

HGD

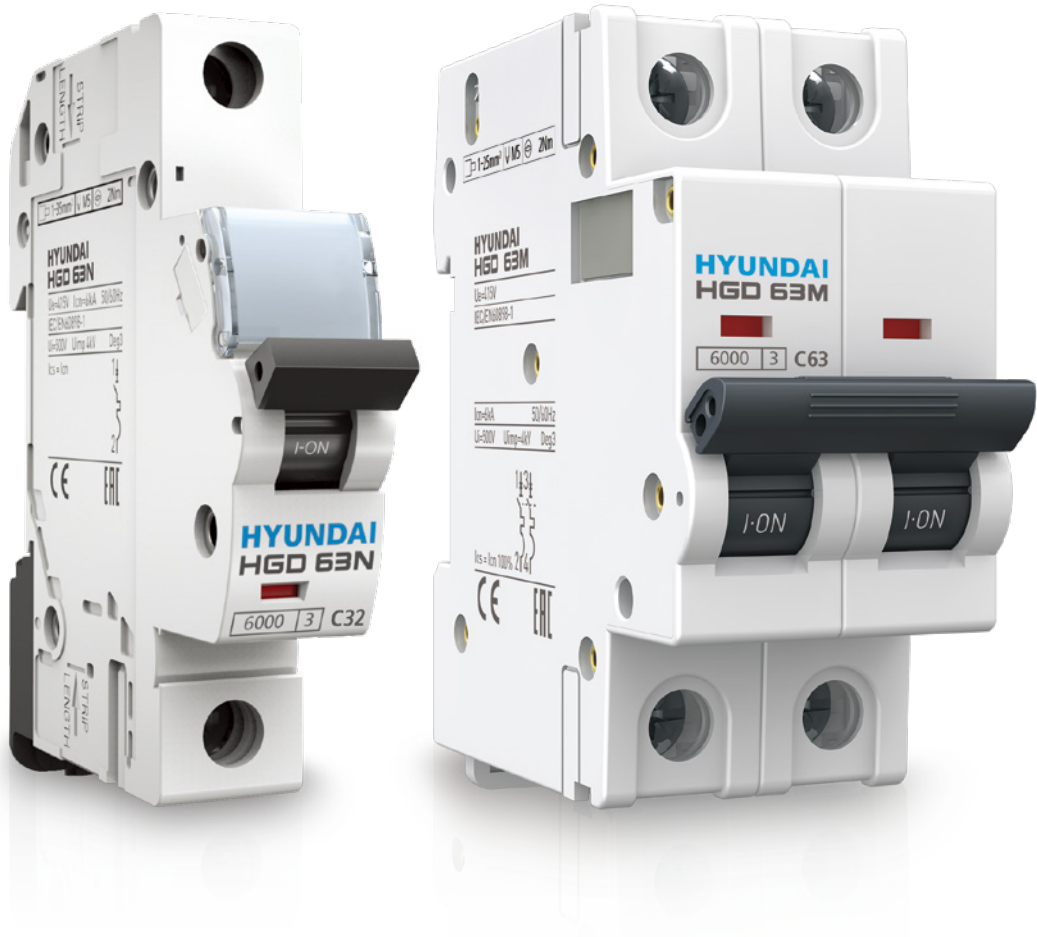
Miniature Circuit Breaker

| | |
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Feature

HGD Miniature Circuit Breaker

Electric distribution needs are continuously evolving in residential, commercial and industrial sectors. Improved operational safety, continuity of service, greater convenience and operating cost have assumed a tremendous significance. Miniature circuit breakers have been designed to continuously adapt to these changing needs.





Product Feature

HGD series MCBs rating covers from 0.5 A to 125 A. The range offers a variety of feature benefits such as uniform breaking capacity of 15 kA across entire range in accordance with IEC/EN 60898-1 and IEC/EN 60947-2. HGD also incorporates features like inscription window, safety terminal, large cable terminals, bi stable clip, positive contact indication and field fittable AUX, ALT, SHT, UVT, OVT.

Deluxe Type

Standard Type



Product Performance

- Low power consumption, thus cost effective & energy saving
- Longer electrical life
- Energy limiting class 3 to ensure low let through energy to limit thermal & mechanical stress on cables.

- Compact structure and external design.
- Customers can choose between deluxe type and standard type depending on the need for inscription window
- Under the standard of IEC 60898-1, all ranges are available with a short circuit capacity of 3 kA~15 kA and it is designed to use both pin type and fork type busbar



Product Structure

- Inscription window
- Precise hammer action
- Easy DIN-Rail extraction
- 13 plates arc chute for effective arc quenching
- Dual termination for bus-bar as well as cable connection
- Trip free mechanism: MCB trips even if held in ON position

- 13 plates arc chute for effective arc quenching
- Dual termination for bus-bar as well as cable connection
- Trip free mechanism: MCB trips even if held in ON position



Accessories

- Selectable AUX/ALT with knob
- Available with enclosure (Option-IP40)

- AUX, ALT, SHT, UVT options are available.
- SHT with AUX function together



Specification

- IEC 60898-2 for DC application
- IEC 60947-2 for industrial application
- IEC 60898-1 for household application

- IEC 60898-1 for household application
- IEC60947-2 for DC application

Product Overview






Deluxe Type (6 kA, 10 kA)



Standard Type (3 kA, 4.5 kA, 6 kA, 10 kA, 15 kA)









Selection Table

HGD (Deluxe Type)

| Model | HGD63N, 63 AF, 6 kA | HGD63H, 63 AF, 10 kA | HGD125, 125 AF, 10 kA |
|-------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| |  |  |  |
| 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 |
| Rated Current (In) | 0.5, 1, 2, 3, 4, 5, 6, 10, 16, 20, 25, 32, 40, 50, 63 A | 0.5, 1, 2, 3, 4, 5, 6, 10, 16, 20, 25, 32, 40, 50, 63 A | 80 A, 100 A, 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 |
| Rated Short Circuit Current (Icn) | 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 | (3-5) In-B Curve (6-9) In-C Curve (8-12) In-D Curve |
| Rated Insulation Voltage (Ui) | 500 V | 500 V | 690 V |
| Rated Impulse Voltage (Uimp) | 4 kV | 4 kV | 4 kV |
| Dielectric Strength | 2.5 kV | 2.5 kV | 2.5 kV |
| Electrical/Mechanical Endurance (no. of operations) Minimum | 10,000/20,000 | 10,000/20,000 | 10,000/20,000 |
| Operating Temperature | -40 °C to + 55 °C | -40 °C to + 55 °C | -40 °C to + 55 °C |
| Humidity | 95 % RH | 95 % RH | 95 % RH |
| Energy Limit Class | 3 | 3 | 3 |
| Terminal Capacity (max) | 35 mm ² | 35 mm ² | 50 mm ² |
| Tightening Torque | 2 N·m | 2 N·m | 3.5 N·m |
| 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 | 0.125 kg | 0.125 kg | 0.215 kg |
| Dimensions (H x D x W)/Pole in mm | 87.5 x 71.7 x 17.7 mm | 87.5 x 71.7 x 17.7 mm | 90 x 76.9 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 Connections Top/Bottom Side | Pin/Fork type (Bottom) | Pin/Fork type (Bottom) | Pin/Fork type (Bottom) |
| AUX/ALT/SHT/UVT/OVT | Yes | Yes | Yes (AUX/ALT) |

※ HGD63N, 63H The appearance are the same.

HGD (Standard Type)

| HGD63E, 63 AF, 3 kA ¹⁾ | HGD63S, 63 AF, 4.5 kA ¹⁾ | HGD32NS, 32 AF, 6 kA | HGD63M, 63 AF, 6 kA ²⁾ | HGD63P, 63 AF, 10 kA ²⁾ | HGD63U, 63 AF, 15 kA | HGD63D (DC), 63 AF, 10 kA | HGD100S, 125 AF, 10 kA |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |  |
| IEC/EN 60898-1 | IEC/EN 60898-1 | IEC/EN 60898-1 | IEC/EN 60898-1, IEC/EN 60947-2 | IEC/EN 60898-1, IEC/EN 60947-2 | IEC/EN 60898-1 IEC/EN 60947-2 | IEC/EN 60947-2 | IEC/EN 60947-2 |
| 1P, 1P + N, 2P, 3P, 3P + N, 4P | 1P, 1P + N, 2P, 3P, 3P + N, 4P | N + 1P (N-left) | 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, 2P, 3P, 4P | 1P, 1P+N, 2P, 3P, 3P + N, 4P |
| 1, 2, 3, 4, 5, 6, 10, 16, 20, 25, 32, 40, 50, 63 A | 1, 2, 3, 4, 5, 6, 10, 16, 20, 25, 32, 40, 50, 63 A | 1, 2, 3, 4, 5, 6, 10, 16, 20, 32 A | 1, 2, 3, 4, 5, 6, 10, 13, 16, 20, 25, 32, 40, 50, 63 A | 1, 2, 3, 4, 5, 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 | 1, 2, 3, 4, 6, 10, 13, 16, 20, 25, 32, 40, 50, 63 A | 63, 80, 100, 125 A |
| AC 240/415 V | AC 240/415 V | AC 240/415 V | AC 240/415 V | AC 240/415 V | AC 240/415 V | 1P: 110V/125V/220V/250Vdc 2P: 220V/250V/440V/500Vdc 3P: 660/750Vdc 4P: 880/1000Vdc | AC 240/415 V |
| 50/60 Hz | 50/60 Hz | 50/60 Hz | 50/60 Hz | 50/60 Hz | 50/60 Hz | - | 50/60 Hz |
| 3 kA (Ics=100 % Icn) | 4.5 kA (Ics=100 % Icn) | 6 kA (Ics=100 % Icn) | 6 kA (Ics=100 % Icn) | 10 kA (Ics=75 % Icn) | 15 kA (Ics=50 % Icn) | 10 kA (Ics=75 % Icu) | 10 kA (Ics=75 % Icu) |
| (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 | (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 | C curve : Ii=6In D curve : Ii=12In | (3-5)In-B Curve (6-9)In-C Curve (8-12)In-D Curve |
| 500 V | 500 V | 500 V | 500 V | 500 V | 500 V | 1,000 V | 500 V |
| 4 kV | 4 kV | 4 kV | 4 kV | 4 kV | 4 kV | 6 kV | 4 kV |
| 2.5 kV | 2.5 kV | 2.5 kV | 2.5 kV | 2.5 kV | 2.5 kV | 2 kV | 2.5 kV |
| 10,000/20,000 | 10,000/20,000 | 10,000/20,000 | 10,000/20,000 | 10,000/20,000 | 10,000/20,000 | 10,000/20,000 | 10,000/20,000 |
| -40 °C to + 55 °C | -40 °C to + 55 °C | -40 °C to + 55 °C | -40 °C to + 55 °C | -40 °C to + 55 °C | -40 °C to + 55 °C | -40 °C to + 55 °C | -40 °C to + 55 °C |
| 95 % RH | 95 % RH | 95 % RH | 95 % RH | 95 % RH | 95 % RH | 95 % RH | 95 % RH |
| 1 | 1 | 3 | 3 | 3 | 3 | 3 | 1 |
| 25 mm ² | 25 mm ² | 10 mm ² | 25 mm ² | 25 mm ² | 25 mm ² | 25 mm ² | 50 mm ² |
| 2 N·m | 2 N·m | 1.2 N·m | 2 N·m | 2 N·m | 2.5 N·m | 2.5 N·m | 3.5 N·m |
| 3 g | 3 g | 3 g | 3 g | 3 g | 3 g | 3 g | 3 g |
| 40 mm free fall | 40 mm free fall | 40 mm free fall | 40 mm free fall | 40 mm free fall | 40 mm free fall | 40 mm free fall | 40 mm free fall |
| IP20 | IP20 | IP20 | IP20 | IP20 | IP20 | IP20 | IP20 |
| Red-ON, Green-OFF | Red-ON, Green-OFF | Red-ON, Green-OFF | Red-ON, Green-OFF | Red-ON, Green-OFF | Red-ON, Green-OFF | Red-ON, Green-OFF | Red-ON, Green-OFF |
| 0.090 kg | 0.090 kg | 0.109 kg | 0.100 kg | 0.115 kg | 0.130 kg | 0.130 kg | 0.155 kg |
| 80.5 x 71.0 x 17.8 mm | 80.5 x 71.0 x 17.8 mm | 83.0 x 71.0 x 17.8 mm | 81 x 71.0 x 17.8 mm | 81 x 71.0 x 17.8 mm | 83.0 x 71.8 x 17.8 mm | 83.0 x 71.8 x 17.8 mm | 81.0 x 71.0 x 26.8 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) | 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) | Clip on DIN Rail (35 mm x 7.5 mm) |
| Vertical/Horizontal | Vertical/Horizontal | Vertical/Horizontal | Vertical/Horizontal | Vertical/Horizontal | Vertical/Horizontal | Vertical/Horizontal | Vertical/Horizontal |
| Molded, flame-retardant thermoplastic material | Molded, flame-retardant thermoplastic material | Molded, flame-retardant thermoplastic material | Molded, flame-retardant thermoplastic material | Molded, flame-retardant thermoplastic material | Molded, flame-retardant thermoplastic material | Molded, flame-retardant thermoplastic material | Molded, flame-retardant thermoplastic material |
| Pin type | Pin type | - | Pin/Fork type | Pin/Fork type | Pin type | Pin type | - |
| No | No | Yes | Yes | Yes | Yes | Yes | Yes (SHT/UVT) |

※ 1) HGD63E, 63S The appearance are the same.

2) HGD63M, 63P The appearance are the same.

3) HGD63U, 63D The appearance are the same.

Accessory (Deluxe Type)

Auxiliary Contact + Alarm Trip (AXT-for 63 AF MCB)

Technical Specification

| | |
|------------------------------------------|---------------------------------------|
| Standard Conformity | IEC/EN 60947-5-4 |
| Current Carrying Capacity (max) | 6 A |
| Rated Voltage (Ue) | AC 240 V |
| Contact Configuration | 1NO + 1NC |
| Rated Insulation Voltage (Ui) | AC 500 V |
| Rated Frequency (F) | 50/60 Hz |
| Utilization Category | AC 12 |
| Electrical Endurance (no. of operations) | 10,000 |
| Terminal Capacity(max) | 2.5 mm ² |
| Protection Degree | IP20 |
| Power Loss | 3 Watts |
| Dimensions (H x D x W) | 88.9 x 71 x 8.85 mm |
| Net Weight | 36 g |
| AUX/ALT Selection knob | AUX(Clockwise)/ALT(Counter clockwise) |
| Mounting | Left side of MCB (HGD63N/H) |

※ Attachment used for signalling, indication and interlocking.

AXT Combination (Position = POS)

| AXT | | | | MCB | | | |
|------|------|------|------|-----|----|----|----|
| POS4 | POS3 | POS2 | POS1 | 1P | 2P | 3P | 4P |
| AUX4 | AUX3 | AUX2 | AUX1 | o | o | o | o |
| - | - | ALT2 | ALT1 | o | o | o | o |
| AUX2 | AUX1 | ALT2 | ALT1 | o | o | o | o |

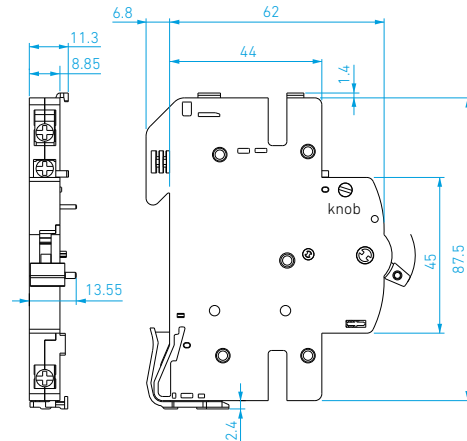
Ordering Information

| | |
|------------|---------|
| AXT HGD63H | AUX/ALT |
|------------|---------|

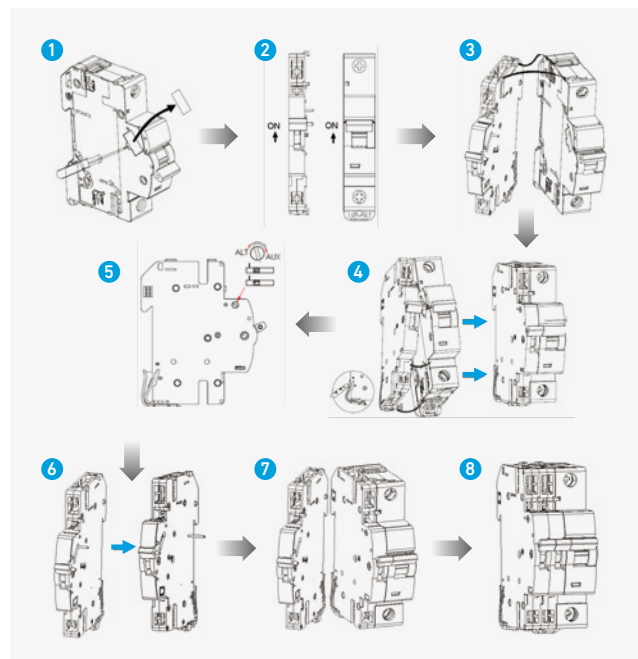
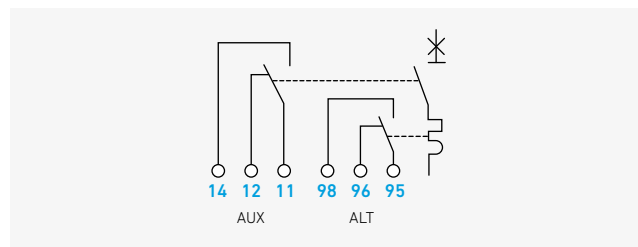
Assembling with MCB (HGD Accessories)

- Remove the window sticker of the protection device with screw driver or by hand
- Make sure the knob is in ON position
Caution don't mount in OFF position
- Adjust the U-shaped locks present at the Upper end of the AXT in such a way that they get fitted into the slots present in the protection device.
- Rotate the AXT so as to bring it nearer to the protection device for final locking. Adjust the U-shaped locks present at the upper end of the AXT in such a way that they get fitted into the slots present in the protection during this snap lock shall remain pressed until the U-Lock of the snap lock gets fitted into the slot provided in the protection.
- AUX-Type: The AXT contacts will signal whether the breaker is in the ON or OFF position.
ALT-Type: The ALT-Type includes a set of contacts that will only signal when the breaker has tripped due to any fault. Typically, the contacts would be connected to an alarm to signal the operator that an overload/short circuit has occurred.
- For multiple mounting of AXT remove the pin from secondary AXT for mounting as shown below with help of any tool.
- Mount the secondary AXT as per previous steps such that the coupling link from secondary AXT gets linked to first one for proper linkage of mechanism with each other in ON position.
- Check for the working of the AXT by switching it ON & OFF.
Set the working of secondary AXT as per step no.5.

Dimension



Circuit Diagram



Shunt Trip (SHT)

Technical Specification

| | |
|------------------------------------------|------------------------------|
| Standard Conformity | IEC 60947-1 |
| Rated Voltage (Ue) | AC 110-415 V DC 110-130 V |
| Rated Frequency (F) | 50/60 Hz |
| Max Release Duration | 10 ms |
| Operational Voltage | 70 %-110 % Ue |
| Coil Resistance | 120 Ω |
| Terminal Capacity(max) | 6 mm ² |
| Mechanical Status Indicator | Front |
| Tightening Torque | 0.8 N·m |
| Dimensions (H x D x W) | 88.3 x 71 x 17.7 mm |
| Net Weight | 72 g |
| Electrical Endurance (no. of operations) | 4,000 |
| Wiring Connection Type | Bottom |
| Mounting | Left side of MCB (HGD63N/H) |

Ordering Information

| | |
|---------------|----------|
| SHT HGD63H S2 | AC 240 V |
| SHT HGD63H S5 | DC 24 V |
| SHT HGD63H S7 | DC 48 V |
| SHT HGD63H S9 | DC 12 V |

Under Voltage Trip (UVT)

Technical Specification

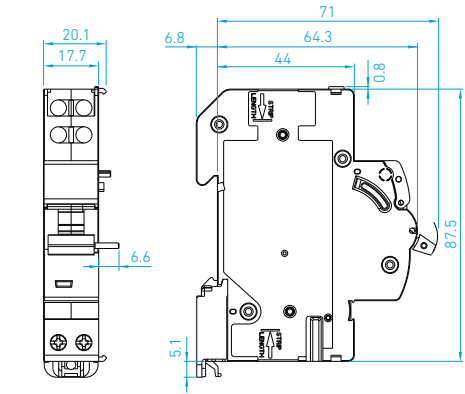
| Phase | Single phase | Three phase |
|------------------------------------------|-----------------------------|-------------|
| Standard Conformity | IEC 60947-1 | |
| Rated Voltage (Ue) | AC 240 V | |
| Rated Frequency (F) | 50/60 Hz | |
| Under Voltage Trip Voltage | $V \leq 0.7 U_e$ | |
| Terminal Capacity(max) | 6 mm ² | |
| Protection Degree | IP20 | |
| Mechanical Status Indicator | Front | |
| Tightening Torque | 0.8 N·m | |
| Dimensions (H x D x W) | 88.3 x 71 x 17.7 mm | |
| Net Weight | 78 g | |
| Electrical Endurance (no. of operations) | 4,000 | |
| Wiring Connection Type | Bottom | Top |
| Mounting | Left side of MCB (HGD63N/H) | |

※ Causes the device with which it is associated to trip when input voltage decreases (between 70 % and 35 % of U_n). Associated device can be manually reclosed when voltage reaches back to 85 %.

Ordering Information

| | |
|----------------|--------------|
| UVT HGD63H US2 | Single phase |
| UVT HGD63H UT2 | Three phase |

Dimension

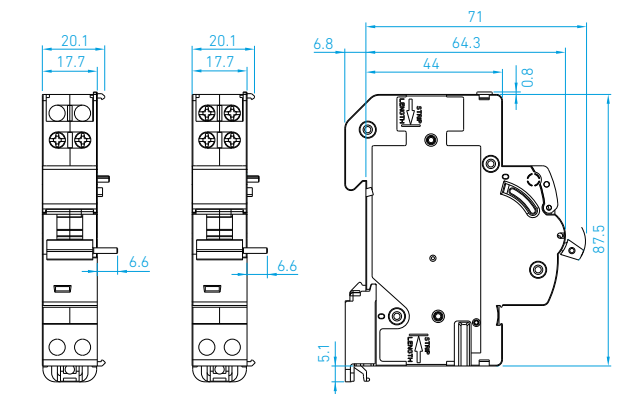


SINGLE PHASE

Circuit Diagram



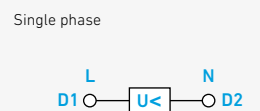
Dimension



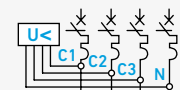
SINGLE PHASE

THREE PHASE

Circuit Diagram



Three phase



Accessory (Deluxe Type)

Under Voltage Trip + Time Delayed (UVT + t)

Technical Specification

| Phase | Single phase | Three phase |
|------------------------------------------|-----------------------------|-------------|
| Standard Conformity | IEC 60947-1 | |
| Rated Voltage (Ue) | AC 240 V | |
| Rated Frequency (F) | 50/60 Hz | |
| Under Voltage Trip Voltage | $V \leq 0.7 U_e$ | |
| Trip Delay | 0.2 sec | |
| Terminal Capacity(max) | 6 mm ² | |
| Protection Degree | IP20 | |
| Mechanical Status Indicator | Front | |
| Tightening torque | 0.8 N·m | |
| Dimensions (H x D x W) | 88.3 x 71 x 17.7 mm | |
| Net Weight | 78 g | |
| Electrical Endurance (no. of operations) | 4,000 | |
| Wiring Connection Type | Bottom | Top |
| Mounting | Left side of MCB (HGD63N/H) | |

※ Causes the device with which it is associated to trip when input voltage decrease (between 70 % and 35 % of Un). No tripping in case of transient voltage drop (up to 0.2 s)

Ordering Information

| | |
|-----------------|--------------|
| UVT HGD63H DUS2 | Single phase |
| UVT HGD63H DUT2 | Three phase |

Over Voltage Trip (OVT)

Technical Specification

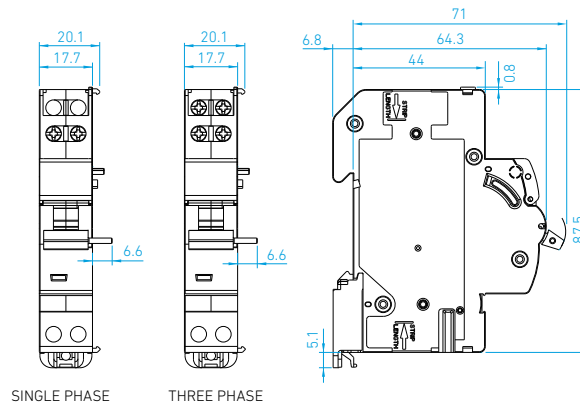
| Phase | Single phase | Three phase |
|------------------------------------------|-----------------------------|----------------|
| Standard Conformity | EN50550 | |
| Rated Voltage (Ue) | AC 240 V | AC 240 V (L-N) |
| Rated Frequency (F) | 50/60 Hz | |
| Max Non-Tripping Voltage | AC 255 V | AC 255 V (L-N) |
| Max Tripping Voltage | AC 280 V | AC 280 V (L-N) |
| Max Duration of Impulse Command | 10 ms | |
| Terminal Capacity(max) | 6 mm ² | |
| Protection Degree | IP20 | |
| Mechanical Status Indicator | Front | |
| Tightening Torque | 0.8 N·m | |
| Dimensions (H x D x W) | 88.3 x 71 x 17.7 mm | |
| Net Weight | 78 g | |
| Electrical Endurance (no. of operations) | 4,000 | |
| Wiring Connection Type | Bottom | Top |
| Mounting | Left side of MCB (HGD63N/H) | |

※ Cuts off the supply power by opening with which it is associated when the phase & neutral voltage is exceeded.

Ordering Information

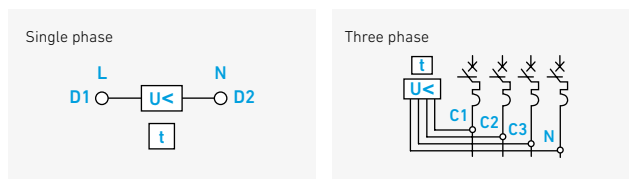
| | |
|----------------|--------------|
| OVT HGD63H OS2 | Single phase |
| OVT HGD63H OT2 | Three phase |

Dimension

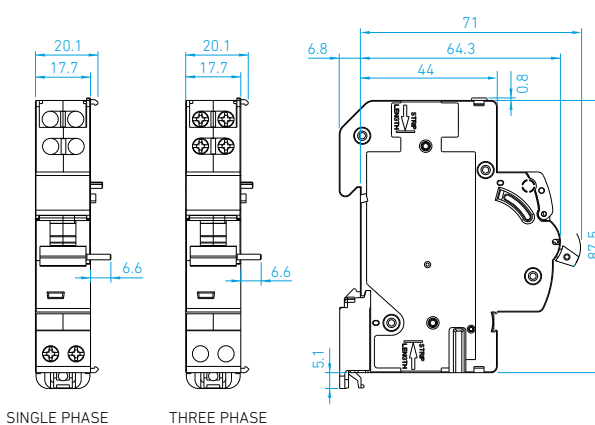


SINGLE PHASE THREE PHASE

Circuit Diagram

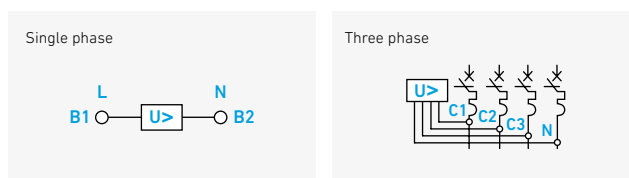


Dimension



SINGLE PHASE THREE PHASE

Circuit Diagram



Under + Over Voltage Trip (UOVT)

Technical Specification

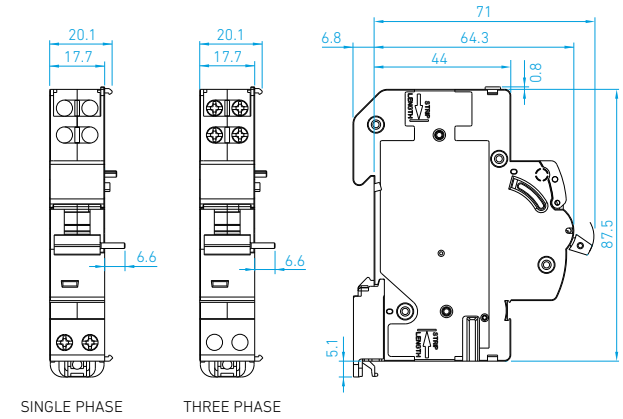
| Phase | Single phase | Three phase |
|------------------------------------------|-----------------------------|----------------|
| Standard Conformity | IEC 60947-1, EN 50550 | |
| Rated Voltage (Ue) | AC 240 V | AC 240 V (L-N) |
| Rated Frequency (F) | 50/60 Hz | |
| Max Non-Tripping Voltage | AC 255 V | AC 255 V (L-N) |
| Max Tripping Voltage | AC 280 V | AC 280 V (L-N) |
| Under Voltage Trip Voltage | $V \leq 0.7 U_e$ | |
| Max Duration of Impulse Command | 10 ms | |
| Terminal Capacity(max) | 6 mm ² | |
| Protection Degree | IP20 | |
| Mechanical Status Indicator | Front | |
| Tightening Torque | 0.8 N·m | |
| Dimensions (H x D x W) | 88.3 x 71 x 17.7 mm | |
| Net Weight | 78 g | |
| Electrical Endurance (no. of operations) | 4,000 | |
| Wiring Connection Type | Bottom | Top |
| Mounting | Left side of MCB (HGD63N/H) | |

※ Cuts the supply power by opening with which it is associated when the phase & neutral voltage is in not with in the limits.

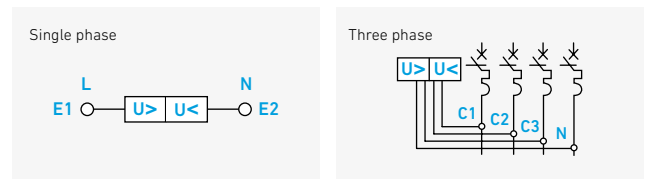
Ordering Information

| | |
|------------------|--------------|
| UOVT HGD63H U0S2 | Single phase |
| UOVT HGD63H U0T2 | Three phase |

Dimension

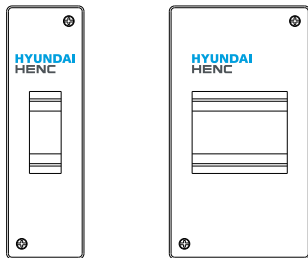


Circuit Diagram



Accessory (Deluxe Type)

Enclosure for MCB-PLASTIC (ENC)



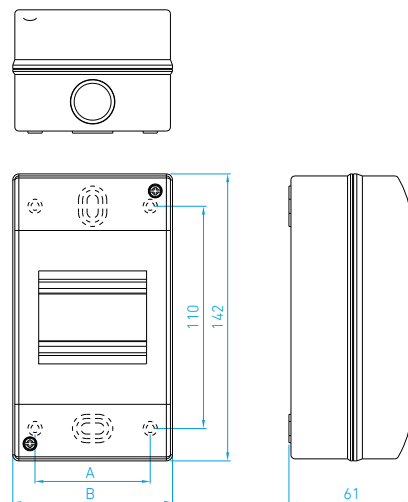
| No. of Ways | Dimensions (In mm) | |
|-------------|--------------------|------|
| | A | B |
| 1P/2P | 29.4 | 43.4 |
| 3P/4P | 57 | 79 |

※ Enclosures for independent cut off/connection of the electrical appliances.

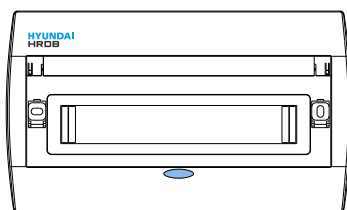
Ordering Information

| | |
|---------------|--------------------------|
| ENC HGD63H 2P | For 1P, 2P MCB Enclosure |
| ENC HGD63H 4P | For 3P, 4P MCB Enclosure |

Dimension



Distribution Box

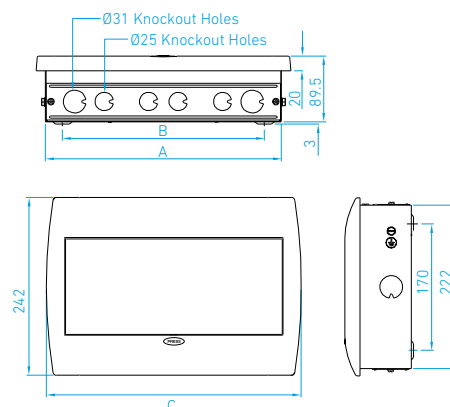


| No. of Ways | A | B | C | Top | | Bottom | | Side |
|-------------|-----|-----|-----|-----|-----|--------|-----|------|
| | | | | Ø25 | Ø31 | Ø25 | Ø31 | |
| 8 | 247 | 195 | 272 | 2 | 2 | 2 | 2 | 1 |
| 12 | 319 | 267 | 344 | 4 | 2 | 4 | 2 | 1 |
| 16 | 391 | 339 | 416 | 4 | 2 | 4 | 2 | 1 |

Specification

- IEC61439-3
- These are most elegantly designed DBs, to suit the décor of homes
- Raised neutral link for easy wiring
- Spring loaded outer cover swings open by just pressing the lock button
- Supplied with masking sheets to protect components from cement during plastering
- Supplied with neutral & earth link, top & bottom detachable plates
- IP 42

Dimension



Ordering Information

| | |
|-----------------|---------|
| ENC HRDB SPN8W | 8 Ways |
| ENC HRDB SPN12W | 12 Ways |
| ENC HRDB SPN16W | 16 Ways |

Accessory (Deluxe Type -125 AF)

Auxiliary Contact + Alarm Trip (AXT-for 125 AF MCB)

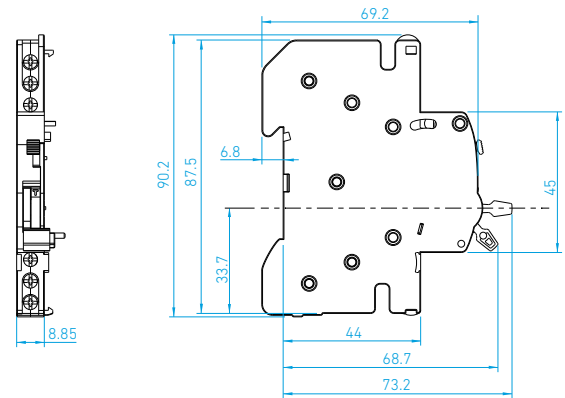
Technical Specification

| | |
|------------------------------------------|---------------------------------------------------------|
| Standard Conformity | IEC/EN 60947-5-4 |
| Coil Consumption | 6 VA |
| Rated Voltage (Ue) | AC240 V |
| Contact Configuration | 1NO + 1NC |
| Rated Insulation Voltage (Ui) | AC500 V |
| Rated Frequency (F) | 50/60 Hz |
| Utilization Category | AC 12 |
| Electrical Endurance (no. of operations) | 10,000 |
| Terminal Capacity (max) | 2.5 mm ² |
| Protection Degree | IP20 |
| Dimensions (H x D x W) | 90.2 x 73.2 x 8.85 |
| Net Weight | 36 g |
| Mounting | Left side of MCB (HGD125) common use of AXT for RCCB |

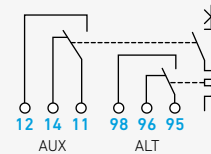
Ordering Information

| | |
|------------|---------|
| AXT HGD125 | AUX/ALT |
|------------|---------|

Dimension



Circuit Diagram

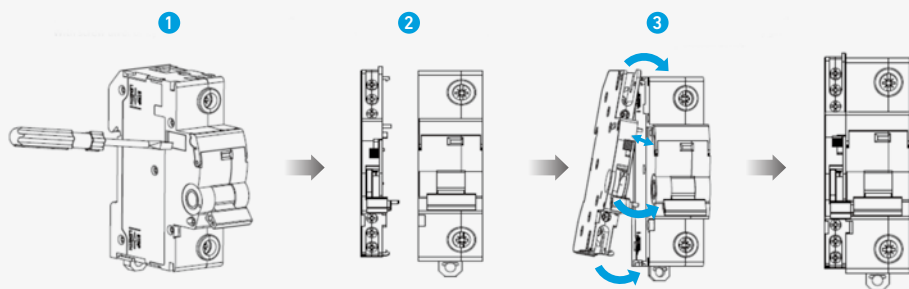


Assembling with MCB (HGD125)

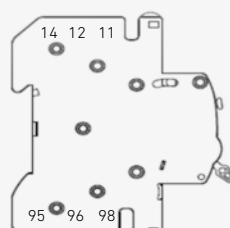
- 1 Remove the window sticker of the protection device with screw driver or by hand

- 2 Make sure the knob is in OFF position
Caution: Don't mount in ON position

- 3 Rotate the AXT so as to bring it nearer to the protection device for locking. Adjust the locks present at the upper end of AXT in such a way that they get fitted in slots present in protection device



Terminal No.



11-12 - ON } AUX
11-14 - OFF

95-96 - ON/OFF } ALT
95-98 - TRIP

Accessory (Standard Type)

Auxiliary Contact (AUX)

Technical Specification

| | | | |
|------------------------------------------|---------------------------------------|---------|-----|
| Standard Conformity | IEC/EN 60947-5-4 | | |
| Current Carrying Capacity (max) | 6 A | | |
| Rated Voltage (Ue) | AC 240 V | | |
| Contact Configuration | 1NO + 1NC | | |
| Rated Insulation Voltage (Ui) | AC 500 V | | |
| Rated Frequency (F) | 50/60 Hz | | |
| Utilization Category | AC 12 | | |
| Electrical Endurance (no. of operations) | 10,000 | | |
| Terminal Capacity (max) | 2.5 mm ² | | |
| Protection Degree | IP20 | | |
| Dimensions (H x D x W) | 81.5 x 74.5 x 8.8 mm | | |
| Net Weight | 32 g | | |
| Mounting | Left side of MCB (HGD63M/P)/Max. 4 EA | | |
| | Operating Power | Current | |
| Operating Current | AC | 415 V | 3 A |
| | | 240 V | 6 A |
| | DC | 130 V | 1 A |
| | | 48 V | 2 A |
| | 24 V | 6 A | |

※ Attachment used for signalling, indication and interlocking point 11 and 14 are connected when circuit is closed. Point 11 and 12 are connected when circuit is open.

Ordering Information

| | |
|------------|-----|
| AUX HGD63P | AUX |
|------------|-----|

Alarm Trip (ALT)

Technical Specification

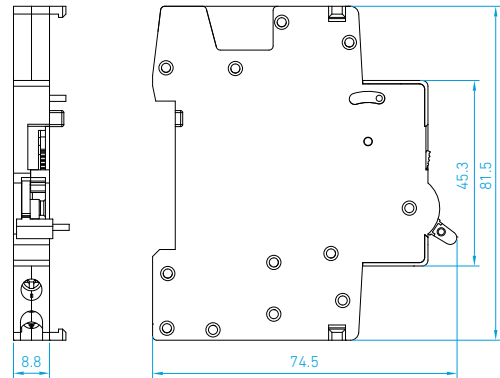
| | | | |
|------------------------------------------|---------------------------------------|---------|-----|
| Standard Conformity | IEC/EN 60947-5-4 | | |
| Current Carrying Capacity (max) | 6 A | | |
| Rated Voltage (Ue) | AC 240 V | | |
| Contact Configuration | 1NO + 1NC | | |
| Rated Insulation Voltage (Ui) | AC 500 V | | |
| Rated Frequency (F) | 50/60 Hz | | |
| Utilization Category | AC 12 | | |
| Electrical Endurance (no. of operations) | 10,000 | | |
| Terminal Capacity (max) | 2.5 mm ² | | |
| Protection Degree | IP20 | | |
| Dimensions (H x D x W) | 81.5 x 74.5 x 8.8 mm | | |
| Net Weight | 32 g | | |
| Mounting | Left side of MCB (HGD63M/P)/Max. 2 EA | | |
| | Operating Power | Current | |
| Operating Current | AC | 415 V | 3 A |
| | | 240 V | 6 A |
| | DC | 130 V | 1 A |
| | | 48 V | 2 A |
| | 24 V | 6 A | |

※ Attachment used for signalling, indication and interlocking
 ※ Point 91 and 92 are connected when circuit is closed.
 Point 91 and 94 are connected when the breaker trips due to fault.
 Point 91 and 92 are connected when the breaker trips by manual operation.
 Meanwhile, point 91 and 94 are disconnected.
 ※ ALT Should be assembled with in 18 mm on the left side of MCB.

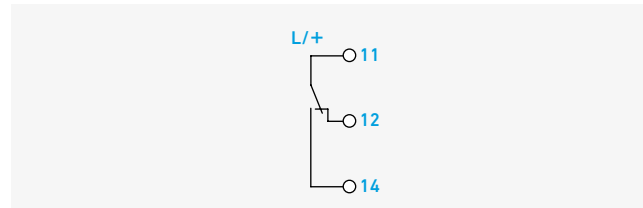
Ordering Information

| | |
|------------|-----|
| ALT HGD63P | ALT |
|------------|-----|

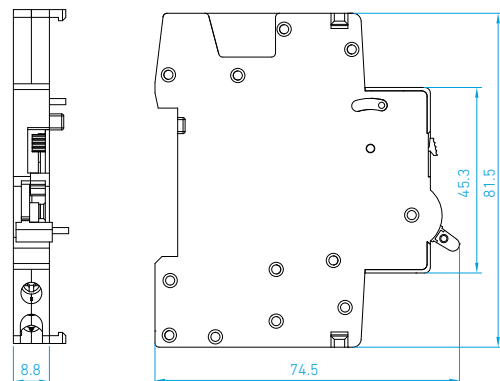
Dimension



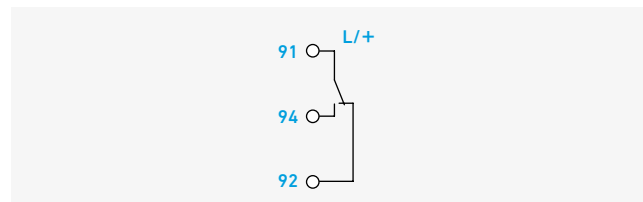
Circuit Diagram



Dimension



Circuit Diagram



Shunt Trip (SHT) + Auxiliary Contact (AUX)

Technical Specification

| | |
|------------------------------------------|--------------------------------|
| Standard Conformity | IEC/EN 60947-1, 60947-5-4 |
| Coil Consumption | 6 VA |
| Rated Voltage (ac) (Ue) | AC 240 V |
| Rated Voltage (dc) (Ue) | 12, 24, 48 V |
| Contact Configuration | 1NO + 1NC |
| Rated Insulation Voltage (Ui) | AC 500 V |
| Rated Frequency (F) | 50/60 Hz |
| Operating Voltage Range | 85 % to 110 % of rated voltage |
| Electrical Endurance (no. of operations) | 4,000 |
| Terminal Capacity(max) | 6 mm ² |
| Protection Degree | IP20 |
| Dimensions (H x D x W) | 81.5 x 74.5 x 18 mm |
| Net Weight | 64 g |
| Mounting | Left side of MCB (HGD63M/P) |

※ Attachment used for remote tripping, signaling and indication.

Ordering Information

| | |
|---------------|----------|
| SHT HGD63P S2 | AC 240 V |
| SHT HGD63P S5 | DC 24 V |
| SHT HGD63P S7 | DC 48 V |
| SHT HGD63P S9 | DC 12 V |

Under Voltage Trip (UVT)

Technical Specification

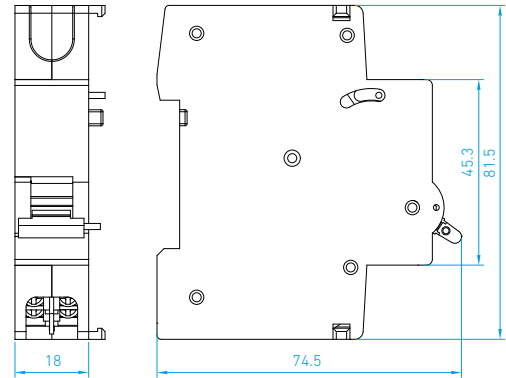
| | |
|------------------------------------------|-----------------------------|
| Standard Conformity | IEC 60947-1 |
| Coil Consumption | 6 VA |
| Rated Voltage (ac) (Ue) | AC 240 V |
| Rated Insulation Voltage (Ui) | AC 500 V |
| Rated Frequency (F) | 50/60 Hz |
| Operating Voltage Range | $V \leq 0.7 U_e$ |
| Electrical Endurance (no. of operations) | 4,000 |
| Terminal Capacity (max) | 6 mm ² |
| Protection Degree | IP20 |
| Dimensions (H x D x W) | 81.5 x 74.5 x 18 mm |
| Net Weight | 60 g |
| Mounting | Left side of MCB (HGD63M/P) |

※ Attachment used for tripping when its input voltage decreases $170 V \pm 5 \%$

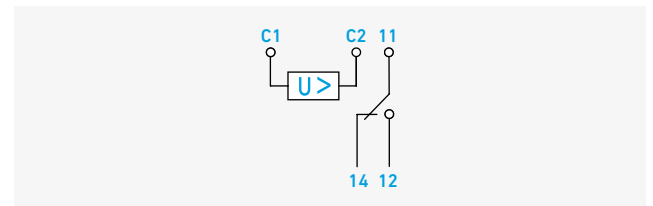
Ordering Information

| | |
|---------------|----------|
| UVT HGD63P U2 | AC 240 V |
|---------------|----------|

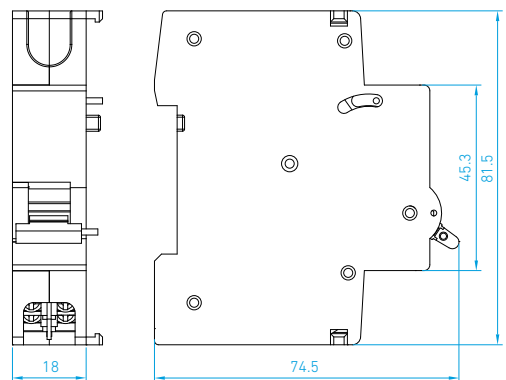
Dimension



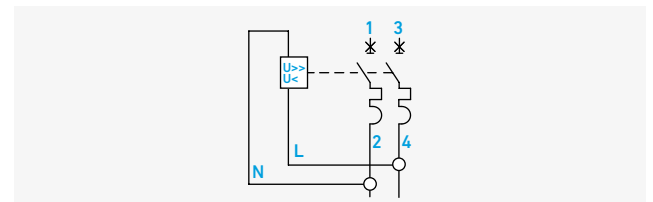
Circuit Diagram



Dimension



Circuit Diagram



Accessory (Standard Type-125 AF)

Shunt Trip (SHT)

Technical Specification

| | |
|------------------------------------------|--------------------------------|
| Standard Conformity | IEC/EN 60947-1 |
| Coil Consumption | 6 VA |
| Rated Voltage (Ue) | AC110 - 415 V DC110 - 130 V |
| Rated Insulation Voltage (Ui) | AC500 V |
| Rated Frequency (F) | 50/60 Hz |
| Operating Voltage Range | 85 % to 110 % of rated voltage |
| Electrical Endurance (no. of operations) | 4,000 |
| Terminal Capacity (max) | 6 mm ² |
| Protection Degree | IP20 |
| Dimensions (H x D x W) | 80.2 x 66.0 x 17.8 |
| Net Weight | 60 g |
| Mounting | Right side of MCB (HGD100S) |

※ Attachment used for remote tripping.

Ordering Information

| | |
|----------------|----------|
| SHT HGD100S S2 | AC 240 V |
|----------------|----------|

Under Voltage Trip (UVT)

Technical Specification


| | |
|------------------------------------------|-----------------------------|
| Standard Conformity | IEC/EN 60947-1 |
| Coil Consumption | 6 VA |
| Rated Voltage (Ue) | AC240 V |
| Rated Insulation Voltage (Ui) | AC500 V |
| Rated Frequency (F) | 50/60 Hz |
| Operating Voltage Range | $V \leq 0.7 U_e$ |
| Electrical Endurance (no. of operations) | 4,000 |
| Terminal Capacity (max) | 6 mm ² |
| Protection Degree | IP20 |
| Dimensions (H x D x W) | 81 x 77.7 x 17.8 |
| Net Weight | 73 g |
| Mounting | Right side of MCB (HGD100S) |

※ Attachment used for tripping when its input voltage decreases 170 V±5 %

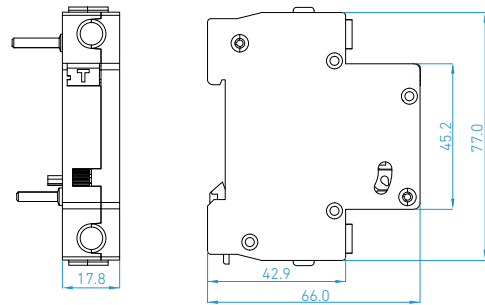
Ordering Information

| | |
|----------------|----------|
| UVT HGD100S U2 | AC 240 V |
|----------------|----------|

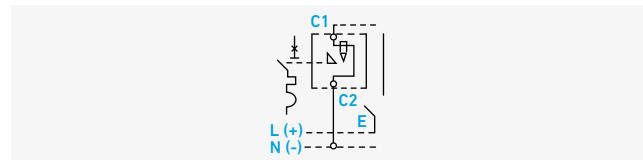
Handle Padlock Device (For 63 AF MCB)

| | |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Function | MCB handle can be locked either at "ON" position or at "OFF" position to prevent unwanted operation of the product |
| General | Diameter of the padlock : 8mm max. Locking in the ON position does not prevent the circuit breaker from tripping in the event of a fault |
| Standard Conformity | IEC/EN 60947-2 |
| Application Type | HGD63 |
| Ordering Information | PLD M63 A |
| Appearance |  |

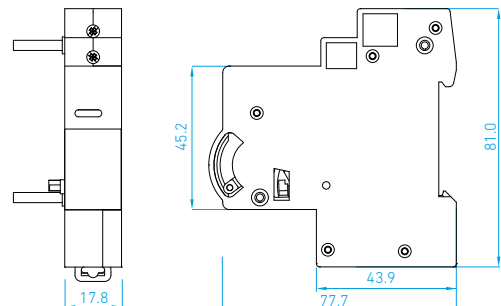
Dimension



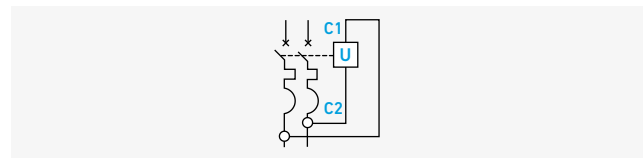
Circuit Diagram



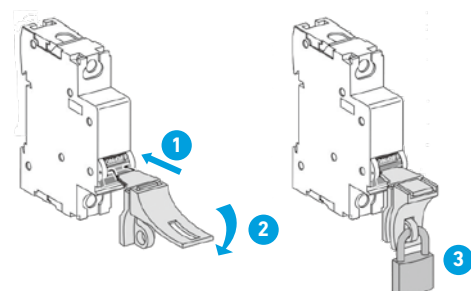
Dimension



Circuit Diagram



Installation



※ Supplied without lock

Accessory (Standard Type-HGD63U/D)

Auxiliary Contact (AUX)

Technical Specification

| | | | |
|------------------------------------------|---------------------------------------|---------|---------|
| Standard Conformity | IEC/EN 60947-5-4 | | |
| Current Carrying Capacity (max) | 6 A | | |
| Rated Voltage (Ue) | AC 240 V | | |
| Contact Configuration | 1NO + 1NC | | |
| Rated Insulation Voltage (Ui) | AC 500 V | | |
| Rated Frequency (F) | 50/60 Hz | | |
| Utilization Category | AC 12 | | |
| Electrical Endurance (no. of operations) | 10,000 | | |
| Terminal Capacity (max) | 2.5 mm ² | | |
| Protection Degree | IP20 | | |
| Dimensions (H x D x W) | 83.6 x 77.3 x 9.0 mm | | |
| Net Weight | 32 g | | |
| Mounting | Left side of MCB (HGD63U/D)/Max. 4 EA | | |
| Operating Current | Operating Power | Voltage | Current |
| | | 415 V | 3 A |
| | AC | 240 V | 6 A |
| | | 130 V | 1 A |
| | DC | 48 V | 2 A |
| | | 24 V | 6 A |

※ Attachment used for signalling, indication and interlocking point 11 and 14 are connected when circuit is closed. Point 11 and 12 are connected when circuit is open.

Ordering Information

| | |
|------------|-----|
| AUX HGD63U | AUX |
|------------|-----|

Alarm Trip (ALT)

Technical Specification

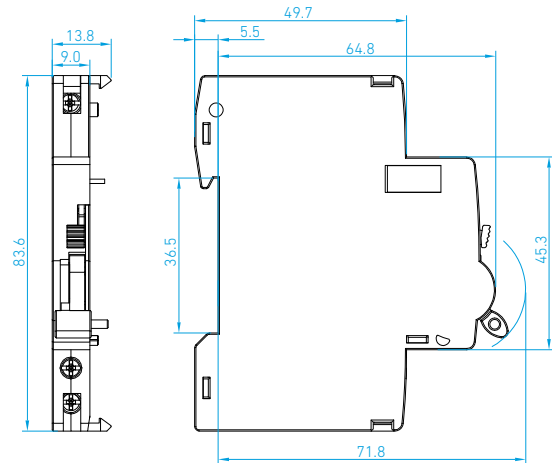
| | | | |
|------------------------------------------|---------------------------------------|---------|---------|
| Standard Conformity | IEC/EN 60947-5-4 | | |
| Current Carrying Capacity (max) | 6 A | | |
| Rated Voltage (Ue) | AC 240 V | | |
| Contact Configuration | 1NO + 1NC | | |
| Rated Insulation Voltage (Ui) | AC 500 V | | |
| Rated Frequency (F) | 50/60 Hz | | |
| Utilization Category | AC 12 | | |
| Electrical Endurance (no. of operations) | 10,000 | | |
| Terminal Capacity (max) | 2.5 mm ² | | |
| Protection Degree | IP20 | | |
| Dimensions (H x D x W) | 83.6 x 77.3 x 9.0 mm | | |
| Net Weight | 32 g | | |
| Mounting | Left side of MCB (HGD63U/D)/Max. 2 EA | | |
| Operating Current | Operating Power | Voltage | Current |
| | | 415 V | 3 A |
| | AC | 240 V | 6 A |
| | | 130 V | 1 A |
| | DC | 48 V | 2 A |
| | | 24 V | 6 A |

※ Attachment used for signalling, indication and interlocking
 ※ Point 91 and 92 are connected when circuit is closed.
 Point 91 and 94 are connected when the breaker trips due to fault.
 Point 91 and 92 are connected when the breaker trips by manual operation.
 Meanwhile, point 91 and 94 are disconnected.
 ※ ALT Should be assembled with in 18 mm on the left side of MCB.

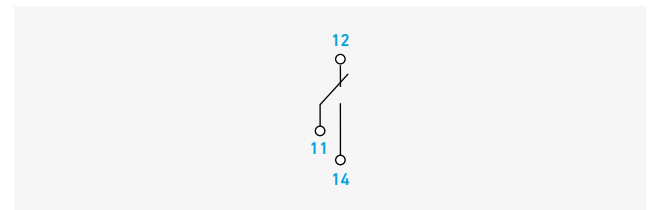
Ordering Information

| | |
|------------|-----|
| ALT HGD63U | ALT |
|------------|-----|

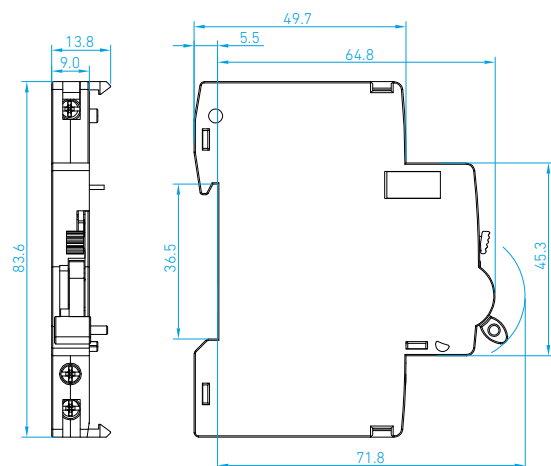
Dimension



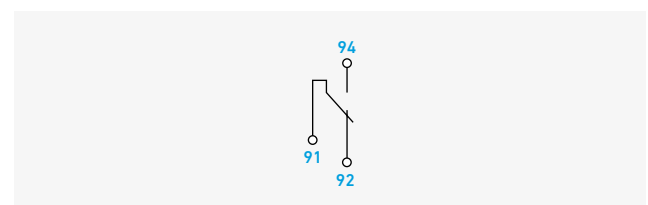
Circuit Diagram



Dimension



Circuit Diagram



Accessory (Standard Type-HGD63U/D)

Shunt Trip (SHT)

Technical Specification

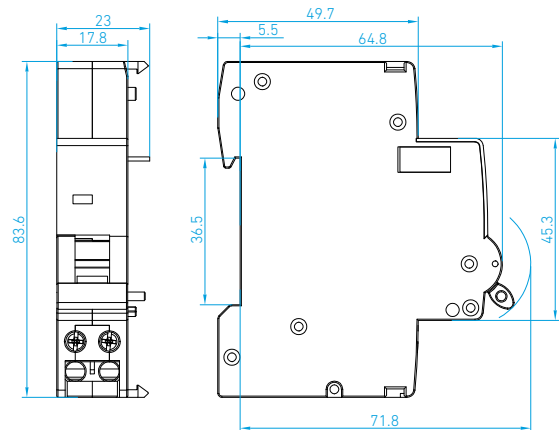
| | |
|------------------------------------------|--------------------------------|
| Standard Conformity | IEC/EN 60947-1, 60947-5-4 |
| Coil Consumption | 6 VA |
| Rated Voltage (Ue) | AC 240 V |
| Rated Insulation Voltage (Ui) | AC 500 V |
| Rated Frequency (F) | 50/60 Hz |
| Operating Voltage Range | 85 % to 110 % of rated voltage |
| Electrical Endurance (no. of operations) | 4,000 |
| Terminal Capacity(max) | 6 mm ² |
| Protection Degree | IP20 |
| Dimensions (H x D x W) | 83.6 x 77.3 x 17.8 mm |
| Net Weight | 64 g |
| Mounting | Left side of MCB (HGD63U/D) |

※ Attachment used for remote tripping, signaling and indication.

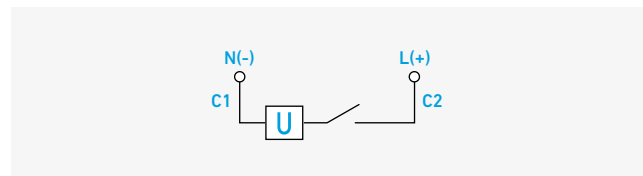
Ordering Information

| | |
|---------------|----------|
| SHT HGD63U S2 | AC 240 V |
|---------------|----------|

Dimension



Circuit Diagram



Under + Over Voltage Trip (UOVT)

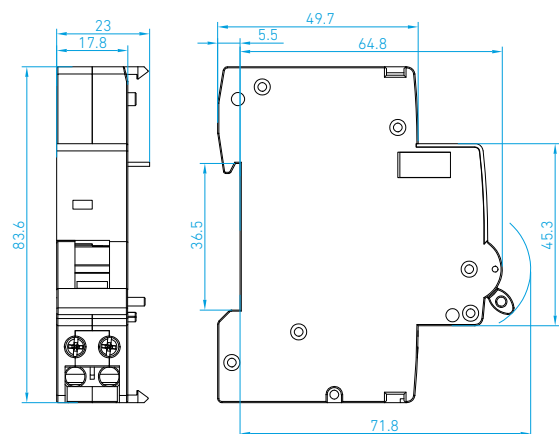
Technical Specification

| | |
|------------------------------------------|-----------------------------|
| Standard Conformity | IEC 60947-1 |
| Rated Voltage (Ue) | AC 240 V |
| Rated Insulation Voltage (Ui) | AC 500 V |
| Max Non-Tripping Voltage | AC 255 V |
| Max Tripping Voltage | AC 280 V |
| Under Voltage Trip Voltage | $V \leq 0.7 U_e$ |
| Max Duration of Impulse Command | 10 ms |
| Terminal Capacity (max) | 6 mm ² |
| Protection Degree | IP20 |
| Mechanical Status Indicator | Front |
| Tightening Torque | 0.8 N·m |
| Dimensions (H x D x W) | 83.6 x 77.3 x 17.8 mm |
| Net Weight | 78 g |
| Electrical Endurance (no. of operations) | 4,000 |
| Mounting | Left side of MCB (HGD63U/D) |

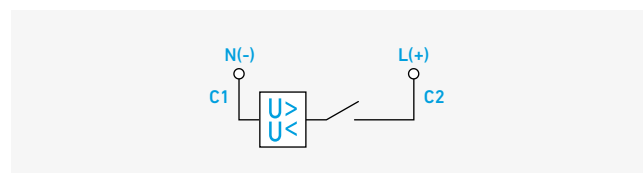
Ordering Information

| | |
|------------------|--------------|
| UOVT HGD63U U0S2 | Single phase |
|------------------|--------------|

Dimension



Circuit Diagram



Accessory Ordering Information

Deluxe Type

| Type | Code | Description | |
|-----------------|----------------------------|-----------------------|-------------------------|
| HGD63N/HGD63H | AXT | AXT HGD63H AUX/ALT | |
| | SHT | SHT HGD63H S2 | AC 240 V |
| | | SHT HGD63H S5 | DC 24 V |
| | | SHT HGD63H S7 | DC 48 V |
| | | SHT HGD63H S9 | DC 12 V |
| | | UVT | UVT HGD63H US2 |
| | UVT (Time Delayed Type) | UVT HGD63H UT2 | Three phase (AC 415 V) |
| | | UVT HGD63H DUS2 | Single phase (AC 240 V) |
| | OVT | UVT HGD63H DUT2 | Three phase (AC 415 V) |
| | | OVT HGD63H OS2 | Single phase (AC 240 V) |
| | UVT + OVT | OVT HGD63H OT2 | Three phase (AC 415 V) |
| | | UOVT HGD63H UOS2 | Single phase (AC 240 V) |
| | ENCLOSURE | UOVT HGD63H UOT2 | Three phase (AC 415 V) |
| | | ENC HGD63H 2P | for 1P/2P MCB |
| | Distribution Box | ENC HGD63H 4P | for 3P/4P MCB |
| | | ENC HRDB SPN8W | 8 Ways |
| ENC HRDB SPN12W | | 12 Ways | |
| HGD125 | ENC HRDB SPN16W | 16 Ways | |
| | AXT | AXT HGD125 AUX/ALT | |

Standard Type

| Type | Code | Description | |
|---------------------------|-----------|-----------------------------|-------------------------|
| HGD63M/HGD63P/ HGD32NS | AUX | AUX HGD63P | |
| | ALT | ALT HGD63P | |
| | SHT + AUX | SHT HGD63P S2 | AC 240 V |
| | | SHT HGD63P S5 | DC 24 V |
| | | SHT HGD63P S7 | DC 48 V |
| | | SHT HGD63P S9 | DC 12 V |
| | UVT | UVT HGD63P U2 | Single phase (AC 240 V) |
| PADLOCK | PLD M63 A | Common use with Deluxe Type | |
| HGD100S | SHT | SHT HGD100S S2 | AC 240 V |
| | UVT | UVT HGD100S U2 | Single phase (AC 240 V) |
| HGD63U/HGD63D | AUX | AUX HGD63U | |
| | ALT | ALT HGD63U | |
| | SHT | SHT HGD63U S2 | AC 240 V |
| | UVT + OVT | UOVT HGD63U UOS2 | Single phase (AC 240 V) |

Technical Data

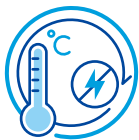
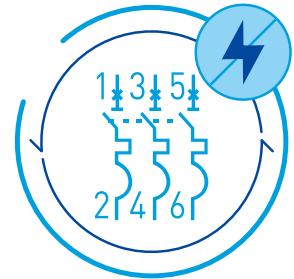
Description

Construction

Miniature circuit breakers have precisely formed molded case & cover of flame 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.

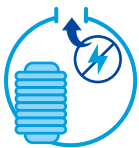
The contact mechanism comprises of fixed & moving contacts specially designed for reliability, long life and anti-weld properties. The arc extinguishing device comprises of 13 plates arc chute. The arc under the influence of the magnetic field and arc guide is moved into the arc chute where it is rapidly split and quenched. The tripping mechanism is thermal magnetic type.



Thermal Operation

The thermal operation provides protection from moderate overloads.

Under overload condition, a thermo-metallic element (bimetallic strip) deflects until it operates a latching mechanism allowing the main contacts to open.

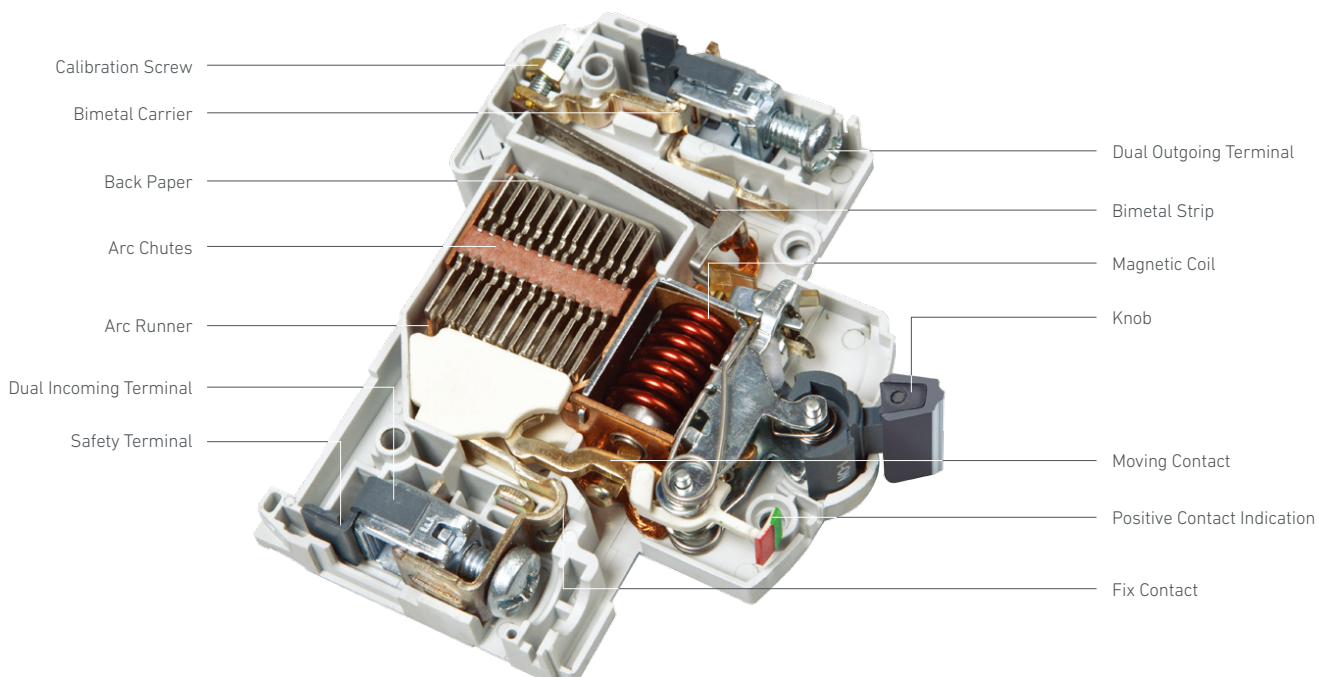


Magnetic Operation

In magnetic operation, large overloads or short circuit current actuates

a solenoid causing a plunger to strike the latching mechanism rapidly opening the main contacts.

Internal View



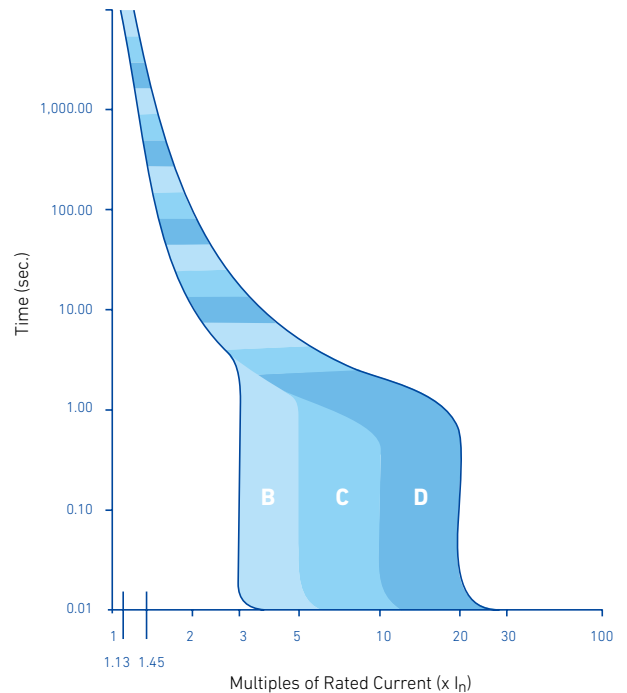
Characteristics Curves

| As per | Thermal Tripping | | | Magnetic Tripping | | |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------|-------------------|------------|-------------------|-----------------|--------------|
| | No Tripping | Tripping | Time | Hold | Trip | Time |
| IEC/EN 60898-1 | Current | Current | Limits | Current | Current | Limits |
| | I_1 | I_2 | t | I_4 | I_5 | t |
| B Curve | $1.13 \times I_n$ | | ≥ 1 h | $3 \times I_n$ | | ≥ 0.1 s |
| | | $1.45 \times I_n$ | <1 h | | $5 \times I_n$ | <0.1 s |
| C Curve | $1.13 \times I_n$ | | ≥ 1 h | $5 \times I_n$ | | ≥ 0.1 s |
| | | $1.45 \times I_n$ | <1 h | | $10 \times I_n$ | <0.1 s |
| D Curve | $1.13 \times I_n$ | | ≥ 1 h | $10 \times I_n$ | | ≥ 0.1 s |
| | | $1.45 \times I_n$ | <1 h | | $20 \times I_n$ | <0.1 s |
| $I_3 = 2.55 \times I_n$ | $1 \text{ s} < t < 60 \text{ s}$ for $I_n \leq 32 \text{ A}$ $1 \text{ s} < t < 120 \text{ s}$ for $I_n > 32 \text{ A}$ | | | | | |

Tripping Characteristics

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) I_n
- **'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) I_n
- **'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) I_n



Technical Data

Temperature Derating Table

| 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 | 60 °C |
| 0.5 | 0.64 | 0.62 | 0.60 | 0.58 | 0.56 | 0.54 | 0.52 | 0.5 | 0.48 | 0.46 | 0.44 | 0.42 | 0.40 | 0.38 |
| 1.0 | 1.28 | 1.24 | 1.20 | 1.16 | 1.12 | 1.08 | 1.04 | 1.0 | 0.96 | 0.92 | 0.88 | 0.84 | 0.80 | 0.76 |
| 2.0 | 2.56 | 2.48 | 2.40 | 2.32 | 2.24 | 2.16 | 2.08 | 2.0 | 1.92 | 1.84 | 1.76 | 1.68 | 1.60 | 1.52 |
| 3.0 | 3.84 | 3.72 | 3.60 | 3.48 | 3.36 | 3.24 | 3.12 | 3.0 | 2.88 | 2.76 | 2.64 | 2.52 | 2.40 | 2.28 |
| 4.0 | 5.12 | 4.96 | 4.80 | 4.64 | 4.48 | 4.32 | 4.16 | 4.0 | 3.84 | 3.68 | 3.52 | 3.36 | 3.20 | 3.04 |
| 5.0 | 6.40 | 6.20 | 6.00 | 5.80 | 5.60 | 5.40 | 5.20 | 5.0 | 4.80 | 4.60 | 4.40 | 4.20 | 4.00 | 3.80 |
| 6.0 | 7.68 | 7.44 | 7.20 | 6.96 | 6.72 | 6.48 | 6.24 | 6.0 | 5.76 | 5.52 | 5.28 | 5.04 | 4.80 | 4.56 |
| 10.0 | 12.80 | 12.40 | 12.00 | 11.60 | 11.20 | 10.80 | 10.40 | 10.0 | 9.60 | 9.20 | 8.80 | 8.40 | 8.00 | 7.60 |
| 16.0 | 20.50 | 19.80 | 19.60 | 18.60 | 17.90 | 17.70 | 16.60 | 16.0 | 15.40 | 14.70 | 14.10 | 13.40 | 12.80 | 12.20 |
| 20.0 | 25.60 | 24.80 | 24.00 | 23.20 | 22.40 | 21.60 | 20.80 | 20.0 | 19.20 | 18.40 | 17.60 | 16.80 | 16.00 | 15.20 |
| 25.0 | 32.00 | 31.00 | 30.00 | 29.00 | 28.00 | 27.00 | 26.00 | 25.0 | 24.00 | 23.00 | 22.00 | 21.00 | 20.00 | 19.00 |
| 32.0 | 41.00 | 39.70 | 38.40 | 37.10 | 35.00 | 34.60 | 33.30 | 32.0 | 30.70 | 29.40 | 28.20 | 26.90 | 25.60 | 24.30 |
| 40.0 | 51.20 | 49.60 | 48.00 | 46.40 | 44.80 | 43.20 | 41.60 | 40.0 | 38.40 | 36.80 | 35.20 | 33.60 | 32.00 | 30.40 |
| 50.0 | 64.00 | 62.00 | 60.00 | 58.00 | 56.00 | 54.00 | 52.00 | 50.0 | 48.00 | 46.00 | 44.00 | 42.00 | 40.00 | 38.00 |
| 63.0 | 80.60 | 78.10 | 75.60 | 73.10 | 70.60 | 68.00 | 65.50 | 63.0 | 60.50 | 58.00 | 55.40 | 52.90 | 50.90 | 47.90 |
| 80.0 | 95.10 | 93.10 | 91.00 | 88.90 | 86.80 | 84.60 | 82.30 | 80.0 | 77.60 | 75.10 | 72.60 | 70.00 | 67.20 | 64.40 |
| 100.0 | 121.10 | 118.30 | 115.50 | 112.50 | 109.50 | 106.50 | 103.30 | 100.0 | 96.60 | 93.10 | 89.60 | 85.60 | 81.60 | 77.50 |
| 125.0 | 144.30 | 141.70 | 139.00 | 136.60 | 133.60 | 130.80 | 127.90 | 125.0 | 121.90 | 118.90 | 115.70 | 112.40 | 109.10 | 105.60 |

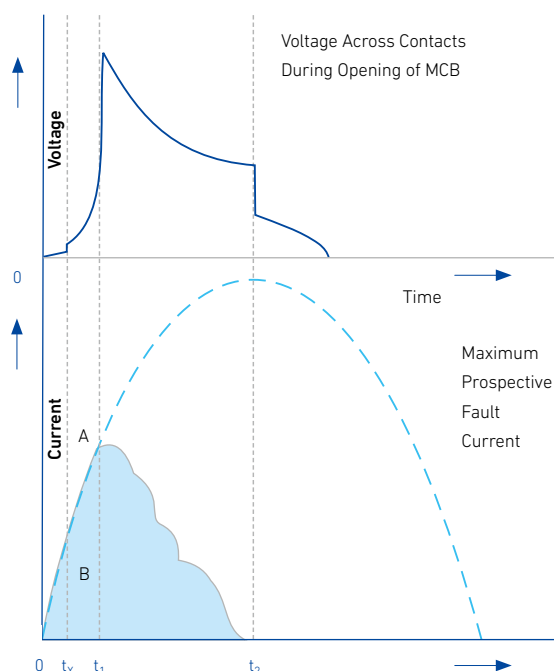
Current Limiting Design

In a current limiting breaker, the tripping & arc control mechanism are designed that under short circuit conditions, the contacts are physically separated and the electrodynamic forces set up by fault current, assist the extinction in less than half cycle.

The figure shows the current limiting effect of circuit breakers.

Fault traces for voltage & current

- 0 = Point of fault initiation
- t_x = Contact opening time (i.e., creation of arc)
- t_1 = Current/Voltage peak (i.e., current limitation)
- t_2 = Time to total extinction of arc (i.e., complete shutdown of fault current)

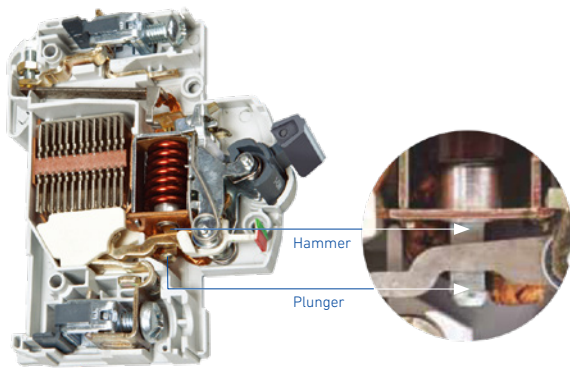


Standard Use Environment

Hammer Trip Mechanism

Current limiting design in itself may not fulfill the requirement of quick breaking (instantaneous action) mainly due to inertia of the latch mechanism and interconnected sequence of operations.

A hammer directly connected to the plunger strikes the moving contact arm with a force proportional to the peak current there by forcibly separating the moving contact from the fixed contact much before the latch mechanism operates. This further reduces the opening time of the circuit breaker.



Effect of Frequency Variation

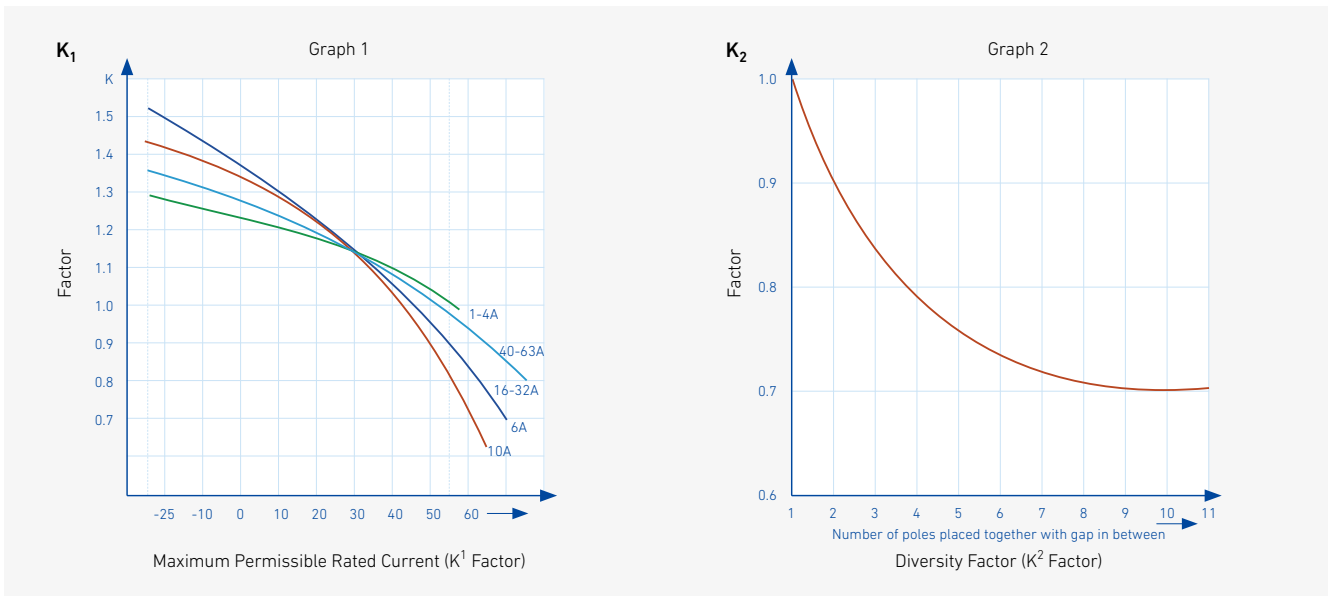
MCBs are designed to operate at AC frequency 50/60 Hz. However, MCBs specially suitable for DC applications and for frequencies upto 400 Hz can be supplied on request.

These can be used on different frequencies in supply from 50-60 Hz without any deration.

For higher frequencies, normal MCBs can be used with a multiplication factor which shall only affect its magnetic trip current.

| Supply | AC | | | DC |
|-----------------------|--------|--------|--------|-----|
| | 100 Hz | 200 Hz | 400 Hz | |
| Frequency | | | | |
| Multiplication Factor | 1.1 | 1.2 | 1.5 | 1.5 |

Ambient Temperature Compensation/Diversity Factor Chart



Calculation

$$I_n / \text{MCB} = K_1 \times K_2 \times I_n$$

Example

4 MCBs with $I_n = 10$ A, and the amb. temp. is 50°C kept with no gap in between

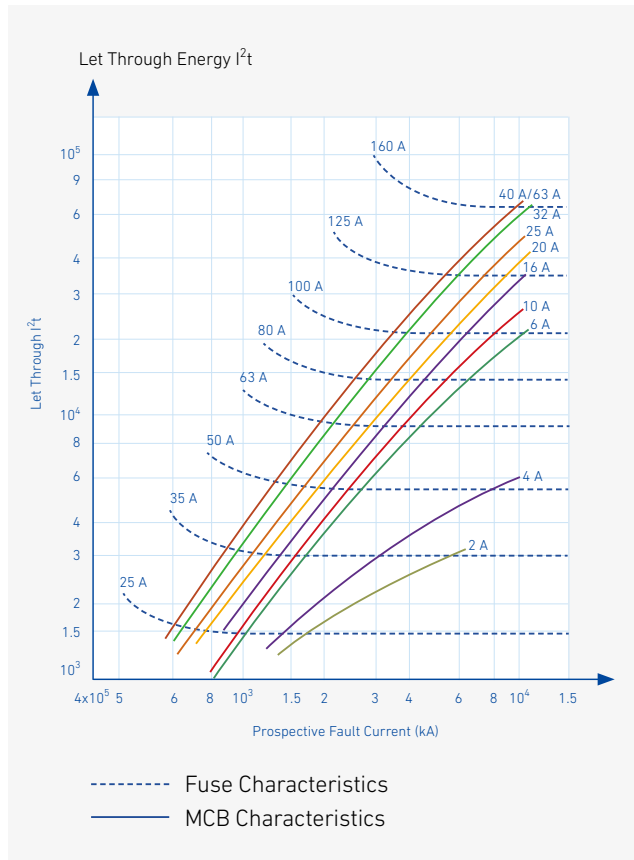
Solution

$K_1 = 0.89$ (from graph 1)

$K_2 = 0.78$ (from graph 2)

$$I_n / \text{pole} = 0.89 \times 0.78 \times 10 = 6.94 \text{ A}$$

Technical Data



Energy Limiting Class 3

MCBs are designed to have low let through energy during faults, thus ensuring better protection of cables and equipment.

Maximum Backup Protection

At site, no. of MCBs are used for outgoing connection. To protect the MCBs under short circuit (higher breaking capacity), we need to put fuses in the incoming side. The current rating of fuses should not be more than the values given in the table.

| MCB Current Rating | Backup Fuse Rating |
|--------------------|--------------------|
| 1 A | 25 A |
| 2 A | 35 A |
| 4 A | 50 A |
| 6 A | 80 A |
| 10-63 A | 100 A |

Cold Resistance & Power Loss Details

The power loss value declared at rated current.

| Rated Current I_n (A) | Cold Resistance R_l (mΩ) | Power Loss per Pole P_v (W) |
|-------------------------|----------------------------|-------------------------------|
| 0.5 | 3,100.00 | 0.8 |
| 1 | 860.80 | 1.0 |
| 2 | 280.00 | 1.2 |
| 4 | 70.00 | 1.2 |
| 6 | 25.00 | 1.3 |
| 10 | 11.68 | 1.4 |
| 13 | 10.10 | 1.6 |
| 16 | 8.00 | 2.2 |
| 20 | 4.50 | 2.3 |
| 25 | 3.78 | 3.1 |
| 32 | 2.57 | 3.3 |
| 40 | 1.94 | 3.6 |
| 63 | 1.30 | 6.2 |
| 80 | 1.00 | 10.0 |
| 100 | 0.85 | 11.0 |
| 125 | 0.80 | 12.5 |

※ Remarks: Tolerance $\pm 5\%$

DC Application

MCBs for DC application are specially designed to meet tough arc quenching conditions. While selecting circuit breaker for DC applications following parameters have to be taken into consideration.

Normal Circuit Currents

The rating and normal running temperature of the MCB are unaffected by DC. The MCB can be selected using the thermal section of the standard time/current curves. Magnetic tripping on DC is different from the equivalent AC by a peak factor of 1.4
 ie., for 'B' curve AC MCB, magnetic range = $(3-5)I_n$
 for DC MCB, magnetic range = $1.4(3-5)I_n = (4-7)I_n$
 for 'C' curve AC MCB, magnetic range = $(5-10)I_n$
 for DC MCB, magnetic range = $1.4(5-10)I_n = (7-14)I_n$

Short Circuit Currents

The maximum short circuit current possible on a DC system is determined by the voltage of the battery and the total internal resistance of the cells.
 It is given by Ohm's law: $I_{SC} = V_b/R_b$
 Where, I_{SC} is the short circuit current
 V_b is the voltage of the battery (with 100 % charged battery)
 R_b is the internal resistance of the battery cells
 (this is usually stated by the manufacturer)

Circuit Time Constant

The time constant is given by: $L/R = 15 \text{ ms max}$ where L is the inductance of the circuit

R is The Resistance Of The Circuit

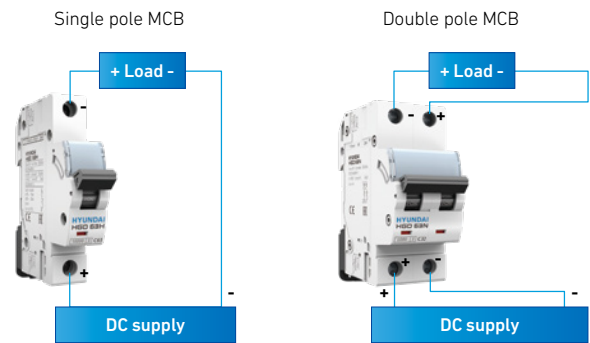
The time constant is usually given in milliseconds (ms.). Ideally, DC circuits would be mainly resistive (i.e. a low number), as inductive circuits produce a back emf when the current suddenly falls. This in turn tends to prolong arcing during switching operations, and so reduce contact life.

Circuit Voltage

The voltage of the circuit is dependent on the power supply. The lower the voltage the easier switching operations will be, but the voltage makes no difference to the running of the MCBs. Contact life can be significantly increased by reducing the voltage, drop across each pole. This can be achieved by wiring poles in series.

Technical Data

Correct polarity connections for DC MCBs
 • Connection diagram

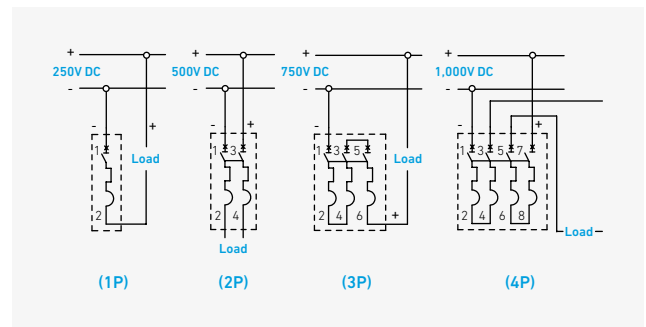


• All HGD type MCB can be applied in DC.

| | | |
|---------------------------------------|----|-------------------|
| Rated Current (I_n) | A | 0.5-63 |
| Rated Voltage (U_e) | V= | 250/500/750/1,000 |
| No. of Poles | | 1P, 2P, 3P, 4P |
| Rated Short Circuit Breaking Capacity | kA | 10 |

※ Also available in DC 24-130 V

Connection Diagram



Technical Data

Discrimination Table

| MCB Downstream | MCB Upstream C Curves | | | | | | | | | |
|-------------------|-----------------------|------|------|------|------|------|------|------|------|------|
| | C Curve | 10 A | 13 A | 16 A | 20 A | 25 A | 32 A | 40 A | 50 A | 63 A |
| 0.5 to 5 A | 50 | 65 | 80 | 100 | 125 | 160 | 200 | 250 | 315 | |
| 6 A | | 65 | 80 | 100 | 125 | 160 | 200 | 250 | 315 | |
| 10 A | | | | 100 | 125 | 160 | 200 | 250 | 315 | |
| 13 A | | | | | 125 | 160 | 200 | 250 | 315 | |
| 16 A | | | | | | 160 | 200 | 250 | 315 | |
| 20 A | | | | | | | 200 | 250 | 315 | |
| 25 A | | | | | | | | 250 | 315 | |
| 32 A | | | | | | | | | | 315 |
| 40 A | | | | | | | | | | |
| 50 A | | | | | | | | | | |

| MCB Downstream | MCB Upstream B Curves | | | | | | | | | | |
|-------------------|-----------------------|-----|------|------|------|------|------|------|------|------|------|
| | B Curve | 6 A | 10 A | 13 A | 16 A | 20 A | 25 A | 32 A | 40 A | 50 A | 63 A |
| 0.5 to 5 A | | | 30 | 39 | 48 | 60 | 75 | 96 | 120 | 150 | 189 |
| 6 A | | | 30 | 39 | 48 | 60 | 75 | 96 | 120 | 150 | 189 |
| 10 A | | | | | 48 | 60 | 75 | 96 | 120 | 150 | 189 |
| 13 A | | | | | | 60 | 75 | 96 | 120 | 150 | 189 |
| 16 A | | | | | | | 75 | 96 | 120 | 150 | 189 |
| 20 A | | | | | | | | 96 | 120 | 150 | 189 |
| 25 A | | | | | | | | | 120 | 150 | 189 |
| 32 A | | | | | | | | | | | 189 |

| MCB Downstream | MCCB Upstream | | | | | | | | | | | | | | | | | | | | | | |
|-------------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|---------|---------|---|
| | C Curve | 16 A | 20 A | 25 A | 32 A | 40 A | 50 A | 63 A | 80 A | 100 A | 125 A | 160 A | 200 A | 250 A | 320 A | 400 A | 500 A | 630 A | 800 A | 1,000 A | 1,250 A | 1,600 A | |
| 0.5 to 6 A | | 1,100 | 1,200 | 1,400 | 1,700 | 2,000 | 2,500 | 3,400 | 4,800 | 5,800 | 6,700 | T | T | T | T | T | T | T | T | T | T | T | T |
| 10 A | | | 1,100 | 1,200 | 1,400 | 1,700 | 2,100 | 2,500 | 3,000 | 3,500 | 4,300 | T | T | T | T | T | T | T | T | T | T | T | T |
| 16 A | | | | | 1,300 | 1,600 | 1,900 | 2,100 | 2,400 | 2,700 | 3,200 | 8,300 | T | T | T | T | T | T | T | T | T | T | T |
| 20 A | | | | | | 1,600 | 1,900 | 2,100 | 2,400 | 2,700 | 2,500 | 8,300 | T | T | T | T | T | T | T | T | T | T | T |
| 25 A | | | | | | | 1,700 | 1,800 | 2,000 | 2,200 | 2,500 | 5,400 | 8,700 | T | T | T | T | T | T | T | T | T | T |
| 32 A | | | | | | | | 1,800 | 2,000 | 2,200 | 2,500 | 5,400 | 8,700 | T | T | T | T | T | T | T | T | T | T |
| 40 A | | | | | | | | | 1,500 | 1,700 | 2,000 | 4,300 | 7,000 | T | T | T | T | T | T | T | T | T | T |
| 50 A | | | | | | | | | | 1,300 | 1,500 | 3,600 | 5,900 | 9,000 | T | T | T | T | T | T | T | T | T |
| 63 A | | | | | | | | | | | 1,100 | 2,800 | 5,200 | 8,200 | T | T | T | T | T | T | T | T | T |

※ Prospective fault levels to which selectivity is achieved (T=Total selectivity)

Discrimination With Fuses (HRC FUSE Upstream Type gG)

| MCBs Downstream | HRC FUSE Link Upstream | | | | | | | | | |
|--------------------|------------------------|------|------|-------|-------|-------|-------|-------|-------|-------|
| | 20 A | 25 A | 32 A | 40 A | 50 A | 63 A | 80 A | 100 A | 125 A | 160 A |
| 0.5 to 6 A | 700 | 850 | 960 | 1,200 | 1,350 | 1,750 | 2,800 | 4,500 | 5,200 | 6,000 |
| 10 A | | 700 | 960 | 1,200 | 1,350 | 1,750 | 2,800 | 4,500 | 5,200 | 6,000 |
| 13 A | | | 850 | 1,200 | 1,200 | 1,750 | 2,800 | 4,500 | 5,200 | 6,000 |
| 16 A | | | | 960 | 1,100 | 1,500 | 2,500 | 3,200 | 5,200 | 6,000 |
| 20 A | | | | | 1,100 | 1,500 | 2,500 | 3,200 | 4,500 | 5,200 |
| 25 A | | | | | 960 | 1,350 | 2,000 | 3,200 | 4,500 | 5,200 |
| 32 A | | | | | | 1,200 | 1,750 | 2,800 | 4,500 | 5,200 |
| 40 A | | | | | | | 1,750 | 2,800 | 4,500 | 5,200 |
| 50 A | | | | | | | | 2,500 | 3,200 | 4,500 |
| 63 A | | | | | | | | | 3,200 | 4,500 |

Technical Data

MCB Selection Chart For Household Applications

| Appliances | Capacity/Watt (Load) (240 V~1 ph) | Current Rating of MCB | Type of MCB |
|--------------------------------------------|-----------------------------------|-----------------------|-------------|
| Air Conditioner | 1.0 ton | 10 A ¹⁾ | "C" series |
| | 1.5 ton | 16 A ¹⁾ | "C" series |
| | 2.0 ton | 20 A ¹⁾ | "C" series |
| Refrigerator | 165 litres | 3 A ¹⁾ | "C" series |
| | 350 litres | 4 A ¹⁾ | "C" series |
| Oven Cum Griller | 4,500 W | 32 A | "B" series |
| | 1,750 W | 10 A | "B" series |
| Oven only Hot Plate only Room Heater | 750 W | 6 A | "B" series |
| | 2,000 W | 10 A | "B" series |
| | 1,000 W | 6 A | "B" series |
| | 2,000 W | 10 A | "B" series |
| Washing Machine | 300 W | 2 A | "C" series |
| Washing Machine (with heater) | 1,300 W | 8 A | "C" series |
| (Storage/Instant) | 1,000 W | 6 A | "B" series |
| | 2,000 W | 10 A | "B" series |
| | 3,000 W | 16 A | "B" series |
| | 6,000 W | 32 A | "B" series |
| Electric Iron | 750 W | 6 A | "B" series |
| | 1,250 W | 8 A | "B" series |
| (2 Slices) | 1,200 W | 8 A | "B" series |
| Electric Kettle | 1,500 W | 10 A | "B" series |

※ 1) The values vary depending on manufacturers.

Rating of MCBs for Specified No. of Fittings ("B" Series MCBs)

| Lamp (Watt) | Number of Lamps | Rating (A) |
|-------------|-----------------|------------|
| 20 W | 8 | 1 |
| | 12 | 1.5 |
| 40 W | 2 | 0.5 |
| | 10 | 2 |
| | 12 | 2.5 |
| 60 W | 1 | 0.5 |
| | 4 | 1.5 |
| | 8 | 3 |
| | 12 | 4 |
| 80 W | 1 | 0.5 |
| | 2 | 1 |
| | 5 | 2 |
| | 8 | 4 |
| | 12 | 5 |
| 100 W | 1 | 1 |
| | 2 | 1.5 |
| | 4 | 2.5 |

※ "B" series MCB is used for all lighting applications

MCB Selection Chart for Motor Protection

| S. No. | kW | HP | 1 Phase 230 V DOL Starting | | 3 Phase 400 V DOL Starting | | 3 Phase 400 V Assisted Starting Star Delta | | |
|--------|------|-------|----------------------------|---------------|----------------------------|---------------|--------------------------------------------|---------------|----|
| | | | Full Load Current | MCB Selection | Full Load Current | MCB Selection | Full Load Current | MCB Selection | |
| 1 | 0.18 | 0.24 | 2.8 | 10 | 0.9 | 2 | | | |
| 2 | 0.25 | 0.34 | 3.2 | 10 | 1.2 | 2 | | | |
| 3 | 0.37 | 0.50 | 3.5 | 10 | 1.2 | 2 | | | |
| 4 | 0.55 | 0.74 | 4.8 | 16 | 1.8 | 3 | | | |
| 5 | 0.75 | 1.01 | 6.2 | 20 | 2.0 | 3 | | | |
| 6 | 1.1 | 1.47 | 8.7 | 25 | 2.6 | 6 | | | |
| 7 | 1.5 | 2.01 | 11.8 | 32 | 3.5 | 10 | | | |
| 8 | 2.2 | 2.95 | 17.5 | 50 | 4.4 | 10 | | | |
| 9 | 3 | 4.02 | 20.0 | 63 | 6.3 | 16 | 6.3 | 16 | 10 |
| 10 | 3.75 | 5.03 | 24.0 | 80 | 8.2 | 20 | 8.2 | 20 | 10 |
| 11 | 5.5 | 7.37 | 26.0 | 80 | 11.2 | 25 | 11.2 | 32 | 16 |
| 12 | 7.5 | 10.05 | 47.0 | 125 | 14.4 | 40 | 14.4 | 40 | 25 |
| 13 | 10 | 13.40 | | | 21.0 | 50 | 21.0 | 50 | 32 |
| 14 | 15 | 20.11 | | | 27.0 | 100 | 27.0 | 63 | 40 |
| 15 | 18.5 | 24.80 | | | 32.0 | 125 | 32.0 | | 50 |
| 16 | 22 | 29.49 | | | 38.0 | 125 | 38.0 | | 63 |
| 17 | 30 | 40.21 | | | 51.0 | 125 | 51.0 | | 63 |

※ Calculation formulae:

- Incomer current rating, for single phase: $\frac{\text{Total Load in Watts}}{240 V}$

- Incomer current rating, for single phase: $\frac{\text{Total Load in Watts}}{\sqrt{3} \times 240 V}$

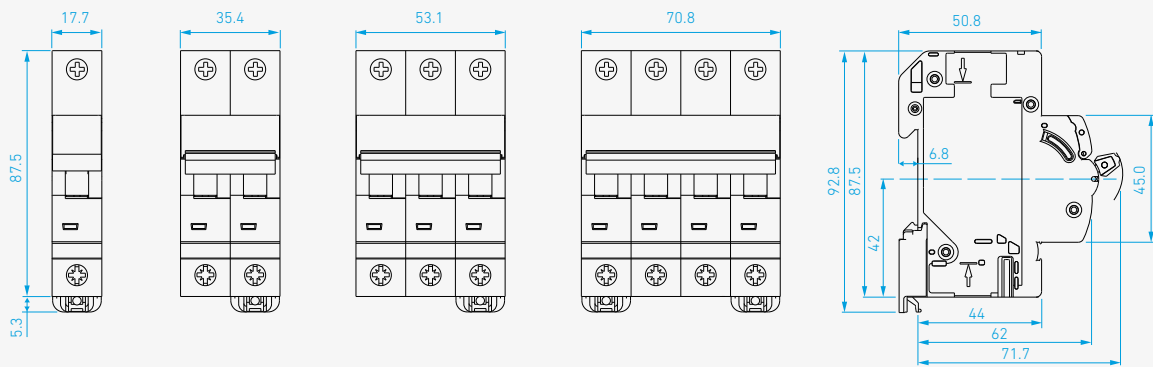
"C" series MCB is used for all motor applications

※ Note: One lighting circuit can have up to 800 W or up to 10 lighting points.
One power circuit can have up to 2,000 W or 1 power points.

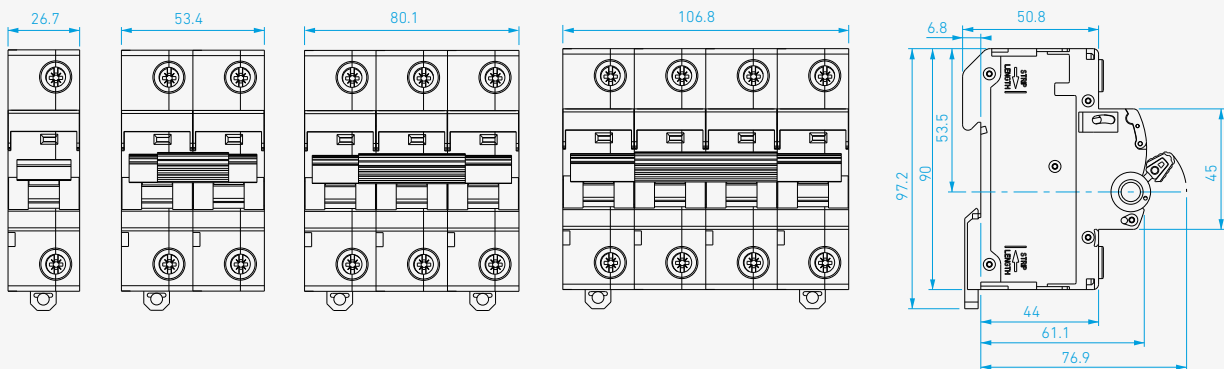
Dimension

HGD (Deluxe Type)

HGD63N/H, 63 AF

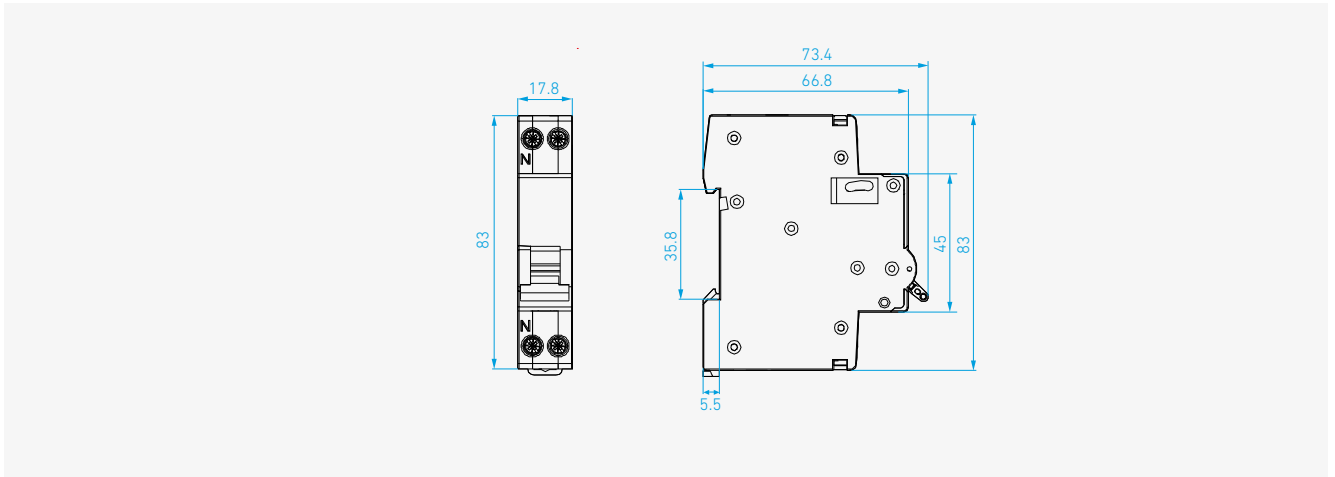


HGD125, 125 AF

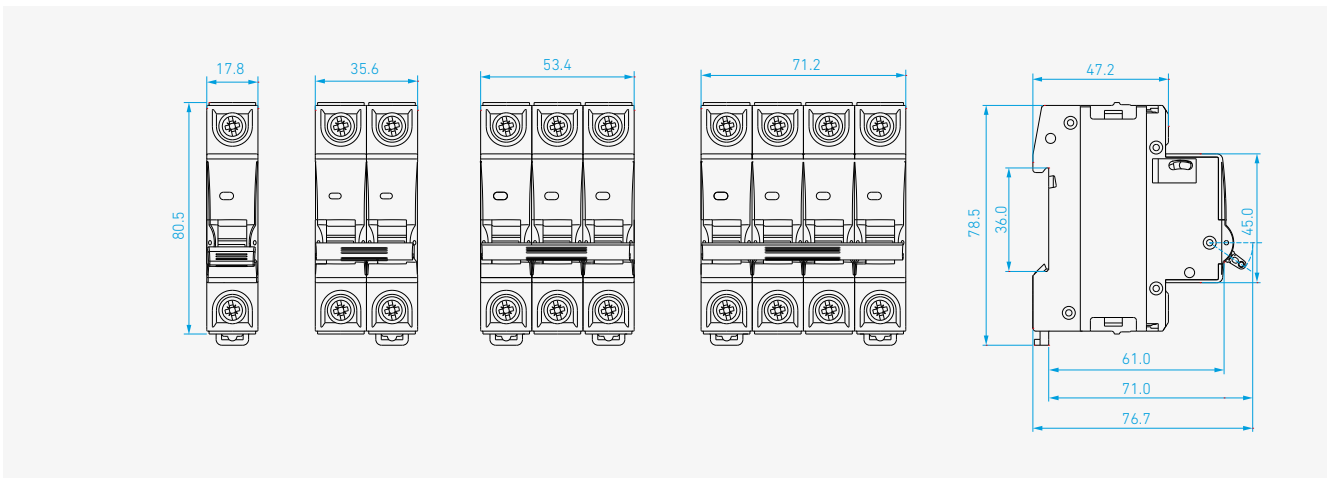


HGD (Standard Type)

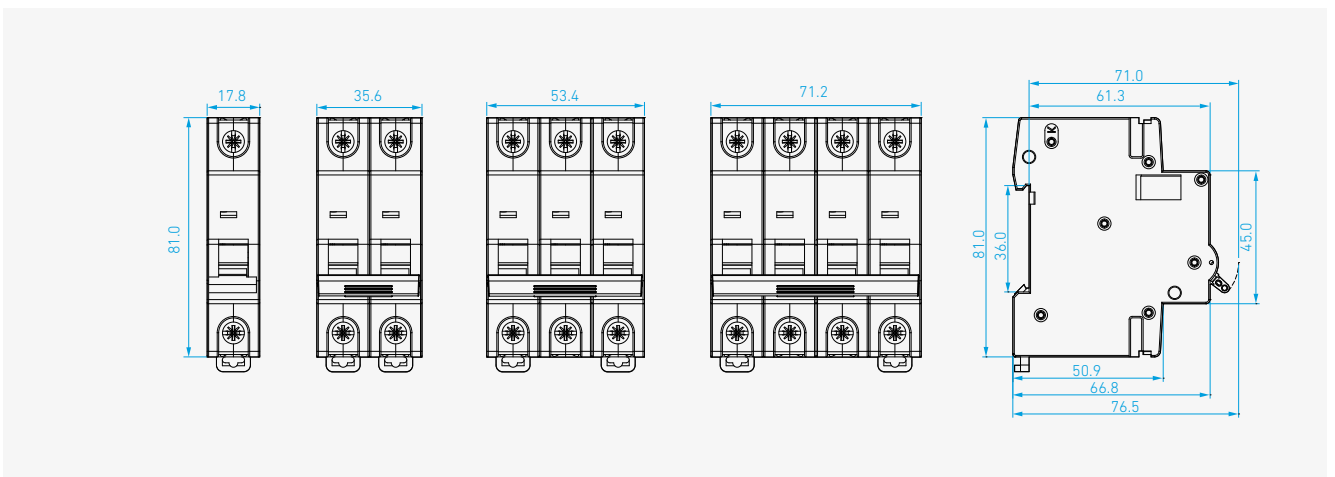
HGD32NS, 32 AF



HGD63E/S, 63 AF



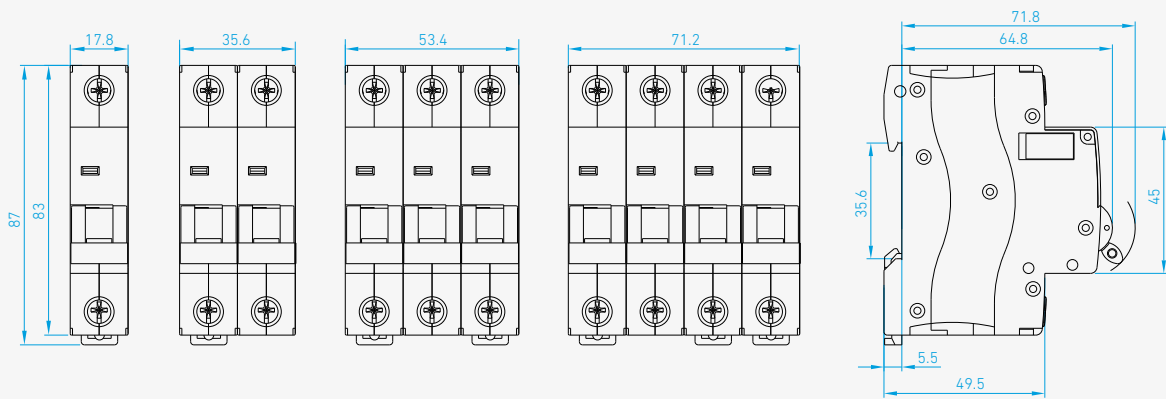
HGD63M/P, 63 AF



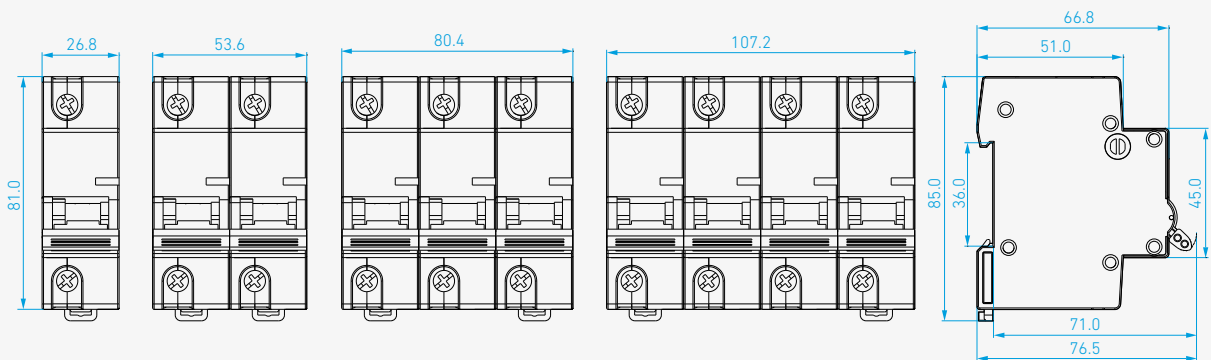
Dimension

HGD (Standard Type)

HGD63U/D, 63 AF

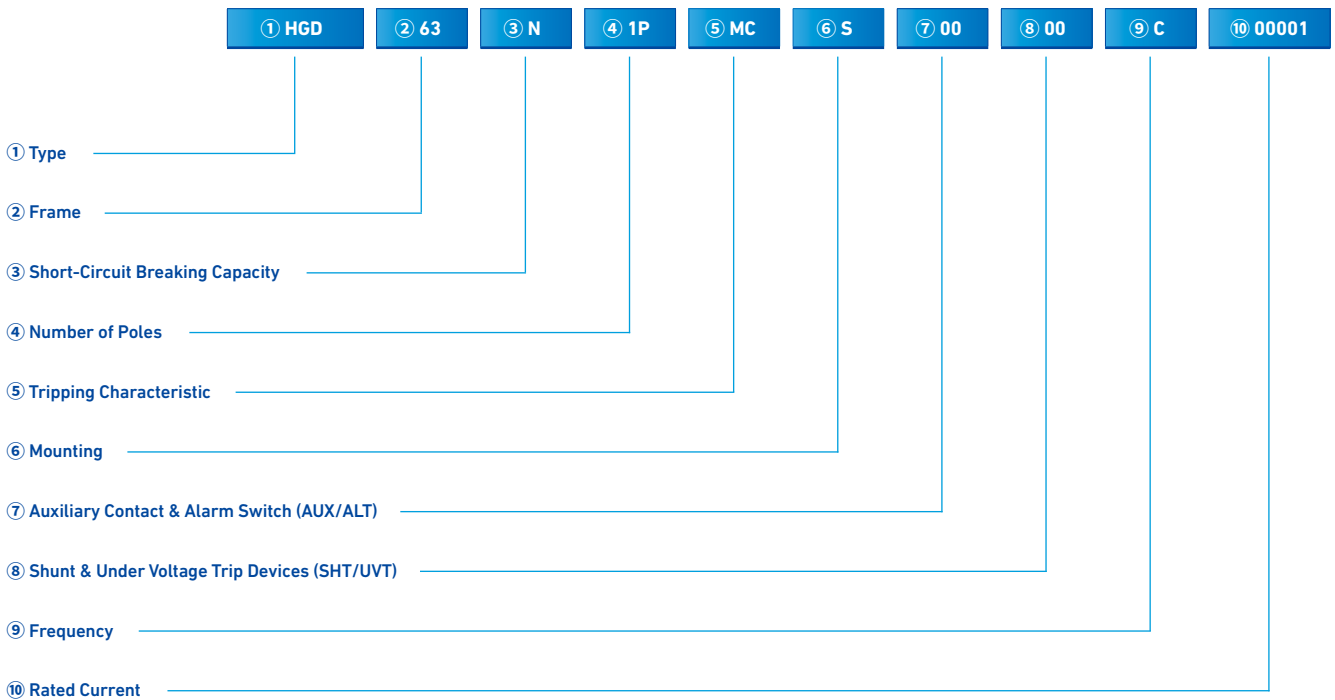


HGD100S, 125 AF



MCB Ordering Information

Ordering Guidelines (Deluxe Type)



| ① Type | |
|--------|---------------------------|
| HGD | Miniature circuit breaker |

| ⑤ Tripping Characteristic | |
|---------------------------|---------|
| MB | B Curve |
| MC | C Curve |
| MD | D Curve |

| ⑨ Frequency | |
|-------------|----------|
| C | 50/60 Hz |

| ② Frame | |
|---------|----------------------|
| 63 | 63 AF (Deluxe type) |
| 125 | 125 AF (Deluxe type) |

| ⑥ Mounting | |
|------------|------------------|
| S | Front connection |

| ⑩ Rated Current | |
|-----------------|-------|
| 000P5 | 0.5 A |
| 00001 | 1 A |
| 00002 | 2 A |
| 00003 | 3 A |
| 00004 | 4 A |
| 00005 | 5 A |
| 00006 | 6 A |
| 00010 | 10 A |
| 00016 | 16 A |
| 00020 | 20 A |
| 00025 | 25 A |
| 00032 | 32 A |
| 00040 | 40 A |
| 00050 | 50 A |
| 00063 | 63 A |
| 00080 | 80 A |
| 00100 | 100 A |
| 00125 | 125 A |

| ③ Short-Circuit Breaking Capacity | |
|-----------------------------------|----------------------------|
| N | 6 kA (Deluxe type), 63 AF |
| H | 10 kA (Deluxe type), 63 AF |

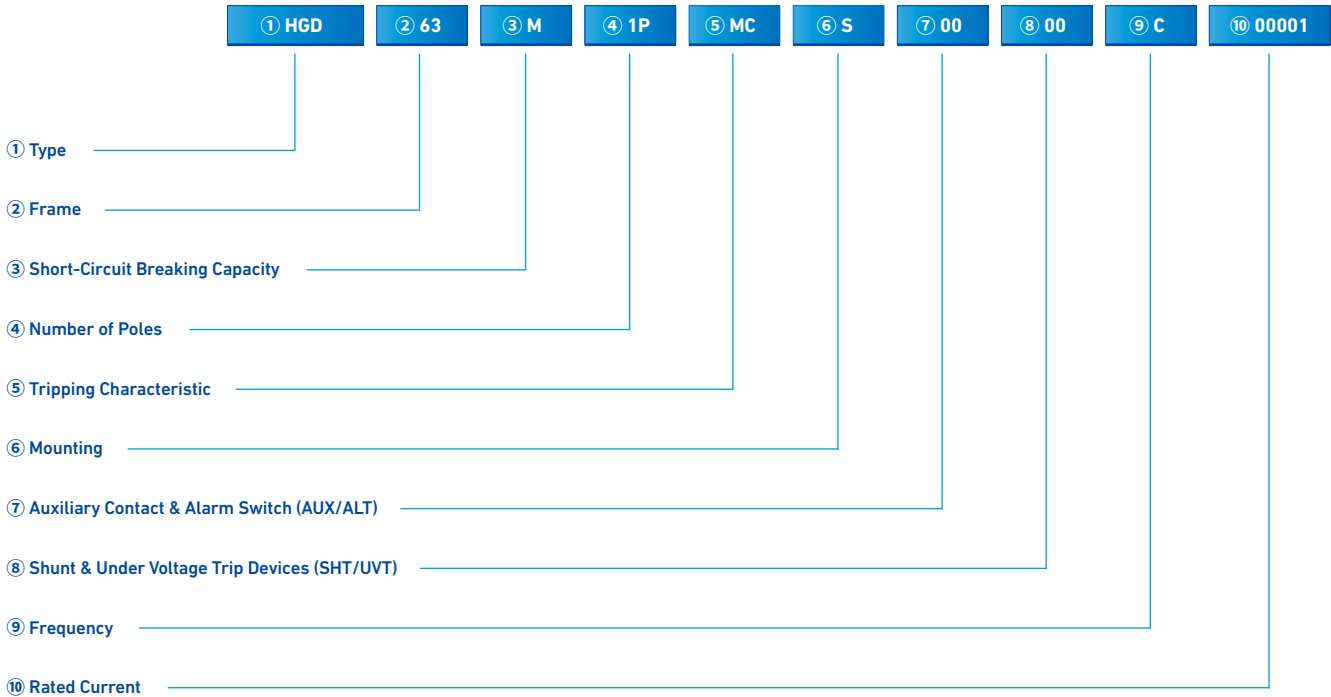
| ⑦ Auxiliary Contact & Alarm Switch | |
|------------------------------------|----------------|
| 00 | Non-attachment |

| ④ Number of Poles | |
|-------------------|------------------|
| 1P | 1 Pole |
| 1N | 1 Pole + Neutral |
| N1 | Neutral +1 Pole |
| 2P | 2 Pole |
| 3P | 3 Pole |
| 3N | 3 Pole + Neutral |
| N3 | Neutral +3 Pole |
| 4P | 4 Pole |

| ⑧ Shunt & Under Voltage Trip Devices | |
|--------------------------------------|----------------|
| 00 | Non-attachment |

MCB Ordering Information

Ordering Guidelines (Standard Type)



| ① Type | |
|--------|---------------------------|
| HGD | Miniature circuit breaker |

| ② Frame | |
|---------|-------------------------|
| 32NS | 32 AF(Neutral + 1 Pole) |
| 63 | 63 AF (Standard type) |
| 100S | 125 AF (Standard type) |

| ③ Short-Circuit Breaking Capacity | |
|-----------------------------------|-----------------------------------|
| E | 3 kA (Standard type), 63 AF |
| S | 4.5 kA (Standard type), 63 AF |
| M | 6 kA (Standard type), 63 AF |
| P | 10 kA (Standard type), 63 AF |
| U | 15 kA (Standard type), 63 AF |
| D | 10 kA (Standard type), 63 AF - DC |

| ④ Number of Poles | |
|-------------------|------------------|
| 1P | 1 Pole |
| 1N | 1 Pole + Neutral |
| N1 | Neutral + 1 Pole |
| 2P | 2 Pole |
| 3P | 3 Pole |
| 3N | 3 Pole + Neutral |
| N3 | Neutral + 3 Pole |
| 4P | 4 Pole |

| ⑤ Tripping Characteristic | |
|---------------------------|---------|
| MB | B Curve |
| MC | C Curve |
| MD | D Curve |

| ⑥ Mounting | |
|------------|------------------|
| S | Front connection |

| ⑦ Auxiliary Contact & Alarm Switch | |
|------------------------------------|----------------|
| 00 | Non-attachment |

| ⑧ Shunt & Under Voltage Trip Devices | |
|--------------------------------------|----------------|
| 00 | Non-attachment |

| ⑨ Frequency | |
|-------------|----------|
| C | 50/60 Hz |

| ⑩ Rated Current | |
|-----------------|-------|
| 00001 | 1 A |
| 00002 | 2 A |
| 00003 | 3 A |
| 00004 | 4 A |
| 00005 | 5 A |
| 00006 | 6 A |
| 00010 | 10 A |
| 00016 | 16 A |
| 00020 | 20 A |
| 00025 | 25 A |
| 00032 | 32 A |
| 00040 | 40 A |
| 00050 | 50 A |
| 00063 | 63 A |
| 00080 | 80 A |
| 00100 | 100 A |
| 00125 | 125 A |