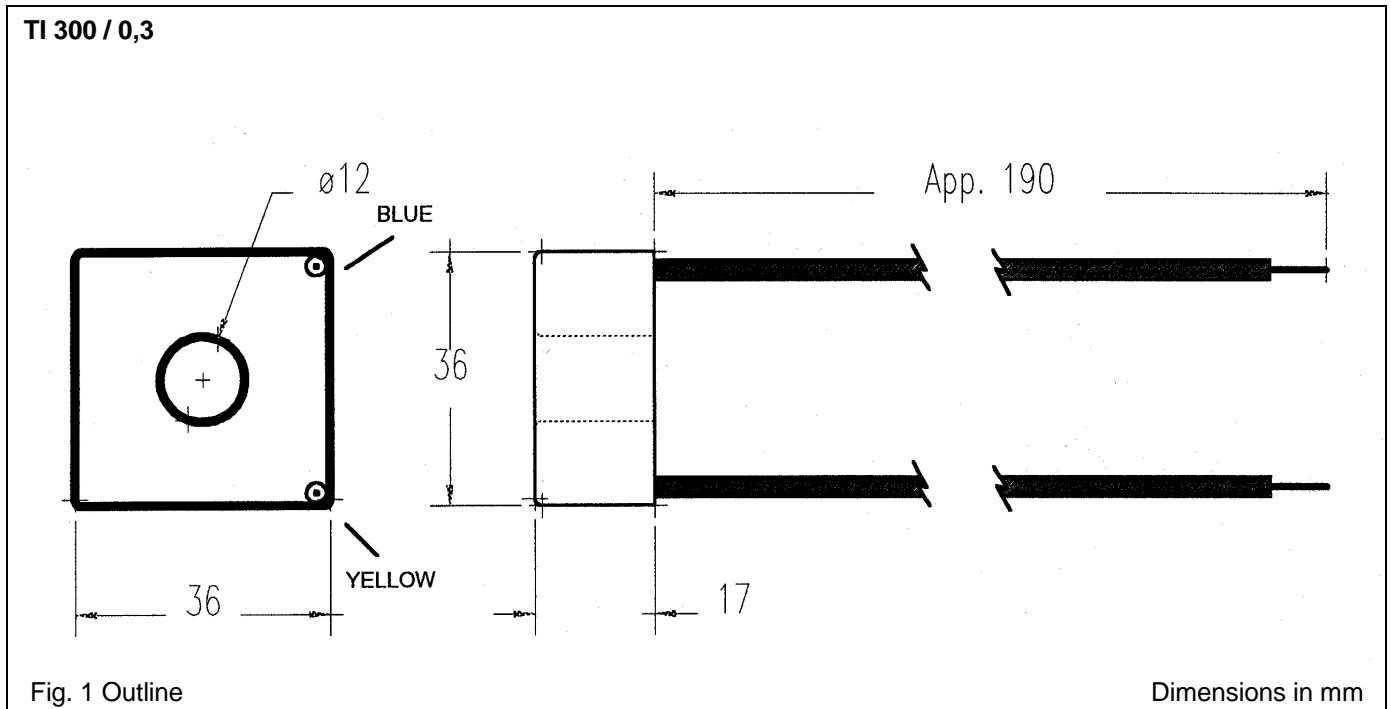


# Current Transformer

TI 300/0,3

300 A / 0,3 A

Absolute Maximum Ratings		
Symbol	Term	Values
$I_1$	Max. primary current	300 A
$I_2$	Max. secondary current	0,3 A
	Precision class sec. current	0,5 %
$\frac{n_s}{n_p}$	Transformer current ratio	1000 : 1
$P_{out}$	Max. Power output (50/60 Hz)	2 VA
$f_{op}$	Operating frequency	50 / 60 Hz
$R_2$	Load resistance <sup>1)</sup>	> 22,2 $\Omega$



## Fans

Types	Ident No.	Heatsink	Noise dB(A)	Weight kg	Tamb max °C
<b>Axial fan</b>					
SKF 3-230-01	30031061	P1, P3	37	0,55	70
<b>Radial fans</b>					
SKF16A-230-01 <sup>3)</sup>	VE001300	P16	55 57	3,6	50 40
SKF16B-230-01 <sup>3)</sup>	30119362	P16	58 57	3,6	45 40
SKF17A-230-01	VE001900	P17	74	2,0	60
SKF17B-230-01	30138251	P17	73	2,8	70
SKFN4-230-01	VE001951	P18, N4	76	3,1	60
<b>Crossflow fans</b>					
QK08A-2EM-25-CF <sup>3)</sup>	VE001400		70 71	3,5	40
QK08A-2EM-35-CF <sup>3)</sup>	VE001500		70,4 71,1	4,0	40
QK10A-2DM-38-FE	VE001600		81,7	7,5	40
QK10A-2DM-38-FK	VE001701		87,7	8,0	40
QK10A-2DM-48-FK <sup>3)</sup>	VE001700		83,2 87,7	10,0	40
QK08A-2DM-68-FK <sup>3)</sup>	VE001800		83,3 84,2	10,0	40



Types	V <sub>1</sub> (V <sub>VRMS</sub> ) <sup>1)</sup> V	f Hz	P1 W	I1 A	max V <sub>air</sub> / t m <sup>3</sup> /h	rpm min <sup>-1</sup>
<b>Axial fan</b>						
SKF 3-230-01	230 <sup>1)</sup>	50 60	15	0,12	159 190	2600
<b>Radial fans</b>						
SKF16A-230-01	230 <sup>2)</sup>	50 60	135 152	0,60 0,68	615 575	1300 1600
SKF16B-230-01	230 <sup>2)</sup>	50 60	160 185	0,71 0,83	610 550	1800 1730
SKF17A-230-01	230	50 60	81 115	0,36 0,51	850 950	2600 2900
SKF17B-230-01	230	50 60	140 194	0,62 0,89	1115 1260	2700 3000
SKFN4-230-01	230	50 60	155 230	0,69 0,98	1410 1540	2600 2900
<b>Crossflow fans</b>						
QK08A-2EM-25-CF	230	50 60	140 175	0,62 0,75	507 550	2540 2850
QK08A-2EM-35-CF	230	50 60	175 215	0,80 1,00	800 815	2400 2450
QK10A-2DM-38-FE	3 x 230/400	50	450	3 x 0,85	1360	2500
QK10A-2DM-38-FK	3 x 230/400	60	610	3 x 1,10	1640	3230
QK10A-2DM-48-FK	3 x 230/400	50 60	670 860	3 x 1,23 3 x 1,60	1880 2065	2730 3000
QK08A-2DM-68-FK	3 x 230/400	50 60	870 980	3 x 1,42 3 x 1,45	2600 2510	2630 3080

<sup>1)</sup> V<sub>1</sub> = 24 Vdc, 48 Vdc and 115 Vac are also available on request

<sup>2)</sup> V<sub>1</sub> = 115 Vac and 3 x 400 Vac are also available on request

<sup>3)</sup> 60 Hz

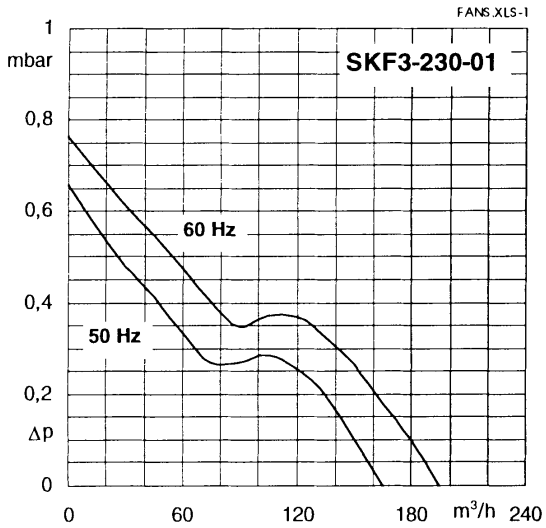


Fig. 1 Airflow vs. pressure drop

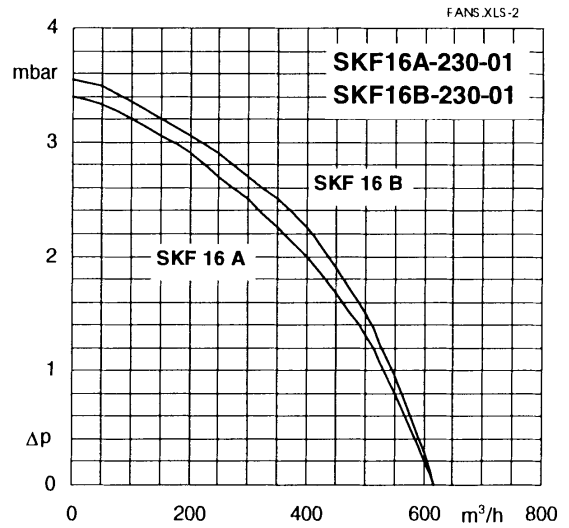


Fig.2 Airflow vs. pressure drop

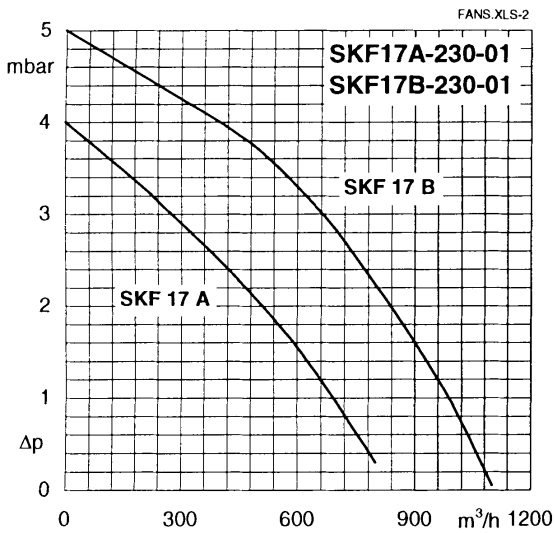


Fig. 3 Airflow vs. pressure drop

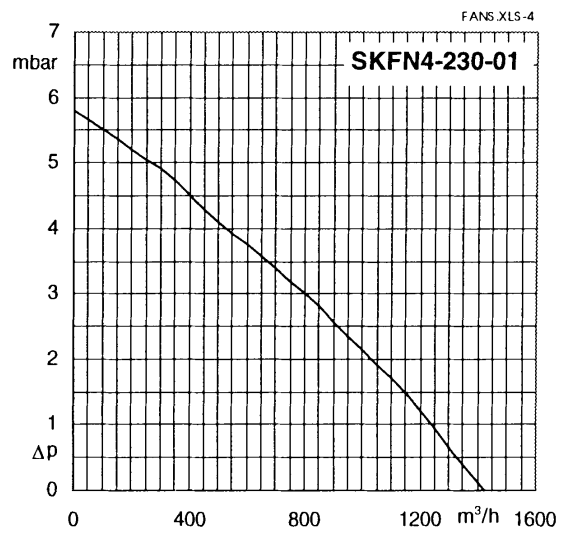


Fig.4 Airflow vs. pressure drop

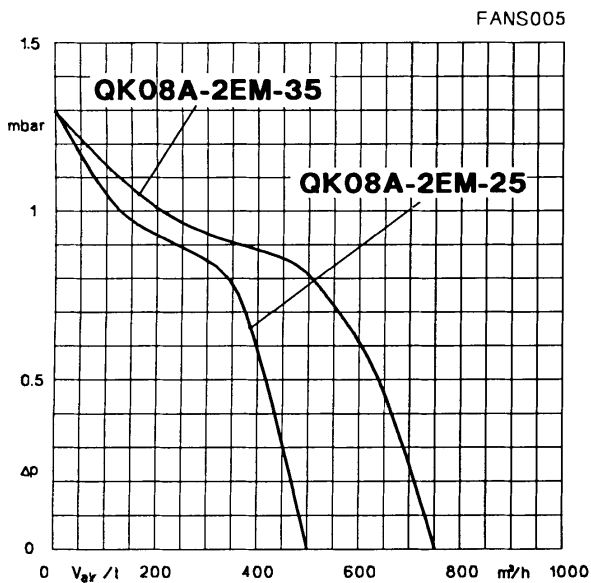


Fig. 5 Airflow vs. pressure drop

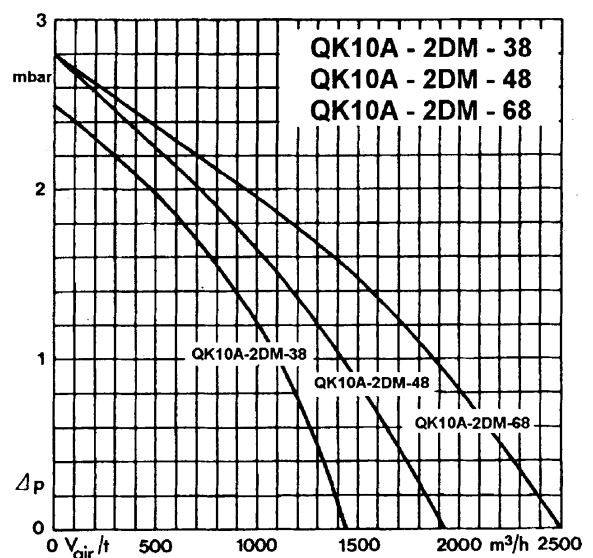
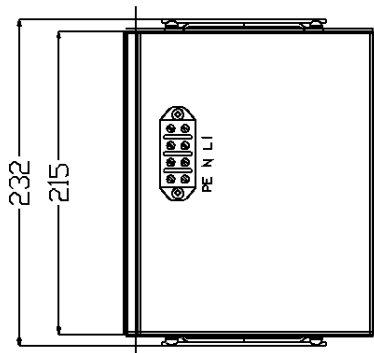
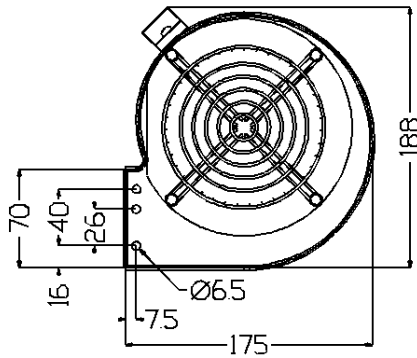
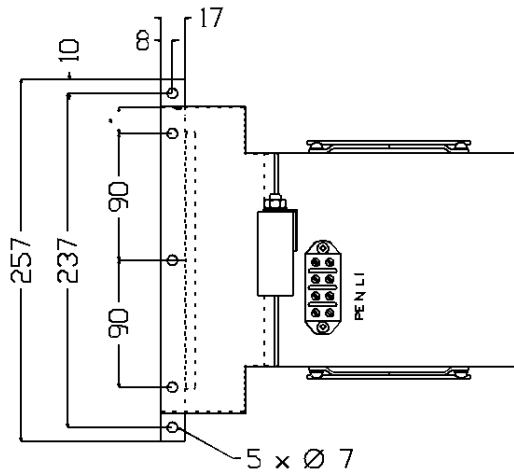
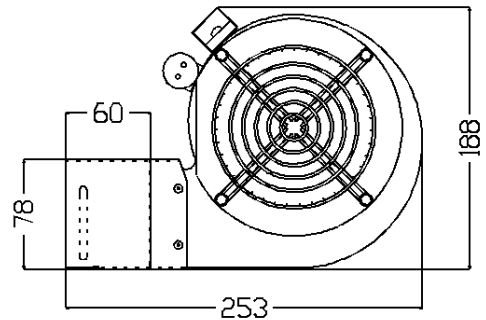


Fig. 6 Airflow vs. pressure drop

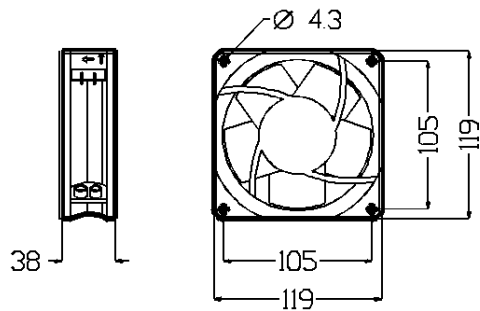
**SKF 16A**



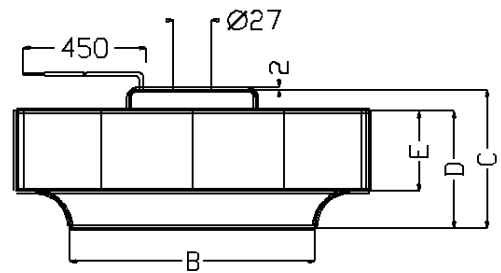
**SKF 16B**



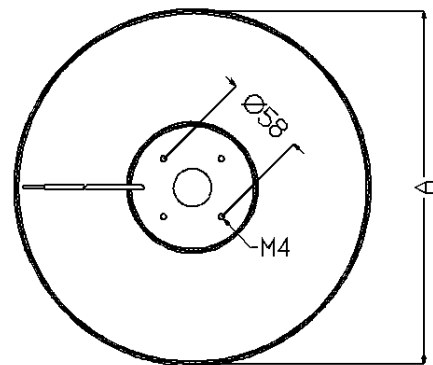
**SKF 3**



**SKF 17  
SKF N4**



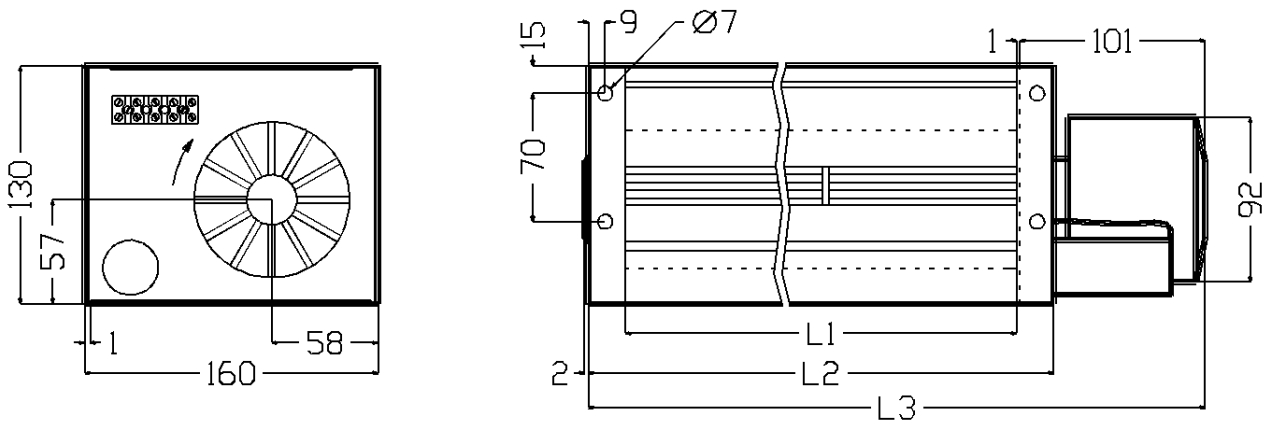
	A	B	C	D	E
<b>SKF 17A</b>	220	159	71	63	45
<b>SKF 17B</b>	227	153	99	88	64
<b>SKF N4</b>	252	172	99	84	57



Dimensions in mm

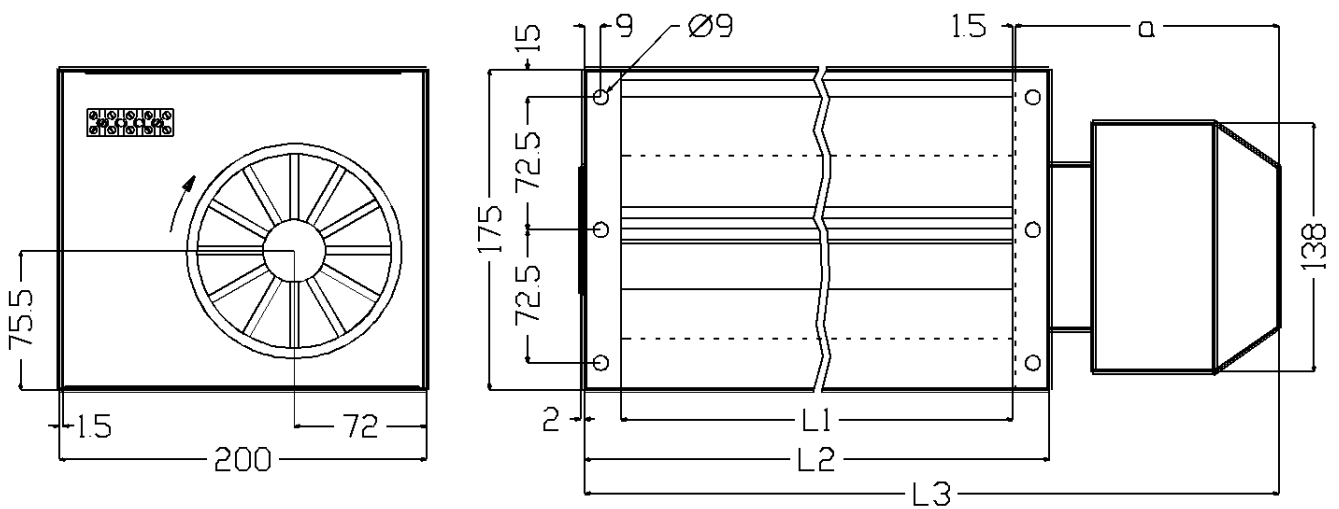


### QK 08A



Types	Ident No.	L1	L2	L3
QK08A-2EM-25-CF	VE001400	250	290	372
QK08A-2EM-35-CF	VE001500	350	390	472

### QK 10A



Types	Ident No.	a	L1	L2	L3
QK10A-2DM-38-FE	VE001600	126	380	420	528
QK10A-2DM-38-FK	VE001701	146	380	420	548
QK10A-2DM-48-FK	VE001700	146	480	520	648
QK10A-2DM-68-FK	VE001800	146	680	720	848

Dimensions in mm

## 14.4 Semiconductor Fuses

Size “000” (slim), with blown-fuse indicator pitch of terminals = 80 mm  
outline see page B 14 – 116

Type <sup>1)</sup> ▲ New Type Ident-No.	Type (for microswitch) <sup>2)</sup> Ident-No.	I <sub>NRMS</sub> A	Maximum values of total operating i <sup>2</sup> t (A <sup>2</sup> s) for V <sub>v</sub> =			
			= 120 V~	= 220 V~	= 250 V~	= 380 V~
30119541	▲ 30140923	32	81	108	113	148
30119551	▲ 30140924	40	138	184	193	253
30119561	▲ 30140925	50	219	292	306	401
30138821	▲ 30140926	63	450	600	630	825
30119571	▲ 30140927	80	750	1000	1050	1375
30119581	▲ 30140928	100	1260	1680	1764	2310
30119591	▲ 30140929	125	2670	3560	3738	4895
30119601	▲ 30140931	160	4800	6400	6720	8800
30140914	▲ 30140932	200	29450	12600	13230	17325
30140915	▲ 30140933	250	15600	20800	21840	28600
30140916	▲ 30140934	315	24600	32800	34440	45100
▲ 30140948	▲ 30140935	350	38500	49500	55000	80850
▲ 30140917	▲ 30140936	400	56000	72000	80000	117600



Type <sup>1)</sup> ▲ New Type Ident-No.	Type (for microswitch) <sup>2)</sup> Ident-No.	I <sub>NRMS</sub> A	Maximum values of total operating i <sup>2</sup> t (A <sup>2</sup> s) for V <sub>v</sub> =				
			= 440 V~	= 500 V~	= 600 V~	= 660 V~	= 690 V~
30119541	▲ 30140923	32	175	191	240	270	294
30119551	▲ 30140924	40	299	326	409	460	501
30119561	▲ 30140925	50	474	518	649	730	795
30138821	▲ 30140926	63	975	1065	1335	1500	1635
30119571	▲ 30140927	80	1625	1775	2225	2500	2725
30119581	▲ 30140928	100	2730	2982	3738	4200	4578
30119591	▲ 30140929	125	5785	6319	7921	8900	9701
30119601	▲ 30140931	160	10400	11360	14240	16000	17440
30140914	▲ 30140932	200	20475	22365	28035	31500	34335
30140915	▲ 30140933	250	33800	36920	46280	52000	56680
30140916	▲ 30140934	315	53300	58220	72980	82000	89380
▲ 30140948	▲ 30140935	350	96800	110000	–	–	–
▲ 30140917	▲ 30140936	400	140800	160000	–	–	–

<sup>1)</sup> total height H = 38,5 mm

<sup>2)</sup> microswitch 30137972, total height G = 55 mm

### Semiconductor Fuses (continued) size 3

Type Ident No.	$I_{NRMS}$	Maximum values of total operating $i^2t(A^2s)$ for $V_v=$					Size case
	A	= 80V ~	= 120V ~	= 220V ~	= 250V ~	= 380V ~	
▪ 3014 6087	80	507	560	700	735	980	30
▪ 3014 6088	100	725	800	1000	1050	1400	
▪ 3014 6083	125	1305	1440	1800	1890	2520	
▪ 3014 6084	160	2465	2720	3400	3570	4760	
▪ 3014 6082	200	4495	4960	6200	6510	8680	
▪ 3014 6089	250	8700	9600	12000	12600	16800	
▪ 3014 6091	315	17980	19840	24800	26040	34720	
▪ 3014 6092	350	23200	2560	32000	33600	44800	
▪ 3014 6093	400	34800	38400	48000	50400	67200	
▪ 3014 6111	450	43500	4800	60000	63000	84000	
▪ 3014 6112	500	69600	76800	96000	100800	134400	
▪ 3014 6094	400	28999	32000	40000	42000	56000	
▪ 3014 6095	450	40600	44800	56000	58800	78400	
▪ 3014 6096	500	56549	62400	78000	81900	109200	
▪ 3014 6113	630	113099	124800	156000	163800	218400	
▪ 3014 6114	700	142100	156800	196000	205800	274400	
▪ 3014 6097	500	42050	46400	58000	60900	81200	32
▪ 3014 6099	630	81200	89600	112000	117600	156800	
▪ 3014 6107	700	115999	128000	160000	168000	224000	
▪ 3014 6101	800	174000	192000	240000	252000	336000	
▪ 3014 6116**	900	260999	280000	360000	378000	504000	
▪ 3014 6117**	1000	362500	400000	500000	525000	700000	
▪ 3014 6102	900	203000	224000	280000	294000	392000	33
▪ 3014 6103	1000	260999	288000	360000	378000	504000	
▪ 3014 6104	1100	365400	403200	504000	529200	705600	
▪ 3014 6105**	1250	536500	592000	740000	777000	1036000	
▪ 3014 6118**	1400	735000	800000	1000000	1050000	1400000	
▪ 3014 6199**	1600	957000	1073000	1276000	1392000	1856000	

\*\* see outline

▪ new type

continued on next page

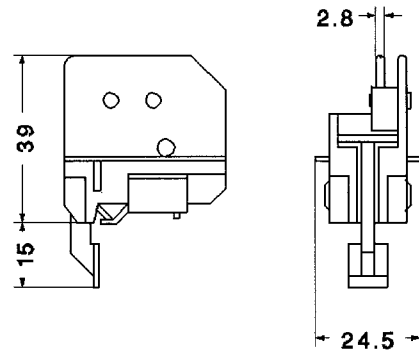
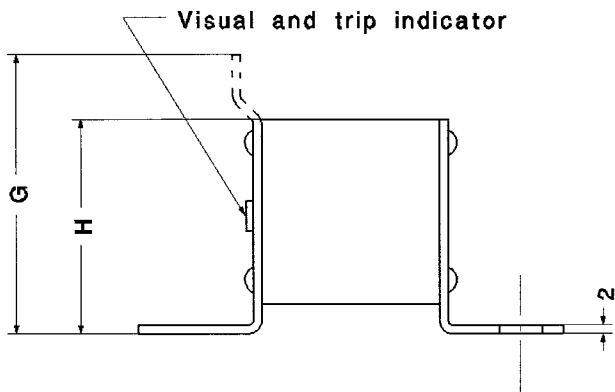
## Semiconductor Fuses (continued) size 30...



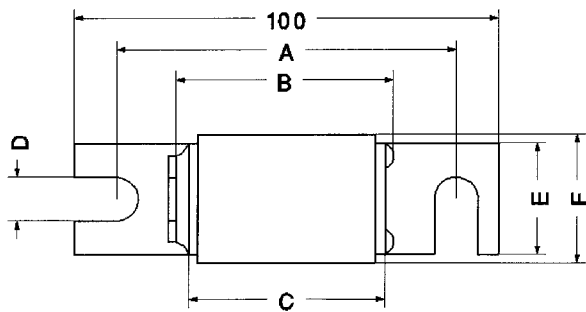
Type Ident No.	I <sub>NRMS</sub> A	Maximum values of total operating i <sup>2</sup> t(A <sup>2</sup> s) for V <sub>v</sub> =					Size
		= 440V ~	= 500V ~	= 600V ~	= 660V ~	= 690V ~	
<b>3014 6087</b>	80	1120	1242	1557	1750	1837	30
<b>3014 6088</b>	100	1600	1775	2225	2500	2625	
<b>3014 6083</b>	125	2880	3195	4005	4500	4725	
<b>3014 6084</b>	160	5440	6035	7565	8500	8925	
<b>3014 6082</b>	200	9920	11005	13795	15500	16275	
<b>3014 6089</b>	250	19200	21300	26700	30000	31500	
<b>3014 6091</b>	315	39680	44020	55180	62000	65100	
<b>3014 6092</b>	350	51200	56800	71200	80000	84000	
<b>3014 6093</b>	400	76800	85200	106800	120000	126000	
<b>3014 6111</b>	450	96000	106500	133500	150000	157500	
<b>3014 6112</b>	500	153600	170400	213600	240000	252000	
<b>3014 6094</b>	400	64000	71000	89000	10000	105000	
<b>3014 6095</b>	450	89600	99400	124600	140000	147000	
<b>3014 6096</b>	500	124800	138450	173550	195000	204750	
<b>3014 6113</b>	630	249600	276900	347100	390000	409500	
<b>3014 6114</b>	700	313600	347900	436100	490000	514500	
<b>3014 6097</b>	500	92800	102950	129050	145000	152250	32
<b>3014 6099</b>	630	179200	198800	249200	280000	294000	
<b>3014 6107</b>	700	256000	284000	356000	400000	420000	
<b>3014 6101</b>	800	384000	426000	534000	600000	630000	
<b>3014 6116**</b>	900	576000	639000	801000	900000	945000	
<b>3014 6117**</b>	1000	800000	887500	1112500	1250000	1312500	
<b>3014 6102</b>	900	448000	497000	623000	700000	735000	33
<b>3014 6103</b>	1000	576000	639000	801000	900000	945000	
<b>3014 6104</b>	1100	806400	894600	1121400	1260000	1323000	
<b>3014 6105**</b>	1250	1184000	1313500	1646500	1850000	1942500	
<b>3014 6118**</b>	1400	1600000	1775000	2225000	2500000	2625000	
<b>3014 6199**</b>	1600	2059000	2610000	2900000	-	-	

\*\* see outline

**Sizes 000**



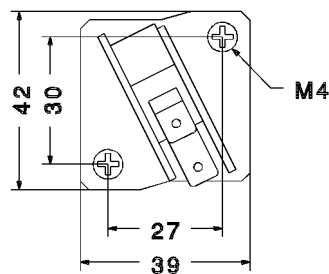
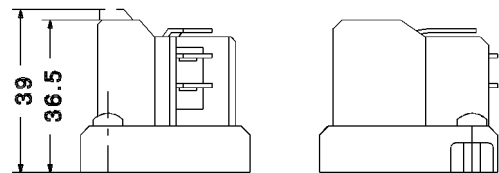
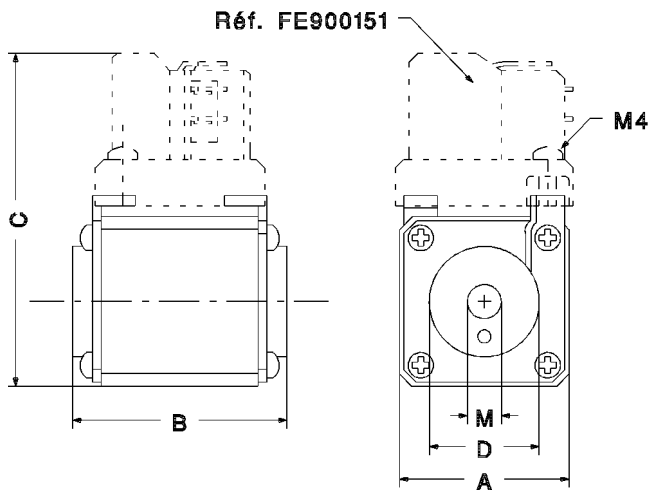
**Microswitch for size 000**  
Ref. 30137972



Size	A	B	C	D	E	F	G	H
000	77.5	.	48	8.5	20	.	55.5	38.5

Dimensions in mm

**Sizes 30 to 33**



**Microswitch for sizes 30 to 33**  
Réf. FE900151

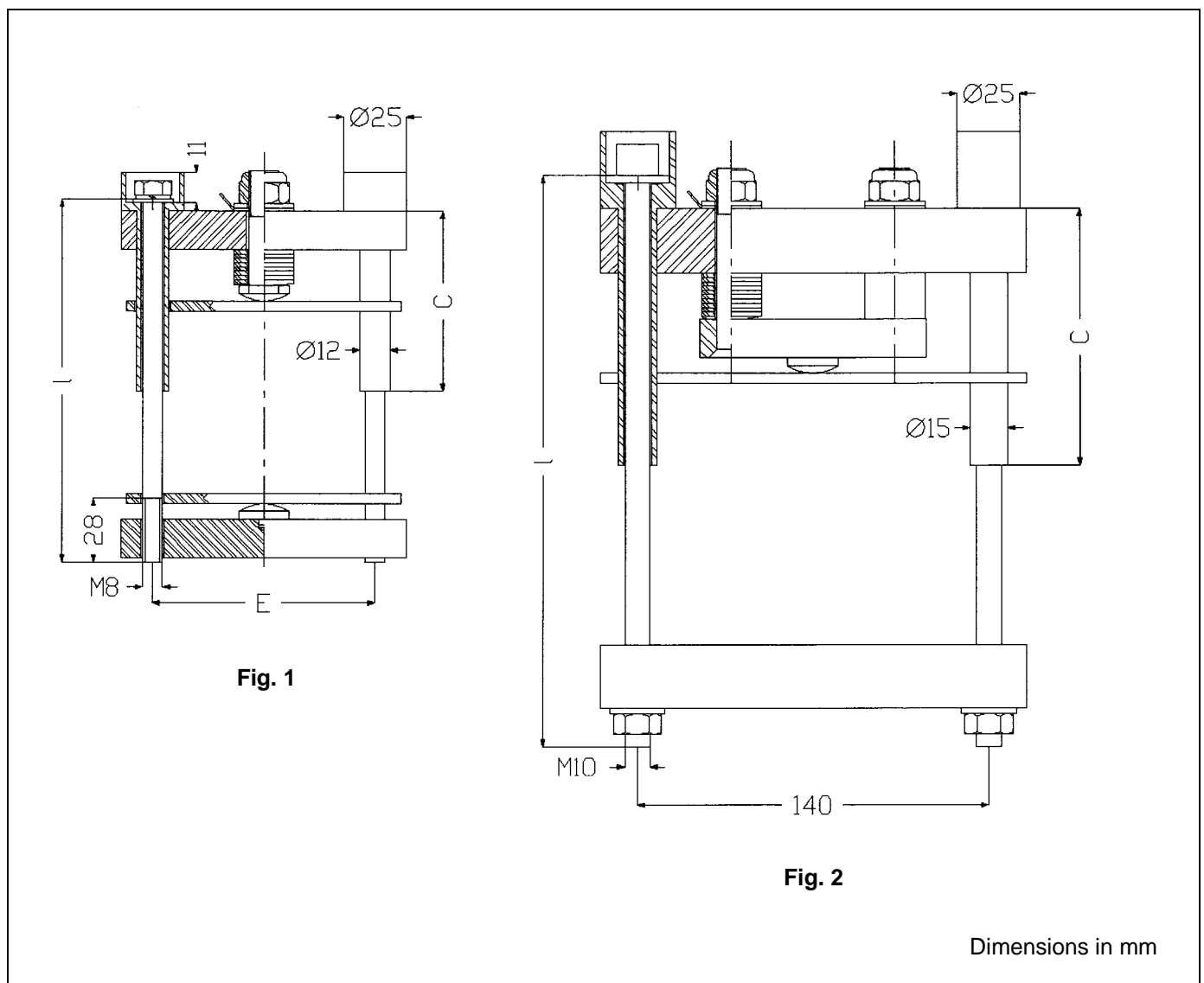
Size	A	B <sup>±1</sup>	C	D	M
30	40	50.6	82	26	M8
31	51	50.6	91	30	M8
32	60	50.6	100	38 (42**)	M10
33	74.5	50.6	114	46 (52**)	M12

Dimensions in mm

## 14.5 Mounting Clamps for Capsule Devices

### Mounting Clamps MC for double sided cooling

Type	Ident-No.	F		fig.	l	c	e	w
		kn	lbs					
▲ New Type								
MC 2-4,5	RC 100 070	4,5	1000	fig. 1	120	71	89	980
MC 2-6	RC 100 080	6	1350	fig. 1	120	71	89	980
MC 2-9	RC 100 100	9	2000	fig. 1	140	71	89	1000
MC 2-12	RC 100 120	12	2750	fig. 1	140	71	89	1000
MC 2-15	RC 100 160	15	3400	fig. 1	140	71	89	1000
MC 2-18	30 11 68 40	18	4000	fig. 1	140	71	89	1000
▲ MC 2-19	RC 100 202	19	4250	fig. 1	130	90	89	1000
MC 2-24	30 11 88 10	24	5400	fig. 1	140	71	89	1000
▲ MC 3-27	RC 100 275	27	6100	fig. 1	150	71	102	1100
▲ MC 6-30	RC 200 400	30	6700	fig. 2	220	100	–	2500
▲ MC 6-43	RC 200 430	40	9000	fig. 2	220	100	–	2500

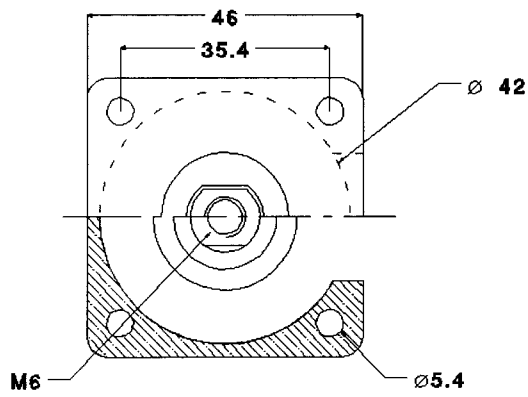
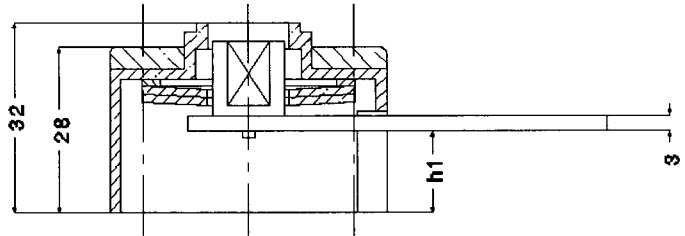
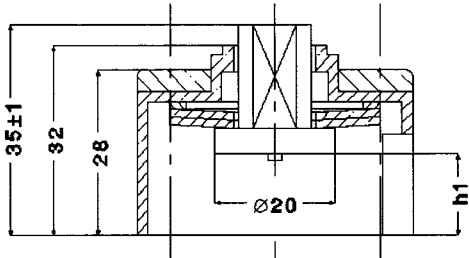


## Mounting Clamps BC for single sided cooling

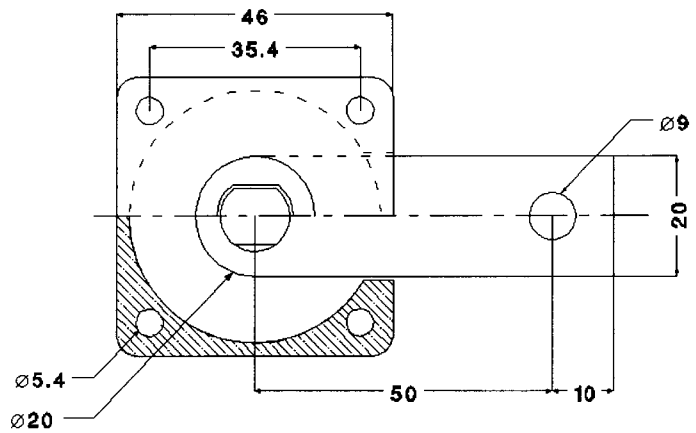
### BC 50

$$h_1^{1)} = 14 \pm 0,1 \text{ mm}$$

$$F = 4,5^{+1}_{-0,5} \text{ kN}$$



**BC 50 - F 4,5**  
Ident-No. RC20 0050



**BC 50 - L 4,5**  
Ident-No. 20 0090

Dimensions in mm

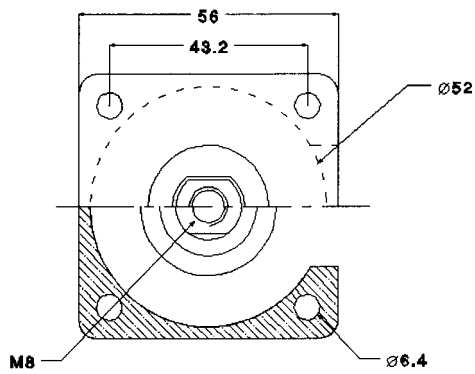
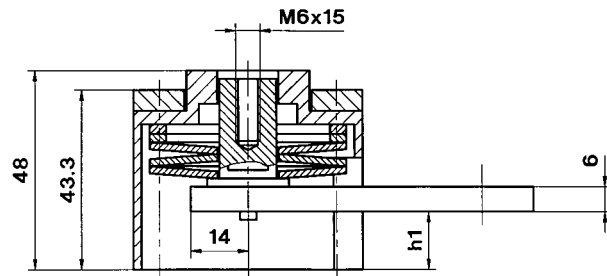
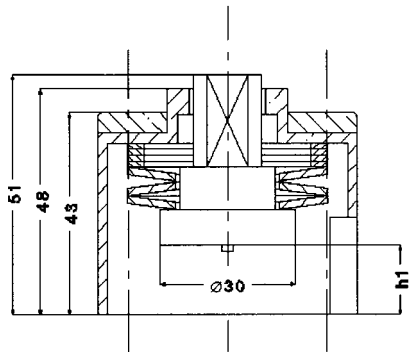
<sup>1)</sup>  $h_1$ : thickness of pressed capsule; F: specified mounting force

## Mounting Clamps BC for single sided cooling

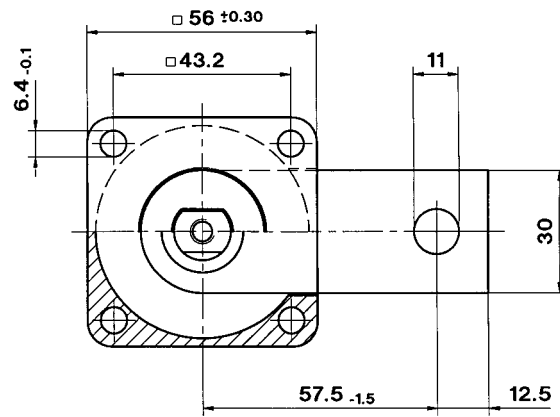
### BC 61

$$h_1^{1)} = 14 \pm 0,1 \text{ mm}$$

$$F = 6^{+1,4}_{-0,7} \text{ kN}$$



**BC 61 - F 6**  
Ident-No. 3013 6260



**BC 61 - L 6**  
Ident-No. 3011 9220

Dimensions in mm

<sup>1)</sup>  $h_1$ : thickness of pressed capsule; F: specified mounting force

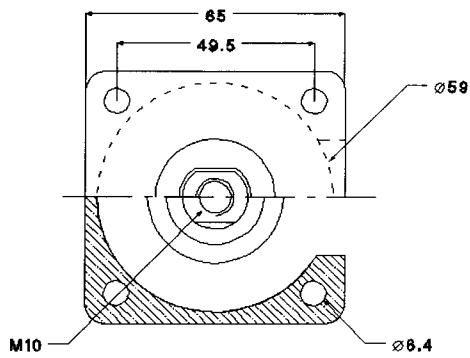
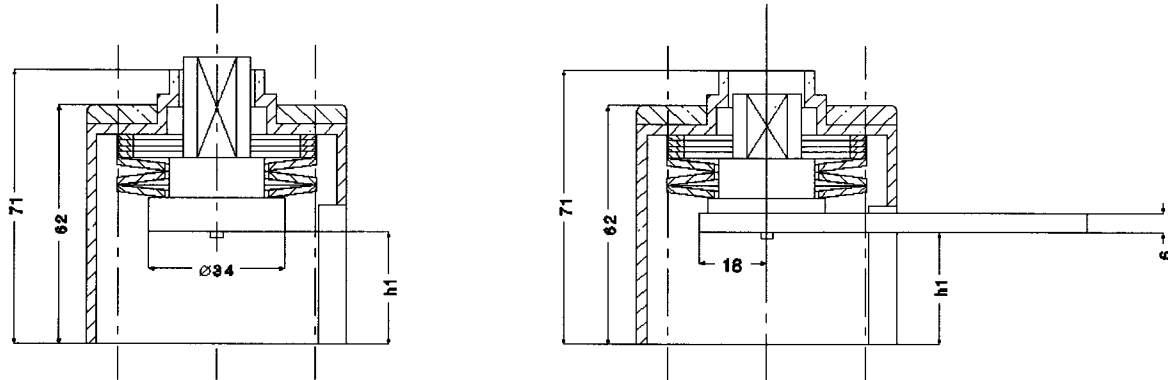


## Mounting Clamps BC for single sided cooling

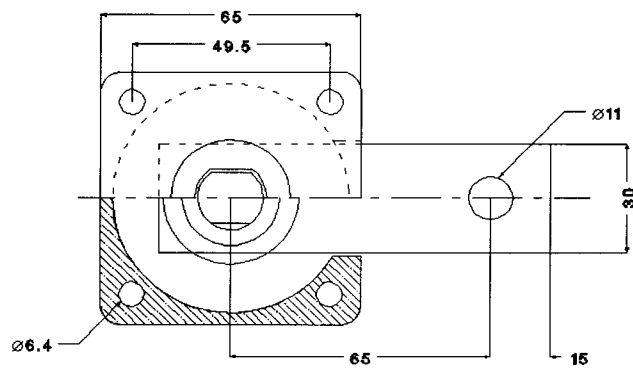
### BC 70

$$h_1^{1)} = 26 \pm 0,1 \text{ mm}$$

$$F = 12 \begin{matrix} +2 \\ -1 \end{matrix} \text{ kN}$$



**BC 70 - F 12**  
Ident-No. RC20 0330



**BC 70 - L12**  
Ident-No. 3012 0470

Dimensions in mm

<sup>1)</sup>  $h_1$ : thickness of pressed capsule; F: specified mounting force

## 14.6 Metaloxide (ZnO) Varistors

Types	$V_V$	$V_{DC}$	$V_{DC} \pm 10\%$	$\hat{I}_p^{1,2)}$	$\hat{I}_p^{1,3)}$	$\hat{W}_p^{1,3)}$	$\hat{P}_{AV}$	$\hat{V}_{pmax}(\hat{I}_p^1) = \dots$			w
	max.	max.	( $I_{DC} = 1\text{ mA}$ )	max. repetitive	max. non- repetitive	max.	max. $T_{amb} \leq 70\text{ °C}$	(10 A)	(100 A)	(1000 A)	
	V	V	V	A	A	J	W	V	V	V	g
<b>Wire terminals <sup>4)</sup></b>											
SKVA 14 A 42	42	56	68	150	4500	24,6	0,6	110	130	215	3
SKVA 14 A 60	60	85	100	150	4500	30,1	0,6	160	185	280	3
SKVA 20 B 130	140	180	220	190	6500	79,3	1,0	350	395	525	6
SKVA 14 A 150	150	200	270	150	4500	58,5	0,6	380	440	570	3
SKVA 14 A 250	250	325	420	150	4500	103	0,6	670	780	925	3
SKVA 20 B 250	250	325	420	190	6500	146,2	1,0	580	680	830	6
SKVA 20 B 275	280	364	470	190	6500	163	1,0	750	835	1025	6
SKVA 14 A 320	330	429	560	150	4500	137	0,6	800	930	1300	3
SKVA 14 A 420	420	546	710	150	4500	175	0,6	1000	1255	1600	3
SKVA 20 B 420	420	546	710	190	6500	224	1,0	1000	1255	1600	6
SKVA 20 B 460	460	598	780	190	6500	289	1,0	1240	1275	1650	6
SKVA 20 B 550	600	780	1000	190	6500	345	1,0	1590	1760	2100	6
<b>Plastic package, 1 varistor</b>											
SKVC 20 A 251	250	320	$390 \pm 15\%$	190	6500	140	0,8 <sup>5)</sup>	600	650	800	120
SKVC 20 A 460	460	615	$750 \pm 15\%$	190	6500	260	0,8 <sup>5)</sup>	1150	1270	1550	120
<b>Plastic package, 1 varistor + 1 capacitor 0,1 <math>\mu</math>F</b>											
SKVC 20 A 460C	460	615	$750 \pm 15\%$	190	6500	260	0,8 <sup>5)</sup>	1150	1270	1550	130
<b>Plastic package, 3 varistors</b>											
SKVC 221	140	180	$220 \pm 15\%$	190	6500	70	0,8 <sup>5)</sup>	310	340	430	145
SKVC 391	250	320	$390 \pm 15\%$	190	6500	130	0,8 <sup>5)</sup>	590	630	790	145
SKVC 681	420	560	$680 \pm 15\%$	190	6500	155	0,8 <sup>5)</sup>	1000	1100	1300	145
SKVC 781	460	615	$750 \pm 15\%$	190	6500	170	0,8 <sup>5)</sup>	1100	1200	1500	145
SKVC 911	550	745	$910 \pm 15\%$	190	6500	210	0,8 <sup>5)</sup>	1350	1450	1900	145

<sup>1)</sup> IEC standard current pulse waveform 8 x 20  $\mu$ s

<sup>2)</sup>  $10^4$  times during lifetime

<sup>3)</sup> Once during lifetime

<sup>4)</sup> Epoxy encapsulation carries Underwriter Laboratories flammability classification 94V-0

<sup>5)</sup>  $T_{case} \leq 85\text{ °C}$ . For higher values of  $P_{AV}$  see chapter B 4 last page.

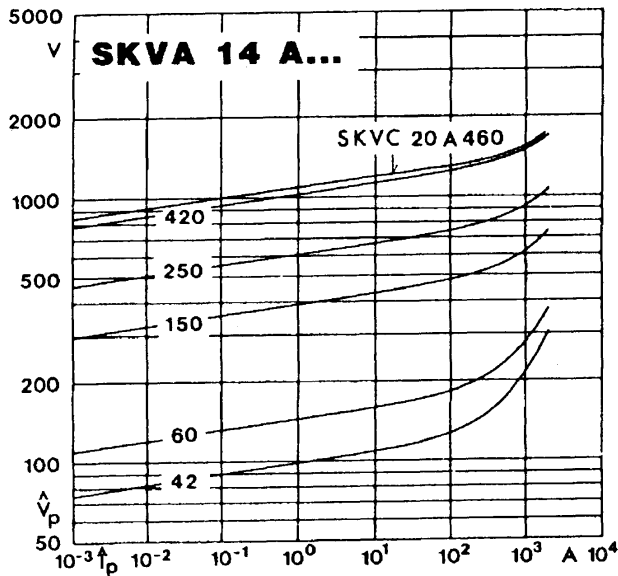


Fig. 2 a Current / voltage characteristics (pulsed)

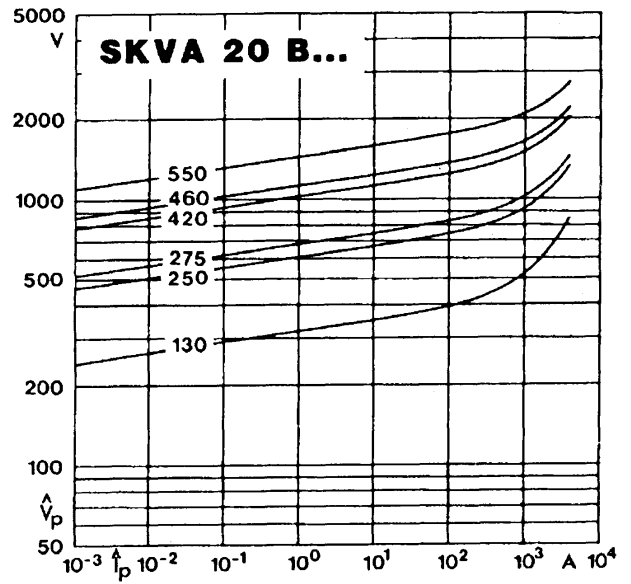


Fig. 2 b Current / voltage characteristics (pulsed)

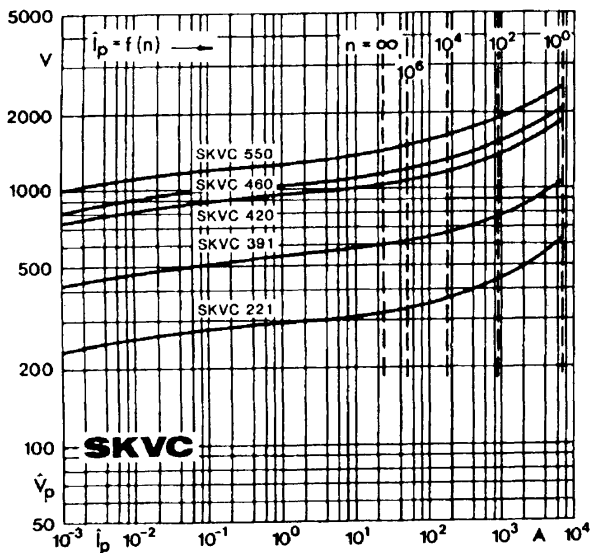


Fig. 2 c Current / voltage characteristics (pulsed)

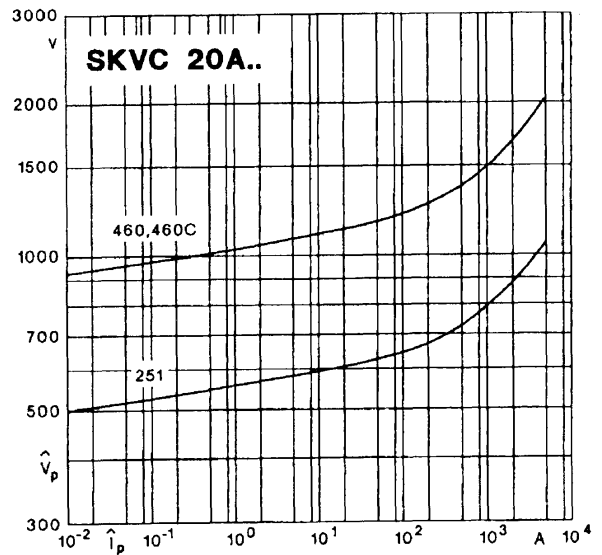
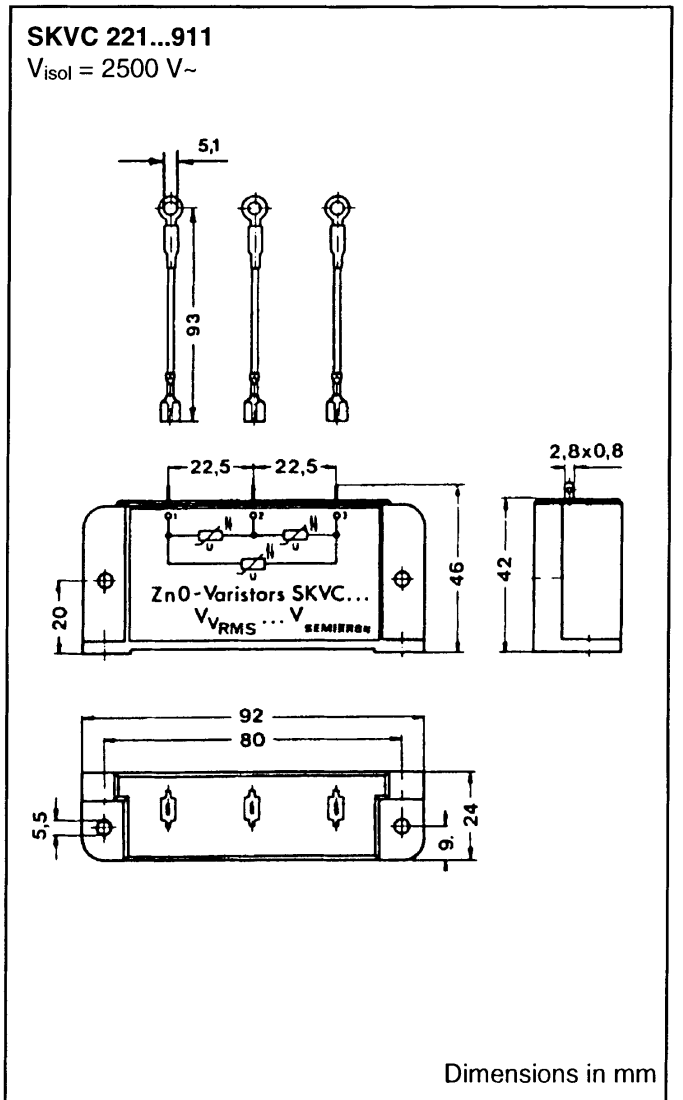
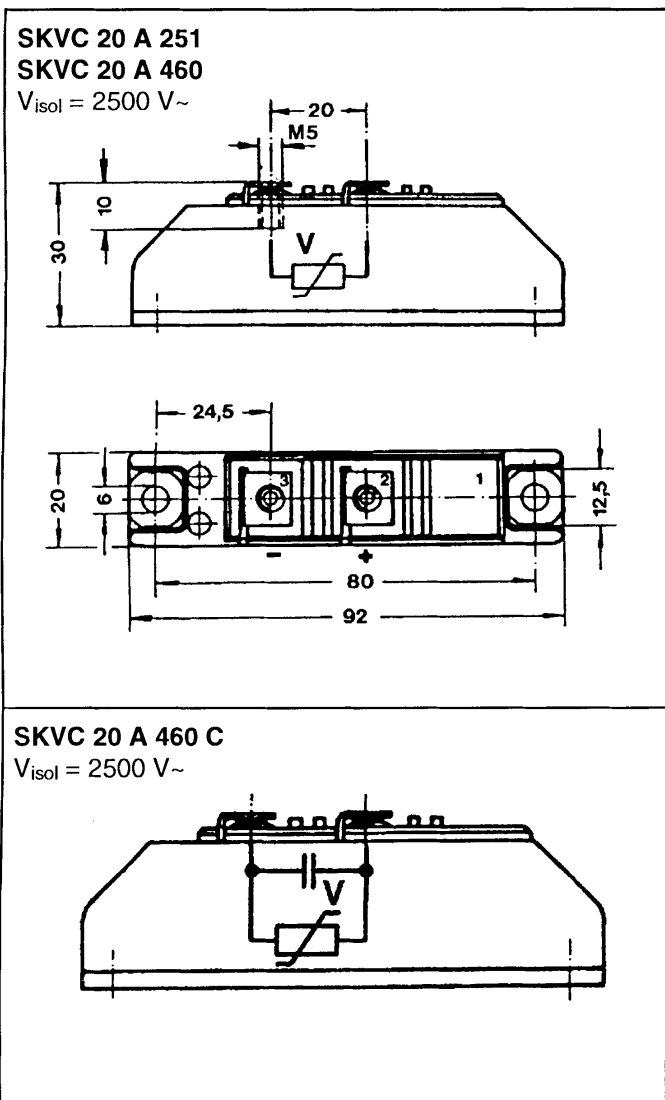
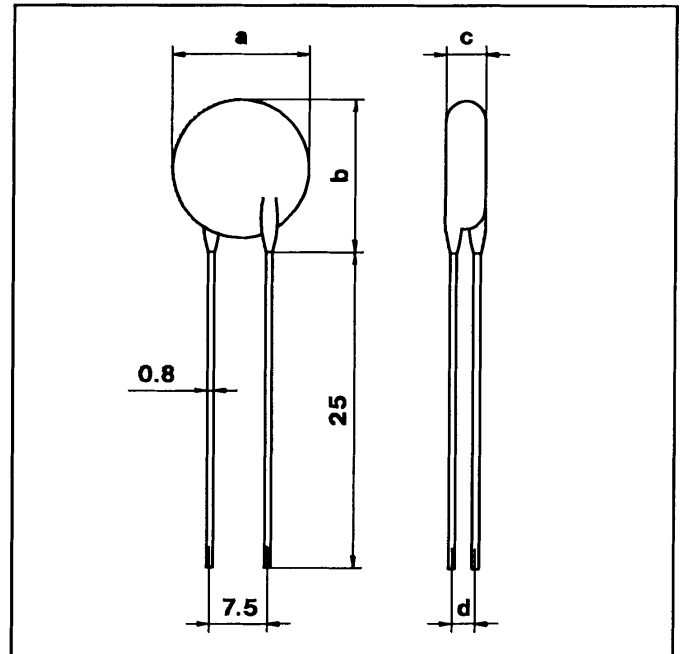


Fig. 2 d Current / voltage characteristics (pulsed)

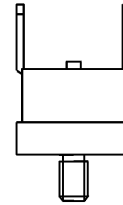
## SKVA

Types	Dimensions			
	a max. mm	b max. mm	c max. mm	d mm
SKVA 14 A 42	16	19		
SKVA 14 A 60	16	19	4	2,2
SKVA 20 B 130	23	26		
SKVA 14 A 150	16	19	5	2,5
SKVA 14 A 250	17	20		3,3
SKVA 20 B 250	24	27		3,3
SKVA 20 B 275	24	27	6	3,6
SKVA 14 A 320	17	20		4,0
SKVA 14 A 420	17	20	7	4,6
SKVA 20 B 420	24	27	7	4,6
SKVA 20 B 460	24	27	7	5,0
SKVA 20 B 550	24	27	8	5,6



Dimensions in mm		Switching temperature °C	Ident No.
		63	30095070
		67	30095080
		75 ± 3 %	30095090
		80	30095100
		85	30095110
		90	30095120
		95	30095130
		118 ± 3,5 %	30095140
		132	30095150
		50	32306700
		56	30095170
		60	30095180
		63	31804300
		71 ± 3 %	30095190
		75	31804400
		80	30138940
		85	31804600
90	30121480		
		95	30121470
		100 ± 3,5 %	30116110
		112	30116120
		118	30121460
		50	30137120
		60 ± 3 %	30138420
		80	30140550
		85	30140540

## 14.7 Bimetal Thermal Trips 240 V~ (30 V=)



### Switching characteristics of the contact

Working voltage	240 V~	30 V=
Maximum current	1 A	3 A
Guaranteed switching cycles	100 000	
Insulation test voltage (rms)	2000 V~ for 2s	

1) The contact is normally closed and will open at the switching temperature

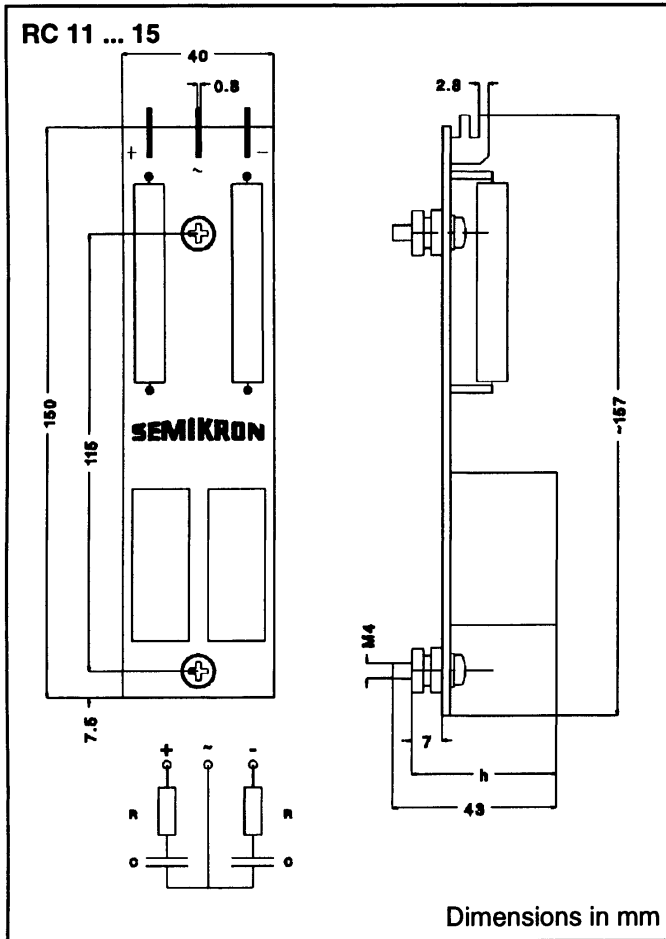
2) The contact is normally open and will close at the switching temperature

### Recommended switching temperature of the thermal trip for the heatsinks K 1,1 and K 0,55

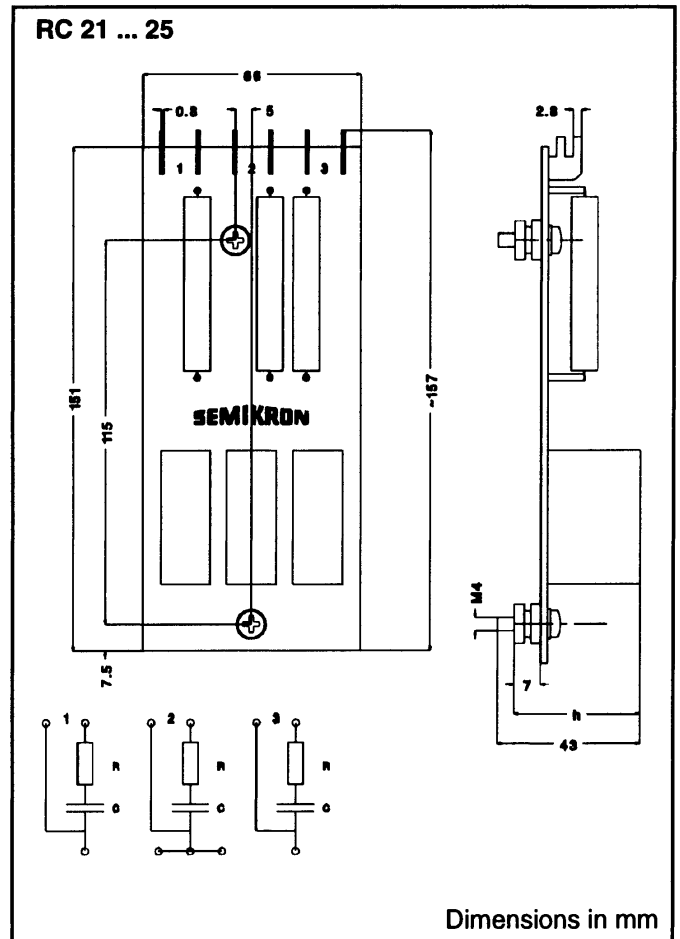
Types	K 1,1	K 1,1 F	K 0,55	K 0,55 F
SKN 45	95 °C	67 °C	-	-
SKN 70	-	90 °C	-	-
SKN 100	118 °C	85 °C	-	-
SKN 130	-	90 °C	-	-
SKN 240	132 °C	-	-	75 °C
SKN 320	-	-	-	95 °C
SKT 40	80 °C	67 °C	-	-
SKT 55	90 °C	67 °C	-	-
SKT 80	95 °C	67 °C	-	-
SKT 100	95 °C	67 °C	-	-
SKT 130	95 °C	80 °C	90 °C	67 °C
SKT 160	95 °C	80 °C	90 °C	67 °C
SKT 215	-	-	95 °C	75 °C
SKT 250	-	-	95 °C	75 °C

## 14.8 RC Snubber Networks on Printed Circuit Boards (Fitting to Heatsink P3)

for protecting the individual thyristors or diodes



Types	h mm
RC 11 B, RC 13 B, RC 14 B	32
RC 12 B, RC 15 B	37

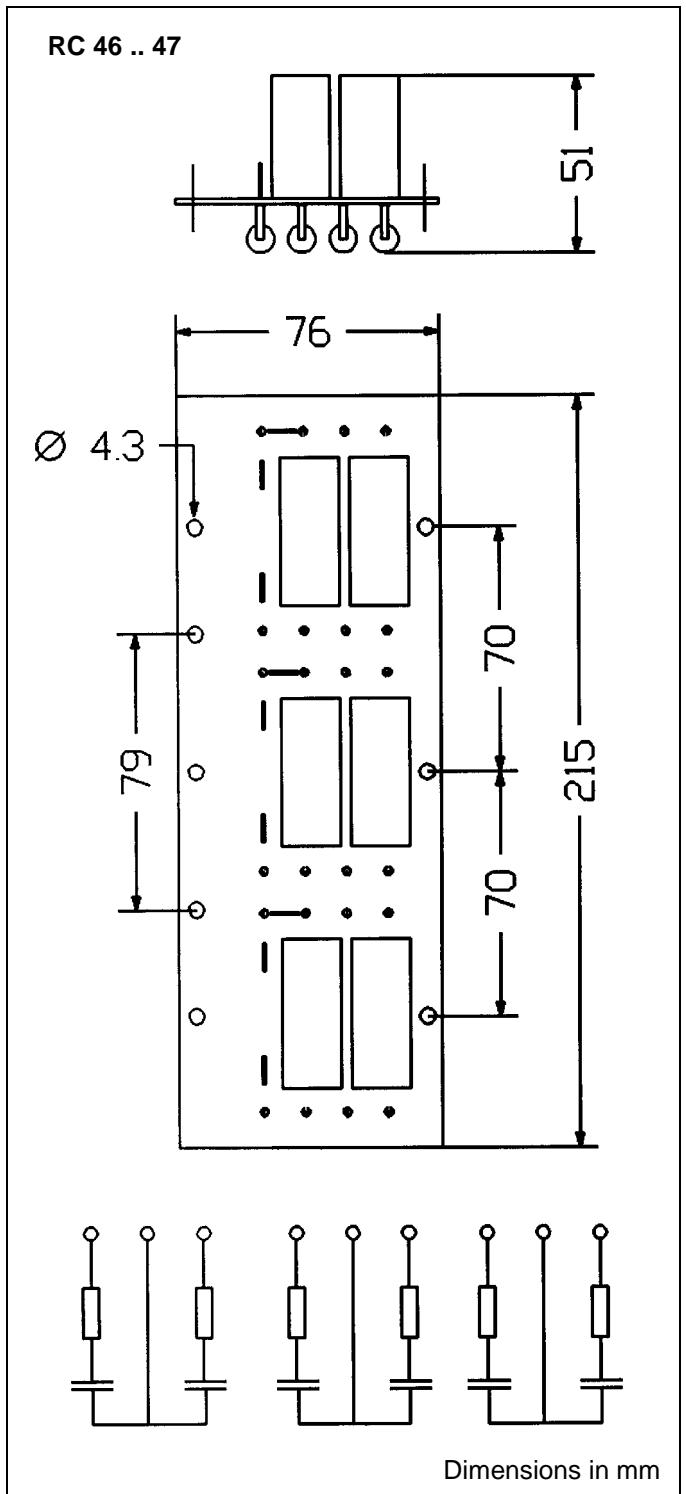
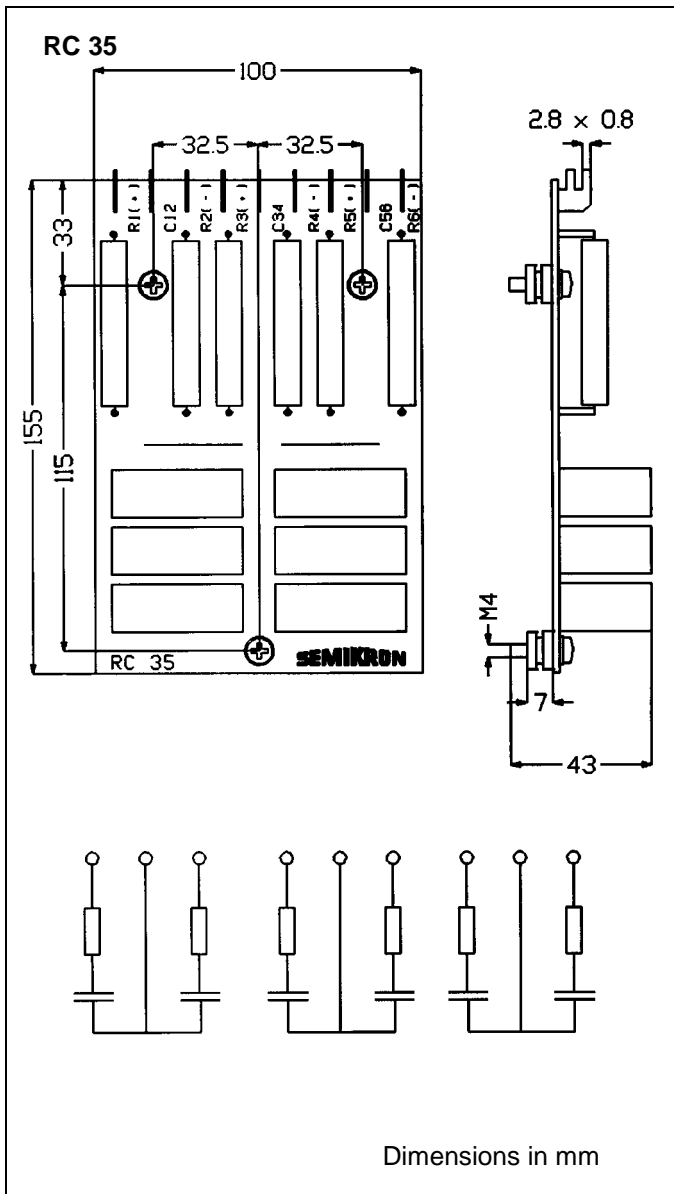


Types	h mm
RC 21 B, RC 23 B, RC 24 B	32
RC 22 B, RC 25 B	37

SEMIPACK®	V <sub>VRMS</sub> ≤ 250 V		V <sub>VRMS</sub> ≤ 400 V		V <sub>VRMS</sub> ≤ 500 V	
	Type	C	R	Type	C	R
SKKT 15 ... 26 SKKH 15 ... 26 SKKD 15	RC 11 B RC 21 B	0,22 μF	68 Ω 10 W	RC 11 B RC 21 B	0,22 μF	68 Ω 10 W
	RC 12 B RC 22 B			0,1 μF		
SKKT 41 ... 250 SKKH 41 ... 250 SKKD 46 ... 260	RC 13 B RC 23 B	0,22 μF	33 Ω 10 W	RC 14 B RC 24 B	0,22 μF	47 Ω 10 W
	RC 15 B RC 25 B			0,1 μF		

## 14.8 RC Snubber Networks on Printed Circuit Boards (continued)

for protecting individual thyristors or diodes



SEMI-PACK	$V_{VRMS} < 500 \text{ V}$		
	Type	C	R
SKKT 41 .. 250	RC 35	0,1 $\mu\text{F}$	68 $\Omega$
SKKH 41 .. 250			
SKKD 46 .. 260			

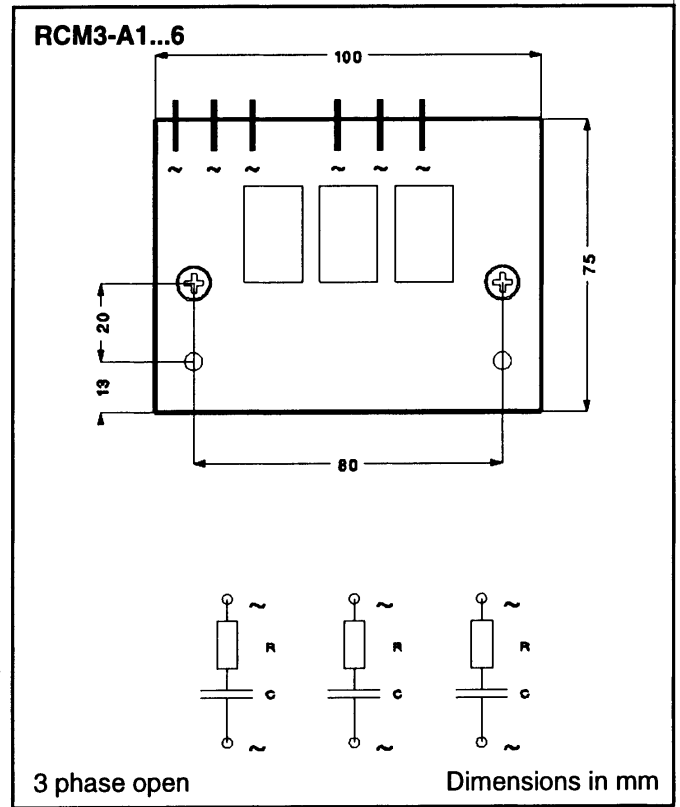
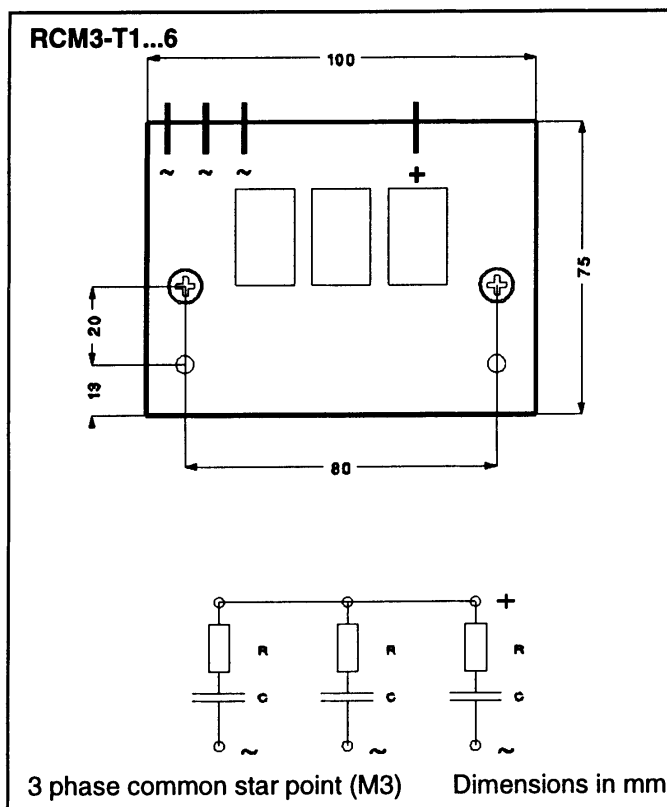
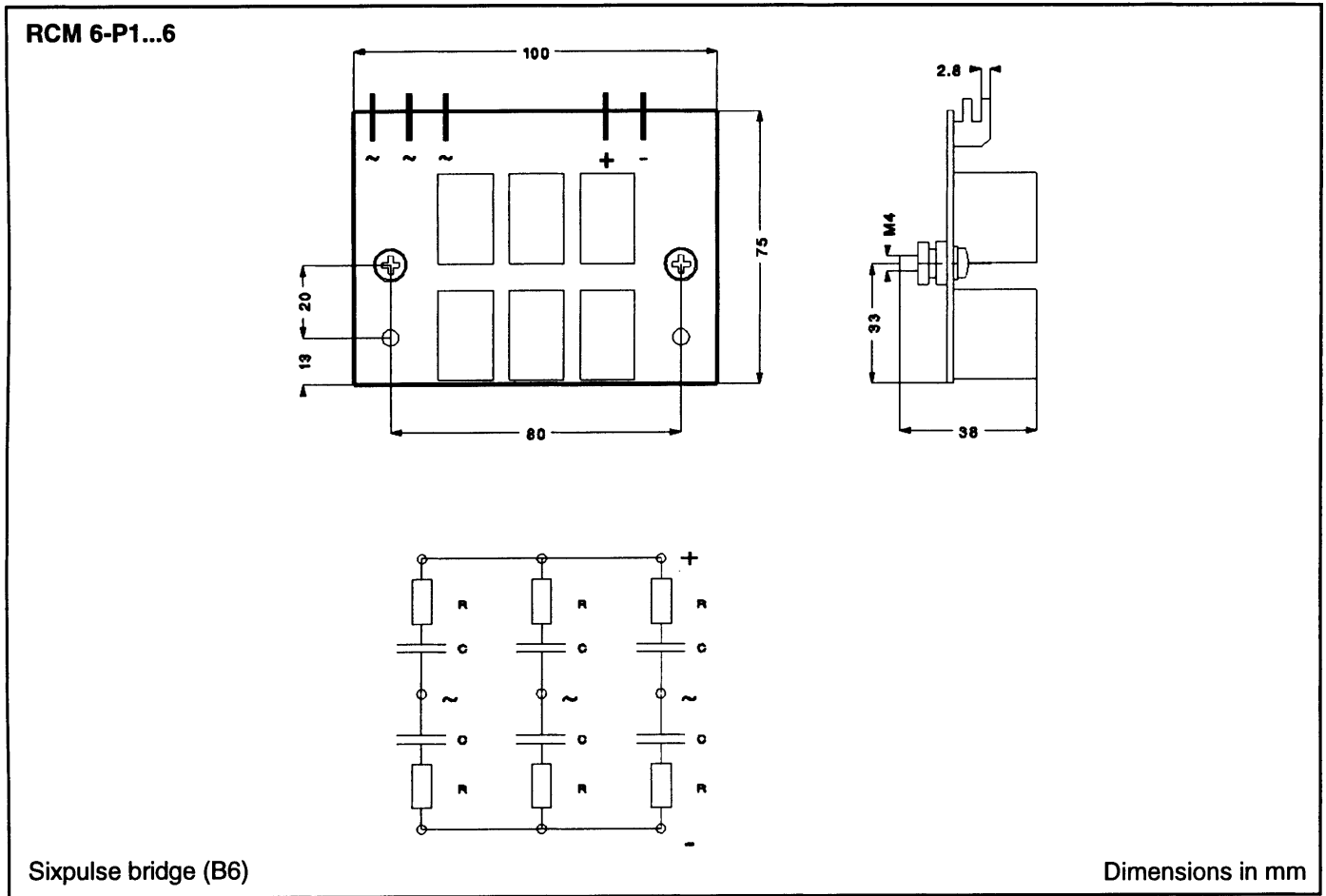
SEMI-PACK	$V_{VRMS} < 400 \text{ V}$			$V_{VRMS} < 600 \text{ V}$		
	Type	C	R	Type	C	R
SKKT 41 .. 250	RC 46	0,47 $\mu\text{F}$	33 $\Omega$	RC 47	0,22 $\mu\text{F}$	47 $\Omega$
SKKH 41 .. 250						
SKKD 46 .. 260						

RC 46 .. 47 is fitted for P16 heatsink with a standard fan.

## 14.8 RC Snubber Networks on Printed Circuit Boards (continued)

for protecting the individual thyristors and diodes

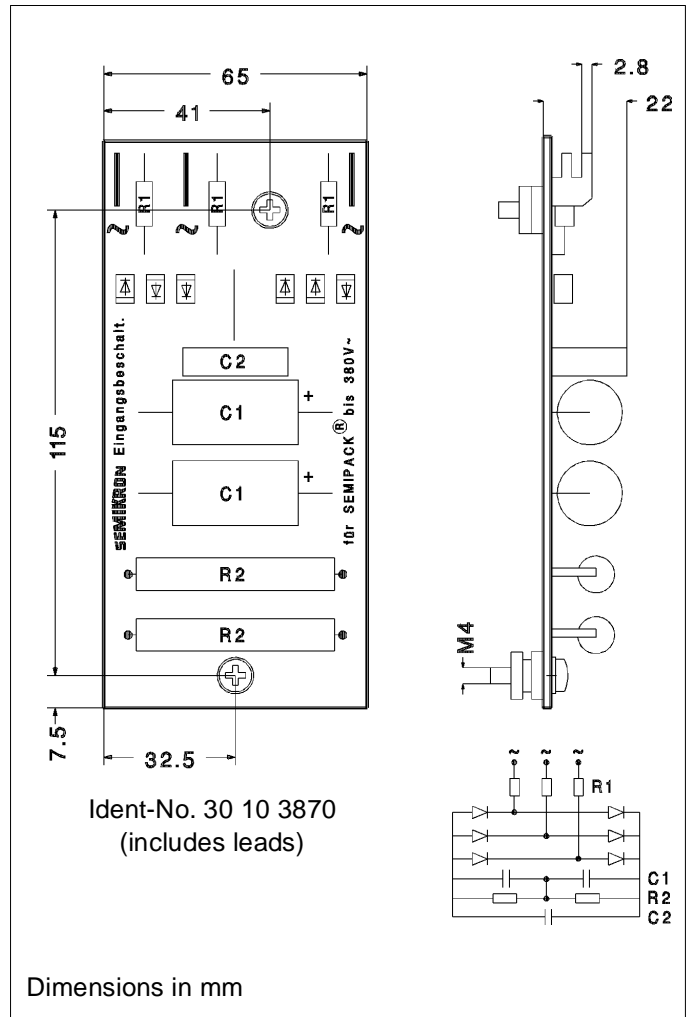
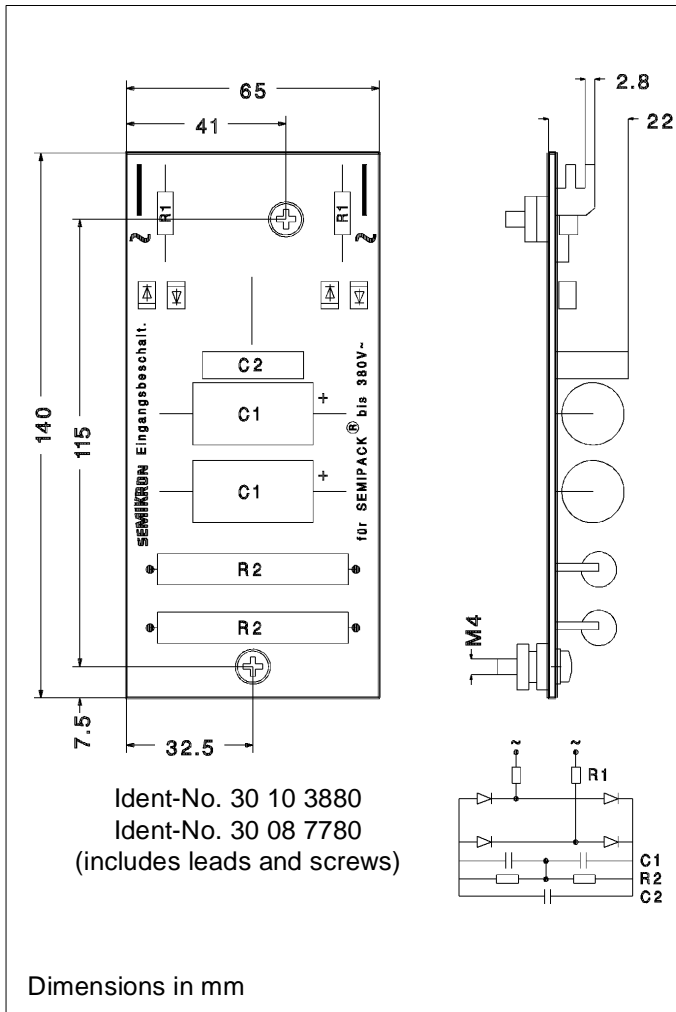
Types and values see table next page





## 14.8 RCD Snubber Networks on Printed Circuit Boards (Fitting to Heatsink P3)

for a.c. input side protection



C1: 2 x 22  $\mu$ F; C2: 4,7 nF; R1: 2x (3x) 5,1  $\Omega$  / 2 W; R2: 2 x 15 k $\Omega$  / 10 W

For component Types	$V_{VRMS} < 125 V$		$V_{VRMS} < 250 V$			
	Type	C	R <sup>1)</sup>	Type	C	R <sup>1)</sup>
SKN 20.. 130 Moulded Bridges	RCM6-P1			RCM6-P3		
	RCM3-T1	0,22 $\mu$ F	47 $\Omega$	RCM3-T3	0,22 $\mu$ F	47 $\Omega$
	RCM3-A1			RCM3-A3		
SKKD 15...26	RCM6-P1			RCM6-P4		
	RCM3-T1	0,22 $\mu$ F	47 $\Omega$	RCM3-T4	0,1 $\mu$ F	47 $\Omega$
	RCM3-A1			RCM3-A4		
SKKD 46...260	RCM6-P2			RCM6-P5		
	RCM3-T2	0,5 $\mu$ F	33 $\Omega$	RCM3-T5	0,25 $\mu$ F	33 $\Omega$
	RCM3-A2			RCM3-A5		
SKN 240	RCM6-P2			RCM6-P6		
	RCM3-T2	0,5 $\mu$ F	33 $\Omega$	RCM3-T6	0,5 $\mu$ F	33 $\Omega$
	RCM3-A2			RCM3-A6		

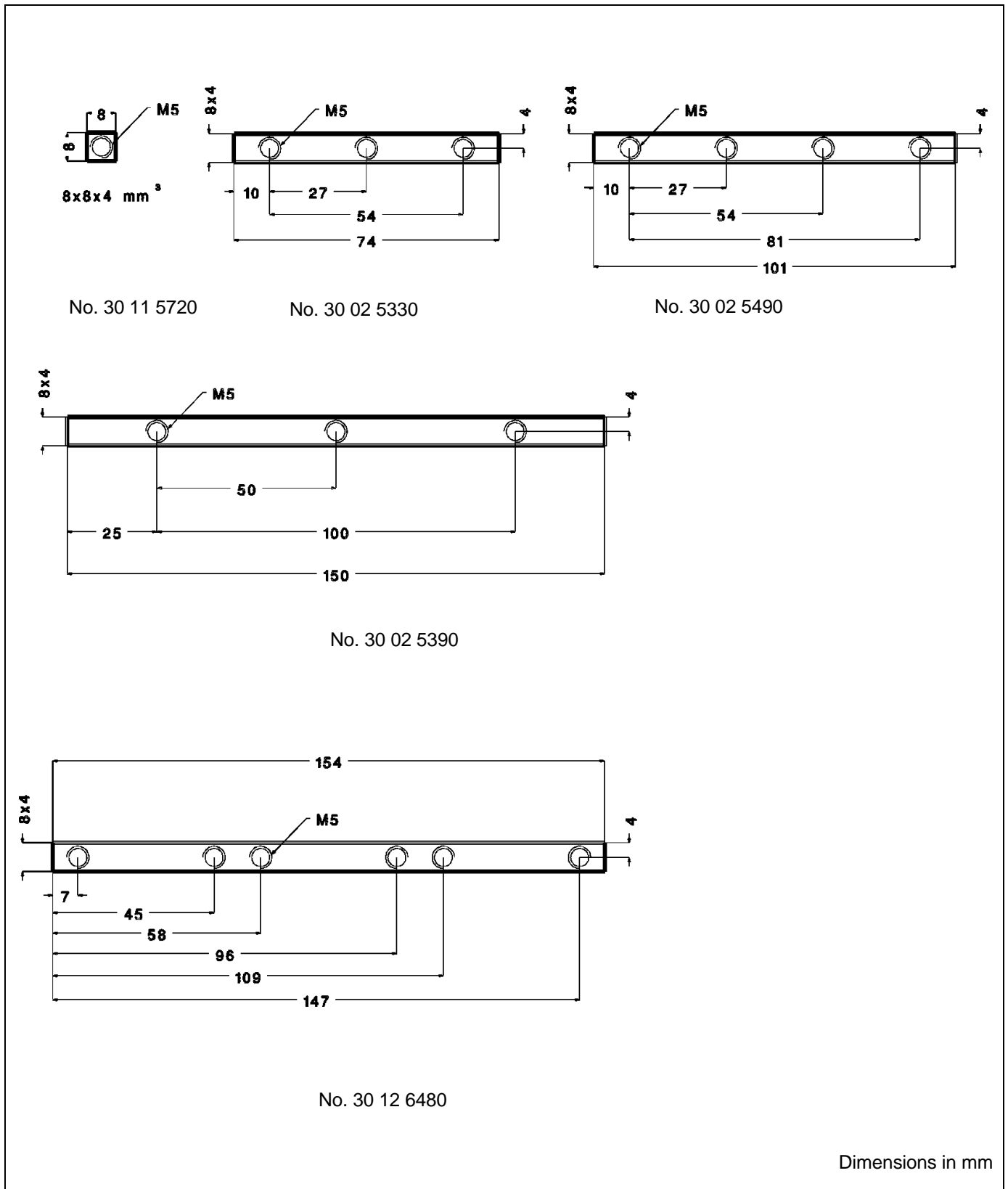
<sup>1)</sup>  $P_R = 0,5 W$

Table 1: Types and values for RC snubbers. Dimensions on page B 14 - 127

## 14.9 Assembly Hardware

Mounting bars 8 x 4 mm fitting into the slots of heatsink P3

Ident No.	30 11 5720	30 02 5330	30 02 5490	30 02 5390	30 12 6480
SEMIPACK	Semipack 1/2/3/4	3 Semipack 1	4 Semipack 1	3 Semipack 2	3 Semipack 3

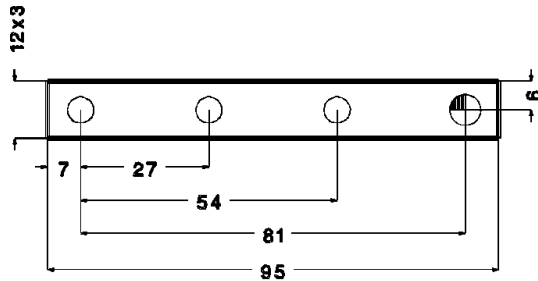


**Busbars (tinned copper)**

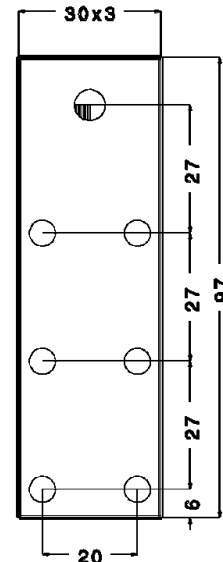
**SEMIPACK 1 (SKKD 26...100, SKKH 26...100, SKKT 19...106)**

Ident No.	Assembly
30 09 2551	W...
30 10 4550	B2...
30 10 4570	B6...-B2...F

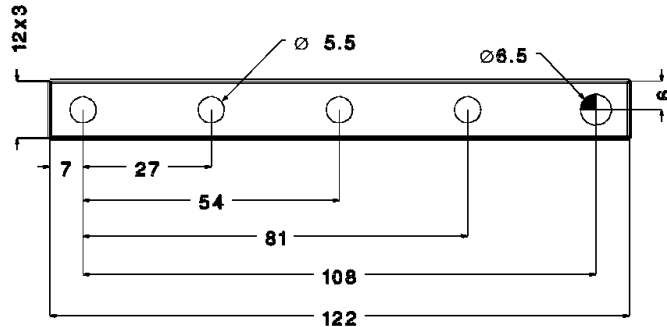
Ident No.	Assembly
30 10 4590	B6...F
30 09 2780	B6C2i
30 08 5640-50-60	For fuses on P3



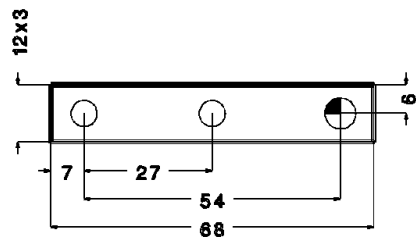
No. 30 10 4570



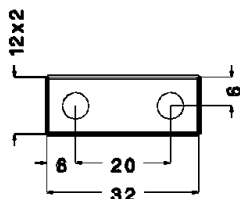
No. 30 09 2780



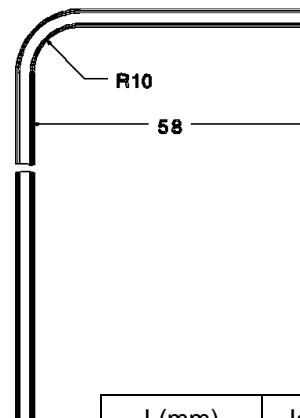
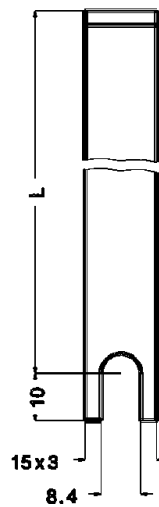
No. 30 10 4590



No. 30 10 4550



No. 30 09 2551



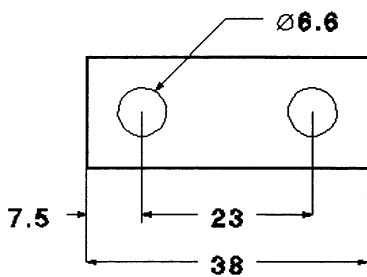
L(mm)	Ident No.
58	30 08 5640
95	30 08 5650
132	30 08 5660

Dimensions in mm

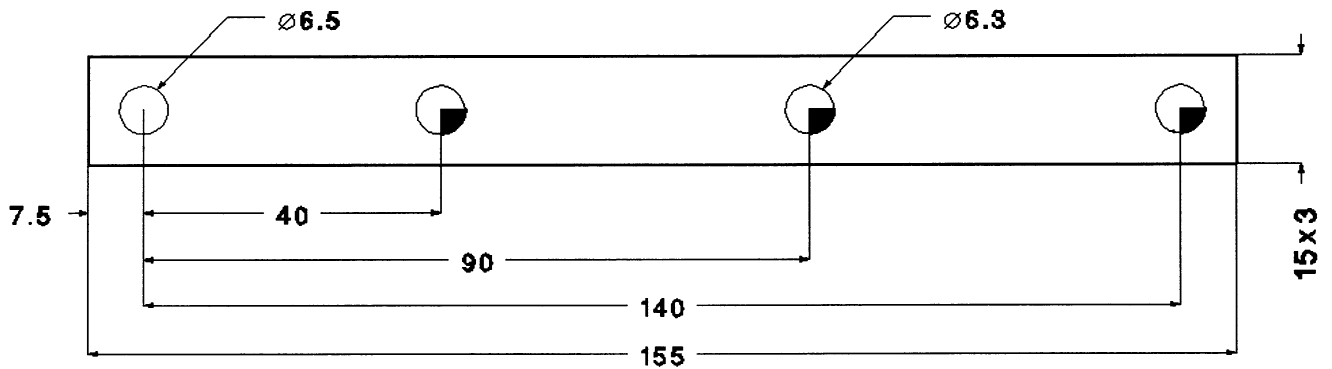
## Busbars (tinned copper)

### SEMIPACK 2 (SKKD 162, SKKH 132, 162, SKKT 132, 162)

Ident No.	Assembly
30 13 6140	W...
30 13 9060	B6...



No. 30 13 6140



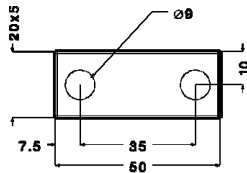
No. 30 13 9060

Dimensions in mm

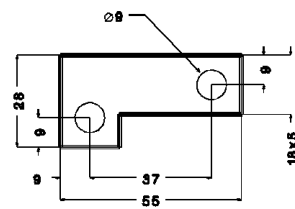
**Busbars (tinned copper)**

**SEMPACK 3 (SKKD 201, 260, SKKH 131...250, SKKT 131...253)**

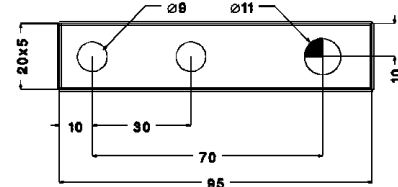
Ident No.	30 11 9710	30 11 9430	30 13 9040	30 11 9650	30 11 9720	30 12 6100	30 11 9700
Assembly	W...	B6...on P16	B6...on P3	B6 with 3 fuses	B6C2i on P16	B6C2i on P16	B6C2i on P16



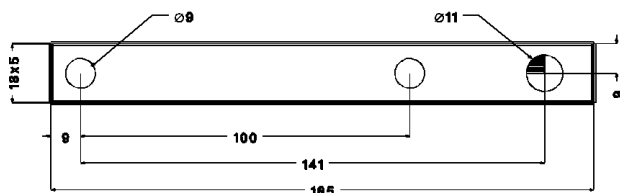
No. 30 11 9710



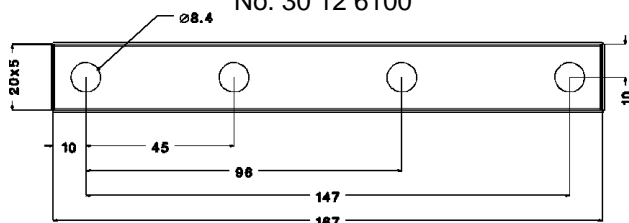
No. 30 11 9720



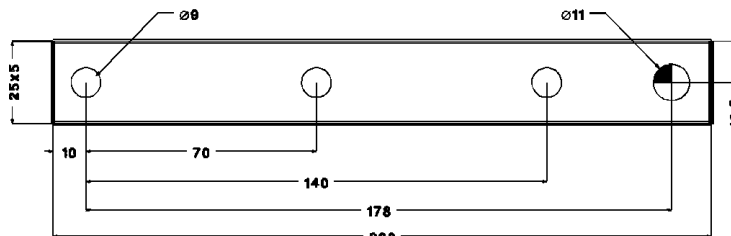
No. 30 11 9650



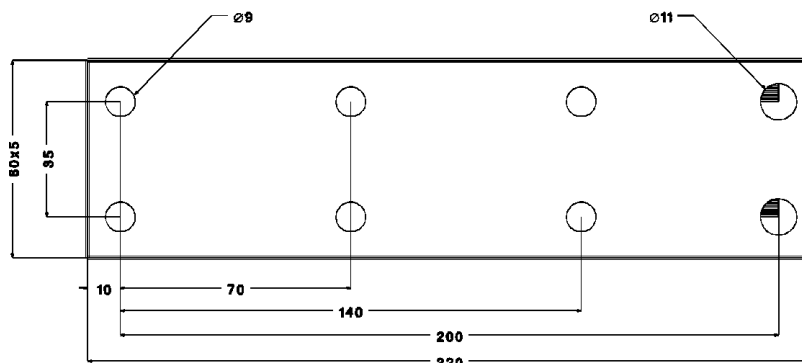
No. 30 12 6100



No. 30 13 9040



No. 30 11 9430



No. 30 11 9700

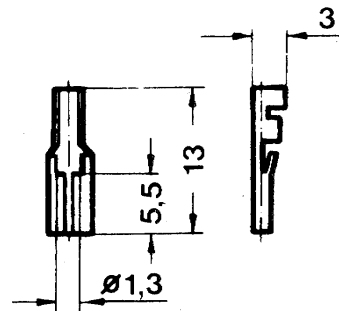
Dimensions in mm

## 14.9 Assembly Hardware (continued)

### Connectors For SEMIPACK<sup>®</sup> 0 and SKB 33

#### No. 3168 3400

Female plugs for the gate terminals  
round 1,3 mm dia for  
SKKT 15  
SKKH 15  
and SKB 33



Dimensions in mm

### For SEMIPACK<sup>®</sup> 1: Gate Double Plug with leads

Type	Sequence <sup>1)</sup> Folge	Leadcolour Litzenfarbe		Ident No.
<p>SKKT 20/... 106/..</p>	K G K G	blue yellow blue yellow	blau gelb blau gelb	<b>9916 1110</b>
<p>SKKH 27/... 106/..</p>	- - K G	- - blue yellow	- - blau gelb	<b>9916 1183</b>
<p>SKKT 20B... 106B..</p>	G K K G	yellow red red yellow	gelb rot rot gelb	<b>9916 1180</b>

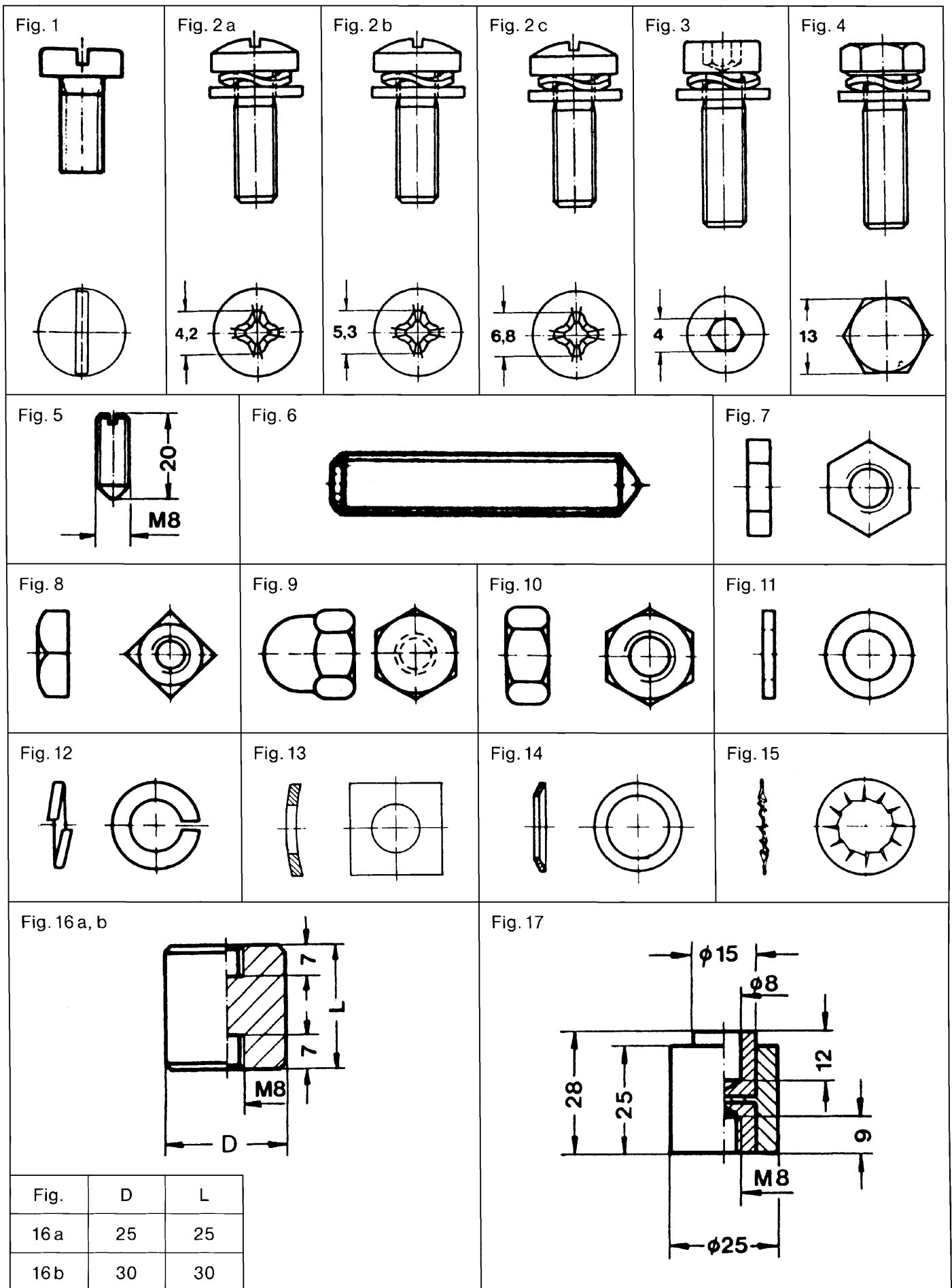
<sup>1)</sup> K = aux. cathode; G = Gate; lead length 280 mm acc. to UL 94V-0; Ident No. is for one pair except for SKKH

## 14.9 Assembly Hardware (continued)

### Recommended Screws, Nuts, etc.



Device	Dimensions mm	DIN Standard	Tensile strength x 10 N/mm <sup>2</sup>	Figure No.	SEMIKRON Ident No.
<b>Slotted screw, pan head</b>	M 3,5 x 5	DIN 85	- 5.8	1	<b>31927800</b>
<b>Pozidrive screw, pan head 1)</b>	M 4 x 8 Z 4-1	DIN 7985	- 4.8	2 a	<b>31947300</b>
	M 5 x 8 Z 4-1	DIN 7985	- 4.8	2 b	<b>32329900</b>
	M 5 x 10 Z 4-1	DIN 7985	- 4.8	2 b	<b>31947900</b>
	M 5 x 12 Z 4-1	DIN 7985	- 4.8	2 b	<b>32711300</b>
	M 5 x 16 Z 4-1	DIN 7985	- 4.8	2 b	<b>31948000</b>
	M 5 x 16 Z 4-1	DIN 7985	- 8.8	2 b	<b>32459400</b>
	M 5 x 18 Z 4-1	DIN 7985	- 4.8	2 b	<b>30039610</b>
	M 5 x 20 Z 4-1	DIN 7985	- 8.8	2 b	<b>32459500</b>
	M 5 x 25 Z 4-1	DIN 7985	- 4.8	2 b	<b>30058360</b>
	M 6 x 12 Z 4-1	DIN 7985	- 8.8	2 c	<b>32584700</b>
	M 6 x 12 Z 4-1	DIN 7985	- 4.8	2 c	<b>30058430</b>
	M 6 x 16 Z 4-1	DIN 7985	- 4.8	2 c	<b>31949100</b>
	M 6 x 20 Z 4-1	DIN 7985	- 8.8	2 c	<b>32596200</b>
	M 6 x 35 Z 4-1	DIN 7985	- 4.8	2 c	<b>30058480</b>
<b>Socket cap screw 1)</b>	M 5 x 18 Z 4-1	DIN 7984	- 8.8	3	<b>31823300</b>
	M 5 x 20 Z 4-1	DIN 7984	- 8.8	3	<b>30145490</b>
<b>Hexagonal head screw 1)</b>	M 8 x 16 Z 4-1	DIN 933	- 8.8	4	<b>31944400</b>
	M 8 x 25 Z 4-1	DIN 933	- 8.8	4	<b>30059250</b>
<b>Slotted grub screw</b>	M 8 x 20	DIN 553	- 5.8	5	<b>30122390</b>
<b>Spindle</b>	M 8 x 30	DIN 916	- 45 H	6	<b>30120430</b>
	M 8 x 40	DIN 916	- 45 H	6	<b>30119490</b>
	M 10 x 50	DIN 916	- 45 H	6	<b>30143660</b>
<b>Hexagonal nut</b>	M 5 "BM 5"	DIN 439	- 5	7	<b>31961400</b>
<b>Square nut</b>	M 5	DIN 557	- 5	8	<b>30115720</b>
<b>Dome nut</b>	M 5	DIN 1587		9	<b>31972400</b>
<b>Hexagonal nut</b>	M 8	DIN 934		10	<b>31967900</b>
	M 10	DIN 934		10	<b>30068610</b>
<b>Washer</b>	3,2	DIN 125 - NIRO4401		11	<b>32018100</b>
<b>Crinkle washer</b>	B 3	DIN 125 - NIRO4401		12	<b>32018200</b>
<b>Square clamp washer</b>	7 x 7 x 0,8			13	<b>31587600</b>
<b>Washer</b>	A 8,4	DIN 125 - A2F		11	<b>30050810</b>
<b>Belleville washer</b>	A 8,4	DIN 6796 - 8FSt		14	<b>30115060</b>
	A 10,5	DIN 6796 - 10 A2F		14	<b>30115820</b>
<b>Shock-proof washer</b>	A 8,2	DIN 6798 - A2F		15	<b>30051070</b>
<b>Isolator</b>	D 25 x 25 - 2 x M8			16 a	<b>30119480</b>
<b>(for SEMIPACK 3)</b>	D 25 x 25 - 1 x M8			17	<b>30139080</b>
	D 30 x 30 - 2 x M8			16 b	<b>30054170</b>

<sup>1)</sup> With captive crinkle washer and washer (= "Z4-1")





## Nuts and Washers for Mounting Threaded Stud Thyristors and Rectifier Diodes

		Stud	Ident No.		
			Hexagonal nut	Washer	Crinkle washer
	SKNa 2 SKN 2,5 SKNa 4 SKN 5	M 4	31967300	30050780	32003200
SKT 10	SKN/R 2F17 SKN/R 3F20	M 5	31538000	32307000	30051520
SKT 16 SKT 24	SKN/R 20 SKN/R 26 SKN/R 2F50	M 6	30050450	31986900	32003400
SKT 40 SKT 50	SKN/R 45 SKN/R 70 SKN/R 71	M 8	30068990	30050810	30051540
SKT 55 SKT 80 SKT 100	SKN/R 100 SKN/R 130 SKN/R 135F SKN/R 136F SKN/R 140F SKN/R 141F	M 12	31969700	30050830	32003800
SKT 130 SKT 160	SKN/R 240	M 16 x 1,5	31969800	31987400	32004000
SKT 250 SKT 300	SKN/R 320 SKN 400	M 24 x 1,5	31969900	31987500	32004100
SKT 10/ ... UNF	SKN/R 2F17..UNF SKN/R 3F20..UNF SKR 26..UNF	10-32 UNF 2A	32715000	32307000	30051520
SKT 16/ ... UNF SKT 24/ ... UNF SKT 40/ ... UNF SKT 50/ ... UNF	SKR 45..UNF SKN/R 2F50..UNF SKR 71 UNF	1/4-28 UNF 2A	31966800	30050810	30051540
SKT 55/ ... UNF SKT 80/ ... UNF SKT 100/ ... UNF	SKR 100..UNF	1/2-20 UNF 2A	31966900	30050830	32003800
SKT 250/ ... UNF SKT 300/ ... UNF	SKR 240..UNF	3/4-16 UNF 2A	31961900	31987900	31592100