Motor protective circuit breaker MSP

Technical data		according to IEC 60947-1; IEC 60947-2; IEC 60947-4-1	
Type		MSP0	MSP1
General data			
Number of poles		3	3
Max. rated current I_n			
• motor protection	A	25	52
Permissible ambient temperature			
• at full rated current	°C	-20 ... +55	
• in storage	°C	-50 ... +80	
Rated operational voltage U_e	V	690	
Rated frequency	Hz	50/60	
Rated insulation voltage U_i	V	750	
Rated impulse withstand voltage U_{imp}	kV	6	
Utilization category			
• to IEC 60947-2 (motor starter protectors)		A	
• to IEC 60947-4-1 (motor starters)		AC-3	
Mechanical endurance			
• up to 25 A	Operating cyles	100000	100000
• 25 A upwards		--	30000
Number of operating cycles/h (on load)	1/h	25	25
Degree of protection with open terminals/with conductors connected		IP00/IP20	
Temperatures compensation to IEC 60947-4-1		✓	
Phase failure sensitivity to IEC 60947-4-1		✓	

Auxiliary contacts				
Utilization category			AC-15	
Rated operational voltage U_e	AC V	230	400	500
Rated operational current I_e	A	3	1.5	1
Utilization category			DC-13	
Rated operational voltage U_e DC L/R200 ms	DC V	24	60	220
Rated operational current I_e	A	2.3	0.7	0.3

Type		MSP0	MSP1
Cross-section for main conductors			
Solid or stranded	mm^2	2 x (1 ... 6)	1 x 1.5 ... 2 x 16 or 1 x 25 + 1 x 10
Finely stranded with end sleeve	mm^2	2 x (1 ... 4)	1 x 1.5 ... 2 x 10 or 1 x 16 + 1 x 10
Cross-sections for auxiliary and control connecting leads			
Solid or stranded	mm^2	1 x 0.5 ... 2 x 2.5	--
Finely stranded with end sleeve	mm^2	1 x 0.5 ... 2 x 1.5	--

Rated short-circuit breaking capacity

The table shows the rated ultimate short-circuit breaking capacity I_{cu} and the rated service short-circuit breaking capacity I_{cs} for the MSP motor starter protectors with respect to rated current I_n and reated operational voltage U_e.

Infeed is permitted at top or bottom without reduction of rated data. In the short-circuit proof areas, I_{cu} is at least 100 kA. A backup fuse is therefore not necessary.

In the other areas, when the short-circuit current at the installation point exceeds the rated short-circuit breaking capacity given in the table for the motor starter protectors, the motor starter protector must be protected by a backup fuse. See the following table for the maximum reated current for the backup
fuse. With a backup fuse according to the table, the maximum short-circuit current is permitted to equal the rated breaking capacity of the backup fuse.

Motor Starter Protectors	Rated current In	Up to AC 240 V			Up to AC 415 V			Up to AC 440 V			Up to AC 500 V			Up to AC 690 V		
		I_{cu}	I_{cs}	Max. Backup fuse (gL/gG)	I_{cu}	I_{cs}	Max. Backup fuse (gL/gG)	I_{cu}	I_{cs}	Max. Backup fuse (gL/gG)	I_{cu}	I_{cs}	Max. Backup fuse (gL/gG)	I_{cu}	I_{cs}	Max. Backup fuse (gL/gG)
Type	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A
MSP0	≤ 1 A	Short-circuit proof up to 100 kA, backup														
	1.6 A	fuse is not necessary												2	2	20
	2.4 A										10 (50)	10 (50)	35	2	2	35
	3.2 & 4 A							10 (50)	10 (50)	50	3 (50)	3 (50)	50	2	2	50
	5 & 6 A							5 (50)	5 (50)	63	3 (50)	3 (50)	63	2	2	63
	8 & 10 A				10 (50)	10 (50)	80	5 (50)	5 (50)	80	3 (5)	3 (5)	80	2	2	80
	13 & 16 A				6 (50)	6 (50)	80	5 (30)	5 (30)	80	3 (5)	3 (5)	80	2	2	80
	20 & 25 A	10 (50)	10 (50)	100	6 (50)	6 (50)	80	5 (30)	5 (30)	80	3 (5)	3 (5)	80	2	2	80
MSP1	≤ 2.4 A	Short-circuit proof up to 100 kA, backup														
	4 A	fuse is not necessary												4	4	80
	6 A											50		4	4	100
	10 A								50		10	5	160	4	4	125
	16 A							25	13	200	10	5	160	4	4	125
	25 A					50		25	13	200	10	5	200	4	4	160
	32 & 52 A				35	17	200	25	13	200	10	5	200	4	4	160

Relation between short-circuit breaking capacity I, related power factor and minimum short-circuit making capacity to IEC 60947-2.		
Short-circuit breaking capacity	Power factor cos φ	Short-circuit making capacity
A		
I ≤ 3000	0.9	1.42 x I
3000 < I ≤ 4500	0.8	1.47 x I
4500 < I ≤ 6000	0.7	1.5 x I
6000 < I ≤ 10000	0.5	1.7 x I
10000 < I ≤ 20000	0.3	2.0 x I
20000 < I ≤ 50000	0.25	2.1 x I
50000 < I	0.2	2.2 x I

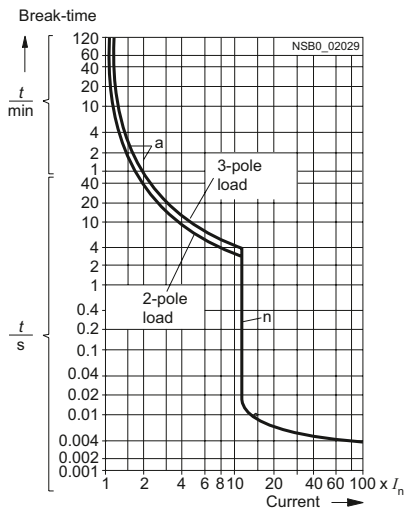
Curves

Characteristic curves

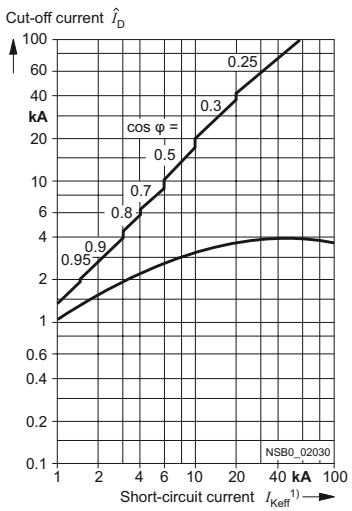
The characteristic curves are obtained in the cold state and 3-pole loading.
At operating temperature, the tripping time of the thermal releases drops by about 25 %. With 3-pole loading, the deviation in tripping time for 3 times the current and upwards is ±20 %.

Characteristic curves for MSP0

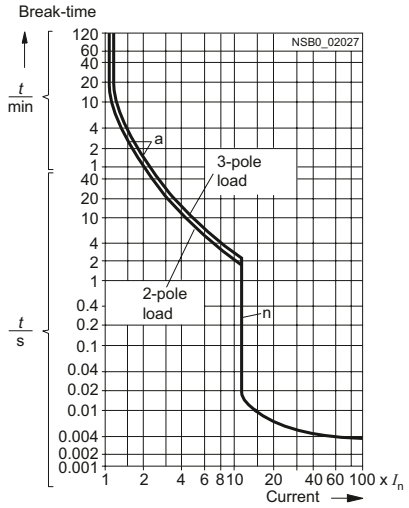
The characteristic curves shown here apply for a MSP0-6 motor starter protector with a rated current of 6 A, a current setting range of 4 to 6 A and a tripping current for the instantaneous overcurrent release of 72 A, at a rated voltage of AC 50 Hz, 400 V.



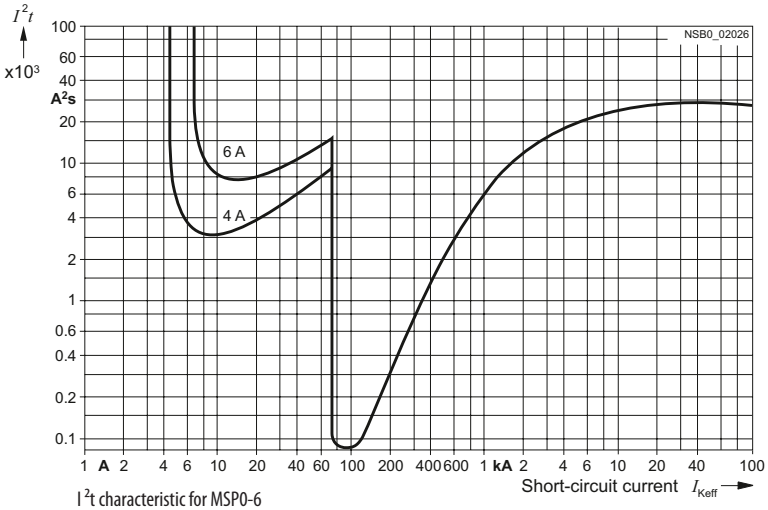
Schematic representation of the time/current characteristic for MSP0



Current limiting characteristic for MSP0-6



Schematic representation of the time/current characteristic for MSP1

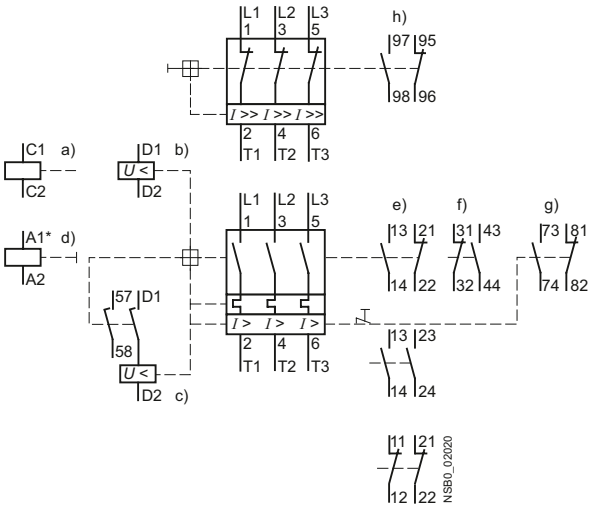


I^2t characteristic for MSP0-6

Characteristic curves for MSP1

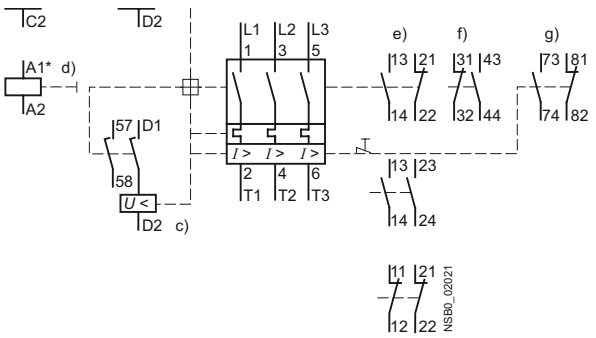
The characteristic curves shown here apply for a motor starter protector with a rated current of 25 A and a tripping current for the instantaneous overcurrent release of 300 A, at a rated voltage of AC 50 Hz, 400 V.

Circuit diagrams



*) The distance to earthed part.

MSP0 motor starter protector and MSP-AS limiter

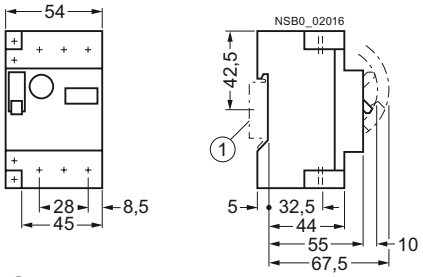


*) The distance to earthed part.

MSP1 motor starter protector

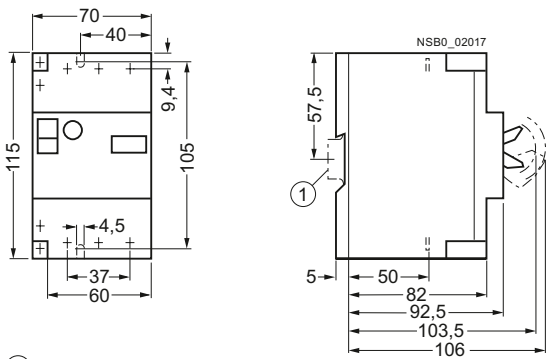
Dimensions

MSP0



1 TH 35 standard mounting rail acc. to IEC 60715

MSP1



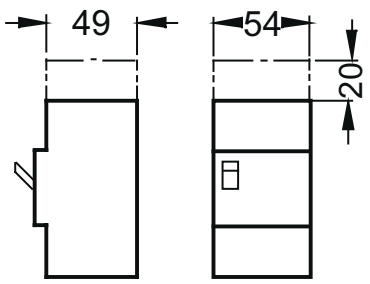
1 TH 35 standard mounting rail acc. to IEC 60715

Space required above arc chutes

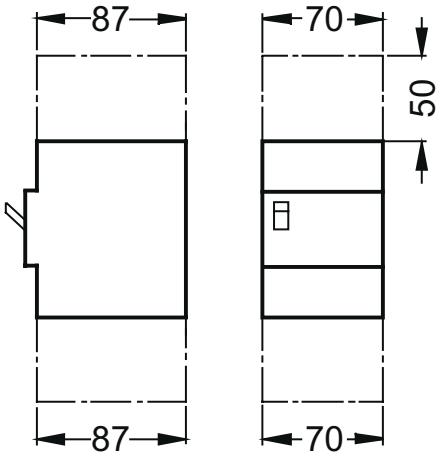
Minimum clearance with rated voltage to adjacent parts as well as non-insulated live parts.

The spacing of minimum 1 cm with MSP0 and minimum 2 cm with MSP1 between large-surface covers and arc openings should be observed.

MSP0



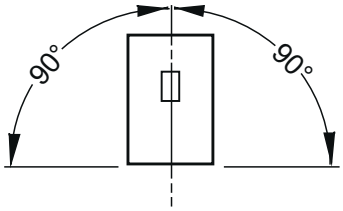
MSP1



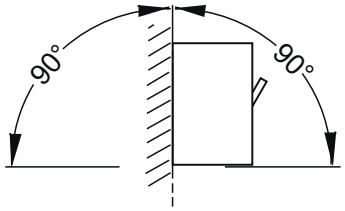
Uninsulated conductors must be insulated within the space required above arc chutes.

Permissible mounting position

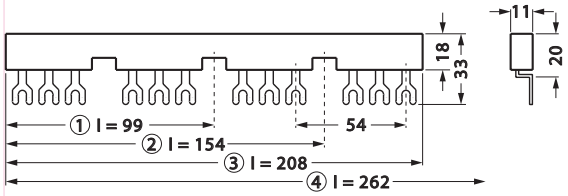
MSP0, MSP1 motor starter protectors permissible mounting position due to the position of the operating parts



Front view

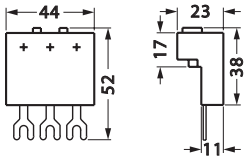


Lateral view

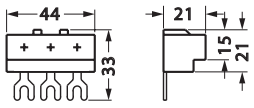


3VU9 135-1AB02, 3VU9 135-1AB03, 3VU9 135-1AB04, 3VU9 135-1AB05 three-phase busbar

① For 2 devices: 3VU9 135-1AB02
② For 3 devices: 3VU9 135-1AB03
③ For 4 devices: 3VU9 135-1AB04
④ For 5 devices: 3VU9 135-1AB05



3VU9 135-1SB30 three-phase feed-in terminal, type I



3VU9 135-1SB01 three-phase feed-in terminal, type II