



Motor-Protective Circuit-Breakers, 2,5-4A, 2p

Part no. **Z-MS-4,0/2**
 Catalog No. **248396**
 Alternate Catalog No. **Z-MS-4.0/2**

Similar to illustration

Design verification as per IEC/EN 61439

Technical data for design verification			
Rated operational current for specified heat dissipation	I _n	A	4
Heat dissipation per pole, current-dependent	P _{vid}	W	1.95
Equipment heat dissipation, current-dependent	P _{vid}	W	3.9
Operating ambient temperature min.		°C	-5
Operating ambient temperature max.		°C	50

Technical data ETIM 7.0

Low-voltage industrial components (EG000017) / Motor protection circuit-breaker (EC000074)			
Electric engineering, automation, process control engineering / Low-voltage switch technology / Circuit breaker (LV < 1 kV) / Motor protection circuit-breaker (ecl@ss10.0.1-27-37-04-01 [AGZ529016])			
Overload release current setting	A		2.5 - 4
Adjustment range undelayed short-circuit release	A		40 - 52
With thermal protection			Yes
Phase failure sensitive			No
Switch off technique			Magnetic
Rated operating voltage	V		400 - 400
Rated permanent current I _u	A		4
Rated operation power at AC-3, 230 V	kW		0
Rated operation power at AC-3, 400 V	kW		1.5
Type of electrical connection of main circuit			Screw connection
Type of control element			Rocker lever
Device construction			Complete device in housing
With integrated auxiliary switch			No
With integrated under voltage release			No
Number of poles			2
Rated short-circuit breaking capacity I _{cu} at 400 V, AC	kA		10
Degree of protection (IP)			IP20
Height	mm		75
Width	mm		36
Depth	mm		80

Specifications | Adjustable MCB Z-MS

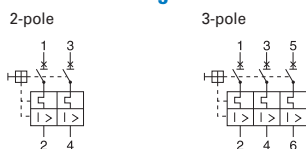
Description

- Reliable protection in case of thermal overload and short circuit
- Suitable for installation in compact distribution boxes
- Contact position indicator red - green
- Main field of application: switching and protection of three-phase AC motors with power ratings up to 15 kW (380/400 V) and other consumers up to 40 A
- Also suitable as main switch, isolating characteristics according to IEC/EN 60947
- All manual motor starters with thermal overload tripping and magnetic short-circuit tripping
- Terminals and accessories compatible with CLS6, Z-A40, PFIM etc.

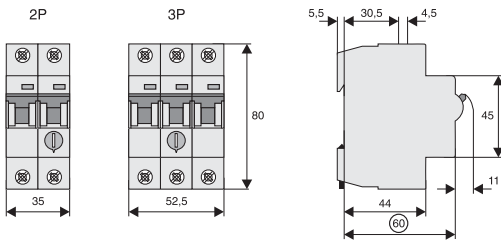
Technical Data

		Z-MS
General		
Terminal capacity		1 - 25 mm ²
Busbar thickness		0.8-2 mm
Endurance mechanical components		20,000 switching operations
Shock resistance (shock duration 20 ms)		20 g
Ambient temperature		
open		-25 ... + 50 °C
hermetically enclosed		-25 ... + 40 °C
Resistance to climatic conditions		
humidity and heat, constant, according to		IEC 68-2-3
humidity and heat, periodical, according to		IEC 68-2-30
Weight approx.		
2-pole		244 g
3-pole		366 g
Degree of protection		IP20
Main Current Paths		
Rated insulation voltage	U_i	440 V
Rated impulse withstand voltage	U_{imp}	4 kV
Rated short circuit breaking capacity	I_q	10 kA
Thermal current $I_{th\ max} = I_{e\ max}$		40 A
Electrical endurance AC3 and I_e		6,000 switching operations
Motor switching capacity AC3		400 (415) V
Power loss per contact		
1.6-10 A		2.3 W
16 A		3.3 W
25-40 A		4.5 W
Operating frequency		50/60 Hz
Auxiliary switch Z-AHK/Z-NHK		
Rated insulation voltage	U_i	440 V
Thermal current	I_{th}	8 A
Rated operational current	I_e	
250 V		6 A
with AC 13, 440 V		2 A
Max. back-up fuse for short-circuit protection		4 A (gL, gG) CLS6-4/B-HS
Terminal capacity (1 or 2 conductors)		0.75 ... 2.5 mm ²
Moisture-Proof Enclosure 4 MU IP54, Z-MFG		
Reliable power loss of incorporated devices		17W (e.g. Z-MS-40/3+Z-USA/230)

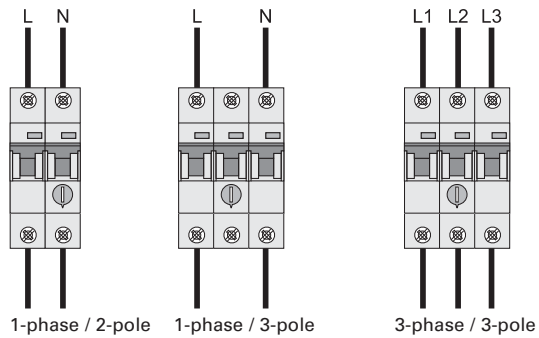
Connection diagram



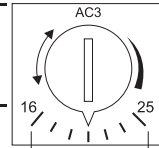
Dimensions (mm)



Connection



U_e = 400 V~
I_e = 10 - 16 A
I_q = 10000 A
Z-MS - 25 /3



Magnetic release responding current (typ.)
referring to setting range end value 16x 10x I_e

Selection of Switches for the Protection of Motors

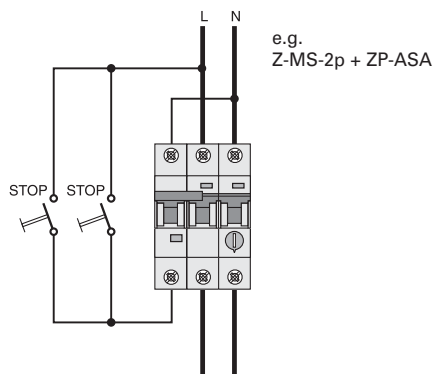
Motor power and current						Setting ranges of overload release
1-phase 230 - 240 V		3-phase 230 - 240 V		3-phase 400 - 415 V		
kW	A	kW	A	kW	A	A
		0.06	0.4	0.06	0.2	0.16 - 0.25
		0.09	0.5	0.09	0.3	0.25 - 0.4
				0.12	0.4	0.4 - 0.63
				0.18	0.6	0.4 - 0.63
0.06	0.7	0.12	0.7	0.25	0.8	0.63 - 1
0.09	0.7					0.63 - 1
0.12	1.3	0.18	1.0	0.37	1.1	1 - 1.6
		0.25	1.4	0.55	1.5	1 - 1.6
0.18	1.9	0.37	2.0	0.75	1.9	1.6 - 2.5
0.25	2.4					1.6 - 2.5
0.37	2.9	0.55	2.7	1.1	2.6	2.5 - 4
		0.8	3.2	1.5	3.6	2.5 - 4
0.55	4.2	1.1	4.6	2.2	5.0	4 - 6.3
0.75	5.6					4 - 6.3
1.1	7.4	1.5	6.3	2.5-3.0	6.6	6.3 - 10
1.5	8.9	2.5	8.7			6.3 - 10
				4.0	8.5	6.3 - 10
2.2	14.5	3.0	11.5	5.5	11.3	10 - 16
				7.5	13.2	10 - 16
3	17.8	4.0	14.8			16 - 20
		5.5	19.6	11.0	21.7	16 - 20
		7.5	26.4	15.0	29.3	25 - 40
		11.0	38.0	18.5	36.0	25 - 40

Overview of Types, Maximum Back-up Fuse and Short Circuit Behaviour

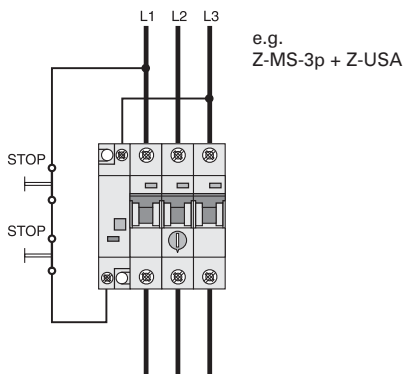
Type	Setting Range (A)	max. Back-up Fuse gL, gG ¹⁾		Typical responding currents of short-circuit releases (A)
		(A) 3 x 230 V	(A) 3 x 400 V	
Z-MS-0.16	0.10 - 0.16			1.3 - 1.7
Z-MS-0.25	0.16 - 0.25			2.0 - 2.6
Z-MS-0.40	0.25 - 0.40			3.1 - 4.8
Z-MS-0.63	0.40 - 0.63			4.9 - 6.6
Z-MS-1.00	0.63 - 1.00			10 - 13
Z-MS-1.60	1.0 - 1.6			16 - 21
Z-MS-2.50	1.6 - 2.5			25 - 33
Z-MS-4.00	2.5 - 4.0			40 - 52
Z-MS-6.30	4.0 - 6.3	100	100	63 - 82
Z-MS-10.0	6.3 - 10.0	100	100	78 - 105
Z-MS-16.0	10.0 - 16.0	100	100	160 - 208
Z-MS-25.0	16.0 - 25.0	100	100	250 - 325
Z-MS-40.0	25.0 - 40.0	100	100	400 - 520

¹⁾ In case of short circuit currents up to the rated breaking capacity, no back-up fuse is required (inherent current withstand capability)

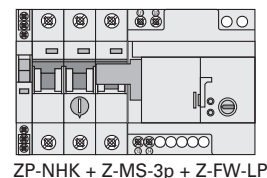
Connection of Shunt Trip Release



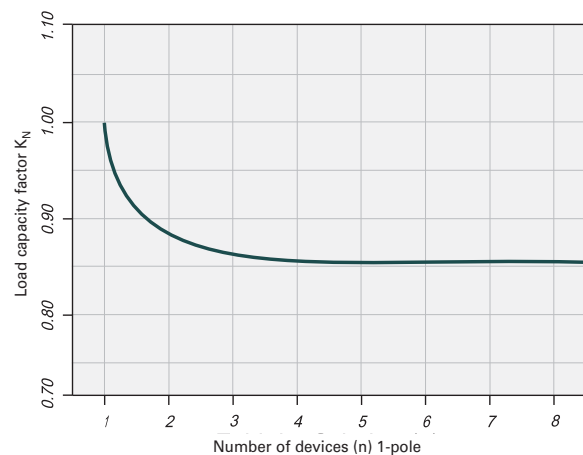
Connection of Undervoltage Release



Block Diagram with Remote Switching Device

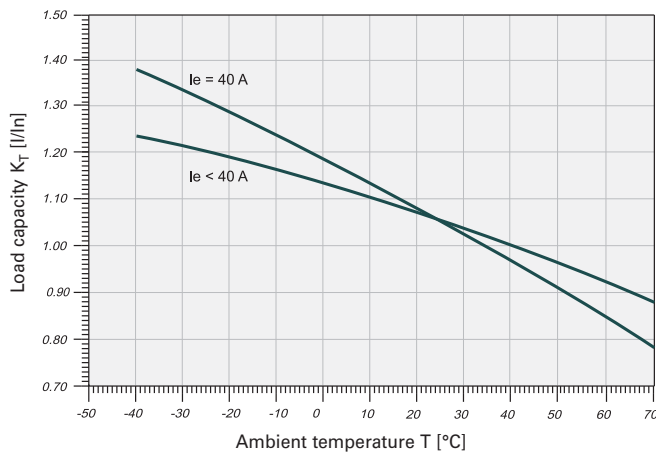


Load Capacity in Case of Block Installation



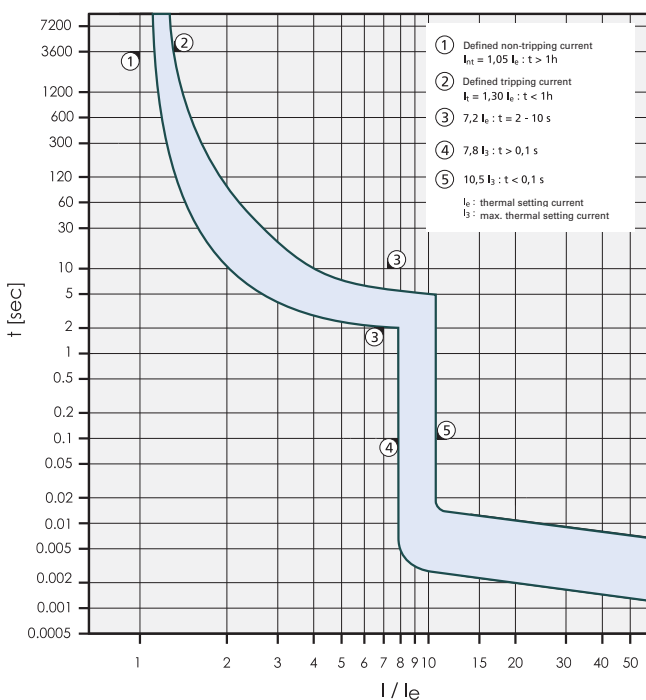
Permitted permanent load at ambient temperature T [°C] with n devices:
 $I_{DL}(T, n) = I_n K_T(T) K_n(n)$

Effect of the Ambient Temperature to the Load Capacity



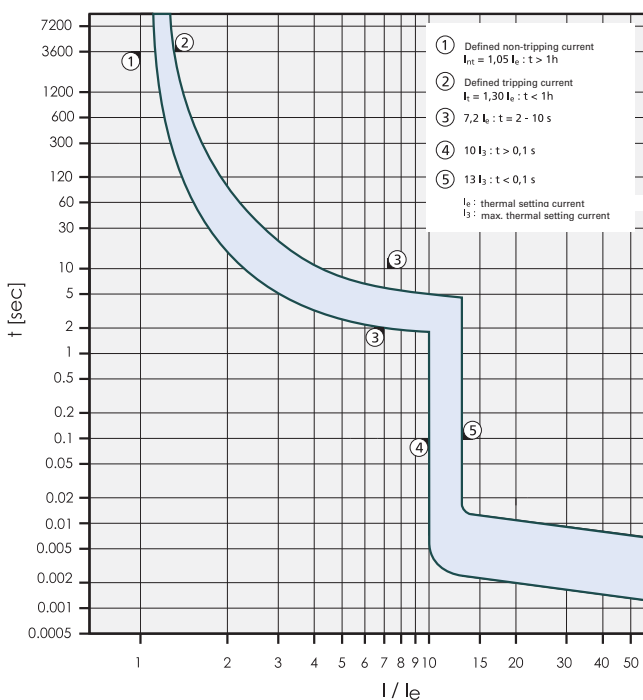
Valid for Z-MS devices, 3-pole, reference ambient temperature 20°C,
 permitted permanent load at ambient temperature T [°C] with n devices:
 $I_L(T) = I_n K_T(T)$

Typical Tripping Characteristic MS 0.16/0.25/0.4/0.63/10A



Tripping current as a multiple of the maximum setting current, at an ambient temperature of 20 °C, from cold state

Typical Tripping Characteristic MS 1/1.6/2.5/4/6.3/16/25/40A



Tripping current as a multiple of the maximum setting current, at an ambient temperature of 20 °C, from cold state