



Catalogue 2006



Motor protection switches

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Motor protection switches

Motor protection switches

- Optimum protection for motors from 0.1 to 25 A through high switch-off capacity and high current limitation
- Magnetic short-circuit and thermal overload protection (temperature compensated)
- Integrateable auxiliary switches, undervoltage trips and operating current trips
- For use as main switch in the insulating casing; (isolating function) emergency-off device can be added
- Phase failure sensitivity according to VDE 0660-102 / IEC 947-4-1
- Intrinsically safe up to 6 kA at 400 V AC

Technical data: According to DIN VDE 0660 IEC 947 EN 60947

Rated operating voltage

Frequency range:

Service life: > 100,000 switching cycles

Max. ambient temperature – open –25...+55 °C

– encapsulated –25...+40 °C

	I _e (A)	max. Motornennleistung [kW]			Typ	Art.-Nr.
		230V	400V	690V		
Motor protection switch with thermal overload and magnetic short-circuit trip Width 2.5 TE	0,1...0,16A	–	–	0,06	NM1-0.16	2513100000
	0,16...0,25A	–	0,06	0,12	NM1-0.25	2513100100
	0,25...0,4A	0,06	0,09	0,18	NM1-0.4	2513100200
	0,4...0,63A	0,09	0,12	0,25	NM1-0.63	2513100300
	0,63...1,0A	0,12	0,25	0,55	NM1-1	2513100400
	1,0...1,6A	0,25	0,55	1,10	NM1-1.6	2513100500
	1,6...2,5A	0,37	0,75	1,50	NM1-2.5	2513100600
	2,5...4,0A	0,75	1,50	3,00	NM1-4	2513100700
	4,0...6,3A	1,10	2,20	4,00	NM1-6.3	2513100800
	6,3...10,0A	2,20	4,00	7,50	NM1-10	2513100900
	10,0...16,0A	4,00	7,50	12,50	NM1-16	2513101000
	16,0...20,0A	5,50	9,00	15,00	NM1-20	2513101100
	20,0...25,0A	5,50	12,50	22,00	NM1-25	2513101200

Motor protection switch

with magnetic short-circuit trip I_e = 25 A

(e.g. for ohmic users or with separate thermal control))

Width 2.5 TE (casing as above)

Transformer protection and safety control switch available on request

NM1-SK **2513102100**



Motor protection switches



Accessories

Current limiter for increasing the switching capacity of not intrinsically safe MSS to 50 kA / 400 V
 Rated continuous current 32 A
 Also for use as group back-up protection: 4 x 10 or 2 x 16 A

NM1-SB **2513102000**

One additional component can be installed per switch

Operating current trip 24V AC	NM1-A 24V	2513104000
Operating current trip 110V AC	NM1-A 110V	2513104100
Operating current trip 230V AC	NM1-A 230V	2513104200
Operating current trip 400V AC	NM1-A 400V	2513104300
Undervoltage trip 24V AC	NM1-U 24V	2513104400
Undervoltage trip 110V AC	NM1-U 110V	2513104500
Undervoltage trip 230V AC	NM1-U 230V	2513104600
Undervoltage trip 400V AC	NM1-U 400V	2513104700
Auxiliary switch can be added 1 NOC + 1 NCC	NM1-EHS 11	2513103600
Fault current indicator switch can be installed 1 NOC*	NM1-ESS 10	2513103700
Fault current indicator switch can be installed 1 NCC*	NM1-ESS 01	2513103800

(*General tripped indicator)

An auxiliary switch each can be installed on the left and right per switch::
 Width 0.5 TE

Auxiliary switch 1 NOC	NM1-HS 10	2513103000
Auxiliary switch 1 NCC	NM1-HS 01	2513103100
Auxiliary switch 1 NOC + 1NCC	NM1-HS 11	2513103200
Auxiliary switch 2 NOC	NM1-HS 20	2513103300
Auxiliary switch 2 NCC	NM1-HS 02	2513103400
Auxiliary switch NOC advancing	NM1-HV 11	2513103500

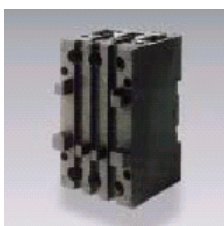
For one protection switch and two laterally attached auxiliary switches with PE(N) terminal

Casing IP 41	NM1-G	2513105000
Casing IP 55	NM1-G1	2513105100
Front plate IP 41	NM1-FP	2513105200
Front plate IP 55	NM1-FP1	2513105300
Padlock feature; max. 3 locks, shackle thickness 6 – 8 mm	NM1-VS	2513106300
Retrofit kit IP 55 for -G and -FP	NM1-NS	2513106400
N-terminal for retrofitting with 5-conductor connection	NM1-N	2513106500
Indicator light 220...240V weiß	NM1-SL1	2513106600
with glow lamp 380...440V weiß	NM1-SL2	2513106700
220...240V grün	NM1-SL3	2513106800
380...440V grün	NM1-SL4	2513106900
220...240V rot	NM1-SL5	2513107000
380...440V rot	NM1-SL6	2513107100

EMERGENCY-OFF mushroom push button	NM1-PT	2513106000
EMERGENCY-OFF mushroom switch, engaging	NM1-PV	2513106100
EMERGENCY-OFF mushroom switch, engaging, lockable	NM1-PS	2513106200

Casing Series CM.7100 with CEE 16A/6H socket

Casing	CM.7100	210200
Casing with neutral line	CM.7100 / N	210201
Casing with phase changer and neutral line	CM.7100 / PH/N	210202
Casing with emergency off push button	CM.7100 / T	210203
Casing with emergency off push button engaging	CM.7100 / TR	210204
Casing with emergency off push button engaging, lockable	CM.7100 / TS	210205
Casing padlockable	CM.7100 / V	210206



Current limiter



Operating current trip



Auxiliary switch



Casing



EMERGENCY-OFF

Motor protection switches



Technical data

General technical data

Regulations / specifications	DIN VDE 0660, IEC 947, EN 60947
Mechanical service life =	
Electrical service life	0.1 x 10 ⁶ switching cycles
Max. switching frequency	30 switching cycles / h
Ambient temperature	
Open	-25...+55 °C
Encapsulated	-25...+40 °C
Installation position	Any
	With encapsulation IP 41: vertical
Connection cross-section	
Solid core	0.75...4 mm ²
Flexible with core end sleeve	0.75...2.5 mm ²
	With 2 conductors, max. 2 cross-sections diff.

Main current paths

Design impulse voltage resistance U_{imp}	6000 V
Overvoltage protection category/ dirt category	III / 3
Design operating voltage U_e	690 V
Design insulation	750 V
Design operating current I_e	Depending on set range 0.16...25 A
Frequency	40...60 Hz
Current heat loss (3 current paths)	6.0 W
Motor switching capacity (DIN VDE 0660 part 102, IEC 947-4-1)	AC-3 max. 690 V
Disconnecting function according to	IEC 947-3

Trip

Adjustable overload trip: total range	0.1...25 A
Short circuit tripping value	~ 12 x I_u (I_u = upper set value)
Phase failure sensitivity	DIN / VDE 0660 part 102, IEC947-4-1
Temperature compensation working range	-25...+ 55 °C
Undervoltage trip – dissipation (pull on 85% U_e , drop out 70...35% U_e), (100% ED AC)	1.8 W
Working current trip – dissipation (pull on 70% U_e) (100% ED AC)	1.8 W

Auxiliary switch

Design impulse voltage resistance U_{imp}	4000 V
Design operating voltage U_e	500 V
Overvoltage category/ dirt category	III / 3
Design operating current I_e for AC-15 230 V / 400 V	3.5 / 2 A
Minimum contact load according to DIN 19240	24 V DC, 10 mA
Connection cross-section (max. 2 conductors)	
Solid core	0.75...2.5 mm ²
Flexible with core end sleeve	0.75...1.5 mm ²

Design limit short-circuit switch-off capacity I_{cu} (DIN VDE 0660 part 101, IEC 947-2)

Motorprotection switch NM 1

Upper set value thermal trip	I_{cu} [kA]				with current limiter NM1-SB		Back-Up-protection (when the short-circuit current exceeds the switching capacity of the NM1)				
	230 V	400 V	500 V	690 V	230 V	400 V	Set values	Back-up fuse (gL, aM) [A]			
								230 V	400 V	500 V	690 V
0.16 – 1.6 A	No additional protective installations necessary, intrinsically safe for any short-circuit currents				No additional protective installations necessary, intrinsically safe for any short-circuit currents		0.16 A 0.25 A 0.4 A	No back-up fuse required with any short-circuit currents			
2.5 – 6.3 A			3	2.5			0.63 A 1 A				
10 A		6	3	2.5		50	1.6 A 2.5 A				
16 – 25 A	10	6	2.5	2	100	50	4 A 6.3 A 10 A 16 A 20 A 25 A		25 35 50 80	20 25 35 50	
								80	80	63 50	35 50

Switching times: with short-circuit exposure:

Minimum command duration	2 ms
Opening delay	2 ms
Total switch-off time	7 ms

Motor protection switches

Auxiliary switch contact equipment

Auxiliary switch for lateral attachment

2NOC	-		NM1-HS20
1NOC	1NCC		NM1-HS11
1NOC			NM1-HS10
-	2NCC		NM1-HS02
-	1NCC		NM1-HS01

Advancing auxiliary switches

For lateral attachment

1NOC	1NCC		NOC advancing to main contacts NM1-HV11
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Installation auxiliary switch

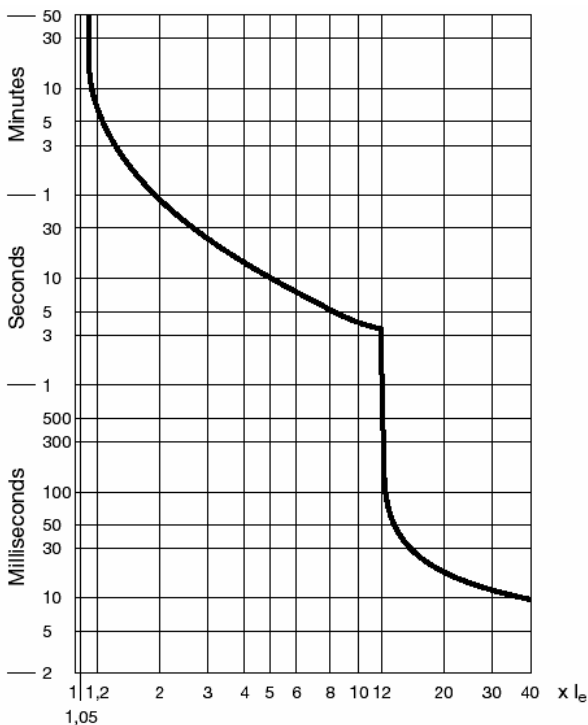
for installation under the cap

1NOC	1NCC		With screwless connection lines NM1-EHS 11
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Installation fault current indicator switch for installations under the cap (general trip indicator)

1NOC	-		With screwless connection lines NM1-ESS 10
-	1NCC		NM1-ESS 01

Motor protection switch NM1



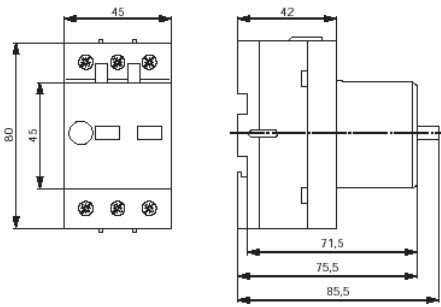
Trip characteristics

The trip characteristics show the trip time of the switches as a function of the operating current. These are mean values of the scattering bands at 20 °C ambient temperature from cold condition. Specific characteristics can be requested for any setting range if required.

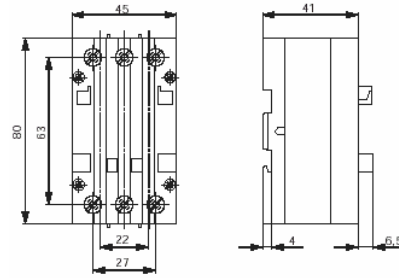
Motor protection switches



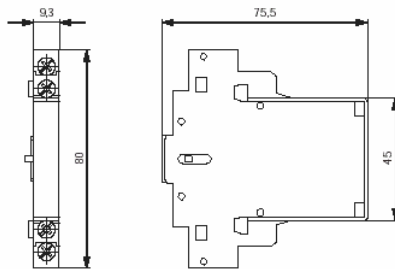
Technical data, dimensions



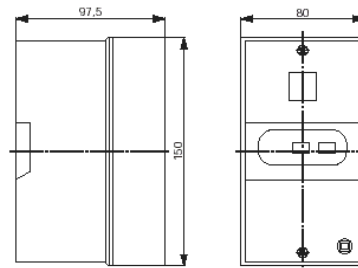
NM1



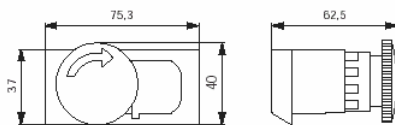
NM1-SB



NM1-HS



NM1-G

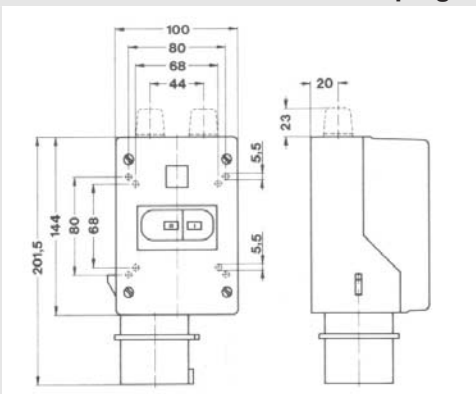


NM1-PV

Nicht mit
Gehäuseserie
CM.7100
kompatibel

MERZ Casing series CM.7100

Plastic enclosure with IEC 309-plug 16A, 3P+N+PE, 400V 6h



CM 7100

Base without
mounting holes,
pre marked
holes for 68 X
68 mm or 80 x
80 mm motor of
wall fixing
present.

Types

Art. No.	Typ
210200	CM.7100
210201	CM.7100/N
210202	CM.7100/PH/N
210203	CM.7100/T
210204	CM.7100/TR
210205	CM.7100/TS
210206	CM.7100/V

Type key

/N	= Neutral line
/PH	= Phase changer
/T	= EMER-OFF mushroom push button
/TR	= EMERGENCY-OFF mushr. switch, engaging
/TS	= EMERGENCY-OFF mushr. switch, engaging, lockable
/V	= padlockable



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