



Technical catalogue
Edition 2024





M-SERIES

- Miniature circuit breaker
- Molded case circuit breakers
- Air circuit breakers
- AC Contactor
- Thermal overload relays

B-SERIES

- Dry Power Capacitors
- Intelligent Capacitor
- Series Reactor
- Discharge Reactor
- Power Factor Relay
- Capacitor Duty Contactor
- Active Harmonic Filter



ACB / MCCB

Series: MA3 for ACB and MF, MT, ME for MCCB
 Un(V): AC415/690
 In(A): 630~6300 for ACB and 16 to 1600 for MCCB
 Trip unit: Fixed, Thermal adjustable, Electronic type
 Icu(kA): 18/25/36/50/65/80/85/100/120/135
 Standard: IEC/EN 60947-2
 Laboratory: DEKRA

MCB

Series: MA63E, MA63S, MA125E, MA125S, BME63
 Un(V): AC240/415
 In(A): 6/10/16/20/25/32/40/50/63/80/100/125
 Curve: B/C/D
 Icu(kA): 6/10
 Standard: IEC/EN 60898-1 & IEC/EN 60947-2
 Laboratory: DEKRA & INTERTEK

ATS

Series: N and TN
 Un(V): AC600 / DC125
 In(A): 63 up to 3200
 Pole: 2P/3P/4P
 Switching frequency: A - B or A - OFF - B
 Standard: IEC/EN 60947-6-1
 Laboratory: KERI



CONTACTOR / THERMAL RELAY

Series: MC3 for Contactor and MT3 for Thermal relay
 Un(V): AC240/440/690
 In(A): 9~800 for Contactor and 1~630 for Thermal relay
 Coil(V): AC24/48/100/110/220/240/380/415
 Standard: IEC/EN 60947-1, IEC/EN 60947-4-1, UL 508
 Laboratory: UL

POWER FACTOR RELAY

Series: PFR96b, PFR60b, PFR80b, PFR120b
 Power system: 240/415V and 0.05 ~ 5.5A
 Cosφ setting: 0.85 (ind) ~ 1.00
 Numbers of outputs: 6/8/12/32(Z)
 Standard: IEC/EN 61000-6-2
 Laboratory: Quatest1

ATS CONTROL

Series: C53, C56, Hanpro1000
 Power system: 3P4W/400V and 1P2W/230V
 Control: Two-stage ATS, three-stage ATS, 2ACB and 2 Contactor
 Standard: IEC/EN 61000-6-2
 Laboratory: Quatest1



BTB Electric is a European manufacturer & supplier of industrial electrical equipment, our products meet the highest safety standards, properly and fully meet the technical standards, competitive and stable prices according to customer requirements.

BTB Electric aims for the best solution in terms of environment, safety for users and especially customer satisfaction through good quality and service.

The following organizations have certified me: Underwriters Laboratory (UL) of the US, Intertek of the UK, Kema of the Netherlands and use the KEMA-KEUR mark on products and many other reputable laboratories.



CAPACITOR

Series: BDC, BIC
 Power range: 1.0 ~ 70kVAR
 Rated voltage(V): 240/415/440/480/525
 Maximum permissible current: 1.5 In
 Standard: IEC/EN 60831 & IEC/EN 61921
 Laboratory: CPRI



REACTOR

Series: BRH3
 Power range(kVAR): 5~100 for LV and 100~2500 for MV
 Rated voltage: 200~690V for LV and 3~35kV for MV
 Resonance frequency: 6/7/13/14%
 Standard: IEC/EN 60076-6
 Laboratory: ETC1



ACTIVE HARMONIC FILTER

Series: BF3
 Rated input line voltage: 380V ± 20%
 Power grid structure: 3P3W / 3P4W
 Compensation current: 50A up to 600A
 Compensation efficiency: ≥ 97%
 Standard: JB/T 11067-2011, IEC/EN 60439-1, EN 61000-6



MCCB Frame 125

Type: Fixed and Thermal adjustable (0.7~1.0In)
 In(A): 16/20/32/40/50/63/80/100/125
 Icu(kA): 18/25/36 at 415V
 Pole: 3P/4P

MCCB Frame 160/250

Type: Fixed, Thermal adjustable and Electronic type
 In(A): 30/32/40/50/63/80/100/125/160 for frame 160
 In(A): 100/125/160/200/250 for frame 250
 Icu(kA): 25/36/50 at 415V
 Pole: 3P/4P

MCCB Frame 400/630

Type: Fixed, Thermal adjustable and Electronic type
 In(A): 250/300/315/350/400 for frame 400
 In(A): 500/550/630 for frame 630
 Icu(kA): 60/75/85 at 415V
 Pole: 3P/4P



MCB code MA

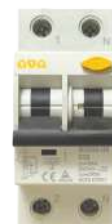
Model: MA63E, MA125E, MA63S, MA125S
 In(A): 1~63 for code MA63 and 40~125 for code MA125
 Icu(kA): 6/10
 Pole: 1P/1P+N/2P/3P/3P+N/4P

MCB code BM

Model: BME63, BMS63
 In(A): 1 ~ 63
 Icu(kA): 6/10
 Pole: 1P/1P+N/2P/3P/3P+N/4P

Catalogue

Miniature Circuit Breaker
 Model BME



ELCB Frame 250/400/800

In(A) 100/125/160/200/225/250/315/350/400/630/700/800
 IΔn(mA) 30, 100, 500 / 100, 300, 500
 Pole: 3P/3P+N

RCBO Frame 63/100

In(A) 16/20/25/32/40/50/63/80/100
 IΔn(mA) 30/100/300
 Pole: 1P+N/3P+N

RCBO Frame 32/63

In(A) 6/10/16/20/25/32/40/63
 IΔn(mA) 30/100/300
 Pole: 1P+N





MCCB Frame 400/630/800

Type: Electronic LCD type
 In(A): 400/630/800A
 Icu(kA): 60/75 at 415V
 Pole: 3P/4P

MCCB Frame 800

Type: Fixed, Electronic type
 In(A): 630/700/800
 Icu(kA): 60/75/85 at 415V
 Pole: 3P/4P

MCCB Frame 1250/1600

Type: Fixed, Electronic type
 In(A): 1000/1250 for frame 1250 (Fixed)
 In(A): 1000/1250/1600 for frame 1600 (Electronic)
 Icu(kA): 65/85 at 415V
 Pole: 3P

Catalogue
 Moulded Case
 Circuit Breaker



ATS Type N/TN

In(A) 63/125/250 for type N
 In(A) 100/200/400/630/800/1000/1250/1600/2000/2500/3200 for type TN
 Pole: 2P/3P/4P



ACB Frame 2000/4000/6300

In(A) 630/800/1000/1250/1600/2000/2500/3200/4000/5000/6300
 Type: Draw-out/Fixed
 Pole: 3P/4P





Contactor code MC3
In(AC-3): 9/12/18/22A
Ith(AC-1): 25/25/40/40A
Auxiliar: 1NO1NC



Contactor code MC3
In(AC-3): 32/40A
Ith(AC-1): 50/60A
Auxiliar: 2NO2NC



Contactor code MC3
In(AC-3): 50/65/75/85A
Ith(AC-1): 80/100/110/135A
Auxiliar: 2NO2NC



Contactor code MC3
In(AC-3): 100/130/150A
Ith(AC-1): 150/150/200A
Auxiliar: 2NO2NC



Contactor code MC3
In(AC-3): 185/225A
Ith(AC-1): 230/260A
Auxiliar: 2NO2NC



Contactor code MC3
In(AC-3): 265~500A
Ith(AC-1): 350~700A
Auxiliar: 2NO2NC



Dry Power Capacitors
Rated voltage: 240~525V
Power range: 5~30kVAR



Capacitor code M
Code: BDCxxxxM
Capacity: 5kVAR



Capacitor code M
Code: BDCxxxxM
Capacity: 10~30kVAR



Capacitor code I
Code: BDCxxxxI
Capacity: 5kVAR



Capacitor code I
Code: BDCxxxxI
Capacity: 10~30kVAR



Contactor code BCC
Operating: 5~25kVAR
Auxiliar: 1NO1NC



Contactor code BCC
Operating: 33~75kVAR
Auxiliar: 1NO2NC



Contactor code MC3
Operating: 9~60kVAR
Auxiliar: 1NO2NC



Switch Series code BCS
In: 45A
Auxiliar: 1NO1NC



Switch Series code BCS
In: 70A
Auxiliar: 1NO1NC



Discharge Reactor
Un:200~690V
Capacity: 5~100kVAR



Power Factor Relay
Code: PFR-96b
Port number: 6



Power Factor Relay
Code: PFR-60b/80b/120b
Port number: 6/8/12



Power Factor Relay-Z
Code: PFR-Z
Port number: 32



ATS control
Code: C56
ATS, 2ACB control



ATS control
Code: C53
ATS type TN/N control



ATS control
Code: Hanpro-1000
ATS type TN control



User Manual
ACB

User Manual
MCCB

User Manual
ATS

User Manual
AHF

User Manual
Capacitor BIC

User Manual
Capacitor BDC

User Manual
Conatctor

User Manual
PFR

User Manual
PFR-Z

User Manual
ATS control



Thermal relay

Code: MT3-22
In: 1~22A

Thermal relay

Code: MT3-40
In: 4~40A

Thermal relay

Code: MT3-85
In: 7~85A

Thermal relay

Code: MT3-150
In: 34~150A

Thermal relay

Code: MT3-225
In: 65~240A

Thermal relay

Code: MT3-630
In: 220~630A

Catalogue
AC Contactor



Intelligent Capacitor

Code: BIC1 (split phase)
Capacity: 5~30kVAR

Intelligent Capacitor

Code: BIC3 (three phase)
Capacity: 10~20kVAR

Intelligent Capacitor

Code: BIC3 (three phase)
Capacity: 30~60kVAR

Intelligent Capacitor

Code: BIC37 (anti-harmonic)
Capacity: 10~40kVAR

Intelligent Capacitor

Code: BIC37 (anti-harmonic)
Capacity: 50~70kVAR



Reactor LV

Code: BRH3
Capacity: 10~20kVAR
Impedance ratio: 6/7/14%

Reactor LV

Code: BRH3
Capacity: 25~75kVAR
Impedance ratio: 6/7/14%

Reactor LV

Code: BRH3
Capacity: 80~100kVAR
Impedance ratio: 6/7/14%

Reactor MV

Code: BRH3 (7%)
Capacity: 100~2500kVAR
Rated voltage: 1~35kV

Catalogue
Electrical Quality Products



Active Harmonic Filter

Type: Drawer
Compensation current: 50~150A

Active Harmonic Filter

Type: Wall-mounted
Compensation current: 50~150A

Active Harmonic Filter

Type: Cabinet
Compensation current: 200~600A

**REALVALUE
FOR LIFE**





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MA63E/S
MAI25E/S
Series

Miniature Circuit Breaker

Application scope

Miniature Circuit Breaker is an automatically operated electrical switch. Miniature circuit breakers are intended to prevent damage to an electrical circuit as a result of excess current. They are designed to trip during an overload or short circuit to protect against electrical faults and equipment failure. MCB is used in homes, factories and commercial centers etc.



Applied Standards and Certifications

- IEC/EN 60898-1 Circuit-breakers for overcurrent protection for household and similar installations.
- IEC/EN 60947-2 Low-voltage switchgear and controlgear.



Our **MA** series Miniature circuit breaker is certified by DEKRA certification body and uses the KEMA-KEUR mark on the product.

Ambient temperature

- Storage: $-30^{\circ}\text{C} \sim +65^{\circ}\text{C}$
- Operation: $-5^{\circ}\text{C} \sim +55^{\circ}\text{C}$

Altitude

Below 2,000m above sea level

Humidity

95%

Salient features

- Miniature circuit breakers have precisely formed molded case & cover of name retardant high strength thermoplastic material having high melting point, low water absorption, high dielectric strength and temperature withstand.
- The switching mechanism is independent, manual and trip free, i.e., the breaker trips internally even if the operating knob is held in ON position for reliability.
- The arc extinguishing device comprises of 11 plates arc chute. The arc under the action of the magnetic field and the arc guide is moved into the arc trough where it is quickly separated and extinguished. The tripping mechanism is thermal magnetic type.

Image and structure



Selection table



Model	MA63E	MA63S	MA125E	MA125S
Reference Standard	IEC/EN 60898-1	IEC/EN 60898-1	IEC/EN 60947-2	IEC/EN 60947-2
No. of Poles	1P, 1P + N, 2P, 3P, 3P + N, 4P	1P, 1P + N, 2P, 3P, 3P + N, 4P	1P, 1P + N, 2P, 3P, 3P + N, 4P	1P, 1P + N, 2P, 3P, 3P + N, 4P
Rated Current (In)	1, 2, 3, 4, 6, 10, 13, 16, 20, 25, 32, 40, 45, 50, 63 A	1, 2, 3, 4, 6, 10, 13, 16, 20, 25, 32, 40, 45, 50, 63 A	40, 50, 63, 80, 100, 125 A	40, 50, 63, 80, 100, 125 A
Rated Voltage (Ue)	AC 240/415 V	AC 240/415 V	AC 240/415 V	AC 240/415 V
Rated Frequency (F)	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Breaking capacity	6 kA (Ics=100% Icn)	10 kA (Ics=75% Icn)	6 kA (Ics=100% Icu)	10 kA (Ics=75% Icu)
Magnetic Release Setting	(3-5) In - B Curve (5-10) In - C Curve (10-20) In - D Curve	(3-5) In - B Curve (5-10) In - C Curve (10-20) In - D Curve	li = 10In	li = 10In
Rated Insulation Voltage (Ui)	500V	500V	690V	690V
Rated Impulse Voltage (Uimp)	4 kV	4 kV	4 kV	4 kV
Dielectric Strength	2.5 kV	2.5 kV	2.5 kV	2.5 kV
Electrical Endurance	10000	10000	5000	5000
Mechanical Endurance	20000	20000	10000	10000
Energy Limit Class	3	3	-	-
Terminal Capacity (max)	35 mm ²	35 mm ²	50 mm ²	50 mm ²
Tightening Torque	2.5 Nm	2.5 Nm	2.5 Nm	2.5 Nm
Vibration	3 g	3 g	3 g	3 g
Shock Resistance	40 mm free fall	40 mm free fall	40 mm free fall	40 mm free fall
Protection Class	IP20	IP20	IP20	IP20
Positive Contact Indication	Red-ON, Green-OFF	Red-ON, Green-OFF	Red-ON, Green-OFF	Red-ON, Green-OFF
Net Weight/Pole in kg	0.102 kg	0.103 kg	0.152 kg	0.155 kg
Dimensions (H x D x W) / Pole in mm	83.8x69.9x17.8	83.8x69.9x17.8	84.2x69.9x26.8	84.2x69.9x26.8
Mounting	Clip on DIN Rail (35 mm x 7.5 mm)	Clip on DIN Rail (35 mm x 7.5 mm)	Clip on DIN Rail (35 mm x 7.5 mm)	Clip on DIN Rail (35 mm x 7.5 mm)
Installation Position	Vertical / Horizontal	Vertical / Horizontal	Vertical / Horizontal	Vertical / Horizontal
Case & Cover	Molded, flame retardant thermoplastic material	Molded, flame retardant thermoplastic material	Molded, flame retardant thermoplastic material	Molded, flame retardant thermoplastic material
Busbar Connections Top/Bottom Side	Pin / Fork type (Bottom)	Pin / Fork type (Bottom)	-	-

Characteristics curves

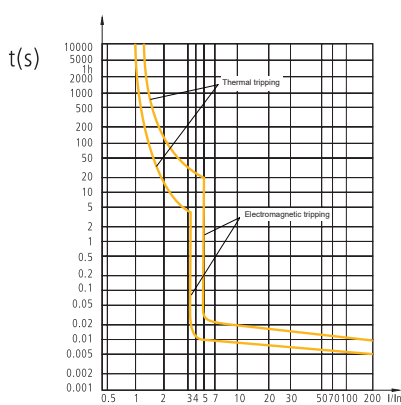
According to IEC/EN 60898-1	Thermal Tripping			Magnetic Tripping		
	No Tripping	Tripping	Time	Hold	Trip	Time
	I1	I2	t	I4	I5	t
B Curve	1.13 x In		≥ 1h	3 x In		≥ 0.1 s
		1.45 x In	< 1h		5 x In	< 0.1 s
C Curve	1.13 x In		≥ 1h	5 x In		≥ 0.1 s
		1.45 x In	< 1h		10 x In	< 0.1 s
D Curver	1.13 x In		≥ 1h	10 x In		≥ 0.1 s
		1.45 x In	< 1h		20 x In	< 0.1 s
I3 = 2.55 x In	1 s < t < 60s for In ≤ 32 A 1 s < t < 120s for In > 32 A					

According to IEC/EN 60947-2	Thermal Tripping			Magnetic Tripping		
	No Tripping	Tripping	Time	Hold	Trip	Time
	I1	I2	t	I4	I5	t
In < 63A	1.05 x In		≥ 1h	8xIn		≥ 0.2s
		1.30 x In	< 1h		12 x In	< 0.2s
In ≥ 63A	1.05xI n		≥ 2h	8xIn		≥ 0.2s
		1.30xI n	< 2h		12 x In	< 0.2s
I3 = 2, 3, 4, 5 x In	According to the operating characteristic curve					

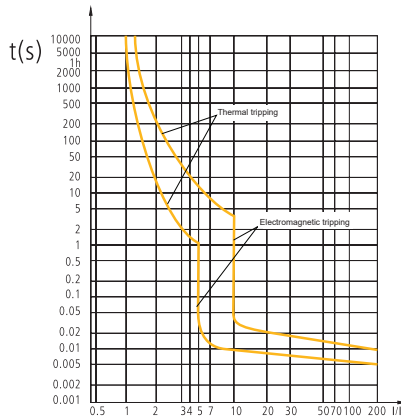
Tripping characteristics

According to IEC/EN 60898-1

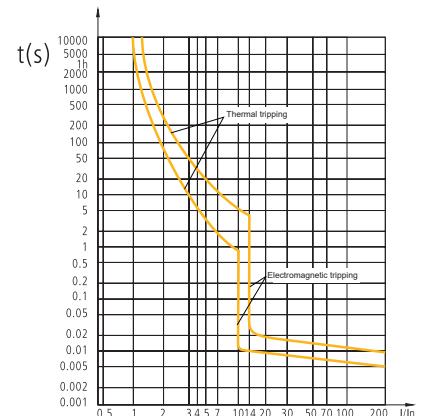
Based on the tripping characteristics, MCBs are available in 'B', 'C' and 'D' curve to suit different types of applications.



'B' Curve: for protection of electrical circuits with equipment that does not cause surge current (lighting and distribution circuits). Short circuit release is set to (3-5) In



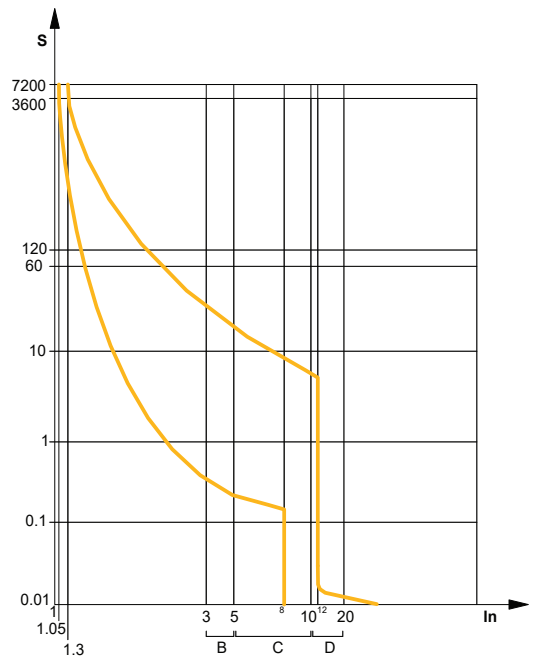
'C' Curve: for protection of electrical circuits with equipment that causes surge current (inductive loads and motor circuits). Short circuit release is set to (5-10)In



'D' Curve: for protection of electrical circuits which causes high inrush current, typically 12-15 times the thermal rated current (transformers, X-ray machines etc.) Short circuit release is set to (10-20)In

According to IEC/EN 60947-2

- Protection range:
 - Protection of conventional load and power distribution cable and industrial power distribution system.
- Rated current:
 - 40 ~ 125A
- Tripping characteristic:
 - Default instantaneous tripping range $10I_n$ (8-12) I_n
 - Also the instantaneous shear range follows B, C, D curves as illustrated by the side line (Option).



Temperature compensation

According to IEC/EN 60898-1

Rated Current (A)	Ambient Temperature (°C)												
	-5°C	0°C	5°C	10°C	15°C	20°C	25°C	30°C	35°C	40°C	45°C	50°C	55°C
1	1.27	1.23	1.9	1.15	1.14	1.08	1.04	1.00	0.96	0.92	0.89	0.85	0.81
2	2.53	2.46	3.8	2.3	2.28	2.15	2.08	2.00	1.92	1.85	1.77	1.7	1.62
3	3.8	3.68	5.7	3.46	3.42	3.23	3.11	3.00	2.89	2.77	2.66	2.54	2.43
4	5.06	4.91	7.6	4.61	4.56	4.3	4.15	4.00	3.85	3.7	3.54	3.39	3.24
6	7.6	7.37	11.4	6.91	6.84	6.46	6.23	6.00	5.77	5.54	5.32	5.09	4.86
10	12.66	12.28	19	11.52	11.4	10.76	10.38	10.00	9.62	9.24	8.86	8.48	8.1
13	16.46	15.96	24.7	14.98	14.82	13.99	13.49	13.00	12.51	12.01	11.52	11.02	10.53
16	20.26	19.65	30.4	18.43	18.24	17.22	16.61	16.00	15.39	14.78	14.18	13.57	12.96
20	25.32	24.56	38	23.04	22.8	21.52	20.76	20.00	19.24	18.48	17.72	16.96	16.2
25	31.65	30.7	47.5	28.8	28.5	26.9	25.95	25.00	24.05	23.1	22.15	21.2	20.25
32	40.51	39.3	60.8	36.86	36.48	34.43	33.22	32.00	30.78	29.57	28.35	27.14	25.92
40	50.64	49.12	76	46.08	45.6	43.04	41.52	40.00	38.48	36.96	35.44	33.92	32.4
45	56.97	55.26	85.5	51.84	51.3	48.42	46.71	45.00	43.29	41.58	39.87	38.16	36.45
50	63.3	61.4	95	57.6	57	53.8	51.9	50.00	48.1	46.2	44.3	42.4	40.5
63	79.76	77.36	119.7	72.82	71.82	67.79	65.39	63.00	60.61	58.21	55.82	53.42	51.03

According to IEC/EN 60947-2

Rated Current (A)	Ambient Temperature (°C) @30°C						Ambient Temperature (°C) @50°C			
	30°C	35°C	40°C	45°C	50°C	55°C	50°C	55°C	60°C	65°C
40	40.00	38.50	37.00	35.00	33.11	31.45	40.00	38.48	36.80	34.90
50	50.00	48.00	45.50	43.50	41.59	39.76	50.00	47.98	45.35	43.35
63	63.00	60.50	57.50	54.50	51.67	49.03	63.00	60.48	57.40	54.40
80	80.00	76.50	73.50	69.60	65.91	62.42	80.00	76.50	73.40	69.45
100	100.00	96.00	91.50	87.00	82.74	78.60	100.00	96.00	91.35	86.80
125	125.00	120.00	114.00	108.80	103.80	99.02	125.00	119.95	113.88	108.72

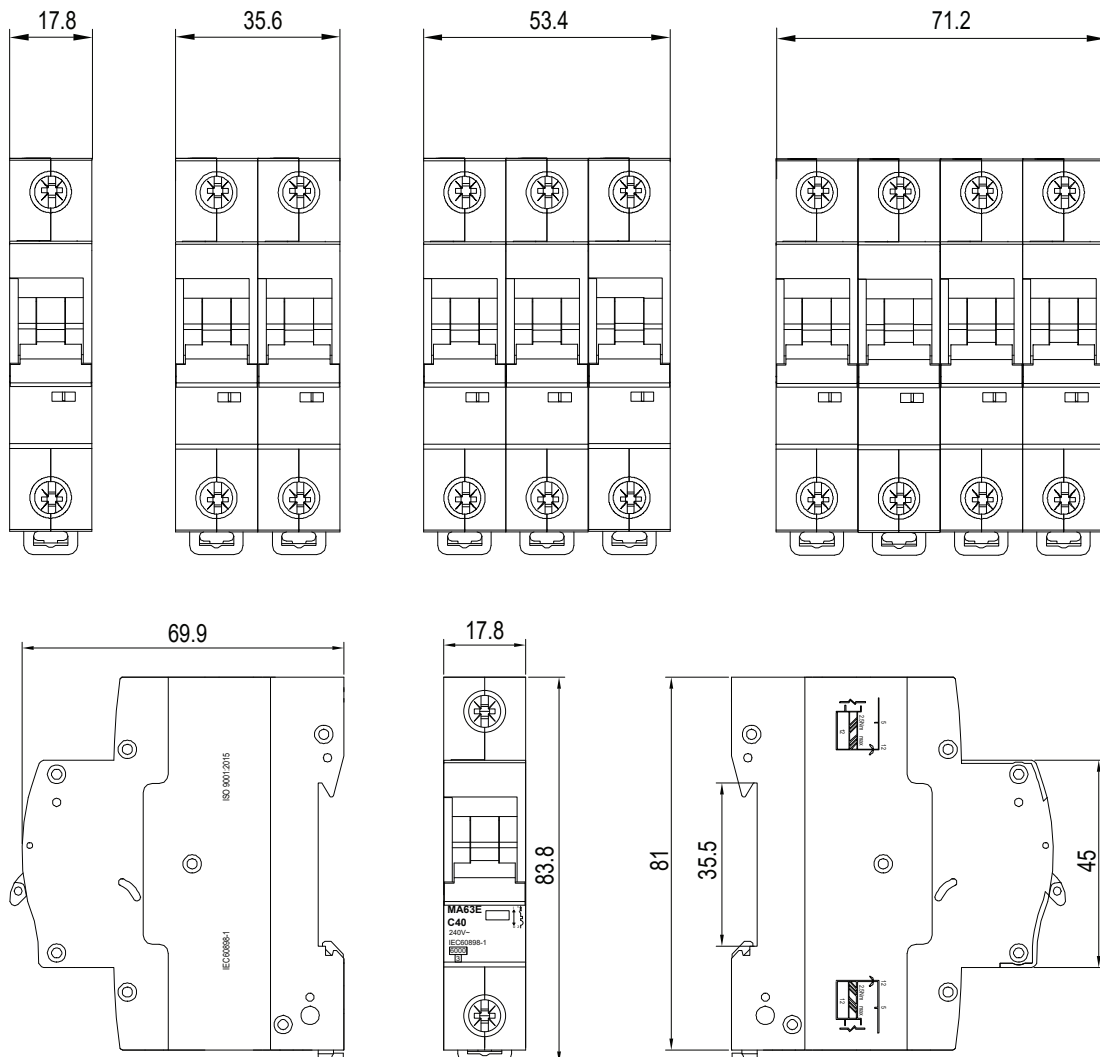
Cold resistance & power loss details

Rated Current In (A)	6	10	16	20	25	32	40	50	63	80	100	125
Cold Resistance (mΩ)	25.1	12	8.2	4.6	3.8	2.6	2.0	1.65	1.4	1.00	0.82	0.68
Power Loss per Pole (W)	1.4	1.6	2.3	2.5	3.1	3.5	3.8	5.0	5.5	7.5	8.5	10.5

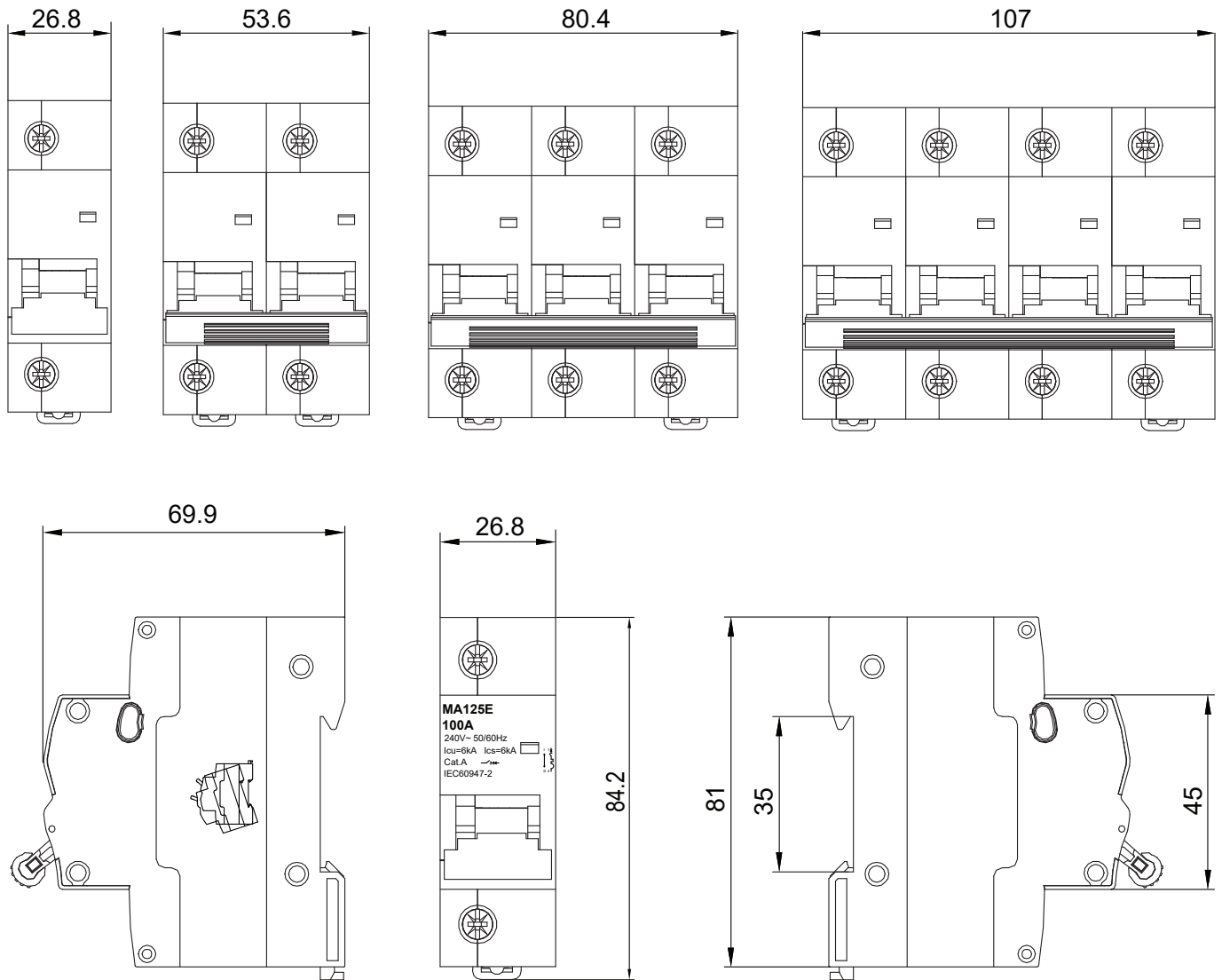
- The power loss value declared at rated current
- Tolerance ±5%

Dimensions (mm)

Frame 63



Frame 125



Ordering guidelines

Model MA63E-C40-2P	MA	Type MCB
	63	Frame: 63 , 125
	E	Economy 6kA Standard 10kA
	C	B Curve (3-5In) C Curve (5-10In) D Curve (10-20In)
	40	Rated Current 1, 2... 40 ...125A
	2P	Number of Poles 1P, 1N, 2P , 3P, 3N, 4P

MR63
MR100
MO32
MO63
Series

Residual Current Circuit Breaker

Residual Current Circuit Breaker with Overcurrent

Application scope

Residual current circuit breaker (RCCB) detects earth leakage in a circuit. It monitors the difference between the current flowing through the phase and neutral wires. When there is an imbalance, it trips to protect against electrical hazards.



RCBO is a step up from a RCCB, providing additional protection. RCBOs trip when overloading or short circuiting occurs, whereas RCCBs do not.

Applied Standards and Certifications

- IEC/EN 61008-1 Residual current operated circuit-breakers without integral overcurrent protection for household and similar use.
- IEC/EN 61009-1 Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses.



Ambient temperature

- Storage: -30°C ~ +65°C
- Operation: -5°C ~ +55°C

Altitude

Below 2,000m above sea level

Humidity

95%

Salient features

- The RCCB works on the current balance principle. The supply conductors, i.e. the phases and the neutral, are passed through a toroid and form the primary windings of a current transformer. Its secondary winding is connected to a highly sensitive electromagnetic trip relay, which operates the trip mechanism.
- In a normal circuit, sum of the currents in phases, is equal to the current in the neutral and the vector sum of all currents is equal to zero. If there is any insulation fault in the current and leakage current flows to earth, the currents do not balance and their vector sum is not equal to zero. This imbalance is detected by the core balanced current transformer, and the RCCB is tripped and supply to load is interrupted. The trip mechanism is operated at a residual current between 50-100 % of its rated tripping current.
- Where RCBO is the sum of the protections of the MCB and the RCCB.

Image and structure



Selection table



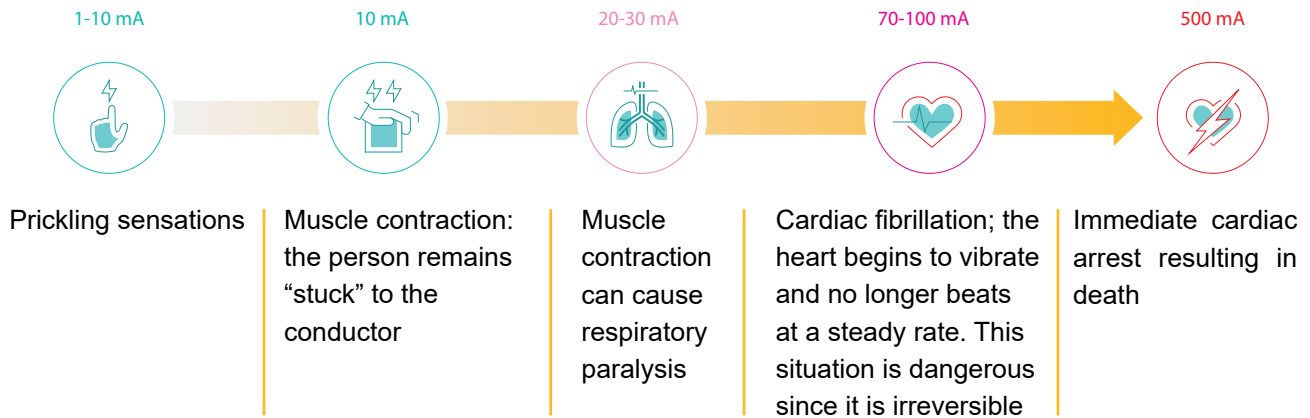
Model	MR63 / MR100	MO32 / MO63
Reference Standard	IEC/EN 61008-1	IEC/EN 61009-1
No. of Poles	2P (1P+N), 4P (3P + N)	1P+N
Rated Current (I _n)	16, 20, 25, 32, 40, 50, 63, 80, 100 A	6, 10, 16, 20, 25, 32, 40, 63 A
Rated Voltage (U _e)	AC 240/415 V	AC 240 V
Rated Frequency (F)	50/60 Hz	50/60 Hz
Rated Conditional Short Circuit Current	6kA, 10 kA (I _{nc})	6 kA (I _{cs} =100%I _{cn})
Rated Residual Operating Current (I _{Δc})	10 mA, 30 mA, 100 mA, 300 mA	10 mA, 30 mA, 100 mA, 300 mA
Magnetic Release Setting	-	(3-5) I _n - B Curve (5-10) I _n - C Curve
Trip Time at I _{Δc}	≤ 100 ms	≤ 100 ms
Detactuin of Wave Form	AC, A, S	AC, A
Rated Insulation Voltage (U _i)	500 V	500 V
Rated Impuls e Voltage (U _{imp})	4 kV	4 kV
Dielectric Strength	2.5 kV	2.5 kV
Electrical Endurance	10000	10000
Mechanical Endurance	20000	30000
Term inal Capacity (max)	35 mm ²	16 mm ²
Tightening Torque	2.5Nm	1.2Nm
Vibration	3 g	3 g
Shock Resistance	40 mm free fall	40 mm free fall
Protection Class	IP20	IP20
Positive Contactindication	Red-ON, Green-OFF	Red-ON, Green-OFF
Dimensions (H x D x W)/Pole in mm	84.5 x 74.5 x 35.5 mm for 2P 84.5 x 74.5 x 71 mm for 4P	83.8 x 72.6 x 17.8 mm 84.3 x 72.6 x 35.6 mm
Mounting	Clip on DIN Rail (35 mm x 7.5 mm)	Clip on DIN Rail (35 mm x 7.5 mm)
Installation Position	Vertical / Horizontal	Vertical / Horizontal
Case & Cover	Molded, flame retardant thermoplastic material	Molded, flame retardant thermoplastic material
Busbar Connections	Pin / Fork type	Pin / Fork type

Standard use environment

The use of exposed, substandard, badly wired, wrongly connected or damaged equipment as well as frayed or badly repaired cables reduces the safety of an installation and increases the risk of person receiving an electric shock. RCCBs are electrical devices which afford a very high degree of protection against the risks of electrocution and fire caused by earth faults.

Protection Against Electrocution

Electrocution is a passage of current through human body, which is dangerous. The flow of current through human body affects vital functions of breathing & heartbeat. Effect of electric current through human body has been well researched and following chart summarizes the results:



However, electrocution should not be viewed in terms of "current" alone, but in terms of "contact voltage". A person gets electrocuted by coming in contact with an object that has a different potential from his/her own. The difference in potential causes the current to flow through the body.

The human body has known limits:

- Under normal dry conditions, voltage limit = 50 V
- In damp surroundings, voltage limit = 25 V

A correctly chosen RCCB can detect small currents flowing to earth and reduces the risk of electrocution.

Protection Against Indirect Contact

Over current protection devices like MCB are unable to act promptly on small earth leakage currents. To comply with wiring regulations, the earth fault loop impedance in Ohms, multiplied by the rated tripping current of the RCCB in amperes must not exceed 50.

Example






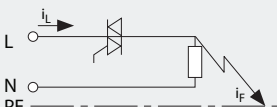


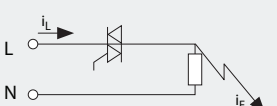


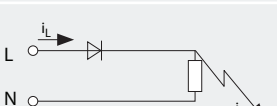
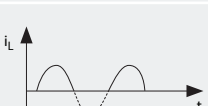

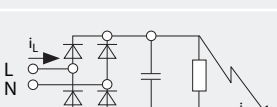

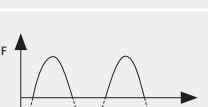
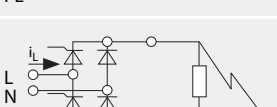

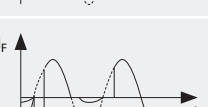
For an RCCB with a rated tripping current of 30 mA, the maximum permissible earth fault loop impedance is calculated as follows: $Z_s (\text{max}) = 50/I_n = 50/0.03 = 1,666$

Protection Against Fire

The majority of fires which occur as a result of faulty wiring are started by current flowing to earth. Fire can be started by fault current of less than 1 amp. The normal domestic overload protective device such as a fuse or MCB will not detect such a small current. A correctly chosen RCCB will detect this fault current and interrupt the supply, hence, reducing the risk of a fire starting.

Rated Tripping Current of the RCCB	Maximum Permissible Earth Fault Loop Impedance in
10 mA	5,000
30 mA	1,666
100 mA	500
300 mA	166

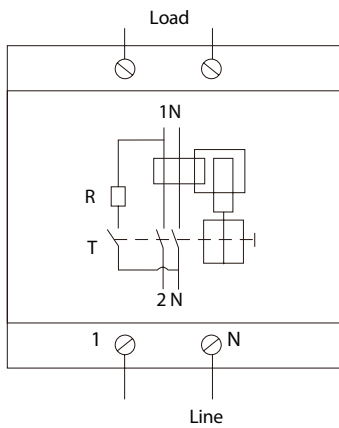
Selection of RCCB type

Type	Circuit	Load Current	Residual Current
A  AC 	1 		
	2 		
	3 		
	4 		
	5 		
	6 		

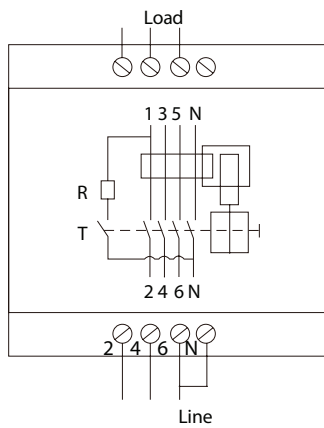
Device is suitable for electronic equipment with input current circuits 1 to 6 in below table

Wiring diagram

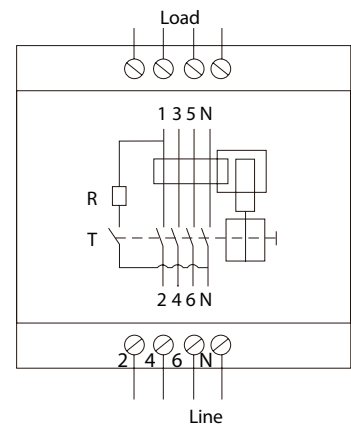
For Single Phase - 2 Wire



For Single Phase - 3 Wire



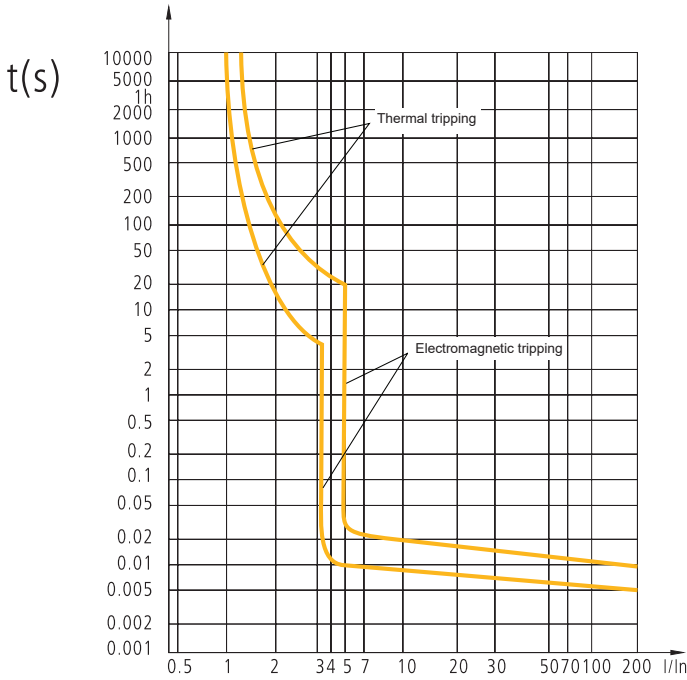
For Single Phase - 4 Wire



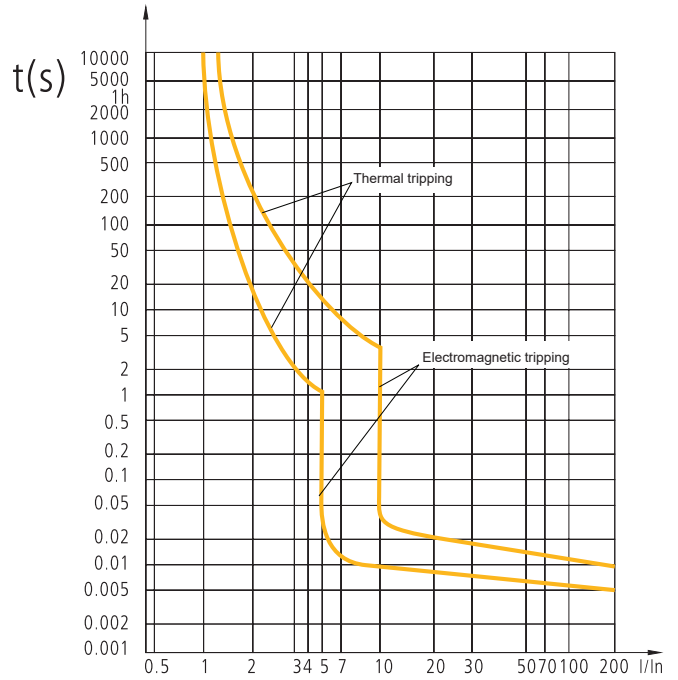
Breaking time of residual current

In(A)	IΔc (A)	Max. breaking time			
		IΔc	2IΔc	5IΔc	5A, 10A, 50A, 100A
6, 10, 16, 20, 25, 32, 40, 50, 63, 80, 100A	0.01, 0.03, 0.1, 0.3	100ms	80ms	40ms	40ms

Tripping characteristics for RCBO



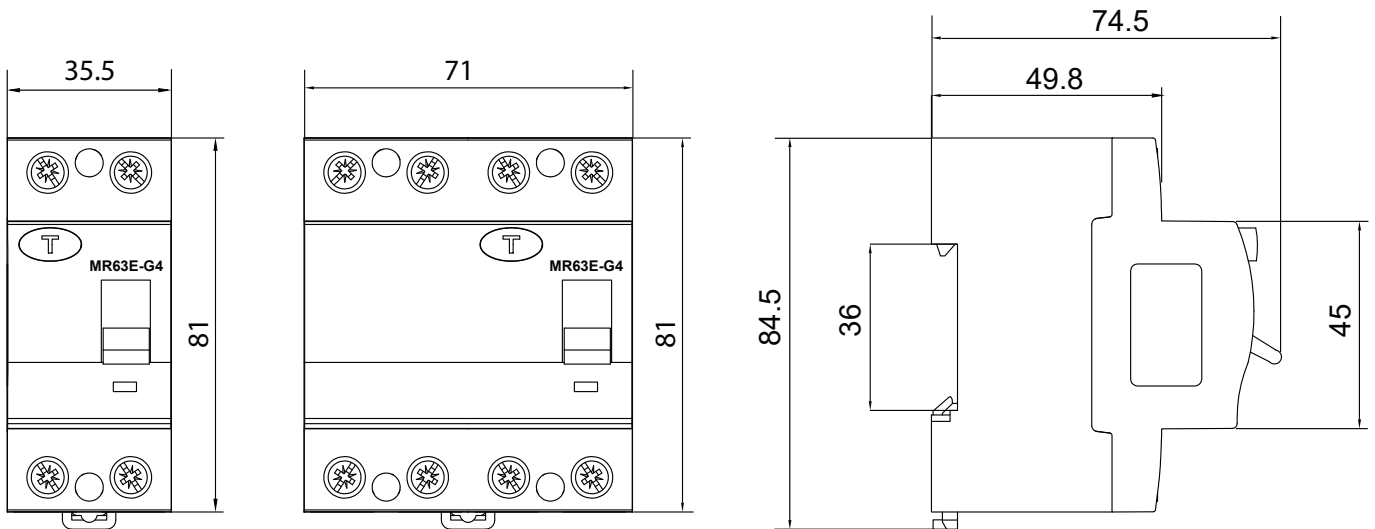
'B' Curve: for protection of electrical circuits with equipment that does not cause surge current (lighting and distribution circuits). Short circuit release is set to (3-5)In



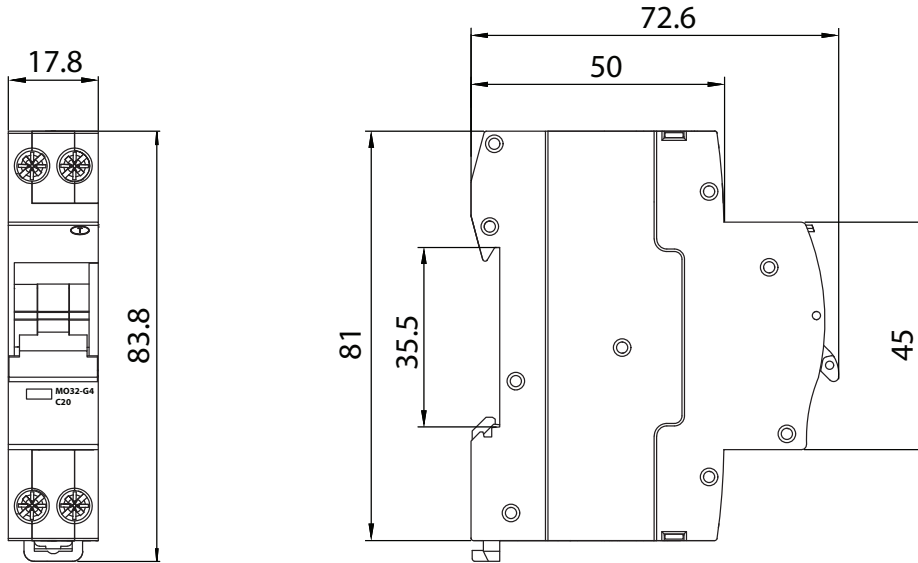
'C' Curve: for protection of electrical circuits with equipment that causes surge current (inductive loads and motor circuits). Short circuit release is set to (5-10)In

Dimensions (mm)

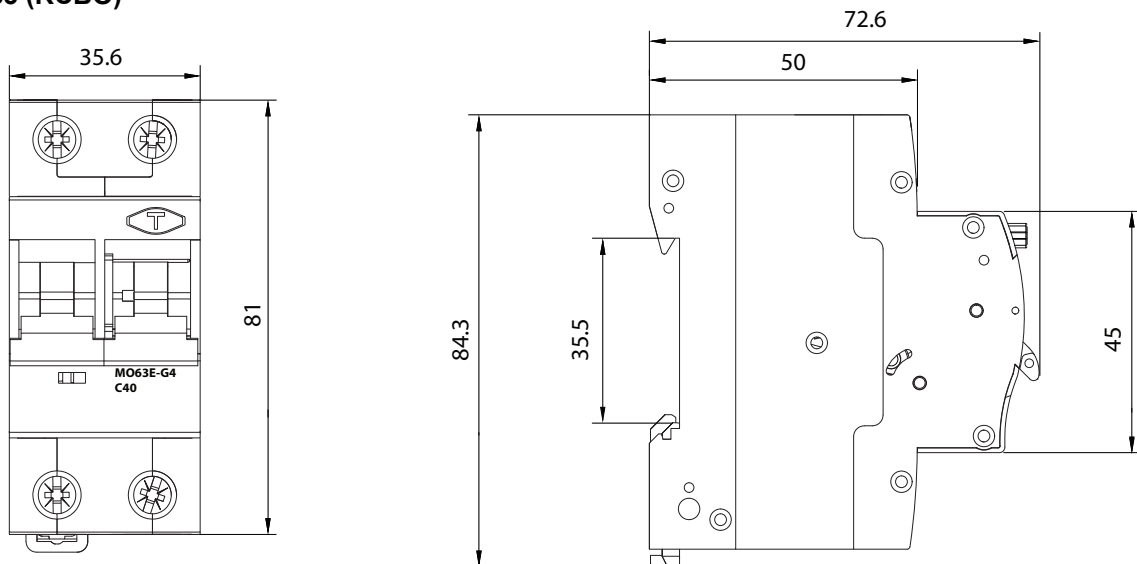
For MR (RCCB)



For MO32 (RCBO)



For MO63 (RCBO)



Ordering guidelines

Model MO63E-G4-40-2P-AC-C	MO	MR type RCCB MO type RCBO
	63	Frane: 32, 63 , 80
	E	Economy 6kA Standard 10kA
	G4	G3 - 10mA G4 - 30mA G6 - 100mA G7 - 300mA
	40	Rated Current 16, 20, 25, 32, 40 , 63, 80, 100A
	2P	Number of Poles 2P (1P+N), 4P (3P + N)
	AC	AC type A type S type
	C	B Curve B (3-5I _n) C Curve C (5-10I _n)

Application scope

Miniature switch disconnecter intended for electrical circuit switching and disconnection under normal conditions up to 125A. Available in a modular frame of 2, 3 and 4 poles.



Applied Standards and Certifications

- IEC/EN 60947-3 Low-voltage switchgear and controlgear - Switches, disconnectors, switch-disconnectors and fuse-combination units



Ambient temperature

- Storage: -30°C ~ +65°C
- Operation: -5°C ~ +55°C

Altitude

Below 2,000m above sea level

Humidity

95%

Salient features

- BTB electric MD type switch disconnectors are mainly used for isolation and switching in the terminal combined electric appliances under the alternating current 50/60 Hz, rated voltage AC 240V or AC 415 V and with rated current 20 to 125 A.
- The double point direct moving structure enlarges the current capacity while making full use of the electrical power supplement. In addition, power reserving handle mechanism with high on/off speed promotes the working reliability. MD type breakers comply with IEC/EN standard, and can be applied to industry, commerce, high-rise buildings, household and other similar installations.

Image and structure

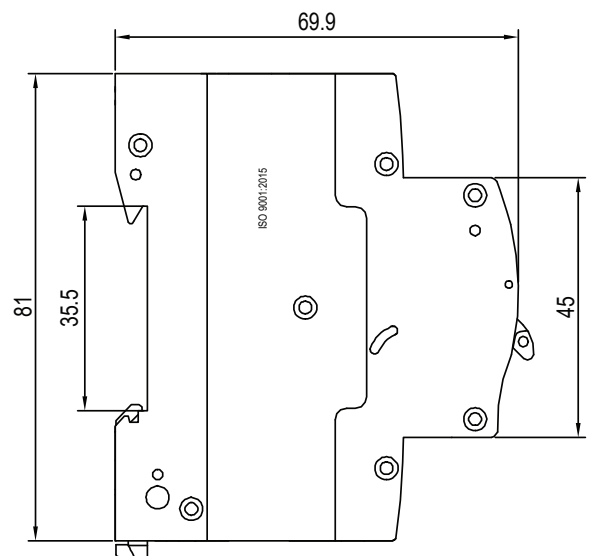
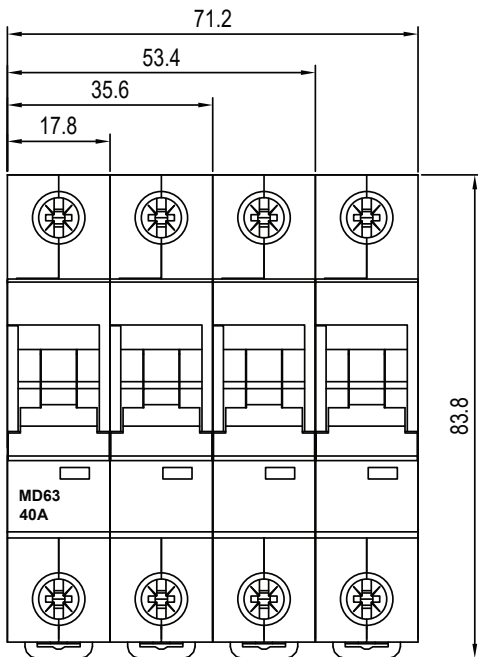


Selection table

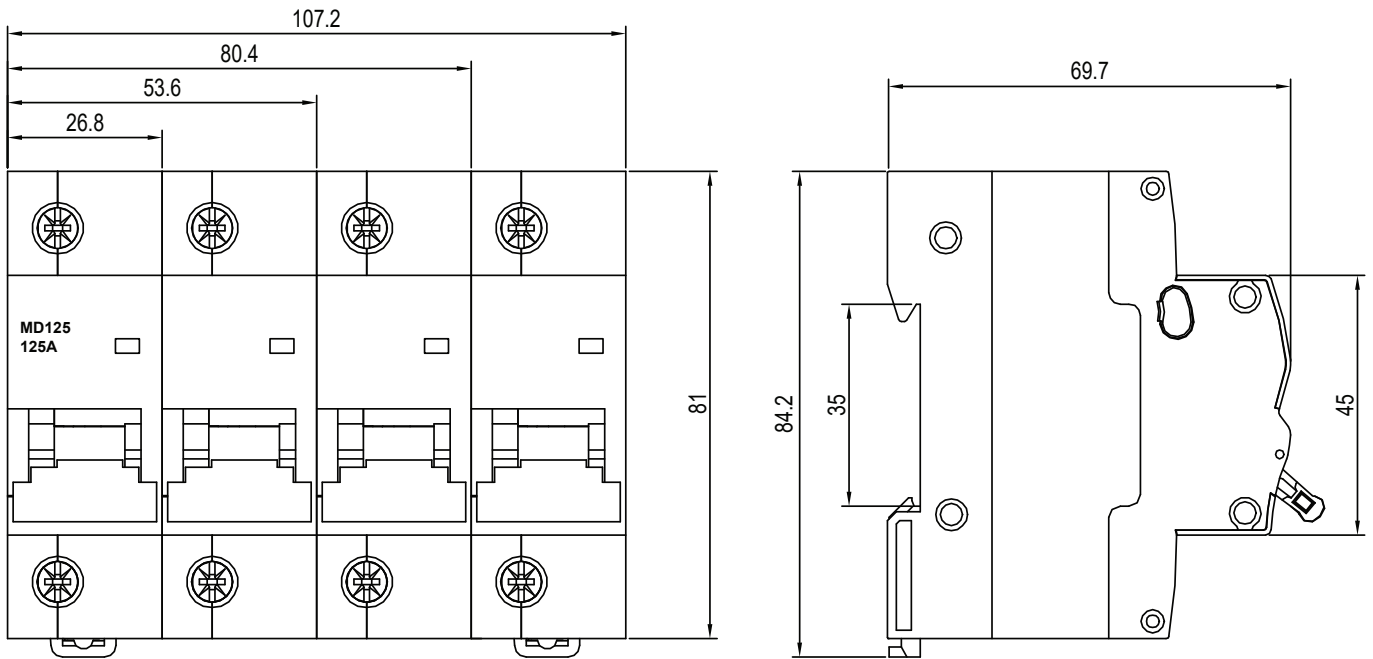
Model	MD63 / MD125
Reference Standard	IEC/EN 60947-3
No. of Poles	2P, 3P, 4P
Rated Current (In)	20, 40, 63, 80, 100, 125 A
Rated Voltage (Ue)	AC 240/415 V
Rated Frequency (F)	50/60 Hz
Rated Insulation Voltage (Ui)	500 V
Rated Impulse Voltage (Uimp)	6 kV
Dielectric Strength	2.5 kV
Electrical Endurance	10000
Mechanical Endurance	20000
Terminal Capacity (max)	35 mm ²
Tightening Torque	2.5Nm
Vibration	3 g
Shock Resistance	40 mm free fall
Protection Class	IP20
Positive Contact Indication	Red-ON, Green-OFF
Dimensions (H x D x W)/Pole in mm	83.8 x 69.9 x 17.8 mm for Frame 63 84.2 x 69.7 x 26.8 mm for Frame 125
Mounting	Clip on DIN Rail (35 mm x 7.5 mm)
Installation Position	Vertical / Horizontal
Case & Cover	Molded, flame retardant thermoplastic material
Busbar Connections	Pin/Fork type

Dimensions (mm)

Frame 63



Frame 125



Ordering guidelines

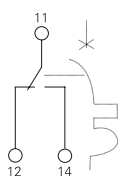
Model MD63-40-2P	MD	Type MSD
	63	Frame: 63 , 125
	40	Rated Current: 20, 40 , 63, 80, 100, 125 A
	2P	Number of Poles: 2P , 3P, 4P

Technical data

Standard	IEC/EN 62019
Rated insulation voltage U	500V
Rated voltage	AC 230V
Rated frequency (Hz)	50/60Hz
Utilization category	AC14, AC15
Ambient temperature (°C)	-5~+40, max 95%humidity
Electric endurance	4000
Mechanical endurance	10000 2000V/1min
Dielectric strength	2000V/1min
Protection degree	IP20



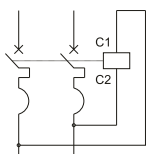
OF Auxiliary contact



- Mounted on the left side of the MCB, RCBO, indicating “ON”, “OFF” status of combined MCB, RCBO
- Terminal Connection Height: 8.8mm

Type code	Rated voltage	Rated current
OF23A	230VAC	6A
OF40A	400VAC	3A

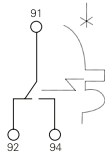
MX Shunt trip



- Operate voltage range: 70-110% Us.
- Mounting on the left side of MCB/RCBO, used to trip the combined MCB/RCBO by remote controlling device.
- Terminal Connection Height: 19mm

Type code	Rated voltage
MX23A	230VAC
MX40A	400VAC

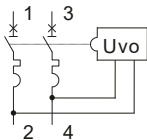
SD alarm switch



- Is used to connect ON/OFF auxiliary contact, work as circuit breaker ON/OFF indicator in case of faulty (tripping)
- Terminal Connection Height: 8.8mm

Type code	Rated voltage	Rated current
SD23A	230VAC	6A
SD40A	400VAC	3A

MN Over-voltage / Under-voltage trip



- Over-voltage tripping range: 280V \pm 5%
- Under-voltage tripping range: 170V \pm 5%.
- Mounted on the left side of circuit breaker, actuate the combined device to trip in case of under-voltage or over-voltage, effectively prevent the device from closing operation under abnormal power voltage condition.
- Terminal Connection Height: 19mm

Type code	Rated voltage
MN23A	230VAC

Storage

Ambient temperature: -20~60°C

Altitude: Below 1,000 m above sea level

Relative humidity: Within 45% ~ 85%

The surrounding environment may affect the insulation function and endurance of the molded case and earth leakage circuit breakers so the environmental condition for usage must be accurately checked before application.



Do not store in places with corrosive gas.
Do not leave it around gas containing sulfurous gas or sulfur or ammonia gas and others.



Do not store in places with high humidity for a long period of time.



Do not leave under direct sunlight for a long period of time.

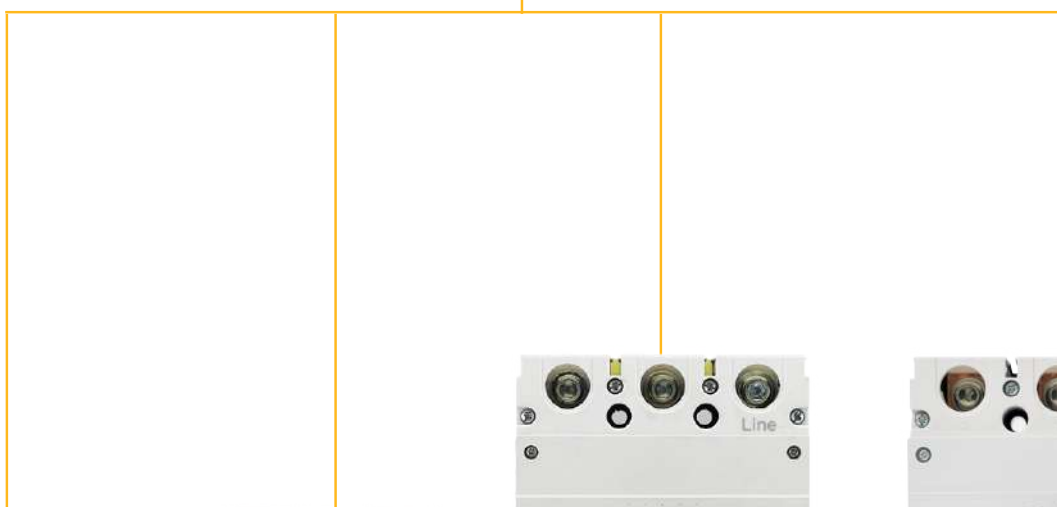


Avoid places with a lot of dust.
Do not store in expose places, use cover or packaging material to prevent dust from piling up on the circuit breaker.



Avoid storage in high or low temperature.
Storage temperature must be maintained between -30°C ~ +65°C.





MF Fixed type
MT Thermal adjustable type
Series

Application scope

M-series moulded case circuit breaker, it is used to distribute electrical energy and protect lines and the power supply equipment from damages such as overload and short circuit. It's a simple, inexpensive way to protect your home or office from electrical fires and appliance damage.



Salient features

- Protection: The **M**-Series circuit-breakers will provide protection for the circuit and equipment in case of overload, short circuit condition occurred in the power distribution circuit.
- Adjustable: As applying to adjustable rated current design, it is possible to protect circuit optimally according to the load factor. (Adjustable range of rated currents - Thermal adjustable type (70% - 85% - 100%) or (80% - 90% - 100%) of rated current).
- Suitable for isolation, ensuring safety for people working behind the circuit breaker.
- Environmental protection: Most components are recyclable.
- High performance and Selectivity category A.

Image and structure

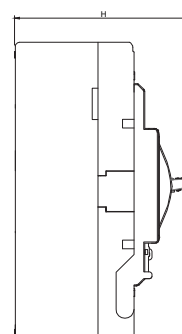
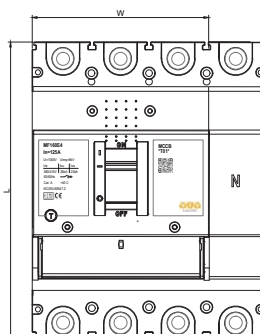
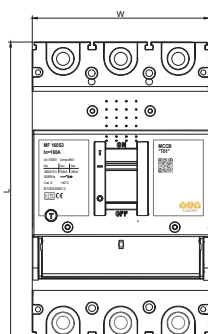


Selection table

Fixed Type

Frame	A	125		160		250		
Type and pole	3P	MF125E3	MF125S3	MF160E3	MF160S3	MF250E3	MF250S3	MF250H3
	4P	MF125E4	MF125S4	MF160E4	MF160S4	MF250E4	MF250S4	MF250H4
Rated current at 40°C, In	A	16-20-25-30-32-40-50-60-63-75-80-100-125		30-32-40-50-60-63-75-80-100-125-150-160		100-125-150-160-175-200-225-250		
Rated Operational Voltage, Ue	V	690		690		690		
Rated Insulation Voltage, Ui	V	800		1000		1000		
Impulse Withstand Voltage, Uimp	kV	8		8		8		
Reference Standard		IEC/EN 60947-2		IEC/EN 60947-2		IEC/EN 60947-2		
Suitablilty for Isolation		Yes		Yes		Yes		
Polution Degree		3		3		3		
Utilization Category		A		A		A		
Trip unit: Thermal Magnetic		*T01*		*T01*		*T01*		
Long time, LT	Ir	1.0xIn		1.0xIn		1.0xIn		
Instantaneous, INST	li	≤ 30A - 320A ≥ 32A - 10xIn		10xIn		10xIn		
Breaking capacity level		E	S	E	S	E	S	H
Rated ultimate short-circuit breaking capacity, Icu (380/415V)	kA	25	36	36	50	36	50	65
Rated service short-circuit breaking capacity, Ics	kA	18	25	25	36	25	36	50
Mechanical Endurance		25000		25000		25000		
Electrical Endurance		10000		8000		8000		
Accessories								
Auxiliary switch	AUX	■		■		■		
Alarm switch	ALT	■		■		■		
Shunt trip	SHT	■		■		■		
Undervoltage trip	UVT	■		■		■		
Motor operator	MOT	■		■		■		
Extended Rotary Handle		■		■		■		
Dimensions mm (W x L x H)	3P	75x133x82		95x155x93		106x165x100		
	4P	100x133x82		122x155x93		141x165x100		

“■” shows it has this option; “□” means it has no this option

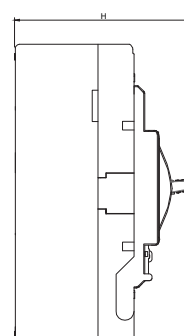
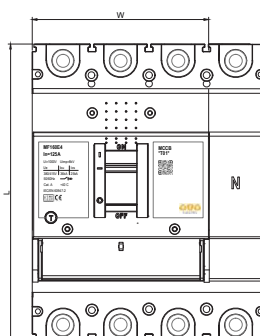
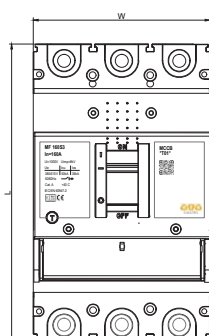


Selection table

Fixed Type

400		630		800		1250	1600
MF400E3	MF400S3	MF630E3	MF630S3	MF800E3	MF800S3	MF1250E3	MF1600E3
MF400E4	MF400S4	MF630E4	MF630S4	MF800E4	MF800S4	-	-
250-300-315-350-400		400-500-550-630		630-700-800		1000-1250	1600
690		690		690		690	690
1000		1000		1000		1000	1000
8		8		8		8	8
IEC/EN 60947-2		IEC/EN 60947-2		IEC/EN 60947-2		IEC/EN 60947-2	IEC/EN 60947-2
Yes		Yes		Yes		Yes	Yes
3		3		3		3	3
A		A		A		A	A
T01		*T01*		*T01*		*T01*	*T01*
1.0xIn		1.0xIn		1.0xIn		1.0xIn	1.0xIn
1.0xIn		1.0xIn		1.0xIn		1.0xIn	1.0xIn
E	S	E	E	E	S	E	E
85	100	85	100	85	100	85	85
60	75	60	75	60	75	65	65
20000		20000		20000		2500	2500
7000		5000		5000		500	500
■		■		■		□	□
■		■		■		□	□
■		■		■		□	□
■		■		■		□	□
■		■		■		□	□
■		■		■		□	□
150x257x148		150x257x148		210x280x155		210x406x196	210x340x245
198x257x148		198x257x148		280x280x155		-	-

“■” shows it has this option; “□” means it has no this option

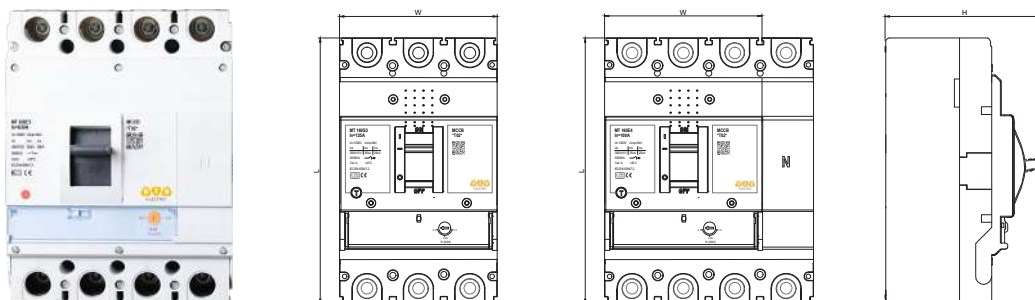


Selection table

Thermal Adjustable Type

Frame	A	125		160		250		
Type and pole	3P	MT125E3	MT125S3	MT160E3	MT160S3	MT250E3	MT250S3	MT250H3
	4P	MT125E4	MT125S4	MT160E4	MT160S4	MT250E4	MT250S4	MT250H4
Rated current at 40°C, In	A	16-20-25-30-32-40-50-60-63-75-80-100-125		30-32-40-50-60-63-75-80-100-125-150-160		100-125-150-160-175-200-225-250		
Rated Operational Voltage, Ue	V	690		690		690		
Rated Insulation Voltage, Ui	V	800		1000		1000		
Impulse Withstand Voltage, Uimp	kV	8		8		8		
Reference Standard		IEC/EN 60947-2		IEC/EN 60947-2		IEC/EN 60947-2		
Suitability for Isolation		Yes		Yes		Yes		
Pollution Degree		3		3		3		
Utilization Category		A		A		A		
Trip unit: Thermal Magnetic		*T02*		*T02*		*T02*		
Long time - Adjustable, LT	Ir	(0.7–0.85–1.0)xIn (0.8–0.9–1.0)xIn		(0.7–0.85–1.0)xIn (0.8–0.9–1.0)xIn		(0.7–0.85–1.0)xIn (0.8–0.9–1.0)xIn		
Instantaneous, INST	Ii	≤ 30A - 320A ≥ 32A - 10xIn		10xIn		10xIn		
Breaking capacity level		E	S	E	S	E	S	H
Rated ultimate short-circuit breaking capacity, Icu (380/415V)	kA	18	25	25	36	25	36	50
Rated service short-circuit breaking capacity, Ics = 100% Icu	kA	18	25	25	36	25	36	50
Mechanical Endurance		25000		25000		25000		
Electrical Endurance		10000		8000		8000		
Accessories								
Auxiliary switch	AUX	■		■		■		
Alarm switch	ALT	■		■		■		
Shunt trip	SHT	■		■		■		
Undervoltage trip	UVT	■		■		■		
Motor operator	MOT	■		■		■		
Extended Rotary Handle		■		■		■		
Dimensions mm (W x L x H)	3P	75x133x82		95x155x93		106x165x100		
	4P	100x133x82		122x155x93		141x165x100		

“■” shows it has this option; “□” means it has no this option

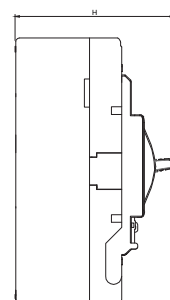
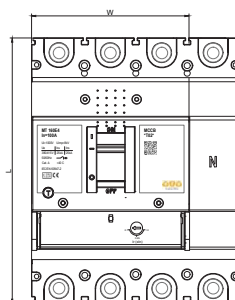
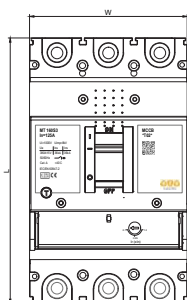


Selection table

Thermal Adjustable Type

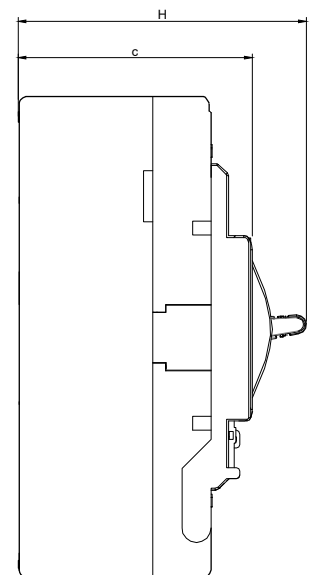
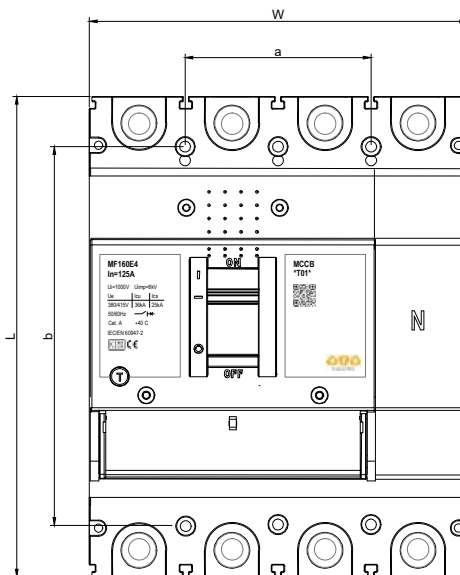
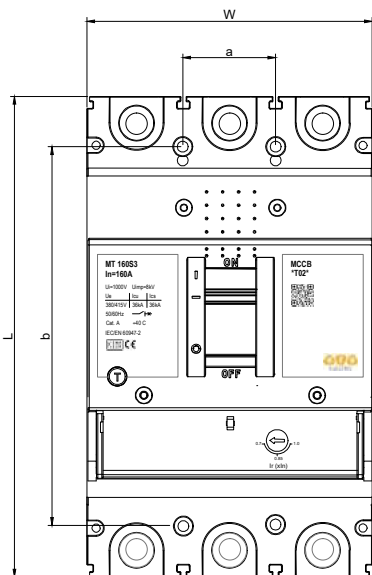
400		630		800		1600	
MT400E3	MT400S3	MT630E3	MT630S3	MT800E3	MT800S3	MT1600E3	MT1600S3
MT400E4	MT400S4	MT630E4	MT630S4	MT800E4	MT800S4	-	-
250-300-315-350-400		400-500-550-630		630-700-800		1000-1250-1600	
690		690		690		690	
1000		1000		1000		1000	
8		8		8		8	
IEC/EN 60947-2		IEC/EN 60947-2		IEC/EN 60947-2		IEC/EN 60947-2	
Yes		Yes		Yes		Yes	
3		3		3		3	
A		A		A		A	
T02		*T02*		*T02*		*T02*	
(0.7–0.85–1.0)xIn (0.8–0.9–1.0)xIn		(0.7–0.85–1.0)xIn (0.8–0.9–1.0)xIn		(0.7–0.85–1.0)xIn (0.8–0.9–1.0)xIn		(0.7–0.85–1.0)xIn (0.8–0.9–1.0)xIn	
1.0xIn		1.0xIn		1.0xIn		1.0xIn	
E	S	E	S	E	S	E	S
60	75	60	75	60	75	50	65
60	75	60	75	60	75	50	65
20000		20000		20000		10000	
7000		5000		5000		2000	
■		■		■		■	
■		■		■		■	
■		■		■		■	
■		■		■		■	
■		■		■		■	
■		■		■		■	
150x257x148		150x257x148		210x280x155		210x340x245	
198x257x148		198x257x148		280x280x155		-	

“■” shows it has this option; “□” means it has no this option



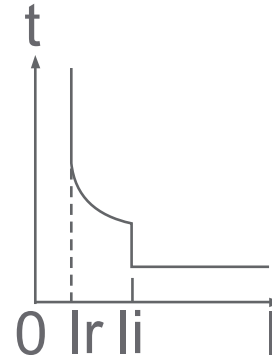
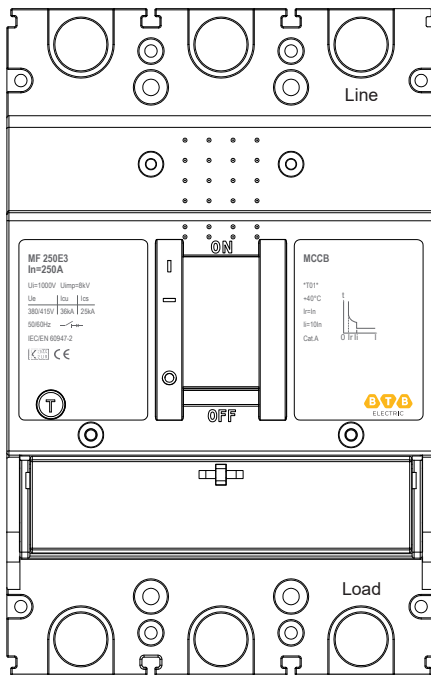
Dimensions

Frame	Type	Poles	Outline Dimension (mm)				Installation Dimension (mm)			Weight (kg)
			W	L	H	c	a	b	d	
125	MF 125E3; MT 125E3 MF 125S3; MT 125S3	3	75	133	82	66.5	25	111	Φ4	0.9
	MF 125E4; MT 125E4 MF 125S4; MT 125S4	4	100	133	82	66.5	50	111	Φ4	1.2
160	MF 160E3; MT 160E3 MF 160S3; MT 160S3	3	92	150	110	90	30	129	Φ4.5	1.4
	MF 160E4; MT 160E4 MF 160S4; MT 160S4	4	122	150	110	90	60	129	Φ4.5	1.8
250	MF 250E3; MT 250E3 MF 250S3; MT 250S3	3	106	165	100	77	35	126	Φ4.5	1.8
	MF 250E4; MT 250E4 MF 250S4; MT 250S4	4	141	165	100	77	70	126	Φ4.5	2.3
400	MF 400E3; MT 400E3 MF 400S3; MT 400S3	3	150	257	148	111	44	194	Φ7	5.8
	MF 400E4; MT 400E4 MF 400S4; MT 400S4	4	198	257	148	111	88	194	Φ7	7.6
630	MF 630E3; MT 630E3 MF 630S3; MT 630S3	3	150	257	148	111	44	194	Φ7	6.0
	MF 630E4; MT 630E4 MF 630S4; MT 630S4	4	198	257	148	111	88	194	Φ7	7.8
800	MF 800E3; MT 800E3 MF 800S3; MT 800S3	3	210	280	155	117	70	243	Φ7	10.2
	MF 800E4; MT 800E4 MF 800S4; MT 800S4	4	280	280	155	117	140	243	Φ7	13.1
1250	MF 1250E3	3	210	406	196	159	70	374	Φ8.5	24.5
1600	MF1600E3; MT1600E3 MT1600S3	3	210	330	196	159	70	298	Φ8.5	21.5

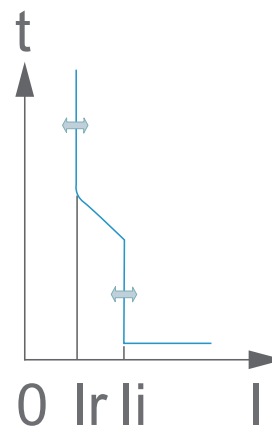
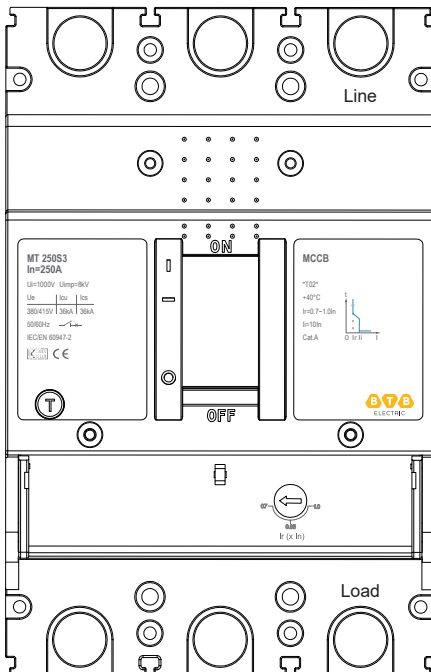


Operation characteristic curve

Characteristic curve Fixed type

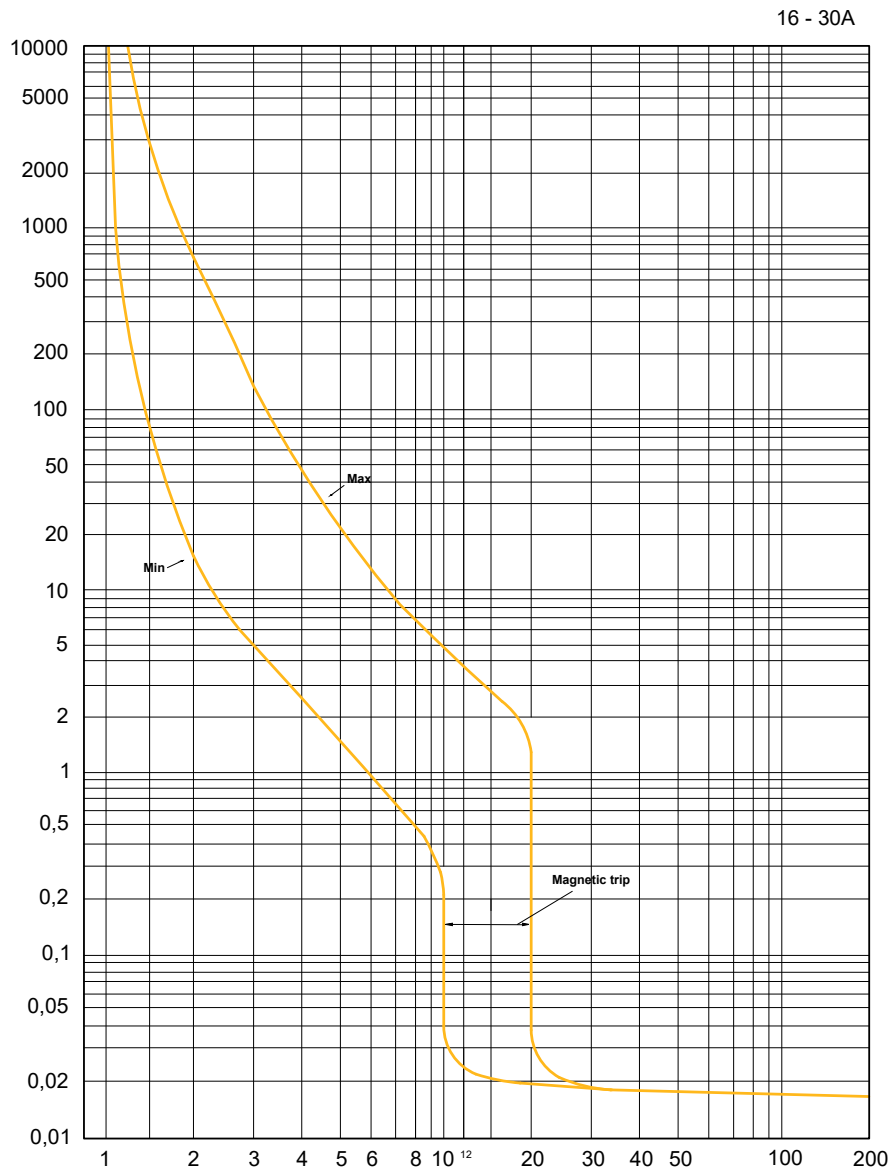


Characteristic curve Thermal adjustable type

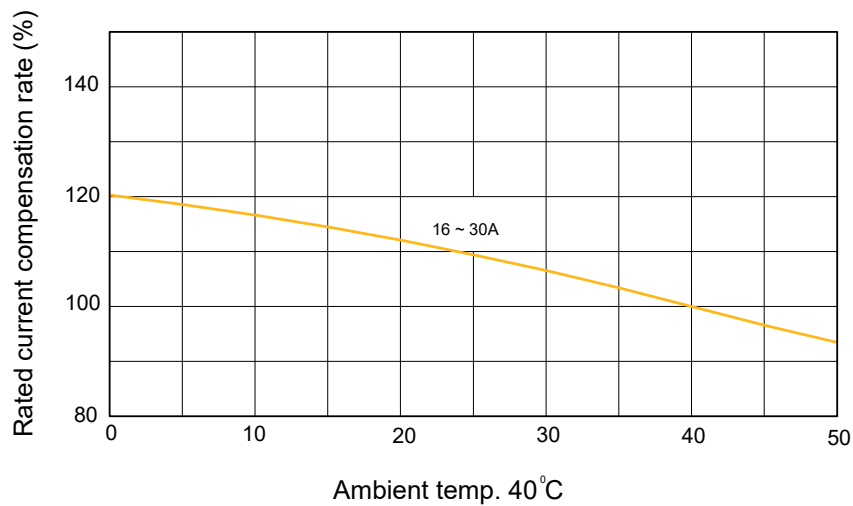


Operation characteristic curve

Frame 125A Time current characteristic curve (16 ~ 30A)

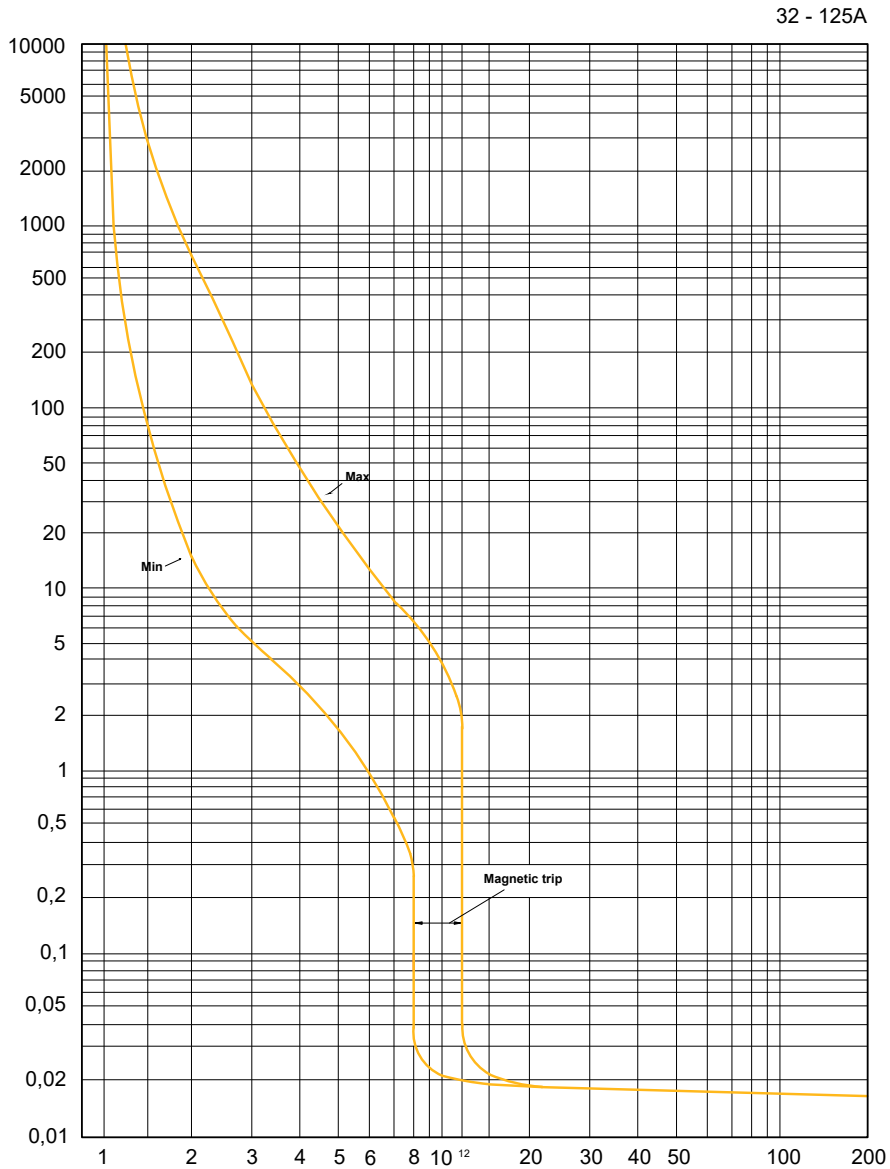


Ambient Temperature Derating Curve

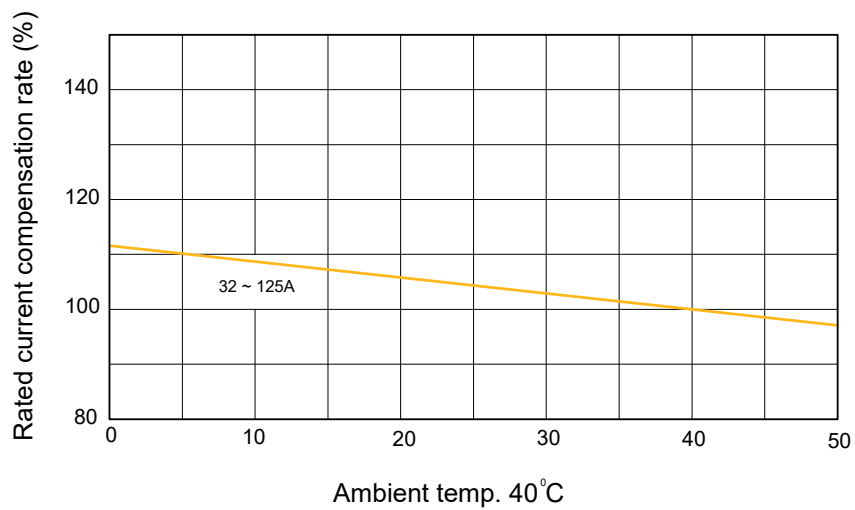


Operation characteristic curve

Frame 125A Time current characteristic curve (32 ~ 125A)

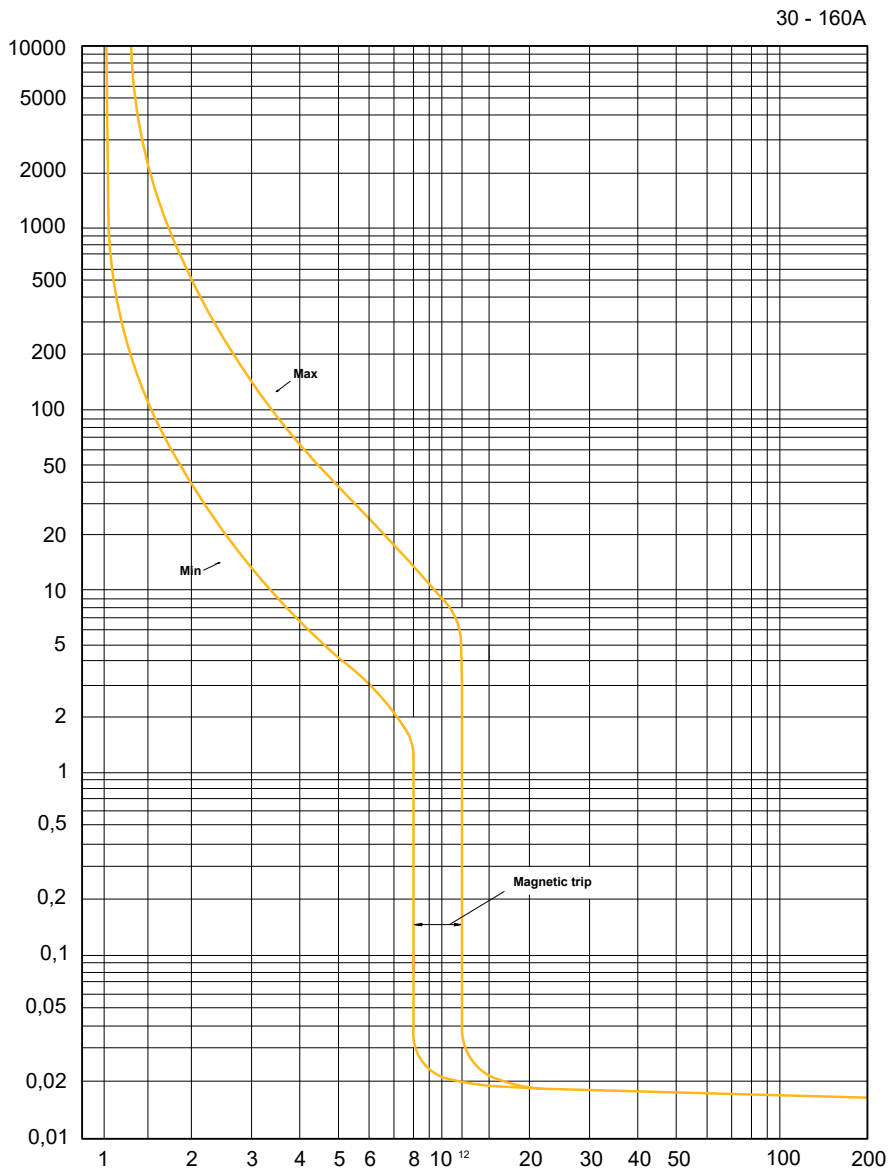


Ambient Temperature Derating Curve

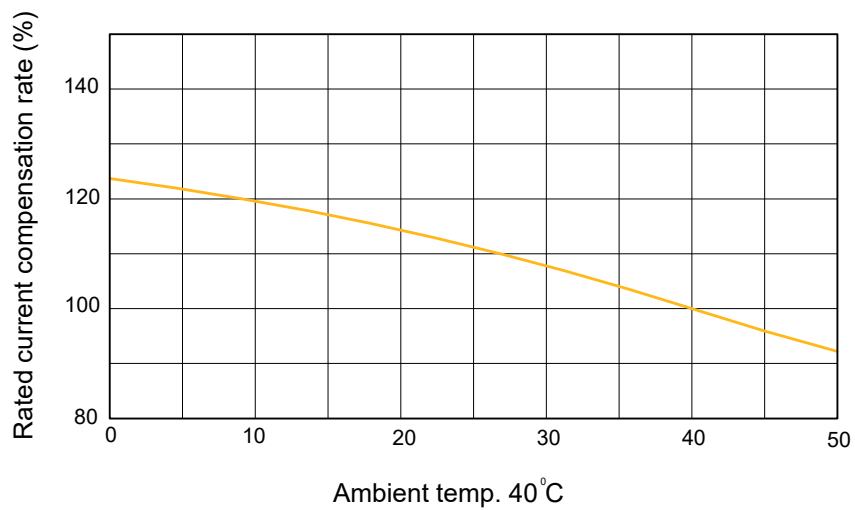


Operation characteristic curve

Frame 160A Time current characteristic curve



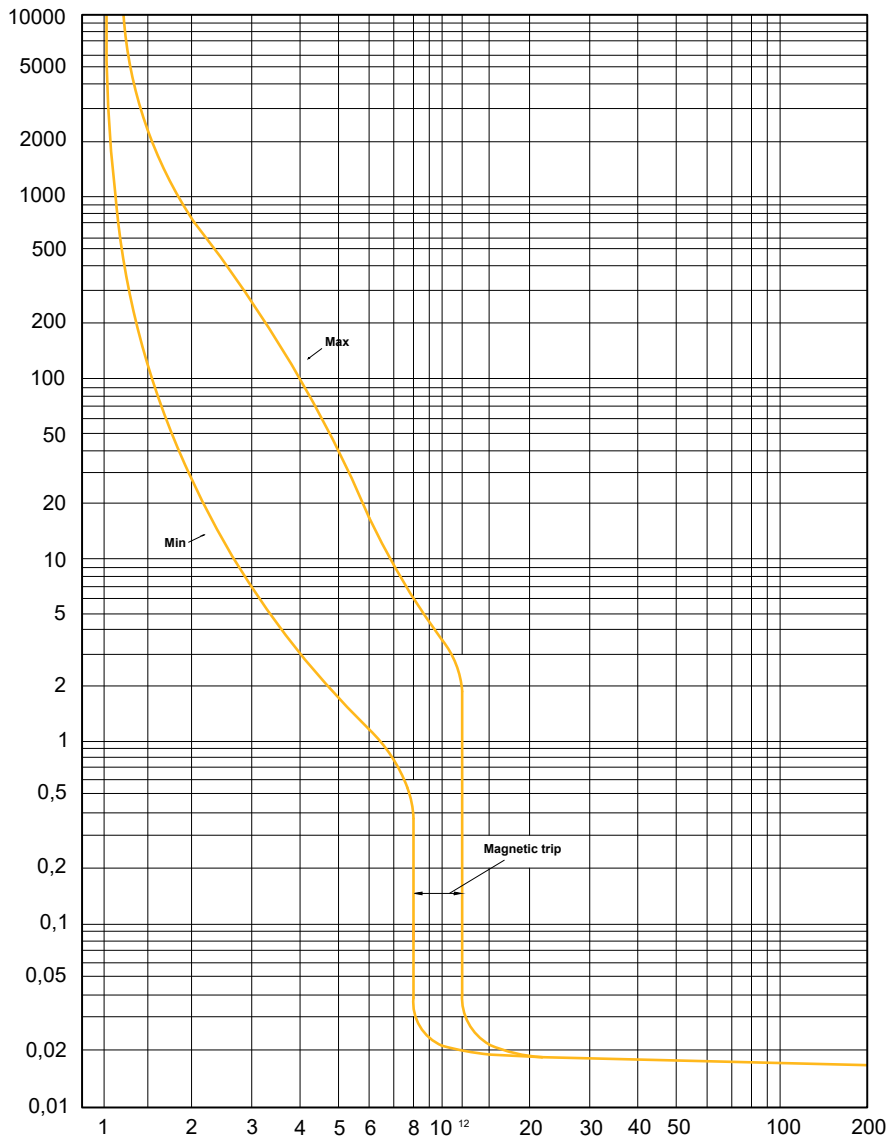
Ambient Temperature Derating Curve



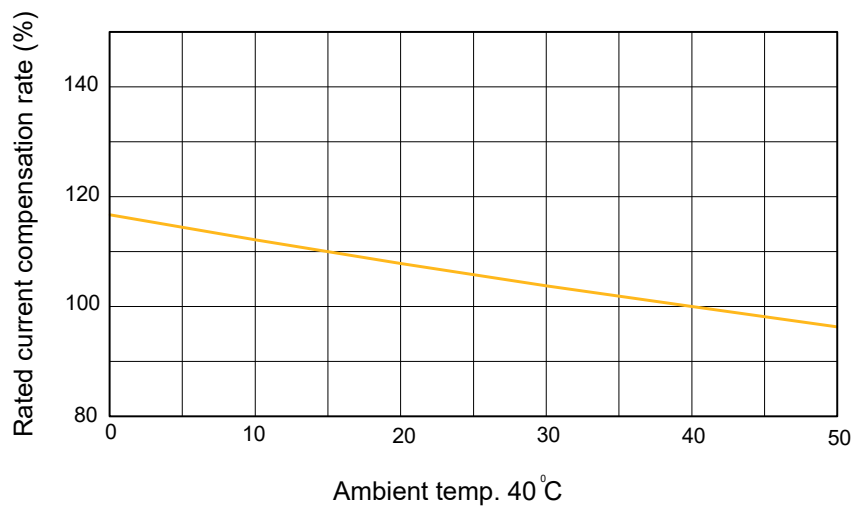
Operation characteristic curve

Frame 250A Time current characteristic curve

100 - 250A

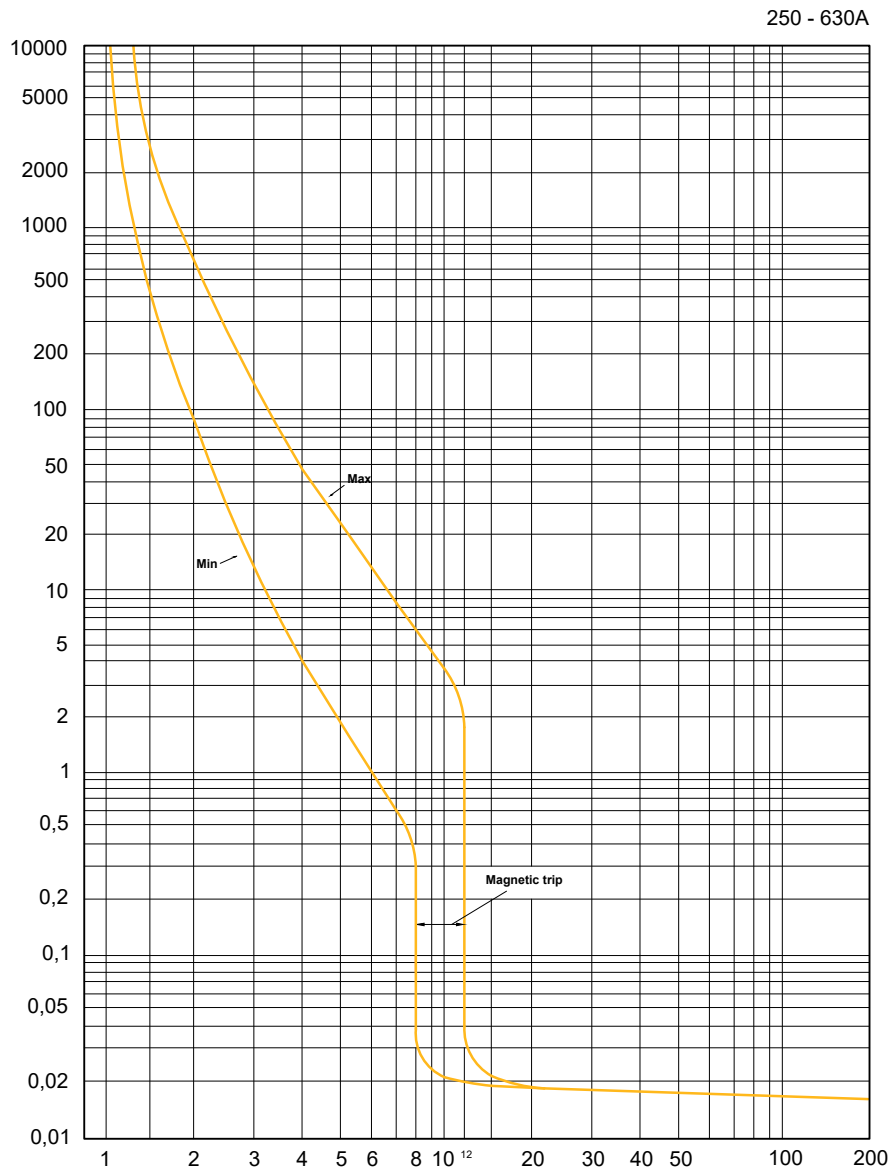


Ambient Temperature Derating Curve

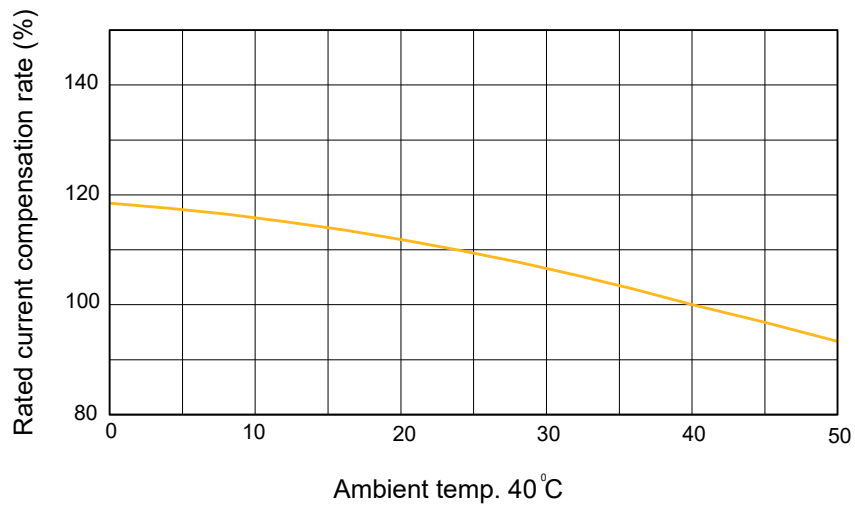


Operation characteristic curve

Frame 400A & 630A Time current characteristic curve



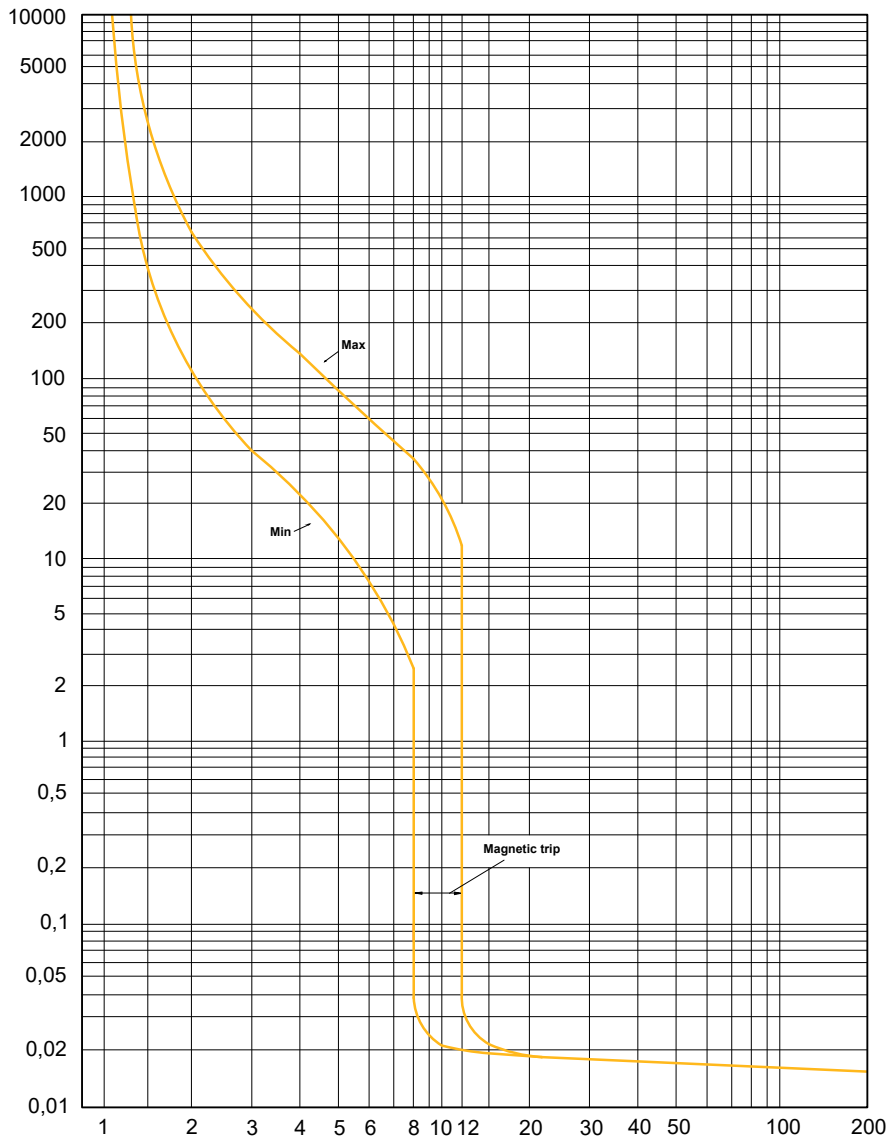
Ambient Temperature Derating Curve



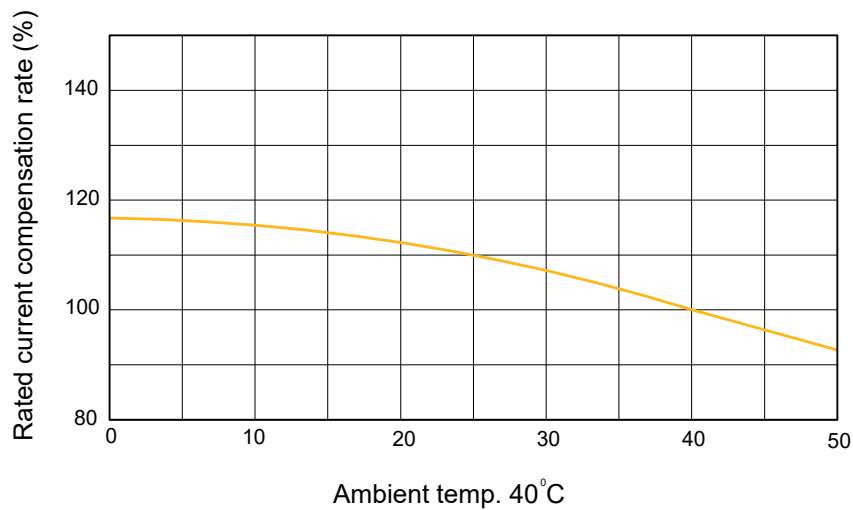
Operation characteristic curve

Frame 800A Time current characteristic curve

630 - 800A

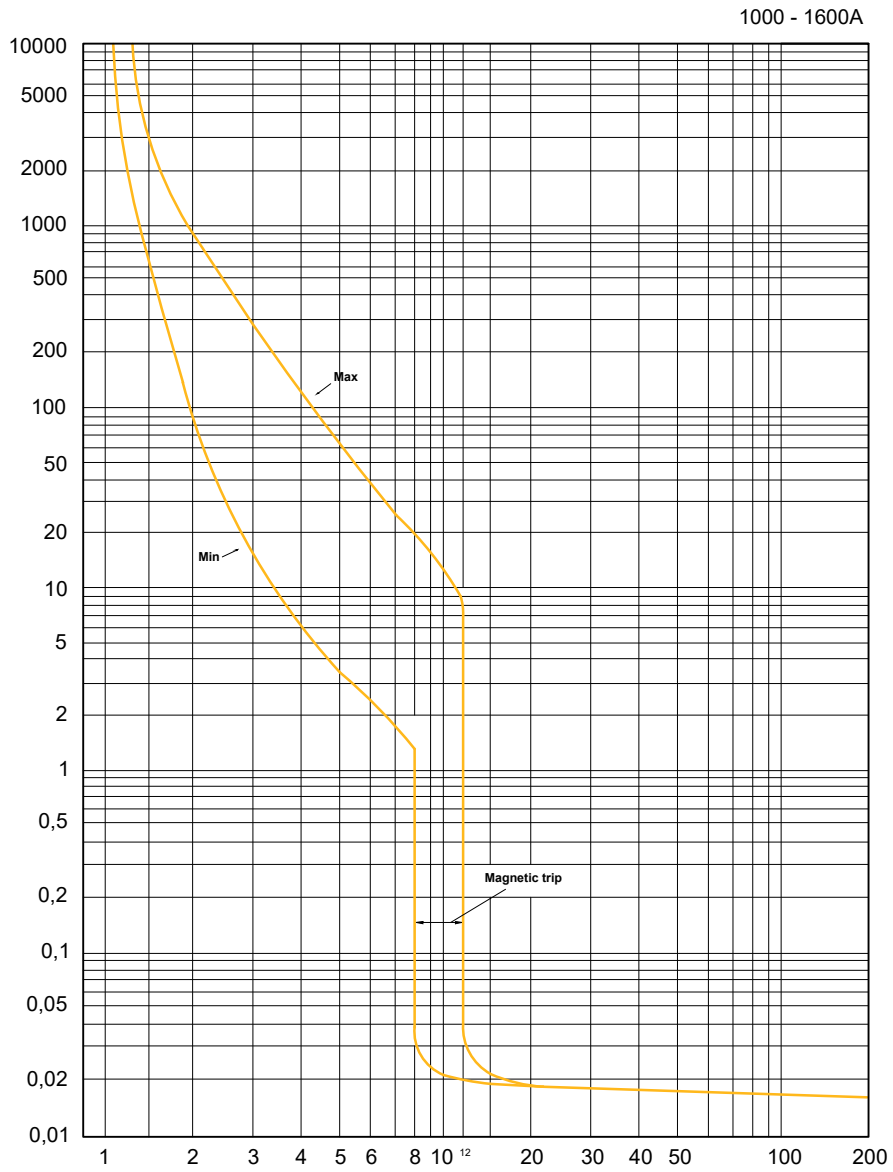


Ambient Temperature Derating Curve

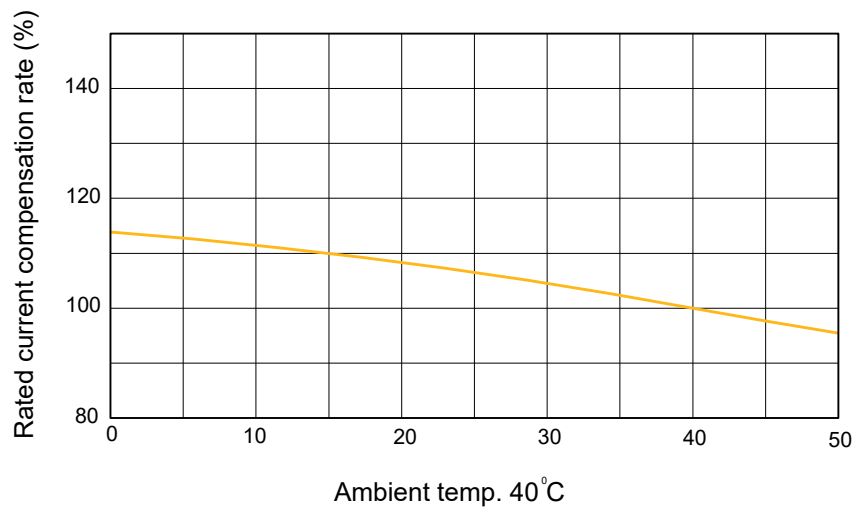


Operation characteristic curve

Frame 1250A - 1600 Time current characteristic curve



Ambient Temperature Derating Curve



Application scope

Electronic molded case circuit breaker, it is used to distribute electrical energy and protect power supply lines and equipment from damages such as overload, short circuit and ground fault. **ME** and **IME** this is a great device to protect your home or office or factory from electrical fires and equipment damage.



Salient features

- Protection: The **M**-Series circuit-breakers will provide protection for the circuit and equipment in case of overload, short circuit and ground fault condition occurred in the power distribution circuit.
- Adjustable: As applying to adjustable rated current design, it is possible to protect circuit optimally according to the load factor. Adjustable range of rated currents 40% ~ 100% of rated current.
- Self-power: Intellectual controller is powered by circuit breaker itself.
- Overload indicator: The LED indicator twinkled when load current exceed rated setting current >5%, means it's overload Over-load alarm indicator. The LED indicator solid when load current between 40% and 100% of setting current in long time delay, means running normally, otherwise will be alarm.
- Rated short-time withstand current: Minimum values of rated short-time withstand current 12In or 5 kA, whichever is the greater.
- Suitable for isolation, ensuring safety for people working behind the circuit breaker.
- Environmental protection: Most components are recyclable.

Image and structure



Selection table

Electronic type with button

Frame	A	250			400	
Type and pole	3P	ME250E3	ME250S3	ME250H3	ME400E3	ME400S3
	4P	ME250E4	ME250S4	ME250H4	ME400E4	ME400S4
Rated current, I _n	A	125-250			250-400	
Rated Operational Voltage, U _e	V	690			690	
Rated Insulation Voltage, U _i	V	1000			1000	
Impulse Withstand Voltage, U _{imp}	kV	8			8	
Reference Standard		IEC/EN 60947-2			IEC/EN 60947-2	
Suitability for Isolation		Yes			Yes	
Pollution Degree		3			3	
Utilization Category		B (Can be set to A)			B (Can be set to A)	
Rated short-time withstand current, I _{cw} /1s	kA/s	5			8	
Trip unit: Electronic		*E01*			*E01*	
Trip unit rating, I _n	A	125-250			250-400	
Long delay current range, I _r	A	125 (50-63-70-75-80-85-90-95-100-125) 250 (100-112-125-140-150-160-180-200-225-250)			250 (100-112-125-140-150-160-180-200-225-250) 400 (160-190-225-250-275-300-325-350-375-400)	
Long delay time, t _r	s	12-60-100-150-OFF @2I _r			12-60-100-150-OFF @2I _r	
Short circuit protection of low level faults, I _{sd}	A	2-2.5-3-4-5-6-7-8-10-12 x I _r			2-2.5-3-4-5-6-7-8-10-12 x I _r	
Short circuit protection time at low level faults, t _{sd}	s	0.06-0.1-0.2-0.3-OFF @1.5I _{sd}			0.06-0.1-0.2-0.3-0.4-0.5-1.0-OFF @1.5I _{sd}	
Short circuit protection of high level faults, I _i	A	4-6-7-8-10-12-13-14 x I _r – OFF			4-6-7-8-9-10-11-12-14 x I _r -OFF	
Pre trip alarm setting multiple, I _p	A	0.7-0.75-0.8-0.85-0.9-0.95-1.0 x I _r			0.7-0.75-0.8-0.85-0.9-0.95-1.0 x I _r	
Ground fault pickup current, I _g	A	0.2-0.3-0.4-0.5-0.6-0.7-0.8-0.9-1.0 x I _n - OFF			0.2-0.3-0.4-0.5-0.6-0.7-0.8-0.9-1.0 x I _n - OFF	
Ground fault pickup current, t _g	s	Fixed for 0.4 sec			Fixed for 0.4 sec	
Breaking capacity level		E	S	H	E	S
Rated ultimate short-circuit breaking capacity, I _{cu} (380/415V)	kA	25	36	50	60	75
Rated service short-circuit breaking capacity, I _{cs}	kA	25	36	50	60	75
Mechanical Endurance		25000			20000	
Electrical Endurance		8000			7000	
Accessories						
Auxiliary switch	AUX	■			■	
Alarm switch	ALT	■			■	
Shunt trip	SHT	■			■	
Undervoltage trip	UVT	■			■	
Motor operator	MOT	■			■	
Extended Rotary Handle		■			■	
Dimensions mm (W x L x H)	3P	106x165x100			150x257x148	
	4P	141x165x100			198x257x148	

“■” shows it has this option; “□” means it has no this option; “Time delay accuracy” ± 20% or below

Selection table

Electronic type with button

630		800		1600	
ME630E3	ME630S3	ME800E3	ME800S3	ME1600E3	ME1600S3
ME630E4	ME630S4	ME800E4	ME800S4	ME1600E4	ME1600S4
400-630		630-800		1000-1250-1600	
690		690		690	
1000		1000		1000	
8		8		8	
IEC/EN 60947-2		IEC/EN 60947-2		IEC/EN 60947-2	
Yes		Yes		Yes	
3		3		3	
B (Can be set to A)		B (Can be set to A)		B (Can be set to A)	
8		10		10	
E01		*E01*		*E01*	
400-630		630-800		1000-1250-1600	
400 (160-190-225-250-275-300-325-350-375-400)		630 (252-300-350-400-435-475-515-550-595-630)		1000 (400-500-600-700-800-900-1000)	
630 (252-300-350-400-435-475-515-550-595-630)		800 (320-435-550-630-660-690-715-745-770-800)		1250 (500-625-750-875-1000-1125-1250)	
				1600 (640-800-960-1120-1280-1440-1600)	
12-60-100-150-OFF @2Ir		12-60-100-150-OFF @2Ir		8-12-16-24-32-48-64-96-128-256-OFF @2Ir	
2-2.5-3-4-5-6-7-8-10-12 x Ir		2-2.5-3-4-5-6-7-8-10-12 x Ir		2-3-4-5-6-7-8-10-12 x Ir - OFF	
0.06-0.1-0.2-0.3-0.4-0.5-1.0-OFF @1.5I _{sd}		0.06-0.1-0.2-0.3-0.4-0.5-1.0-OFF @1.5I _{sd}		0.05-0.1-0.15-0.2-0.3-OFF @1.5I _{sd}	
4-6-7-8-9-10-11-12-14 x Ir -OFF		4-6-7-8-9-10-11-12-14 x Ir -OFF		4-6-7-8-9-10-11-12-14 x Ir - OFF	
0.7-0.75-0.8-0.85-0.9-0.95-1.0 x Ir		0.7-0.75-0.8-0.85-0.9-0.95-1.0 x Ir		0.6-0.65-0.7-0.75-0.8-0.85-0.9-0.95-1.0 x Ir - OFF	
0.2-0.3-0.4-0.5-0.6-0.7-0.8-0.9-1.0 x I _n - OFF		0.2-0.3-0.4-0.5-0.6-0.7-0.8-0.9-1.0 x I _n - OFF		0.2-0.3-0.4-0.5-0.6-0.7-0.8-0.9-1.0 x I _n - OFF	
Fixed at 0.4		Fixed at 0.4		Fixed at 0.4	
E	E	E	S	E	S
60	75	60	75	50	65
60	75	60	75	50	65
20000		20000		10000	
5000		5000		2000	
■		■		■	
■		■		■	
■		■		■	
■		■		■	
■		■		■	
■		■		■	
150x257x148		210x280x155		210x340x245	
198x257x148		280x280x155		280x340x245	

“■” shows it has this option; “□” means it has no this ; “Time delay accuracy” ± 20% or below

Selection table

Electronic type with LCD

Frame	A	400		630		800	
Type and pole	3P	iME400E3	iME400S3	iME630E3	iME630S3	iME800E3	iME800S3
	4P	iME400E4	iME400S4	iME630E4	iME630S4	iME800E4	iME800S4
Rated current, In	A	250-400		250-400-630		630-800	
Rated Operational Voltage, Ue	V	690		690		690	
Rated Insulation Voltage, Ui	V	1000		1000		1000	
Impulse Withstand Voltage, Uimp	kV	8		8		8	
Reference Standard		IEC/EN 60947-2		IEC/EN 60947-2		IEC/EN 60947-2	
Suitability for Isolation		Yes		Yes		Yes	
Pollution Degree		3		3		3	
Utilization Category		B (Can be set to A)		B (Can be set to A)		B (Can be set to A)	
Rated short-time withstand current, Icw/1s	kA/s	8		8		10	
Trip unit: Electronic		*E02*		*E02*		*E02*	
Trip unit rating, In	A	250-400		250-400-630		630-800	
Long delay current range, Ir	A	250 (100-250) 400 (160-400) with increment by 1A		250 (100-250) 400 (160-400) 630 (252-630) with increment by 1A		630 (252-630) 800 (320-800) with increment by 1A	
Long delay time, tr	s	12-150 with increment by 1 sec + OFF @2Ir		12-150 with increment by 1 sec + OFF @2Ir		12-150 with increment by 1 sec + OFF @2Ir	
Short circuit protection of low level faults, Isd	A	250 (200-3000) 400 (320-4800) with increment by 1A		250 (200-3000) 400 (320-4800) 630 (500-7560) with increment by 1A		630 (500-7560) 800 (650-8000) with increment by 1A	
Short circuit protection time at low level faults, tsd	s	0.06-1s with increment by 0.02 sec + OFF @1.5Isd		0.06-1s with increment by 0.02 sec + OFF @1.5Isd		0.06-1s with increment by 0.02 sec + OFF @1.5Isd	
Short circuit protection of high level faults, Ii	A	250 (400-3500 +OFF) 400 (640-5600 +OFF) with increment by 1A		250 (400-3500 +OFF) 400 (640-5600 +OFF) 630 (1000-8820 +OFF) with increment by 1A		630 (1000-8820 +OFF) 800 (1300-9600 +OFF) with increment by 1A	
Pre trip alarm setting multiple, Ip	A	250 (70-250) 400 (112-400) with increment by 1A		250 (70-250) 400 (112-400) 630 (175-630) with increment by 1A		630 (175-630) 630 (228-800) with increment by 1A	
Ground fault pickup current, Ig	A	250 (50-250 +OFF) 400 (80-400 +OFF) with increment by 1A		250 (50-250 +OFF) 400 (80-400 +OFF) 630 (126-630 +OFF) with increment by 1A		630 (126-630 +OFF) 800 (160-800 +OFF) with increment by 1A	
Ground fault pickup current, tg	s	Fixed for 0.4 sec		Fixed for 0.4 sec		Fixed for 0.4 sec	
Breaking capacity level		E	S	E	S	E	S
Rated ultimate short-circuit breaking capacity, Icu (380/415V)	kA	60	75	60	75	60	75
Rated service short-circuit breaking capacity, Ics = 100% Icu	kA	60	75	60	75	60	75
Mechanical Endurance		20000		20000		20000	
Electrical Endurance		7000		5000		5000	

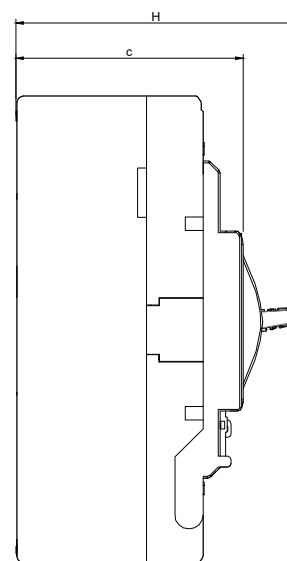
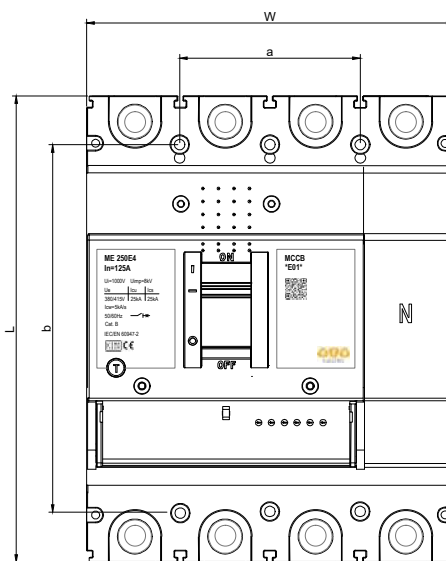
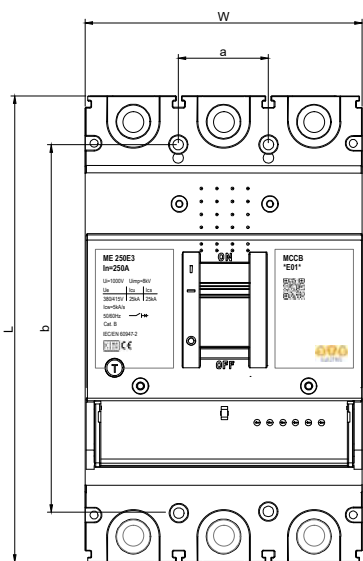
“■” shows it has this option; “□” means it has no this option; “Time delay accuracy” ± 20% or below



Frame	A	400	630	800
Accessories				
Auxiliary switch	AUX	■	■	■
Alarm switch	ALT	■	■	■
Shunt trip	SHT	■	■	■
Undervoltage trip	UVT	■	■	■
Motor operator	MOT	■	■	■
Extended Rotary Handle		■	■	■
Dimensions mm	3P	150x257x148	150x257x148	210x280x155
(W x L x H)	4P	198x257x148	198x257x148	280x280x155

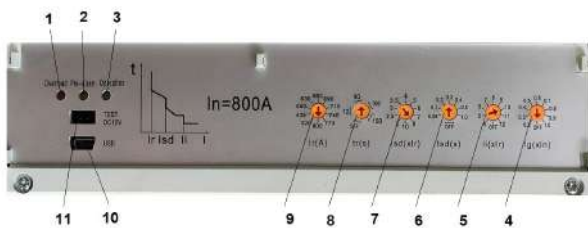
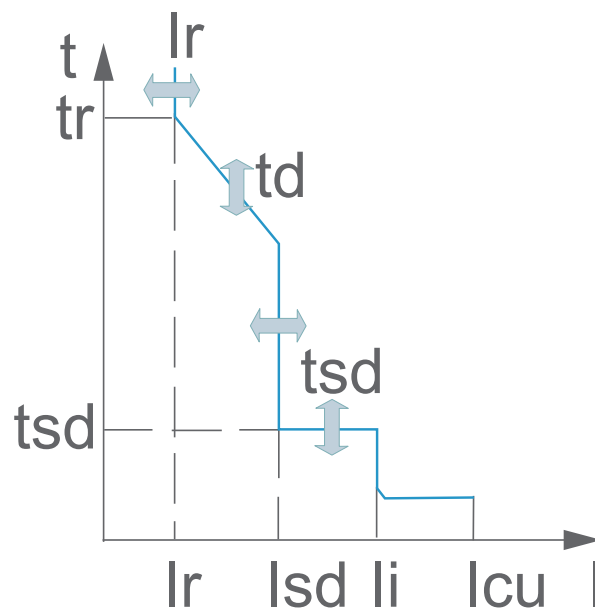
Dimensions

Frame	Type	Poles	Outline Dimension (mm)				Installation Dimension (mm)			Weight (kg)
			W	L	H	c	a	b	d	
250	ME 250S3; ME 250L3	3	106	165	100	77	35	126	Φ4.5	1.8
	ME 250S4; ME 250L4	4	141	165	100	77	70	126	Φ4.5	2.3
400	ME 400E3; ME 400S3 iME 400E3; iME 400S3	3	150	257	148	111	44	194	Φ7	5.8
	ME 400E4; ME 400S4 iME 400E4; iME 400S4	4	198	257	148	111	88	194	Φ7	7.6
630	ME 630E3; ME 630S3 iME 630E3; iME 630S3	3	150	257	148	111	44	194	Φ7	6.0
	ME 630E4; ME 630S4 iME 630E4; iME 630S4	4	198	257	148	111	88	194	Φ7	7.8
800	ME 800E3; ME 800S3 iME 800E3; iME 800S3	3	210	280	155	117	70	243	Φ7	10.2
	ME 800E4; ME 800S4 iME 800E4; iME 800S4	4	280	280	155	117	140	243	Φ7	13.1
1600	ME 1600E3; ME 1600S3	3	210	340	192	152	70	303	Φ8.5	21.5
	ME 1600E4; ME 1600S4	4	280	340	192	152	140	303	Φ8.5	28.1



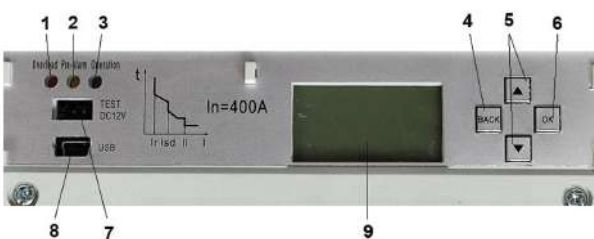
Operation characteristic curve

Installation Instructions



Electronic type with button

- | | |
|----|---------------------------------------------------|
| 1 | Trip indicator LED |
| 2 | Pre trip alarm LED |
| 3 | Operation LED |
| 4 | Pre trip alarm setting multiple |
| 5 | Short circuit protection of high level faults |
| 6 | Short circuit protection time at low level faults |
| 7 | Short circuit protection of low level faults |
| 8 | Long delay time |
| 9 | Long delay current range |
| 10 | Debug port |
| 11 | Test port |

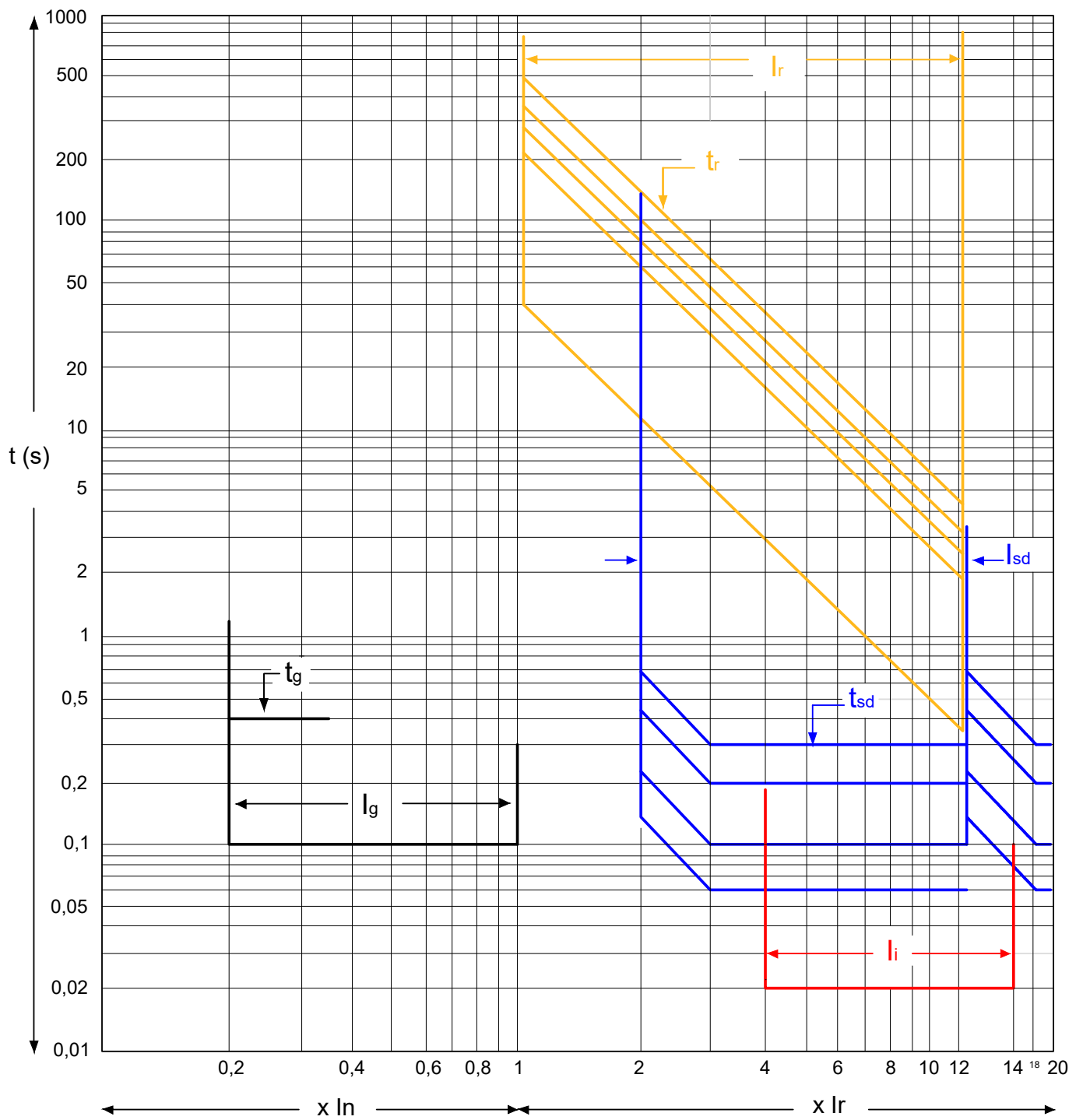


Electronic type with LCD

- | | |
|---|------------------------------|
| 1 | Trip indicator LED |
| 2 | Pre trip alarm LED |
| 3 | Operation LED |
| 4 | Go back to previous settings |
| 5 | Up & Down value |
| 6 | Setting and confirmation |
| 7 | Test port |
| 8 | Debug port |
| 9 | Display screen |

Operation characteristic curve

Current-time characteristic curve for electronic type MCCB



Application scope

Earth leakage circuit breakers (ELCB) is a molded case circuit breaker used in a low-voltage AC electrical circuit to provide electric shock protection and prevent fires from current leakages. ELCB is called a “Circuit-breaker incorporating residual current protection” (IEC/EN 60947-2) or a “Residual current operated circuit breaker” (IEC/EN 61009-1). It is also referred to as a “Ground-fault circuit-interrupter”.



Why is ELCB needed?

Awareness toward electric shock injuries and short-circuit fires has increased in view of saving human life and assets. In addition, places requiring installation of ELCB has increased for legal reasons.

Salient features

- Residual current circuit breakers are used mainly to provide protection against leakage current which may cause insulation failure , electric shock to equipment and human body irrespectively along with the standard protection against over load & short circuit condition.
- Standardized size of accessories, compatible with MCCB.
- Adjustable Residual current and current cut-Off time.
- Application of 3 phase power supply system, enabling normal operation under one phase loss fault.

Image and structure



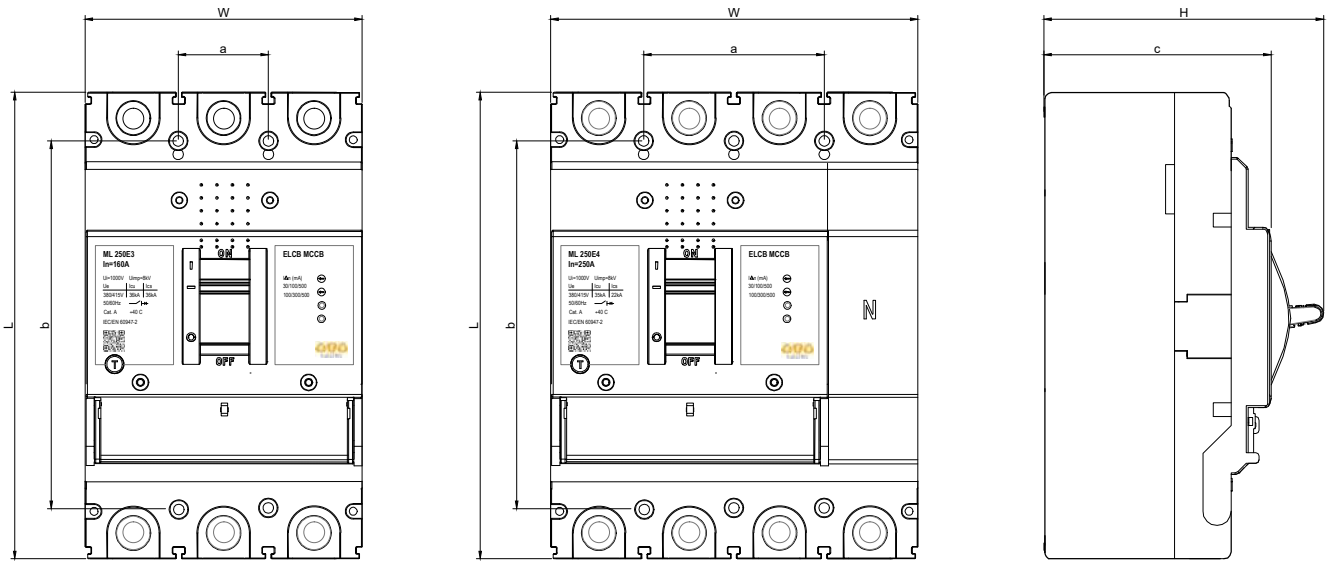
Selection table

Frame	A	250		400		800	
Type and pole	3P	ML250E3	ML250S3	ML400E3	ML400S3	ML800E3	ML800S3
	4P	ML250E4	ML250S4	ML400E3	ML400S4	ML800E4	ML800S4
Rated current at 40°C, I _n	A	100-125-160-200-225		225-250-315-350-400		630-700-800	
Rated Operational Voltage, U _e	V	440		440		440	
Rated Insulation Voltage, U _i	V	1000		1000		1000	
Impulse Withstand Voltage, U _{imp}	kV	8		8		8	
Reference Standard		IEC/EN 60947-2		IEC/EN 60947-2		IEC/EN 60947-2	
Suitability for Isolation		Yes		Yes		Yes	
Pollution Degree		3		3		3	
Utilization Category		A		A		A	
Rated residual operating current I _{Δn} (mA)		G6 or G7		G7		G7	
I _{Δn} (Without time delay)	mA	30/100/500 100/300/500		100/300/500		100/300/500	
I _{Δn} (With time delay)	mA	100/300/500		100/300/500		300/500/1000	
Rated residual non-operating current	mA	½ I _{Δn}		½ I _{Δn}		½ I _{Δn}	
Breaking time at a residual current	s	2I _{Δn}		5I _{Δn}		10I _{Δn}	
Max. breaking times							
Without time delay	s	0.15		0.04		0.04	
With time delay	s	0.4/1		0.4/1		0.4/1	
Trip unit: Thermal Magnetic		*T01*		*T01*		*T01*	
Long time, LT	I _r	1.0xI _n		1.0xI _n		1.0xI _n	
Instantaneous, INST	I _i	10xI _n		10xI _n		10xI _n	
Breaking capacity level		E	S	E	S	E	S
Rated ultimate short-circuit breaking capacity, I _{cu} (380/415V)	kA	35	50	50	100	50	100
Rated service short-circuit breaking capacity, I _{cs} (380/415V)	kA	22	35	35	65	35	65
Mechanical Endurance		8500		7000		4000	
Electrical Endurance		1500		1000		1000	
Accessories							
Auxiliary switch	AUX	■		■		■	
Alarm switch	ALT	■		■		■	
Shunt trip	SHT	■		■		■	
Undervoltage trip	UVT	■		■		■	
Motor operator	MOT	■		■		■	
Extended Rotary Handle		■		■		■	
Dimensions mm (W x L x H)	3P	106x165x100		150x257x148		210x280x155	
	4P	141x165x100		198x257x148		280x280x155	

“■” shows it has this option; “□” means it has no this option.

Dimensions

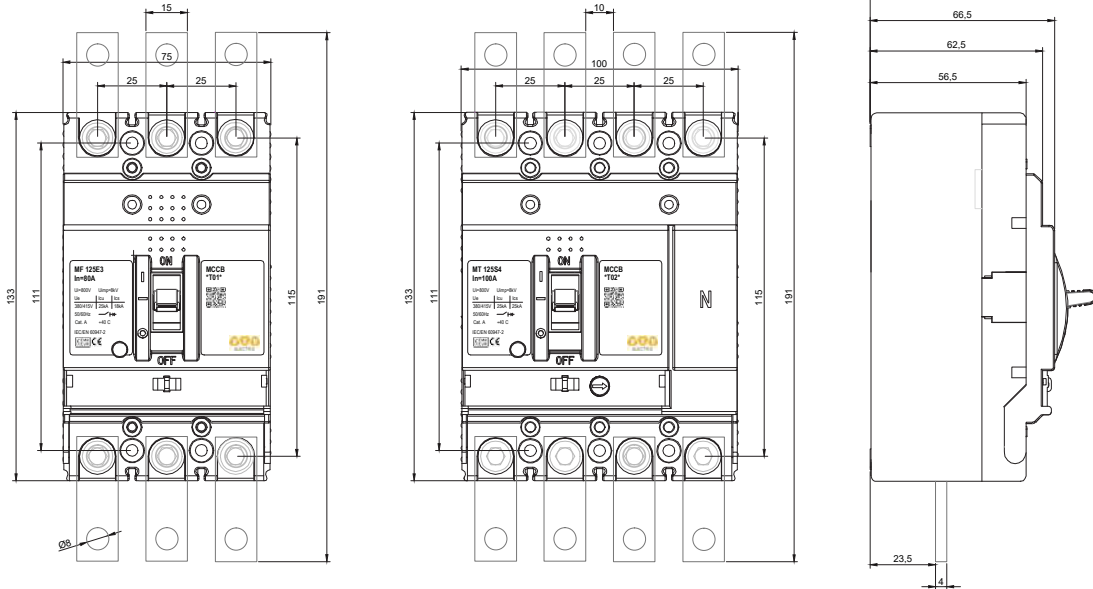
Frame	Type	Poles	Outline Dimension (mm)				Installation Dimension (mm)			Weight
			W	L	H	c	a	b	d	kg
250	ML 250E3; ML 250S3	3	106	165	100	77	35	126	Φ4.5	1.8
	ML 250E4; ML 250S4	4	141	165	100	77	70	126	Φ4.5	2.3
400	ML 400E3; ML 400S3	3	150	257	148	111	44	194	Φ7	5.8
	ML 400E4; ML 400S4	4	198	257	148	111	88	194	Φ7	7.6
800	ML 800E3; ML 800S3	3	210	280	155	117	70	243	Φ7	10.2
	ML 800E4; ML 800S4	4	280	280	155	117	140	243	Φ7	13.1



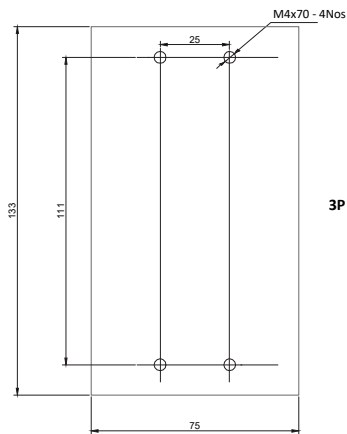


Dimensions

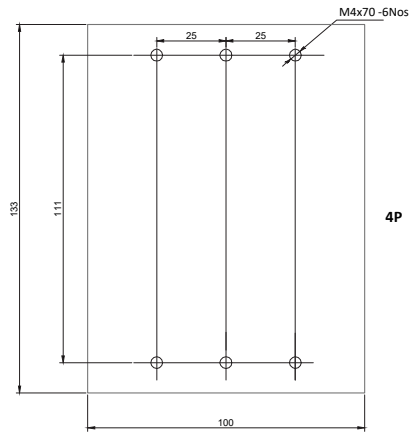
Frame 125A



Panel drilling

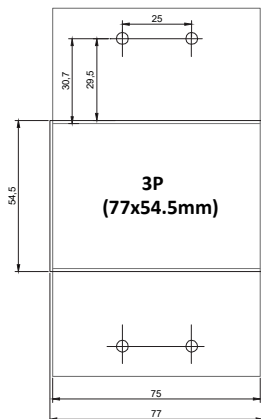


3P

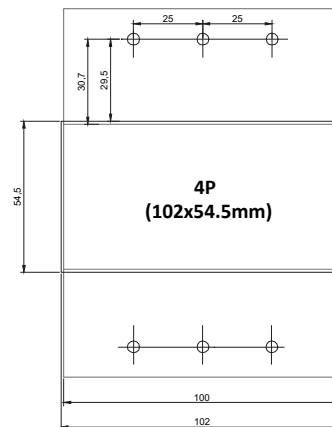


4P

Front panel cutting

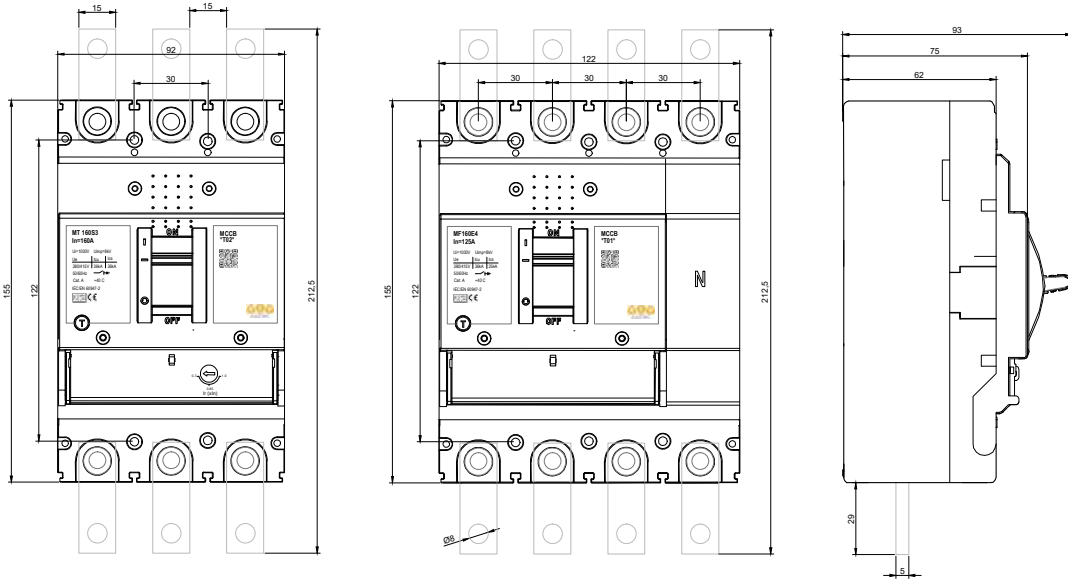


3P
(77x54.5mm)

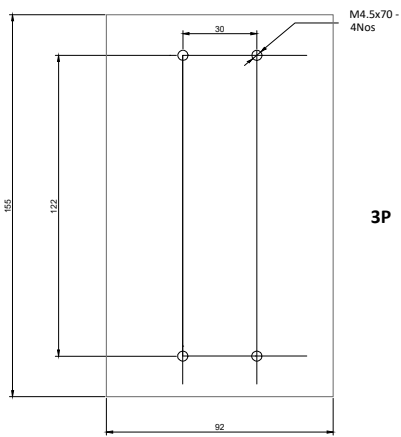


4P
(102x54.5mm)

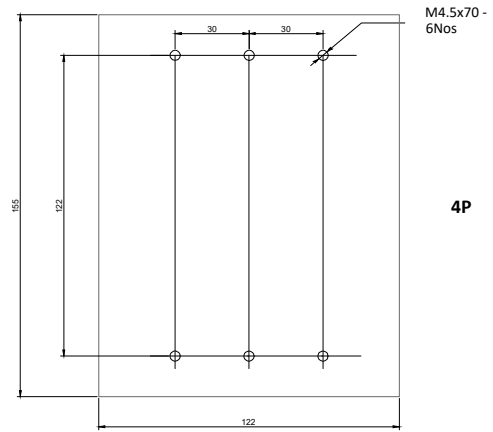
Frame 160A



Panel drilling

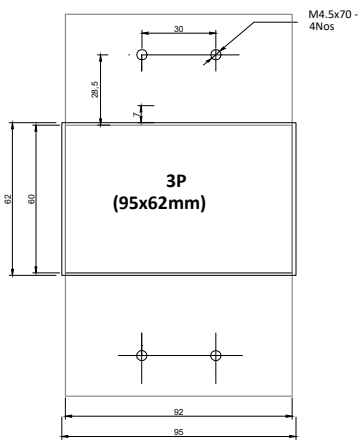


3P

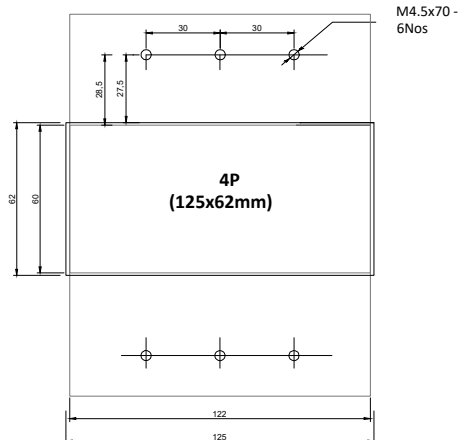


4P

Front panel cutting

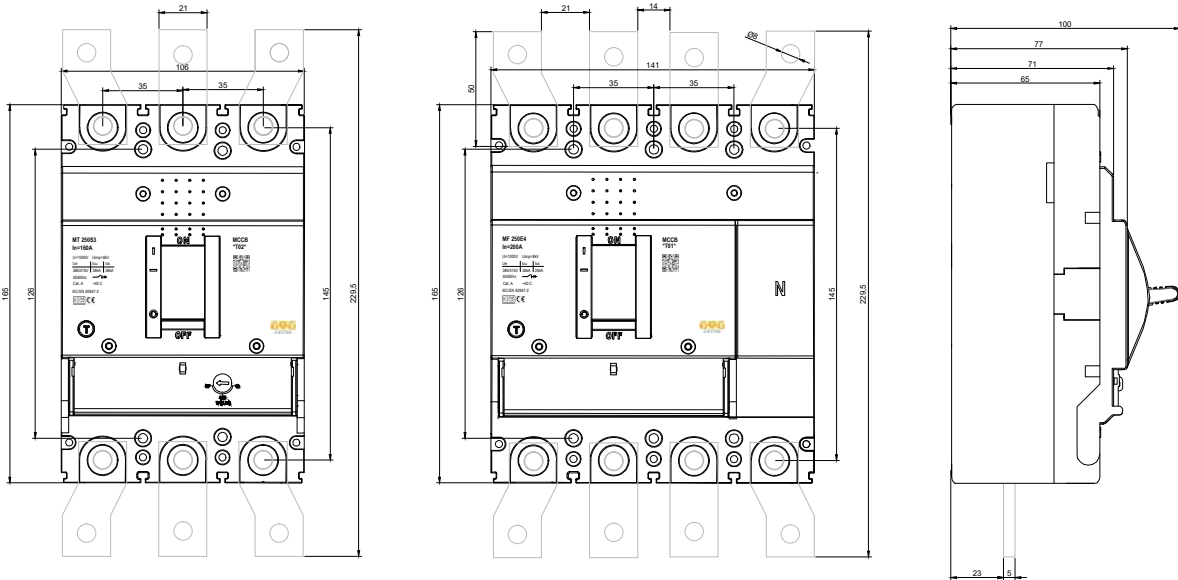


3P
(95x62mm)

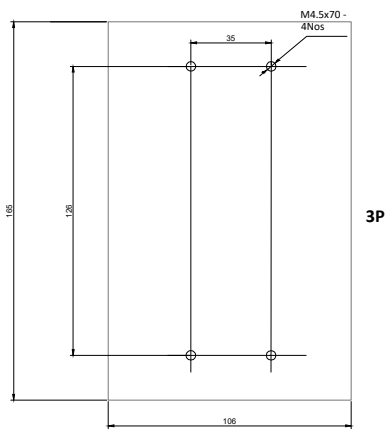


4P
(125x62mm)

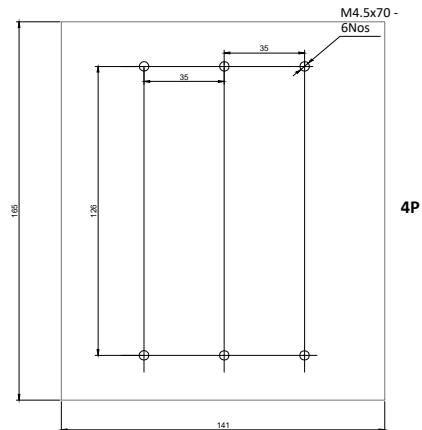
Frame 250A



Panel drilling

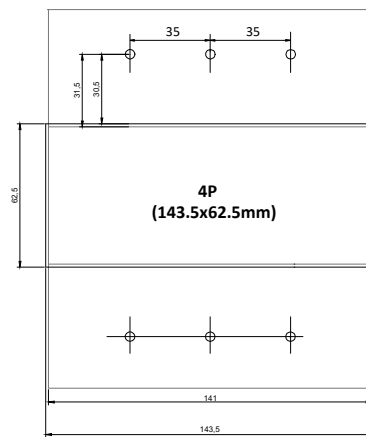
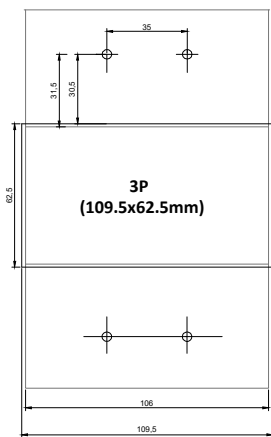


3P

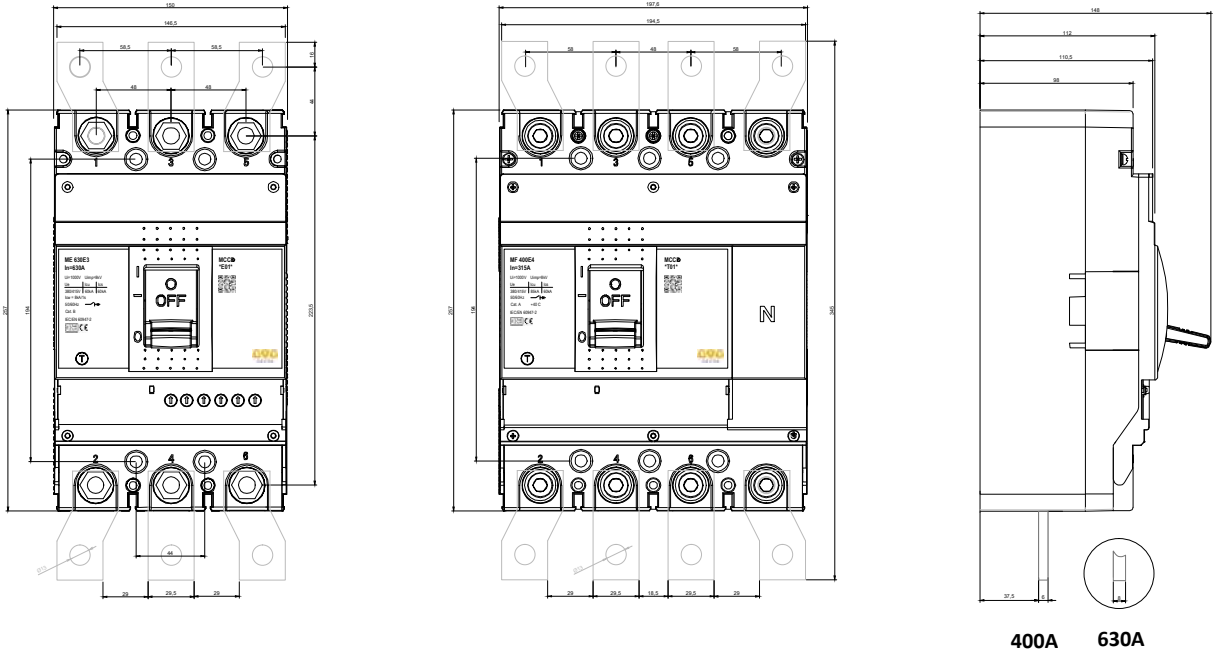


4P

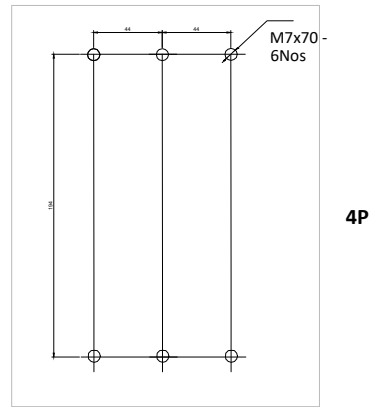
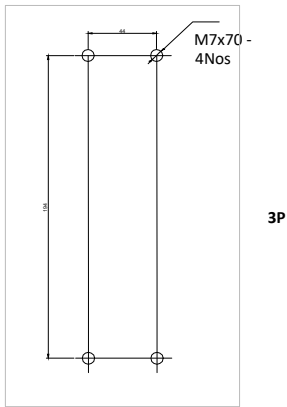
Front panel cutting



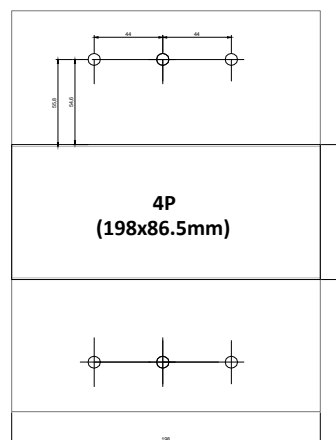
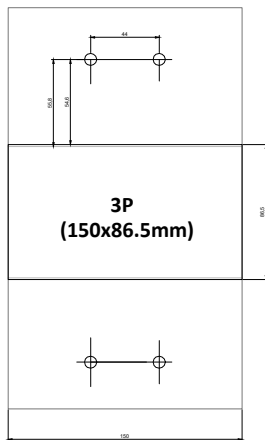
Frame 400A & 630A



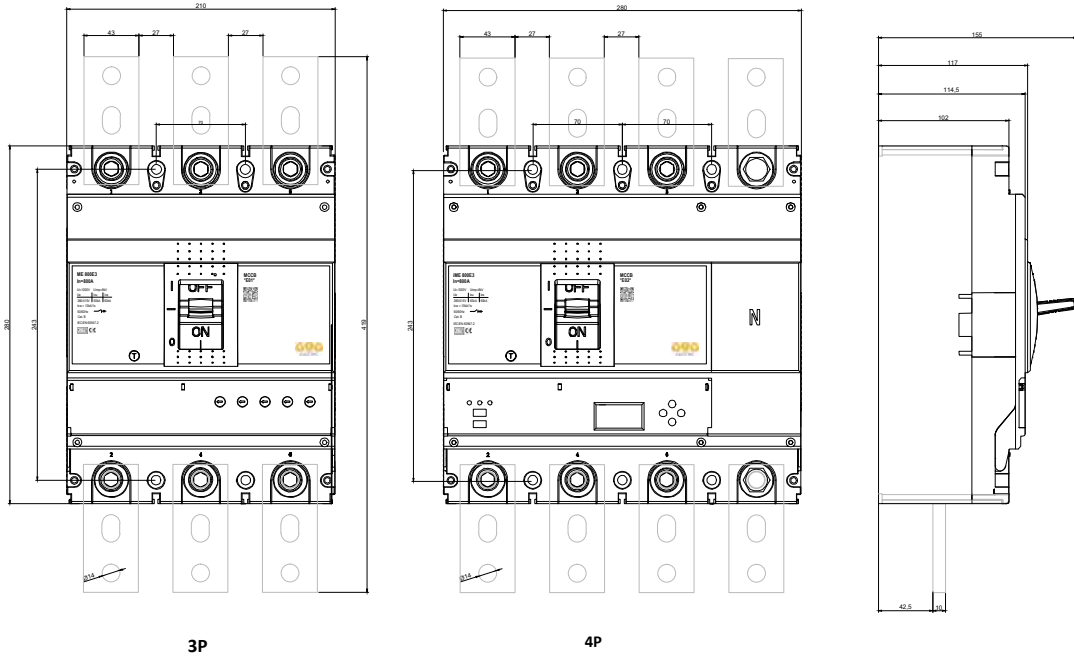
Panel drilling



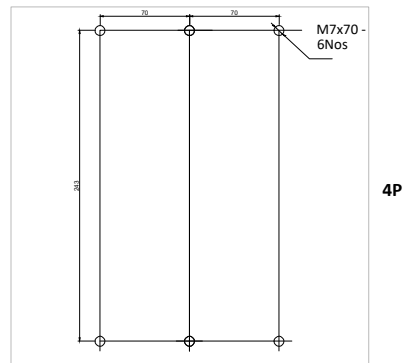
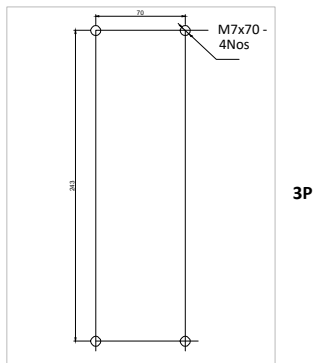
Front panel cutting



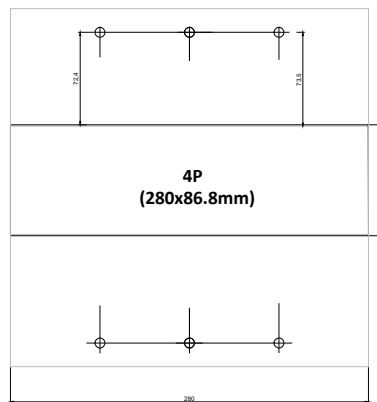
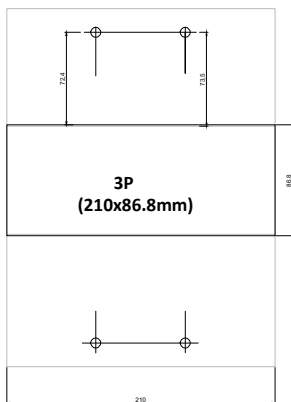
Frame 800A



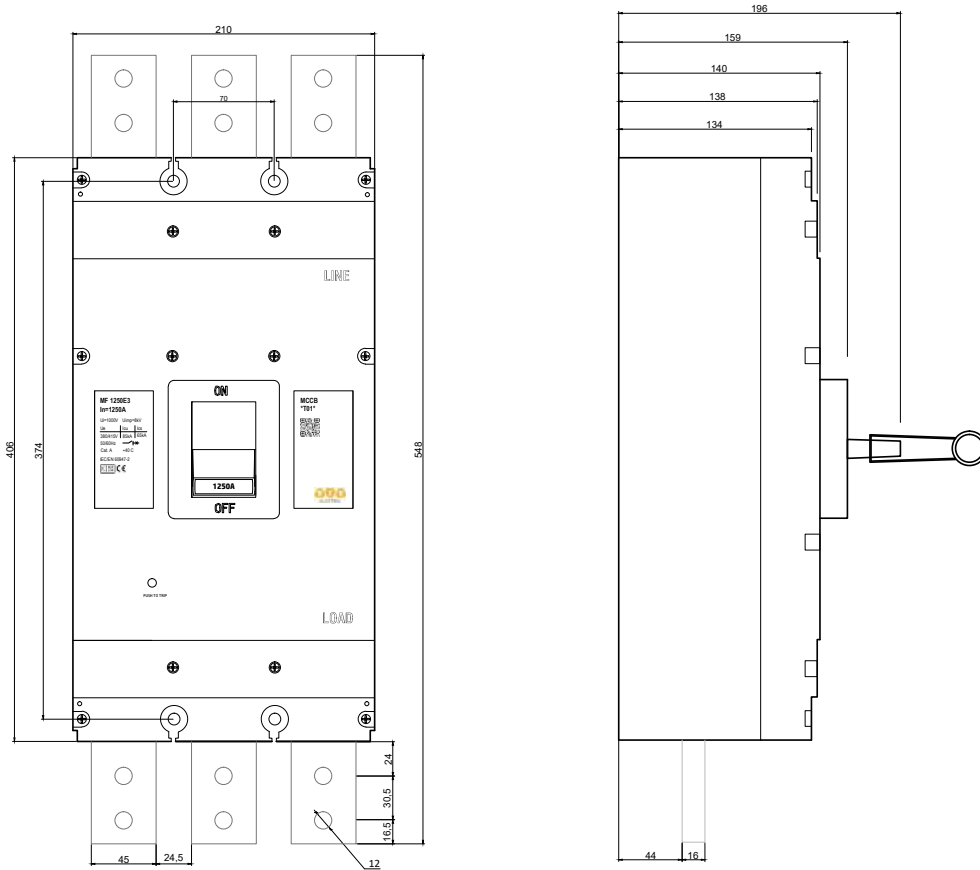
Panel drilling



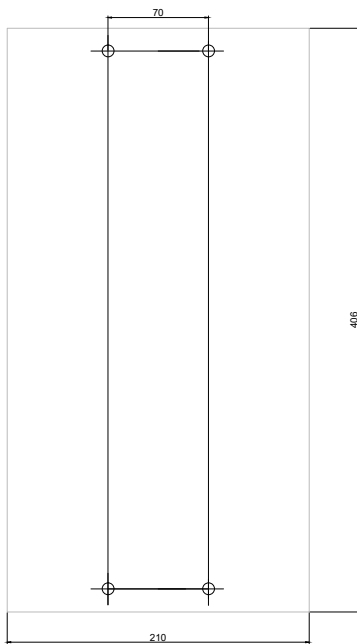
Front panel cutting



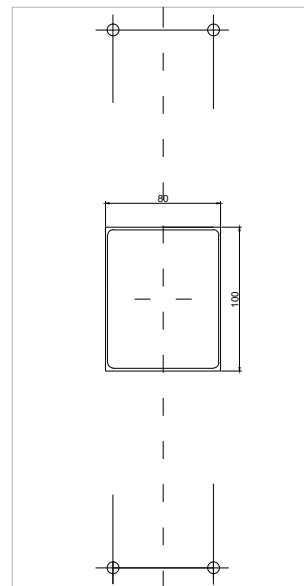
Frame 1250A



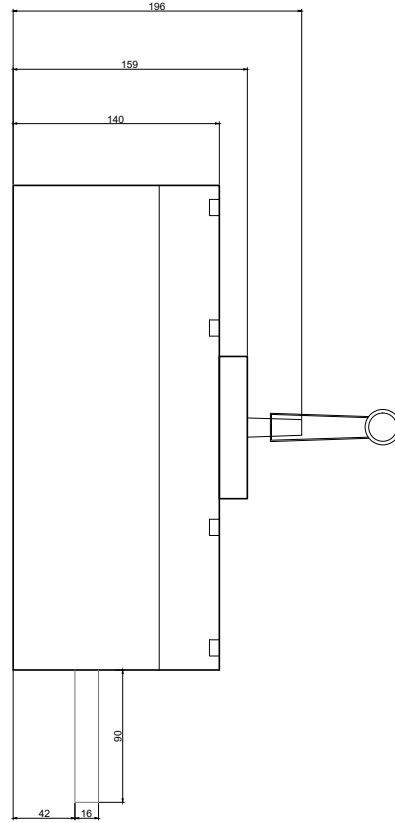
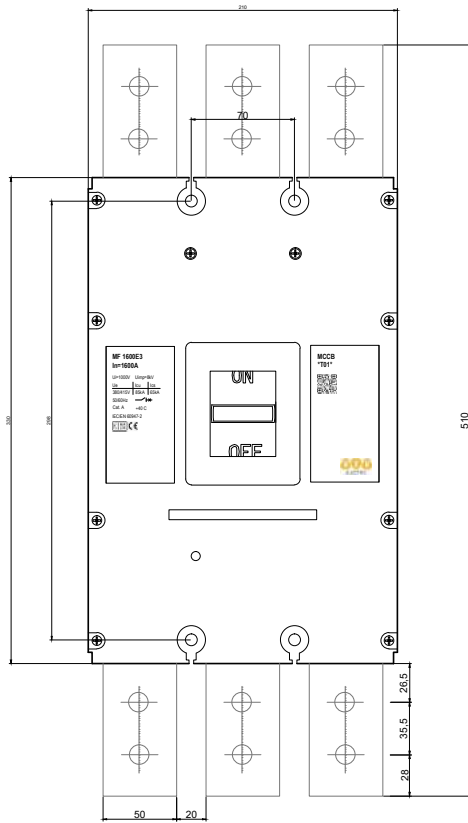
Panel drilling



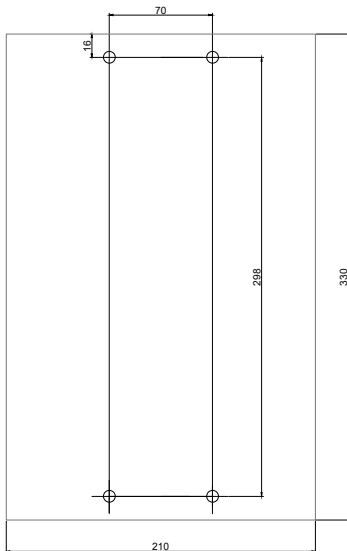
Front panel cutting



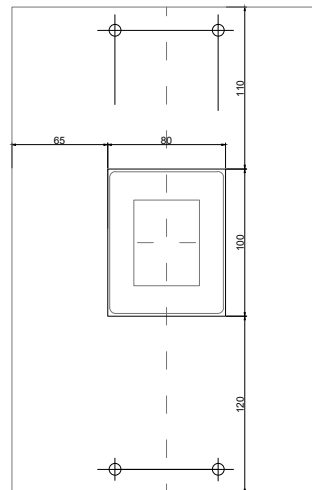
Frame 1600A (MF)



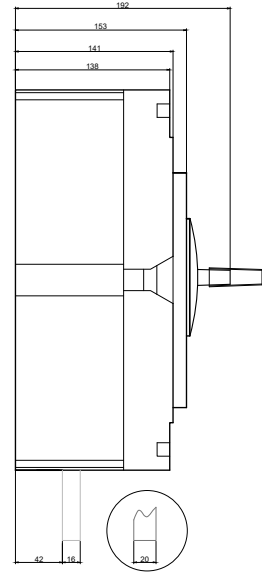
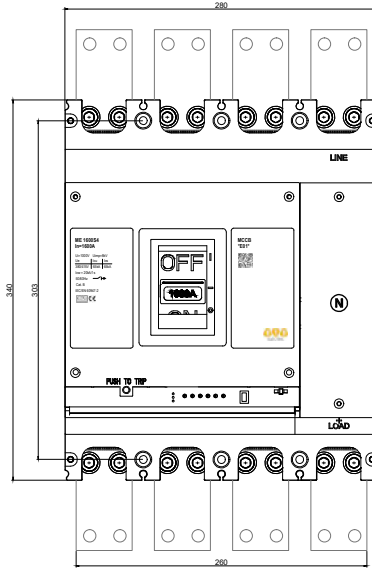
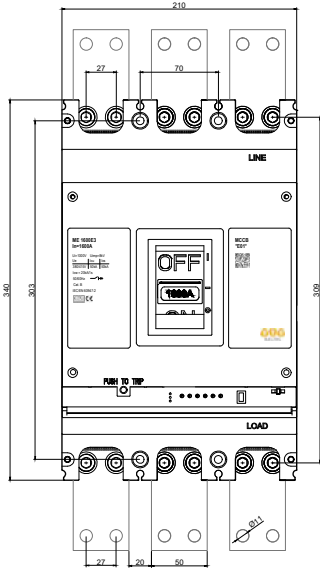
Panel drilling



Front panel cutting

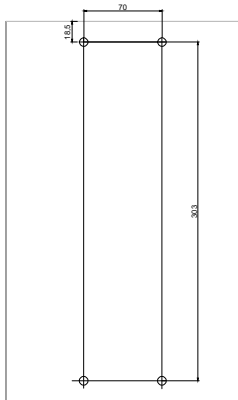


Frame 1600A (MT & ME)

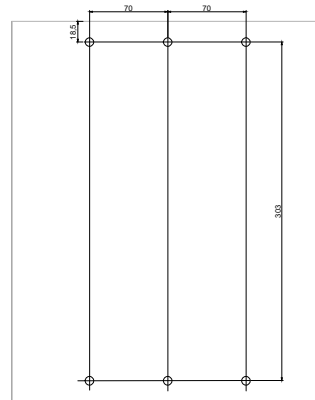


1000-1250A 1600A

Panel drilling

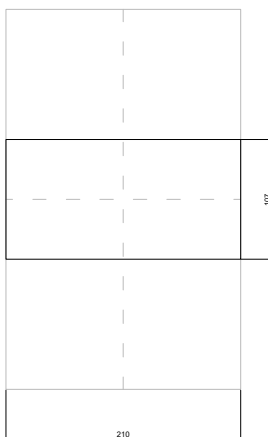


3P

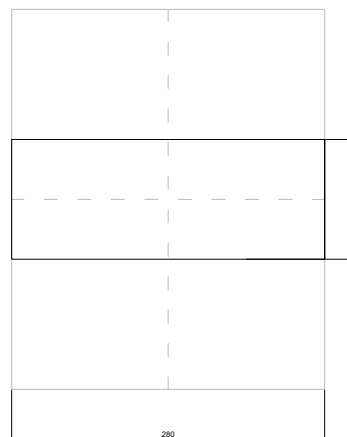


4P

Front panel cutting

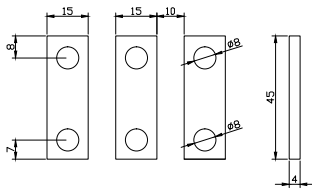


3P
(210x107mm)

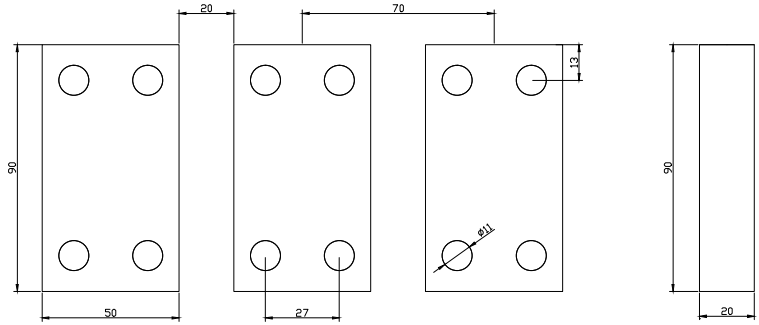


4P
(280x107mm)

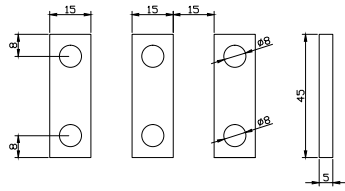
Spreader links



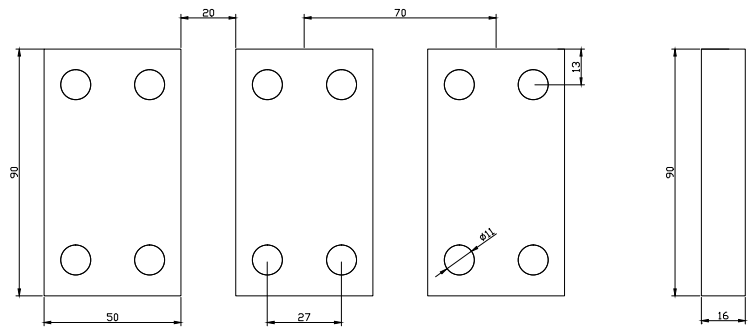
Frame 125A



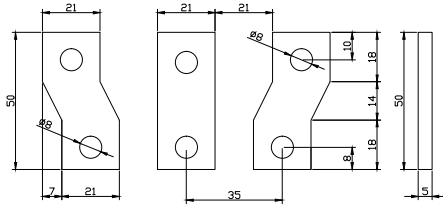
Frame 1600A



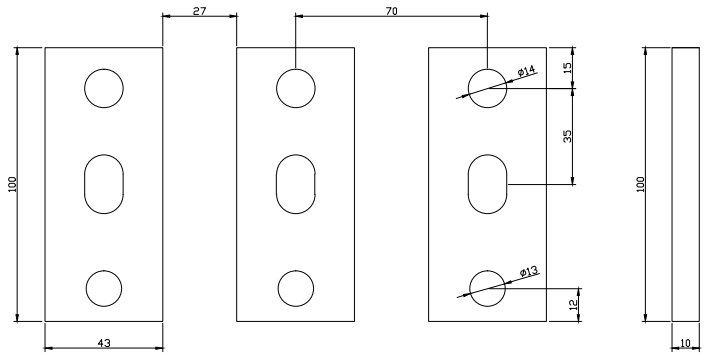
Frame 160A



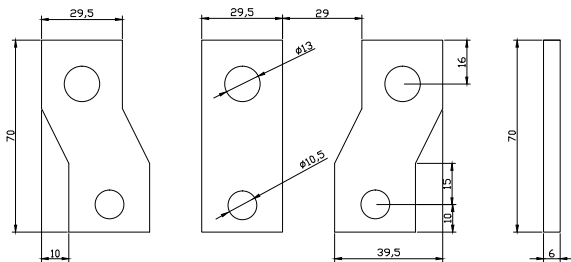
Frame 1250A



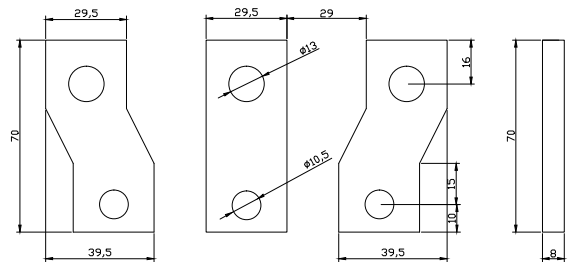
Frame 250A



Frame 800A



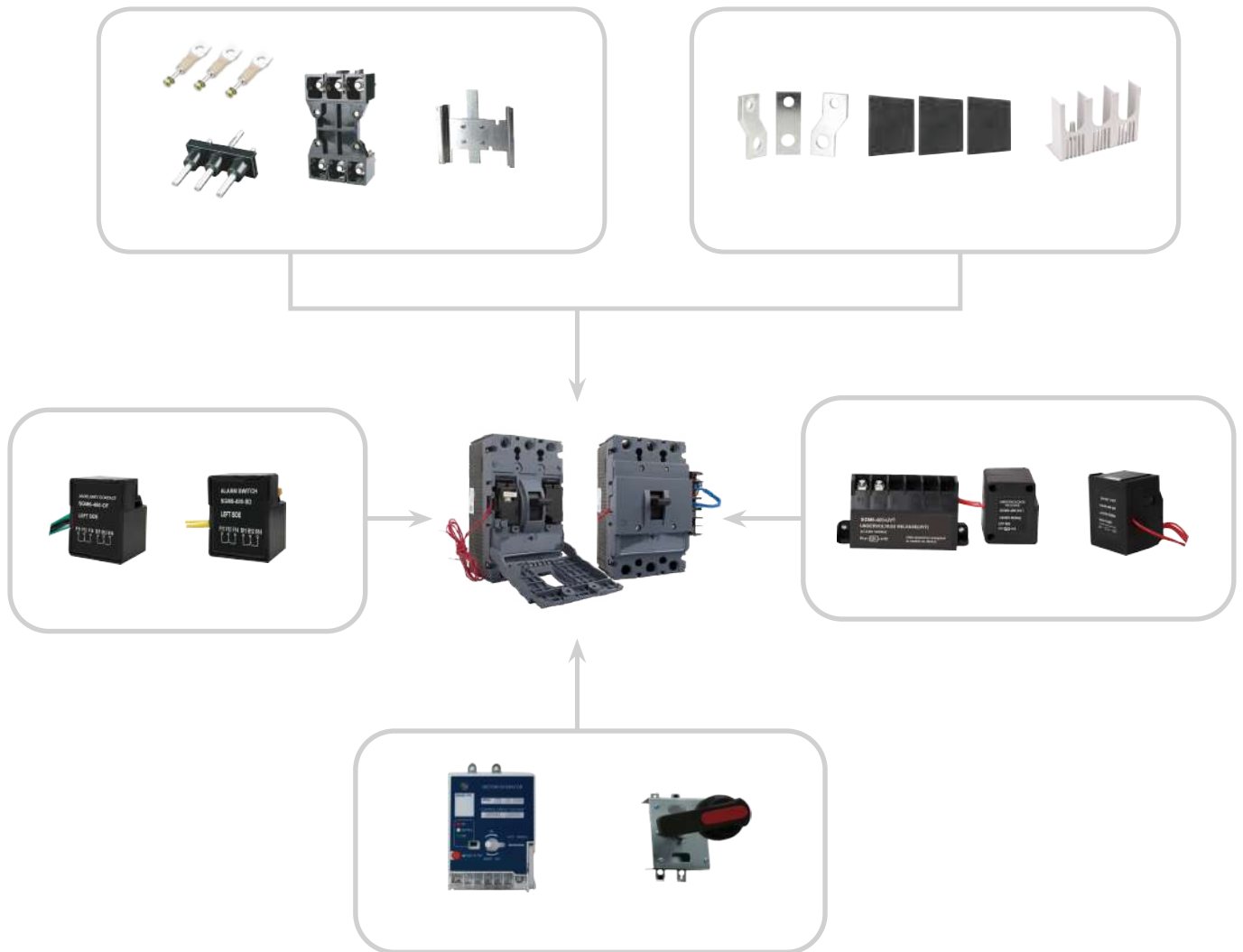
Frame 400A



Frame 630A



Accessories



Auxiliary switch (AUX)

- For breakers up to 160A operating current through the auxiliary contact: 3A
- For breakers from 250 to 800A operating current through the auxiliary contact: 6A
- Available joining conductors
- Labeling of the cables



Alarm switch (ALT)

- The device changes its condition conformably to the breaker's condition; it has a NO and a NC contactor.



Shunt trip (SHT)

- Rated operating voltage: 230/400V 50/60Hz
- Electromagnetic coil 100VA for breakers up to 400A
- Electromagnetic coil 150VA for breakers 630-800A
- Available joining conductors



Undervoltage trip (UVT)

- Operating voltage: 230/400V 50Hz
- Electromagnetic coil 6VA for breakers up to 400A
- Electromagnetic coil 10VA for breakers 630-800A
- Available joining conductors
- Switches off at voltage decrease under 75% of the operating



Motor operator (MOT)

- The base is bolted right on the cover, used to control the MCCB remotely / locally via the motor



Extended Rotary Handle

- The base is mounted with bolts right on the cover, and the handle is mounted at the door of the distribution box, using an extension axis it is joined to the base.
- Use for MCCB frame 125A to 800A



Spreader links

The spreader links are connected to the terminal of the circuit breaker, in order to provide many other wiring schemes in the limited space:

- Direct spreader links
- Spreader link with inter-electrode distance

The busbar and extension terminal can be connected to the inlet or outlet terminal of the circuit breaker.

BEST-SOLUTION

*Various line-up and high flexibility,
Current range 630A ~ 6300A*

HIGH-RELIABILITY

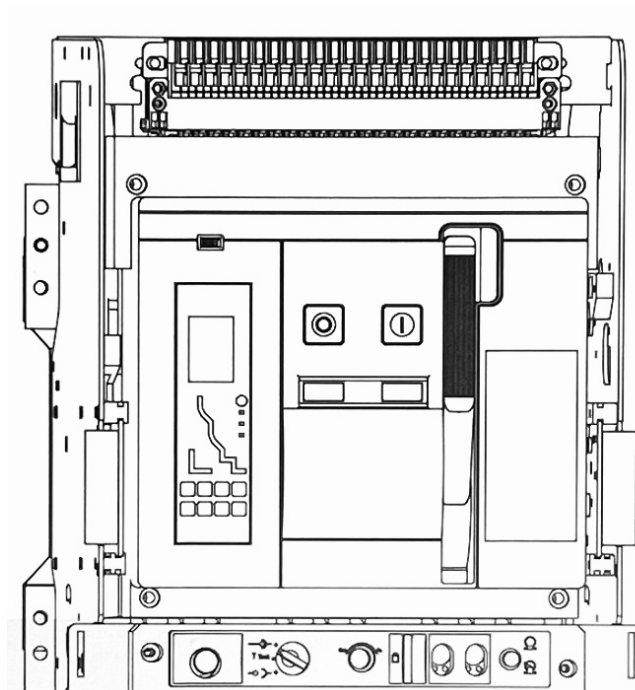
*Highest offered safety and reliability,
Impulse withstand voltage up to 12 kV*

HIGH-PERFORMANCE

*The highest breaking capacity:
135kA (6300A at 415V)*

CUSTOMER FRIENDLY

*3 ampere frame sizes 2000/4000/6300A,
Easy handling and retrofitted solution*



Application scope

MA3 series air circuit breaker is suitable for the circuit of AC 50Hz/60Hz with rated service voltage 400V, 690V and rated service current up to 6300A. It is mainly used to distribute electric energy and protect circuits and electric equipment against over-load, under-voltage, short-circuit and single-phase earthing fault.

With intelligentized and selective protection functions, the breaker can improve the reliability of power supply, and avoid unnecessary power failure. The breaker is applicable for power stations, factories, mines (for 690V) and modern high-buildings, especially for the distribution system of intelligentized building.

Applied Standards and Certifications

MA3 series air circuit breaker has acquired testing/certifications from IEC/EN 60947-1, 2 certified testing institute and can be installed and applied according to the usage environment and conditions permitted by the standards.

Compliance with Part No.: 1 General of IEC/EN 60947 Low Switch and Control Equipment.

Compliance with Part No.: 2 Low Voltage Switch Circuit Breaker of IEC/EN 60947 Low Switch and Control Equipment.

Our **MA3** series air circuit breakers are tested by IECEE laboratories – IEC system of conformity assessment schemes for electrotechnical equipment and components.



Operating conditions

Ambient temperature

-5°C~+40°C (the average value within 24h shall not exceed +35°C, special situation excluded)

Altitude

Below 2,000m above sea level.

Air conditions

Maximum temperature + 40°C (relative humidity should be under 85%)

Maximum temperature + 20°C (relative humidity should be under 90%)

Mounting conditions

Perpendicularity and angularity $\leq 5^\circ$

Air circuit breaker shall be installed under non-explosive, non-conducted dust, non-sufficient corrosion metal and without destructive insulation conditions.

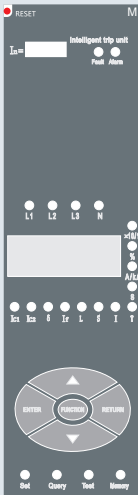
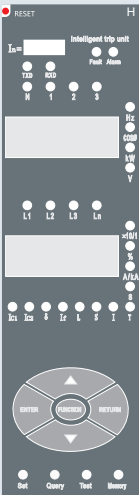


Note

Without the intelligent controller, the breaker functions as a switch-disconnector.

As for the total harmonic distortion (THD) rate, it must be managed below 5% in the distribution system phase. In case it is not complied with, it may cause heating in the product.

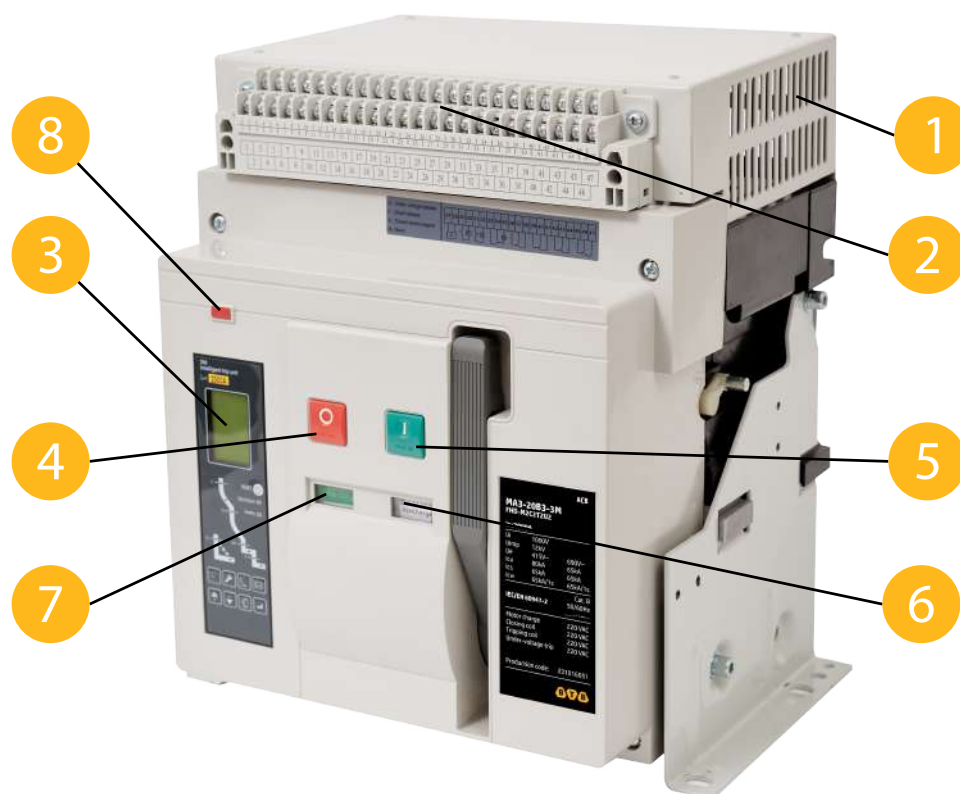
Intelligent trip unit

- Intelligent trip unit built in the **MA3**-Series Air circuit breaker has reinforced power monitoring functions such as temperature monitoring, fault recording other than the basic protection function, ultimately enabling stable power supply.
- Protection with power from Internal CT.
- Trip relays are classified according to function as follows:

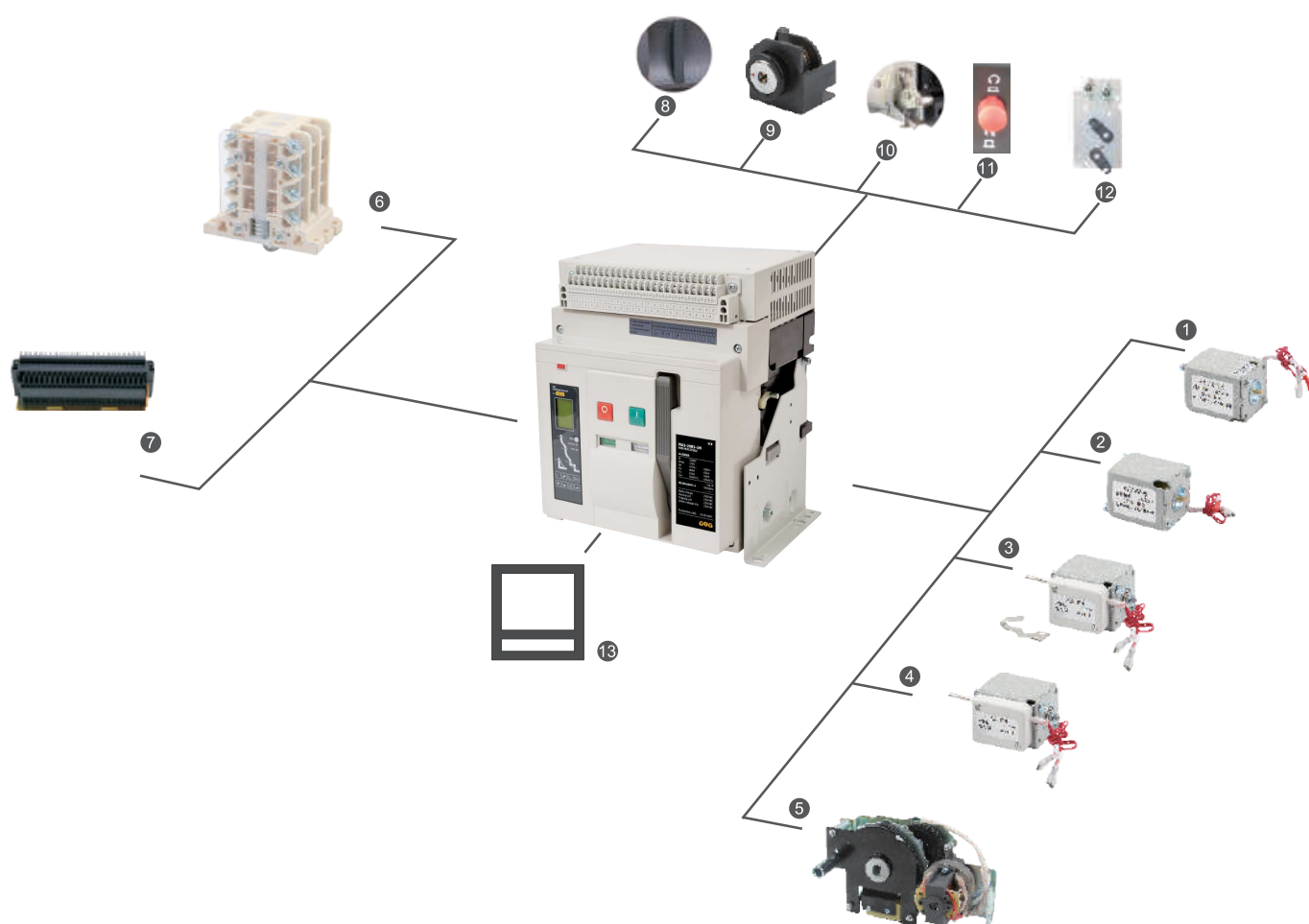
M type	H type	3M type	3H type
			
<p>Protection: Ir/Isd/li/lg Neutral protection Thermal</p>	<p>Protection: Ir/Isd/li/lg Neutral protection Thermal Load monitor/alarm</p>	<p>Protection: Ir/Isd/li/lg Neutral protection Thermal OV/UV/OF/UF/rP</p>	<p>Protection: Ir/Isd/li/lg Neutral protection Thermal Load monitor/alarm OV/UV/OF/UF/rP</p>
<p>Measurement: LED A Fault status indicating Maintenance functions</p>	<p>Measurement: LED V/A/W/F/PF Fault status indicating Maintenance functions</p>	<p>Measurement: LCD V/A/W/Wh/F/PF Harmonics (31th) Fault status indicating Maintenance functions</p>	<p>Measurement: LCD V/A/W/Wh/F/PF Harmonics (31th) Fault status indicating Maintenance functions</p>
<p>Connect: Self Power 250VAC</p>	<p>Connect: Modbus/RS-485 Self Power 250VAC</p>	<p>Connect: Self Power 250VAC</p>	<p>Connect: Modbus/RS-485 Self Power 250/400VAC</p>

External configuration

- 1 Arc extinguishing chamber
- 2 Control circuit terminal block
- 3 Intelligent trip relay
- 4 OFF button
- 5 ON button
- 6 Charging indicator
- 7 ON/OFF indicator
- 8 Manual reset button



Accessories

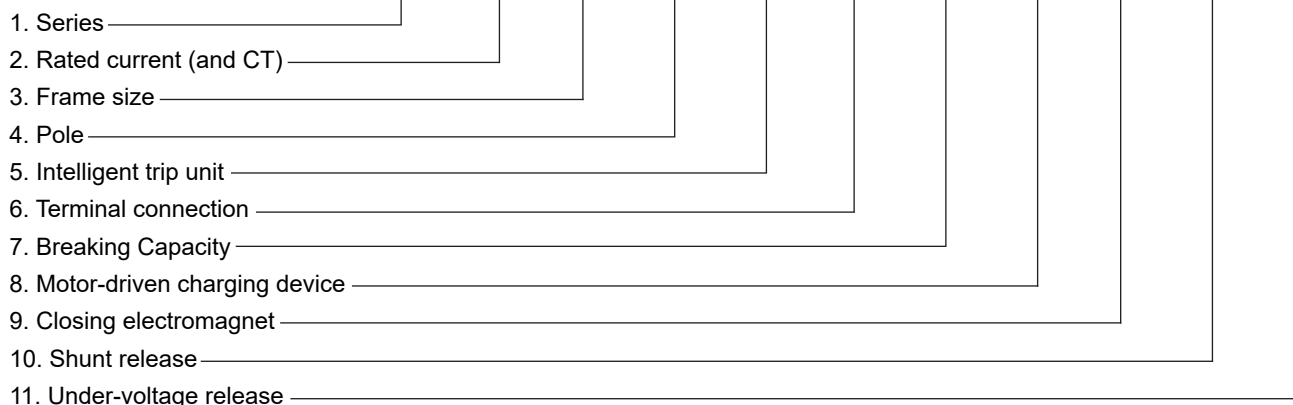


- | | | | |
|----------|----------------------------------|-----------|----------------------------------------------------------|
| 1 | Shunt release | 8 | Padlock |
| 2 | Closing electromagnet | 9 | Key lock |
| 3 | Under-voltage release | 10 | Door Interlock |
| 4 | Under-voltage release time-delay | 11 | Connected, disconnected, test position locking mechanism |
| 5 | Motor-driven charging device | 12 | Mechanical interlock |
| 6 | Auxiliary contact | 13 | Doorcase |
| 7 | Secondary wiring terminal | | |

Model definition



1	2	3	4	5	6	7	8	9	10	11
MA3	20	B	3	3M	FH	D	M2	C2	T2	U2



1. Series

MA3	Air Circuit Breakers / Design number
-----	--------------------------------------

2. Rated current

06	630A
08	800A
10	1000A
12	1250A
16	1600A
20	2000A
25	2500A
32	3200A
40	4000A
50	5000A
63	6300A

3. Frame size

B	2000A (630 ~ 2000A)
D	4000A (2500 ~ 4000A)
E	6300A (4000 ~ 6300)

4. Pole

3	3 Pole
4	4 Pole

5. Intelligent trip relay

M	Relay M type
H	Relay H type
3M	Relay 3M type
3H	Relay 3H type

6. Terminal connection

Fixed type	
FH	Horizontal type
FV	Vertical type
FM	Mixed type (Horizontal Vertical)
Draw-out type	
DH	Horizontal type
DV	Vertical type
DM	Mixed type; Horizontal; Vertical

7. Breaking Capacity

D	Ics ≠ Icu
E	Ics = Icu

8. Motor-driven charging device

M0	Manual type
M1	110 VAC
M2	220 VAC
M3	400 VAC
M6	110 VDC
M7	220 VDC

9. Closing electromagnet

C0	Manual type
C1	110 VAC
C2	220 VAC
C3	400 VAC
C6	110 VDC
C7	220 VDC

10. Shunt release

T0	Manual type
T1	110 VAC
T2	220 VAC
T3	400 VAC
T6	110 VDC
T7	220 VDC

11. Under-voltage release

U0	Without
U1	110 VAC
U2	220 VAC
U3	400 VAC
U6	110 VDC
U7	220 VDC

Frame size (A) (In max)		2000	
Type		MA3-06B, MA3-08B, MA3-10B, MA3-12B, MA3-16B, MA3-20B	
Current setting I _r (A) and CT rating at (40°C)		630, 800, 1000, 1250, 1600, 2000	
Setting current (A) Control trip relay (... × I _n max)		0.4 ~ 1.0	
Rated Operational Voltage, U _e		AC 415V/690V	
Rated Insulation Voltage, U _i		1000V	
Rated Impulse Withstand Voltage, U _{imp}		12kV	
Rated Frequency		50/60Hz	
No. of Poles		3, 4	
Rated Current of N-pole I _N (A)		100%I _n	
Breaking Capacity		D / E	
Ultimate breaking capacity I _{cu} (kA rms) IEC/EN 60947-2	400/415V	80 / 65	
	660V/690V	65 / 65	
Rated service breaking capacity I _{cs} (kA rms) IEC/EN 60947-2	400/415V	65 / 65	
	660V/690V	65 / 65	
Rated short-time withstand current I _{cw} (kA rms (1s – 415V))		65	
Operating time (ms)	Maximum total breaking time		≤35
	Maximum closing time		≤75
Operating performance (cycles)	Electrical life		8000
	Mechanical life	Maintenance free	15000
		Maintenance required	30000
Terminal connection Horizontal / Vertical / Mixed	Fixed	● / ○ / ○	
	Draw-out	● / ○ / ●	
Weight (kg)	Fixed	3P	43
		4P	54
	Draw-out	3P	79
		4P	91
Dimensions (mm) W x D x H	Fixed	3P	362×323×401
		4P	457×323×401
	Draw-out	3P	375×419×432
		4P	470×419×432
Intelligent trip unit M / H / 3M / 3H type		● / ● / ● / ●	
With front shield (closed cabinet)		IP54	

Remarks: “●” with this function; “○” function for selection; “-” without this function

4000		6300	
MA3-25D, MA3-32D	MA3-40D	MA3-40E, MA3-50E	MA3-63E
2500, 3200, 4000		4000, 5000, 6300	
0.4 ~ 1.0		0.4 ~ 1.0	
AC 415V/690V		AC 415V/690V	
1000V		1000V	
12kV		12kV	
50/60Hz		50/60Hz	
3, 4		3, 4	3
100%In		50% / 100%In	
D / E		D / E	
120 / 100		135 / 135	
85 / 85		100 / 100	
100 / 100		135 / 135	
85 / 85		100 / 100	
100		135	
≤35		≤35	
≤75		≤75	
6000		1500	
10000		2500	
20000		5000	
● / ○ / ○		● / ○ / ○	
● / ○ / ●		● / ○ / ○	
54	62	105	130
67	81	131	-
90	126	212	228
119	157	231	-
426×325×401	426×367×401	807×396×401	922×396×401
537×325×401	537×367×401	922×396×401	-
435×419×432	435×489×432	813×492×432	928×492×432
550×419×432	550×489×432	928×492×432	-
● / ○ / ○ / ●		○ / ○ / ○ / ●	
IP54		IP54	

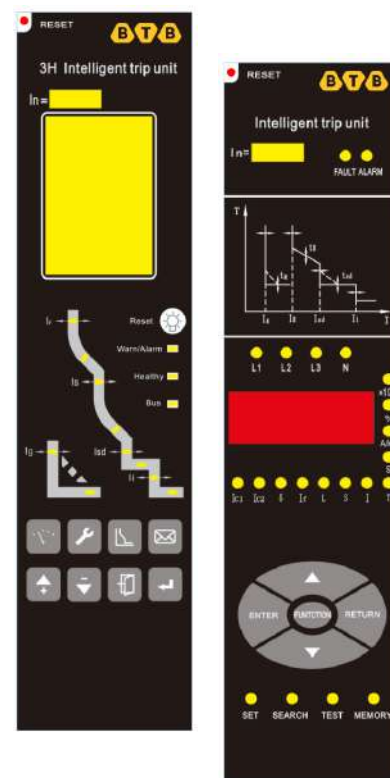


Protection with power from Internal CT

The Over current protection and Ground Module for display and communication fault protection can work with power from Internal CT, even if the control power source is off.

Intelligent trip unit are classified according to function

- Protection: overload, short current, ground fault, earth leakage, under voltage, over voltage, under frequency, over frequency, reverse power, unbalance, etc
- Measurement: voltage, ampere, power, energy, frequency, power factor, Harmonics, etc.
- Event & fault recording: Max. 8 events & faults
- Communication: Modbus/RS-485, Profibus-DP



Select function

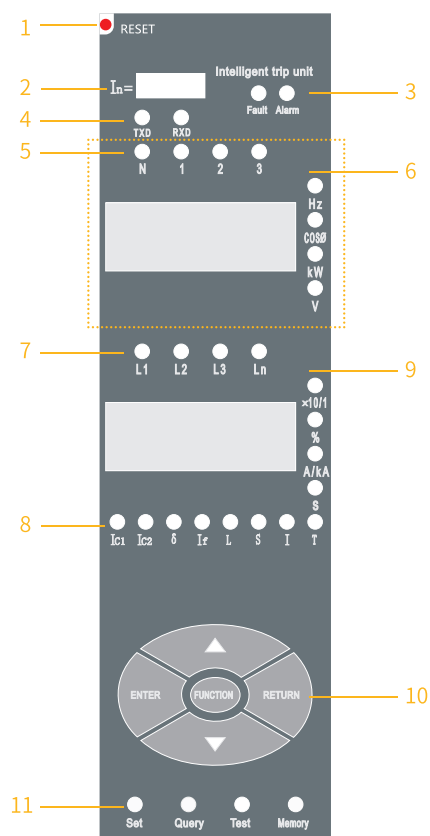
Function items	M type	H type	3M type	3H type
Display interface				
Digital tube display	●	●	-	-
LCD display	-	-	●	●
Protection functions				
Overload long delay protection	●	●	●	●
Overload thermal memory	●	●	●	●
Overload pre-alarm/alarm signaling operation	● / ○	● / ○	● / ○	● / ○
Short-circuit short delay protection	●	●	●	●
Short delay thermal memory	●	●	●	●
Short-circuit instantaneous protection	●	●	●	●
Grounding protection (Differential T)	●	●	●	●
Grounding alarm/ alarm signaling operation	● / ○	● / ○	● / ○	● / ○
Leakage protection /alarm/ alarm signaling operation (and grounding protection for selection)	○ / ○ / ○	○ / ○ / ○	○ / ○ / ○	○ / ○ / ○
Neutral solidly grounded protection	●	●	●	●
Current asymmetric protection/alarm/ alarm signaling operation	● / ● / ○	● / ● / ○	● / ● / ○	● / ● / ○
MCR / HSISC	○ / ○	○ / ○	○ / ○	○ / ○
Load monitor/ alarm/ alarm signaling operation	○ / ○ / ○	● / ● / ○	○ / ○ / ○	● / ● / ○

Select function

Function items	M type	H type	3M type	3H type
Display interface				
Over-voltage protection/ alarm/ alarm signaling operation	-	-	● / ● / ○	● / ● / ○
Voltage asymmetric protection / alarm/ alarm signaling operation	-	-	● / ● / ○	● / ● / ○
Phase sequence protection/ alarm/ alarm signaling operation	-	-	● / ● / ○	● / ● / ○
Under-frequency protection / alarm/ alarm signaling operation	-	-	● / ● / ○	● / ● / ○
Over-frequency protection / alarm/ alarm signaling operation	-	-	● / ● / ○	● / ● / ○
Current allowable-value protection/ alarm/ alarm signaling operation	-	-	● / ● / ○	● / ● / ○
Reverse-power protection / alarm/ alarm signaling operation	-	-	● / ● / ○	● / ● / ○
Testing functions				
Current testing (Phase-poles, N-pole and Grounding)	●	●	●	●
Voltage testing (Phase-voltage, Cable-voltage and Voltage asymmetric rate)	○	●	●	●
Phase sequence testing	-	-	●	●
Frequency testing	○	●	●	●
Allowable-value testing (Current)	-	-	●	●
Allowable-value testing (Power)	-	-	●	●
Power testing (Active & Reactive power)	○	●	●	●
Power factor testing	-	●	●	●
Power energy testing (Active & Reactive power energy)	-	-	●	●
Harmonics testing	-	-	●	●
Maintenance functions				
Fault status indicating	●	●	●	●
Fault record and query	●	●	●	●
Past record of peak current	-	-	●	●
Past record of alarm and query	-	-	●	●
Fault to trip signaling operation	●	●	●	●
Self-diagnostics function	●	●	●	●
Analog tripping test function	●	●	●	●
Contacts abrasion equivalent (alarm) query	●	●	●	●
Operation times query	●	●	●	●
Clock functions	○	○	●	●
Other				
Signal unit	○	●	○	●
Communication	-	●	-	●
Regional selective interlock	○	○	○	○

Remarks: “●” with this function; “○” function for selection; “-” without this function

M/H type



1. Fault to trip & reset
2. Rated current for name-plate
3. In sequence of fault & alarm indicating
4. In sequence of communication emission & receiver indicating (*for H type*)
5. In sequence of N phase, A phase, B phase, C phase voltage indicating (*for H type*)
6. In sequence of frequency, power factor, power, voltage indicating from upper to bottom (*for H type*)
7. In sequence of A phase, B phase, C phase, N phase current indicating
8. In sequence

Ic1: load monitor 1,

Ic2: load monitor 2,

δ: asymmetric current,

If: grounding protection,

L: over-load long delay,

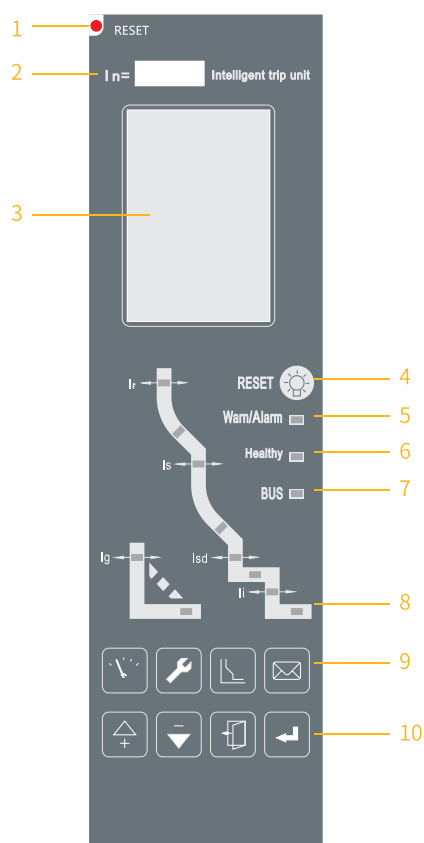
S: short-circuit short delay,

I: short-circuit instantaneous indicating

9. In sequence of opening & closing time, main contacts abrasion rate, current unit, time, self-diagnostics fault statuses indicating from upper to bottom
10. 5 pieces operation buttons
11. In sequence of controller setting, query, testing, store service status indicating
12. Notes:

- *The dashed box is controller with voltage indicating function. Without indicating if no.*
- *Serial no.: 4 is with communication function controller. Without indicating if no.*
- *A/kA of serial no.: 9, light fixed is current A and continuous blinking in kA*
- *kW of serial no.: 6, light fixed is activepower and continuous blinking is reactive power*

3M/3H type



1. Fault to trip & reset
2. Rated current for name-plate
3. LCD indicating interface
4. Fault/alarm resetting button
5. Fault/alarm LED indicating (LED without light while normal working. LED with continuous blinking quickly while fault to trip. LED with light fixed while alarm)
6. LED always continuous blinking while controller on power and normal working status
7. Communication indicating (Modbus: extinguish without communication. Continuous blinking while communication. Proibus; extinguish without communication. Light fixed while communication – for 3H type)
8. Curve LED (Fault to trip at corresponding LED light flash indicating fault type. LED light fixed indicating present setting items while protective parameter setting)
9. In sequence of testing function, setting function, protection function and information function button. From left to right
10. In sequence of upward, downward, ESC and selection OK button. from left to right

Remarks: Serial no.: 7 is with communication function controller. No indicating if no-communication function



Setting and Protective Characteristics

Over-load long delay protection M/H type & 3M/3H type			
Current setting I_r	(0.4 ~ 1.0 or 1.25) I_n or OFF (OFF-function close) Notes: Distribution protection is $1.0I_n$; Generator protection is $1.25I_n$		
6 categories protective curve	SI: Normal inverse time $t=0.01396 Tr / (NO.02-1)$ VI: Fast inverse time $t=Tr / (N-1)$ EI (G): Express inverse time (use of general distribution protection) $t=3 Tr / (N^2-1)$ EI (M): Express inverse time (use of generator protection) $t=2.95 Trx I_n [N^2 / (N^2-1.15)]$ HV: High voltage fuse compatibility $t=15Tr/(N^4-1)$ I2t: Normal distribution protection $t=2.25Tr/N^2$ (factory default) $N=I/I_r$ I-fault current t-long delay acting time I_r -long delay setting current Tr -long delay setting time Remarks: only normal distribution protection I ² t for M/H type controller. Other protective curves shall be order. 3M/3H type controller with 6 categories protective curve for selection.		
Normal distribution protection I ² t time setting Tr (1.5 I_r)	M/H: 15, 20, 25, 30, 40, 50, 60, 80, 100, 120, 160, 200, 240, 320, 400, 480 (s) 3M/3H: 15, 30, 60, 120, 240, 360, 480, 600, 720, 840, 960 (s)		
Protective curve type	3M/3H: C1-C16 over-load long delay protective operating delay time in the drop-down list		
Protective characteristics (Accuracy $\pm 10\%$)	Current (I/I_r)	Trip time	
	1.05	> 2h no-acting	
	1.3 (Distribution protection)	< 2h acting	
	1.2 (Motor protection)	< 2h acting	
	$\geq 1.2I_r$	Acting time as per 6 categories protection type formula calculator or curve query	
Thermal memory time	M/H type: 30ms (ON) or power failure release 3M/3H type: instantaneous, 10ms, 20ms, 30ms, 45ms, 1hr, 2hrs, 3hrs or power failure release Remarks: connecting controller for auxiliary power supply with thermal memory function and auxiliary power supply failure, that is, release thermal memory		
Short-circuit short delay protection M/H type & 3M/3H type			
Current setting I_{sd}	(1.5 ~ 15) I_r or OFF (OFF-functions close)		
Time setting	Tsd1 inverse time	M/H type: 0.1 ~ 1.0	
Tsd (s)	Tsd2 definite time	3M/3H type: 0.1, 0.2, 0.3, 0.4 (selection: 0.1 ~ 1.0)	
	Current (I/I_{sd})	Trip time	
	≤ 0.9	No-acting	
	≥ 1.1	Inverse time $I_{sd} < I < 8I_r$	Curre 1 - 5 and over-load long delay simultaneously, but curve speed faster 10 times. curve 6 characteristics formula $t=64Tsd/N^2$
		Definite time $I > 8I_r$ (or $I > I_{sd}$)	Delay protection as per definite time delay setting time Tsd
Thermal memory time	M/H type: 15min (ON) or power failure release 3M/3H type: instantaneous, 10ms, 20ms, 30ms, 45ms, 1hr, 2hrs, 3hrs or power failure release Remarks: connecting controller for auxiliary power supply with thermal memory function and auxiliary power supply failure, that is, release thermal memory		
Short-circuit instantaneous protection M/H type & 3M/3H type			
Current setting I_i	M/H type: $1.0I_n \sim 50kA$ or OFF (OFF-function close) 3M/3H type: (1.0 ~ 20) I_n or OFF (OFF-function close)		
Protective characteristics (Accuracy $\pm 10\%$)	Current (I/I_i)	Trip time	
	≤ 0.85	no-acting	
	> 1.15	<40ms acting	

Setting and Protective Characteristics

Grounding protection/alarm M/H type & 3M/3H type

Protection type	Differential type (T), Earth current type (W), alternative factory default is differential type (T)			
Current setting I_g	(0.2 ~ 1.0) I_n or OFF (OFF-function close)			
Time setting T_g	Definite time delay T_g (s)	0.1 ~ 1.0 or OFF (OFF-only alarm and no trip)		
	Inverse time factor KG	1.5 ~ 6 or OFF (OFF-grounding protection is definite time)		
Protective characteristics (Accuracy $\pm 10\%$)	Current (I/I_g)	Trip time		
	≤ 0.8	No-acting (no alarm)		
	≥ 1.0	$(I/I_g) < KG$	Inverse time delay acting (or alarm) $t = T_g \times KG \times I/I_g$	
		$(I/I_g) \geq KG$	Definite time delay acting (or alarm) as per time setting	

Grounding alarm 3M/3H type

Performance mode	Alarm / Close	
Alarm operating current setting	(0.2 ~ 1.0) I_n	
Alarm operating delay time setting	0.1 ~ 1.0 (s)	
Alarm return current setting	(0.2 ~ 1.0) I_n	
Alarm return delay time setting	0.1 ~ 1.0 (s)	
Alarm operating characteristics (Accuracy $\pm 10\%$)	Multiple of current (I/I setting)	Acting time
	< 0.8	No-alarm
	≥ 1.0	Alarm (time as per alarm operating time setting)
Alarm return characteristics (Accuracy $\pm 10\%$)	≥ 1.0	Alarm without return
	≤ 0.9	Alarm return (time as per alarm return time setting)

Neutral protection M/H type & 3M/3H type

Neutral protective setting	M/H type: 50% I_n , 100% I_n or OFF 3M/3H type: 50% I_n , 100% I_n , 160% I_n , 200% I_n or OFF OFF- close N phase protective function
Protective characteristics	Same as phases and poles over-load long delay protection, short-circuit short delay protection, short-circuit instantaneous protection and grounding protection

Current asymmetric protection/Alarm M/H type & 3M/3H type

M/H type	Current asymmetric rate setting δ	(40% ~ 100%) or OFF (OFF-function close)	
	Acting delay time setting T_δ	0.1 ~ 1.0 (s) or OFF (OFF-alarm no trip)	
3M/3H type	Performance mode	Alarm /Trip /Close	
	Protective start setting	5%-60%	
	Acting delay time setting T_δ	0.1 ~ 40 (s)	
	Alarm acting return setting	5%~Start setting	Performance mode is alarm for setting this item
	Alarm return delay time	10 ~ 200 (s)	
Protective characteristics (Accuracy $\pm 10\%$)	Actual current asymmetric rate / setting	Trip time	
	< 0.9	No-acting (No-alarm)	
	≥ 1.1	Acting (or alarm) as per setting delay time	
Alarm return characteristics (Accuracy $\pm 10\%$)	Actual current asymmetric rate / setting	Acting time	
	≥ 1.1	No return	
	≤ 0.9	Return as per alarm return delay time	

Setting and Protective Characteristics

Under-voltage protection/Alarm 3M/3H type

Performance mode	Close / Trip / Alarm	
Protection/Alarm start setting	100 (V) ~ Return value	
Protection acting delay time setting	0.2 ~ 60 (s)	
Alarm acting return setting	Start value ~1200 (V)	Performance mode is alarm for setting this item. Return value \geq start value
Alarm return delay time	0.2 ~ 60 (s)	
Protective characteristics (Accuracy $\pm 10\%$)	Multiple of voltage (Umin /Acting setting)	Trip time
	>1.1	No-acting (No-alarm)
	≤ 0.9	Acting (or alarm) as per setting delay time
Alarm return characteristics (Accuracy $\pm 10\%$)	Multiple of voltage (Umin /Operating setting)	Acting time
	<0.9	No return
	≥ 1.1	Return as per alarm return delay time

Over-voltage protection/Alarm 3M/3H type

Performance mode	Close / Trip / Alarm	
Protection/Alarm start setting	Return value ~1200 (V)	
Protection acting delay time setting	0.2 ~ 60 (s)	
Alarm acting return setting	100 (v) ~ Start value	Performance mode is alarm for setting this item. Return value \geq start value
Alarm return delay time	0.2 ~ 60 (s)	
Protective characteristics (Accuracy $\pm 10\%$)	Multiple of voltage (U min / Acting setting)	Trip time
	<0.9	No-acting (No-alarm)
	≥ 1.1	Acting (or alarm) as per setting delay time
Alarm return characteristics (Accuracy $\pm 10\%$)	Multiple of voltage (U min / Return setting)	Acting time
	≥ 1.1	No return
	≤ 0.9	Return as per alarm return delay time

Voltage asymmetric protection/Alarm 3M/3H type

Performance mode	Close / Trip / Alarm	
Protection/Alarm start setting	2% ~ 30%	
Protection acting delay time setting	0.2 ~ 60 (s)	
Alarm acting return setting	2% ~ Start value	Performance mode is alarm for setting this item. Return value \geq start value
Alarm return delay time	0.2 ~ 60 (s)	
Protective characteristics (Accuracy $\pm 10\%$)	Actual voltage asymmetric rate / setting	Trip time
	<0.9	No-acting (No-alarm)
	≥ 1.1	Acting (or alarm) as per setting delay time
Alarm return characteristics (Accuracy $\pm 10\%$)	Actual voltage asymmetric rate / setting	Acting time
	>1.1	No return
	≤ 0.9	Return as per alarm return delay time

Reverse power protection/Alarm 3M/3H type

Performance mode	Close / Trip / Alarm	
Protection/Alarm start setting	5 ~ 500(kW)	
Protection acting delay time setting	0.2 ~ 20 (s)	
Alarm acting return setting	5(kW) ~ Start value	Setting this item while only performance mode is alarm. Return value \geq start value
Alarm return delay time	1.0 ~ 360 (s)	
Protection/Alarm operating characteristics	Same as over-voltage protection / Alarm	

Setting and Protective Characteristics

Phase sequence /Alarm 3M/3H type					
Performance mode		Close / Trip / Alarm			
Acting sequence setting range		$\Delta \Phi$: A, B, C / $\Delta \Phi$: A, C, B			
Acting/Alarm characteristics		Instantaneous			
Under-frequency, Over-frequency/Alarm_3M/3H type					
Performance mode		Close / Trip / Alarm			
Under-frequency	Protection / Alarm start setting		45 (Hz) ~ Return value		
	Acting delay time setting		0.2 ~ 5.0 (s)		
	Alarm acting return setting		Start value ~65 (Hz)	Performance mode is alarm for setting this item. Return value \geq start value	
	Alarm return delay time setting		0.2 ~ 36 (s)		
Over-frequency	Protection / Alarm start setting		Return value ~65 (Hz)		
	Acting delay time setting		0.2 ~ 5.0 (s)		
	Alarm acting return setting		45 (Hz) ~Start value	Performance mode is alarm for setting this item. Return value \geq start value	
	Alarm return delay time setting		0.2 ~ 36 (s)		
Protection/Alarm acting characteristics		Same as under-voltage, over-voltage protection/Alarm			
Load monitor M/H type & 3M/3H type					
M/H type	Current setting I _{c1} , I _{c2}		(0.2 ~ 1) I _n or OFF (OFF-function close)		
	Time setting		15, 20, 25, 30, 40, 50, 60, 80, 100, 120, 160, 200, 240, 320, 400, 480 (s)		
	Output characteristics (Accuracy $\pm 10\%$)	Load monitor mode		Multiple of current	Acting time
		Mode 1 (Independent control two branches load)		$\leq 1.05 I_{c1}$ or I_{c2}	No operation
				$> 1.2 I_{c1}$ or I_{c2}	Delay replay operating (same as over-load long delay characteristics curve)
		Mode 2 (Control the same branch load, require $I_{c1} > I_{c2}$)		$\leq 1.05 I_{c1}$	No operation
	$> 1.2 I_{c1}$			Delay replay operating (same as over-load long delay characteristics curve)	
		$< I_{c2}$	Delay relay operating (delay fixed 60s)		
Thermal memory time		30min (OFF) or power failure release			
3M/3H type	Operating mode		Current setting	Time setting	
	Discharge I	Current mode 1	(0.2 ~ 1.0) I _n	(20% ~ 80%) TR (TR: over-load long delay acting time)	
		Current mode 2			
		Power mode 1	200 ~ 10000 (kW)		10 ~ 3600(s)
		Power mode 2			
	Discharge II	Current mode 1	(0.2~1.0) I _n	(20% ~ 80%) TR (TR: over-load long delay acting time)	
		Current mode 2	0.2I _n ~ Discharge I	10 ~ 600(s)	
		Power mode 1	200 ~ 10000 (kW)	10 ~ 3600(s)	
Power mode 2		100 (kW) ~ Discharge I			

Setting and Protective Characteristics

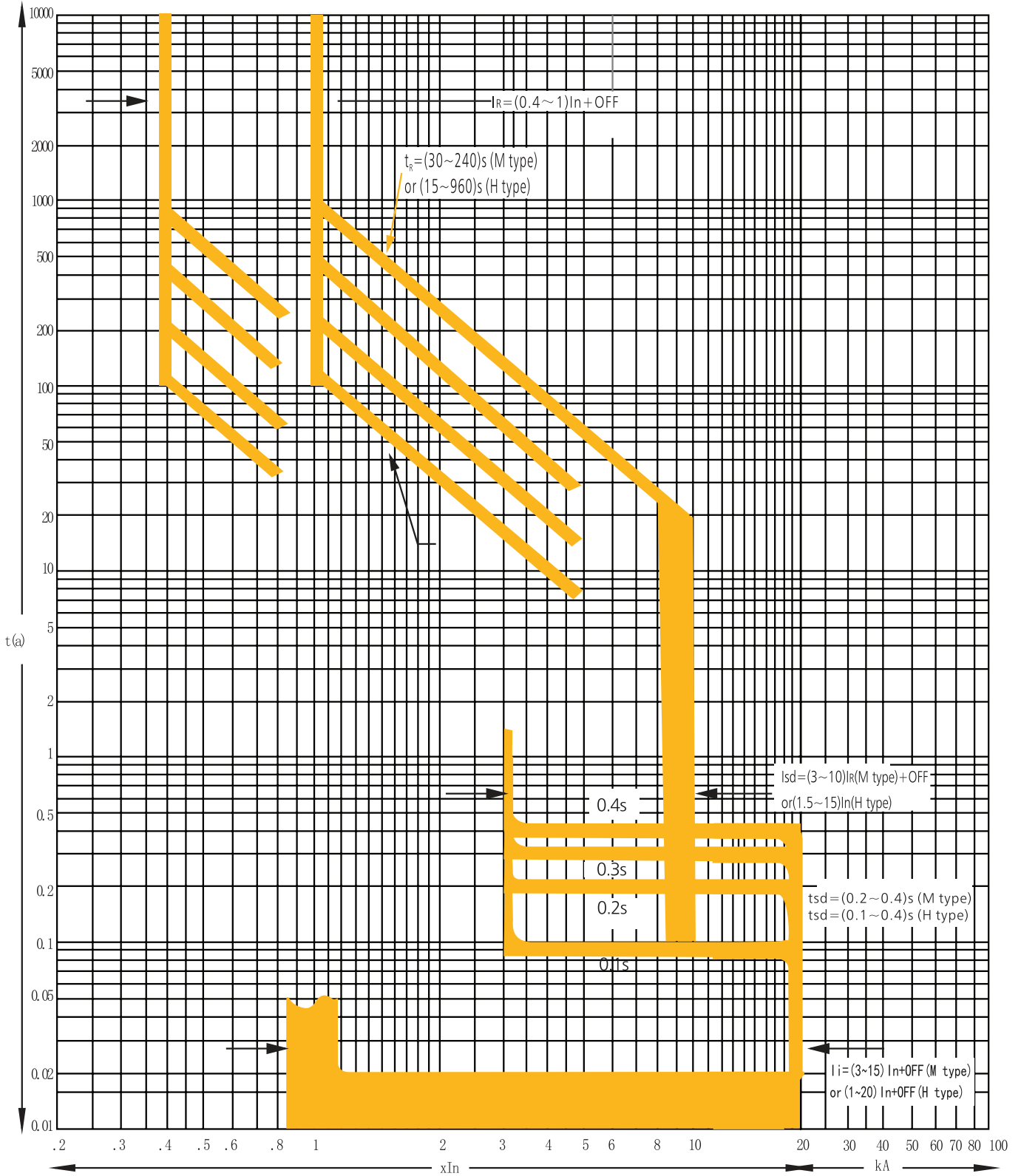
Over-load long delay protective operating delay table C1-C16

Current type	Fault current	Delay time (s)															
		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
SI	1.5lr	0.61	0.98	1.47	2.46	3.68	4.91	6.14	8.29	11.1	17.2	24.6	36.8	49.1	61.4	73.7	86
	6lr	0.14	0.22	0.33	0.55	0.82	1.1	1.39	2.06	2.47	3.84	5.48	8.22	10	13.7	16.4	19.2
VI	1.5lr	2	3.2	4.8	8	12	16	20	27	36	56	80	120	160	200	240	280
	6lr	0.2	0.32	0.48	0.8	1.2	1.6	2	2.7	3.6	5.6	8	12	16	20	24	28
EI(G)	1.5lr	8	12.8	19.2	32	48	64	80	108	144	224	320	480	640	800	960	1120
	6lr	0.29	0.46	0.69	1.14	1.71	2.29	2.86	3.86	5.14	8	11.4	17.1	22.9	28.6	34.3	37.1
EI(M)	1.5lr	6.22	9.96	14.9	24.9	37.3	49.8	62.2	84	112	174	249	373	498	622	747	871
	6lr	0.28	0.45	0.68	1.13	1.69	2.26	2.82	3.81	5.08	7.9	11.3	16.9	22.6	28.2	33.9	36.7
HV	1.5lr	2.46	3.94	5.9	9.85	14.8	19.7	24.6	33.2	44.3	68.9	98.5	147	197	246	295	344
	6lr	0.01	0.01	0.02	0.03	0.05	0.06	0.08	0.1	0.14	0.22	0.31	0.46	0.62	0.77	0.93	1
I ² t	1.5lr	15	20	25	30	40	60	80	120	160	240	360	480	600	720	840	960
	6lr	0.94	1.25	1.56	1.88	2.5	3.75	5	7.5	10	15	22.5	30	37.5	45	52.5	60

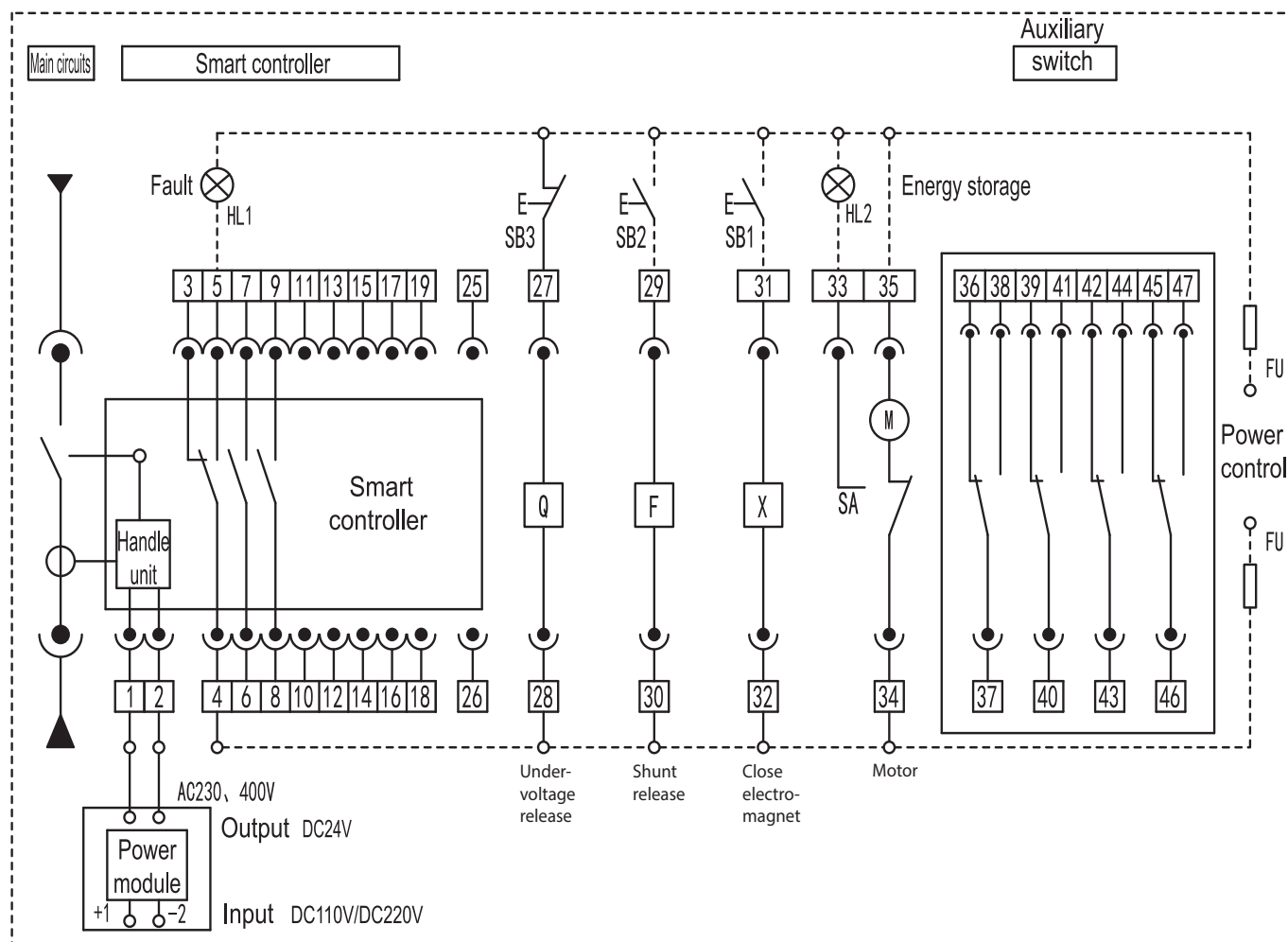
Factory Setting (Approval)

Protection characteristics			Setting current	Setting time	Remarks
Over-load long delay			1.0I _n	30s	Thermal memory (ON-30ms)
Short-circuit delay	short	Inverse time	6lr	0.2s	-
		Definite time	8lr	0.2s	
Short-circuit instantaneous			12I _n	-	-
Neutral protection			100%I _n	-	-
Grounding protection	I _n ≤ 1250A		0.8I _n	Alarm no trip	-
	I _n 1600A		1200A		
Asymmetry current			OFF	-	The user open by themselves according to their request
Load monitor			OFF	-	-

Over current protection characteristic



M type connections



1, 2: Auxiliary power supply incoming for smart controller. auxiliary power supply is DC, which add the power module

3, 4, 5: Signal contacts for release fault to trip indicating, 4 for common terminal

6, 7 & 8, 9: Two sets of auxiliary open contacts for circuit breakers (for selection)

10, 11: /

12, 13: Group 1 controller signal outgoing (for selection)

14, 15: Group 2 controller signal outgoing (for selection)

16, 17: Group 3 controller signal outgoing (for selection)

18, 19: Group 4 controller signal outgoing (for selection)

20: Controller grounding

21, 22, 23, 24: N, A, B, C phase voltage signal incoming (for selection)

25, 26: External connection N pole or incoming of earth current transformer

27, 28: Under-voltage release

29, 30: Shunt release

31, 32: Closing electromagnet

33, 34, 35: Motor operation mechanism, 34 for common terminal

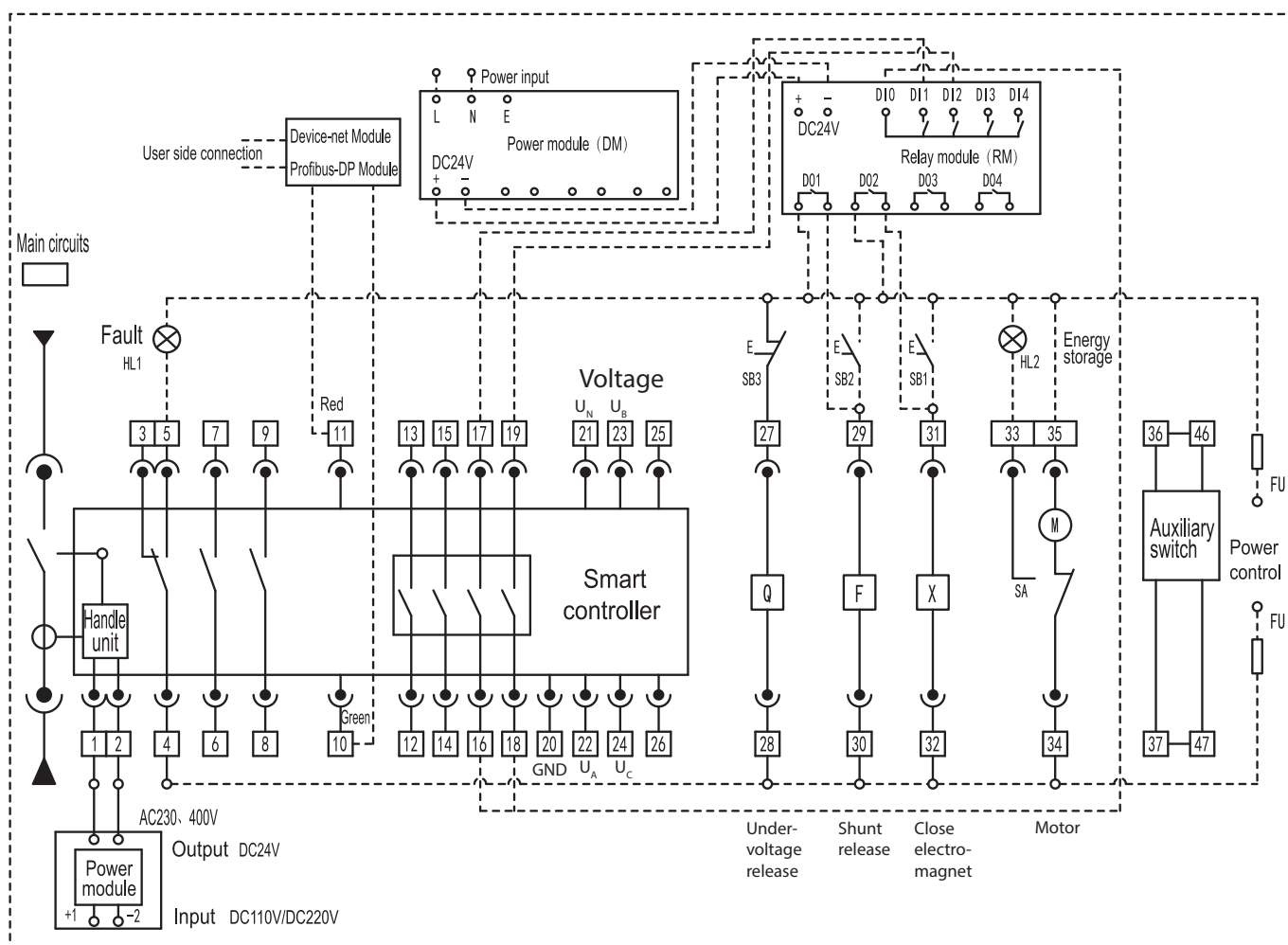
Q, F, X, M: Under-voltage release, shunt release, closing electromagnet, motor operation mechanism

HL1, HL2: Fault to trip indicating, motor energy storage fulfill indicating (provide by the user)

SB1, SB2, SB3: Close, open, under-voltage button (provide by the user/under-voltage shall be short connection)

SA, FU: Motor travel switch (with motor), fuse (provide by the user)

H type connections



1,2: Auxiliary power supply incoming for smart controller. auxiliary power supply is DC, which add the power module

3, 4, 5: Signal contacts for release fault to trip indicating, 4 for common terminal

6, 7 & 8, 9: Two sets of auxiliary open contacts for circuit breakers

10, 11: Communication interface

12, 13: Load monitor 1 (default)

14, 15: Load monitor 2 (default)

16, 17: Opening signal output

18, 19: Closing signal output

20: Controller grounding

21, 22, 23, 24: N, A, B, C phase voltage signal incoming

25, 26: External connection N pole or earth current transformer incoming

27, 28: Under-voltage release or no-voltage release

29, 30: Shunt release

31, 32: Close electromagnet

33, 34, 35: Motor operation mechanism (34 for common terminal)

36 – 47: Auxiliary switch

Q, F: Under-voltage release and shunt release

X, M: Close electromagnet and operation mechanism

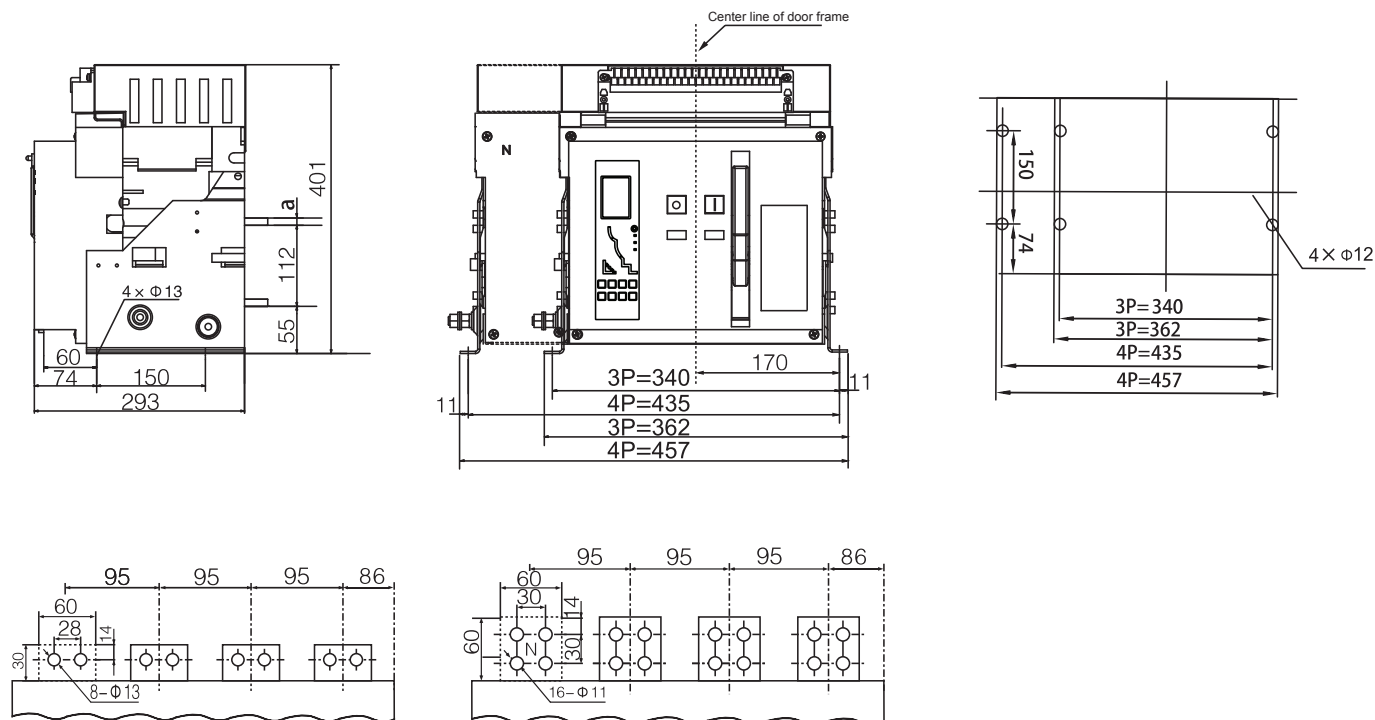
HL1, HL2: Fault to trip indicating and motor energy storage finish indicating (provide by the user)

SB1, SB2, SB3: Opening, closing and under-voltage button (provide by the user)

SA: Motor travel switch with the motor

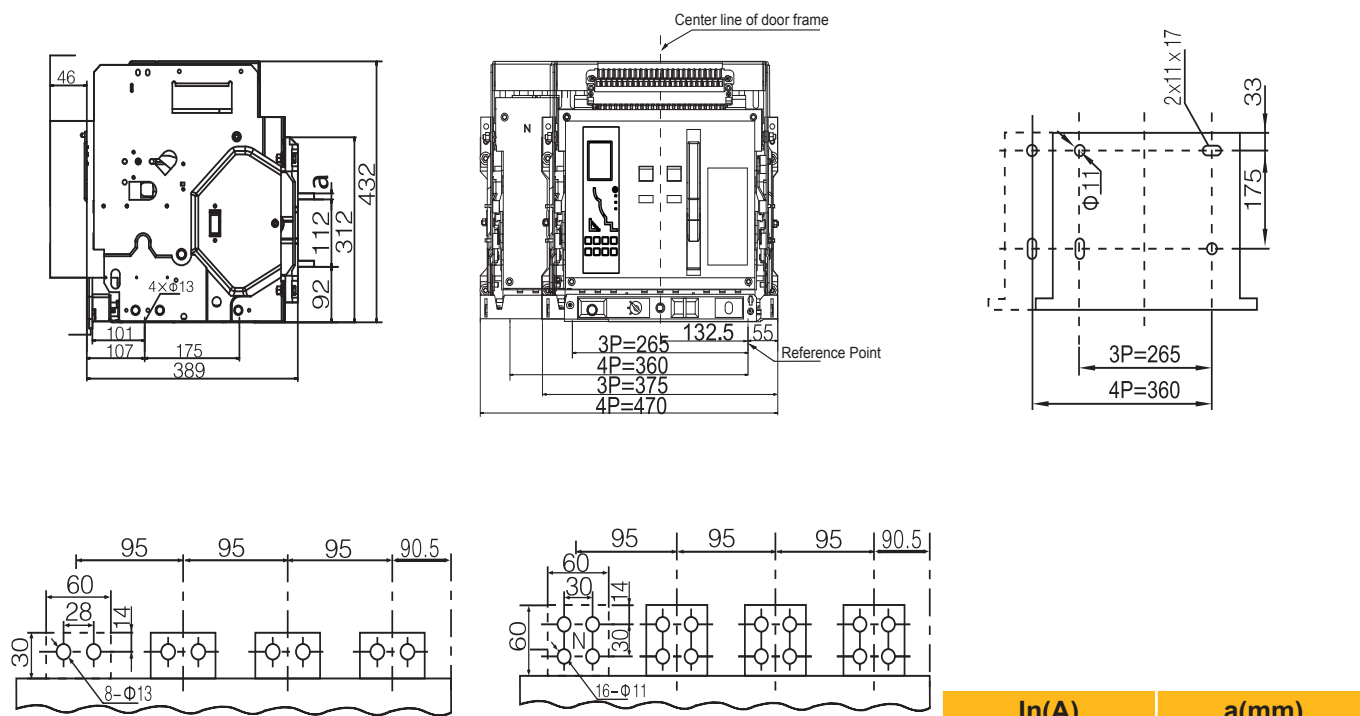
FU: Fuse (provide by the user)

ACB Fixed type – Frame 2000A 3P/4P (630A ~ 2000A)



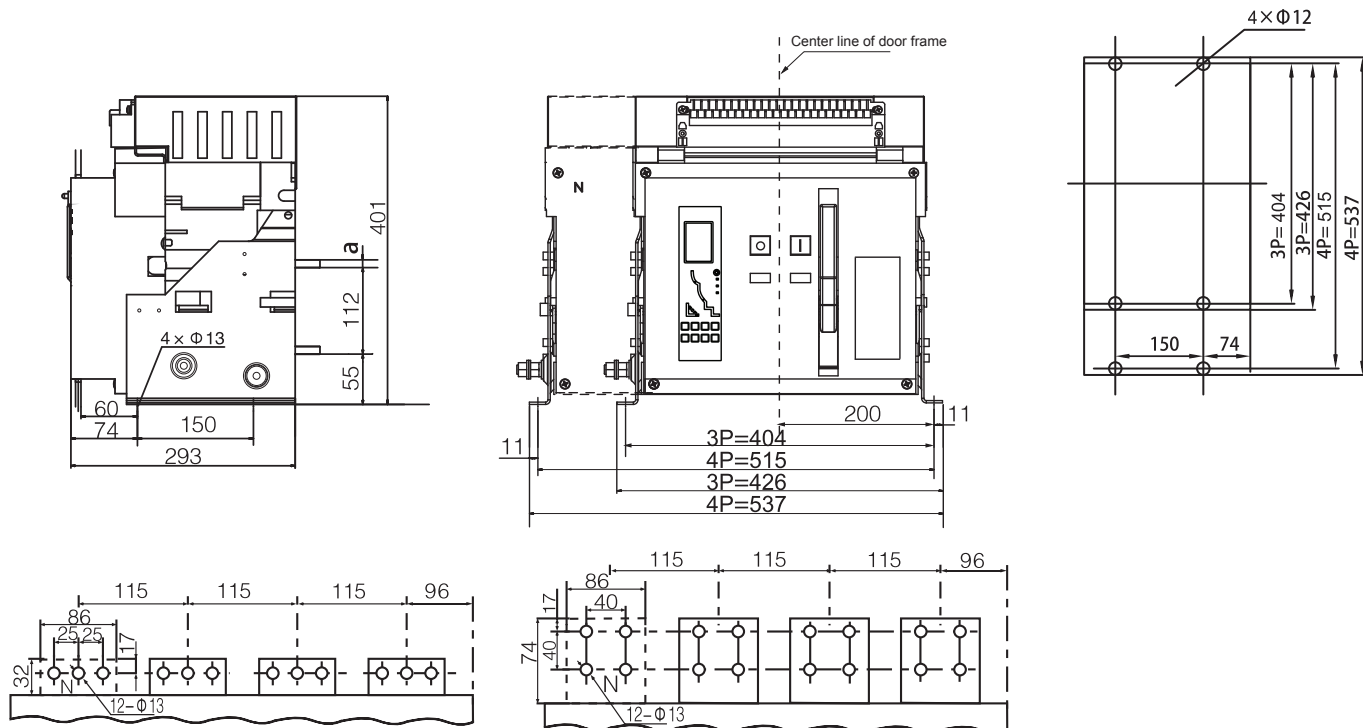
In(A)	a(mm)
630 - 800	10
1000 - 1600	15
2000	20

ACB Drawout type – Frame 2000A 3P/4P (630A ~ 2000A)



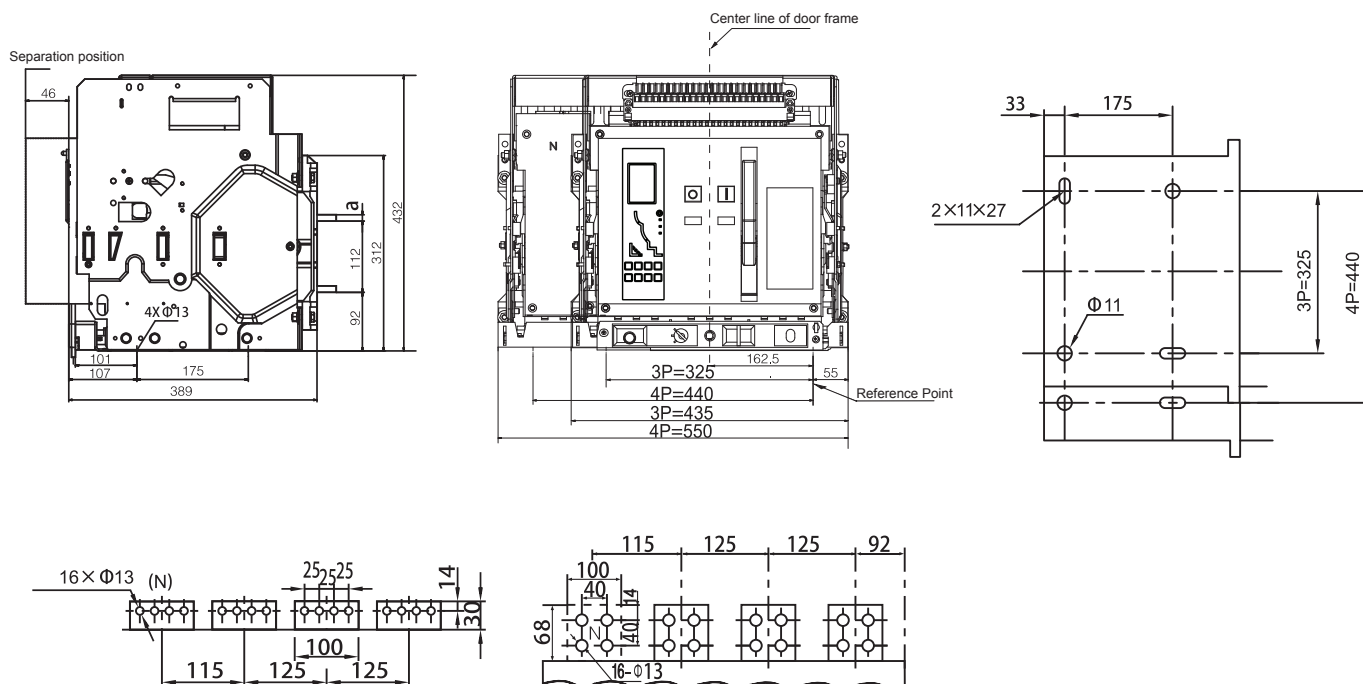
In(A)	a(mm)
630 - 800	10
1000 - 1600	15
2000	20

ACB Fixed type – Frame 4000A 3P/4P (2500A, 3200A)



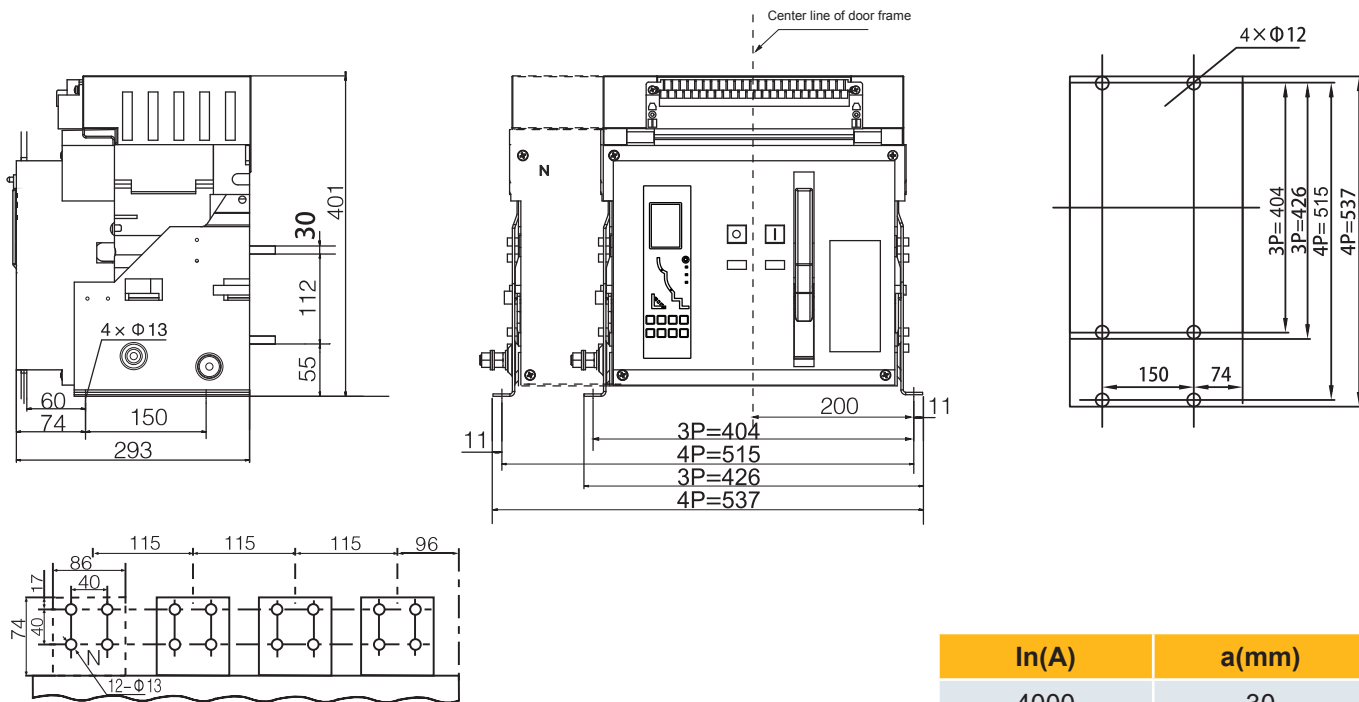
In(A)	a(mm)
2500	20
3200	30

ACB Drawout type – Frame 4000A 3P/4P (2500A, 3200A)

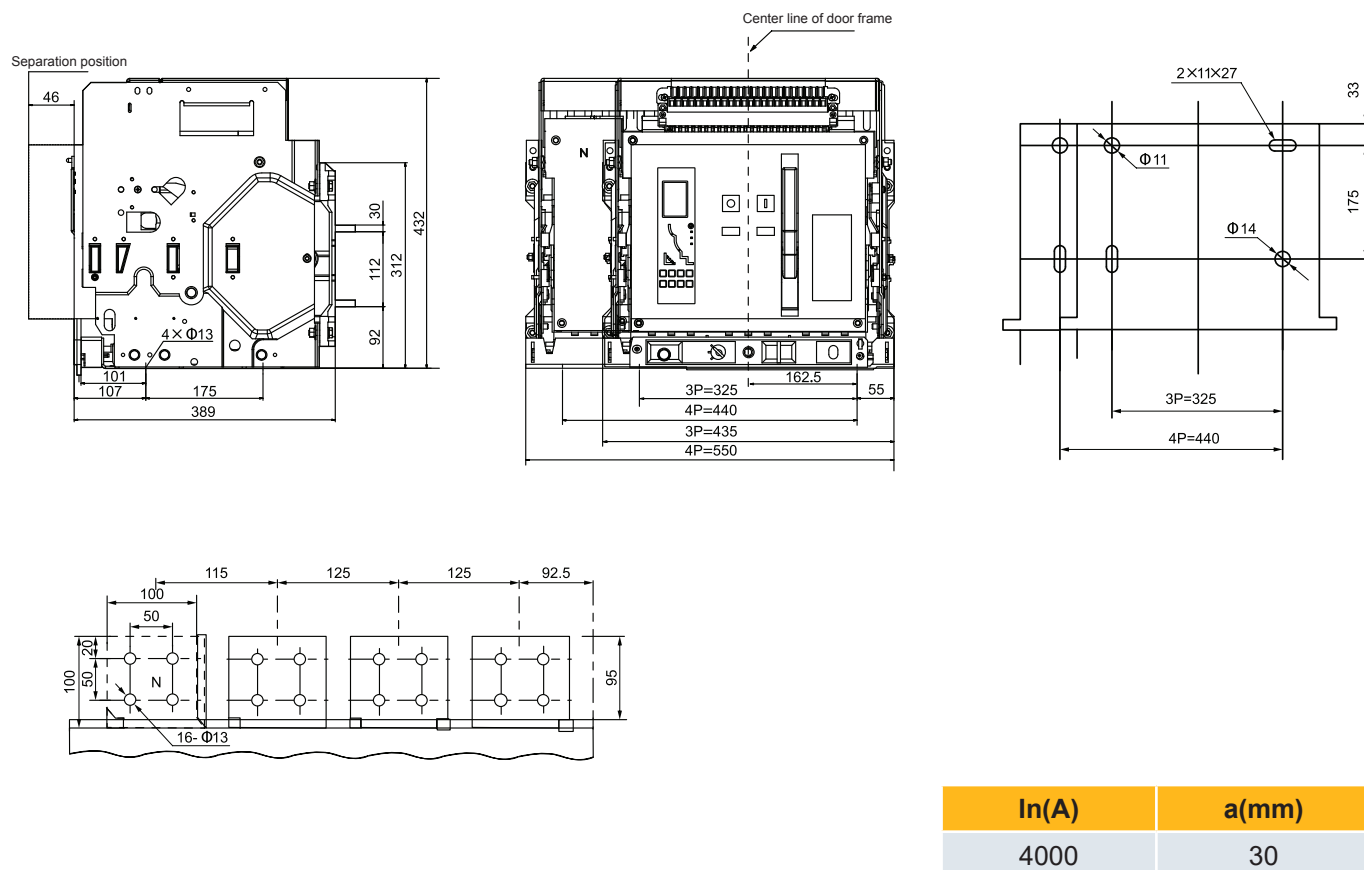


In(A)	a(mm)
2500	20
3200	30

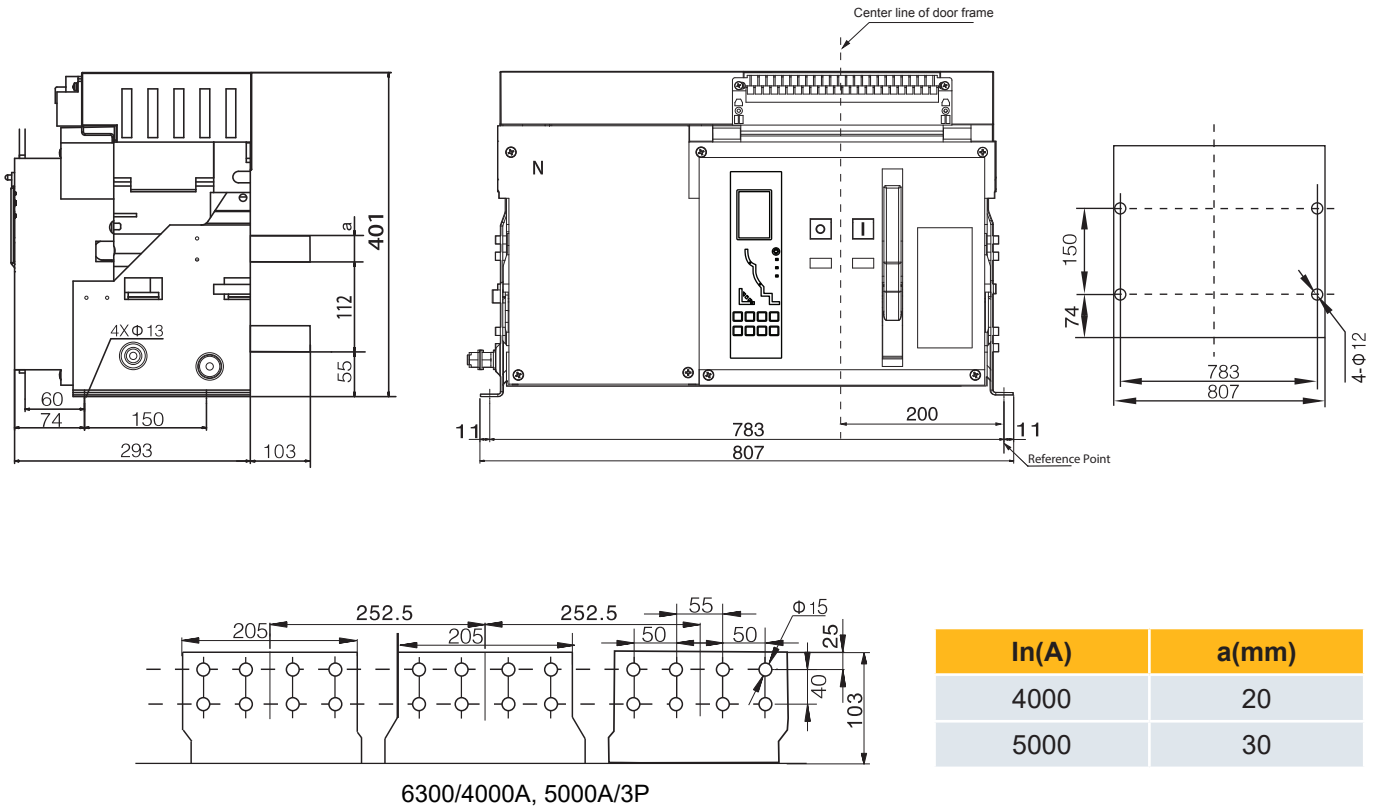
ACB Fixed type – Frame 4000A 3P/4P (4000A)



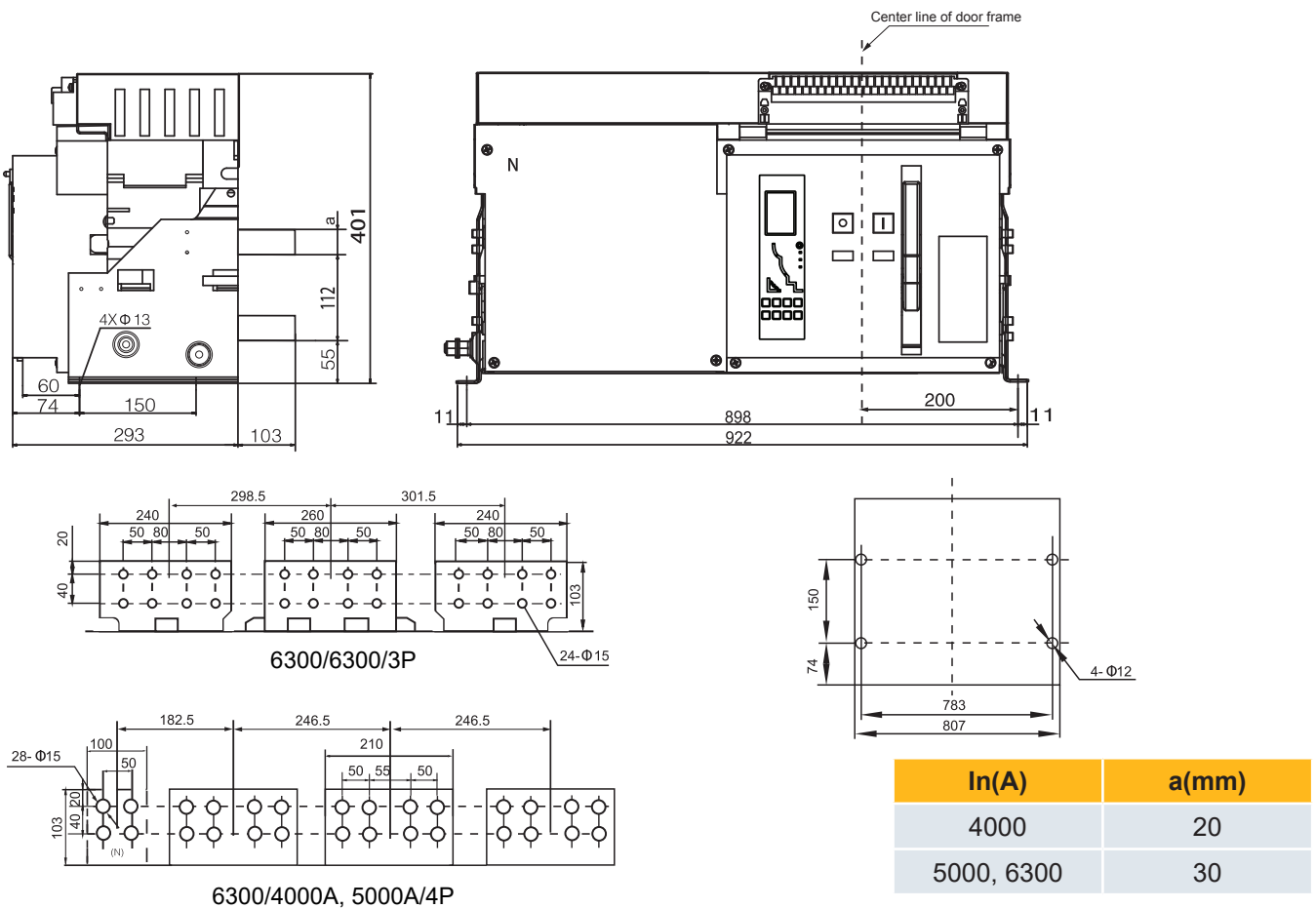
ACB Drawout type – Frame 4000A 3P/4P (4000A)



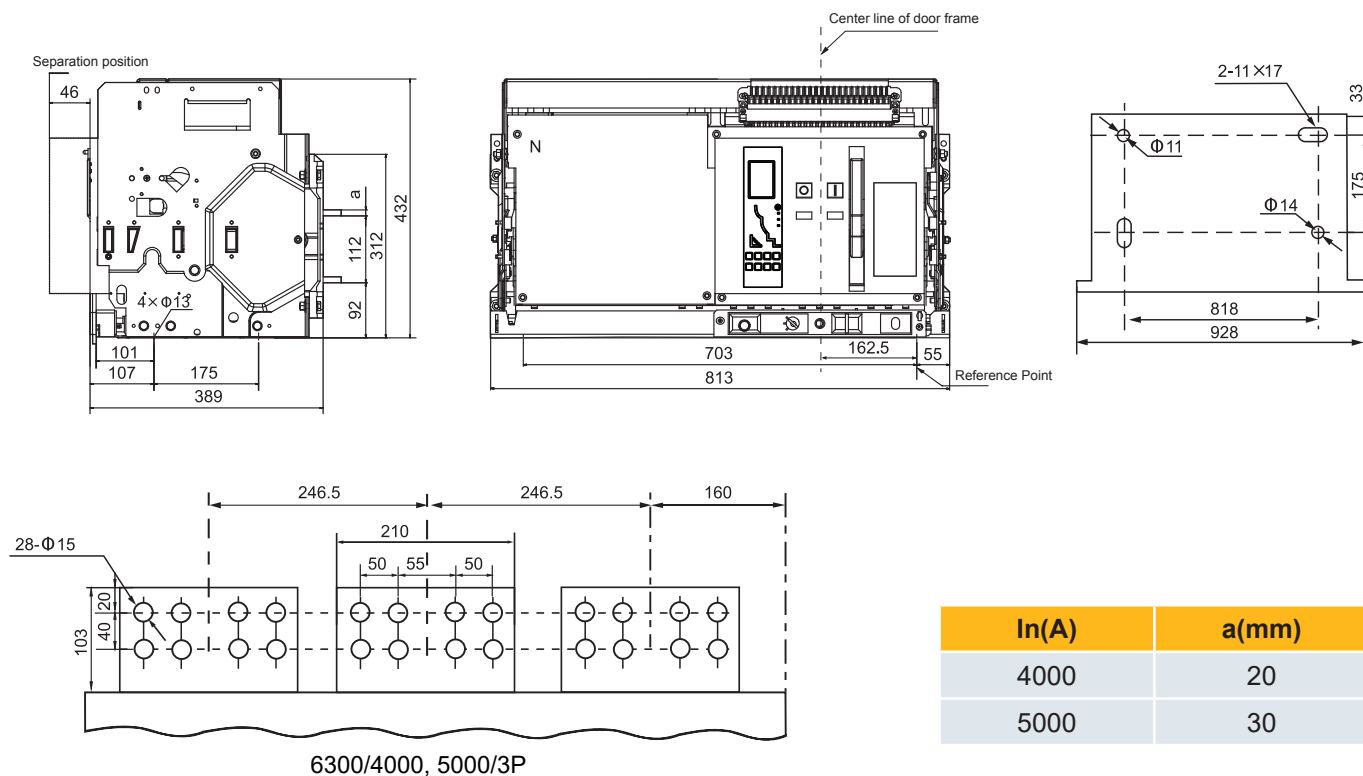
ACB Fixed type – Frame 6300A 3P (4000A, 5000A/3P)



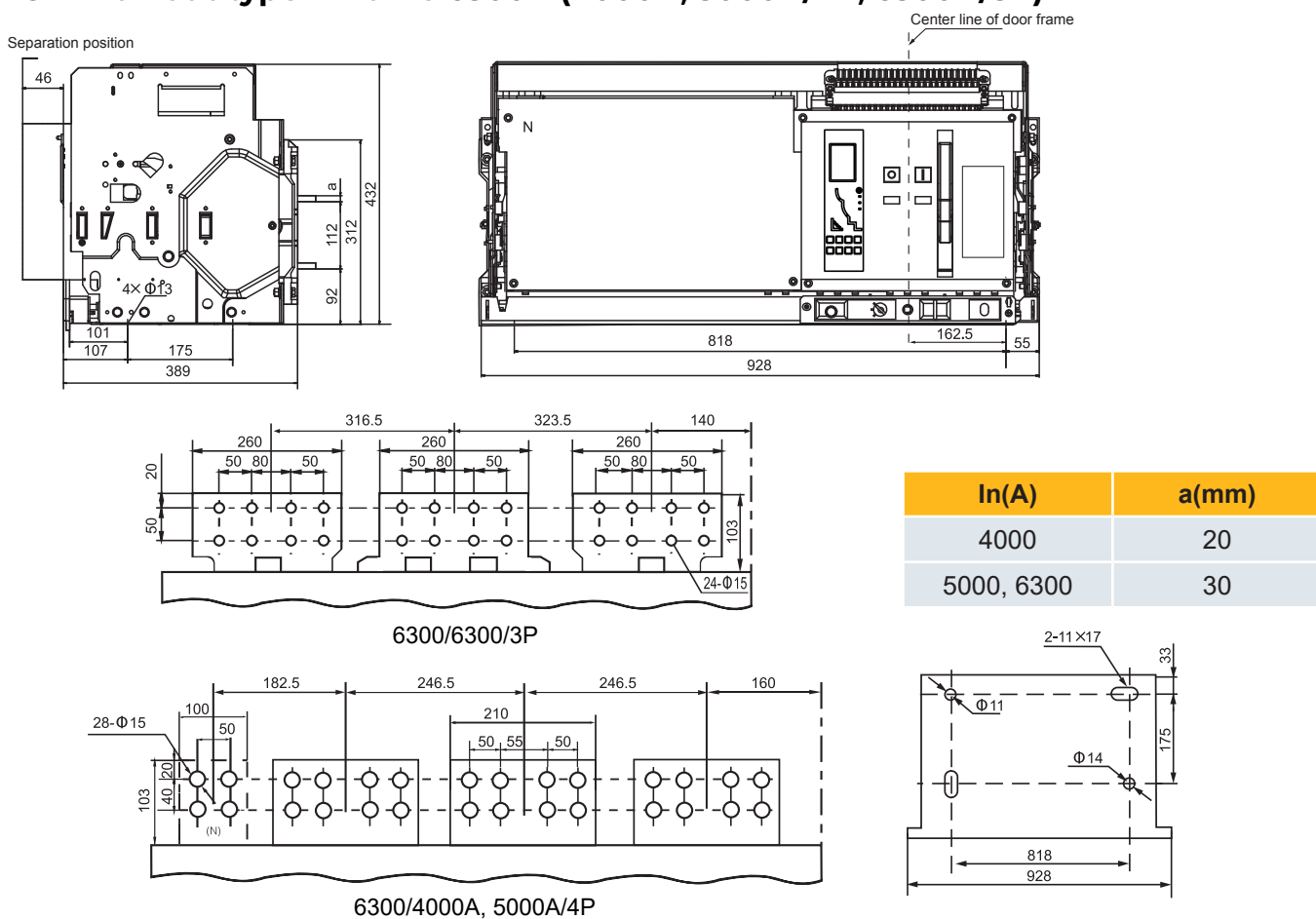
ACB Fixed type – Frame 6300A (4000A, 5000A/4P, 6300A/3P)



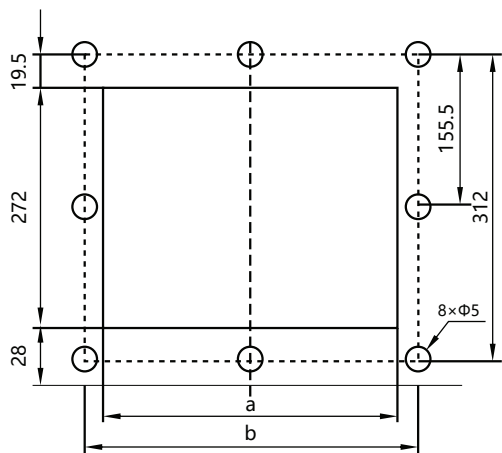
ACB Drawout type – Frame 6300A 3P (4000A, 5000A/3P)



ACB Drawout type – Frame 6300A (4000A, 5000A/4P, 6300A/3P)



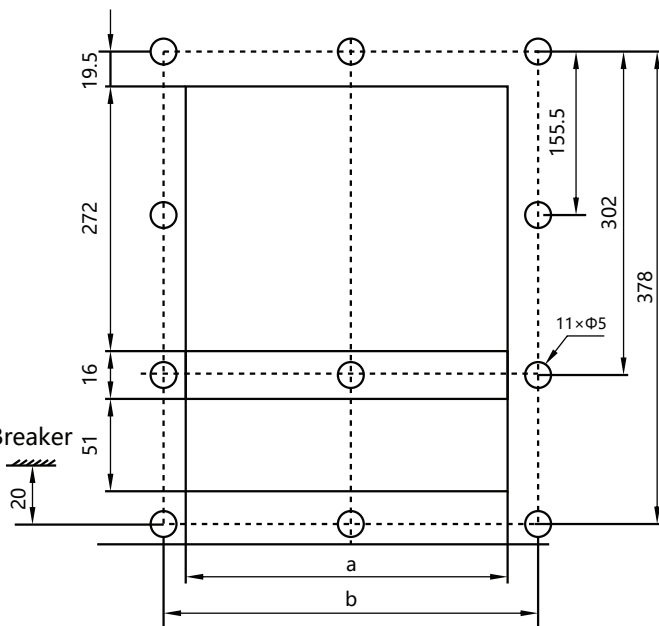
Installation size for panel drilling



Fixed-type



Undersurface of Breaker



Drawout-type

Frame	a	b
2000A	306	346
2500A ~ 6300A	366	406

Shunt release



Shunt release can realize the remote control to break the circuit breaker.

- Rated control power voltage $U_s(V)$ AC220V/230V, AC380V/400V, DC220V, DC110V
- Work voltage (0.7~1.1) U_s
- Breaking time (50±10) ms

Forbid making the power for long time to avoid the shunt release being damaged.

Closing electromagnet



After the motor finishing the energy storage, closing release can instantly close the circuit breaker

- Rated control power voltage $U_s(V)$ AC220V/230V, AC380V/400V, DC220V, DC110V
- Work voltage (0.85~1.1) U_s
- Closing time (55±10) ms

Forbid making the power for long time to avoid the closing release being damaged

Under-voltage release

Without power supply, under-voltage release can't close. It is classified into instantaneous and time-delay type.

After closing the circuit breaker, under-voltage release can break the circuit breaker when the voltage drops to (70%~35%) U_s . The circuit breaker can be closed again when power voltage recovers and exceeds 85% U_s



- Rated control power voltage $U_s(V)$ AC220V/230V, AC380V/400V
- Action voltage (0.35~0.7) U_s
- Reliable making voltage (0.85~1.1) U_s
- Reliable non-making voltage $\leq 0.35U_s$
- Delay time: 0.5s, 1s, 1.5s, 3s (Frame-1600 , non-adjustable); 0.5s, 1s, 3s, 5s (Frame-2000A, 3200A, 4000A, 6300A, adjustable)

Make sure there is power supply on the under-voltage release, before making the circuit breaker

Auxiliary contact



- Standard model: 4NO/4NC
- For Frame-1600: only have 4NO/4NC
- For Frame-2000, 3200, 4000, 6300: 4NO/4NC, 4NO+4NC, 2NO+6NC, 3NO+3NC
- Ith: AC380V/AC400V 0.75A, DC220V 0.15A, AC220V/AC230V 1.3A

Motor-driven charging device



With the function of motor-driven storing and auto restoring energy after closing the circuit breaker, the mechanism can ensure closing the circuit breaker instantly after breaking the circuit breaker

- Rated control power voltage $U_s(V)$ AC220V/230V, AC380V/400V, DC220V, DC110V
- Work voltage $(0.85\sim 1.1) U_s$
- Power loss 75W(1600A), 85W(2000A), 110W(3200A, 4000A), 150W(6300A)
- Energy-storage time $<5s$

Key lock



The OFF push-button of the breaker can be locked in the position of depress, and at this time, the breaker can not be closed for operation; when the user selects the option, the factory provides locks and keys; One breaker is provided with one lock and one key for the lock; two breakers are provided with two locks and one key for the locks; three breakers are provided with three same locks and two same keys for the locks

Note: the air circuit breaker with key lock, when the key has to be pulled out, it is necessary to first press the OFF key, turn the key anticlockwise, and then pull out the key

“Disconnected” position locking device for the draw-out type

For the “disconnected” position of the draw-out circuit breaker, a lock rod can be pulled out to lock the matter, and the breaker locked will be unable to be turned towards the TEST or CONNECTION position, Padlocks have to be provided by users themselves

Three position locking device for the draw-out

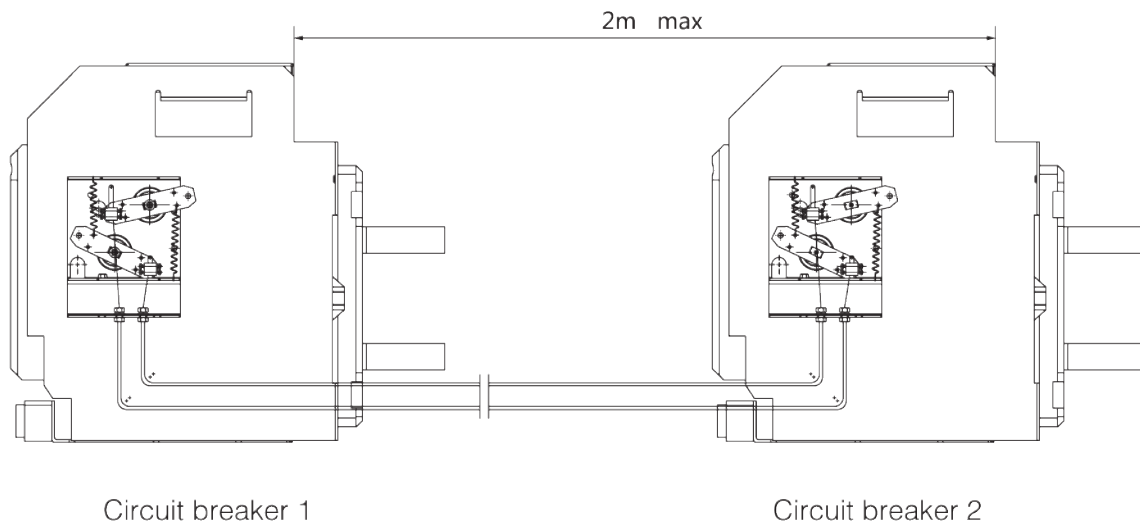
It is locking device for three position (disconnected, test, connection) of draw-out type. Three position of circuit breaker is indicated by indicator, the driving and reversing handle is locked in the exact position, the lock can be released by the reset button



Door-case

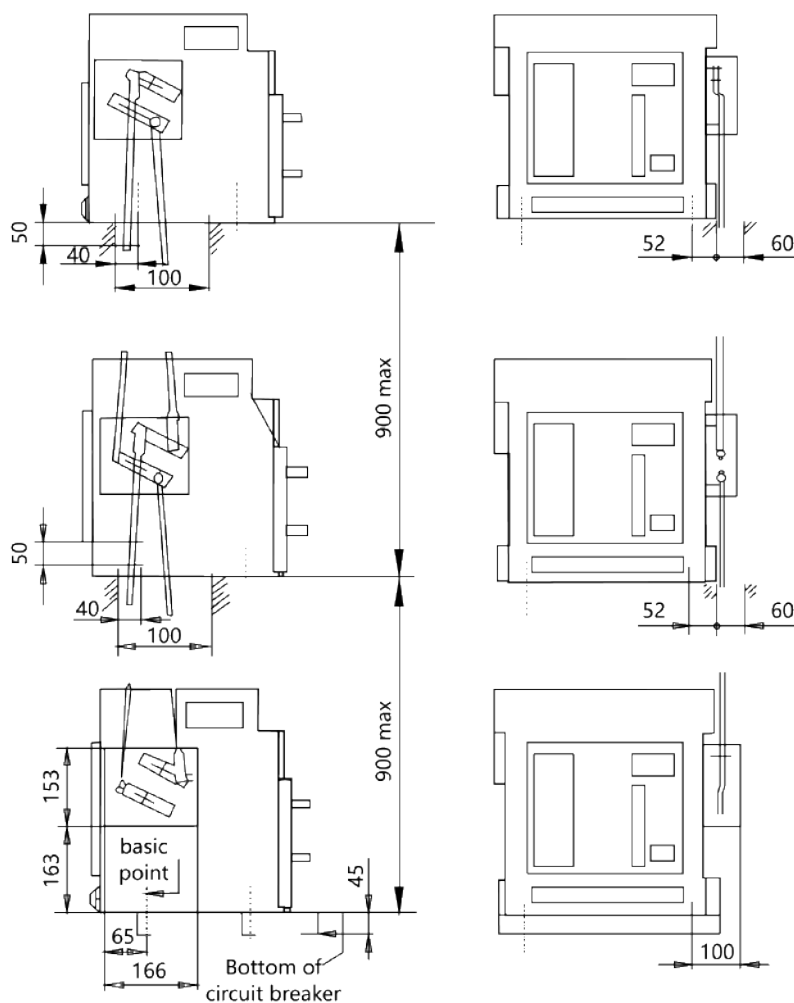
Installed on the door of the distribution cubicle, for sealing the distribution cubicle and making the protection class to IP40 (fixed type and draw-out type)

Horizontal-installed mechanical interlock



Note: 2 pcs of circuit breaker horizontal-installed with steel cable mechanical interlock (fixed type or drawout type circuit breaker).

Vertical-installed mechanical interlock



Note: 3 pcs of circuit breaker vertical-installed with connecting-rod type mechanical interlock. If need 2 pcs of circuit breaker interlocked, just remove the top one

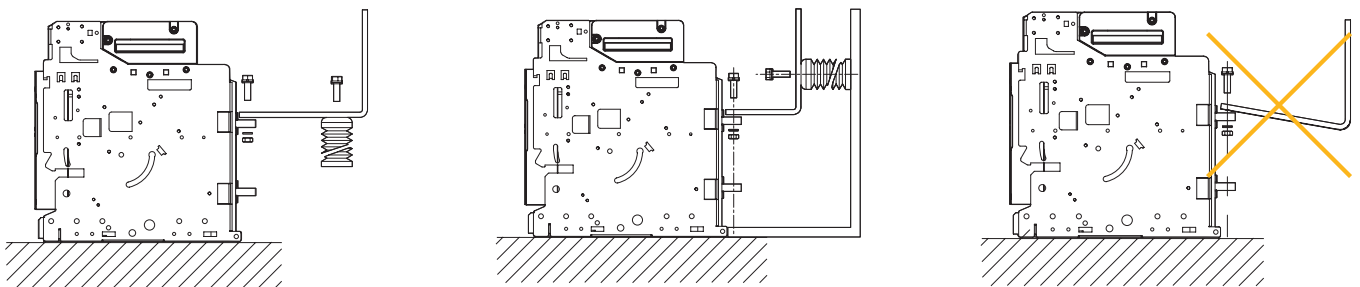
Temperature derating

Ambient temperature: -5°C - $+40^{\circ}\text{C}$; the average value no more than $+35^{\circ}\text{C}$ within 24 hours. Over $+40^{\circ}\text{C}$ the user shall be de-rating capacity as described in the following.

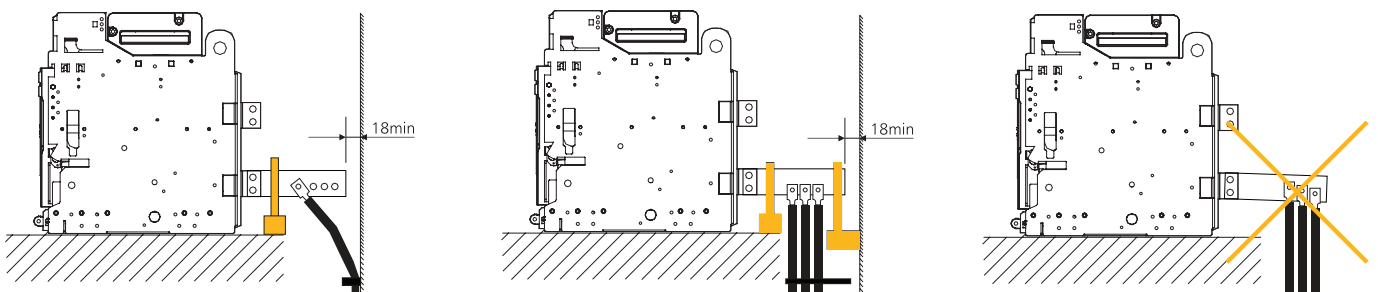
Ambient temperature		+40°C	+50°C	+60°C
Frame 2000	630A	630A	630A	630A
	800A	800A	800A	800A
	1000A	1000A	1000A	1000A
	1250A	1250A	1250A	1250A
	1600A	1600A	1550A	1500A
	2000A	2000A	1900A	1750A
Frame 4000A	2000A	2000A	2000A	2000A
	2500A	2500A	2500A	2500A
	3200A	3200A	3100A	2900A
	4000A	4000A	3550A	3200A
Frame 6300A	4000A	4000A	4000A	4000A
	5000A	5000A	5000A	5000A
	6300A	6300A	5500A	4800A

Installation recommendation BUS-BAR Connection

Bus-bar connection

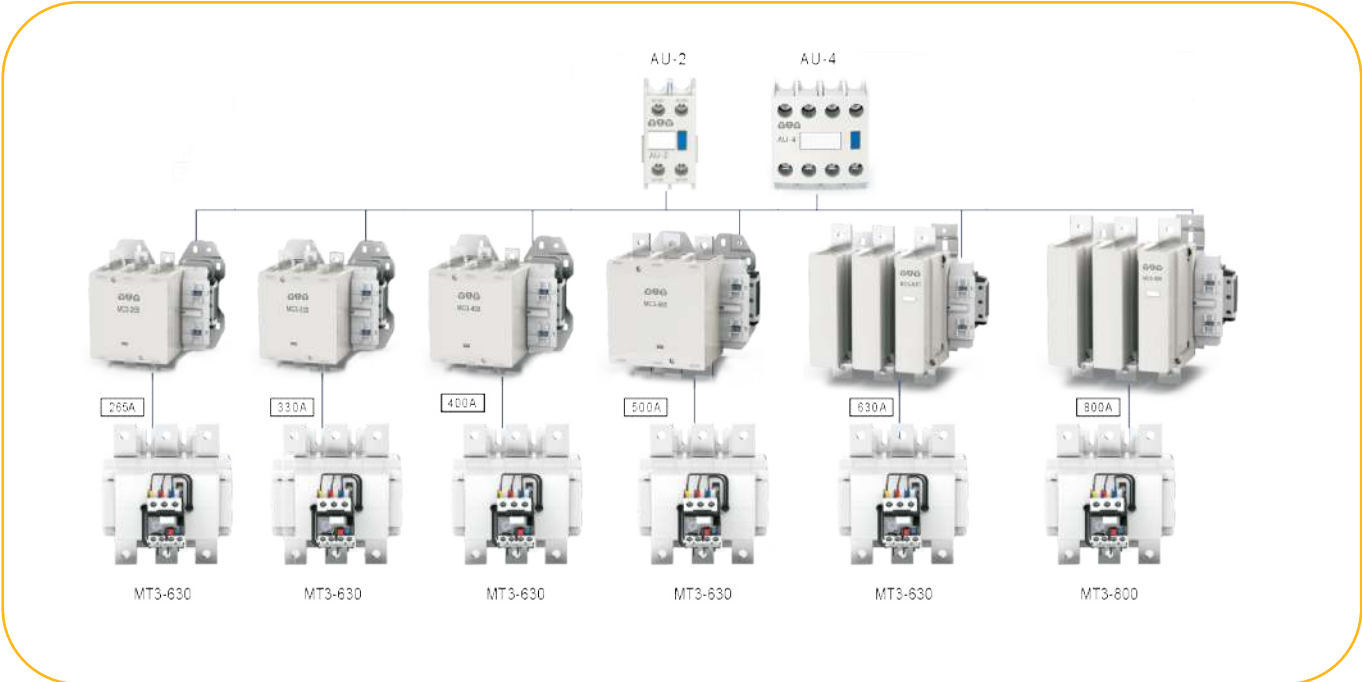
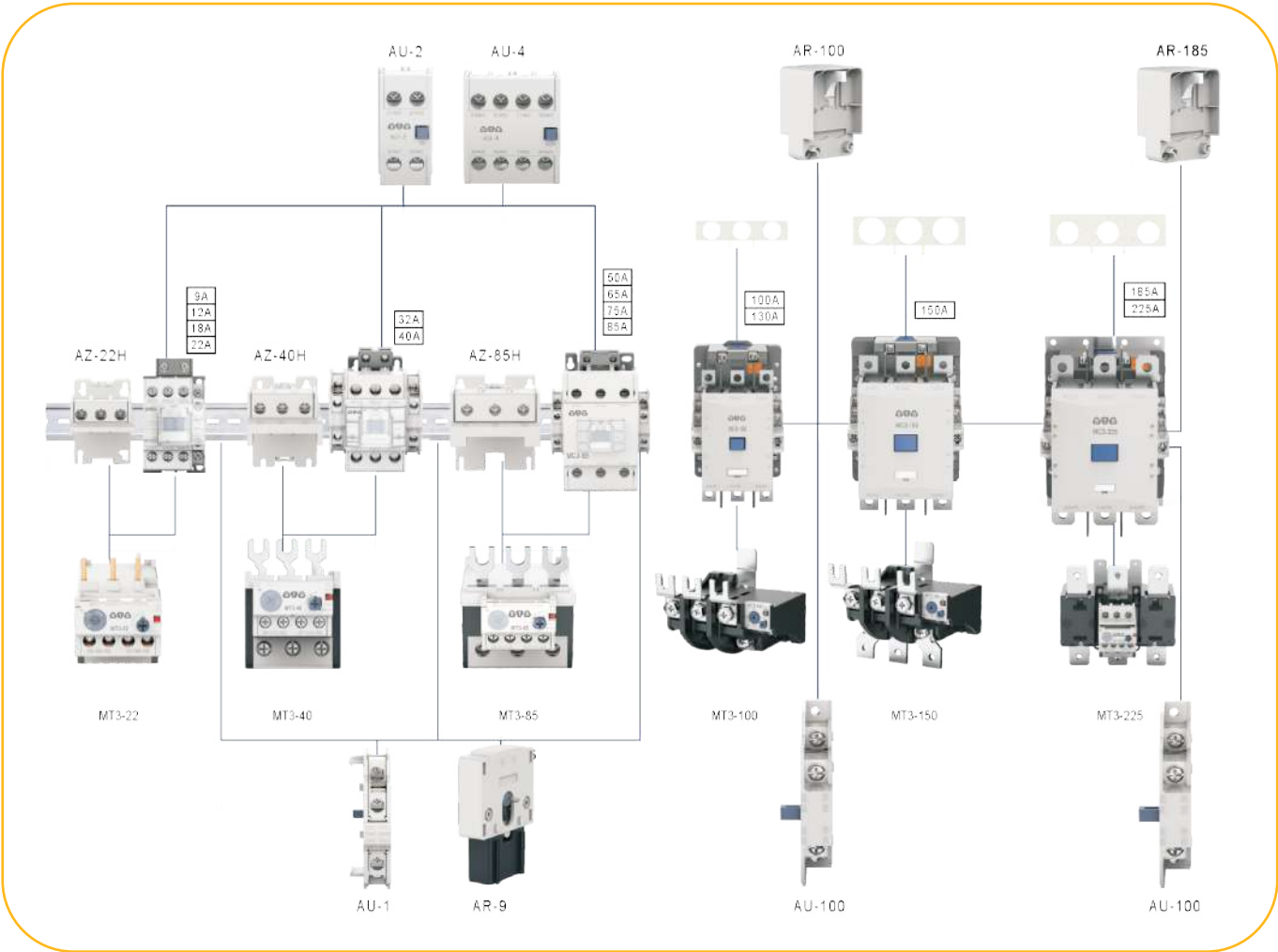


Cables connections



Technical Overview

Composition



Enhanced safety

Front Protection Cover

- Minimize foreign input.
- Prevent unexpected operation due to user's error.



Improved Quality and Decreased Noise.

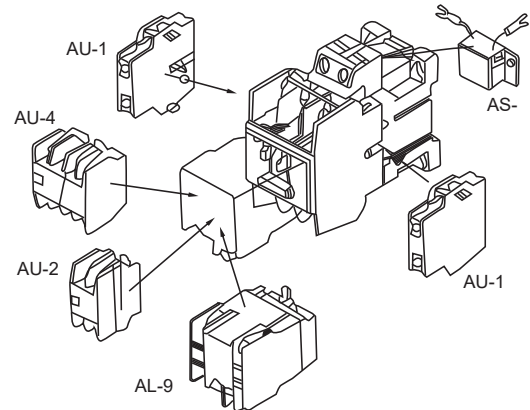
- Extended life is achieved by new technology of contact.
- Suitable for severe duty operation such as inch driving and phase reverse by improving arc resistance, abrasion resistance, electrical life expectancy, etc.
- Reliability improved by using special coil for each voltage.



Utility

Convenient and Safe structure

- Various mounting options available using DIN rail and screw type.
- Easy maintenance and replacement in attached status on switchgear.
- Convenient for use and reasonable structure.



Removable Terminal Cover

- Applicable for main contact, auxiliary contact, coil contact.
- IP20.
- Changing of coil ass'y is easy by the ergonomic design of 'A' in Coil Ass'y locker.
- It is easy to replace coil for using drawout type coil structure and unnecessary to dismantle contactor (for model 100~800A).



Table of Specifications



Model		MC3-9	MC3-12	MC3-18	MC3-22	MC3-32	MC3-40	
Rated Operational Voltage, Ue		690V						
Rated Insulation Voltage, Ui		690V						
Rated Impulse Withstand Voltage, Uimp		6kV						
Rated Frequency		50/60Hz						
IEC/EN 60947	AC-1 Thermal Current	25A	25A	40A	40A	50A	60A	
	AC-3 Current and power	200/240V	2.5kW 11A	3.5kW 13A	4.5kW 18A	5.5kW 22A	7.5kW 32A	11kW 40A
		380/440V	4kW 9A	5.5kW 12A	7.5kW 18A	11kW 22A	15kW 32A	18.5kW 40A
		500/550V	4kW 7A	7.5kW 12A	7.5kW 13A	15kW 22A	18.5kW 28A	22kW 32A
		660/690V	4kW 5A	7.5kW 9A	7.5kW 9A	15kW 18A	18.5kW 20A	22kW 23A
UL508	Continuous current	20A	25A	30A	32A	45A	50A	
	Single phase	115V	0.5HP	0.5HP	1HP	2HP	2HP	3HP
		230V	1HP	2HP	3HP	3HP	5HP	5HP
	Three phase	200V	2HP	3HP	5HP	7.5HP	7.5HP	10HP
		230V	2HP	3HP	5HP	7.5HP	10HP	10HP
		460V	5HP	7.5HP	10HP	10HP	20HP	25HP
		575V	7.5HP	10HP	15HP	15HP	20HP	25HP
Frequency of operation (AC-3)	times/hour	1800						
Electrical life (AC-3)	10000 times	250			200	200		
Mechanical life	times	2500			2500	1500		
Mounting Method		Screw & DIN-Rail						
Dimensions (W×H×D) 3P		44x80x86.8			68x82x94.5			
Weight 3P		0.33kg		0.37kg		0.45kg		
Auxiliary	Standard	1NO1NC (1a1b)				2NO2NC (2a2b)		
	Side mount	AU-1				AU-1		
	Front mount	AU-2, AU-4, AC-9				AU-2, AU-4, AC-9		
Coil voltage (AC50/60Hz)		24, 48, 100, 110, 220, 240, 380, 415V						
Thermal Overload Relays		MT3-22				MT3-40		

Table of Specifications



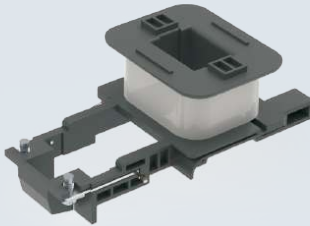

MC3-50	MC3-65	MC3-75	MC3-85	MC3-100	MC3-130	MC3-150	MC3-185	MC3-225
690V				690V				
1000V				690V				
8kV				8kV				
50/60Hz				50/60Hz				
80A	100A	110A	135A	150A	150A	200A	230A	260A
15kW	18.5kW	22kW	25kW	30kW	37kW	45kW	55kW	75kW
55A	65A	75A	85A	105A	130A	150A	185A	250A
22kW	30kW	37kW	45kW	55kW	60kW	75kW	90kW	132kW
50A	65A	75A	85A	105A	130A	150A	185A	250A
30kW	33kW	37kW	45kW	55kW	60kW	90kW	110kW	132kW
43A	60A	64A	75A	85A	90A	140A	180A	200A
30kW	33kW	37kW	45kW	55kW	60kW	90kW	110kW	132kW
28A	35A	42A	45A	65A	70A	100A	120A	150A
70A	80A	90A	100A	160A	160A	210A	230A	275A
3HP	5HP	5HP	7.5HP	7.5HP	10HP	15HP	15HP	15HP
7.5HP	10HP	15HP	15HP	15HP	20HP	25HP	30HP	40HP
10HP	15HP	20HP	25HP	30HP	40HP	40HP	60HP	60HP
15HP	20HP	25HP	30HP	30HP	40HP	50HP	60HP	75HP
30HP	40HP	50HP	50HP	60HP	75HP	100HP	125HP	150HP
30HP	40HP	50HP	50HP	60HP	75HP	100HP	125HP	150HP
1200				1200			1000	
200				120				
1000				600				
Screw & DIN-Rail				Screw				
94x123.5x117.4				126x165.8x146.5	144x175.8x157	162x203x181		
1.0kg				2.9kg	3.4kg	5.4kg		
2NO2NC (2a2b)				2NO2NC (2a2b)				
AU-1				AU-100				
AU-2, AU-4, AC-50				-				
24, 48, 100, 110, 220, 240, 380, 415V				24, 48, 110, 220V (AC/DC), 400V				
MT3-85				MT3-100 & MT3-150			MT3-225	

Table of Specifications



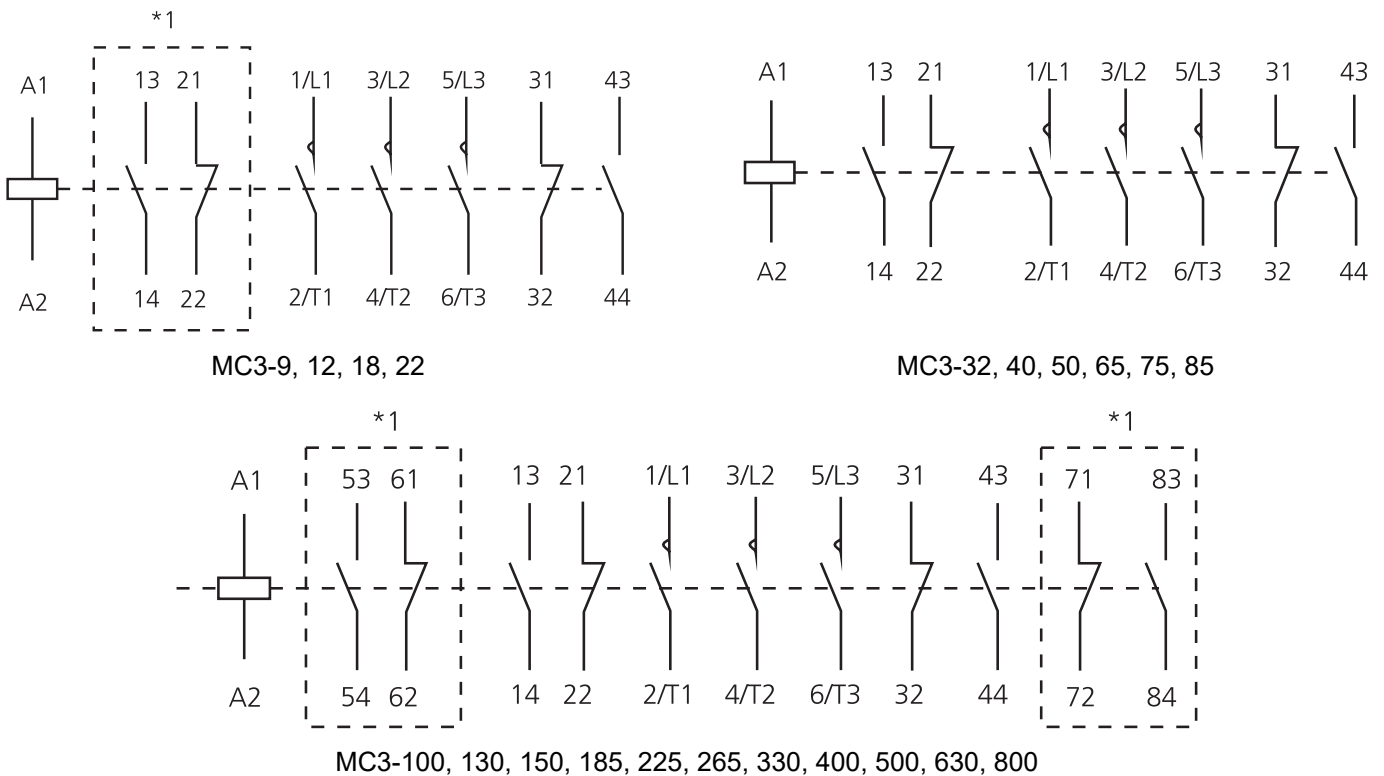
Model		MC3-265	MC3-330	MC3-400	MC3-500	MC3-630	MC3-800	
Rated Operational Voltage, Ue		1000V						
Rated Insulation Voltage, Ui		1000V						
Rated Impulse Withstand Voltage, Uimp		8kV						
Rated Frequency		50/60Hz						
IEC/EN 60947	AC-1 Thermal Current	350A	400A	500A	700A	1000A	1600A	
	AC-3 Current and power	200/240V	75kW 265A	100kW 330A	110kW 400A	147kW 500A	200kW 630A	250kW 800A
		380/440V	140kW 265A	180kW 330A	220kW 400A	280kW 500A	375kW 630A	450kW 800A
		500/550V	160kW 245A	200kW 310A	257kW 400A	355kW 450A	400kW 600A	450kW 650A
		660/690V	160kW 185A	220kW 200A	280kW 305A	355kW 355A	450kW 460A	470kW 500A
1000V	147kW 105A	160kW 115A	185kW 130A	335kW 260A	450kW 355A	450kW 355A		
UL508	Continuous current	350A	400A	500A	700A	1000A	1600A	
	Single phase	115V	-	-	-	-	-	-
		230V	-	-	-	-	-	-
	Three phase	200V	75HP	100HP	125HP	140HP	150HP	200HP
		230V	100HP	100HP	150HP	170HP	200HP	250HP
		460V	200HP	200HP	300HP	350HP	400HP	500HP
		575V	200HP	200HP	300HP	350HP	400HP	500HP
Frequency of operation (AC-3)	times/hour	600						
Electrical life (AC-3)	10000	60						
Mechanical life	times	600						
Mounting Method		Screw						
Dimensions (W×H×D) 3P		213x206x219			233x238x232	309x304x255		
Weight 3P		8.2kg	8.3kg	8.5kg	11.1kg	17.1kg	17.3kg	
Auxiliary	Standard	-						
	Side mount	-						
	Front mount	AU-2, AU-4						
Coil voltage (AC50/60Hz)		24, 48, 110, 220V (AC/DC), 400V						
Thermal Overload Relays		MT3-630						

Coil Characteristics








Model	MC3-9, 12, 18, 22	MC3-32, 40	MC3-50, 65, 75, 85	MC3-100, 130, 150	MC3- 185, 225	MC3-265, 330, 400, 500	MC3- 630, 800	
AC Coil (50/60Hz)	24, 48, 100, 110, 220, 240, 380, 415V			24, 48, 110, 220, 400V				
DC Coil	24, 48, 110, 125, 220, 250V			-				
AC/DC Coil	-			24, 48, 100/240V AC/DC; 400V AC				
Voltage limit (Uc)	80 ~ 110%			85 ~ 110%				
Drop-out (Uc)	30 ~ 60%			20 ~ 75%v				
Coil consumption (220V/60 Hz)	Inrush	85VA	100VA	220VA	310VA	360VA	750AV	1200VA
	Holding	10VA	12VA	15VA	14VA	15VA	22VA	32VA
Coil consumption (110VDC)	Inrush	8W	10W	16W	220W	230W	250W	370W
	Holding	8W	10W	16W	7W	8W	10W	11W
Frame size	40AF		85AF	150AF	225AF	500AF	800AF	
Description								

D AC Contactor

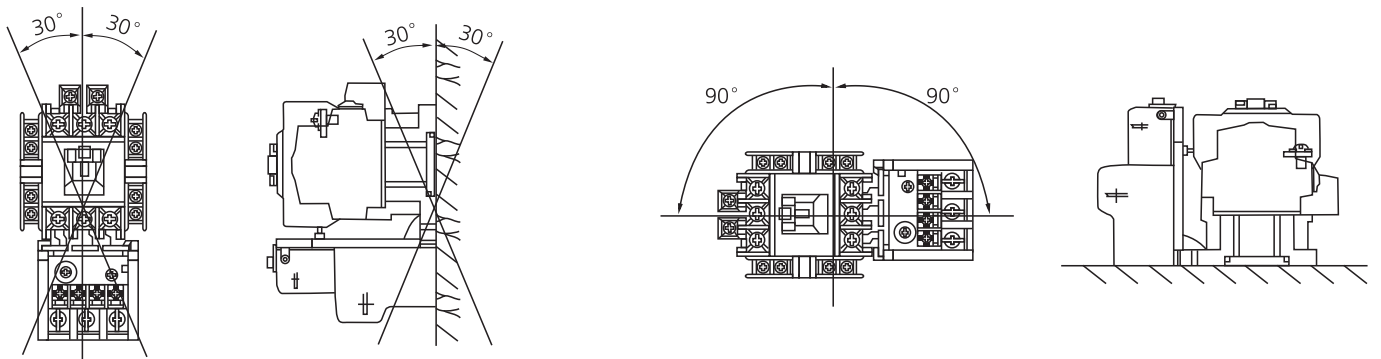
Contact Conguration



Connections

Model	Main Terminal Size		Applicable Wire Size (mm ²)	Ring Tongue Terminal (mm)	Screwing Torque	
					(Nm)	(kgf.cm)
MC3-9		M4	1~6	9.6	2.25	23
MC3-12			1~6			
MC3-18			1.5~10			
MC3-22			1.5~10			
MC3-32		M5	2.5~10	12.8	4	41
MC3-40			10~16			
MC3-50		M6	6~25	14	4	41
MC3-65			6~35			
MC3-75			10~35			
MC3-85			10~50			
MC3-100			10~70			
MC3-130		M8	35~70	24.5	9.1	93
MC3-150			50~95			
MC3-185			50~120			
MC3-225		M10	50~150	25	14.7	150
MC3-265			95~185			
MC3-330		M12	95~240	30	22.6	230
MC3-400			185~185X2			
MC3-500		M16	185~240X2	40	56.5	576
MC3-630			-			
MC3-800			-			

Mounting



Standard mounting

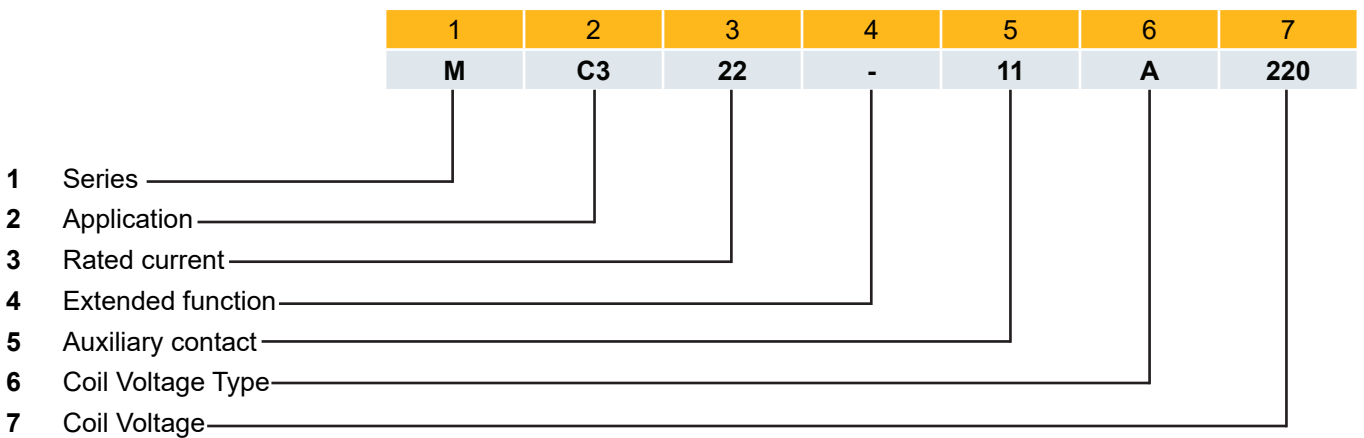
Vertical mounting or level mounting

Specification for Tranformer and Condenser Load

Model	Load is Transformer (kVA)				Load is Condenser (kVAR)	
	Single Phase		Three Phase		Three Phase	
	220VAC	440VAC	220VAC	440VAC	220VAC	440VAC
MC3-9	1	1.5	2	2.5	2	3
MC3-12	1.5	2	3	4	3	4
MC3-18	2	3	3.5	5	4	6
MC3-22	2.5	3.5	4	7	5	9
MC3-32	3	5	5	10	9	16
MC3-40	4	7.5	6.5	12	11	20
MC3-50	5	10	10	18	13	24
MC3-65	7	15	12	25	17	34
MC3-75	8	17	13	27	20	40
MC3-85	9	18	15	30	22	45
MC3-100	10	20	18	35	24	48
MC3-130	15	25	25	42	29	58
MC3-150	17	33	30	60	35	70
MC3-185	20	40	35	70	42	84
MC3-225	25	50	42	85	58	115
MC3-265	30	57	48	95	63	125
MC3-330	33	66	57	100	69	139
MC3-400	44	90	75	150	92	185
MC3-500	55	110	90	180	115	230
MC3-630	65	130	110	220	145	291
MC3-800	90	175	150	300	185	369



Model Definition



2. Application	
C1	Relay contactor
C2	DC Contactor
C3	AC Contactor

4. Extended function	
-	Basic Contactor
C	Capacitor Switching Contactor

6. Coil Voltage Type	
A	AC 50/60Hz
D	DC
F	AC/DC
X	AC 50Hz
S	AC 60Hz

3. Rated current			
6	6A	100	100A
9	9A	130	130A
12	12A	150	150A
18	18A	185	185A
22	22A	225	225A
32	32A	265	265A
40	40A	330	330A
50	50A	400	400A
65	65A	500	500A
75	75A	630	630A
85	85A	800	800A

5. Auxiliary contact	
10	1NO
01	1NC
11	1NO+1NC
21	2NO+1NC
12	1NO+2NC
22	2NO+2NC

7. Coil Voltage	
24	24V
48	48V
110	110V
220	220V
380	380V
415	415V

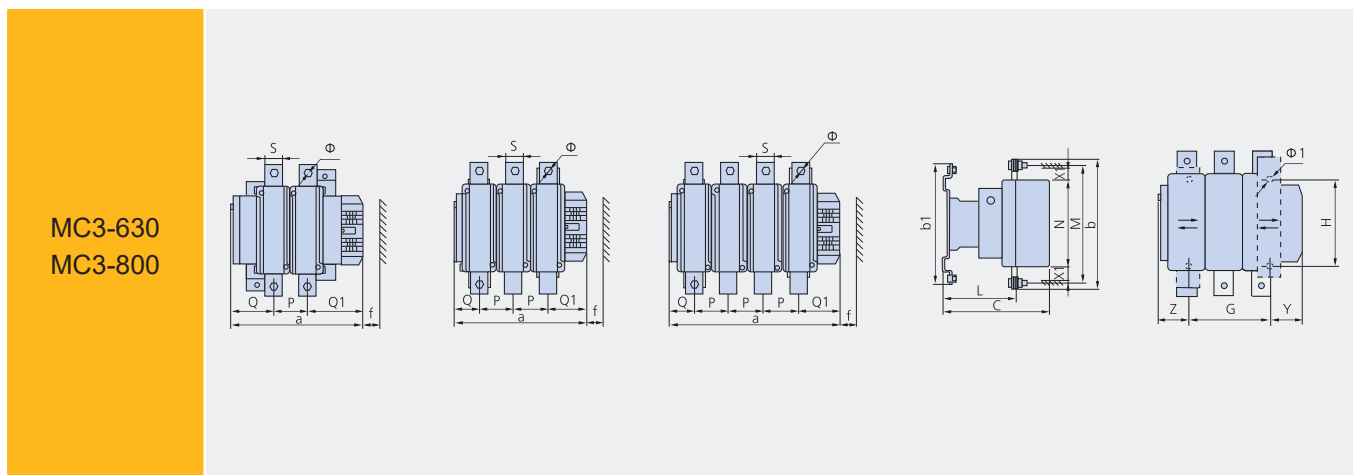
Dimensions

<p>MC3-9 MC3-12 MC3-18 MC3-22</p>			<p>35mm Rail</p> <p>MC3-9,12:0.33kg MC3-18,22:0.37kg</p>
<p>MC3-32 MC3-40</p>			<p>35mm Rail</p> <p>0.45kg</p>
<p>MC3-50 MC3-65 MC3-75 MC3-85</p>			<p>35mm Rail</p> <p>1kg</p>
<p>MC3-100 MC3-130</p>			<p>2.9kg</p>

Dimensions

<p>MC3-150</p>	<p>3.4kg</p>
<p>MC3-185 MC3-225</p>	<p>5.4kg</p>
<p>MC3-265 MC3-330</p>	
<p>MC3-400 MC3-500</p>	

Dimensions



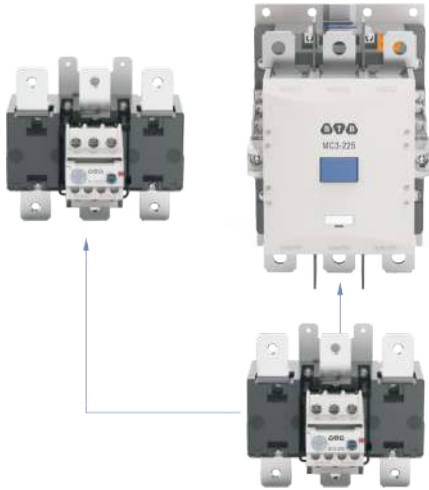
Model	MC3-265 MC3-330	MC3-400	MC3-500	MC3-630 MC3-800
a	204	213	233	309
P	48	48	55	80
Q	39	43	46	60
Q1	69	74	77	89
s	25	25	30	40
Φ	M10	M10	M10	M12
f	147	151	169	201
b	205/210	206	238	304
b1	145	209	209	280
M	179/184	181	208	264
N	149	158	172	202
C	204/214	219	232	255
L	134/139	145	146	155
G	96	80 (66-102)	80 (66-102)	180 (100-195)
H	106/120	180	180	180
Φ1	6.5	8.5	8.5	10.5
G1	141/154	170 (156-192)	170 (156-210)	-
Z	20.5	-	-	60.5
Y	38	19.5	39.5	68.5
X1	≤500V	10	15	20
	>500V	15	20	30

mm

Technical Overview

Type MT3, bimetal-style, overload relays are designed to protect AC circuits and motors against overloads, phase failure, long starting times and prolonged stalling of the motor

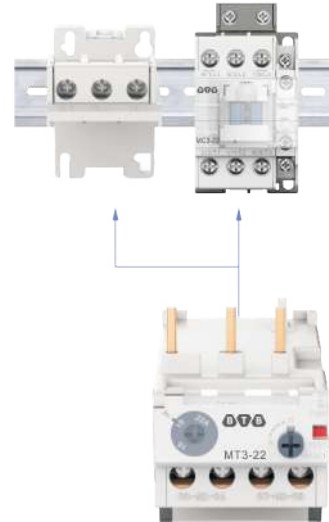
Thermal (bimetal element) type, max reaches 225A, UK type thermal overload relay can be connected with contactor directly or individually with the help of additional independent mounting support.



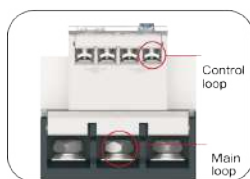
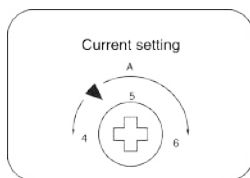
Thermal overload relays characteristics

If it is required to mount the thermal overload relay separately, use single seat and fix with screws or guide track.

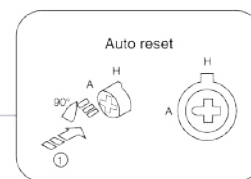
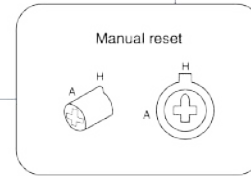
(Application type: UKH-22, 40, 85)



The thermal overload relay will protrude about 2-3mm in the case of release, which shows the release status available



Main loop terminal has sharp difference from control loop terminal, thus it is hard to make wrong connection



Automatic reset setting: Press down the reset button and rotate anticlockwise for 90degree.

Table of Specifications

Model		MT3 - 22	MT3 - 40	MT3 - 85
Rated Operational Voltage, U _e		690V		
Rated Insulation Voltage, U _i		690V		
Rated Impulse Withstand Voltage, U _{imp}		6kV		
Rated Frequency		50/60Hz		
Poles		3P		
Temperature compensation		-5~+40°C		
Trip class		10A (20A)		
Functions		Trip, Test, Reset A/H		
Auxiliary contact rated current (AC15 duty)		5A / 240V		
Terminals	Main-upstream	Screw clamp	Screw/Lug clamp	
	Main-downstream	Screw clamp	Screw/Lug clamp	
	Auxiliary	Screw clamp		
Setting range		1A ~ 22A	4A ~ 40A	7A ~ 85A
		1-1.6 (1.3A)	4-6 (5A)	7-10 (8.5A)
		1.6-2.5 (2.1A)	5-8 (6.5A)	9~13 (11A)
		2.5-4 (3.3A)	6-9 (7.5A)	12-18 (15A)
		4-6 (5A)	7-10 (8.5A)	16-22 (19)
		5-8 (6.5A)	9-13 (11A)	18-26 (22A)
		6-9 (7.5A)	12-18 (15A)	24-36 (30A)
		7-10 (8.5A)	16-22 (19A)	28-40 (34A)
		9-13 (11A)	18-26 (22A)	34-50 (42A)
		12-18 (15A)	24-36 (30A)	45-65 (55A)
		16-22 (19A)	28-40 (34A)	54-75 (65A)
Weight		0.11kg	0.17kg	0.3kg
Connection	Main terminal	1.25 ~ 5.5mm ² (M4)	4 ~ 10mm ² (M4)	6 ~ 16mm ² (M6)
	Aux. contact	1 ~ 5 mm ² (M3.5)		
Applied contactors		MC3-9	MC3-32	MC3-50
		MC3-12	MC3-40	MC3-65
		MC3-18		MC3-75
		MC3-22		MC3-85
Separate mounting unit		AZ-22H	AZ-40H	AZ-85H

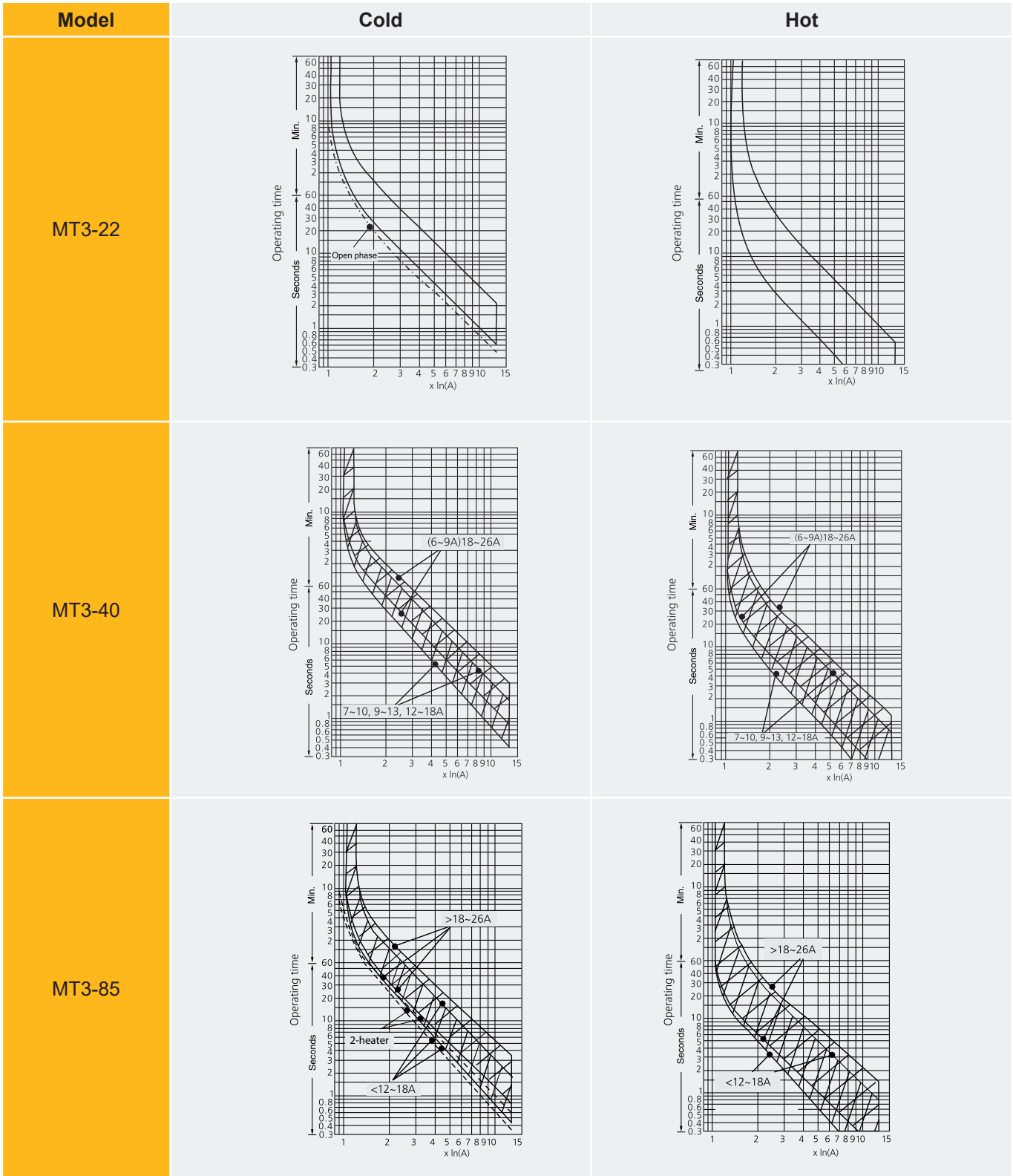


Table of Specifications

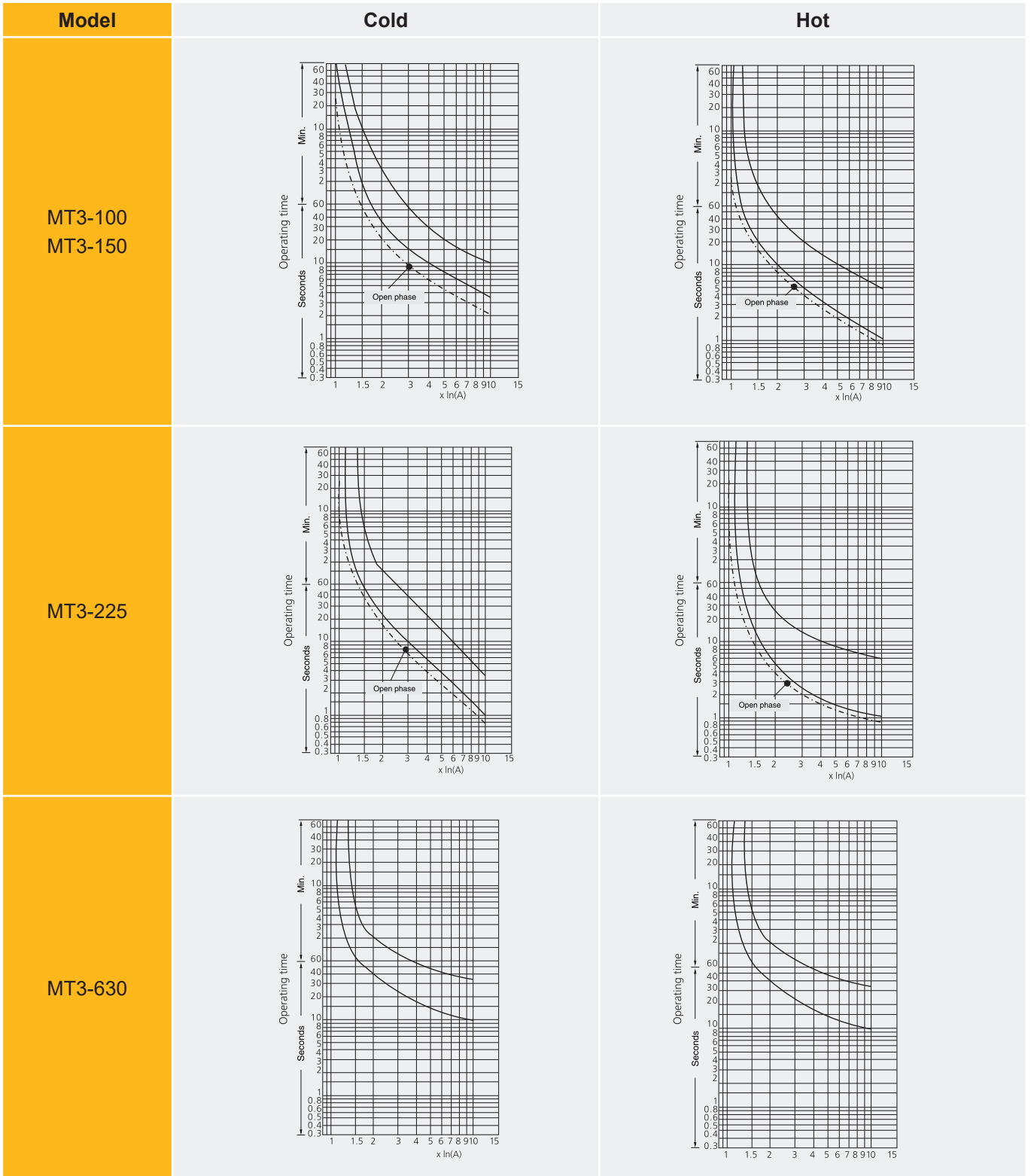
Model		MT3 – 100 MT3 - 150	MT3 - 225	MT3 - 630
Rated Operational Voltage, Ue		690V		
Rated Insulation Voltage, Ui		690V		
Rated Impulse Withstand Voltage, Uimp		6kV		
Rated Frequency		50/60Hz		
Poles		3P		
Temperature compensation		-5~+40°C		
Trip class		10A (20A)		
Functions		Trip, Reset A/H		
Auxiliary contact rated current (AC15 duty)		5A / 240V		
Terminals	Main-upstream	Screw clamp		
	Main-downstream	Screw clamp		
	Auxiliary	Screw clamp		
Setting range		34A ~ 150A	65A ~ 240A	220A ~ 630A
		34-50 (41A)	65-100 (80A)	220-300 (260A)
		39-57 (48A)	85-125 (107A)	300-500 (400A)
		43-65 (56A)	100-160 (130A)	380-630 (505A)
		54-80 (67A)	120-180 (150A)	-
		65-100 (80A)	160-240 (200A)	-
		85-125 (107A)	-	-
		100-160 (130A)	-	-
		100-160 only at MT3-150	-	-
Weight		0.5/0.6kg	2.5kg	3.1kg
Connection	Main terminal	16 ~ 95mm ² (M8)	35 ~ 150mm ² (M10)	95 ~ 325mm ² (M16)
	Aux. contact	1 ~ 6 mm ² (M4)		
Applied contactors		MC3-100	MC3-185	MC3-265
		MC3-130	MC3-225	MC3-330
		MC3-150	-	MC3-400
		-	-	MC3-500
		-	-	MC3-630
Separate mounting unit		-	-	-



Characteristics Curve



Characteristics Curve

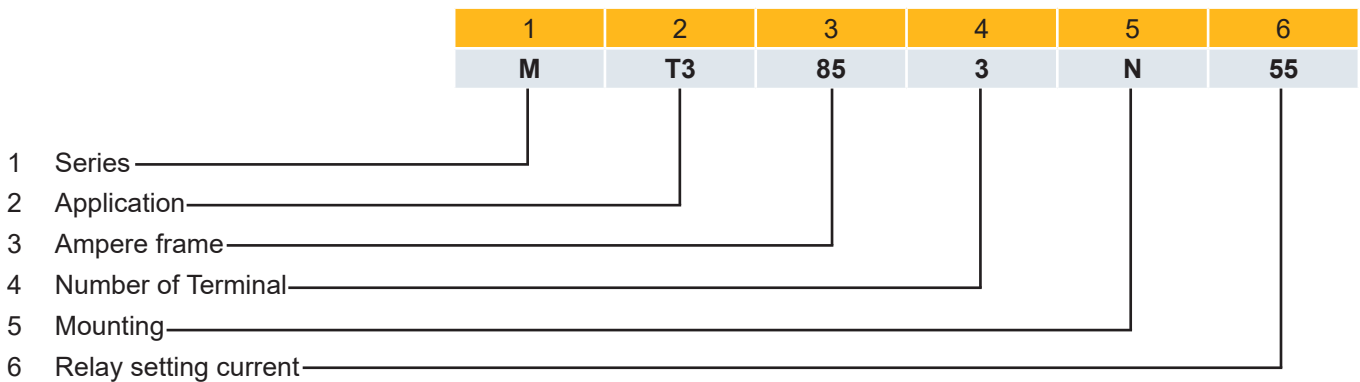


Quick Option for Thermal Overload Relays

Rated Operational Power		Thermal Overload Relays		AC Contactor
kW	Current at 400V (A)	Model	Setting Range	Model
0.37	1.1	MT3-22	1~1.6	MC3-9
0.55	1.5	MT3-22	1~1.6	MC3-9
0.75	1.9	MT3-22	1.6~2.5	MC3-9
1.1	2.7	MT3-22	2.5~4	MC3-9
1.5	3.6	MT3-22	2.5~4	MC3-9
2.2	4.9	MT3-22	4~6	MC3-9
3.0	6.5	MT3-22	5~8	MC3-12
4.0	8.5	MT3-22	7~10	MC3-12
5.5	11.5	MT3-22	9~13	MC3-18
7.5	15.5	MT3-22	12~18	MC3-22
11	22	MT3-40	18~25	MC3-32
15	29	MT3-40	24~36	MC3-40
18.5	35	MT3-40	28~40	MC3-40
22	41	MT3-85	34~50	MC3-50
30	55	MT3-85	45~65	MC3-65
37	66	MT3-85	54~75	MC3-75
45	80	MT3-85	63~85	MC3-85
55	90	MT3-150	70~95	MC3-100
59	97	MT3-150	80~105	MC3-130
75	125	MT3-150	110~150	MC3-150
90	146	MT3-225	120~185	MC3-185
110	178	MT3-225	160~240	MC3-225
132	215	MT3-225	160~240	MC3-225
160	256	MT3-630	220~300	MC3-330
200	330	MT3-630	300~500	MC3-400
220	353	MT3-630	300~500	MC3-400
250	401	MT3-630	300~500	MC3-500
300	481	MT3-630	380~630	MC3-630



Model Definition



2. Application

T1	Electronic thermal overload relay
T2	Relay thermal overload and phase loss
T3	Standard thermal overload relay

3. Ampere frame

22	1~22A
40	4~40A
85	9~85A
100	34~125A
150	34~160A
225	65~240A
630	220~630A

4. Number of Terminal

2	2-heater
3	3-heater

5. Mounting

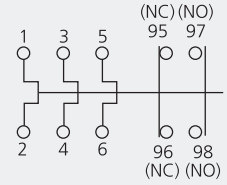
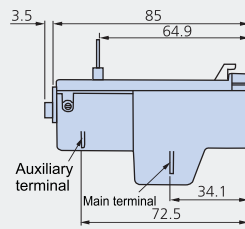
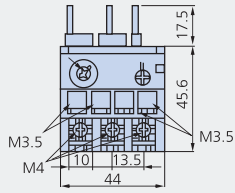
N	On contactor
Y	Separate mounting

6. Relay setting current

1.3	1-1.6A	41	34-50A
2.1	1.6-2.5A	48	39-57A
3.3	2.5-4A	56	43-65A
5	4-6A	67	54-80A
6.5	5-8A	80	65-100A
7.5	6-9A	107	85-125A
8.5	7-10A	130	100-160A
11	9-13A	150	120-180A
15	12-18A	200	160-240A
19	16-22A	280	220-300A
22	18-26A	400	300-500A
30	24-36A	505	380-630A
43	28-40A		
42	34-50A		
55	45-65A		
65	54-75A		
74	63-85A		

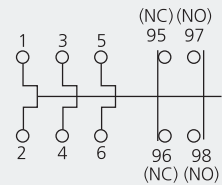
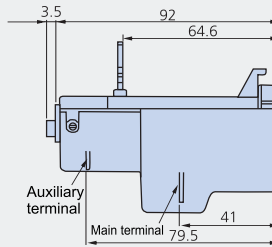
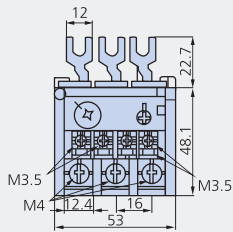
Dimensions

MT3-22



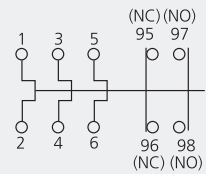
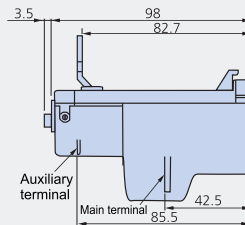
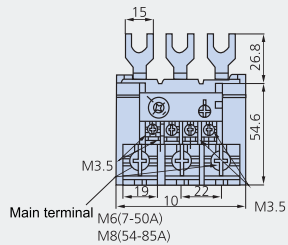
0.11kg

MT3-40



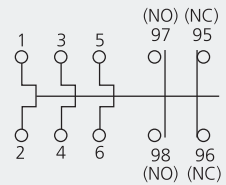
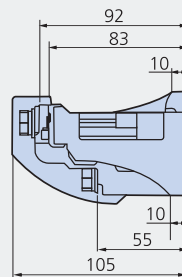
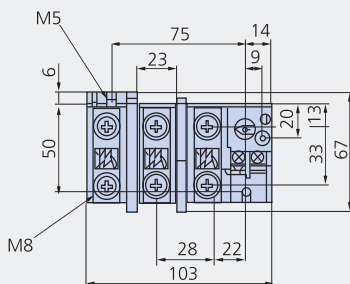
0.17kg

MT3-85



0.3kg

MT3-100

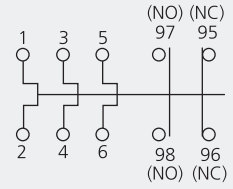
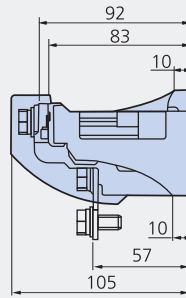
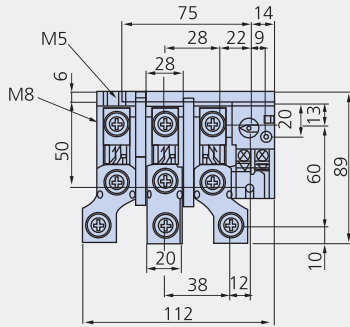


0.48kg



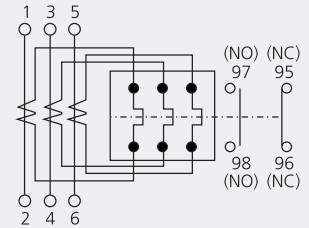
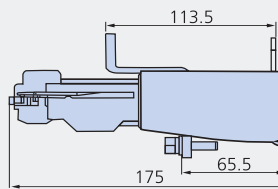
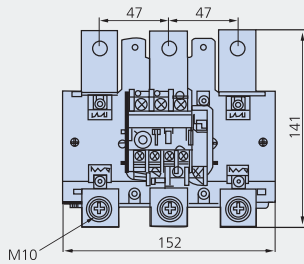
Dimensions

MT3-150



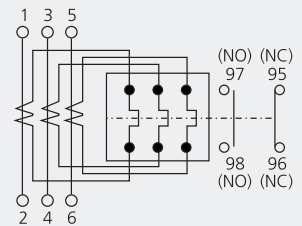
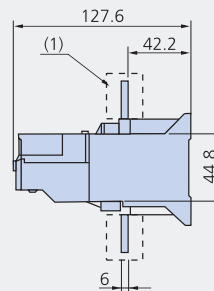
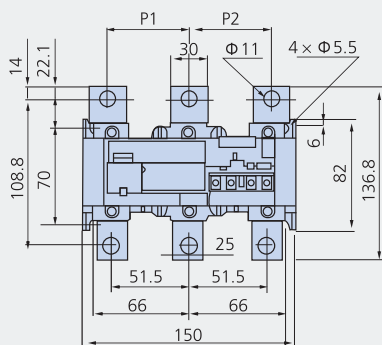
0.6kg

MT3-225



2.5kg

MT3-630



Characteristics

Contactors are assembled with damping resistors which limit the high in-rush current when the capacitors are switched on. They are assembled with early-make contact block, which is switched on before the main contacts, thus, limiting the in-rush current.

When power is supplied, capacitor creates oscillation frequency (1~15KHZ) and generates transient current (over 180 In). Capacitor switching unit limits the transient current, thus, protects main contacts.

When power is supplied to magnetic contactor, the value of maximum current is reduced as following cases.

- Inductance of main power supply is too high.
- Rating of line transformer is too low.
- Short circuit of transformer is too high.

Swichover capacitor can switch over 3-phase single-or multiple-stage capacitor bank. In conformity with IEC/EN 69047-4941, UL and CSA.

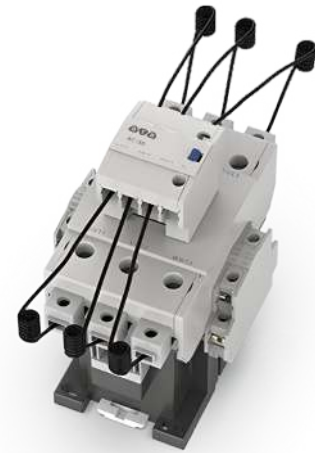
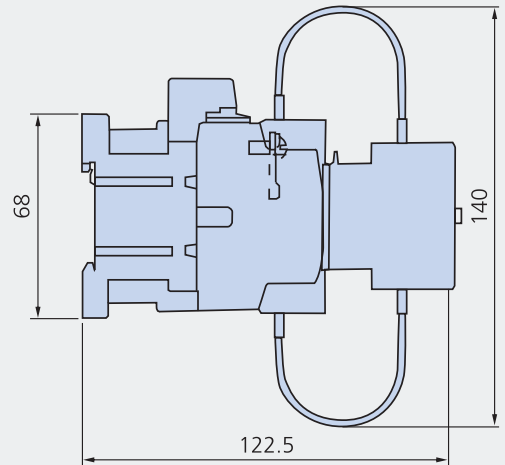
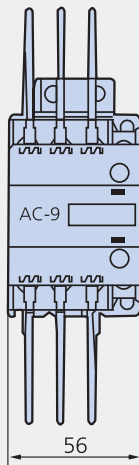


Table of Specifications

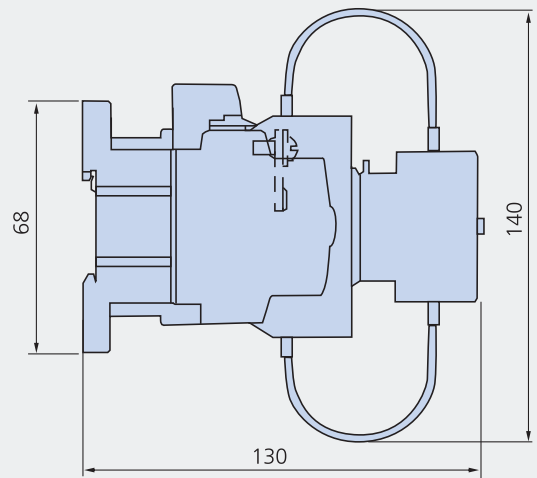
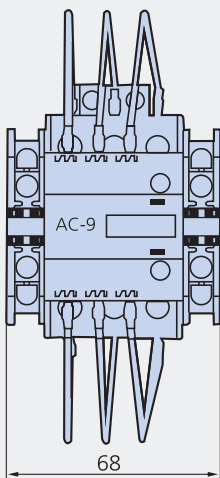
Model		Capacitor capacity			Rated current	Operations/ hours	Electrical life	
		220-240V	400-440V	660-690V			440V	690V
MC3-9 with AC-9	MC3-9C	5kVAr	9.7kVAr	14kVAr	14A	240	300000	200000
MC3-12 with AC-9	MC3-12C	6.5kVAr	12.5kVAr	18kVAr	18A	240	300000	200000
MC3-18 with AC-9	MC3-18C	8.5kVAr	16.7kVAr	24kVAr	24A	240	300000	200000
MC3-22 with AC-9	MC3-22C	10kVAr	18kVAr	26kVAr	26A	240	300000	200000
MC3-32 with AC-9	MC3-32C	15kVAr	25kVAr	36kVAr	36A	240	300000	200000
MC3-40 with AC-9	MC3-40C	20kVAr	33.3kVAr	48kVAr	48A	240	300000	200000
MC3-50 with AC-50	MC3-50C	22kVAr	40kVAr	58kVAr	58A	100	300000	200000
MC3-65 with AC-50	MC3-65C	25kVAr	45.7kVAr	66kVAr	66A	100	300000	200000
MC3-75 with AC-50	MC3-75C	29.7kVAr	54kVAr	78kVAr	78A	100	300000	200000
MC3-85 with AC-50	MC3-85C	35kVAr	60kVAr	92kVAr	92A	100	300000	200000

Dimensions

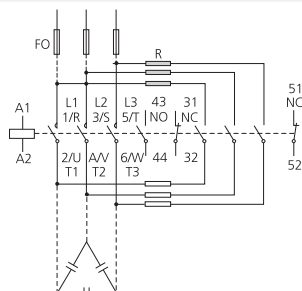
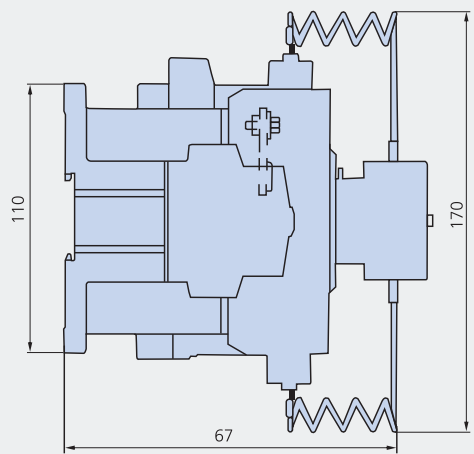
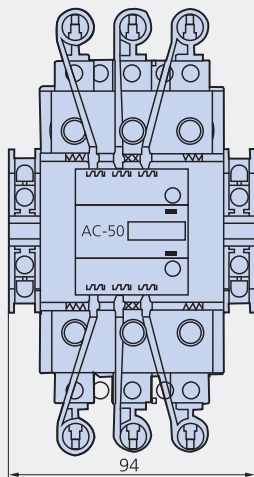
MC3-9C
MC3-12C
MC3-18C
MC3-22C



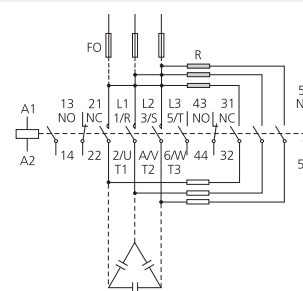
MC3-32C
MC3-40C



MC3-50C
MC3-65C
MC3-75C
MC3-85C



MC3-9C, MC3-12C
MC3-18C, MC3-22C



MC3-32C, MC3-40C, MC3-50C
MC3-65C, MC3-75C, MC3-85C

Table of Specifications

Model		AU-1	AU-2 AU-4	AU-100	
Rated Operational Voltage, Ue		550V			
Rated Insulation Voltage, Ui		690V			
Rated Impulse Withstand Voltage, Uimp		6kV			
Rated Frequency		50/60Hz			
Contact sensibility	Voltage	17V DC	24V DC		
	Current	5mA DC	10mA DC		
Rated operation current	AC15 duty	120V	6A	6A	6A
		240V	5A	3A	5A
		440V	3A	1.5A	3A
		550V	3A	1.2A	3A
	DC13 duty	24V	3A	3A	6A
		48V	1.5A	1.5A	3A
		110V	0.55A	0.55A	1.2A
		220V	0.27A	0.27A	0.2A
Rated thermal current		16A			
Frequency (times/hour)		1800			
Electrical life (10000 times)	AC15	50			
	AC12	25			
	DC13	50			
Mechanical (10000 times)		2500	20000	1000	
Contact arrangement		1NO1NC	1NO1NC 2NO2NC	1NO1NC	
Weight		41g	26g 50g	54g	
Connection (Conductor size)		1~2.5 mm ²			
Applied contactors		MC3-9, 12, 18, 22, 32, 40, 50, 65, 75, 85	MC3-9, 12, 18, 22, 32, 40, 50, 65, 75, 85 and MC3-265, 330, 400, 500, 630, 800	MC3-100, 130, 150, 185, 225	



Dry Power Capacitors

Application

Three-phased Cylindrical - Dry Power Capacitors is used to correct power factor for motors, low voltage transformers and inside industrial switchboard. It is sometimes used with blocking reactors with harmonics presence.



Salient features

- Dry type, cylindrical aluminium case
- Available for rated voltage 440V / 3 phase connection
- Maximum permissible current 1.5 In
- Maximum inrush current 200 In
- Loss < 0,2W/kVAR
- Statistical Life Expectancy > 130,000 operating hours
- Equipped with pressure activated series interruptor
- Compliance to standard IEC/EN 60831-1 & 2

Technical specifications

General characteristics	
Standards	IEC/EN 60831-1/ 2
Type	Dry, Self healing
Rated Voltage (Un)	240V to 690V
Frequency (fn)	50/60Hz
Connection	3-phase (Internal delta)
Power range	1 to 50 kvar
Capacitance tolerance	-5% / +10%
Dielectric loss	≤ 0.2W / kVAR
Testing voltage between terminals / time	2.15 Un / 10s
Testing voltage between terminals and container / time	4kV / 10s
Lighting impulse test between terminal and container	8kV (Peak)
Maximum permissible voltage	1.1 Un (8hours in evenry 24hours) 1.15 Un (30minutes in evenry 24hours) 1.2 Un (5minutes) 1.3 Un (1minute)
Discharge resistor	Fitted, parameters in the table
Construction	
External terminal box & casing finishing	Extruded aluminum casing
Dielectric	Metallized polypropylene film with Zn/Al alloy.
Plate	Zinc-Aluminum alloy (*)
Impregnation	Non-PCB, biodegradable soft resin
Working conditions	
Temperature category	- 25°C to +55°C (class D)
Max altitude	2000 m
Max relative humidity	95%
Maximum permissible current	1.5 In
Maximum inrush current	200 In
Statistical life expectancy	> 130,000 Operating hours (**)
IP rating	IP20
Installation characteristics	
Mounting position	Indoor, upright & horizontal
Fastening / earthing	Threaded M12 stud at the bottom (≤ 15Nm)
Terminals	Screw terminal top deck
Safety features	
Safety Device	Auto disconnect, when capacitor has trouble (Pressure Active Series Interruptor)
Protection	IP20
Note	
(*) Special resisity & profile, special edge - Wave-cut (THD ≤4%)	
(**) Respect the manufacturer's technique	

Dimension and structure

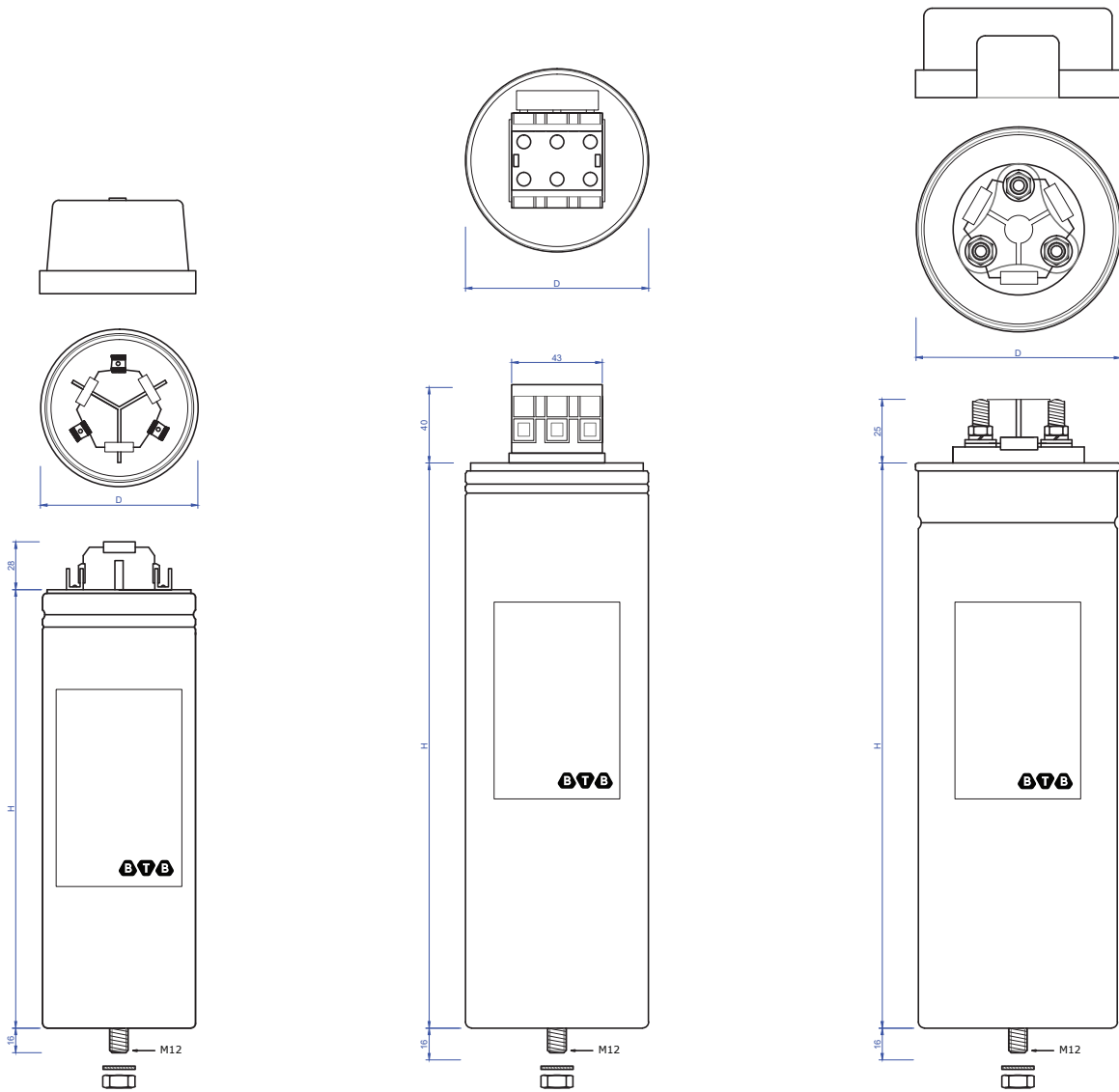


Fig A

Fig B

Fig C

Capacitor code M data sheet - 240V/50Hz

Product Code	U_N	f_N	Q_N	C_N	I_N	Dimension (mm)		Resistor (k Ω)	Weight ± 0.1 (kg)	Figure
	(V)	(Hz)	(kVAR)	(μ F)	(A)	$\varnothing D$	H			
BDC2405M	240	50	5	3x97	12	86	225	100	1.4	Fig B
BDC2410M	240	50	10	3x194	24	100	287	100	2.5	Fig B
BDC2415M	240	50	15	3x276	36	120	287	100	3.0	Fig B

Capacitor code I data sheet - 250V/50Hz

Product Code	U_N	f_N	Q_N	C_N	I_N	Dimension (mm)		Resistor (k Ω)	Weight ± 0.1 (kg)	Figure
	(V)	(Hz)	(kVAR)	(μ F)	(A)	\varnothing D	H			
BDC2505I	250	50	5	3x85	11.5	75	200	100	1.1	Fig C
BDC2510I	250	50	10	3x170	23	85	300	100	2.0	Fig C
BDC2515I	250	50	15	3x255	35	100	300	100	2.6	Fig C
BDC2520I	250	50	20	3x340	46	116	300	80	3.5	Fig C
BDC2525I	250	50	25	3x424	58	136	300	80	4.6	Fig C

Capacitor code M data sheet - 415V/50Hz

Product Code	U_N	f_N	Q_N	C_N	I_N	Dimension (mm)		Resistor (k Ω)	Weight ± 0.1 (kg)	Figure
	(V)	(Hz)	(kVAR)	(μ F)	(A)	\varnothing D	H			
BDC4105M	415	50	5	3x31	7	65	206	680	0.5	Fig A
BDC4110M	415	50	10	3x62	14	75	225	100	1.4	Fig B
BDC4115M	415	50	15	3x93	21	86	225	100	1.5	Fig B
BDC4120M	415	50	20	3x123	28	86	287	100	1.8	Fig B
BDC4125M	415	50	25	3x154	35	100	287	100	2.4	Fig B
BDC4130M	415	50	30	3x185	42	100	287	100	2.5	Fig B

Capacitor code I data sheet - 415V/50Hz

Product Code	U_N	f_N	Q_N	C_N	I_N	Dimension (mm)		Resistor (k Ω)	Weight ± 0.1 (kg)	Figure
	(V)	(Hz)	(kVAR)	(μ F)	(A)	\varnothing D	H			
BDC4105I	415	50	5	3x31	7	63	200	680	0.7	Fig A
BDC4110I	415	50	10	3x62	14	85	200	100	1.3	Fig B/C
BDC4115I	415	50	15	3x93	21	85	300	100	2.0	Fig B/C
BDC4120I	415	50	20	3x123	28	90	300	100	2.3	Fig B/C
BDC4125I	415	50	25	3x154	35	100	300	100	2.6	Fig B/C
BDC4130I	415	50	30	3x185	42	116	300	100	3.2	Fig B/C

Capacitor code M data sheet - 440V/50Hz

Product Code	U_N	f_N	Q_N	C_N	I_N	Dimension (mm)		Resistor (k Ω)	Weight ± 0.1 (kg)	Figure
	(V)	(Hz)	(kVAR)	(μ F)	(A)	\varnothing D	H			
BDC4405M	440	50	5	3x27	7	60	153	680	0.5	Fig A
BDC4410M	440	50	10	3x55	13	75	225	100	1.3	Fig B
BDC4415M	440	50	15	3x82	20	75	225	100	1.3	Fig B
BDC4420M	440	50	20	3x110	26	75	287	100	2.0	Fig B
BDC4425M	440	50	25	3x137	33	86	287	100	2.1	Fig B
BDC4430M	440	50	30	3x164	39	86	329	100	2.5	Fig B



Capacitor code I data sheet - 440V/50Hz

Product Code	U_N	f_N	Q_N	C_N	I_N	Dimension (mm)		Resistor	Weight ± 0.1	Figure
	(V)	(Hz)	(kVAR)	(μ F)	(A)	\varnothing D	H	(k Ω)	(kg)	
BDC4405I	440	50	5	3x27	7	63	200	680	0.7	Fig A
BDC4410I	440	50	10	3x55	13	75	200	100	1.1	Fig B/C
BDC4415I	440	50	15	3x82	20	75	300	100	1.5	Fig B/C
BDC4420I	440	50	20	3x110	26	85	300	100	2.0	Fig B/C
BDC4425I	440	50	25	3x137	33	90	300	100	2.3	Fig B/C
BDC4430I	440	50	30	3x164	39	100	300	100	2.6	Fig B/C

Capacitor code M data sheet - 480V/50Hz

Product Code	U_N	f_N	Q_N	C_N	I_N	Dimension (mm)		Resistor	Weight ± 0.1	Figure
	(V)	(Hz)	(kVAR)	(μ F)	(A)	\varnothing D	H	(k Ω)	(kg)	
BDC4805M	480	50	5	3x23	6	65	206	680	0.8	Fig A
BDC4810M	480	50	10	3x46	12	75	225	100	1.4	Fig B
BDC4815M	480	50	15	3x69	18	86	287	100	1.8	Fig B
BDC4820M	480	50	20	3x92	24	86	287	100	2.4	Fig B
BDC4825M	480	50	25	3x115	30	86	329	100	2.5	Fig B
BDC4830M	480	50	30	3x138	36	120	287	100	2.9	Fig B

Capacitor code M data sheet - 525V/50Hz

Product Code	U_N	f_N	Q_N	C_N	I_N	Dimension (mm)		Resistor	Weight ± 0.1	Figure
	(V)	(Hz)	(kVAR)	(μ F)	(A)	\varnothing D	H	(k Ω)	(kg)	
BDC5205M	525	50	5	3x19	5	65	206	680	0.5	Fig A
BDC5210M	525	50	10	3x38	11	75	225	100	1.3	Fig B
BDC5215M	525	50	15	3x58	16	75	287	100	1.4	Fig B
BDC5220M	525	50	20	3x77	22	86	287	100	1.8	Fig B
BDC5225M	525	50	25	3x96	27	86	287	100	2.4	Fig B
BDC5230M	525	50	30	3x115	33	86	329	100	2.5	Fig B

Intelligent Capacitor

Application

BIC series intelligent combined low voltage power capacitor compensation device (intelligent power capacitor) is an intelligent reactive power compensation device applied to 0.4kV low voltage distribution network to reduce line loss, improve power factor and power quality.

This product can be used in industrial areas like steel, chemical, construction materials, papermaking, textile, minel, electricity, telecommunications, aluminium, shipping ports, tabacoo, brewing, carmaking, precision electronics, and precision machinery.

BIC3 series typically integrate modern measurement and control equipment, power electronics, communication networks, automation controls, capacitors and other advanced technologies.

BIC37 series with reactors are designed primarily for high-performance power situations harmonics and traditional capacitors cannot work. It's not possible only meets reactive power compensation, improving power factor, but also limits the influence of corresponding harmonics on the capacitor and improve power quality.



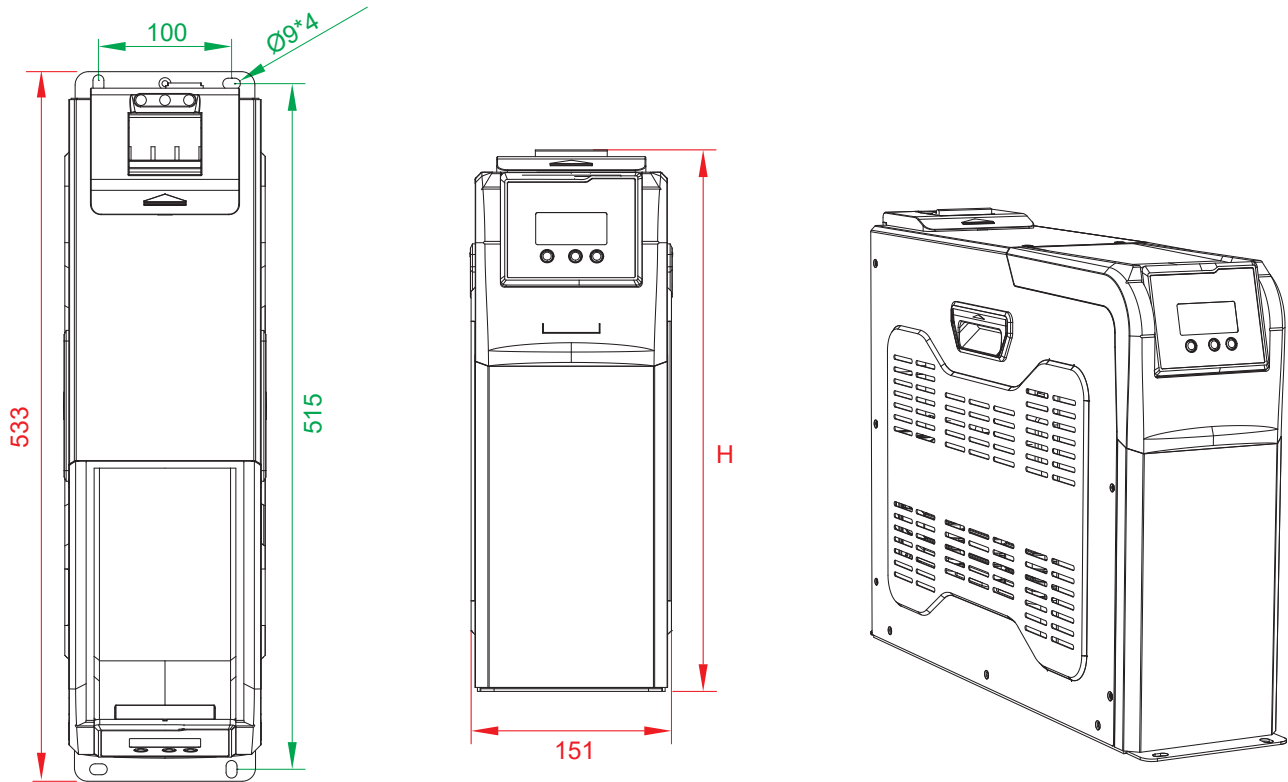
Salient features

- New generation box type
- Automatic control
- Communication protocol Modbus / DL645 protocol
- Protective function U / I / THD / over-temperature
- Integrated 7% & 14% Harmonic Resistance
- Reduce installation time
- Compliance to standard GB/T15576-2008

Technical specifications

General characteristics	
Standards	IEC/EN 61921 & GB/T15576-2008
Type	New generation box type, Self healing
Rated Voltage (Un)	250V to 525V $\pm 20\%$
Frequency (fn)	50Hz $\pm 10\%$
Connection	3-phase
Power range	5 to 60 kvar
Capacitance tolerance	-5% / +10%
Reactance ratio (%)	7% / 14% (for BIC series with reactors)
Dielectric	Metallized polypropylene film with Zn/Al alloy
Impregnation	Non-PCB, biodegradable soft resin
Maximum permissible voltage	1.1 Un (8hours in every 24hours) 1.15 Un (30minutes in every 24hours) 1.2 Un (5minutes) 1.3 Un (1minute)
Discharge resistor	Fitted, parameters in the table
Measurement and control	
Measurement tolerance	Voltage: $\leq \pm 0.5\%$ (0.8~1.2Un), current: $\leq \pm 0.5\%$ (0.2~1.2In) active power: $\leq \pm 2\%$, power factor: $\leq \pm 1\%$, temperature: $\pm 1^\circ\text{C}$
Protection tolerance	Voltage: $\leq \pm 1\%$, current: $\leq \pm 1\%$, temperature: $\pm 1^\circ\text{C}$, time: $\pm 0.1\text{s}$
Reactive compensation parameters	Reactive power compensation tolerance: $\leq 50\%$ of the min. capacitor capacity, capacitor switching time: $\geq 10\text{s}$, can be set between 10s and 180s
Reliability paramete	Control accuracy: 100%, allowable switching times: 1 million times, capacitor capacity running time attenuation rate: $\leq 1\%$ / year, capacitor capacity switching attenuation rate: $\leq 0.1\%$ / 10,000 times
Working conditions	
Temperature category	- 25°C to +55°C (class D)
Max altitude	2000 m
Max relative humidity	Relative humidity $\leq 50\%$ at 40°C; $\leq 90\%$ at 20°C
Environmental condition	No harmful gas and steam, no conductive or explosive dust, no severe mechanical vibration
Mounting position	Indoor, upright
THDv	$\leq 4\%$ and $\leq 5\%$ (for BIC series with reactors)
THDi	$\leq 20\%$
Safety features	
Protective function	Over-voltage protection, under-voltage protection, short-circuit protection, over-current protection, over-harmonic protection, over-temperature protection, drive failure protection
Communication monitoring capability	
Communication interface	RS485
Communication protocol	Modbus protocol / DL645

Dimension and structure



Functional equivalence diagram of intelligent capacitor



The reactor appears in the Intelligent anti-harmonic capacitor

Intelligent Capacitor data sheet (three phase)

Product Code	U_N (V)	f_N (Hz)	Q_N (kVAR)	Dimension WxDxH (mm)
BIC3-4505/05	450	50	10	80×395×215
BIC3-4510/05	450	50	15	80×395×235
BIC3-4510/10	450	50	20	80×395×235
BIC3-4515/15	450	50	30	80×395×315
BIC3-4520/10	450	50	30	80×395×315
BIC3-4520/20	450	50	40	80×395×315
BIC3-4525/25	450	50	50	80×395×345
BIC3-4530/30	450	50	60	80×395×345

When equipped with controller, can be only used PFR-Z32 controller.

Intelligent Capacitor data sheet (split phase)

Product Code	U_N (V)	f_N (Hz)	Q_N (kVAR)	Dimension WxDxH (mm)
BIC1-2505	250	50	5	80×395×215
BIC1-2510	250	50	10	80×395×215
BIC1-2515	250	50	15	80×395×235
BIC1-2520	250	50	20	80×395×265
BIC1-2525	250	50	25	80×395×315
BIC1-2530	250	50	30	80×395×315

Intelligent anti-harmonic capacitor data sheet (split phase)

Product Code	U_N (V)	f_N (Hz)	Q_N (kVAR)	Reactance ratio	Dimension WxDxH (mm)
BIC17-2805	280	50	5	7%	150x533x357
BIC17-2810	280	50	10	7%	150x533x357
BIC17-2815	280	50	15	7%	150x533x357
BIC17-2820	280	50	20	7%	150x533x357
BIC17-2825	280	50	25	7%	150x533x407
BIC17-2830	280	50	30	7%	150x533x407

Product Code	U_N (V)	f_N (Hz)	Q_N (kVAR)	Reactance ratio	Dimension WxDxH (mm)
BIC114-3005	300	50	5	14%	150x533x357
BIC114-3010	300	50	10	14%	150x533x357
BIC114-3015	300	50	15	14%	150x533x357
BIC114-3020	300	50	20	14%	150x533x357
BIC114-3025	300	50	25	14%	150x533x407
BIC114-3030	300	50	30	14%	150x533x407

Intelligent anti-harmonic capacitor data sheet (three phase)

Product Code	U_N (V)	f_N (Hz)	Q_N (kVAR)	Reactance ratio	Dimension WxDxH (mm)
BIC37-4810	480	50	10	7%	150x533x357
BIC37-4820	480	50	20	7%	150x533x357
BIC37-4830	480	50	30	7%	150x533x407
BIC37-4840	480	50	40	7%	150x533x407
BIC37-4850	480	50	50	7%	270x482x430
BIC37-4860	480	50	60	7%	270x482x430
BIC37-4870	480	50	70	7%	270x482x430

When equipped with controller, can be only used PFR-Z32 controller.

Intelligent anti-harmonic capacitor data sheet (three phase)

Product Code	U_N (V)	f_N (Hz)	Q_N (kVAR)	Reactance ratio	Dimension WxDxH (mm)
BIC314-5210	525	50	10	14%	150x533x357
BIC314-5220	525	50	20	14%	150x533x357
BIC314-5230	525	50	30	14%	150x533x407
BIC314-5240	525	50	40	14%	150x533x407
BIC314-5250	525	50	50	14%	270x482x430
BIC314-5260	525	50	60	14%	270x482x430
BIC314-5270	525	50	70	14%	270x482x430

When equipped with controller, can be only used PFR-Z32 controller.

Accessories (additional purchased)

Secondary current transformer





Three phase compensation type secondary current transformer



Split phase (mixed) compensation type secondary current transformer



Communication cable

Specification	Length	Picture	Usage
W20	20cm		Connection of two adjacent intelligent capacitors
W80	80cm		Connection of upper and lower layers of intelligent capacitors
W260	260cm		Connection of intelligent capacitors in main and sub cabinet
D300-W	300cm		Connection of intelligent capacitor and controller

Description of the model

B	IC	3	7	-	48	10	/	10
1	2	3	4		5	6		7

1	Enterprise code: BTB Electric	5	Capacitor voltage: 25: 250V; 30: 28: 280V;	
2	Code: Intelligent Capacitor		30: 300V; 45: 450V; 52: 525V	
3	3: 3 phase; 1: 1 phase	6	Capacitor capacity: 10: 10kVAR; 20: 20kVAR...	
4	Reactance ratio: 7% or 14% (anti-harmonic)	7	2nd capacitor capacity (if any)	

Low voltage reactors

Application

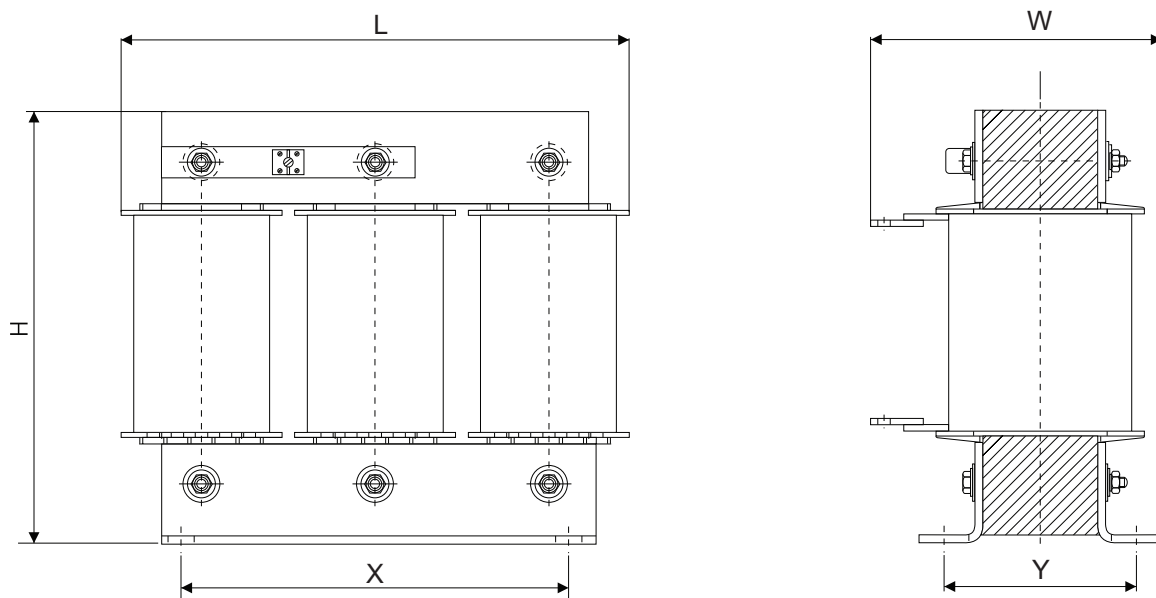
Frequent use of power electronic devices with nonlinear loads leads to harmonic distortion in electrical system. This nonsinusoidal load causes increase of effective current of power capacitor and other components of the system as well as the possibility of capacitor resonance with other inductive loads. Finally it may lead to problems or even failures in the installation. The solution is to use detuning (filtering) reactors, which creates a series resonant circuit with power capacitors. This detuned system prevents the installation from resonance effect and also acts as a filter for higher harmonic content. Usually there is recommended to use detuning reactors for the total voltage distortion THD-U higher than 3 %.

Salient features

- Special Design with High-Level Saturation
- Superior Performance
- High-Grade Laminations in Magnetic Circuit
- Easy Pad Termination & Mounting
- Low Power Losses
- Protection from Excess Temperature



Dimension and structure



Technical specifications

General characteristics	
Standards	IEC/EN60076-6
Rated voltage (Un)	200V to 690V
Frequency (In)	50Hz
Power range	10 to 100 kvar (Ordered for special sizes)
Resonance frequency	6% - 204Hz / 7% - 189 Hz / 14% - 134Hz
Impedance ratio / model	P= 6% of Capacitor Value / BRH3-6 P= 7% of Capacitor Value / BRH3-7 P= 14% of Capacitor Value / BRH3-14
Tolerance of inductance	+/- 3% at Effective Current (Ieff)
The harmonic content of line voltage	U3 = 0.5%, U5 = 6%, U7 = 5%, U11 = 3.5%, U13 = 3%
Maximum current including harmonics overload	1.5 Times the Capacitor current
Insulation level	1.1 kV
Insulation strength testing voltage	3kV / 1min
Construction	
Design	Three phase, iron core with multi air gap
Coil winding material	Aluminium [Copper on request]
Duty cycle	Continuous
Vacuum impregnation	Yes
Working conditions	
Temperature category	- 25°C to +55°C
Maximum reactor operating temperature	135°C at ambient temperature 45°C
Insulation class	Class F / H (155°C / 180°C)
Max altitude	2000 m
Max relative humidity	95%
Linearity of Inductance	1.8 x Ic
Statistical life expectancy	> 200 000 hours
Installation characteristics	
Ventilation	Air-Cooled
IP Class	IP 00 [Indoor]
Noise level	Below 63db
Safety features	
Thermal overvload protection	Built-in thermostat cut off at 135°C

For p = 7% reactor, with 440V/50Hz capacitor at 380-400V/50Hz only

Product code	Q _c (440V)	Reactor Inductance	Dimension (mm)					Fixing Holes	Irms	R	Total Loss
	kVAR	mH	L	W	H	X	Y	mm	A	mOhm	W
BRH3 7/400/10	10	4.31	190	136	205	150	85	Φ8x12	14.5	35.8	74.8
BRH3 7/400/15	15	2.88	190	144	205	150	95	Φ8x12	21.8	30.2	82.3
BRH3 7/400/20	20	2.16	225	165	195	210	105	Φ10x20	28.6	14.66	113
BRH3 7/400/25	25	1.73	240	165	200	210	110	Φ10x20	35.7	14.66	143
BRH3 7/400/30	30	1.44	250	170	200	210	115	Φ10x20	42.8	12.48	161
BRH3 7/400/40	40	1.08	275	175	230	210	130	Φ10x20	57.1	8.77	215
BRH3 7/400/50	50	0.86	275	175	230	210	130	Φ10x20	71.5	6.51	240
BRH3 7/400/60	60	0.72	300	180	260	210	130	Φ10x20	85.7	4.19	260
BRH3 7/400/70	70	0.62	300	210	260	265	130	Φ10x20	100.0	3.57	281
BRH3 7/400/75	75	0.58	300	220	260	265	140	Φ10x20	107.0	3.20	308
BRH3 7/400/80	80	0.54	300	220	260	265	145	Φ13x22	114.2	3.20	327
BRH3 7/400/100	100	0.43	300	230	290	265	150	Φ13x22	142.8	2.07	380

For p = 14% reactor, with 525V/50Hz capacitor at 380-415V/50Hz only

Product code	Q _c (525V)	Reactor Inductance	Dimension (mm)					Fixing Holes	Irms	R	Total Loss
	kVAR	mH	L	W	H	X	Y	mm	A	mOhm	W
BRH3 14/400/10	10	12.3	190	156	205	150	105	Φ8x12	11.0	126.7	82.7
BRH3 14/400/15	15	8.19	240	161	210	210	115	Φ10x22	16.5	76.3	119.4
BRH3 14/400/20	20	6.14	290	171	210	210	125	Φ10x20	22.0	44.3	180
BRH3 14/400/25	25	4.91	290	185	235	210	130	Φ10x20	27.5	28.7	215
BRH3 14/400/30	30	4.09	295	195	235	210	140	Φ10x20	33	23.6	238
BRH3 14/400/40	40	3.07	300	200	265	265	150	Φ10x20	44	16.2	242
BRH3 14/400/50	50	2.46	330	200	290	265	150	Φ10x20	55	11.0	268
BRH3 14/400/60	60	2.05	330	200	290	265	150	Φ10x20	66	8.5	288
BRH3 14/400/70	70	1.76	350	215	315	265	175	Φ10x20	77	7.2	334
BRH3 14/400/75	75	1.64	350	215	315	265	175	Φ10x20	82.5	6.5	340
BRH3 14/400/80	80	1.54	350	240	315	265	175	Φ13x22	88	5.9	350
BRH3 14/400/100	100	1.23	420	250	315	265	150	Φ13x22	110	3.8	382

Medium voltage series reactor

Application

The products, also called detuned reactors or filter reactors, are generally used in series with medium voltage capacitors in PFC system, in order to reach its target induced current. It possesses the functions of increasing power factors and limiting harmonic current.



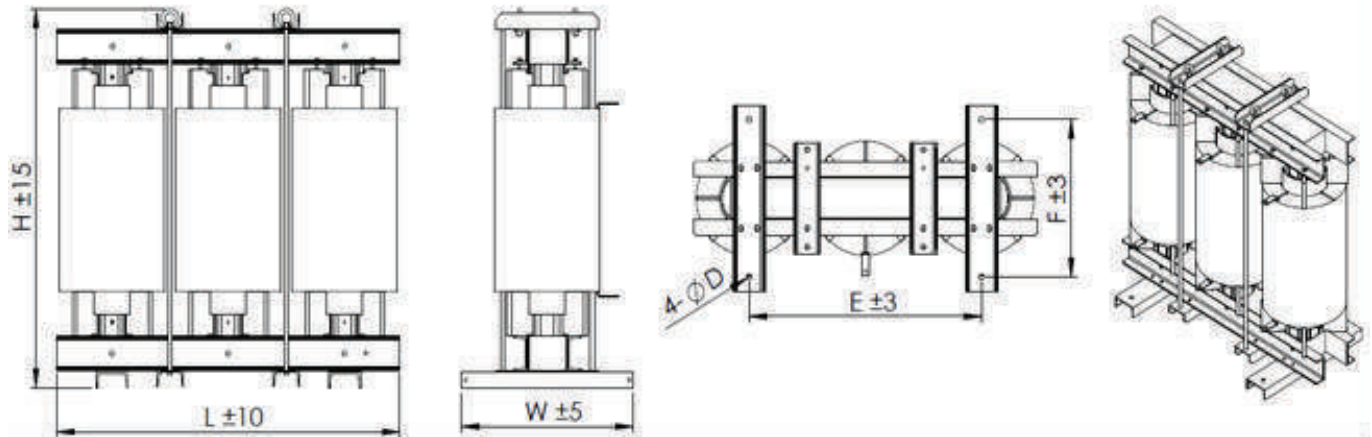
Salient Features

- Very higher linearity
- Lower temperature rising
- Stand 25 times short circuit current in one second
- Easy Pad Termination & Mounting
- VPI process control
- Copper connections
- EN standard type testing

Technical specifications

General characteristics	
Standards	IEC/EN60076-6
Rated voltage (Un)	1kV to 35kV
Frequency (In)	50Hz
Power range	100 to 2500 kvar (Ordered for special sizes)
Resonance frequency	6% - 204Hz / 7% - 189 Hz / 14% - 134Hz
Impedance ratio / model	P= 6% of Capacitor Value P= 7% of Capacitor Value P= 14% of Capacitor Value
Tolerance of inductance	+/- 3% at Effective Current (Ieff)
The harmonic content of line voltage	U3 = 0.5%, U5 = 6%, U7 = 5%, U11 = 3.5%, U13 = 3%
Construction	
Design	Three phase, iron core with multi air gap
Coil winding material	Aluminium [Copper on request]
Duty cycle	Continuous
Vacuum impregnation	Yes
Working conditions	
Temperature category	- 25°C to +55°C
Maximum reactor operating temperature	135°C at ambient temperature 45°C
Insulation class	Class H (180°C)
Max altitude	2000 m
Max relative humidity	95%
Linearity of Inductance	1.55 ~ 2.2 x Ic
Statistical life expectancy	> 200 000 hours
Installation characteristics	
Cooling method	Natural air
Terminals	Copper bar
IP Class	IP 00 [Indoor]
Noise level	Below 65db

Dimension and structure



Reactor p = 7%

Product code	Q_c	U_N/U_c	L_N	Dimension (mm)		Irms	Weight
	kVAR	kV	mH	L x W x H	E x F	A	kg
BRH3 7/6.3/100	100	6.3/6.9	106	700 x 400 x 720	460 x 300	9.5	125
BRH3 7/6.3/150	150		70.7	700 x 400 x 785	460 x 300	14.2	140
BRH3 7/6.3/200	200		53.0	700 x 400 x 855	460 x 300	18.9	155
BRH3 7/6.3/300	300		35.4	750 x 400 x 1000	500 x 300	28.4	180
BRH3 7/6.3/600	600		17.7	800 x 450 x 1070	540 x 350	56.7	300
BRH3 7/6.3/900	900		11.8	950 x 500 x 1060	640 x 400	85.1	420
BRH3 7/6.3/1500	1500		7.07	1100 x 550 x 930	720 x 450	141.8	520

BRH3 7/11/150	150	11/12	214	800 x 400 x 740	540 x 300	8.1	200
BRH3 7/11/300	300		107	850 x 400 x 970	580 x 300	16.3	282
BRH3 7/11/500	500		64.2	950 x 450 x 990	640 x 350	27.2	310
BRH3 7/11/600	600		53.5	950 x 500 x 1110	640 x 400	32.7	350
BRH3 7/11/900	900		35.7	1000 x 500 x 1100	660 x 400	48.9	450
BRH3 7/11/1500	1500		21.4	1150 x 550 x 1280	780 x 450	81.6	550

Discharge Reactor

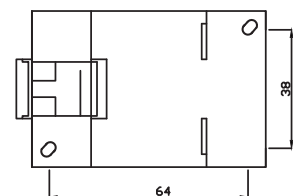
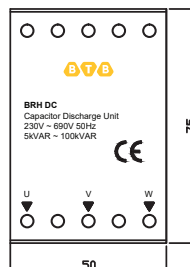
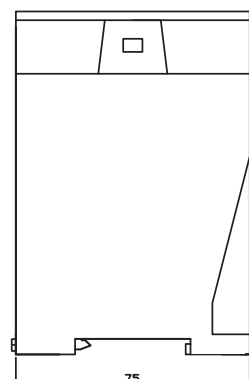
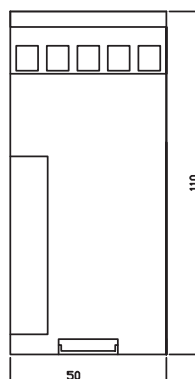
Application

In a volatile reactive power environment, discharge reactors reduced discharge time and increase the life-time of the capacitors in a power factor correction system.

Salient Features

- Reduces discharge time of capacitors for fast changing reactive power demands
- Low Loss
- Compact Design
- Up to 100 kVAR discharging
- Up to 690V operation voltage
- Din Rail mountable shockproof casin
- CE sign and manufactured under ISO 9001 quality management system

Dimension and structure



Technical specifications

General characteristics	
Product code	BRH DC
Design	Resistors
Resistance value	6k Ω
Rated voltage (Un)	200V to 690V
Frequency (In)	50Hz
Capacitor capacity	5 to 100 kvar
Working conditions	
Temperature category	- 5°C to +55°C
Max altitude	2000 m
Max relative humidity	95%
Insulation strength testing voltage	3kV
Statistical life expectancy	> 200 000 hours
Installation characteristics	
Mounting	Clip on DIN Rail (35 mm x 7.5 mm)
Location in diagram	Mounted behind the Contactor
IP Class	IP 00 [Indoor]
Time to discharge voltage below 50V	
Discharge time 250V	up to 25 kVAr < 10 s up to 50 kVAr < 20 s
Discharge time 400V - 525V	up to 25 kVAr < 5 s up to 50 kVAr < 10 s up to 100 kVAr < 20 s
Discharge time 690V	up to 25 kVAr < 3 s up to 50 kVAr < 5 s up to 100 kVAr < 10 s

Power Factor Relay

Application

Power Factor Controllers are used for measurement and control of power factor control units for central reactive power compensation. The power factor measured by PFR is compared with the set point values in order to provide necessary compensation, Power Factor Controller switches capacitor steps ON and OFF automatically. PFR is microcontroller relay, designed for flush mounting with rear plug-in connectors. In addition it displays the system's Cos ϕ , in Automatic Operating Mode, PFR displays the RMS value of Voltage (V), Current (I), Active Power (W), Reactive Power (kvar) and Apparent Power (VA) of measuring phase.

Salient Features

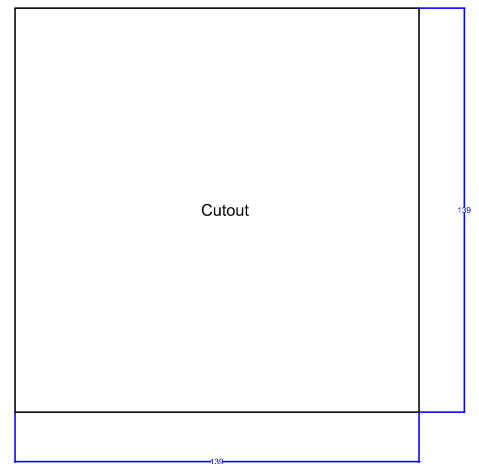
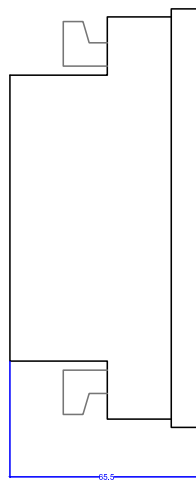
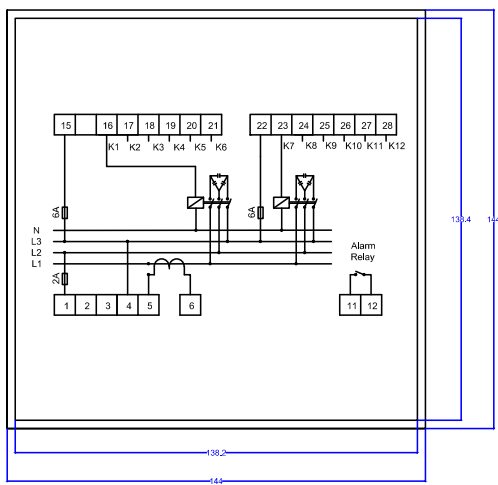
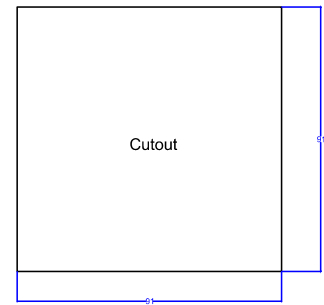
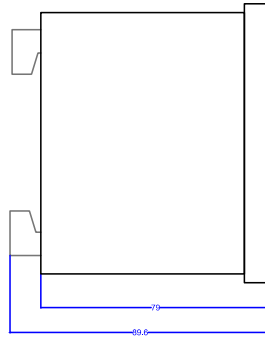
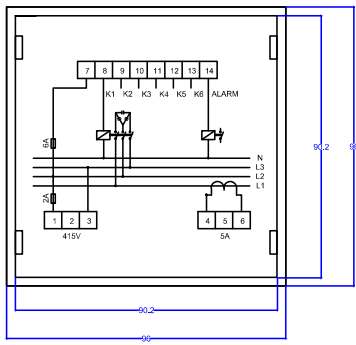
- Manual, auto switching control
- Automatic C/K and rated step adjustment
- Automatic CT polarity correction
- Alarm Relay
- User-friendly setting
- Complies with IEC 61000-6-2 standard



Technical specifications

Auxiliary Supply	
Rated voltage (Un)	240V/415V
Operating voltage Range	±10%
Frequency (In)	50/60Hz
Power consumption	3VA – 10VA
Current Input	
Rated current (In)	5A
Operating current range	50mA ~ 5.5A
Power consumption	2VA max
Frequency (In)	50/60Hz
Relay Output	
Numbers of outputs	6 / 8 / 12 (PFR96b, PFR60b/ PFR80b / PFR120b)
Output contact	5 A, 250V (NO Contact)
Expected electrical life	> 100000 operations at rated current
Expected mechanical life	> 5000000 operations
No-Volt Feature	In case of power failure longer than 200 msec.all capacitor steps are disconnected automatically
Alam relay	1 (NO Contact)
Control Range	
Cosφ setting	0.85 (ind.) - 1.00
C/k setting	Automatic / 0.02-1.0
CT value	5 - 10000/5
Time delay (on, off)	Between 2 sec.-1800 sec; (2 sec - 50 sec for 96b)
Over voltage values	240-275V (265) / 410-480V (475)
Switching program	PS1 – PS5
Display	
Display screen	LED
Measure	Cosφ, PF, V, I, W, Var, VA
Environmental Conditions	
Ambient temperature	-5°C - 55°C
Humidity	5% - 95% non-condensing
Protection class	IP 40
Terminal block protection class	IP 00
Equipment protection class	Double Insulation-Class II
Mechanical	
Mounting	Panel mounting
Connections	Socket terminals with screw
Dimension (HxWxD)	143x143x67mm / 96x96x91mm
Switchboard cut-out	139x139mm / 91x91mm
Weight	0.8 kg

Dimension and structure



Ordering Information

Product code	Explain
PFR96b-415	6 steps, system voltage is 415V, dimensions 96x96mm
PFR60b-415	6 steps, system voltage is 415V, dimensions 144x144mm
PFR80b-415	8 steps, system voltage is 415V, dimensions 144x144mm
PFR120b-415	12 steps, system voltage is 415V, dimensions 144x144mm
PFR96b-240	6 steps, system voltage is 240V, dimensions 96x96mm
PFR60b-240	6 steps, system voltage is 240, dimensions 144x144mm
PFR80b-240	8 steps, system voltage is 240, dimensions 144x144mm
PFR120b-240	12 steps, system voltage is 240, dimensions 144x144mm

Intelligent power factor relay

Application

PFR-Z is an integrated controller for reactive power compensation and power distribution monitoring. It integrates data acquisition, communication, reactive power compensation, grid parameter measurement, and analysis. RS485 communication control 32 pieces of intelligent capacitors (mixed or three phase compensation).

Salient Features

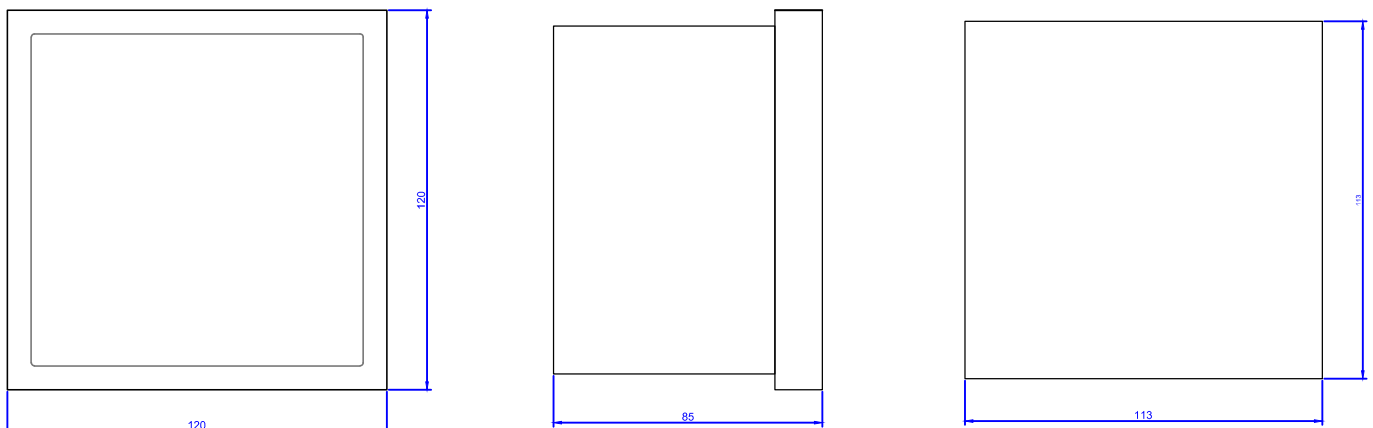
- Control 32 intelligent capacitors
- Mixed or three-phase compensation control
- Protective function $U>$, $U<$, $I>$, THD
- Communication interface RS485



Technical specifications

General characteristics	
Standards	JB/T 9663-2013
Product code	PFR-Z / PFR-D
Rated voltage (Un)	220V \pm 20%
Frequency (fn)	50Hz \pm 10%
Measurement and control	
Measurement accuracy	Voltage: $\leq \pm 0.5\%$ (0.8~1.2Un), current: $\leq \pm 0.5\%$ (0.2~1.2In) reactive power: $\leq \pm 2\%$, power factor: $\leq \pm 1\%$
Control quantity	PFR-Z RS485 communication control 32 pieces of intelligent capacitors (mixed or three phase compensation) or 16 pieces of communication type composite switches. PFR-D 12V output control 12 steps or 16 steps (composite switch node)
Compensation method	Mixed or three phase compensation
Working conditions	
Temperature category	- 25°C to +55°C (class D)
Max altitude	2000 m
Max relative humidity	Relative humidity $\leq 50\%$ at 40°C; $\leq 90\%$ at 20°C
Environmental condition	No harmful gas and steam, no conductive or explosive dust, no severe mechanical vibration
Mounting position	Indoor, upright
THDv	$\leq 5\%$
Safety features	
Protective function	Over-voltage protection, under-voltage protection, over-current protection, over-harmonic protection
Communication monitoring capability	
Communication interface	RS485
Communication protocol	Modbus protocol

Dimension and structure

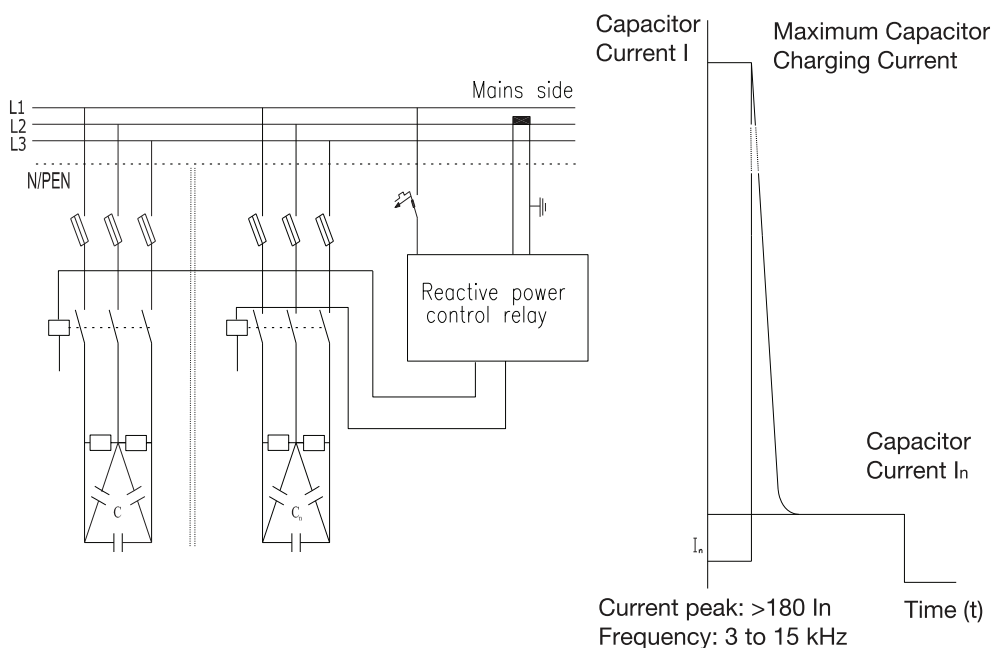


Capacitor Duty Contactor

Application

In low voltage installations, when a Capacitor is switched-on, it results in resonant circuit damped to a greater degree. In addition to the rated current, over current of high amplitude ($> 180 I_n$) and high frequencies (3 ~ 15 kHz) occur during transit period (1 to 2 ms). The resultant high in-rush current peaks, caused due to capacitor switching, depends upon following factors (Network inductances, Transformer power and short circuit voltage, Harmonics presence in the system...). The in-rush current of such high magnitudes is undesirable and it is likely to weld main poles of any standard contactor.

Capacitor contactor are specially designed to meet stringent requirements of capacitor switching as deliberated above. The contactor are fitted with front-mounted block of 3 early make auxiliary contact in series with quick discharge damping six-resistors – 2 per phase to limit peak current to value within contactor making capacity such that nominal rated capacitor current is carried by main contacts which, after closing effectively short out the resistors.



Salient Features

- Damping of inrush current
- Low ohmic losses
- Power quality improvement
- Enhanced equipment life
- Low maintenance and down – time
- Optimized solution cost
- Capacitor bank switching in parallel without derating (Permanent current that can reach 1.5 time the nominal current of capacitor bank)



Technical specifications

General characteristics	
Reference Standard	IEC 60947-4-1
Number of poles	3 poles
Rated Operational Voltage (Ue)	690V
Rated Insulation Voltage (Ui)	690V
Impulse Withstand Voltage (Uimp)	8kV
Rated Frequency	50/60Hz
Contactors fitted with a block of early make poles and damping resistors	Yes
Prospective peak current at switch-on	200In
Electrical durability at nominal load (all contactor ratings)	400V: 300000 operating cycles 690V: 200000 operating cycles

Product Code	Operating power at 50/60Hz $\theta \leq 55^\circ\text{C}$ (kVA _r)*			Rated current (A)	Instantaneous auxiliary contacts ***		Maximum operating rate (Operations/hours)	Weight kg
	200/240V	400/440V	660/690V		NO	NC		
BCC05K11**	4	7	10.2	10	1	1	240	0.5
BCC10K11**	5.5	10	14.3	14	1	1	240	0.5
BCC12K11**	6.7	12.5	18	18	1	1	240	0.5
BCC15K11**	8.5	16.7	24	24	1	1	240	0.5
BCC20K11**	10	20	30	29	1	1	240	0.7
BCC25K11**	15	25	36	36	1	1	240	0.7
BCC30K12**	20	33.3	48	48	1	2	240	1.5
BCC40K12**	25	40	58	58	1	2	100	1.5
BCC50K12**	30	50	72	70	1	2	100	1.5
BCC60K12**	40	60	92	92	1	2	100	1.8
BCC75K12**	45	75	120	108	1	2	100	1.8
BCC100K12**	60	100	143	144	1	2	100	2.5

*) The average temperature over a 24-hour period, in accordance with standards IEC 60070 and 60831 is 45°C

***) Contactor coil code

***) Maximum instantaneous auxiliary contact option 2NO+3NC

Control circuit voltage (Uc)	24V	110V	220V	240V	415V
Coil code 50Hz	B5	F5	M5	U5	N5
Coil code 50/60Hz	B7	F7	M7	U7	N7
Operating range at $\leq 60^\circ\text{C}$	0.8 ~ 1.1Uc				
Drop-out	0.3 ~ 0.6 Uc				

Dimension and structure

<p>BCC-10K11, 15K11</p>			<p>BCC-20K11, 25K11</p>		
BCC	10K11	15K11	BCC	20K11	25K11
C	80	85	C	93	98
G	117	122	G	130	135

<p>BCC-30K12, 40K12, 50K12</p>			<p>BCC-60K12, 75K12</p>		
<p>BCC-100K12</p>					

Switch Series

Application

BCS series composite switch uses thyristor switch and magnetic holding switch to run in parallel. It has the advantages of thyristor zero-crossing switching at the moment of switching on and off, and has the advantages of zero power consumption of magnetic holding switch during normal switching on. This switch has the obvious advantages of no shock, low power consumption, long service life, etc., it can replace contactor or thyristor switch, and is widely used in low voltage reactive power compensation.



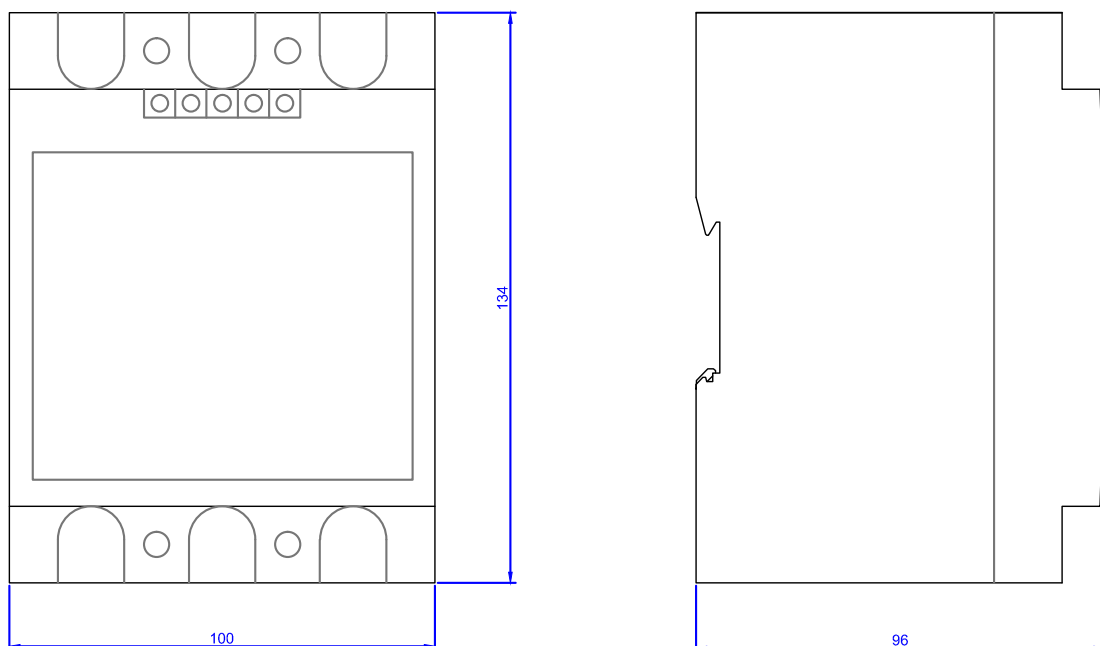
Salient Features

- Built-in microprocessor and intelligent software, can intelligently control capacitor switching
- The product achieves zero crossing switching, no arc, no inrush current, fast response
- On-resistance is zero, no harmonics are generated
- Non-heating, can be installed in a closed box
- Low failure rate and much longer service life than thyristors and contactors

Technical specifications

General characteristics	
Standards	IEC 60947-4-1
Product code	BCW
Rated voltage (Un)	380VAC \pm 20%
Frequency (fn)	50Hz \pm 10%
Performance	
Rated working current	2mA
DC control voltage	DC8~18V
DC control current	2~10mA
Service life	300000 time
Working conditions	
Temperature category	- 25°C to +55°C (class D)
Max altitude	2500 m
Max relative humidity	Relative humidity \leq 50% at 40°C; \leq 90% at 20°C
Environmental condition	No harmful gas and steam, no conductive or explosive dust, no severe mechanical vibration
Mounting position	Indoor
Rail or bolt mounting	35mm rail installation; or M4x 35mm bolt installation, mounting size: 117 × 28mm
BCS	
380-45- Δ (Z) three phase compensation	Control capacity \leq 30, control current 45A, control number of poles 3P
380-70- Δ (Z) three phase compensation	Control capacity \leq 40, control current 70A, control number of poles 3P
220-45-Y (Z) split phase compensation	Control capacity \leq 10kvar / phase \times 3, control current 45A, control number of poles A + B + C
220-70-Y (Z) split phase compensation	Control capacity \leq 13kvar / phase \times 3, control current 70A, control number of poles A + B + C

Dimension and structure



Active Harmonic Filter

Application

AHF connected in parallel to the low-voltage side of the power grid to improve the power quality. Featuring smart control, high efficiency, rapid dynamic response, and stable and reliable operation, they eliminate the complicated power quality problems and make it possible to achieve perfect power quality.



Salient Features

- Harmonic compensation: AHF can filter 2 ~ 50 times random harmonics at the same time
- Reactive power compensation: Capacitive & Inductive (-1 ~ 1) stepless compensation
- Fast response
- Design life is more than 100,000 hours (more than ten years)

Technical specifications

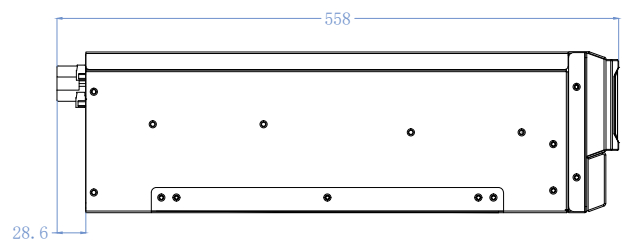
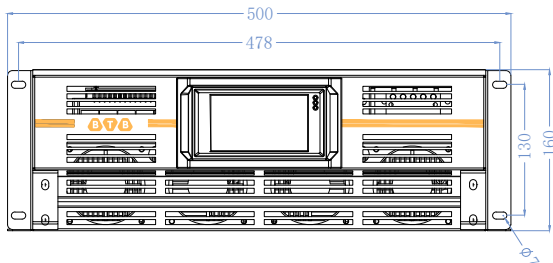
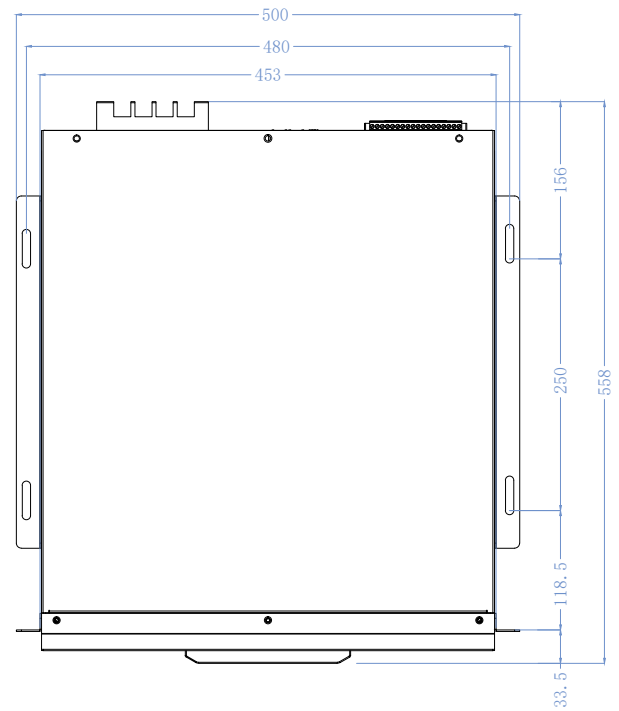
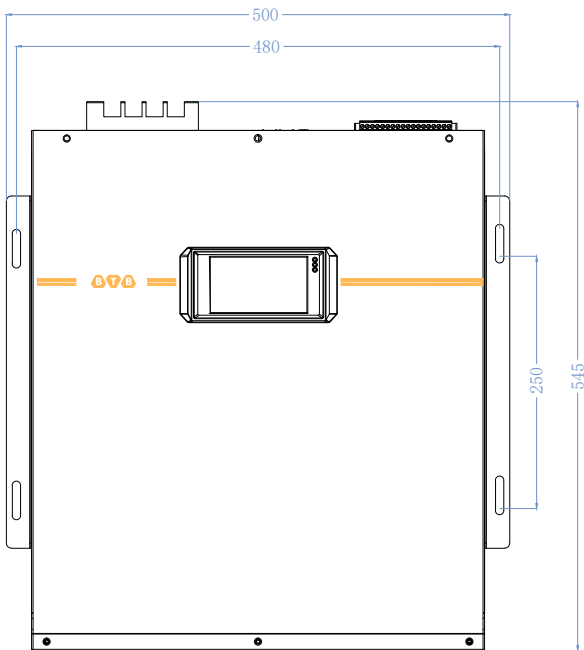
General characteristics	
Standards	JB/T 11067-2011, DL/T 1216-2013 IEC/EN 60439-1, 2014/30/EU, EN 61000-6
Rated input line voltage	380V \pm 20%
Frequency (fn)	50Hz \pm 10%
Compensation current	50A, 75A, 100A, 150A per module 200A, 300A, 400A, 450A, 500A, 600A per cabinet
Power grid structure	3P3W / 3P4W
Performance specifications	
Operating mode	Active harmonic filtering / Power factor correction / Load balancing
Compensation efficiency	\geq 97%
Harmonic spectrum	2nd to 50th harmonics
Harmonic compensation selection	2nd to 50th harmonics all can be selected individually
Response time	Instantaneous response time < 0.1ms Full response time < 10ms
Power factor correction	Power factor programmable from 1 (inductive) to -1 (capacitive)
Load balancing	Programmable load balancing between phases
Protections	Over-voltage protection, under-voltage protection, short-circuit protection, over-current protection, over-temperature protection, drive fault protection
Operation configuration	
Parallel operation	Up to 8 modules (different rated currents capable)
CT requirements	3 CTs required (100/5A ~ 5000/5A, class 0.5)
Circuit topology	Three-level
Power loss	Less than 3% of rated power
Communication monitoring capability	
Communication interface	RS485, CAN interface
Communication protocol	Modbus protocol
Module display interface	LCD multi-function touch color screen (optional)
Error alarm	Support independent monitoring or centralized monitoring
Environmental conditions	
Operation temperature	-10 ~ 40°C (higher operation temperature allowed with derating)
Humidity	\leq 95% non-condensation
Altitude	\leq 1500m, 1500~3000m (derating 1% per 100m)
Environmental conditions	No harmful gas and steam, no conductive or explosive dust, no severe mechanical vibration
Intelligent air cooling	Excellent ventilation
Protection class	IP20 (higher protection class available on request)
Noise level	Below 65db



Dimension and structure

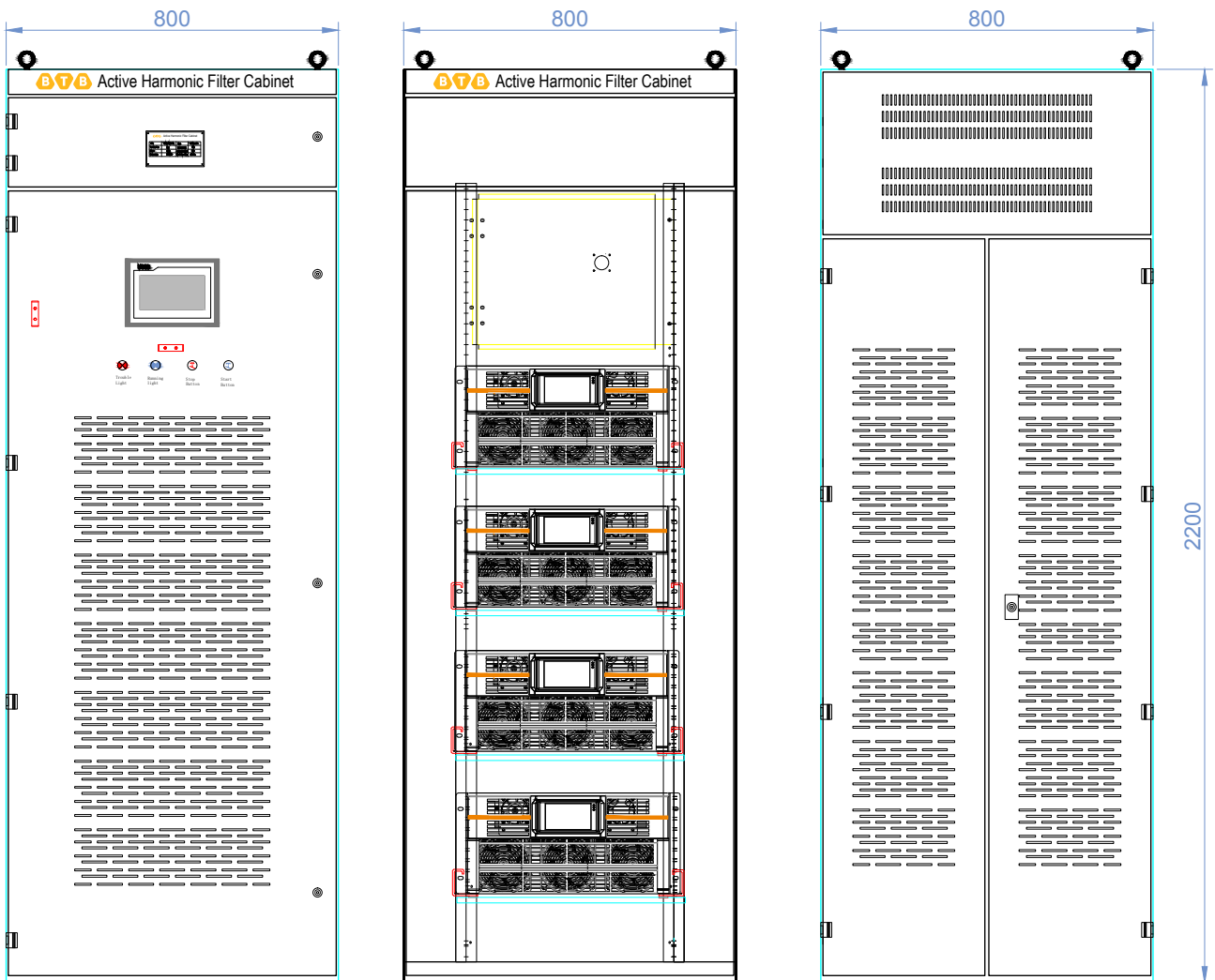
1. Drawer type and wall-mounted type

Code	Dimension (W×H×D) mm		Mounting dimension(W×H) mm	
	Drawer type	Wall-mounted type	Drawer type	Wall-mounted type
BF3-050-4-4L/D(W)	500×160×558	500×545×173	478×130 480×250	480×250
BF3-075-4-4L/D(W)	500×160×558	500×545×173	478×130 480×250	480×250
BF3-100-4-4L/D(W)	555×260×665	555×665×260	530×150 535×350	535×350
BF3-150-4-4L/D(W)	555×260×665	555×665×260	530×150 535×350	535×350



2. Cabinet type

Code	Installation	Dimension (W×H×D) mm
BF3-200-4-4L/C	2 modules	800x2200x800
BF3-250-4-4L/C	2 modules	
BF3-300-4-4L/C	2 modules or 3 modules	
BF3-350-4-4L/C	3 modules	
BF3-400-4-4L/C	3 modules or 4 modules	
BF3-450-4-4L/C	3 modules or 4 modules	
BF3-500-4-4L/C	4 modules	
BF3-600-4-4L/C	4 modules	



Operating conditions

- Temperature condition:

-50C ~500C; the average value within 24h shall not exceed +400C (special situation excluded);

- Altitude: ≤2000m;

- Pollution grade: Grade 3;

- Air conditions:

At mounting site, relative humidity not exceed 50% at the max temperature of +500C, higher relative humidity is allowable under lower temperature, RH could be 90% at +200C, special measures should be taken to occurrence of dews.



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