SG02013

Description

- High-quality residual current device / miniature circuit breaker combination, line voltage-independent
- Contact position indicator red - green
- Fault current tripping indicator white - blue
- Guide for secure terminal connection
- 3-position DIN rail clip, permits removal from existing busbar system
- Comprehensive range of accessories suitable for subsequent installation
- Wide variety of rated tripping currents
- Rated currents up to 32 A
- Tripping characteristics B, C, D
- Rated breaking capacitiy 10 kA

$I_n/I_{\Delta n}$ (A)	Type Designation	Article No.	Units per package

Type A

10 kA, 3-poles

Conditionally surge current-proof 250 A, sensitive to residual pulsating DC, Type A

SG02013

Characteristic B

10/0.03	FRBmM-B10/3/003-A	170733	1/30
13/0.03	FRBmM-B13/3/003-A	170734	1/30
16/0.03	FRBmM-B16/3/003-A	170735	1/30
20/0.03	FRBmM-B20/3/003-A	170736	1/30
10/0.1	FRBmM-B10/3/01-A	170780	1/30
13/0.1	FRBmM-B13/3/01-A	170781	1/30
16/0.1	FRBmM-B16/3/01-A	170782	1/30
20/0.1	FRBmM-B20/3/01-A	170783	1/30

SG02013

Characteristic C

6/0.03	FRBmM-C6/3/003-A	170737	1/30
10/0.03	FRBmM-C10/3/003-A	170738	1/30
13/0.03	FRBmM-C13/3/003-A	170739	1/30
16/0.03	FRBmM-C16/3/003-A	170740	1/30
20/0.03	FRBmM-C20/3/003-A	170741	1/30
25/0.03	FRBmM-C25/3/003-A	170772	1/30
32/0.03	FRBmM-C32/3/003-A	170773	1/30
6/0.1	FRBmM-C6/3/01-A	170742	1/30
10/0.1	FRBmM-C10/3/01-A	170743	1/30
13/0.1	FRBmM-C13/3/01-A	170744	1/30
16/0.1	FRBmM-C16/3/01-A	170745	1/30
20/0.1	FRBmM-C20/3/01-A	170746	1/30
25/0.1	FRBmM-C25/3/01-A	170747	1/30
32/0.1	FRBmM-C32/3/01-A	170748	1/30

SG02013

Characteristic D

6/0.03	FRBmM-D6/3/003-A	170774	1/30
10/0.03	FRBmM-D10/3/003-A	170775	1/30
13/0.03	FRBmM-D13/3/003-A	170776	1/30
16/0.03	FRBmM-D16/3/003-A	170777	1/30
20/0.03	FRBmM-D20/3/003-A	170778	1/30
25/0.03	FRBmM-D25/3/003-A	170779	1/30
6/0.1	FRBmM-D6/3/01-A	170749	1/30
10/0.1	FRBmM-D10/3/01-A	170750	1/30
13/0.1	FRBmM-D13/3/01-A	170751	1/30
16/0.1	FRBmM-D16/3/01-A	170752	1/30
20/0.1	FRBmM-D20/3/01-A	170753	1/30
25/0.1	FRBmM-D25/3/01-A	170754	1/30

Specifications | Combined RCD/MCB Devices FRBmM, 3-poles

Description

- Combined RCD/MCB device
- Line voltage-independent tripping
- Compatible with standard busbar
- Twin-purpose terminal (lift/open-mouthed) above and below
- Busbar positioning optionally above or below
- Free terminal space despite installed busbar
- Guide for secure terminal connection
- Contact position indicator red - green
- Fault current tripping indicator white - blue
- Comprehensive range of accessories suitable for subsequent installation
- The test key “T” must be pressed every 6 months. The system operator must be informed of this obligation and his responsibility in a way that can be proven. Under special conditions (e.g. damply and/or dusty environments, environments with polluting and/or corroding conditions, environments with large temperature fluctuations, installations with a risk of overvoltages due to switching of equipment and/or atmospheric discharges, portable equipment ...), it’s recommended to test in monthly intervals.
- Pressing the test key “T” serves the only purpose of function testing the residual current device (RCD). This test does not make earthing resistance measurement (R_E), or proper checking of the earth conductor condition redundant, which must be performed separately.
- **Type -A**: Protects against special forms of residual pulsating DC which have have not been smoothed.
- **Type -G**: High reliability against unwanted tripping. Compulsory for any circuit where personal injury or damage to property may occur in case of unwanted tripping (ÖVE/ÖNORM E 8001-1 § 12.1.6).

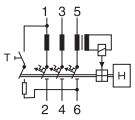
Accessories:		
Auxiliary switch for subsequent installation	ZP-IHK	286052
	ZP-WHK	286053
Tripping signal switch for subsequent installation	ZP-NHK	248437
Shunt trip release	ZP-ASA/..	248438, 248439
Terminal cover 4-poles	Z-TC/SD-4P	178101

Technical Data

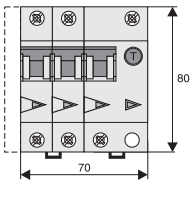
		FRBmM, 3-poles
Electrical		
Design according to		IEC/EN 61009
Current test marks as printed onto the device		
Tripping line voltage-independent		instantaneous 250A (8/20µs), surge current-proof
Type G		10 ms delay, surge current-proof
Rated voltage	U_n	240/415V AC, 50Hz
Rated tripping current	$I_{\Delta n}$	30, 100 mA
Rated non-tripping current	$I_{\Delta no}$	0.5 $I_{\Delta n}$
Sensitivity		AC and pulsating DC
Selectivity class		3
Rated short circuit capacity	I_{cn}	10 kA
Rated current		6 - 32 A
Rated impulse withstand voltage	U_{imp}	4 kV (1.2/50µs)
Characteristic		B, C, D
Maximum back-up fuse (short circuit protection)		100 A gL (>10 kA)
Endurance		
electrical components		≥ 4,000 operating cycles
mechanical components		≥ 10,000 operating cycles
Mechanical		
Frame size		45 mm
Device height		80 mm
Device width		70 mm (4MU)
Mounting		3-position DIN rail clip, permits removal from existing busbar system
Degree of protection switch		IP20
Degree of protection, built-in		IP40
Upper and lower terminals		open mouthed/lift terminals
Terminal protection		finger and hand touch safe, DGUV VS3, EN 50274
Terminal capacity		1 - 25 mm^2
Terminal torque		2 - 2.4 Nm
Busbar thickness		0.8 - 2 mm
Operation temperature		-25°C to +40°C
Storage- and transport temperature		-35°C to +60°C
Resistance to climatic conditions		acc. to IEC 68-2 (25..55°C / 90..95% RH)

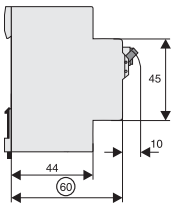
Connection diagram

3-poles

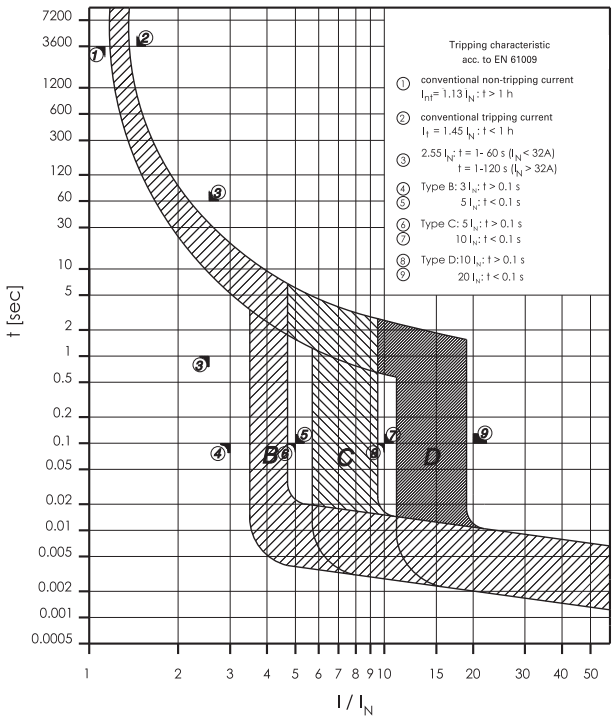


Dimensions (mm)





Tripping Characteristic FRBmM 3-poles, Characteristics B, C and D



Internal Resistance FRBmM 3-poles

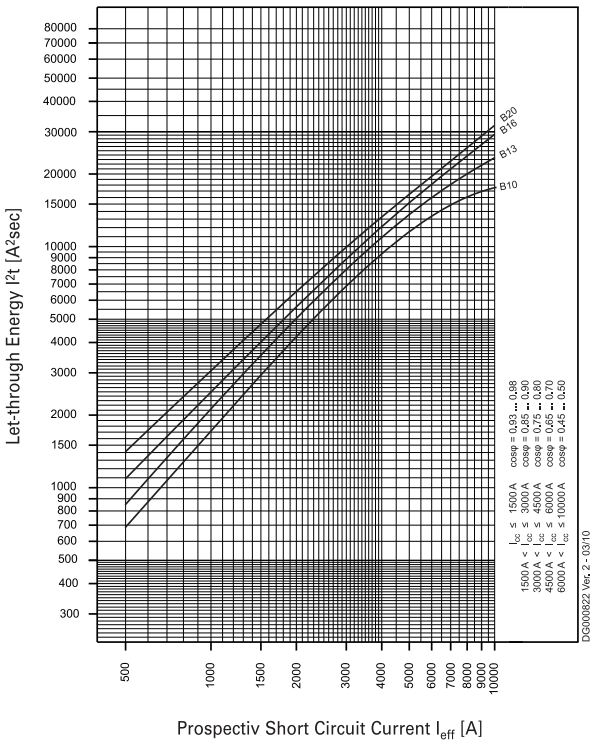
	Type B	Type C	Type D
At room temperature (single pole)			
I_n [A]	Z* [mΩ]	Z* [mΩ]	Z* [mΩ]
6	-	34	34
10	22	56	20
13	38	31	9.8
16	28	27	9.3
20	7.4	6.4	6.6
25	-	4.2	3.9
32	-	3.1	-
* 50Hz			

Power Loss at I_n FRBmM 3-poles

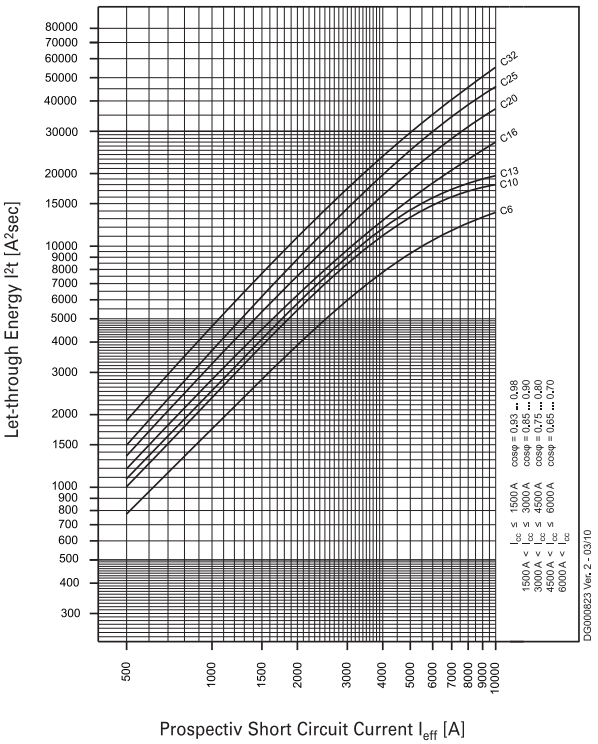
	Type B	Type C	Type D
(entire unit)			
I_n [A]	P* [W]	P* [W]	P* [W]
6	-	4.0	4.0
10	7.6	6.3	6.5
13	8.9	9.0	5.9
16	8.3	8.6	9.0
20	11.3	9.2	9.7
25	-	9.4	9.2
32	-	12.8	-
* 50Hz			

Maximale Let-through Energy FRBmM 3-poles

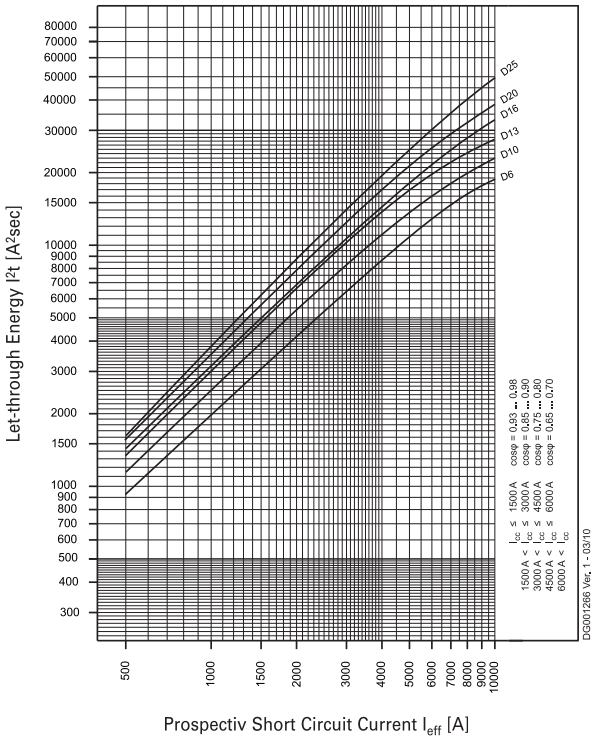
Type B



Type C

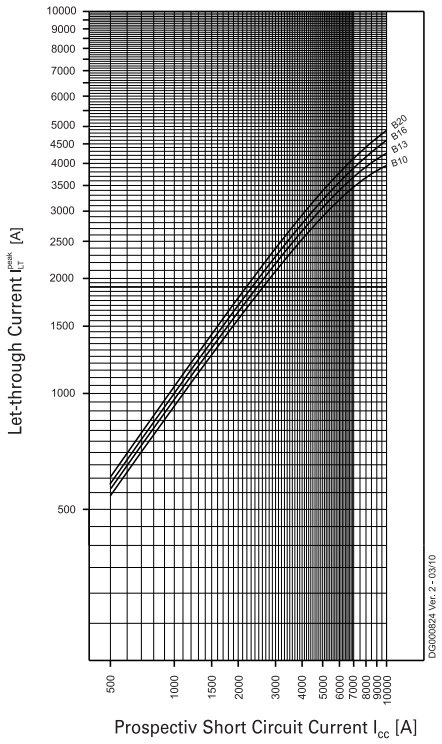


Type D

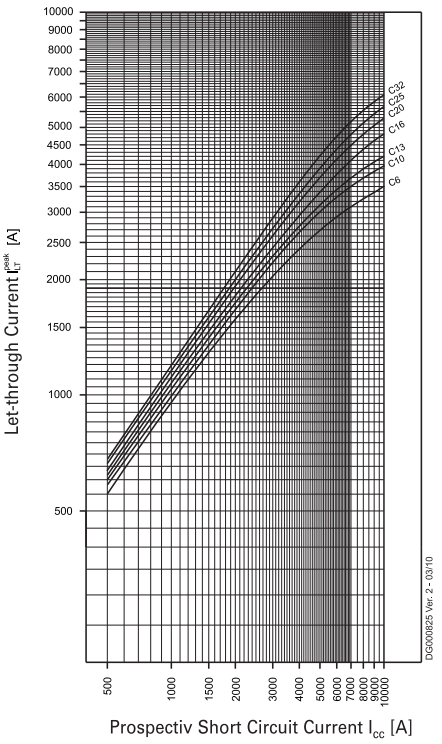


Maximaler Let-through Current FRBmM 3-poles

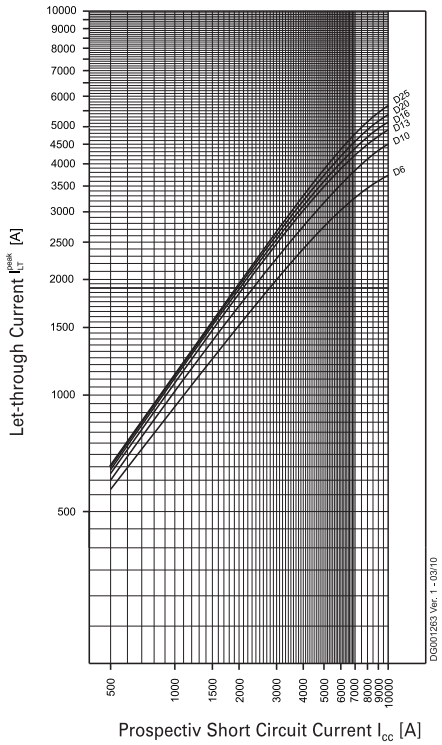
Type B



Type C



Type D



Short-circuit Selectivity FRBmM, 3-poles

In case of a short-circuit, selectivity is provided up to the specified selective current values I_s (kA) applicable between the FRBmM RCD/MCB circuit breakers and the up-stream protective devices.

When a short-circuit occurs, this means that with I_{KS} current values below I_s only the MCB will trip. However, in case of short-circuit currents beyond these values both protective devices will trip.

FRBmM, 3-poles, Characteristic B and NZM 1/2

Selectivity-limit current I_s [kA] for selectivity between FRBmM-.../B and NZM (overload and short-circuit release unit NZM at max. value).

FRBmM-B	NZM...1-A... I_{cu} = 25(36)(50)(100) kA bei U_e = 400/415 V					
I_n [A]	40	50	63	80	100	125
10	1.2	1.5	2	2	4	10
13	1	1.5	2	2	4	10
16	1	1.2	1.5	2	3	8
20	0.8	1.2	1.5	1.5	3	8

FRBmM-B	NZM...2-A... I_{cu} = 25(36)(50)(150) kA bei U_e = 400/415 V								
I_n [A]	40	50	63	80	100	125	160	200	250
10	1	1.5	2.5	3	10	10	10	10	10
13	1	1.2	2	3	10	10	10	10	10
16	1	1.2	1.5	2.5	10	10	10	10	10
20	1	1.2	1.5	1.5	10	10	10	10	10

FRBmM, 3-poles, Characteristic C and NZM 1/2

Selectivity-limit current I_s [kA] for selectivity between FRBmM-.../C and NZM (overload and short-circuit release unit NZM at max. value).

FRBmM-C	NZM...1-A... I_{cu} = 25(36)(50)(100) kA bei U_e = 400/415 V					
I_n [A]	40	50	63	80	100	125
6	1.2	2	2.5	3	5	10
10	1.2	1.5	2	2	4	10
13	1	1.5	2	2	4	10
16	1	1.2	1.5	2	3	8
20	0.8	1.2	1.5	1.5	3	8
25	0.7	1.2	1.5	1.5	3	7
32	-	1.2	1	1.5	2	6

FRBmM-C	NZM...2-A... I_{cu} = 25(36)(50)(150) kA bei U_e = 400/415 V								
I_n [A]	40	50	63	80	100	125	160	200	250
6	1.2	1.5	2.5	3	10	10	10	10	10
10	1	1.5	2.5	3	10	10	10	10	10
13	1	1.2	2	3	10	10	10	10	10
16	1	1.2	1.5	2.5	10	10	10	10	10
20	1	1.2	1.5	1.5	10	10	10	10	10
25	0.8	1	1.5	2	10	10	10	10	10
32	-	1	1.5	2	6	6	6	6	6

FRBmM, 3-poles, Characteristic D and NZM 1/2

Selectivity-limit current I_s [kA] for selectivity between FRBmM-.../D and NZM (overload and short-circuit release unit NZM at max. value).

FRBmM-D	NZM...1-A... I_{cu} = 25(36)(50)(100) kA bei U_e = 400/415 V					
I_n [A]	40	50	63	80	100	125
6	1.2	2	2.5	3	5	10
10	1.2	1.5	2	2	4	10
13	1	1.5	2	2	4	10
16	1	1.2	1.5	2	3	8
20	0.8	1.2	1.5	1.5	3	8
25	0.7	1.2	1.5	1.5	3	7

FRBmM-D	NZM...2-A... I_{cu} = 25(36)(50)(150) kA bei U_e = 400/415 V								
I_n [A]	40	50	63	80	100	125	160	200	250
6	1.2	1.5	2.5	3	10	10	10	10	10
10	1	1.5	2.5	3	10	10	10	10	10
13	1	1.2	2	3	10	10	10	10	10
16	1	1.2	1.5	2.5	10	10	10	10	10
20	1	1.2	1.5	1.5	10	10	10	10	10
25	0.8	1	1.5	2	10	10	10	10	10

Back-up Protection FRBmM 3-poles

The up-stream protective devices will protect the down-stream FRBmM up to the short-circuit current specified.

FRBmM 3-poles and NZMB(C)(N)(H)1

FRBmM 3-poles and NZMB1

U_e = 133 / 230 V

FRBmM	NZMB1 I_n/3/B(C)(D)/003(01)(03)		
	Type B	Type C	Type D
6	-	25kA	25kA
10	25kA	25kA	25kA
13	25kA	25kA	25kA
16	25kA	25kA	25kA
20	25kA	25kA	25kA
25	-	25kA	25kA
32	-	25kA	-

FRBmM 3-poles and NZMC1

U_e = 133 / 230 V

FRBmM	NZMC1 I_n/3/B(C)(D)/003(01)(03)		
	Type B	Type C	Type D
6	-	36kA	36kA
10	36kA	36kA	36kA
13	36kA	36kA	36kA
16	36kA	36kA	36kA
20	36kA	36kA	36kA
25	-	36kA	36kA
32	-	36kA	-

FRBmM 3-poles and NZMN1

U_e = 133 / 230 V

FRBmM	NZMN1 I_n/3/B(C)(D)/003(01)(03)		
	Type B	Type C	Type D
6	-	50kA	50kA
10	50kA	50kA	50kA
13	50kA	50kA	50kA
16	50kA	50kA	50kA
20	50kA	50kA	50kA
25	-	50kA	50kA
32	-	50kA	-

FRBmM 3-poles and NZMH1

U_e = 133 / 230 V

FRBmM	NZMH1 I_n/3/B(C)(D)/003(01)(03)		
	Type B	Type C	Type D
6	-	70kA	70kA
10	70kA	70kA	70kA
13	70kA	70kA	70kA
16	70kA	70kA	70kA
20	70kA	70kA	70kA
25	-	70kA	70kA
32	-	70kA	-

FRBmM 3-poles and NZMB(C)(N)(H)2

FRBmM 3-poles and NZMB2

U_e = 133 / 230 V

FRBmM	NZMB2 I_n/3/B(C)(D)/003(01)(03)		
	Type B	Type C	Type D
6	-	25kA	25kA
10	25kA	25kA	25kA
13	25kA	25kA	25kA
16	25kA	25kA	25kA
20	25kA	25kA	25kA
25	-	25kA	25kA
32	-	25kA	-

FRBmM 3-poles and NZMC2

U_e = 133 / 230 V

FRBmM	NZMC2 I_n/3/B(C)(D)/003(01)(03)		
	Type B	Type C	Type D
6	-	36kA	36kA
10	36kA	36kA	36kA
13	36kA	36kA	36kA
16	36kA	36kA	36kA
20	36kA	36kA	36kA
25	-	36kA	36kA
32	-	36kA	-

FRBmM 3-poles and NZMN2

U_e = 133 / 230 V

FRBmM	NZMN2 I_n/3/B(C)(D)/003(01)(03)		
	Type B	Type C	Type D
6	-	50kA	50kA
10	50kA	50kA	50kA
13	50kA	50kA	50kA
16	50kA	50kA	50kA
20	50kA	50kA	50kA
25	-	50kA	50kA
32	-	50kA	-

FRBmM 3-poles and NZMH2

U_e = 133 / 230 V

FRBmM	NZMH2 I_n/3/B(C)(D)/003(01)(03)		
	Type B	Type C	Type D
6	-	70kA	70kA
10	70kA	70kA	70kA
13	70kA	70kA	70kA
16	70kA	70kA	70kA
20	70kA	70kA	70kA
25	-	70kA	70kA
32	-	70kA	-

FRBmM 3-poles and NH00

FRBmM 3-poles and NH00 125A gG/gL

U_e = 133 / 230 V

FRBmM	NH00 125A gG/gL I_n/3/B(C)(D)/003(01)(03)		
	Type B	Type C	Type D
6	-	70kA	70kA
10	70kA	70kA	70kA
13	70kA	70kA	70kA
16	70kA	70kA	70kA
20	70kA	70kA	70kA
25	-	70kA	70kA
32	-	70kA	-