

# LVS

## Low Voltage Switchgears

## Technical Catalogue



**Circuit Breakers for motor protection ///**

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### **Further service supplies**

This technical catalogue is designed to give an overview of the extensive range of Circuit Breakers for motor protection. If you cannot find the information you require in this catalogue, there are a number of ways you can get further details on configuration and technical issues, pricing and availability.

For technical issues visit the [www.mitsubishi-automation.com](http://www.mitsubishi-automation.com) website.

Our website provides a simple and fast way of accessing further technical data and up to the minute details on our products and services. Manuals and catalogues are available in several different languages and can be downloaded for free.

For technical, configuration, pricing and availability issues contact our distributors and partners.

Mitsubishi partners and distributors are only too happy to help answer your technical questions or help with configuration building. For a list of Mitsubishi partners please see the back of this catalogue or alternatively take a look at the "contact us" section of our website.

### **About this technical catalogue**

This catalogue is a guide to the range of products available. For detailed configuration rules, system building, installation and configuration the associated product manuals must be read. You must satisfy yourself that any system you design with the products in this catalogue is fit for purpose, meets your requires and conforms to the product configuration rules as defined in the product manuals.

Specifications are subject to change without notice. All trademarks acknowledged.

# I CIRCUIT BREAKERS

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Circuit Breakers M4 for motor protection

■ Circuit Breakers M4-32T/32R/63R



M4-32T switch type



M4-32R rotary type



M4-63R rotary type

Technical data		M4-32T-0,16	M4-32T-0,25	M4-32T-0,4	M4-32T-0,63	M4-32T-1	M4-32T-1,6	M4-32T-2,5	M4-32T-4
Rated current	(A)	0.16	0.25	0.4	0.63	1	1.6	2.5	4
Suitable for motors (3~400 V) <sup>①</sup>	(kW)	—	0.06	0.09	0.18	0.25	0.55	0.75	1.5
Setting range (thermal)	(A)	0.10–0.16	0.16–0.25	0.25–0.4	0.40–0.63	0.63–1.0	1.0–1.6	1.6–2.5	2.5–4
Instantaneous short circuit overload release	(A)	2.1	3.3	5.2	8.2	13	20.8	32.5	52
Short circuit breaking release (3~400 V)	(kA)	100	100	100	100	100	100	100	100
Weight	(kg/pc.)	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
<b>Order information</b>	Art. no.	226314	226635	226636	226637	226638	226639	226640	226641

<sup>①</sup> Approximate values of standard motors

Technical data		M4-32T-6	M4-32T-8	M4-32T-10	M4-32T-13	M4-32T-17	M4-32T-22	M4-32T-26	M4-32T-32
Rated current	(A)	6	8	10	13	17	22	26	32
Suitable for motors (3~400 V) <sup>①</sup>	(kW)	2.2	3	4	5.5	7.5	7.5	11	15
Setting range (thermal)	(A)	4–6	5–8	6–10	9–13	11–17	14–22	18–26	22–32
Instantaneous short circuit overload release	(A)	78	104	130	169	221	286	338	416
Short circuit breaking release (3~400 V)	(kA)	100	100	50	50	20	15	15	15
Weight	(kg/pc.)	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
<b>Order information</b>	Art. no.	226642	226643	226644	226645	226646	226647	226648	226649

<sup>①</sup> Approximate values of standard motors

Technical data		M4-32R-0,16	M4-32R-0,25	M4-32R-0,4	M4-32R-0,63	M4-32R-1	M4-32R-1,6	M4-32R-2,5	M4-32R-4
Rated current	(A)	0.16	0.25	0.4	0.63	1	1.6	2.5	4
Suitable for motors (3~400 V) <sup>①</sup>	(kW)	—	0.06	0.09	0.18	0.25	0.55	0.75	1.5
Setting range (thermal)	(A)	0.10–0.16	0.16–0.25	0.25–0.4	0.40–0.63	0.63–1.0	1.0–1.6	1.6–2.5	2.5–4
Instantaneous short circuit overload release	(A)	2.1	3.3	5.2	8.2	13	20.8	32.5	52
Short circuit breaking release (3~400 V)	(kA)	100	100	100	100	100	100	100	100
Weight	(kg/pc.)	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36
<b>Order information</b>	Art. no.	226650	226651	226652	226653	226654	226655	226656	226657

<sup>①</sup> Approximate values of standard motors

Technical data		M4-32R-6	M4-32R-8	M4-32R-10	M4-32R-13	M4-32R-17	M4-32R-22	M4-32R-26	M4-32R-32
Rated current	(A)	6	8	10	13	17	22	26	32
Suitable for motors (3~400 V) <sup>①</sup>	(kW)	2.2	3	4	5.5	7.5	7.5	11	15
Setting range (thermal)	(A)	4-6	5-8	6-10	9-13	11-17	14-22	18-26	22-32
Instantaneous short circuit overload release	(A)	78	104	130	169	221	286	338	416
Short circuit breaking release (3~400 V)	(kA)	100	100	100	100	50	50	50	50
Weight	(kg/pc.)	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36
<b>Order information</b>	Art. no.	226658	226659	226660	226661	226662	226663	226664	226665

<sup>①</sup> Approximate values of standard motors

Technical data		M4-63R-26	M4-63R-32	M4-63R-40	M4-63R-50	M4-63R-63
Rated current	(A)	26	32	40	50	63
Suitable for motors (3~400 V) <sup>①</sup>	(kW)	12.5	15	18,5	22	30
Setting range (thermal)	(A)	18-26	22-32	28-40	34-50	45-63
Instantaneous short circuit overload release	(A)	338	416	520	650	819
Short circuit breaking release (3~400 V)	(kA)	50	50	50	50	50
Weight	(kg/pc.)	1.0	1.0	1.0	1.0	1.0
<b>Order information</b>	Art. no.	226666	226667	226668	226669	226670

<sup>①</sup> Approximate values of standard motors

■ Transverse Auxiliary Contact Block, max. 1 pc. per circuit breaker <sup>①</sup>



M4-HQ20

Technical data		M4-HQ11	M4-HQ20	M4-HQ02
Contacts	NC	1	2	—
	NO	1	—	2
Rated Operational Current	AC15 24 V (A)	3	3	3
	240 V (A)	2	2	2
	AC1 240 V(A)	5	5	5
Weight	(kg/pc.)	0.02	0.02	0.02
<b>Order information</b>		Art. no.	226671	226672
			226673	

<sup>①</sup> Number and position see page 15

■ Auxiliary Contact Block for left hand side mounting, 1 or 2 pcs. per circuit breaker <sup>①</sup>



M4-HS20

Technical data		M4-HS11	M4-HS20	M4-HS02
Contacts	NC	1	2	—
	NO	1	—	2
Rated Operational Current	AC15 24 V (A)	6	6	6
	240 V (A)	4	4	4
	AC1 240 V(A)	10	10	10
Weight	(kg/pc.)	0.03	0.03	0.03
<b>Order information</b>		Art. no.	226674	226675
			226676	

<sup>①</sup> Number and position see page 15

■ Alarm Switch (any tripping) for left hand side mounting, max. 1 pc. per circuit breaker <sup>①</sup>



M4-MA

Technical data		M4-MA11
Contacts	NC	1
	NO	1
Rated Operational Current	AC15 24 V (A)	6
	240 V (A)	4
	AC1 240 V(A)	10
Weight	(kg/pc.)	0.04
<b>Order information</b>		Art. no.
		226677

<sup>①</sup> Number and position see page 15

■ Alarm Switch (short circuit) for left hand side mounting, max. 1 pc. per circuit breaker <sup>①</sup>



M4-M11

Technical data		M4-M11
Contacts	NC	1
	NO	1
Rated Operational Current	AC15 24 V (A)	6
	240 V (A)	4
	AC1 240 V(A)	10
Weight	(kg/pc.)	0.04
<b>Order information</b>		Art. no.
		226678

<sup>①</sup> Number and position see page 15

■ Undervoltage Releases for right hand side mounting, max. 1 pc. per circuit breaker <sup>①</sup>



Technical data	M4-U24	M4-U110	M4-U230	M4-U240	M4-U400	M4-U415
Trips the circuit breaker when the voltage is interrupted. Prevents the motor from being restarted accidentally when the voltage is restored, suitable for EMERGENCY STOP acc. to IEC 60204	24 V 50 Hz, 28 V 60 Hz	110-127 V 50 Hz, 120 V 60 Hz	220-230 V 50 Hz, 240-260 V 60 Hz	240 V 50 Hz, 277 V 60 Hz	380-400 V 50 Hz, 440-460 V 60 Hz	415-440 V 50 Hz, 460-480 V 60 Hz
Weight (kg/pc.)	0.11	0.11	0.11	0.11	0.11	0.11
<b>Order information</b>	Art. no. 226679	226680	226681	226682	226683	226684

<sup>①</sup> Number and position see page 15

■ Shunt Releases for right hand side mounting, max. 1 pc. per circuit breaker <sup>①</sup>



Technical data	M4-A24	M4-A110	M4-A230	M4-A240	M4-A400	M4-A415
Trips the circuit breaker when the release coil energized.	24 V 50 Hz, 28 V 60 Hz	110-127 V 50 Hz, 120 V 60 Hz	220-230 V 50 Hz, 240-260 V 60 Hz	240 V 50 Hz, 277 V 60 Hz	380-400 V 50 Hz, 440-460 V 60 Hz	415-440 V 50 Hz, 460-480 V 60 Hz
Weight (kg/pc.)	0.12	0.12	0.12	0.12	0.12	0.12
<b>Order information</b>	Art. no. 226685	226686	226687	226688	226689	226690

<sup>①</sup> Number and position see page 15

■ Enclosure for circuit breaker M4-32R protection degree IP65



Technical data	M4-32R-PFH4	M4-32R-PFHN4
Case	Plastic enclose with rotary operating mechanism black-grey, lockable, with N- and PE-terminal, space for 1 transverse and side aux. contact + release	Enclose with rotary operating mechanism yellow - red, lockable, with N- and PE-terminal, space for 1 transverse and side aux. contact + release
Weight (kg/pc.)	0.53	0.53
<b>Order information</b>	Art. no. 226691	226692

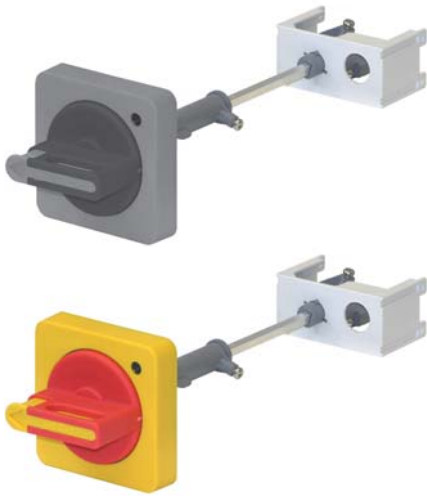
■ Accessories for circuit breakers



Technical data	M4-K	M4-32-L
Function	Scale cover sealable for covering the current setting scale	Push-in lugs for screwing the circuit breaker onto mounting plates <sup>①</sup>
For circuit breaker	M-32...100	M4-32
Weight (kg/pc.)	0.003	0.01
<b>Order information</b>	Art. no. 226693	226694

<sup>①</sup> 2 units required (1 bag with 10 units)

■ Door-coupling rotary mechanisms IP65



The door locking device prevents accidental opening of the cubicle door in the ON position of the circuit breaker.

The OFF position can be locked with up to 3 padlocks.

Technical data	M4-32R EHN1-115	M4-32R EHN1-315	M4-63R EHN1-115	M4-63R EHN1-315
Function	Door-coupling rotary mechanism black			
Mounting depth (mm)	149–210	149–410	149–255	194–455
For circuit breaker	M4-32R	M4-32R	M4-63R	M4-63R
Weight (kg/pc.)	0.1	0.2	0.1	0.2
<b>Order information</b>	Art. no. 226695	226696	226697	226698

Technical data	M4-32R EHN1-115	M4-32R EHN1-315	M4-63R EHN1-115	M4-63R EHN1-315
Function	Emergency-Stop, Door-coupling rotary mechanism; red/yellow			
Mounting depth (mm)	149–210	149–410	149–255	194–455
For circuit breaker	M4-32R	M4-32R	M4-63R	M4-63R
Weight (kg/pc.)	0.1	0.2	0.1	0.2
<b>Order information</b>	Art. no. 226699	226700	226701	226702

■ Insulated 3-phase busbar system



M4-32-S2



M4-32-SE



M4-32-SF



M4-63-S2

- For feeding several modular circuit breakers M4-32, on standard mounting rails, insulated
- With spade connection
- Modular spacing 45 mm (54 mm on request)
- Rated operational voltage max. 690 V, 63 A

Technical data	M4-32-S2	M4-32-S3	M4-63-S4
Function	3-phase busbars		
Other	for 2 circuit breakers	for 3 circuit breakers	for 4 circuit breakers
Protection degree	IP20	IP10	IP10
Weight (kg/pc.)	0.03	0.05	0.07
<b>Order information</b>	Art. no. 226703	226704	226705

Technical data	M4-32-S5	M4-32-SE	M4-63-SF
Function	3-phase busbars	Line side terminal, 3-pole <sup>①</sup>	Cover for tags
Other	for 5 circuit breakers	Conductor cross-section <sup>②</sup>	—
Protection degree	IP10	IP20	Touch guard for empty spaces
Weight (kg/pc.)	0.1	0.04	0.003
<b>Order information</b>	Art. no. 226706	226707	226708

① Connection from above  
 ② Solid or stranded 6-25 mm<sup>2</sup> with end sleeve 4-16 mm<sup>2</sup>

Technical data	M4-63-S2
Function	3-phase busbars
Other	for 2 circuit breakers
Protection degree	IP20
Weight (kg/pc.)	0.15
<b>Order information</b>	Art. no. 226709

2 ACCESSORIES



**Technical Data according to IEC/EN 60947-1, 60947-2, 60947-4-1 and VDE 0660**

This table shows the rated ultimate short-circuit breaking capacity **I<sub>cu</sub>** and the rated service short-circuit breaking capacity **I<sub>cs</sub>** of the M4 circuit breakers with different operational voltages as a function of the rated current **I<sub>n</sub>** of the circuit breakers.

The circuit breakers can be fed at the top or bottom supply terminals without any reduction of the rated data.

If the short-circuit current exceeds the rated short-circuit breaking capacity of the circuit breaker specified in the tables at

the installation point, a back-up fuse is to be used.

The maximum rated current for the back-up fuse is specified in the tables. These fuses are only suitable for the short-circuit-currents as indicated on the fuses.

Technical data		M4-32T												
Rated current	(A)	0.16	1	1,6	2,5	4	6	8	10	13	17	22	26	32
Up to AC 240 V <sup>②</sup>	I <sub>cu</sub> (kA)	100	100	100	100	100	100	100	100	100	50	40	40	30
	I <sub>cs</sub> (kA)	100	100	100	100	100	100	100	100	100	38	30	30	22
	Max. fuse (gL/gG) (A) <sup>①</sup>	—	—	—	—	—	—	—	—	—	—	125	125	125
Up to AC 400 V <sup>②</sup> Up to AC 415 V <sup>③</sup>	I <sub>cu</sub> (kA)	100	100	100	100	100	100	100	50	50	20	15	15	15
	I <sub>cs</sub> (kA)	100	100	100	100	100	100	100	38	38	15	11	11	11
	Max. fuse (gL/gG) (A) <sup>①</sup>	—	—	—	—	—	—	—	80	80	100	100	100	100
Up to AC 440 V <sup>②</sup> Up to AC 460 V <sup>③</sup>	I <sub>cu</sub> (kA)	100	100	100	100	50	15	15	15	10	10	8	8	6
	I <sub>cs</sub> (kA)	100	100	100	100	38	11	11	11	8	8	6	6	4
	Max. fuse (gL/gG) (A) <sup>①</sup>	—	—	—	—	50	50	63	63	80	80	100	100	100
Up to AC 500 V <sup>②</sup> Up to AC 525 V <sup>③</sup>	I <sub>cu</sub> (kA)	100	100	100	50	15	10	10	6	6	6	6	6	5
	I <sub>cs</sub> (kA)	100	100	100	38	11	8	8	5	5	5	5	5	4
	Max. fuse (gL/gG) (A) <sup>①</sup>	—	—	—	50	40	50	63	63	80	80	80	80	80
Up to AC 690 V <sup>②</sup>	I <sub>cu</sub> (kA)	100	100	3	3	3	3	3	3	3	3	3	3	3
	I <sub>cs</sub> (kA)	100	100	3	3	3	3	3	3	3	3	3	3	3
	Max. fuse (gL/gG) (A) <sup>①</sup>	—	—	20	35	40	50	63	63	63	63	63	63	63

① Back up fuse required if short-circuit current at installation point > I<sub>cu</sub>  
 ② 10 % overvoltage  
 ③ 5 % overvoltage  
 — No back-up fuse required

Technical data		M4-32R												
Rated current	(A)	0.16	1.6	2.5	4	6	8	10	13	17	22	26	32	
Up to AC 240 V <sup>②</sup>	I <sub>cu</sub> (kA)	100	100	100	100	100	100	100	100	100	100	100	100	
	I <sub>cs</sub> (kA)	100	100	100	100	100	100	100	100	100	100	100	100	
	Max. fuse (gL/gG) (A) <sup>①</sup>	—	—	—	—	—	—	—	—	—	—	—	—	
Up to AC 400 V <sup>②</sup> Up to AC 415 V <sup>③</sup>	I <sub>cu</sub> (kA)	100	100	100	100	100	100	100	100	50	50	50	50	
	I <sub>cs</sub> (kA)	100	100	100	100	100	100	100	100	38	38	38	38	
	Max. fuse (gL/gG) (A) <sup>①</sup>	—	—	—	—	—	—	—	—	100	125	125	125	
Up to AC 440 V <sup>②</sup> Up to AC 460 V <sup>③</sup>	I <sub>cu</sub> (kA)	100	100	100	100	100	50	50	50	20	20	20	20	
	I <sub>cs</sub> (kA)	100	100	100	100	100	38	38	38	15	15	15	15	
	Max. fuse (gL/gG) (A) <sup>①</sup>	—	—	—	—	—	80	80	80	80	100	100	100	
Up to AC 500 V <sup>②</sup> Up to AC 525 V <sup>③</sup>	I <sub>cu</sub> (kA)	100	100	100	100	100	50	50	42	10	10	10	10	
	I <sub>cs</sub> (kA)	100	100	100	100	100	38	38	32	8	8	8	8	
	Max. fuse (gL/gG) (A) <sup>①</sup>	—	—	—	—	—	63	80	80	80	80	80	80	
Up to AC 690 V <sup>②</sup>	I <sub>cu</sub> (kA)	100	100	8	8	6	6	6	6	4	4	4	4	
	I <sub>cs</sub> (kA)	100	100	8	8	6	6	6	6	4	4	4	4	
	Max. fuse (gL/gG) (A) <sup>①</sup>	—	—	35	40	50	63	63	63	63	63	63	63	

① Back up fuse required if short-circuit current at installation point > I<sub>cu</sub>  
 ② 10 % overvoltage  
 ③ 5 % overvoltage  
 — No back-up fuse required

Technical data		M4-63R				
Rated current	(A)	26	32	40	50	63
	I <sub>cu</sub> (kA)	100	100	100	100	100
Up to AC 240 V <sup>②</sup>	I <sub>cs</sub> (kA)	100	100	100	100	100
	Max. fuse (gL/gG) (A) <sup>①</sup>	—	—	—	—	—
	I <sub>cu</sub> (kA)	50	50	50	50	50
Up to AC 400 V <sup>②</sup> Up to AC 415 V <sup>③</sup>	I <sub>cs</sub> (kA)	50	50	50	50	50
	Max. fuse (gL/gG) (A) <sup>①</sup>	125	125	160	160	160
	I <sub>cu</sub> (kA)	35	35	35	35	35
Up to AC 440 V <sup>②</sup> Up to AC 460 V <sup>③</sup>	I <sub>cs</sub> (kA)	27	27	27	27	27
	Max. fuse (gL/gG) (A) <sup>①</sup>	125	125	125	125	160
	I <sub>cu</sub> (kA)	12	10	10	10	10
Up to AC 500 V <sup>②</sup> Up to AC 525 V <sup>③</sup>	I <sub>cs</sub> (kA)	9	8	8	8	8
	Max. fuse (gL/gG) (A) <sup>①</sup>	100	100	100	100	100
	I <sub>cu</sub> (kA)	5	5	5	5	5
Up to AC 690 V <sup>②</sup>	I <sub>cs</sub> (kA)	5	5	5	5	5
	Max. fuse (gL/gG) (A) <sup>①</sup>	80	80	80	80	80




① Back up fuse required if short-circuit current at installation point > I<sub>cu</sub>  
 ② 10 % overvoltage  
 ③ 5 % overvoltage  
 — No back-up fuse required

### Main Circuit

Technical data		M4-32T	M4-32R	M4-63R
Number of poles		3	3	3
Max. rated current I <sub>max</sub> (=max. rated operational current I <sub>e</sub> )	(A)	32	32	63
Permissible ambient temperature	Storage/transport (°C)	-50 to +80	-50 to +80	-50 to +80
	Operation (°C)	-20 to +60	-20 to +60	-20 to +60
Rated insulation voltage U <sub>i</sub>	(V)	690 <sup>①</sup>	690 <sup>①</sup>	1000 <sup>②</sup>
Rated impulse withstand voltage U <sub>imp</sub>	(kV)	6	6	8
Rated operational voltage U <sub>e</sub>	(V)	690	690	690
Rated frequency	(Hz)	50/60	50/60	50/60
Utilization category	IEC 60947-2 (circuit breaker)	A	A	A
	IEC 60947-4-1 (motor starter)	AC3	AC3	AC3
Class	Acc. to IEC 60947-4-1	10	10	10
Power loss P <sub>v</sub> per circuit breaker dependent on rated current I <sub>n</sub> (upper setting range)	I <sub>n</sub> -> up to 4 A (W)	9.8	9.8	—
	I <sub>n</sub> -> 6 up to 26 A (W)	8	8	—
	I <sub>n</sub> -> 32 A (W)	3.9	3.9	—
	I <sub>n</sub> -> 26 up to 63 A (W)	—	—	12.6
R per conducting path = P <sub>v</sub> /I <sup>2</sup> × 3	I <sub>n</sub> -> up to 63 A (W)	—	—	—
	I <sub>n</sub> -> 75 up to 100 A (W)	—	—	—
	Acc. to IEC 60068 Part 2-27 (g)	25	25	25
Degree of protection	Acc. to IEC 60529	IP20	IP20	IP20
Shock hazard protection	Acc. to DIN VDE 0106 Part 100	Safe against finger touch	Safe against finger touch	Safe against finger touch
Temperature compensation	Acc. to IEC 60947-4-1 (°C)	-20 to +60	-20 to +60	-20 to +60
Mechanical endurance	Operating cycles	100 000	100 000	50 000
Electrical endurance	Operating cycles	100 000	100 000	20 000
Max. operating frequency per hour (motor starts)	1/h	25	25	25

① Suitable at 690 V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry); U<sub>imp</sub> = 6 kV.  
 ② Suitable at 1000 V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry); U<sub>imp</sub> = 8 kV.  
 Data for other conditions on request.

## Conductor cross-sections for main circuit

Technical data	M4-32T	M4-32R	M4-63R
Terminal type, screw type	Pz2 	Pz2 	Pz2 
Tightening torque	(Nm) 0.8 to 2,5 (lb-in) 7 to 22	0.8 to 2.5 7 to 22	3 to 4,5 26 to 39
Conductor cross-sections, solid	mm <sup>2</sup> 1x (1 to 10)	1x (1 to 10)	1x (0.75 to 35)
	mm <sup>2</sup> 2x (1 to 6)	2x (1 to 6)	2x (0.75 to 25)
	AWG 1x (18 to 8)	1x (18 to 8)	1x (18 to 2)
	AWG 2x (18 to 10)	2x (18 to 10)	2x (18 to 4)
Conductor cross-sections, stranded	mm <sup>2</sup> 1x (1 to 6)	1x (1 to 6)	1x (0.75 to 35)
	mm <sup>2</sup> 2x (1 to 6)	2x (1 to 6)	2x (0.75 to 25)
	AWG 1x (18 to 10)	1x (18 to 10)	1x (18 to 2)
	AWG 2x (18 to 10)	2x (18 to 10)	2x (18 to 4)
Conductor cross-sections, flexible	mm <sup>2</sup> 1x (1 to 6)	1x (1 to 6)	1x (0.75 to 25)
	mm <sup>2</sup> 2x (0.75 to 4)	2x (0.75 to 4)	2x (0.75 to 16)
	AWG 1x (18 to 10)	1x (18 to 10)	1x (18 to 4)
	AWG 2x (18 to 10)	2x (18 to 10)	2x (18 to 6)

## Auxiliary switches

Technical data		M4 HQ.. Front transverse auxiliary switch	
Rated operational voltage U <sub>e</sub>	(V)	24	240
Rated operational current I <sub>e</sub> /AC-15	AC (A)	3	3
Rated operational current I <sub>e</sub> /AC-12 lth	(A)	5	5
Rated operational voltage U <sub>e</sub>	(V)	24	220
Rated operational current I <sub>e</sub> /DC-13	DC L/R 200 ms (A)	1	0.1
Technical data		M4 HS.., M4 M.. Lateral auxiliary switch and signalling switch	
Rated operational voltage U <sub>e</sub>	(V)	24	240
Rated operational current I <sub>e</sub> /AC-15	AC (A)	6	4
Rated operational current I <sub>e</sub> /AC-12 lth	(A)	10	10
Rated operational voltage U <sub>e</sub>	(V)	24	220
Rated operational current I <sub>e</sub> /DC-13	DC L/R 200 ms (A)	2	0.25
Technical data		M4 U.. Undervoltage release	
Power consumption	During pick-up	(VA/W)	8.5/6
	Uninterrupted duty	(VA/W)	3/1.2
Response voltage	Trip	(V)	0.7 to 0.35xU <sub>s</sub>
	Pick-up	(V)	0.85 to 1.1xU <sub>s</sub>
Technical data		M4 A.. Shunt release	
Power consumption	Power consumption during pick-up	(VA/W)	8.5/6
	Trip	(VA/W)	3/1.2
Response voltage acc. to IEC 60947-1	(V)	0.7 to 1.1xU <sub>s</sub>	
Technical data		Short-circuit protection for auxiliary and control circuits	
Fuse	gL/gG (A)	16	
Miniature circuit breaker	C-characteristic (A)	6	
Technical data		Conductor cross-sections for auxiliary and control circuits (Screw-type Pz2)	
Solid	(mm <sup>2</sup> )	1x(0.5 to 2.5) / 2x(0.5 to 2.5) <sup>①</sup>	
Flexible	(mm <sup>2</sup> )	1x(0.5 to 4) / 2x(0.75 to 2.5)	
AWG-wires, solid	AWG	1x(20 to 14) / 2x(20 to 14) <sup>①</sup>	
Flexible	AWG	1x(20 to 10) / 2x(18 to 14)	

**Releases**

Circuit-breakers M4 are equipped with bimetallic-based, inverse-time delayed overload releases and with instantaneous overcurrent releases (electromagnetic short-circuit releases).

The overload releases can be set in accordance with the load current. The overcurrent releases are permanently set to a value 13 times the rated current and thus enable trouble-free start-up of motors.

The scale cover can be sealed to prevent unauthorized adjustments to the set current.

**Operating mechanisms**

Circuit-breakers M4-32T are actuated via a rocker operating mechanism and circuit-breakers M4-32R, M4-63R and M4-100R via a rotary operating mechanism.

An electrical signal can be output, at all Circuit-breakers, via a signalling switch to indicate that the Circuit-breaker has tripped. All operating mechanisms can be

locked in the 0 position with a padlock (shackle diameter 3.5 to 4.5 mm). The M4 Circuit breakers fulfil the isolation characteristics specified in IEC 60947-2.

**Operating conditions**

Circuit-breakers M4 are suitable for use in any climate. They are designed for operation in enclosed rooms under normal conditions (e. g. no dust, corrosive vapours or harmful gases).

Suitable enclosures must be provided for installation in dusty or damp rooms. Circuit breakers M4 can also be fed from below. In order to prevent premature tripping due to phase failure sensitivity,

the three conducting paths must always be uniformly loaded. The conducting paths must be connected in series in the case of single-phase loads.

**Short-circuit protection**

The short-circuit releases of M4 circuit breakers disconnect the faulty load feeder from the system in the event of a short circuit and thus prevent any further damage from being caused.

Circuit breakers with a short-circuit breaking capacity of 50 kA or 100 kA at a voltage of 400 V AC are practically short-circuit-proof at this voltage, as higher short-circuit currents are not

usually encountered at the installation point. Back-up fuses are only necessary if the short-circuit current at the installation point exceeds the rated ultimate short-circuit breaking capacity of the circuit-breakers.

**Motor protection**

The tripping characteristics of M4 circuit breakers are designed mainly to protect three-phase induction motors.

The circuit-breakers are therefore also referred to as Manual Motor Starters.

The current of the motor to be protected is set with the aid of the scale.

**Line protection**

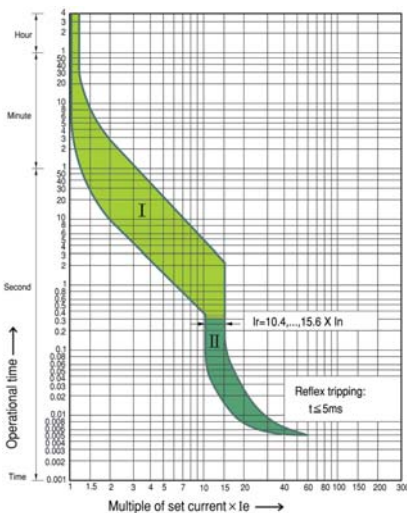
M4 Circuit-breakers for motor protection are also suitable for line protection. The M4 Circuit-breakers fulfil the isolation conditions of IEC 60 947-3 as well as the

additional test conditions for circuit breakers with isolation characteristics specified in IEC 60947-2. Taking IEC 60 204-1 into consideration, they can thus be implemented

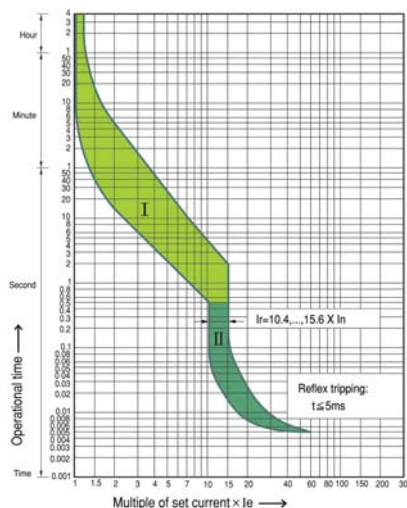
as main and EMERGENCY STOP switches. Door-coupling rotary operating mechanism do not fulfill the isolation characteristics.

**Tripping-Characteristics**

**M4-32**



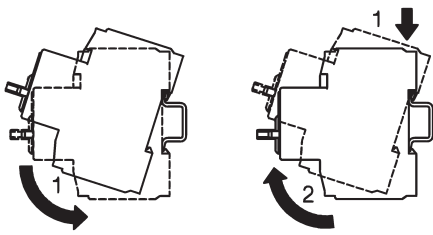
**M4-63R**



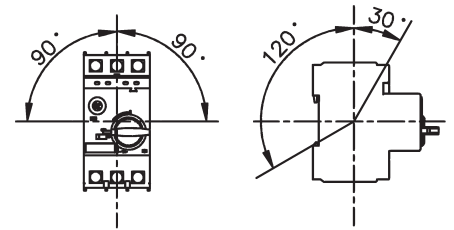
- I: The curve shows the mean operating current at an ambient temperature of 20°C starting from cold.
- II: The tripping characteristic of electromagnetic overcurrent releases (short-circuit releases)

The tripping characteristic of the inverse-time delayed overload releases apply for DC and AC with a frequency of 0 to 400 Hz. At operating temperature, the tripping times of the thermal releases are reduced to approximately 25%. The characteristic shown here is a schematic representation of circuit breakers for all ranges. Current limiting characteristics and I<sup>2</sup>t characteristics are available on request.

■ DIN-rail mounting

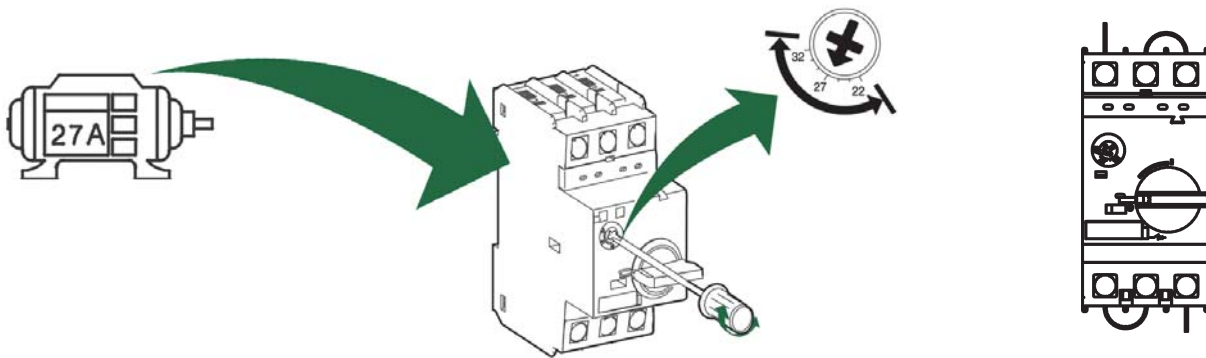


Operating positions



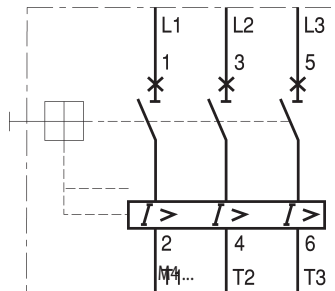
■ Connection of 1-phase motor

Current setting (don't rotate the dial out of the shown range)

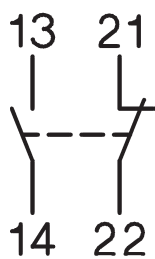


Wiring diagrams

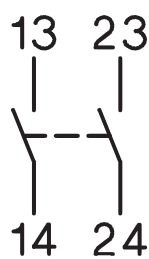
■ Circuit breaker



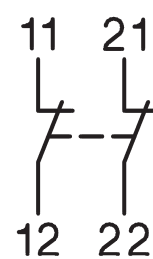
■ Traverse Aux. Contact Block



M4-HQ11

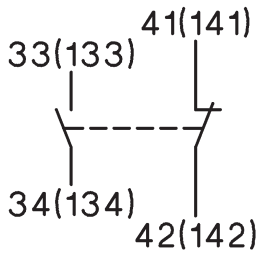


M4-HQ20

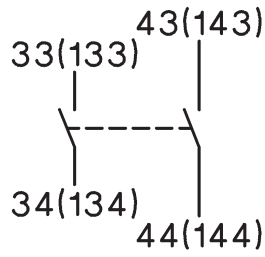


M4-HQ02

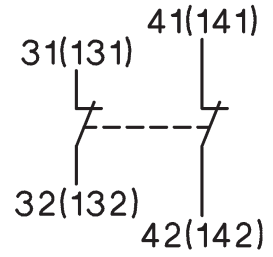
**Aux. Contact Block (side mounted)**



M4-HS11

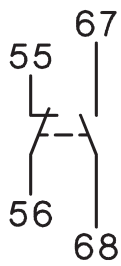


M4-HS20



M4-HS02

**Alarm Switch**

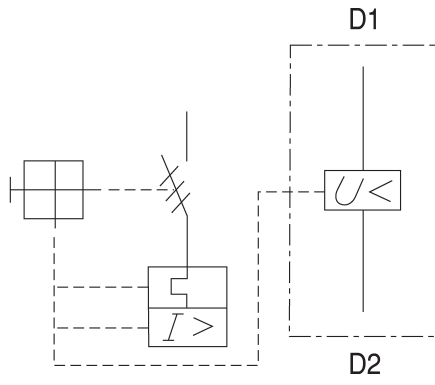


M4-M11



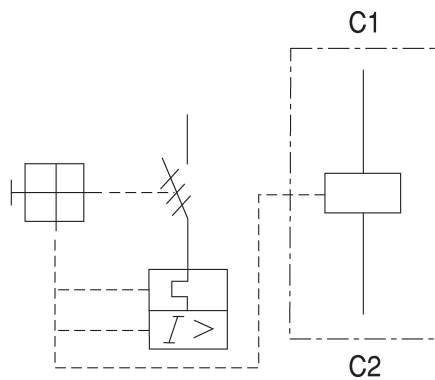
M4-MA11

**Undervoltage Release**



M4-U...

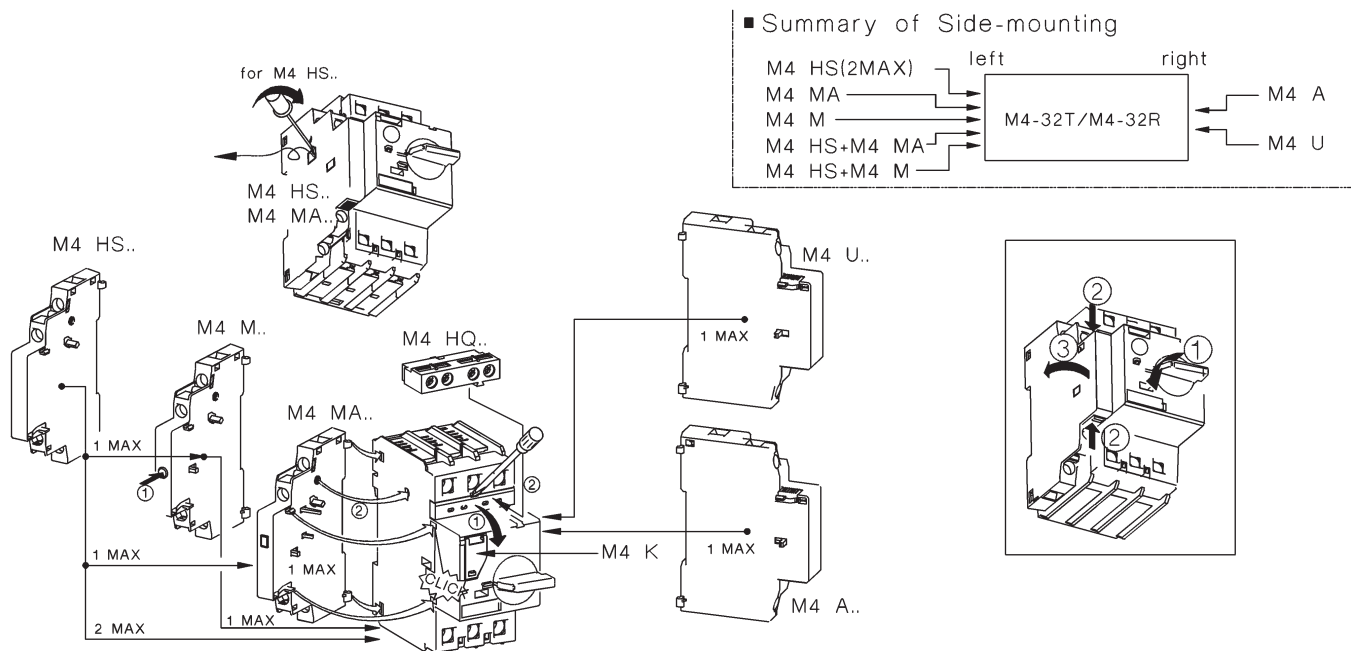
**Shunt Release**



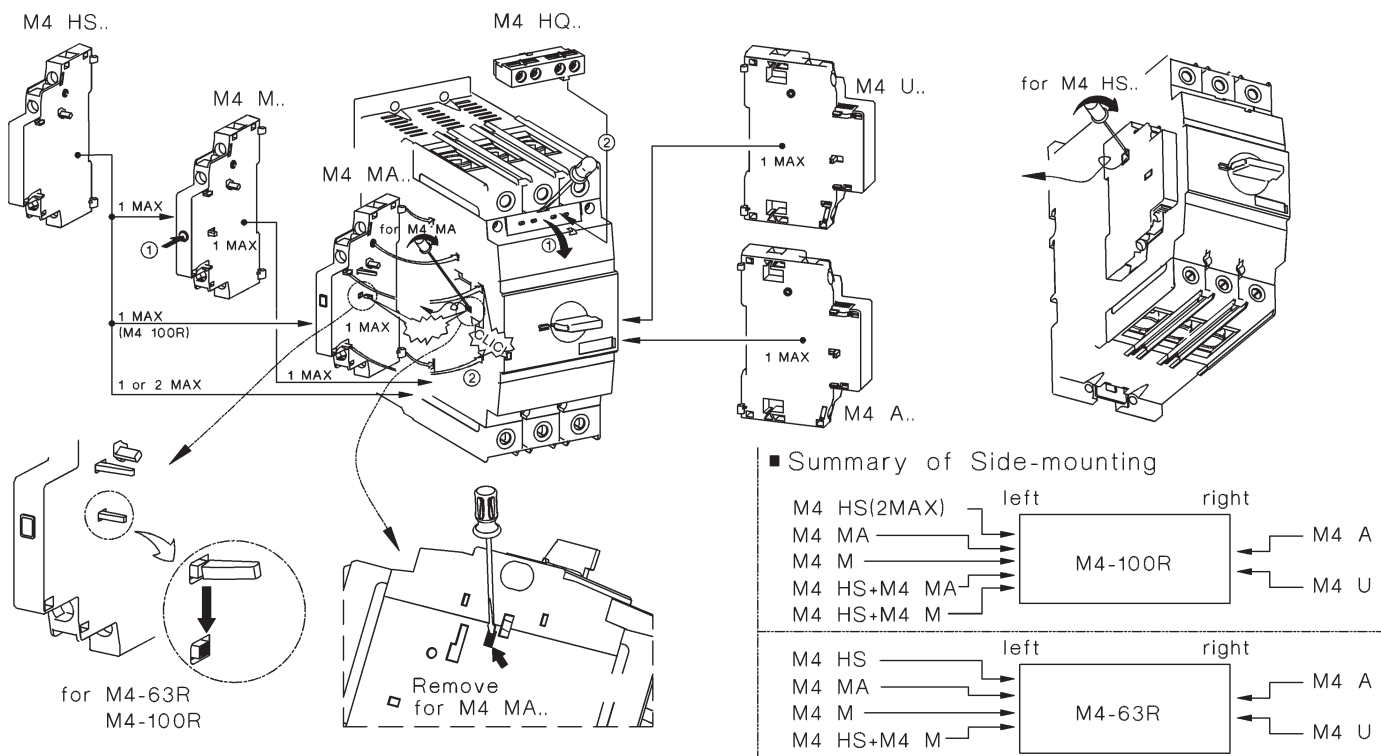
M4-A...

5 MOUNTING

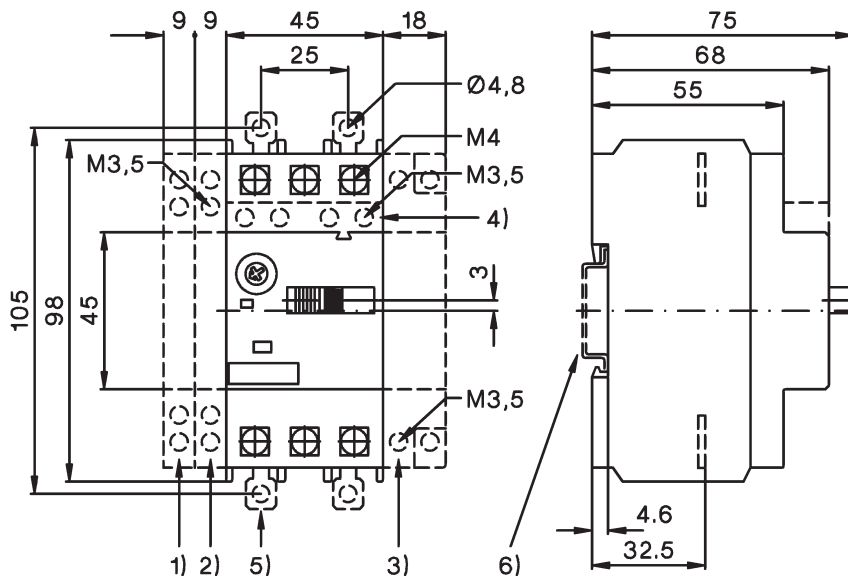
■ M4-32T, M4-32R



■ M4-63R



**■ Circuit breaker M4-32T**

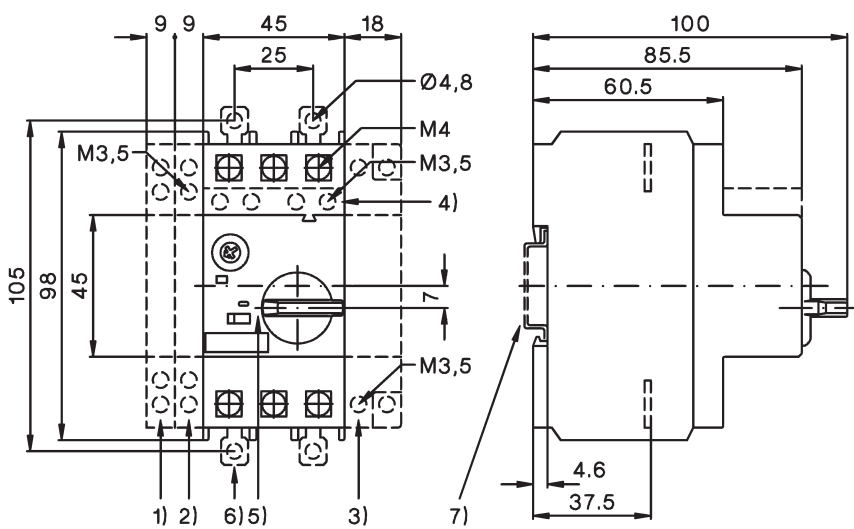


- 1) Side aux. contact
- 2) Magnetic trip alarm
- 3) Shunt or undervoltage release of arcing
- 4) Transverse aux. contact
- 5) Push-in Lugs for screw mounting
- 6) 35 mm DIN-rail acc. to EN 50022

Height of arcing spaces (clearance from earthed parts)

	(V)	240	415	460	525	690
At Ue	(mm)	20	20	20	20	20
	(inch)	0.8	0.8	0.8	0.8	0.8

**■ Circuit breaker M4-32R**



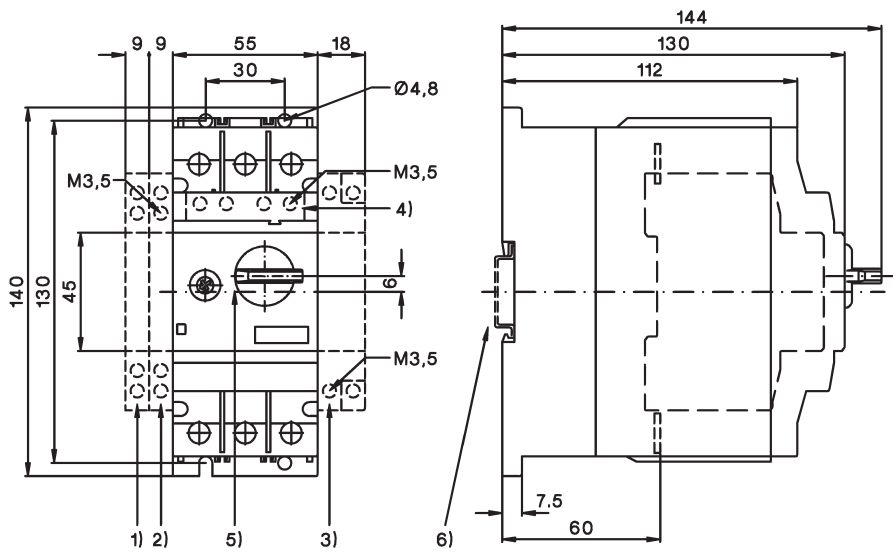
- 1) Side aux. contact
- 2) Magnetic trip alarm
- 3) Shunt or undervoltage release of arcing
- 4) Transverse aux. contact
- 5) Handle lock in OFF-position (Ø 5 mm)
- 6) Push-in Lugs for screw mounting
- 7) 35 mm DIN-rail acc. to EN 50022

Height of arcing spaces (clearance from earthed parts)

	(V)	240	415	460	525	690
At Ue	(mm)	30	30	30	30	50



**■ Circuit breaker M4-63R**

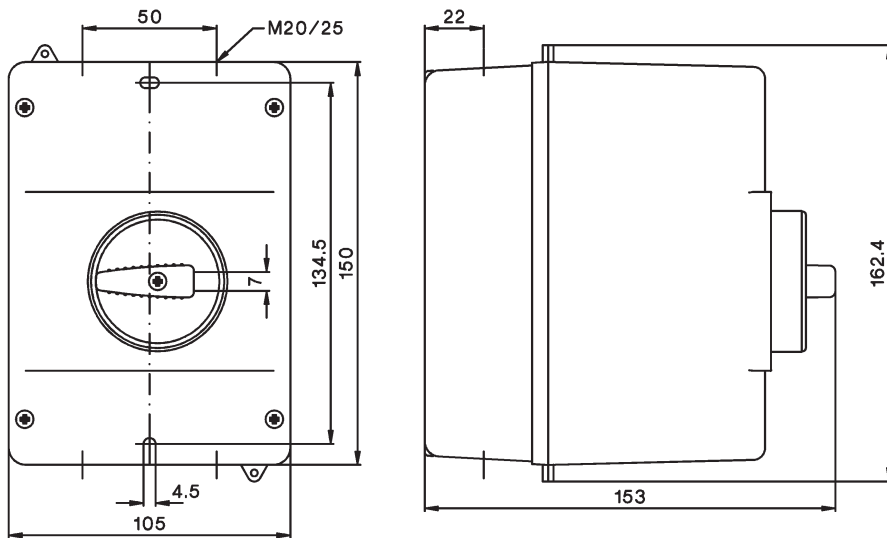


- 1) Side aux. contact
- 2) Magnetic trip alarm
- 3) Shunt or undervoltage release
- 4) Transverse aux. contact
- 5) Handle lock in OFF-position ( $\varnothing 5$  mm)
- 6) 35 mm DIN-rail acc. to EN 50022

Height of arcing spaces (clearance from earthed parts)

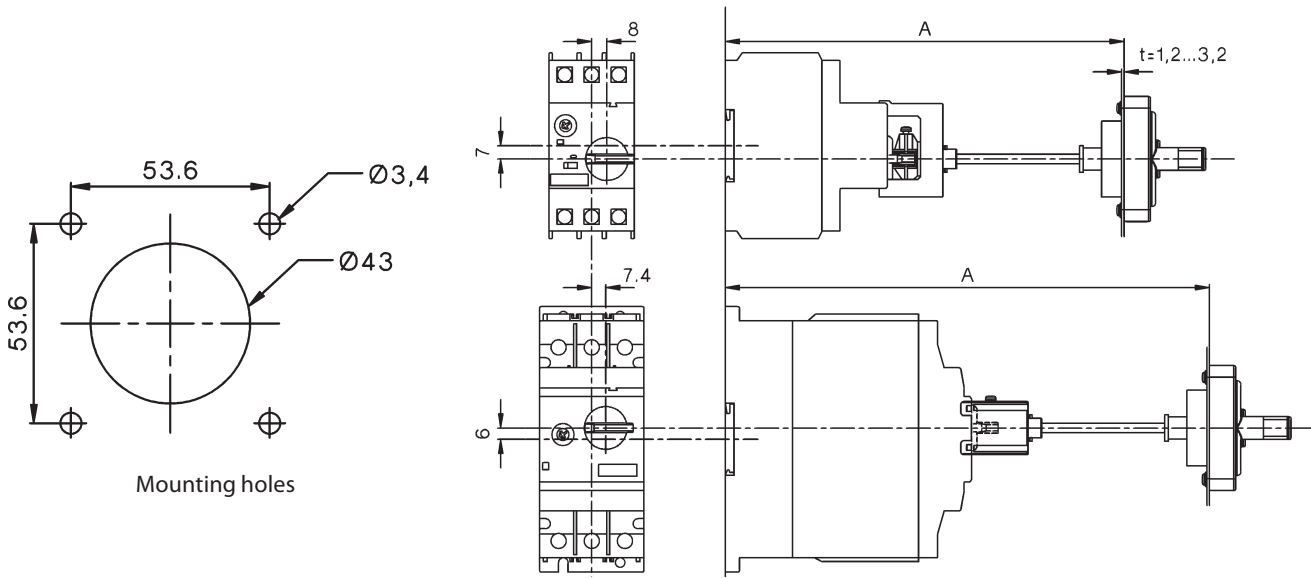
At Ue	(V)	240	415	460	525	690
	(mm)	50	50	50	50	50

**■ Case M4-32R-PFH4, M4-32R-PFHN4**



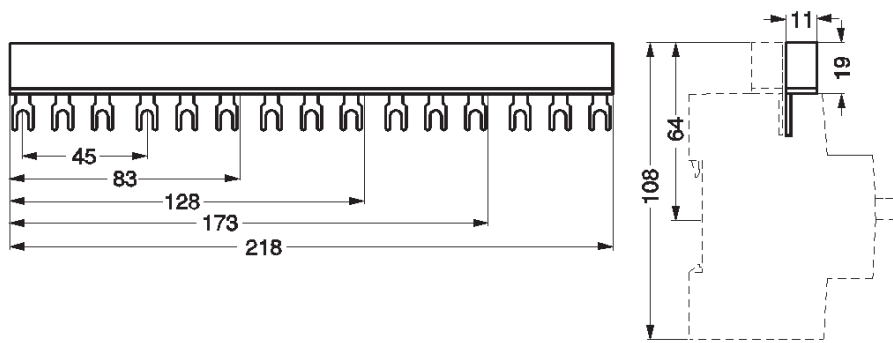
Dimensions in mm

■ Door-coupling rotary mechanisms

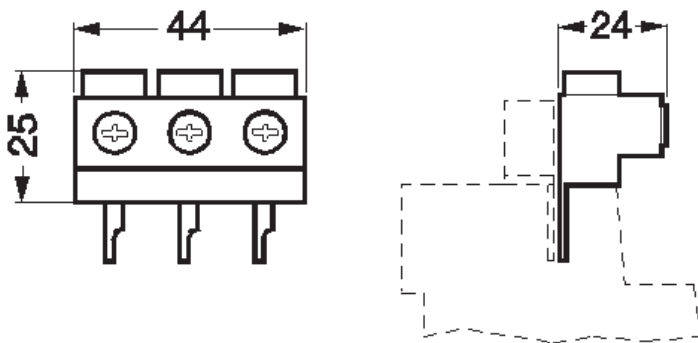


Technical data	M4 32R EH1 115	M4 32R EHN1 115	M4 32R EH1 315	M4 32R EHN1 315
Dimensions	mm 149-210	149-210	149-410	149-410

■ Insulated 3-phase busbar system



M4-32-S..



M4-32-SE

Dimensions in mm



**Price list of circuit breakers for motor protection**

Article	Product Description	Art. no.	Price
<b>Motor protecting switch Size 32 (Toggle operator)</b>			
M4-32T-0.16	Motor prot. switch. -, kW; Ir=0.10 ~ 0.16 A; In-Tr. 2.1 A; Icu AC 400 V=100 kA	226314	45,00 €
M4-32T-0.25	Motor prot. switch. 0.06 kW; Ir=0.16 ~ 0.25 A; In-Tr. 3.3 A; Icu AC 400 V=100 kA	226635	45,00 €
M4-32T-0.4	Motor prot. switch. 0.09 kW; Ir=0.25 ~ 0.40 A; In-Tr. 5.2 A; Icu AC 400 V=100 kA	226636	45,00 €
M4-32T-0.63	Motor prot. switch. 0.12 kW; Ir=0.40 ~ 0.63 A; In-Tr. 8.2 A; Icu AC 400 V=100 kA	226637	45,00 €
M4-32T-1	Motor prot. switch. 0.25 kW; Ir=0.63 ~ 1.00 A; In-Tr. 13.0 A; Icu AC 400 V=100 kA	226638	45,00 €
M4-32T-1.6	Motor prot. switch. 0.55 kW; Ir=1.00 ~ 1.60 A; In-Tr. 20.8 A; Icu AC 400 V=100 kA	226639	50,00 €
M4-32T-2.5	Motor prot. switch. 0.75 kW; Ir=1.60 ~ 2.50 A; In-Tr. 32.5 A; Icu AC 400 V=100 kA	226640	50,00 €
M4-32T-4	Motor prot. switch. 1.50 kW; Ir=2.50 ~ 4.00 A; In-Tr. 52.0 A; Icu AC 400 V=100 kA	226641	50,00 €
M4-32T-6	Motor prot. switch. 2.20 kW; Ir=4.00 ~ 6.00 A; In-Tr. 78.0 A; Icu AC 400 V=100 kA	226642	50,00 €
M4-32T-8	Motor prot. switch. 3.00 kW; Ir=5.00 ~ 8.00 A; In-Tr. 104.0 A; Icu AC 400 V=100 kA	226643	50,00 €
M4-32T-10	Motor prot. switch. 4.00 kW; Ir=6.00 ~ 10.00 A; In-Tr. 130.0 A; Icu AC 400 V=50 kA	226644	54,00 €
M4-32T-13	Motor prot. switch. 5.50 kW; Ir=9.00 ~ 13.00 A; In-Tr. 169.0 A; Icu AC 400 V=50 kA	226645	54,00 €
M4-32T-17	Motor prot. switch. 7.50 kW; Ir=11.00 ~ 17.00 A; In-Tr. 221.0 A; Icu AC 400 V=20 kA	226646	54,00 €
M4-32T-22	Motor prot. switch. 7.50 kW; Ir=14.00 ~ 22.00 A; In-Tr. 286.0 A; Icu AC 400 V=15 kA	226647	54,00 €
M4-32T-26	Motor prot. switch. 11.00 kW; Ir=18.00 ~ 26.00 A; In-Tr. 338.0 A; Icu AC 400 V=15 kA	226648	54,00 €
M4-32T-32	Motor prot. switch. 15.00 kW; Ir=22.00 ~ 32.00 A; In-Tr. 416.0 A; Icu AC 400 V=15 kA	226649	59,00 €
<b>Motor protecting switch Size 32 (Rotary operator)</b>			
M4-32R-0.16	Motor prot. switch. -, kW; Ir=0.10 ~ 0.16 A; In-Tr. 2.1 A; Icu AC 400 V=100 kA	226650	50,00 €
M4-32R-0.25	Motor prot. switch. 0.06 kW; Ir=0.16 ~ 0.25 A; In-Tr. 3.3 A; Icu AC 400 V=100 kA	226651	50,00 €
M4-32R-0.4	Motor prot. switch. 0.09 kW; Ir=0.25 ~ 0.40 A; In-Tr. 5.2 A; Icu AC 400 V=100 kA	226652	50,00 €
M4-32R-0.63	Motor prot. switch. 0.12 kW; Ir=0.40 ~ 0.63 A; In-Tr. 8.2 A; Icu AC 400 V=100 kA	226653	50,00 €
M4-32R-1	Motor prot. switch. 0.25 kW; Ir=0.63 ~ 1.00 A; In-Tr. 13.0 A; Icu AC 400 V=100 kA	226654	55,00 €
M4-32R-1.6	Motor prot. switch. 0.55 kW; Ir=1.00 ~ 1.60 A; In-Tr. 20.8 A; Icu AC 400 V=100 kA	226655	55,00 €
M4-32R-2.5	Motor prot. switch. 0.75 kW; Ir=1.60 ~ 2.50 A; In-Tr. 32.5 A; Icu AC 400 V=100 kA	226656	56,00 €
M4-32R-4	Motor prot. switch. 1.50 kW; Ir=2.50 ~ 4.00 A; In-Tr. 52.0 A; Icu AC 400 V=100 kA	226657	56,00 €
M4-32R-6	Motor prot. switch. 2.20 kW; Ir=4.00 ~ 6.00 A; In-Tr. 78.0 A; Icu AC 400 V=100 kA	226658	56,00 €
M4-32R-8	Motor prot. switch. 3.00 kW; Ir=5.00 ~ 8.00 A; In-Tr. 104.0 A; Icu AC 400 V=100 kA	226659	56,00 €
M4-32R-10	Motor prot. switch. 4.00 kW; Ir=6.00 ~ 10.00 A; In-Tr. 130.0 A; Icu AC 400 V=100 kA	226660	62,00 €
M4-32R-13	Motor prot. switch. 5.50 kW; Ir=9.00 ~ 13.00 A; In-Tr. 169.0 A; Icu AC 400 V=100 kA	226661	62,00 €
M4-32R-17	Motor prot. switch. 7.50 kW; Ir=11.00 ~ 17.00 A; In-Tr. 221.0 A; Icu AC 400 V=50 kA	226662	62,00 €
M4-32R-22	Motor prot. switch. 7.50 kW; Ir=14.00 ~ 22.00 A; In-Tr. 286.0 A; Icu AC 400 V=50 kA	226663	68,00 €
M4-32R-26	Motor prot. switch. 11.00 kW; Ir=18.00 ~ 26.00 A; In-Tr. 338.0 A; Icu AC 400 V=50 kA	226664	78,00 €
M4-32R-32	Motor prot. switch. 15.00 kW; Ir=22.00 ~ 32.00 A; In-Tr. 416.0 A; Icu AC 400 V=50 kA	226665	78,00 €
<b>Motor protecting switch Size 63 (Rotary operator)</b>			
M4-63R-26	Motor prot. switch. 11.00 kW; Ir=18.00 ~ 26.00 A; In-Tr. 338.0 A; Icu AC 400 V=50 kA	226666	139,00 €
M4-63R-32	Motor prot. switch. 15.00 kW; Ir=22.00 ~ 32.00 A; In-Tr. 416.0 A; Icu AC 400 V=50 kA	226667	157,00 €
M4-63R-40	Motor prot. switch. 18.50 kW; Ir=28.00 ~ 40.00 A; In-Tr. 520.0 A; Icu AC 400 V=50 kA	226668	157,00 €
M4-63R-50	Motor prot. switch. 22.00 kW; Ir=34.00 ~ 50.00 A; In-Tr. 650.0 A; Icu AC 400 V=50 kA	226669	177,00 €
M4-63R-63	Motor prot. switch. 30.00 kW; Ir=45.00 ~ 63.00 A; In-Tr. 819.0 A; Icu AC 400 V=50 kA	226670	177,00 €
<b>Accessories – Auxiliary Contact</b>			
M4-HQ11	Transversal, max. 1 pc. per Breaker, 1NO + 1NC	226671	9,50 €
M4-HQ20	Transversal, max. 1 pc. per Breaker, 2NO	226672	11,40 €
M4-HQ02	Transversal, max. 1 pc. per Breaker, 2NC	226673	11,40 €
M4-HS11	Left side mounting, max. 2 pc. per Breaker, 1S + 1Ö	226674	15,10 €
M4-HS20	Left side mounting, max. 2 pc. per Breaker, 2S	226675	15,10 €
M4-HS02	Left side mounting, max. 2 pc. per Breaker, 2Ö	226676	15,10 €

Article	Product Description	Art. no.	Price
<b>Alarm Contact</b>			
M4-MA11	Show anyny tripping, left side mount., max. 1 pc. per Breaker, 1NO + 1NC	226677	21,00 €
M4-M11	Show short circuit tripping, left side mount., max. 1 pc. per Breaker, 1NO + 1NC	226678	21,00 €
<b>Under voltage trip devices</b>			
M4-U24	AC 24 V 50 Hz, 28 V 60 Hz, right side mounting, max. 1 pc. per Breaker	226679	29,40 €
M4-U110	AC 110-127 V 50 Hz, 120 V 60 Hz, right side mounting, max. 1 pc. per Breaker	226680	29,40 €
M4-U230	AC 220-230 V 50 Hz, 240-260 V 60Hz, right side mounting, max. 1 pc. per Breaker	226681	29,40 €
M4-U240	AC 240 V 50 Hz, 277 V 60 Hz, right side mounting, max. 1 pc. per Breaker	226682	29,40 €
M4-U400	AC 380-400 V 50 Hz, 440-460 V 60 Hz, fright side mounting, max. 1 pc. per Breaker	226683	29,40 €
M4-U415	AC 415-440 V 50 Hz, 460-480 V 60 Hz, right side mounting, max. 1 pc. per Breaker	226684	29,40 €
<b>Shunt trip device</b>			
M4-A24	AC 24 V 50 Hz, 28 V 60 Hz, right side mounting, max. 1 pc. per Breaker	226685	29,40 €
M4-A110	AC 110-127 V 50 Hz, 120 V 60 Hz, right side mounting, max. 1 pc. per Breaker	226686	29,40 €
M4-A230	AC 220-230 V 50 Hz, 240-260 V 60 Hz, right side mounting, max. 1 pc. per Breaker	226687	29,40 €
M4-A240	AC 240 V 50 Hz, 277 V 60 Hz, right side mounting, max. 1 pc. per Breaker	226688	29,40 €
M4-A400	AC 380-400 V 50 Hz, 440-460 V 60 Hz, right side mounting, max. 1 pc. per Breaker	226689	29,40 €
M4-A415	AC 415-440 V 50 Hz, 460-480 V 60 Hz, right side mounting, max. 1 pc. per Breaker	226690	29,40 €
<b>Enclosure for M4-32R-.....</b>			
M4-32R PFH4	Plastic enclose with rotary operating mechanism black-grey. (locable)	226691	23,80 €
M4-32R PFHN4	Plastic enclose with rotary operating mechanism yellow-red. (locable)	226692	25,30 €
<b>Scale cover</b>			
M4-K	Scale cover (sealable) for covering the current setting scale.	226693	1,20 €
<b>Push-in lugs</b>			
M4-32 L	Push in lugs for screwing the circuit breaker onto mounting plates (10 pcs. set)	226694	8,90 €
<b>Door-coupling rotary mechanisms IP65</b>			
M4-32R EH1 115	Door-coupling rotary handle, black, IP65,Shaft 115 mm	226695	27,50 €
M4-32R EH1 315	Door-coupling rotary handle, black, IP65,Shaft 315 mm	226696	32,90 €
M4-63R EH1 115	Door-coupling rotary handle, black, IP65,Shaft 115 mm	226697	27,50 €
M4-63R EH1 315	Door-coupling rotary handle, black, IP65,Shaft 315 mm	226698	32,90 €
M4-32R EHN1 115	Door-coupling rotary handle, red/yellow, IP65,Shaft 115 mm	226699	27,50 €
M4-32R EHN1 315	Door-coupling rotary handle, red/yellow, IP65,Shaft 315 mm	226700	32,90 €
M4-63R EHN1 115	Door-coupling rotary handle, red/yellow, IP65,Shaft 115 mm	226701	27,50 €
M4-63R EHN1 315	Door-coupling rotary handle, red/yellow, IP65,Shaft 315 mm	226702	32,90 €
<b>Insulated 3-phase busbar system</b>			
M4-32 S2	3-phase busbar for 2 circuit breakers IP 20 (Spade connection)	226703	7,20 €
M4-32 S3	3-phase busbar for 2 circuit breakers IP 10 (Spade connection)	226704	9,30 €
M4-32 S4	3-phase busbar for 2 circuit breakers IP 10 (Spade connection)	226705	14,00 €
M4-32 S5	3-phase busbar for 2 circuit breakers IP 10 (Spade connection)	226706	16,50 €
M4-32SE	Line side terminal 3-pole, connection from above (Spade)	226707	9,40 €
M4-32SF	Cover for tags. Touch guard for emptyspaces.	226708	1,50 €
M4-63 S2	3-phase busbar for 2 circuit breakers IP 20	226709	8,20 €

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