



Commercial Buildings



Industrial and Power Plants



Vessels

HYUNDAI

Air Circuit Breaker,

the essential piece of your system!



HiAN & HiAH type

HiAN06-20	70kA up to 2000A
HiAN25-32	85kA 2500A, 3200A
HiAN40	100kA 4000A
HiAN50-63	120kA 5000A, 6300A
HiAH32	130kA 3200A

※ Breaking capacity: Icu at AC500V

HiAS type

HiAS06-16	50kA up to 1600A
HiAS20-32	65kA up to 3200A

※ Breaking capacity: Icu at AC500V

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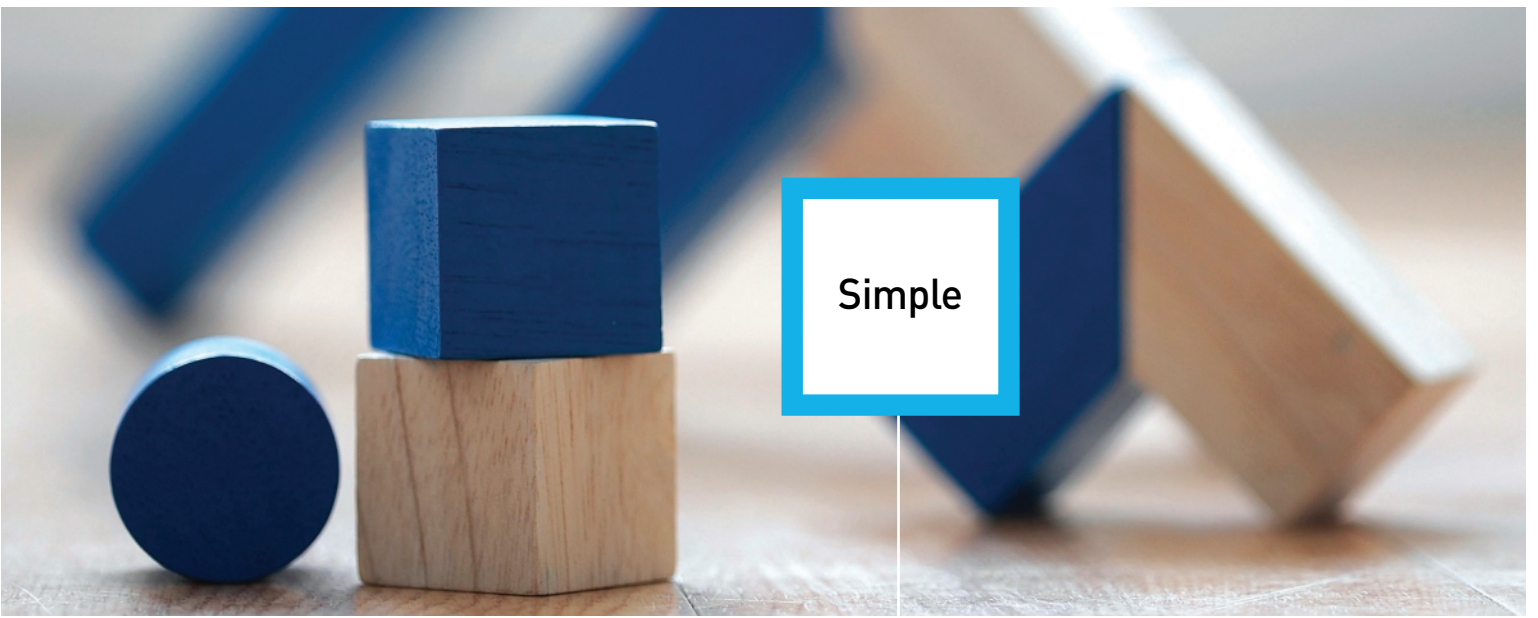
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Air Circuit Breaker





Optimized for both industrial
and marine application,
HYUNDAI Air Circuit Breakers have
Powerful protection, **Customized design**
and **Reliable performance**.

Qualified Standard & Approval

Standard

- ▶ IEC 60947-2 International Electrotechnical Commission
- ▶ EN 60947-2 European Standard
- ▶ AS 3972-2 Australian Standard
- ▶ NEMA PUB NO.SG3 National Electrical Manufactures Association
- ▶ ANSI C37.13 American National Standard Institute
- ▶ VDE 0660 Verband Deutscher Elektrotechniker
- ▶ GOST R 50030.2-99 9 Government Standard of Russia
- ▶ GOST R 50030.1-2000 Government Standard of Russia

Approval

- ▶ ISO 18001, 14001, 9001
- ▶ KERI/KOREA Korea Electro Technology Reserch Institute
- ▶ KS/KOREA Korea Quality Certificate Standard Association
- ▶ CE/EU Community European/TÜV Rheinland
- ▶ GOST-R/RUSSIA Government Standard of Russia
- ▶ CCC/CHINA China Compulsory Certification
- ▶ KR/KOREA Korean Register of Shipping
- ▶ GL/GERMANY Germanischer Lloyd
- ▶ LR/U.K. Lloyd's Register of Shipping
- ▶ ABS/U.S.A. American Bureau of Shipping
- ▶ BV/France Bureau Veritas
- ▶ NK/JAPAN Nippon Kaiji Kyokai



Features

High breaking capacity

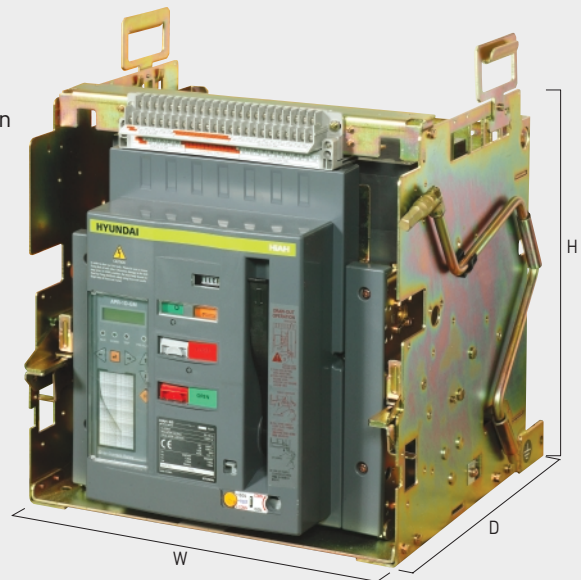
Hyundai Air Circuit Breakers realize high breaking capacity and short-time withstand current with advanced technologies.

- HiAN type: up to Icu 120kA, Icw 100kA at AC500V
- HiAH type: Icu 130kA, Icw 65kA at AC500V

HiAN06-20	→	70kA
HiAN25-32	→	85kA
HiAN40	→	100kA
HiAN50-63	→	120kA
HiAH32	→	130kA

Customized design

- Minimized dimension difference of ACBs make easy to design switchboards. Breakers can also be replaced according to system specification changes.
- All type ACBs have same panel cut-out size, so it is also easy to standardize the switchboard design.
- All circuits and manual operation parts are in front side. This front mounted design enables easy wiring, operation and inspection.
- Easy insertion to cradle, line and load side reverse connection and convenient replacement of APR, trip device and motor also offer greater satisfaction to customers.



(Unit: mm)

Draw-out type	H	W	D
HiAN06-16	490	320	461.2
HiAN20-32	490	410	461.2
HiAN40	478	480	481
HiAN50-63	478	984	481
HiAH32	478	480	481
HiAS06-16	459	320	461.2
HiAS20-32	459	410	461.2

※ H: Height, W: Width, D: Depth (including terminal part)

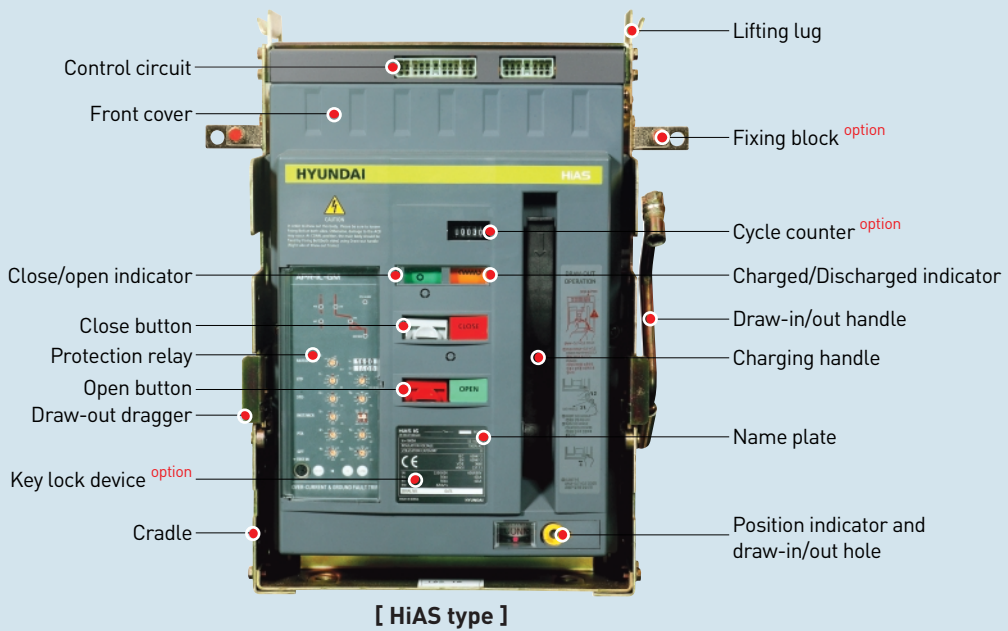
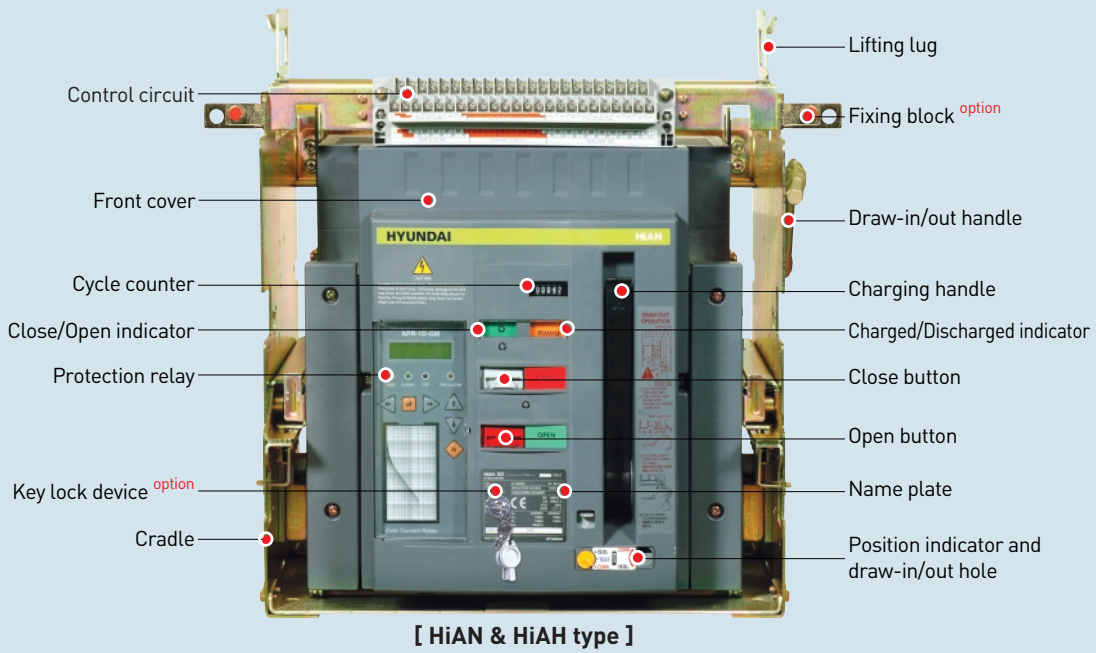
Multi-function ACB protection relay (APR)

- By mounting of high-reliable multi function protection relay, ACBs can conduct perfect performance. 7 types of APR are available according to required functions.



Features

Front view of ACB



Safety provision

- The fully molded body increases the safety in any application.
- The neutral pole contact closes earlier than the main circuit contacts and opens later. This early-make late-break N pole contact effectively prevents the occurrence of the abnormal voltages between the phase lines and the neutral line, thus ensuring safety.
- Internal surge protection device suppresses the surge of ACB itself and protects against mis-operation of loads.
- Various accessories also contribute to safety features.

Various accessories and options

- Various accessories are available for better safety, convenience and performance of ACBs.
- All accessories are easy to install and maintain.

- | | |
|--|---|
| <ul style="list-style-type: none"> • Extensional auxiliary switch (1a1b) • Key lock device (lock in open) • Cycle counter • Door flange • Button lock cover • Neutral CT • Mechanical interlock device • Spring charge switch • Non-flammable cable • Safety shutter | <ul style="list-style-type: none"> • Fixing blocks • Vertical type bus-bar • Short circuit 'b' contact • Position switch • Wrong inserting prevention device • Arc shield • 100% size neutral pole • Test jumper • APR checker |
|--|---|

Introduction of HiAH & HiAS type

Both HiAH & HiAS type ACB are based on the HiAN type. By adopting different technology, they can cover all applications together with HiAN type.

- HiAH type
HiAH type ACB has the highest breaking capacity in the world, especially for marine use or in power plants. Wide current from 630A to 3200A can be realized in the same frame.
- HiAS type
HiAS type ACB is best suited for simple application with lower breaking capacity and compact size compared to HiAN type.

Ratings

General feeder application / HiAN & HiAH type

Model		HiAN06	HiAN08	HiAN10	HiAN12	HiAN16	HiAN20	HiAN25	HiAN32	HiAN40	HiAN50	HiAN63	HiAH32		
Rated current (A)		630	800	1,000	1,250	1,600	2,000	2,500	3,200	4,000	5,000	6,300	3,200		
Rated neutral phase current (A)		630	800	1,000	1,250	1,600	2,000	2,500	3,200	4,000	2,500	3,200	3,200		
Number of poles		3, 4													
Utilization category		B													
Rated primary current of ACB protection relay [IcT] (A)		160	160	160	160	160	1,000	1,000	1,000	3,200	4,000	4,000	630		
		320	320	320	320	320	1,600	1,600	1,600	4,000	5,000	5,000	800		
		630	630	630	630	630	2,000	2,000	2,000			6,300	1,000		
			800	800	800	800		2,500	2,500				1,250		
				1,000	1,000	1,000			3,200				1,600		
					1,250	1,250							2,000		
						1,600							2,500		
													3,200		
Rated insulation voltage (Ui) (V)		AC1,000													
Rated operation voltage (Ue) (V)		AC690													
Rated breaking capacity (kA sym) [Icu]															
IEC VDE BS AS	with Inst. Icu=100% Ics	AC690V	50	50	50	50	50	65	65	65	85	100	100	100	
		AC500V	70	70	70	70	70	70	70	85	85	100	120	120	130
		AC415V below	70	70	70	70	70	85	85	85	100	120	120	130	
		without Inst. (MCR)	AC600V	50	50	50	50	50	65	65	65	85	100	100	65
			AC500V below	70	70	70	70	70	70	85	85	100	120	120	65
Rated making capacity (kA peak) [Icm]															
IEC VDE BS AS	with Inst. Icu=100% Ics	AC690V	105	105	105	105	105	143	143	143	187	220	220	220	
		AC500V	154	154	154	154	154	154	154	187	187	220	291	291	286
		AC415V below	154	154	154	154	154	187	187	187	220	291	291	286	
		without Inst. (MCR)	AC600V	105	105	105	105	105	143	143	143	187	220	220	143
			AC500V below	154	154	154	154	154	154	187	187	220	291	291	143
Rated impulse withstand voltage (Uimp) [kV]		8													
Rated short-time withstand current [Icw] (kA r.m.s)		1sec	65	65	65	65	65	70	85	85	75	100	100	65	
Rated latching current (kA)			65	65	65	65	65	70	85	85	75	100	100	65	
Total breaking time (sec)		0.04													
Closing operating time	Charging time (sec) max.	10													
	Closing time (sec) max.	0.04						0.06							
Durability	Mechanical	without maintenance	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	5,000	3,000	3,000	5,000	
		with maintenance	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	10,000	5,000	5,000	10,000	
	Electrical	without maintenance	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	3,000	2,000	2,000	2,000	
		with maintenance	10,000	10,000	10,000	10,000	10,000	7,500	7,500	5,000	5,000	5,000	5,000	5,000	
Weight (kg)	3pole, fixed type		43	43	43	49	49	60	63	65	-	-	-	-	
	3pole, draw-out type		65	65	65	72	72	87	92	96	115	210	230	110	
	4pole, fixed type		51	51	51	58	58	69	76	83	-	-	-	-	
	4pole, draw-out type		76	76	76	85	85	100	110	120	135	230	250	130	
Dimensions (mm) (3pole, draw-out type)		Height	490						478						
		Width	320				410				480	984	480		
		Depth	461.2						481						

※ Value is at ambient temperature 40°C.

General feeder application / HiAS type

Model			HiAS06	HiAS08	HiAS10	HiAS12	HiAS16	HiAS20	HiAS25	HiAS32
Rated current (A)			630	800	1,000	1,250	1,600	2,000	2,500	3,200
Rated neutral phase current (A)			630	800	1,000	1,250	1,600	2,000	2,500	3,200
Number of poles			3, 4							
Utilization category			B							
Rated primary current of ACB protection relay [I _{CT}] (A)			160	160	160	160	160	1,000	1,000	1,000
			320	320	320	320	320	1,600	1,600	1,600
			630	630	630	630	630	2,000	2,000	2,000
				800	800	800	800		2,500	2,500
					1,000	1,000	1,000			3,200
						1,250	1,250			
Rated insulation voltage (U _i) (V)			AC1,000							
Rated operation voltage (U _e) (V)			AC690							
Rated breaking capacity (kA sym) [I _{cu}]										
IEC VDE BS AS	with Inst. I _{cu} =100% I _{cs}	AC690V	42	42	42	42	42	50	50	50
		AC500V	50	50	50	50	50	65	65	65
		AC415V below	50	50	50	50	50	65	65	65
AS	without Inst. (MCR)	AC600V	42	42	42	42	42	50	50	50
		AC500V below	50	50	50	50	50	65	65	65
Rated making capacity (kA peak) [I _{cm}]										
IEC VDE BS AS	with Inst. I _{cu} =100 % I _{cs}	AC690V	88.2	88.2	88.2	88.2	88.2	105	105	105
		AC500V	110	110	110	110	110	143	143	143
		AC415V below	110	110	110	110	110	143	143	143
AS	without Inst. (MCR)	AC600V	88.2	88.2	88.2	88.2	88.2	105	105	105
		AC500V below	110	110	110	110	110	143	143	143
Rated impulse withstand voltage (U _{imp}) [kV]			8							
Rated short-time withstand current [I _{cw}] (kA r.m.s)		1sec	42	42	42	42	42	50	50	50
Rated latching current (kA)			42	42	42	42	42	50	50	50
Total breaking time (sec)			0.04							
Closing operating time	Charging time (sec) max.		10							
	Closing time (sec) max.		0.04							
Durability	Mechanical	without maintenance	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
		with maintenance	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
	Electrical	without maintenance	5,000	5,000	5,000	5,000	5,000	5,000	5,000	3,000
		with maintenance	10,000	10,000	10,000	10,000	10,000	7,500	7,500	5,000
Weight (kg)	3pole, fixed type		43	43	43	49	49	60	63	65
	3pole, draw-out type		65	65	65	72	72	87	92	96
	4pole, fixed type		51	51	51	58	58	69	76	83
	4pole, draw-out type		76	76	76	85	85	100	110	120
Dimensions (mm) (3pole, draw-out type)		Height	459							
		Width	320				410			
		Depth	461.2							

※ Value is at ambient temperature 40°C.

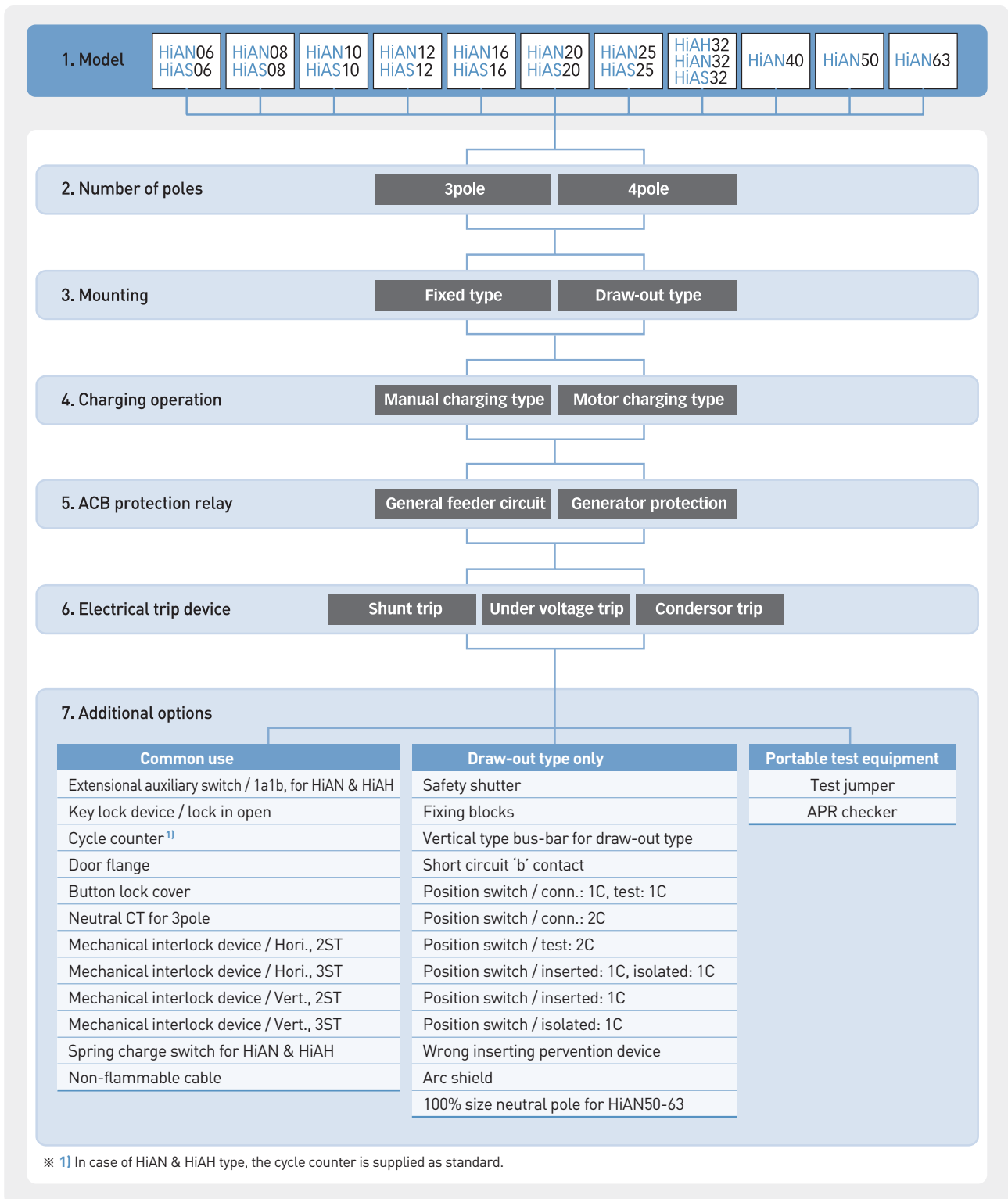
Ratings

Generator application for marine purpose / HiAN & HiAH type

Model		HiAN08	HiAN12	HiAN16	HiAN20	HiAN25	HiAN32	HiAN40	HiAN50	HiAN63	HiAH32	
Rated current (A)		800	1,250	1,600	2,000	2,500	3,200	4,000	5,000	6,300	3,200	
Number of poles		3										
Utilization category		B										
Base current of ACB protection relay [I _o] (A)		40 ≤ I _o ≤ 80	40 ≤ I _o ≤ 80	40 ≤ I _o ≤ 80	500 ≤ I _o ≤ 1,000	500 ≤ I _o ≤ 1,000	500 ≤ I _o ≤ 1,000	1,600 ≤ I _o ≤ 4,000	2,000 ≤ I _o ≤ 4,000	2,000 ≤ I _o ≤ 4,000	320 < I _o ≤ 630	
		80 ≤ I _o ≤ 160	80 ≤ I _o ≤ 160	80 ≤ I _o ≤ 160	800 ≤ I _o ≤ 1,600	800 ≤ I _o ≤ 1,600	800 ≤ I _o ≤ 1,600		2,500 ≤ I _o ≤ 5,000	2,500 ≤ I _o ≤ 5,000	400 < I _o ≤ 800	
		160 ≤ I _o ≤ 320	160 ≤ I _o ≤ 320	160 ≤ I _o ≤ 320	1000 ≤ I _o ≤ 2,000	1,000 ≤ I _o ≤ 2,000	1,000 ≤ I _o ≤ 2,000			3,200 ≤ I _o ≤ 6,300	500 < I _o ≤ 1,000	
		320 ≤ I _o ≤ 630	320 ≤ I _o ≤ 630	320 ≤ I _o ≤ 630		1,250 ≤ I _o ≤ 2,500	1,250 ≤ I _o ≤ 2,500				630 < I _o ≤ 1,250	
		400 ≤ I _o ≤ 800	400 ≤ I _o ≤ 800	400 ≤ I _o ≤ 800			1,600 ≤ I _o ≤ 3,200				800 < I _o ≤ 1,600	
			500 ≤ I _o ≤ 1,000	500 ≤ I _o ≤ 1,000							1,000 < I _o ≤ 2,000	
			630 ≤ I _o ≤ 1,250	630 ≤ I _o ≤ 1,250							1,250 < I _o ≤ 2,500	
				800 ≤ I _o ≤ 1,600							1,600 < I _o ≤ 3,200	
Rated insulation voltage (U _i) (V)		AC1,000										
Rated operation voltage (U _e) (V)		AC690										
Rated breaking capacity (kA, sym) [I _{cu}] / Rated making capacity (kA peak) [I _{cm}]												
KR	I _{cu} =100% I _{cs}	AC480V	70/154	70/154	70/154	70/154	85/187	85/187	100/220	120/291	120/291	130/266
LR		AC500V	70/154	70/154	70/154	70/154	85/187	85/187	100/220	120/291	120/291	130/266
ABS		AC480V	70/154	70/154	70/154	70/154	85/187	85/187	100/220	120/291	120/291	130/266
GL		AC480V	70/154	70/154	70/154	70/154	85/187	85/187	100/220	120/291	120/291	130/266
BV		AC480V	70/154	70/154	70/154	70/154	85/187	85/187	100/220	120/291	120/291	130/266
NK		AC480V	70/154	70/154	70/154	70/154	85/187	85/187	100/220	120/291	120/291	130/266
Rated short-time withstand current [I _{cs}] (kA r.m.s)		1sec	65	65	65	70	85	85	75	100	100	65
Rated latching current (kA)			65	65	65	70	85	85	75	100	100	65
Total breaking time (sec)		0.04										
Closing operating time	Charging time (sec) max.	10										
	Closing time (sec) max.	0.04					0.06					
Weight (kg) (3pole, draw-out type)		65	72	72	87	92	96	115	210	230	110	
Dimensions (mm)		490					478					
(3pole, draw-out type)		320			410			480	984			480
		461.2					481					

※ Value is at ambient temperature 40°C.

Specification Overview



Mounting

Fixed type

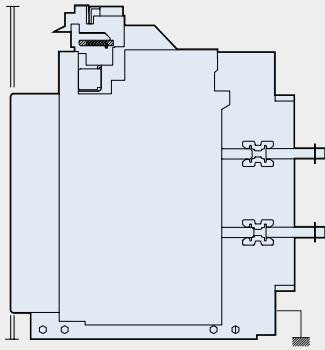
Fixed type ACB has no draw-out cradle and is designed to be directly mounted on the switchboard.

Draw-out type

Draw-out type ACB consists of a breaker body and a draw-out cradle. The breaker body is installed in draw-out cradle that is fixed in the switchboard, and can be in four positions: CONNECTED, TEST, ISOLATED, and REMOVED. The switchboard panel door can be kept closed at the CONNECTED, TEST, and ISOLATED positions (“shut-in three positions”)

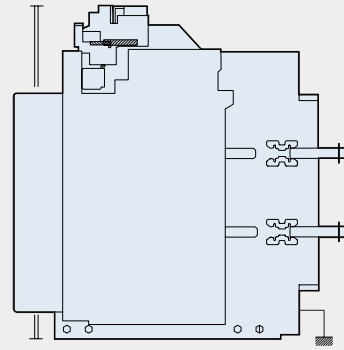
[HiAN & HiAH type]

CONNECTED position



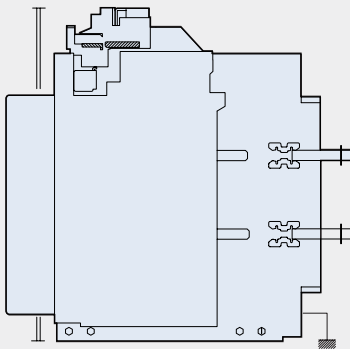
Both the main and control circuit are connected for normal service.

TEST position



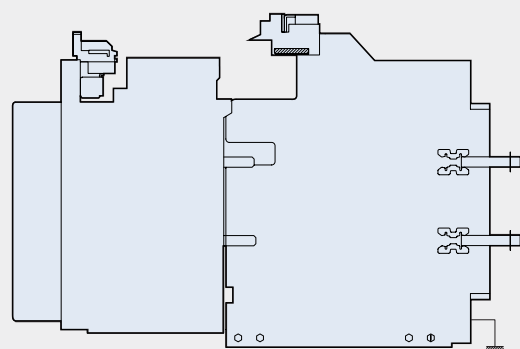
The main circuit is disconnected and the control circuit is connected. This position permits operation tests without the opening of the switchboard panel door.

ISOLATED position



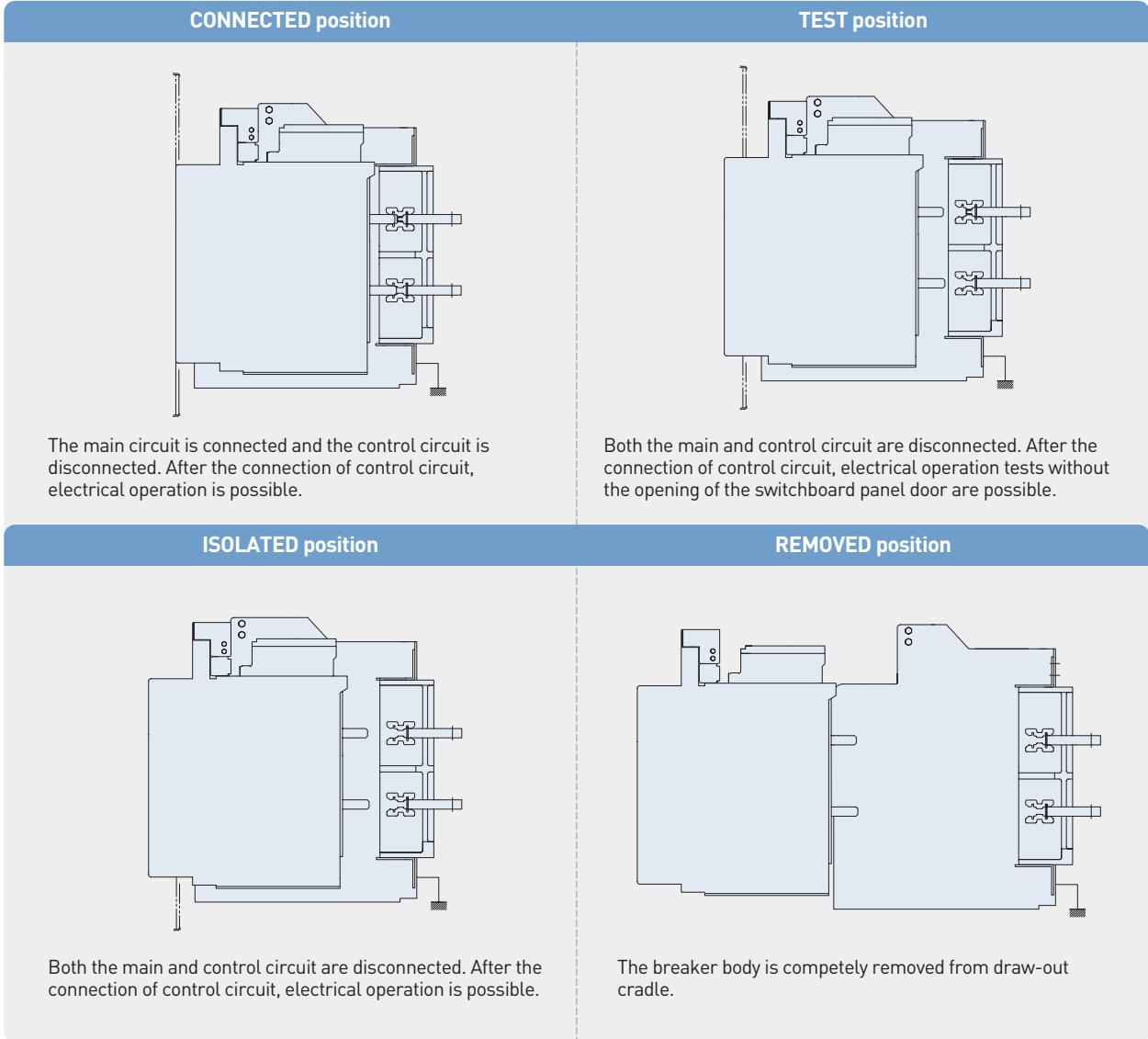
Both the main and control circuit are disconnected. The switchboard panel door can be closed.

REMOVED position



The breaker body is completely removed from draw-out cradle.

[HiAS type]



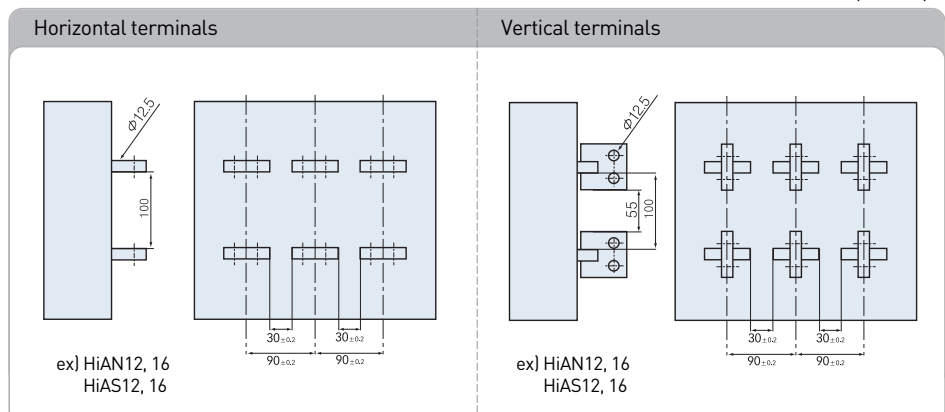
Control circuit terminals

Control circuit terminals are front located to allow easy wiring and access.

Main circuit terminals

Two types of main circuit terminal arrangements are available: vertical terminals and horizontal terminals. Different types of terminal arrangements can be specified for the line and load sides. Unless otherwise specified by the user, horizontal terminals are given as standard.

[Unit: mm]



Charging Operations

Manual charging type

The closing springs are charged by the spring charging handle.
ON/OFF operation of the ACB is performed by CLOSE/OPEN buttons.

Motor charging type

The closing springs are charged by a motor. ON/OFF operation of the ACB can be performed remotely.
The control circuits provide optimum control to the spring charging and ACB ON/OFF operation.
A manual charging mechanism is also fitted to facilitate inspection or maintenance work.

■ Charging the closing springs

A motor is used to charge the closing springs. When the closing springs are released to close the ACB, they are automatically charged again by the motor for the next ON operation.

■ Closing the ACB

Turning on "remote" ON switch enables the ACB to be remotely closed.

■ Opening the ACB

For opening the ACB remotely, specify the shunt trip or the undervoltage trip.

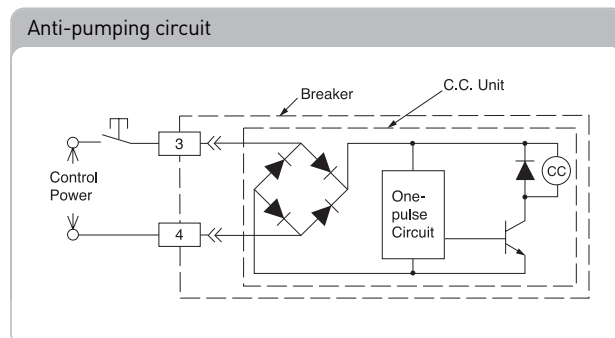
Rating of ACB charging motor

Applied model	Rated voltage (V)	Operation voltage (V)	Inrush current (at peak) (A)	Steady-state current (rms) (A)	Charging time (s)	Closing current (at peak) (A)
HiAN06-32 HiAH32 HiAS06-32	AC220	187-246	2.5	0.5	5	1.5
	AC110	93.5-123	2.5	1.0	5	3.2
	DC220	170-246	2.5	0.5	5	1.5
	DC125	106-140	3.0	0.7	5	3.6
	DC110	85-126	3.5	1.0	5	3.2
	DC24	20-27	3.0	1.0	5	8.0
HiAN40-63	AC220	187-246	8.0	4.0	10	1.0
	AC110	93.5-123	15	7.0	10	1.5
	DC220	170-246	6.0	1.5	10	1.0
	DC125	106-140	5.0	1.2	5	1.5
	DC110	85-126	12	3.0	10	1.5
	DC24	20-27	5.0	1.5	5	3.0

Anti-pumping function

Even if the ON switch is kept on, ACB closing operation is performed only once. To close the ACB again, turn off the ON switch to charge the closing springs, and then turn on the ON switch.

If ON and OFF signals are simultaneously given of the ACB, the ON signal is ignored.



Electrical Trip Devices

Shunt trip (SHT)

The shunt trip is used to electrically open the breaker from a remote place(s).

The shunt trip may be used to open the breaker by means of external protective devices, such as over-current relays or reverse power relays.

Both shunt trip and undervoltage trip may be fitted in a single breaker.

Rating of shunt

Applied model	Rated voltage (V)	Operation voltage (V)	Excitation current (at peak) (A)	Current passage time (ms)	
HiAN06-16 HiAS06-16	AC	421-480	252-528	1.2 (450V)	27
		380-420	228-462	1.3 (380V)	27
		180-250	108-275	1.5 (220V)	27
		100-150	60-165	3.1 (110V)	27
	DC	100-150	60-165	3.7 (125V)	27
		150-230	90-276	1.3 (220V)	30
		90-125	54-150	3.2 (110V)	30
		48	29-57	4.8 (48V)	30
	24	14-28	8.8 (24V)	29	
HiAN20-32 HiAH32 HiAS20-32	AC	421-480	252-528	1.3 (450V)	27
		380-420	228-462	1.4 (380V)	27
		180-250	108-275	1.6 (220V)	27
		100-150	60-165	3.2 (110V)	27
	DC	100-150	60-165	3.7 (125V)	27
		150-230	90-276	1.4 (220V)	28
		90-125	54-150	3.2 (110V)	30
		48	29-57	4.9 (48V)	29
	24	14-28	8.8 (24V)	28	
HiAN40 HiAN50 HiAN60	AC	421-480	252-528	0.6 (450V)	27
		380-420	228-462	0.7 (380V)	27
		180-250	108-275	1.0 (220V)	27
		100-150	60-165	1.5 (110V)	27
	DC	100-150	60-165	1.5 (125V)	27
		150-230	90-276	1.0 (220V)	28
		90-125	54-150	1.5 (110V)	30
		48	29-57	2.5 (48V)	29
	24	14-28	3.0 (24V)	28	

Condensor trip device (CTD)

The capacitor trip is used in conjunction with a shunt trip, to ensure normal operation within 30 seconds after the control power (AC) is out or in a low voltage condition.

A combination of capacitor trip and shunt trip work as a normal AC-rated shunt trip, and may be used to open the breaker by an external protective device.

Under voltage trip (UVT)

The undervoltage trip (UVT) automatically opens the Air Circuit Breaker when control power voltage drops below a predetermined value.

When the voltage is restored to a value higher than the pick-up voltage, the Air Circuit Breaker can be closed. The undervoltage trip consists of a tripping coil and a trip control device.

Two types of UVT are available:

- An instantaneous trip, which trips the Air Circuit Breaker immediately, its circuit voltage drops below a predetermined value.
- A time-delay trip, which operates with a time-delay of 500ms, thus providing coordination with the short time-delay characteristic.

The UVT device is also available for DC applications in conjunction with a current limiting resistor (installed externally to the breaker)

Rating of UVT

Type	Rated voltage (V)	Operating voltage		Excitation coil current (A)	
		Pick-up voltage	Drop-out voltage		
Time-delay type	AC	480-500	85% of rated voltage	35-70% of rated voltage	0.15 (480V)
		430-470			0.15 (450V)
		360-400			0.15 (380V)
		200-240			0.15 (220V)
		100-120			0.15 (110V)
Instantaneous type	AC	480-500	85% of rated voltage	35-70% of rated voltage	0.15 (480V)
		430-470			0.15 (450V)
		360-400			0.15 (380V)
		200-240			0.15 (220V)
		100-120			0.15 (110V)
DC	200-220	85% of rated voltage	35-70% of rated voltage	0.1 (200V)	
	100-125			0.1 (100V)	

Order code	HVFS-T7	HVFS-T9
Rated input voltage	AC110V	AC220V
Ordinary charging voltage	DC145V	DC290V
Rated current	DC2A	
Frequency	50/60Hz	
Delay time	1.5sec	
Applied standard	IEC 60694/KSC4611	

ACB Protection Relays

APR is high-reliable multi function protection relay of Hyundai Air Circuit Breaker.

7 Types of APR are available: 5 types for general feeder protection, and 2 types for generator protection.

Each APR has different protection and indication functions, so that customers can select the proper one in consideration of the system and load characteristics.

Application	Type	Order code	Protection function				Indication function					Filed test ²⁾	Individual control power ³⁾	AMS ⁴⁾		
			AL, AS, AI	AP	AG	MCR	IU	IUt	CP/I	Fault LED ¹⁾	Event memory				LCD display	
General feeder	APR-1L-GL	23	●		●		●									
	APR-1L-GS	24	●	●	●	●			●	●			●	●		
	APR-1L-GM	27	●	●	●	●		●		●			●	●		
	APR-2L-GS	25	●	●	●	●			●	●		●	●	●	●	
	APR-1D-GM	26	●	●	●				●	●	●	●	●	●	●	●
Generator	APR-1S-AL	28	●				●									
	APR-1S-AS	29	●	●		●			●	●			●	●		

- ※ 1) LED makes signal when protection function operates.
- 2) AL, AS and AI function can be tested by APR itself or APR checker.
- 3) Individual control power for APR is required.
- 4) APR monitoring system, please refer to page 18.

Protection function

- AL** Adjustable Long Time Delay Trip

- AS** Adjustable Short Time Delay Trip

- AI** Adjustable Instantaneous Trip

- AP** Adjustable Pre-trip Alarm
: When the current reaches to the setting value, pre-trip alarm operates.

- AG** Adjustable Ground Fault Trip

- MCR** Making Current Release
: MCR is one kind of instantaneous trip device, it trips the ACB when the current exceeds pick-up current (I_p) only during the closing operation. After the ACB is completely closed, MCR function dose not work. AI function is default, and MCR function can work by switching the INST/MCR knob.

Indication function

- IU** Integrated Instantaneous Indication Contact
: 1a contact makes the signal for 80ms after a protection function operates.

- IUt** Integrated Continuous Indication Contact
: When any protection function operates, contacts make the signal through LED or LCD until the APR is reset.

- CP/I** Individual Continuous Indication Contact
: When each protection function operates, contacts make the signal through LED or LCD until the APR is reset.

- ※ - Insulation level from earth to terminal is 1500V.
- Signal for AP is automatically off when the current drops below the pick-up current (I_p).
- CPU is also monitored (system alarm function).

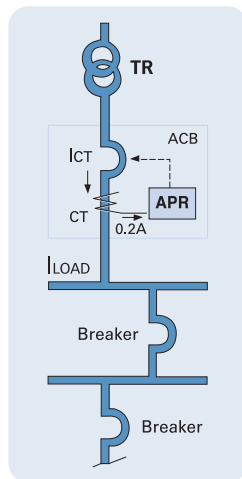
General feeder protection

■ **Step1**

- Determine the rated current of load (I_{LOAD}) that will pass through the breaker.

■ **Step2**

- Determine the rated primary current (I_{CT}) of APR based on below table.
- Keep the condition $(I_{CT}) \geq (I_{LOAD})$.



Model	Rated primary current (I_{CT}) of APR (A)
HiAN06, HiAS06	80, 160, 320, 630
HiAN08, HiAS08	80, 160, 320, 630, 800
HiAN10, HiAS10	80, 160, 320, 630, 800, 1000
HiAN12, HiAS12	80, 160, 320, 630, 800, 1000, 1250
HiAN16, HiAS16	80, 160, 320, 630, 800, 1000, 1250, 1600
HiAN20, HiAS20	1000, 1600, 2000
HiAN25, HiAS25	1000, 1600, 2000, 2500
HiAN32, HiAS32	1000, 1600, 2000, 2500, 3200
HiAN40	4000
HiAN50	4000, 5000
HiAN63	4000, 5000, 6300
HiAH32	630, 800, 1000, 1250, 1600, 2000, 2500, 3200

※ The rated secondary current of APR is 0.2A.

■ **Step3**

- Determine the base current (I_0) for the current setting of trip functions.
- $(I_0) = (I_{CT}) \times 0.5, 0.63, 0.8, 1.0$

■ **Step4**

- Determine the characteristic of long time delay trip (AL), short time delay trip (AS), instantaneous trip (AI), Pre-trip alarm (AP) and ground fault trip (AG).

Note: The ground fault trip function is not available when the rated primary current (I_{CT}) of the APR is 160A.

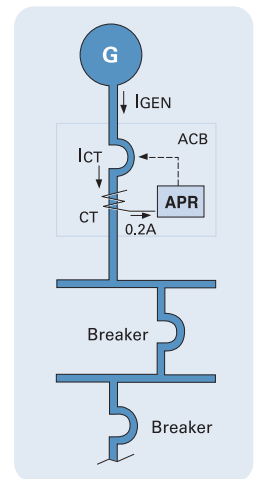
Generator protection

■ **Step1**

- Determine the rated current of generator (I_{GEN}).

■ **Step2**

- Determine the base current (I_0) for the current setting of trip functions.



Model	Base current (I_0) of APR (A)
HiAN08, HiAS08	$40 \leq [I_0] \leq 800$
HiAN12, HiAS12	$40 \leq [I_0] \leq 1250$
HiAN16, HiAS16	$40 \leq [I_0] \leq 1600$
HiAN20, HiAS20	$500 \leq [I_0] \leq 2000$
HiAN25, HiAS25	$500 \leq [I_0] \leq 2500$
HiAN32, HiAS32	$500 \leq [I_0] \leq 3200$
HiAN40	$1600 \leq [I_0] \leq 4000$
HiAN50	$2000 \leq [I_0] \leq 5000$
HiAN63	$2000 \leq [I_0] \leq 6300$
HiAH32	$320 \leq [I_0] \leq 3200$

※ - The rated secondary current of APR is 0.2A.
 - HiAS types are not applicable for marine purpose.

■ **Step3**

- Determine the characteristic of long time delay trip (AL), short time-delay trip (AS), instantaneous trip (AI), Pre-trip alarm (AP) and ground fault trip (AG).

ACB Protection Relays

APR monitoring system (AMS)

APR-1D-GM type APR has the RS-485 communication port. Through the interface unit or coordination with SCADA (supervisory control and data acquisition) system, APR monitoring system controls ACB and monitors system as well as operates.

■ **Method**

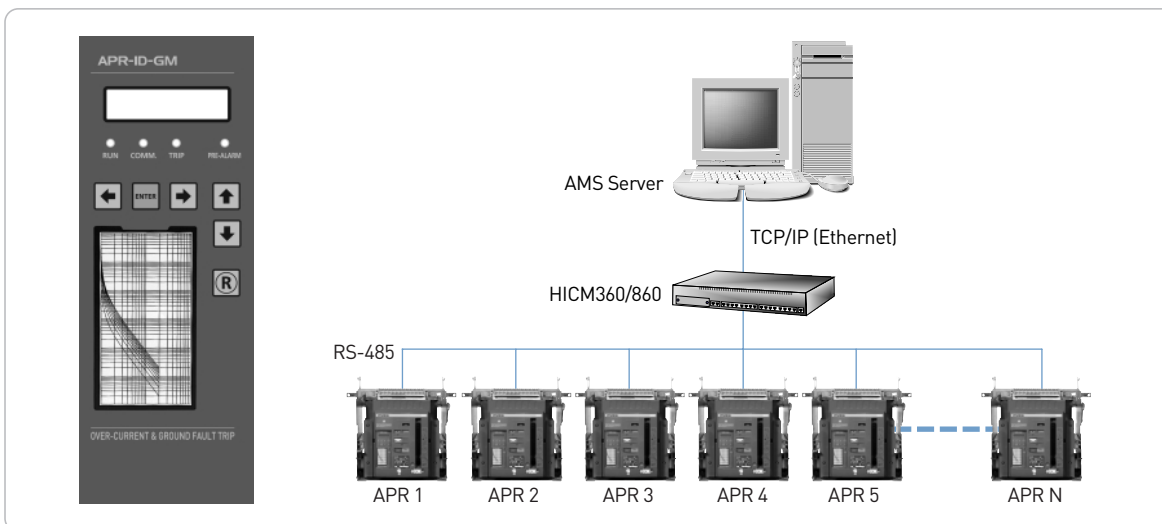
- RS-485
- Nonsyn.
- Baud Rate: 9600 bps
- Data bit: 8 bit
- Parity: None
- Stop bit: 1 bit

■ **Protocol**

- Modbus Protocol (RTU)
- CRC16

■ **Holding register (16 bit register)**

Address	Holding register	Remark
00	Pass Word	Read 0×FFFF
01	LTD Pickup	Read (%)
02	LTD Time	× 10 (mSec)
03	STD Pickup	Read (%)
04	STD Time	× 10 (mSec)
05	INST Pickup	Read (%)
06	PreAlarm Pickup	Read (%)
07	PreAlarm Time	× 10 (mSec)
08	GFT Pickup	Read (%)
09	GFT Time	× 10 (mSec)
10	OCR On/Off	bit Masking
11	OCGR On/Off	bit Masking
12	APR Mode	
13	CT Ratio	Frame Current
14	PT Ratio	System Voltage
15	Hz	50/60Hz



Precise protection coordination

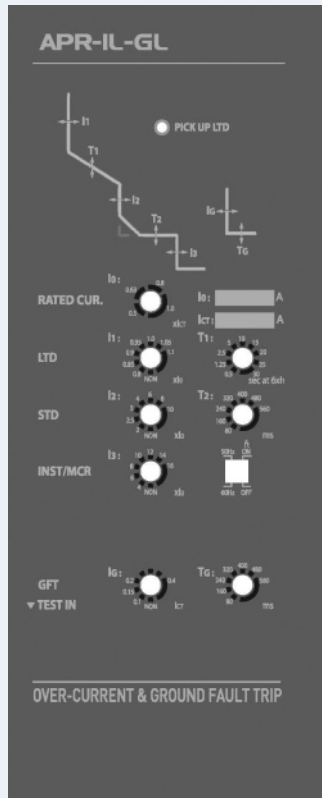
Non position for pick-up current

The pick-up current setting dials of protection functions (AL, AS, AI, AG) can be set to NON position so that precise protection coordination is possible according to load characteristics.

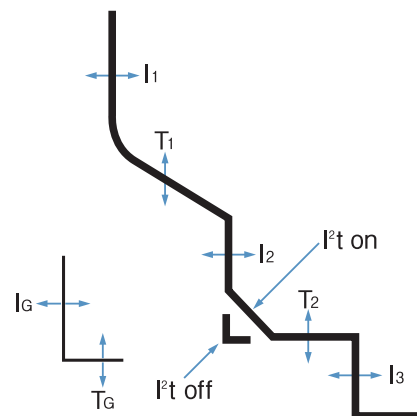
Fail-safe function for system security

In the event of a fault current exceeding ten times the base current (I_0) (five times for generator protection) while the AL, AS and AI functions are set to NON position, "Fail-Safe" function will interrupt the fault current in a time equal to the short-time delay setting (T_2).

APR-1L-GL order code 23, for general feeder



Characteristic



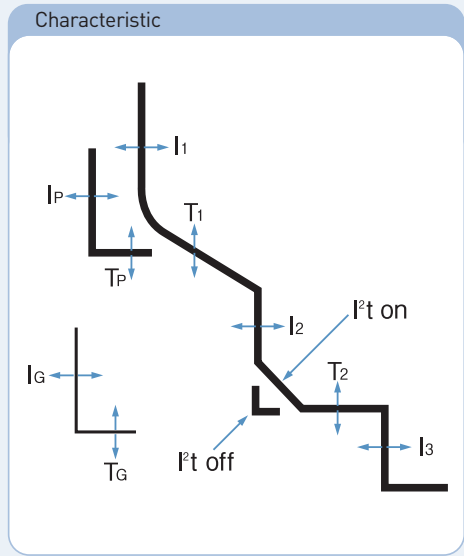
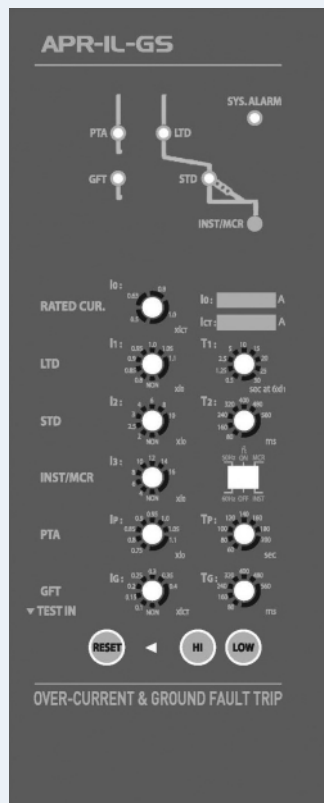
- I₁: LTD current
- I₂: STD current
- I₃: INST current
- I₆: GFT current
- T₁: LTD time
- T₂: STD time
- T₆: GFT time

Type		APR-1L-GL	Tolerance	
Protection function	AL (LTD)	Base current (I ₀)	I _{CT} × (0.5-0.63-0.8-1.0)	
		Current (I ₁)	I ₀ × (Non-0.8-0.85-0.9-0.95-1.0-1.05-1.1) I ₁ × 1.05 Non Trip, I ₁ × 1.2 Trip	
		Time (T ₁)	0.5-1.25-2.5-5-10-15-20-25-30 sec at I ₁ × 600%	± 15%
	AS (STD)	Current (I ₂)	I ₀ × (Non-2-2.5-3-4-6-8-10)	± 15%
		Time (T ₂)	80-160-240-320-400-480-560 msec, I ² t is possible by ON/OFF	
	AI (INST)	Current (I ₃)	I ₀ × (Non-4-6-8-10-12-14-16)	± 20%
AG (GFT)	Current (I ₆)	I _{CT} × (Non-0.1-0.15-0.2-0.25-0.3-0.35-0.4)	± 7.5%	
	Time (T ₆)	80-160-240-320-400-480-560 msec	± 15%	
Indication function	IU (Integrated instantaneous contact)	1a, 80ms ON for AL, AS, AI, AG		
	LED	for LTD (AL) pick-up		

ACB Protection Relays

APR-1L-GS order code 24, for general feeder

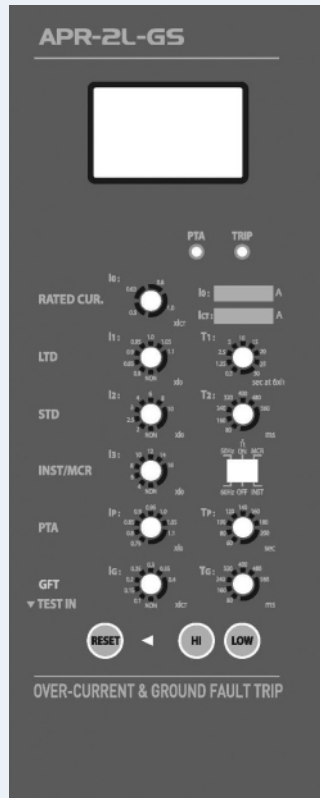
APR-1L-GM order code 27, for general feeder



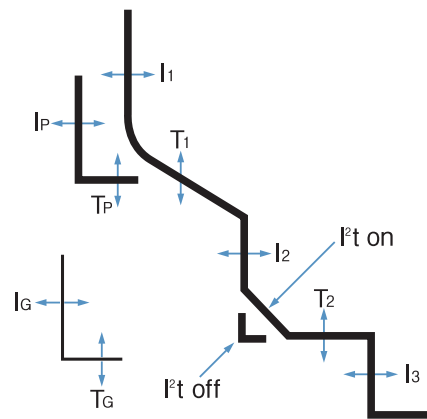
- I₁: LTD current
- I₂: STD current
- I₃: INST current
- I₄: GFT current
- I₅: PTA current
- T₁: LTD time
- T₂: STD time
- T₃: GFT time
- T_P: PTA time

Type		APR-1L-GS / APR-1L-GM		Tolerance
Protection function	AL (LTD)	Base current (I ₀)	I _{CT} × [0.5-0.63-0.8-1.0]	
		Current (I ₁)	I ₀ × (Non-0.8-0.85-0.9-0.95-1.0-1.05-1.1) I ₁ × 1.05 Non Trip, I ₁ × 1.2 Trip	
		Time (T ₁)	0.5-1.25-2.5-5-10-15-20-25-30 sec at I ₁ × 600%	±15%
	AS (STD)	Current (I ₂)	I ₀ × (Non-2-2.5-3-4-6-8-10)	±15%
		Time (T ₂)	80-160-240-320-400-480-560 msec, I' _t is possible by ON/OFF	
	AI (INST)/MCR	Current (I ₃)	I ₀ × (Non-4-6-8-10-12-14-16)	±20%
	AP (PTA)	Current (I ₄)	I _{CT} × [0.75-0.8-0.85-0.9-0.95-1.0-1.05-1.1]	±7.5%
		Time (T _P)	60-80-100-120-140-160-180-200 sec	±15%
AG (GFT)	Current (I ₅)	I _{CT} × (Non-0.1-0.15-0.2-0.25-0.3-0.35-0.4)	±20%	
	Time (T ₃)	80-160-240-320-400-480-560 msec		
Indication function	CP/I (Individual continuous contact)		1a for AL, AS, AI/MCR, 1a for AP, 1a for AG * applicable to APR-1L-GS type only	
	IUt (Integrated continuous contact)		2a for AL, AS, AI/MCR, 1a for AG * applicable to APR-1L-GM type only	
	Fault LED		for AL, AS, AI/MCR, AP, AG, System alarm	
Individual control power voltage		AC/DC100-250V		
Field test		for LTD, STD, INST by APR or APR checker		

APR-2L-GS order code 25, for general feeder



Characteristic



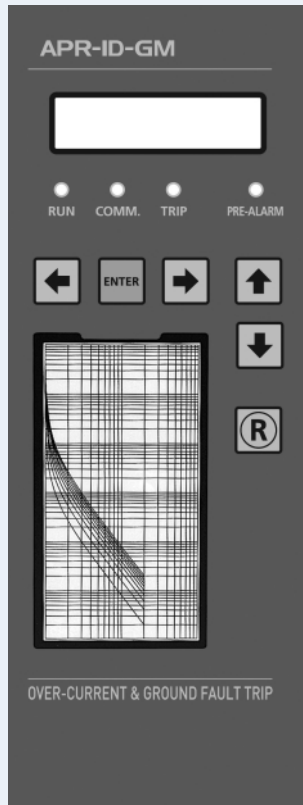
- I₁: LTD current
- I₂: STD current
- I₃: INST current
- I₀: GFT current
- I₀: PTA current
- T₁: LTD time
- T₂: STD time
- T₀: GFT time
- T_P: PTA time

Type		APR-2L-GS		Tolerance
Protection function	AL (LTD)	Base current (I ₀)	I _{cr} × 0.5, 0.63, 0.8, 1.0	
		Time (T ₁)	I ₀ × (Non-0.8-0.85-0.9-0.95-1.0-1.05-1.1 8 steps)	
			I ₁ × 1.05 Non Trip, I ₁ × 1.2 Trip	
	AS (STD)	Current (I ₂)	I ₀ × (Non-2-2.5-3-4-6-8-10)	±15%
		Time (T ₂)	80-160-240-320-400-480-560 msec, I' _t is possible by ON/OFF	
	AI (INST)/MCR	Current (I ₃)	I ₀ × (Non-4-6-8-10-12-14-16)	±20%
	AP (PTA)	Current (I ₀)	I ₀ × (0.75-0.8-0.85-0.9-0.95-1.0-1.05-1.1)	±7.5%
		Time (T _P)	60-80-100-120-140-160-180-200 sec	±15%
AG (GFT)	Current (I ₀)	I _{cr} × (Non-0.1-0.15-0.2-0.25-0.3-0.35-0.4)	±20%	
	Time (T ₀)	80-160-240-320-400-480-560 msec		
Indication function	CP/I (Individual continuous contact)	1a for AL, AS, AI/MCR, 1a for AP, 1a for AG		
	Fault LED	for AL, AS, AI/MCR, AG, AP		
Individual control power voltage		AC/DC100-250V		
Field test		for AL, AS, AI by APR or APR checker		
Measurement ¹⁾		Current monitoring for N phase as well as R, S, T		±2%

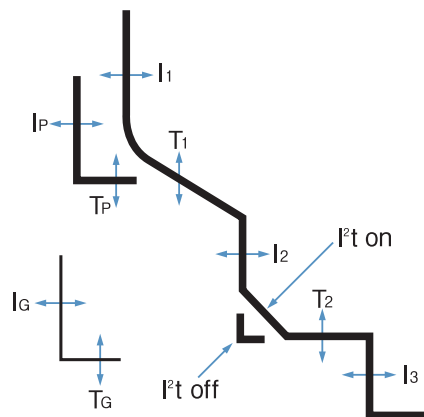
※ 1) LCD displays the current when it becomes 20% over than the rated current.

ACB Protection Relays

APR-1D-GM order code 26, for general feeder



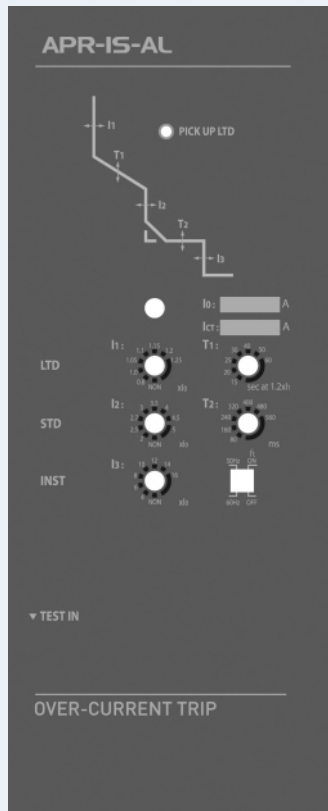
Characteristic



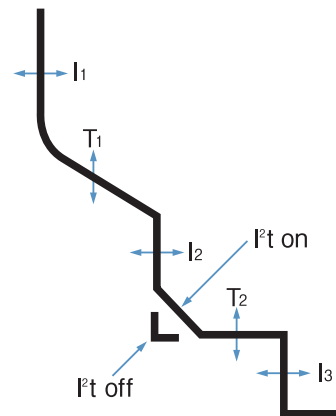
- I₁: LTD current
- I₂: STD current
- I₃: INST current
- I_g: GFT current
- I_p: PTA current
- T₁: LTD time
- T₂: STD time
- T_g: GFT time
- T_p: PTA time

Type		APR-1D-GM		Tolerance
Protection function	AL (LTD)	Current (I ₁)	Non, (I ₀) × 40-120%, 2% step	±5%
		Time (T ₁)	0.5-30.0 sec, 0.1 sec step at I ₁ × 600% (for general) 15-60 sec, 1 sec step at I ₁ × 300% (for generator) 1.0-5.0 sec, 0.1 sec step at I ₁ × 120% (for motor)	
	AS (STD)	Current (I ₂)	Non, (I ₀) × 100-1000%, 20% step	±10%
		Time (T ₂)	80-560 msec, 10 msec step	
	AI (INST)	Current (I ₃)	Non, (I ₀) × 200-1600%, 20% step	±15%
	AP (PTA)	Current (I _p)	(I ₀) × 32-120%, 2% step	±5%
		Time (T _p)	5-200 sec, 1 sec step	±10%
	AG (GFT)	Current (I _g)	Non, (I ₀) × 10-40%, 20% step	±15%
Time (T _g)		80-560 msec, 10 msec step		
Indication function	CP/I (Individual continuous contact)		1a for AL, AS, AI/MCR, AG, 1a for AP	
	Fault LED		for AL, AS, AI, AG, AP	
	Event memory		Maximum 8 events can be memorized for fault	
Individual control power voltage		AC/DC100-250V		
Field test		for AL, AS, AI by APR or APR checker		
Measurement		Ampere, Voltage, Frequency (Hz), cos φ, Watt (W)		
AMS (Communication)		RS-485		

APR-1S-AL order code 28, for generator



Characteristic

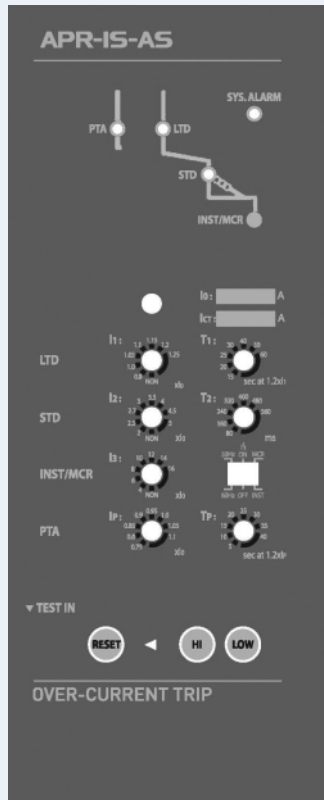


I_1 : LTD current T_1 : LTD time
 I_2 : STD current T_2 : STD time
 I_3 : INST current

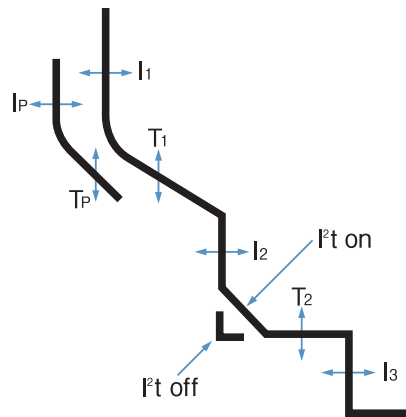
Type		APR-1S-AL	Tolerance	
Protection function	AL (LTD)	Base current (I_0)	$I_{CT} \times (0.5-1.0)$, 1% step	
		Current (I_1)	$I_0 \times (\text{Non-}0.8-0.9-1.0-1.05-1.1-1.15-1.2-1.25)$ $I_1 \times 1.0$ Trip	
		Time (T_1)	15-20-25-30-40-50-60 sec at $I_1 \times 120\%$	$\pm 15\%$
	AS (STD)	Current (I_2)	$I_0 \times (\text{Non-}2-2.5-2.7-3-3.5-4-4.5-5)$	$\pm 15\%$
		Time (T_2)	80-160-240-320-400-480-560 msec, $I't$ is possible by ON/OFF	
AI (INST)	Current (I_3)	$I_0 \times (\text{Non-}4-6-8-10-12-14-16)$	$\pm 20\%$	
Indication function	IU (Integrated instantaneous contact)		1a, 80ms ON for AL, AS, AI	
	Fault LED		for LTD (AL) pick-up	

ACB Protection Relays

APR-1S-AS order code 29, for generator



Characteristic

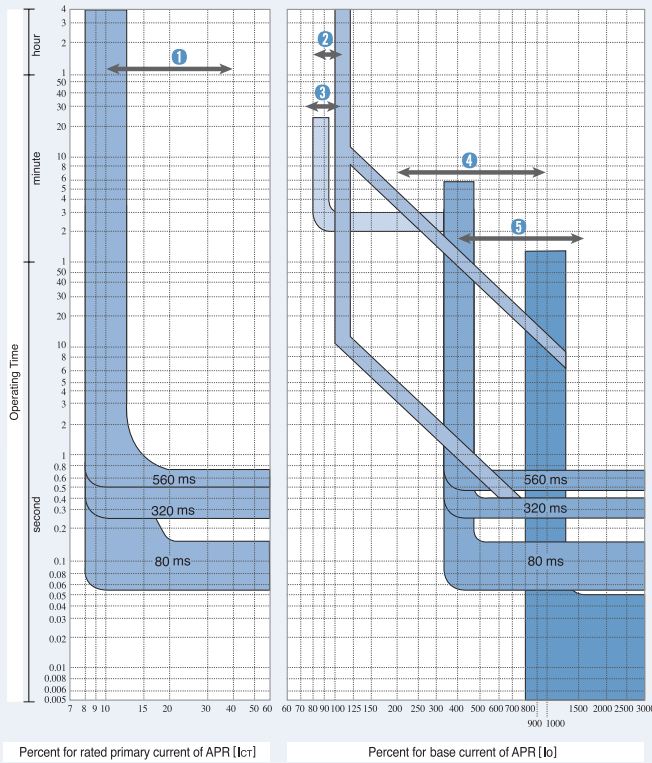


- I₁: LTD current
- I₂: STD current
- I₃: INST current
- I_p: PTA current
- T₁: LTD time
- T₂: STD time
- T_p: PTA time

Type		APR-1S-AS		Tolerance
Protection function	AL (LTD)	Base current (I ₀)	I _{CT} × (0.5-1.0), 1% step	
		Current (I ₁)	I ₀ × (Non-0.8-1.0-1.05-1.1-1.15-1.2-1.25) I ₁ × 1.0 Trip	
		Time (T ₁)	15-20-25-30-40-50-60 sec at I ₁ × 120%	±5%
	AS (STD)	Current (I ₂)	I ₀ × (Non-2-2.5-2.7-3-3.5-4-4.5-5)	±10%
		Time (T ₂)	80-160-240-320-400-480-560 msec, I't is possible by ON/OFF	
	AI (INST)/MCR	Current (I ₃)	I ₀ × (Non-4-6-8-10-12-14-16)	±20%
AP (PTA)	Current (I _p)	I ₀ × (0.75-0.8-0.85-0.9-0.95-1.0-1.05-1.1)	±5%	
	Time (T _p)	5-10-15-20-25-30-35-40-45 sec at I _p × 120%	±15%	
Indication function	CP/I (Individual continuous contact)	1a for AL, AS, AI/MCR, 1a for AP		
	Fault LED	for AL, AS, AI/MCR, AP, System alarm		
Individual control power voltage		AC/DC 100-250V		
Field test		for AL, AS, AI by APR or APR checker		

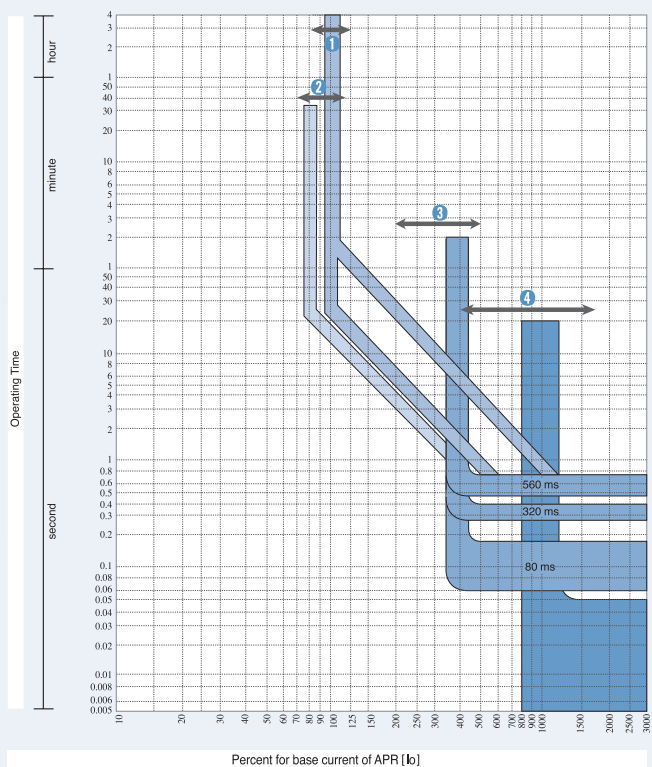
Characteristic Curves

General feeder



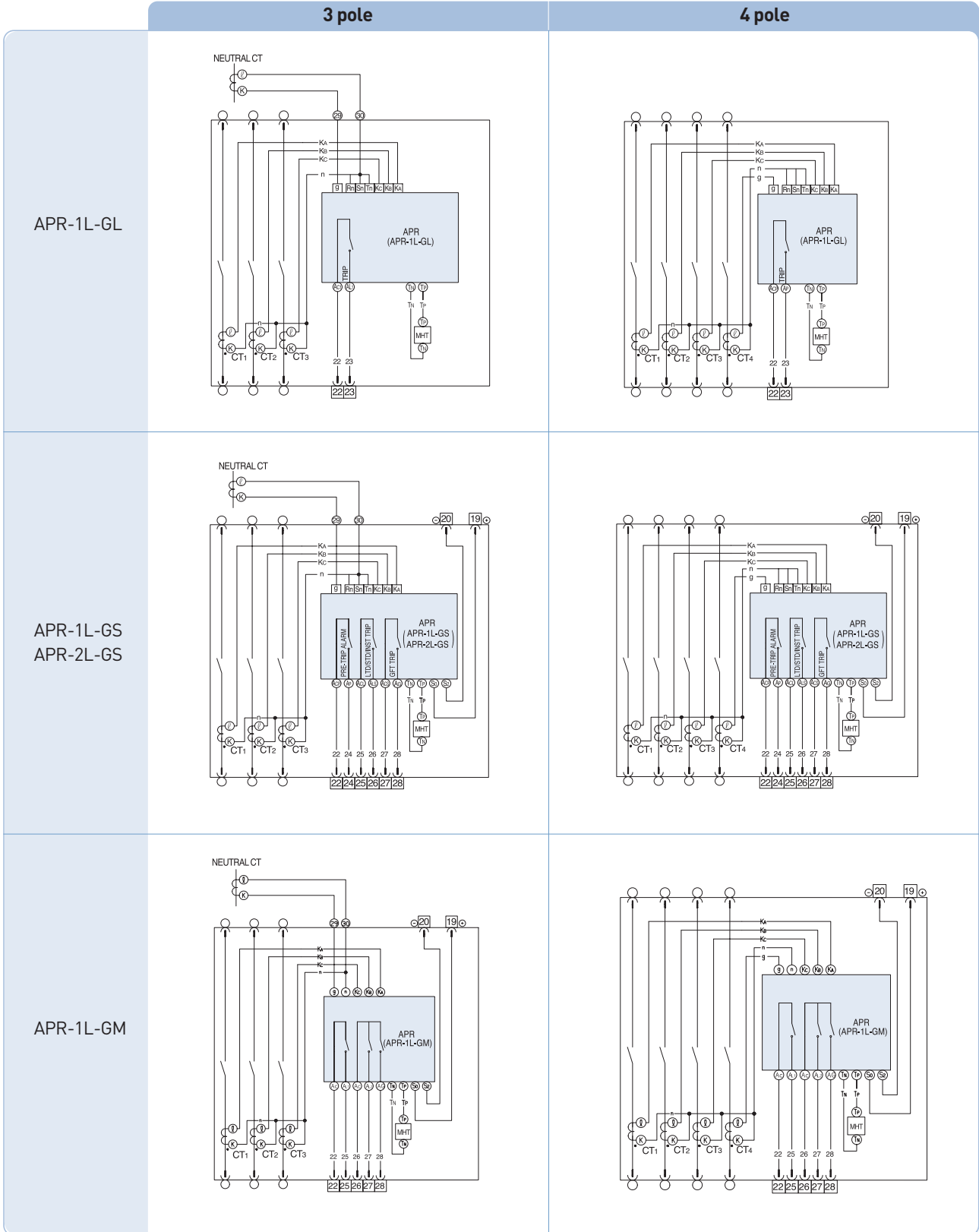
- 1 GFT current setting range (10-40%)
- 2 LTD current setting range (80-110%)
- 3 PTA current setting range (75-110%)
- 4 STD current setting range (200-1000%)
- 5 INST current setting range (400-1600%)

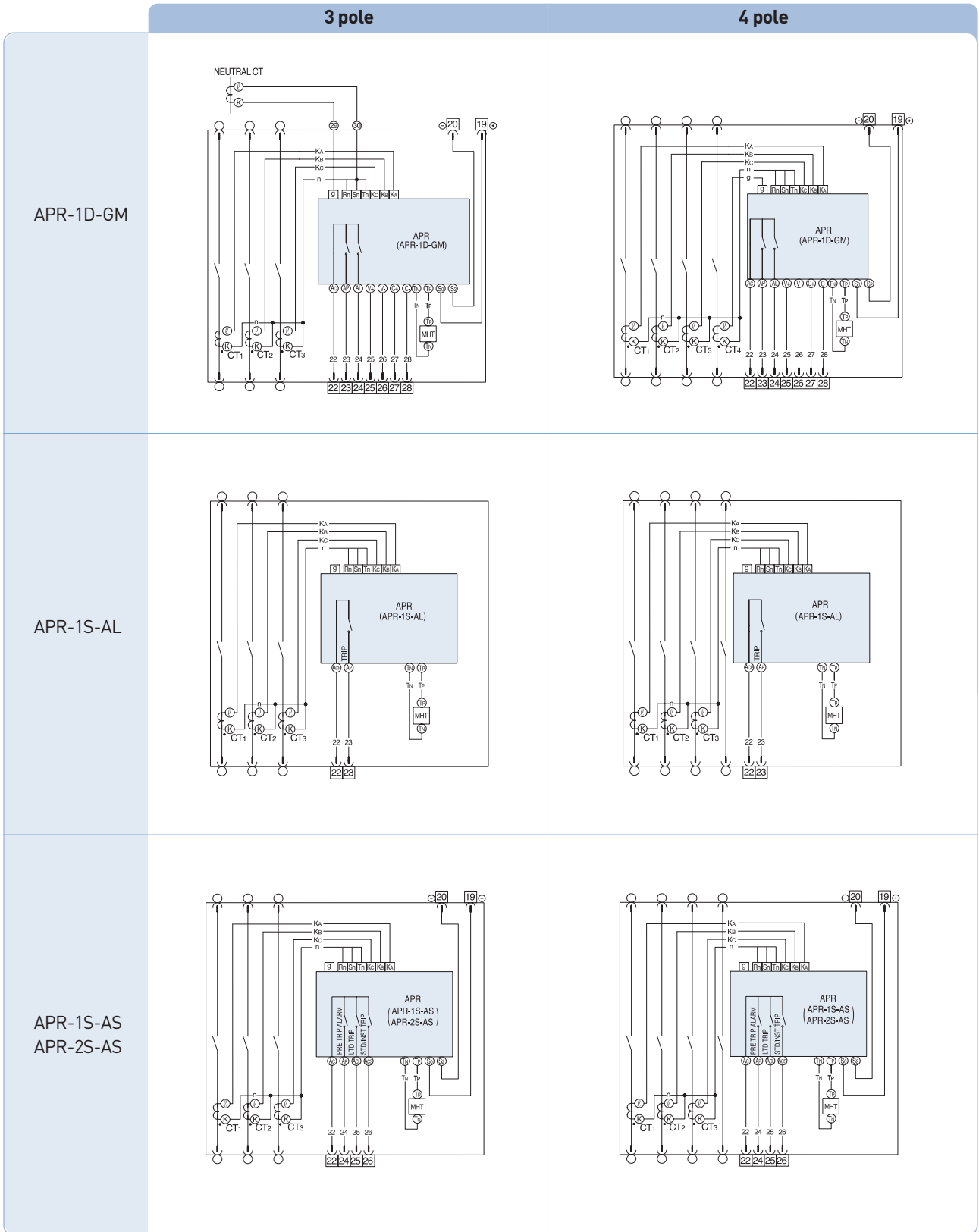
Generator



- 1 LTD current setting range (80-125%)
- 2 PTA current setting range (75-110%)
- 3 STD current setting range (200-500%)
- 4 INST current setting range (400-1600%)

APR Wiring Diagrams



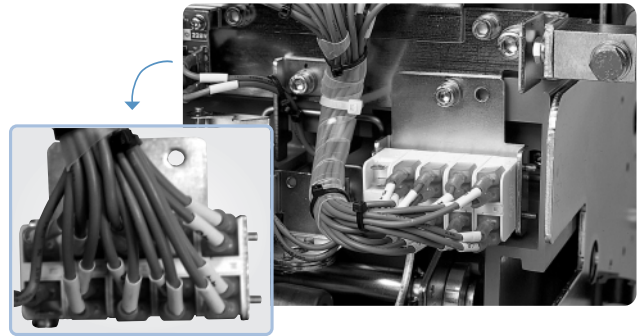


Accessories

Standard components

Auxiliary switch

The auxiliary switch electrically indicates close/open status of ACB. In case of draw-out type, the auxiliary switch indicates the position of connected, test and isolated. The connection parts are ring terminals. HiAN and HiAH type are 4a4b, HiAS type is 3a3b.



Voltage	for general service ①			for microload ②			
	Resistive load (A)	Inductive load (A) AC: $\cos\phi \geq 0.3$ DC: $L/R \geq 0.01$	AC: $\cos\phi \geq 0.3$ DC: $L/R \geq 0.01$	Resistive load (A)	Inductive load (A) AC: $\cos\phi \geq 0.6$ DC: $L/R \geq 0.007$	AC: $\cos\phi \geq 0.6$ DC: $L/R \geq 0.007$	Min. applicable load
AC100-250V	5		5	0.1		0.1	
AC251-500V	5		5	-		-	
DC30V	1		1	0.1		0.1	
DC125-250V	1		1	-		-	

※ ① The chattering of b-contacts due to ON-OFF operation of the ACB lasts for less than 20 ms.
 ② Do not supply different voltages to contacts of a switch.

Position indicator and draw-in/out holes

Connected, test and isolated position can be shown by position indicator. In case of HiAN06-32 and HiAS06-32 type, the draw-in/out hole cover can be padlocked in connected, test and isolated position, and it is possible to prevent the draw-in/out of ACB in careless. The diameter of padlock is $\phi 8$ or $\phi 6$, the padlock is not supplied.



[HiAN06-32, HiAS06-32]



[HiAN40-63, HiAH32]

Draw-in/out handle

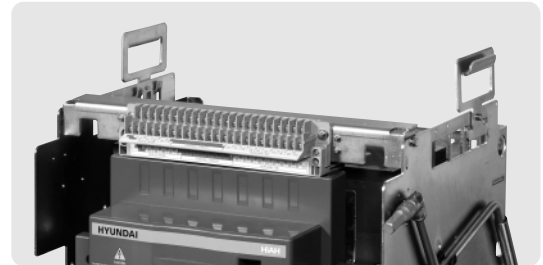
The draw-in/out handle is supplied as a standard item, and it is attached to the side of cradle.

draw-out type only



■ **Lifting lugs**

The lifting lugs can be attached to the side of the ACB body for lifting.



Additional options

■ **Key lock device (Lock in open)**

common / order code AB

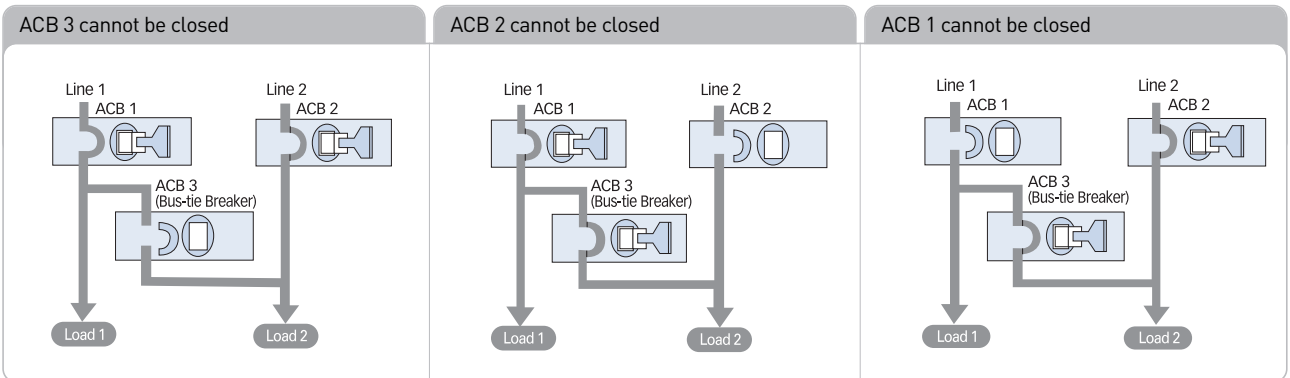
The key lock device prevents operation by unauthorized people.

Lock in open system

- The key shall be removed only in open position of ACB.
 - ACB cannot be closed without the release from open position.
- The key lock device also enables the designing of an interlock system between ACBs and other devices such as switchboard door.



[Interlock system for prevention of parallel closing from two breaker]



■ **Cycle counter**

common / order code AD

The cycle counter shows the number of close/open cycle by a 5 digit display. It can serve as the signal for maintenance or inspection. In case of HiAN and HiAH type, the cycle counter is supplied as standard.

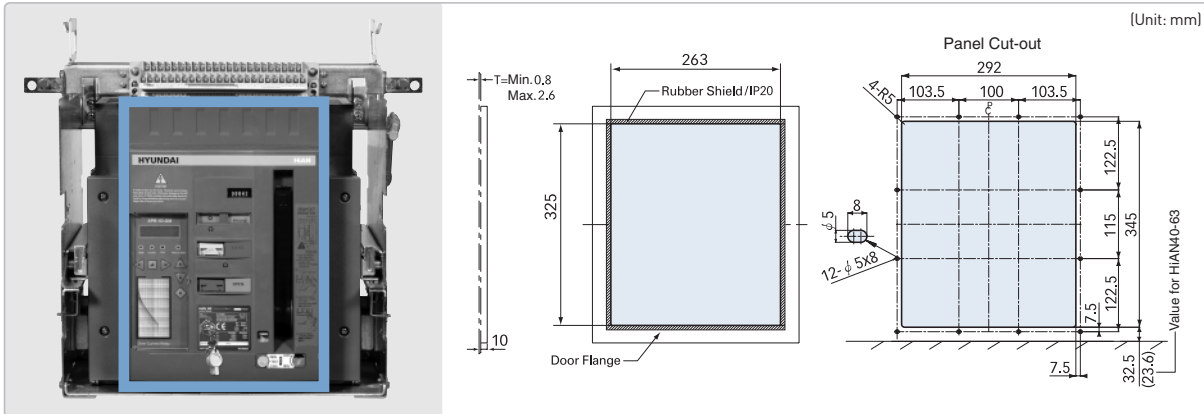


Accessories

■ Door flange

common / order code AG

The door flange can cover the space between the panel cut-out and ACB. It provides IP20 protection as well as makes the cut-out clean.



■ Button lock cover

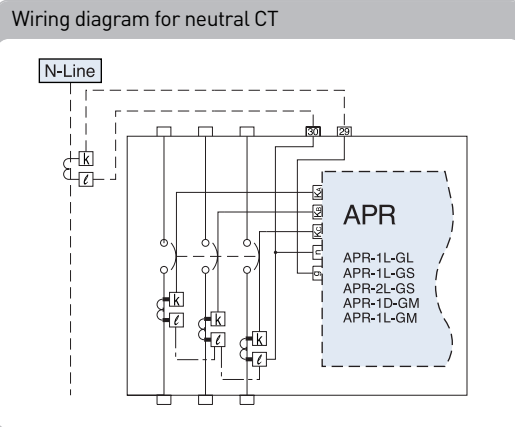
common / order code AM

The button lock cover is installed inside the ACB. It can enable locking in close function to prevent operation by mistake or unauthorized people. The key is not supplied.

■ Neutral line current transformer (Neutral CT)

common / order code AN

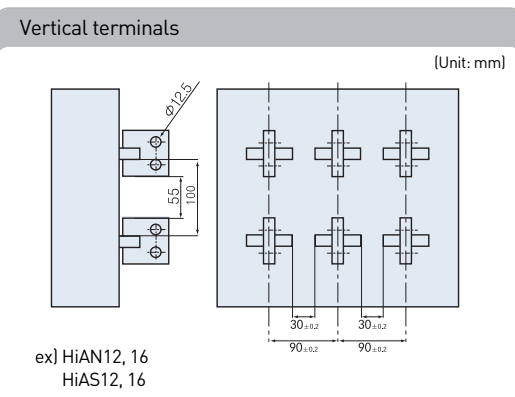
When you use 3 pole ACB with the ground fault trip protection function in 3-phase 4-line distribution system, neutral line current transformer must be installed in the neutral line. In case of 4 pole ACB with the ground fault trip protection function, neutral CT is built in ACB as standard.



■ Vertical type bus-bar

draw-out type only / order code AH

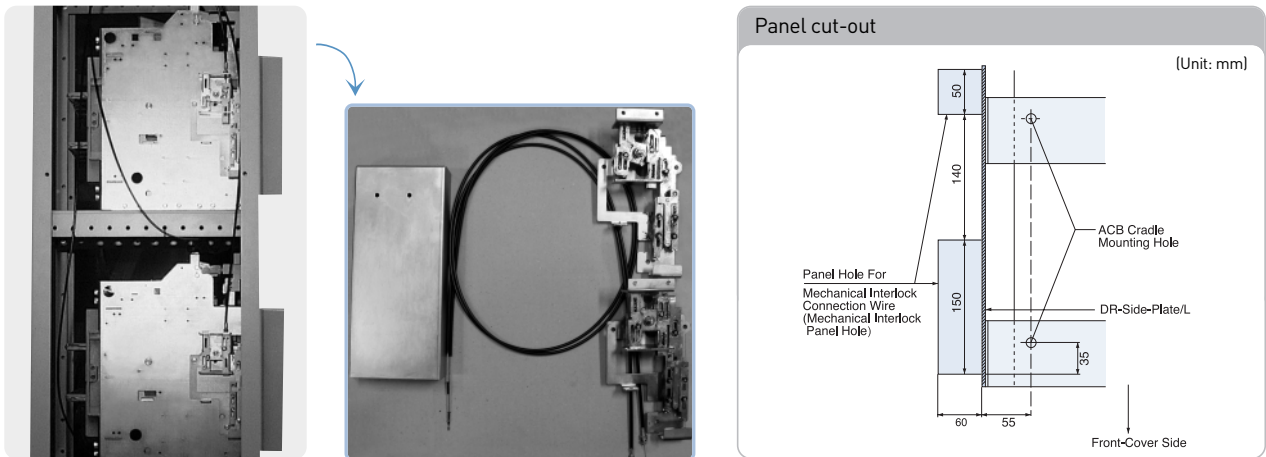
The vertical type bus-bar can be assembled to cradle for wide application.



■ **Mechanical interlock device**

common / order code B1-B4

2 or 3 ACBs can be interlocked mechanically by cables. Mechanical interlock can be realized between all range in same type ACB. Both horizontal and vertical mounting are available. Interlock function shall be worked only in connected position.



■ **Spring charge switch**

common / order code B6

The spring charge switch electrically makes signal for charge condition of ACB.

■ **Extensional auxiliary switch**

common / order code AA

The extensional auxiliary switch 1a1b can be supplied.

■ **Non-flammable cable**

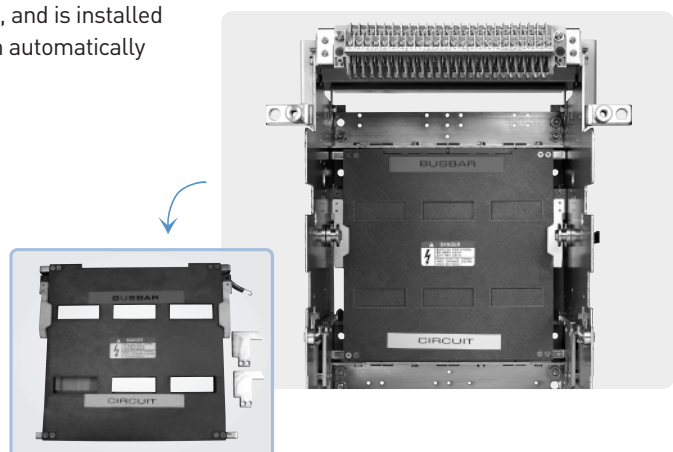
common / order code NC

In case of power plant application, non-flammable cables are recommended to use for better safety.

■ **Safety shutter**

draw-out type only / order code AE

The safety shutter is composed of fixed and moving parts, and is installed in the cradle. When the ACB is drawn out, the shutter can automatically shut down and cut the main circuit safely.

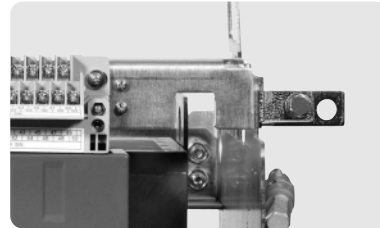


Accessories

■ Fixing blocks

draw-out type only / order code AF

The fixing blocks can be mounted on the cradle to fix the breaker against vibration. For marine application, it is an essential item.



■ Short circuit 'b' contact

draw-out type only / order code AK

The short circuit 'b' contact is used for interlock system to prevent wrong operation in test position. It makes 'b' signal for test or isolated position, and 'a' signal for connected position. The short circuit 'b' contact is generally used for marine application.

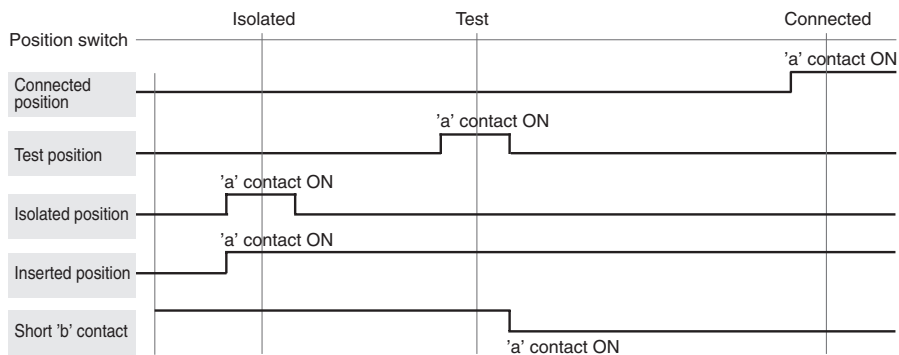
■ Position switch

draw-out type only / order code AQ, AR, AS, AT, AU, AV

The position switch electrically indicates connected, test, isolated and inserted position of ACB. 6 Types are available, and connection cables are not supplied.

- connected: 1C and test: 1C - connected: 2C - test: 2C
- inserted: 1C and isolated: 1C - inserted: 1C - isolated: 2C

Operation sequence of contacts

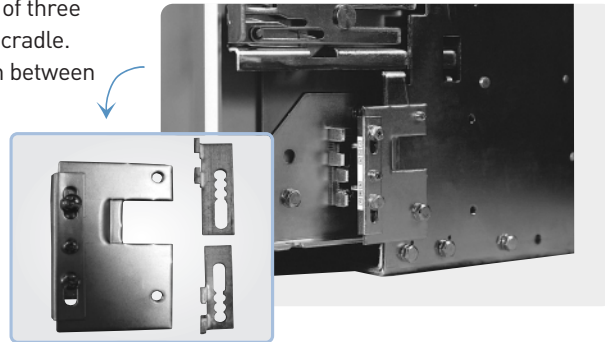


Application	Resistive load	Lamp	Inductive load	Motor
AC250V	10A	1.5A	6A	2A
DC30V	6A	3A	6A	3A
DC125V	0.6A	0.1A	0.6A	0.1A
DC250V	0.3A	0.05A	0.3A	0.05A

■ **Wrong inserting prevention device**

draw-out type only / order code AW

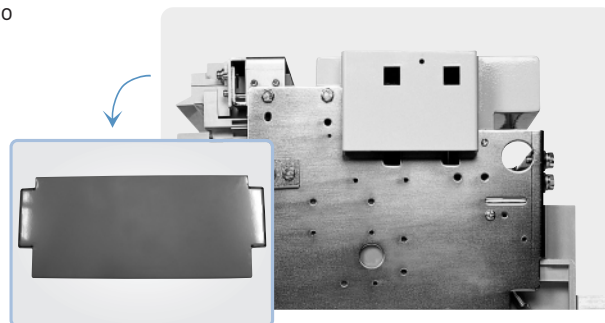
The wrong inserting prevention device is composed of three plates and they are mounted on both ACB body and cradle. This device is used for prevention of wrong insertion between ACB body and cradle.



■ **Arc shield**

draw-out type only / order code AX

The arc shield is mounted on the top side of cradle to increase the safety level.



■ **100% size neutral pole**

HiAN50, 63 only / order code B5

In case of 4 pole HiAN50 and HiAN63, the size of the neutral pole is 50% of the other poles. 100% size neutral pole is available for 4pole HiAN50 and HiAN63. Other type ACBs have 100% size neutral pole as standard.

Portable test equipment

■ **Test jumper**

draw-out type only / order code IANS TJ

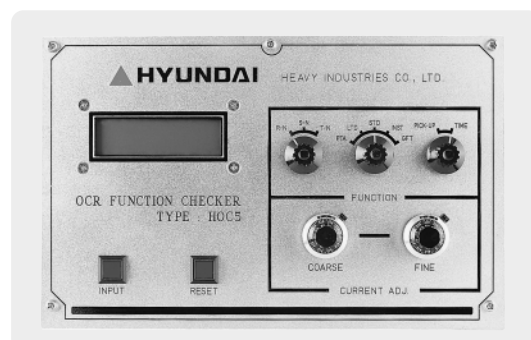
The test jumper is used for the close/open operation test in drawn-out position. It is a connector type, and the cable length is 3.5m.

■ **APR checker**

common / order code IANS H0C5

IANS H0C5 type portable APR checker enables easy inspection of ACB protection relay functions in the field.

Rated input voltage	AC220V, 50/60Hz
Power consumption	10W
Dimensions	220 (W) × 90 (H) × 150 (D)mm
Weight	3kg



Derating Tables

Derated current by the ambient temperature.

Fixed type with horizontal mounting bus-bar

Model	Rated current (A)	Bus-bar size	Derated current by temperature of panel (max.)(A)			
			30	40	50	60
HiAN06, HiAS06	630	1EA×40mm×10mm	630	630	630	630
HiAN08, HiAS08	800	1EA×60mm×10mm	800	800	800	800
HiAN10, HiAS10	1000	1EA×60mm×10mm	1000	1000	1000	1000
HiAN12, HiAS12	1250	1EA×60mm×10mm	1250	1250	1250	1250
		2EA×40mm×10mm	1250	1250	1250	1250
HiAN16, HiAS16	1600	2EA×40mm×10mm	1600	1600	1600	1560
		2EA×60mm×10mm	1600	1600	1600	1600
HiAN20, HiAS20	2000	2EA×60mm×10mm	2000	2000	2000	2000
HiAN25, HiAS25	2500	2EA×100mm×10mm	2500	2500	2500	2350
HiAN32, HiAS32	3200	3EA×100mm×10mm	3200	3200	3020	2760
		4EA×100mm×10mm	3200	3200	3200	3160

Draw-out type with horizontal mounting bus-bar

Model	Rated current (A)	Bus-bar size	Derated current by temperature of panel (max.)(A)			
			30	40	50	60
HiAN06, HiAS06	630	1EA×40mm×10mm	630	630	630	630
HiAN08, HiAS08	800	1EA×60mm×10mm	800	800	800	800
HiAN10, HiAS10	1000	1EA×50mm×10mm	1000	1000	1000	900
		1EA×60mm×10mm	1000	1000	1000	990
HiAN12, HiAS12	1250	1EA×60mm×10mm	1250	1250	1140	990
		2EA×40mm×10mm	1250	1250	1250	1150
HiAN16, HiAS16	1600	2EA×40mm×10mm	1600	1480	1330	1150
		2EA×50mm×10mm	1600	1600	1560	1350
		2EA×60mm×10mm	1600	1600	1600	1540
HiAN20, HiAS20	2000	2EA×60mm×10mm	2000	1980	1770	1540
		2EA×80mm×10mm	2000	2000	2000	1890
		2EA×100mm×10mm	2000	2000	2000	2000
HiAN25, HiAS25	2500	2EA×80mm×10mm	2500	2430	2180	1890
		2EA×100mm×10mm	2500	2500	2500	2220
HiAN32, HiAS32	3200	3EA×100mm×10mm	3190	3010	2830	2590
		4EA×100mm×10mm	3200	3120	2930	2740

Draw-out type with vertical mounting bus-bar

Model	Rated current (A)	Bus-bar size	Derated current by temperature of panel (max.)(A)			
			30	40	50	60
HiAN06, HiAS06, HiAH32	630	1EA×40mm×10mm	630	630	630	630
HiAN08, HiAS08, HiAH32	800	1EA×60mm×10mm	800	800	800	800
HiAN10, HiAS10, HiAH32	1000	1EA×50mm×10mm	1000	1000	1000	950
		1EA×60mm×10mm	1000	1000	1000	1000
HiAN12, HiAS12, HiAH32	1250	1EA×60mm×10mm	1250	1250	1250	1100
		2EA×40mm×10mm	1250	1250	1250	1250
HiAN16, HiAS16, HiAH32	1600	2EA×40mm×10mm	1600	1600	1600	1440
		2EA×50mm×10mm	1600	1600	1600	1580
		2EA×60mm×10mm	1600	1600	1600	1600
HiAN20, HiAS20, HiAH32	2000	2EA×60mm×10mm	2000	2000	2000	1920
		2EA×80mm×10mm	2000	2000	2000	2000
		2EA×100mm×10mm	2000	2000	2000	2000
HiAN25, HiAS25, HiAH32	2500	2EA×80mm×10mm	2500	2500	2500	2360
		2EA100mm×10mm	2500	2500	2500	2500
HiAN32, HiAS32, HiAH32	3200	3EA×80mm×10mm	3200	3150	2950	2750
		2EA×100mm×10mm	3190	3010	2830	2650
		3EA×100mm×10mm	3200	3200	3070	2860
		4EA×100mm×10mm	3200	3200	3200	3120
HiAN40	4000	3EA×140mm×10mm	4000	4000	3880	3560
HiAN50	5000	4EA×140mm×10mm	5000	5000	5000	4800
HiAN63	6300	6EA×140mm×10mm	6300	6300	6000	5800

Internal Resistance

HiAN & HiAH type

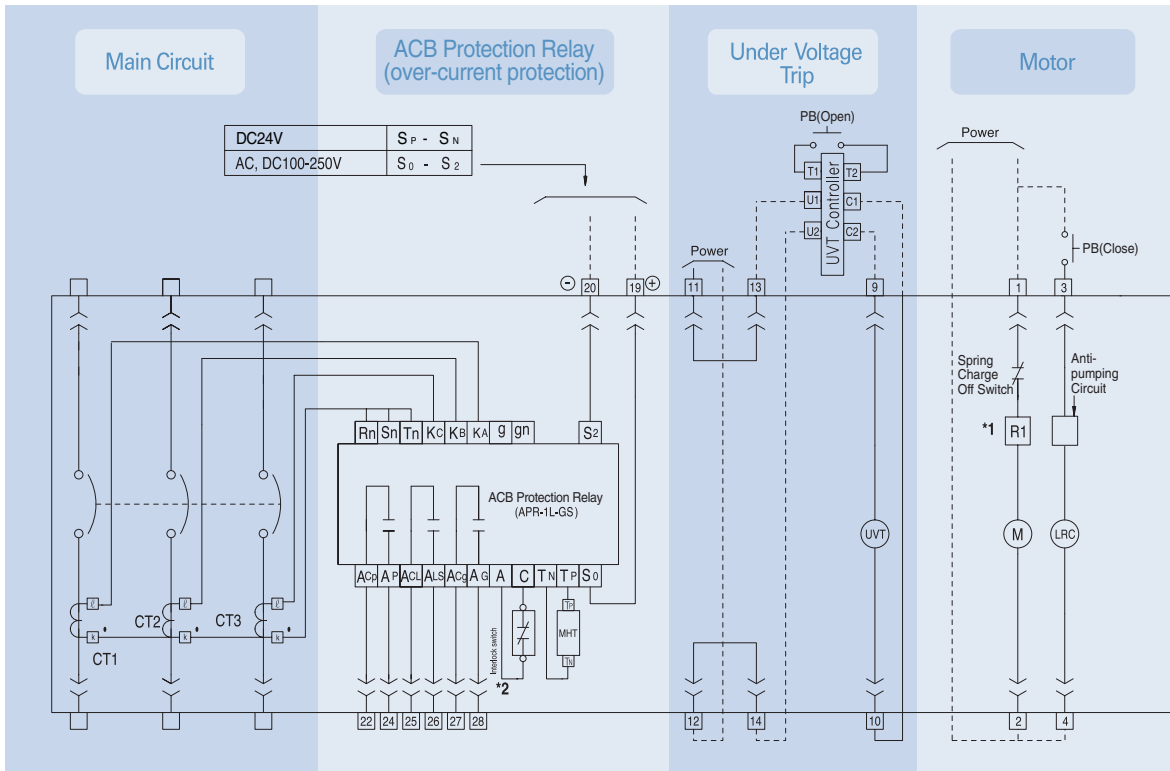
		HiAN06-10	HiAN12	HiAN16	HiAN20	HiAN25	HiAN32	HiAN40	HiAN50	HiAN63	HiAH32
Internal resistance (μΩ)	Draw-out type	66	48	48	30	24	22	20	15	10	20
	Fixed type	38	20	20	16	14	13	-	-	-	-
Power consumption (W)	Draw-out type	26/42/66	75	123	120	150	225	320	375	397	205
	Fixed type	15/24/38	31	51	64	87.5	133	-	-	-	-
Reactance (mΩ)	Draw-out type	0.12	0.1	0.085	0.08	0.065	0.055	0.045	0.035	0.03	0.045
	Fixed type	0.12	0.1	0.085	0.08	0.065	0.055	-	-	-	-

HiAS type

		HiAS06-10	HiAS12	HiAS16	HiAS20	HiAS25	HiAS32
Internal resistance (μΩ)	Draw-out type	76	66	48	30	24	22
	Fixed type	48	38	20	16	14	13
Power consumption (W)	Draw-out type	30/49/76	103	123	120	150	225
	Fixed type	19/31/48	59	51	64	87.5	133

Circuit Diagrams

HiAN & HiAH draw-out type / APR-1L-GS



*1: Attach at rated voltage DC125V *2: Option (MCR)

Main Circuit

CT: Current Transformer for APR

APR Protection Relay / APR-1L-GS (over-current protection)

19	20	Control Power Terminal (CP/I)
22	24	AP Indication Terminal
25	26	AL AS AI Indication Terminal
27	28	AG Indication Terminal

MHT Magnetic Hold Trigger

※ For other type APR, please refer to page 26, 27.

Under Voltage Trip (UVT)

11	12	Control Power Terminal
T1	T2	Remote Trip Terminal
UVT		Under Voltage Trip Coil

Spring Charge Switch

15	16	Spring Charge Switch Terminal
----	----	-------------------------------

Motor Charging/Closing Circuits

1	2	Charging Power Terminal
3	4	Closing Power Terminal
M		Charging Motor
LRC		Latch Release Coil
R1		Resistance

Shunt Trip (SHT)

7	8	Control Power Terminal
SHT		Shunt Trip Coil

Condenser Trip (CTD)

U	V	Control Power Terminal
P	N	Remote Trip Terminal
CTD		Condenser Trip Device

Auxiliary Switch

31-46	Auxiliary Contact Terminal
47-50	Extensional Auxiliary Contact (1a1b)

※ - In case that you use shunt trip in combination with under voltage trip, 1a contact [33, 34] shall be used in the circuit of under voltage trip.
- Extensional auxiliary contact 1a1b is not applicable to HiAN40-63 and HiAH32.

Position Switch

TEST position

61-62 ON
61-63 OFF
64-65 ON
64-66 OFF

CONNECTED position

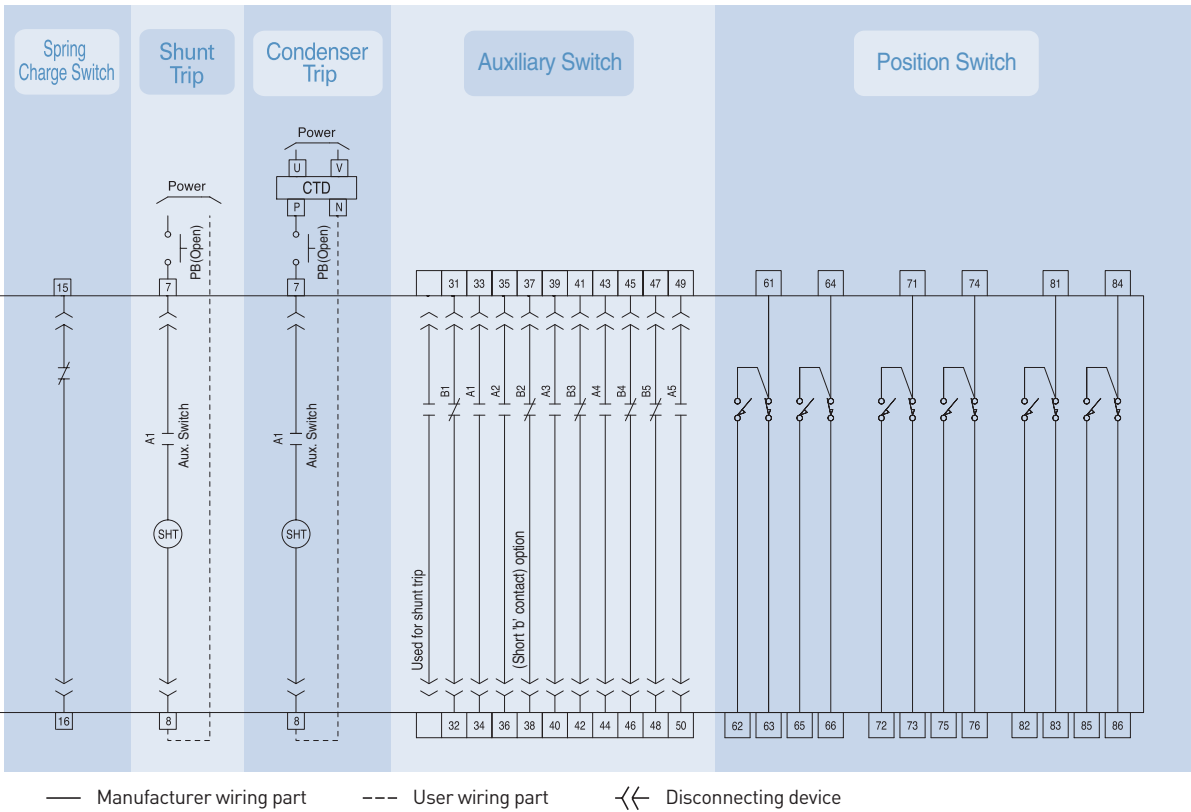
71-72 ON
71-73 OFF
74-75 ON
74-76 OFF

ISOLATED position

81-82 ON
81-83 OFF

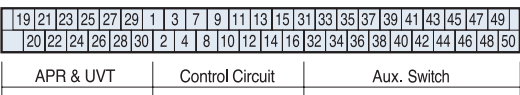
INSERTED position

84-85 ON
84-86 OFF

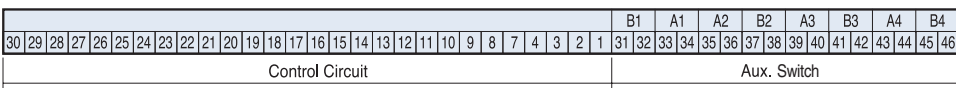


Control Circuit Lay-out

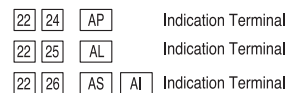
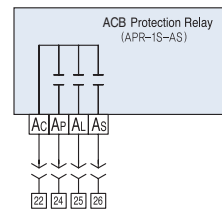
Draw-out Type



Fixed Type

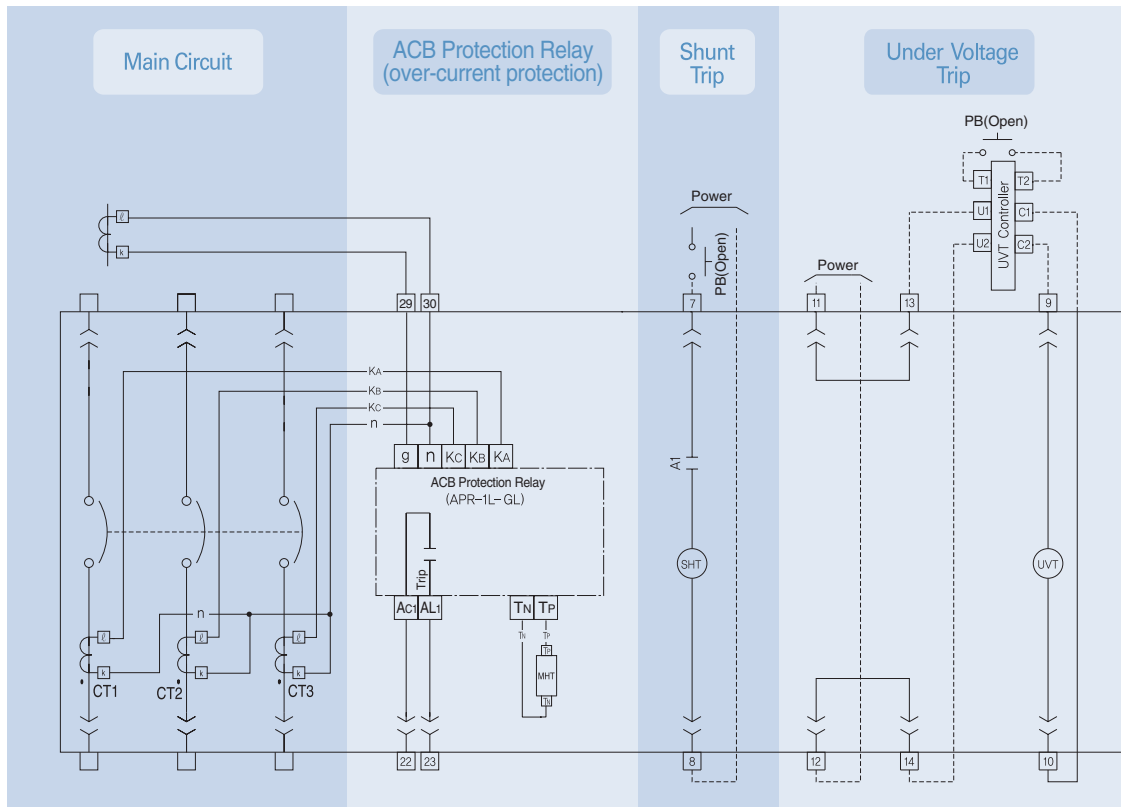


APR-1S-AS type APR



Circuit Diagrams

HiAS type / APR-1L-GL



*1: Attach at rated voltage DC125V

Main Circuit

CT: Current Transformer for APR

APR Protection Relay / APR-1L-GL (over-current protection)

- 19 20 Control Power Terminal (CP/I)
- 22 25 AL AS AI Indication Terminal
- 26 27 AL AS AI Indication Terminal
- MHT Magnetic Hold Trigger

※ For other type APR, please refer to page 39.

Under Voltage Trip (UVT)

- 9 10 Control Power Terminal
- T1 T2 Remote Trip Terminal
- UVT Under Voltage Trip Coil

Spring Charge Switch

- 15 16 Spring Charge Switch Terminal

Motor Charging/Closing

- 1 2 Charging Power Terminal
- 3 4 Closing Power Terminal
- M Charging Motor
- LRC Latch Release Coil
- RI Resistance

Shunt Trip (SHT)

- 7 8 Control Power Terminal
- SHT Shunt Trip Coil

Capacitor Trip (CTD)

- U V Control Power Terminal
- P N Remote Trip Terminal
- CTD Condensor Trip Device

Auxiliary Switch

- 31 42 Auxiliary Contact Terminal

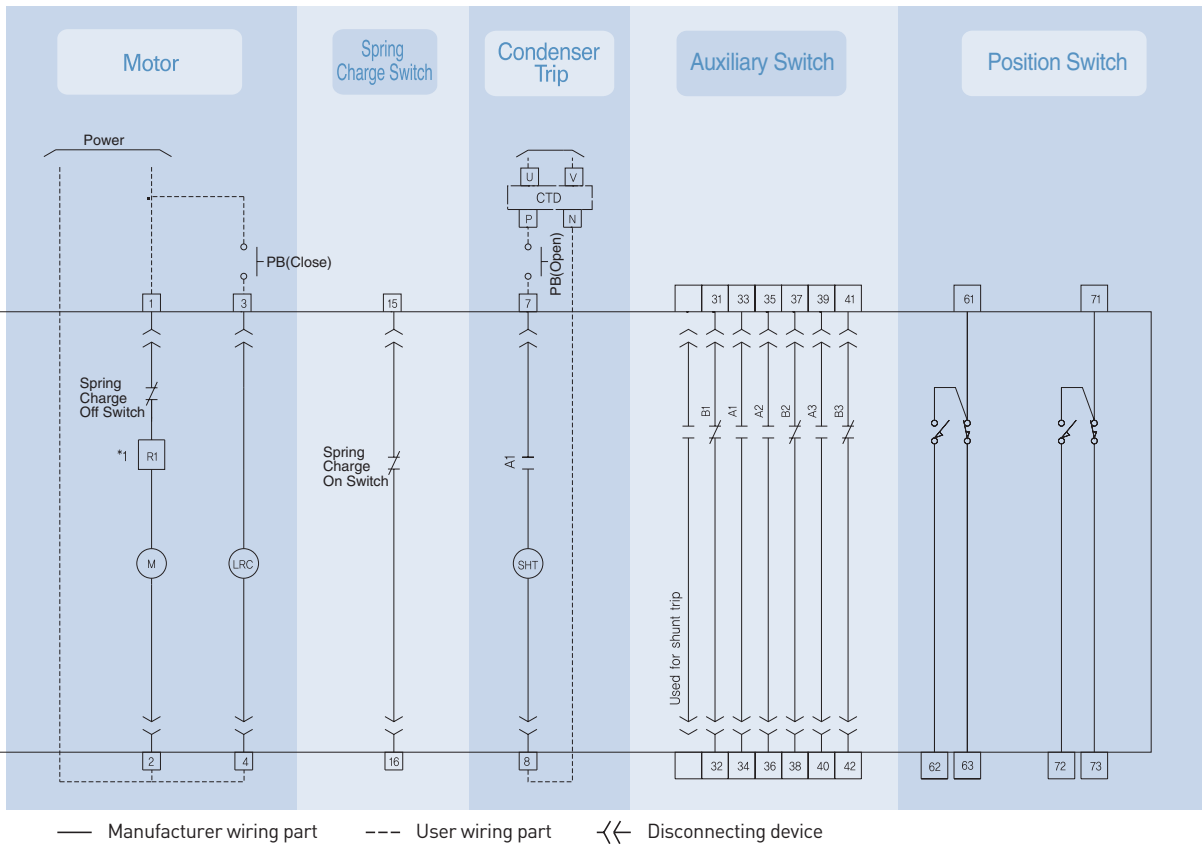
Position Switch

TEST position

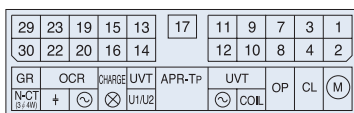
- 61-62 ON
- 61-63 OFF
- 64-65 ON
- 64-66 OFF

CONNECTED position

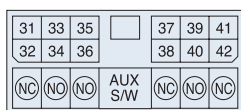
- 71-72 ON
- 71-73 OFF
- 74-75 ON
- 74-76 OFF



Control Circuit Lay-out

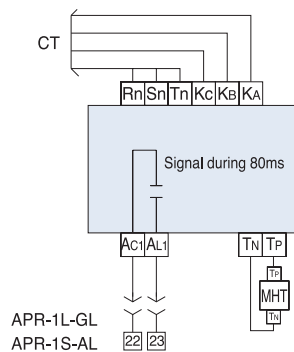


< Control Circuit >



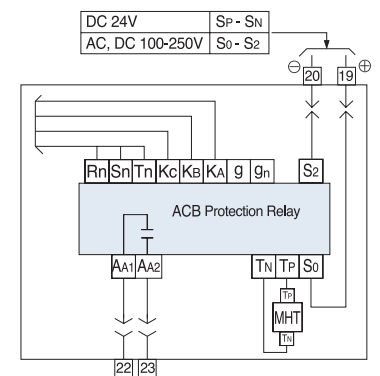
< Aux. Switch >

APR-1L-GL, APR-1S-AL type APR



APR-1L-GL
APR-1S-AL

APR-1L-GM type APR

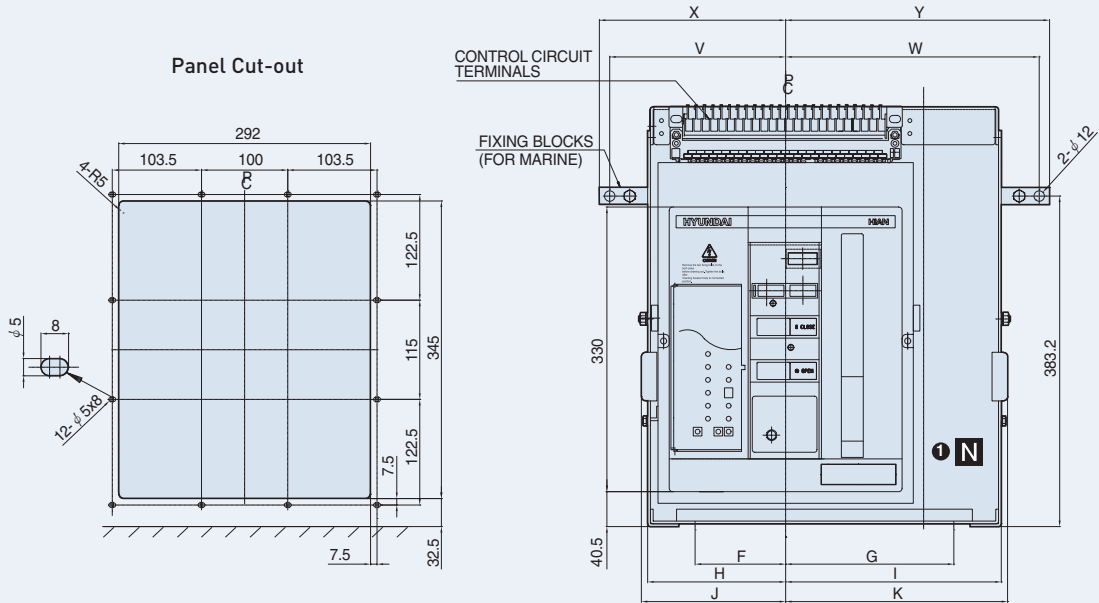


19 20 Control Power Terminal (CP/I)
22 23 AL AS AI AG Indication Terminal

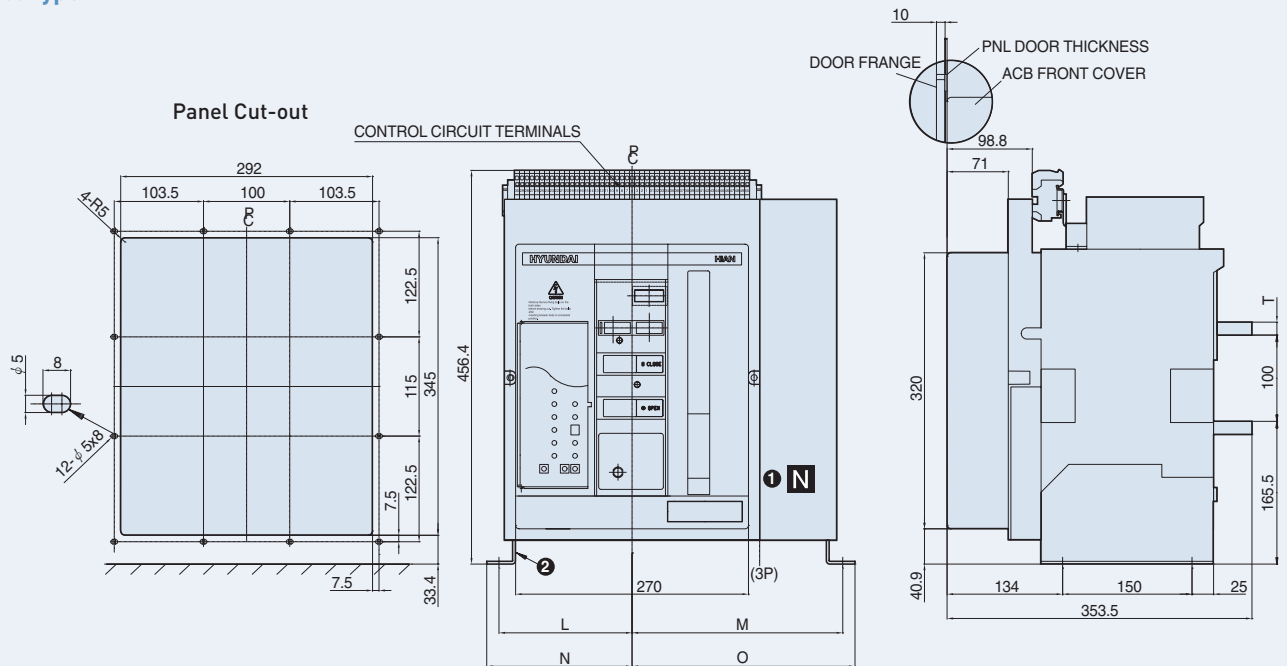
Dimensions

HiAN06-32 with horizontal bus-bar

Draw-out type



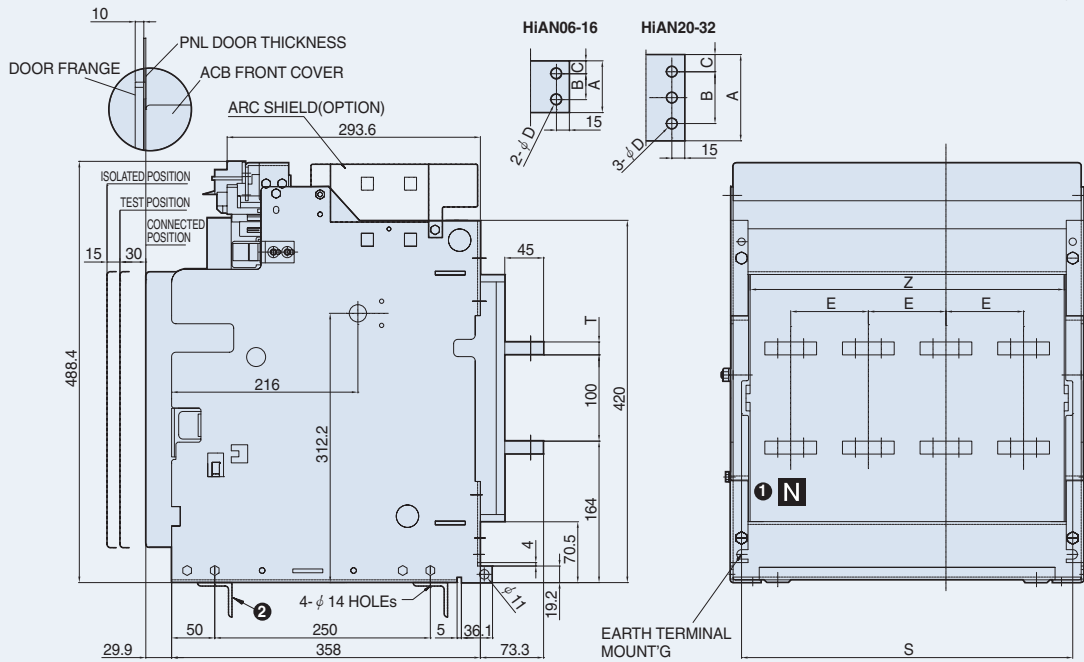
Fixed type



※ ① N is neutral pole of 4 pole breaker.
 ※ ② Mounting angle is not supplied.

(Unit: mm)

P: Front PNL Center Line
C: Front PNL Center Line



3 pole

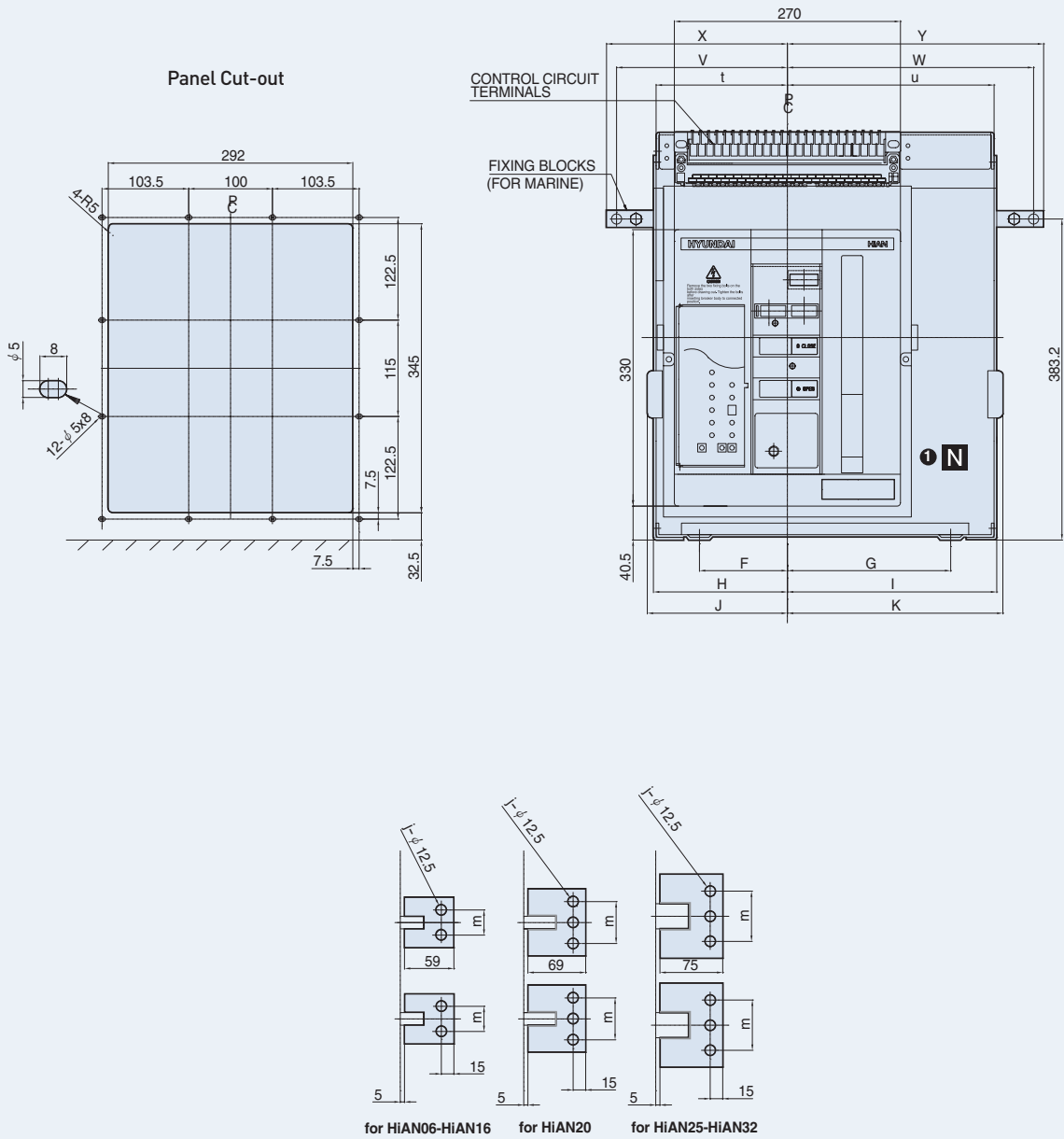
Model	Dimensions (mm)																								
	A		B		C		D	E	F	G	H	I	J	K	L	M	N	O	T	V	W	X	Y	Z	S
	Draw-out	Fixed	Draw-out	Fixed	Draw-out	Fixed																			
HiAN06 HiAN10	60	60	30	30	15	15	12.5	90	105	105	160	160	167.3	167.3	154.3	154.3	168.5	168.5	8	204	204	216	216	277.8	294
HiAN12 HiAN16	60	60	30	30	15	15	12.5	90	105	105	160	160	167.3	167.3	154.3	154.3	168.5	168.5	15	204	204	216	216	277.8	294
HiAN20	80	80	50	50	15	15	12.5	120	150	150	205	205	212.3	209.3	199.3	199.3	213.5	213.5	15	249	249	261	261	367.8	384
HiAN25	100	80	60	50	20	15	12.5	120	150	150	205	205	212.3	209.3	199.3	199.3	213.5	213.5	22	249	249	261	261	367.8	384
HiAN32	100	80	60	50	20	15	12.5	120	150	150	205	205	212.3	209.3	199.3	199.3	213.5	213.5	30	249	249	261	261	367.8	384

4 pole

Model	Dimensions (mm)																								
	A		B		C		D	E	F	G	H	I	J	K	L	M	N	O	T	V	W	X	Y	Z	S
	Draw-out	Fixed	Draw-out	Fixed	Draw-out	Fixed																			
HiAN06 HiAN10	60	60	30	30	15	15	12.5	90	105	195	160	250	167.3	257.3	154.3	244.3	168.5	258.5	8	204	294	216	306	367.8	384
HiAN12 HiAN16	60	60	30	30	15	15	12.5	90	105	195	160	250	167.3	257.3	154.3	244.3	168.5	258.5	15	204	294	216	306	367.8	384
HiAN20	80	80	50	50	15	15	12.5	120	150	270	205	325	212.3	332.3	199.3	319.3	213.5	333.5	15	249	369	261	381	487.8	504
HiAN25	100	80	60	50	20	15	12.5	120	150	270	205	325	212.3	332.3	199.3	319.3	213.5	333.5	22	249	369	261	381	487.8	504
HiAN32	100	80	60	50	20	15	12.5	120	150	270	205	325	212.3	332.3	199.3	319.3	213.5	333.5	30	249	369	261	381	487.8	504

Dimensions

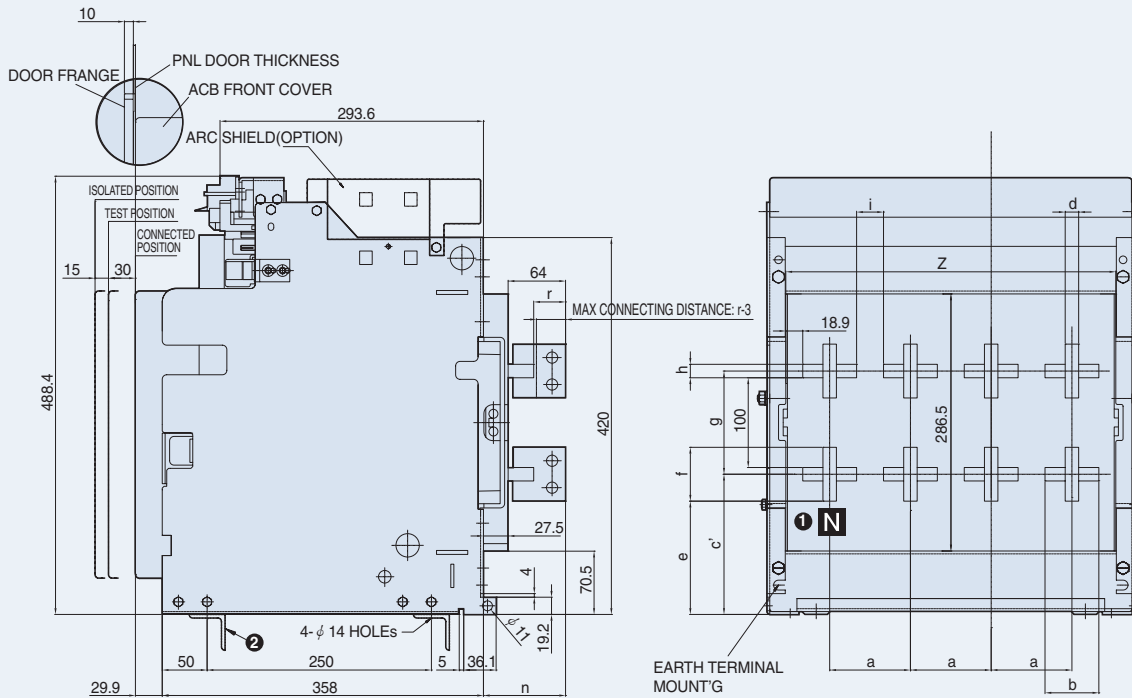
HiAN06-32 with vertical bus-bar, draw-out type only



※ ① N is neutral pole of 4 pole breaker.
 ※ ② Mounting angle is not supplied.

(Unit: mm)

P: Front PNL Center Line
C: Front PNL Center Line



3 pole

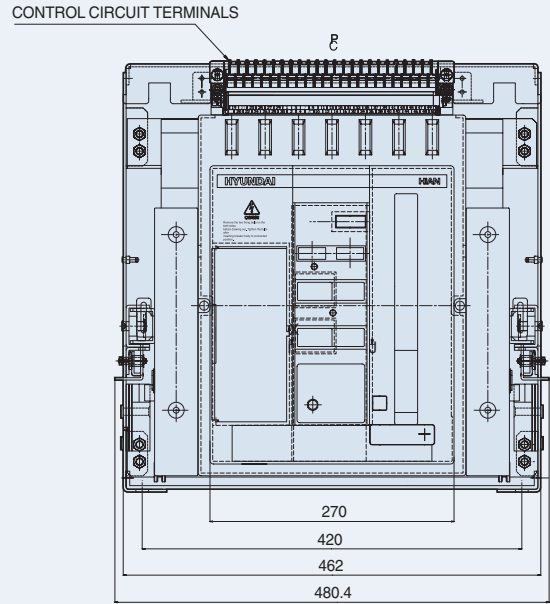
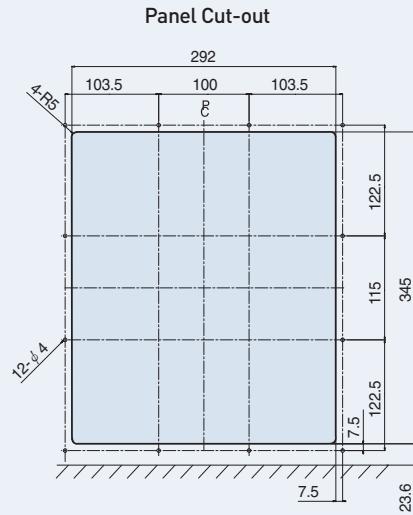
Model	Dimensions (mm)																									
	F	G	H	I	J	K	V	W	X	Y	Z	a	b	c'	d	e	f	g	h	i	j	m	n	r	t	u
HiAN06 HiAN10	105	105	160	160	167.3	167.3	204	204	216	216	277.8	90	60	160.75	8	130.75	60	108	8	30	12	30	92.2	35.5	156.8	156.8
HiAN12 HiAN16	105	105	160	160	167.3	167.3	204	204	216	216	277.8	90	60	157.25	15	127.25	60	115	15	30	12	30	92.2	35.5	156.8	156.8
HiAN20	150	150	205	205	212.3	212.3	249	249	261	261	367.8	120	80	157.25	15	117.25	80	115	15	40	18	50	102.2	35.5	201.8	201.8
HiAN25	150	150	205	205	212.3	212.3	249	249	261	261	367.8	120	100	153.75	22	103.75	100	122	22	20	18	60	108.3	35	201.8	201.8
HiAN32	150	150	205	205	212.3	212.3	249	249	261	261	367.8	120	100	149.75	30	99.75	100	130	30	20	18	60	108.3	40	201.8	201.8

4 pole

Model	Dimensions (mm)																									
	F	G	H	I	J	K	V	W	X	Y	Z	a	b	c'	d	e	f	g	h	i	j	m	n	r	t	u
HiAN06 HiAN10	105	195	160	250	167.3	257.3	204	294	216	306	367.8	90	60	160.75	8	130.75	60	108	8	30	16	30	92.2	35.5	156.8	246.8
HiAN12 HiAN16	105	195	160	250	167.3	257.3	204	294	216	306	367.8	90	60	157.25	15	127.25	60	115	15	30	16	30	92.2	35.5	156.8	246.8
HiAN20	150	270	205	325	212.3	332.3	249	369	261	381	487.8	120	80	157.25	15	117.25	80	115	15	40	24	50	102.2	35.5	201.8	321.8
HiAN25	150	270	205	325	212.3	332.3	249	369	261	381	487.8	120	100	153.75	22	103.75	100	122	22	20	24	60	108.3	35	201.8	321.8
HiAN32	150	270	205	325	212.3	332.3	249	369	261	381	487.8	120	100	149.75	30	99.75	100	130	30	20	24	60	108.3	40	201.8	321.8

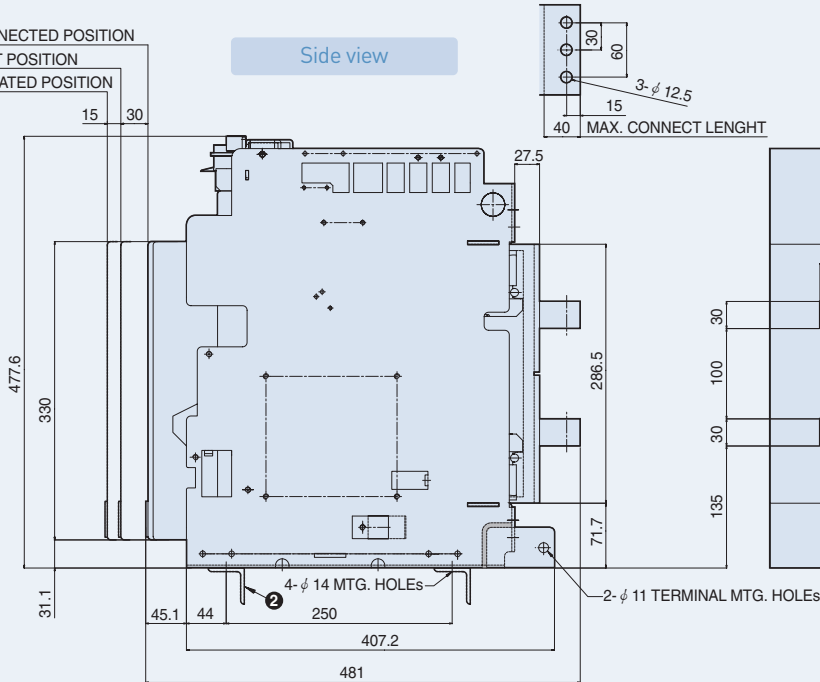
Dimensions

HiAN40 with horizontal bus-bar, draw-out type only

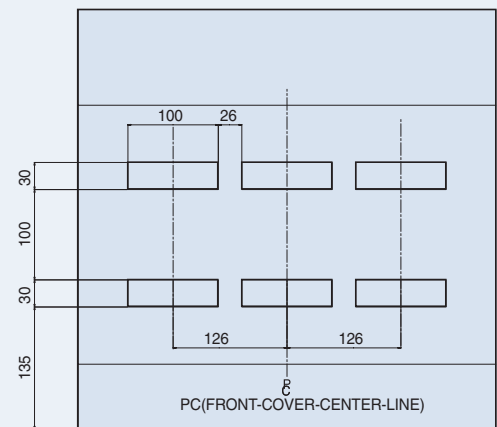


CONNECTED POSITION
TEST POSITION
ISOLATED POSITION

Side view



Rear view of 3 pole

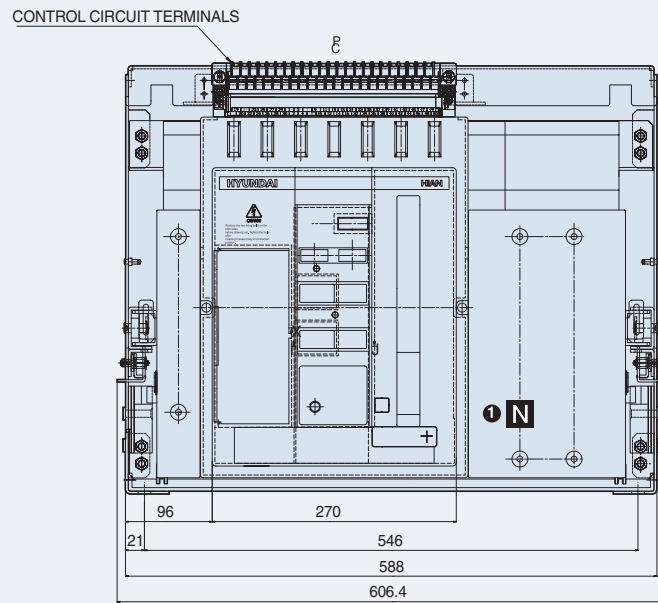


※ ① N is neutral pole of 4 pole breaker.
② Mounting angle is not supplied.

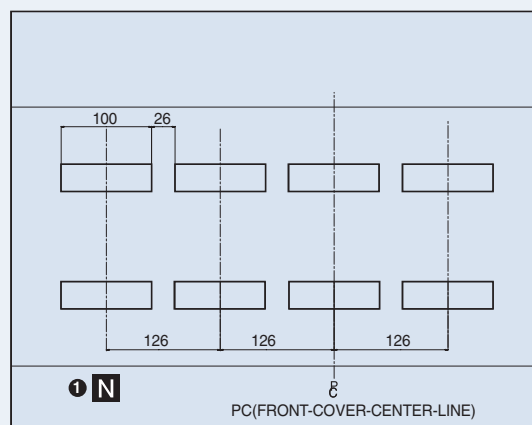
(Unit: mm)

P: Front PNL Center Line
C: Front PNL Center Line

Front view of 4 pole

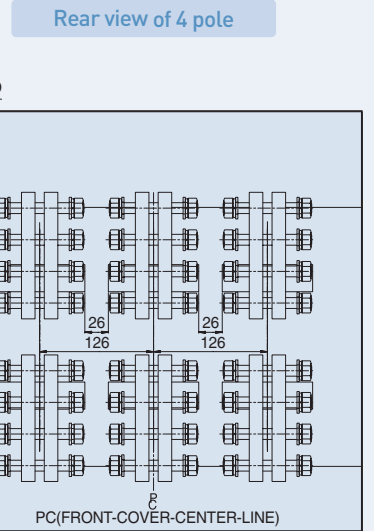
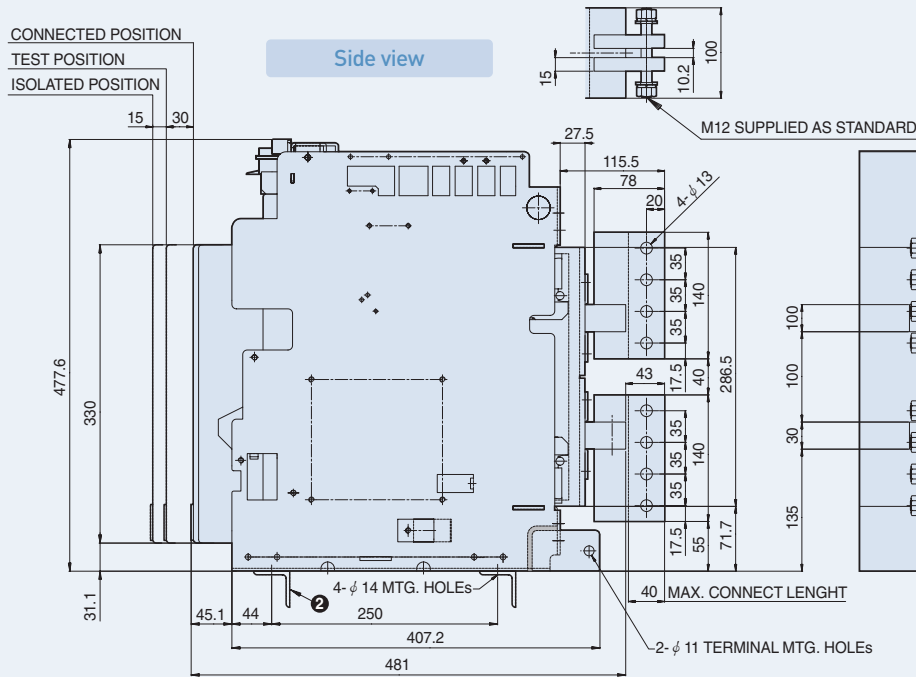
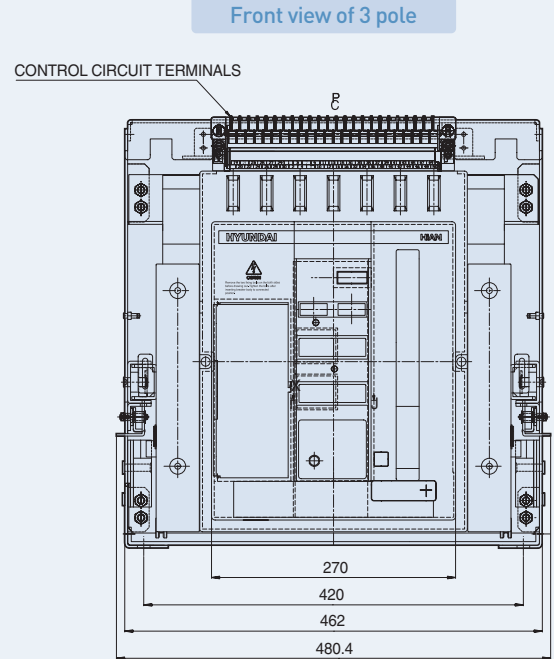
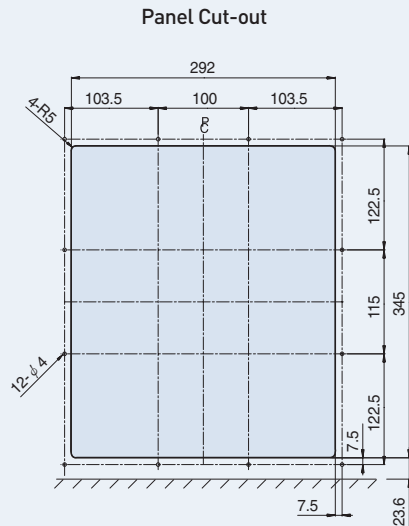


Rear view of 4 pole



Dimensions

HiAN40 with vertical bus-bar, draw-out type only

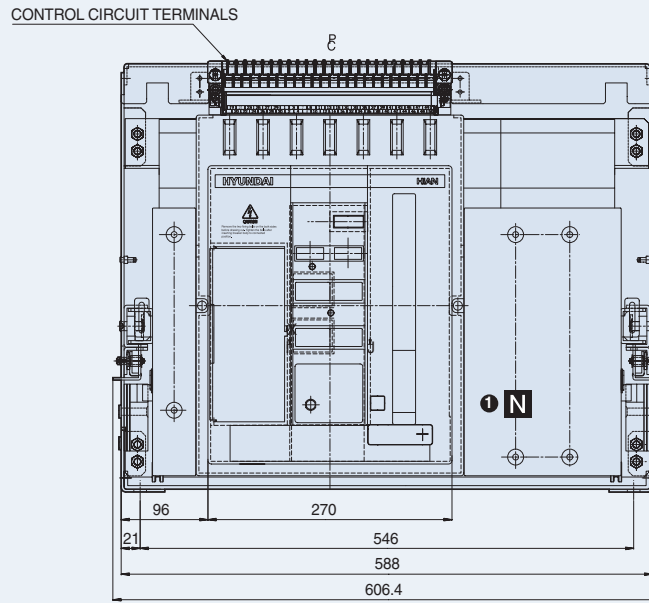


※ ① N is neutral pole of 4 pole breaker.
② Mounting angle is not supplied.

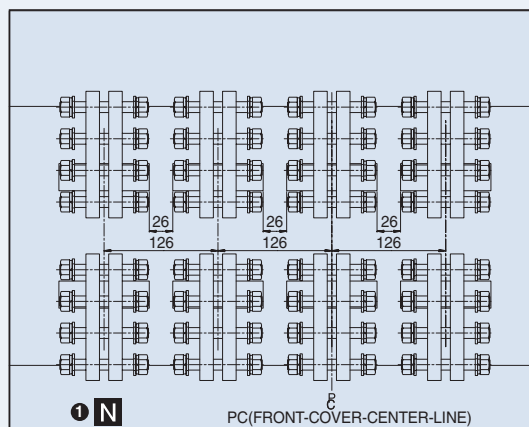
(Unit: mm)

Ⓒ: Front PNL Center Line

Front view of 4 pole

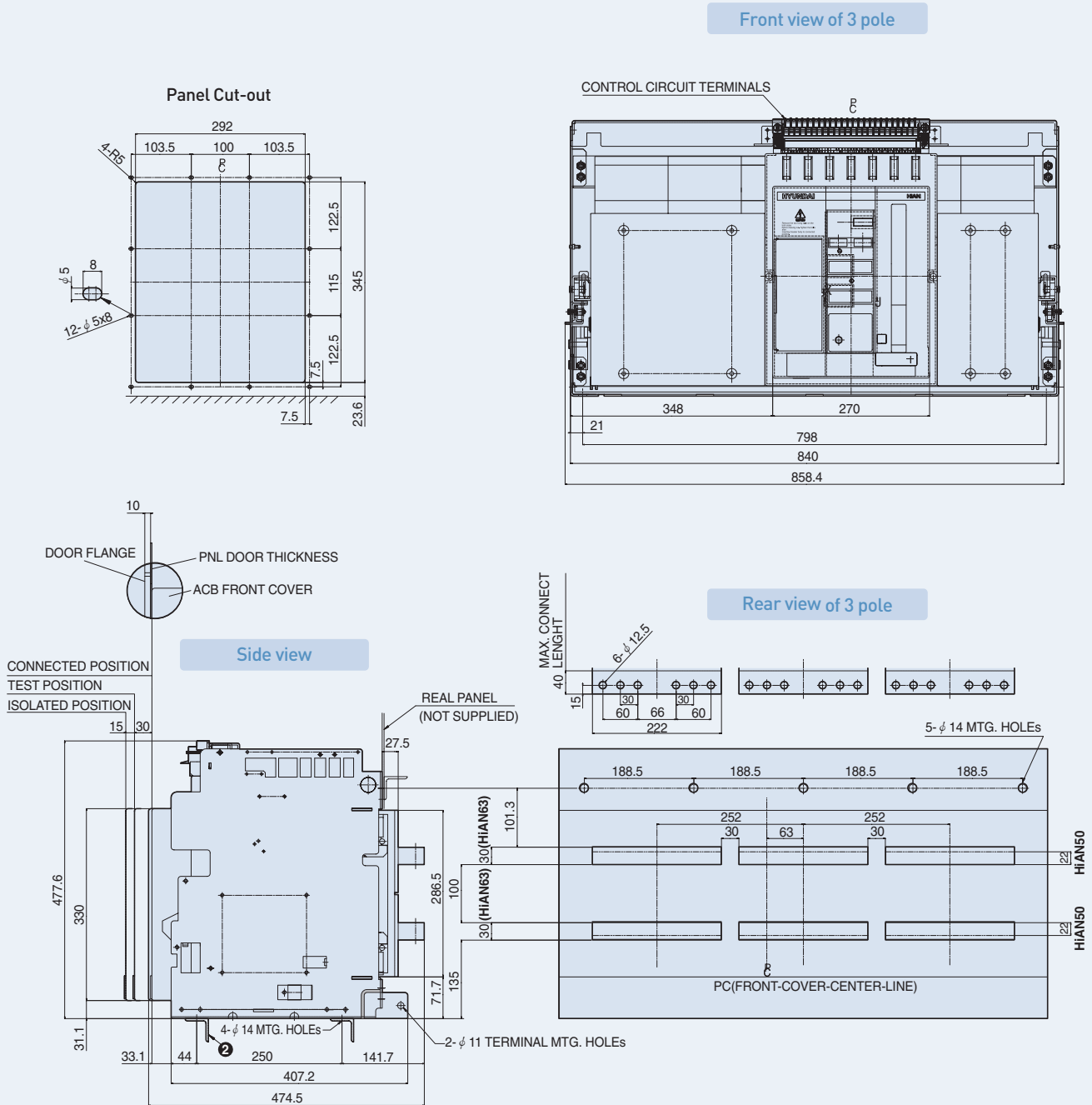


Rear view of 4 pole



Dimensions

HiAN50-63 with horizontal bus-bar, draw-out type only

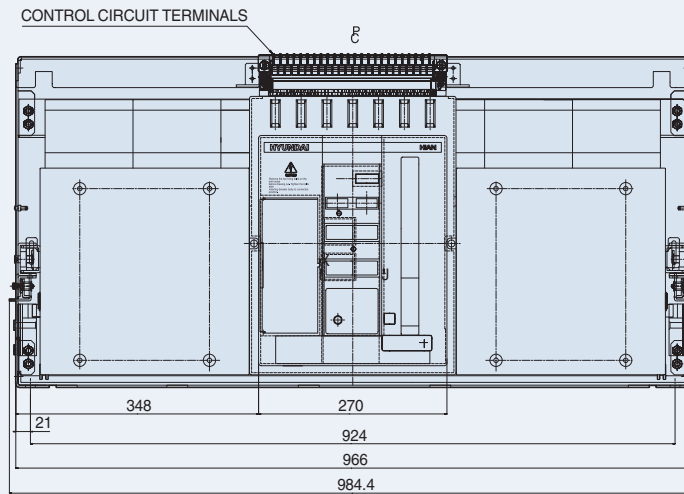


※ ① N is neutral pole of 4 pole breaker, and the size is 50% of other poles. 100% size is available as option, refer to page 22
 ② Mounting angle is not supplied.

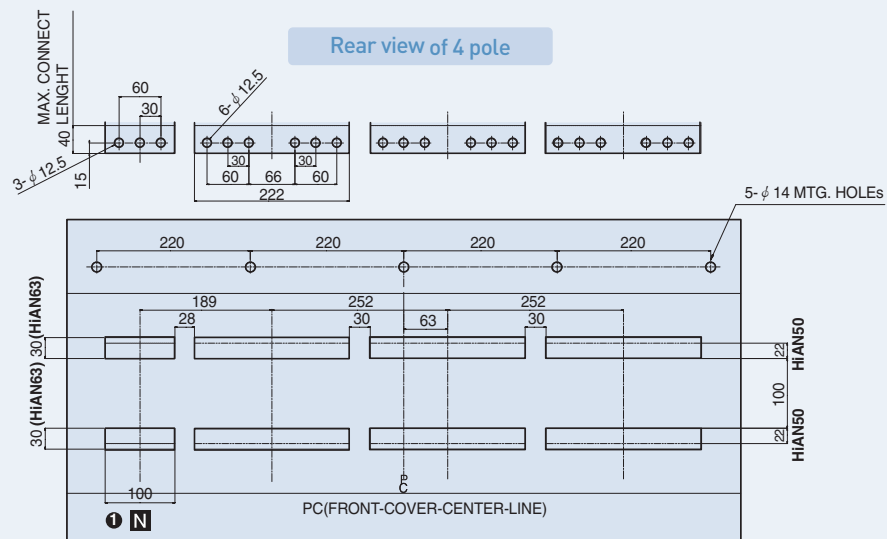
(Unit: mm)

P: Front PNL Center Line
C: Front PNL Center Line

Front view of 4 pole

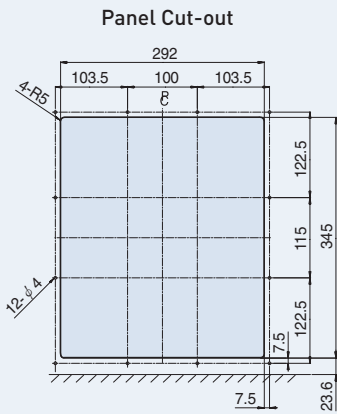


Rear view of 4 pole

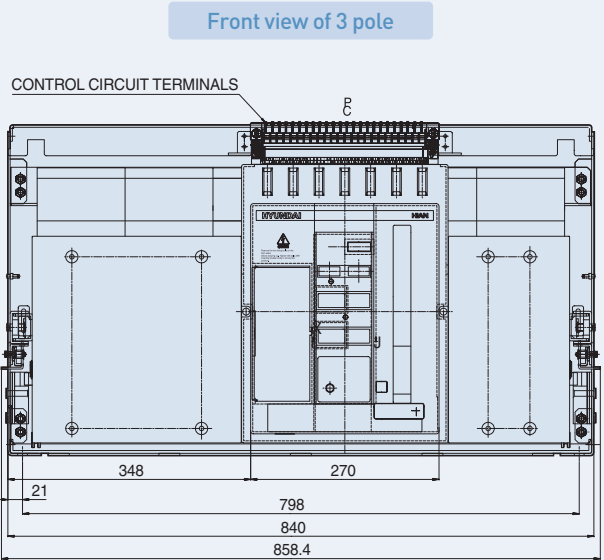


Dimensions

HiAN50-63 with vertical bus-bar, draw-out type only



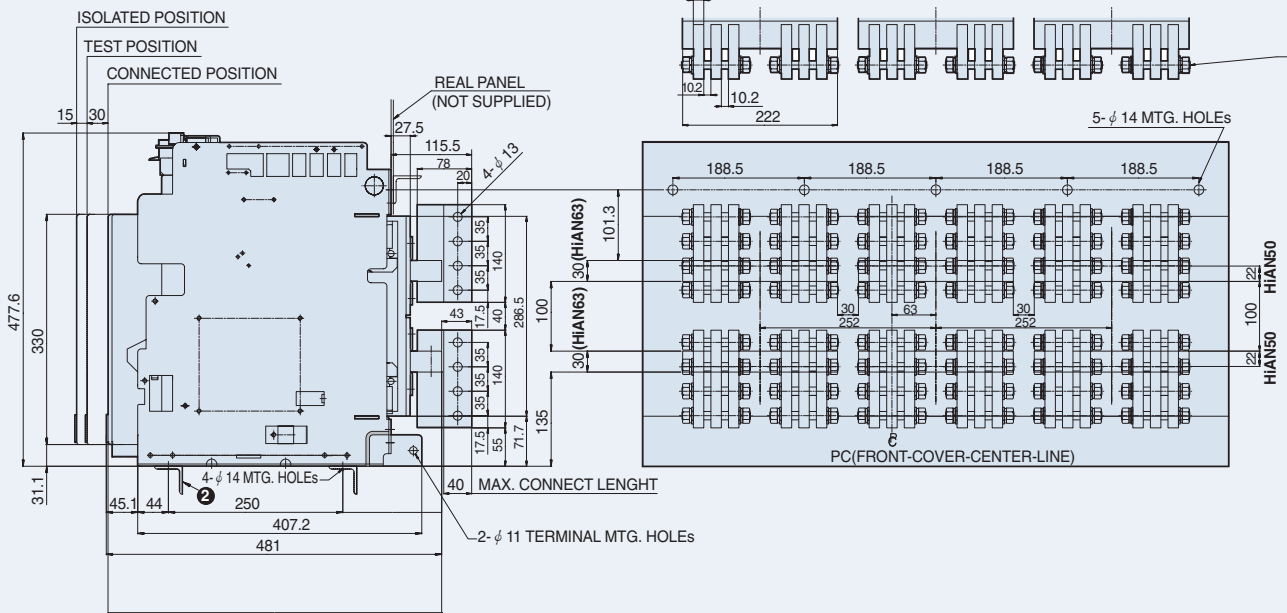
Panel Cut-out



Front view of 3 pole

Side view

Rear view of 3 pole

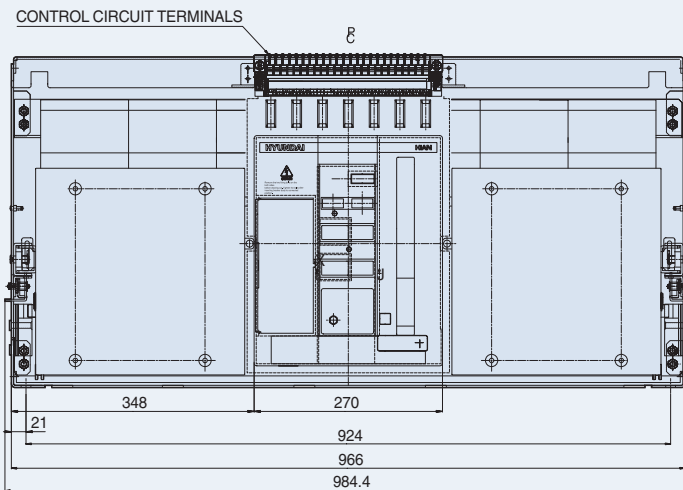


※ ① N is neutral pole of 4 pole breaker.
 ② Mounting angle is not supplied.

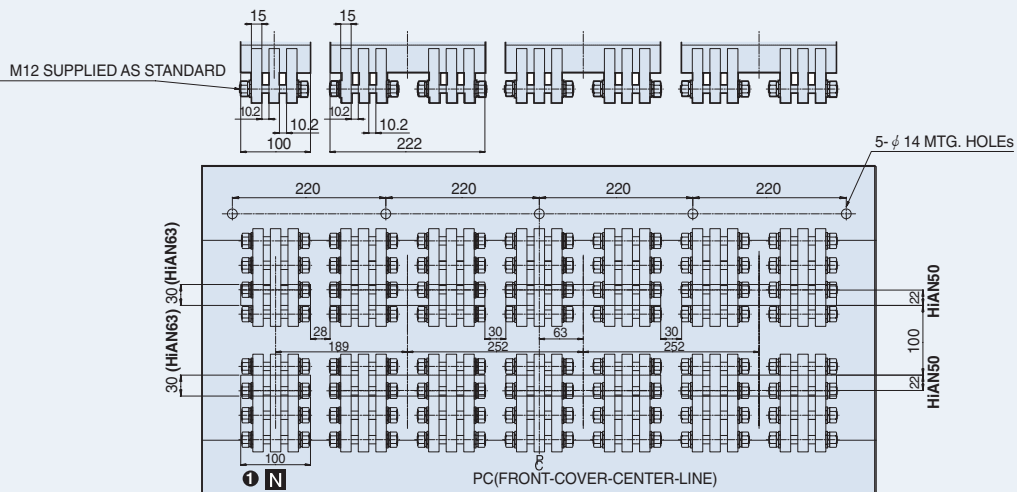
(Unit: mm)

P: Front PNL Center Line
C: Front PNL Center Line

Front view of 4 pole

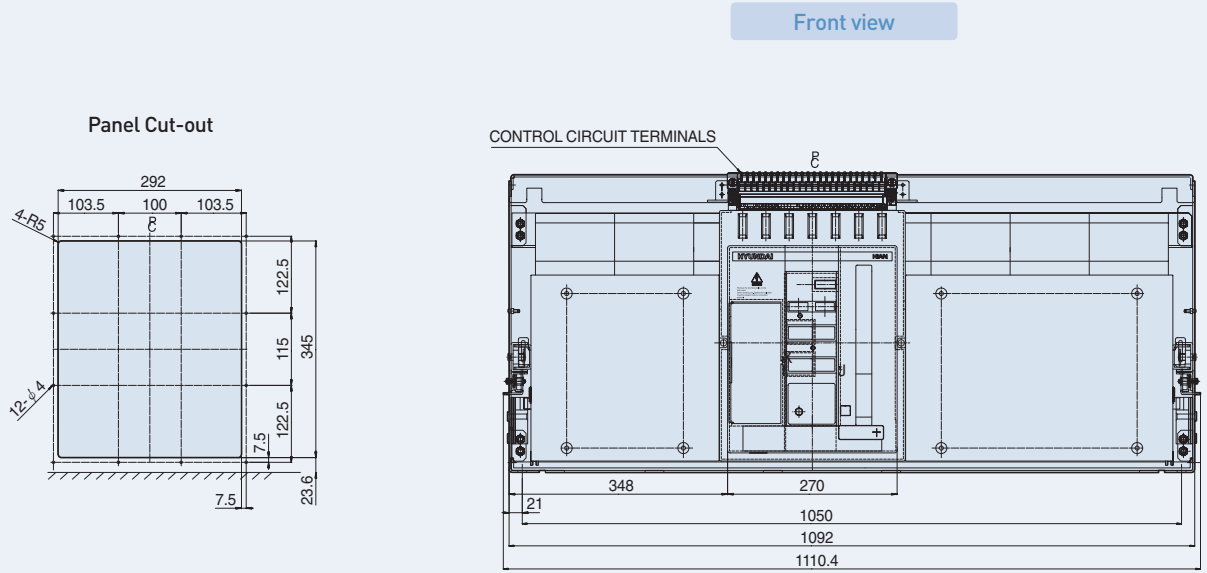


Rear view of 4 pole

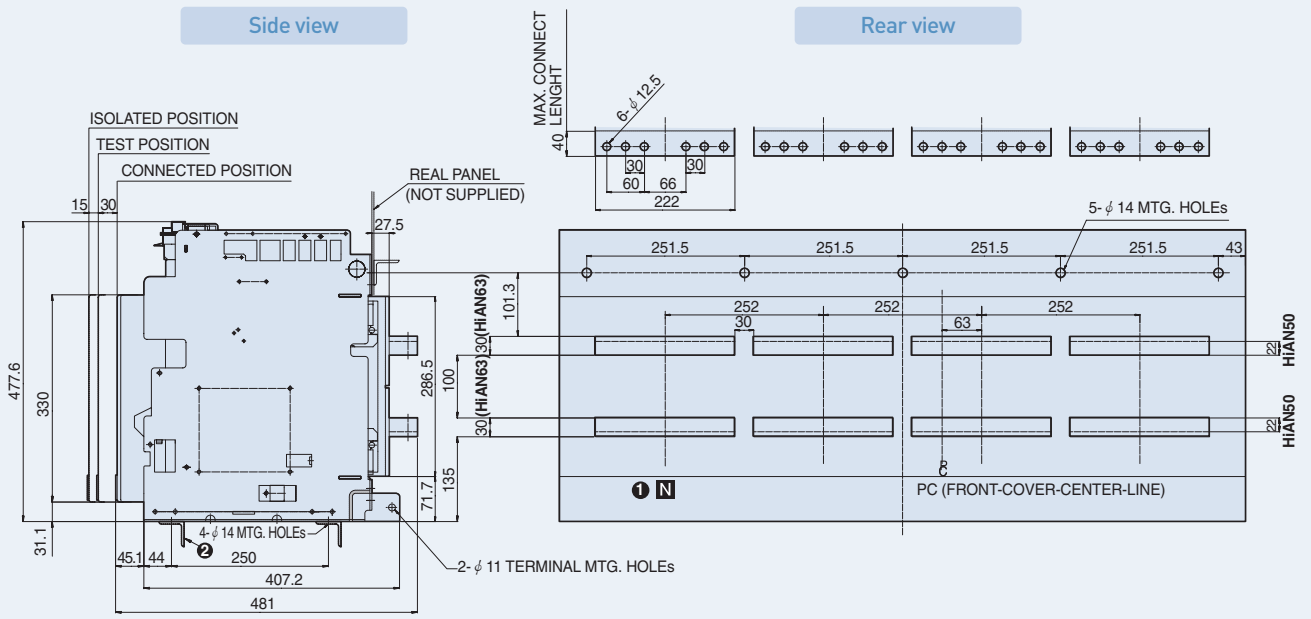


Dimensions

HiAN50-63, 4 pole with 100% size N pole, draw-out type only



[Horizontal bus-bar]



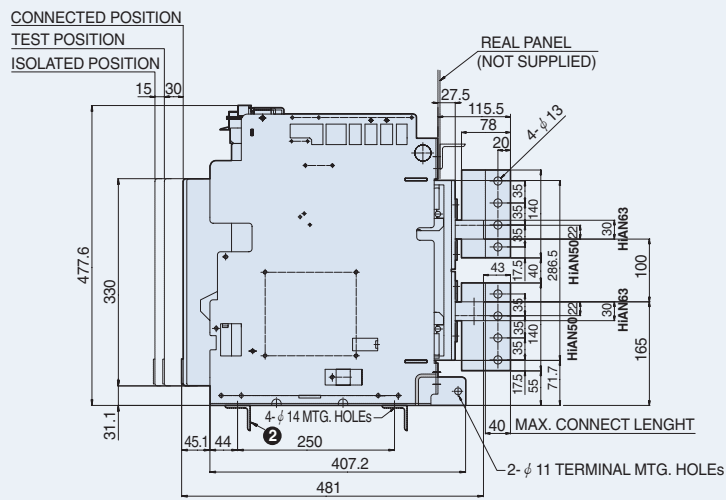
※ ① N is neutral pole of 4 pole breaker.
 ② Mounting angle is not supplied.

(Unit: mm)

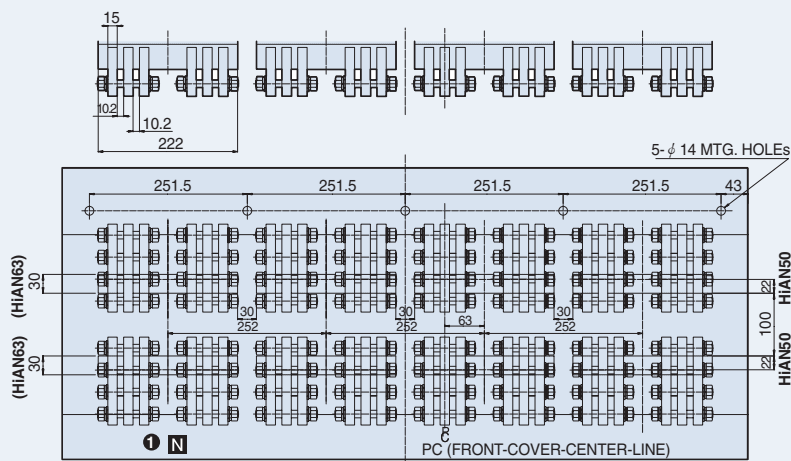
[Vertical bus-bar]

P: Front PNL Center Line
C: Front PNL Center Line

Side view

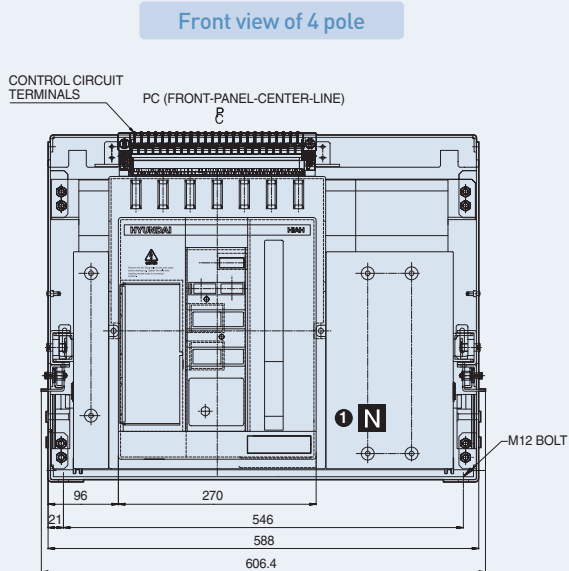
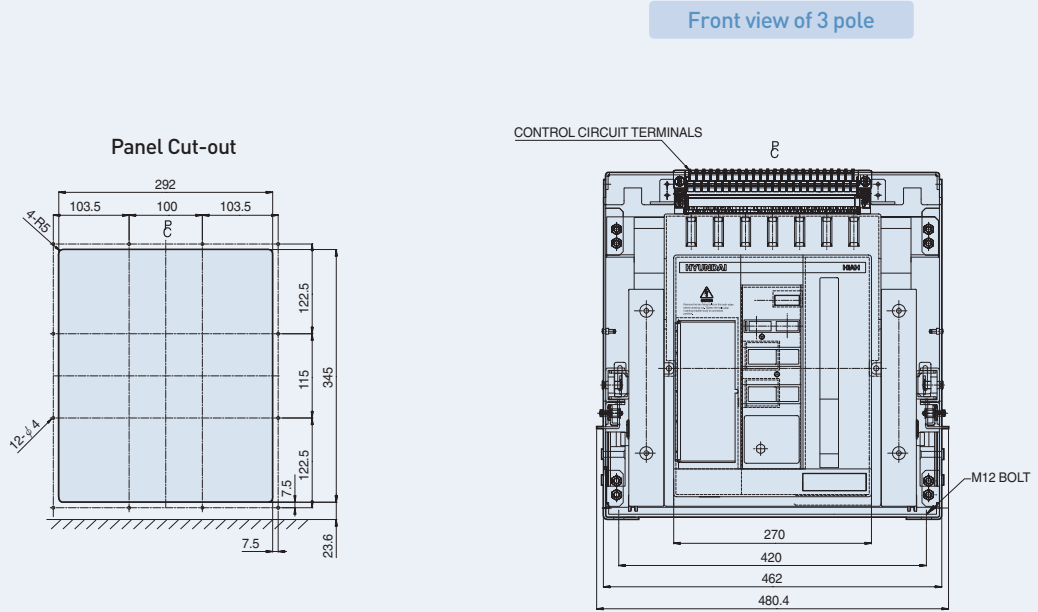


Rear view



Dimensions

HiAH32, draw-out type only



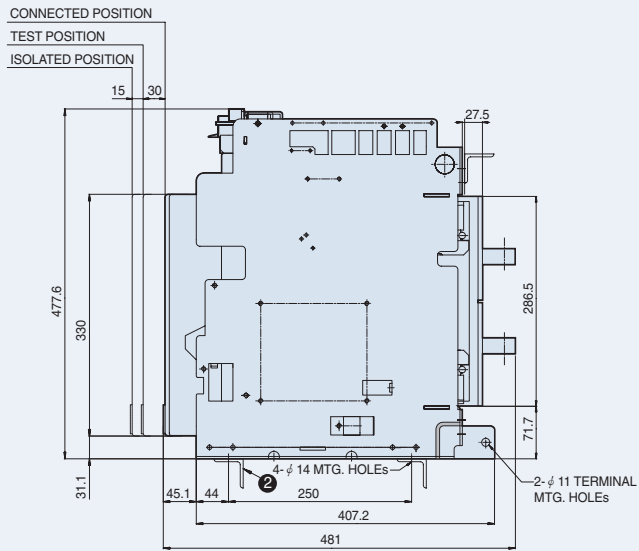
※ ① N is the neutral pole for 4 pole ACB.
 ② Mounting angle is not supplied.

(Unit: mm)

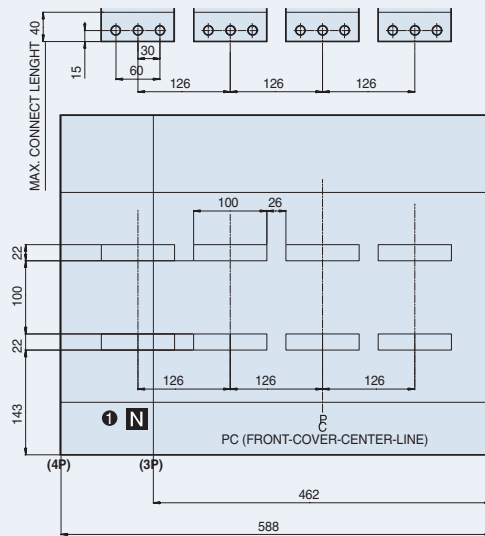
[Horizontal bus-bar]

P: Front PNL Center Line
C: Front PNL Center Line

Side view

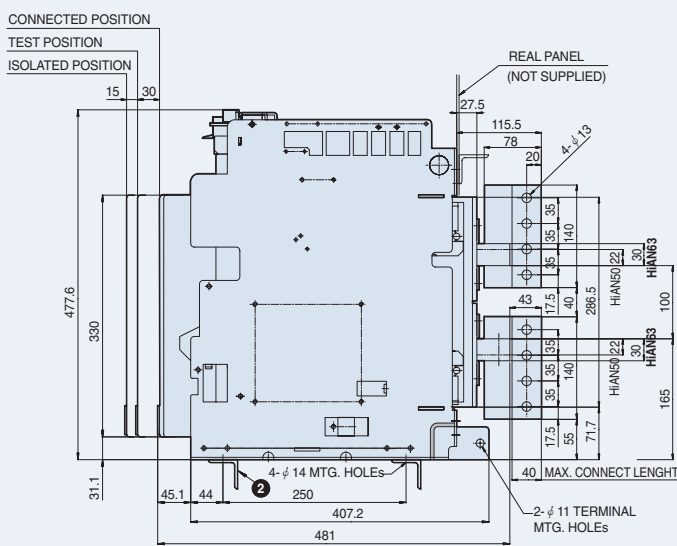


Rear view

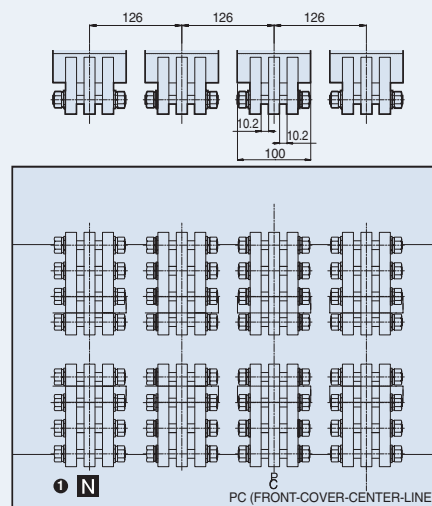


[Vertical bus-bar]

Side view



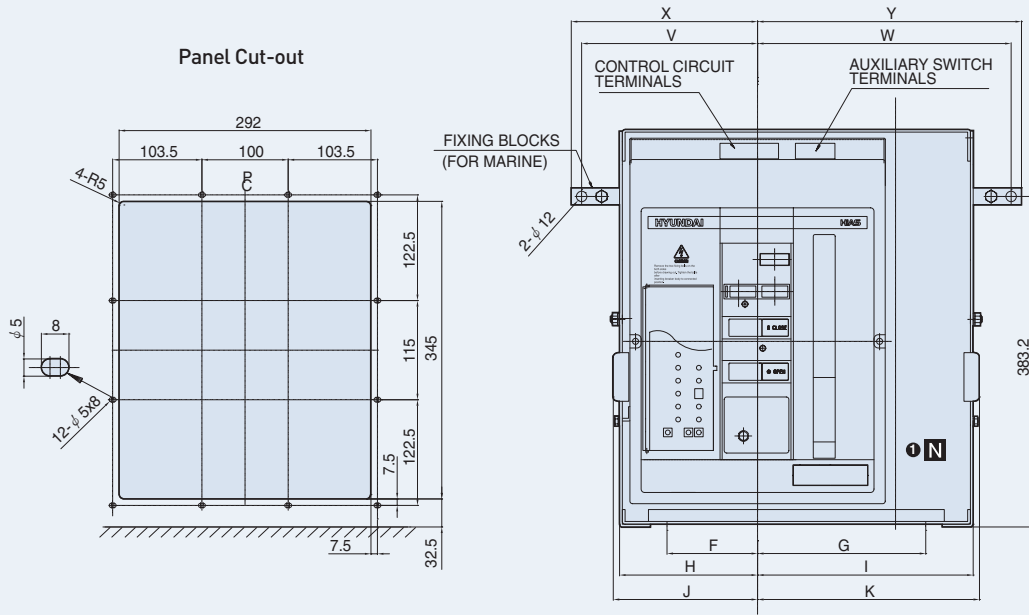
Rear view



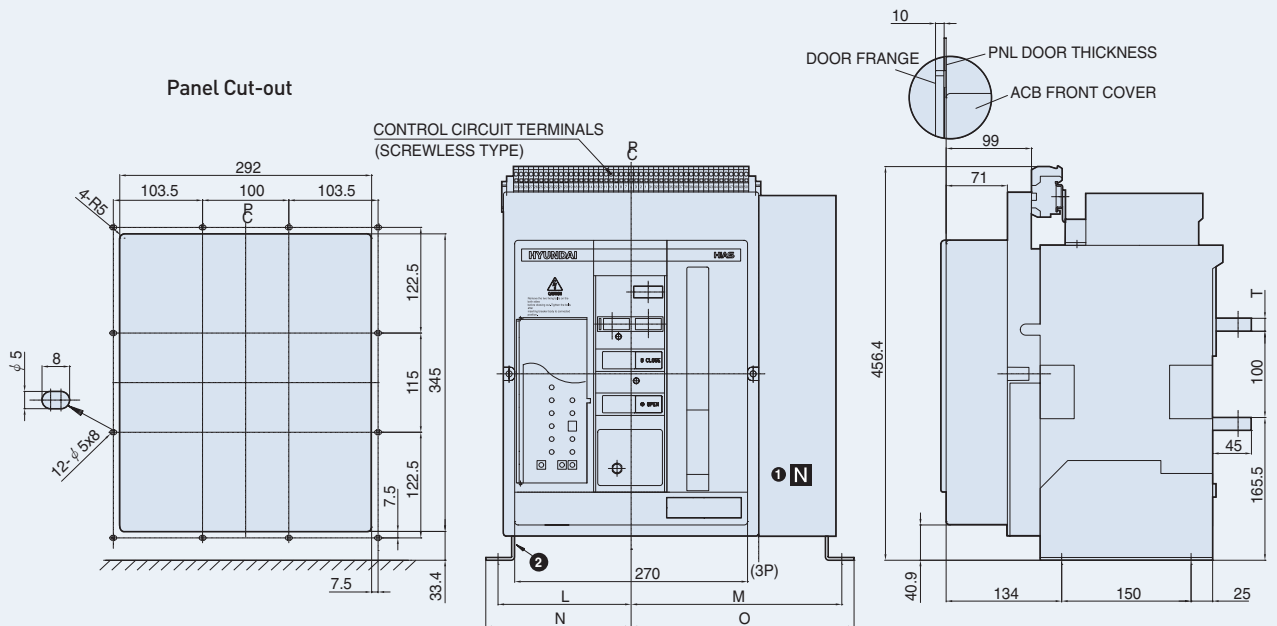
Dimensions

HiAS06-32 with horizontal bus-bar

Draw-out type

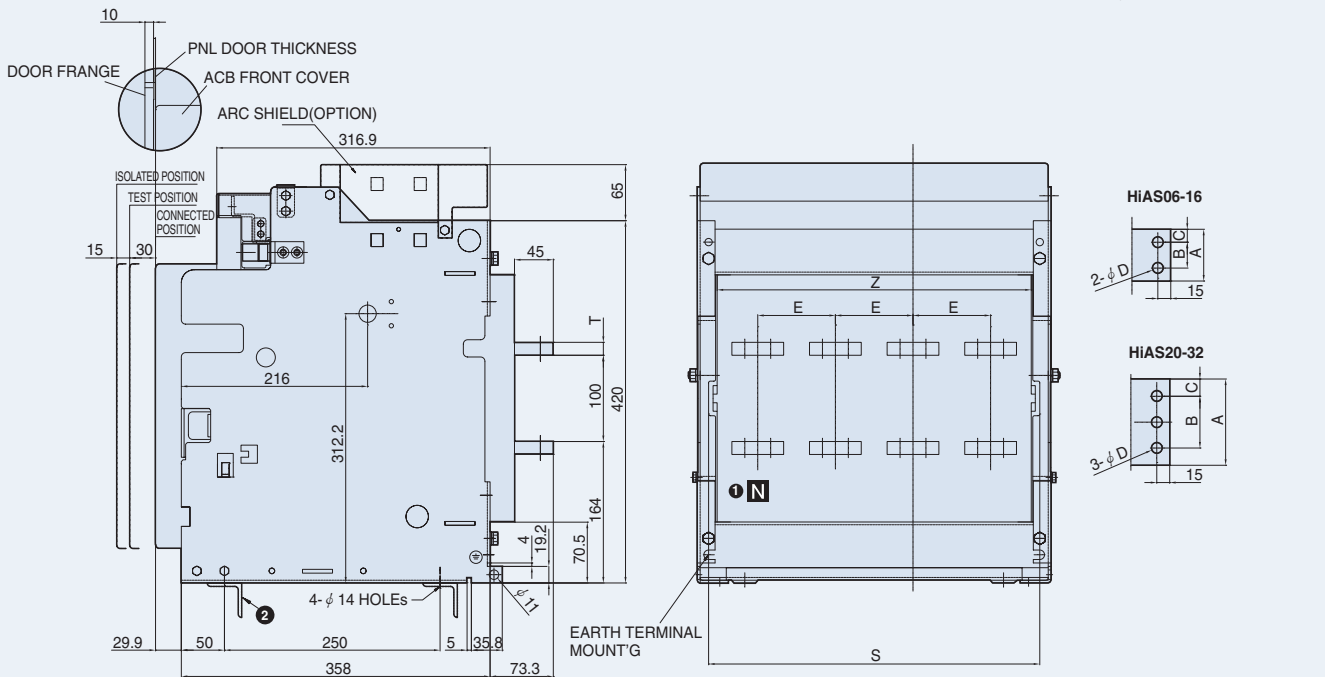


Fixed type



※ ① **N** is the neutral pole for 4 pole ACB.
 ② Mounting angle is not supplied.

(Unit: mm)



3 pole

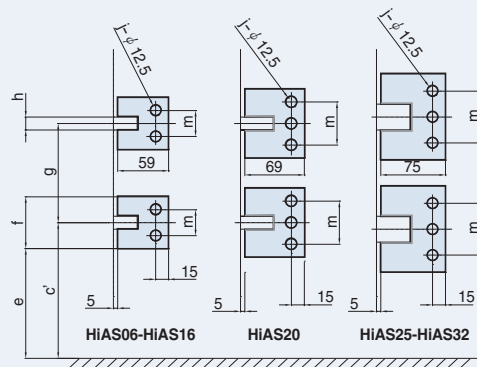
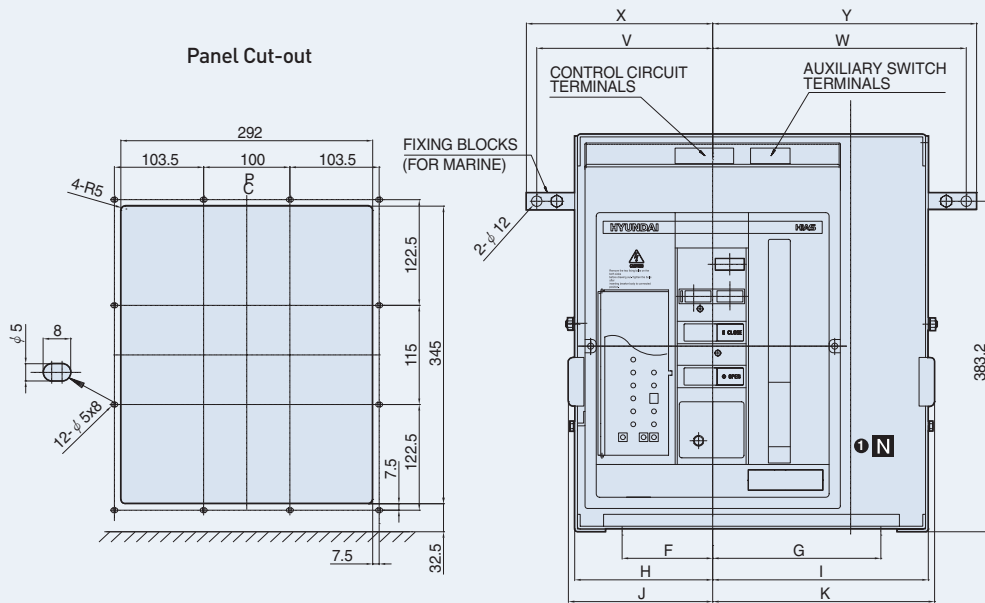
Model	Dimensions (mm)																								
	A		B		C		D	E	F	G	H	I	J	K	L	M	N	O	T	V	W	X	Y	Z	S
	Draw-out	Fixed	Draw-out	Fixed	Draw-out	Fixed																			
HiAS06 HiAS10	45	60	30	30	7.5	15	12.5	90	105	105	160	160	167.3	167.3	154.3	154.3	168.5	168.5	8	204	204	216	216	277.8	294
HiAS12	55	60	30	30	12.5	15	12.5	90	105	105	160	160	167.3	167.3	154.3	154.3	168.5	168.5	8	204	204	216	216	277.8	294
HiAS16	80	60	30	30	12.5	15	12.5	90	105	105	160	160	167.3	167.3	154.3	154.3	168.5	168.5	15	204	204	216	216	277.8	294
HiAS20	80	80	50	50	15	15	12.5	120	150	150	205	205	212.3	209.3	199.3	199.3	213.5	213.5	15	249	249	261	261	367.8	384
HiAS25	80	80	60	50	10	15	12.5	120	150	150	205	205	212.3	209.3	199.3	199.3	213.5	213.5	22	249	249	261	261	367.8	384
HiAS32	80	80	60	50	10	15	12.5	120	150	150	205	205	212.3	209.3	199.3	199.3	213.5	213.5	30	249	249	261	261	367.8	384

4 pole

Model	Dimensions (mm)																								
	A		B		C		D	E	F	G	H	I	J	K	L	M	N	O	T	V	W	X	Y	Z	S
	Draw-out	Fixed	Draw-out	Fixed	Draw-out	Fixed																			
HiAS06 HiAS10	45	60	30	30	7.5	15	12.5	90	105	195	160	250	167.3	257.3	154.3	244.3	168.5	258.5	8	204	294	216	306	367.8	384
HiAS12	55	60	30	30	12.5	15	12.5	90	105	195	160	250	167.3	257.3	154.3	244.3	168.5	258.5	8	204	294	216	306	367.8	384
HiAS16	80	60	30	30	12.5	15	12.5	90	105	195	160	250	167.3	257.3	154.3	244.3	168.5	258.5	15	204	294	216	306	367.8	384
HiAS20	80	80	50	50	15	15	12.5	120	150	270	205	325	212.3	332.3	199.3	319.3	213.5	333.5	15	249	369	261	381	487.8	504
HiAS25	80	80	60	50	10	15	12.5	120	150	270	205	325	212.3	332.3	199.3	319.3	213.5	333.5	22	249	369	261	381	487.8	504
HiAS32	80	80	60	50	10	15	12.5	120	150	270	205	325	212.3	332.3	199.3	319.3	213.5	333.5	30	249	369	261	381	487.8	504

Dimensions

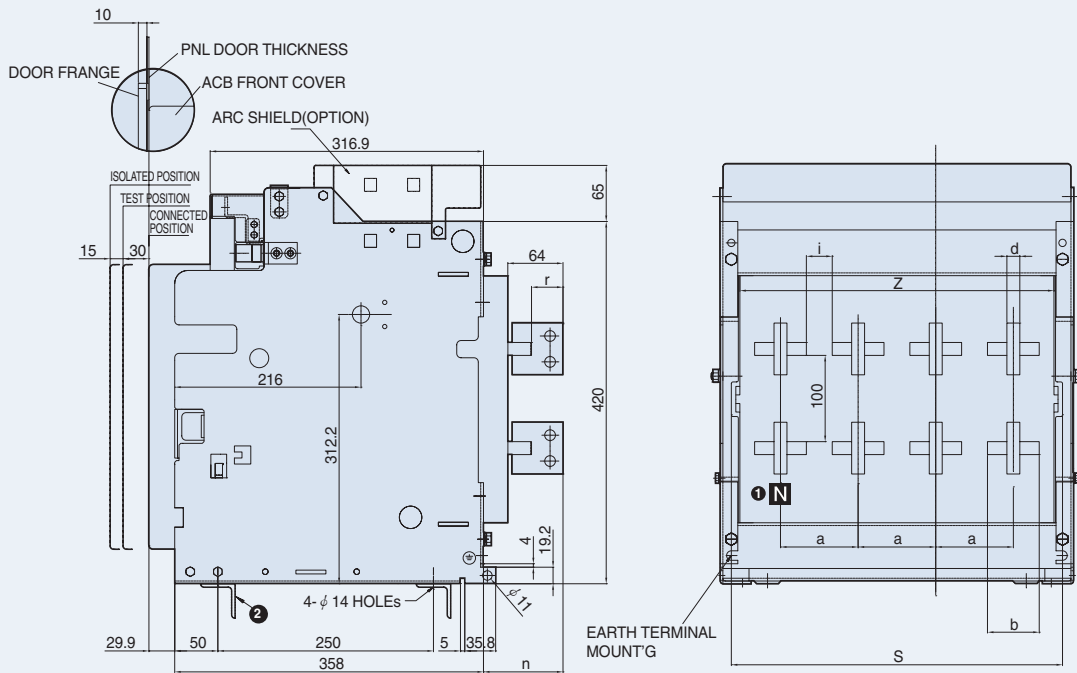
HiAS06-32 with vertical bus-bar, draw-out type only



※ ① N is the neutral pole for 4 pole ACB.
 ※ ② Mounting angle is not supplied.

(Unit: mm)

P: Front PNL Center Line
C: Front PNL Center Line



3 pole

Model	Dimensions (mm)																								
	F	G	H	I	J	K	V	W	X	Y	Z	S	a	b	c'	d	e	f	g	h	i	j	m	n	r
HiAS06 HiAS10	105	105	160	160	167.3	167.3	204	204	216	216	277.8	294	90	45	160.75	8	130.75	60	108	8	45	12	30	92.5	35.5
HiAS12	105	105	160	160	167.3	167.3	204	204	216	216	277.8	294	90	55	157.25	8	127.25	60	115	15	35	12	30	92.5	35.5
HiAS16	105	105	160	160	167.3	167.3	204	204	216	216	277.8	294	90	55	157.25	15	127.25	60	115	15	35	12	30	92.5	35.5
HiAS20	150	150	205	205	212.3	212.3	249	249	261	261	367.8	384	120	80	157.25	15	117.25	80	115	15	40	18	50	102.2	35.5
HiAS25	150	150	205	205	212.3	212.3	249	249	261	261	367.8	384	120	80	153.75	22	103.75	100	122	22	40	18	60	108.3	35
HiAS32	150	150	205	205	212.3	212.3	249	249	261	261	367.8	384	120	80	149.75	30	99.75	100	130	30	40	18	60	108.3	40

4 pole

Model	Dimensions (mm)																								
	F	G	H	I	J	K	V	W	X	Y	Z	S	a	b	c'	d	e	f	g	h	i	j	m	n	r
HiAS06 HiAS10	105	195	160	250	167.3	257.3	204	294	216	306	277.8	384	90	45	160.75	8	130.75	60	108	8	45	16	30	92.2	35.5
HiAS12	105	195	160	250	167.3	257.3	204	294	216	306	277.8	384	90	55	157.25	8	127.25	60	115	15	35	16	30	92.2	35.5
HiAS16	105	195	160	205	167.3	257.3	204	294	216	306	277.8	384	90	55	157.25	15	127.25	60	115	15	35	16	30	92.2	35.5
HiAS20	150	270	205	325	212.3	332.3	249	369	261	381	367.8	504	120	80	157.25	15	117.25	80	115	15	40	24	50	102.2	35.5
HiAS25	150	270	205	325	212.3	332.3	249	369	261	381	367.8	504	120	80	153.75	22	103.75	100	122	22	40	24	60	108.3	35
HiAS32	150	270	205	325	212.3	332.3	249	369	261	381	367.8	504	120	80	149.75	30	99.75	100	130	30	40	24	60	108.3	40

Order Information

IAN06	
Code	Model name
HiAN type	
IAN06	HiAN06
IAN08	HiAN08
IAN10	HiAN10
IAN12	HiAN12
IAN16	HiAN16
IAN20	HiAN20
IAN25	HiAN25
IAN32	HiAN32
IAN40	HiAN40
IAN50	HiAN50
IAN63	HiAN63
HiAH type	
IAH32	HiAH32
HiAS type	
IAS06	HiAS06
IAS08	HiAS08
IAS10	HiAS10
IAS12	HiAS12
IAS16	HiAS16
IAS20	HiAS20
IAS25	HiAS25
IAS32	HiAS32

3		D		M2	
Code	Pole	Code	Mounting	Code	Charging operation
3	3 pole	F ¹⁾	Fixed type	H0	Manual
4	4 pole	D	Draw-out type	M1	Motor / AC110V
※ 1) HiAN40-63 and HiAH32 are not applicable.					
				M2	Motor / AC220V
				M5	Motor / DC110V
				M6	Motor / DC220V
				M7	Motor / DC24V
				M8	Motor / DC48V
				M9	Motor / DC125V

23		
Code	APR type	Function
00	Without APR	
General feeder		
23 ¹⁾	APR-1L-GL	AL, AS, AI, AG / IU
24	APR-1L-GS	AL, AS, AI, AP, AG / CP/I, LED
27 ¹⁾	APR-1L-GM	AL, AS, AI, AP, AG, MCR / IUt, LED
25	APR-2L-GS	AL, AS, AI, AP, AG, MCR / CP/I, LED, LCD
26	APR-1D-GM	AL, AS, AI, AP, AG / CP/I, LED, LCD / AMS
Generator		
28 ¹⁾	APR-1S-AL	AL, AS, AI / IU
29	APR-1S-AS	AL, AS, AI, AP, MCR / CP/I, LED

※ 1) In case of HiAS type, no. 23, 27 and 28 shall be orderd.

S2		T				
Code	Electrical trip device	Code	Rated primary current (I _{CT}) of APR	Applied ACB		
Shunt trip		0	Without CT	HiAN	HiAH	HiAS
S1	Shunt / AC110V	I	80A	06-16	06-16	06-16
S2	Shunt / AC220V	B	160A	06-16	06-16	06-16
S3	Shunt / AC380V	V	320A	06-16	06-16	06-16
S4	Shunt / AC440V	T	630A	06-16	32	06-16
S5	Shunt / DC110V	H	800A	08-16	32	08-16
S6	Shunt / DC220V	J	1000A	10-32	32	10-32
S7	Shunt / DC24V	K	1250A	12-16	32	12-16
S8	Shunt / DC48V	L	1600A	16-32	32	16-32
Under voltage trip / Time delay type		M	2000A	20-32	32	20-32
T1	UVT (Delay) / AC110V	N	2500A	32-40	32	25-32
T2	UVT (Delay) / AC220V	P	3200A	32-40	32	32
T3	UVT (Delay) / AC380V	Q	4000A	40-63		
T4	UVT (Delay) / AC440V	S	5000A	50-63		
T5	UVT (Delay) / AC480V	X	6300A	63		
Under voltage trip / Instantaneous type						
U1	UVT (Inst.) / AC110V					
U2	UVT (Inst.) / AC220V					
U3	UVT (Inst.) / AC380V					
U4	UVT (Inst.) / AC440V					
U5	UVT (Inst.) / DC100V					
U6	UVT (Inst.) / DC200V					
Shunt and Delay type UVT						
D1	S1 + T1 / AC110V					
D2	S2 + T2 / AC220V					
D3	S3 + T3 / AC380V					
D4	S4 + T4 / AC440V					
X1	S5 / DC110V + T3 / AC380V					
X2	S1 / AC110V + T3 / AC380V					
X3	S7 / DC24V + T4 / AC440V					
X4	S7 / DC24V + T2 / AC220V					
W1	S1 / AC110V + T2 / AC220V					
W2	S1 / AC110V + T4 / AC440V					
W3	S2 / AC220V + T4 / AC440					
W4	S5 / DC110V + T1 / AC110V					
W5	S5 / DC110V + T2 / AC220V					
W6	S5 / DC110V + T4 / AC440V					
W7	S5 / DC110V + T5 / AC480V					
Shunt and Instantaneous type UVT						
I1	S1 + U1 / AC110V					
I2	S2 + U2 / AC220V					
I3	S3 + U3 / AC380V					
I4	S4 + U4 / AC440V					
I5	S5 / DC110V + U5 / DC100V					
I6	S6 + U6 / DC220V + U6 / DC200V					
Condensor trip device						
C1	CTD / AC110V					
C2	CTD / DC220V					

ABADAE	
Code	Additional options
Common use	
AA	Extensional auxillary switch / 1a1b, for HiAN & HiAH
AB	Key lock device / lock in open
AD	Cycle counter ¹⁾
AG	Door flange
AM	Button lock cover
AN	Neutral CT for 3 pole
B1	Mechanical interlock device / Hori., 2ST
B2	Mechanical interlock device / Hori., 3ST
B3	Mechanical interlock device / Vert., 2ST
B4	Mechanical interlock device / Vert., 3ST
B6	Spring charge switch for HiAN & HiAH
NC	Non-flammable cable
Draw-out type only	
AE	Safety shutter
AF	Fixing blocks
AH	Vertical type bus-bar for draw-out type
AK	Short circuit 'b' contact
AQ	Position switch / conn: 1C, test: 1C
AR	Position switch / conn: 2C
AS	Position switch / test: 2C
AT	Position switch / inserted: 1C, isolated: 1C
AU	Position switch / inserted: 1C
AV	Position switch / Isolated: 1C
AW	Wrong inserting prevention device
AX	Arc shield
B5	100% size natural pole for HiAN50-63

※ 1) In case of HiAN & HiAH type, the cycle counter is supplied as standard.

Order Information

Spare parts

Code	Description		Applied ACB			ACB order code	Category
	Name	Specification	HiAN	HiAH	HiAS		
Spare parts based on ACB main order code							
IANS M1U	Charging motor unit	AC110V	06-32		06-32	M1	ACB
IANS M16U	Charging motor unit	AC110V	40-63	32			
IANS M2U	Charging motor unit	AC220V	06-32		06-32	M2	
IANS M26U	Charging motor unit	AC220V	40-63	32			
IANS M5U	Charging motor unit	DC110V	06-32		06-32	M5	
IANS M56U	Charging motor unit	DC110V	40-63	32			
IANS M6U	Charging motor unit	DC220V	06-32		06-32	M6	
IANS M66U	Charging motor unit	DC220V	40-63	32			
IANS M7U	Charging motor unit	DC24V	06-32		06-32	M7	
IANS M76U	Charging motor unit	DC24V	40-63	32			
IANS M8U	Charging motor unit	DC48V	06-32		06-32	M8	
IANS M86U	Charging motor unit	DC48V	40-63	32			
IANS M9U	Charging motor unit	DC125V	06-63		06-32	M9	
IANS M96U	Charging motor unit	DC125V	40-63	32			
IANS 23U	ACB protection relay	APR-1L-GL	06-63	32	06-32	23	
IANS 24U	ACB protection relay	APR-1L-GS	06-63	32		24	
IANS 27U	ACB protection relay	APR-1L-GM	06-63	32	06-32	27	
IANS 25U	ACB protection relay	APR-2L-GS	06-63	32		25	
IANS 26U	ACB protection relay	APR-1D-GM	06-63	32		26	
IANS 28U	ACB protection relay	APR-1S-AL	06-32	32	06-32	28	
IANS 29U	ACB protection relay	APR-1S-AS	06-63	32		29	
IANS S1U	Shunt trip unit	AC110V	06-32		06-32	S1	
IANS S16U	Shunt trip unit	AC110V	40-63	32			
IANS S2U	Shunt trip unit	AC220V	06-32		06-32	S2	
IANS S26U	Shunt trip unit	AC220V	40-63	32			
IANS S3U	Shunt trip unit	AC380V	06-32		06-32	S3	
IANS S36U	Shunt trip unit	AC380V	40-63	32			
IANS S4U	Shunt trip unit	AC440V	06-32		06-32	S4	
IANS S46U	Shunt trip unit	AC440V	40-63	32			
IANS S5U	Shunt trip unit	DC110V	06-32		06-32	S5	
IANS S56U	Shunt trip unit	DC110V	40-63	32			
IANS S6U	Shunt trip unit	DC220V	06-32		06-32	S6	
IANS S66U	Shunt trip unit	DC220V	40-63	32			
IANS S7U	Shunt trip unit	DC24V	06-32		06-32	S7	
IANS S76U	Shunt trip unit	DC24V	40-63	32			
IANS S8U	Shunt trip unit	DC48V	06-32		06-32	S8	
IANS S86U	Shunt trip unit	DC48V	40-63	32			
IANS T1U	Under voltage trip unit	Time delay type, AC110V	06-32		06-32	T1	
IANS T1U6	Under voltage trip unit	Time delay type, AC110V	40-63	32			
IANS T2U	Under voltage trip unit	Time delay type, AC220V	06-32		06-32	T2	
IANS T2U6	Under voltage trip unit	Time delay type, AC220V	40-63	32			
IANS T3U	Under voltage trip unit	Time delay type, AC380V	06-32		06-32	T3	
IANS T3U6	Under voltage trip unit	Time delay type, AC380V	40-63	32			
IANS T4U	Under voltage trip unit	Time delay type, AC440V	06-32		06-32	T4	
IANS T4U6	Under voltage trip unit	Time delay type, AC440V	40-63	32			
IANS T5U	Under voltage trip unit	Time delay type, AC480V	06-32		06-32	T5	
IANS T5U6	Under voltage trip unit	Time delay type, AC480V	40-63	32			
IANS U1U	Under voltage trip unit	Instantaneous type, AC110V	06-32		06-32	U1	
IANS U1U6	Under voltage trip unit	Instantaneous type, AC110V	40-63	32			
IANS U2U	Under voltage trip unit	Instantaneous type, AC220V	06-32		06-32	U2	
IANS U2U6	Under voltage trip unit	Instantaneous type, AC220V	40-63	32			

Code	Description		Applied ACB			ACB order code	Category	
	Name	Specification	HiAN	HiAH	HiAS			
IANS U3U	Under voltage trip unit	Instantaneous type, AC380V	06-32		06-32	U3	ACB	A9
IANS U3U6	Under voltage trip unit	Instantaneous type, AC380V	40-63	32				
IANS U4U	Under voltage trip unit	Instantaneous type, AC440V	06-32		06-32	U4		
IANS U4U6	Under voltage trip unit	Instantaneous type, AC440V	40-63	32				
IANS U5U	Under voltage trip unit	Instantaneous type, DC100V	06-32		06-32	U5		
IANS U5U6	Under voltage trip unit	Instantaneous type, DC100V	40-63	32				
IANS U6U	Under voltage trip unit	Instantaneous type, DC200V	06-32		06-32	U6		
IANS U6U6	Under voltage trip unit	Instantaneous type, DC200V	40-63	32				
HVFS-T4	Condensor trip device	AC110V	06-63	32	06-32	C1	VCB	V9
HVFS-T7	Condensor trip device	AC220V	06-63	32	06-32	C2		
Spare parts based on ACB additional option order code for common use								
IANS 103AA	Extensional auxiliary switch	1a1b, for 3 pole	06-63	32		AA	ACB	A9
IANS 104AA	Extensional auxiliary switch	1a1b, for 4 pole	06-63	32				
IANS 163AA	Extensional auxiliary switch	1a1b, for 3 pole	06-63	32				
IANS 164AA	Extensional auxiliary switch	1a1b, for 4 pole	06-63	32				
IANS 203AA	Extensional auxiliary switch	1a1b, for 3 pole	06-63	32				
IANS 204AA	Extensional auxiliary switch	1a1b, for 4 pole	06-63	32				
IANS 253AA	Extensional auxiliary switch	1a1b, for 3 pole	06-63	32				
IANS 254AA	Extensional auxiliary switch	1a1b, for 4 pole	06-63	32				
IANS 323AA	Extensional auxiliary switch	1a1b, for 3 pole	06-63	32				
IANS 324AA	Extensional auxiliary switch	1a1b, for 4 pole	06-63	32				
IANS KL/B	Key lock device	lock in open	06-32		06-32	AB		
IANS KL/B-63	Key lock device	lock in open	40-63	32				
IANS CK	Cycle counter	5 digits	06-63	32	06-32	AD		
IANS DP	Door flange	for gray color front cover	06-32		06-32	AG		
IANS DP63	Door flange		06-63	32	06-32			
IANS BL	Button lock cover	for gray color front cover	06-32		06-32	AM		
IANS BL63	Button lock cover		06-63	32	06-32			
IANS NCT016E	Neutral CT	160/0.2A, 1EA, for 3 pole	06-16		06-16	AN		
IANS NCT032E	Neutral CT	320/0.2A, 1EA, for 3 pole	06-16		06-16			
IANS NCT063E	Neutral CT	630/0.2A, 1EA, for 3 pole	06-16	32	06-16			
IANS NCT080E	Neutral CT	800/0.2A, 1EA, for 3 pole	08-16	32	08-16			
IANS NCT110E	Neutral CT	1000/0.2A, 1EA, for 3 pole	10-32	32	10-32			
IANS NCT113E	Neutral CT	1250/0.2A, 1EA, for 3 pole	12-16	32	12-16			
IANS NCT116E	Neutral CT	1600/0.2A, 1EA, for 3 pole	16-32	32	16-32			
IANS NCT220E	Neutral CT	2000/0.2A, 1EA, for 3 pole	20-32	32	20-32			
IANS NCT225E	Neutral CT	2500/0.2A, 1EA, for 3 pole	25-32	32	25-32			
IANS NCT332E	Neutral CT	3200/0.2A, 1EA, for 3 pole	32-40	32	32			
IANS NCT440E	Neutral CT	4000/0.2A, 1EA, for 3 pole	40-63					
IANS 116F	Mechanical interlock device	Horizontal connection, for fixed type	06-16		06-16	B1		
IANS 116	Mechanical interlock device	Horizontal connection, for draw-out type	06-16		06-16			
IANS 132F	Mechanical interlock device	Horizontal connection, for fixed type	20-32		20-32	B2		
IANS 132	Mechanical interlock device	Horizontal connection, for draw-out type	20-32		20-32			
IANS 316F	Mechanical interlock device	Vertical connection, for fixed type	06-16		06-16	B3		
IANS 316	Mechanical interlock device	Vertical connection, for draw-out type	06-16		06-16			
IANS 332F	Mechanical interlock device	Vertical connection, for fixed type	20-32		20-32	B4		
IANS 332	Mechanical interlock device	Vertical connection, for draw-out type	20-32		20-32			

Order Information

Spare parts

Code	Description		Applied ACB			ACB order code	Category			
	Name	Specification	HiAN	HiAH	HiAS					
Spare parts based on ACB additional option order code for draw-out type										
IANS CA163S	Safety shutter	for 3 pole	06-16		06-16	AE	ACB	A9		
IANS CA164S	Safety shutter	for 4 pole	06-16		06-16					
IANS CA323S	Safety shutter	for 3 pole	20-32		20-32					
IANS CA324S	Safety shutter	for 4 pole	20-32		20-32					
IANS CA403S	Safety shutter	for 3 pole	40	32						
IANS CA404S	Safety shutter	for 4 pole	40	32						
IANS CA503S	Safety shutter	for 3 pole	50-63							
IANS CA504S	Safety shutter	for 4 pole	50-63							
IANS FB	Fixing blocks		06-32		06-32				AF	
IANS FB63	Fixing blocks		40-63	32						
IANS SB	short circuit 'b' contact		06-63	32	06-32	AK				
IANS PS-SW	Position switch	conn.: 1C, test: 1C	06-63	32	06-32	AQ				
IANS PSC2	Position switch	conn.: 2C	06-63	32	06-32	AR				
IANS PST2	Position switch	test: 2C	06-63	32	06-32	AS				
IANS PS-T	Position switch	inserted: 1C, isolated: 1C	06-63	32	06-32	AT				
IANS PS-U	Position switch	inserted: 1C	06-63	32	06-32	AU				
IANS PS-V	Position switch	isolated: 1C	06-63	32	06-32	AV				
IANS WR-INSERT.	Wrong inserting prevention device		06-63	32	06-32	AW				
IANS AB163	Arc shield	for 3 pole	06-16		06-16	AX	ACB	A9		
IANS AB164	Arc shield	for 4 pole	06-16		06-16					
IANS AB323	Arc shield	for 3 pole	20-32		20-32					
IANS AB324	Arc shield	for 4 pole	20-32		20-32					
IANS AB403	Arc shield	for 3 pole	40	32						
IANS AB404	Arc shield	for 4 pole	40	32						
IANS AB503	Arc shield	for 3 pole	50-63							
IANS AB504	Arc shield	for 4 pole	50-63							
Portable test equipments										
IANS TJ	Test jumper		06-63	32	06-32					ACB
IANS H0C5	APR checker		06-63	32	06-32					
Spare parts for general replacement										
IANS ANTI110	Anti-pumping relay	AC110V	06-63	32	06-32		ACB	A9		
IANS ANTI220	Anti-pumping relay	AC220V	06-63	32	06-32					
IANS APR-DP	APR panel display unit		06-63	32	06-32					
IANS AUX-SW	Auxiliary contact	1a1b of auxiliary switch	06-32							
IANS AS/32F	Auxiliary switch unit	for fixed type	06-32							
IANS AS/32D	Auxiliary switch unit	for draw-out type	06-32							
IANS CJ	Control circuit unit	both male and female part	06-63	32						
IANS CT016E	Current transformer	160/0.2A, 1EA	06-16		06-16					
IANS CT032E	Current transformer	320/0.2A, 1EA	06-16		06-16					
IANS CT063E	Current transformer	630/0.2A, 1EA	06-16	32	06-16					
IANS CT080E	Current transformer	800/0.2A, 1EA	08-16	32	08-16					
IANS CT110E	Current transformer	1000/0.2A, 1EA	10-32	32	10-32					
IANS CT113E	Current transformer	1250/0.2A, 1EA	12-16	32	12-16					
IANS CT116E	Current transformer	1600/0.2A, 1EA	16-63	32	16-32					
IANS CT220E	Current transformer	2000/0.2A, 1EA	20-32	32	20-32					
IANS CT225E	Current transformer	2500/0.2A, 1EA	25-32	32	25-32					
IANS CT332E	Current transformer	3200/0.2A, 1EA	32-40	32	32					
IANS CT440E	Current transformer	4000/0.2A, 1EA	40-63							
IANS CT550E	Current transformer	5000/0.2A, 1EA	50-63							
IANS CT663E	Current transformer	6300/0.2A, 1EA	63							
IANS DI16P	DI unit	Arc chamber, for 1 pole	06-16		06-16					
IANS DI32P	DI unit	Arc chamber, for 1 pole	20-32		20-32					

Code	Description		Applied ACB			ACB order code	Category
	Name	Specification	HiAN	HiAH	HiAS		
IANS DI63P	DI unit	Arc chamber, for 1 pole	40-63	32			ACB
IANS LL	Lifting lugs		06-32		06-32	AL	
IANS LL/63	Lifting lugs		40-63	32			
IANS FC06	Fix arcing contact	1EA, 630A	06		06		
IANS FC08	Fix arcing contact	1EA, 800A	08		08		
IANS FC10	Fix arcing contact	1EA, 1000A	10		10		
IANS FC12	Fix arcing contact	1EA, 1250A	12		12		
IANS FC16	Fix arcing contact	1EA, 1600A	16		16		
IANS FC20	Fix arcing contact	1EA, 2000A	20		20		
IANS FC25	Fix arcing contact	1EA, 2500A	25		25		
IANS FC32	Fix arcing contact	1EA, 3200A	32	32	32		
IANS IC06E	Isolating contact	1EA, 630A	06		06		
IANS IC08E	Isolating contact	1EA, 800A	08		08		
IANS IC10E	Isolating contact	1EA, 1000A	10		10		
IANS IC12E	Isolating contact	1EA, 1250A	12		12		
IANS IC16E	Isolating contact	1EA, 1600A	16		16		
IANS IC20E	Isolating contact	1EA, 2000A	20		20		
IANS IC25E	Isolating contact	1EA, 2500A	25		25		
IANS IC32E	Isolating contact	1EA, 3200A	32	32	32		
IANS IC40E	Isolating contact	1EA, 4000A	40				
IANS IC50E	Isolating contact	1EA, 5000A	50				
IANS IC63E	Isolating contact	1EA, 6300A	63				
IANS HANDLE	Draw-in/out handle		06-32		06-32		
IANS HANDLE5	Draw-in/out handle		40-63	32			
IANS L1	LRC unit	AC110V	06-32		06-32		
IANS L16	LRC unit	AC110V	40-63	32			
IANS L2	LRC unit	AC220V	06-32		06-32		
IANS L26	LRC unit	AC220V	40-63	32			
IANS L5	LRC unit	DC110V	06-32		06-32		
IANS L56	LRC unit	DC110V	40-63	32			
IANS L6	LRC unit	DC220V	06-32		06-32		
IANS L66	LRC unit	DC220V	40-63	32			
IANS L7	LRC unit	DC24V	06-32		06-32		
IANS L76	LRC unit	DC24V	40-63	32			
IANS L8	LRC unit	DC48V	06-32		06-32		
IANS L86	LRC unit	DC48V	40-63	32			
IANS MHT	Magnetic holing trigger		06-63	32	06-32		
IANS UVT-CON1	UVT controller	Time delay type, AC110V	06-63	32	06-32		
IANS UVT-CON2	UVT controller	Time delay type, AC220V	06-63	32	06-32		
IANS UVT-CON3	UVT controller	Time delay type, AC380V	06-63	32	06-32		
IANS UVT-CON4	UVT controller	Time delay type, AC440V	06-63	32	06-32		
IANS UVT-CON5	UVT controller	Instantaneous type, DC100V	06-63	32	06-32		
IANS UVT-CON6	UVT controller	Instantaneous type, DC200V	06-63	32	06-32		
IANS UVT/COIL	UVT coil		06-32		06-32		
IANS UVT/COIL6	UVT coil		40-63	32			

Order Information

Spare parts for marine applications (HiAN type only)

No	Code	Specification	Applied ACB								
			HiAN08	HiAN12	HiAN16	HiAN20	HiAN25	HiAN32	HiAN40	HiAN50	HiAN63
1	IANS-SP01	With Motor, APR, UVT Trip	●								
2	IANS-SP02	With Motor, APR, UVT Trip		●							
3	IANS-SP03	With Motor, APR, UVT Trip			●						
4	IANS-SP04	With Motor, APR, UVT Trip				●					
5	IANS-SP05	With Motor, APR, UVT Trip					●				
6	IANS-SP06	With Motor, APR, UVT Trip						●			
7	IANS-SP07	With Motor, APR, UVT Trip	●	●							
8	IANS-SP08	With Motor, APR, UVT Trip	●		●						
9	IANS-SP09	With Motor, APR, UVT Trip		●	●						
10	IANS-SP10	With Motor, APR, UVT Trip	●	●	●						
11	IANS-SP11	With Motor, APR, UVT Trip			●	●					
12	IANS-SP12	With Motor, APR, UVT Trip		●	●	●					
13	IANS-SP13	With Motor, APR, UVT Trip			●	●	●				
14	IANS-SP14	With Motor, APR, UVT Trip				●	●				
15	IANS-SP15	With Motor, APR, UVT Trip				●	●	●			
16	IANS-SP16	With Motor, APR, UVT Trip					●	●			
17	IANS-SP17	With Motor, APR, UVT Trip		●			●				
18	IANS-SP18	With Motor, APR, UVT Trip		●				●			
19	IANS-SP19	With Motor, APR, SHT Trip	●								
20	IANS-SP20	With Motor, APR, SHT Trip		●							
21	IANS-SP21	With Motor, APR, SHT Trip			●						
22	IANS-SP22	With Motor, APR, SHT Trip				●					
23	IANS-SP23	With Motor, APR, SHT Trip					●				
24	IANS-SP24	With Motor, APR, SHT Trip						●			
25	IANS-SP25	With Motor, APR, SHT Trip	●	●							
26	IANS-SP26	With Motor, APR, SHT Trip	●		●						
27	IANS-SP27	With Motor, APR, SHT Trip		●	●						
28	IANS-SP28	With Motor, APR, SHT Trip	●	●	●						
29	IANS-SP29	With Motor, APR, SHT Trip			●	●					
30	IANS-SP30	With Motor, APR, SHT Trip		●	●	●					
31	IANS-SP31	With Motor, APR, SHT Trip			●	●	●				
32	IANS-SP32	With Motor, APR, SHT Trip				●	●				
33	IANS-SP33	With Motor, APR, SHT Trip				●	●	●			
34	IANS-SP34	With Motor, APR, SHT Trip					●	●			
35	IANS-SP35	With Motor, APR, SHT Trip		●			●				
36	IANS-SP36	With Motor, APR, SHT Trip		●				●			
37	IANS-SP37	With Motor, APR, UVT Trip							●		
38	IANS-SP38	With Motor, APR, UVT Trip								●	
39	IANS-SP39	With Motor, APR, UVT Trip									●
40	IANS-SP40	With Motor, APR, UVT Trip			●		●		●		
41	IANS-SP41	With Motor, APR, UVT Trip						●		●	
42	IANS-SP42	With Motor, APR, UVT Trip						●	●		●

Operation Environment

▶ Ambient temperature

-5°C to +40°C

The average temperature for 24hours must not exceed 35°C.

▶ Relative humidity

45% to 85%

▶ Altitude

Below 2000m (6,600 feet)

▶ Atmosphere

Excessive water vapor, oil vapor, smoke, dust or corrosive gases must not exist.

Sudden change in temperature, condensation, or icing must not occur.

▶ Transportation conditions

Never enter the area under the air circuit breaker when it is lifted or suspended using a lifter or chain block.

The air circuit breaker may suddenly drop.

▶ Installation conditions

When installing the HiAN series air circuit breaker, refer to the installation instructions in the catalogue and instruction manual.

▶ IP protection

Standard: IP20

A door flange can be used as a decoration panel that covers the cutout on the switchboard panel, and provides IP20 protection.

With door flange: IP41

IP41 is possible with the use of door flange in switchboard door.

▶ Storage

Store the breaker in a dry indoor location to prevent condensation due to a sudden change in temperature, which is quite harmful to the breaker insulation.

Store the breaker in a clean place free of corrosive gases, dirt and dust.



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