

# Semiconductor (AC) fuses



## Protistor® Square-body Fuses PSC gR/aR sizes 000/00 gR/aR - 600 to 690 VAC DIN 00

gRB-URB from 16 to 450 A  
Size: 00



EXTREMELY HIGH BREAKING CAPACITY FUSES:  
PROTECTION OF POWER SEMICONDUCTORS  
AS PER IEC STANDARD 60269.1 AND 4

690 V VOLTAGE RATING

gR CLASS (gRB RATINGS 16 to 160 A) AS PER VDE 636-23  
- CLEARING ALL OVERLOADS  
- IMPROVING SAFETY AND PROTECTION  
- ENABLING SELECTIVE COORDINATION WITH ALL FUSES

aR CLASS (URB RATINGS 16 TO 450 A) ACCORDING TO  
VDE 636-23 AND IEC 60269-4

CONNECTIONS ACCORDING TO  
- DIN 43653/00 80 AND 110 mm BETWEEN AXES  
- DIN 43620/00 SOLID BLADES

WITH AN INDICATING PAWL ACTIVATING A MICROSWITCH IF NEEDED



### Main Characteristics

Voltage rating $U_N$ (V)	Class	Current rating $I_N$ (A)	Pre-arcing $I_t'$ @ 1 ms $I_{tp}$ (A,s)	Total clearing $I_t'$ total@ UN $I_{tt}$ (A,s)	Watts loss		Tested Breaking Capacity	Estimated Breaking Capacity
					0.8 IN	IN		
690	gRB	16	8	61	2.7	5	200 kA @ 690 V	300 kA @ 690 V
		20	12	86	3.3	6		
		25	18	140	4.4	8		
		32	39	250	6.0	11		
		40	68	450	7.1	13		
		50	116	750	8.8	16		
		63	210	1400	9.9	18		
		80	525	3000	10.5	19		
		100	970	5400	10.7	19.5		
	125	1710	9600	13.2	24			
	160	4270	22400	13.7	25			
	URB	16	7	52	3.8	7	200 kA @ 690 V	300 kA @ 690 V
		20	10	75	5.0	9		
		25	15	120	6.0	11		
		32	32	210	8.2	15		
		40	61	400	9.9	18		
		50	102	700	11.5	21		
		63	177	1200	12.6	23		
		80	390	2200	13.8	25		
100		692	3900	15.4	28			
125		1170	6600	18.1	33			
160	2680	14 000	19.8	36				
200	4690	24 000	23.1	42				
250	8300	42 500	27.5	50				
315	17 520	81 000	31.9	58				
350	25 450	118 000	33.0	60				
400	33 200	150 000	38.5	70				
600	URB	450 **	51 850	196 000	40.7	74	200 kA @ 600 V	300 kA @ 600 V

NOTE: voltage rating of 350-400-450 A rated fuses is defined with a CC' curve at 1 second limited by minimum breaking current.

■ Voltage rating: 690 V with CC' at 1s - 450 V with CC' at 10 s  
\*\* Voltage rating: 600 V with CC' at 1s - 450 V with CC' at 10 s

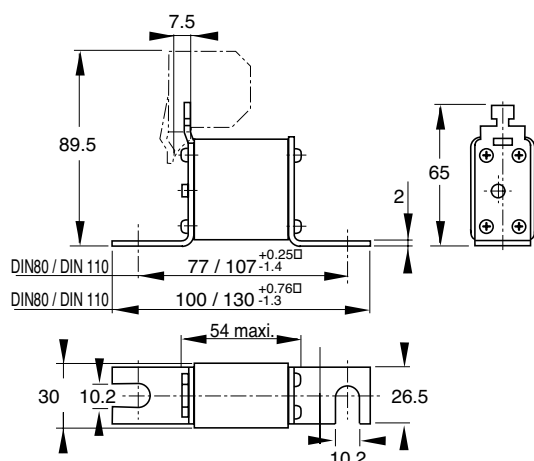
Minimum operating voltage for trip indicator = 20 V

## Protistor® Square-body Fuses PSC gR/aR sizes 000/00 gR/aR - 600 to 690 VAC DIN 00

### German standard as per DIN43653/00C - DIN 80 & 110

#### gRB - DIN 80

Current rating	Designation	Ref. Number	I <sub>N</sub> * fuse base	Catalog Number
16	6,9 gRB 00 D08L 016	S330273	1	DN00GB69V16L
20	6,9 gRB 00 D08L 020	S330227	1	DN00GB69V20L
25	6,9 gRB 00 D08L 025	T330228	1	DN00GB69V25L
32	6,9 gRB 00 D08L 032	V330229	1	DN00GB69V32L
40	6,9 gRB 00 D08L 040	W330230	1	DN00GB69V40L
50	6,9 gRB 00 D08L 050	X330231	1	DN00GB69V50L
63	6,9 gRB 00 D08L 063	Y330232	1	DN00GB69V63L
80	6,9 gRB 00 D08L 080	Z330233	1	DN00GB69V80L
100	6,9 gRB 00 D08L 100	A330234	1	DN00GB69V100L
125	6,9 gRB 00 D08L 125	B330235	0.9	DN00GB69V125L
160	6,9 gRB 00 D08L 160	C330236	0.9	DN00GB69V160L



Weight: 140 g(D08) - 190 g(D11)

Packaging: 3 pieces

Microswitches: MC 4L 2.5 B6 + PRES - Ref. Number: F210156

MC 4L 2.5 B2 + PRES - Ref. Number: G210157

Fuse-base: SI 00 DIN 80 - Ref. Number: Q098040

#### URB - DIN 80

Current rating	Designation	Ref. Number	I <sub>N</sub> * fuse base	Catalog Number
16	6,9 URB 00 D08L 016	V330275	1	DN00UB69V16L
20	6,9 URB 00 D08L 020	T330274	1	DN00UB69V20L
25	6,9 URB 00 D08L 025	M330268	1	DN00UB69V25L
32	6,9 URB 00 D08L 032	N330269	1	DN00UB69V32L
40	6,9 URB 00 D08L 040	P330270	1	DN00UB69V40L
50	6,9 URB 00 D08L 050	Q330271	1	DN00UB69V50L
63	6,9 URB 00 D08L 063	R330272	1	DN00UB69V63L
80	6,9 URB 00 D08L 080	D330237	1	DN00UB69V80L
100	6,9 URB 00 D08L 100	E330238	1	DN00UB69V100L
125	6,9 URB 00 D08L 125	F330239	0.9	DN00UB69V125L
160	6,9 URB 00 D08L 160	G330240	0.85	DN00UB69V160L
200	6,9 URB 00 D08L 200	H330241	0.85	DN00UB69V200L
250	6,9 URB 00 D08L 250	J330242	0.80	DN00UB69V250L
315	6,9 URB 00 D08L 315	K330243	0.75	DN00UB69V315L
350	6,9 URB 00 D08L 350	L330244	0.75	DN00UB69V350L
400	6,9 URB 00 D08L 400	M330245	0.70	DN00UB69V400L
450	6 URB 00 D08L 450	N330246	0.65	DN00UB60V450L

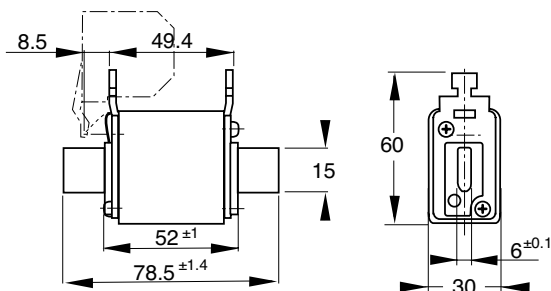
#### gRB - DIN 110

16	6,9 gRB 00 D11L 016	W330276	1	DN00GB69V16D1L
20	6,9 gRB 00 D11L 020	P330247	1	DN00GB69V20D1L
25	6,9 gRB 00 D11L 025	Q330248	1	DN00GB69V25D1L
32	6,9 gRB 00 D11L 032	R330249	1	DN00GB69V32D1L
40	6,9 gRB 00 D11L 040	S330250	1	DN00GB69V40D1L
50	6,9 gRB 00 D11L 050	T330251	1	DN00GB69V50D1L
63	6,9 gRB 00 D11L 063	V330252	1	DN00GB69V63D1L
80	6,9 gRB 00 D11L 080	W330253	1	DN00GB69V80D1L
100	6,9 gRB 00 D11L 100	X330254	1	DN00GB69V100D1L
125	6,9 gRB 00 D11L 125	Y330255	0.9	DN00GB69V125D1L
160	6,9 gRB 00 D11L 160	Z330256	0.9	DN00GB69V160D1L

#### URB - DIN 110

80	6,9 URB 00 D11L 80	A330257	1	DN00UB69V80D1L
100	6,9 URB 00 D11L 100	B330258	1	DN00UB69V100D1L
125	6,9 URB 00 D11L 125	C330259	0.9	DN00UB69V125D1L
160	6,9 URB 00 D11L 160	D330260	0.85	DN00UB69V160D1L
200	6,9 URB 00 D11L 200	E330261	0.85	DN00UB69V200D1L
250	6,9 URB 00 D11L 250	F330262	0.80	DN00UB69V250D1L
315	6,9 URB 00 D11L 315	G330263	0.75	DN00UB69V315D1L
350	6,9 URB 00 D11L 350	H330264	0.75	DN00UB69V350D1L
400	6,9 URB 00 D11L 400	J330265	0.70	DN00UB69V400D1L
450	6 URB 00 D11L 450	K330266	0.65	DN00UB60V450D1L

### German standard as per DIN43620/00



Weight: 210 g

Packaging: 3 pieces

Microswitches: MC 4L 2.5 B2 + PRES - Ref Number: G210157 or

MC 4L 2.5 B6 + PRES - Ref Number: F210156

Fuse-base: 00EP - Ref. Number : F215170

Current rating	Designation	Ref. Number	I <sub>N</sub> * fuse base	Catalog Number
16	6,9 gRB 00 PV/016	L330267	1	PC00GB69V16PV
20	6,9 gRB 00 PV/020	W330207	1	PC00GB69V20PV
25	6,9 gRB 00 PV/025	X330208	1	PC00GB69V25PV
32	6,9 gRB 00 PV/032	Y330209	1	PC00GB69V32PV
40	6,9 gRB 00 PV/040	Z330210	1	PC00GB69V40PV
50	6,9 gRB 00 PV/050	A330211	1	PC00GB69V50PV
63	6,9 gRB 00 PV/063	B330212	0.90	PC00GB69V63PV
80	6,9 gRB 00 PV/080	C330213	0.90	PC00GB69V80PV
100	6,9 gRB 00 PV/100	D330214	0.90	PC00GB69V100PV
125	6,9 gRB 00 PV/125	E330215	0.85	PC00GB69V125PV
160	6,9 gRB 00 PV/160	F330216	0.85	PC00GB69V160PV

For curves see pages

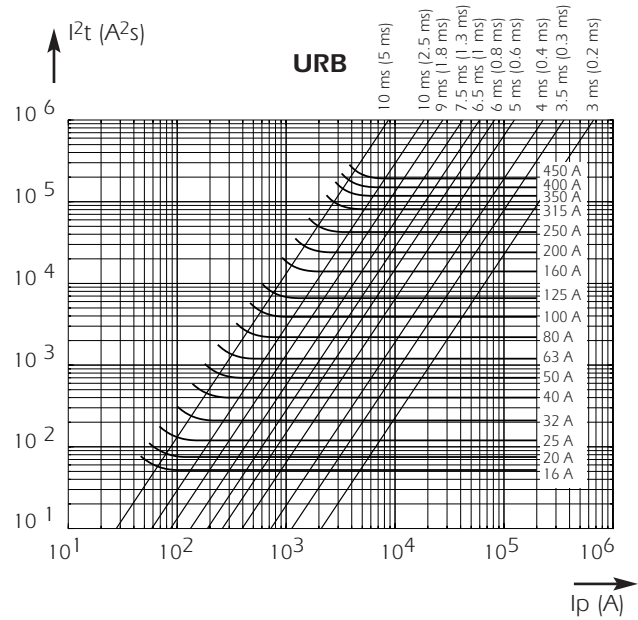
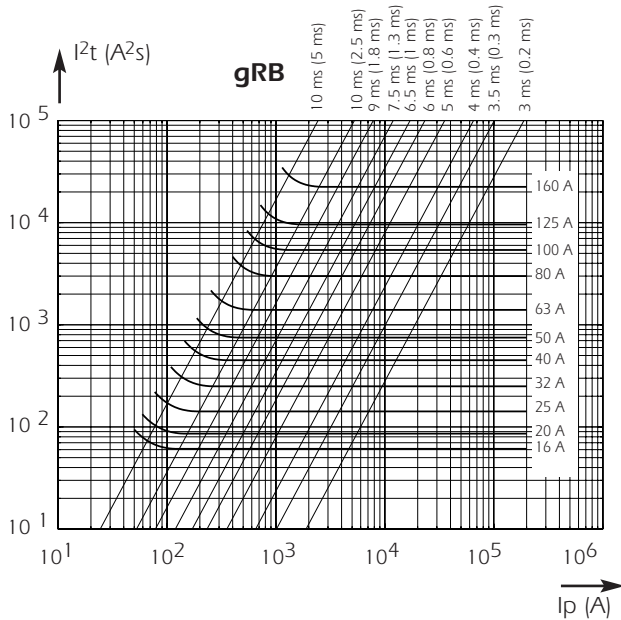
I<sub>N</sub> : Ratio RMS steady current / current rating for fuses in base.

# Semiconductor (AC) fuses



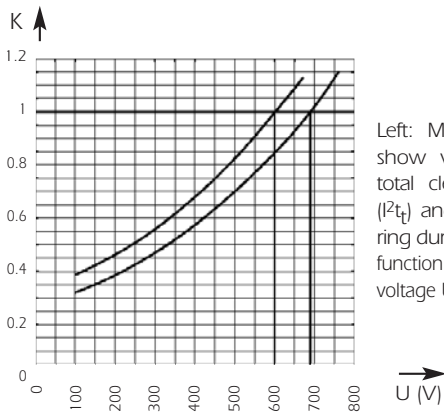
## Protistor® Square-body Fuses PSC gR/aR sizes 000/00 gR/aR - 600 to 690 VAC DIN 00

### Total clearing $I^2t$



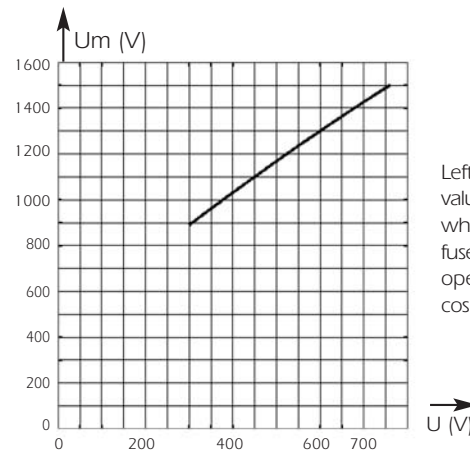
Above: horizontal curves show, for each rated current, maximum values of total clearing  $I^2t$  ( $I^2t_t$ ) as a function of prospective current  $I_p$ . @ UN with  $\cos\varphi = 0.15$ .  
Oblique lines indicate total clearing duration  $T_t$ , with associated pre-arcing duration shown in brackets.

### $I^2t$ corrective factor



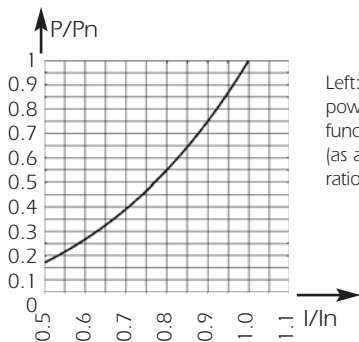
Left: Mean curves show variation of total clearing time ( $I^2t_t$ ) and total clearing duration  $T_t$  as a function of operating voltage U.

### Peak arc voltage



Left: Curve shows peak value  $U_m$  of the arc voltage which appears across fuse-link as a function of operating voltage U @  $\cos\varphi = 0.15$

### Watts loss

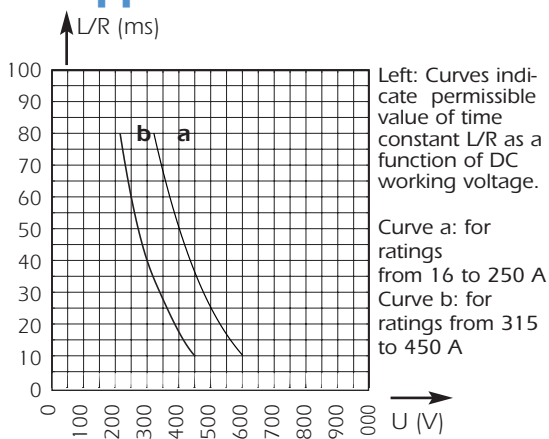


Left: Curve enables computation of power losses P for a  $I_N$ -rated fuse as a function of R.M.S. current I (as a multiple of  $I_N$  for steady state operation)

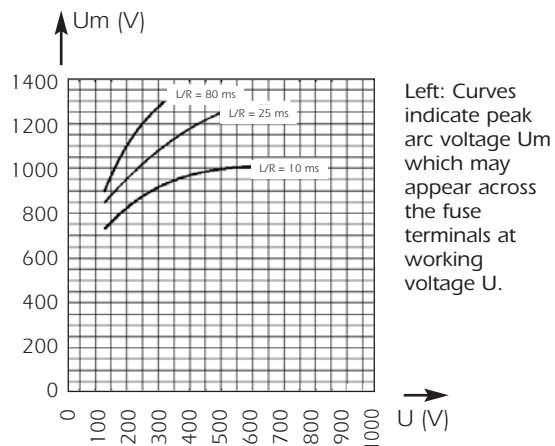
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## Protistor® Square-body Fuses PSC gR/aR sizes 000/00 gR/aR - 600 to 690 VAC DIN 00

### DC Application data

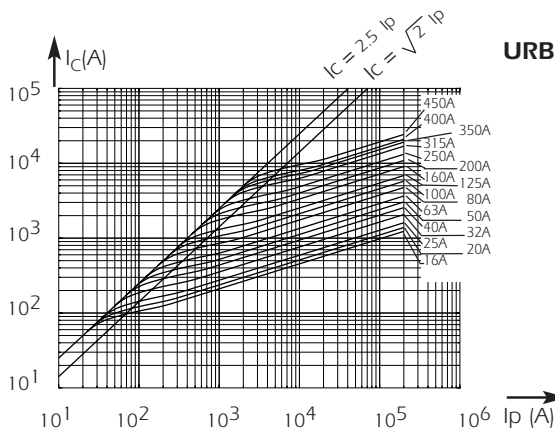
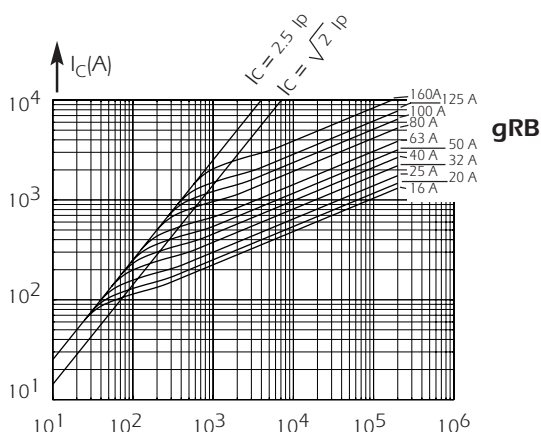


Rated current	Curve	I <sub>pm</sub> (A) gRB	I <sub>pm</sub> (A) URB
16	a	32	32
20	a	40	40
25	a	50	50
32	a	64	64
40	a	80	80
50	a	100	100
63	a	126	126
80	a	160	170
100	a	200	220
125	a	250	280
160	a	320	390
200	a	510	510
250	a	650	650
315	b	840	840
350	b	1770	1770
400	b	2040	2040
450	b	2250	2250



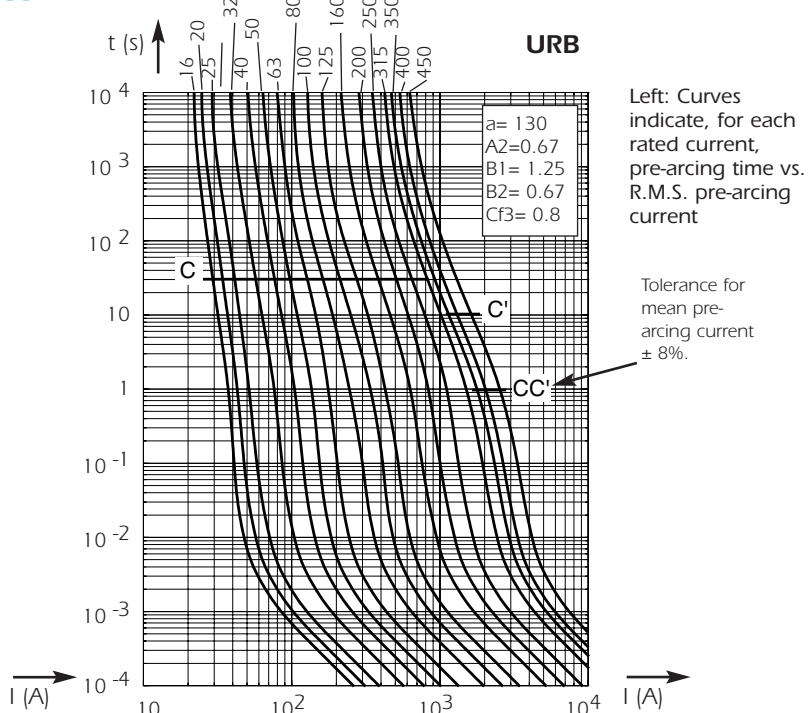
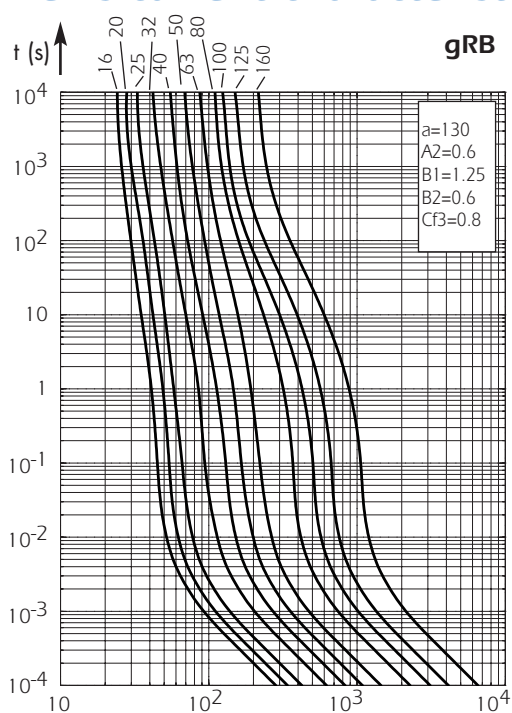
### Current limitation curves

I<sub>pm</sub> values give minimum DC interrupting current in amps.



Above: Curves show, for each rating, value of peak let-through current  $I_c$  as a function of available fault current  $I_p$ .

### Time vs current characteristics



# Semiconductor (AC) fuses



## Protistor® Square-body Fuses

### PSC gR/aR sizes 000/00

### Microswitches for PSC sizes 000/00 and NH Fuses

MICROSWITCH SYSTEMS ADAPTED TO THE FOLLOWING FUSES:

- PSC sizes 000/00 (brackets) DIN43653
- NH Fuses (plain blades) see details in "General Purpose IEC Fuses" section
- NH plain blades 690 VAC Protistor square-body Fuses

MS 4L 2-5



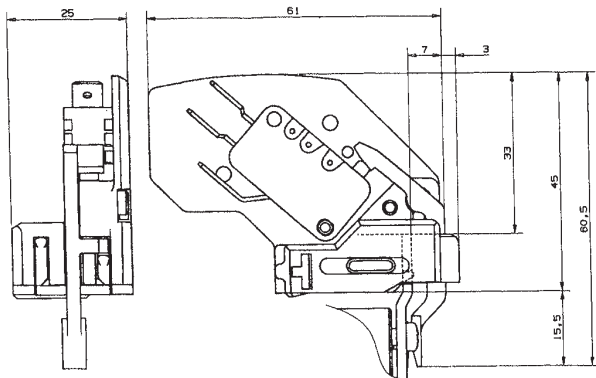
## Main Characteristics

Code	AC Insulation voltage rating (***)	Positive operating voltage/current	Current rating	Current	Interrupting rating						AC voltage withstand test (*)	Impulse voltage test Uimp1.2/50 µs (**)	Fire class according to UL 94
					Non inductive circuit			Inductive circuit : L/R = 25ms					
					30V	110V	250V	30V	110V	250V			
MS 4L 2-5 B2 + Pres	1000 V	20 V 100 mA	5 A	50 Hz DC	4A -	4A -	5A -	- -	5A 2 A	5 A 0,4 A	12 kV 8 kV	16 kV 13 kV	V0
MS 4L 2-5 B6 + Pres	1000 V	20 V 50 mA	10 A	50/60 Hz DC	10 A 8 A	10 A 0,4 A	10 A 0,2 A	10 A 4 A	10 A 0,2 A	10 A 0,1 A	8 kV	10 kV	V0

\* Between power circuit and microswitch terminals as per IEC 60 and 694 and NFC 64010 (50/60 Hz 1 min duration in dry air)

\*\* Between power circuit and microswitch terminals Uimp: impulse voltage as per IEC 60947-1

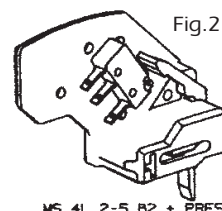
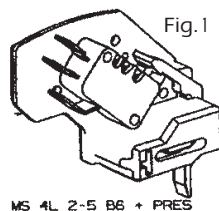
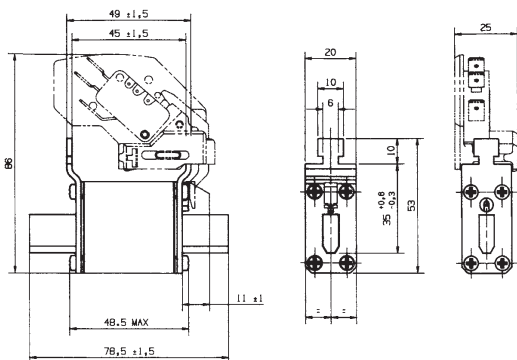
\*\*\* Between power circuit and microswitch terminals



Designation	Ref. Number	Weight (g)	Pack.	Catalog Number
MS 4L 2-5 B6 + PRES (Fig. 1) (1)	F210156	30	3	MS 4L2-5B6PRES
MS 4L 2-5 B2 + PRES (Fig. 2) (2)	G210157	26	3	MS 4L2-5B2PRES

Automatically resettable, these microswitch systems indicate fuse presence (PRES) and proper mounting.

In case of improper mounting or fuse melting, this is indicated (terminal 1-4 closed)



- (1) 6.3 mm clips
- (2) 2.8 mm clips