



DC

HGN DC Type

Interrupor automatico corte en aire (DC)

HGP DC Type

Interrupor automatico caja moldeada (DC)

HGD DC Type

Interrupor automatico a riel din (DC)



Essential for Today, Potential for Tomorrow

HD Hyundai Electric solely pursues the growth of our customers' business. From power generation to power distribution, we focus on developing and commercializing products and solutions aimed at increasing the efficiency of energy equipment as well as at proactively monitoring and controlling assets in an integrated manner to improve our customers' productivity and management efficiency. We are well aware that our efforts add to the driving force behind our customers' growth and contribute to the creation and maintenance of a more dynamic world. We focus on achieving innovation and strive to evolve continuously to shape a better tomorrow based on today's technological advancement.

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INTEGRICT

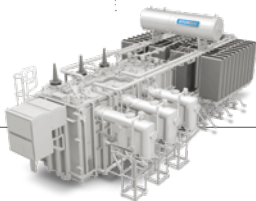
Energy Solution Energy solution business refers to the business of designing, procuring and establishing a system that enables the efficient use of power energy through integrated management of the production, consumption, sales and operation.

Asset Management Solution Asset management solution is a business that maximizes the overall business efficiency by systematically managing the performance, risk, maintenance cost and others as well as by providing an asset management solution suitable to the customer's circumstance depending on the product lifecycle (PLC) of various products.

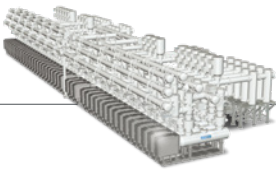
Generation(step-up)

Power Plants

- Supplied to more than 70 countries around the world for the past 45 over years since 1978
- Satisfies the various demands of customers through the acquisition of quality certifications from international accredited institute
- Participates in the world's key technical committee such as GIGRE and others, pioneering the establishment of technology standard related to power network

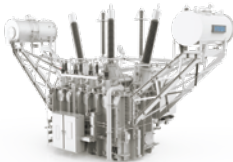


Power Transformer
· up to 800 kV, 1,500 MVA



Gas Insulated Switchgear
· up to 800 kV

- Can be installed in spaces smaller than the open type of substation by using SF₆ gas with outstanding insulation and arc extinguishing characteristics
- Manufacturing advanced products that are resistant to external environment and climate effects through the sealing at the charge part
- Extensive project experiences around the world
- Reduces installation period and cost due to simple installation and transportation, convenient maintenance
- Design considering the safety of the workers as priority



ECO Transformer
· up to 500 kV, 1,000 MVA

- Eco-friendly oil (Natural/Synthetic)
- Dynamic Pressure Resistant System(DPRS)
- Guarantees excellence in safety

Transmission

Primary Substation/Secondary Substation



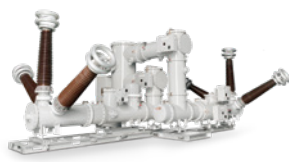
Gas Insulated Switchgear
· up to 800 kV



Power Transformer
· up to 800 kV, 1,500 MVA



Shunt Reactor
· up to 765 kV, 300 Mvar



SF₆ Free Gas Insulated Switchgear
· GIS for 170 kV 50 kA 60 Hz
· ECO GIS for 72.5 kV, 145 kV

- Korea's first solely developed technology
- Eco-friendly Novec mixture gas instead of SF₆ gas

Distribution



Cubicle GIS
· up to 40.5 kV
· IEC, ANSI, GOST, UL

- Produces high quality products using angle-less type
- Multi-functional digital protection relay (HiMAP) applied
- High reliability secured, provides various operation information such as protection, measurement and control
- Firm external box, size and compact, making it safe
- Maintains high quality through stringent quality control system and continuous research and development

Motor & Generator



Synchronous Generator
· Rated Output: < 50 MVA
· Rated Voltage: < 15 kV
· Ploes: > 2P

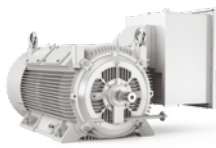
Marine

Marine Solution

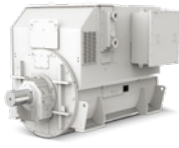
- Production of high quality marine devices satisfying the regulations and standards of key marine associations (LRS, ABS, DNV, GL, BV, NK etc.) and world's renowned institutes
- High quality safety secured through the latest equipment and stringent quality control system
- Realization of optimal high efficiency by converging SWGR, Generator, Motor, Telecom, Automation, Intelligent Motor Control Unit and others



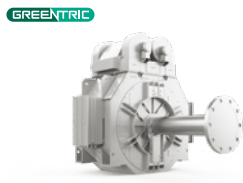
Marine Switchgear



Marine Motor



Generator



Shaft Generator



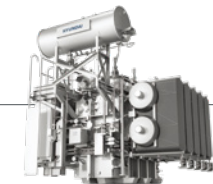
Metal Clad Switchgear

- up to 38 kV
- IEC, ANSI, UL



Low Voltage Switchgear & Motor Control Center

- H8PU : 480 V, 3,200 A, 65 kA
- H5600 : 480 V, 1,200 A, 65 kA
- HiMCC : 480 V, 5,000 A, 100 kA



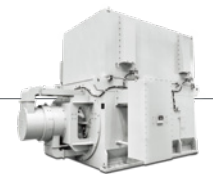
Distribution Transformer

- up to 36 kV, 50 MVA



Cast Resin Transformer

- up to 36 kV, 20 MVA



Synchronous Motor

- Rated Output: < 40 MW
- Rated Voltage: < 15 kV
- Ploes: > 2P



MV&HV Induction Motor

- Rated Output: < 35 MW
- Rated Voltage: < 15 kV
- Poles: 2P-30P



VCB

- IEC, ANSI, UL
- up to 36/38 kV, 50 kA, 4,000 A



ACB

- AC : up to 150 kA, 6,300 A
- DC : up to 60 kA, 4,000 A



VC

- up to 12 kV, 400 A



Switch-Disconnecter

- DC : up to 100 kA/1 s, 4,000 A



HGMAP

- HGMAP Series



HGCAM

- HGCAM Series



MCCB

- AC : up to 150 kA, 1,600 A
- DC : up to 100 kA, 800 A



ELCB

- up to 85 kA, 800 A, 1,000 mA



MCCB / ELCB

- up to 10 kA, 100 A, 100 mA



MS / MC

- up to 800 A



Distribution Box

- Up to 36 ways
- Surface/Flush type



MCB

- up to 15 kA, 125 A



RCCB / RCBO

- up to 100 A, 500 mA



Isolator

- up to 125 A



Electronic Circuit Breaker

- up to 20 A



Fuse Links & Switches

- up to 1,250 A

- Can be applied to various places of demand due to various domestic and international certifications and marine certifications
- Full HG-Series line-up established
- High standard of breaking capacity and various product line offers production in any load environments
- Increased reliability with reinforced breaking performance of high-breaking MCCB
- Reinforced usage stability through internal reliability verification



SPD

- up to 200 kA
- AC, DC



HGDM



EOCR

- up to 60 A



MMS

- up to 100 kA, 80 A



Installation Contactor

- up to 63 A



LV Motor

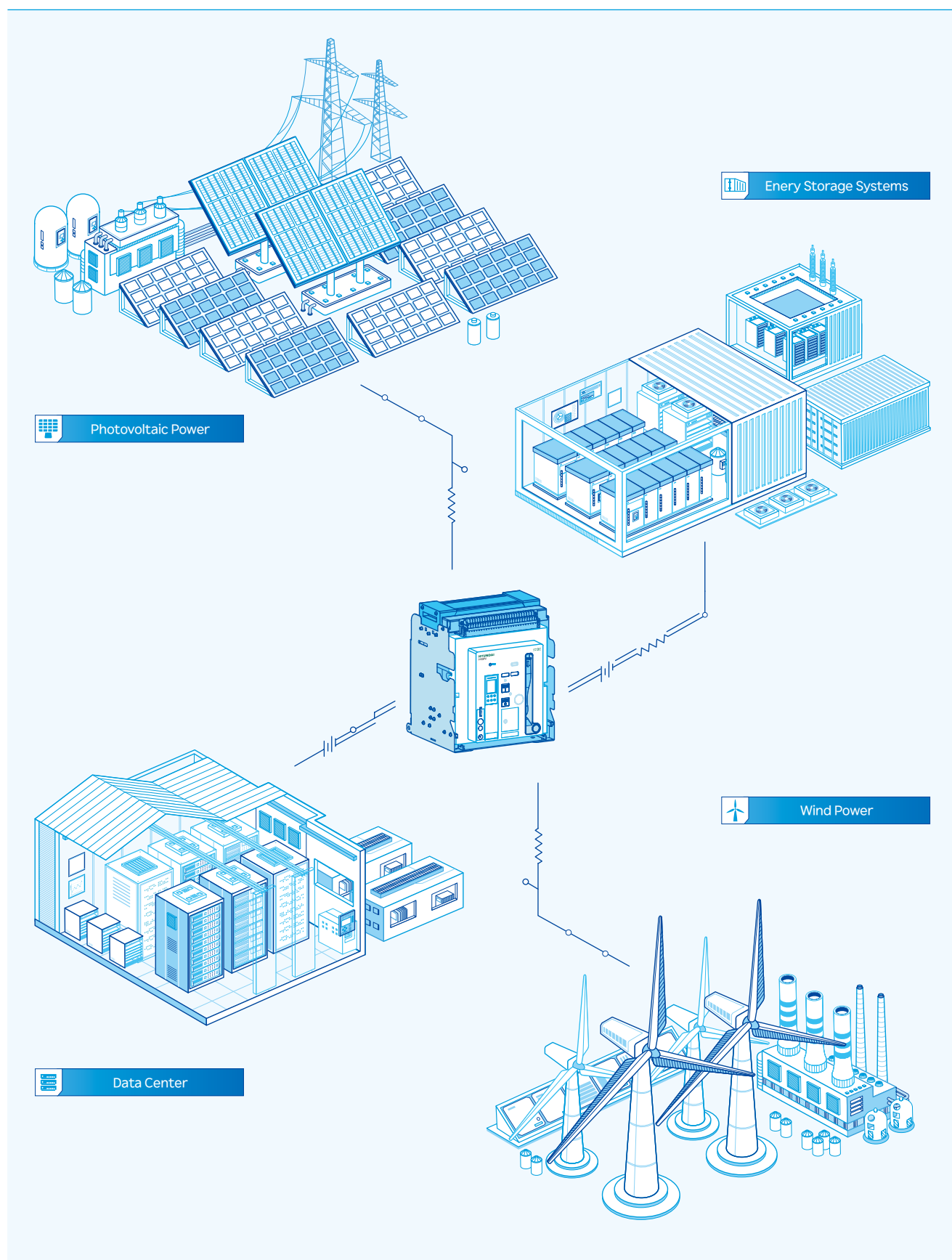
- Rated Output: < 750 kW
- Rated Voltage: < 690 V
- Poles: 2P-12P

- Enhanced reliability and secured safety with production of products based on the world's best equipment and stringent quality system
- Realized high efficiency by selecting slot based on FEM
- Realized small and lightweight with optimal design based on FEM analysis method
- Satisfies the quality standards of international accredited institutes (IEC, IEEE, CSA, NEMA, API etc.)

HGN DC Type

Air Circuit Breaker & Switch-Disconnecter

Versatile Usage Environments



Product Features

HGN DC Type is suitable for direct current (DC) power/load protection in various applications such as solar energy, energy storage systems (ESS), data centers, and wind turbines, with a maximum operating voltage of DC 1,500 V (4P).



Maximized Insulation Performance

- Rated Insulation Voltage U_i : 1,000 V / 1,500 V
- Rated Impulse Withstand Voltage U_{imp} : 12 kV



Maximum Breaking Capacity

- Circuit Breaker :
60 kA @ 1,500 Vdc, 50 kA/1s
- Switch-Disconnecter :
100 kA @ 1,500 Vdc, 100 kA/1s
(Consistent performance across the entire frame)



Equipped with DC-specific Protection Relays (OCR) and Common Accessories

- Equipped with DC-specific protection relays for versatile applications in solar energy, EES, and more.
- Temperature monitoring, accident recording, diagnostics, digital output (DO), communication capabilities, etc.
- Compatible with AC circuit breakers and various accessories like motors, coils, and more.



Specifications and Certifications

- IEC 60947-2 CB certification
- IEC 60947-3 CB certification



Selection Table

Air Circuit Breaker (HGN DC Type)

Model Name				HGN			
Certification				IEC 60947-2			
Rated Current	Based on 40℃	A	1,600 AF	2,500 AF	3,200 AF	4,000 AF	
			800,	1,600,	1,600,	2,000,	
			1,000,	2,000,	2,000,	2,500,	
			1,250,	2,500	2,500,	3,200,	
1,600			3,200	4,000			
Rated Operational Voltage [Ue]		Vdc	1,000 (3P) / 1,500 (4P)				
Rated Insulation Voltage [Ui]		Vdc	1,500				
No. of Poles		P	3 / 4				
Rated Impulse Withstand Voltage [Uimp]		kV	12				
Rated Ultimate Breaking Capacity [Icu]	3P 1,000 V DC	kA	60				
	4P 1,500 V DC		60				
Service Short-Circuit Breaking Capacity [Ics]		(%)	100 %				
Rated Short-Time Withstand Current [Icw]	3P 1,000 V DC	kA/1s	50				
	4P 1,500 V DC		50				
Utilization Category (IEC 60947-2)			B				
Overcurrent Protection	Electronic Trip Units for DC Applications			●			
Closing Operational Time	Motor Charging Time (sec) max.			10			
	Rated Close Time (ms) max.			80			
Weight	3P	Draw-Out Type	kg	95(115) ¹⁾			
		Fixed Type	kg	44(61) ¹⁾			
	4P	Draw-Out Type	kg	112(149) ¹⁾			
		Fixed Type	kg	55(80) ¹⁾			
Dimension (W×H×D)	3P	Draw-Out Type	mm	399×480×368.4			
		Fixed Type	mm	408.4×404.4×295.8			
	4P	Draw-Out Type	mm	514×480×368.4			
		Fixed Type	mm	523.4×404.4×295.8			

※ 1) 4,000 AF

Switch-Disconnecter (HGN DC Type)

Model Name				HGN						
Certification				IEC 60947-3						
Frame		AF		800	1,000	1,250	1,600	2,000	2,500	3,200 4,000
Rated Operational Voltage [Ue]		Vdc		1,000 (3P) / 1,500 (4P)						
Rated Insulation Voltage [Ui]		Vdc		1,500						
No. of Poles		P		3 / 4						
Rated Impulse Withstand Voltage [Uimp]		kV		12						
Rated Making Capacity [Icm]		kA, peak		100						
Rated Short-Time Withstand Current [Icw]		kA/1s		100						
Operation Time (max)	Open	ms		40						
	Close	ms		Below 80						
Utilization Category (according to IEC 60947-3)				DC-23A						
Weight	3P	Draw-Out Type	kg	95(115) ¹⁾						
		Fixed Type	kg	44(61) ¹⁾						
	4P	Draw-Out Type	kg	112(149) ¹⁾						
		Fixed Type	kg	55(80) ¹⁾						
Dimension (W×H×D)	3P	Draw-Out Type	mm	399×480×368.4						
		Fixed Type	mm	408.4×404.4×295.8						
	4P	Draw-Out Type	mm	514×480×368.4						
		Fixed Type	mm	523.4×404.4×295.8						

※ 1) 4,000 AF

Over Current Relay (OCR)

Appearance and Setting Value



Rated Current Setting

800 AF	800 A
1,000 AF	800, 1,000 A
1,250 AF	800, 1,000, 1,250 A
1,600 AF	800, 1,000, 1,250, 1,600 A
2,000 AF	1,000, 1,250, 1,600, 2,000 A
2,500 AF	1,600, 2,000, 2,500 A
3,200 AF	1,600, 2,000, 2,500, 3,200 A
4,000 AF	2,000, 2,500, 3,200, 4,000 A

Key Functions

- **Overload Protection**
 - Long time delay
 - Thermal operation
- **Short Circuit Protection**
 - Short time delay, instantaneous trip
 - Selectable time-delay settings (definite/Inverse)
- **Ground Fault Protection**
 - Selectable time-delay settings (definite/Inverse)
- **Over-Voltage, Under-Voltage, Imbalance, Reverse Power**
- **ZSI (Zone Selective Interlocking)**
- **Start-up Function**
 - Selectable from short time delay, instantaneous, or ground fault protection
 - Adjustable start-up current and delay time settings
- **Fault Recording**
 - Records up to 128 fault information
 - Fault type, fault value, occurrence time of fault
- **Event Recording**
 - Records changes in device settings, operations, and status changes
 - Records up to 128 events of devices
- **Load Profile**
 - Records load usage every hour
- **Diagnostic Function**
 - Confirmation of trip device connection
 - Verification of rated current setting
 - Trip operation testing
- **4a DO (Digital Output)**
 - Configuration of trip unit protection functions
- **Communication Function**
 - Modbus-RTU / RS-485

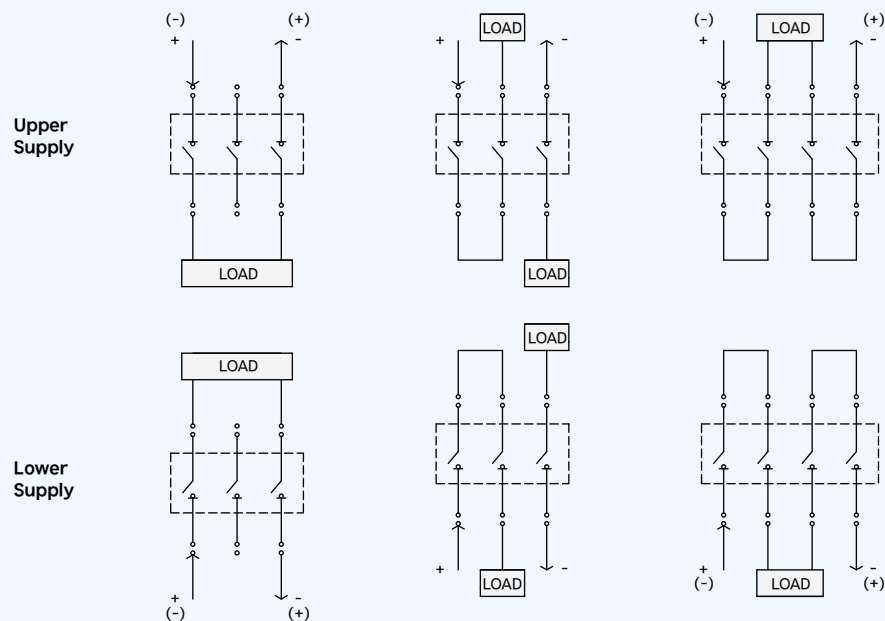
Short Busbar

Composition of Short Busbar

1. Please refer to the table below and order the Shortbusbar separately using the PKG product code.
2. If the customer manufactures it separately, please manufacture it to specifications according to AF.
3. The tightening torque of the Shortbusbar is 480 ± 57 N.m. (M12)

Type	AF	Pole	Terminal Arrangement	Order Code	Composition
DC ACB DC SD	800~3,200 AF	3	Vertical	HGNS DC SB_083-323	Short busbar : 75mm×10T×2EA×1SET Bolt : M12×L60 + P, S/W×6EA×1SET NUT : M12×6EA×1SET
		4		HGNS DC SB_084-324	Short busbar : 75mm×10T×2EA×2SET Bolt : M12×L60 + P, S/W×6EA×2SET NUT : M12×6EA×2SET
DC ACB DC SD	4,000 AF	3	Vertical	HGNS DC SB_403	Short busbar : 125mm×10T×3EA×1SET Bolt : M12×L80 + P, S/W×6EA×1SET NUT : M12×6EA×1SET
		4		HGNS DC SB_404	Short busbar : 125mm×10T×3EA×2SET Bolt : M12×L80 + P, S/W×6EA×2SET NUT : M12×6EA×2SET

Connection Diagram

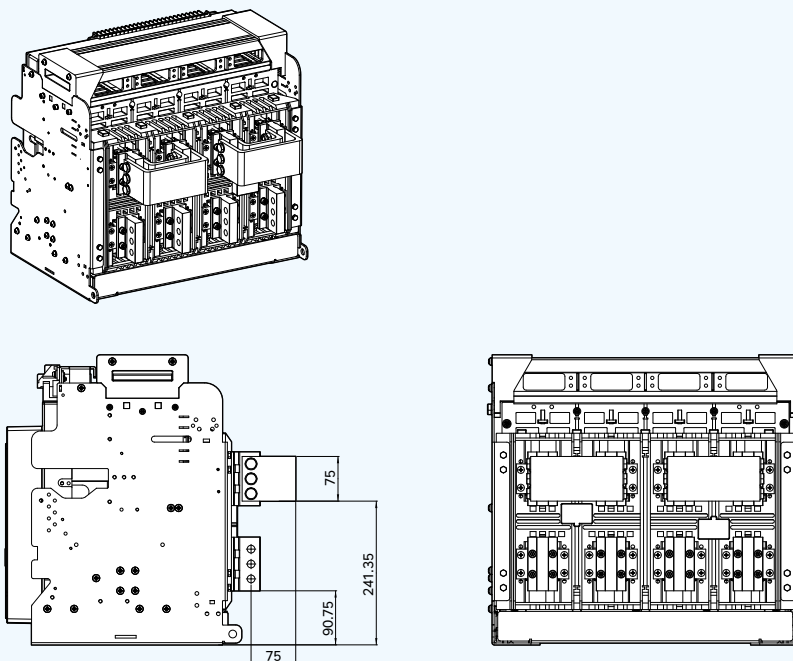


※ If you need a connection other than the one shown in the circuit diagram above, please contact us.
 ※ Please refer to the next page for the dimensions of the Shortbusbar.

Short Busbar Connection

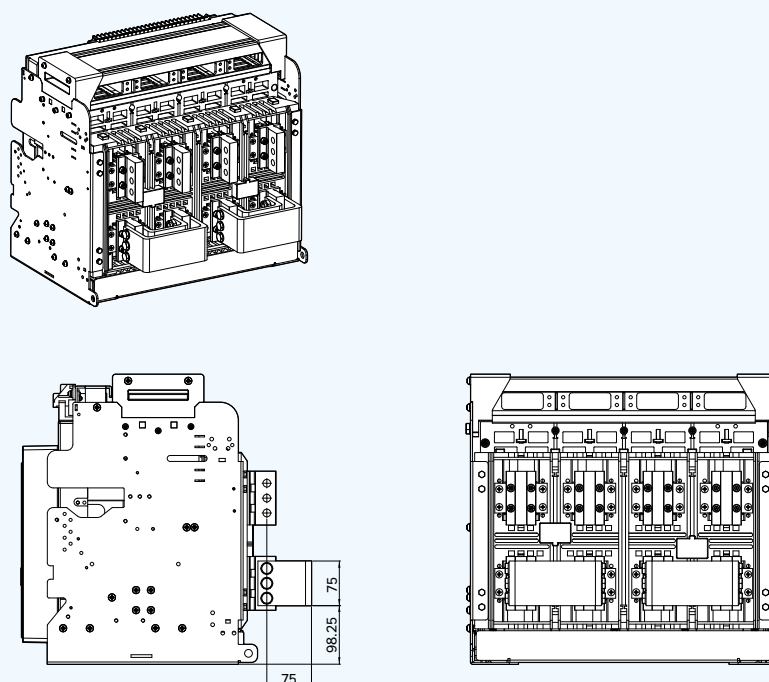
HGN DC Draw-Out Type 1,600 (800) ~ 3,200 A, Vertical Type LOWER SUPPLY

Unit : mm



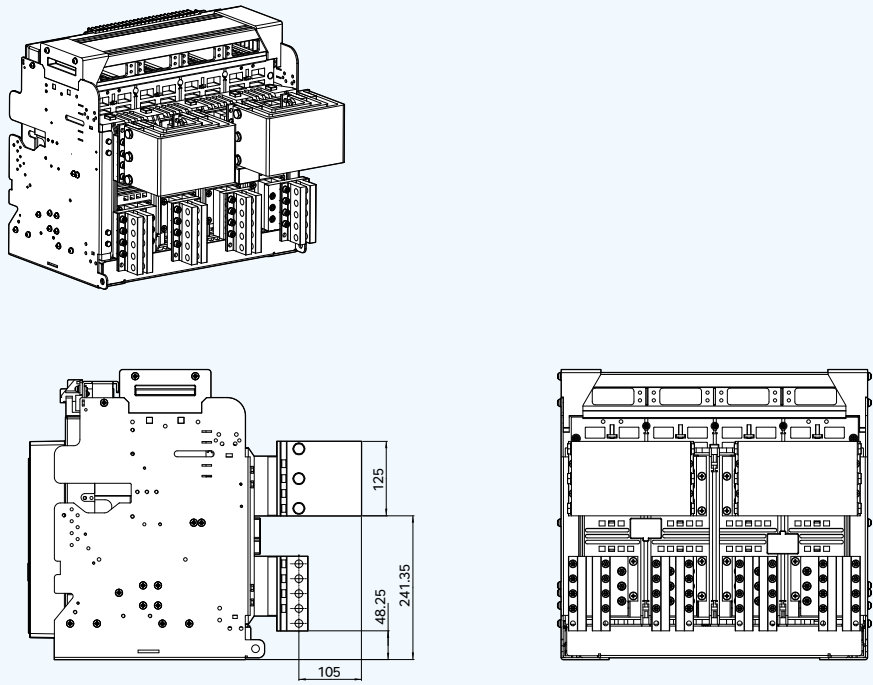
HGN DC Draw-Out Type 1,600 (800) ~ 3,200 A, Vertical Type UPPER SUPPLY

Unit : mm



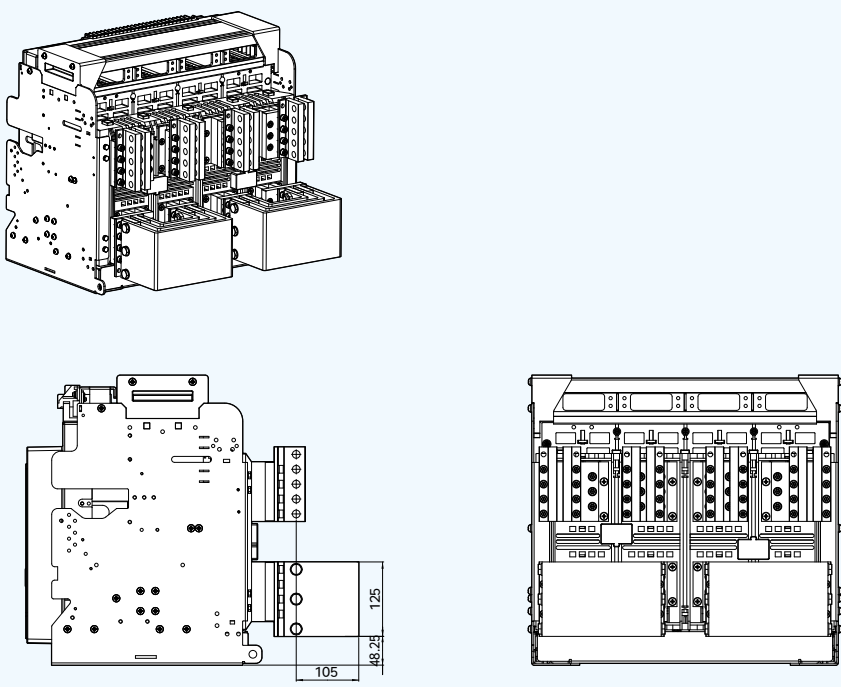
HGN DC Draw-Out Type 4,000 A, Vertical Type LOWER SUPPLY

Unit : mm



HGN DC Draw-Out Type 4,000 A, Vertical Type UPPER SUPPLY

Unit : mm

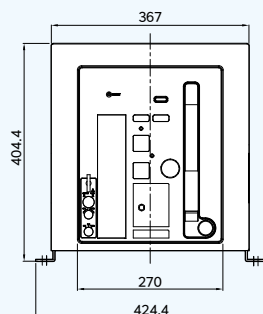


Dimension

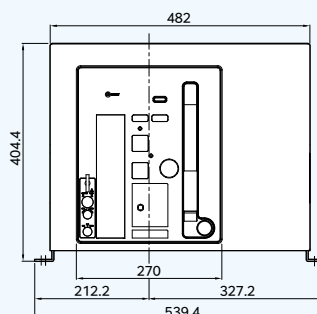
HGN DC Fixed Type 1,600 (800) ~ 3,200 A

Front

Unit : mm

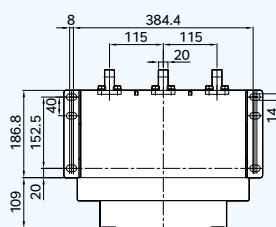


1,000 V

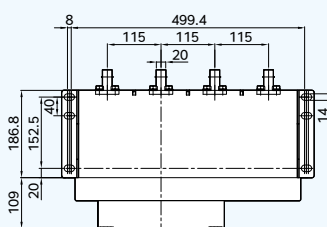
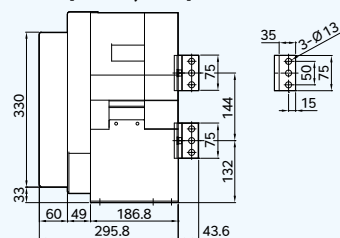


1,500 V

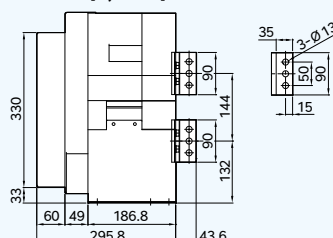
Vertical Type



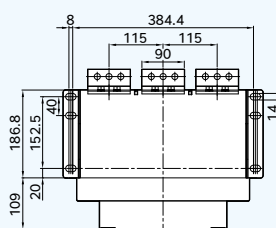
[800 ~ 2,500 A]



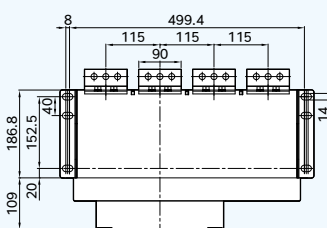
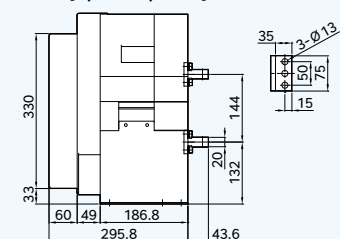
[3,200 A]



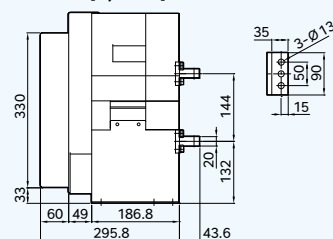
Horizontal Type



[2,000 ~ 2,500 A]



[3,200 A]

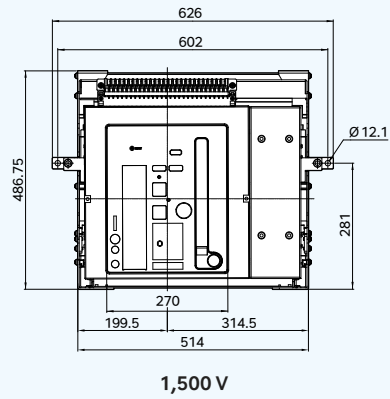
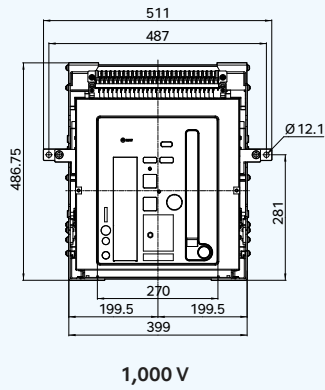


Model Name	Detail "A"
HGN20 (06) ~ 25	75
HGN32	90

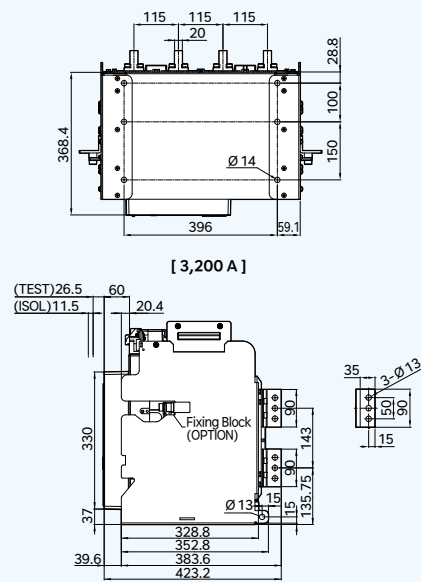
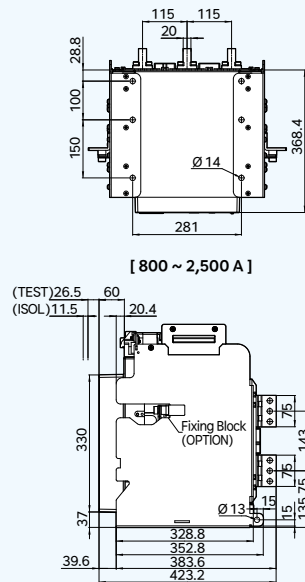
HGN DC Draw-Out Type 1,600 (800) ~ 3,200 A

Front

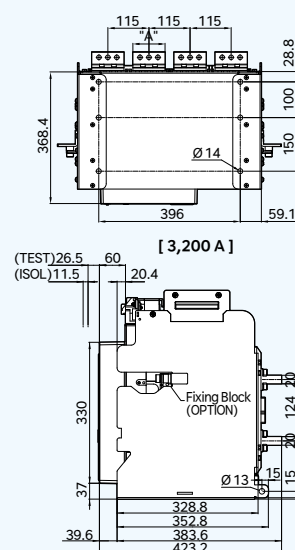
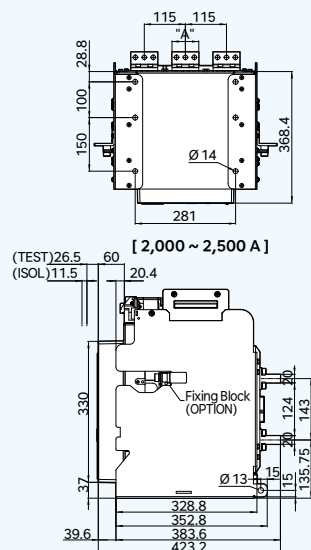
Unit : mm



Vertical Type



Horizontal Type



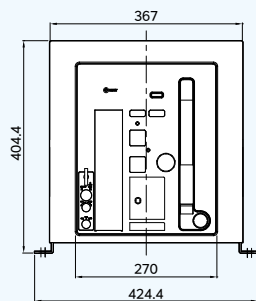
Model Name	Detail "A"
HGN20 (06) ~ 25	75
HGN32	90

Dimension

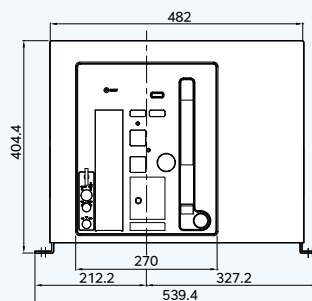
HGN DC Fixed Type 4,000 A

Front

Unit : mm

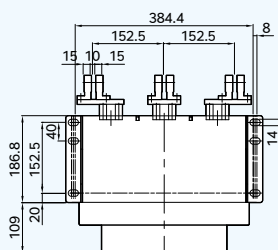


1,000 V

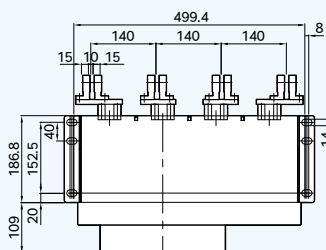
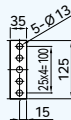
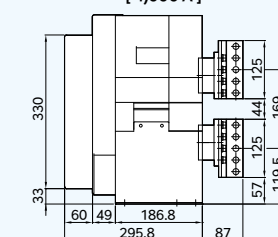


1,500 V

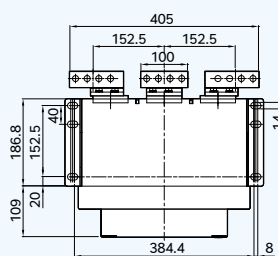
Vertical Type



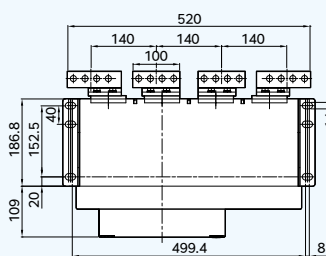
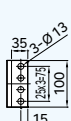
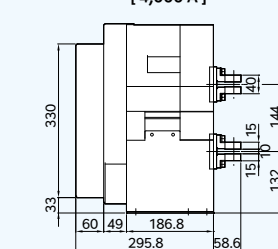
[4,000 A]



Horizontal Type



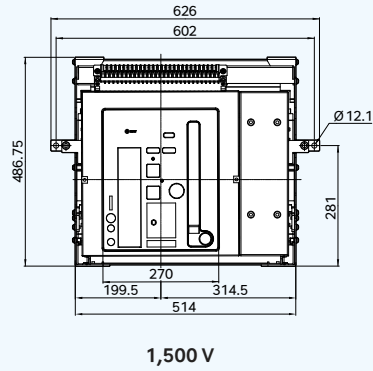
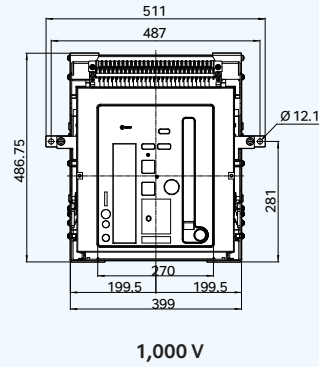
[4,000 A]



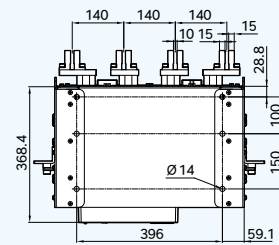
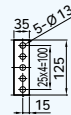
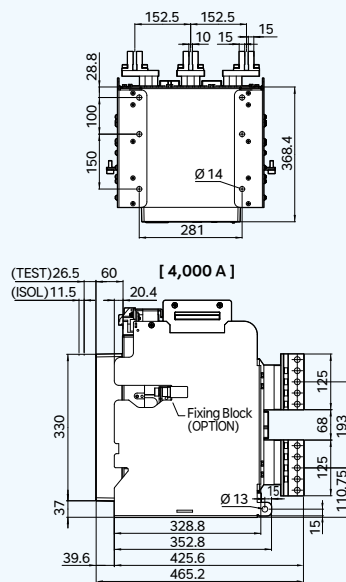
HGN DC Draw-Out Type 4,000 A

Front

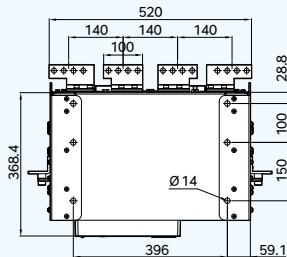
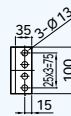
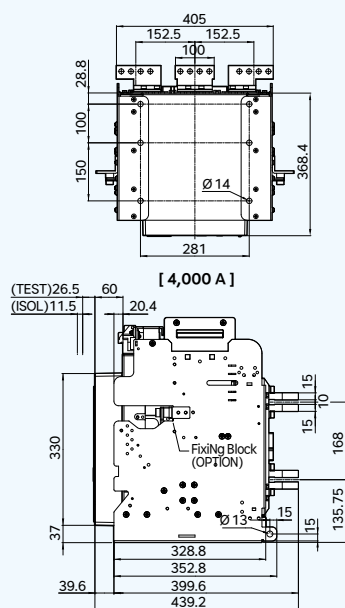
Unit : mm



Vertical Type

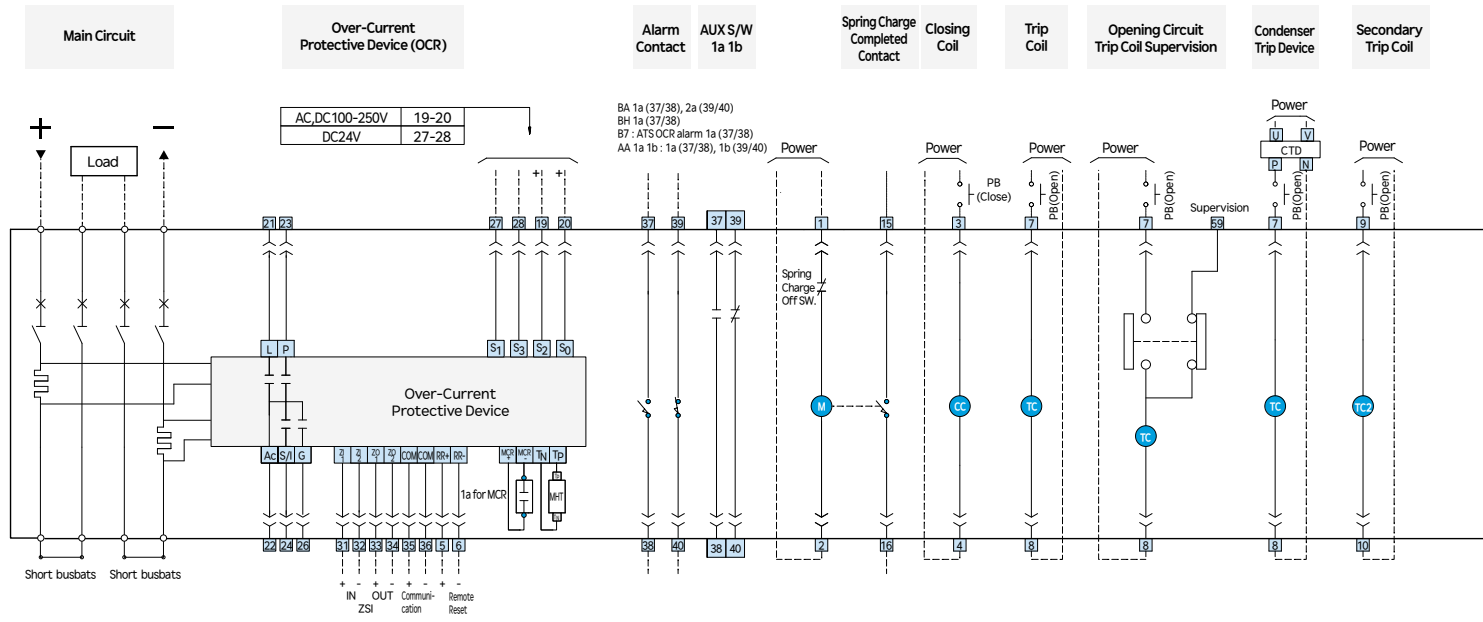


Horizontal Type



Circuit Diagram

Air Circuit Breaker (HGN DC Type)



Symbol Description

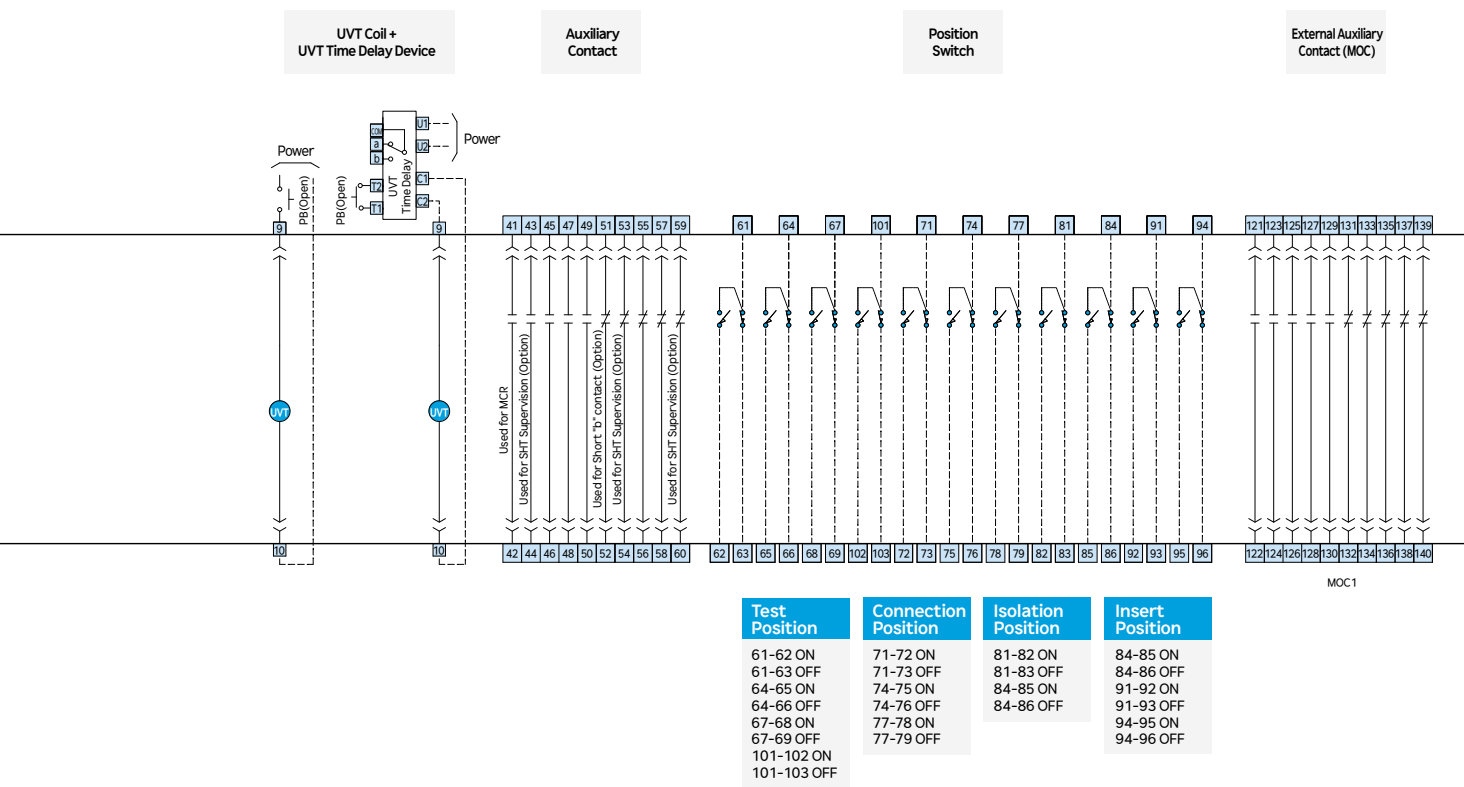
L	LTD Terminal
PT	Pre-Trip Alarm
G	Ground Fault Contact
S / I	STD/INST Contact
Ac	Common Contact
ZI	Zone Selective Interlock Input
ZO	Zone Selective Interlock Output
MCR +, -	MCR Input Terminal
Tp / Tn	MHT Output Terminal
T	Charging Motor
CC	Close Coil
TC	Trip Coil
UVT	Under-Current Voltage Trip Coil
MHT	Magnetic Hold Trigger
SO / S2	OCR Power (AC, DC 100~250 V)
S1 / S3	OCR Power (DC 24 V)

· RR : Remote Reset · VM : Voltage Module · VR ~ VN : Voltage phase input
· R ~ N : Current input · Rn ~ Nn : Current input

Terminal Description

1 ~ 2	Charging Motor Power
3 ~ 4	Closing Coil Power
5 ~ 6	Remote Reset
7 ~ 8	Trip Coil Power
9 ~ 10	UVT Coil Power
15 ~ 16	Spring Charge Switch
19 ~ 20	OCR Power (AC, DC 100~250 V)
27 ~ 28	OCR Power (DC 24 V)
22 ~ 21	LTD Contact
22 ~ 23	Pre-Trip Alarm/Temperature Alarm Contact
22 ~ 24	STD/UBST Contact
22 ~ 26	GFT Contact
31 ~ 34	ZSI (Zone Selective Interlock)
35 ~ 36	Communication (RS485)
41 ~ 60	Auciliary Contact
61 ~ 93	Position Switch

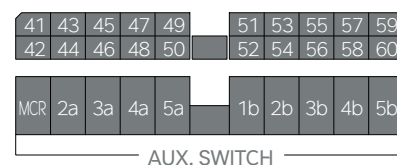
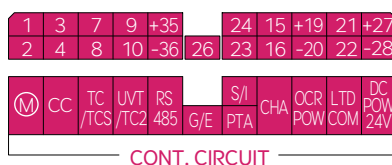
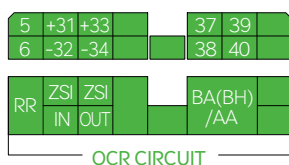
— Manufacture's Wiring - - - - User's Wiring << Disconnecting Device (Draw-Out Type)



Control Jack Lay-out (Auto Connection Type)

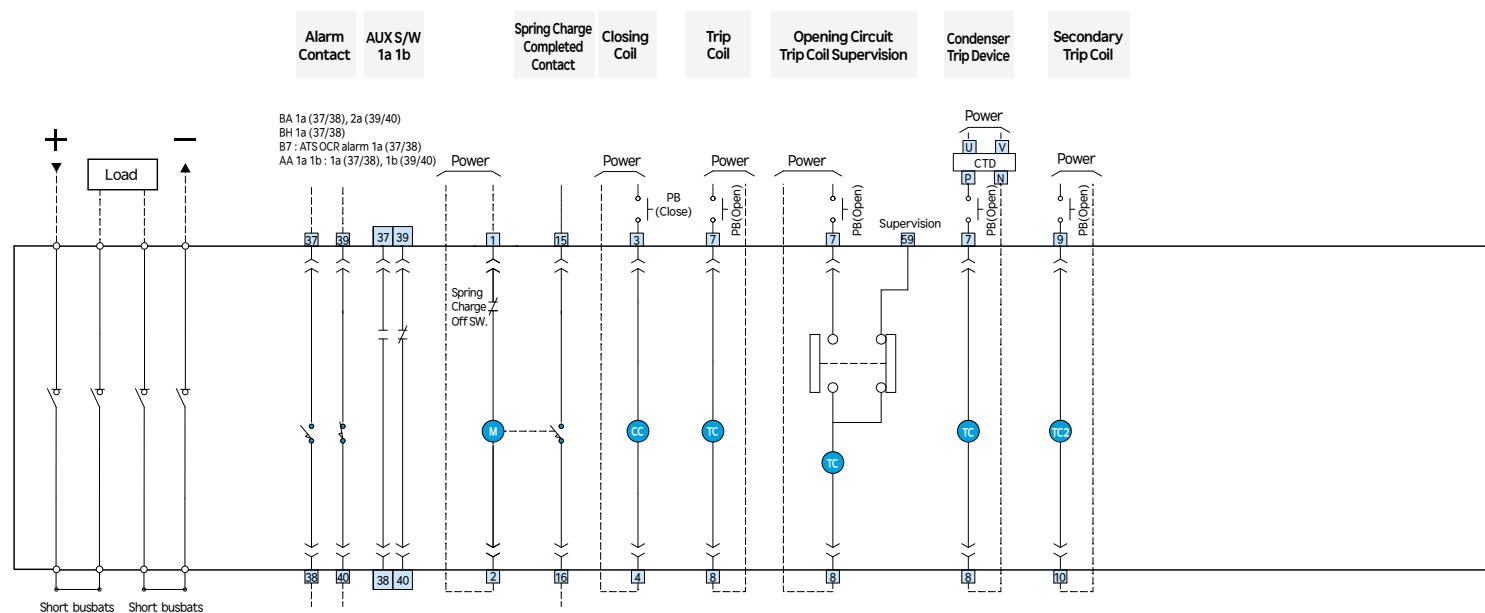
OCR													Operating					Auxiliary switch											
POW	OCR Contact					DC POW	RR	ZSI	COM	Temp			M	CC	TC	UVT	CHA	MCR	2a	3a	4a	5a	1b	2b	3b	4b	5b		
	COM	L	S/I	P/T	G																								
19(+)	21	23		27(+)	5	31	33	35	37	39			1	3	7	9	15	41	43	45	47	49	51	53	55	57	59		
20(-)	22	24	26	28(-)	6	32	34	36	38	40			2	4	8	10	16	42	44	46	48	50	52	54	56	58	60		
OCR Protection relay													Operating circuit					Auxiliary switch											

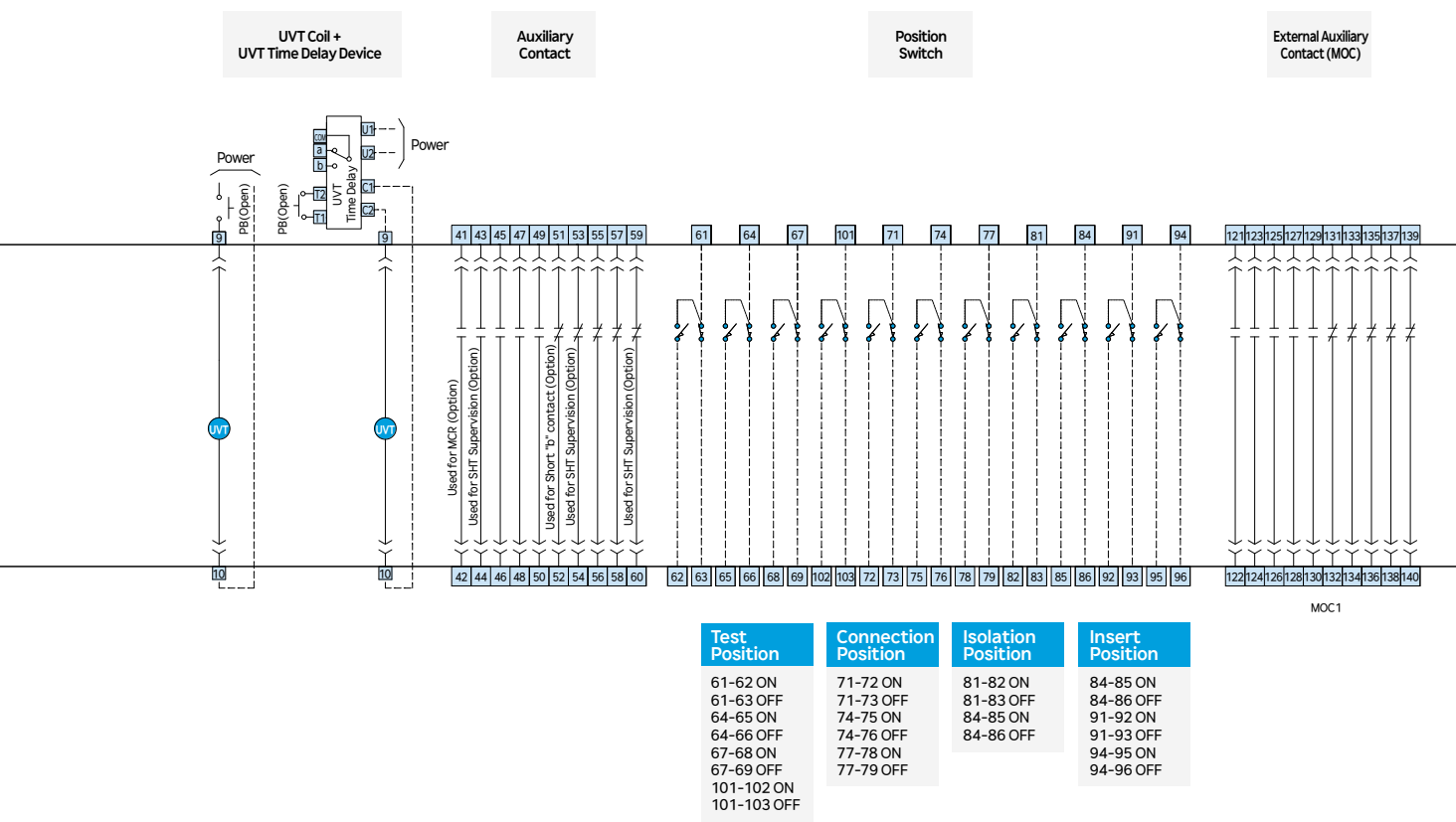
Control Jack Lay-out (Manual Connection Type)



Circuit Diagram

Switch-Disconnecter (HGN DC Type)





Ordering Information

HGN DC Type

	① HGN	② 12	③ I	④ 3	⑤ J	⑥ M2	⑦ C2	⑧ S2	⑨ 61	⑩ K	⑪ AB
① Model Name											
② Rated Frame											
③ Frame & Product Category											
④ Pole & Rated Operational Voltage											
⑤ Mounting Method											
⑥ Charging Motor Power											
⑦ Closing Coil											
⑧ Trip Coil											
⑨ Trip Unit											
⑩ Rated Current											
⑪ Parts											

- U□ is only applicable when instantaneous type and only the UVT coil is installed. When using time delay type, place a separate order for the time delay type of controller (HGNS UT□ ~) and install externally.
- V□ is only applicable when time delay type is applied and the UVT coil is installed in the main unit while the time delay type of controller is installed at the side of the cradle.
In case of dimension issues, place an order for HGNS V□ for separate installation.
- B0 : The mechanical interlock device has to be ordered separately and when B0 is added, only the components interlocked inside the main unit are assembled for release.
(Refer to additional components).
- The secondary trip coil cannot be assembled at the same time as the UVT coil.
- When using T□ trip coil monitoring contact, it becomes 4a3b and when using MCR function of B8 OCR, it can be used as 4a5b. When both functions are applied, 3a3b can be possible.
- In the order code for the main unit only (A/J/Fixed type), combination with cradle accessories is not possible and the cradle accessory arrangement is only possible when purchased with cradle arrangement. For the independent release of the main unit, place a separate order (HGNS ~) (refer to additional components).
- Position switch cannot be overlapped for use and can only be attached only at the right side of cradle. In case a combination other than the combination indicate is required, make an inquiry separately.
- Mechanical interlock device (B0), external auxiliary contact (MC) and fixing block (AF) cannot be used together.
- BC : The control terminal's safety cover is only available for the auto connection.
- AK : Short "b" is only available for auto connection and is attached to 51, 52. It can be attached as much as the number of "B" contact so upon additional mounting, order (HGNS ~).
- AG : Basically, it is used separately from the main body, but is supplied combined with the front cover.
- AA and BA (BH) cannot be assembled at the same time.
- UVT and Secondary Trip Coil cannot be assembled at the same time.

① Model Name	
HGN	Air Circuit Breaker

② Rated Frame	
Circuit Breaker (DC)	
16	1,600 AF
25	2,500 AF
32	3,200 AF
40	4,000 AF
Switch-Disconnecter (DC)	
08	800 AF
10	1,000 AF
12	1,250 AF
16	1,600 AF
20	2,000 AF
25	2,500 AF
32	3,200 AF
40	4,000 AF

③ Frame & Product Category	
I	Air Circuit Breaker
H	Switch-Disconnecter

④ Pole & Rated Operational Voltage	
3	1,000 Vdc 3 Pole
4	1,500 Vdc 4 Pole

⑤ Mounting Method	
Independent Release of Draw-Out Type (Control Power) of Main Unit	
A	Auto Connection
J	Manual Connection
Fixed Type (Terminal Form)	
H	Horizontal Type
V	Vertical Type
T	Upper Side: Horizontal / Lower Side: Vertical
L	Upper Side: Vertical / Lower Side: Horizontal
Draw-Out Type (Combined with Cradle)	
B	Auto Connection + Horizontal Type
C	Auto Connection + Vertical Type
D	Auto Connection + Upper Side: Horizontal / Lower Side: Vertical
E	Auto Connection + Upper Side: Vertical / Lower Side: Horizontal
K	Manual Connection + Horizontal Type
M	Manual Connection + Vertical Type
N	Manual Connection + Upper: Horizontal / Lower: Vertical
Q	Manual Connection + Upper Side: Vertical / Lower Side: Horizontal

⑥ Charging Motor Power	
M0	Manual Type
M1	AC/DC 110 V
M2	AC/DC 220 V
M7	DC 24 V
M8	DC 48 V
M9	DC 125 V

⑦ Closing Coil	
C0	Not Attached
C1	AC/DC 110 V
C2	AC/DC 220 V
C3	AC 380 V
C4	AC 440 V
C7	DC 24 V
C8	DC 48 V
C9	DC 125 V

⑧ Trip Coil	
S0	Not Attached
S1	AC/DC 110 V
S2	AC/DC 220 V
S3	AC 380 V
S4	AC 440 V
S7	DC 24 V
S8	DC 48 V
S9	DC 125 V
Trip Supervision Coil	
T1	AC/DC 110 V
T2	AC/DC 220 V
T3	AC 380 V
T4	AC 440 V
T7	DC 24 V
T8	DC 48 V
T9	DC 125 V

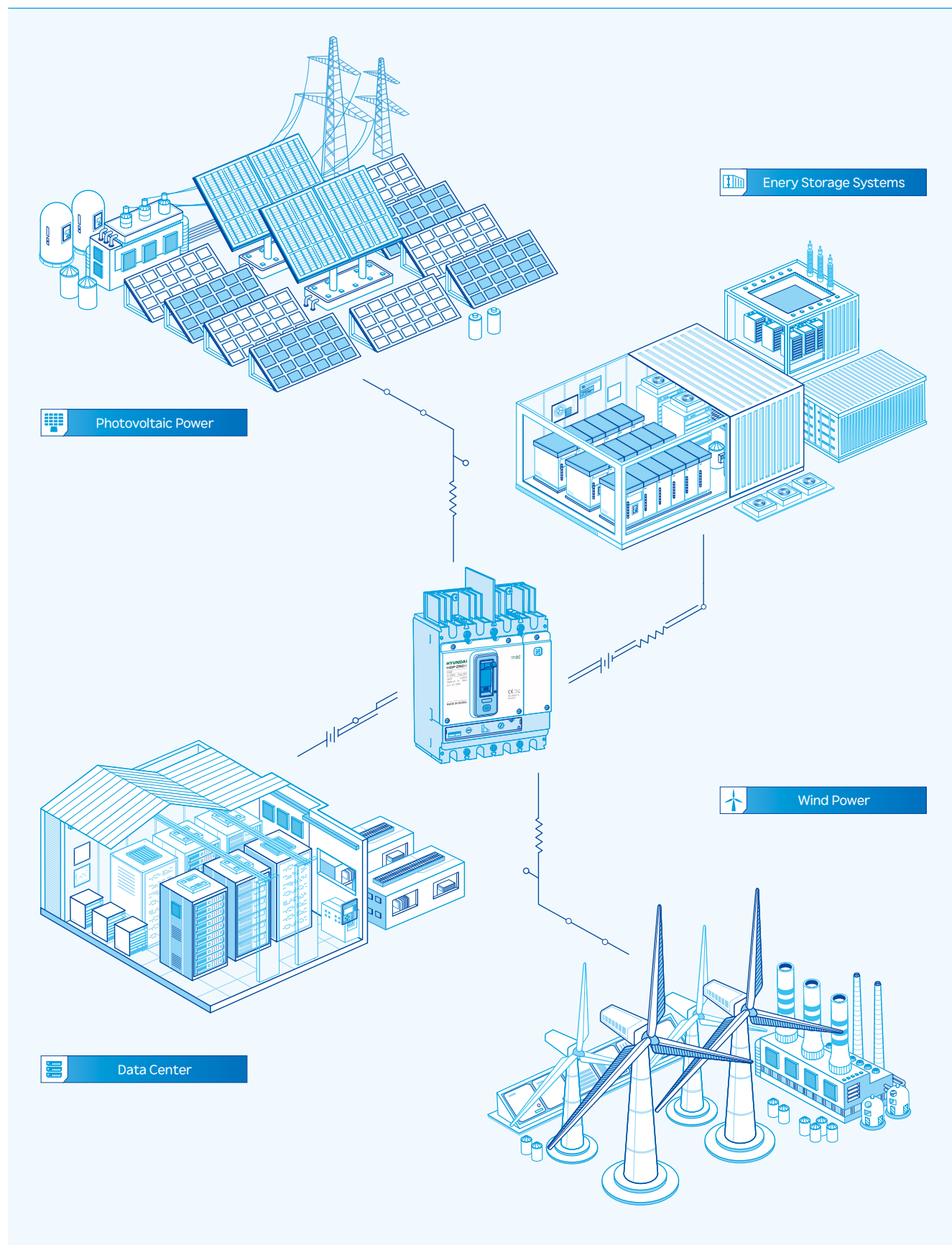
⑨ Trip Unit	
O0	N/A
D1	AC/DC 110/220 V

⑩ Rated Current	
O	OCR Not Attached
H	800 A
J	1,000 A
K	1,250 A
L	1,600 A
M	2,000 A
N	2,500 A
P	3,200 A
Q	4,000 A

⑪ Parts	
Parts for Main Unit	
INST (UVT Coil)	
U1	AC/DC 110 V
U2	AC/DC 220 V
U3	AC 380 V
U4	AC 440 V
U7	DC 24 V
U8	DC 48 V
U9	DC 125 V
Secondary Trip Coil	
S1	AC/DC 110 V
S2	AC/DC 220 V
S3	AC 380 V
S4	AC 440 V
S7	DC 24 V
S8	DC 48 V
S9	DC 125 V
AM	On/Off Button Lock Device
AA	Auxiliary Switch (Additional 1a 1b)
AB	Key Lock Device (Prevent ON)
B8	OCR MCR
BR	OCR Manual Reset Function
BA	OCR Manual Reset & Alarm S/W 2a
BH	OCR Manual Reset + High Capacity Alarm S/W 1a
B0	Mechanical Interlock Device
B6	Spring Charge Switch
AG	Door Flange
BT	Closing Preparation Contact (B6 and CT cannot be Combined)
Parts Mounted on Cradle (Only Applicable when Placing an Order for Combination Type)	
Time Delay Type (UVT Coil + UVT Controller)	
V1	AC/DC 110 V
V2	AC/DC 220 V
V3	AC 380 V
V4	AC 440 V
V9	DC 125 V
Position S/W	
AQ	Test 1C, Connected 1C
AR	Connected 2C
AS	Test 2C
AT	Isolated 1C, Inserted 1C
AU	Inserted 2C
AV	Isolated 2C
P4	Test 2C, Connected 2C
PT	Test 4C
PS	Isolated 1C, Test 1C, Connected 2C
PQ	Inserted 1C, Isolated 1C, Test 1C, Connected 1C
P8	Inserted 2C, Isolated 2C, Test 2C, Connected 2C
PR	Inserted 1C, Isolated 1C, Test 3C, Connected 3C
PU	Test 4C, Connected 4C
BC	Auto Connection Control Terminal's Safety Cover
MC	External Auxiliary Contact (MOC) 5a5b
AK	Short "b" Contact
AE	Safety Shutter
AX	Arc Shield
AF	Fixing Block
AW	Miss Insertion Preventer
TM	Temperature Sensor Bracket
ATS Production	
BAB7	Emergency Power Transfer

HGP DC Type Molded Case Circuit Breaker

Versatile Usage Environments



Product Features

HGP DC Type is the optimal product for low voltage direct current (LVDC) systems, with a maximum operating voltage of DC 1,500 V (4P). Particularly, when HGP100/160/250/400/630 undergo testing in accordance with IEC 60947-2 standard certification, they exhibit exceptional reliability for PV (Photovoltaic) system applications related to Annex. P clauses.



Maximized Insulation Performance

- Rated Insulation Voltage U_i :
1,000 V(at 1,000 Vdc),
1,500 V(at 1,500 Vdc)
- Rated Impulse Withstand Voltage U_{imp} :
8 kV



Maximum Breaking Capacity

- 100 kA at 1,000 Vdc
- 50 kA at 1,500 Vdc
(Consistent performance across the entire frame)



Basic Adoption of Adjustable Rated Current for Entire Frame

- Time-delayed Current:
HGP100/160/250 - Adjustable in 4 stages of 0.7-0.8-0.9-1.0 times the rated current
HGP400/630/800 - Adjustable in 3 stages of 0.8-0.9-1.0 times the rated current
- Instantaneous Current:
Adjustable in 6 steps of 5-6-7-8-9-10 times the rated current
(thermal magnetic type)



Specifications and Certifications

- IEC 60947-2, CB certification
: DC 1,000 V (HGP100/160/250/630/800)
- IEC 60947-2 Annex.P, CB certification
: DC 1,000 V (HGP100/160/250),
DC 1,500 V (HGP100/160/250/400/630)



Selection Table

Molded Case Circuit Breaker (HGP DC Type)

Common Ratings

Rated Insulation Voltage [UI]	1,000 V	Suitability for Isolation	Yes
Rated Impulse Withstand Voltage [Uimp]	8 kV	Utilization Category	A
Protection Function	Overload, Instantaneous, Short-Circuit Protection	Pollution Degree	3
		Reference Standard	IEC 60947-2

Model Name					HGP100				HGP160			
Frame			(AF)		100				160			
Number of Poles			(P)		3, 4 ¹⁾				3, 4 ¹⁾			
Rated Current, at 40 °C			(A)		40, 50, 63, 80, 100				100, 125, 150, 160			
Rated Ultimate Short Circuit Breaking Capacity [Icu] (kA)	Short Circuit Breaking Category Code				F	S	H	X	F	S	H	X
	DC 750 V for 3P				10	55	85	100	10	55	85	100
	DC 1,000 V for 4P				10	55	85	100	10	55	85	100
	Service Breaking Capacity [Ics = % Icu]				100	100	100	100	100	100	100	100
Trip Device	Thermal Magnetic	Long Time [LTD]		(0.7 - 0.8 - 0.9 - 1.0)×In				(0.7 - 0.8 - 0.9 - 1.0)×In				
		Instantaneous [INST]		10×In				(5 - 6 - 7 - 8 - 9 - 10)×In				
Accessory	Internal	Auxiliary Switch		AUX	●				●			
		Alarm Switch		ALT	●				●			
		Shunt Trip		SHT	●				●			
		Under Voltage Trip		UVT	●				●			
	External	Rotary Handle	Front Contact	TFG	●				●			
			Extended	TFH	●				●			
		Mechanical Open/Close Device		MOT	●				●			
		Mechanical Interlock		MIF	●				●			
		Handle Locking Device		PLD	●				●			
		Cage Terminal Block		CTB	●				●			
		Insulation Barrier		TQQ	●				●			
		Terminal Bus Bar		TBB	●				●			
		Series Busbar		SBB	●				●			
Installation and Dimension	Connection/Installation		Front Connection		Terminal Screw, Terminal Bus Bar				Terminal Screw, Terminal Bus Bar			
	Dimension (mm)	a (3/4P)		105 / 140				105 / 140				
		b		165				165				
		c		86.5				86.5				
	Weight (kg)		3/4P		2 / 2.6				2 / 2.6			
Certification			IEC CB		●				●			

※ 1) 4 Pole Arrangement : Basic specification of R-S-T-N

HGP250				HGP400				HGP630				HGP800			
250				400				630				800			
3, 4 ¹⁾				3, 4 ¹⁾				3, 4 ¹⁾				3, 4 ¹⁾			
125, 150, 160, 175, 200, 225, 250				300, 350, 400				500, 630				700, 800			
F	S	H	X	F	S	H	X	F	S	H	X	F	S	H	X
10	55	85	100	10	55	85	100	10	55	85	100	10	55	85	100
10	55	85	100	10	55	85	100	10	55	85	100	10	55	85	100
100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
(0.7 - 0.8 - 0.9 - 1.0)×In				(0.8 - 0.9 - 1.0)×In				(0.8 - 0.9 - 1.0)×In				(0.8 - 0.9 - 1.0)×In			
(5 - 6 - 7 - 8 - 9 - 10)×In				(5 - 6 - 7 - 8 - 9 - 10)×In				(5 - 6 - 7 - 8 - 9 - 10)×In				(5 - 6 - 7 - 8 - 9 - 10)×In			
●				●				●				●			
●				●				●				●			
●				●				●				●			
●				●				●				●			
●				●				●				●			
●				●				●				●			
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●				●				●				●			
●				●				●				●			
●				●				●				●			
●				●				●				●			
Terminal Screw, Terminal Bus Bar				Terminal Screw, Terminal Bus Bar				Terminal Screw, Terminal Bus Bar				Terminal Screw, Terminal Bus Bar			
105 / 140				140 / 186.5				140 / 186.5				210 / 280			
165				260				260				320			
86.5				110				110				135			
2 / 2.6				5.4 / 7.2				5.4 / 7.2				15.1 / 19.6			
●				●				●				●			

Selection Table

Molded Case Circuit Breaker (HGP DC Type)

Common Ratings

Rated Insulation Voltage [UI]	1,500 V	Suitability for Isolation	Yes
Rated Impulse Withstand Voltage [Uimp]	8 kV	Utilization Category	A
Protection Function	Overload, Instantaneous, Short-Circuit Protection	Pollution Degree	3
		Reference Standard	IEC60947-2 Annex.P

Model Name				HGP100		HGP160	
Frame		(AF)		100		160	
Number of Poles		(P)		4 ¹⁾		4 ¹⁾	
Rated Current, at 40 °C		(A)		100		100, 160	
Rated Ultimate Short Circuit Breaking Capacity [Icu] (kA)	Short Circuit Breaking Category Code			S	H	S	H
	DC 1,500 V for 4P (τ : 2ms)			20	50	20	50
	Service Breaking Capacity [Ics = % Icu]			100	100	100	100
Trip Device	Thermal Magnetic	Long Time [LTD]		(0.7 - 0.8 - 0.9 - 1.0)×In		(0.7 - 0.8 - 0.9 - 1.0)×In	
		Instantaneous [INST]		10×In		10×In	
Accessory	Internal	Auxiliary Switch AUX		●		●	
		Alarm Switch ALT		●		●	
		Shunt Trip SHT		●		●	
		Under Voltage Trip UVT		●		●	
	External	Rotary Handle	Front Contact TFG	●		●	
			Extended TFH	●		●	
		Mechanical Open/Close Device MOT		●		●	
		Mechanical Interlock MIF		●		●	
		Handle Locking Device PLD		●		●	
		Cage Terminal Block CTB		●		●	
		Insulation Barrier TQQ		●		●	
		Terminal Bus Bar TBB		●		●	
		Series Busbar SBB		●		●	
Installation and Dimension	Connection/Installation		Front Connection	Terminal Screw, Terminal Bus Bar		Terminal Screw, Terminal Bus Bar	
	Dimension (mm)	a		140		140	
		b		165		165	
		c		86.5		86.5	
	Weight (kg)			2.6		2.6	
Certification		IEC CB		●		●	

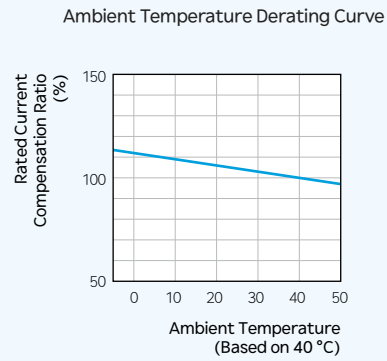
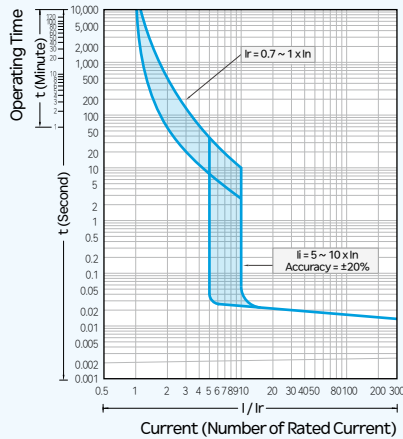
※ 1) 4 Pole Arrangement : Basic specification of R-S-T-N

HGP250		HGP400		HGP630	
250		400		630	
4 ¹⁾		4 ¹⁾		4 ¹⁾	
160, 200, 250		300, 350, 400		500, 630	
S	H	S	H	S	H
20	50	20	50	20	50
100	100	100	100	100	100
(0.7 - 0.8 - 0.9 - 1.0)×In		(0.8 - 0.9 - 1.0)×In		(0.8 - 0.9 - 1.0)×In	
10×In		10×In		10×In	
●		●		●	
●		●		●	
●		●		●	
●		●		●	
●		●		●	
●		●		●	
●		●		●	
●		●		●	
●		●		●	
●		●		●	
●		●		●	
●		●		●	
●		●		●	
●		●		●	
Terminal Screw, Terminal Bus Bar		Terminal Screw, Terminal Bus Bar		Terminal Screw, Terminal Bus Bar	
140		186.5		186.5	
165		260		260	
86.5		110		110	
2.6		7.2		7.2	
●		●		●	

Operation Characteristic Curve

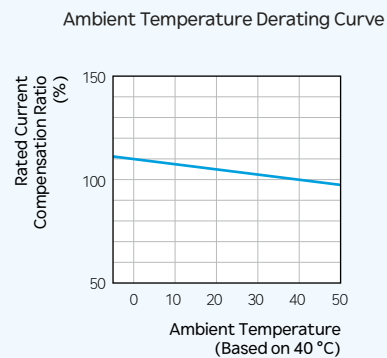
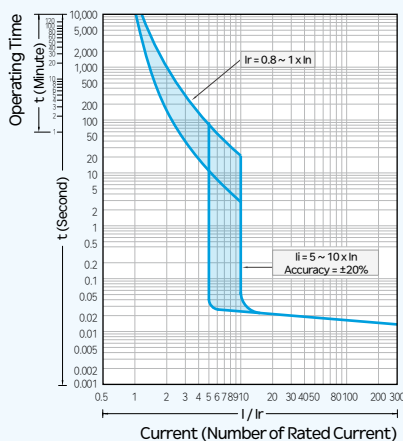
Thermal Magnetic Type DC 1,000 V HGP250

• HGP100, 160, 250



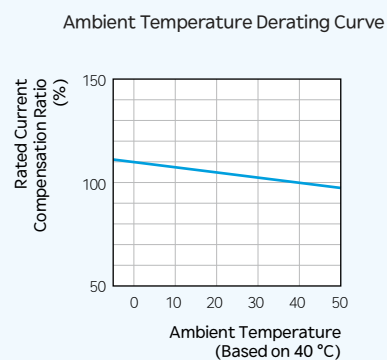
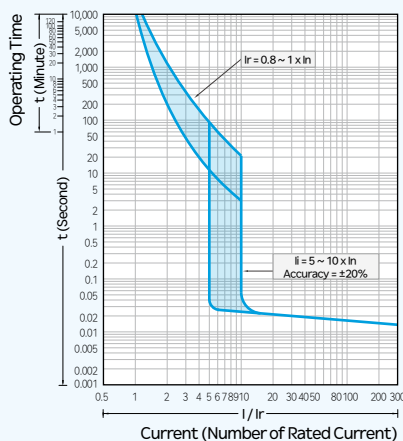
Thermal Magnetic Type DC 1,000 V HGP630 (300 ~ 630 A)

• HGP400, 630



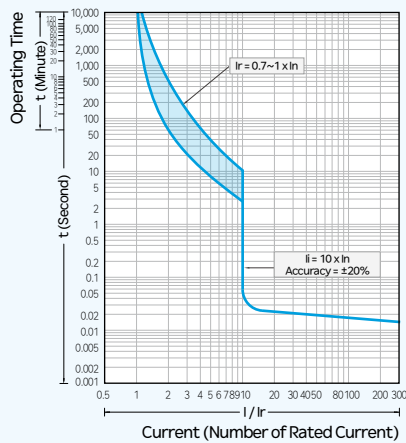
Thermal Magnetic Type DC 1,000 V HGP800 (700 ~ 800 A)

• HGP800

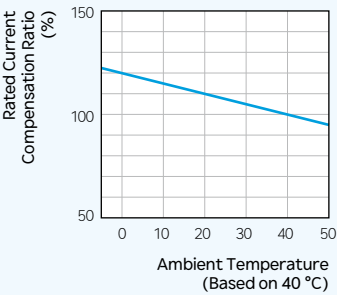


Thermal Magnetic Type DC 1,500 V HGP250

• HGP100, 160, 250

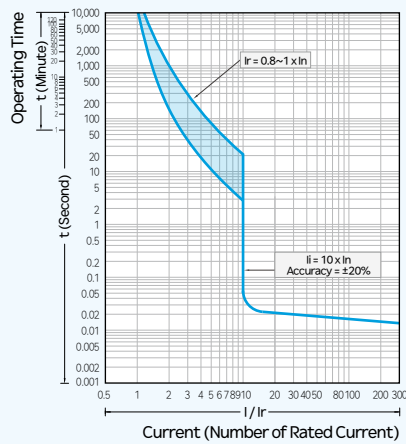


Ambient Temperature Derating Curve

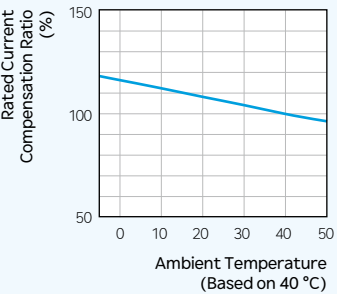


Thermal Magnetic Type DC 1,500 V HGP630

• HGP400, 630



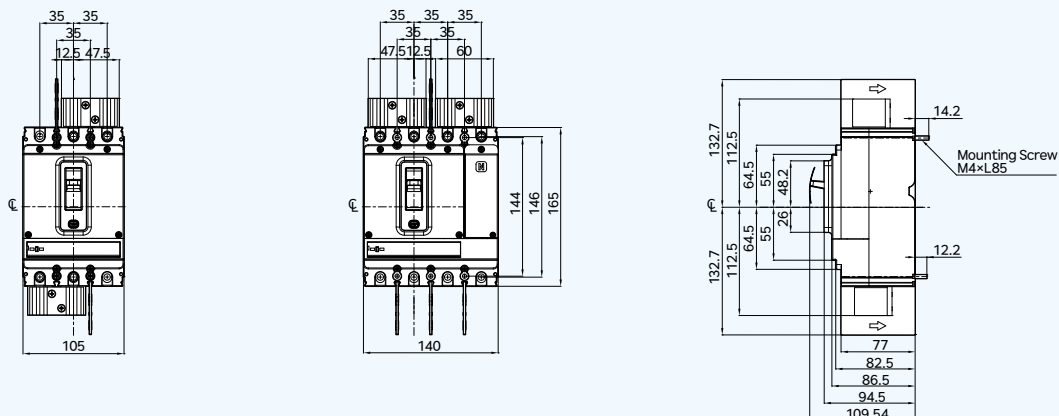
Ambient Temperature Derating Curve



Dimension

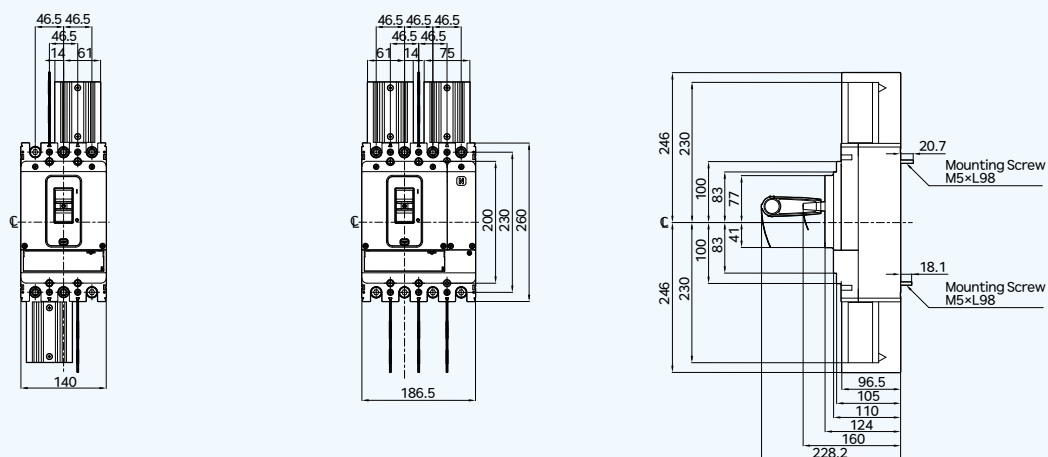
HGP100, 160, 250

External
Dimension



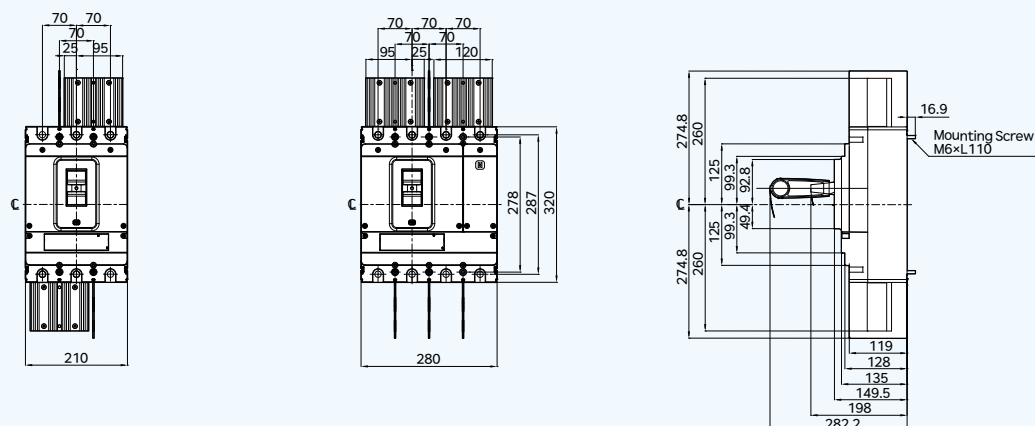
HGP400, 630

External
Dimension



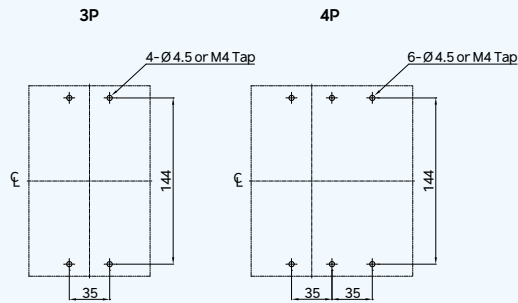
HGP800

External
Dimension



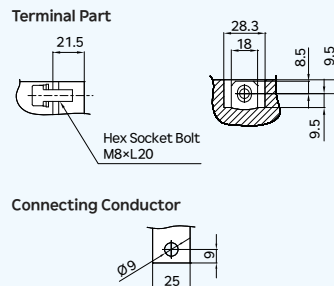
HGP100, 160, 250

Panel Installation Dimension

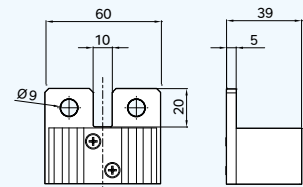


※ Screw Applied : M4×L85 S/W (For Circuit Breaker Mounting), M8×L18 S/W P/W (For Terminal Mounting)

Detail Drawing of Terminal Part/
Connecting Conductor

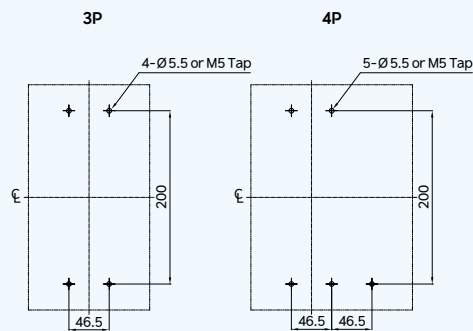


Detail Drawing of SBB

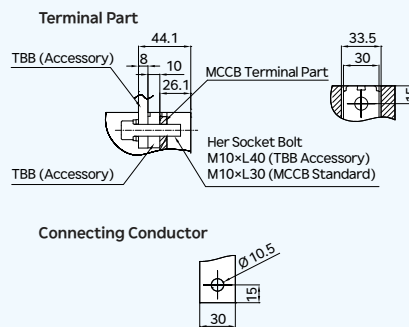


HGP400, 630

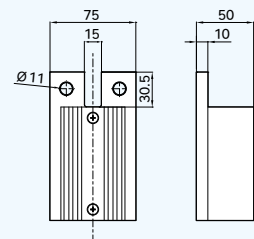
Panel Installation Dimension



Detail Drawing of Terminal Part/
Connecting Conductor

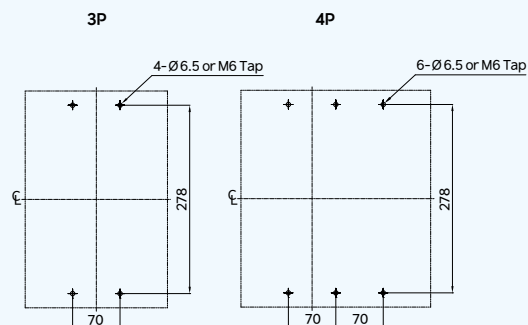


Detail Drawing of SBB

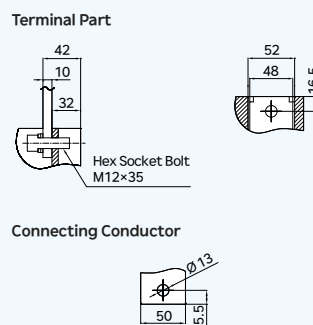


HGP800

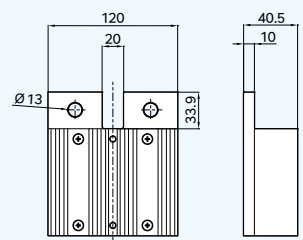
Panel Installation Dimension



Detail Drawing of Terminal Part/
Connecting Conductor

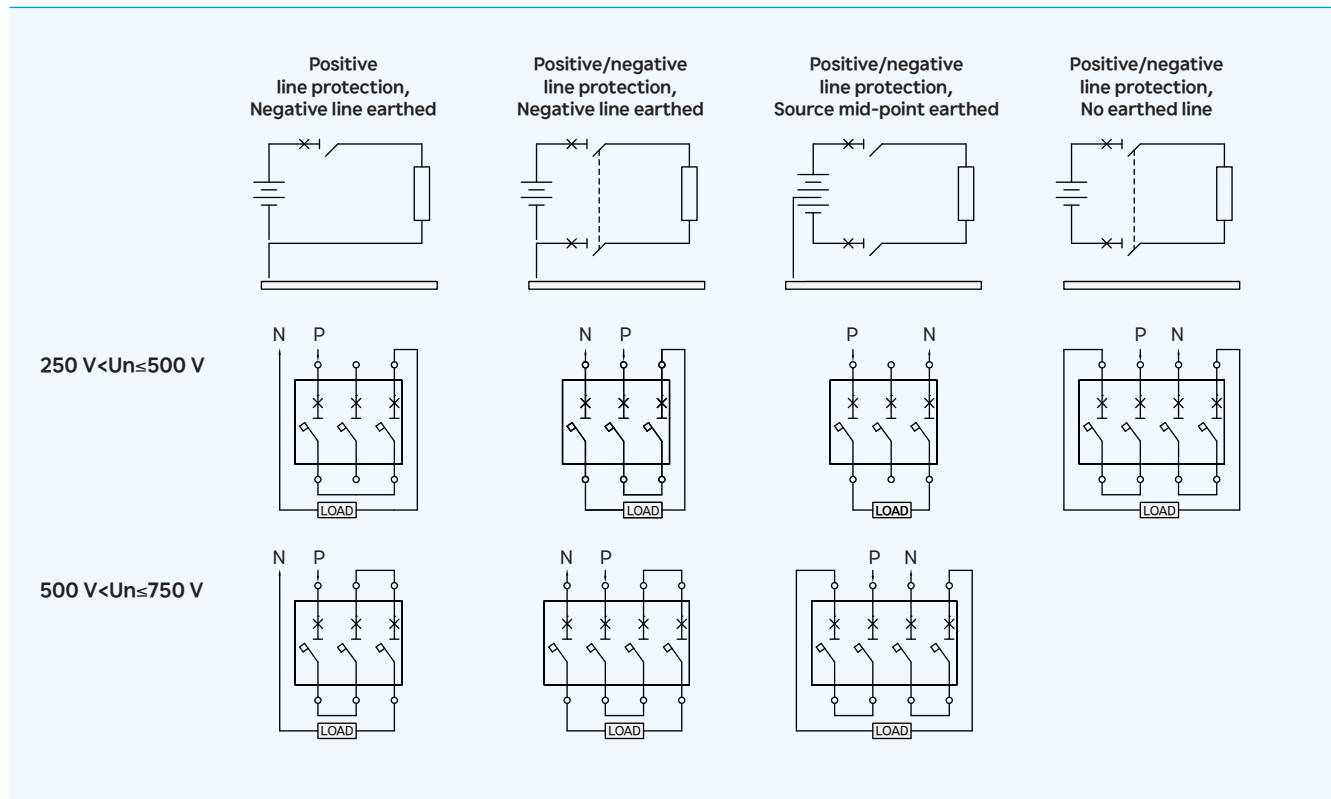


Detail Drawing of SBB

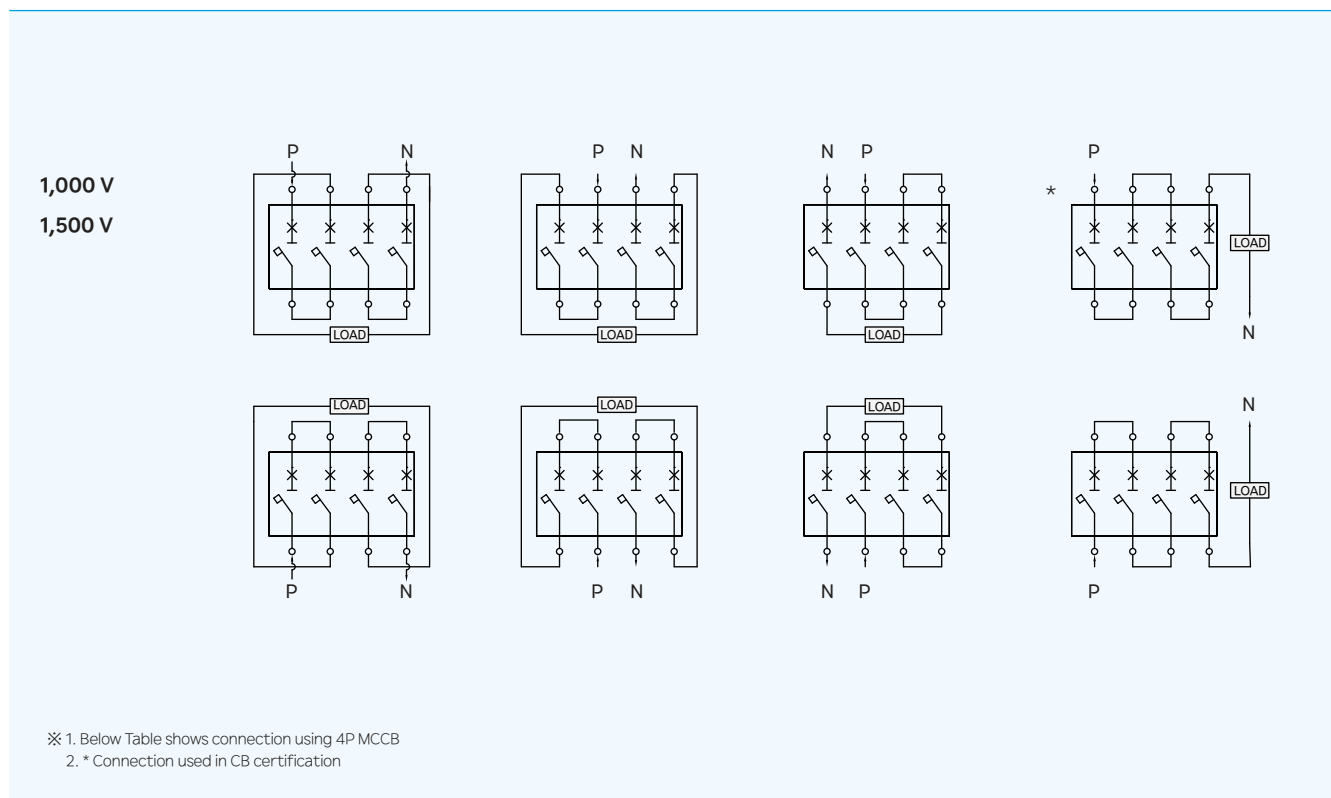


Connection Diagram

DC MCCB for Network



DC MCCB for Photo Volatic



Ordering Information

HGP DC Type

	① HGP	② 250	③ S	④ -G	⑤ P4	⑥ T4	⑦ S	⑧ 00	⑨ 00	⑩ Z	⑪ 00250	⑫ N
① Model Name												
② Frame Size												
③ Short Circuit Breaking Category Code												
④ Classification-250 AF												
⑤ No. of Poles and Voltage												
⑥ Product Category												
⑦ Connection Method												
⑧ Signal Device (AUX/ALT)												
⑨ Trip Device (SHT/UVT)												
⑩ Frequency												
⑪ Rated Current												
⑫ Trip Device Characteristics												

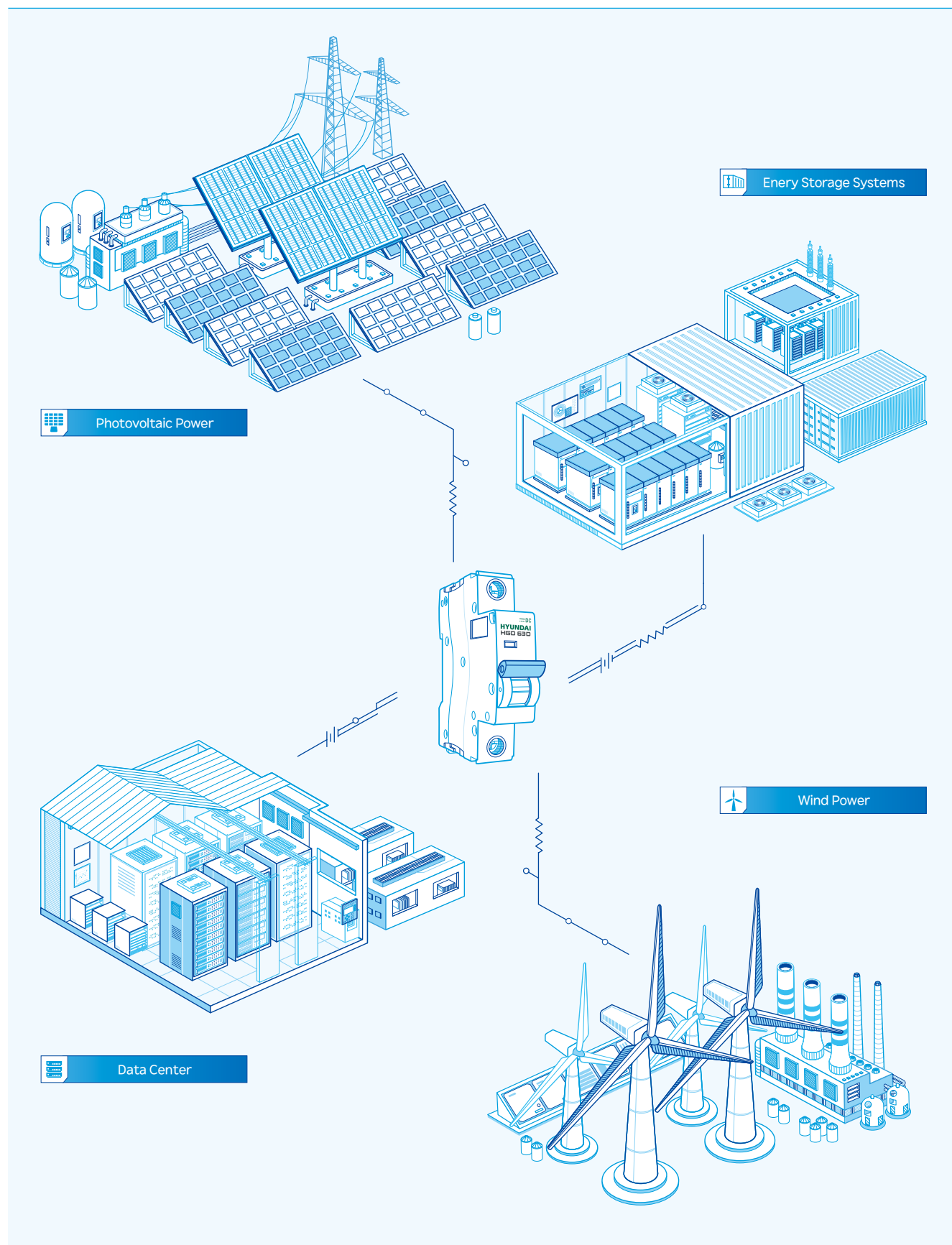
① Model Name		④ Classification-250 AF		⑦ Connection Method		⑩ Frequency	
HGP	Molded Case Circuit Breaker / Earth Leakage Circuit Breaker	-G	Only for HGP100/160/250	S	Front Connection	Z	DC only
② Frame Size		⑤ No. of Poles and Voltage		⑧ Signal Device (AUX/ALT)		⑪ Rated Current	
100	100 AF	D3	750 Vdc 3 Pole	00	Not Attached	00040	40 A
160	160 AF	D4	1,000 Vdc 4 Pole	10	AUX 1C	.	.
250	250 AF	P4	1,500 Vdc 4 Pole	20	AUX 2C	.	.
400	400 AF			01	ALT 1C	.	.
630	630 AF			11	AUX 1C + ALT 1C	00800	800 A
800	800 AF			21	AUX 2C + ALT 1C		
				31 ³⁾	AUX 3C + ALT 1C		
				32 ³⁾	AUX 3C + ALT 2C		
③ Short Circuit Breaking Category Code		⑥ Product Category		⑨ Trip Device (SHT/UVT)		⑫ Trip Device Characteristics	
F	10 kA	Molded Case Circuit Breaker		00	Not Attached	For Protecting Overload Short-Circuit	
S	55 kA(1,000 Vdc) 20 kA(1,500 Vdc)	T4	Ambient Temperature of 40 °C	S1	SHT AC 100 - 120 V	- 4)	Thermal Fixed/ Instantaneous Fixed (MTM - FF)
H	85 kA(1,000 Vdc) 50 kA(1,500 Vdc)			S2	SHT AC 200 - 230 V	F 4)	Thermal Adjustable/ Instantaneous Fixed (MTM - JF)
X	100 kA			S3	SHT AC 380 - 415 V	H 4)	Thermal Adjustable/ Instantaneous Adjustable (MTM - JJ)
				S4	SHT AC 440 - 480 V	N	Thermal Fixed/Instantaneous Fixed (MTM - FF) + 4P N Phase Protection
				S5	SHT DC 24 V	FN	Thermal Adjustable/ Instantaneous Fixed (MTM - JF) + 4P N Phase Protection
				S6	SHT DC 100 - 110 V	HN ⁵⁾	Thermal Adjustable/ Instantaneous Adjustable (MTM - JJ) + 4P N Phase Protection
				U1	UVT AC 100 - 120 V		
				U2	UVT AC 200 - 230 V		
				U3	UVT AC 380 - 415 V		
				U4	UVT AC 440 - 480 V		
				U5	UVT DC 24 V		
				U6	UVT DC 100 - 110 V		

※ 1) Applicable to both Line part / Load part, HGP400~800
2) Applicable to both Line part / Load part, HGP400~630
3) Applicable to HGP400~630
4) Applicable to "D3" in NO. of poles and Voltage
5) Applicable to "D4" in NO. of poles and Voltage

※ 1) Applicable to both Line part / Load part, HGP400~800
2) Applicable to both Line part / Load part, HGP400~630
3) Applicable to HGP400~630
4) Applicable to "D3" in NO. of poles and Voltage
5) Applicable to "D4" in NO. of poles and Voltage

HGD DC Type Miniature Circuit Breaker

Versatile Usage Environments



Product Features

HGD DC Type is suitable for DC distribution facilities aimed at reducing power conversion losses and improving energy efficiency, with a maximum operating voltage of DC 1,000 V (4P). Compliant with international standards IEC 60947-2, it is manufactured with a rated breaking capacity of 10kA and rated current ranging from 1 to 63 A, with tripping characteristics C/D, and includes accessories such as AUX/ALT/SHT/UVT/PLD.



Superior Breaking Capacity and Applicable to Various DC Voltage Sources

- Rated Breaking Capacity : 10 kA
- Rated Current : 1 A ~ 63 A
- Rated Voltage :
 - DC 110/125/220/250 V (1P)
 - DC 220/250/440/500 V (2P)
 - DC 660/750 V (3P)
 - DC 880/1,000 V (4P)
- Instantaneous Operation Characteristics :
 - li=6 In (C type), li=12 In (D type)
- Rated Impulse Withstand Voltage : 6 kV



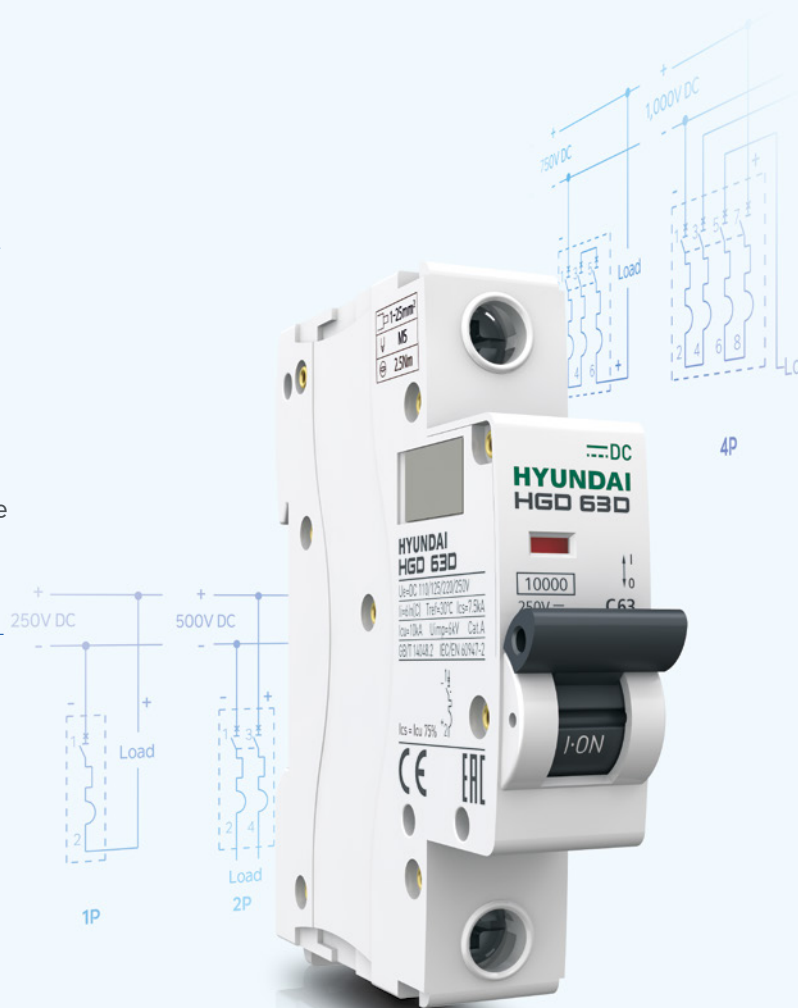
HGD 63U Model Shares the Same Appearance and Common Options

- Compact design and simple appearance
- Easy Din-rail attachment
- Effective current distribution with 13 arc chutes
- AUX/ALT/SHT/UVT/PLD options are available



Specifications and Certifications

- IEC 60947-2 Annex.P, CB certification



Selection Table

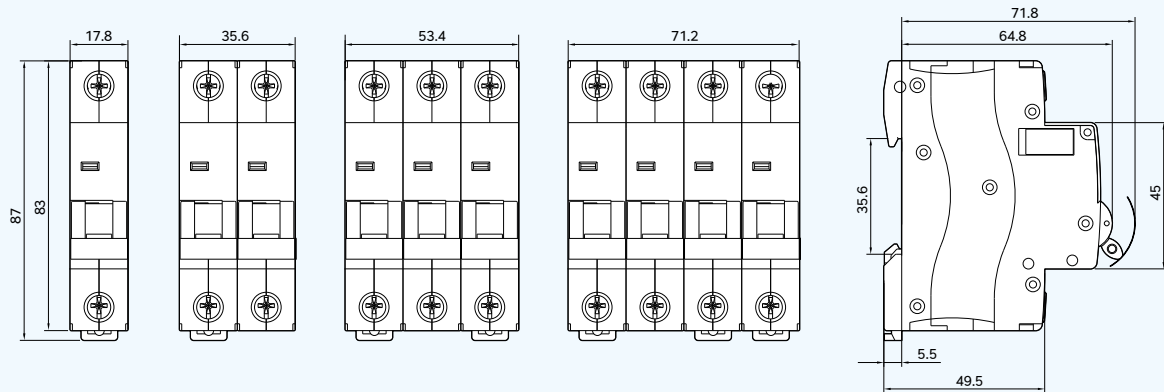
Miniature Circuit Breaker (HGD DC Type)

Model Name		HGD63D (DC), 63 AF, 10 kA
Reference Standard		IEC/EN 60947-2
No. of Poles	P	1P, 2P, 3P, 4P
Rated Current	I _n	1, 2, 3, 4, 5, 6, 8, 10, 13, 16, 20, 25, 32, 40, 50, 63 A
Rated Voltage	U _e	1P : 110/125/220/250 Vdc, 2P : 220/250/440/500 Vdc 3P : 660/750 Vdc, 4P : 880/1,000 Vdc
Rated Short Circuit Current	I _{cu}	10 kA (I _{cs} =75 % I _{cu})
Rated Insulation Voltage	U _i	1,000 V
Rated Impulse Withstand Voltage	U _{imp}	6 kV
Electrical/Mechanical Endurance	times	10,000/20,000
Withstand Voltage	kV	2 kV
Instantaneous Operation Characteristics		C curve : I _i =6 I _n , D curve : I _i =12 I _n
Operating Temperature		-40°C to + 55°C
Humidity		95 % RH
Terminal Capacity (max)		25 mm ²
Tightening Torque (max)		2 N·m
Vibration		3 g
Shock Resistance		40 mm free fall
Protection Class		IP20
Positive Contact Indication		Red-ON, Green-OFF
Installation and Dimension	Weight/pole	0.100 kg
	Dimension (H×D×W) /pole	81×71.0×17.8 mm
	Installation Method	Clip on DIN Rail(35×7.5 mm)
	Installation Direction	Vertical/Horizontal
	Casing Material	flame-retardant thermoplastic material
	Busbar Application (Line, Load)	Pin/Fork type
	Accessory	AUX/ALT/SHT/UVT/PLD

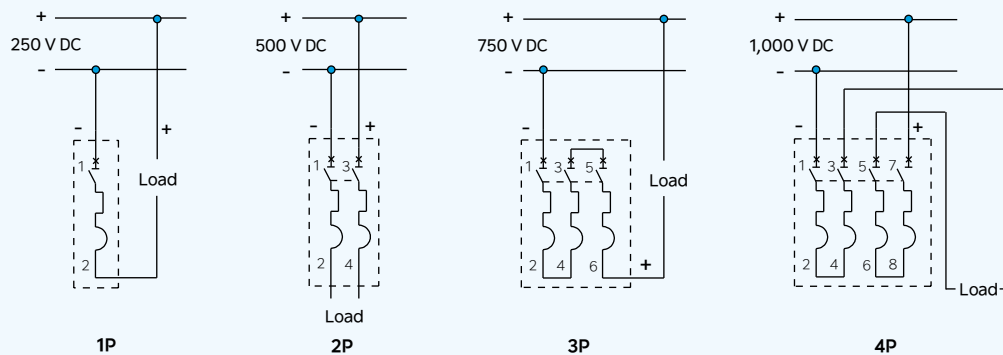
Dimension & Connection Diagram

HGD63D

Unit : mm



Connection Diagram



Ordering Information

HGD DC Type

① HGD	② 63	③ D	④ 1P	⑤ MC	⑥ S	⑦ 00	⑧ 00	⑨ C	⑩ 00001
-------	------	-----	------	------	-----	------	------	-----	---------

① Model Name _____

② Frame Size _____

③ Short Circuit Breaking Category Code _____

④ No. of Poles _____

⑤ Instantaneous Operation Characteristics _____

⑥ Connection Method _____

⑦ Auxiliary Contact Composition (AUX/ALT) _____

⑧ Shunt Trip Device Rating (SHT/UVT) _____

⑨ Frequency _____

⑩ Rated Current _____

① Model Name	④ No. of Poles	⑦ Auxiliary Contact Composition (AUX/ALT)	⑩ Rated Current
HGD Miniature Circuit Breaker	1P 1 Pole 2P 2 Pole 3P 3 Pole 4P 4 Pole	00 Not Attached	00001 1 A 00002 2 A 00003 3 A 00004 4 A 00005 5 A 00006 6 A 00008 8 A 00010 10 A 00013 13 A 00016 16 A 00020 20 A 00025 25 A 00032 32 A 00040 40 A 00050 50 A 00063 63 A
② Frame Size	⑤ Instantaneous Operation Characteristics	⑧ Shunt Trip Device Rating (SHT/UVT)	
63 63 AF	MC C curve MD D curve	00 Not Attached	
③ Short Circuit Breaking Category Code	⑥ Connection Method	⑨ Frequency	
D 10 kA, 63 AF	S Front Connection	C 50/60 Hz	



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Osaka	1-Room 5th Floor Nagahori Plaza Bldg. 2-4-8 Minami Senba, chuo-ku, Osaka 542-0081, Japan	Tel : +81-6-6261-5766~7	Fax : +81-6-6261-5818