

Technical Catalogue

Electrical Protection & Control

BTB ELECTRIC



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Electrical Protection & Control

MA / MO / MR / MS / MD / MC5 / MB

Reliable Protection and Control

BTB Electric provides a comprehensive range of MCBs, RCCBs, RCBOs, AFDDs, Modular Contactors and Distribution Boxes for residential, commercial, and industrial applications.

MCBs protect against overloads and short circuits. RCCBs help protect against electric shock and fire caused by earth leakage, while RCBOs combine overcurrent and earth leakage protection. AFDDs detect arc faults to help prevent electrical fires. Modular Contactors provide reliable switching and control for lighting, heating, motors, and other electrical loads. Surface and flush-mounting distribution boxes, available in plastic and metal enclosures, offer safe, durable, and aesthetic housing for modular devices.

BTB Electric delivers reliable solutions for electrical protection, safety and control.

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MA63E/S
MA125E/S
Series

Miniature Circuit Breaker

Application scope

The Miniature Circuit Breaker (MCB) is an automatic protective device designed to protect electrical circuits against overload and short-circuit currents. It automatically trips when abnormal current conditions occur, helping prevent equipment damage and electrical hazards. MCBs are widely used in residential, commercial, and industrial applications to ensure reliable circuit protection and electrical safety.

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.

Certified by the DEKRA certification body and featuring the KEMA-KEUR mark, our MA series MCB ensures adherence to quality and safety standards for reliable performance in various applications.

Ambient temperature

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

Altitude

≤ 2,000m above sea level

Humidity

≤ 95% RH

Salient features

- Flame-retardant housing: Precisely molded from high-strength thermoplastic material, offering excellent dielectric strength, heat resistance, low water absorption, and a high melting point.
- Reliable trip-free mechanism: The independent switching mechanism ensures the breaker trips internally even when the operating handle is held in the ON position.
- Effective arc extinguishing: An 11-plate arc chute rapidly splits and extinguishes the arc, enhancing switching safety and reliability.
- Thermal-magnetic protection: Provides reliable protection against overloads and short circuits.

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, 1PN, 2P, 3P, 3PN, 4P	1P, 1PN, 2P, 3P, 3PN, 4P	1P, 1PN, 2P, 3P, 3PN, 4P	1P, 1PN, 2P, 3P, 3PN, 4P
Rated Current (In)	1, 2, 3, 4, 6, 10, 13, 16, 20, 25, 32, 40, 50, 63 A	1, 2, 3, 4, 6, 10, 13, 16, 20, 25, 32, 40, 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	Ii = 10In	Ii = 10In
Rated Insulation Voltage (Ui)	500 V	500 V	690 V	690 V
Rated Impulse Voltage (Uimp)	4 kV	4 kV	4 kV	4 kV
Dielectric Strength	2000 V	2000 V	1890 V	1890 V
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	83.8 x 69.9 x 17.8 mm	83.8 x 69.9 x 17.8 mm	84.2 x 69.9 x 26.8 mm	84.2 x 69.9 x 26.8 mm
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	Pin / Fork type	Pin / Fork type	Pin / Fork type

Selection table







Model	MA125Eb	MA125Sb	MA125Hb
Reference Standard	IEC/EN 60898-1	IEC/EN 60898-1	IEC/EN 60898-1
No. of Poles	1P, 1PN, 2P, 3P, 3PN, 4P	1P, 1PN, 2P, 3P, 3PN, 4P	1P, 1PN, 2P, 3P, 3PN, 4P
Rated Current (In)	63, 80, 100, 125 A	63, 80, 100, 125 A	63, 80, 100, 125 A
Rated Voltage (Ue)	AC 240/415 V	AC 240/415 V	AC 240/415 V
Rated Frequency (F)	50/60 Hz	50/60 Hz	50/60 Hz
Breaking capacity	Icn = Icn1 = 6 kA, Ics = 6 kA	Icn = Icn1 = 10 kA, Ics = 7.5 kA	Icn = Icn1 = 15 kA, Ics = 10 kA
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	(3-5) In - B Curve (5-10) In - C Curve (10-20) In - D Curve
Rated Insulation Voltage (Ui)	500 V	500 V	500 V
Rated Impulse Voltage (Uimp)	4 kV	4 kV	4 kV
Dielectric Strength	2000 V	2000 V	2000 V
Electrical Endurance	5000	5000	5000
Mechanical Endurance	10000	10000	10000
Energy Limit Class	1	1	3
Terminal Capacity (max)	50 mm^2	50 mm^2	50 mm^2
Tightening Torque	2.5 Nm	2.5 Nm	2.5 Nm
Vibration	3 g	3 g	3 g
Shock Resistance	40 mm free fall	40 mm free fall	40 mm free fall
Protection Class	IP20	IP20	IP20
Positive Contact Indication	Red-ON, Green-OFF	Red-ON, Green-OFF	Red-ON, Green-OFF
Net Weight/Pole in kg	0.195 kg	0.195 kg	0.205 kg
Dimensions (H x D x W) / Pole in mm	89.5 x 76.4 x 26.8 mm	89.5 x 76.4 x 26.8 mm	89.5 x 76.4 x 26.8 mm
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)
Installation Position	Vertical / Horizontal	Vertical / Horizontal	Vertical / Horizontal
Case & Cover	Molded, flame retardant thermoplastic material	Molded, flame retardant thermoplastic material	Molded, flame retardant thermoplastic material
Busbar Connections Top/Bottom Side	Pin / Fork type	Pin / Fork type	Pin / Fork type

Characteristics curves

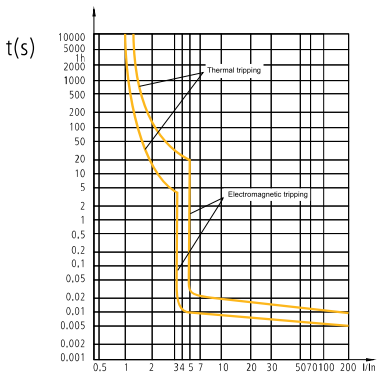
According to IEC/EN 60898-1	Thermal Tripping			Magnetic Tripping		
	No Tripping	Tripping	Time	Hold	Trip	Time
	I1	I2	t	I4	I5	t
B Curve	1.13 x In		≥ 1h	3 x In		≥ 0.1 s
		1.45 x In	< 1h		5 x In	< 0.1 s
C Curve	1.13 x In		≥ 1h	5 x In		≥ 0.1 s
		1.45 x In	< 1h		10 x In	< 0.1 s
D Curve	1.13 x In		≥ 1h	10 x In		≥ 0.1 s
		1.45 x In	< 1h		20 x In	< 0.1 s
I3 = 2.55 x In	1 s < t < 60 s for In ≤ 32 A 1 s < t < 120 s 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	8 x In		≥ 0.2 s
		1.30 x In	< 1h		12 x In	< 0.2 s
In ≥ 63A	1.05x In		≥ 2h	8 x In		≥ 0.2 s
		1.30xI n	< 2h		12 x In	< 0.2 s
I3 = 2, 3, 4, 5 x In	According to the operating characteristic curve					

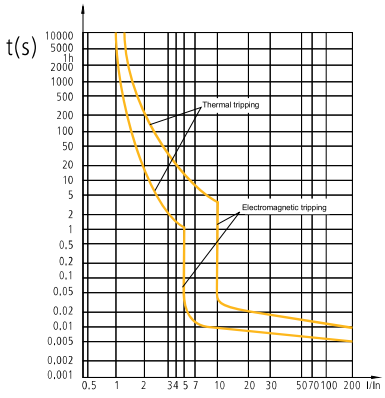
Tripping characteristics

According to IEC/EN 60898-1

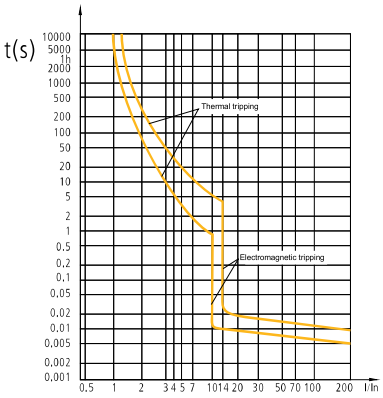
Miniature Circuit Breakers (MCBs) are available in 'B', 'C', and 'D' curve types, each with different tripping characteristics to suit various applications.



'B' Curve: designed for protecting electrical circuits with equipment that does not cause surge current, such as lighting and distribution circuits. The short circuit release is set to (3 - 5) times the rated current (In).



'C' Curve: intended for protecting electrical circuits with equipment that causes surge current, such as inductive loads and motor circuits. The short circuit release is set to (5 - 10) times the rated current (In).



'D' Curve: for protection of electrical circuits which cause 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:

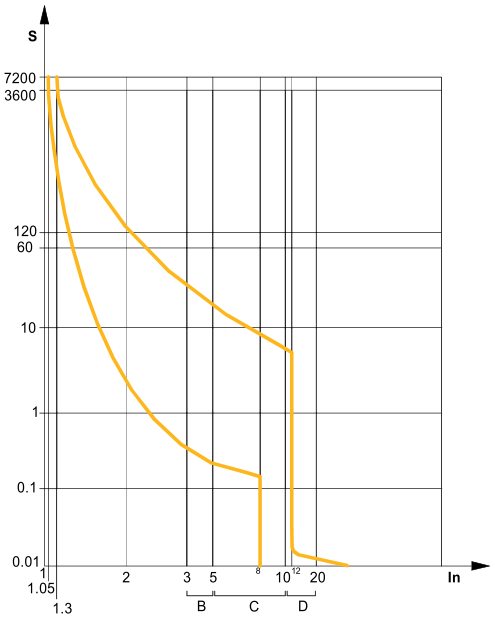
Protection of conventional load and power distribution cable and industrial power distribution system.

- Rated current:

40 ~ 125A

- Tripping characteristic:

- Default instantaneous tripping range 10In (8-12)In
- Also the instantaneous tripping range follows B, C, D curves as illustrated by the dashed 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	1.19	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	2.38	2.30	2.28	2.15	2.08	2.00	1.92	1.85	1.77	1.70	1.62
3	3.80	3.68	3.57	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	4.76	4.61	4.56	4.30	4.15	4.00	3.85	3.70	3.54	3.39	3.24
6	7.60	7.37	7.14	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	11.90	11.52	11.40	10.76	10.38	10.00	9.62	9.24	8.86	8.48	8.10
13	16.46	15.96	15.47	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	19.04	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	23.80	23.04	22.80	21.52	20.76	20.00	19.24	18.48	17.72	16.96	16.20
25	31.65	30.70	29.75	28.80	28.50	26.90	25.95	25.00	24.05	23.10	22.15	21.20	20.25
32	40.51	39.3	38.08	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	47.60	46.08	45.60	43.04	41.52	40.00	38.48	36.96	35.44	33.92	32.40
45	56.97	55.26	53.55	51.84	51.30	48.42	46.71	45.00	43.29	41.58	39.87	38.16	36.45
50	63.30	61.40	59.50	57.60	57.00	53.80	51.90	50.00	48.10	46.20	44.30	42.40	40.50
63	79.76	77.36	74.97	72.82	71.82	67.79	65.39	63.00	60.61	58.21	55.82	53.42	51.03
80	92.32	90.56	88.80	87.04	85.28	83.52	81.76	80.00	78.24	76.48	74.72	72.96	71.20
100	115.4	113.2	111.0	108.8	106.6	104.4	102.2	100.0	97.80	95.60	93.40	91.20	89.00
125	144.3	141.5	138.8	136.0	133.3	130.5	127.8	125.0	122.3	119.5	116.8	114.0	111.3

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

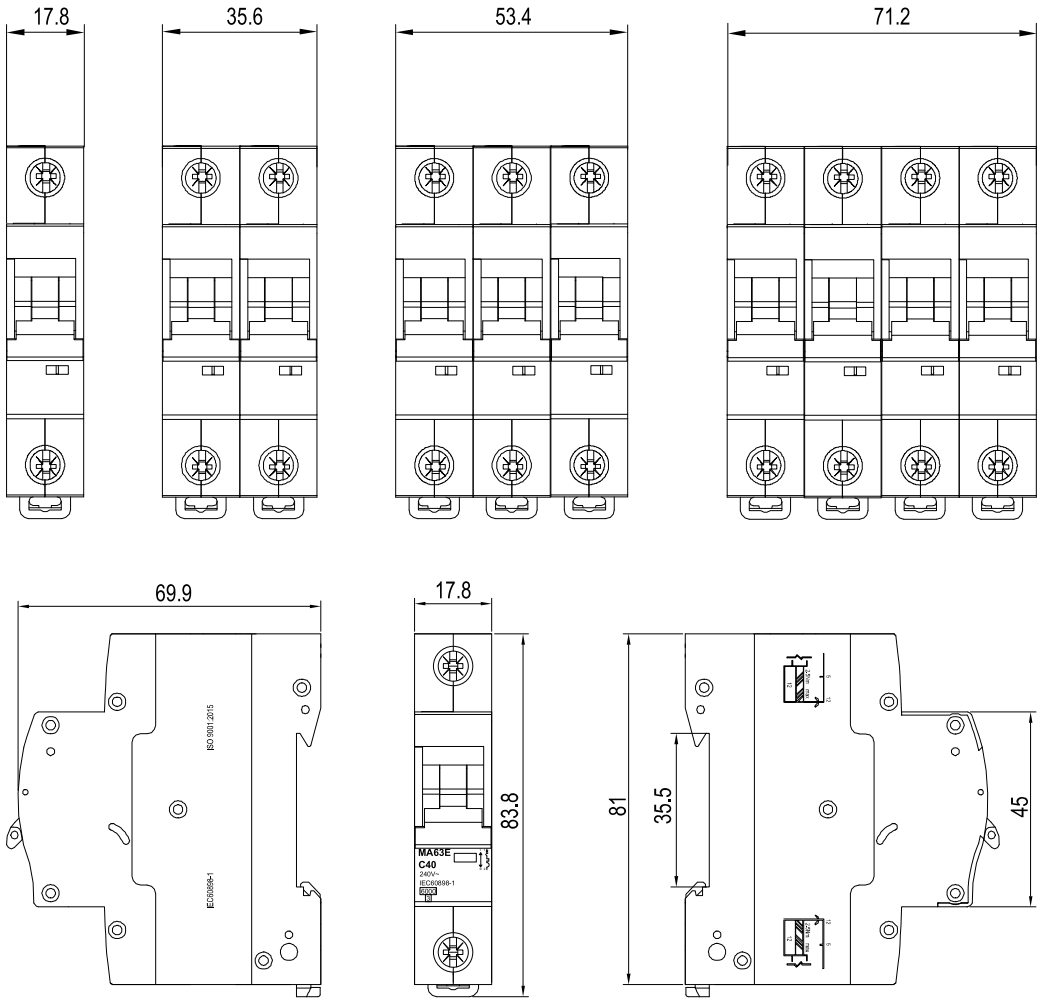
Cold resistance & power loss details

Rated Current In (A)	6	10	16	20	25	32	40	50	63	80	100	125
Cold Resistance (mΩ)	25.1	12.0	8.20	4.60	3.80	2.60	2.00	1.65	1.40	1.00	0.82	0.68
Power Loss per Pole (W)	1.40	1.60	2.30	2.50	3.10	3.50	3.80	5.00	5.50	7.50	8.50	10.5

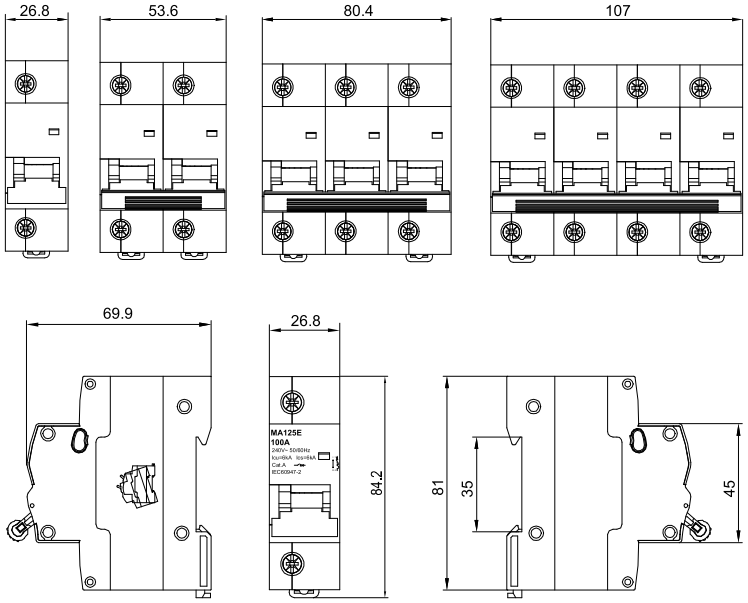
- The power loss value declared at rated current.
- Tolerance ±5%.

Dimensions (mm)

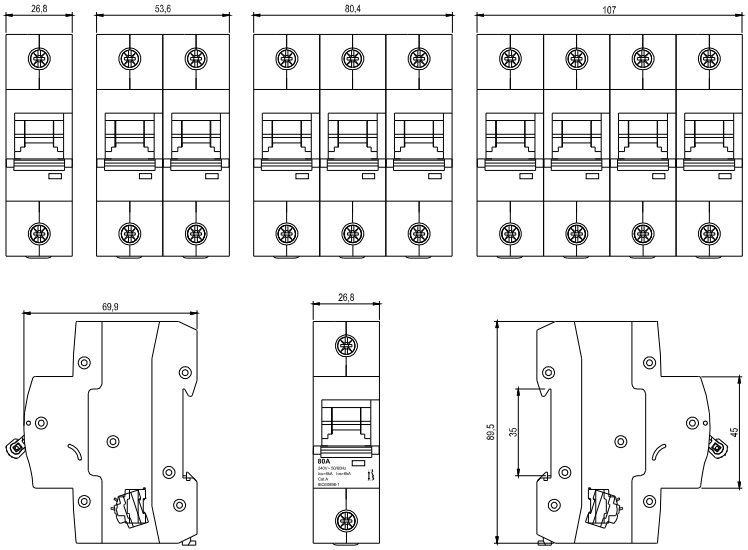
Frame 63



Frame 125 - According to IEC/EN60947-2



Frame 125 - According to IEC/EN60898-1



Ordering guidelines

Model **MA63E2PC40**	**MA**	Type MCB
	63	Frame: **63**, 125
	E	**E:** Economy (6 kA) S: Standard (10 kA) H: High capacity (15 kA)
	b	Special version adds “b”, standard version is left blank
	2P	Number of Poles: 1P, 1N, **2P**, 3P, 3N, 4P
	C	B Curve (3-5 In) **C** Curve (5-10 In) D Curve (10-20 In) For 10 In, leave blank (IEC/EN 60947-2 standard)
	40	Rated Current 1, 2,…, **40,** …, 125A

MR63
MR100
MO32
MO63
NO63
Series

Residual Current Circuit Breaker

Residual Current Circuit Breaker with Overcurrent

Application scope

RCCB detects earth leakage by monitoring the current balance between the phase and neutral conductors. It trips when residual current exceeds the specified level, helping protect against electric shock and electrical hazards.

RCBO combines residual current and overcurrent protection in a single device, providing protection against earth leakage, overload, and short circuits.

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 use.

Ambient temperature

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

Altitude

≤ 2,000m above sea level

Humidity

≤ 95% RH

Salient features

- Current balance principle: RCCB operates by monitoring the current balance between the phase and neutral conductors through a high-sensitivity residual current transformer.
- Sensitive earth-leakage detection: Under normal conditions, the vector sum of the currents is approximately zero. When leakage current flows to earth, an imbalance occurs, which is detected by the residual current transformer and causes the RCCB to trip, disconnecting the load from the supply.
- Reliable tripping: The RCCB trips when the residual current reaches the specified operating range, providing effective protection against electric shock and electrical hazards.
- Combined protection: RCBO combines the functions of an MCB and an RCCB, providing protection against overload, short circuit, and earth leakage in a single device.

Image and structure



Selection table



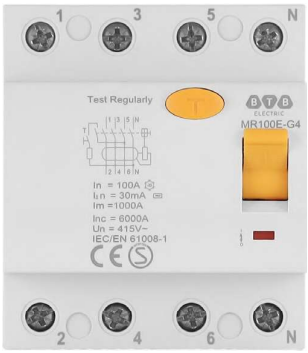




Model	MO32	MO63	NO63
Reference Standard	IEC/EN 61009-1	IEC/EN 61009-1	IEC/EN 61009-1
No. of Poles	1PN	1PN	1PN
Rated Current (In)	6, 10, 16, 20, 25, 32 A	6, 10, 16, 20, 25, 32, 40, 50, 63A	6, 10, 16, 20, 25, 32, 40, 50, 63A
Rated Voltage (Ue)	AC 240 V	AC 240 V	AC 230 V
Rated Frequency (f)	50/60 Hz	50/60 Hz	50/60 Hz
Rated Conditional Short Circuit Current	6 kA (Ics = 100% Icn)	6 kA (Ics = 100% Icn)	6 kA (Ics = 100% Icn)
Rated Residual Operating Current (IΔn)	10 mA, 30 mA, 100 mA, 300 mA	10 mA, 30 mA, 100 mA, 300 mA	10 mA, 30 mA
Type of trip	Electronic & Thermal-magnetic	Electronic & Thermal-magnetic	Electronic & Thermal-magnetic
Magnetic Release Setting	(3-5) In - B Curve (5-10) In - C Curve	(3-5) In - B Curve (5-10) In - C Curve	(3-5) In - B Curve (5-10) In - C Curve
Trip Time at IΔn	≤ 100 ms	≤ 100 ms	≤ 100 ms
Leakage type	AC, A	AC, A	AC
Rated Insulation Voltage (Ui)	500 V	500 V	500 V
Rated Impulse Voltage (Uimp)	4 kV	4 kV	4 kV
Electrical Endurance	4000	4000	4000
Mechanical Endurance	10000	10000	10000
Term inal Capacity (max)	16 mm^2	25 mm^2	25 mm^2
Tightening Torque	1.2 Nm	1.2 Nm	1.2 Nm
Vibration	3 g	3 g	3 g
Shock Resistance	40 mm free fall	40 mm free fall	40 mm free fall
Protection Class	IP20	IP20	IP20
Positive Contact Indication	Red-ON, Green-OFF	Red-ON, Green-OFF	Red-ON, Green-OFF
Net Weight	0.125 kg	0.205 kg	0.203 kg
Dimensions (H x D x W) in mm	83.8 x 78.2 x 17.8 mm	84.3 x 78 x 35.6 mm	84.3 x 78 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)	Clip on DIN Rail (35 mm x 7.5 mm)
Installation Position	Vertical / Horizontal	Vertical / Horizontal	Vertical / Horizontal
Case & Cover	Molded, flame retardant thermoplastic material	Molded, flame retardant thermoplastic material	Molded, flame retardant thermoplastic material
Busbar Connections	Pin / Fork type	Pin / Fork type	Pin / Fork type

Selection table





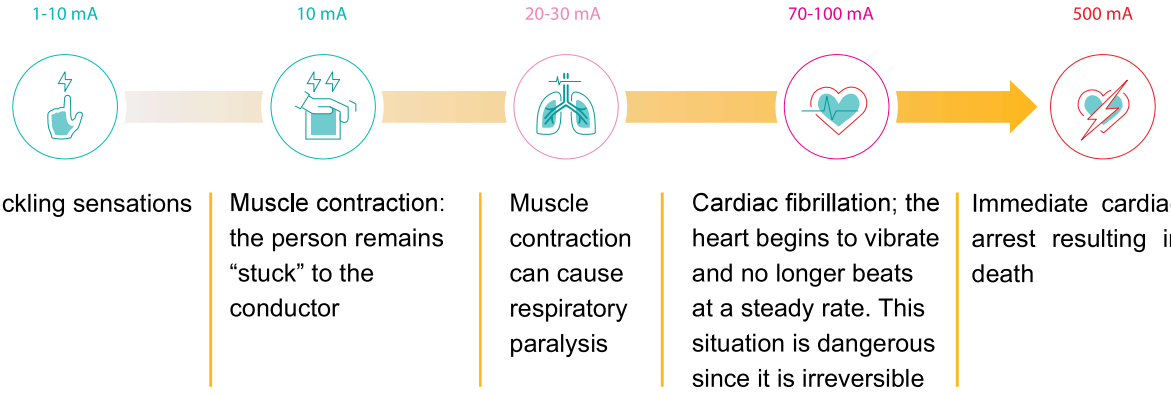
Model	MR63	MR100
Reference Standard	IEC/EN 61008-1	IEC/EN 61008-1
No. of Poles	1PN (2P), 3PN (4P)	1PN (2P), 3PN (4P)
Rated Current (In)	25, 40, 63 A	100 A
Rated Voltage (Ue)	AC 240/415 V	AC 240/415 V
Rated Frequency (f)	50/60 Hz	50/60 Hz
Rated Conditional Short Circuit Current	6kA, 10 kA (Inc)	6kA, 10 kA (Inc)
Rated Residual Operating Current (IΔn)	30 mA, 100 mA, 300 mA	30 mA, 100 mA, 300 mA
Type of trip	Electro-magnetic release	Electro-magnetic release
Trip Time at IΔn	≤ 100 ms	≤ 100 ms
Leakage type	AC, A	AC, A
Rated Insulation Voltage (Ui)	500 V	500 V
Rated Impulse Voltage (Uimp)	4 kV	4 kV
Electrical Endurance	4000	4000
Mechanical Endurance	10000	10000
Terminal Capacity (max)	35 mm^2	35 mm^2
Tightening Torque	2.5 Nm	2.5 Nm
Vibration	3 g	3 g
Shock Resistance	40 mm free fall	40 mm free fall
Protection Class	IP20	IP20
Positive Contact Indication	Red-ON, Green-OFF	Red-ON, Green-OFF
Net Weight	0.216 kg for 1PN 0.330 kg for 3PN	0.225 kg for 1PN 0.345 kg for 3PN
Dimensions (H x D x W) in mm	84.5 x 74.5 x 35.5 mm for 1PN 84.5 x 74.5 x 71 mm for 3PN	84.5 x 74.5 x 35.5 mm for 1PN 84.5 x 74.5 x 71 mm for 3PN
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 a 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 the human body, which is dangerous. The flow of current through the human body affects vital functions of breathing & heartbeat. Effect of electric current through human body has been well researched and the following chart summarizes the results:



Absolutely, electrocution risks are not solely determined by the current but also by the contact voltage. When a person touches an object with a different electrical potential, it can result in current flowing through the body. Human bodies have defined limits for safe voltage exposure:

- Under normal dry conditions, the safe voltage limit is 50 V.
- In damp environments, where conductivity increases, the safe voltage limit reduces to 25 V.

By employing a correctly selected Residual Current Circuit Breaker (RCCB), the risk of electrocution can be mitigated. RCCBs are designed to detect even small currents flowing to the earth, thereby swiftly interrupting the circuit and reducing the likelihood of electrocution, particularly in situations where there is a difference in electrical potential between objects.

Protection Against Indirect Contact

MCBs are primarily designed to protect against overcurrents caused by overload or short circuits and may not respond promptly to small earth leakage currents. To ensure compliance with wiring regulations and enhance safety measures, the earth fault loop impedance, measured in ohms, multiplied by the rated tripping current of the RCCB in amperes should not exceed 50. This requirement ensures that the RCCB can effectively detect and respond to earth faults, providing an additional layer of protection against electrical hazards such as electrocution and fire.

Example

That’s correct. For an RCCB with a rated tripping current of 30 mA, the maximum permissible earth fault loop impedance can be calculated using the formula:

$$Z_{s(max)} = \frac{50}{I\Delta n} = \frac{50}{0.03} = 1666\Omega$$

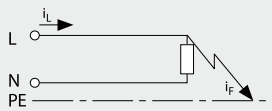
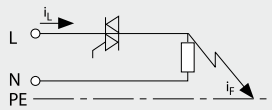
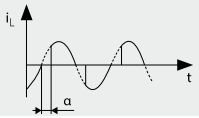
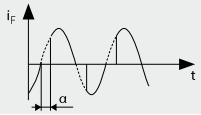
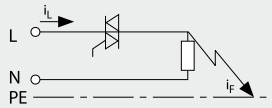
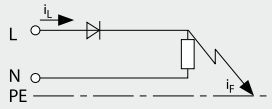
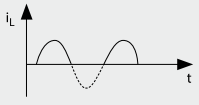
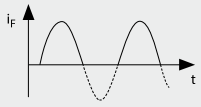
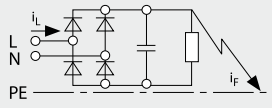
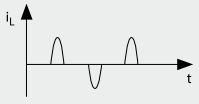
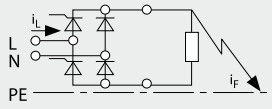
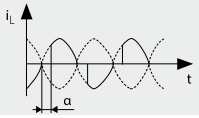
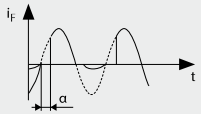
So, the maximum permissible earth fault loop impedance $Z_{s(max)}$ would be 1666 ohms. This calculation ensures that the RCCB can effectively detect and respond to earth faults within the specified safety parameters.

Protection Against Fire

Faulty wiring can lead to fires, and often, the current flowing to earth is the culprit. Even a small fault current, less than 1 amp, can be enough to start a fire. Traditional overload protective devices like fuses or MCBs may not detect such low currents effectively. However, a properly selected RCCB can detect these fault currents and swiftly interrupt the power supply, significantly reducing the risk of fire initiation.

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

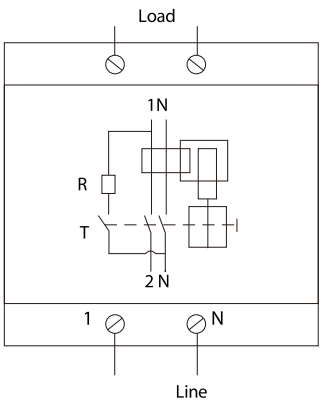
Selection of RCCB type

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

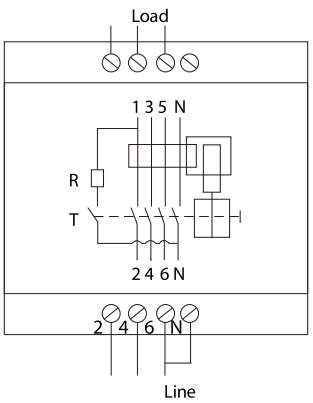
The device is suitable for electronic equipment with input circuits 1 to 6 in the table above.

Wiring diagram

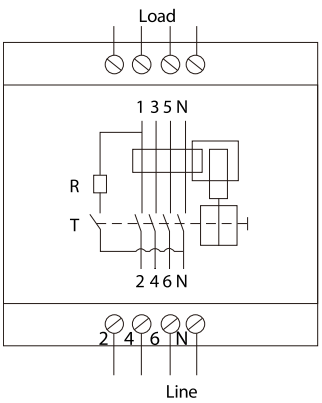
For Single Phase - 2 Wire



For Three Phase - 3 Wire



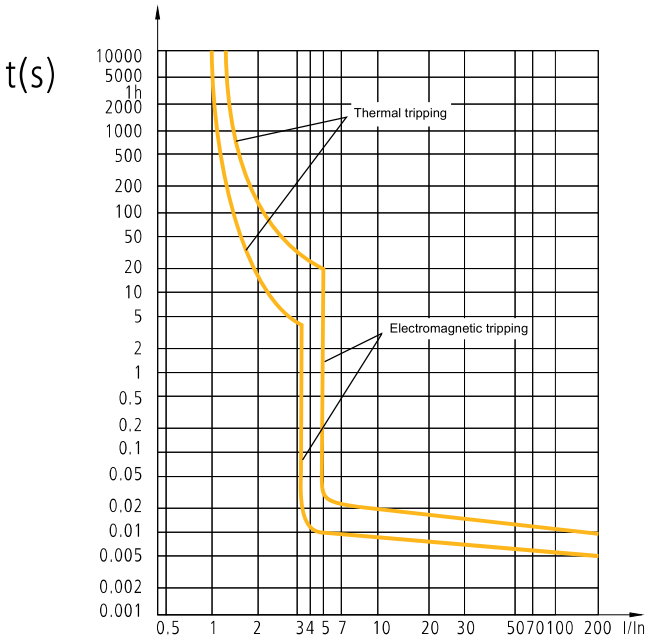
For Three Phase - 4 Wire



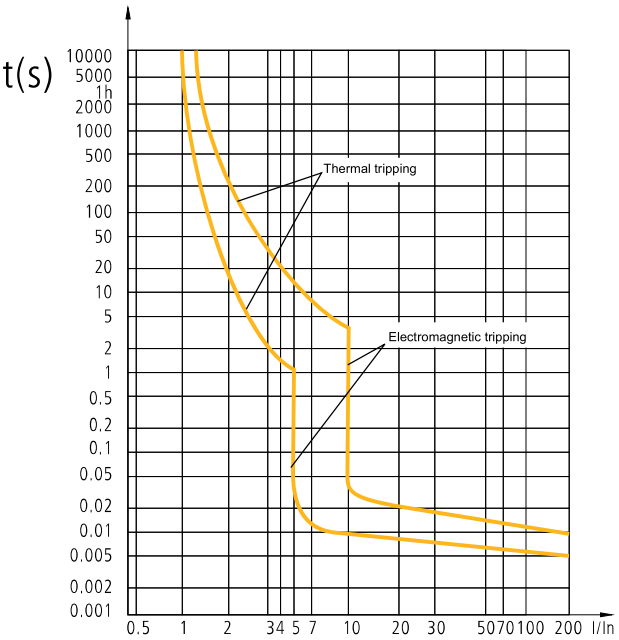
Breaking time of residual current

In(A)	IΔn (A)	Max. breaking time			
		IΔn	2IΔn	5IΔn	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



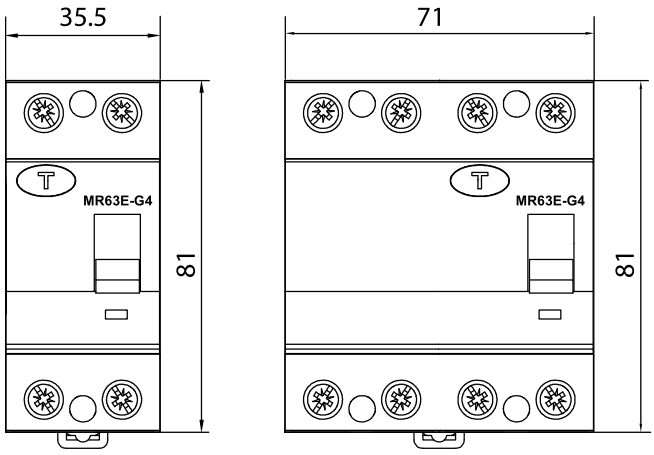
'B' Curve: for protection of electrical circuits with equipment that does not cause surge current (such as lighting and distribution circuits). Short circuit release is set to (3 - 5) times the rated current (In).

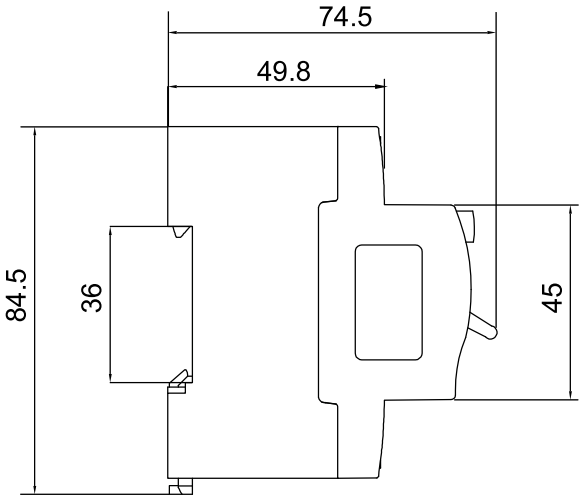


'C' Curve: for protection of electrical circuits with equipment that causes surge current, such as inductive loads and motor circuits. Short circuit release is set to (5 - 10) times the rated current (In).

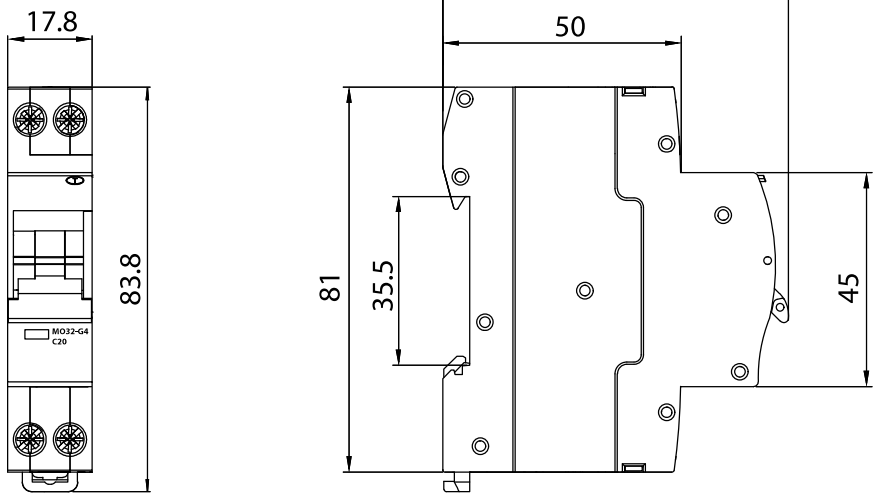
Dimensions (mm)

For MR63 & MR100 (RCCB)

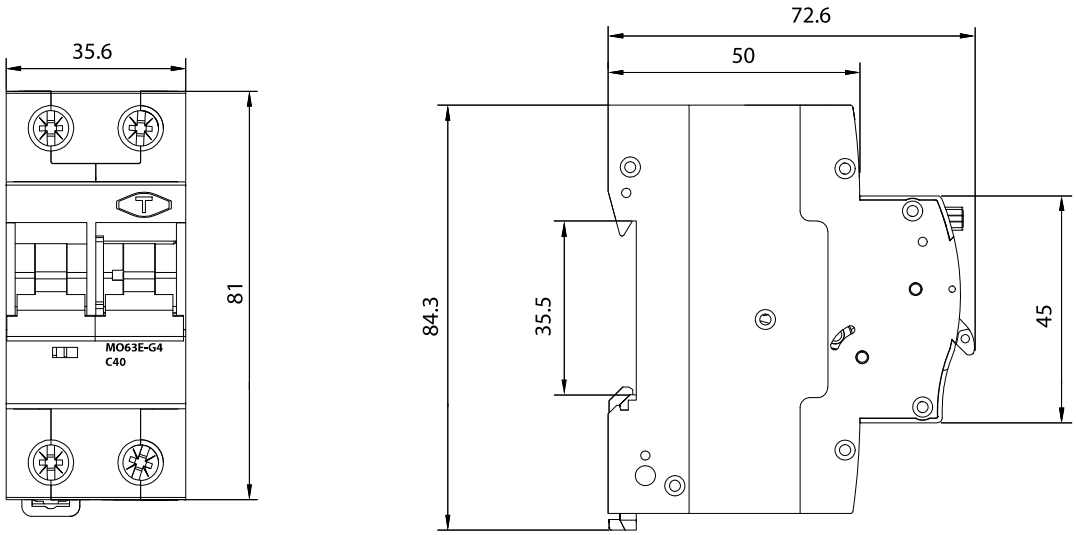




For MO32 (RCBO)



For MO63 & NO63 (RCBO)



Ordering guidelines

Model **MO63EG41PN40ACB**	**MO**	MR type RCCB **MO** type RCBO NO type RCBO
	63	Frame: 32, **63**, 80
	E	**E:** Economy (6 kA) S: Standard (10 kA)
	G4	**G4 -** 30 mA G6 **-** 100 mA G7 **-** 300 mA
	1PN	Number of Poles: **1PN**, 3PN
	40	Rated Current: 16, …, **40,** …, 80A
	AC	**AC** type A type
	B	**B** Curve (3-5In) C Curve (5-10In)

MD63E
MD63S
Series

Arc Fault Detection Device

Application scope

AFDDs are widely applied in residential, commercial, and public buildings where fire safety is critical. They are particularly effective in protecting circuits in environments with high fire risks, such as hotels, hospitals, libraries, and wooden-structured houses. By detecting and interrupting arc faults at an early stage, AFDDs help prevent electrical fires and enhance overall system safety.

Applied Standards and Certifications

- IEC/EN 61009-1: Residual current operated circuit-breakers with integral overcurrent protection for household and similar use.
- IEC/EN 62606: General requirements for arc fault detection devices (Cl. 8.17 Integrated automatic self-test function).

Ambient temperature

- Storage: -20°C to +60°C
- Operation: -10°C to +40°C

Altitude

≤ 2,000m above sea level

Humidity

≤ 95% RH

Salient features

- Detects and prevents arc faults in electrical circuits, a major cause of fires.
- Analyzes current and voltage waveforms to identify abnormal arc fault signals.
- Automatically disconnects the circuit when a fault is detected, ensuring user and system safety.
- Ideal for residential, commercial, and public buildings with high fire safety requirements.
- Enhances system reliability, reduces fire risks, and protects both property and human life.

Image and structure



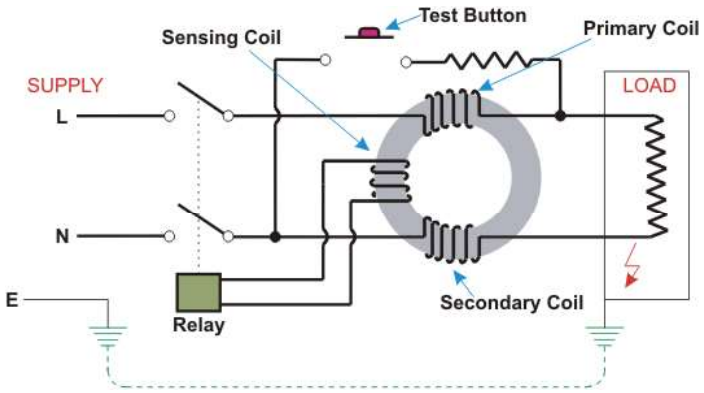
Selection table

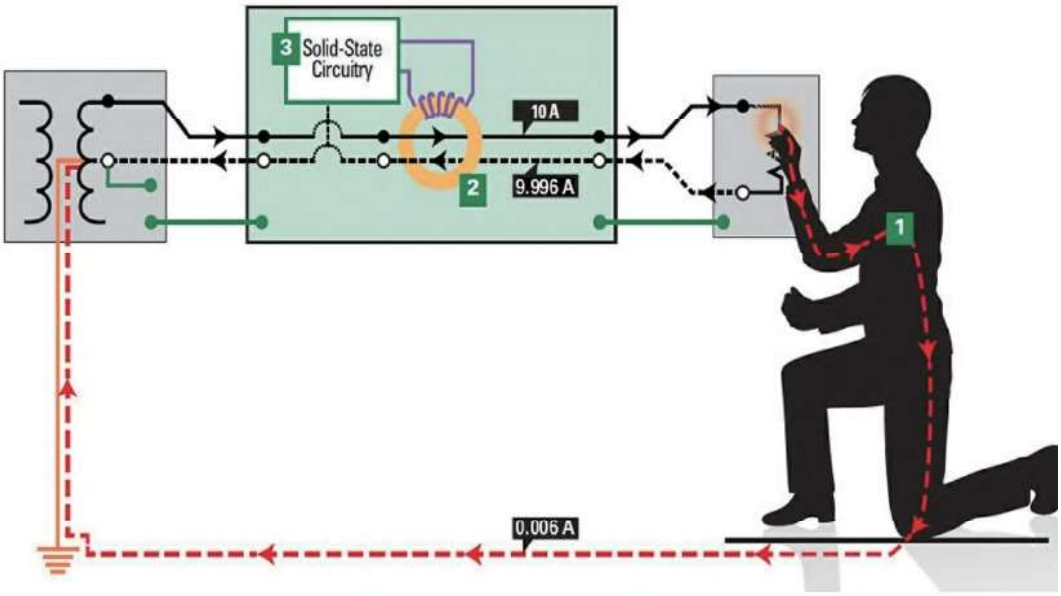
Model	MD63E - AFDD	MD63S - AFDD
Reference Standard	IEC/EN 61009-1, IEC/EN 62606	IEC/EN 61009-1, IEC/EN 62606
No. of Poles	1PN (2P)	1PN (2P)
Rated Current (In)	6, 10, 16, 20, 25, 32, 40 A	6, 10, 16, 20, 25, 32, 40 A
Rated Voltage (Ue)	180 V to 264 V	180 V to 264 V
Rated Frequency (f)	50/60 Hz	50/60 Hz
Rated Conditional Short Circuit Current	6 kA (Ics = 100% Icn)	10 kA (Ics = 75% Icn)
Rated Residual Operating Current (IΔn)	10, 30, 100 mA	10, 30, 100 mA
Type of trip	Electronic & Thermal-magnetic Protection against arc fault fires	Electronic & Thermal-magnetic Protection against arc fault fires
Magnetic Release Setting	(3-5) In - B Curve (5-10) In - C Curve	(3-5) In - B Curve (5-10) In - C Curve
Trip Time at IΔn	≤ 100 ms	≤ 100 ms
Leakage type	AC, A	AC, A
Rated Insulation Voltage (Ui)	500 V	500 V
Rated Impulse Voltage (Uimp)	4 kV	4 kV
Electrical Endurance	4000	4000
Mechanical Endurance	10000	10000
Terminal Capacity (max)	25 mm^2	25 mm^2
Protection Class	IP20 / IP40 (Terminals / Housing)	IP20 / IP40 (Terminals / Housing)
Positive Contact Indication	Red-ON, Green-OFF	Red-ON, Green-OFF
Dimensions (H x D x W) in mm	84.3 x 78 x 35.6 mm	84.3 x 78 x 35.6 mm
Normal operation (Steady green light)		
Series Arc Fault (The red light blinks after switching on, once per second for 25 seconds)		
Parallel Arc Fault (The red light stays on steadily after switching on, lasting 25 seconds)		
Leakage (The yellow light blinks once per second after switching on, lasting 25 seconds)		
Overvoltage (The yellow light remains steady after switching on, lasting 25 seconds)		

Earth leakage protection

The integrated earth-leakage protection operates on the principle that the incoming current equals the outgoing current in a healthy circuit, as illustrated in the diagram. It utilizes a current transformer (CT) along with a sensitive tripping coil to instantaneously detect imbalance fault signals and trigger circuit disconnection.

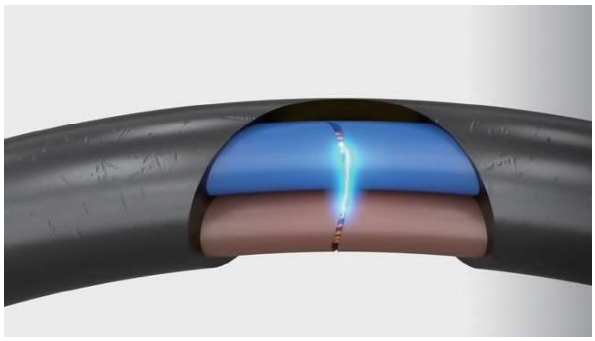
- Current flows through the body.
- CT detects the imbalance current.
- Closing coil pushes the plunger forward.
- Switching mechanism actuates.





Series and Parallel arc fault protection

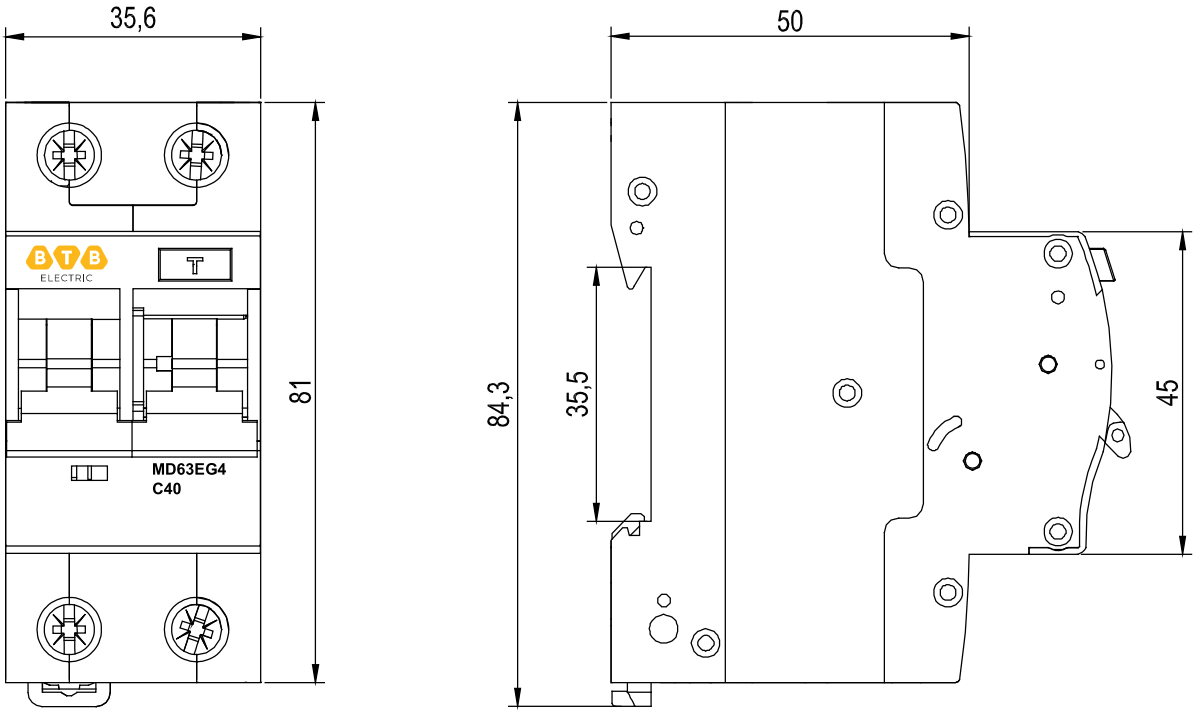
Digital arc fault detection at a very early stage.



An arc commences, heat builds up.



Dimensions (mm)



Ordering guidelines

Model **MD63EG41PN20ACB**	**MD**	Type AFDD
	63	Frame: **63**
	E	**E:** Economy 6kA S: Standard 10kA
	G4	G2 - 10 mA **G4** - 30 mA G6 - 100 mA
	1PN	Number of Poles: **1PN**
	40	Rated Current: 6, 10, 16, **20**, 25, 32, 40 A
	AC	**AC** type A type
	B	**B** Curve (3-5In) C Curve (5-10In)

MS50E
MO50E
Series

Safety Breaker
Earth Leakage Breaker

Application scope

The Safety Breaker is widely used in residential, commercial, and industrial applications to provide overload protection, safeguarding electrical circuits and equipment from excessive current. The Earth Leakage Breaker (ELB) combines earth leakage and overload protection, making it ideal for environments where protection against electric shock and fire hazards is critical, particularly in moisture-prone areas such as bathrooms and kitchens.



Applied Standards and Certifications

- IEC/EN 60898-1: Circuit-breakers for overcurrent protection for household and similar installations.
- IEC/EN 61009-1: Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses.standard.

CB CE

Ambient temperature

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

Altitude

≤ 2,000m above sea level

Humidity

≤ 95% RH

Salient features

Safety Breaker

- Automatically disconnects the circuit under overload conditions, safeguarding equipment and wiring from damage caused by excessive current.
- Compact and practical design, suitable for residential, commercial, and industrial applications.

Earth Leakage Breaker (ELB)

- Combines earth leakage and overload protection in a single device.
- Detects leakage current to earth and automatically disconnects the circuit to help protect against electric shock and electrical hazards.
- Ensures swift and reliable disconnection to minimize fire hazards and protect against electric shock.

Image and structure







Selection table

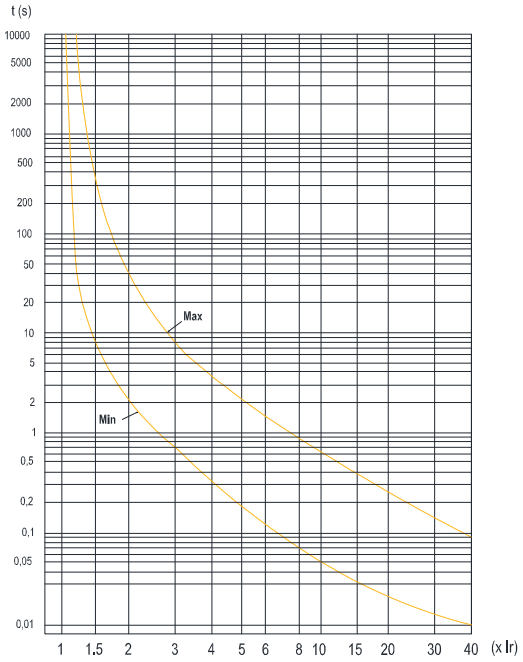


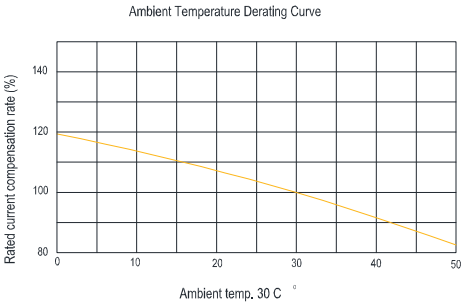


Model	MS50E	MO50E
Reference Standard	IEC/EN 60898-1	IEC/EN 61009-1
No. of Poles	2P (2P1E)	1PN (2P2E)
Rated Current (In)	10, 15, 20, 32, 40, 50 A	10, 15, 20, 32, 40 A
Rated Voltage (Ue)	AC 240 V	AC 240 V
Rated Frequency (f)	50/60 Hz	50/60 Hz
Breaking capacity	1.5 kA (Icn = Ics)	1.5 kA (Icn = Ics)
Leakage type	-	Type AC
Rated Residual Operating Current (IΔn)	-	30 mA
Trip Time at IΔn	-	≤ 100 ms
Type of trip	Thermal Protection	Electronic & Thermal Protection
Rated Insulation Voltage (Ui)	500 V	500 V
Rated Impulse Voltage (Uimp)	4 kV	4 kV
Dielectric Strength	1.5 kV	1.5 kV
Electrical Endurance	4000	4000
Mechanical Endurance	10000	10000
Terminal Capacity (max)	16 mm^2	16 mm^2
Tightening Torque	1.2 Nm	1.2 Nm
Shock Resistance	40 mm free fall	40 mm free fall
Protection Class	IP20	IP20
Net Weight	0.105 kg	0.123 kg
Dimensions (H x D x W) in mm	70 x 52 x 32 mm	70 x 52 x 32 mm
Mounting	Install on flat surface	Install on flat surface
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

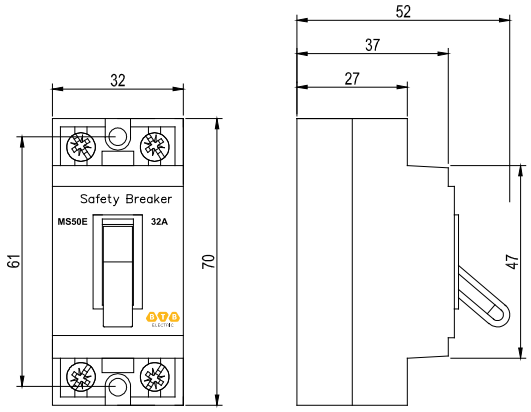
Tripping characteristics

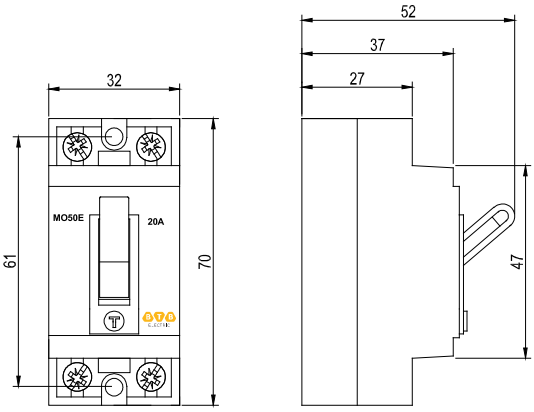
According to IEC/EN 60898-1





Dimensions (mm)





Ordering guidelines

Model **MS50E1PN20**	**MS**	**MS** type Safety Breaker MO type Earth Leakage Breaker
	50	Frame: **50**
	E	**E:** Economy 1.5kA S: Standard 2.5kA
	1PN	Number of Poles: **1PN**, 2P
	20	Rated Current: 10, 15, **20**, 32, 40, 50 A

Application scope

Modular Contactors are widely used in residential, commercial, and industrial applications for the switching and control of electrical loads. They are suitable for controlling lighting, heating, motors, pumps, and other electrical equipment, particularly in applications requiring frequent and reliable switching.

Applied Standards and Certifications

- IEC/EN 61095: Electrical contactors for household and similar purposes.
- Certified and tested by TÜV Rheinland in accordance with international quality and safety standards, ensuring equivalent performance and reliability.

Ambient temperature

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

Altitude

≤ 2,000m above sea level

Humidity

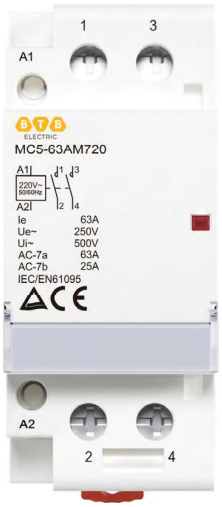
≤ 95% RH

Salient features

- **Reliable switching performance:** Designed for seamless and frequent switching of electrical loads in residential, commercial, and industrial applications.
- **Compact modular design:** Space-saving profile for efficient installation in distribution boards and electrical enclosures.
- **Low operating noise:** Optimized magnetic system for smooth and quiet operation, especially suitable for lighting and residential applications.
- **Long electrical life:** High-quality contacts and robust construction ensure stable performance and extended service life.
- **High safety standards:** Designed in accordance with IEC/EN 61095, providing dependable performance for household and similar applications.

Image and structure







Selection table





Model	MC5-16	MC5-25	MC5-16	MC5-25
Reference Standard	IEC/EN 61095		IEC/EN 61095	
No. of Poles	2P		4P	
Power Pole Contact Composition	2NO or 1NO1NC or 2NC		4NO or 3NO1NC or 2NO2NC or 4NC	
Rated Operational Current (Ie): AC-7a (heating) AC-7b (motor control)	 16 A 6 A	 25 A 9 A	 16 A 6 A	 25 A 9 A
Contactor rating: 40°C 60°C	 16 A 13 A	 25 A 20 A	 16 A 13 A	 25 A 20 A
Rated Short-time Withstand Current (Icw) at 10s	128 A	200 A	128 A	200 A
Rated Voltage (Ue)	AC 250 V		AC 415 V	
Rated Insulation Voltage (Ui)	500 V		500 V	
Rated Impulse Voltage (Uimp)	4 kV		4 kV	
Rated Frequency (f)	50/60 Hz		50/60 Hz	
Electrical Endurance AC-7a, AC-7b	100000		100000	
Mechanical Endurance	5000000		5000000	
Maximum operating rate	300 cycles/h		300 cycles/h	
Terminal Capacity (max)	6 mm^2		6 mm^2	
Tightening Torque	1.2 Nm		1.2 Nm	
Rated control circuit voltage (Uc)	230 V (other voltages available upon request)		230 V (other voltages available upon request)	
Control voltage limits: Operational Drop-out	 0.85…1.1Uc 0.2…0.75Uc		 0.85…1.1Uc 0.2…0.75Uc	
Control type	Remote control		Remote control	
Protection Class	IP20		IP20	
Net Weight	0.125 kg		0.216 kg	
Dimensions (H x D x W) in mm	81 x 68 x 18 mm		81 x 68 x 36 mm	
Mounting Support	DIN rail		DIN rail	
Operating position	20° from vertical		20° from vertical	

Selection table

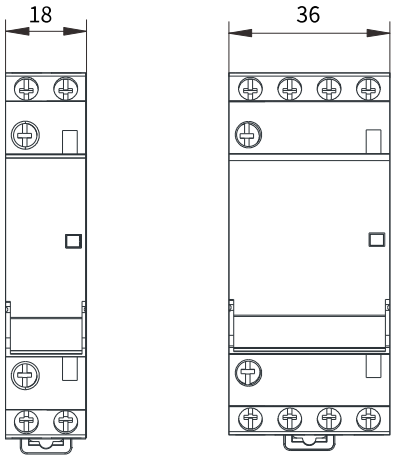


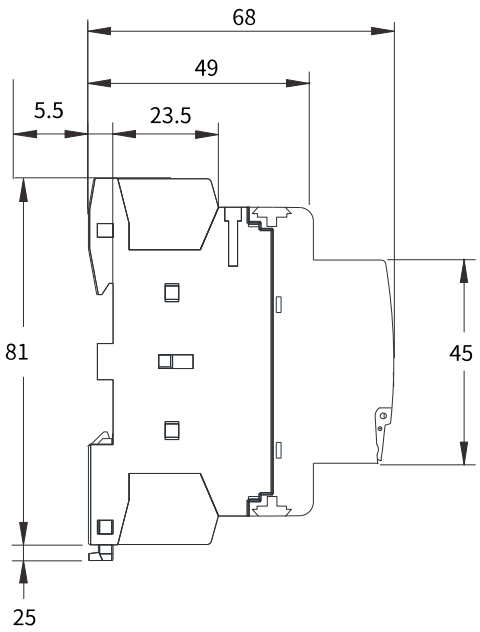


Model	MC5-32	MC5-40	MC5-63	MC5-32	MC5-40	MC5-63
Reference Standard	IEC/EN 61095			IEC/EN 61095		
No. of Poles	2P			4P		
Power Pole Contact Composition	2NO or 1NO1NC or 2NC			4NO or 3NO1NC or 2NO2NC or 4NC		
Rated Operational Current (Ie): AC-7a (heating) AC-7b (motor control)	 32 A 12 A	 40 A 18 A	 63 A 25 A	 32 A 12 A	 40 A 18 A	 63 A 25 A
Contactor rating: 40°C 60°C	 32 A 25 A	 40 A 32 A	 63 A 50 A	 32 A 25 A	 40 A 32 A	 63 A 50 A
Rated Short-time Withstand Current (Icw) at 10s	256 A	320 A	504 A	256 A	320 A	504 A
Rated Voltage (Ue)	AC 250 V			AC 415 V		
Rated Insulation Voltage (Ui)	500 V			500 V		
Rated Impulse Voltage (Uimp)	4 kV			4 kV		
Rated Frequency (f)	50/60 Hz			50/60 Hz		
Electrical Endurance AC-7a, AC-7b	100000			100000		
Mechanical Endurance	5000000			5000000		
Maximum operating rate	300 cycles/h			300 cycles/h		
Terminal Capacity (max)	16 mm^2			16 mm^2		
Tightening Torque	2.5 Nm			2.5 Nm		
Rated control circuit voltage (Uc)	230 V (other voltages available upon request)			230 V (other voltages available upon request)		
Control voltage limits: Operational Drop-out	 0.85…1.1Uc 0.2…0.75Uc			 0.85…1.1Uc 0.2…0.75Uc		
Control type	Remote control			Remote control		
Protection Class	IP20			IP20		
Net Weight	0.25 kg			0.325 kg		
Dimensions (H x D x W) in mm	85 x 68 x 36 mm			85 x 68 x 54 mm		
Mounting Support	DIN rail			DIN rail		
Operating position	20° from vertical			20° from vertical		

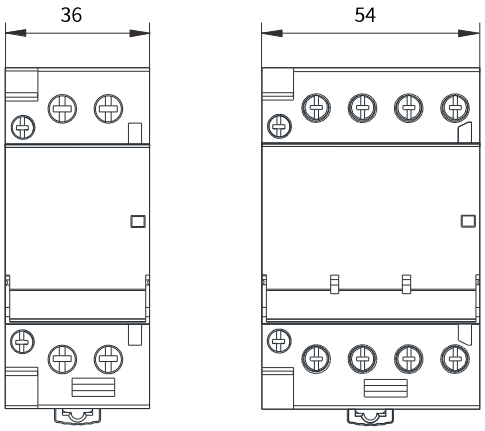
Dimensions (mm)

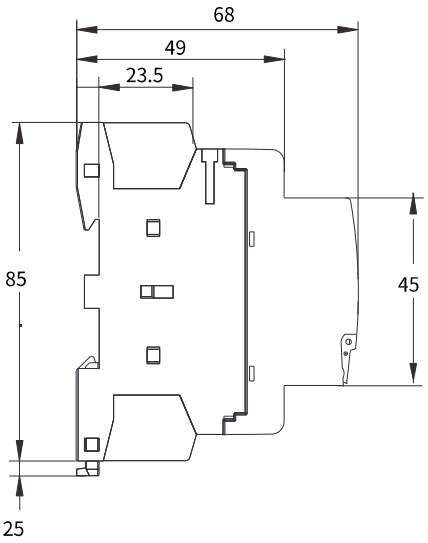
MC5-16, MC5-25 (2P & 4P)





MC5-32, MC5-40, MC5-63 (2P & 4P)





Ordering guidelines

Model **MC5-25AP720**	**MC5**	Modular Contactors
	25	Rated current **25:** 25 A; 40: 40 A; 63: 63 A
	A	Standard Contactor
	P	Coil Voltage B - 24 V; F - 110 V; M - 220 V; **P** - 230 V; U - 240 V; Q - 380 V; N - 415 V
	7	Coil Voltage Type 5 - 50 Hz; 6 - 60 Hz; **7** - 50/60 Hz
	20	Contact Composition **20** - 2NO; 11 - 1NO1NC; 02 - 2NC 40 - 4NO; 31 - 3NO1NC; 22 - 2NO2NC; 04 - 4NC

MB3-F
MB3-S
Series

Plastic Distribution Box

Application scope

The plastic distribution box is designed for residential and light commercial buildings, including houses, villas, and apartments. It supports both surface-mounted and flush-mounted installations. The enclosure complies with IEC 60439-3 (IEC 61439-3) and is suitable for accommodating various modular devices such as MCBs, RCDs, and modular contactors.

Applied Standards and Certifications

- IEC/EN 60439-3: Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution boards.

CE

Ambient temperature

- Storage: -40°C to +75°C
- Operation: -5°C to +40°C

Altitude

≤ 2,000m above sea level

Humidity

≤ 95% RH

Salient features

- MB3 series included 2 kinds of enclosures: surface-mounted and flush-mounted types.
- The interiorly mounted MCBs are all in compliance with relative IEC standards, 9 mm modularized electric components are applicable, as well.
- On request, various circuit combinations can be assembled and the mounting capacity of the product units can be taken to 6 to 54 units.
- The distribution box is designed with internal terminal blocks for connection of neutral line and protective grounding wire.
- The enclosure of the unit is made of plastic material with metal structure; ABS/ PC for body and PC for door. The color of the door: transparent or non-transparent.
- On request, specified colors are available.

Technical data

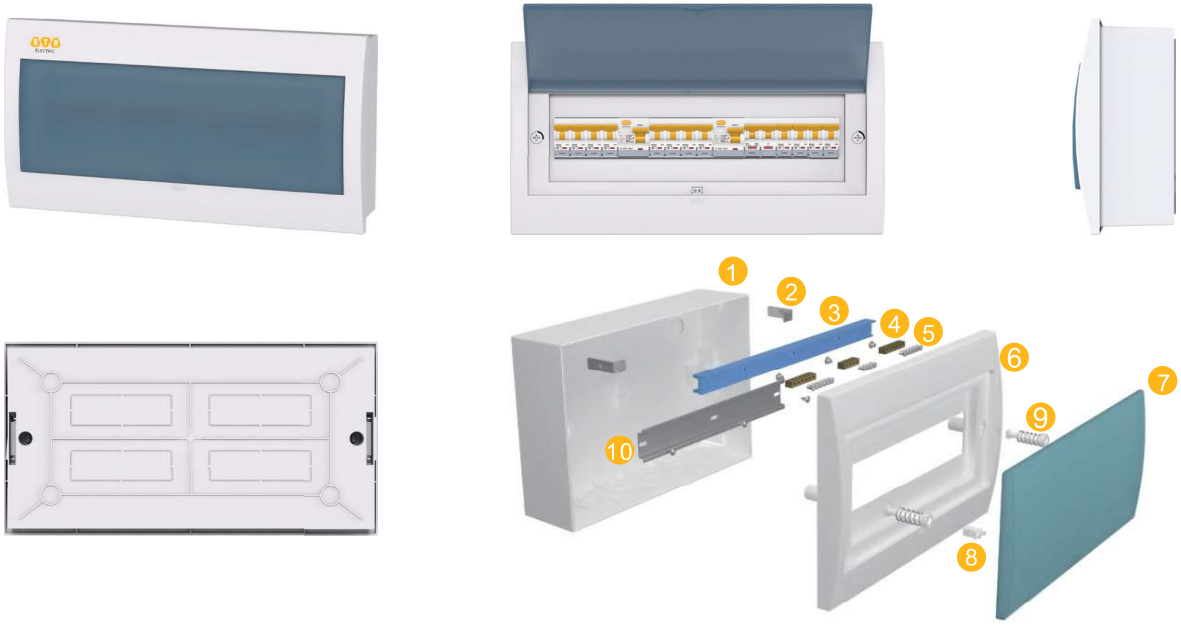


Approval	CE certified
Modules (No.)	6, 8, 12, 18, 24, 36, 54
Row	1 row for 6, 8, 12, 18 modules 2 rows for 24, 36 modules 3 rows for 54 modules
Rated Current (In)	63, 100, 125 A
Color	White RAL 9003 and Grey RAL 7035
Color of door	Blue, White
Mounting type	Surface-mounted, Flush-mounted
Degree of protection	IP30
Material	PS or ABS for body, PC for door
Fire resistance	650°C / 30s

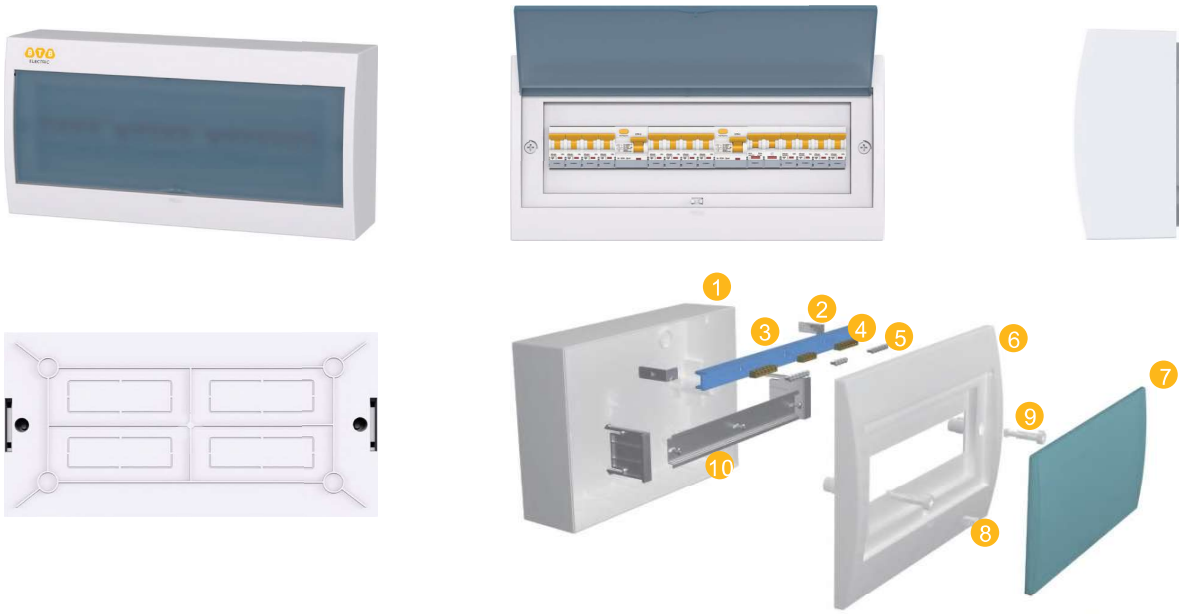
Image and structure

01. Plastic Base	05. Brass Terminal Block Screw	09. Plastic Screw and Spring
02. Steel Support Bracket	06. Plastic Front Cover	10. DIN Rail
03. Terminal Block Support	07. PC Transparent Door	
04. Brass Terminal Block	08. Door Latch	

MB3-F Flush-Mounted Type



MB3-S Surface-Mounted Type

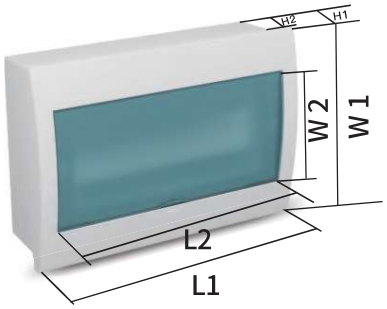


Order code and dimensions

MB3-F Flush-Mounted Type

Model	No. of Modules	Dimensions (mm)		
		L1 / L2	W1 / W2	H1 / H2
MB3-F06	6 modules	210 / 168	219 / 129	102 / 77
MB3-F08	8 modules	244 / 203	219 / 129	102 / 77
MB3-F12	12 modules	317 / 275	219 / 129	102 / 77
MB3-F18	18 modules	426 / 384	219 / 129	102 / 77
MB3-F24	24 modules	318 / 298	310 / 242	109 / 77
MB3-F36	36 modules	426 / 406	310 / 242	109 / 77

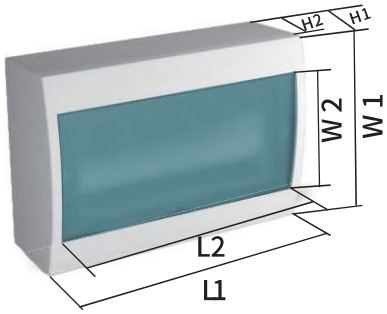




MB3-S Surface-Mounted Type

Model	No. of Modules	Dimensions (mm)		
		L1/L2	W1/W2	H1/H2
MB3-S06	6 modules	194 / 168	204 / 129	102 / 77
MB3-S08	8 modules	228 / 203	204 / 129	102 / 77
MB3-S12	12 modules	300 / 275	204 / 129	102 / 77
MB3-S18	18 modules	410 / 384	204 / 129	102 / 77
MB3-S24	24 modules	300 / 298	294 / 242	109 / 77
MB3-S36	36 modules	410 / 406	294 / 242	109 / 77
MB3-S54	54 modules	435 / 425	601 / 579	143 / 120





MBI-S Series

Metal Distribution Box

Application scope

The MB1 series metal distribution box is designed for robust low-voltage electrical distribution in residential buildings, commercial complexes, offices, and industrial facilities. Engineered with heavy-duty metal housing, it provides superior mechanical strength, enhanced corrosion resistance, and dependable operational safety for indoor installations.

Applied Standards and Certifications

- IEC/EN 60439-3: Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use – Distribution boards.

Ambient temperature

- Storage: -40°C to +75°C
- Operation: -5°C to +40°C

Altitude

≤ 2,000m above sea level

Humidity

≤ 95% RH

Salient features

- **Full Metal Construction:** Ensures high mechanical durability, enhanced safety, and an extended service life.
- **Metal Base Enclosure:** Superior corrosion resistance; highly resilient against wear and environmental impacts.
- **Premium Material:** High-strength cold-rolled steel plate (Q195/SPCC), delivering exceptional rigidity and preventing deformation under load.
- **Degree of Protection:** IP30 rating, engineered for dependable indoor low-voltage power distribution.
- **Inner Folding & Crimping Technology:** Reinforced structural integrity, superior impact resistance, and enhanced safety during installation and operation.
- **Anti-Corrosion Treatment:** High-grade surface treatment with professional anti-rust processes, verified by rigorous salt spray and environmental testing.

Technical data

Approval	CE certified
Modules (No.)	4, 6, 8, 10, 12, 14, 16, 18, 22
Row	1 row
Rated Current (In)	63, 100, 125 A
Color	Grey
Color of door	Grey
Mounting type	Surface-mounted
Degree of protection	IP30
Material	Steel
Fire resistance	650°C / 30s



Image and structure



01. Plastic Strip Support	05. Round M-Shape Screw	09. Screw
02. Plastic Strip	06. Din Rail Support on Left and Right	10. Hinge
03. Flat Semi-Recessed Head Screw	07. DIN Rail	11. Metal Front Cover Screw and Spring
04. Brass Terminal Block	08. M4x4 Screw	12. Metal Door

Order code and dimensions

Model	No. of Modules	Dimensions (mm)		
		L	W	H
MB1-S04	4 modules	150	260	116
MB1-S06	6 modules	186	260	116
MB1-S08	8 modules	222	260	116
MB1-S10	10 modules	258	260	116
MB1-S12	12 modules	294	260	116
MB1-S14	14 modules	330	260	116
MB1-S16	16 modules	366	260	116
MB1-S18	18 modules	402	260	116
MB1-S22	22 modules	474	260	116

AUX
SHT
ALT
UVT
Series

Circuit Breaker Accessory

Technical data

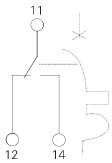
Standard	IEC/EN 62019
Rated insulation voltage (Ui)	500 V
Rated operational voltage (Ue)	AC 230 V
Rated frequency (Hz)	50/60 Hz
Utilization category	AC-12, AC-14, AC-15
Ambient temperature (°C)	-5°C to +40°C, max. 95% RH
Electrical endurance	4000
Mechanical endurance	10000
Dielectric strength	2000 V / 1min
Degree of protection (IP)	IP20





Auxiliary Contact



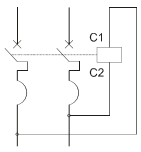


- Indicates the ON/OFF contact status of the circuit breaker for remote indication, signaling, and auxiliary control.
- Terminal Connection Height: 13.5 mm
- Rated operational current (Ie): 4 A at 240 V AC (AC-12)
- Rated operational current (Ie): 2 A at 240 V AC (AC-14)

Frame	Contact	Model
63	1NO + 1NC	AUX11MA63
125	1NO + 1NC	AUX11MA125

Shunt Trip



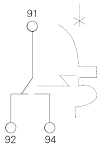


- Operating voltage: 230 V AC or 400 V AC
- Operating voltage range: 70% – 110% Us
- Mounted on the left side of MCB / RCBO, used to trip the combined MCB/ RCBO via remote control device.
- Terminal Connection Height: 22.8 mm

Frame	Model	
	AC 230 V	AC 400 V
63	SHTP7MA63	SHTV7MA63
125	SHTP7MA125	SHTV7MA125

Alarm Switch



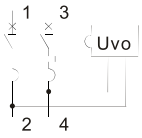


- The alarm contact of the MCB is mainly used to provide fault indication signals, serving monitoring, alarming, and remote control purposes. The ALT is mounted on the left side of the MCB or RCBO.
- Terminal Connection Height: 13.5 mm
- Rated operational current (Ie): 4 A at 240 V AC (AC-12)
- Rated operational current (Ie): 2 A at 240 V AC (AC-14)

Frame	Contact	Model
63	1NO + 1NC	ALT11MA63
125	1NO + 1NC	ALT11MA125

Under/Over-Voltage Release





- Operating voltage: 230 V AC
- Over-voltage tripping range: 280 V ± 5%
- Under-voltage tripping range: 170 V ± 5%
- Mounted on the left side of the circuit breaker, it activates the combined device to trip in case of under-voltage or over-voltage, effectively preventing the device from closing operation under abnormal power voltage conditions.
- Terminal Connection Height: 19 mm

Frame	Model
63	UVTP7MA63
125	UVTP7MA125



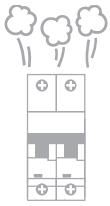
Handling and Maintenance Inspection

Installation

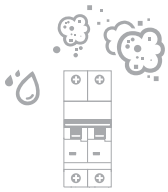
Installation Precautions

Installing the circuit breaker in environments that do not meet these conditions may result in malfunction, operational failure, or fire hazards.

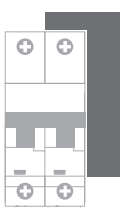
- Ambient temperature: -5°C to +55°C (24-hour average not exceeding +45°C).
- Relative humidity: 45% to 95%.
- Vibration & shock: Avoid excessive vibration or mechanical impact.
- Altitude: Below 2,000 m above sea level.
- Atmospheric conditions: Free from excessive water/oil vapor, smoke, dust, alkaline, and corrosive contaminants.
- Sunlight exposure: Avoid direct exposure to sunlight.



The arc gas exhaust hole must not be blocked, as it may reduce the breaking capacity.



Attention should be paid to dust, metal fragments, and other debris. Ensure protective terminal covers remain in place during work.



The insulation barrier attached to the base of the circuit breaker must not be removed, as this will compromise dielectric properties and reduce insulation performance.

Connection Precautions



Incomplete tightening of terminal screws may lead to overheating. Always tighten each screw strictly to the specified torque to ensure optimal contact and prevent physical damage to the terminals or housing.



Exposed conductors must be insulated. Insulating tubes or insulating tape must be used to ensure complete insulation between the bare conductors of the MCCB. Failure to insulate the terminals may result in secondary short-circuits during short-circuit accidents.



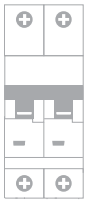
In the case of a 4-pole circuit breaker, the neutral wire of a 3-phase 4-wire system must be connected to the N pole. Failure to do so may result in improper function during overcurrent situations, potentially leading to fire hazards.



The use of lubricant at the terminal screw part is prohibited. Lubricant reduces the friction of the screw, causing it to loosen over time, which can result in an increase in temperature and potential hazards.



The stud must not be deformed during wiring. Excessive force should not be applied to the stud at the conductor connecting part of the rear connection type.



The conductor must be firmly fixed in a flat state. For connecting conductors, the electromagnetic force generated by extremely high fault currents requires secure fixing.

Maintenance inspection

Initial Inspection

- Ensure no residues of steel plate, wire grinding debris, or other conductive foreign contaminants are left around the circuit breaker terminal.
- Inspect the cover and base for cracks or damage.
- Verify terminal screw tightening torque.
- Confirm the rated voltage and breaking capacity of the circuit breaker.
- Measure the insulation resistance with a 500 V insulation-resistance tester; it should be above 5 MΩ.

Withstand voltage

Main Circuit		Auxiliary Circuit or Control Circuit	
Rated Insulation Voltage	Test Voltage (AC r.m.s.)	Rated Insulation Voltage of Operational Circuit	Test Voltage (AC r.m.s.)
Ui ≤ 300 V	2,000 V for 1 min	Uis ≤ 60 V	1,000 V for 1 min
300 V < Ui ≤ 600 V	2,500 V for 1 min	60 V < Uis ≤ 600 V	2 × Uis + 1,000 V (min. 1,500 V) for 1 min

Regular Inspection

An initial inspection should be conducted one month after the commencement of operation to verify system stability, followed by periodic maintenance according to environmental conditions.

Standard inspection period

Operating Conditions	Environment	Standard of Inspection Period
Standard Environment	Clean and dry air environment	Within 10 years after installation: Once every 2-3 years
		More than 10 years after installation: Once a year
		More than 15 years after installation: Once every 6 months
	Locations without corrosive gases, even if dust is present	Within 10 years after installation: Once a year
		More than 10 years after installation: Once every 6 months
		More than 15 years after installation: Once a month
Harsh Environment	Areas free from sulfurous acid, hydrogen sulfide, salinity, vapor, and similar contaminants	Within 5 years after installation: Once every 6 months
		More than 5 years after installation: Once every 3 months
	Environments with particularly high levels of corrosive gases	Once a month

Storage

Ambient temperature: -30 ~ 65°C Altitude: Below 1,000 m above sea level Relative humidity: Within 45% to 85%	The surrounding environment may affect the insulation function and endurance of Moulded Case Circuit Breakers (MCCBs) and Earth Leakage Circuit Breakers (ELCBs), so it is essential to verify the environmental conditions prior to installation and use.



Do not store in places with corrosive gas. Avoid leaving it around gases containing sulfur, ammonia, or other corrosive substances.



Do not leave it exposed to direct sunlight for extended periods.



Avoid storing the circuit breaker in areas with high or low temperatures. The storage temperature should be maintained between -30°C and +65°C.



Avoid storing the circuit breaker in areas with high humidity for extended periods.



Avoid storing the circuit breaker in dusty environments. Keep the unit covered or inside its original packaging to prevent dust accumulation.

BTB ELECTRIC

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