



# **Circuit-Breakers C4 For Motor Protection**

## **Provisional Data**



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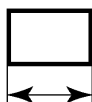
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## Circuit Breakers C4 for Motor Control



Rated Current $I_n$	Suitable for motors <sup>1)</sup> 3~400V kW	Setting range Thermal Overload Release	Instantaneous Short Circuit Release	Short Circuit Breaking Capacity at 3~400V kA ( $I_{CU}$ )	Type	Pack pcs.	Weight approx. kg/pc.
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### Circuit Breaker C4-32T-..



switch type

0,16	-	0,10 – 0,16	2,1	100	C4-32T-0,16	1	0,32
0,25	0,06	0,16 – 0,25	3,3	100	C4-32T-0,25	1	0,32
0,4	0,09	0,25 – 0,4	5,2	100	C4-32T-0,4	1	0,32
0,63	0,18	0,4 – 0,63	8,2	100	C4-32T-0,63	1	0,32
1	0,25	0,63 – 1	13	100	C4-32T-1	1	0,32
1,6	0,55	1 – 1,6	20,8	100	C4-32T-1,6	1	0,32
2,5	0,75	1,6 – 2,5	32,5	100	C4-32T-2,5	1	0,32
4	1,5	2,5 – 4	52	100	C4-32T-4	1	0,32
6	2,2	4 – 6	78	100	C4-32T-6	1	0,32
8	3	5 – 8	104	100	C4-32T-8	1	0,32
10	4	6 – 10	130	50	C4-32T-10	1	0,32
13	5,5	9 – 13	169	50	C4-32T-13	1	0,32
17	7,5	11 – 17	221	20	C4-32T-17	1	0,32
22	7,5	14 – 22	286	15	C4-32T-22	1	0,32
26	11	18 – 26	338	15	C4-32T-26	1	0,32
32	15	22 – 32	416	15	C4-32T-32	1	0,32

### Circuit Breaker C4-32R-..



rotary type

0,16	-	0,10 – 0,16	2,1	100	C4-32R-0,16	1	0,36
0,25	0,06	0,16 – 0,25	3,3	100	C4-32R-0,25	1	0,36
0,4	0,09	0,25 – 0,4	5,2	100	C4-32R-0,4	1	0,36
0,63	0,18	0,4 – 0,63	8,2	100	C4-32R-0,63	1	0,36
1	0,25	0,63 – 1	13	100	C4-32R-1	1	0,36
1,6	0,55	1 – 1,6	20,8	100	C4-32R-1,6	1	0,36
2,5	0,75	1,6 – 2,5	32,5	100	C4-32R-2,5	1	0,36
4	1,5	2,5 – 4	52	100	C4-32R-4	1	0,36
6	2,2	4 – 6	78	100	C4-32R-6	1	0,36
8	3	5 – 8	104	100	C4-32R-8	1	0,36
10	4	6 – 10	130	100	C4-32R-10	1	0,36
13	5,5	9 – 13	169	100	C4-32R-13	1	0,36
17	7,5	11 – 17	221	50	C4-32R-17	1	0,36
22	7,5	14 – 22	286	50	C4-32R-22	1	0,36
26	11	18 – 26	338	50	C4-32R-26	1	0,36
32	15	22 – 32	416	50	C4-32R-32	1	0,36

### Circuit Breaker C4-63R-..



rotary type

26	12,5	18 – 26	338	50	C4-63R-26	1	1,0
32	15	22 – 32	416	50	C4-63R-32	1	1,0
40	18,5	28 – 40	520	50	C4-63R-40	1	1,0
50	22	34 – 50	650	50	C4-63R-50	1	1,0
63	30	45 – 63	819	50	C4-63R-63	1	1,0

### Circuit Breaker C4-100R-..



rotary type

63	30	45 – 63	819	50	C4-100R-63	1	2,2
75	37	55 – 75	975	50	C4-100R-75	1	2,2
90	45	70 – 90	1170	50	C4-100R-90	1	2,2
100	-	80 – 100	1300	50	C4-100R-100	1	2,2

1) Approximate values of standard motors

Contacts	Rated Operational Current			Type	Pack	Weight approx.
	AC15 24V A	240V A	AC1 240V A			
NO					pcs.	kg/pc.
NC						

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



1	1	3	2	5	C 4 HQ11	1	0,02
2	-	3	2	5	C4 HQ20	1	0,02
-	2	3	2	5	C4 HQ02	1	0,02

Auxiliary Contact Block for left hand side mounting, 1 or 2 pcs. per circuit-breaker



1	1	6	4	10	C4 HS11	1	0,03
2	-	6	4	10	C4 HS20	1	0,03
-	2	6	4	10	C4 HS02	1	0,03

Alarm Switch (any tripping) for left hand side mounting, max. 1 pc. per circuit-breaker



1	1	6	4	10	C4 MA11	1	0,04
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Alarm Switch (short circuit) for left hand side mounting, max. 1 pc. per circuit-breaker for C4/32 only



1	1	6	4	10	C4 M11	1	0,04
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Undervoltage Releases for right hand side mounting, max. 1 pc. per circuit-breaker

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



24V 50Hz, 28V 60Hz	C4 U24	1	0,11
110-127V 50Hz, 120V 60Hz	C4 U110	1	0,11
220-230V 50Hz, 240-260V 60Hz	C4 U230	1	0,11
240V 50Hz, 277V 60Hz	C4 U240	1	0,11
380-400V 50Hz, 440-460V 60Hz	C4 U400	1	0,11
415-440V 50Hz, 460-480V 60Hz	C4 U415	1	0,11

Shunt Releases for right hand side mounting, max. 1 pc. per circuit-breaker

Trips the circuit-breaker when the release coil energized.



24V 50Hz, 28V 60Hz	C4 A24	1	0,12
110-127V 50Hz, 120V 60Hz	C4 A110	1	0,12
220-230V 50Hz, 240-260V 60Hz	C4 A230	1	0,12
240V 50Hz, 277V 60Hz	C4 A240	1	0,12
380-400V 50Hz, 440-460V 60Hz	C4 A400	1	0,12
415-440V 50Hz, 460-480V 60Hz	C4 A415	1	0,12

Enclosure for circuit breaker C4 32R protection degree IP65



Plastic enclose with rotary operating mechanism black-grey lockable, with N- and PE-terminal space for 1 transverse and side aux. contact + release	C4 32R PFH4	1	0,53
Enclose with rotary operating mechanism yellow - red, lockable with N- and PE-terminal space for 1 transverse and side aux. contact + release	C4 32R PFHN4	1	0,53

			for circuit- breaker	Type	Pack pcs.	Weight approx. kg/pc.
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Accessories

	Scale cover sealable	for covering the current setting scale	C4-32...100	C4 K	10	0,003
	Push-in lugs	for screwing the circuit-breaker onto mounting plates. 2 units required (1 bag with 10 units)	C4-32	C4 32 L	10	0,01
	Terminal block	up to 600V acc. UL 489	C4-32R	C4 32R E	on request	
	Insulation barriers	up to 600V acc. UL 489 for increased distances and clearances acc. to UL Type "E" 4 pcs per device (2 pcs on each side)	C4-100	C4 100 E	2	0,01

Door-coupling rotary mechanisms

The door-coupling rotary operating mechanisms consist of a knob, a coupling driver and an extension shaft (5 mm x 5 mm). The door-coupling rotary operating mechanisms are designed for degree of protection IP 65. 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.

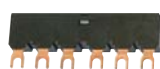


	Door-coupling rotary mechanism black	extension shaft 130mm	C4-32...100	C4 32R-100R ZH4 130	1	0,1
		extension shaft 330mm with supporting bracket	C4-32...100	C4 32R-100R ZH4 330	1	0,3
	Emergency-Stop Door-coupling rotary mechanism; red/yellow	extension shaft 130mm	C4-32...100	C4 32R-100R ZHN4 130	1	0,1
		extension shaft 330mm with supporting bracket	C4-32...100	C4 32R-100R ZHN4 330	1	0,3

			for circuit- breaker	Type	Pack pcs.	Weight approx. kg/pc.
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Insulated 3-phase busbar system

For feeding several modular circuit-breakers on standard mounting rails, insulated, shock-protected  
Rated operational voltage max. 690 V



	3-phase busbars modular spacing 45mm	for 2 circuit-breakers	C4-32	C4 32 S2	1	0,03
		for 3 circuit-breakers		C4 32 S3	1	0,05
		for 4 circuit-breakers		C4 32 S4	1	0,07
		for 5 circuit-breakers		C4 32 S5	1	0,10



	3-phase busbars modular spacing 55 mm	for 2 circuit-breakers	C4-63	C4 63 S2	1	0,15
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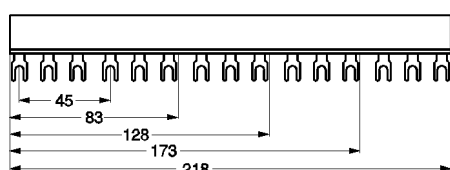


	Line side terminal 3-pole, connection from above	Conductor cross-section solid or stranded 6-25mm <sup>2</sup> with end sleeve 4-16mm <sup>2</sup>	C4-32	C4 32 SE	1	0,04
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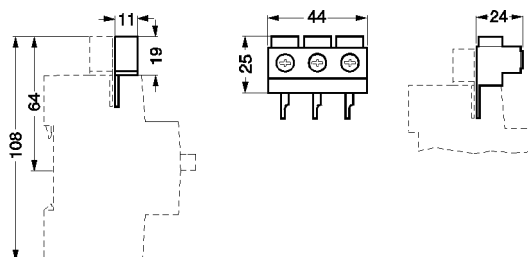


	Cover for tags	Touch guard for empty spaces	C4-32	C4 32 SF	1	0,003
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3-phase busbar for C4-32, modular spacing 45mm



3-phase line-side terminal C4-32 SE



Type Pack Weight approx.  
pcs. kg/pc.

DIN-rail adapters with DIN-rail for contactor



for C4-32.. DIN-rails moveable for easy mounting and replacing can be connected on one 35 mm DIN-rail (high 15mm) or two 35 mm-DIN-rails (125mm distance) suitable for contactors MB-.., MC(D)10 to MC(D)40	C4 32 HU1	1	0,1
Adapter, for C4-63.. can be connected on two 35 mm DIN-rails (125mm distance) or one 75 mm DIN-rail, or screw mounting suitable for contactors MC(D)24 to MC(D)40, MC50 to MC74	C4 63 HU1	1	0,2
Adapter, for C4-100.. can be connected on two 35 mm DIN-rails (125mm distance) or one 75 mm DIN-rail, or screw mounting suitable for contactors MC50 to MC74	C4 100 HU1	1	0,2

Busbar adapters for 60-mm-system, 3 copper busbars acc. to DIN 46433



for C4-32 up to 32A, 690V 45mm width, 182mm long bar width: 12 und 15mm bar thickness: 5 and 10mm	C4 32 SA60	1	0,18
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Link modules, for mechanical and electrical connection between circuit-breaker and contactor



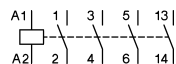
for C4-32.. with contactors MB-..	max. 32A	C4 32 VK1	1	0,015
for C4-32.. with contactors MC10 to MC22	max. 32A	C4 32 VK3	1	0,02
for C4-32.. with contactors MCD10 to MCD22	max. 32A	C4 32 VKG3	1	0,02

Link modules, for electrical connection between circuit-breaker and contactor

for C4-32.. with contactors MC(D)24 to MC(D)40	max. 32A	C4 32 VD	1	0,01
for C4-63R. with contactors MC24 to MC74	max. 63A	C4 63 VD	1	0,02
for C4-63R. with contactors MCD24 to MCD40	max. 63A	C4 63 VDG	1	0,02
for C4-100R. with contactors MC50 to MC74	max. 100A	C4 100 VD	1	0,02

Motor AC3 400V kW	Current $I_{th}$ A	add. contact blocks max.	Type	Coil VAC ▼	Pack pcs.	Weight approx. kg/pcs.
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Contactors for Circuit Breakers C4-32.



4	25	4 HN..	MC10-S-10 230 VK3	1	0,25
5,5	25	4 HN..	MC14-S-10 230 VK3	1	0,25
7,5	32	4 HN..	MC18-S-10 230 VK3	1	0,25
11	32	4 HN..	MC22-S-10 230 VK3	1	0,25

# Components for Fuseless Load Feeders, DIN-Rail Mounting

Type of coordination "1" 3x415V 10kA <sup>1)</sup>



Motor 3~400V kW	Setting range A	Circuit-breaker page 2 Type	Link module Type	Contactor <sup>2)</sup> 220-230V 50Hz Type	DIN-rail adapter Type
-	0,10 – 0,16	C4-32T-0,16	C4 32 VK1	MB09-S-10 230	-
0,06	0,16 – 0,25	C4-32T-0,25	C4 32 VK1	MB09-S-10 230	-
0,09	0,25 – 0,4	C4-32T-0,4	C4 32 VK1	MB09-S-10 230	-
0,18	0,4 0– 0,63	C4-32T-0,63	C4 32 VK1	MB09-S-10 230	-
0,25	0,63 – 1	C4-32T-1	C4 32 VK1	MB09-S-10 230	-
0,55	1,0 – 1,6	C4-32T-1,6	C4 32 VK1	MB09-S-10 230	-
0,75	1,6 – 2,5	C4-32T-2,5	C4 32 VK1	MB09-S-10 230	-
1,5	2,5 – 4	C4-32T-4	C4 32 VK1	MB09-S-10 230	-
2,2	4 – 6	C4-32T-6	C4 32 VK1	MB09-S-10 230	-
3	5 – 8	C4-32T-8	C4 32 VK1	MB09-S-10 230	-
4	6 – 10	C4-32T-10	C4 32 VK1	MB09-S-10 230	-
5,5	9 – 13	C4-32T-13	C4 32 VK1	MB12-S-10 230	-
7,5	11 – 17	C4-32T-17	-	MC18-S-10 230 VK3	-
7,5	14 – 22	C4-32T-22	-	MC22-S-10 230 VK3	-
11	18 – 26	C4-32T-26	-	MC22-S-10 230 VK3	-
15	22 – 32	C4-32T-32	C4 32 VD	MC32-S-00 230	C4 32 HU1
-	0,10 – 0,16	C4-32R-0,16	-	MC10-S-10 230 VK3	-
0,06	0,16 – 0,25	C4-32R-0,25	-	MC10-S-10 230 VK3	-
0,09	0,25 – 0,4	C4-32R-0,4	-	MC10-S-10 230 VK3	-
0,18	0,4 0– 0,63	C4-32R-0,63	-	MC10-S-10 230 VK3	-
0,25	0,63 – 1	C4-32R-1	-	MC10-S-10 230 VK3	-
0,55	1,0 – 1,6	C4-32R-1,6	-	MC10-S-10 230 VK3	-
0,75	1,6 – 2,5	C4-32R-2,5	-	MC10-S-10 230 VK3	-
1,5	2,5 – 4	C4-32R-4	-	MC10-S-10 230 VK3	-
2,2	4 – 6	C4-32R-6	-	MC10-S-10 230 VK3	-
3	5 – 8	C4-32R-8	-	MC10-S-10 230 VK3	-
4	6 – 10	C4-32R-10	-	MC10-S-10 230 VK3	-
5,5	9 – 13	C4-32R-13	-	MC14-S-10 230 VK3	-
7,5	11 – 17	C4-32R-17	-	MC18-S-10 230 VK3	-
7,5	14 – 22	C4-32R-22	-	MC22-S-10 230 VK3	-
11	18 – 26	C4-32R-26	-	MC22-S-10 230 VK3	-
15	22 – 32	C4-32R-32	C4 32 VD	MC32-S-00 230	C4 32 HU1
12,5	18 – 26	C4-63R-26	C4 63 VD	MC32-S-00 230	C4 63 HU1
15	22 – 32	C4-63R-32	C4 63 VD	MC32-S-00 230	C4 63 HU1
18,5	28 – 40	C4-63R-40	C4 63 VD	MC40-S-00 230	C4 63 HU1
22	34 – 50	C4-63R-50	C4 63 VD	K3-50A00 230	C4 63 HU1
30	45 – 63	C4-63R-63	C4 63 VD	K3-62A00 230	C4 63 HU1
30	45 – 63	C4-100R-63	C4 100 VD	K3-62A00 230	C4 100 HU1
37	55 – 75	C4-100R-75	C4 100 VD	K3-74A00 230	C4 100 HU1
45	70 – 90	C4-100R-90	-	K85A22 230	-
-	80 – 100	C4-100R-100	-	K110A22 230	-

1) Other conditions on request

2) Contactors MB.. 220-230V 50Hz, Contactors MC.. 220-240V 50Hz, .

## 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  $I_{cu}$  and the rated service short-circuit breaking capacity  $I_{cs}$  of the C4 circuit-breakers with different operational voltages as a function of the rated current  $I_n$  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.

Circuit-breaker	Rated current $I_n$	up to AC 240V <sup>2)</sup>			up to AC 400V <sup>2)</sup> up to AC 415V <sup>3)</sup>			up to AC 440V <sup>2)</sup> up to AC 460V <sup>3)</sup>			up to AC 500V <sup>2)</sup> up to AC 525V <sup>3)</sup>			up to AC 690V <sup>2)</sup>		
		$I_{cu}$	$I_{cs}$	max. fuse <sup>1)</sup> (gL/gG)	$I_{cu}$	$I_{cs}$	max. fuse <sup>1)</sup> (gL/gG)	$I_{cu}$	$I_{cs}$	max. fuse <sup>1)</sup> (gL/gG)	$I_{cu}$	$I_{cs}$	max. fuse <sup>1)</sup> (gL/gG)	$I_{cu}$	$I_{cs}$	max. fuse <sup>1)</sup> (gL/gG)
Type	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A
C4-32T	0,16 ... 0,63	100	100	--	100	100	--	100	100	--	100	100	--	100	100	--
	1	100	100	--	100	100	--	100	100	--	100	100	--	100	100	--
	1,6	100	100	--	100	100	--	100	100	--	100	100	--	3	3	20
	2,5	100	100	--	100	100	--	100	100	--	50	38	50	3	3	35
	4	100	100	--	100	100	--	50	38	50	15	11	40	3	3	40
	6	100	100	--	100	100	--	15	11	50	10	8	40	3	3	50
	8	100	100	--	100	100	--	15	11	63	10	8	63	3	3	63
	10	100	100	--	50	38	80	15	11	63	6	5	63	3	3	63
	13	100	100	--	50	38	80	10	8	80	6	5	80	3	3	63
	17	50	38	--	20	15	100	10	8	80	6	5	80	3	3	63
	22	40	30	125	15	11	100	8	6	100	6	5	80	3	3	63
	26	40	30	125	15	11	100	8	6	100	6	5	80	3	3	63
	32	30	22	125	15	11	100	6	4	100	5	4	80	3	3	63
C4-32R	0,16 ... 1,0	100	100	--	100	100	--	100	100	--	100	100	--	100	100	--
	1,6	100	100	--	100	100	--	100	100	--	100	100	--	100	100	--
	2,5	100	100	--	100	100	--	100	100	--	100	100	--	8	8	35
	4	100	100	--	100	100	--	100	100	--	100	100	--	8	8	40
	6	100	100	--	100	100	--	100	100	--	100	100	--	6	6	50
	8	100	100	--	100	100	--	50	38	80	50	38	63	6	6	63
	10	100	100	--	100	100	--	50	38	80	50	38	80	6	6	63
	13	100	100	--	100	100	--	50	38	80	42	32	80	6	6	63
	17	100	100	--	50	38	100	20	15	80	10	8	80	4	4	63
	22	100	100	--	50	38	125	20	15	100	10	8	80	4	4	63
	26	100	100	--	50	38	125	20	15	100	10	8	80	4	4	63
	32	100	100	--	50	38	125	20	15	100	10	8	80	4	4	63
	C4-63R	26	100	100	--	50	50	125	35	27	125	12	9	100	5	5
32		100	100	--	50	50	125	35	27	125	10	8	100	5	5	80
40		100	100	--	50	50	160	35	27	125	10	8	100	5	5	80
50		100	100	--	50	50	160	35	27	125	10	8	100	5	5	80
63		100	100	--	50	50	160	35	27	160	10	8	100	5	5	80
C4-100R		63	100	100	--	50	38	160	40	30	160	12	9	100	6	5
	75	100	100	--	50	38	160	40	30	160	8	6	125	5	4	100
	90	100	100	--	50	38	160	40	30	160	8	6	125	5	4	125
	100	100	100	--	50	38	160	40	30	160	8	6	125	5	4	125

-- No back-up fuse required

1) Back up fuse required if short-circuit current at installation point >  $I_{cu}$

2) 10 % overvoltage

3) 5 % overvoltage

**Main Circuit**





Type		C4-32T	C4-32R	C4-63R	C4-100R
Number of poles		3	3	3	3
Max. rated current $I_{nmax}$ (=max. rated operational current $I_e$ )	A	32	32	63	100
Permissible ambient temperature					
Storage/transport	°C	-50 to +80	-50 to +80	-50 to +80	-50 to +80
Operation	°C	-20 to +60	-20 to +60	-20 to +60	-20 to +60
Storage/transport	°F	-58 to +176	-58 to +176	-58 to +176	-58 to +176
Operation	°F	-4 to +140	-4 to +140	-4 to +140	-4 to +140
Rated insulation voltage $U_i$	V	690 <sup>1)</sup>	690 <sup>1)</sup>	1000 <sup>2)</sup>	1000 <sup>2)</sup>
Rated impulse withstand voltage $U_{imp}$	kV	6	6	8	8
Rated operational voltage $U_e$	V	690	690	690	690
Rated frequency	Hz	50/60	50/60	50/60	50/60
Utilization category					
IEC 60947-2 (circuit-breaker)		A	A	A	A
IEC 60947-4-1 (motor starter)		AC3	AC3	AC3	AC3
Class	acc. to IEC 60947-4-1	10	10	10	10
Power loss $P_v$ per circuit-breaker	$I_n \rightarrow$ up to 4 A	W	9,8	9,8	-
dependent on rated current $I_n$	$I_n \rightarrow$ 6 up to 26 A	W	8	8	-
(upper setting range)	$I_n \rightarrow$ 32 A	W	3,9	3,9	-
R per conducting path = $P/I^2 \times 3$	$I_n \rightarrow$ 26 up to 63 A	W	-	-	12,6
	$I_n \rightarrow$ up to 63 A	W	-	-	11,9
	$I_n \rightarrow$ 75 up to 100 A	W	-	-	15
Shock resistance	acc. to IEC 60068 Part 2-27	g	25	25	25
Degree of protection	acc. to IEC 60529		IP 20	IP 20	IP 20
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			100 000	100 000	25 000
Max. operating frequency per hour (motor starts) 1/h	25		25	25	25

1) Suitable at 690V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{imp} = 6kV$ .

2) Suitable at 1000V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{imp} = 8kV$ .  
Data for other conditions on request.

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

## Conductor cross-sections for main circuit

Type		C4-32T	C4-32R	C4-63R	C4-100R
Terminal type, screw type		Pz2 	Pz2 	Pz2 	4mm hexagon socket screw 
Tightening torque	Nm lb-in	0,8 to 2,5 7 to 22	0,8 to 2,5 7 to 22	3 to 4,5 26 to 39	4 to 6 35 to 53
Conductor cross-sections solid	mm <sup>2</sup>	1 x (1 to 10)	1 x (1 to 10)	1 x (0,75 to 35)	1 x (2,5 to 70)
	mm <sup>2</sup>	2 x (1 to 6)	2 x (1 to 6)	2 x (0,75 to 25)	2 x (2,5 to 50)
	AWG	1 x (18 to 8)	1 x (18 to 8)	1 x (18 to 2)	1 x (12 to 2/0)
	AWG	2 x (18 to 10)	2 x (18 to 10)	2 x (18 to 4)	2 x (12 to 1/0)
stranded	mm <sup>2</sup>	1 x (1 to 6)	1 x (1 to 6)	1 x (0,75 to 35)	1 x (2,5 to 70)
	mm <sup>2</sup>	2 x (1 to 6)	2 x (1 to 6)	2 x (0,75 to 25)	2 x (2,5 to 50)
	AWG	1 x (18 to 10)	1 x (18 to 10)	1 x (18 to 2)	1 x (12 to 2/0)
	AWG	2 x (18 to 10)	2 x (18 to 10)	2 x (18 to 4)	2 x (12 to 1/0)
flexible	mm <sup>2</sup>	1 x (1 to 6)	1 x (1 to 6)	1 x (0,75 to 25)	1 x (2,5 to 50)
	mm <sup>2</sup>	2 x (0,75 to 4)	2 x (0,75 to 4)	2 x (0,75 to 16)	2 x (2,5 to 35)
	AWG	1 x (18 to 10)	1 x (18 to 10)	1 x (18 to 4)	1 x (12 to 1/0)
	AWG	2 x (18 to 10)	2 x (18 to 10)	2 x (18 to 6)	2 x (10 to 2)

## Auxiliary switches

Aux. Type	Switching capacity			Control voltage	
C4 HQ..	Front transverse auxiliary switch				
	Rated operational voltage Ue	AC	V	24	240
	Rated operational current Ie/AC-15		A	3	3
	Rated operational current Ie/AC-12 Ith		A	5	5
	Rated operational voltage Ue	DC L/R 200 ms	V	24	220
	Rated operational current Ie/DC-13		A	1	0,1
C4 HS..	Lateral auxiliary switch and signalling switch				
C4 M..	Rated operational voltage Ue	AC	V	24	240
	Rated operational current Ie/AC-15		A	6	4
	Rated operational current Ie/AC-12 Ith		A	10	10
	Rated operational voltage Ue	DC L/R 200 ms	V	24	220
	Rated operational current Ie/DC-13		A	2	0,25
C4 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 0,35 × Us
			pick-up	V	0,85 to 1,1 × Us
C4 A..	Shunt release	Power consumption during pick-up		VA/W	8,5/6
				VA/W	3/1,2
			Response voltage acc. to IEC 60947-1, trip	V	0,7 to 1,1 × Us
Short-circuit protection for auxiliary and control circuits					
	Fuse	gL/gG	A	10	
	Miniature circuit breaker C-characteristic		A	6	
Conductor cross-sections for auxiliary and control circuits				Screw-type Pz2	
	solid	mm <sup>2</sup>		1 x (0,5 bis 2,5) / 2 x (0,5 bis 2,5) <sup>1)</sup>	
	flexible	mm <sup>2</sup>		1 x (0,5 to 4) / 2 x (0,75 to 2,5)	
	AWG-wires, solid	AWG		1 x (20 bis 14) / 2 x (20 bis 14) <sup>1)</sup>	
	flexible	AWG		1 x (20 to 10) / 2 x (18 to 14)	

1) C4 HQ.. 1 solid conductor only

# Permissible ratings of devices approved for North America



## Circuit breakers C4 as „Manual Motor Starter“

If used as „Manual Motor Starter“ the circuit breaker is always operated in combination with a short circuit device. For use with approbated fuses or circuit breakers according to UL489 or CSA22.2 No. 5 only. The sizes are selected according to National Electrical Code (UL), or Canadian Electrical Code (CSA).

### C4-32T

Rated operational current Ie	A	0.16	0.25	0.4	0.63	1	1.6	2.5	4	6	8	10	13	17	22	26	32
<b>Max. short-circuit current</b>																	
240V	kA	100	100	100	100	100	100	100	100	100	100	50	50	40	30	30	20
480V	kA	50	50	50	50	50	50	50	50	25	25	10	10	10	10	7,5	7,5
600V	kA	10	10	10	10	10	10	10	5	5	5	5	5	5	5	5	5
<b>Motor load</b>																	
<b>1-phase</b>																	
115V	HP	-	-	-	-	-	-	-	1/8	1/4	1/3	1/2	1/2	1	1 1/2	2	2
230V	HP	-	-	-	-	-	1/10	1/6	1/3	1/2	1	1 1/2	2	3	3	3	5
<b>Motor load</b>																	
<b>3-phase</b>																	
200V	HP	-	-	-	-	-	-	1/2	3/4	1	2	2	3	3	5	7 1/2	7 1/2
230V	HP	-	-	-	-	-	-	1/2	3/4	1 1/2	2	3	3	5	7 1/2	7 1/2	10
460V	HP	-	-	-	-	-	3/4	1	2	3	5	5	7 1/2	10	15	15	20
600V	HP	-	-	-	-	1/2	3/4	1 1/2	3	5	5	7 1/2	10	15	20	20	30
Max. rated fuse	A	1	1	1	1	3	6	10	15	20	30	40	50	60	80	100	125
Max. breaker size	A	15	15	15	15	15	15	15	15	20	30	40	50	60	80	100	125

### C4-32R

Rated operational current Ie	A	0.16	0.25	0.4	0.63	1	1.6	2.5	4	6	8	10	13	17	22	26	32
<b>Max. short-circuit current</b>																	
240V	kA	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
480V	kA	50	50	50	50	50	50	50	50	50	50	50	50	30	30	30	30
600V	kA	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
<b>Motor load</b>																	
<b>1-phase</b>																	
115V	HP	-	-	-	-	-	-	-	1/8	1/4	1/3	1/2	1/2	1	1 1/2	2	2
230V	HP	-	-	-	-	-	1/10	1/6	1/3	1/2	1	1 1/2	2	3	3	3	5
<b>Motor load</b>																	
<b>3-phase</b>																	
200V	HP	-	-	-	-	-	-	1/2	3/4	1	2	2	3	3	5	7 1/2	7 1/2
230V	HP	-	-	-	-	-	-	1/2	3/4	1 1/2	2	3	3	5	7 1/2	7 1/2	10
460V	HP	-	-	-	-	-	3/4	1	2	3	5	5	7 1/2	10	15	15	20
600V	HP	-	-	-	-	1/2	3/4	1 1/2	3	5	5	7 1/2	10	15	20	20	30
Max. rated fuse	A	1	1	1	1	3	6	10	15	20	30	40	50	60	80	100	125
Max. breaker size	A	15	15	15	15	15	15	15	15	20	30	40	50	60	80	100	125

### C4-63R

Rated operational current Ie	A	26	32	40	50	63
<b>Max. short-circuit current</b>						
240V	kA	100	100	100	100	100
480V	kA	50	50	50	50	50
600V	kA	10	10	10	10	10
<b>Motor load</b>						
<b>1-phase</b>						
115V	HP	2	2	3	5	5
230V	HP	3	5	7 1/2	10	10
<b>Motor load</b>						
<b>3-phase</b>						
200V	HP	7 1/2	7 1/2	10	15	20
230V	HP	7 1/2	10	10	15	20
460V	HP	15	20	30	30	40
600V	HP	20	30	30	40	60
Max. rated fuse	A	100	125	150	200	250
Max. breaker size	A	100	125	150	200	250

### C4-100R

Rated operational current Ie	A	63	75	90	100
<b>Max. short-circuit current</b>					
240V	kA	100	100	100	100
480V	kA	25	25	25	25
600V	kA	10	10	10	10
<b>Motor load</b>					
<b>1-phase</b>					
115V	HP	5	5	7 1/2	10
230V	HP	10	15	20	20
<b>Motor load</b>					
<b>3-phase</b>					
200V	HP	20	20	25	30
230V	HP	20	25	30	30
460V	HP	40	50	60	75
600V	HP	60	60	75	100
Max. rated fuse	A	250	300	350	400
Max. breaker size	A	250	300	350	400



## Permissible ratings of devices approved for North America

### Circuit breakers C4 as „Combination Motor Controller Type E“ and "Suitable for Group Installation"

Acc to UL508 demands a line-side 1 inch air and 2 inch creepage distance for „Combination Motor Controller Type E“ is necessary. Therefore circuit-breaker C4-32R is approved to UL 508 in combination with the Terminal block C4 32R E. Circuit-breakers C4-100 are approved to UL 508 in combination with the insulation barriers C4 100 E. According to CSA these terminal blocks can be omitted when the device is used as „Combination Motor Controller Type E“.

#### C4-32R (+C4 32R E)

Rated operational current I <sub>e</sub>		A	0.16	0.25	0.4	0.63	1	1.6	2.5	4	6	8	10	13	17	22	26	32		
Max. short-circuit current																				
	240V	kA	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
	480V	kA	50	50	50	50	50	50	50	50	50	50	50	50	30	30	30	30		
	600V	kA	25	25	25	25	25	25	25	25	25	25	25	25	10	10	10	10		
Motor load																				
1-phase	115V	HP	-	-	-	-	-	-	-	1/8	1/4	1/3	1/2	1/2	1	1 1/2	2	2		
	230V	HP	-	-	-	-	-	1/10	1/6	1/3	1/2	1	1 1/2	2	3	3	5	5		
Motor load																				
3-phase	200V	HP	-	-	-	-	-	-	1/2	3/4	1	2	2	3	3	5	7 1/2	7 1/2		
	230V	HP	-	-	-	-	-	-	1/2	3/4	1 1/2	2	3	3	5	7 1/2	7 1/2	10		
	460V	HP	-	-	-	-	-	3/4	1	2	3	5	5	7 1/2	10	15	15	20		
	600V	HP	-	-	-	-	1/2	3/4	1 1/2	3	5	5	7 1/2	10	15	20	20	30		
Max. rated fuse or breaker		A	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	

#### C4-63R

Rated operational current I <sub>e</sub>		A	26	32	40	50	63
Max. short-circuit current							
	240V	kA	100	100	100	100	100
	480V	kA	50	50	50	50	50
	600V	kA	10	10	10	10	10
Motor load							
1-phase	115V	HP	2	2	3	5	5
	230V	HP	3	5	7 1/2	10	10
Motor load							
3-phase	200V	HP	7 1/2	7 1/2	10	15	20
	230V	HP	7 1/2	10	10	15	20
	460V	HP	15	20	30	30	40
	600V	HP	20	30	30	40	60
Max. rated fuse or breaker		A	600	600	600	600	600

#### C4-100R (+C4 100 E)

Rated operational current I <sub>e</sub>		A	63	75	90	100
Max. short-circuit current						
	240V	kA	100	100	100	100
	480V	kA	40	40	40	40
	600V	kA	10	10	10	10
Motor load						
1-phase	115V	HP	5	5	7 1/2	10
	230V	HP	10	15	20	20
Motor load						
3-phase	200V	HP	20	20	25	30
	230V	HP	20	25	30	30
	460V	HP	40	50	60	75
	600V	HP	60	60	75	100
Max. rated fuse or breaker		A	1000	1000	1000	1000

Ratings of auxiliary switches and alarm switches

Lateral auxiliary switch  
C4 HS..  
and signalling switch  
C4 M..

Transversal auxiliary switch  
C4 HQ..

Breaking capacity

AC  
DC

A600  
Q300

A600  
Q300

## Description

### Releases

Circuit-breakers C4 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 C4-32T are actuated via a rocker operating mechanism and circuit-breakers C4-32R, C4-63R and C4-100R 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 C4 Circuit-breakers fulfil the isolation characteristics specified in IEC 60947-2.

### Operating conditions

Circuit-breakers C4 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 C4 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 C4 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

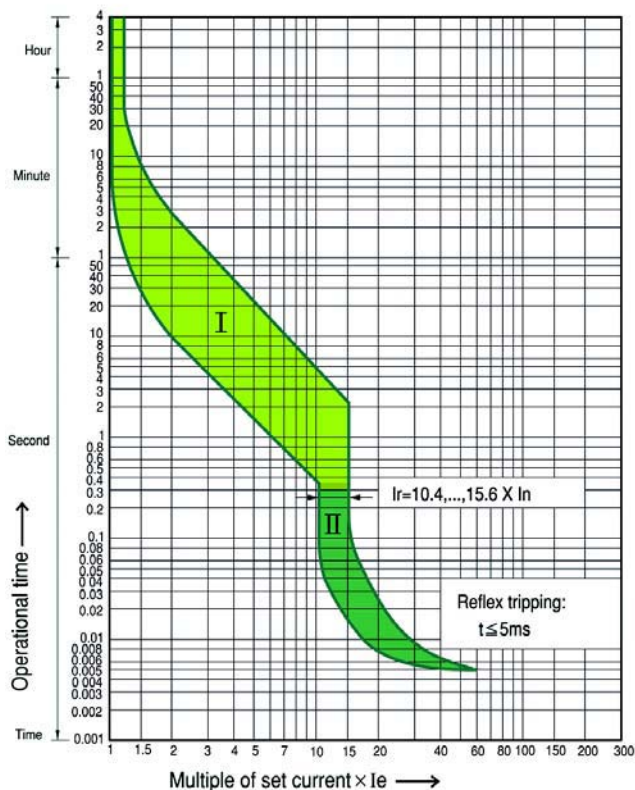
The tripping characteristics of C4 circuit-breakers are designed mainly to protect three-phase induction motors. The circuit-breakers are therefore also referred to as Manual Motor Starters. The current of the motor to be protected is set with the aid of the scale.

### Line protection

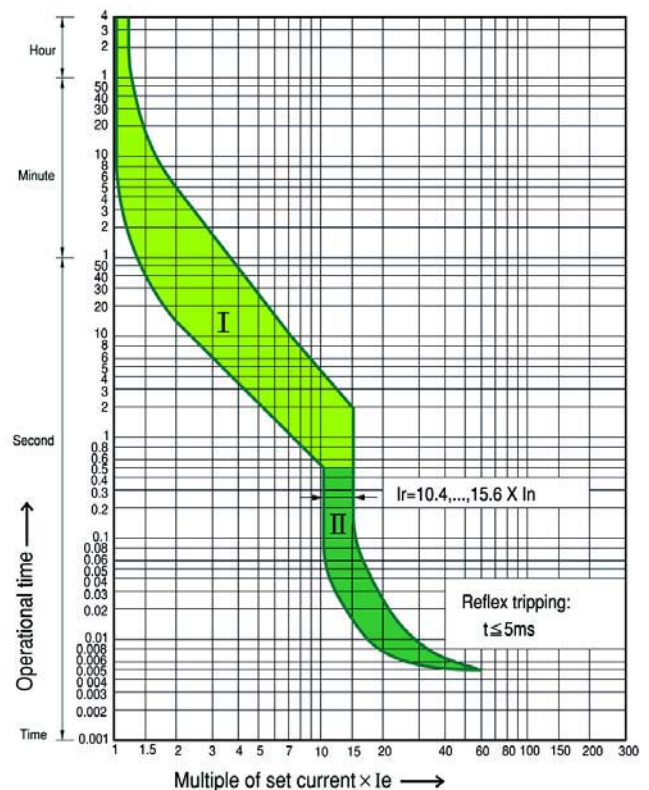
C4 Circuit-breakers for motor protection are also suitable for line protection. The C4 Circuit-breakers fulfil the isolation conditions of IEC 60 947-3 as well as the additional test conditions for circuit-breakers with isolation characteristics specified in IEC 60947-2. Taking IEC 60 204-1 into consideration, they can thus be implemented as main and EMERGENCY STOP switches. Door-coupling rotary operating mechanism do not fulfil the isolation characteristics.

## Tripping-Characteristics

### C4-32



### C4-63R, C4-100R



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)

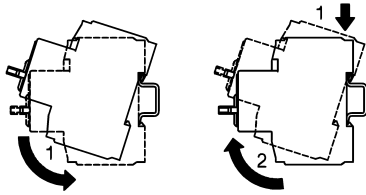
The tripping characteristic of the inverse-time delayed overload releases apply for DC and AC with a frequency of 0 to 400 Hz. At operating temperature, the tripping times of the thermal releases are reduced to approximately 25 %.

The characteristic shown here is a schematic representation of circuit-breakers for all ranges.

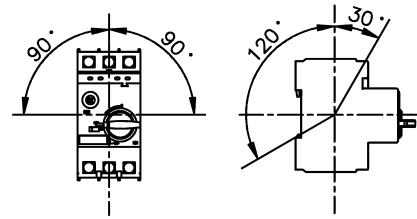
Current limiting characteristics and  $I^2t$  characteristics are available on request.

# Mounting

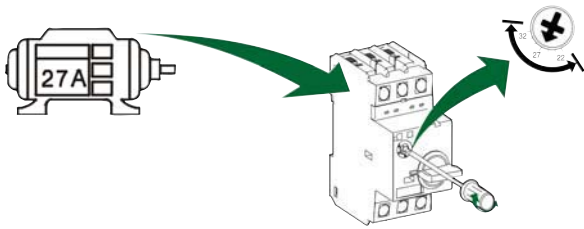
## DIN-rail mounting



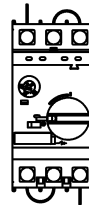
## Operating positions



## Current setting (dont rotate the dial out of the shown range)



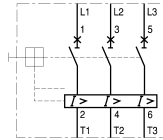
## Connection of 1-phase motor



# Wiring diagrams

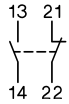
## Circuit breaker

C4...



## Traverse Aux. Contact Block

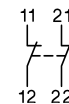
C4 HQ11



C4 HQ20

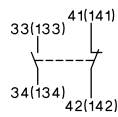


C4HQ02

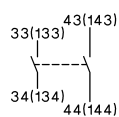


## Aux. Contact Block (side mounted)

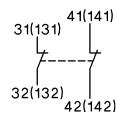
C4 HS11



C4 HS20

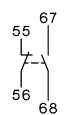


C4 HS02

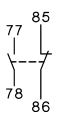


## Alarm Switch

C4 M11

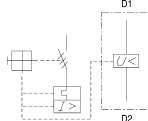


C4 MA11



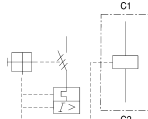
## Undervoltage Release

C4 U...



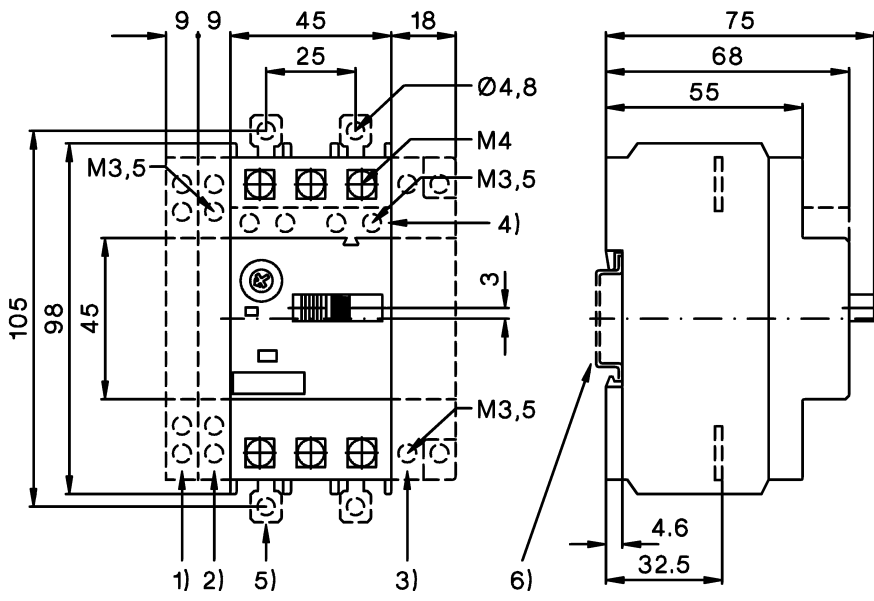
## Shunt Release

C4 A...



Dimensions

Circuit-breaker C4-32T

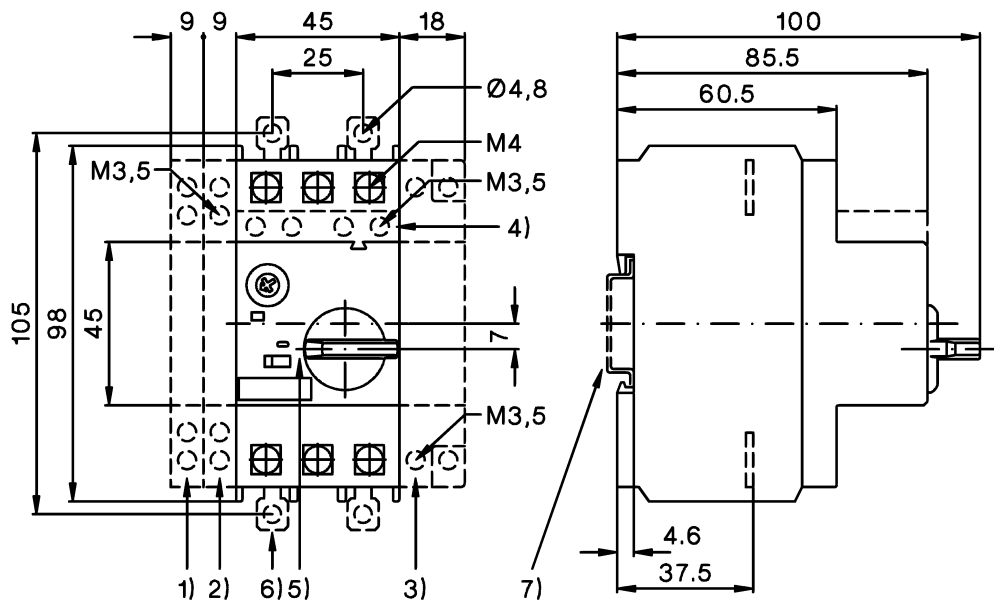


- 1) Side aux. contact
- 2) Magnetic trip alarm
- 3) Shunt or undervoltage release of arcing
- 4) Transverse aux. contact
- 5) Push-in Lugs for screw mounting
- 6) 35mm DIN-rail acc. to EN 50022

Height of arcing spaces (clearance from earthed parts )

at Ue (V)	240	415	460	525	690
mm	20	20	20	20	20
inch	0,8	0,8	0,8	0,8	0,8

Circuit-breaker C4-32R



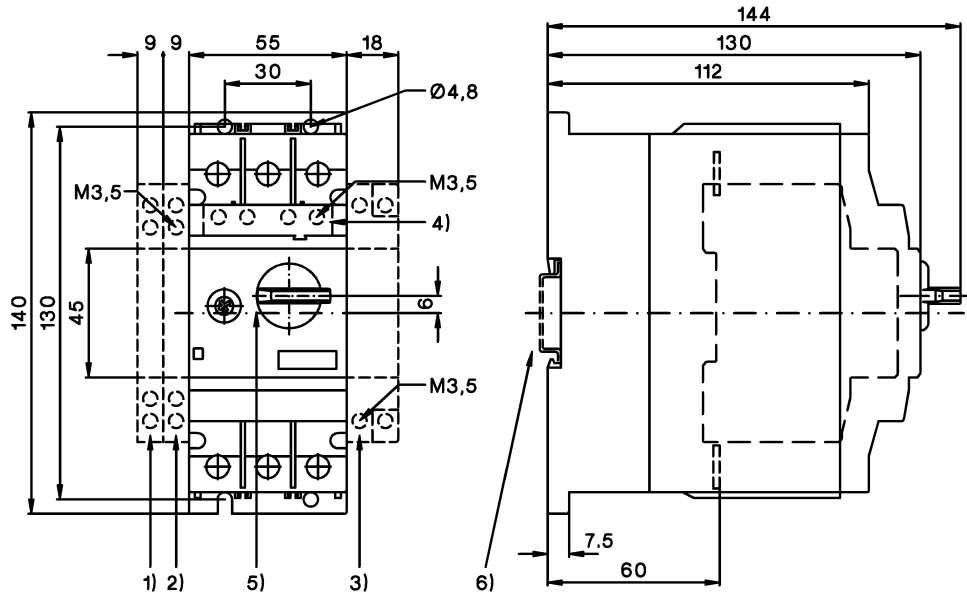
- 1) Side aux. contact
- 2) Magnetic trip alarm
- 3) Shunt or undervoltage release of arcing
- 4) Transverse aux. contact
- 5) Handle lock in OFF-position (Ø 5mm)
- 6) Push-in Lugs for screw mounting
- 7) 35mm DIN-rail acc. to EN 50022

Height of arcing spaces (clearance from earthed parts )

at Ue (V)	240	415	460	525	690
mm	30	30	30	30	50
inch	1,18	1,18	1,18	1,18	2

# Dimensions

## Circuit-breaker C4-63R

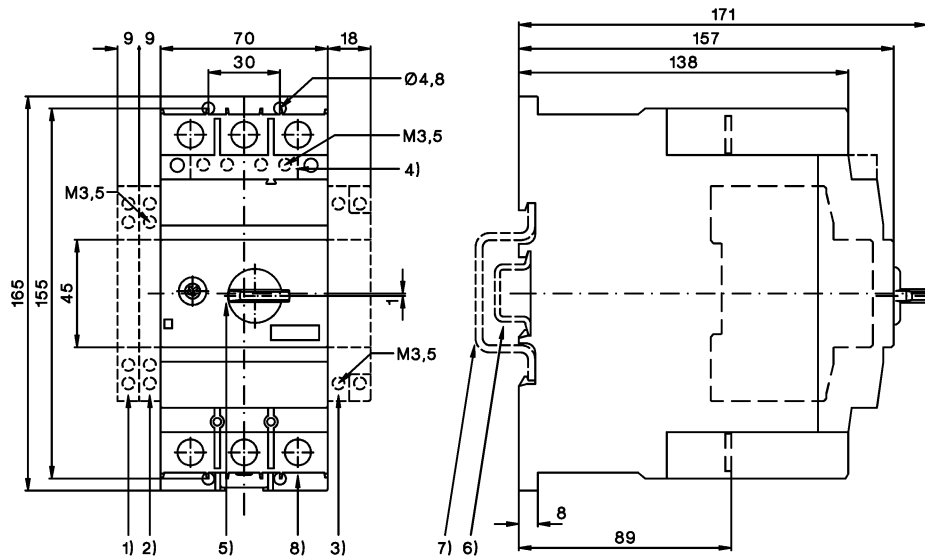


- 1) Side aux. contact
- 2) Magnetic trip alarm
- 3) Shunt or undervoltage release
- 4) Transverse aux. contact
- 5) Handle lock in OFF-position (Ø 5mm)
- 6) 35mm DIN-rail acc. to EN 50022

Height of arcing spaces (clearance from earthed parts)

at U <sub>e</sub> (V)	240	415	460	525	690
mm	50	50	50	50	50
inch	2	2	2	2	2

## Circuit-breaker C4-100R



- 1) Side aux. contact
- 2) Magnetic trip alarm
- 3) Shunt or undervoltage release
- 4) Transverse aux. contact
- 5) Handle lock in OFF-position (Ø 5mm)
- 6) 35mm DIN-rail acc. to EN 50022
- 7) 70mm DIN-rail acc. to EN 50023
- 8) 4mm hexagon socket screw

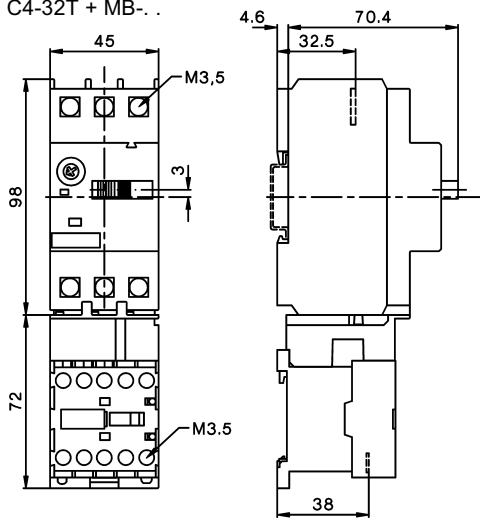
Height of arcing spaces (clearance from earthed parts)

at U <sub>e</sub> (V)	240	415	460	525	690
mm	50	70	70	110	150
inch	2	2¾	2¾	4,33	6

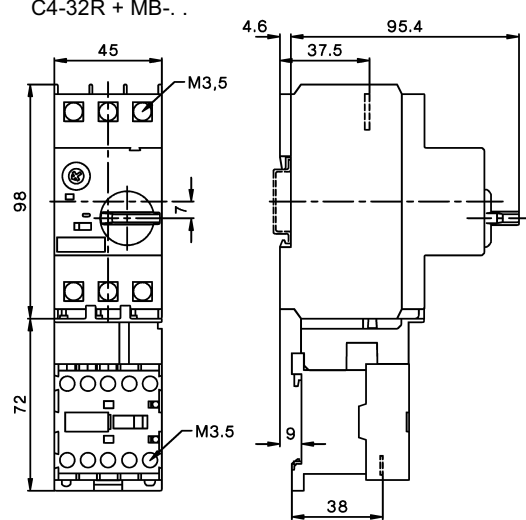
# Dimensions

## Link Module C4 32 VK1

C4-32T + MB-. .

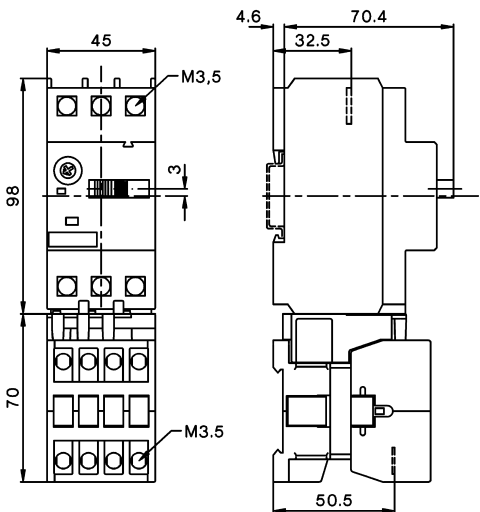


C4-32R + MB-. .



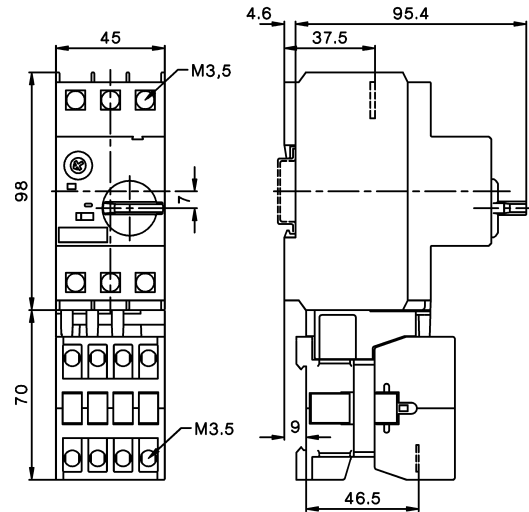
## Link Module C4 32 VK3

C4-32T + MC10. .  
C4-32T + MC18. .



C4-32T + MC14. .  
C4-32T + MC22. .

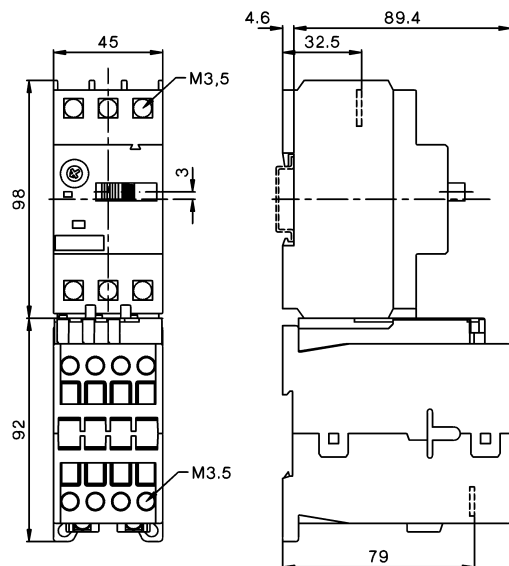
C4-32R + MC10. .  
C4-32R + MC18. .



C4-32R + MC14. .  
C4-32R + MC22. .

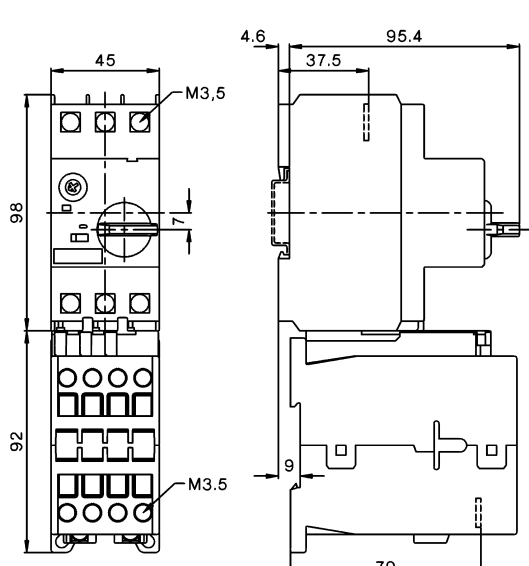
## Link Module C4 32 VKG3

C4-32T + MCD10. .  
C4-32T + MCD18. .



C4-32T + MCD14. .  
C4-32T + MCD22. .

C4-32R + MCD10. .  
C4-32R + MCD18. .

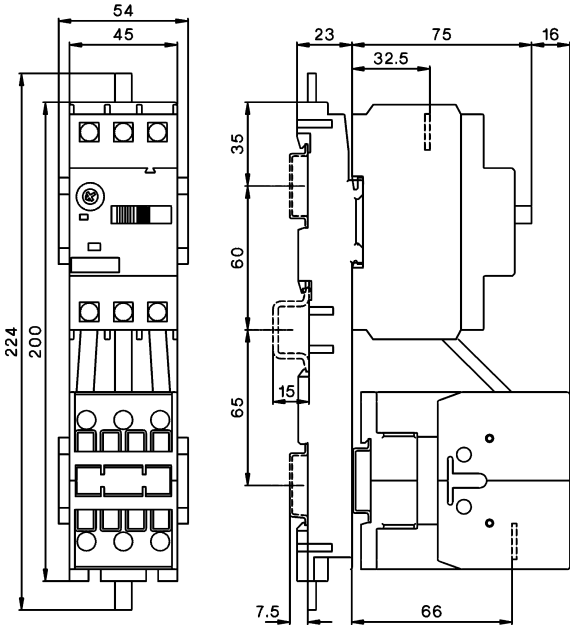


C4-32R + MCD14. .  
C4-32R + MCD22. .

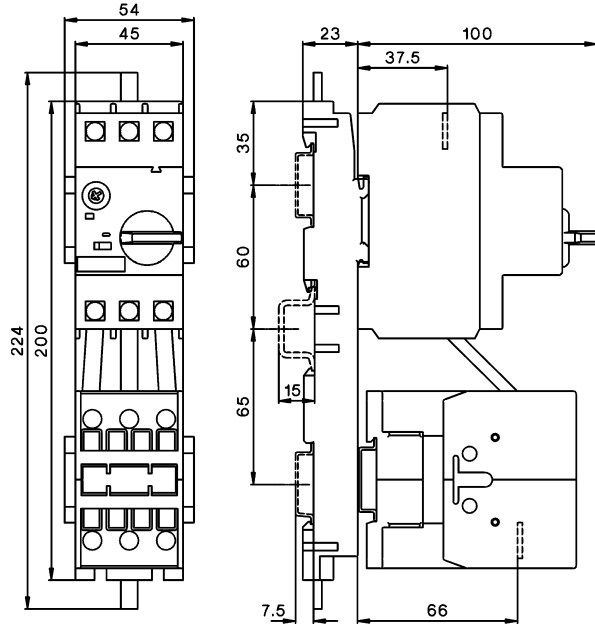
Dimensions

DIN-rail adapter C4 32 HU1

C4-32T + K3-24 + C4 32VD  
 C4-32T + K3-32 + C4 32VD

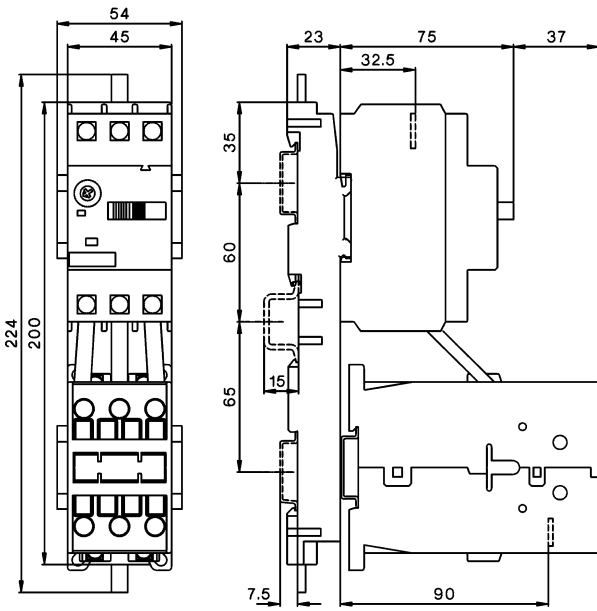


C4-32R + MC24 + C4 32VD  
 C4-32R + MC32 + C4 32VD

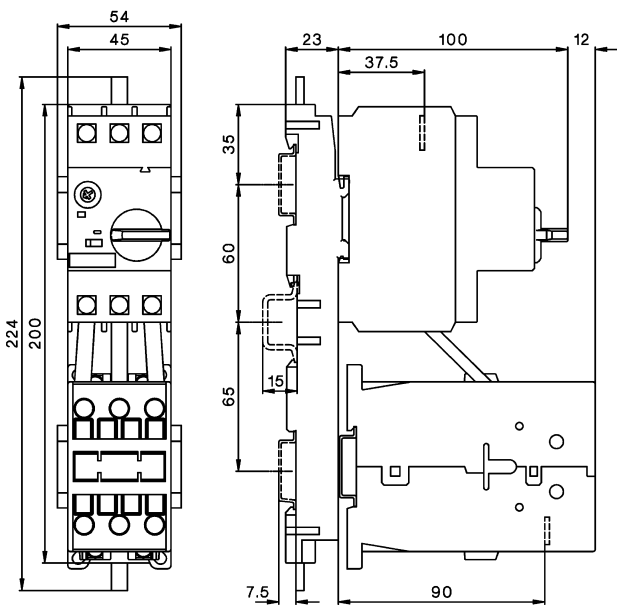


DIN-rail adapter C4 32 HU1

C4-32T + MCD24 + C4 32 VD  
 C4-32T + MCD32 + C4 32 VD



C4-32R + MCD24 + C4 32 VD  
 C4-32R + MCD32 + C4 32 VD

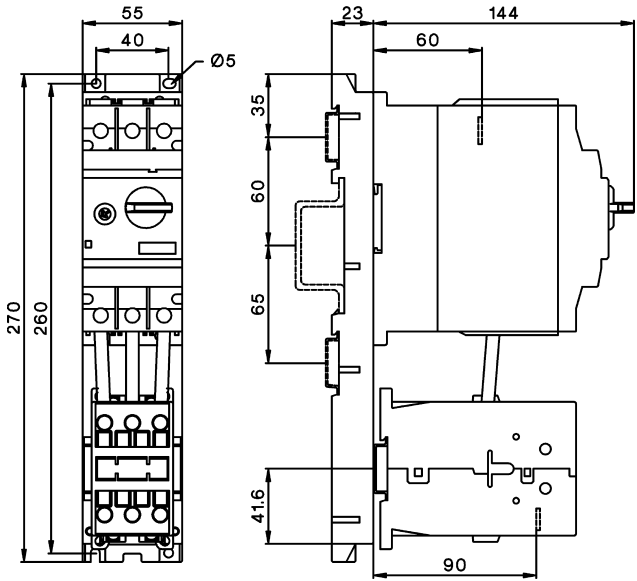
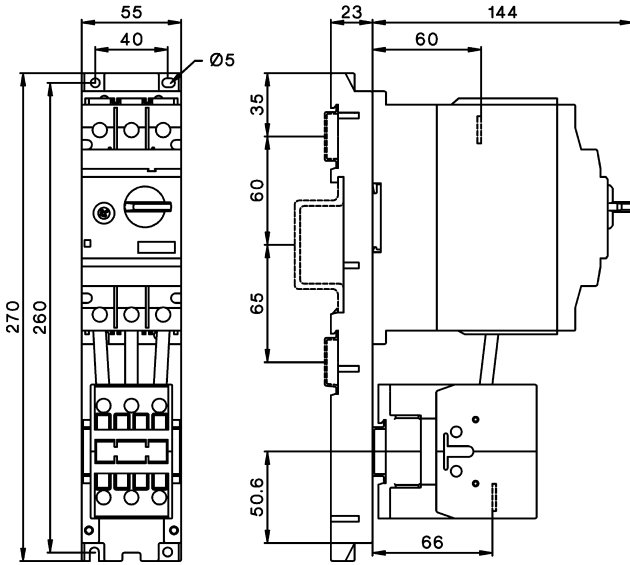


# Dimensions

## DIN-rail adapter C4 63 HU1

C4-63T + MC32 + C4 63 VD  
 C4-63T + MC40 + C4 63 VD

C4-63T + MCD32 + C4 63 VDG  
 C4-63T + MCD40 + C4 63 VDG

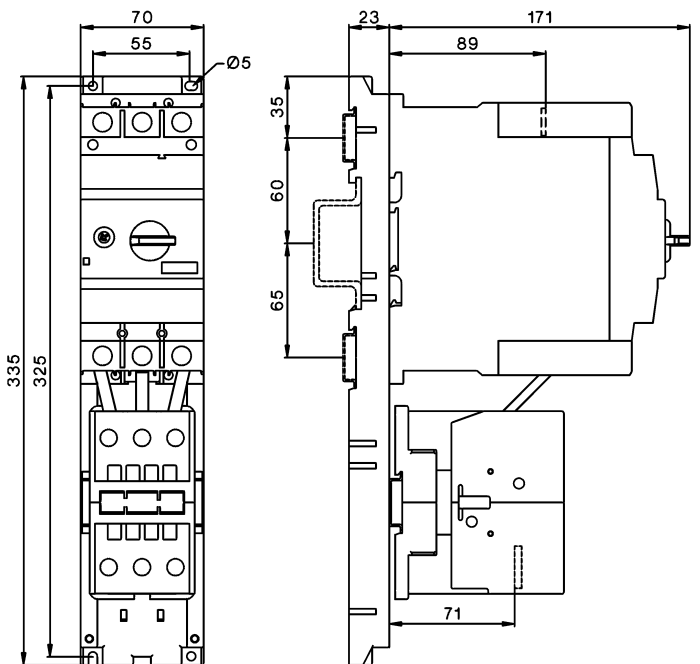
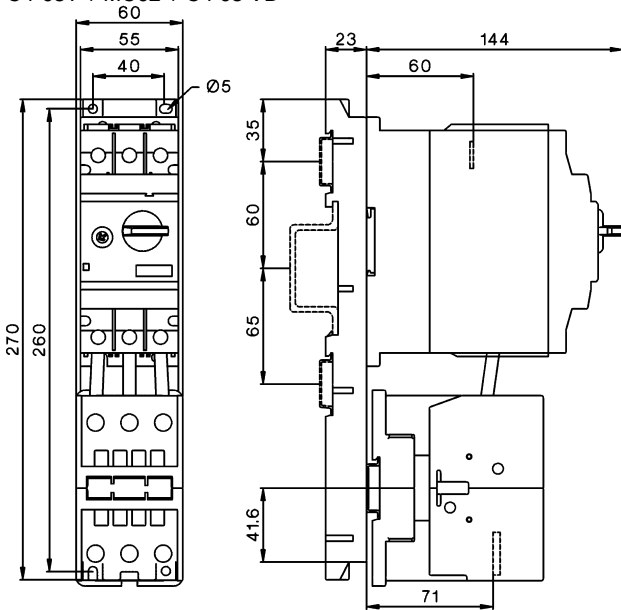


## DIN-rail adapter C4 63 HU1

C4-63T + MC50 + C4 63 VD  
 C4-63T + MC62 + C4 63 VD

## DIN-rail adapter C4 100 HU1

C4-100R + MC62 + C4 100 VD  
 C4-100R + MC74 + C4 100 VD



Dimensions

Enclosures

C4 32R PFH4  
C4 32R PFHN4

