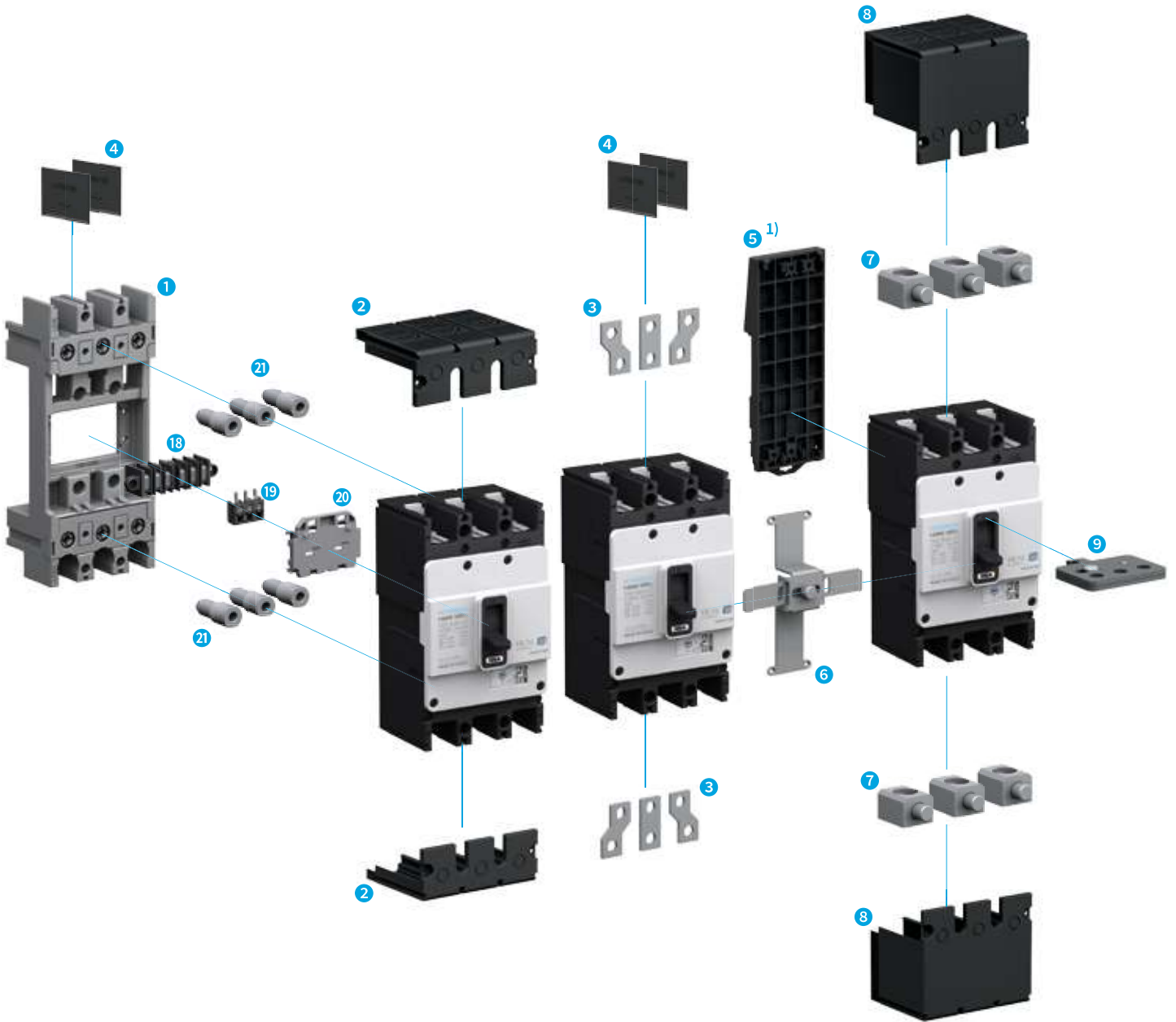


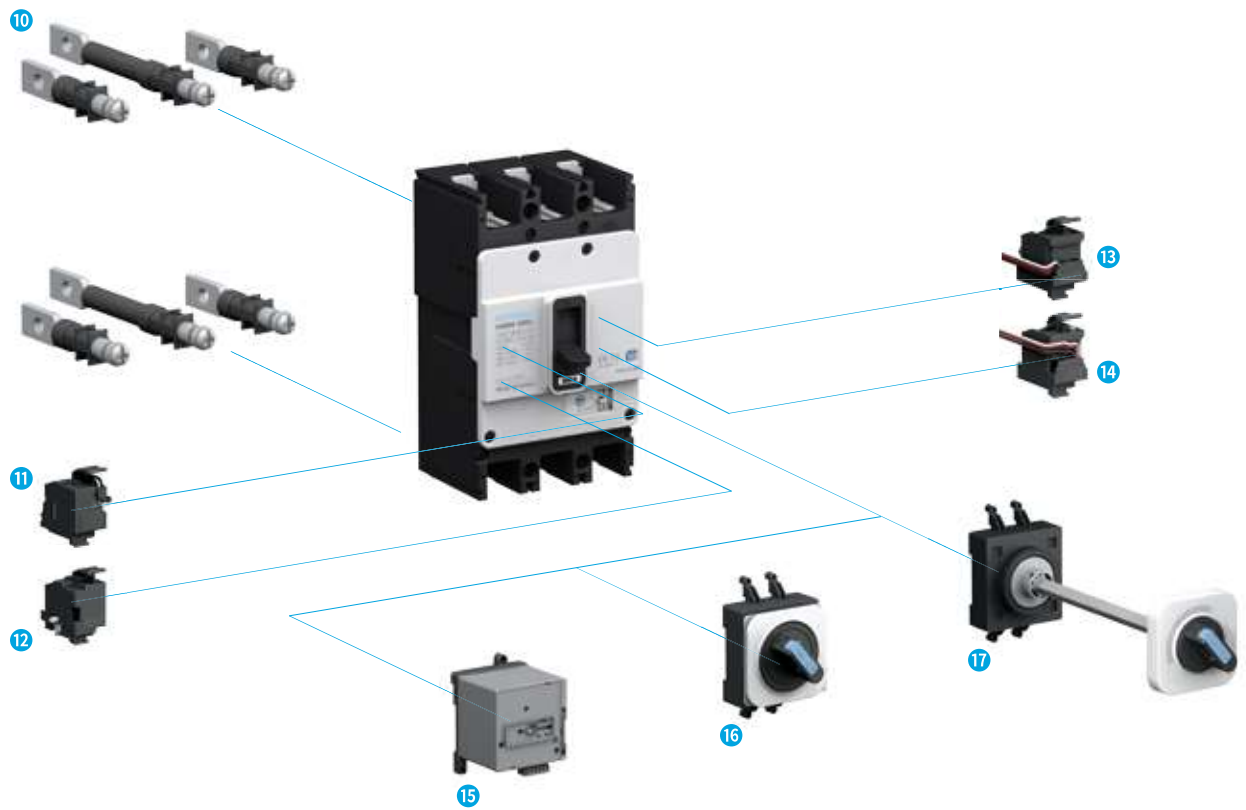
Accessory

HGM General-Type

Accessories



※ 1) DIN Rail Adaptor (DRA) : For HGM/HGE100

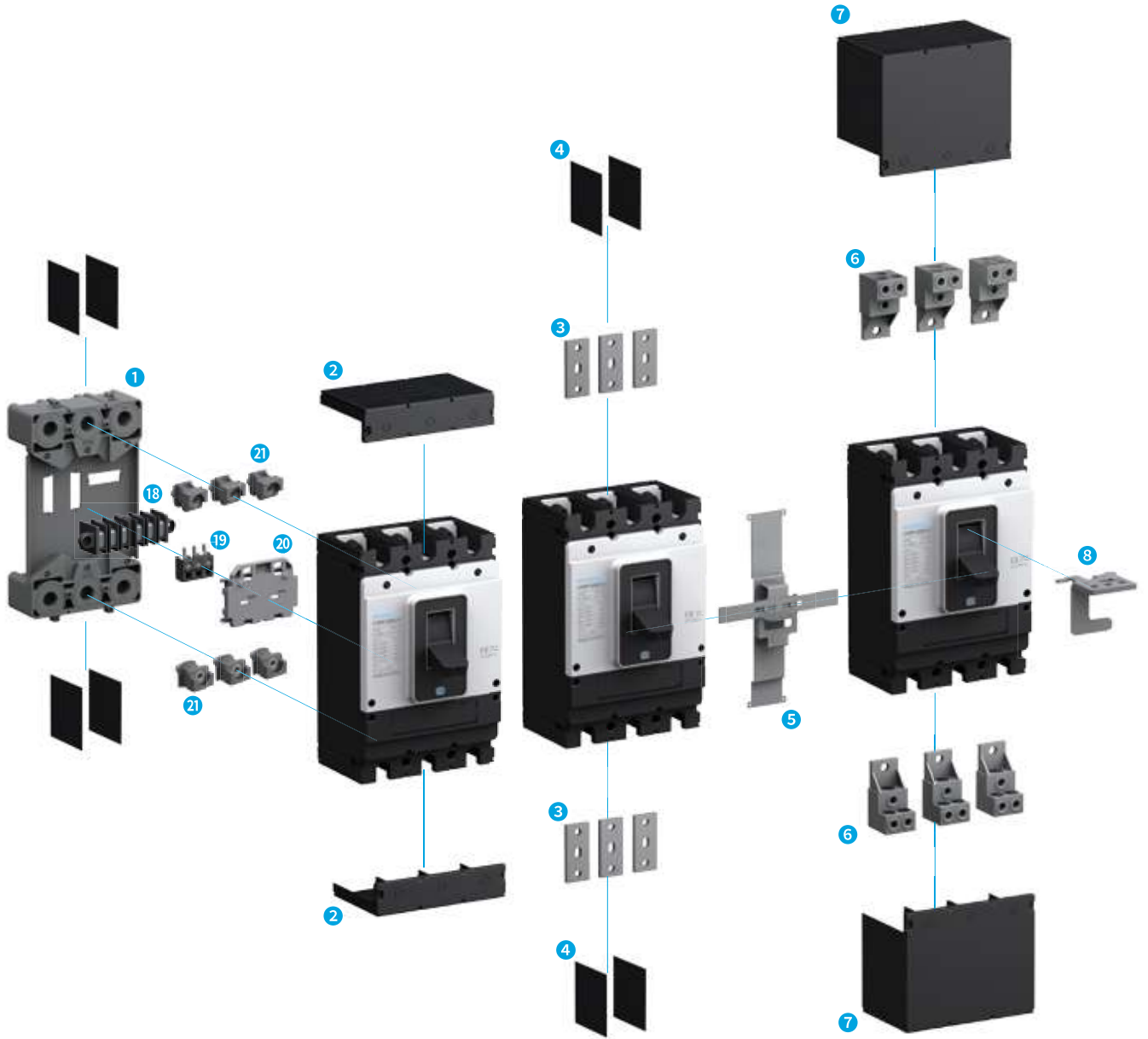


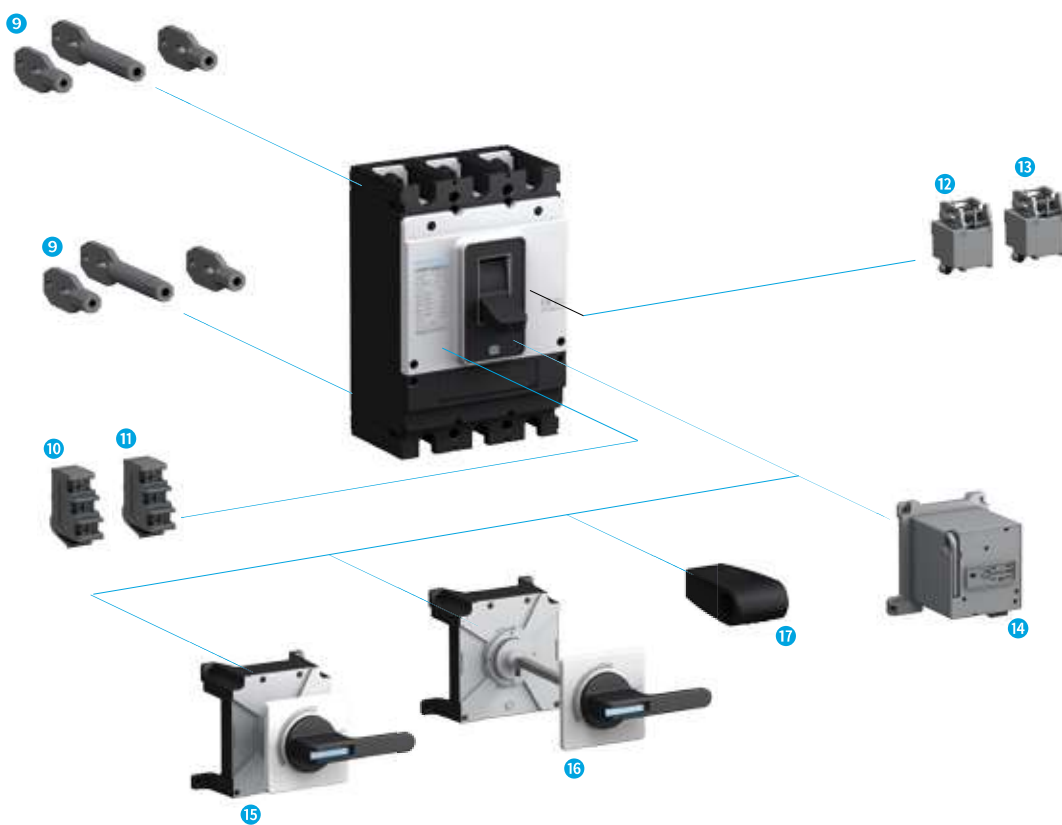
HGM Type MCCB

- | | | |
|--------------------------------------|---------------------------------------|--|
| 1 Plug-in Device (TDA, TDM, TDF) | 8 Terminal Cover (General-Type) (TCF) | 15 Motor Operator (MOT) |
| 2 Terminal Cover (For Plug-in) (TCF) | 9 Padlock (PLD) | 16 Front Contact Rotary Handle (TFG) |
| 3 Bus Bar (TBB) | 10 Rear Connection Terminal (RCT) | 17 Extension Rotary Handle (TFH) |
| 4 Insulation Barrier (TQQ) | 11 Shunt Trip Switch (SHT) | 18 Plug-in Terminal Block (CBM) |
| 5 DIN Rail Adaptor (DRA) | 12 Under-Voltage Trip Switch (UVT) | 19 Plug-in Terminal Block (CBB BLOCK UNIT) |
| 6 Mechanical Interlock (MIF) | 13 Auxiliary Switch (AUX) | 20 Plug-in Terminal Block (CBB PLATE) |
| 7 Lug Terminal (CTB) | 14 Trip Alarm Switch (ALT) | 21 Plug-in Terminal (PC MALE) |

Accessory

HGP High Breaking Capacity





HGP Type MCCB

- | | | |
|---|------------------------------------|--|
| 1 Plug-In Device (TDM) | 8 Padlock (PLD) | 15 Front Contact Rotary Handle (TFG) |
| 2 Terminal Cover (For Plug-in) (TCF Short Type) | 9 Rear Connection Terminal (RCT) | 16 Extension Rotary Handle (TFH) |
| 3 Bus Bar (TBB) | 10 Auxiliary Switch (AUX) | 17 Auxiliary Handle (THA) |
| 4 Insulation Barrier (TQQ) | 11 Trip alarm Switch (ALT) | 18 Plug-in Terminal Block (CBM) |
| 5 Mechanical Interlock MIF | 12 Shunt trip Switch (SHT) | 19 Plug-in Terminal Block (CBB BLOCK UNIT) |
| 6 Lug Terminal (CTB) | 13 Under-Voltage Trip Switch (UVT) | 20 Plug-in Terminal Block (CBB PLATE) |
| 7 Terminal Cover (General-Type) (TCF Long Type) | 14 Motor Operator (MOT) | 21 Plug-in Terminal (PC MALE) |

Internal Accessories (HGM)



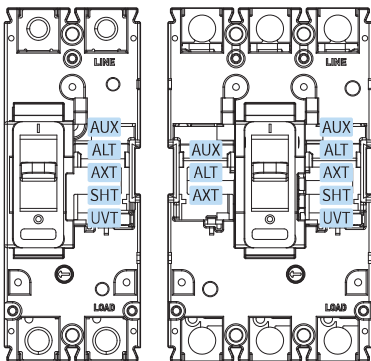
AUX, ALT, AXT, SHT, UVT



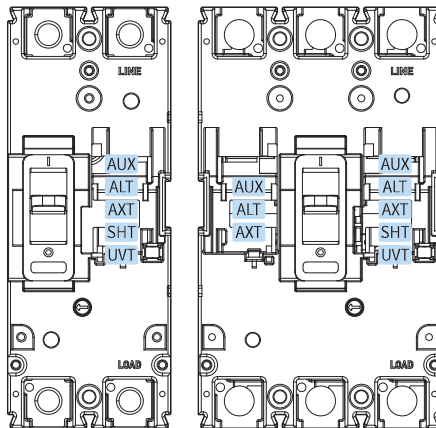
AUX, ALT, AXT



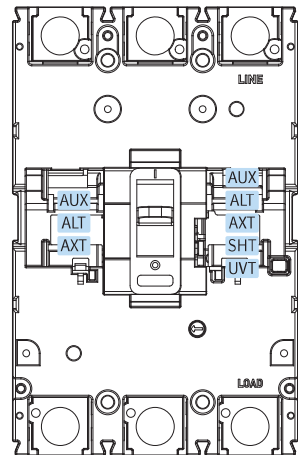
HGM30, 50E/S, 60, 100



HGM50H/L, 125



HGM160, 250



Possible Installation Combinations (Below 250 AF)

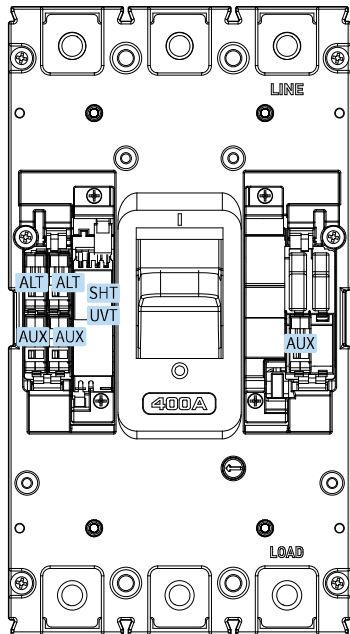
Type	Pole	AUX	ALT	SHT	UVT	AXT	AUX	AUX	SHT	UVT	SHT	UVT	SHT	UVT
							ALT	ALT	AUX	AUX	ALT	ALT	AXT	AXT
HGM30 ~ HGM125	2													
HGM30 ~ HGM250	3/4													
HGE30 ~ HGE250	2/3/4													

※ AUX : Auxiliary Switch □ / ALT : Alarm Switch ■ / SHT : Shunt Trip ▨ / UVT : Under-Voltage Trip ▩ / AXT : Auxiliary Alarm Switch ◼ (AUX/ALT Integrated Type)

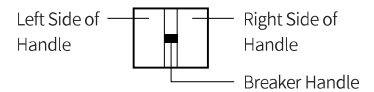
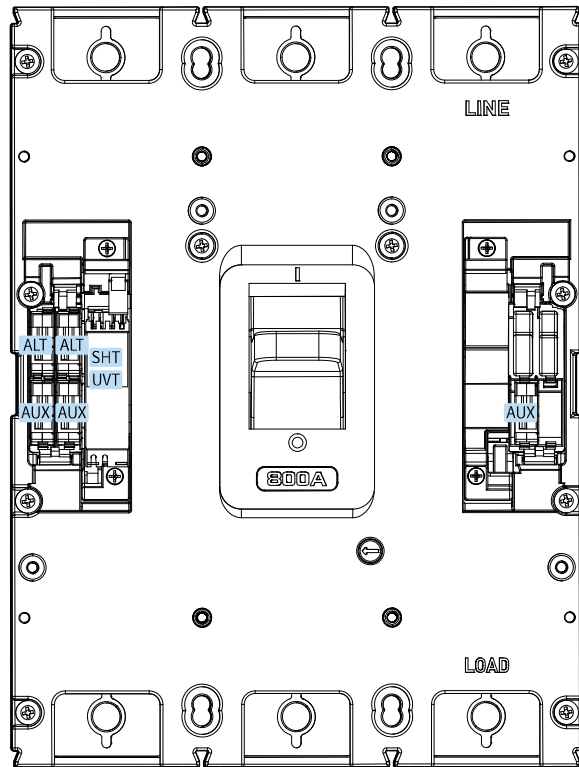
HGM Type's Internal Accessories and Possible Location for Installation

- Auxiliary Switch (AUX)
- Alarm Switch (ALT)
- Auxiliary + Trip Alarm Switch (AXT)
- Shunt Trip Coil (SHT)
- Under-Voltage Trip Coil (UVT)

HGM400



HGM630, 800



Possible Installation Combinations (400 ~ 800 AF)

Type	Pole	AUX	ALT	SHT	UVT	AUX	SHT	UVT	SHT	UVT	SHT	UVT
						ALT	AUX	AUX	ALT	ALT	AUX	ALT
HGM400	2/3/4											
HGM630 HGM800	2/3 4RSTN											
HGM630 HGM800	4NRST											
HGE400	2/3/4											
HGE630 HGE800	2/3											

※ AUX : Auxiliary Switch □ / ALT : Alarm Switch ■ / SHT : Shunt Trip ☒ / UVT : Under-Voltage Trip ☒
HGM Type's ZCT embedded type of product can be combined equally as HGE Type.

Internal Accessories (HGM)

Auxiliary Switch (AUX) / Trip Alarm Switch (ALT)

It is a contact for indicating the status of the circuit breaker in a remote position.

This contact can be used to realize not only the indication function but also electrical functions such as electrical lock and relay.

Auxiliary Switch (AUX)

- Indicates the ON/OFF status of the circuit breaker contact.
- Status is OFF during TRIP.
- It is comprised of C contact.

Trip Alarm Switch (ALT)

- It is only activated when the circuit breaker has tripped due to an overload, short circuit or operation of shunt trip switch and does not operate during general ON/OFF.
- Returns to original state when circuit breaker has been reset.
- It is comprised of C contact.

Auxiliary + Trip Alarm Switch (AXT)

- This switch is an integrated combination of auxiliary switch and trip alarm switch.

Contact Circuit Diagram

	Auxiliary Switch (AUX)	Trip Alarm Switch (ALT)
MCCB ON		
MCCB OFF		
MCCB TRIP		

Possible Location for Installation

Type	Pole	AUX	ALT	AXT
HGM30 ~ HGM125	2			
HGM30 ~ HGM250	3/4			
HGE30 ~ HGE250	2/3/4			
HGM400	2/3/4			
HGE400	2/3/4			
HGM630 HGM800	2/3/4			
HGE630 HGE800	2/3			

※ AUX : Auxiliary Switch
 ALT : Alarm Switch
 AXT : Auxiliary Alarm Switch (AUX/ALT Integrated Type)

Rating of Contact

Rated Conventional Thermal Current	5 A		
Minimum Load	160 mA, 5 VDC		
Rated Operation Current	Resistive Load	Inductive Load	
	AC 125 V	5 A	3 A
	AC 250 V	3 A	2 A
	DC 30 V	4 A	3 A
	DC 125 V	0.4 A	0.4 A
	DC 250 V	0.2 A	0.2 A



Shunt Trip Device (SHT)

Shunt trip device (SHT) is a device that remotely trips the circuit breaker by applying voltage to both terminals of the coil.

Operating Condition

- $U \geq 0.7 \times U_n$ (More than 70 % of rated voltage applied)
- As for impulse type voltage, more than 20 ms applied

Rated Voltage and Characteristics (100 ~ 250 AF)

Rated voltage (Un)	Power Consumption	
	VA (W)	A (A)
DC	24 V	50.2
	48 V	94.6
	60 V	91.2
	100 ~ 120 V	11.8
	125 V	58.1
AC (50/60 Hz)	100 ~ 120 V	75.2
	200 ~ 250 V	64.8
	380 ~ 480 V	131
Rated Operational Voltage	0.7 ~ 1.1 × Un	
Operating Time	50 ms	

※ Controller output voltage : DC 45 V

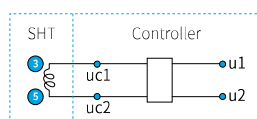
SHT Wiring

1. SHT Only



※ Not applicable to
HGM400, 630, 800 AF DC 24 V

2. HGM400, 630, 800 AF DC 24 V (SHT + Controller)



Possible Location for Installation

Type	Pole	SHT	UVT
HGM30 ~ HGM125	2		
HGM30 ~ HGM250	3/4		
HGE30 ~ HGE250	2/3/4		
HGM400	2/3/4		
HGE400	2/3/4		
HGM630 HGM800	2/3/4		
HGE630 HGE800	2/3		

※ SHT : Shunt Trip
UVT : Under-Voltage Trip



SHT

Internal Accessories (HGM)

Under-Voltage Trip Device (UVT)

In case the circuit voltage drops to less than 35 % of the rated voltage (U_n), UVT automatically initiates a trip in the circuit breaker to prevent damage to the load.

Opening Conditions

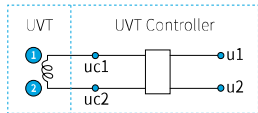
- Operating characteristics are guaranteed to conform to the IEC 60947-2 standard criteria.
- Trip Condition of Circuit Breaker : $U \leq 0.35 \times U_n$
- Fixed Type : 50 ms (400 ~ 800 AF)
- Time Delay Type : 500 ~ 1,000 ms (Below 250 AF)
- No Trip Condition of Circuit Breaker : $U \geq 0.7 \times U_n$
- In the $U = 0.35 \sim 0.7 \times U_n$ interval, the circuit breaker can be tripped but the operation is not guaranteed.

Time Delay Function

Malfunction is prevented during a short momentary voltage drop of below 500 ms. (Below 250 AF)

UVT Wiring

1. HGM30 ~ 250 AF (UVT + Controller)



※ DC 24 V among HGM400 and above products require a controller.

2. HGM400, 630, 800 AF (UVT Only)



Closing Conditions

- In case of circuit breakers assembled with UVT, the circuit breaker cannot be ON (Closing) when voltage is not applied to the UVT.
- The reset operation after the circuit breaker's trip caused by UVT operation may differ depending on the circuit breaker's type and UVT structure.
- In order to close the circuit breaker, Voltage must be applied to UVT.
- Closing Condition : $U \geq 0.85 \times U_n$

Rated Voltage and Characteristics (Below 250 AF)

Rated Voltage (U_n)	Power Consumption		
	VA (W)	A (mA)	
DC	24 V	0.96	40
	48 V	1.1	22.7
	100 ~ 110 V	2.2	20
AC (50/60 Hz)	100 ~ 120 V	5.1	42
	200 ~ 230 V	6	26
	380 ~ 415 V	9.6	23
	440 ~ 480 V	12.5	26
Starting Voltage	Opening	0.35 ~ 0.7 \times U_n	
	Closing	0.85 \times U_n	
Rated Operational Voltage	0.85 ~ 1.1 \times U_n		
Operating Time	500 ~ 1,000 ms		

※ Do not use UVT for electrical interlocking system.

※ Controller output voltage : DC 45 V



UVT

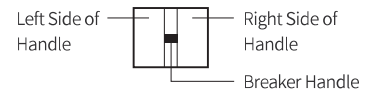
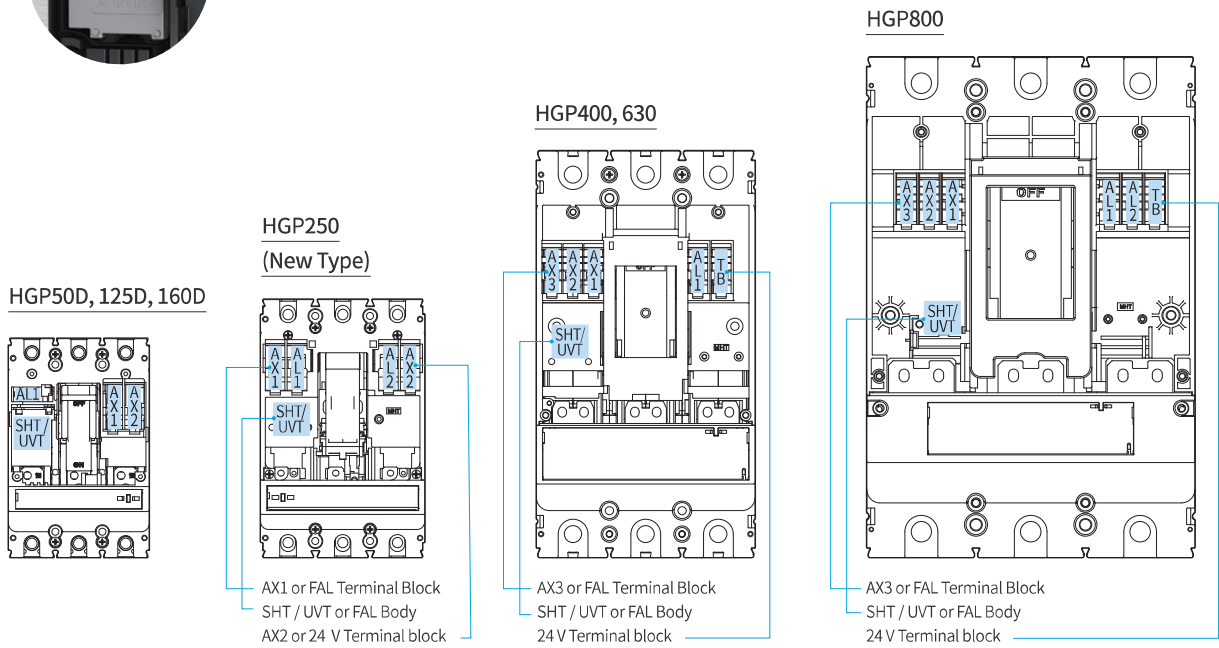
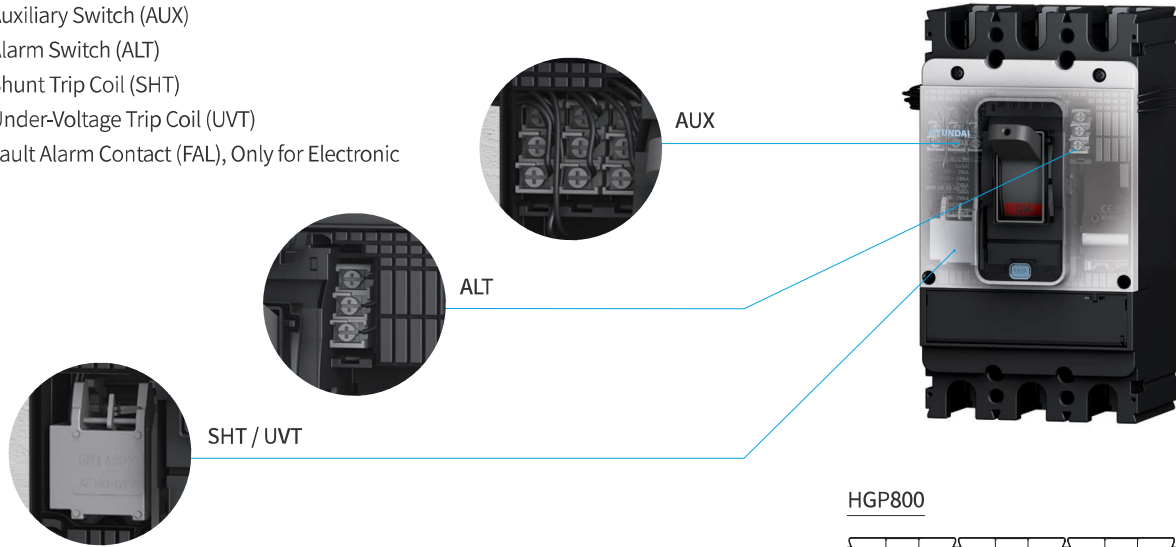


UVT Controller

Internal Accessories (HGP)

HGP Type's Internal Accessories and Possible Location for Installation

- Auxiliary Switch (AUX)
- Alarm Switch (ALT)
- Shunt Trip Coil (SHT)
- Under-Voltage Trip Coil (UVT)
- Fault Alarm Contact (FAL), Only for Electronic



Possible Location for Installation

Type	Pole	AUX	ALT	SHT	UVT	SHT	SHT	UVT	UVT	SHT	UVT
						AUX	ALT	AUX	ALT	AUX	ALT
HGP50D HGP125D HGP160D	3/4										
HGP250	3/4										
HGP400 HGP630	3/4										
HGP800	3/4										

※ AUX : Auxiliary Switch □ / ALT : Alarm Switch ■ / SHT : Shunt Trip ▣ / UVT : Under-Voltage Trip ⊗ / AXT : Auxiliary Alarm Switch □■ (AUX/ALT Integrated Type)

Internal Accessories (HGP)

Auxiliary Switch (AUX)/ Trip Alarm Switch (ALT)

It is a contact for indication to inform the status of the circuit breaker in a remote position.

This contact can be used to realize not only the indication function but also electrical functions such as electrical lock and relay.

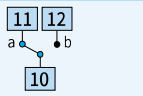
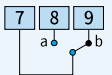
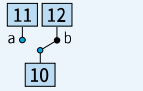
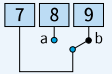
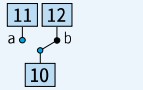
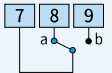
Auxiliary Switch (AUX)

- Indicates the ON/OFF status of the circuit breaker contact.
- Status is OFF during TRIP.
- It is comprised of C contact.









Trip Alarm Switch (ALT)

- It is only activated when the circuit breaker has tripped due to an overload, short circuit or operation of shunt trip switch and does not operate during general ON/OFF.
- Returns to original state when circuit breaker has been reset.
- It is comprised of C contact.

Contact Circuit Diagram

	Auxiliary Switch (AUX)	Trip Alarm Switch (ALT)
MCCB ON		
MCCB OFF		
MCCB TRIP		

Possible Location for Installation

Type	AUX	ALT
HGP50D HGP125D HGP160D		
HGP250		
HGP400 HGP630		
HGP800		

Rating of Contact

Rated Conventional Thermal Current	5 A		
Minimum Load	160 mA, 5 VDC		
Rated Operation Current	Resistive Load	Inductive Load	
AC	125 V	5 A	3 A
	250 V	3 A	2 A
DC	30 V	4 A	3 A
	125 V	0.4 A	0.4 A
	250 V	0.2 A	0.2 A



HGP160D ALT



HGP250 ~ 800 ALT
HGP160D ~ 800 AUX

Shunt Trip Device (SHT) / Under-Voltage Device (UVT)

SHT/UVT is installed inside the circuit breaker and it offers the function of remote tripping the circuit breaker by controlling the voltage applied to both terminals of the coil.

Shunt Trip Device (SHT)

It is able to remotely trip the circuit breaker by applying voltage to the shunt trip device installed in the circuit breaker.

Operating Condition

- $U \geq 0.7 \times U_n$ (More than 70 % of rated voltage applied)
- As for impulse type voltage, more than 20 ms applied

Rated Voltage and Characteristics

Rated Voltage (Un)	Power Consumption		
	W or VA	A (mA)	
DC	24 V	1.2	49.7
	100 ~ 110 V	2.8	25
	100 ~ 120 V	3.3	27.5
AC (50/60 Hz)	200 ~ 230 V	5.2	22.6
	380 ~ 415 V	13.9	33.4
	440 ~ 480 V	10.9	22.8
Rated Operational Voltage	0.7 ~ 1.1 × Un		
Operating Time	50 ms		

※ Controller output voltage : DC 45 V

Possible Location for Installation

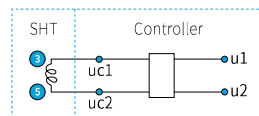
Type	SHT	UVT
HGP50D HGP125D HGP160D		
HGP250		
HGP400 HGP630		
HGP800		

SHT Wiring

1. SHT Only

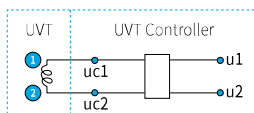


2. HGP160D DC SHT



※ 160D AF (50D, 125D, 160D) DC products include controller.

UVT Wiring



Under-Voltage Device (UVT)

If the under-voltage trip device is installed in the circuit breaker, the circuit breaker is tripped or is not closed in case the circuit voltage is below the reference value.

In case the circuit voltage drops to less than 35 % of the rated voltage (Un), UVT automatically initiates a trip in the circuit breaker to prevent damage to the load.

Opening Conditions

- Operating characteristics are guaranteed to conform to the IEC 60947-2 standard criteria.
- Trip Condition of Circuit Breaker : $U \leq 0.35 \times U_n$
- No Trip Condition of Circuit Breaker : $U \geq 0.7 \times U_n$
- In the $U = 0.35 \sim 0.7 \times U_n$ interval, the circuit breaker can be tripped but the operation is not guaranteed.

Closing Conditions

- In case of circuit breakers assembled with UVT, the circuit breaker can be OFF/RESET when voltage is not applied but the circuit breaker cannot be ON (Closing).
- In order to close the circuit breaker, Voltage must be applied to UVT.
- Closing Condition : $U \geq 0.85 \times U_n$

Rated Voltage and Characteristics

Rated Voltage (Un)	Power Consumption		
	W or VA	A (mA)	
DC	24 V	2.6	110
	100 ~ 110 V	5	45
	100 ~ 120 V	4.5	37.9
AC (50/60 Hz)	200 ~ 230 V	5.6	24.3
	380 ~ 415 V	10.8	26
	440 ~ 480 V	12.5	26
Starting Voltage	Opening	0.35 ~ 0.7 × Un	
	Closing	0.85 × Un	
Rated Operational Voltage	0.85 ~ 1.1 × Un		
Operating Time	50 ms		

※ Do not use UVT for electrical interlocking system.

※ Controller output voltage : DC 45 V



HGP50D ~ 160D SHT/
UVT



HGP250
SHT/UVT



HGP400 ~ 800 SHT/
UVT



UVT Controller

External Accessories (HGM)

Locking Device

Handle Locking Device Using Padlock (PLD)

This device is used for locking the handle of circuit breaker to the OFF position by using a padlock. Padlock is not provided separately and up to 3 can be used. The applicable specifications of padlocks are as below.

Type	Application	Padlock Diameter ¹⁾
PLD 10GM	HGM30 ~ HGM250	5 mm
	HGE30 ~ HGE250	
PLD 40GM	HGM400 ~ HGM800	6 mm
	HGE400 ~ HGE800	

Mechanical Interlock

This device interlocks two circuit breakers by using a mechanical interlock.

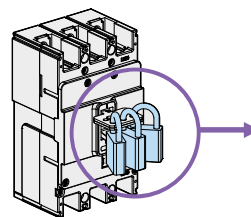
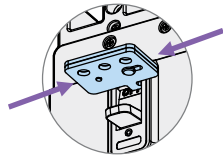
Key Features

- It prevents two breakers from closing at the same time.
- All circuit breakers are turned OFF. The applicable specifications of padlocks are as below.

Type				Application	Padlock Diameter ¹⁾
2P	3P	4P (RSTN)	4P (NRST)		
MIF 10GM 2	MIF 10GM 3	MIF 10GM R4	MIF 10GM N4	HGM/HGE30, 50E/S, 60, 100	5 mm
MIF 12GM 2	MIF 12GM 3	MIF 12GM R4	MIF 12GM N4	HGM/HGE50H/L,125	
-	MIF 25GM 3	MIF 25GM R4	MIF 25GM N4	HGM/HGE160, 250	6 mm
-	MIF 40GM 3	MIF 40GM R4	MIF 40GM N4	HGM/HGE400	
-	MIF 80GM 3	MIF 80GM R4	MIF 80GM N4	HGM/HGE630, 800	



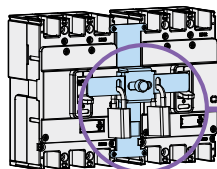
PLD



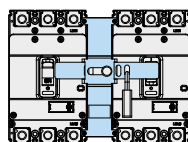
Padlock Diameter
(Refer to Table)



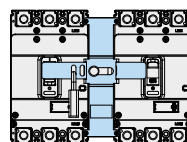
MIF



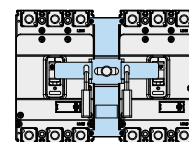
Padlock Diameter
(Refer to Table)



Right Off Lock



Left Off Lock



Double Off Lock

※ 1) Padlock not included

Terminal Cover

As a part that insulates the circuit breaker's live and load side of terminal area from the outside, it prevents electric shock and short-circuit accidents that may occur due to direct contact of people's hand or tools such as drivers with the live current part. When the terminal cover is used, the protection grade of IP40 is applied to the power part. Based on the connection method of the circuit breaker, it can be classified into long or short type for use and various handles and interlock devices can be combined for use.

Short Type

It is suitable for plug-in or rear connection.

Long Type

It is suitable for front connection by using wires, bus bar or lug terminals.

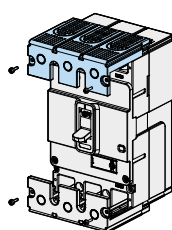
Type						Application	Pitch (mm)
2P		3P		4P			
Short	Long	Short	Long	Short	Long		
TCF 10GM S2	TCF 10GM L2	TCF 10GM S3	TCF 10GM L3	TCF 10GM S4	TCF 10GM L4	HGM30, 50E/S, 60, 100 HGE30, 50E/S, 60, 100	25
TCF 12GM S2	TCF 12GM L2	TCF 12GM S3	TCF 12GM L3	TCF 12GM S4	TCF 12GM L4	HGM50H/L, 125 HGE50H/L, 125	30
TCF 25GM S3	TCF 25GM L3	TCF 25GM S3	TCF 25GM L3	TCF 25GM S4	TCF 25GM L4	HGM160, 250 HGE160, 250	35
TCF 40GM S3	TCF 40GM L3	TCF 40GM S3	TCF 40GM L3	TCF 40GM S4	TCF 40GM L4	HGM400 HGE400	44
TCF 80GM S3	TCF 80GM L3	TCF 80GM S3	TCF 80GM L3	TCF 80GM S4	TCF 80GM L4	HGM630, 800 HGE630, 800	70
TCF 10HD S2	-	TCF 10HD S3	-	-	-	HDB30, 50, 100 HDG30, 50, 100	25



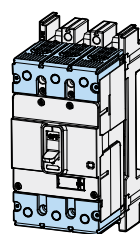
Short Type



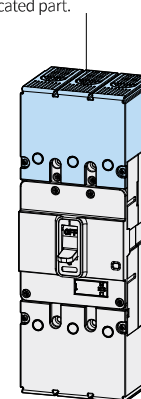
Long Type



Assembly Diagram



Short Type
(Plug-in Connection)



Long Type
(Front Connection)

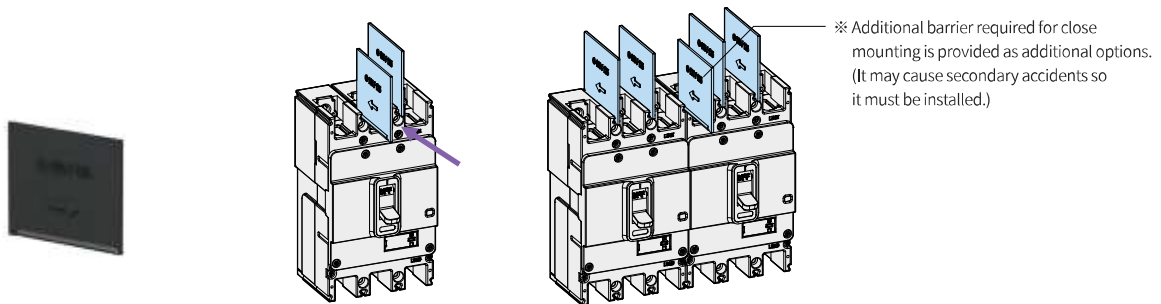
External Accessories (HGM)

Insulation Barrier

As a part used to prevent accidents with regards to insulation and conductive foreign substance between the circuit breaker terminals, it improves the performance of phase-to-phase insulation by installing it in the groove between the circuit breaker's terminals. It can easily be assembled even if the circuit breaker has already been installed and in case the two circuit breakers have been installed side by side, it can also be assembled in the gap between the two circuit breakers. In addition, it is used in the terminal cover and plug-in base.

※ In case insulation barrier is not mounted between the circuit breaker's terminal, it may cause secondary short-circuit accidents so it must be used.
Insulation barrier must be installed towards the direction of the circuit breaker's line indication part.

Type			Application	No. of Parts (EA/Set)		
2P	3P	4P		2P	3P	4P
TQQ 10GM 2	TQQ 10GM 3	TQQ 10GM 4	HGM30, 50E/S, 60, 100 HGE30, 50E/S, 60, 100	1	2	3
TQQ 10GM 2	TQQ 10GM 3	TQQ 10GM 4	HGM50H/L, 125 HGE50H/L, 125	1	2	3
TQQ 25GM 2	TQQ 25GM 3	TQQ 25GM 4	HGM160, 250 HGE160, 250	1	2	3
TQQ 40GM 2	TQQ 40GM 3	TQQ 40GM 4	HGM400 HGE400	1	2	3
TQQ 40GM 2	TQQ 40GM 3	TQQ 40GM 4	HGM630, 800 HGE630, 800	1	2	3
TQQ 10HD 2	TQQ 10HD 3	-	HDB30, 50, 100 HDG30, 50, 100	2	4	-



Rotary Handle

Rotary handle is a product that can check and operate MCCB's ON/OFF/TRIP even when the panel door is closed by installing the circuit breaker in enclosed switchgear or on MCCB panel and others. There are two types of rotary handle, front contact type and extension type and all the rotary handles offer panel door locking function and handle locking function. The rotary handle can be rotated clockwise to turn the circuit breaker "ON" and according to the mounting direction of MCCB, it is categorized into the upper line, the right line and the left line. The IP rating of the handle is IP40/IP54.

Front Contact Rotary Handle

- 32 ~ 250 AF : The handle is attached directly to the circuit breaker.
- 400 ~ 800 AF : The handle attached to the door of the panel.

Extension Rotary Handle

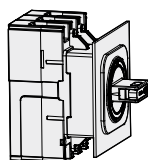
It is suitable in case the distance between the circuit breaker and the panel door is long. The handle is attached to the door of the panel and there is no trip-button function.

Type			Application
Upper Line	Right Line	Left Line	
TFG 10GM U	TFG 10GM R	TFG 10GM L	HGM/HGE30, 50E/S, 60, 100
TFG 12GM U	TFG 12GM R	TFG 12GM L	HGM/HGE50H/L, 125
TFG 25GM U	TFG 25GM R	TFG 25GM L	HGM/HGE160, 250
TFG 40GM U	TFG 40GM R	TFG 40GM L	HGM/HGE400
TFG 80GM U	TFG 80GM R	TFG 80GM L	HGM/HGE630, 800

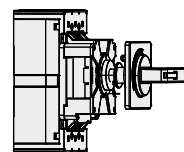
Type	Application
TFH 10GM	HGM/HGE30, 50E/S, 60, 100
TFH 12GM	HGM/HGE50H/L, 125
TFH 25GM	HGM/HGE160, 250
TFH 40GM	HGM/HGE400
TFH 80GM	HGM/HGE630, 800



Front Contact Rotary Handle
(TFG-HGM)



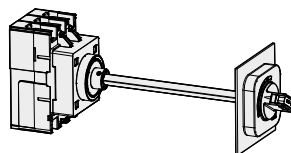
HGM30 ~ HGM250



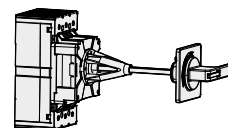
HGM400 ~ HGM800



Extension Rotary Handle
(TFH-HGM)



HGM30 ~ HGM250



HGM400 ~ HGM800

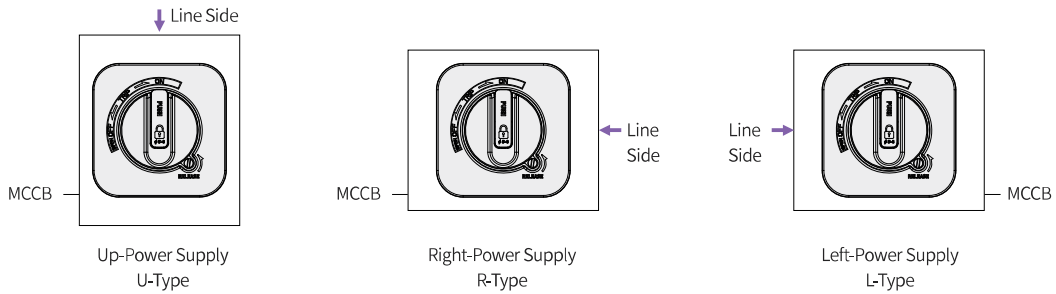
※ When installing an extension rotary handle, the eccentric tolerance of the handle drive shaft is 1.5 degrees.

External Accessories (HGM)

Rotary Handle

Types of Handle Depending on the Circuit Breaker's Installation Type

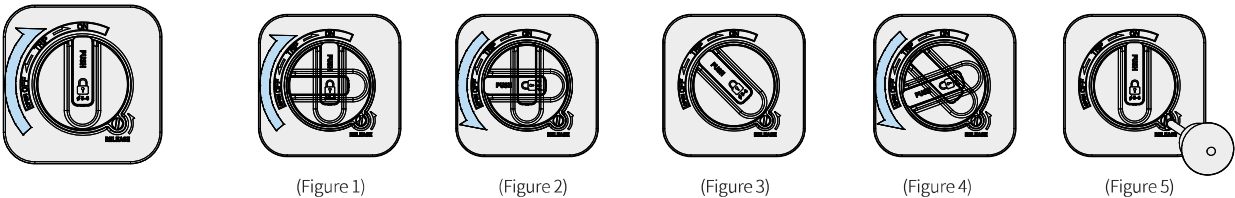
Rotary handle is divided into the following three types depending on the circuit breaker's direction of power supply.



How to Operate the Handle

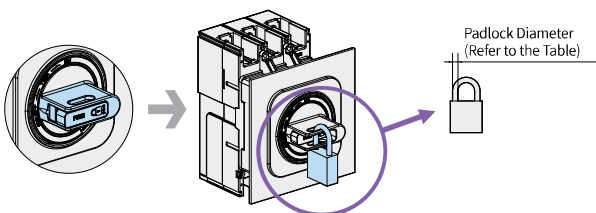
Operating Direction : Turn the handle clockwise to turn the breaker ON.

- Circuit Breaker ON : Rotate the handle to ON position. (Figure 1)
- Circuit Breaker OFF : Rotate the handle to OFF position. (Figure 2)
- Circuit Breaker TRIP : If the circuit breaker is tripped, the handle will automatically return to TRIP position. (Figure 3)
- After the circuit breaker is tripped, rotate the handle to the RESET position first (Figure 4) then rotate to the ON position and the circuit breaker will turn ON (Figure 1).
- If you need to open the door when the handle is in the ON state, rotate the RELEASE screw to the direction of the arrow then open the door (Figure 5).



Handle Locking Device

Lock Function	OFF State Door Lock	ON State Door Lock	Reverse Interlock	Handle Padlock
Details	<ul style="list-style-type: none"> • Impossible to open the panel door when the circuit breaker is in the OFF state. • Possible at RESET position • Possible to open the panel door after rotating the handle to RESET 	<ul style="list-style-type: none"> • Impossible to open the panel door when the circuit breaker is in the ON state • Possible to open the panel door after rotating the RELEASE screw 	<ul style="list-style-type: none"> • Impossible to close the circuit breaker (ON) in case the panel door is open 	<ul style="list-style-type: none"> • Padlocking function which locks using a padlock to prevent handle operation. • Padlock is not provided separately and the number of padlocks depends on the padlock diameter. (Refer to the table below) • As for the specifications of the applicable padlocks, refer to the table below.
Front Contact Type (TFG)	●	●	● (100/125/250 AF Only)	●
Extension Type (TFH)	●	●	-	●



Application	Padlock Diameter ¹⁾	No. of Padlocks that can be Used
HGM/HGE30 ~ 250	6 ~ 8 mm	Ø6,Ø7 : 2 EA Ø8 : 1 EA
HGM/HGE400 ~ 800	5 ~ 7 mm	3 EA

※ 1) Padlock not included

Front Connection of Fixed Devices

Straight/spreader bus bar or lug terminal can be selected for use depending on the size specification of the cable or bus bar to be connected to the circuit breaker.

Insulated Bar Connection

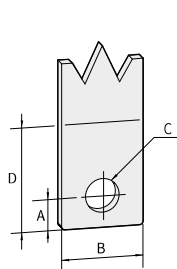
In case the bus bar pitch of the switchgear is equal to the circuit breaker, it can be connected directly to the circuit breaker by using an insulation tube. Refer to the following connection bus bar specification for connection. Interphase barrier and terminal cover must be used.

Application	Connection Bus Bar Dimensions (mm)				Applicable Bolt and Tightening Torque	
	A	B	C	D	Bolt Spec.	Max. Tightening Torque (kgf×cm)
HGM/HGE 30, 50E/S, 60, 100	< 7.5	< 17	$\varnothing \geq 5.5$ (≤ 50 A)	A + 7.5	M5 Screw (≤ 50 A)	28.5
	< 7.5	< 17	$\varnothing \geq 9$ (> 50 A)	A + 7.5	M8 Screw (> 50 A)	110
HGM/HGE50H/L, 125	< 7.5	< 20	$\varnothing \geq 9$	A + 7.5	M8 Screw	110
HGM/HGE160, 250	< 10	< 27	$\varnothing \geq 9$	A + 10	M8 Hex Socket	110
HGM/HGE400	< 12.5	< 30	$\varnothing \geq 11$	A + 12.5	M10 Hex Socket	270
HGM/HGE630, 800	< 12.5	< 45	$\varnothing \geq 13$	A + 12.5	M12 Hex Socket	470

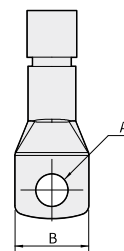
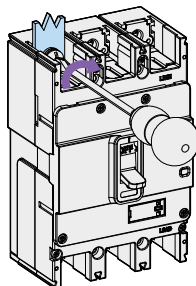
Crimp Terminal

The terminal that conforms to the specification (crimped/copper tubing terminal) must be used and the interphase barrier and the terminal cover must be used. Select the terminal that meets the material and specification of the cable according to the circuit breaker's rating. The terminal is not provided separately. Refer to the table below for the wire specifications for the main ratings.

Application Type	Rated Current	Cu Cable Size (mm ²)	Applicable Terminal Dimensions (mm)	
			A	B
HGM/HGE 30, 50E/S, 60, 100	32	6	$\varnothing \geq 5.5$	< 18
	50	10	$\varnothing \geq 5.5$	
	63	16	$\varnothing \geq 9$	
	100	35	$\varnothing \geq 9$	
HGM/HGE50H/L, 125	50	10	$\varnothing \geq 9$	< 21
	125	50	$\varnothing \geq 9$	
HGM/HGE160, 250	160	70	$\varnothing \geq 9$	< 28
	250	120	$\varnothing \geq 9$	
HGM/HGE400	400	240	$\varnothing \geq 11$	< 30
HGM/HGE630, 800	800	240×2	$\varnothing \geq 13$	< 45



Connection Bus Bar



Crimped Terminal

External Accessories (HGM)

Front Connection of Fixed Devices

Busbar

Straight Busbar

It is used to meet the cable and standards of the switchgear.
(Pitch between the poles maintained)

Spreader Busbar

It is used to extend the internal insulation distance of the switchgear. (Pitch between the poles extended)

Application		Straight		Spreader		Thickness
Type	Pole	Type	Pitch	Type	Pitch	
HGM/HGE 160, 250	2	TBB 25GP 2S	35 mm	-	45 mm	4 mm
	3	TBB 25GP 3S		TBB 25GP 3E45		
	4	TBB 25GP 4S		TBB 25GP 4E45		
HGM/HGE 400	2	TBB 40GM 2S	44 mm	-	59 mm	8 mm
	3	TBB 40GM 3S		TBB 40GM 3E59		
	4	TBB 40GM 4S		TBB 40GM 4E59		
HGM/HGE 630	2	TBB 63GM 2S	70 mm	-	-	8 mm
	3	TBB 63GM 3S		-		
	4	TBB 63GM 4S		-		
HGM/HGE 800	2	TBB 80GM 2S	70 mm	-	-	10 mm
	3	TBB 80GM 3S		-		
	4	TBB 80GM 4S		-		

LUG Terminal

As a part that connects the cable to the circuit breaker so that the cable can be used without crimp terminal, it must be selected according to the product's rating and size of cable.

Application		LUG Terminal		Applicable Cable			Tightening Torque (kgf×cm)
Type	Pole	Type	Material	EA	Material	S (mm ²)	
HGM/HGE 30, 50E/S, 60, 100 (≤ 50 A)	2	CTB 10GM 2S50	Al	1	Cu/Al	2.5 ~ 16	14
	3	CTB 10GM 3S50					
	4	CTB 10GM 4S50					
HGM/HGE 60, 100 (> 50 A)	2	CTB 10GM 2S100	Al	1	Cu/Al	16 ~ 50	14
	3	CTB 10GM 3S100					
	4	CTB 10GM 4S100					
HGM/HGE 50H/L, 125	2	CTB 12GM 2S	Al	1	Cu/Al	2.5 ~ 70	14
	3	CTB 12GM 3S					
	4	CTB 12GM 4S					
HGM/HGE 160, 250	2	CTB 25GM 2S	Al	1	Cu/Al	50 ~ 180	19
	3	CTB 25GM 3S					
	4	CTB 25GM 4S					
HGM/HGE 400	3	CTB 40GM 3S1H	Al	1	Cu/Al	60 ~ 240	30 ~ 60
	4	CTB 40GM 4S1H				60 ~ 125	
HGM/HGE 400	3	CTB 40GM 3S	Al	2	Cu/Al	60 ~ 240	30 ~ 60
	4	CTB 40GM 4S					
HGM/HGE 630, 800	3	CTB 80GM 3S	Al	3	Cu/Al	60 ~ 185	30 ~ 60
	4	CTB 80GM 4S					

※ Quantity per Set : 2P - 2 EA, 3P - 3 EA, 4P - 4 EA

This type is inch type. For HGM100~250, ISO type (mm) is also available.



Straight
Busbar



Spreader
Busbar

LUG Terminal



HGM/HGE30 ~ 250



HGM400



HGM/HGE630, 800

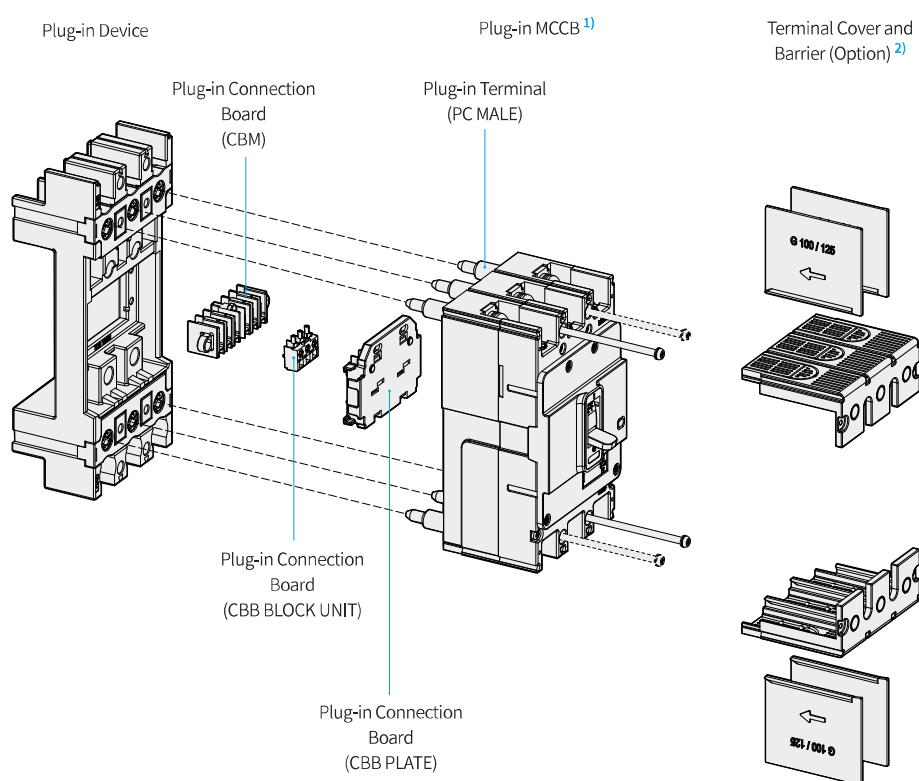


○ S
Wire

Plug-in Connection Devices

If the plug-in connection method is used, the circuit breaker can be replaced quickly and accurately without separating the power cable during a malfunction of a circuit breaker. Therefore, if plug-in type circuit breaker is installed in important electrical facilities such as shipping, broadcast station and others, the circuit breaker can be replaced and maintained quickly and conveniently without disconnecting the bus bar.

- Applicable to 32 ~ 800 AF.
- Offers convenient maintenance of switchgear.
- Convenient and relaxed installation after manufacture of the switchgear.
- Circuit breaker can be removed or replaced quickly without touching the terminal connection area.
- Connection block can be made by connecting the internal accessory to the circuit breaker.
- Type : For switchgear (TDM/TDF), for distribution board (TDA)
- Composition : Plug-in devices, plug-in MCCB, terminal cover or insulation barrier (Option).



※ 1) Plug-in MCCB must be used to apply plug-in connection method.

2) In case of not using the terminal cover, be sure to install a interphase barrier.

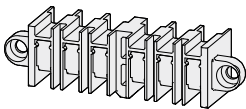
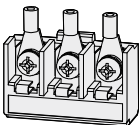
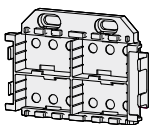
External Accessories (HGM)

HG-MCCB Plug-in CBM Wiring Position (TDM Front Side)

Option	HGM30, 50E/S, 60, 100 / 2P	HGM30, 50E/S, 60, 100	HGM50H/L, 125, 160, 250	HGM400, 630, 800	HGP50D, 125D, 160D	HGP250	HGP630	HGP800
AUX								
AUX2								
AUX3								
ALT								
SHT/UVT								
AUX+ALT								
AUX2+ALT								
AUX3+ALT								
AUX+SHT/UVT								
AUX2+SHT/UVT								
AUX3+SHT/UVT								
ALT+SHT/UVT								
AUX+ALT+SHT/UVT								
AUX+ALT+SHT/UVT Max. Mounting Combination								

Plug-in Connection Block

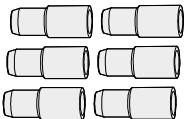
It is a connection block enables plug-in connection method, and it can be connected to the internal and external accessory of the circuit breaker.

Application			
HGM100 (≤ 50 A)	CBM 10GM 2PUNIT (2P) CBM 10GM UNIT (3P)	CBB BLOCK UNIT CBB BLOCK UNIT2C	CBBPLATE 10GM
HGM100 (> 50 A)			CBBPLATE 40GM
HGM125			CBBPLATE 80GM
HGM250			
HGM400			
HGM800			
Quantity per Set	1	1	1

※ Please refer to the bolt tightening torque of CBM/CBB.
 CBM : 5~10kgf · cm
 CBB : 15~20kgf · cm
 Specifications for the wires : AWG20 to AWG22

Plug-in Terminal

It is a part that can implement the plug-in MCCB.

Application	
HGM100 (≤ 50 A)	PCMALE 10GM 50 A
HGM100 (> 50 A)	PCMALE 10GM 100 A
HGM125	PCMALE 12GM
HGM250	PCMALE 25GM
HGM400	PCMALE 40GM
HGM800	PCMALE 80GM
Quantity per Set	6

External Accessories (HGM)

Plug-in Devices

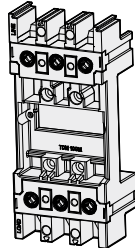
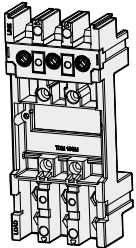
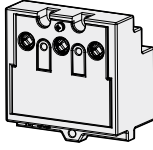

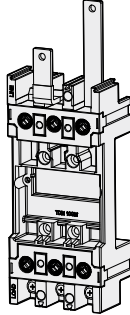
It is a connection block for plug-in MCCB installation and it is available according to the applicable panel and usage.

TDM Type

- TDM-P : It is comprised of plug-in terminal for both line/load for convenient use of connection block depending on the structure of the switchgear.
- TDM-F : Only plug-in parts of the line terminal are provided in TDM-P products.

TDF Type

- Only the line terminal is comprised of plug-in terminal but the plug-in device can be fixed to the switchgear using the same method as TDM-P.

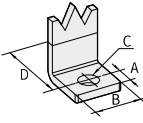
Applied Panel Type	Switchgear			Distribution Board	
	TDM-P	TDM-F	TDF	TDA (2 row)	TDA (1 row)
Composition					
Purpose	Line/Load Side	Line Side	Line Side	Duble Base	Single Base
HGM/HGE Type	32 ~ 800 AF	32 ~ 800 AF	32 ~ 125 AF	32 ~ 125 AF	32 ~ 125 AF
Pole	3P	3P	3P	2P (100 AF Only), 3P	3P

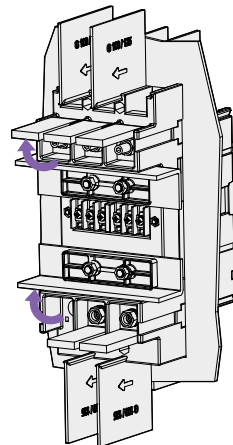
Specification of Connection Busbar

The bus bar of the switchgear can directly be connected to the plug-in device. The specifications of the applicable bus bar are as below and the insulation barrier or terminal cover must be used.

Unit : mm

Product	A	B	C	D	Remark
HGM/HGE30, 50E/S, 60, 100	< 10	< 21	$\varnothing \geq 6.5$	< 17.5	
HGM/HGE50H/L, 125	< 10	< 21	$\varnothing \geq 6.5$	< 19.5	
HGM/HGE160, 250	< 17.5	< 25	$\varnothing \geq 8.5$	< 27.5	
HGM/HGE400	< 22	< 32	$\varnothing \geq 10.5$	< 38	
HGM/HGE630, 800	< 30	< 40	$\varnothing \geq 17$	< 48.5	

Product	A	B	C	D	Remark
HGM/HGE30, 50E/S, 60, 100	< 7.5	< 15	$\varnothing \geq 7$	< 13	
HGM/HGE50H/L, 125	< 7.5	< 15	$\varnothing \geq 7$	< 13	
HGM/HGE160, 250	-	-	-	-	
HGM/HGE400	-	-	-	-	
HGM/HGE630, 800	-	-	-	-	

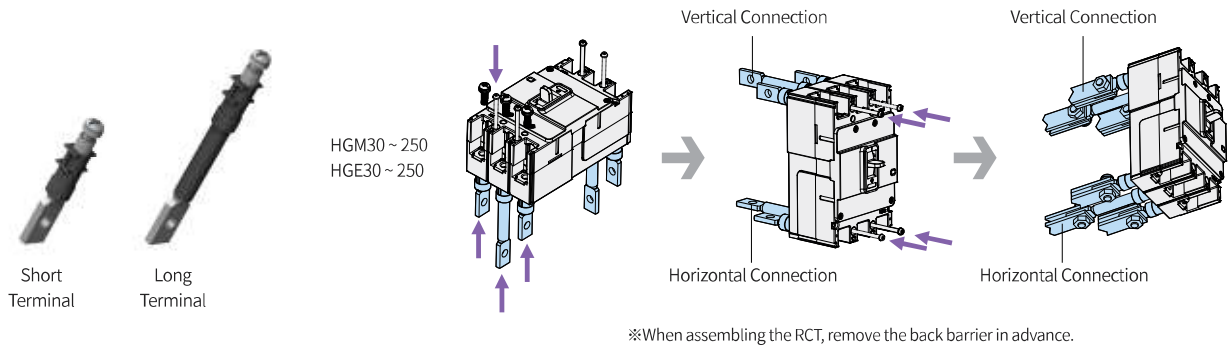


Rear Connection Terminal

It is a part for rear connection instead of front connection requirement it applies the fixed type of circuit breaker to the switchgear. The bus bar of the switchgear can be wired vertically or horizontally depending on the assembly direction of the connection.

Flat Type

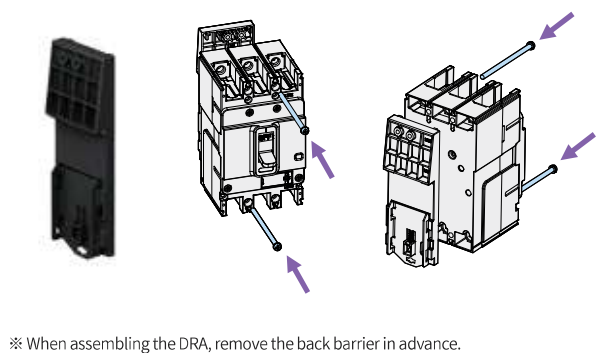
Application		Rear Terminal		Quantity per Set	
Type	Pole	Line Side	Load Side	Short Terminal	Long Terminal
HGM/HGE 30, 50E/S, 60, 100 (≤ 50 A)	2	RCT 05GM F2		1	1
	3	RCT 05GM F3		2	1
	4	RCT 05GM F4		2	2
HGM/HGE 60, 100 (> 50 A)	2	RCT 10GM F2		1	1
	3	RCT 10GM F3		2	1
	4	RCT 10GM F4		2	2
HGM/HGE 50H/L, 125	2	RCT 12GM F2		1	1
	3	RCT 12GM F3		2	1
	4	RCT 12GM F4		2	2
HGM/HGE 160, 250	2	RCT 25GM F2		2	0
	3	RCT 25GM F3		2	1
	4	RCT 25GM F4		2	2
HGM/HGE 400	3	RCT 40GM F3 LINE	RCT 40GM F3 LOAD	2	1
	4	RCT 40GM F4 LINE	RCT 40GM F4 LOAD	2	2
HGM/HGE 630, 800	3	RCT 80GM F3 LINE	RCT 80GM F3 LOAD	2	1
	4	RCT 80GM F4 LINE	RCT 80GM F4 LOAD	2	2



DIN Rail Adaptor

This is a part that enables a separate adaptor to be assembled and mounted for rear connection with the circuit breaker when the circuit breaker is mounted on the DIN Rail. (HGM/HGE100 Only)

Application		Din Rail Adaptor	Quantity
Type	Pole		
HGM/HGE 30, 50E/S, 60, 100	2	DRA 10GM	1
	3	DRA 10GM	1
	4	DRA 10GM	2



External Accessories (HGM)

Motor Operator

This device is used for turning the circuit breaker ON/OFF in remote position.

It is convenient for establishing automation system for low-voltage system and for selecting load when operating under emergency power.

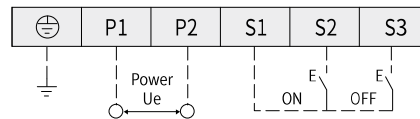
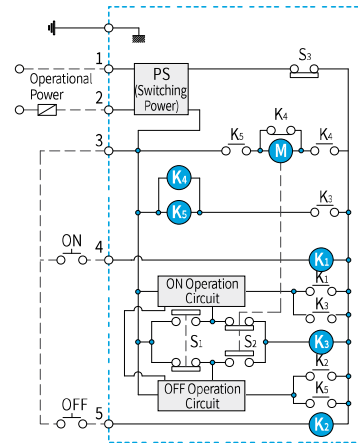
Application		MOT	Voltage
Type	Pole		
HGM30, 50E/S, 60, 100	3, 4	MOT 10GM	DC 24 V AC/DC 110 V AC/DC 240 V
HGM50H/L, 125	3, 4	MOT 12GM	
HGM160, 250	3, 4	MOT 25GM	
HGM400	3, 4	MOT 40GM	
HGM630, 800	3, 4	MOT 80GM	

Rating and Characteristics

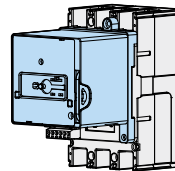
Format	Mechanical Lifespan	Operational Voltage	Operational Current (A)	Operating Time (ms)		Power Consumption (W)
				Closing	Opening	
MOT 10GM	10,000	DC 24 V	≤ 2.5	1,000	1,000	14
		AC/DC 110 V	≤ 0.5			
		AC/DC 240 V	≤ 0.5			
MOT 12GM	10,000	DC 24 V	≤ 2.5	1,000	1,000	14
		AC/DC 110 V	≤ 0.5			
		AC/DC 240 V	≤ 0.5			
MOT 25GM	8,000	DC 24 V	≤ 2.5	1,000	1,000	14
		AC/DC 110 V	≤ 0.5			
		AC/DC 240 V	≤ 0.5			
MOT 40GM	5,000	DC 24 V	≤ 6.0	1,200	1,200	14
		AC/DC 110 V	≤ 3.0			
		AC/DC 240 V	≤ 2.0			
MOT 80GM	5,000	DC 24 V	≤ 6.0	1,200	1,200	35
		AC/DC 110 V	≤ 3.0			
		AC/DC 240 V	≤ 2.0			

※ Operating Voltage Range : 85 ~ 110 % (DC 24 V : 95 ~ 110 %)

Circuit and Wiring Drawing



- Ⓜ : Motor
- Ⓚ₁ : ON Relay
- Ⓚ₂ : OFF Relay
- Ⓚ₃ : Relay for Motor
- Ⓚ₄ : Relay for Motor
- Ⓚ₅ : Relay for Motor
- Ⓚ₆ : Relay for Motor
- S₁ : ON Limit Switch
- S₂ : OFF Limit Switch
- S₃ : Auto/Manual Limit Switch



※ Precaution for mounting

When mounting the motor operator on MCCB, it must be mounted when the MCCB's handle position is in OFF position. Mounting the motor operator in other positions (ON, TRIP) may cause damage to the motor.

※ Operation caution

When device tripped in off position, it is tripped and handle position is located in trip position even if indicator turn off to green color. In this case, device should be reset manually.

External Accessories (HGP)

Locking Device

Padlock Device (PLD)

This device is used for locking the handle of circuit breaker to the OFF position by using a padlock. Padlock is not provided separately and up to 3 can be used. The applicable specifications of padlocks are as below.

Mechanical Interlock

This device interlocks two circuit breakers by using a mechanical interlock.

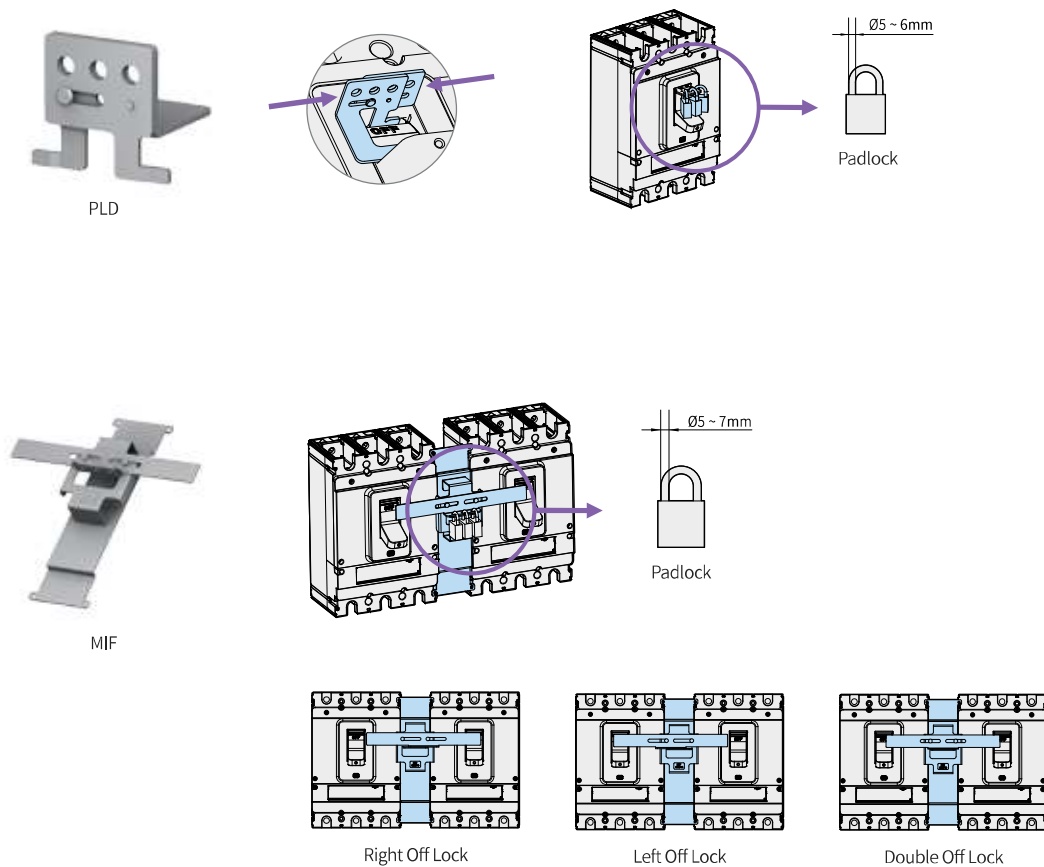
Key Features

- It prevents two breakers from closing at the same time.
- All circuit breakers are open. The applicable specifications of padlocks are as below.

Type	Application	Padlock Diameter ¹⁾
PLD 16GP	HGP50D, HGP125D, HGP160D	5 ~ 6 mm
PLD 25GP	HGP250 (HGP100/MCP)	
PLD 63GP	HGP400, HGP630	
PLD 80GP	HGP800	

Type		Application	Padlock Diameter ¹⁾
3P	4P		
MIF 16GP 3	MIF 16GP R4	HGP50D, HGP125D, HGP160D	5 ~ 7 mm
MIF 25GP 3	MIF 25GP R4	HGP250 (HGP100/MCP)	
MIF 63GP 3	MIF 63GP R4	HGP400, HGP630	
MIF 80GP 3	MIF 80GP R4	HGP800	

※ 1) Padlock not included



External Accessories (HGP)

Terminal Cover / Insulation Barrier

Terminal Cover

It is our insulation part of circuit breaker for live and load side of terminal area from the outside and it prevents electric shock and short-circuit accidents that may occur due to direct contact of people's hand or tools with the live current part. When the terminal cover is used, the protection degree of IP40 is applied to the conductor part. Based on the connection method of the circuit breaker, it can be classified into long or short type for use and various handles and interlock devices can be combined for use.

Short Type

It is suitable for plug-in or rear connection.

Long Type

It is suitable for front connection using wires, bus bar or lug terminals.

Insulation Barrier

As a part used to prevent accidents with regards to insulation and conductive foreign substance between the circuit breaker terminals, it improves the performance of phase-to-phase insulation by installing it in the groove between the circuit breaker's terminals. It can easily be assembled even if the circuit breaker has already been installed and in case the two circuit breakers have been installed side by side, it can also be assembled in the gap between the two circuit breakers. In addition, it is used in the terminal cover and plug-in base. In case insulation barrier is not mounted between the circuit breaker's terminal, it may cause secondary short-circuit accidents so it must be used.

Type			Application	Pitch (mm)	No. of Parts (EA/Set)
3P Short (Plug-in)	3P Long (3P)	4P Long (4P)			
TCF 16GP S3	TCF 16GP L3	TCF 16GP L4	HGP50D, HGP125D, HGP160D	30	1
TCF 25GP-G S3	TCF 25GP-G L3	TCF 25GP-G L4	HGP250 (HGP100/MCP)	35	1
TCF 63GP S3	TCF 63GP L3	TCF 63GF L4	HGP400, HGP630	46.5	1
TCF 80GP S3	TCF 80GP L3	TCF 80GF L4	HGP800	70	1

Type			No. of Parts (EA/Set)	
3P	4P	Application	3P	4P
TQQ 16GP 3	TQQ 16GP 4	HGP50D, HGP125D, HGP160D	4	6
TQQ 25GP-G 3	TQQ 25GP-G 4	HGP250 (HGP100/MCP)	4	6
TQQ 63GP 3	TQQ 63GP 4	HGP400, HGP630	4	6
TQQ 80GP 3	TQQ 80GP 4	HGP800	4	6



Terminal Cover Short Type



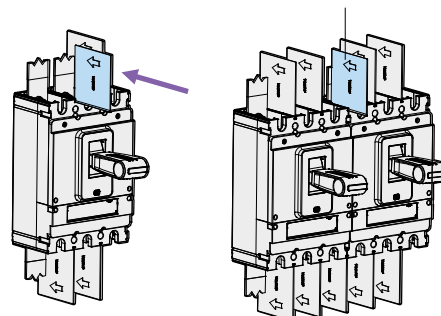
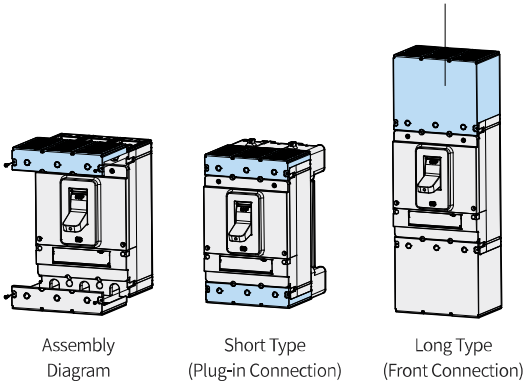
Terminal Cover Long Type



Insulation Barrier

※ In case of using as front connection, please use it after removing the indicated part.

※ Additional barrier required for close mounting is provided as additional options. (It may cause secondary accidents, so it must be installed.)



Rotary Handle

Rotary handle is a product that can check and operate MCCB's ON/OFF/TRIP even when the panel door is closed by installing the circuit breaker in enclosed switchgear or on MCCB panel and others. There are two types of rotary handle, front contact type and extension type and all the rotary handles offer panel door locking function and handle locking function. The rotary handle can be rotated clockwise to turn the circuit breaker "ON" and according to the mounting direction of MCCB, it is categorized into the upper line, the right line and the left line. The IP grade of the handle is IP40/IP54.

Front Contact Rotary Handle

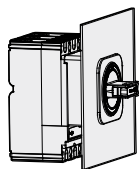
- 160 ~ 250 AF : The handle is installed directly to the circuit breaker.
- 630 ~ 800 AF : The handle is installed to the door of the panel.

Type			Application
Upper Line	Right Line	Left Line	
TFG 16GP U	TFG 16GP R	TFG 16GP L	HGP50D, HGP125D, HGP160D
TFG 25GP U	TFG 25GP R	TFG 25GP L	HGP250 (HGP100/MCP)
TFG 63GP U	TFG 63GP R	TFG 63GP L	HGP400, HGP630
TFG 80GP U	TFG 80GP R	TFG 80GP L	HGP800

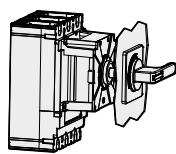
Extension Rotary Handle

It is suitable if the distance between the circuit breaker and the panel door is long. The handle is installed to the door of the panel and there is no trip-button function.

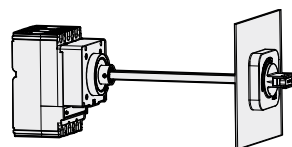
Type	Application
TFH 16GP	HGP50D, HGP125D, HGP160D
TFH 25GP	HGP250 (HGP100/MCP)
TFH 63GP	HGP400, HGP630
TFH 80GP	HGP800



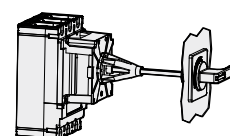
HGP50D, HGP125D
HGP160D, HGP250



HGP400, HGP630
HGP800



HGP50D, HGP125D
HGP160D, HGP250



HGP400, HGP630
HGP800

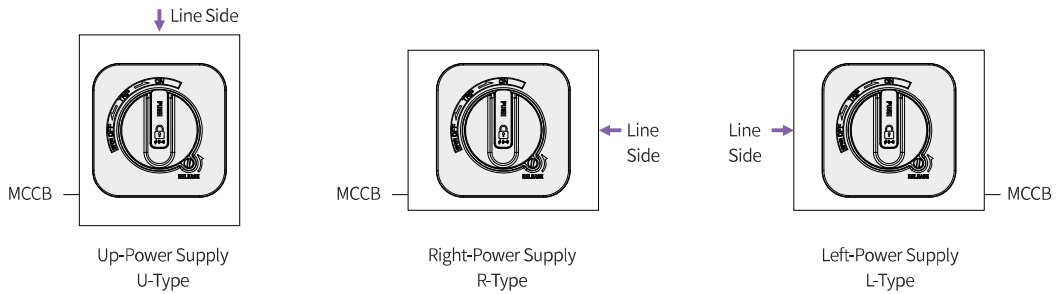
※ When installing an extension rotary handle, the eccentric tolerance of the handle drive shaft is 1.5 degrees.

External Accessories (HGP)

Rotary Handle

Types of Handle by the Circuit Breaker's Installation Type

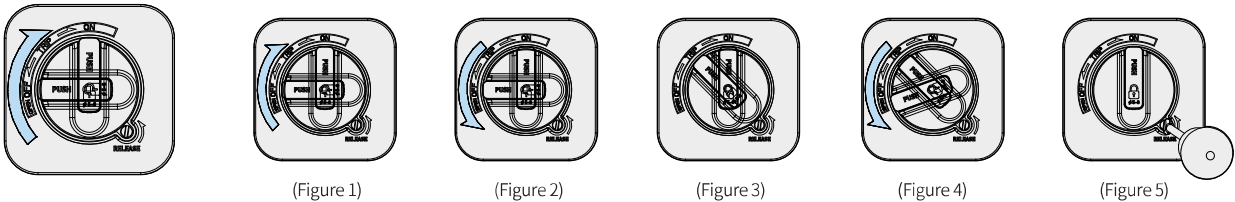
Rotary handle is divided into the following three types by the circuit breaker's direction of power supply.



How to Operate the Handle

Operating Direction : Turn the handle clockwise to turn the breaker ON.

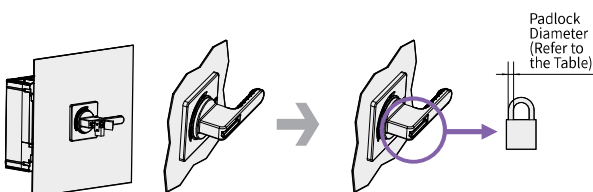
- Circuit Breaker ON : Rotate the handle to ON position. (Figure 1)
- Circuit Breaker OFF : Rotate the handle to OFF position. (Figure 2)
- Circuit Breaker TRIP : If the circuit breaker is tripped, the handle will automatically return to TRIP position. (Figure 3)
- After the circuit breaker is tripped, rotate the handle to the RESET position first (Figure 4) then rotate to the ON position and the circuit breaker will turn ON (Figure 1).
- If you need to open the door when the handle is in the ON state, rotate the RELEASE screw to the direction of the arrow then open the door (Figure 5).



Handle Locking Device

Lock Function	OFF State Door Lock	ON State Door Lock	Reverse Interlock	Handle Padlock ¹⁾
Details	<ul style="list-style-type: none"> • Impossible to open the panel door when the circuit breaker is in the OFF state. • Possible at RESET position • Possible to open the panel door after rotating the handle to RESET 	<ul style="list-style-type: none"> • Impossible to open the panel door when the circuit breaker is in the ON state • Possible to open the panel door after rotating the RELEASE screw 	<ul style="list-style-type: none"> • Impossible to close the circuit breaker (ON) in case the panel door is open 	<ul style="list-style-type: none"> • Padlocking function which locks using a padlock to prevent handle operation. • Padlock is not provided separately and the number of padlocks depends on the padlock diameter. (Refer to the table below) • As for the specifications of the applicable padlocks, refer to the table below.
Front Contact Type (TFG)	●	●	● (160/250 AF Only)	●
Extension Type (TFH)	●	●	-	●

※ 1) For TFG 250 AF or less, The handle remains ON when the circuit breaker is tripped after padlocking in ON position.



Application	Padlock Diameter ¹⁾
HGP50D, HGP125D, HGP160D, HGP250	6 ~ 8 mm
HGP400, HGP630, HGP800	5 ~ 7 mm

※ 1) Padlock not included

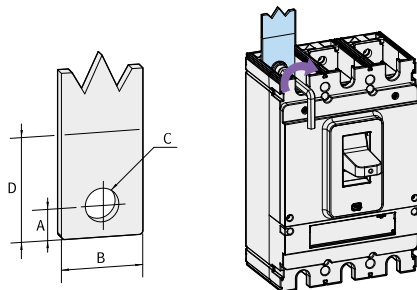
Front Connection of Fixed Devices

Straight/spreader bus bar or lug terminal can be selected according to the size and specification of the cable or bus bar to be connected to the circuit breaker.

Insulated Bar Connection

In case the bus bar pitch of the switchgear is equal to the circuit breaker, it can be connected directly to the circuit breaker by using an insulation tube. Refer to the following connection bus bar specification for connection and the insulation barrier between phases and terminal cover must be used.

Application	Connection Bus Bar Dimensions (mm)				Applicable Bolt and Tightening Torque	
	A	B	C	D	Bolt Spec.	Max. Tightening Torque (kgf×cm)
50 ~ 160 AF	< 9	< 22	∅9	A + 9	M8 Screw	136
250 AF	< 9	< 25	∅9	A + 10	M8 Hex Socket	136
400 ~ 630 AF	< 15	< 32	∅10.5	A + 15	M10 Hex Socket	270
800 AF	< 15.5	< 50	∅13	A + 16.5	M12 Hex Socket	470



Busbar

Straight Busbar

It is used to meet the cable and standards of the switchgear. (Pitch between the poles maintained)

Spreader Busbar

It is used to extend the internal insulation distance of the switchgear. (Pitch between the poles extended)

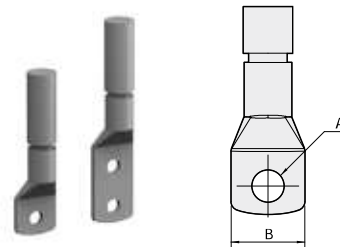
Series Busbar

Used for serial connection of adjacent phases. (DC only)

Crimped Terminal

Standard terminals (crimped/copper tubing terminal) must be used and the insulation barrier between phases and the terminal cover must be used. Standard terminals must be selected for use according to the rating of the circuit breaker and the terminal is not provided separately. As for the cable specifications with regards to important ratings, refer to the table below.

Application	Rated Current	Cu Cable Size (mm ²)	Applicable Terminal Dimensions (mm)		
			A	B	C
50 ~ 160 AF	100 A 160 A	35 70	∅9	< 22	< 9
250 AF	160 A 250 A	70 120	∅9	< 25	< 9
400 ~ 630 AF	400 A 630 A	240 185×2	∅10.5	< 32	< 15
800 AF	800 A	240×2	∅13	< 50	< 15.5



Straight Busbar



Spreader Busbar



Series Busbar

Application	Pole	Straight		Spreader		Series
		Type	Pitch	Type	Pitch	
HGP250	3	TBB 25GP 3S	35 mm	TBB 25GP 3E45	45 mm	SBB 25GP
	4	TBB 25GP 4S		TBB 25GP 4E45		
HGP630	3	TBB 63GP 3S	46.5 mm	TBB 63GP 3E61.5	61.5 mm	SBB 63GP
	4	TBB 63GP 4S		TBB 63GP 4E61.5		
HGP800	3	TBB 80GP 3S	70 mm	-	-	SBB 80GP
	4	TBB 80GP 4S		-		

※ Quantity per Set : 3P - 3 EA, 4P - 4 EA, SBB - 1 EA

External Accessories (HGP)

LUG Terminals

As a cable connection to the circuit breaker the cable can be used without crimped terminal, it must be selected according to the product's rating and size of cable.

Application		LUG Terminal		Application				Tightening Torque (kgf×cm)
Type	Pole	Type	Material	EA	Material	S (mm ²)	L (mm)	
HGP50D HGP125D HGP160D	3 4	CTB 16GP 3 CTB 16GP 4	Steel	1	Cu/Al	1.5 ~ 95	19	140
HGP250 (HGP100/MCP)	3 4	CTB 25GP 3 CTB 25GP 4	Al	1	Cu/Al	14 ~ 185	19	
HGP400 HGP630	3 4	CTB 63GP 3 CTB 63GP 4	Al	2	Cu/Al	60 ~ 240	30 ~ 60	353
HGP800	3 4	CTB 80GP 3 CTB 80GP 4	Al	3	Cu/Al	60 ~ 185	30 ~ 60	

※ Packaging Quantity per Set : Provided in the composition quantity of line or load side (3P-3 EA, 4P-4 EA)



HGP50D
HGP125D
HGP160D



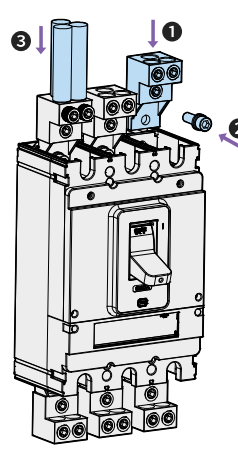
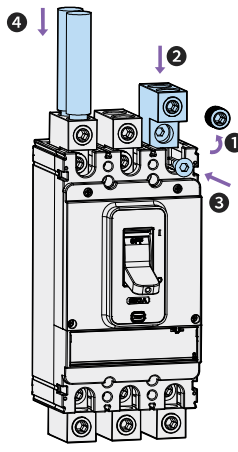
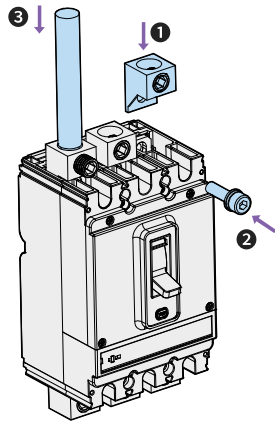
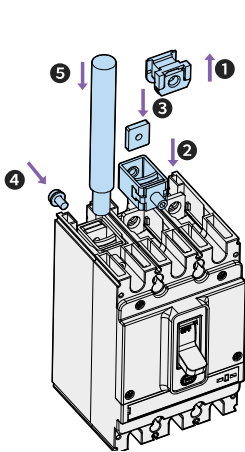
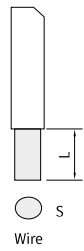
HGP250



HGP400
HGP630



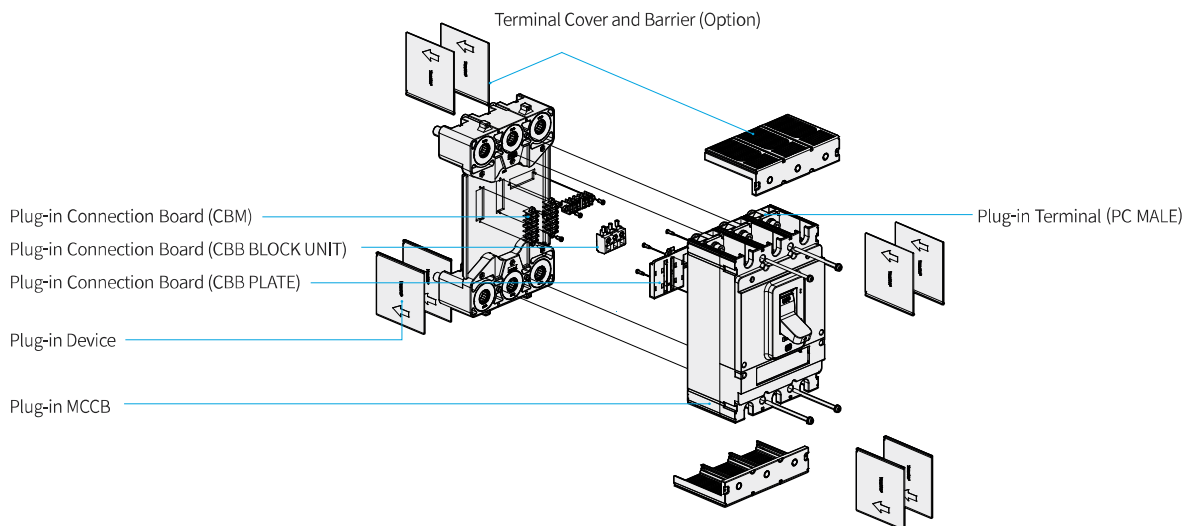
HGP800



Plug-in Connection Devices

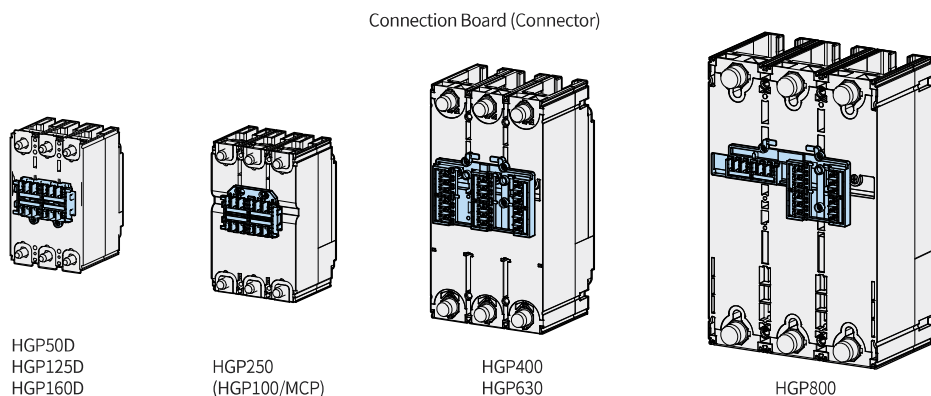
When the plug-in connection method is used, the circuit breaker can be replaced quickly and accurately without power off during a malfunction of a circuit breaker. Therefore, in case the plug-in method of circuit breaker is installed in important electrical facilities such as shipping, broadcast station and others, the circuit breaker can be removed and maintained quickly and conveniently without disconnecting the bus bar.

- Applicable to 50 ~ 800 AF, up to 3P.
- Offers convenient maintenance of switchgear.
- Convenient and relaxed installation after manufacture of the switchgear.
- Circuit breaker can be removed or replaced quickly without touching the terminal connection area.
- Type : For switchboard (TDM/TDF)
- Composition : Plug-in devices, plug-in MCCB, terminal cover or insulation barrier (Option)



Plug-in MCCB (For HGP)

In order to apply the plug-in connection method, the plug-in MCCB must be used instead of the general type, even for the MCCB. The product covers various breaking capacity up to the rated current of 800 A so this product conforms to the switchgear standard. Connection board (Connector) can be added to connect internal accessories to the circuit breaker.



External Accessories (HGP)

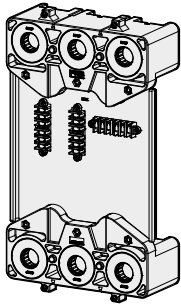
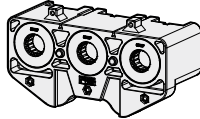
Plug-in Connection Devices

Plug-in Devices

As a connection block in which plug-in MCCB can be installed, it is available according to the applied panel and the purpose.

TDM Type

- TDM-P : It is comprised of plug-in terminal for both line/load for convenient use of connection block depending on the structure of the switchgear.
- TDM-F : Only plug-in parts of the line terminal are provided in TDM-P products.

Applied Panel	For Switchgear	
Type	TDM-P	TDM-F
Composition		
Purpose	Line/Load Side	Line Side
Applicable MCCB	HGP50 ~ 800 AF 3P	

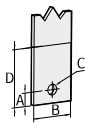
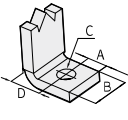
Specification of Connection Busbar

The bus bar of the switchgear can directly be connected to the plug-in device.

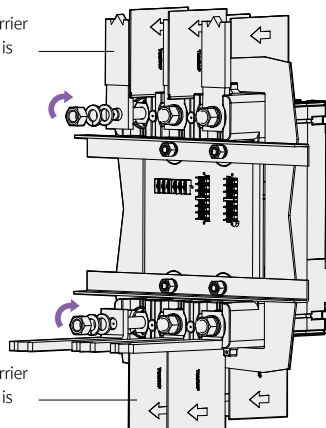
The specifications of the applicable bus bar are as below and the insulation barrier or terminal cover must be used.

There is no separate bus bar for connection.

Unit : mm

Product	A	B	C	D	Remark	Product	A	B	C	D	Remark
50 ~ 160 AF	< 12	< 21	$\varnothing \geq 8.5$	A + 18		50 ~ 160 AF	< 12	< 21	$\varnothing \geq 8.5$	< 12	
250 AF	< 18	< 25	$\varnothing \geq 8.5$	A + 17		250 AF	< 18	< 25	$\varnothing \geq 8.5$	< 18	
400 ~ 630 AF	< 34	< 35	$\varnothing \geq 10.5$	A + 26		400 ~ 630 AF	< 25	< 35	$\varnothing \geq 10.5$	< 25	
800 AF	< 30	< 40	$\varnothing \geq 16.5$	A + 30		800 AF	< 30	< 40	$\varnothing \geq 16.5$	< 30	

※ The insulation barrier for plug-in device is an option



※ The insulation barrier for plug-in device is an option.

HG-MCCB Plug-in CBM Wiring Position (TDM Front Side)

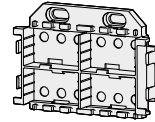
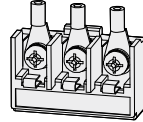
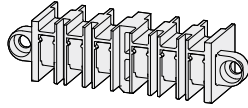
Option	HGP50D, HGP125D, HGP160D	HGP250 (HGP100/MCP)	HGP400, HGP630	HGP800
AUX				
AUX2				
AUX3				
ALT				
SHT/UVT				
AUX+ALT				
AUX2+ALT				
AUX3+ALT				
AUX+ SHT/UVT				
AUX2+ SHT/UVT				
AUX3+ SHT/UVT				
ALT+ SHT/UVT				
AUX+ALT+ SHT/UVT				
AUX+ALT+ SHT/UVT Max. Mounting Combination				

External Accessories (HGP)

Plug-in Connection Block

In order for the plug-in connection method, it can be connected to the internal and external accessory of the circuit breaker.

Application



HGP160D	CBM 10GM UNIT (3P)	CBB BLOCK UNIT CBB BLOCK UNIT2C	CBBPLATE 16GP
HGP250			CBBPLATE 25GP
HGP630			CBBPLATE 63GP
HGP800			CBBPLATE 80GP
Quantity per Set			1

※ Please refer to the bolt tightening torque of CBM/CBB.

CBM : 5~10kgf · cm

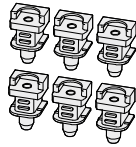
CBB : 15~20kgf · cm

Specifications for the wires : AWG20 to AWG22

Plug-in Terminal

It is a part that can realize the plug-in MCCB.

Application



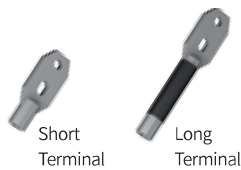
HGP160D	PCMALE 16GP
HGP250	PCMALE 25GP-G
HGP630	PCMALE 63GP
HGP800	PCMALE 80GP
Quantity per Set	6

Rear Connection Terminal

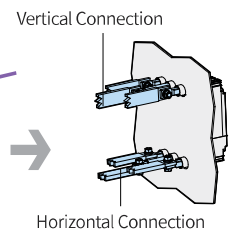
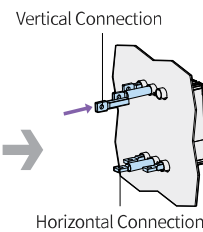
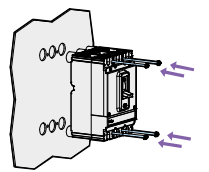
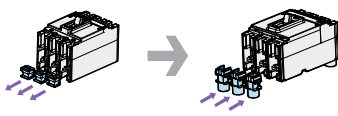
It is a part that is used in case there is a need for rear connection instead of front connection by applying the fixed type of circuit breaker to the switchgear. The bus bar of the switchgear can be wired vertically or horizontally depending on the assembly direction of the connection.

Flat Type

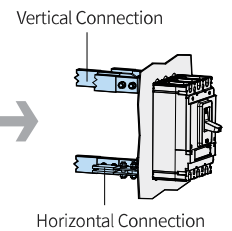
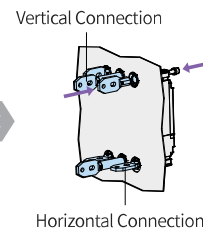
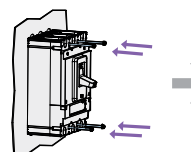
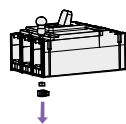
Application		Rear Terminal		Quantity per Set	
Type	Pole	Line Side	Load Side	Short Terminal	Long Terminal
HGP50D, HGP125D, HGP160D	3	RCT 16GP F3		2	1
	4	RCT 16GP F4		2	2
HGP250 (HGP100/MCP)	3	RCT 25GP-G F3		2	1
	4	RCT 25GP-G F4		2	2
HGP400 HGP630	3	RCT 63GP F3 LINE	RCT 63GP F3 LOAD	2	1
	4	RCT 63GP F4 LINE	RCT 63GP F4 LOAD	2	2
HGP800	3	RCT 80GP F3 LINE	RCT 80GP F3 LOAD	2	1
	4	RCT 80GP F4 LINE	RCT 80GP F4 LOAD	2	2



HGP50D
HGP125D
HGP160D
HGP250

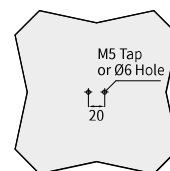
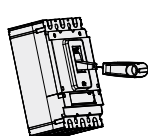


HGP400
HGP630
HGP800



Auxiliary Handle (THA)

As an auxiliary handle used to reduce the operating force of ON, OFF, RESET in large capacity circuit breaker (400 ~ 800 AF), it is a standard product provided. It comes together with a holder for storing auxiliary handle that can be fixed to the switchboard panel.



External Accessories (HGP)

Motor Operator

This device is used for turning the circuit breaker ON/OFF from remote position. It is convenient for establishing automation system for low-voltage load system and for selecting load when operating under emergency power.

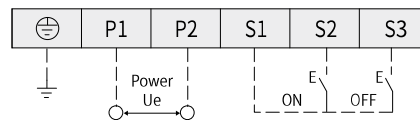
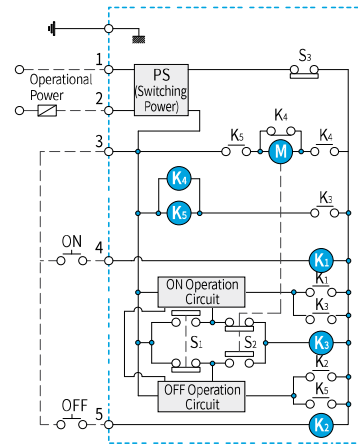
Application		Pole	MOT	Voltage
Type				
HGP50D, HGP125D, HGP160D		3, 4	MOT 16GP	DC 24 V AC/DC 110 V AC/DC 240 V
HGP250 (HGP100/MCP)		3, 4	MOT 25GP	
HGP400, HGP630		3, 4	MOT 63GP	
HGP800		3, 4	MOT 80GP	

Rating and Characteristics

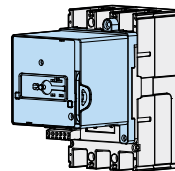
Format	Operational voltage	Operational Current (A)	Operating Time (ms)		Power Consumption (W)	Endurance
			Closing	Opening		
MOT 16GP	DC 24 V	≤ 2.5				
	AC/DC 110 V	≤ 0.5	1,000	1,000	14	10,000
	AC/DC 240 V	≤ 0.5				
MOT 25GP	DC 24 V	≤ 2.5				
	AC/DC 110 V	≤ 0.5	1,000	1,000	14	10,000
	AC/DC 240 V	≤ 0.5				
MOT 63GP	DC 24 V	≤ 6.0				
	AC/DC 110 V	≤ 3.0	1,200	1,200	35	5,000
	AC/DC 240 V	≤ 2.0				
MOT 80GP	DC 24 V	≤ 6.0				
	AC/DC 110 V	≤ 3.0	1,200	1,200	35	5,000
	AC/DC 240 V	≤ 2.0				

※ Range of Operational Voltage : 85 ~ 110 % (DC 24 V : 95 ~ 110 %)

Circuit and Wiring Drawing



- : Motor
- : ON Relay
- : OFF Relay
- : Relay for Motor
- S1 : ON Limit Switch
- S2 : OFF Limit Switch
- S3 : Auto/Manual Limit Switch



※ Precaution for mounting

When mounting the motor operator on MCCB, it must be mounted when the MCCB's handle position is at in position. Mounting the motor operator in other positions (ON, TRIP) may cause damage to the motor.

※ Operation caution

When device tripped in off position, it is tripped and handle position is located in trip position even if indicator turn off to green color. In this case, device should be reset manually.

