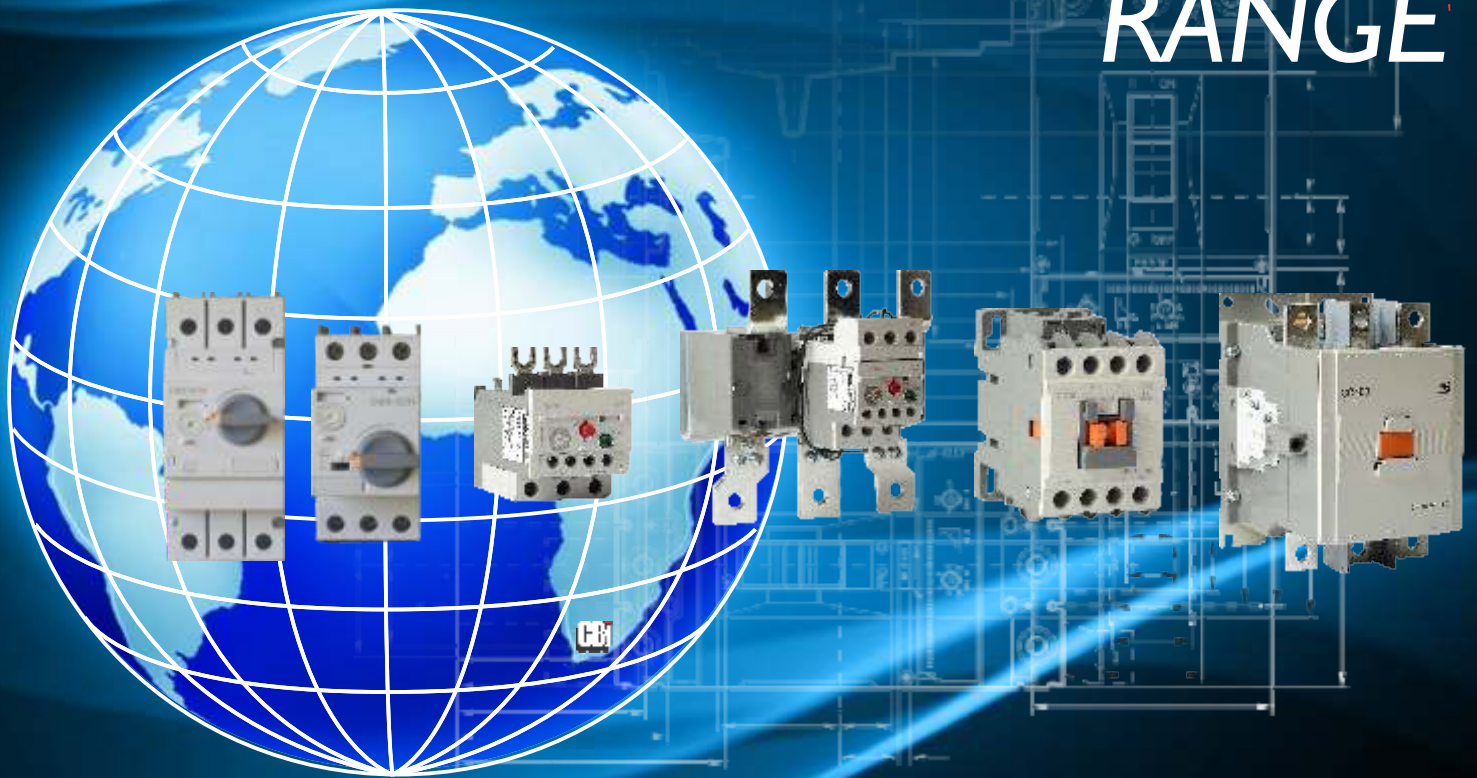


CATALOGUE

**GLOBAL
RANGE**



2. Motor Control

Contactors - Thermal Overload Relay's - Manual Motor Starters

Index

2. Motor Control

Page 1	Product Overview
Page 2	Overload Relay Setting Range
Page 3 - 8	Product Specifications
Page 9 - 11	Dimensional Drawings
Page 12	Auxiliary Contact Units
Page 13	Control Coil Characteristics
Page 14	Mechanical Interlock
Page 15	Thermal Overload Relay Specifications
Page 16 - 18	Thermal Overload Relay Dimensions
Page 19	Manual Motor Starter Specifications
Page 20	Dimensional Drawings
Page 21	Manual Motor Starter Characteristic Curves
Page 22	Manual Motor Starter Accessories
Page 23	Type 2 Co ordination
Page 24	Contactor Mounting Consideration
Page 25	Contactor Termination

Motor Control Product Overview

Magnetic Contactors Coil Control Voltages

AC Contactor	CC18	CC22	CC40	CC50	CC65	CC85	CC100	CC130	CC150	CC185	CC225	CC265	CC330	CC400	CC630	CC800
24 V	●	●	●	●	●	●	●	●	●	●	●					
48 V	●	●	●	●	●	●	●	●	●	●	●					
110 V	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
230 V	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
415 V	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
525 V								●	●	●	●	●	●	●	●	●
550 V	●	●	●	●	●	●	●									
DC Contactor	CDC18	CDC22	CDC40	CDC50	CDC65	CDC85	CDC100	CDC130	CDC150	CC185	CC225	CC265	CC330	CC400		
12 DC	●	●	●	●	●	●	●									
24 DC	●	●	●	●	●	●	●	●	●	●	●					
48 DC	●	●	●	●	●	●	●	●	●	●	●					
110 DC	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
220 DC	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
230 DC										●	●	●	●	●		
240 DC											●					

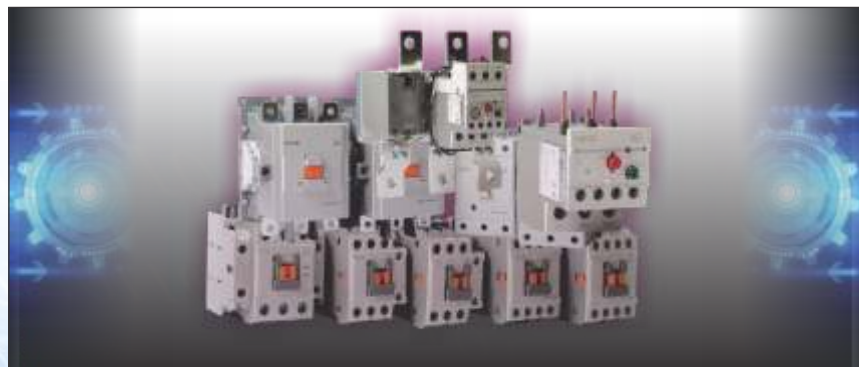
Thermal Overload Relay's Nominal Amp Rating

Amp	0.14	0.21	0.33	0.52	0.82	1.3	2.1	3.3	5	6.5	7.5	8.5	11	15	19	21.5	27	30	34	42	55				
CMT12	●	●	●	●	●	●	●	●	●	●	●	●	●	●											
CMT32	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
CMT63									●	●	●	●	●	●	●	●	●	●	●	●	●	●			
Amp	8.5	11	15	19	21.5	27	30	34	42	55	65	74	80	83	90	93	107	113	130	153	200	265	350	515	660
CMT95	●	●	●	●	●	●	●	●	●	●	●	●		●	●										
CMT150									●	●	●	●				●	●	●	●						
CMT225													●				●	●	●	●					
CMT400														●			●	●	●	●	●	●	●	●	●
CMT800																						●	●	●	●

Contactors & Thermal Overload Relay's Compatibility

Contactor	CC18	CC22	CC40	CC50 ~ 65	CC85 ~ 100	CC130 ~ 150	CC185 ~ 225	CC265 ~ 330 ~ 400	CC630 ~ 800
	CDC18	CDC22	CDC40	CDC50 ~ 65	CDC85 ~ 100	CDC130 ~ 150			
Thermal Overload Relay	CMT12	CMT32	CMT32	CMT63	CMT95	CMT150	CMT225	CMT400	CMT800

Standards	IEC / EN 60947-1, IEC / EN 60947-4-1
Certifications	CE, CSA, UL, CCC



Overload Relay Setting Range

Global Range Thermal Overload Relay's

Type	Contacteur Size	Nominal Amps	Setting Amps	Type	Contacteur Size	Nominal Amps	Setting Amps		
CMT12-3H-0.14A	CC18 CDC18	0.14	0.1~0.16	CMT95-3H-8.5A	CC85 CDC85 CC100 CDC100	8.5	7~10		
CMT12-3H-0.21A		0.21	0.16~0.25	CMT95-3H-11A		11	9~13		
CMT12-3H-0.33A		0.33	0.25~0.4	CMT95-3H-15A		15	12~18		
CMT12-3H-0.52A		0.52	0.4~0.63	CMT95-3H-19A		19	16~22		
CMT12-3H-0.82A		0.82	0.63~1	CMT95-3H-21.5A		21.5	18~25		
CMT12-3H-1.3A		1.3	1~1.6	CMT95-3H-30A		30	24~36		
CMT12-3H-2.1A		2.1	1.6~2.5	CMT95-3H-34A		34	28~40		
CMT12-3H-3.3A		3.3	2.5~4	CMT95-3H-42A		42	34~50		
CMT12-3H-5A		5	4~6	CMT95-3H-55A		55	45~65		
CMT12-3H-6.5A		6.5	5~8	CMT95-3H-65A		65	54~75		
CMT12-3H-7.5A		7.5	6~9	CMT95-3H-74A		74	63~85		
CMT12-3H-8.5A		CMT12 (Dimensions) 45 x 73.2 x 63.7 mm	8.5	7~10		CMT95-3H-83A	CMT95 (Dimensions) 70 x 97 x 110 mm	83	70~95
CMT12-3H-11A			11	9~13		CMT95-3H-90A		90	80~100
CMT12-3H-15A			15	12~18		CMT150-3H-42A		CC130	42
CMT32-3H-0.14A		CC22 CDC22 CC40 CDC40	0.14	0.1~0.16		CMT150-3H-55A	CDC130	55	45~65
CMT32-3H-0.21A	0.21		0.16~0.25	CMT150-3H-65A	CC-150	65	54~75		
CMT32-3H-0.33A	0.33		0.25~0.4	CMT150-3H-74A	CDC150	74	63~85		
CMT32-3H-0.52A	0.52		0.4~0.63	CMT150-3H-93A	CMT150 (Dimensions) 95 x 109 x 113 mm	93	80~105		
CMT32-3H-0.82A	0.82		0.63~1	CMT150-3H-113A		113	95~130		
CMT32-3H-1.3A	1.3		1~1.6	CMT150-3H-130A	130	110~150			
CMT32-3H-2.1A	2.1		1.6~2.5	CMT225-3H-80A	CC185	80	65~100		
CMT32-3H-3.3A	3.3		2.5~4	CMT225-3H-107A	CC225	107	85~125		
CMT32-3H-5A	5		4~6	CMT225-3H-130A	CMT225 (Dimensions) 147x 141 x 184 mm	130	100~160		
CMT32-3H-6.5A	6.5		5~8	CMT225-3H-153A		153	120~185		
CMT32-3H-7.5A	7.5		6~9	CMT225-3H-200A	200	160~240			
CMT32-3H-8.5A	8.5		7~10	CMT400-3H-107A	CC330 CC400	107	85~125		
CMT32-3H-11A	11		9~13	CMT400-3H-130A		130	100~160		
CMT32-3H-15A	15		12~18	CMT400-3H-153A		153	120~185		
CMT32-3H-19A	19		16~22	CMT400-3H-200A		CMT400 (Dimensions) 151 x 171 x 198 mm	200	160~240	
CMT32-3H-21.5A	CMT32 (Dimensions) 45 x 75 x 90 mm		21.5	18~25			CMT400-3H-265A	265	200~330
CMT32-3H-27A			27	22~32	CMT400-3H-350A	350	260~400		
CMT32-3H-34A			34	24~36	CMT800-3H-265A	CC630	265	200~300	
CMT63-3H-5A	CC50 CDC50 CC65 CDC65	5	4~6	CMT800-3H-350A	CC800	350	260~400		
CMT63-3H-6.5A		6.5	5~8	CMT800-3H-515A	CMT800 (Dimensions) 360 x 530 x 212	515	400~600		
CMT63-3H-7.5A		7.5	6~9	CMT800-3H-660A		660	520~800		
CMT63-3H-8.5A		8.5	7~10						
CMT63-3H-11A		11	9~13						
CMT63-3H-15A		15	12~18						
CMT63-3H-19A		19	16~22						
CMT63-3H-21.5A		21.5	18~25						
CMT63-3H-30A		30	22~32						
CMT63-3H-34A		CMT63 (Dimensions) 55 x 81 x 100 mm	34	24~36					
CMT63-3H-42A	42		34~50						
CMT63-3H-55A	55		45~65						

Magnetic Contactors & Overload Relay's Specifications

Frame Size / Type		
Screws Clamp Terminals		
Number of Poles		
Rated Operational Voltage, Ue		
Rated Insulation Voltage, Ui		
Rated Frequency		
Rated Impulse Withstand Voltage, Uimp		
Maximum Operating Rate in Operating Cycles Per Hour (AC3)		
Durability	Mechanical	
	Electrical	
Current and Power	AC-1, Thermal	A
	AC-3 200 / 240 V	kW
	380 / 440 V	kW
	500 / 550 V	kW
	690 V	kW
	1000 V	kW
Rated Short-time	1 s	A
Withstand Current (IEC 60947)	10 s	A
	30 s	A
	1 Min	A
	3 Min	A
	10 Min	A
	≤ 15 Min	A
UL Rating(50 / 60Hz)	Continuous Current	
	Single	110 ~ 120 V
	Phase	220 ~ 240 V
		200 ~ 208 V
	Three	220 ~ 240 V
	Phase	440 ~ 480 V
		550 ~ 600 V
NEMA Size		
Size and weight	AC Control Weight	
	Size (W x H x D)	
	DC Control Weight	
	Size (W x H x D)	
Auxiliary (Standard)		
Auxiliary	Side Mount	
	Front Mount	

Type		
Screws Clamp Terminals		
Rated Operational Voltage Ue		
Rated Insulation Voltage Ui		
Rated Impulse Withstand Voltage Uimp		
Trip Class		
Setting Range		
Size and Weight	Weight	
	Size (W x H x D)	
Auxiliary (Standard)		

CC/CDC18
●
3 pole
690 V
690 V
50 / 60 Hz
6 kV
1800 operations per hour
15 mil. operations
2.5 mil. operations
32
4.5
18
7.5
18
7.5
13
7.5
9
-
-
300
130
85
70
50
40
40
32
1
3
5
7.5
10
15
0
0.33
45 x 73.5 x 80.4
0.5
45 x 73.5 x 110.7
Ia
CCUA-1
CCUA-2, CCUA-4

CC/CDC22
●
3 pole
690 V
690 V
50 / 60 Hz
6 kV
1800 operations per hour
15 mil. operations
2.5 mil. operations
40
5.5
22
11
22
15
20
15
18
-
-
400
186
130
90
60
50
45
40
2
3
7.5
10
15
20
1
0.34
45 x 73.5 x 87.4
0.51
45 x 73.5 x 117.7
Ia
CCUA-1
CCUA-2, CCUA-4

CC/CDC40
●
3 pole
690 V
1000 V
50 / 60 Hz
8 kV
1800 operations per hour
12 mil. operations
2 mil. operations
60
11
40
18.5
40
22
32
22
23
22
17
700
300
190
120
80
65
60
60
3
7.5
15
15
30
30
1
0.44
45 x 83 x 90
0.6
45 x 83 x 117.1
2a + 2b
CCUA-1
CCUA-2, CCUA-4

CMT12
●
690V
690V
6 kA
10 A, 20
0.1 ~ 18 A
0.1
45 x 73.2 x 63.7
Ia + Ib

CMT32
●
690V
690V
6 kA
10 A, 20
0.1 ~ 65 A
0.17
45 x 75 x 90
Ia + Ib

Magnetic Contactors & Overload Relay's Specifications

Frame Size / Type			
Screws Clamp Terminals			
Number of Poles			
Rated Operational Voltage, Ue			
Rated Insulation Voltage, Ui			
Rated Frequency			
Rated Impulse Withstand Voltage, Uimp			
Maximum Operating Rate in Operating Cycles Per Hour (AC3)			
Durability	Mechanical		
	Electrical		
Current and Power	AC-1, Thermal	A	
	AC-3	200 / 240V	kW
			A
		380 / 440V	kW
		A	
		500 / 550V	kW
		A	
		690V	kW
		A	
		1000V	kW
	A		
Rated Short-time	1 s	A	
Withstand Current (IEC 60947)	10 s	A	
	30 s	A	
	1 Min	A	
	3 Min	A	
	10 Min	A	
	≤ 15 Min	A	
UL Rating (50 / 60Hz)	Continuous Current	A	
	Single	110 ~ 120V	HP
	Phase	220 ~ 240V	HP
		200 ~ 208V	HP
	Three	220 ~ 240V	HP
		Phase	440 ~ 480V
		550 ~ 600V	HP
NEMA Size			
Size and weight	AC Control Weight	kg	
	Size (W x H x D)	mm	
	DC Control Weight	kg	
	Size (W x H x D)	mm	
Auxiliary (Standard)			
Auxiliary	Side Mount		
	Front Mount		

CC/CDC50	CC/CDC65	CC/CDC85
●	●	●
3 pole	3 pole	3 pole
690 V	690 V	690 V
690 V	1 000 V	1 000 V
50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
6 kV	8 kV	8 kV
1800 operations per hour	1800 operations per hour	1800 operations per hour
12 mil. operations	12 mil. operations	12 mil. operations
2 mil. operations	2 mil. operations	2 mil. operations
70	100	135
15	18.5	25
55	65	85
22	30	45
50	65	85
30	33	45
43	60	75
30	33	45
28	35	45
30	33	45
23	26	33
1 000	1 050	1 200
550	700	800
330	380	450
250	270	350
150	200	270
90	120	170
87	100	150
70	100	135
3	5	7.5
10	15	15
20	25	30
25	30	40
40	50	60
50	60	75
2	2	3
0.9	0.9	1.6
55 x 106 x 119	55 x 106 x 119	70 x 106 x 135.8
1.2	1.2	2.6
55 x 106 x 146.4	55 x 106 x 146.4	70 x 40 x 172.3
2a + 2b	2a + 2b	2a + 2b
CCUA-1	CCUA-1	CCUA-1
CCUA-2, CCUA-4	CCUA-2, CCUA-4	CCUA-2, CCUA-4

Type		
Screws Clamp Terminals		
Rated Operational Voltage Ue		
Rated Insulation Voltage Ui		
Rated Impulse Withstand Voltage Uimp		
Trip Class		
Setting Range		
Size and Weight	Weight	kg
	Size (W x H x D)	mm
Auxiliary (Standard)		

CMT63
●
690V
690V
6 kA
10 A, 20
4 ~ 65 A
0.31
55 x 81 x 100
1a + 1b

CMT95
●
690V
690V
6 kA
10 A, 20
7 ~ 100 A
0.48
70 x 97 x 110
1a + 1b

Magnetic Contactors & Overload Relay's Specifications

Frame Size / Type		
Screws Clamp Terminals		
Number of Poles		
Rated Operational Voltage, Ue		
Rated Insulation Voltage, Ui		
Rated Frequency		
Rated Impulse Withstand Voltage, Uimp		
Maximum Operating Rate in Operating Cycles Per Hour (AC3)		
Durability	Mechanical	
	Electrical	
Current and Power	AC-1, Thermal	A
	AC-3	200 / 240 V
		kW
		380 / 440 V
		kW
		500 / 550 V
		kW
		690 V
		kW
		1000V
	kW	
	A	
Rated Short-time	1 s	A
Withstand Current (IEC 60947)	10 s	A
	30 s	A
	1 Min	A
	3 Min	A
	10 Min	A
	≤ 15 Min	A
UL Rating(50 / 60Hz)	Continuous Current	
	Single	110 ~ 120 V
	Phase	220 ~ 240 V
		HP
		200 ~ 208 V
		HP
		220 ~ 240 V
	HP	
	Phase	440 ~ 480 V
	HP	
	550 ~ 600 V	HP
NEMA Size		
Size and weight	AC Control Weight	
		kg
	Size (W x H x D)	
		mm
	DC Control Weight	
		kg
	Size (W x H x D)	
		mm
Auxiliary (Standard)		
Auxiliary	Side Mount	
	Front Mount	

Type		
Screws Clamp Terminals		
Rated Operational Voltage Ue		
Rated Insulation Voltage Ui		
Rated Impulse Withstand Voltage, Uimp		
Trip Class		
Setting Range		
Size and Weight	Weight	
		kg
	Size (W x H x D)	
		mm
Auxiliary (Standard)		

CC/CDC100
●
3 pole
690 V
1 000 V
50 / 60 Hz
8 kV
1 800 operations per hour
12 mil. operations
2 mil. operations
160
30
105
55
105
55
85
55
65
45
33
1 320
900
500
400
270
180
160
160
10
20
30
40
75
75
3
1.6
70 x 106 x 135.8
2.6
70 x 40 x 172.3
2a + 2b
CCUA-100
-

CC/CDC130
●
3 pole
690 V
1 000 V
50 / 60 Hz
8 kV
1 200 operations per hour
15 mil. operations
1 mil. operations
160
37
130
60
130
60
90
55
60
75
53
1 350
950
700
550
350
200
170
160
10
20
40
40
75
75
3
2.4
95 x 158 x 132
2.3
95 x 158 x 132
2a + 2b
CCUA-100
-

CC/CDC150
●
3 pole
690 V
1 000 V
50 / 60 Hz
8 kV
1 200 operations per hour
15 mil. operations
1 mil. operations
210
45
150
75
150
70
100
45
60
90
65
1 800
1 200
800
600
450
300
280
210
15
25
40
50
100
75
4
2.4
95 x 158 x 132
2.3
95 x 158 x 132
2a + 2b
CCUA-100
-

CMT95
●
690V
690V
6 kA
10 A, 20
7 ~ 100 A
0.48
70 x 97 x 110
1a + 1b

CMT150
●
690V
690V
6 kA
10 A, 20
34 ~ 150 A
0.67
95 x 109 x 113
1a + 1b

Magnetic Contactors & Overload Relay's Specifications

Frame Size / Type			CC185	CC225	CC265	
Screws Clamp Terminals			●	●	●	
Number of Poles			3 pole	3 pole	3 pole	
Rated Operational Voltage, Ue			690 V	690 V	690 V	
Rated Insulation Voltage, Ui			1 000 V	1 000 V	1 000 V	
Rated Frequency			50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	
Rated Impulse Withstand Voltage, Uimp			8 kV	8 kV	8 kV	
Maximum Operating Rate in Operating Cycles Per Hour (AC3)			1 200 operations per hour	1 200 operations per hour	1 200 operations per hour	
Durability	Mechanical		5 mil. operations	5 mil. operations	5 mil. operations	
	Electrical		1 mil. operations	1 mil. operations	1 mil. operations	
Current and Power	AC-1, Thermal	A	230	275	300	
		kW	55	75	80	
	AC-3	200 / 240V	A	185	225	265
			kW	90	132	147
		380 / 440V	A	185	225	265
		kW	110	132	147	
		500 / 550V	A	180	200	225
		kW	110	140	160	
		690V	A	120	150	185
		kW	132	140	147	
	1000V	A	90	100	105	
Rated Short-time	1 s	A	2 000	2 500	3 500	
Withstand Current (IEC 60947)	10 s	A	1 500	1 700	2 400	
	30 s	A	1000	1200	1500	
	1 Min	A	800	1000	1100	
	3 Min	A	520	700	800	
	10 Min	A	350	500	600	
	≤ 15 Min	A	320	400	500	
UL Rating (50 / 60Hz) Continuous Current	Single	A	230	275	300	
		HP	15	15	-	
	Phase	220 ~ 240V	HP	30	40	-
		200 ~ 208V	HP	60	60	75
	Three	220 ~ 240V	HP	60	75	100
		Phase	440 ~ 480V	HP	125	150
		550 ~ 600V	HP	125	150	200
NEMA Size			4	4	5	
Size and weight	AC / DC Control Weight	kg	5.4	5.4	9.2	
	Size (W x H x D)	mm	138 x 203 x 181	138 x 203 x 181	163 x 243 x 198	
Auxiliary (Standard)			2a + 2b	2a + 2b	2a + 2b	
Auxiliary	Side Mount		CCUA-100 (Max.4NO4NC)	CCUA-100 (Max.4NO4NC)	CCUA-100 (Max.4NO4NC)	
	Front Mount		-	-	-	

Type		
Screws Clamp Terminals		
Rated Operational Voltage Ue		
Rated Insulation Voltage Ui		
Rated Impulse Withstand Voltage Uimp		
Trip Class		
Setting Range		
Size and Weight	Weight	kg
	Size (W x H x D)	mm
Auxiliary (Standard)		

CMT225	
	●
	690 V
	690 V
	6 kA
	10 A, 20
	65 ~ 240 A
	2.5
	147 x 141 x 184
	1a + 1b

CMT400	
	●
	690 V
	690 V
	6 kA
	10 A, 20
	85 ~ 400 A
	2.6
	151 x 171 x 198
	1a + 1b

Magnetic Contactors & Overload Relay's Specifications

Frame Size / Type			
Screws Clamp Terminals			
Number of Poles			
Rated Operational Voltage, Ue			
Rated Insulation Voltage, Ui			
Rated Frequency			
Rated Impulse Withstand Voltage, Uimp			
Maximum Operating Rate in Operating Cycles Per Hour (AC3)			
Durability	Mechanical		
	Electrical		
Current and Power	AC-1, Thermal		A
	AC-3	200 / 240V	kW
			A
		380 / 440V	kW
			A
		500 / 550V	kW
			A
		690V	kW
			A
		1000V	kW
			A
Rated Short-time	1 s		A
Withstand Current (IEC 60947)	10 s		A
	30 s		A
	1 Min		A
	3 Min		A
	10 Min		A
	≤ 15 Min		A
UL Rating(50 / 60Hz)	Continuous Current		
	Single	110 ~ 120V	HP
	Phase	220 ~ 240V	HP
		200 ~ 208V	HP
	Three	220 ~ 240V	HP
	Phase	440 ~ 480V	HP
		550 ~ 600V	HP
NEMA Size			
Size and weight	AC / DC Control Weight		kg
	Size (W x H x D)		mm
Auxiliary (Standard)			
Auxiliary	Side Mount		
	Front Mount		

Type			
Screws Clamp Terminals			
Rated Operational Voltage Ue			
Rated Insulation Voltage Ui			
Rated Impulse Withstand Voltage Uimp			
Trip Class			
Setting Range			
Size and Weight	Weight		kg
	Size (W x H x D)		mm
Auxiliary (Standard)			

	CC330	CC400	CC630
	●	●	●
	3 pole	3 pole	3 pole
	690 V	690 V	690 V
	1 000 V	1 000 V	1 000 V
	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
	8 kV	8 kV	8 kV
	1 200 operations per hour	1 200 operations per hour	1 200 operations per hour
	5 mil. operations	5 mil. operations	2.5 mil. operations
	1 mil. operations	1 mil. operations	0.5 mil. operations
	350	450	660
	90	125	190
	330	400	660
	160	200	330
	330	400	630
	160	225	330
	180	350	500
	200	250	400
	225	300	420
	160	185	355
	115	140	262
	4 000	4 600	7 000
	3 000	4 400	6 400
	2 500	2 974	4 500
	1 700	1 846	3 500
	1 000	1 313	2 200
	620	760	1 550
	553	699	1300
	350	450	660
	-	-	-
	-	-	-
	100	125	200
	125	150	250
	250	300	500
	250	300	500
	5	5	6
	9.2	9.2	22.4
	163 x 243 x 198	163 x 243 x 198	285 x 312 x 242
	2a + 2b	2a + 2b	2a + 2b
	CCUA-100 (Max.4NO4NC)	CCUA-100 (Max.4NO4NC)	CCUA-100 (Max.4NO4NC)
	-	-	-

CMT400
●
690V
690V
6 kA
10 A, 20
85 ~ 400 A
2.6
151 x 171 x 198
1a + 1b

CMT800
●
690V
690V
6 kA
10 A, 20
200 ~ 800 A
11.5
360 x 530 x 212
1a + 1b

Magnetic Contactors & Overload Relay's Specifications

Frame Size / Type		
Screws Clamp Terminals		
Number of Poles		
Rated Operational Voltage, Ue		
Rated Insulation Voltage, Ui		
Rated Frequency		
Rated Impulse Withstand Voltage, Uimp		
Maximum Operating Rate in Operating Cycles Per Hour (AC3)		
Durability	Mechanical	
	Electrical	
Current and Power	AC-1, Thermal	A
	AC-3 200 / 240V	kW
		A
	380 / 440V	kW
		A
	500 / 550V	kW
		A
	690V	kW
		A
	1000V	kW
		A
Rated Short-time	1 s	A
Withstand Current (IEC 60947)	10 s	A
	30 s	A
	1 Min	A
	3 Min	A
	10 Min	A
	≤ 15 Min	A
UL Rating(50 / 60Hz)	Continuous Current	A
	Single 110 ~ 120V	HP
	Phase 220 ~ 240V	HP
	200 ~ 208V	HP
	Three 220 ~ 240V	HP
	Phase 440 ~ 480V	HP
	550 ~ 600V	HP
	NEMA Size	
Size and weight	AC / DC Control Weight	kg
	Size (W x H x D)	mm
Auxiliary (Standard)		
Auxiliary	Side Mount	
	Front Mount	

Type		
Screws Clamp Terminals		
Rated Operational Voltage Ue		
Rated Insulation Voltage Ui		
Rated Impulse Withstand Voltage Uimp		
Trip Class		
Setting Range		
Size and Weight	Weight	kg
	Size (W x H x D)	mm
Auxiliary (Standard)		

CC800	
	●
	3 pole
	690 V
	1 000 V
	50 / 60 Hz
	8 kV
	1 200 operations per hour
	2.5 mil. operations
	0.5 mil. operations
	900
	220
	800
	440
	800
	500
	720
	500
	630
	400
	288
	7 500
	7 000
	4 900
	3 800
	2 500
	1 550
	1 300
	900
	-
	-
	200
	300
	600
	600
	7
	22.4
	285 x 312 x 242
	2a + 2b
	CCUA-100 (Max.4NO4NC)
	-

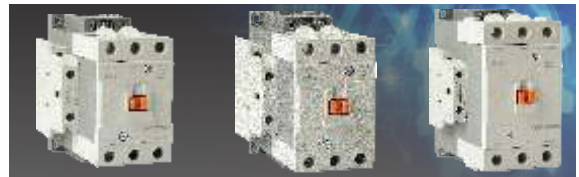
CMT800	
	●
	690V
	690V
	6 kA
	10 A, 20
	200 ~ 800 A
	11.5
	360 x 530 x 212
	1a + 1b



CC/CDC18

CC/CDC22

CC/CDC40



CC/CDC50

CC/CDC65

CC/CDC85



CC/CDC100

CC/CDC130

CC/CDC150



CC185

CC225

CC265



CC330

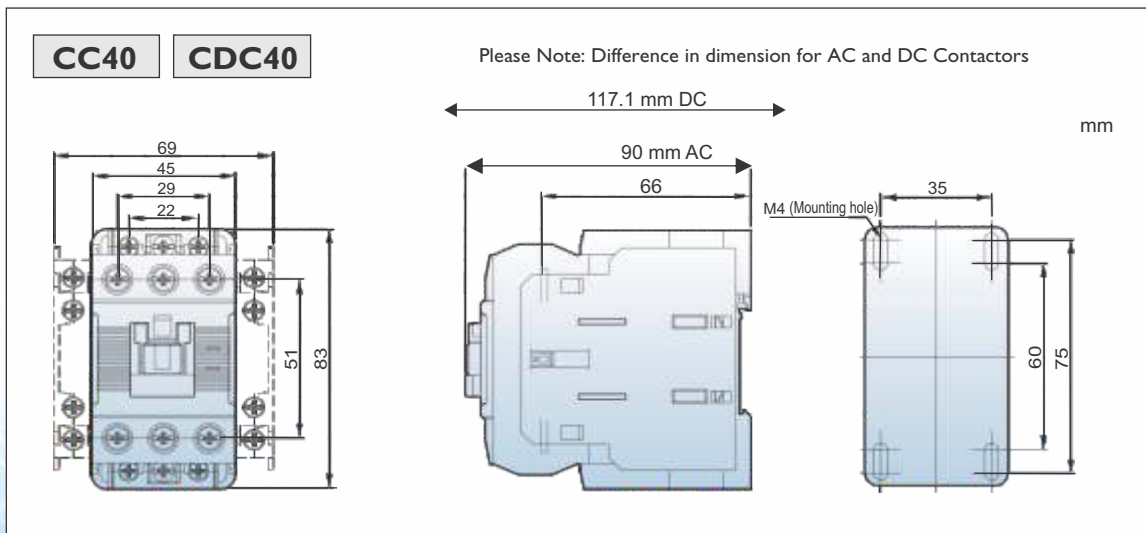
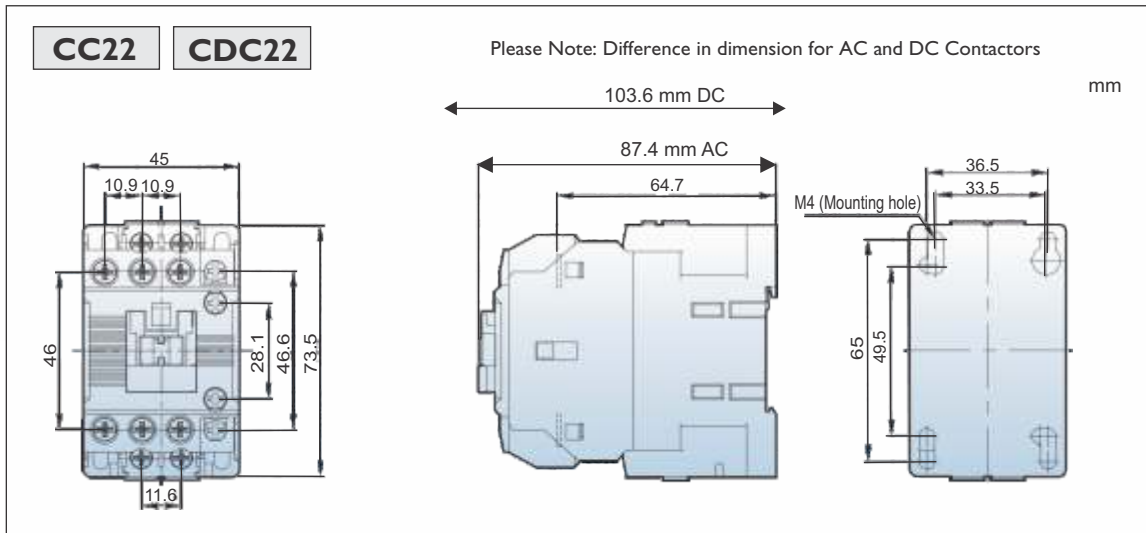
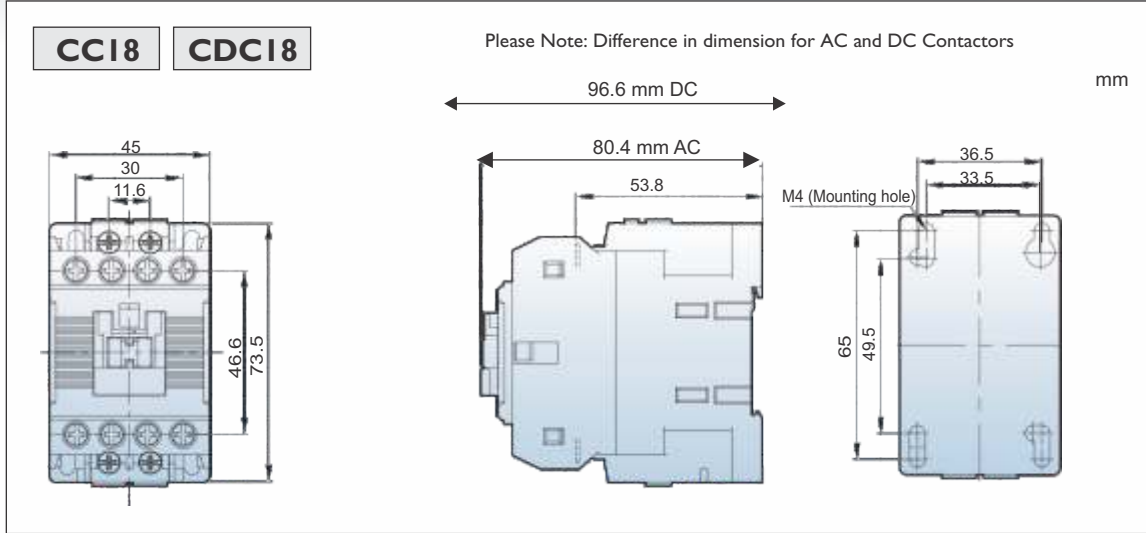
CC400

CC630



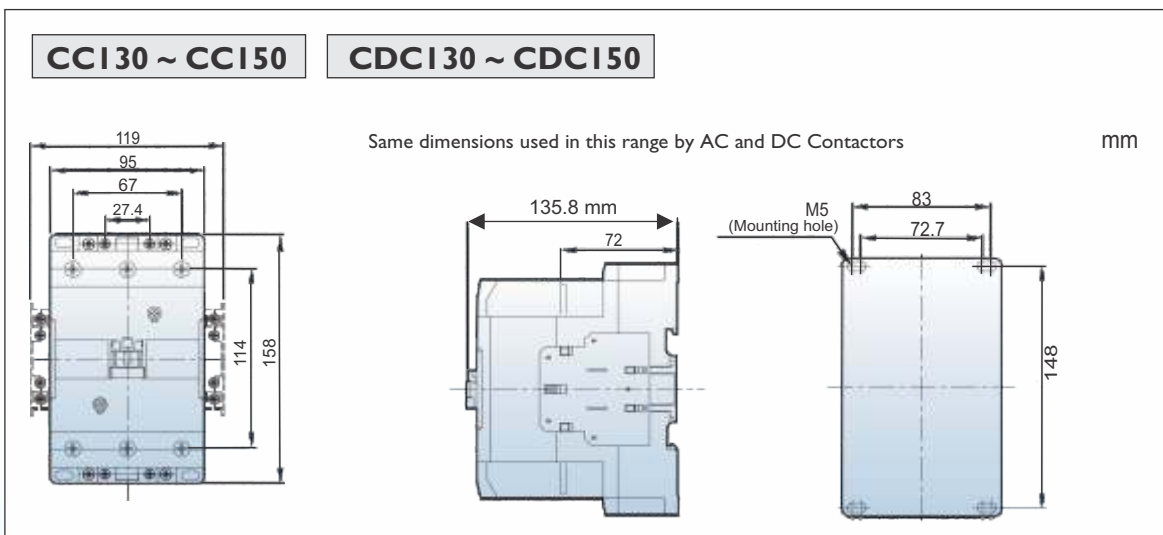
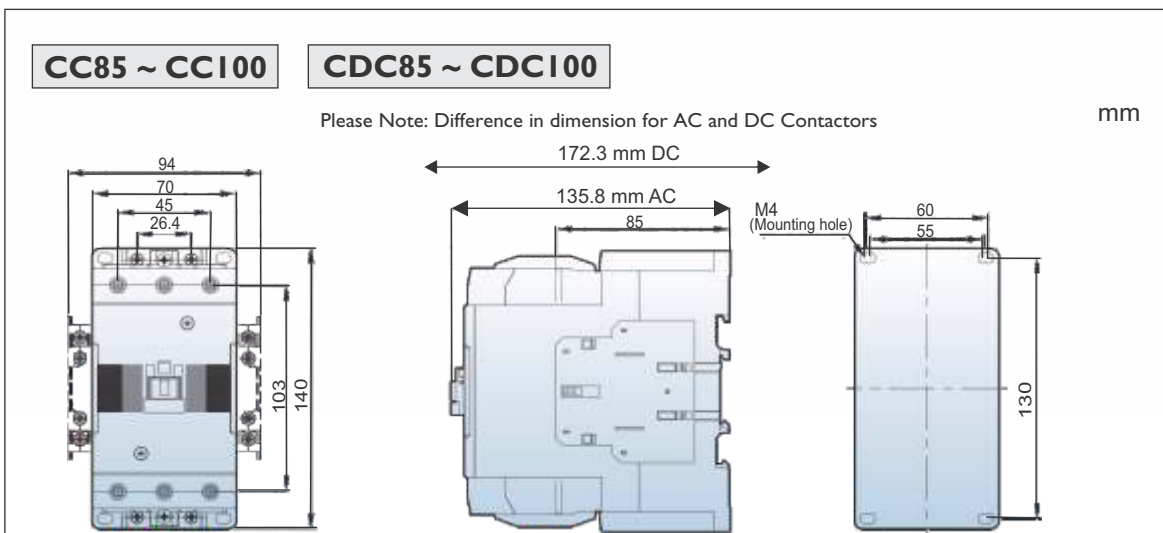
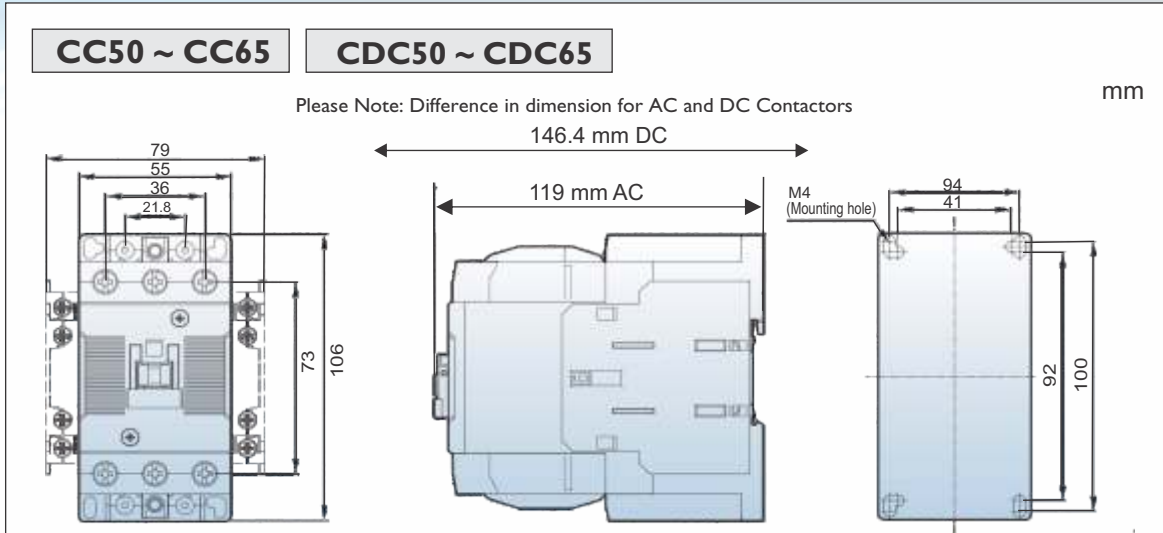
CC800

Dimensional Drawings

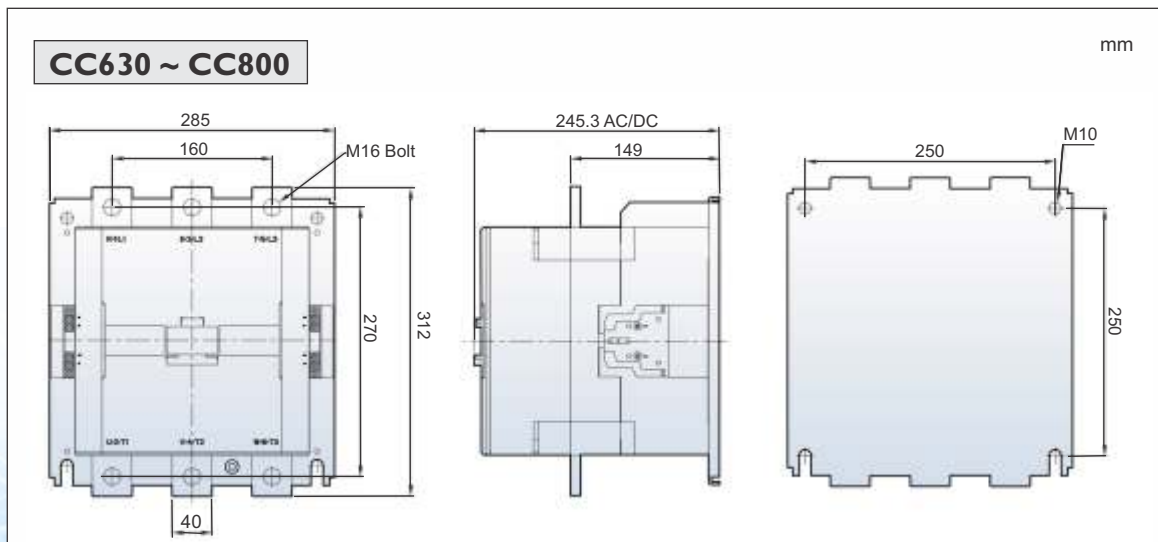
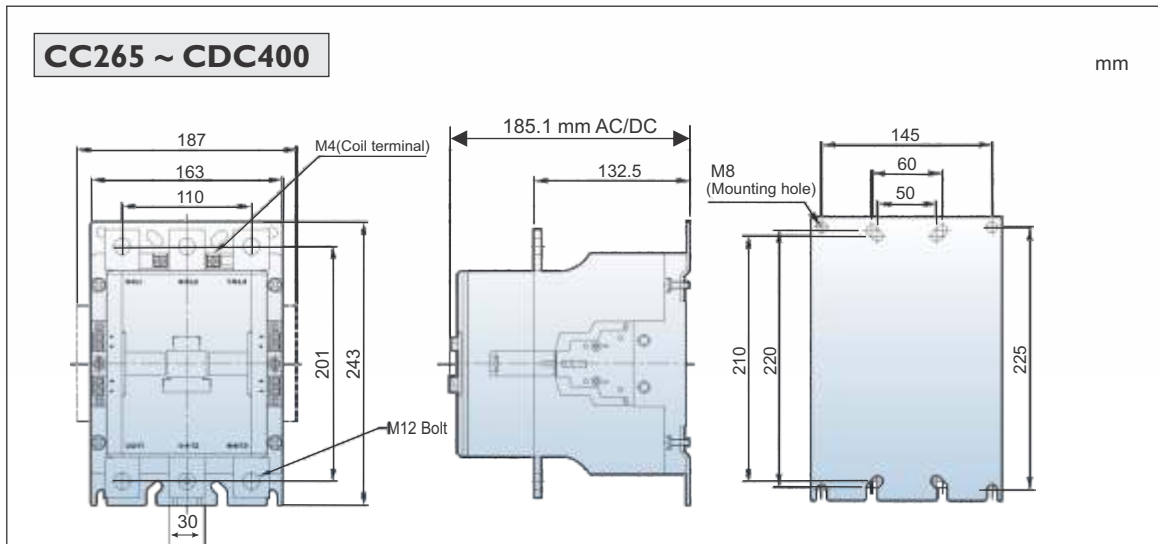
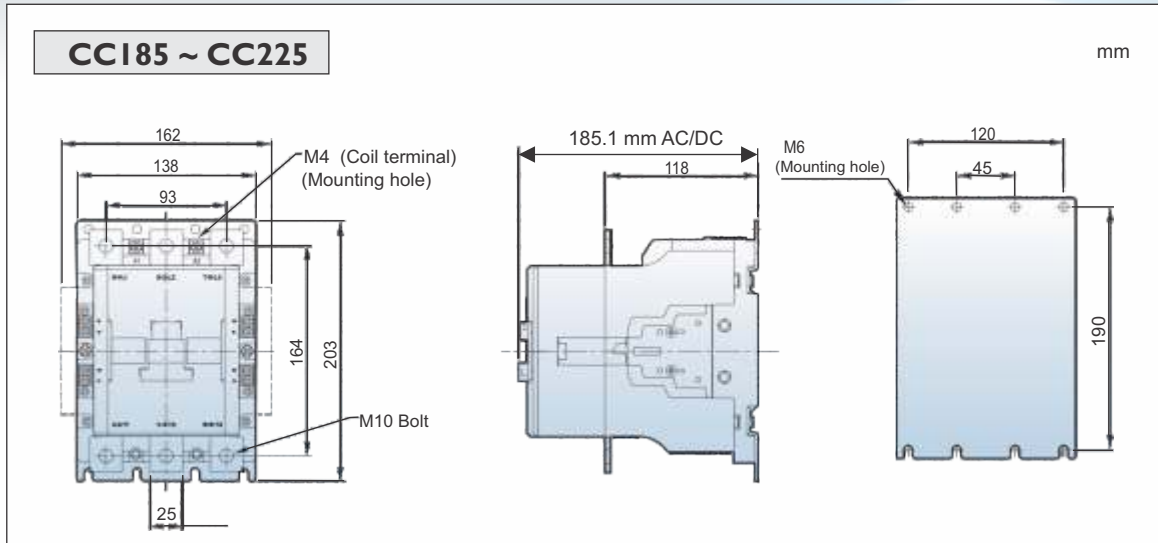


Dimensions: mm

Dimensional Drawings

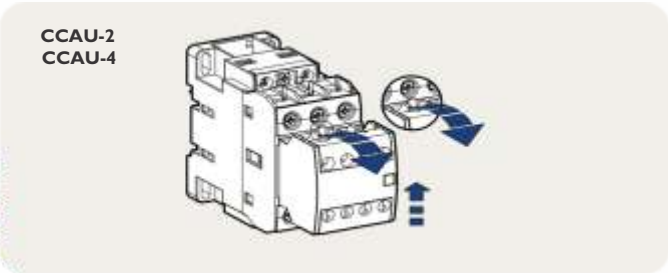
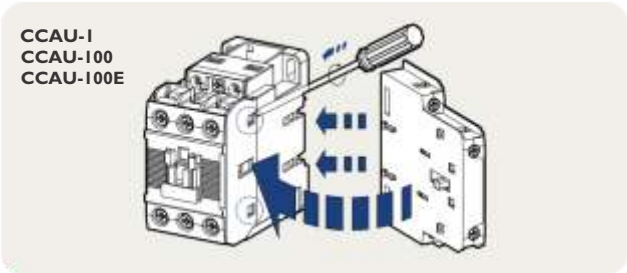
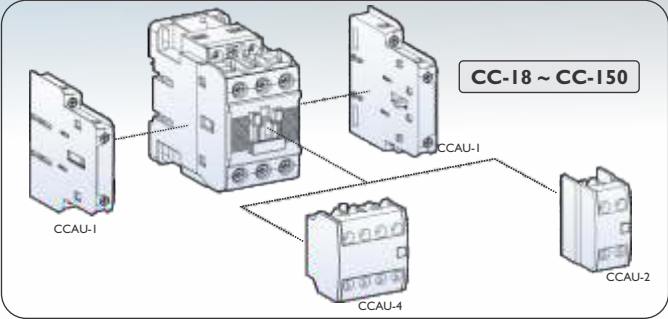


Dimensional Drawings



Dimensions: mm

Auxiliary Contact Units



To install the side mounting unit, remove the indicated part in the circle first. Fit each part as shown. To separate push forward and pull.

To install front mounting unit fit it on the upper part of the front of the contactor and push it down. To separate pull the lever of the unit and push the unit upward.

Type	Appearance	Pole	NO	NC	Contact Arrangement	Mount	Weight
CCUA-1 CCAU-100 CCAU-100E		2	1	1		Side	53 g
CCUA-2		2	2 1 -	- 1 2		Front	28 g
CCUA-4		4	4 3 2 1 -	- 1 2 3 4		Front	50 g

Control Coil Characteristics

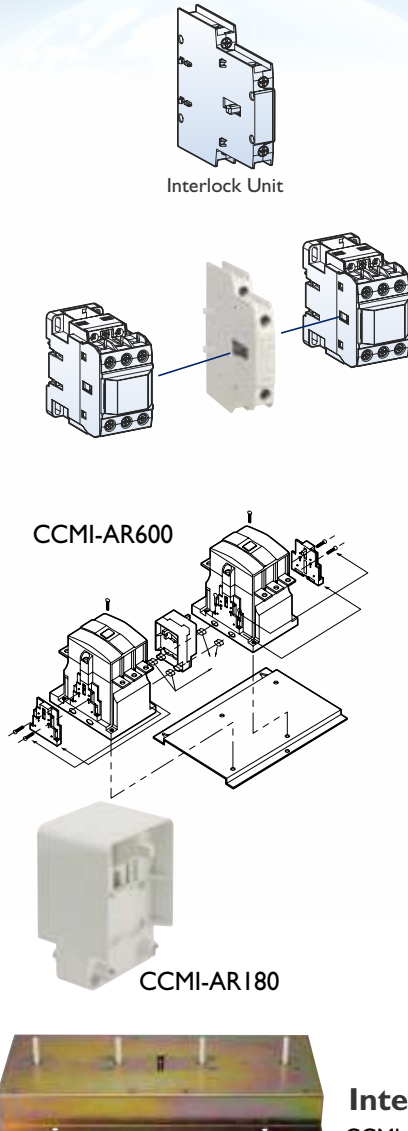
Frame size Type	CC-18	CC-22	CC-40	CC-50 CC-65	CC-85 CC-100
AC Coil					
Control Voltage [Uc]					
50 Hz [V]	24, 32, 36, 42, 48, 80, 100, 110, 220, 230, 240, 380, 400, 415, 440, 500, 550 V				
60 Hz [V]	24, 48, 100, 110, 120, 200, 208, 220, 230, 240, 277, 380, 440, 480, 600 V				
Voltage Limit [Uc]	85 - 110%				
Coil Consumption at 20°C					
AC 220 V Inrush [VA]	70	70	90	110	240
60 Hz Holding [VA]	9	9	9	13	17
Heat Dissipation [W]	2.3	2.3	2.7	2.8	5.4
Operating Time Close [ms]	15...30	15...30	15...30	15...30	15...30
Opening [ms]	4...30	4...19	4...19	4...19	10...30
DC Coil					
Control Voltage [Uc]					
	12, 20, 24, 48, 60, 80, 80, 100, 110, 125, 200, 220, 250V				
Voltage Limit [Uc]	85 ~ 110%				
Coil Consumption at 20°C					
DC 110V Inrush [W]	5	5	9	9	18
Holding [W]	5	5	9	9	18
Time Constant (L / R) [ms]	28	28	28	65	75
Operating Time					
Closing [ms]	40...60	40...60	50...65	50... 65	100...120
Opening [ms]	40...60	40...60	4...19	4...19	10...25

Frame size Type	CC-130 CC-150	CC-185 CC-225	CC-265 CC-330 CC-400	CC-500 CC-630 CC-800
Control Voltage (Uc) AC / DC	24			
AC / DC	48			
AC / DC	70 - 110	100 - 220 - 240	100 - 220 - 240	100 / 200
AC / DC	100 - 220 / 110 / 220			
50 / 60 Hz AC	24 / 48 / 100 - 240 110 - 120 220 - 240	300 / 400 - 440 500	300 450 500	300 400 500
Voltage Limit [Uc]	85 - 110%			
Coil Consumption at 20°C				
220 V Inrush AC / DC [VA]	110 / 213	380	571	1 000
60 Hz Holding AC / DC [VA]	18 / 7.5	11.6	14	29
Heat Dissipation [W]	2.7	4.7	5	7.8
Operating Time Close AC / DC [ms]	20...40 / 70...80	70	55	75
Opening AC / DC [ms]	60...70	70	55	75

Mechanical Interlock

Interlocks

Component Parts for assembly by customer. Interlock unit, CCMI-UR2 is a mechanical interlock unit and provides 2NC contacts for use in electrical interlocking.



Contactor	Interlock unit	
	Type	Weight
CC18 CC22 CC40 CC50 CC65 CC85 CC100 CC130 CC150	CCMI-UR02	0.06 kg
CC185 CC225 CC265 CC330	CCMI-AR180	0.09 kg
CC400 CC630 CC800	CCMI-AR600 H/V	15.2 kg

CC Auxiliary Contacts

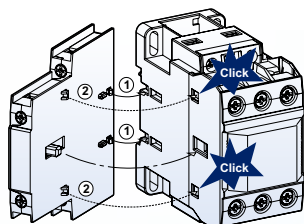
Type	CCAU - 1A8	CCAU - 100	CCAU - 2/4
Rated operation voltage (Ue)	600V	600V	600V
Rated insulation voltage (Ui)	600V	600V	600V
Rated impulse withstand voltage (Uimp)	6kV	6kV	6kV
Rated frequency	50/60Hz	50/60Hz	50/60Hz
Contact Ratings			
Voltage	DC 17V	DC 24V	DC 24V
Current	DC 5mA	DC 10mA	DC 10mA
Rated thermal current (Ith, AC12 duty)	10A	16A	16A
Rated operation current			
AC15 duty (A600)	120V	6A	6A
	240V	3A	3A
	380V	1.9A	1.9A
	480V	1.5A	1.5A
	500V	1.4A	1.4A
	600V	1.2A	1.2A
DC13 duty (P600)	125V	1.1A	1.1A
	250V	0.55A	0.55A
	400V	0.31A	0.31A
	500V	0.27A	0.27A
	600V	0.2A	0.2A
	Electrical lifetime (mil. operations)		
AC15 duty	220V	0.5	0.5
	440V	0.5	0.5
DC13 duty	220V	0.5	0.5
	440V	0.5	0.5
Maximum operating cycles per hour	1800	1800	1800
Conductor size (Solid, stranded)	AWG 18-10	18-10	18-10
(the max. number of conductors: 2)	mm ² 1-2.5	1-2.5	1-2.5

* CCMI-AR600 H / V
H = Horizontal
V = Vertical

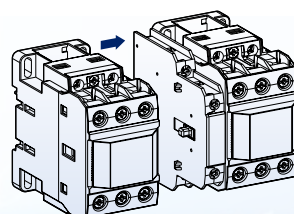
Interlock Unit - CCMI-AR180 & CCMI-AR600 H / V

CCMI-AR180 & CCMI-AR600 H / V are mechanical interlock units in which electrical contacts for use in electrical interlocking are not included. Please use the auxiliary contacts on the sides of the Contactors for that purpose.

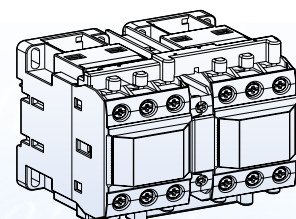
Installation of Interlock and Wire Kits



Install the interlock unit on the side of a contactor first. Fit each part as indicated in the figure.



And then install the other contactor on the other side of the interlock unit as shown.



Thermal Overload Relay Specifications

Thermal Overload Relay

Type CMT, bimetal-style, Overload Relays are designed to protect AC circuits & motors against overloads, phase failure, long starting times and prolonged starting of the motor.

① Adjustment Dial











Before adjusting the dial open the protection cover. Current setting can be done by using (+) or (-) screw driver. Do not rotate the dial out of the setting range.

② Stop Test Button



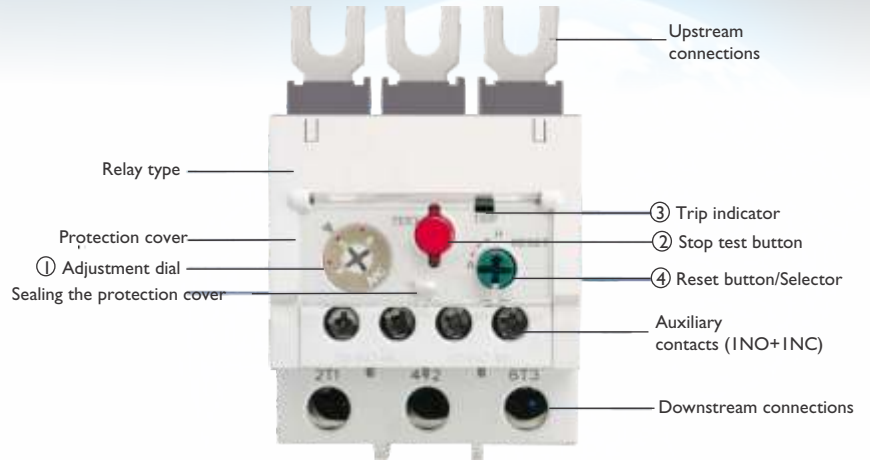
STOP function is executed by pushing the button which causes the next sequence. In case of operation test, pull this button.

Auxiliary contact operation

Terminal no	Normal	STOP	TEST/TRIP	RESET
NC 95-96				
NO 97-98				

Environment and auxiliary circuit

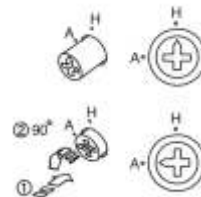
Environment		CMT-12-800
Standards		IEC / EN 60947-1, IEC / EN 60947-4-1
Certifications		CE, CSA, UL, CCC
Rated Operation Voltage		Max. 690 V
Rated Insulation Voltage		690 V
Rated Frequency		50 / 60 Hz
Degree of Protection (Conforming to IEC 60 529)		IP 20
Ambient Air Temperature	Storage	-30 ~ +65°C
	Operation	-5 ~ +55°C (AC Type), -5 ~ +40° C
Mounting Position		Vertical plane
Shock Resistance (Conforming to IEC 68-2-7)		15 gn - 11 ms
Vibration Resistance (Conforming to IEC 68-2-6)		6 G
Insulation Strength (Conforming to IEC 801-5)		6 kV
Rated Impulse Withstand Voltage (Conforming to IEC 801-5)		6 kV
Auxiliary Contacts Characteristics		
Composition		INO + INC
Rated Thermal Current	Max	5 A
Rated Operation Current		C600, R300
	AC15 duty	120 V
	(C600)	240 V
		380 V
		480 V
		500 V
		600 V
	DC13 duty	120 V
	(R300)	240 V
Connector	Size	1 mm ² / 18 AWG
Connection to Screw Clamp Terminals	Type	65 / 75°C Cu-Wire



③ Trip Indicator If relay is tripped it flags.

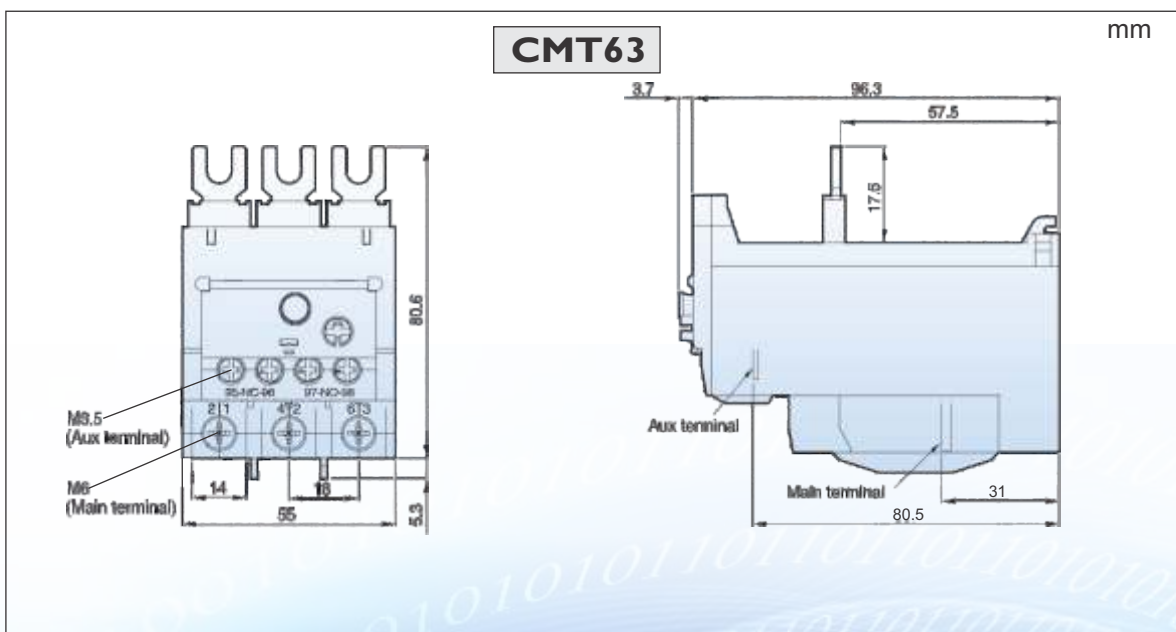
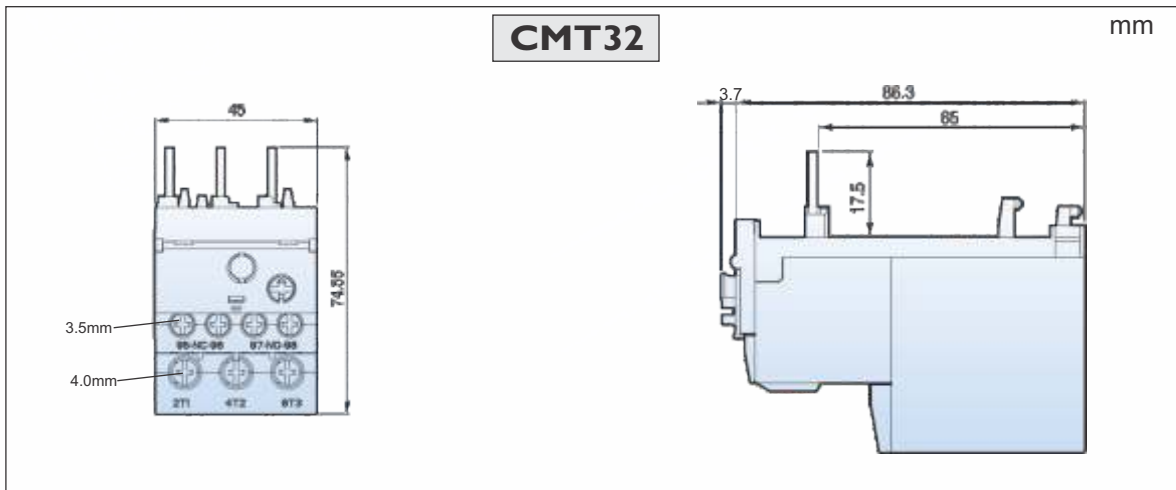
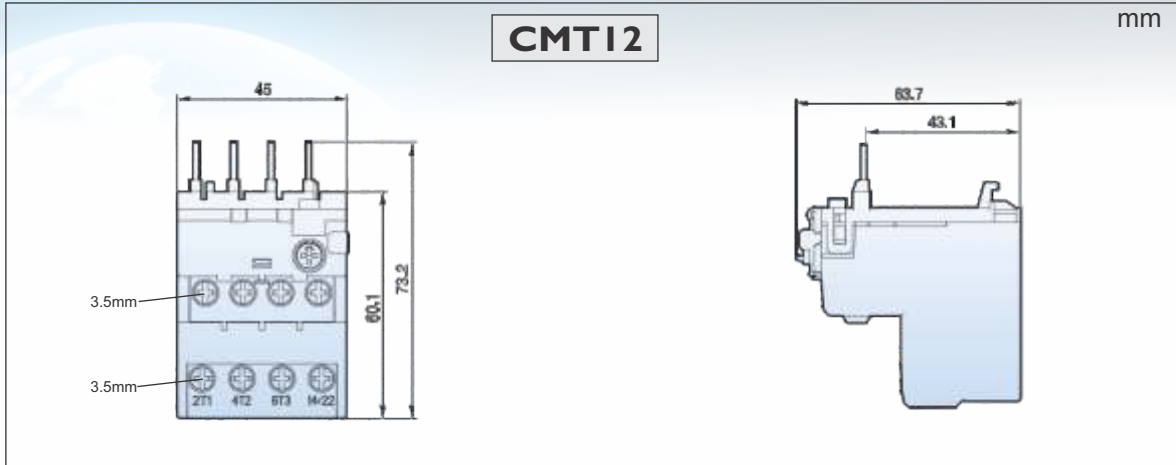


④ Reset Button / Selector



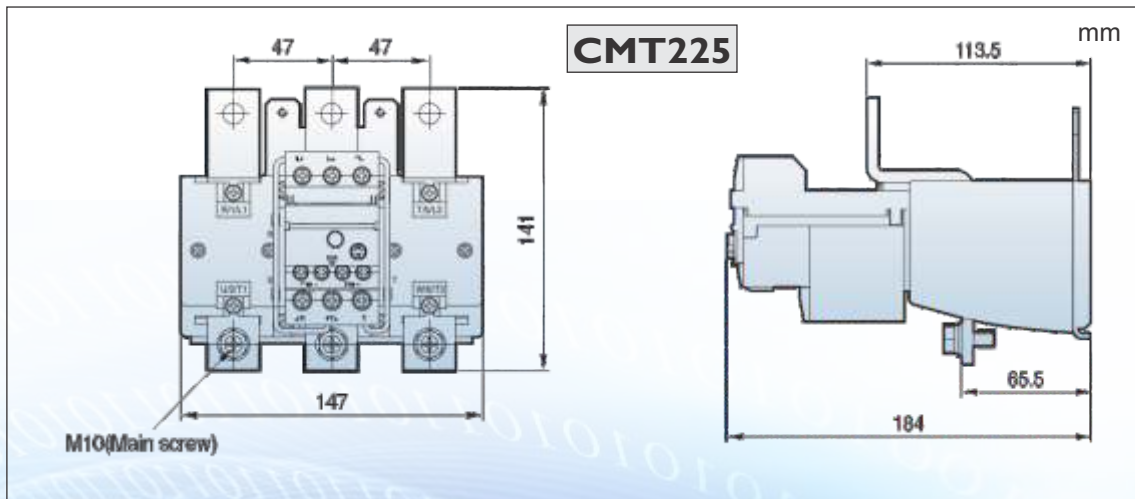
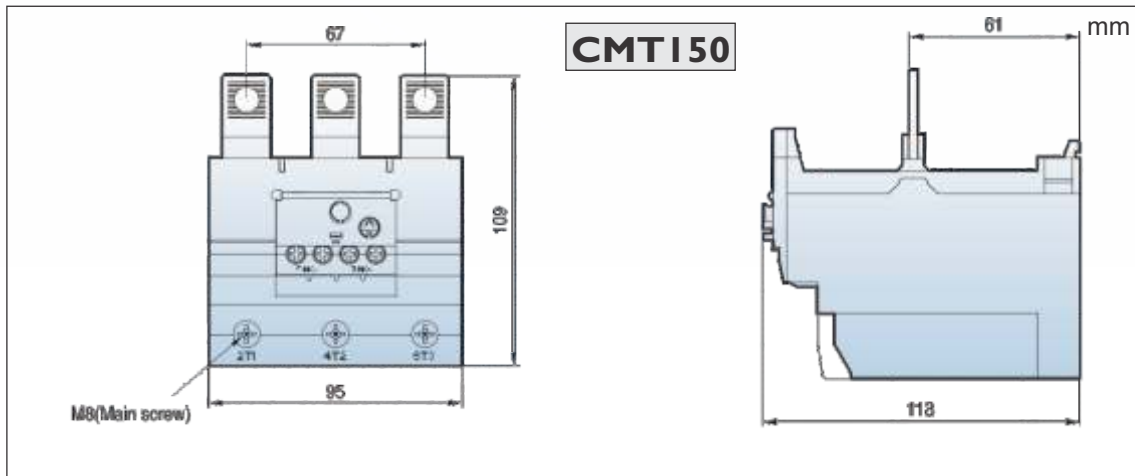
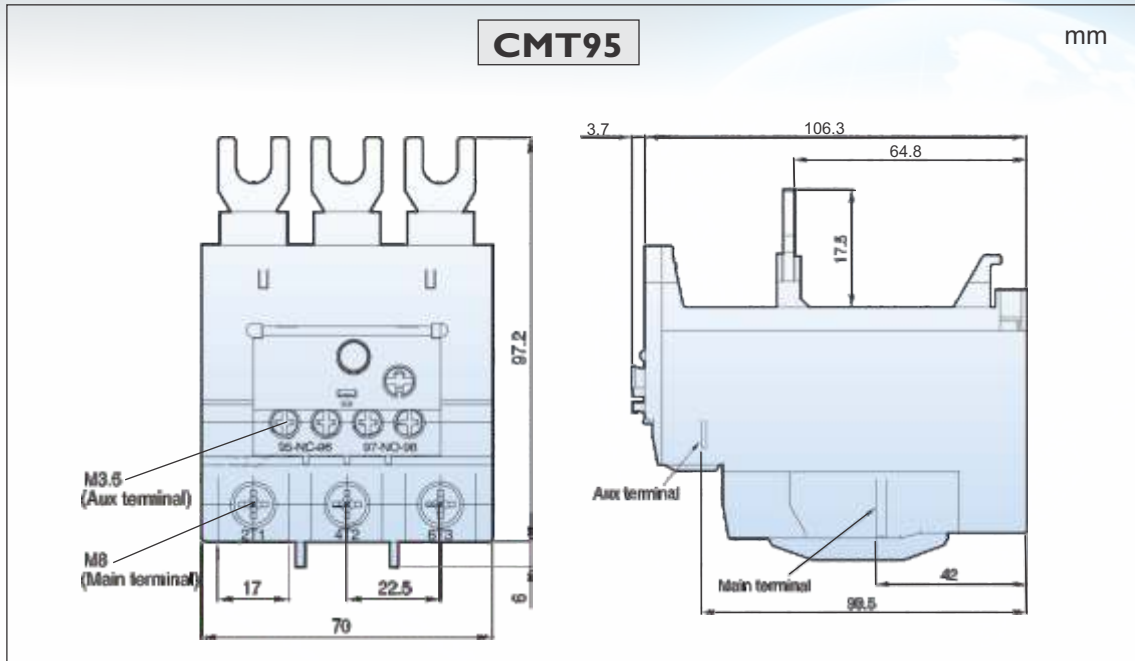
Using a screw driver to set the reset mode. In case of Manual mode (H) push the button to reset the relay. To change the Automatic mode (A) from Manual mode push the button and rotate as shown in the figure (left).

Dimensional Drawings



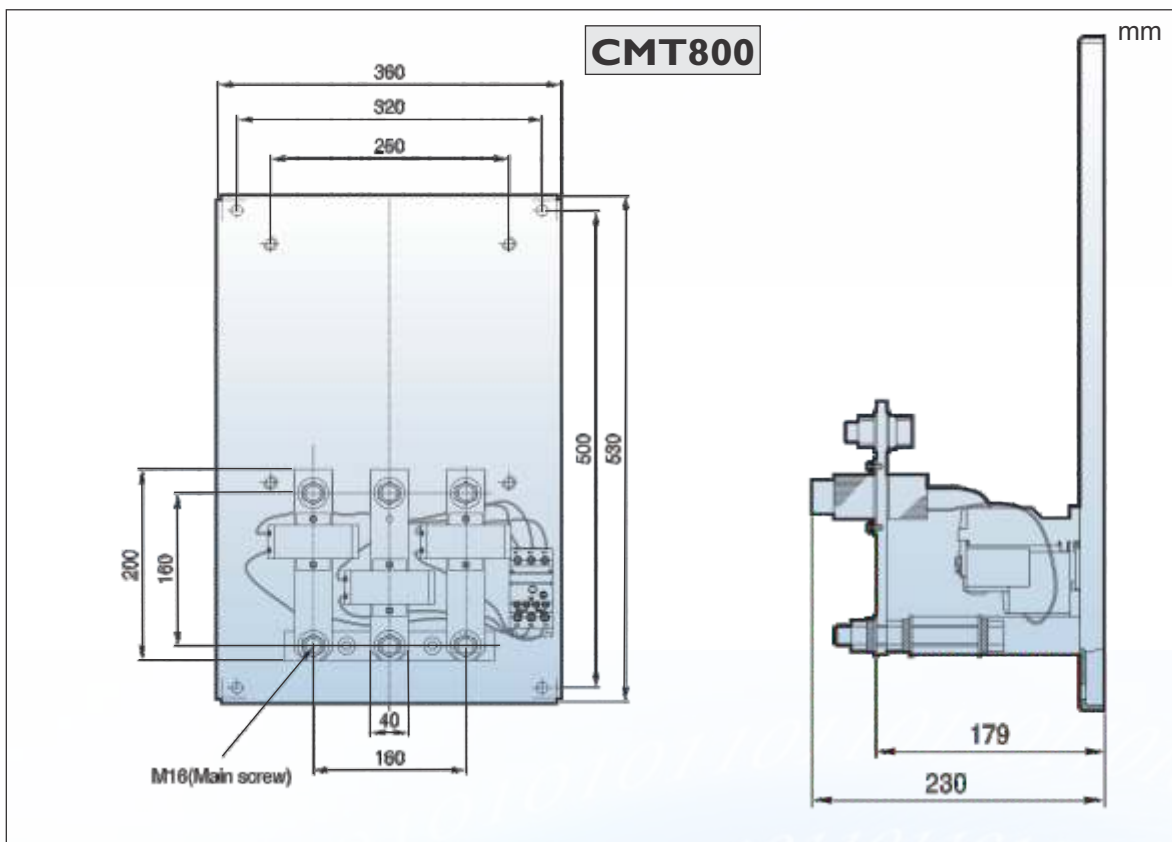
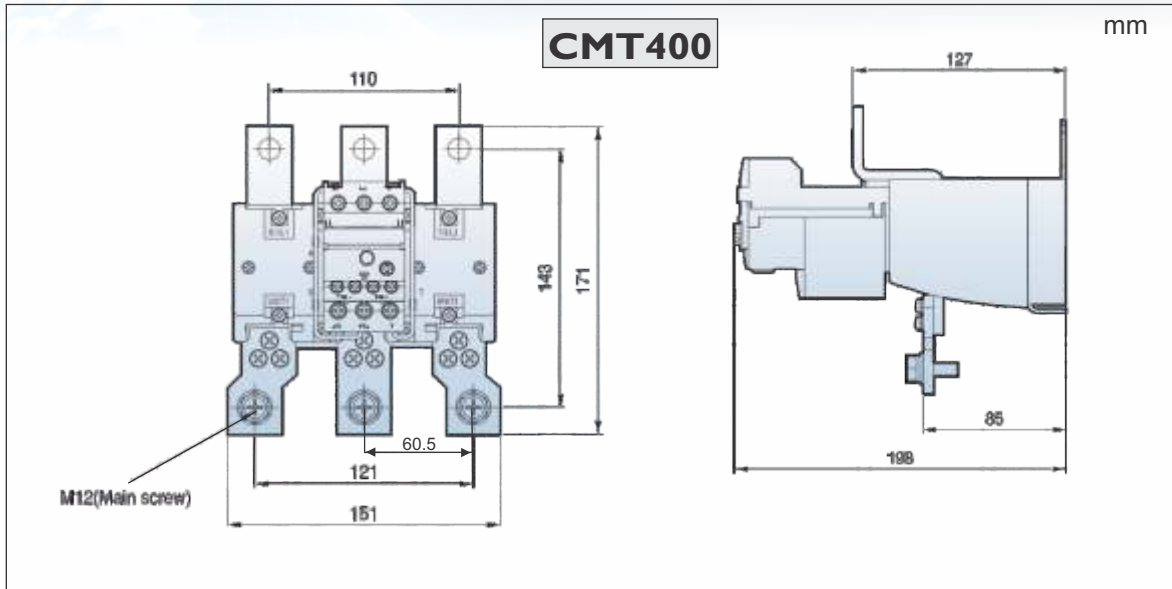
Dimensions: mm

Dimensional Drawings



Dimensions: mm

Dimensional Drawings



Dimensions: mm

Manual Motor Starters Specifications

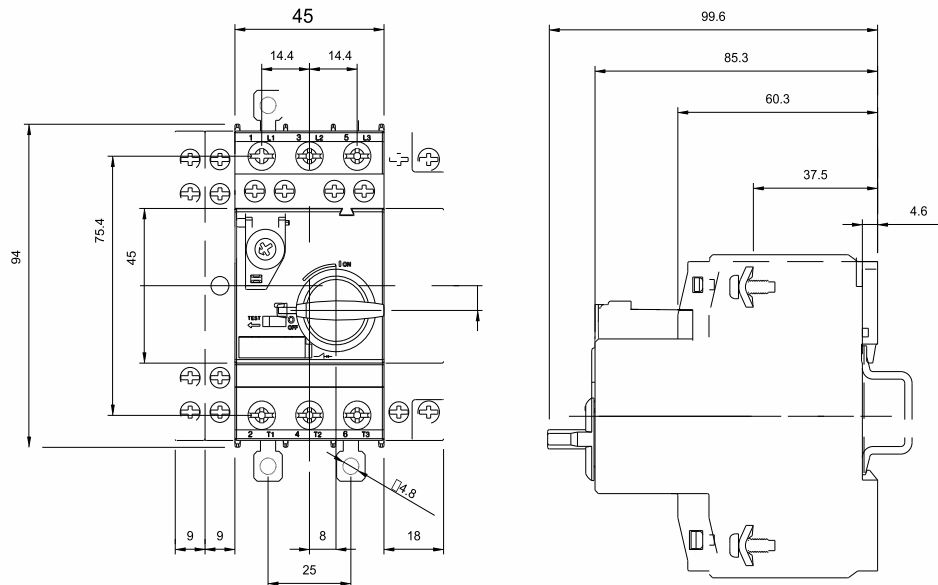


Current Adjustable Type		CMS-32H	CMS-63H
Breaking Capacity		High	High
Handle Type		Rotary (lockable)	Rotary (lockable)
Number of Poles		3	3
Rated Operational Voltage (Ue)		Up to 690 V	Up to 690 V
Rated Frequency		50 / 60 Hz	50 / 60 Hz
Rated Insulation Voltage (Ui)		690 V	1 000 V
Rated Impulse Voltage (Uimp)		6 kV	8 kV
Utilization	IEC 60 947-2 (Breaker)	Cat. A	Cat. A
Category	IEC 60 947-4 (Motor Starter)	AC3	AC3
Mechanical Endurance (Operating)		100 000	50 000
Electrical Endurance (Cycles)		100 000	25 000
Max Operating Frequency per Hour (Ope.h)		25	25
Temperature Compensation (Operation)		-20 ~ +60°C	-20 ~ +60°C
Instantaneous Short Circuit Release		13 x Ie max.	13 x Ie max.
Overload Protection		●	●
Phase Failure Function		●	●
Trip Indicating Function (Trips to Off)		X	X
Test Function (Push Button)		●	●
Dimension (W x H x D)		45 x 105 x 54.4 x 60.3	55 x 125 x 112.3
Weight (g)		320	1 000

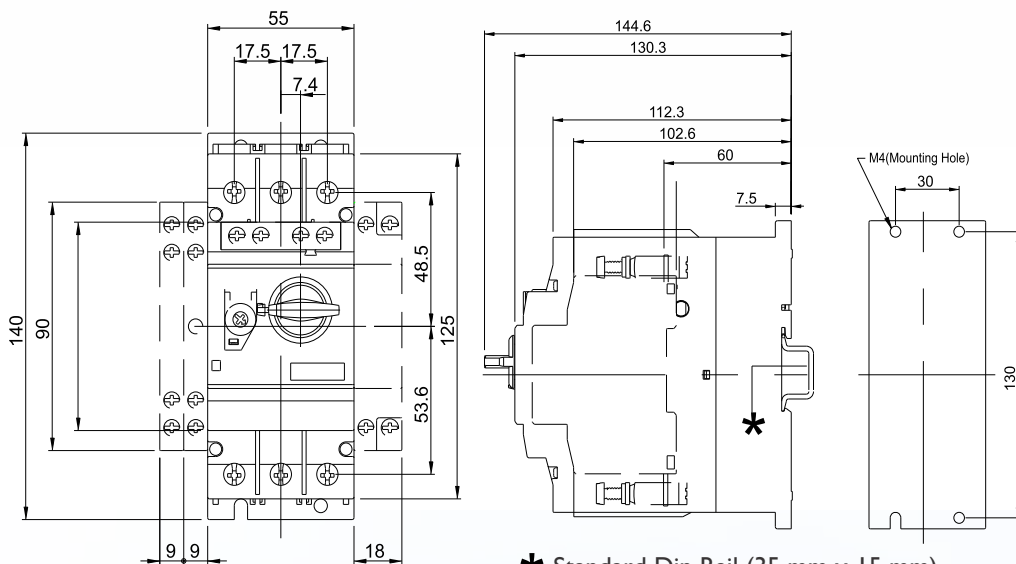
Rated Breaking Capacity (kA)	Rated Operational Current (Ie)	Thermal Release Adjustment Range (A)	220 V 240 V 230 V		415 V 400 V		460 V 440 V		525 V 500 V		690 V 600 V		220 V 240 V 230 V		415 V 400 V		460 V 440 V		525 V 500 V		690 V 600 V	
			Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics
0.16	0.1 ~ 0.16		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
0.25	0.16 ~ 0.25		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
0.4	0.25 ~ 0.4		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
0.63	0.4 ~ 0.63		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
1	0.63 ~ 1		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
1.6	1 ~ 1.6		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2.5	1.6 ~ 2.5		100	100	100	100	100	100	100	100	8	8	—	—	—	—	—	—	—	—	—	—
4	2.5 ~ 4		100	100	100	100	100	100	100	100	8	8	—	—	—	—	—	—	—	—	—	—
6	4 ~ 6		100	100	100	100	100	100	100	100	6	6	—	—	—	—	—	—	—	—	—	—
8	5 ~ 8		100	100	100	100	50	38	50	38	6	6	—	—	—	—	—	—	—	—	—	—
10	6 ~ 10		100	100	100	100	50	38	50	38	6	6	100	100	100	100	50	38	50	38	6	5
13	9 ~ 13		100	100	100	100	50	38	42	32	6	6	100	100	100	100	50	38	42	32	6	5
17	11 ~ 17		100	100	50	38	20	15	10	8	4	4	100	100	50	50	50	38	12	9	5	5
22	14 ~ 22		100	100	50	38	20	15	10	8	4	4	100	100	50	50	50	38	12	9	5	5
26	18 ~ 26		100	100	50	38	20	15	10	8	4	4	100	100	50	50	35	27	12	9	5	5
32	22 ~ 32		100	100	50	38	20	15	10	8	4	4	100	100	50	50	35	27	10	8	5	5
40	28 ~ 40		—	—	—	—	—	—	—	—	—	—	100	100	50	50	35	27	10	8	5	5
50	34 ~ 50		—	—	—	—	—	—	—	—	—	—	100	100	50	50	35	27	10	8	5	5
63	45 ~ 63		—	—	—	—	—	—	—	—	—	—	100	100	50	50	35	27	10	8	5	5

Dimensional Drawings

TYPE	CMS-32H
Amp	RANGE
0.16	0.1 ~ 0.16 A
0.25	0.16 ~ 0.25 A
0.4	0.25 ~ 0.4 A
0.63	0.4 ~ 0.63 A
1	0.63 ~ 1 A
1.6	1 ~ 1.6 A
2.5	1.6 ~ 2.5 A
4	2.5 ~ 4 A
6	4 ~ 6 A
8	5 ~ 8 A
10	6 ~ 10 A
13	9 ~ 13 A
17	11 ~ 17 A
22	14 ~ 22 A
26	18 ~ 26 A
32	22 ~ 32 A



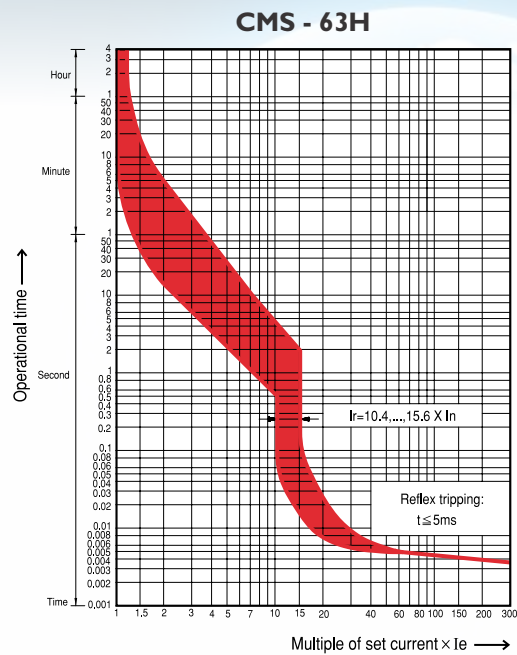
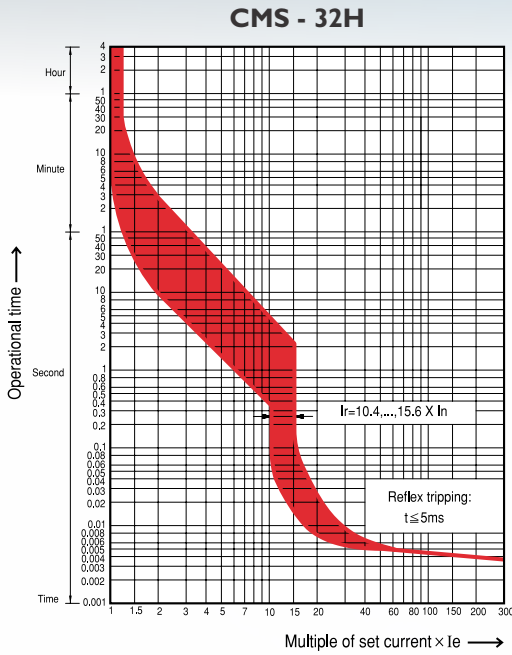
TYPE	CMS-63H
Amp	RANGE
10	6 ~ 10 A
13	9 ~ 13 A
17	11 ~ 17 A
22	14 ~ 22 A
26	18 ~ 26 A
32	22 ~ 32 A
40	28 ~ 40 A
50	34 ~ 50 A
63	45 ~ 63 A



* Standard Din Rail (35 mm x 15 mm)

Dimensions: mm

Manual Motor Starters - Characteristic Curve



I) Thermal Release Trip Current :

The adjustable inverse bimetal trip reliably protects motors against overloads.
The curve shows the mean operating current at an ambient temperature of 20°C starting from cold.
Careful testing and setting ensures effective motor protection even in the case of single-phasing.

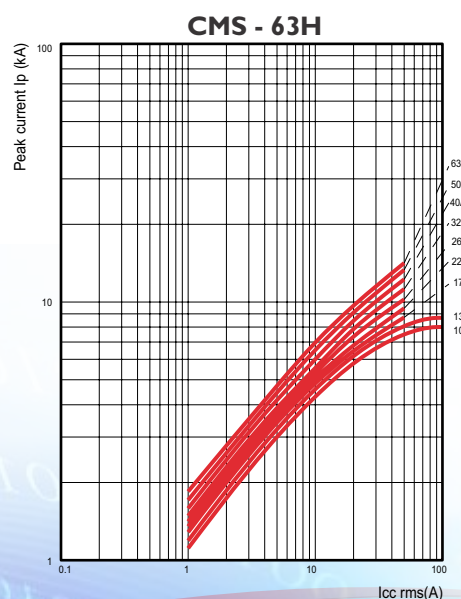
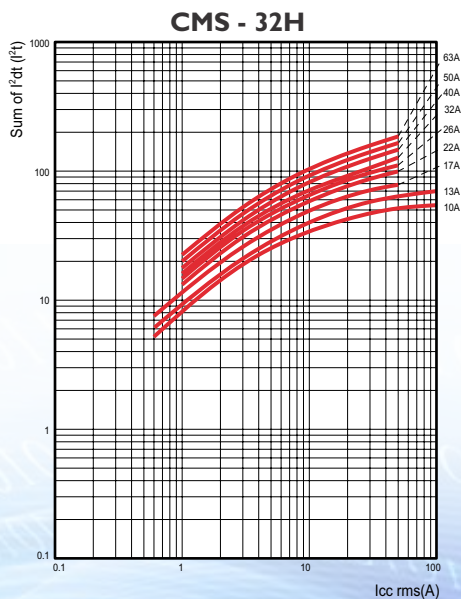
II) Magnetic Release Trip Current :

The instantaneous magnetic trip has a fixed operating current setting.
This corresponds to 13 times the maximum value of the setting range.

Current setting Ie :


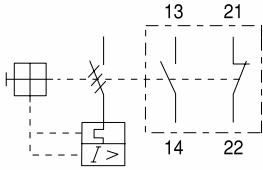
The Overload Trip corresponds to a Thermal Overload Relay in a Motor Starter conforming to IEC 947-4-1.
If a different value is prescribed (e.g. reduced Ie for cooling medium having a temperature higher than 40°C or a place of installation higher than 2000m above sea level).
The setting current is equal to the reduced rated current Ie of the motor.


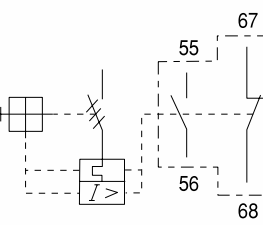
Thermal limit in kA²s in the magnetic operating zone (Ue = 415 V)


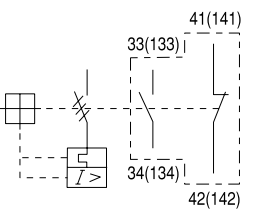



Manual Motor Starters Accessories

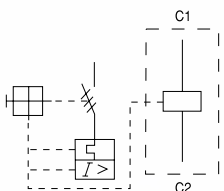
Accessories (Electrical Auxiliaries)


Type	Connection Diagram
Front  Auxiliary Switch <ul style="list-style-type: none"> Front mounting 2-pole One front mounting module per circuit breaker 	1NO1NC 

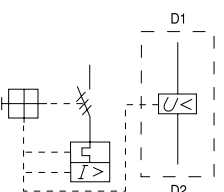
Type	Connection Diagram
Side Any Trip Alarm Switch <ul style="list-style-type: none"> Operates in case of trip Side mounting on the left 2-pole 	1NO1NC 

Type	Connection Diagram
Side Auxiliary Switch <ul style="list-style-type: none"> Side mounting on the left 2-pole One side mounting module per Circuit Breaker 	1NO1NC 

Type	Description
Side 	Shunt Release <ul style="list-style-type: none"> Side mounting on the right One side mounting module per circuit breaker. Can not use with UVT

Connection Diagram	
	24 V 50 Hz 110 V 50 Hz 220 ~ 230 V 50 Hz 380 ~ 400 V 50 Hz 415 ~ 440 V 50 Hz

Type	Description
Side 	Undervoltage release <ul style="list-style-type: none"> Side mounting on the right One side mounting module per circuit breaker. Can not use with SHT

Connection Diagram	
	24 V 50 Hz 110 V 50 Hz 220 ~ 230 V 50 Hz 380 ~ 400 V 50 Hz 415 ~ 440 V 50 Hz

E-Handle (Rotary-type)

E-Handle is a Rotary-Type Handle Accessory which can be attached to the front control and verify the ON, TRIP or OFF condition of Manual Motor Starters under the situation of closing panel.

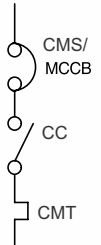
- Application Model : CMS-32 / CMS-63
- Operation Temp. : -20~ +60°C
- CE and UL certified
- Degree of Protection : IP65
- Locking Device : Lockable in on/off position
- Material of Insulation : Plastic (PA66)



Type	Application	MMS	Remarks
CMEH-32	CMS-32		Length of shaft : 315 mm
CMEH-63	CMS-63		

Type 2 Co-ordination CMS + MCCB

Rated Operational Power		Circuit Breaker		Contactor	Thermal Overload Relays		Short Circuit Breaking Capacity	
kW	Current [A]	Type	Rating Amp	Type	Type	Setting Range Amp	Ir [kA]	Iq [kA]
	415 V							
0.06	0.19	CMS 32H	0.25	CC18	CMT 12	0.16 ~ 0.25	1	50
0.09	0.29	CMS 32H	0.4	CC18	CMT 12	0.25 ~ 0.4	1	50
0.12	0.42	CMS 32H	0.63	CC18	CMT 12	0.4 ~ 0.63	1	50
0.18	0.58	CMS 32H	0.63	CC18	CMT 12	0.4 ~ 0.63	1	50
0.25	0.82	CMS 32H	1	CC18	CMT 12	0.63 ~ 1	1	50
0.37	1.06	CMS 32H	1.6	CC18	CMT 12	1 ~ 1.6	1	50
0.55	1.4	CMS 32H	1.6	CC18	CMT 12	1 ~ 1.6	1	50
0.75	1.8	CMS 32H	2.5	CC18	CMT 12	1.6 ~ 2.5	1	50
1.1	2.6	CMS 32H	4	CC22	CMT 32	2.5 ~ 4	1	50
1.5	3.5	CMS 32H	4	CC22	CMT 32	2.5 ~ 4	1	50
2.2	4.7	CMS 32H	6	CC22	CMT 32	4 ~ 6	1	50
3.0	6.3	CMS 32H	8	CC40	CMT 32	5 ~ 8	1	50
4.0	8.2	CMS 32H	10	CC40	CMT 32	6 ~ 9	1	50
5.5	11.1	CMS 32H	13	CC40	CMT 32	9 ~ 13	1	50
7.5	14.9	CMS 32H	17	CC40	CMT 32	12 ~ 18	1	50
11.0	21.2	G37D	25	CC50	CMT 63	18 ~ 25	3	37
15.0	28	G37D	32	CC50	CMT 63	24~36	3	37
18.5	34	G37D	40	CC50	CMT 63	28 ~ 40	3	37
22	40	G37D	50	CC50	CMT 63	34 ~ 50	3	37
30	53	G37D	63	CC65	CMT 63	45 ~ 65	3	37
37	64	G37D	75	CC85	CMT 95	54 ~ 75	3	37
45	77	G37D	100	CC85	CMT 95	63 ~ 85	3	37
55	93	G37D	125	CC100	CMT 95	70 ~ 95	3	37



Type 2 Co-ordination

Under short circuit conditions, the Contactor or Starter shall cause no danger to persons or the installation and shall be suitable for further use. The risk of contact welding is recognised, in which case the manufacturer shall indicate the measures to be taken with regard to equipment maintenance. The key to Type 2 co-ordinated protection is to use a protective device that limits the peak current and clears in less than 8 milliseconds, or the first half cycle.

Benefits of Type 2 Co-ordination

There are 3 key benefits of Type 2 co-ordination:

- 1. Safety:** Type 2 co-ordination is intended to provide safety for operating personnel, facility and installed equipment.
- 2. Reduced Costs:** When a starter is properly protected from short circuits, all components of the branch circuit remain intact and operational. Only fuses may need to be replaced. Savings result from a reduction in labor required to perform maintenance after a short circuit and in the amount of replacement parts and required equipment. Savings are also realised by minimising spoiled or lost production in a continuous process environment, such as may occur in some food and chemical process plants.
- 3. Increased productivity:** The manufacturing process relies on continuous motor operation. If starters are damaged and must be repaired or replaced, the motors are shut down and the manufacturing process stops. By implementing Type 2 co-ordination, manufacturing processes should function with minimum disruption from short circuits on the motor circuits.

Contactor Mounting Consideration

Installation Minimum Safety Clearance Distances

Please maintain safety clearance distances as seen in the table below in order to protect lives and equipment.

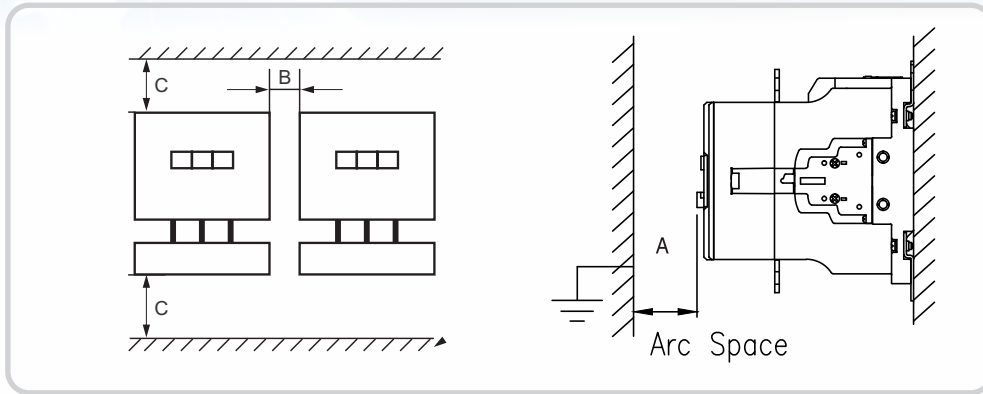
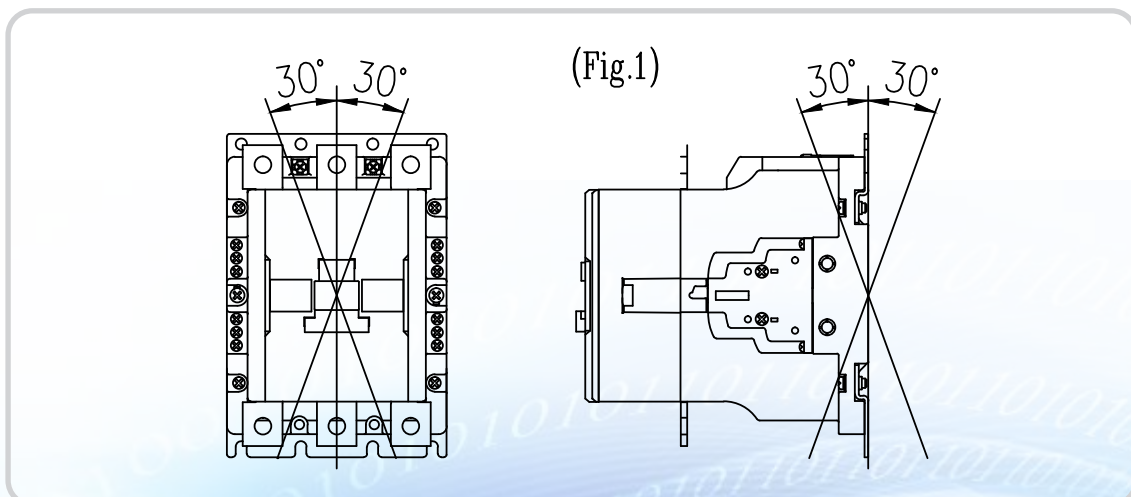


Table I. Installation Minimum Clearance Dimensions (unit: mm)




















Contactor	A	B	C
CC18	5	2	15
CC22	5	2	15
CC40 - CC65	5	4	15
CC85 - CC100	10	6	25
CC130 - CC150	20	10	30
CC185 - CC225	30	10	50
CC265 - CC400	50	10	50
CC630 - CC800	50	10	80

Please note: it is not recommended to install Contactors in close dimension to each other if used continuously.

Maximum Deviation From Normal Mounting



Contactor Termination

Frame	Wire type	Main Terminal Size	Wire type						Torque			
										mm(max)	[lb-in]	[Nm]
			(AWG / mm ²)									
CC18		M3.5	18 ~ 10 / 1 ~ 6	18 ~ 10 / 1 ~ 6	18 ~ 10 / 1 ~ 6			8.3	10	1.13	12	
			16 ~ 10 / 1.5 ~ 10	16 ~ 10 / 1.5 ~ 10	16 ~ 10 / 1.5 ~ 10							
			16 ~ 8 / 1.5 ~ 10	16 ~ 8 / 1.5 ~ 10	16 ~ 8 / 1.5 ~ 10							
CC22		M4	18 ~ 10 / 1 ~ 6	18 ~ 10 / 1 ~ 6	18 ~ 10 / 1 ~ 6			9.6	20	2.25	23	
			18 ~ 10 / 1 ~ 6	16 ~ 10 / 1 ~ 6	16 ~ 10 / 1 ~ 6							
			18 ~ 10 / 1 ~ 6	16 ~ 8 / 1.5 ~ 10	16 ~ 8 / 1.5 ~ 10							
CC40		M5	18 ~ 10 / 1 ~ 6	12 ~ 8 / 2.5 ~ 10	12 ~ 8 / 2.5 ~ 10			12.8	35	4	41	
			18 ~ 10 / 1 ~ 6	8 ~ 6 / 10 ~ 16	8 ~ 6 / 10 ~ 16							
CC50		M6	-	10 ~ 4 / 6 ~ 25	10 ~ 4 / 6 ~ 25			14	35	4	41	
CC65			-	8 ~ 3 / 10 ~ 35	8 ~ 3 / 10 ~ 35							
CC85		M8	-	8 ~ 2 / 10 ~ 35	8 ~ 2 / 10 ~ 35			17	45	5.1	52	
CC100			-	8 ~ 1/0 / 10 ~ 50	8 ~ 1/0 / 10 ~ 50							
CC130		M8	-	8 ~ 2/0 / 10 ~ 70	8 ~ 2/0 / 10 ~ 70			24.5	80	9.1	93	
CC150			-	3 ~ 2/0 / 35 ~ 70	3 ~ 2/0 / 35 ~ 70							
CC185		M10	-	3 ~ 4/0 / 35 ~ 95	3 ~ 4/0 / 35 ~ 95			25	130	14.7	150	
CC225			-	1 ~ 4/0 / 50 ~ 95	1 ~ 4/0 / 50 ~ 95							
CC265		M12	-	1/0 ~ 300 / 50 ~ 150	1/0 ~ 300 / 50 ~ 150			30	200	22.6	230	
CC330			-	3/0 ~ 500 / 95 ~ 240	3/0 ~ 500 / 95 ~ 240							
CC400		M16	-	4/0 ~ 500 / 95 ~ 240	4/0 ~ 500 / 95 ~ 240			40	500	26.5	270	
CC630			-	350 ~ 700 / 185 ~ 185x2	350 ~ 700 / 185 ~ 185x2							
CC800		M16	-	350 ~ 800 / 185 ~ 240x2	350 ~ 800 / 185 ~ 240x2			40	500	26.5	270	
CC185-CC800			-	600 ~ 2000	-							
Aux/Coil		M4	20 ~ 14 / 0.5 ~ 2.5	18 ~ 12 / 0.75 ~ 2.5	18 ~ 12 / 0.75 ~ 2.5			7.6	10	1.13	12	
Aux/Coil		M4	16 ~ 10 / 1.25 ~ 5.5	16 ~ 10 / 1.25 ~ 5.5	16 ~ 10 / 1.25 ~ 5.5			7.6	15	1.75	18	

