Technical Catalogue

Miniature Circuit Breaker

BTB ELECTRIC

BME63
BMS63
BMSI25 Series

Application scope

An 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. BM series Miniature Circuit Breaker is of high quality from the BTB Electric brand, fully meeting the technical specifications for high-end projects.

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

Ambient temperature

- Storage: -30°C ~ +65°C
- Operation: -5°C ~ +55°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, the breaker trips internally even if the operating knob is held in ON position for reliability.
- The arc extinguishing device comprises of 12 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	BME63	BMS63	BMS125
Reference Standard	IEC/EN 60898-1	IEC/EN 60898-1	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
Rated Current (In)	1, 2, 3, 4, 6, 10, 13, 16, 20, 25, 32, 40, 50, 63A	1, 2, 3, 4, 6, 10, 13, 16, 20, 25, 32, 40, 50, 63A	63, 80, 100, 125A
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	6 kA (Ics=100 % Icn)	10 kA (Ics=75% Icn)	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
Rated Insulation Voltage (Ui)	500 V	500 V	690 V
Rated Impuls e Voltage (Uimp)	4 kV	4 kV	4 kV
Dielectric Strength	2.5 kV	2.5 kV	2.5 kV
Electrical Endurance	10000	10000	5000
Mechanical Endurance	20000	20000	10000
Energy Limit Class	3	3	-
Terminal Capacity (max)	35 mm2	35 mm2	50 mm2
Tightening Torque	2.5Nm	2.5Nm	2.5Nm
Vibration	3 g	3 g	3 g
Shock Resistance	40 mmfree fall	40 mmfree fall	40 mmfree 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	0.122 kg	0.125 kg	0.155 kg
Dimensions (HxDxW) / Pole in mm	83 x 71.8 x 17.8 mm	83 x 71.8 x 17.8 mm	83 x 73.5 x 26.7 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 C onnections Top/ Bottom Side	Pin/Fork type (Bottom)	Pin/Fork type (Bottom)	-

Characteristics curves

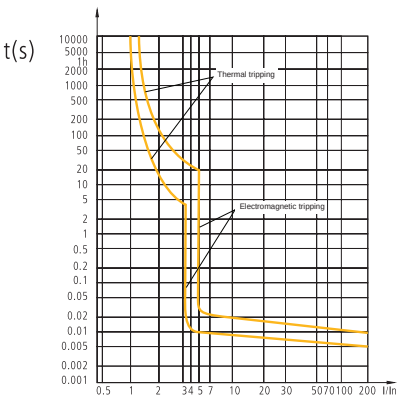
According to IEC/ EN 60898-1	Thermal Tripping			Magnetic Tripping		
	No Tripping	Tripping	Time	Hold	Trip	Time
	I1	I2	t	I4	I5	t
B Curve	1.13 x In		≥1 h	3 x In		≥0.1 s
		1.45 x In	<1 h		5 x In	<0.1 s
C Curve	1.13 x In		≥1 h	5 x In		≥0.1 s
		1.45 x In	<1 h		10 x In	<0.1 s
D Curve	1.13 x In		≥1 h	10 x In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

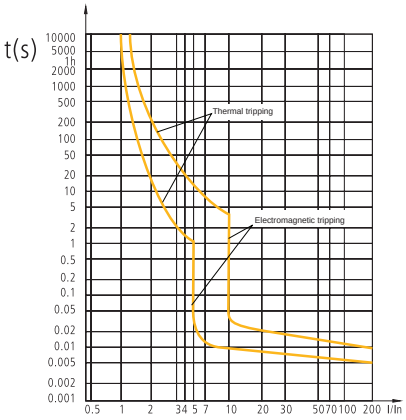
Tripping characteristics

According to IEC/EN 60898-1

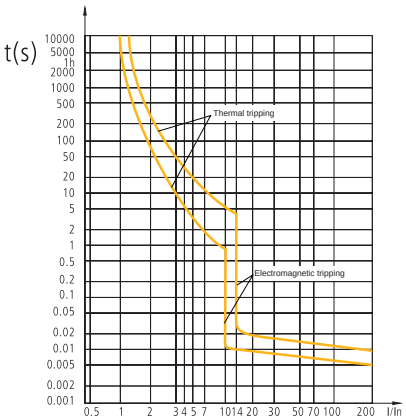
Based on the tripping characteristics, MCBs are available in 'B', 'C' and 'D' curve to suit different types of applications.



'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:

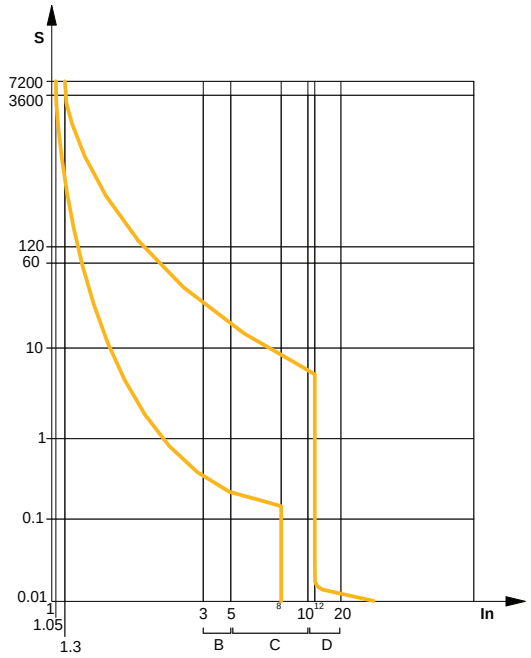
Protection of conventional load and power distribution cable and industrial power distribution system.

- Rated current:

63 ~ 125A

- Tripping characteristic:

- Default instantaneous tripping range 10In (8-12)In
- 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
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

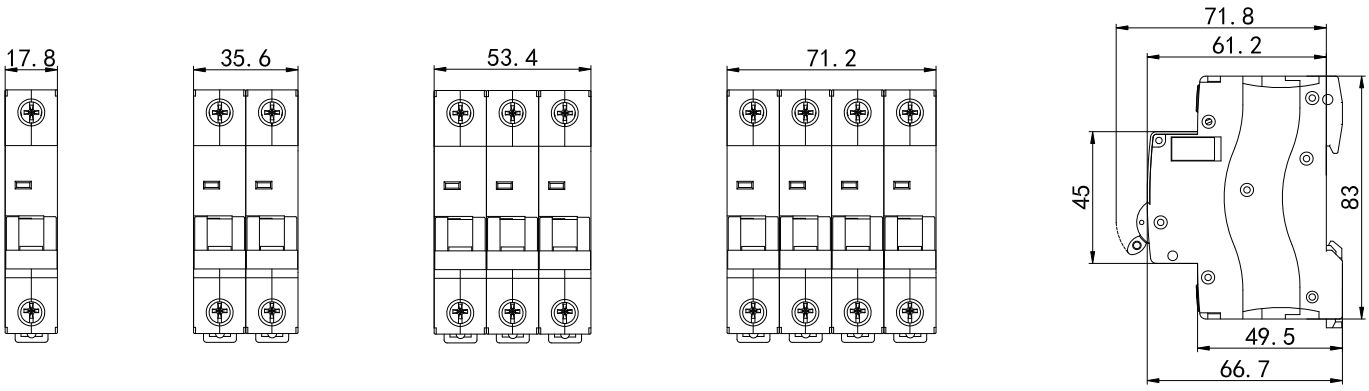
Cold resistance & power loss details

Rated Current In (A)	6	10	16	20	25	32	40	50	63	80	100	125
Cold Resistance (mΩ)	25.05	11.68	8.03	4.52	3.78	2.57	1.94	1.61	1.31	0.98	0.80	0.65
Power Loss per Pole (W)	1.3	1.4	2.1	2.2	2.9	3.2	3.5	4.6	5.9	7.1	7.7	9.2

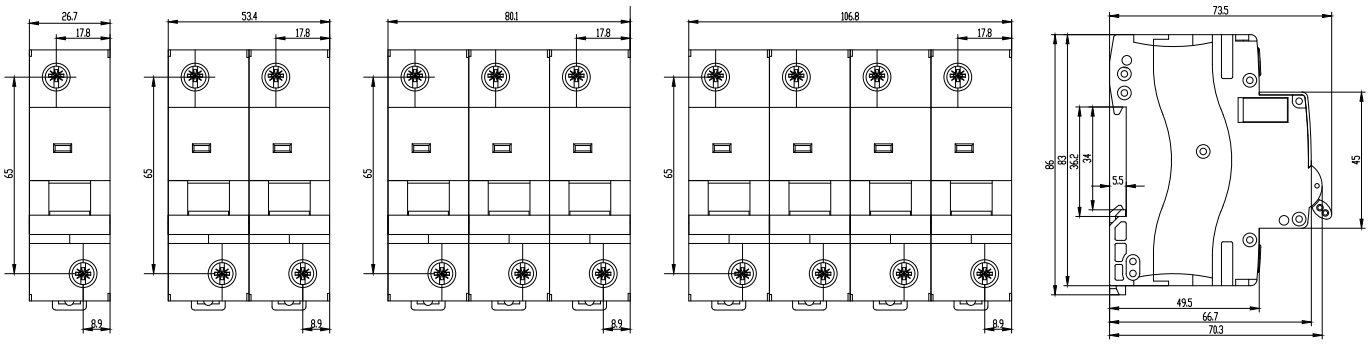
- The power loss value declared at rated current
- Tolerance ±5%

Dimensions (mm)

Frame 63



Frame 125



Ordering guidelines

Model **BME63-C40-2P**	**BM**	Type MCB
	E	**E**conomy 6kA Standard 10kA
	63	Frame: **63**, 125
	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

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 leave under direct sunlight for a long period of time.

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

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

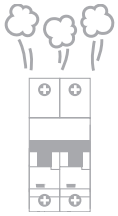
Avoid places with a lot of dust.
Do not store in expose places, use cover or packaging material to prevent dust from piling up on the circuit breaker.

Installation

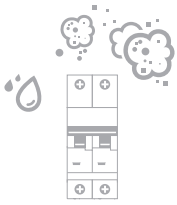
Installation Precautions

Install the circuit breaker in a place that satisfies the following environmental conditions. Installing the circuit breaker in places and environment other than the following may cause malfunction of circuit breaker, fire and others.

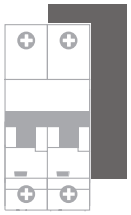
- Ambient temperature of -5°C to +55°C (However, the 24-hour average temperature must not exceed 45°C).
- Relative humidity to be within 45 ~ 95%
- Excessive vibration or impact to be avoided.
- Altitude to be below 2,000 m
- To be used in an environment without excessive water vapor, oil vapor, smoke, dust, alkaline, corrosive material and others.
- To avoid direct sunlight.



Arc gas exhaust hole must not be blocked
It may drop the breaking capacity



Attention to be paid to dust, metal fragments and others
After installation, protection cover and coivers to be covered during work



The insulation plate attached to the bottom of the circuit breaker must not be separated
It mat destroy insulation and drop the insulation performance.

Connection Precautions

When fastening the terminal screw, it should be fastened according to the specified torque
Incomplete fastening ofterminal screw may cause overheating so each terminal screw must be fastened completely according to the specified torque may cause damage in the terminal screw and the circuit breaker case.

Exposed conductor must be insulated
Insulating tube or insulating tape must be used for complete insulation between the bare conductors of the MCCB.
In case the terminals are not insulated, it may cause secondary short-circuit during short-circuit accidents.

In case of 4 pole circuit breaker, the neutral wire of 3 phase 4 wise must be connected to the N phase
It may not function in overcurrent which may cause fire.

Use of lubricant at the terminal screw part is prohibited
Lubricant reduces the friction of the screw, causing the screw to loosen, ultimately leading to an increase in temperature.

Stud must not be deformed
Excessive force must not be applied to the stud at the conductor connecting part of the rear connection type.
In addition, stud must not be deformed during wiring.

The conductor must be fixed firmly on a flat state
As for the connecting conductor, electromagnetic force between conductors is generated by extremely big fault current so it must be fixed firmly.

Maintenance inspection

Initial Inspection

- Residues of steel plate, grinded materials of the wire, other conductor's foreign substances and others must not be left around the terminal of the circuit breaker.
- There must be no crack and damage in the cover and base.
- The fastening status of the terminal fastening part must be checked.
- Check if the rated voltage and breaking capacity of the circuit breaker are correct.
- When the insulation resistance is measured using a 500 V insulation-resistance tester, it must be above 5 MΩ.

Withstand voltage

Main Circuit		Auxiliary Circuit or Control Circuit	
Rated Insulation Voltage	Test Voltage (Effective Value of Interchange)	Rated Insulation Voltage of Operational Circuit	Test Voltage (Effective Value of Interchange)
Ui 300 V	2,000 V for 1 min	Uis 60 V	1,000 V for 1 min
300 < 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

Inspection shall be conducted 1 month before/after the commencement of the equipment operation in order to maintain the performance of the circuit breaker and to prevent unexpected accidents. After that, regular inspection is required depending on the environment.

Standard inspection period

Extent	Environment	Standard of Inspection Period
Standard Usage State	Clean and dry state of air	Less than 10 years after installation-Once in 2~3 years
		More than 10 years after installation-Once a year
		More than 15 years after installation-Once in 6 months
	Place without corrosive gas even though there is dust inside	Less than 10 years after installation-Once a year
		More than 10 years after installation-Once in 6 months
		More than 15 years after installation-Once a month
Bad Environment	Place containing sulfurous acid, hydrogen sulfide, salinity, vapor and others	Less than 5 years after installation-Once in 6 months
		More than 5 years after installation-Once a year
	Places with specially more corrosive gas	Once a month

BTB ELECTRIC

REALVALUE FORLIFE

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10 I 2023