HAVELLS

Air Circuit Breaker
Titania & Titania +

Titania

Air Circuit Breaker

400 A – 2500 A

Breaking Capacity @ 415 V	E Frame	S Frame	H Frame
	400 A - 2000 A	400 A - 2000 A	2500 A
Ics=100% Icu	50 kA	65kA	75kA
Icw for 1 sec	50kA	50kA	65kA

Titania+

Air Circuit Breaker

3200 A – 6300 A

Breaking Capacity @ 415 V	B Frame	C Frame	D Frame
	3200 A - 4000 A	5000 A	6300 A
Ics=100% Icu	100kA	100kA	150kA
Icw for 1 sec	85kA	85kA	100kA

Construction

Operating Mechanism is of stored energy type, which operates using pre-charged springs. The springs are charged manually with the help of charging handle or with the help of charging motor, if provided. The same operating mechanism is used for the entire range. Mechanism has been developed using less number of parts resulting in more reliability, longer mechanical life and requiring very less maintenance.

Contact Mechanism

Conductor Unit is of modular design. Each pole consists of Main and Arcing contacts which are housed in the moulded housing The contacts are made from sintered silver alloy for reliability, longer life and anti-weld properties. The construction of the contact is such that arcing contact closes before and opens later than the main contact, this substantially reduces erosion of main contact under normal and short circuit conditions.

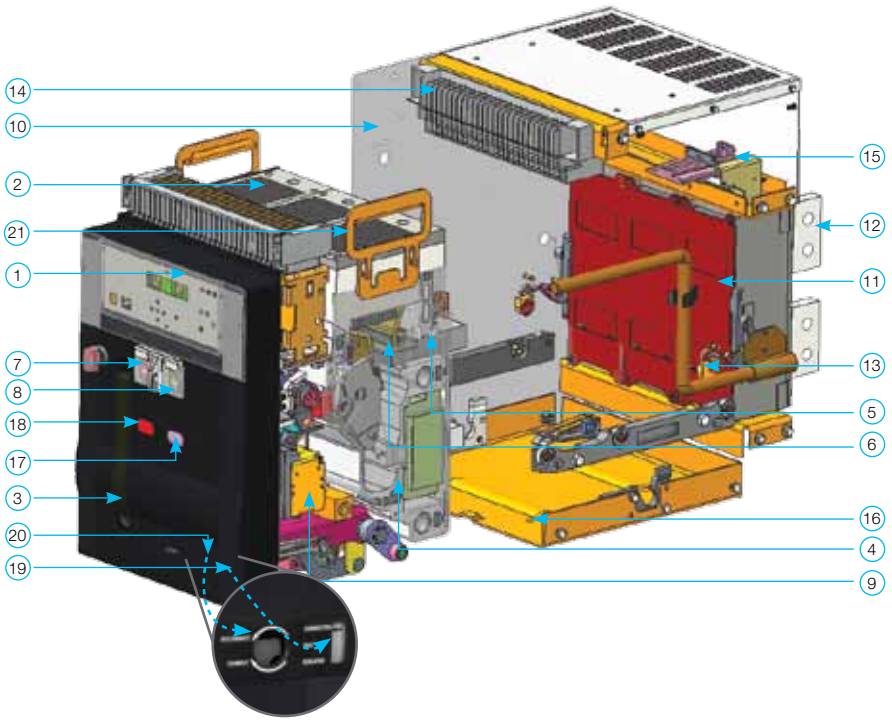
The current transformer is placed inside the pole unit around the lower terminal.

Arc Chutes are provided for quenching the arc. Arc chute comprises of grid plates mounted in parallel in the insulated housing. The arc is divided between these grid plates which helps in its fast quenching. The arc is thus confined, divided and extinguished in the arc chute. The excellent insulation between the conducting parts and better energy dissipation after short circuit makes it possible to make the load and line connections on either side.

The **Tripping Mechanism** comprises of magnet holder trigger which is linked to the trip bar unit. The electronic circuit gives a signal to this unit in case of over current fault and this unit mechanically trips the Circuit Breaker.

In **Over Current Protection** the sensing of the current is through the current transformers fitted on the main terminals. In case of any fault the secondary output of the CT increases. This secondary output of CT goes to the micro controller based electronic circuit. The micro controller is programmed to give a signal as per inverse time characteristics. The signal in the form of DC supply is given to magnet holder trigger which trips the ACB. The required tripping time and tripping current can be set with the help of the switches provided on the front panel of the electronic release.

Internal View of ACB



1. Over Current Release
2. Arc Chute
3. Charging Handle
4. Pole Unit
5. Terminal assembly
6. Moving Contact assembly
7. Push Button “OFF”
8. Push Button “ON”
9. Shunt Trip Coil
10. Cradle Unit
11. Safety Shutter
12. Terminals
13. Pad lock facility for safety shutter
14. Control Terminals
15. Position Indication Switch (Optional)
16. Mounting Holes
17. Spring charge indicator
18. ACB ON OFF indicator
19. ACB connection status indication
20. Cradle rake in / out slot
21. Lifting Plate

Technical Data

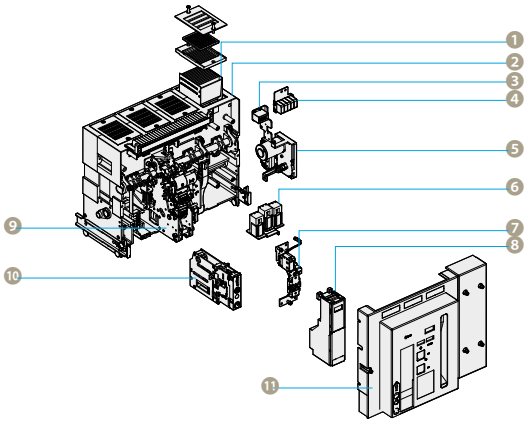
External Structure

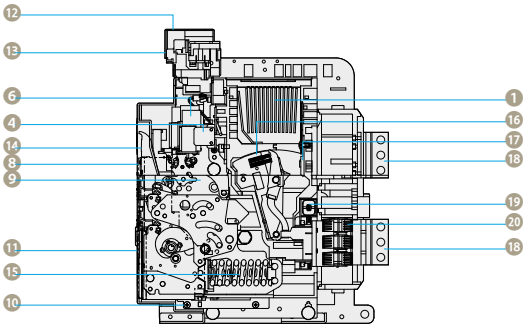
Fixed Type

Draw-In/Out Type (Including Cradle)

1. Control Circuit Terminal
2. Front Cover
3. Close/Open Indicator
4. Close Button
5. Overcurrent Relay Device
6. Open Button
7. Position Padlock
8. Position Lock Release Button
9. Draw-In/Out Handle Insertion Hole
10. Position Indicator
11. Counter
12. Charged/Discharged Indicator
13. Manual Charging Handle
14. Rating Nameplate
15. Terminal Busbar
16. OCR & Alarm S/W Reset Button
17. Draw-In/Out Guide Rail

Internal Structure





1. DI Grid
2. CO Unit
3. Counter
4. AUX Switch
5. Motor
6. Closing/Trip/UVT Coil
7. MHT Device
8. OCR
9. Mechanism
10. DR Device
11. Cover
12. Control Terminal Protection Cover
13. Control Terminal
14. Manual Charging Handle
15. Closing Spring
16. Moving Contact
17. Fixed Contact
18. Terminal
19. Current Transformer (CT)
20. Terminal Clip

※ Titania + Series air circuit breaker has been designed so that upon closing, the N phase is closed earlier than R, S, T phase and upon opening, the N phase is disconnected last in order to reduce burden of main contact and to prevent ripple effect of accident of N phase.

Titania
Air Circuit Breaker

Technical Information (400 A - 2500 A)

Standard Conformity : IEC 60947-2 & IS 13947-2

Performance Series		Sl Unit	E	S	H
Rated Current (In) (Ref. Temp. 45 °C)		A	400	400	2500
			630	630	
			800	800	
			1000	1000	
			1250	1250	
			1600	1600	
			2000	2000	
Rated Service voltage (Ue)		V	690 Vac 250 Vdc	690 Vac 250 Vdc	690 Vac 250 Vdc
Rated Insulation voltage (Ui)		V	1000 V	1000 V	1000 V
Rated impulse withstand voltage (Uimp)					
		kV	12 kV	12 kV	12 kV
Frequency		(Hz)	50/60	50/60	50/60
No. of Poles*			3, 4	3, 4	3, 4
Rated short-circuit breaking capacity (Ics=100%Icu) -220 / 380 / 415 / 440 Vac -500 / 660 / 690 Vac -250 Vdc		(kA)	 50 40 40	 65 55 55	 75 65 65
Rated short-time withstand current (Icw) 1 second 3 second		(kA)	 50 36	 50 36	 65 50
Rated short-circuit making capacity (peak value) (Icm) -220 / 380 / 415 / 440 -500 / 660 / 690		(kA)	 105 84	 143 121	 165 143
Utilization category			B	B	B
Isolation behavior			Yes	Yes	Yes
Closing time		ms	<70	<70	<70
Break time (max)			30	30	30
Mechanical life (No. of operations) (with regular maintenance)			25000	25000	20000
Electrical life (at 440 Vac) (No. of operations)			400 A - 800 A : 15000	400 A - 800 A : 10000	10000
			1000 A,1250 A : 12000	1000 A,1250 A : 10000	
			1600 A : 12000	1600 A : 8000	
			2000 A : 10000	2000 A : 8000	
Overall Dimensions	(mm)				
Fixed (WxHxD)	3P	mm	291x421x307		400x421x307
	4P	mm	381x421x307		525x421x307
Draw out (WxHxD)	3P	mm	330x460x386		435x460x386
	4P	mm	420x460x386		560x460x386

Technical Information (3200 A - 6300 A)

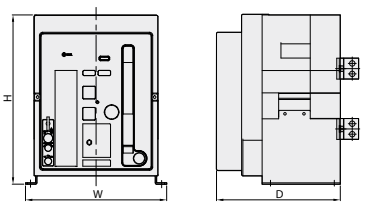
Performance Series			SI Unit	B Frame	C Frame	D Frame
Rated Current [In max]	Based on 40		A	3,200	5,000	6,300
				4,000		
Rated Operational Voltage [Ue]			V	690		
Rated Insulation Voltage [Ui]			V	1,000		
Frequency			Hz	50/60		
No. of Poles			P	3, 4		
Current Setting Range (…× In max)			A	0.4 ~ 1.0		
Rated Current of Neutral Pole (N) (··· %×In)			A	100 %	100 %	100 %
Rated Breaking Capacity [Icu] [Sym]						
IEC 60947-2 Category "B" KS C 4620	AC	(690/600/550) V	kA	85	85	100
		(500/480/460) V		100	100	150
		(415/380/230/220) V		100	100	150
Rated Service Short-Circuit Breaking Capacity [Ics] ···%×Icu			kA	100 %	100 %	100 %
Rated Closing Current [Icm] [Peak]						
IEC 60947-2 Category "B" KS C 4620	AC	(690/600/550) V	kA	187	187	220
		(500/480/460) V		220	220	330
		(415/380/230/220) V		220	220	330
Rated Short-Time withstand Voltage [Icw] (Without Inst)						
1 second			kA	85	85	100
2 seconds				75	75	85
3 seconds				65	65	75
Rated Impulse withstand Voltage [Uimp]			kV	12		
Total Breaking-Time			ms	40		
Closing Operational Time						
Motor Charging Time (sec) max.				10		
Rated Trip Time (ms) max.				80		
Lifecycle (Cycles)						
Mechanical	Without Maintenance			20,000	10,000	5,000
	With Maintenance			30,000	15,000	10,000
Electrical	Without Maintenance			20 : 5,000 25 ~ 40 : 3,000	2,000	2,000
	With Maintenance			20 : 10,000 25 ~ 40 : 8,000	5,000	5,000
Weight						
3 Pole	Draw-Out Type		kg	87 (107) [2]	145	169
	Fixed Type			44 (61) [2]	76	108
4 Pole	Draw-Out Type			103 (140) [2]	173	214
	Fixed Type			55 (80) [2]	81	137
(W×H×D)						
3 Pole	Draw-Out Type		mm	399×460×368.4	624×460×368.4	766×460×368.4
	Fixed Type		mm	408.4×404.4×295.8	633.4×404.4×295.8	775.4×404.4×295.8
4 Pole	Draw-Out Type		mm	514×460×368.4	794×460×368.4	996×460×368.4
	Fixed Type		mm	523.4×404.4×295.8	803.4×404.4×295.8	1005×404.4×295.8

1) 4,000 AF

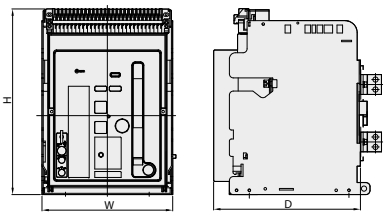
2) In case of MCR and override setting, INST is 50 ms.

Life time is the limit lifespan and is not the guaranteed lifespan. In case of maintenance, it is charged. In the event of abnormalities in accessories during use, it can be replaced. Quality Assurance: Based on IEC 60947-2's number of opening/closing within the warranty period.

Fixed Type



Draw-Out Type



Release Protection Feature (400 A - 2500 A)




S. No.	Features		IPR E+	IPR 1+	IPR 3+	IPR 5+
	Release settings:		●	●	●	●
1	LTD	Current Setting	●	●	●	●
		Time Setting	●	●	●	●
2	STD	Current Setting		●	●	●
		Time Setting		●	●	●
3	INST	Current Setting	●	●	●	●
4	GFT	Current Setting		●	●	●
		Time Setting		●	●	●
5	PTA	Current Setting			●	●
		Time Setting			●	●
6	Function Blocking		●	●	●	●
7	Field Test Function		●	●	●	●
8	IPR Fit Indicator				●	●
9	Load Shedding Function				●	●
10	Reset Function		●	●	●	●
11	Thermal Memory				●	●
12	LED Indications		●	●	●	●
13	Fault History on Display				●	●
14	Making Current Release		●	●	●	●
15	Zone Selectivity				●	●
16	Circuit Breaker Fail Protection				●	●
17	Operation Counter				●	●
18	Contact Erosion Indicator				●	●
19	Ready to Close (RTC)*				●	●
20	I2t ON/OFF				●	●
21	LCD Display				●	●
22	Bar Graphs Indication				●	●
23	External Relay Card*				●	●
	Advanced Protection				●	●
24	Under Voltage Release				●	●
25	Over Voltage Release				●	●
26	Under Frequency protection				●	●
27	Over Frequency protection				●	●
28	Voltage unbalance protection				●	●
29	Phase sequence protection				●	●
30	Over Temperature Protection				●	●
	Measurement Module				●	●
31	Current (Both in 3 phase & neutral)				●	●
32	Voltage (both Line & Phase)				●	●
33	Frequency (Hz.)				●	●
34	Temperature (deg. C)				●	●
35	Maximum Demand					●
36	Apparent Power (KVA)					●
37	Real Power (KW)					●
38	Reactive Power (KVAr)					●
39	Power factor					●
40	Communication Enabled (MODBUS)					●

*Provided on request. #Communication software provided on requrest.
Note: IPR+ releases do not require any extenrnal power supply for their basic protection functioning. For other functions and display to run, they require an external power supply of 12 Vdc - 24 Vdc.

Release Protection Feature (3200 A - 6300 A)

Model Name	N Type	A Type	P Type	H Type
	LN	LA	LP	LH
Frequency				
50 Hz	50 Hz	50 Hz	50 Hz	50 Hz
60 Hz	60 Hz	60 Hz	60 Hz	60 Hz
Control Power				
External Power	-	●	●	●
Self-Power	●	●	●	●
Protection Function				
LTD (Long Time)	●	●	●	●
STD (Short Time)	●	●	●	●
INST (Instantaneous)	●	●	●	●
Pre-Trip Alarm	-	●	●	●
Ground Fault Trip	●	●	●	●
Thermal Function	●	●	●	●
Field Test	-	●	●	●
Fail Safe	●	●	●	●
Indication				
True RMS Detection Method	●	●	●	●
LED Indication per Trip Type	-	●	●	●
Fault LED	L[1)]	PTA, L, S/I, G	PTA, L, S/I, G	PTA, L, S/I, G
Real-Time LCD Indication of Load Rate per Phase	-	●	●	●
Measurement LCD	-	●	●	●
3 Phase current	-	●	●	●
Voltage	-	-	●	●
Power	-	-	●	●
Power factor & power quantity	-	-	●	●
Demand	-	-	●	●
Zone selective interloacking	-	●	●	●
Voltage / current harmonics (1st ~ 63 th)	-	-	-	●
3 Phase wave form	-	-	-	●
TDH, TDD	-	-	-	●
Output Contact				
Integrated Instantaneous Contact (1a)	●	-	-	-
Individual Continuous Contact (4a)	-	●	●	●
Operation				
MCR	-	❍	❍	❍
Communication	NFC	Modbus-RTU	Modbus-RTU	Modbus-RTU
Event/Fault Recording	●	●	●	●

● Standard ❍: Option
1) Indicates reserve before operation during long time delay.
2) ZCT designated by the customer is used.
3) ZCT designated by our company is used.
4) As for marine type, individual continuous contact is 3a.

Titania
Air Circuit Breaker

Intelligent Protection Releases (400 A - 2500 A)

New Intelligent Protection Releases - Plus (IPR +) are the multifunctional dedicated protection units for ACB, using advanced micro-controller with full benefits of microprocessor technology offering overload & short circuit protection functions, advance protection functions, measurement & advanced monitoring functions, LCD display, MODBUS communication etc.

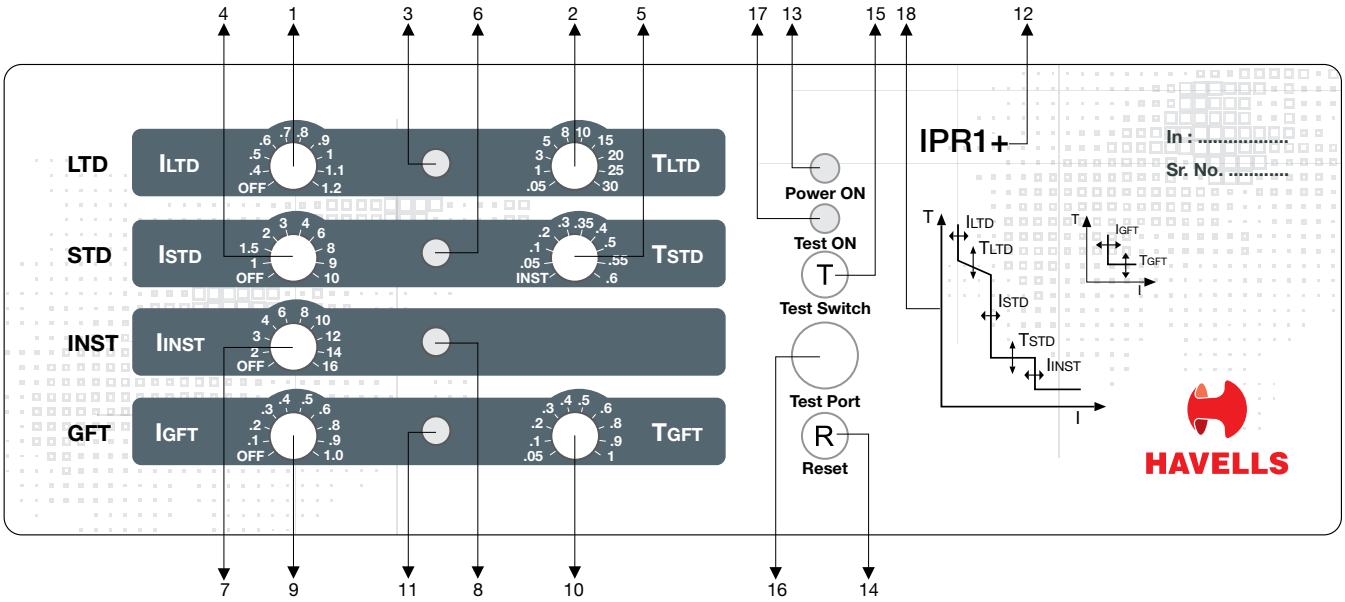
For meeting all the application requirements, ACBs come with a wide variety of new electronic releases, categorized into 4 different categories as IPR E+, IPR 1+, IPR 3+, and IPR 5+. IPR 1+ being the basemodel and IPR E+ as the economical version. The next four new models IPR 3+ and IPR 5 + are of premium segment with High-end Features.

IPR+ Specification

- **Overload function (LTD)**
  LTD Current — OFF, 40% to 100% of I_{CT}
  LTD Time — 0.5 s to 30 s
- **Short Circuit function (STD)**
  STD Current — OFF, 100% to 1000% of I_{CT}
  STD Time — 50 ms to 600 ms
- **Instantaneous function (INST)**
  INST Current — OFF, 200% to 1600% of I_{CT}
- **Ground fault function (GFT)**
  GFT Current — OFF, 10% to 100% of I_{CT}
  GFT Time — 50 ms to 1000 ms

Features (IPR E + & IPR 1+):

- Self powered by built in Current Transformer
- User friendly settings of current and time delay using Rotary Switches
  - For IPR E+ : Adjustable LTD & INST settings (Economical Version)
  - For IPR 1+ : Adjustable LTD, STD, INST & GFT settings
- Both Three Phase and Earth fault protection in same unit (IPR 1+)
- More Reliable and repetitive accuracy, using high end micro-controller
- True RMS sensing with immunity to system disturbances
- Compatible with both 5P10 & 5P10 CTs
- LED Indication for fault discrimination
- Function blocking facility provided
- Compact Size & light weight
- Elegant Aesthetics

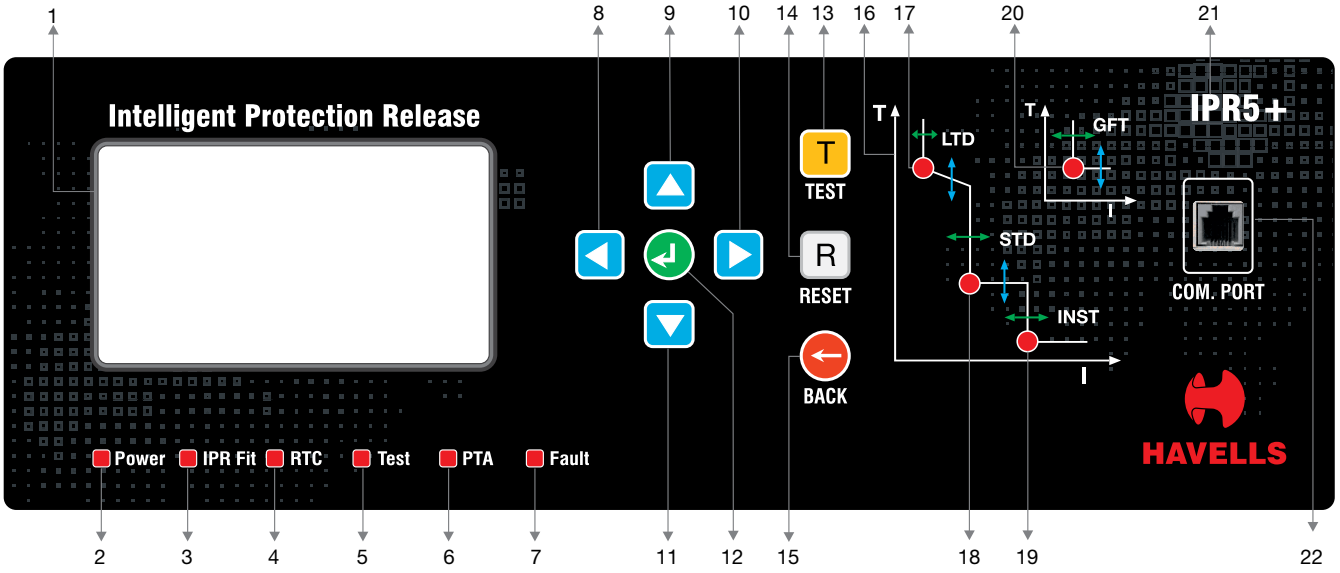


Ref.	Description	Ref.	Description
1	Rotary switch for setting LTD current	10	Rotary switch for setting GFT time
2	Rotary switch for setting LTD Time	11	LED indication for GFT fault
3	LED indication for LTD fault	12	Product identification code
4	Rotary switch for setting STD current	13	LED for “Power ON”
5	Rotary switch for setting STD time	14	Reset push button
6	LED indication for STD fault	15	Test push button
7	Rotary switch for setting INST current	16	Socket for test supply
8	LED indication for INST fault	17	LED for “Test ON”
9	Rotary switch for setting GFT current	18	Time current characterstics curve

Intelligent Protection Releases (400 A - 2500 A)

Features (IPR3+ and IPR5+) :

- Advanced Protection Functions
- In-built Measurement Module
- Wide LCD Display
- Zone Selective Interlocking
- Making Current Release Function
- Thermal Memory
- *Ready To Close Feature
- I^2t ON/OFF Feature
- Contact Erosion Indicator
- Bar Graphs for Current & Voltage
- Fault History on Display
- Circuit Breaker Failure Function
- Downstream CB Fail Feature
- Digital Operation Counter
- LED Annunciations on Front Fascia
- Maximum Demand
- Over Temprature Protection
- RS-485 MODBUS Communication facility

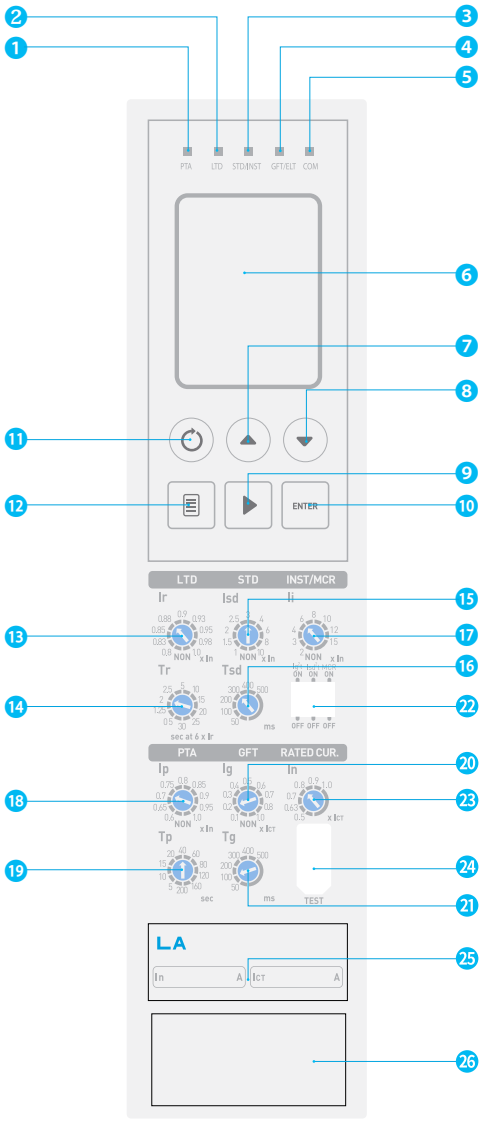


Ref.	Description	Ref.	Description
1	LCD Screen	12	Enter / Save Push Button
2	LED for “Power ON”	13	Test Push Button
3	LED for “IPR Fit”	14	Reset Push Button
4	#LED for “RTC (Ready to Close)”	15	Back Push Button
5	LED for “Test ON”	16	Time Current Characterstic Curvev
6	LED for “PTA (Pre-Trip Alarm)”	17	LED Indication for LTD Fault
7	LED for “Faults”	18	LED Indication for STD Fault
8	Scroll “Left” Push Button	19	LED Indication for INST Fault
9	Scroll “Up” Push Button	20	LED Indication for GFT Fault
10	Scroll “Right” Push Button	21	Product Identification Code
11	Scroll “Down” Push Button	22	MODBUS RS-485 Communication Port

*Provided on request
#LED is functional only when RTC feature is requested

Protection Release (3200 A - 6300 A)

External



1. PTA Signal LED
2. LTD Signal LED
3. STD/INST Signal LED
4. GFT/ELT Signal LED
5. Com. Signal LED
6. LCD/NFC Antenna (LN, SN)
7. STD/INST Test Button
8. LTD Test Button
9. Movement Button
10. Enter Button
11. Reset Button
12. Menu Button
13. LTD Pick Up Setting
14. LTD Operational Time Setting
15. STD Pick Up Setting
16. STD Operational Time Setting
17. INST Pick Up Setting
18. PTA Pick Up Setting
19. PTA Operational Time Setting
20. GFT/ELT Pick Up Setting
21. GFT/ELT Operational Time Setting
22. GFT/STD (Inverse Time Setting)., MCR ON/OFF Setting Switch
23. In (Rated Current) Setting
24. Temporary Test Connection Jack
25. Model Name
26. Battery

※ Self-power functions normally in the case of 10 % for 3 phases and 30 % for a single phase. However, when 200 A ~ 320 A CT is used, it functions normally in case of 50 % for 3 phase and more than 100 % for single phase.
When using MCR function, mark B8 in the name of order type. Auxiliary contact point is 4a5b.
The lifespan of the battery is usually 10 years so in case it is time for replacement, contact our customer support division and services can be received at a cost.
High/low test function is automatically disabled when a load current is applied.

Protection Release (3200 A - 6300 A)

Enhancement of Protection Release Functions

Protection Release built in the Titania+ Series air circuit breaker has reinforced power monitoring functions such as temperature monitoring, fault recording other than the basic protection function, ultimately enabling stable power supply.

Model Name	N Type	A Type	P Type	H Type
	LN	LA	LP	LH
Externals				
Frequency 50 Hz	50 Hz	50 Hz	50 Hz	50 Hz
Frequency 60 Hz	60 Hz	60 Hz	60 Hz	60 Hz
Main Functions	· L/S/I/G · Thermal · Self-Power · Fail Safe · Integrated Instantaneous Contact · 10 ea Fault Recording (Check Via Communication) · Last Fault's Waveform Recording (4 Cycles, Check Via Communication)	· L/S/I/G · Thermal · Self-Power · Fail Safe · Communication (Modbus) · External Power · ZSI · Remote Reset Function · Individual Continuous Contact : LTD, STD/INST, GFT, PTA · 256 ea Fault Recording · Last Fault's Waveform Recording (4 Cycles, Check Via Communication) · 200 ea Event Recording (Check Via Communication)	· L/S/I/G · Thermal · Self-Power · Fail Safe · Communication (Modbus) · External Power · ZSI · Remote Reset Function · Individual Continuous Contact : LTD, STD/INST, GFT, PTA · 256 ea Fault Recording · Last Fault's Waveform Recording (4 Cycles, Check Via Communication) · 200 ea Event Recording (Check Via Communication) · Over-Voltage/ Under-Voltage · Imbalance Type (Voltage/Current) · Reverse Power · 3 Phase Voltage/Current RMS/Vector · Power (P, Q, S), Power Factor (3 Phase) · Energy (Normal/Reverse Direction) · Demand	· L/S/I/G · Thermal · IDMTL · Self-Power · Fail Safe · Communication (Modbus) · External Power · ZSI · Remote Reset Function · Individual Continuous Contact : LTD, STD/INST, GFT, PTA · 256 ea Fault Recording · Last Fault's Waveform Recording (4 Cycles, Check Via Communication) · 200 ea Event Recording · Over-Voltage/Under-Voltage · Imbalance Type (Voltage/Current) · Reverse Power · 3 Phase Voltage/Current RMS/ Vector · Power (P, Q, S), Power Factor (3 Phase) · Energy (Normal/Reverse Direction) · Frequency, Demand · Minute Current Adjustment at Long Time, Short Time, Instantaneous, Ground Setting · Voltage/Current Harmonics (1 st ~63 th) · View 3 Phase Waveform · THD, TDD

Accessories (400 A - 2500 A)

Electrical Accessories:

Charging Motor:

These are available in 110 V and 220 Vac / DC. The VA burden of this motor is 150 VA only and the charging time is 3 to 4 seconds.

Shunt Trip Coil / Closing Coil:

These coils are available in 24 V, 110 Vac/DC, 220 Vac / DC & 415 Vac. The same coil can be used as a shunt trip coil or closing coil. The inrush power is 200 VA.

Undervoltage release:

These coils are available in 24 Vdc, 110 Vac / DC, 220 Vac / DC & 415 Vac.

Inrush power of this coil is 200 VA and the continuous power is 5 VA only.

Auxillary Contacts:

A set of five changeover switches are provided in the circuit breaker which can be used for external circuit. Additional five changeover switches can also be provided as an optional.

Drawout Accessories:

Safety Shutter for main circuit

It is provided on the cradle which automatically isolates the Main circuit terminals when the breaker is drawn out. A provision is also there for locking the safety shutter in the closed position with the help of Pad Lock (not supplied with ACB).

Position Indication Switch:

A set of 5 micro switches is provided in the cradle which indicates the position of breaker in the cradle i.e. CONNECTED, TEST, or DISCONNECTED position. Two switches each are provided for CONNECTED AND DISCONNECTED position and one switch is for TEST position.

Adaptor terminals for Cradle:

Special Adaptor Terminals can also be provided for Ist frame ACB which can make the terminals suitable for taking horizontal as well as vertical bus bar connections. The standard cradles are supplied with horizontal terminals. Adaptor terminals are factory fitted and are available at extra cost.

Mal-insertion prevention device:

It prevents the breaker of a different rating being inserted into the cradle of different rating.

Drawout position lock

This feature is available to lock the breaker into different drawout positions i.e. CONNECTED, TEST, or DISCONNECTED position with the help of padlock (not supplied with ACB).

Other Accessories:

Close open cycle Counter

It indicates the number of mechanical operations of the circuit breaker and the same is visible on the front of ACB Cover.

Key Lock/ Key Interlock:

It is provided to lock the ACB in open position. Once the ACB is locked it can not be switched on. For interlocking purpose three locks with two keys or two locks with one key can be supplied.

ON/OFF push button cover

A special cover can be provided on the front cover on which a pad lock (not supplied with ACB) can be fitted for locking the ON & OFF push buttons.

Trip Indication Switch

It is provided to get a remote signal indicating that ACB has tripped due to the operation of over current release.

Spring charge Indication Switch

A micro switch is provided to get a remote signal indicating the status of Circuit Breaker closing spring.

Door Interlock:

It prevents the opening of panel door, if the ACB is in closed (ON) position. When this interlock is fitted in the Circuit Breaker it is necessary to switch off the breaker, before opening the panel door.

Lifting Plates

Air Circuit Breakers are fitted with specially designed lifting plates which makes the lifting of these ACBs very convenient.

Safety shutter padlock feature

For the safety of the personnel, safety shutter can be padlocked once the breaker has been withdrawn from the cradle.

Accessories (3200 A - 6300 A)

Spring Charging Switch or Ready to Close Switch

- Spring charging switch delivers the charged status when mechanism spring charge is complete.
- Read to close switch delivers only when the circuit breaker is open and simultaneously only when the mechanism spring charge is complete.
- Two accessories cannot be ordered simultaneously.

Closing Coil (CC)

- A control device which closes a circuit breaker remotely from outside.
- The circuit breaker is closed by applying power of at least more than 150 ms within the range of 85 ~ 110 % of the rated control voltage to the control power terminal.
- It can be purchased separately.
- Use a separate switch externally to apply power to the closing coil.

Trip Coil (TC)

- A control device which trips a circuit breaker remotely.
- The circuit breaker is tripped by applying power of at least more than 150 ms within the range of 70 ~ 110 % of the rated control voltage to the control power terminal.
- It can be purchased separately.
- Use a separate switch externally to apply power to the closing coil.

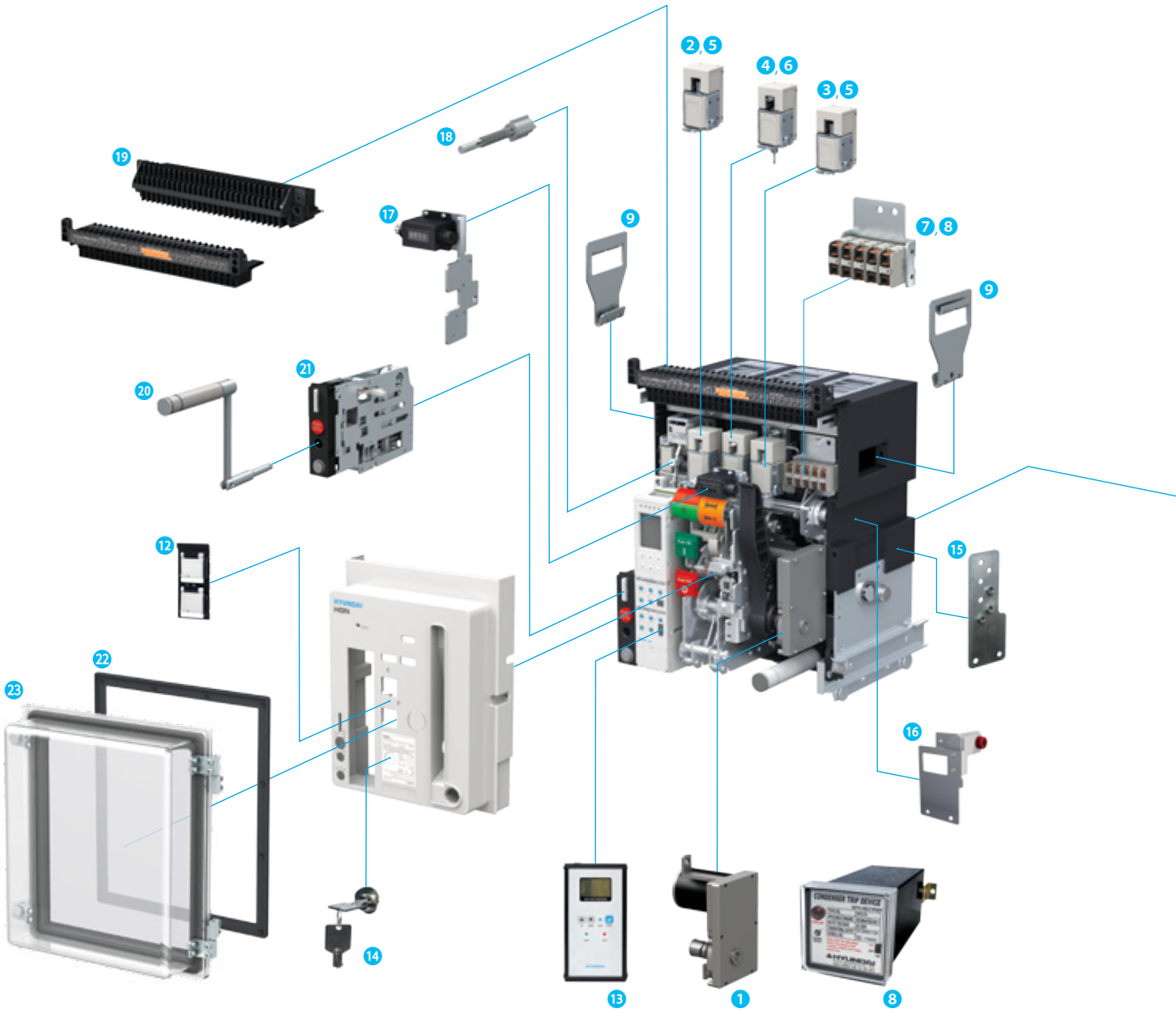
UVT Coil

- Under-voltage trip device is a device that automatically trips the circuit breaker if the load voltage drops to below 70 % of the standard or to prevent accidents at the load part during a black out.
- Under-voltage trip device is classified into instantaneous and time delay type for use. As for instantaneous type, directly connect to control power terminal for use and as for time delay type, the Time Delay Controller can be used.
- The circuit breaker trips when the load voltage at the UVT coil becomes less than 35 %, becomes an interlocked state that cannot be closed and when load voltage of 85% is applied, normal closing is possible.
- When instantaneous type of UVT is used, dual trip coil cannot be used.
- It can be purchased separately.

AUX Switch

- It is an output contact to remotely monitor the On/Off state of the ACB.
- As for Titania + Type, 5a5b is provided as standard without separate indication in the order form.
- AUX switch can be expanded up to 6a6b maximum.
- When using the monitoring contact for trip coil, 3a3b can be used for the AUX switch and when using the MCR function of OCR, it can be used as 4a3b.
- When short “b” is added, it will be attached to ‘b’ contacts 51, 52 for outgoing and upon additional mounting, the short “b” sealed and released can be mounted additionally depending
- on the number of b contacts.
- 5a5b can be purchased separately.

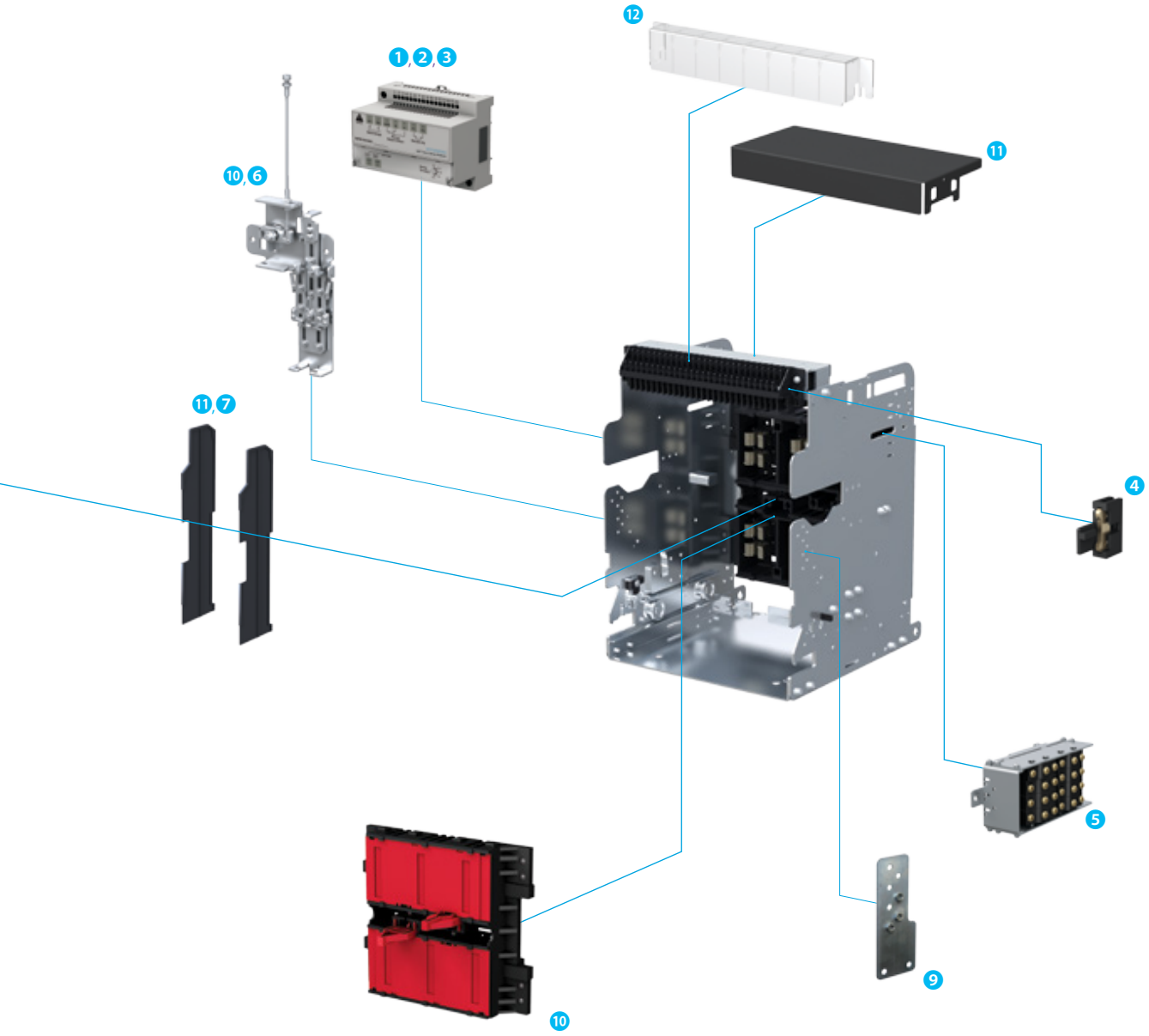
Accessories (3200 A - 6300 A)



Accessories for Circuit Breaker

1. Spring Charge Geared Motor
2. Closing Coil
3. Trip Coil
4. Secondary Trip Coil
5. Trip Coil Supervision
6. UVT Coil
7. AUX Switch
8. Condenser Trip Device (CTD)
9. Lifting Lug
10. Mechanical Interlock
11. Phase Insulation Barrier
12. ON/OFF Button Lock
13. OCR Portable Checker
14. Key Lock
15. Miss-Insertion Preventer
16. Fixing Block
17. Counter
18. OCR & Alarm S/W Reset Button
19. Test Jumper
20. Draw-In/Out Handle
21. Position Pad Lock
22. Door Flange
23. Dust Cover

Various Accessories (Cradle)



Accessories for Cradle

1. UVT Time Delay Controller
2. Remote Closing Prevention Module
3. Temperature Monitoring Device Module
4. Short “b” Contact
5. Position Switch
6. Mechanical Interlock
7. Phase Insulation Barrier
8. Mechanical Operated Cell Switch
9. Miss-Insertion Preventer
10. Safety Shutter
11. Arc Shield
12. Control Terminal Protection Cover

Titania
Air Circuit Breaker

Order Form

Please check ☑ in front of appropriate box. Fill separate sheet for each type of ACB

Order Form

Please check ☑ in front of appropriate box. Fill separate sheet for each type of ACB

CUSTOMER/ DEALER NAME	ORDER NO./DATE	END USER NAME

Rating of ACB — Qty.

630 A ☐ 1000 A ☐ 1600 A ☐ 2500 A ☐ 4000 A ☐ 6300 A ☐

800 A ☐ 1250 A ☐ 2000 A ☐ 3200 A ☐ 5000 A ☐

Breaking Capacity Icu

Upto 2500 A — 50 kA ☐ 65 kA ☐ 75 kA ☐ 100 kA ☐ 150 kA ☐

3200 A to 6300 A

No. of Poles

3 ☐ 4 ☐ (100% Neutral) 4 ☐ (50% Neutral for V-Series only)

Mounting

Fixed ☐ Drawout ☐
- Standard (for E&S series) ☐
- Vertical terminals (for H&V series) ☐

Note: For E & S series - Adapter terminals are on demand

Spring Charging Operation

Manual ☐ Electrical ☐
- Closing Coil _____ VAC / DC
- Tripping Coil _____ VAC / DC
- Motor _____ V

Release

Upto 2500 A: ☐ Without Release ☐ IPR E+ ☐ IPR 1+ ☐ IPR 3+ ☐ IPR 5+

3200 A to 6300 A: ☐ Without Release ☐ LN ☐ LA ☐ LP ☐ LH

Setting: O/L _____ A, S/C _____ A, Inst. _____ A, GFT _____ A, CT Rating _____ A, Neutral CT ☐

Note: Unless otherwise specified O/L will be set at maximum value and all other settings would be set at mid values.

Other Accessories

Close open cycle counter	☐	Five c/o additional Aux. contacts	☐
Field test unit	☐	Shunt Trip	☐
Position Indication Switch	☐	UVT	☐
Spring Charge Indication Switch	☐	Trip Indication Switch	☐
Door Interlock	☐	Key Interlock — 1L+1K	☐
		Key Interlock — 2L+1K	☐
		Key Interlock — 3L+2K	☐

OFV-6

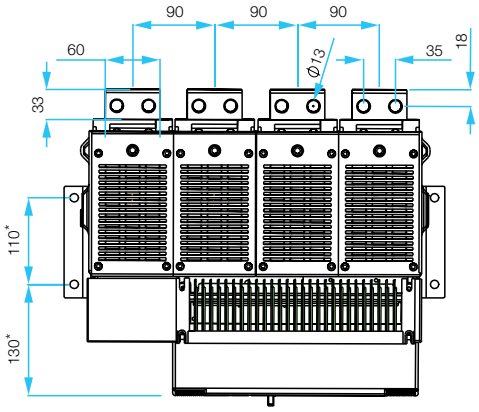
Note :
1. Please specify the voltages for closing coil, shunt trip coil and UVT, available voltages are 24 VDC, 110 VAC / DC, 220 VAC / DC and 415 VAC and for motor available voltages are 220 VAC / D C and 110 VAC / DC.
2. For details of Protection Releases, please refer the chart of technical features.
*3. Communication Software on Chargeble basis.

Out Line Dimensions, Mounting Detail & Terminal Arrangement

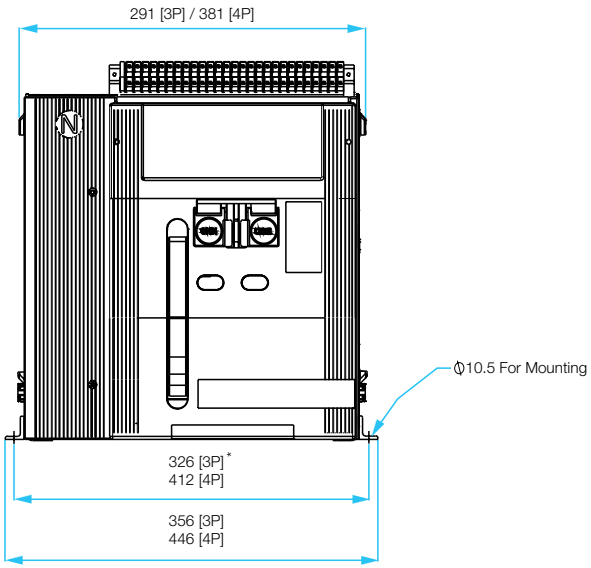
Rating: 630A to 2000A (E & S Series) Fixed Type

Dimensions (in mm)

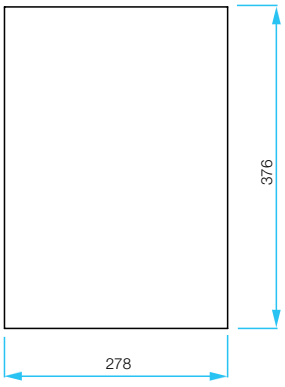
Top View



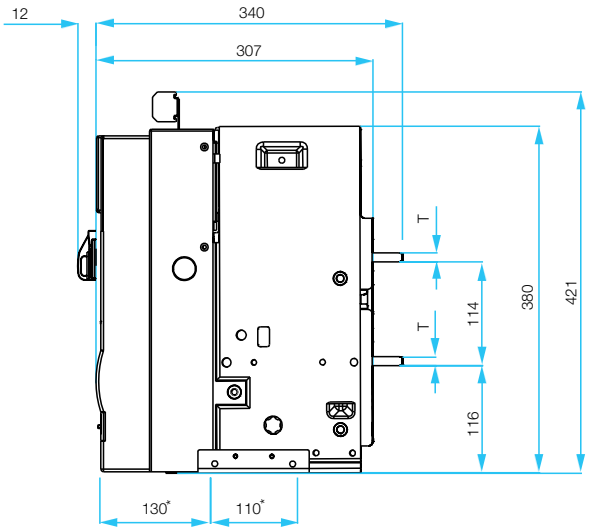
Front View



Door Frame



Panel Door Cut Out



Side View

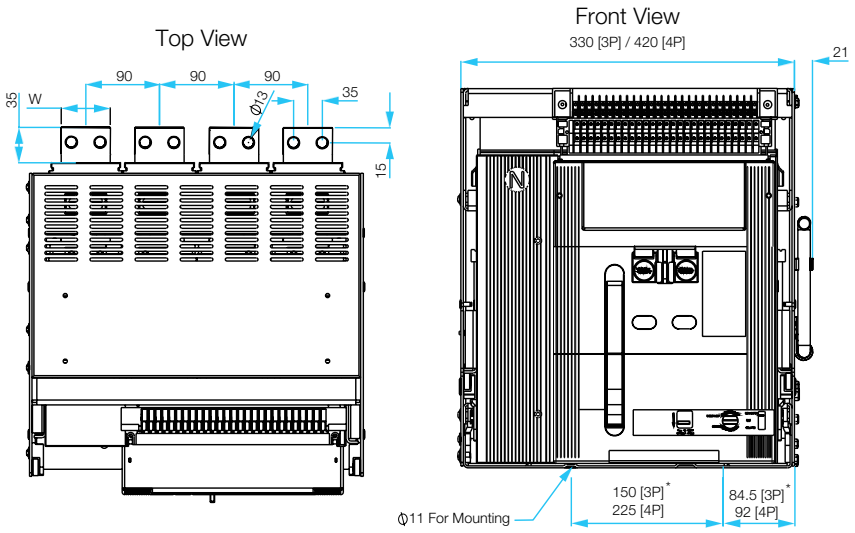
* Mounting hole dimensions
All dimensions are in mm.

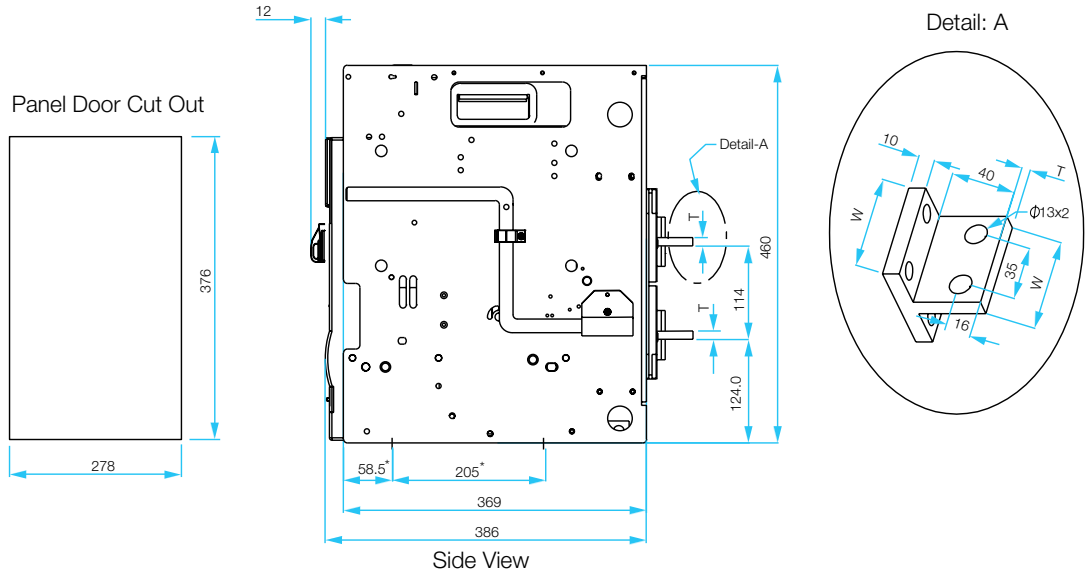
Thickness - 'T'		
	E- Series	S- Series
630-800A	10	20
1000-1250A	15	20
1600A	20	20
2000A	25	25

Out Line Dimensions, Mounting Detail & Terminal Arrangement

Rating: 400 A to 1600 A (E & S Series) Drawout Type

Dimensions (in mm)





Thickness - 'T'		
	E- Series	S- Series
400-800 A	10	20
1000-1250 A	15	20
1600 A	20	20
2000 A	25	25

Width - 'W'		
	E- Series	S- Series
400-800 A	50	50
1000-1250 A	60	60
1600 A	60	60
2000 A	60	60

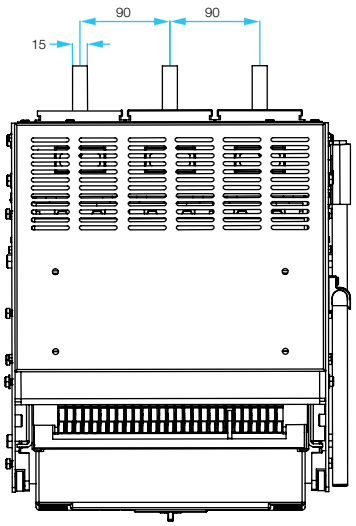
* Mounting hole dimensions
All dimensions are in mm.

Out Line Dimensions, Mounting Detail & Terminal Arrangement

Rating: 2000 A (E & S Series) Drawout Type

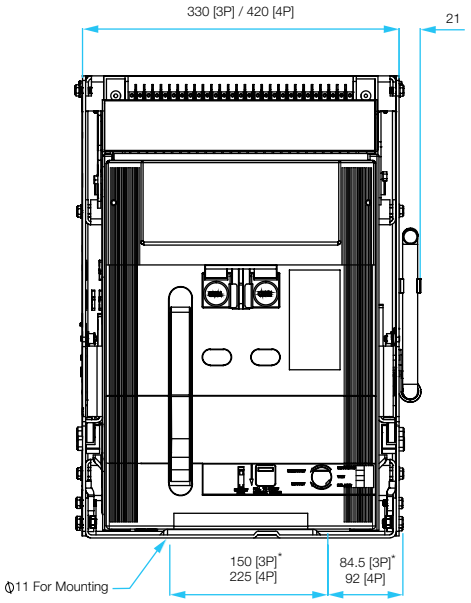
Dimensions (in mm)

Top View

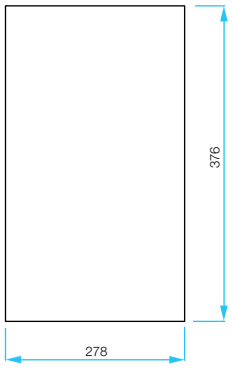


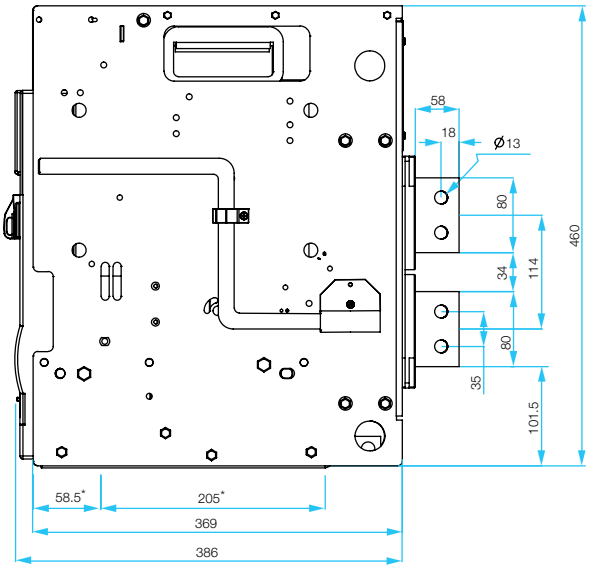
Top View

Front View



Door Frame
Panel Door Cut Out



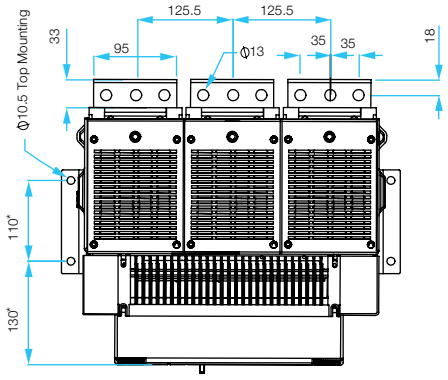


Out Line Dimensions, Mounting Detail & Terminal Arrangement

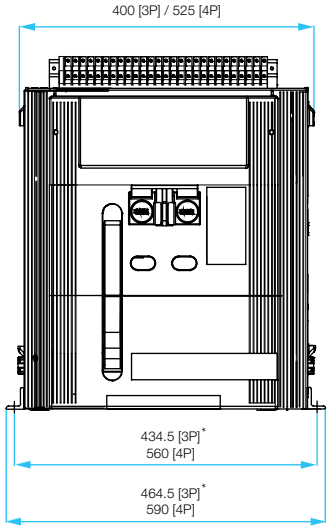
Rating: 2500 A (H Series) Fixed Type

Dimensions (in mm)

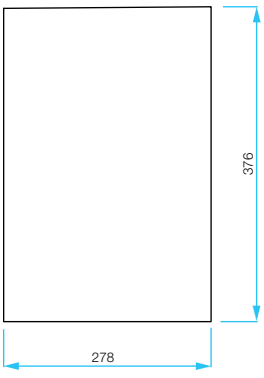
Top View

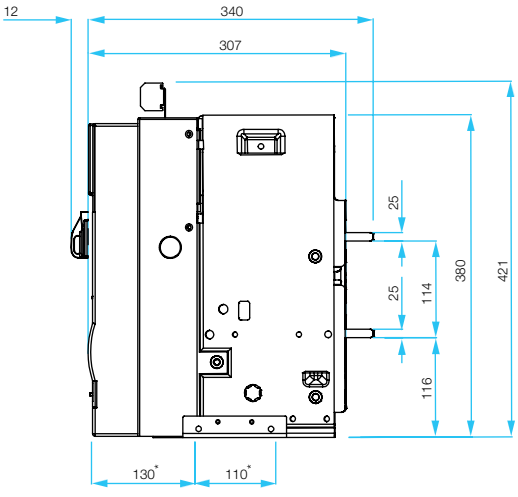


Front View



Door Frame
Panel Door Cut Out





Side View

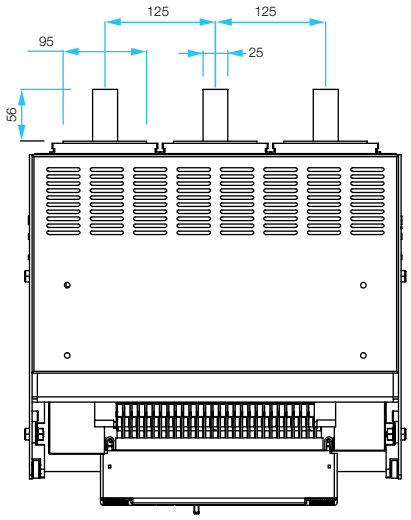
* Mounting hole dimensions
All dimensions are in mm.

Out Line Dimensions, Mounting Detail & Terminal Arrangement

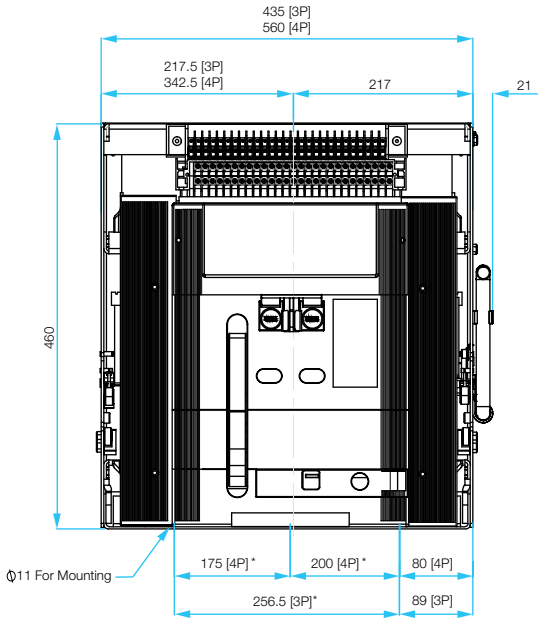
Rating: 2500 A (H Series) Drawout Type

Dimensions (in mm)

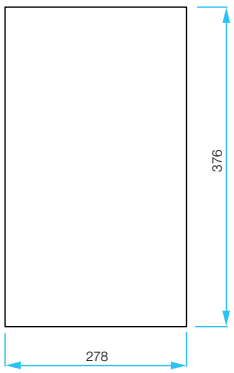
Top View

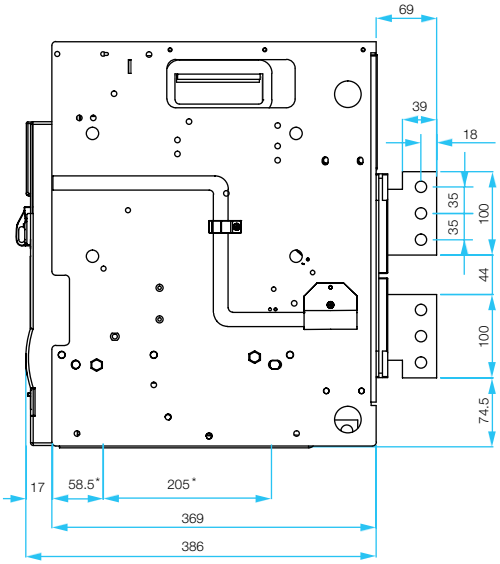


Front View



Door Frame
Panel Door Cut Out



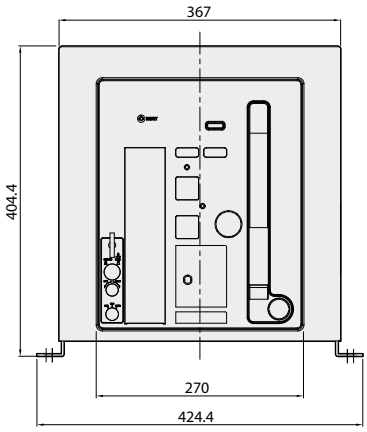


* Mounting hole dimensions
All dimensions are in mm.

Fixed Type 3200 A - B Frame

Dimensions (in mm)

Front



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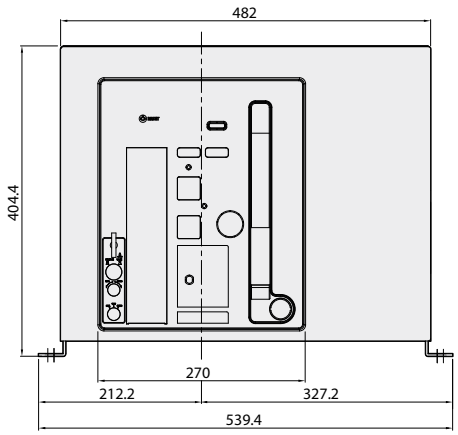
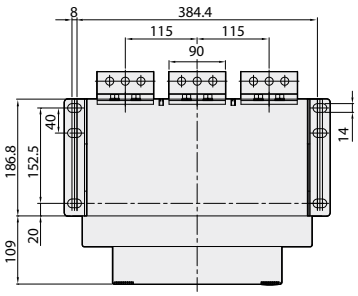
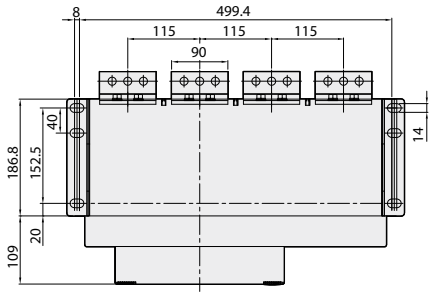


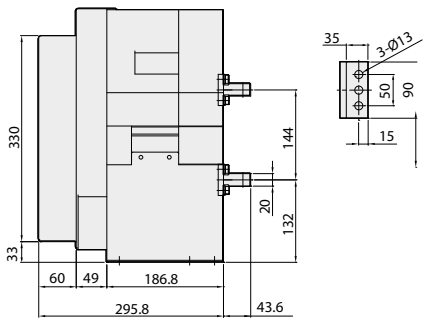
4P

Horizontal Type



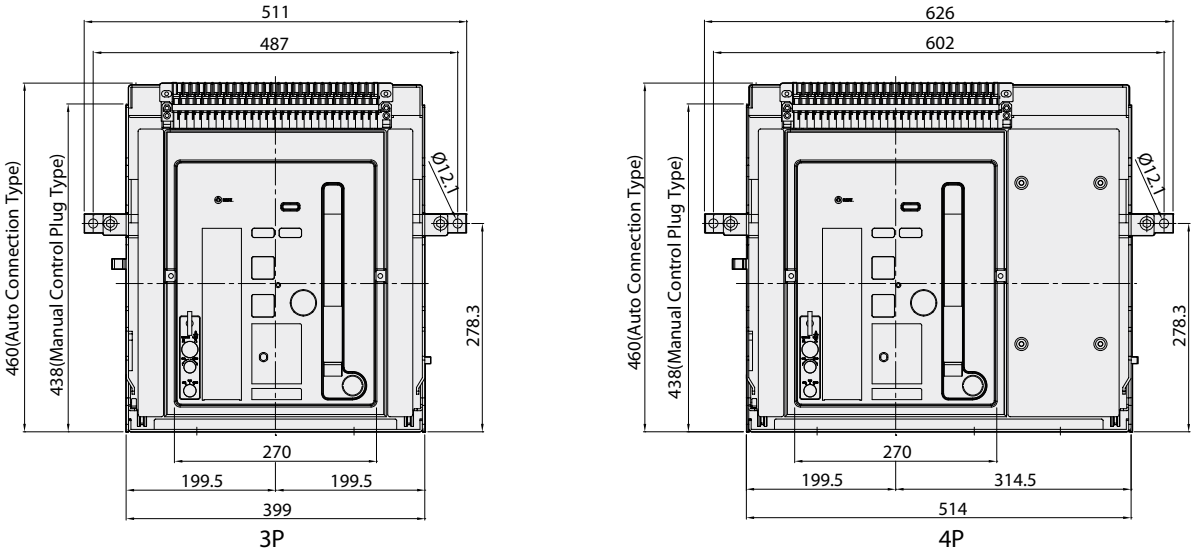


Model Name	Detail"A"
3200 A	90

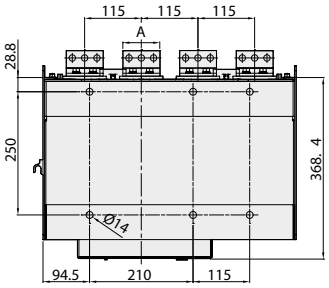


Draw-Out Type 3200 A - B Frame

Front

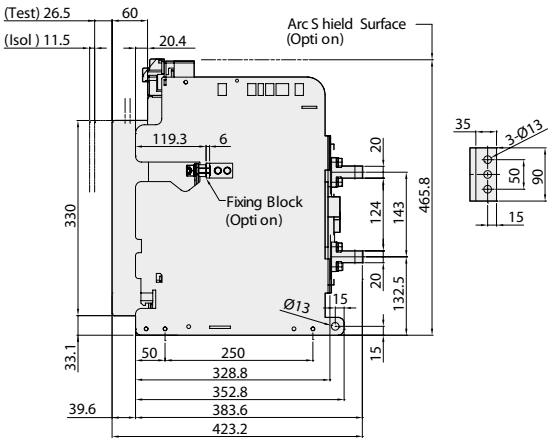


Horizontal Type



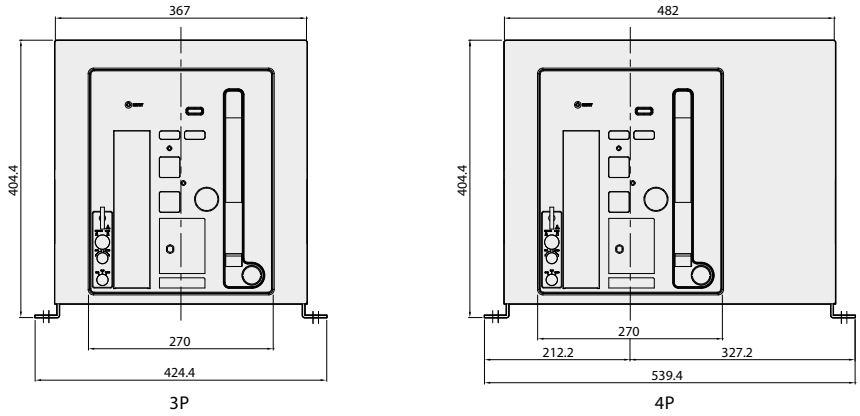
[3,200 A]

Model Name	Detail"A"
3200 A	90

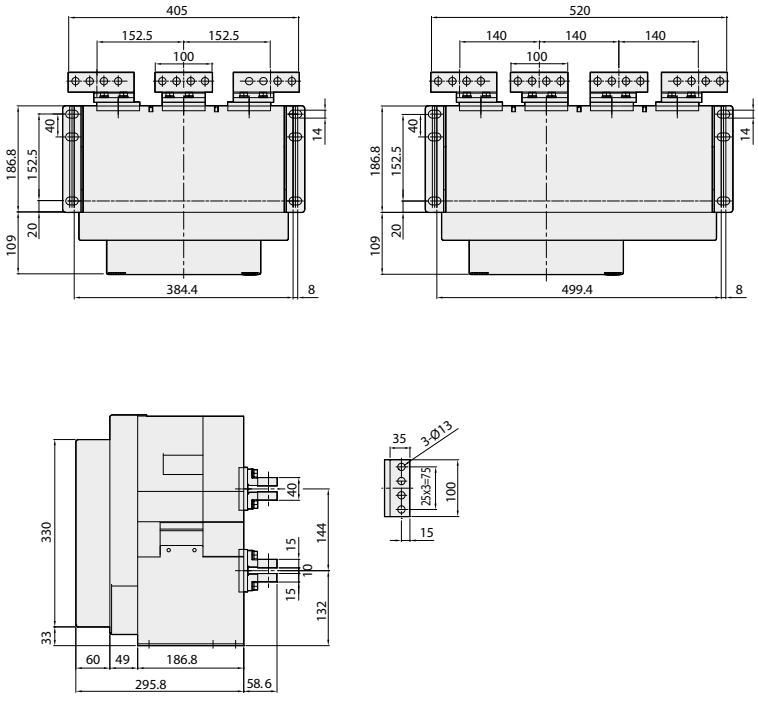


Fixed Type 4000 A - B Frame

Front



Horizontal Type



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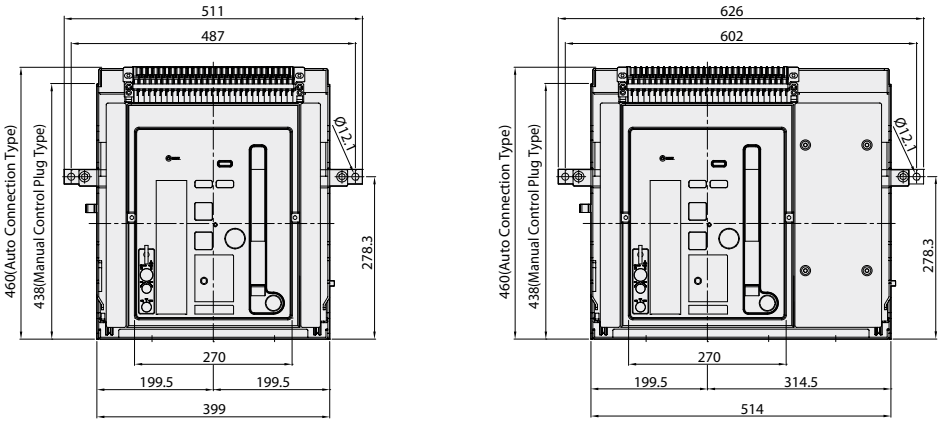
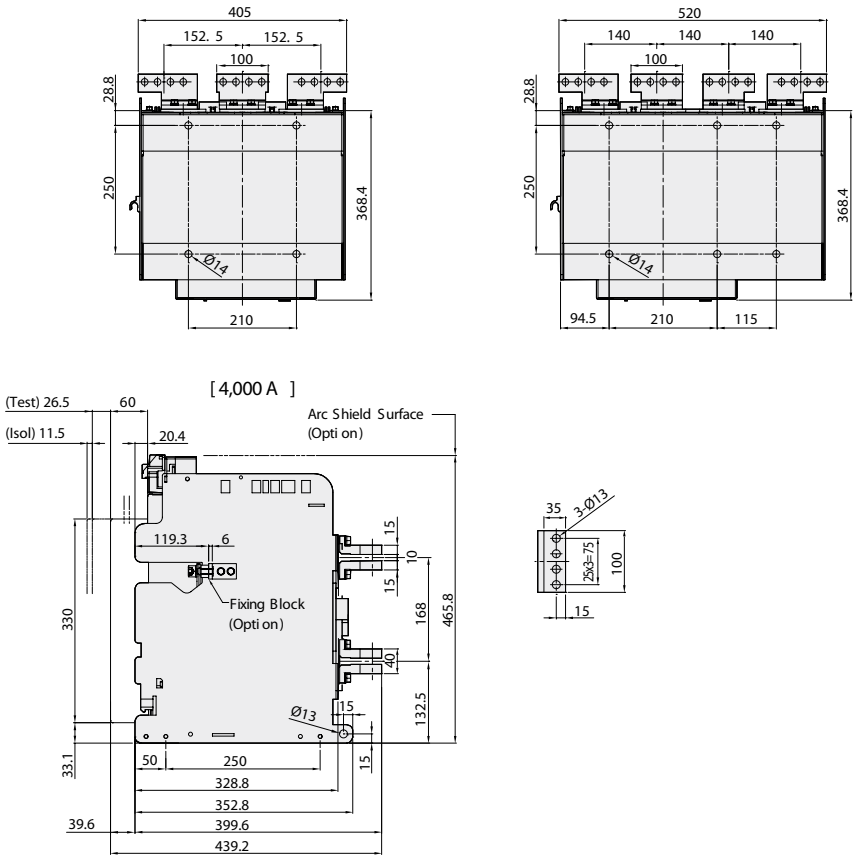
Draw-Out Type 4000 A - B Frame

Dimensions (in mm)

Front



Horizontal Type



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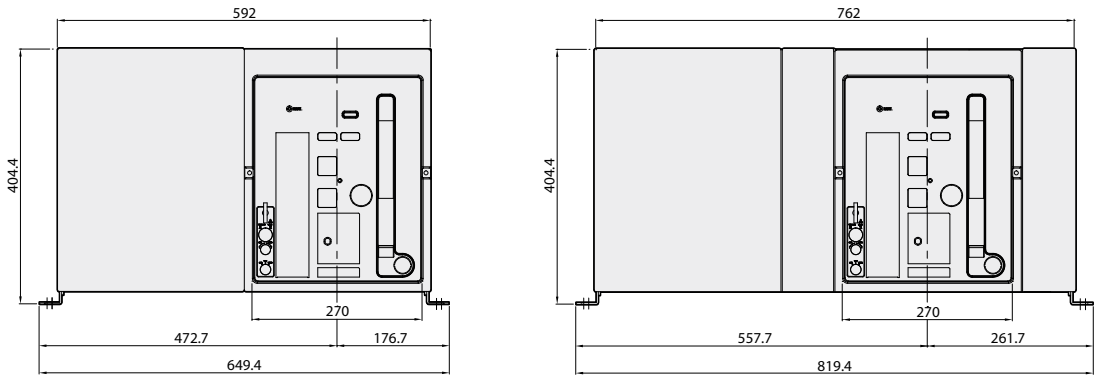
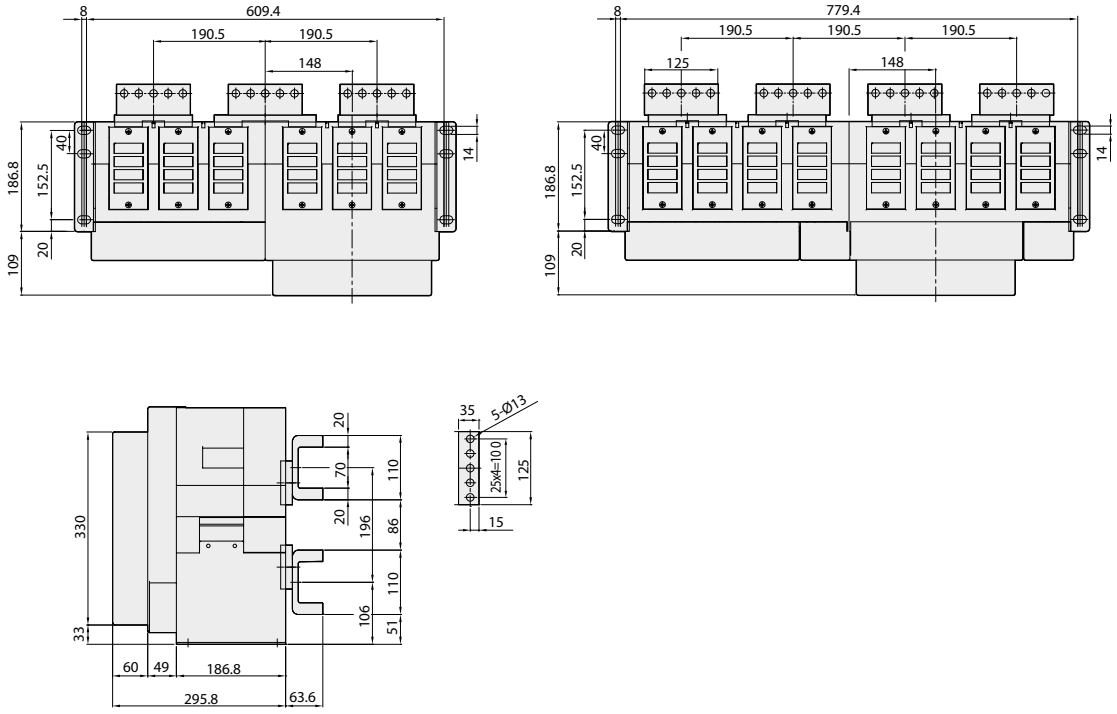
Front



3P 4P

Horizontal Type



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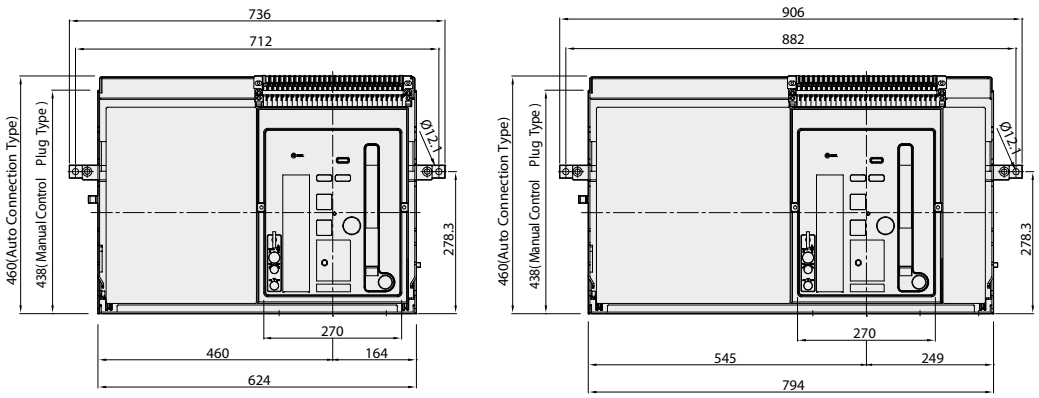
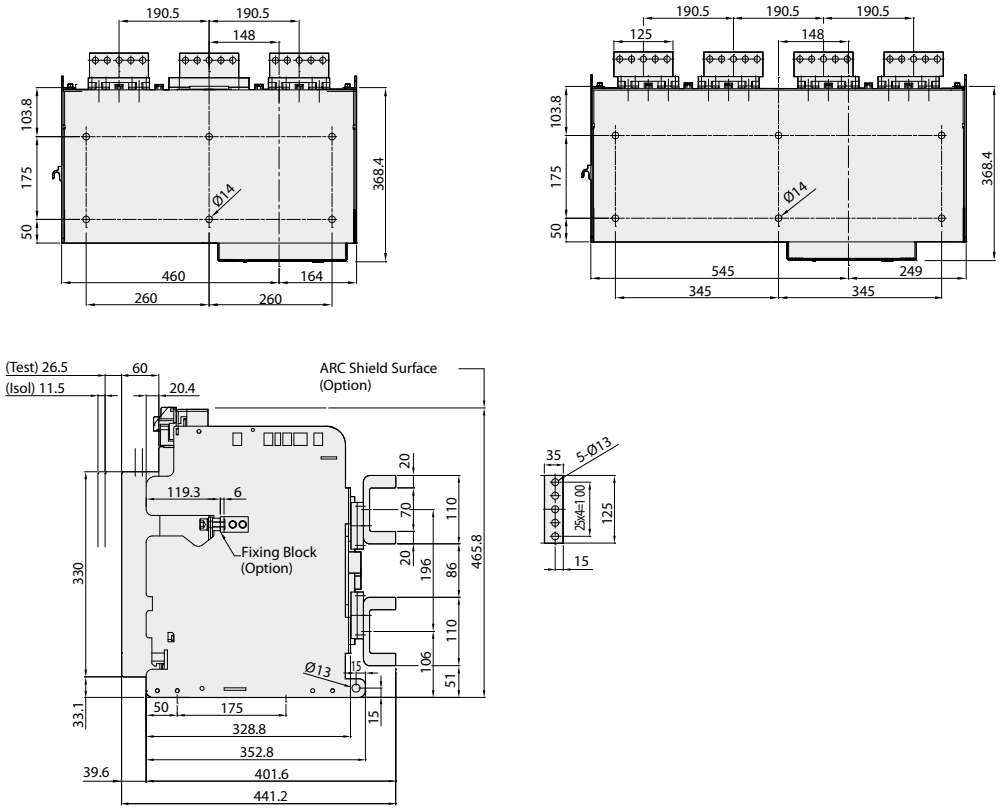
Draw-Out Type 5000 A - C Frame

Dimensions (in mm)

Front



Horizontal Type



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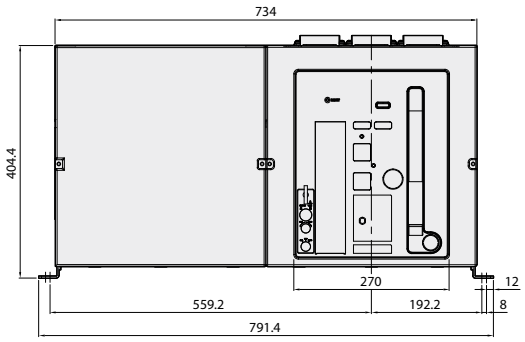
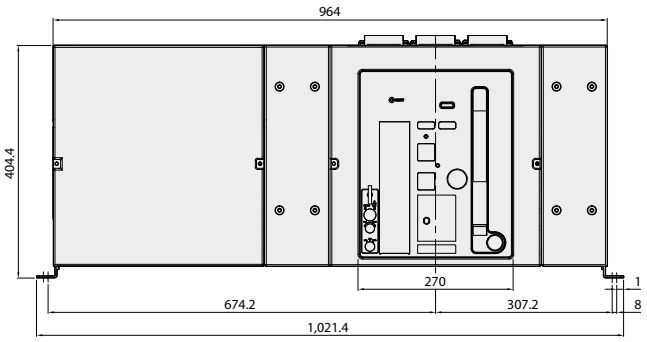
Fixed Type 6300 A - D Frame

Dimensions (in mm)

Front

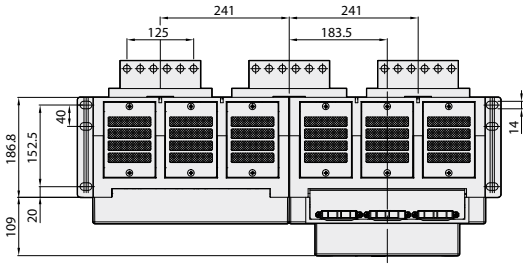


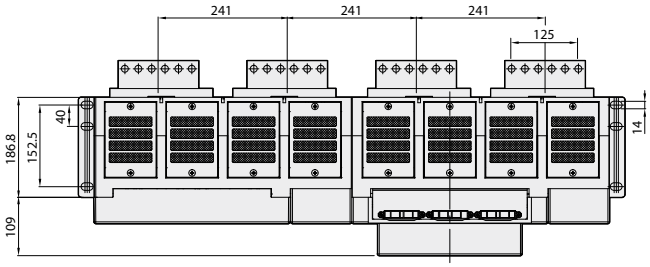
3P

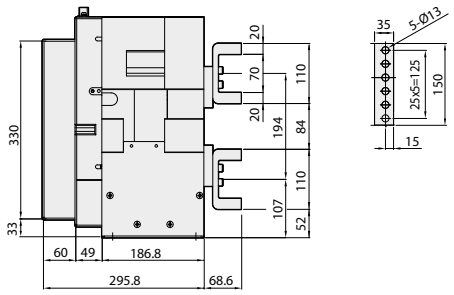


4P

Horizontal Type





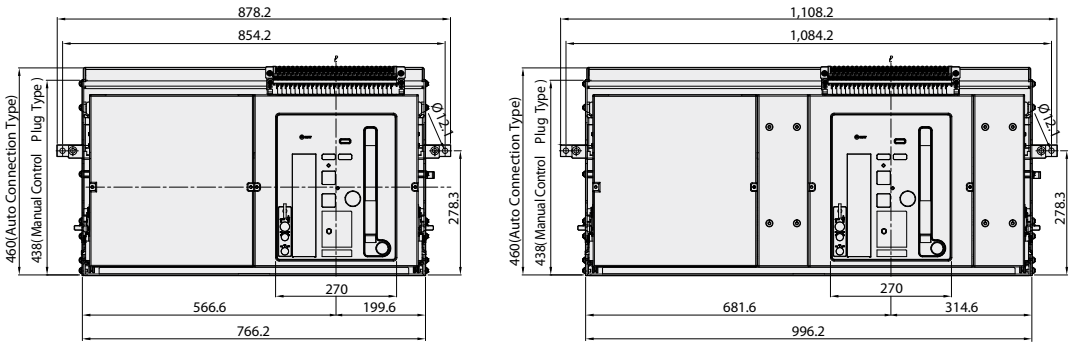


The drawing dimension of this page may be subject to change without prior notice.

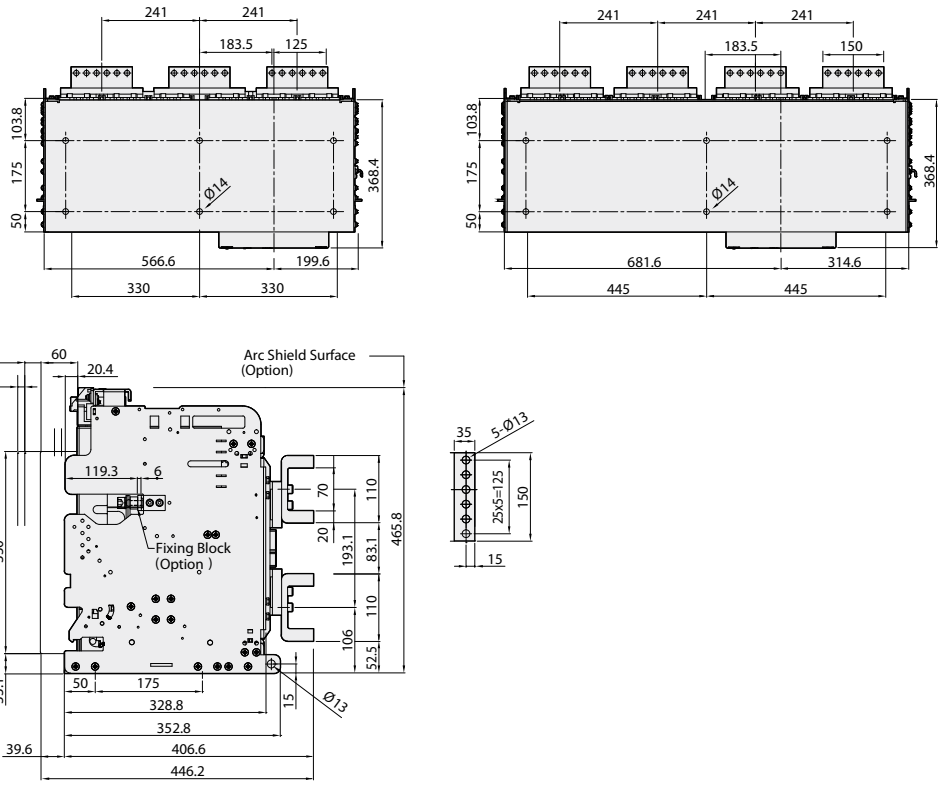
Draw-Out Type 6300 A - D Frame

Dimensions (in mm)

Front



Horizontal Type



The drawing dimension of this page may be subject to change without prior notice.

Current of Status Acquired Standards

Approvals & Certificates

ACB

● : Acquired
❍ : In Progress (Expected)

Type of Certification	Approvals				
Type of Standard	KS	IEC	IEC	IEC	ANSI
Mark					
Testing Institute	KS	CE	DEKRA	Nuclear	KERI
Certification Country	Korea	Europe	Netherlands	Korea	Korea
3200 A- B Frame	●	●	●	❍	●
4000 A- B Frame	●	●	●		●
5000 A- C Frame	●	●	●		●
6300 A- D Frame		●	●		

Type of Certification	Vessel								
Type of Standard	Korea	U.K	U.S.A	France	Japan	Germany	Germany	Italy	Russia
Mark									
Testing Institute	KR	LR	ABS	BV	NK	GL	DNV	RINA	RMRS
Certification Country	Korea	U.K.	USA	France	Japan	Germany	Germany	Italy	Russia
3200 A- B Frame	●	●	●	●	●	●	●	●	●
4000 A- B Frame	●	●	●	●	●	●	●	●	●
5000 A- C Frame	●	●	●	●	●	●	●	●	●
6300 A- D Frame	●	●	●	●	●	●	●	●	●

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Ludhiana: Tel: 0161-4676000 / 24,
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Nagpur: Tel: 0712-2240932, 2242692, 2242699
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Jabalpur: Tel: 0761-4064491

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ZHIMC00023/14Dec 20/Mar 22

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