New name of the Electrical-equipment
VIDER
Value Provider

Low-Voltage Equipment

Product Catalog

Air Circuit Breakers

VITZRO EM

Contents

- About VITZRO EM
- Company Information
- Company History
- Products Guide
- Company Vision

Create Better Life

To the Light of Technology, To the Light of Value and To the Light of Reliability VITZRO EM, in company with the customers

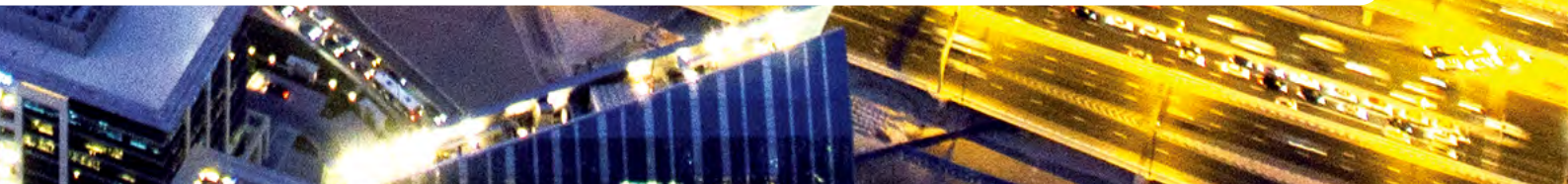
VITZRO EM is a leading company in the electric equipment field, developing an advanced technology, to provide more satisfaction and more advantages for you. Based on a great, expert knowledge and technology on heavy electric equipment, electric power equipment and aerospace field, VITZRO EM creates a new value to propose a new standard that will change the future.

A Bright Future, VITZRO EM

A company that customers love more than ever for we give you a larger value.
Find a bigger world along with VITZRO EM!

A company that believes in faith and creativity as the optimal value

VITZRO EM has developed into a manufacturer of MV equipment, LV equipment, protective equipment and relays in the domestic electric equipment business with the company vision, 'Faith' and 'Creativity.' Based on the 'Faith', we think of our customers and with 'Creativity', we provide a new value. VITZRO EM will provide the new value for the convenience of customers. Basically, high-quality electric equipment and services will be provided and we will endeavor to meet the requirements of customers through our humane and sensible attitudes. Our company represents the electric equipment, yet we are the company of humans. Our company thinks of customers first by providing and enabling the use of convenient and stable equipment.
VITZRO EM is the new value to pursue.



Technology Integrated Global Group

The History of VITZRO EM is the History of Technology.

VITZRO EM was founded in 1955, at the embryonic stage of domestic electric power industry and as we continue our tradition and history for over half a century, we constantly challenged and leapt forward, leading the future with the reputation of Korea's best technology company.

2009 K-STAR Plasma facing component manufacture & assembly

2006 Awarded prize for USD 10million tower of export

1999 Designated as Top 50 companies for competitive quality(at present VITZRO EM)

1955 Establishment for Gwang Myung electric machinery(at present VITZRO EM)

1955 ~ 1988 _ History of Technology, Open Up New Vistas

Kwangmyung Electric Co. was founded in 1955 and started as a neutral electricity manufacturer in January, 1968 and moved the plant to Seongsu-dong in April, 1972. The company prepared a foundation as a technology company through a technical tie-up with AICHI Company and VSS & ATS of Japan in April, 1981 and a technical cooperation with MEIDENSHA Company of Japan and a contract was concluded on Korean retail stores (V.I) in December of the same year. VCB 7.2kV-Class Type Test (localization) was completed in July, 1982 and VCB 25.8kV-Class MCSG 2 Type and 7.2kV Type Tests were completed in September of the following year. We were designated as an electric parts and materials development company (Ministry of Commerce, Industry and Energy) for Type1 other than a vacuum contact in July, 1986 and established a technical cooperation with LINDSEY Company, USA on Polymer Concrete in December of the following year. In addition, 4 types of ACB were developed in June, 1988 and successfully localized them (KEMA Authentication, Netherlands).

1989 ~ 1999 _ Opportunity, Challenge and Remarkable Leap

The company name was changed to Kwangmyung Electric Generation Co. in June, 1989 and an affiliated technology lab was founded in December of the same year. We obtained KS marks for VCB 7.2kB, 8kA and 12.5kA in 1990 (Industrial Advancement Administration) and passed the development test for ACB 2 Types (KERI) in 1991 and for outdoor VCB and Gas Insulated Load Break Switch (PGS) (CESI, Italy) in 1993. We acquired the KS mark for Gas Insulated Load Break Switch (PGS for manufacturing) in 1995 and were awarded with the first Export Award (KEMC). We began exporting ATS to GENERAC.CORP, USA in 1995 and obtained KSA-QA ISO9001 certificate. We moved the office to Seoul in August, 1996 (Neung-dong, Gwangjin-gu, Seoul) and successfully developed Manual/ Motorized ASS 25.8kV 200A in December. Also, VCB development test was completed in 1997 (POWER TECH, CANADA), developed L/A 5kA in 1998 (Polymer Rubber Type), developed VCB 25.8kV, 31.5kA, 38kA and 40kA and acquired BVQ1 ISO 9001 certificate. A joint company with China was founded in 1998 and we were awarded IR52 Jang Young Shil Award in February of the following year (Maeil Business Newspaper) and selected as one of the 50 firms with qualitative competitiveness in 1999 which displayed our technical skills and quality that we strengthened for years.

2000 ~ 2016 _ VITZRO, Stepping Forward to the World

The company name was changed to VITZRO EM Co. in 2000. We laid a foundation for a rapid growth by developing VCB 12kV 1250A 25kA/15kV 1200A 25kA and registering in KOSDAQ stock market. A new plant was constructed in July of the following year (located in Seonggok-dong, Ansan, Gyeonggi Province) and we were designated as a promising small business (Gyeonggi Province Office), an electric parts and materials development company and INNO BIZ company (Joint Korean Economic Newspaper/Small and Medium Business Administration). We sped up on development of new technology and products and developed Cable Termination kits, Insulation Cover, Feed-type ASS (auto & manual), Outdoor VCB Bushing (Polymer Type) and Processed Gas Insulated Load Break Switch in 2002, VCB for nuclear power, ACB for nuclear power (508V 30/50/65kA), Current Limit Power Fuse and so forth in 2003. We were also awarded with various certificates and awards that prove our quality and technology such as a reliability certificate on Processed Gas Insulated Load Break Switch (PGS) in 2004 (R Mark, Korean Agency for Technology and Standards), a Certificate of Quality & Environment System and Aerospace Quality System (ISO 9001 & AS9100, ISO 14001) and a grand prize at the 1st Logo & Symbol Mark Contest (Ministry of Commerce, Industry and Energy Award). We obtained GD mark in 2005 and finally got a 1,000 ten million dollar-export prize in November, 2006, confirming the remarkable growth of VITZRO EM.

2017 _ VITZRO EM New Subsidiary

In July 2017, VITZRO EM starts its electric-power equipment business through physical division. Through product development using VI technology, we plans to grow into a only one of electrical equipment industry, VITZRO EM has a vision to become a global leader based on its technical superiority and business expertise.

Best products of electric equipment field including LV and HV from designing, manufacturing, installing and diagnosing the equipment to composing the power system, it is based on the accumulated, global standard technology and continuous R&D.

LV Equipment

Air Circuit Breakers

- ANSI C37.13/EED1200 Certification for Nuclear Power
- Adopted multifunction digital trip relay
- KS, KERI, IEC Certification
- Compact, lightweight
- Standard Specification: IEC 60947-2
- Implementing remote monitoring and control communication

Molded Case Circuit Breakers

- UL Certification, Max. 800AF
- Max. 1200AF, fully equipped with all series 3/4P
- MCCB / ELCB same frame
- Realization of various auxiliary devices
- Compatible installation of new and old products

Earth Leakage Circuit Breakers

- Standardized main sizes, easy manufacturing of panel
- Composed of max. 225AF, 2/3/4P
- MCCB / ELCB same frame
- Compatible installation of new and old products
- Adjustable sensitivity current, Max. 500mA

Miniature Circuit Breakers

- Minimum size, easy to apply panel board
- Increase of breaking capacity (5kA at AC 220V)
- Equipped with leakage display button

Auto Transfer Switches

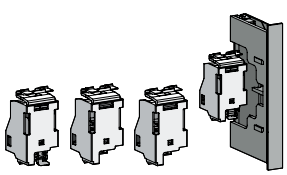
- UL1008 Certification, KERI Type Test completed
- Maximum short circuit capacity in the country
- Optimal form that enables installation of 600mm-panel board for all types
- Ensure stability through separately sealed structure for each phase

Magnetic Contact

- Improved Quality and Decreased Noise
- Convenient and Safe structure
- Enhanced safety by adopting Transparent Safety Cover

Thermal Overload Relay

- Direct connection to a magnetic contactor
- Finger proof cover can be installed
- Separation of power/operation part



Auxiliaries

- Standardized auxiliaries, easier to apply
- AL, AX, UVT, Shunt - various auxiliaries

MV Equipment

Vacuum Circuit Breakers

- Rated breaking time of all types - 3 cycle
- Nuclear power certification ANSI C37.06 / EED1100
- Developed the first domestic Embedded VCB
- Passed KERI, KEMA, CESI development test
- Standard Specification: IEC 62271-100 [M2, E2, C2 Class]

Load Break Switch/Auto Section Switch

- Maximum fuse combined capacity in the country–Max. 100A
- LA & PF external combination structure
- Easy to design single-body panel through optimal form design
- Standard Specification: IEC 62271-105, IEC 60265-1, KEMC1126
- Compatible structure for LBS and ASS

Vacuum Contact Switches

- Rated breaking time 6.3kA(16.4kA peak)
- Minimize switch surge through optimal VI design
- Standard Specification: IEC 60470, IEC 60282-1
- Realization of mechanical interlock between VCSs or with other devices

Vacuum Interrupter/Embedded Pole

- Maintain high-vacuum state through automation process
- Compact and lightweight, durable design
- Collect and store all manufacturing information
- Excellent mechanical strength and degasing
- High-speed breaking and short arcing time

IED & Controller

Protective Device

Main Circuit Breaker for Rolling Stock/ Vacuum Train Breaker(MCB/VTB)

- The sole main circuit breaker for rolling stock in the country
- Excellent seismic performance
- Detection of operating pressure and auto trip function
- Stable breaking feature (AC, DC line)

Gas Insulated Load Break Switch(GLBS)

- Division of lines and tapped line applied
- 3 position function(ON, OFF, Earth)
- Increase safety with hot-line display
- Certificate on reliability by KATS
- Low pressure display and lock function

Vacuum Transfer Switches

- The one and only Medium Voltage Transfer Switch in Korea
- Electrical & Mechanical Interlock available.
- Economical optimization (Two sides of panels and two pieces of VCBs are not necessary.)
- Minimized outside dimension which can be possible with multistage loading.

Current Limit Power Fuse

- Optimal current limit feature
- Protection through full back-up with high breaking capacity
- Maximum striker motional energy in the country
- Simplified with 4 types of fuse forms
- Protect transformers, motors, Capacitor and wires

Digital Protection Relay VIPAM

- System protection required, relay element provided
- Store history of faults(trouble) and wave form
- Provide analysis function through PC interlocking
- RS422/485 communication support
- English/Korean language support

Digital Control Meter VIMAC, VIDER

- Power quality analysis and breaker control
- Automatic power factor control (APFC), harmonic analysis

Lightning Arrester/Surge Absorber(LA/SA)

- Optimal motion of Gapless type
- Scatter prevention when explodes using a polymer LA
- Can be used outdoors using a polysil SA
- Fire prevention due to nonflammable material

Surge Protective Device

- IEC and KS standard certification
- Built-in fuse with disconnecting device function
- Excellent TOV failure feature
- Operation status display lamp (LED Lamp)
- Easy to install using a Plug In type

VITZRO EM

We Create the Next Value

By the light of technology, value and confidence, Together with customers, we are VITZRO EM

Leading the pleasant and affluent field of electric power equipment with state-of-the-art technology, VITZRO EM is creating new value in order to offer greater customer satisfaction with greater business value as well as present new standards, while making a difference for a better future, based on thorough knowledge and skills in the fields of heavy electric equipment, power electronics and aerospace.

VITZRO EM

A1 Air Circuit Breakers

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Air Circuit Breakers for industrial and residential

VITZRO EM Air Circuit Breaker is a circuit breaker that passed new IEC standard (IEC60947-2, LV switch equipment and control equipment-circuit breaker) and KS standard (KSC 4620) development tests. It is a premium circuit breaker that is convenient to use with a design that enables a short breaking time and maximum safety and protection functions.

Performance / Easy / Compact

The more compact and light machine enables customers to use space more efficiently.

- It is optimized for the package panel system due to its compact size.
- The smaller exterior enables 3-stage loading of low-voltage panel.

It provide reliable image and superior breaking performance.

- The insulation molding of the front side and mechanism of the machine provide improved worker safety.
- The precise structure and superior breaking capability of the machine provide higher reliability.
- It offers excellent switching performance and durability.

It features easy maintenance and excellent parts compatibility.

- The modularized mechanism and accessories of the machine allow for easy maintenance.
- It is equipped with an overheat protection feature.
- The systematically coupled parts allow users to easily perform maintenance.

It has been designed as a safe and convenient structure with an intelligent trip device.

- The LED display of the intelligent trip device allows users to easily identify the trip status.
- It satisfies the needs for an intelligent control center and automated system with remote measuring and control based on the intelligent trip device.
- The digitalized surge protector (dialog setting) allows for improved reliability and convenience.
- It ensures easy and precise monitoring and identification of currents from low to maximum currents (4000A).
- The shunt coil overheat protection feature provides improved reliability and convenience.

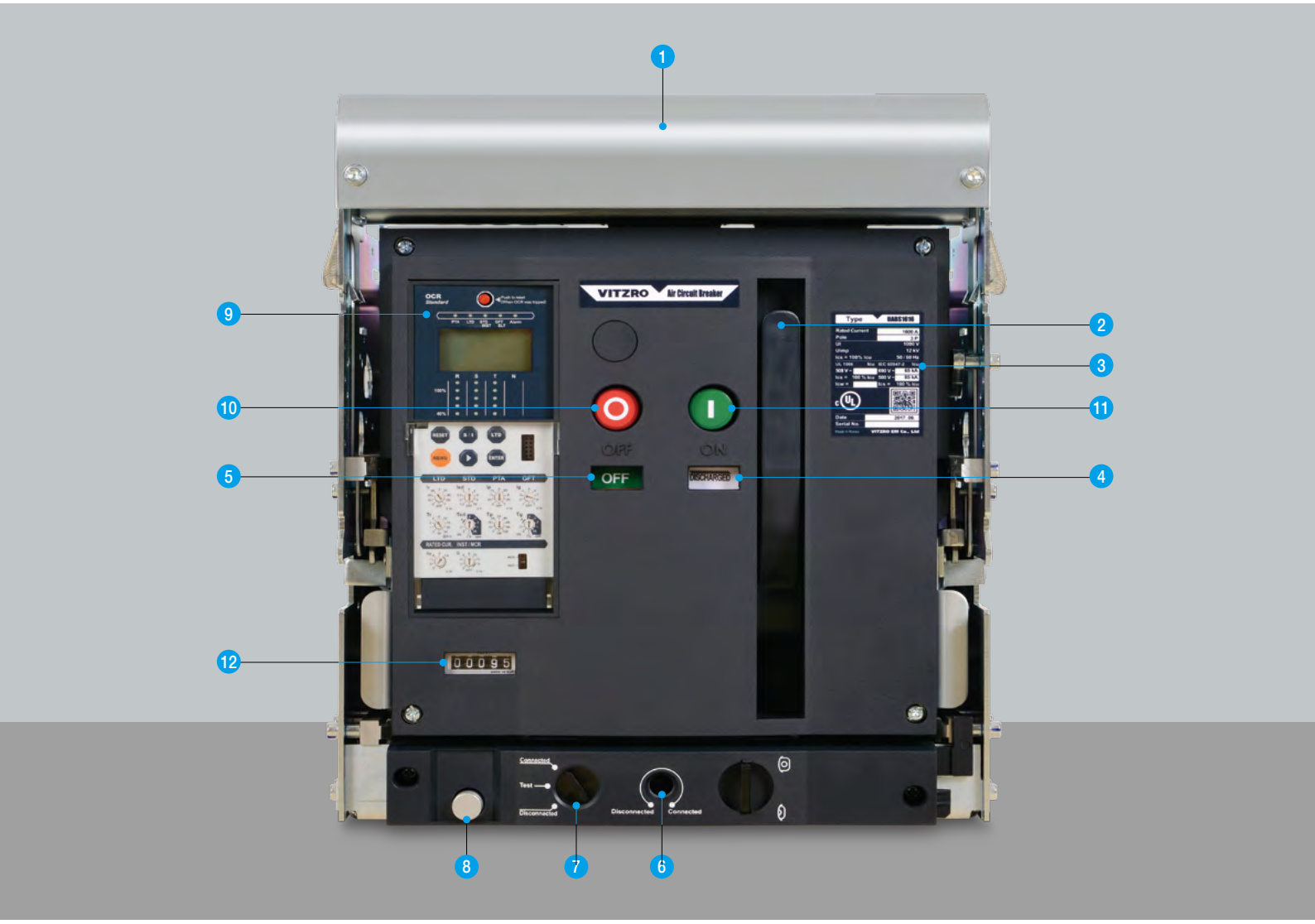
It provides excellent user safety and convenient features.

- It features a dramatically improved draw-out rail guide for easier draw-out.
- It is equipped with intelligent protection and highly accurate and selective protection features with reliable power supply.
- It provides improved reliability with a highly accurate current sensing circuit, which is used in measuring devices.

Product Guide

Item	Specification
Rated Current	630~4000A
Breaking Capacity	50~85kA
Operation Method	Motor operation, Manual operation
Voltage	AC690V
Installing Method	Draw-out Type, Fixed Type
Trip Method Number of	Multifunction Release, Under-voltage Release, Shunt Release
Poles	3P, 4P
Standard	IEC 60947-2, KS C 4620

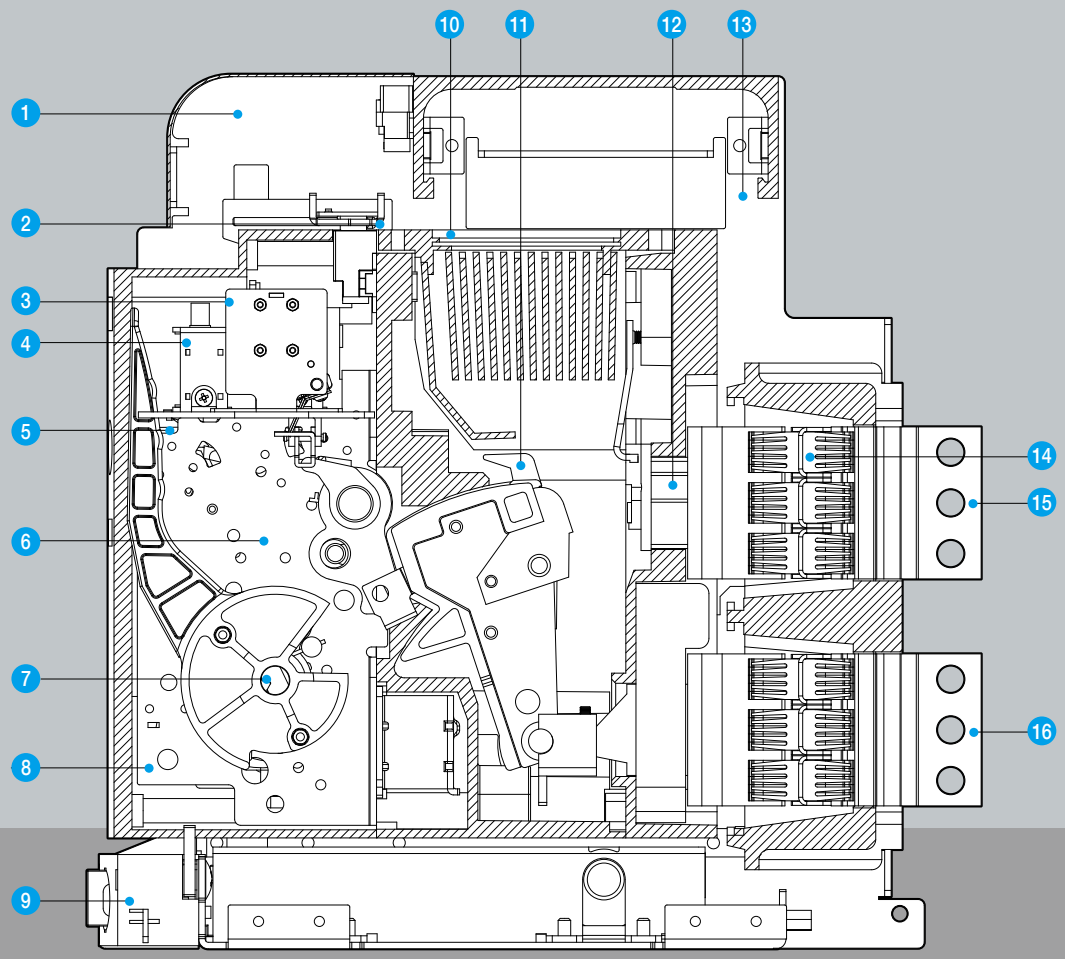
External & Internal Configuration



It is a premium product which the top priority is the user's safety.
It is designed considering various protective functions, safety and convenience in order to satisfy the diverse needs of customers.

External Configuration

1. Control Terminal
2. Charge Handle
3. Rating Name Plate
4. Charge/Discharge Indicator
5. ON/OFF Indicator
6. Draw-in/out Handle Insertion Point
7. Draw-in/out Indicator
8. Draw-in/out Handle
9. Trip Relay
10. OFF Button
11. ON Button
12. Counter



Internal Configuration

1. Upper Cover
2. Control Terminal
3. Auxiliary Switch
4. Closing/Trip Coil
5. Charge handle
6. Mechanism
7. Charge gear
8. Front Mold cover
9. Draw in/out Device
10. Arc Chamber
11. Moving Contact
12. Fixed Contact
13. Cradle
14. Clip
15. CB Connecting Conductor
16. Load Part Conductor

Basic Operation / Trip Method / Standards / Certification

Basic Operation

Air Circuit Breakers are equipped with the following functions to safely use the CB wires so as to not only protect the loading part equipment, but also to prevent accidents including fire and human damages.

Circuit Closing

A closing operation of mechanism provides the current to the load. When the current is applied through the closing operation, some loads generate far larger inrush current than the rated current (In). (That is, a motor becomes 7~8 In for several seconds)
The closing should be operated promptly in order to prevent any damages (damages due to Arc) due to this inrush current which is dangerous at the contact. If the circuit breaker meets the standard, it should endure the current that is 15~20 times bigger than the rated current and it should be opened quickly when failures occur during closing or after closing.

Current Conducting

A current conducting within the rated current should not exceed the allowable temperature and during an over-current conducting, the conducting should be safely performed till the breaking time. Furthermore, if the circuit breaker is used for a selective breaking, the downstream circuit breaker should be designed to endure a high electromagnetic repulsion force so that it can allow a short circuit current during the breaking time.

Circuit Opening, Current Breaking

- A current breaking can be generated through an optional operation of mechanism (through manual and remote control).
- With the current conducting, the circuit breaker will be operated automatically using an auxiliary trip device (under voltage trip device, ground trip device and etc) to open the circuit safely.
- Although the circuit breaker maintains the closing Position based on OCR when the over-current is generated, it shall be automatically operated to open the circuit safely.

Isolation

When the circuit breaker is opened, it requires a Specific Isolation Level between the Charge part and Discharge part.

- Maximum Leakage Current Test between Input and Output under the rated voltage (Max, Ue)
- Impulse Voltage

Trip Method

When an over-current is generated in the above functions, there are the following circuit-breaking methods to apply.

Failure Breaking (Instantaneous Operation)

If an abnormal amount of current flows in the circuit due to a failure such as short-circuit, ACB will instantly break the circuit to minimize the impact due to the failure. This is called an instantaneous operation.

Delay Breaking

If an abnormal amount of current (for example, an inrush current of the transformer, an inrush current of the Capacitor and a start electric current of the motor) flows in the circuit, ACB maintains the current conducting state for a certain period of time and if the abnormal current is maintained afterwards, the circuit will be broken. And, in case of a short circuit current, the impact of the failure will be minimized during the delay time set by customers considering the breaking time of the downstream circuit breaker at the selective breaking.
If the downstream circuit breaker fails to function and the abnormal current is generated continuously, the circuit after the delay time will be broken. This is called a delay breaking.

Overload Breaking (Time Delay)

If a current that exceeds the rated current flows continuously, the wire gets hot and if neglected, it may result in fire. ACB will break the circuit before the temperature of wire gets to a dangerous level. This is called an overload breaking.

Ground Fault Breaking

When a current flows from the circuit or charge part of load to the ground due to failures such as contact or destruction of insulator, it is called a ground fault. When the ground current flows, the current is induced to the neighboring cables due to an electromagnetic induction and a dislocation climb will be generated which will impact or even damage the other devices. If a person touches it, it may lead to casualties because of an electric shock. To prevent these kinds of failures, the circuit is broken when the grounding is generated and this is called a ground fault breaking.

Standards

VITZRO EM VIDER ACB is installed at the distribution line (1000V or under) to protect the equipment by circuit-breaking under air status when fault currents such as the over-current, short-circuit and ground fault are generated. It prevents fire from occurring and protects people from getting hurt. VITZRO EM ACB was tested to meet the following international standards and it acquired the certificates, allowing it to be used safely and conveniently.

Acquisition of KS Standard (KSC 4620)

IEC 60947 - 1

- Part 1 : General Rules Low - voltage switchgear and controlgear

IEC 60947 - 2

- Part 2 : Circuit Breakers Low - voltage switchgear and controlgear

ACB has acquired the following certificates and these can be provided, if requested appropriately.

- CB Certificates (IEC 60947)
- Test report (KEMA/KERI)
- KS Standard Certificates(KSC4620)

Certification

CE Certification Mark

CE Mark represents that all duties are met for the products manufactured according to th EU instructions. CE Mark shows the decision of the manufacturer or the authorized representative who complied with the suitable preparations including the product evaluation process.

Features

Features

MECHANISM, BODY PART

FIXED TYPE ACB

HORIZONTAL BUSBAR

VERTICAL BUSBAR

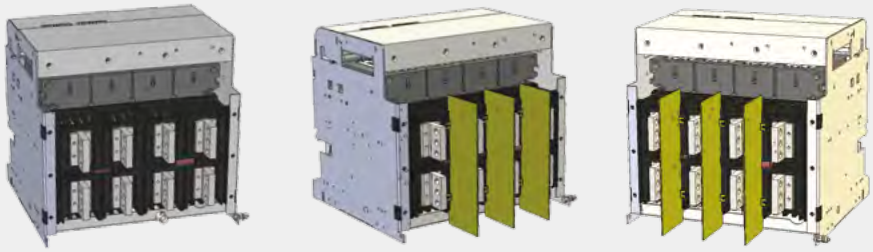
MTD(Magnetic Trip Device)

1. The horizontal/vertical busbar type provides improved installation compatibility. (Only the vertical busbar type is available for products with a rated current of 2000A.)
2. The Rogowski-type current measuring device enables more precise measuring.
   * Rogowski type : a type that conducts the measuring of the load condition of lines and power generation at the same time. It facilitates power supply in low-current areas and prevents power supply subjects from being damaged in high current areas.
3. The modularization of the current measuring device (Rogowskii CT) provides easy maintenance and replacement.
4. Insulation and durability have been enhanced by improving the shape of the main body frame and the movable elements of the machine and by applying sealing to areas requiring more insulation.
5. Electrical performance has been improved by reinforcing various contacts and all conductive parts (new materials and expanded area).
6. The improved control system (reinterpretation and modification of various links and gears) provides improved switching performance of the machine.
7. The coil protection and anti-pumping feature brought by replacing the existing switching solenoid with a PCB integrated type provides improved reliability and performance.
8. The new MTD (magnetic trip device), a rapid trip auxiliary device, guarantees more rapid and accurate breaking performance.
9. It provides expanded auxiliary contacts. (4a4b → 6a6b)
10. The resistance to noise has been improved with the reinforced PCB pattern of OCR.

Features

CRADLE PART

(OPTION) SHUTTER



(OPTION) INSULATION BARRIER

1. (Option) The new safety shutter automatically breaks the conductive parts of the main circuit when the breaker is drawn out.
2. (Option) The new insulation barrier breaks an interphase arc, preventing interphase short circuit.
3. The improved bonding of the inlet of the terminal of the breaker enables a structure that is more resistant to temperature and vibration.
4. The material of the arc shield has been changed from a steel plate to FRP (fiber-reinforced plastic) to prevent arc-derived accidents in case of a fault.

Economic and Standard Types of ACB

Standard TYPE ACB - 65kA

Economy TYPE ACB - 50kA

1. ACB is divided into different types according to their rated breaking current (50/65kA).
2. ACB is also divided depending on OCGR display and the control terminal connection method (Auto/Manual).

Ratings

VIDER Series

Type				VAB16					
				Economic Type					
Frame Size	(AF)			note1) 1600					
Rated Current (In)	(A) at 40°C			400 630	800	1000	1250	1600	
Rated Operating Voltage (Ue)	(V)			690					
Rated Insulation Voltage (Ui)	(V)			1000					
Rated Impulse Voltage (Uimp)	(kV)			12					
Frequency	(Hz)			50/60					
Poles	(P)			3, 4					
Set Current (Iu)	(A)×In			0.5 / 0.6 / 0.7 / 0.8 / 0.9 / 1.0					
N-phase Rated Current	(%In)			100					
Rated Breaking Current (Icu)	(kA)	IEC60947-2	690V/600V/550V	50					
			500V/480V/460V	65					
			415V/380V/220V	65					
Rated Service Breaking Capacity (Ics)	(%Icu)			100					
Rated Closing Current (Icm)	(kA)	IEC60947-2	690V/600V/550V	105					
			500V/480V/460V	143					
			415V/380V/220V	143					
Rated Short Time Current (Icw)	(kA)/1s			50					
Operation Time	(ms)		Total Breaking Time(In)	40					
			Closing Time (In)	80					
Service Life	(Times)	Mechanical	Maintained	15,000					
			Unmaintained	10,000					
		Electrical	Maintained	10,000					
			Unmaintained	10,000					
Installation Type	Fixing (Vertical)			○					
	Fixing (Horizontal)			○					
	Fixing (Plane)			○					
	Draw-out (Vertical)			○					
	Draw-out (Horizontal)			○					
	Draw-out (Plane)			○					
External Dimension W×D *The external dimension of the main body (Busbar Excluded)	(mm)	Fixed Type H:310	3P	316×301					
			4P	411×301					
		Draw-Out Type H:432	3P	353×396					
			4P	448×396					
Weight	(kg)	Fixed Type (Vertical, Horizontal type)	3P	40	40	40	42	42	
			4P	51	51	51	53	53	
		Draw-Out Type (Vertical, Horizontal type)	3P	60	60	60	64	64	
			4P	77	77	77	82	82	
		Fixed Type (Plane type)	3P	52	52	52	54	54	
			4P	67	67	67	69	69	
		Draw-Out Type (Plane type)	3P	72	72	72	76	76	
			4P	93	93	93	98	98	
Certified	KS C 4620			-	-	-	-	-	

*Note1) 50kA is not KS
*Note2) 400A is not KS

	VAB20						VAB40		
	Standard Type								
	2000						4000		
note2] 400 630	800	1000	1250	1600	2000		2500	3200	4000
	690						690		
	1000						1000		
	12						12		
	50/60						50/60		
	3, 4						3, 4		
	0.5 / 0.6 / 0.7 / 0.8 / 0.9 / 1.0						0.5 / 0.6 / 0.7 / 0.8 / 0.9 / 1.0		
	100						100		
	65						85		
	85						100		
	85						100		
	100						100		
	143						187		
	187						220		
	187						220		
	50						65		
	40						40		
	80						80		
	15,000						15,000		
	10,000						10,000		
	10,000						10,000		
	10,000						10,000		
	○						○		○
	○						○		X
	○						○		X
	○						○		○
	○						○		X
	○						○		X
	316×301						377×301		
	411×301						492×301		
	353×396						413×396		
	448×396						528×396		
41	41	41	43	43	45		48	59	65
53	53	53	55	55	58		62	77	83
65	65	65	68	68	70		75	90	98
84	84	84	88	88	92		95	117	125
53	53	53	55	55	57		68	79	-
69	69	69	71	71	74		88	103	-
77	77	77	80	80	82		95	110	-
100	100	100	104	104	108		121	143	-
●	●	●	●	●	●		●	●	●

OC(G)R (Over Current (Ground) Relay)

OC(G)R Type

OC(G)R Options

Type	Normal Type	Standard Type	High Class Type
Appearance			
Current Relay	• L / S / I / G	• L / S / I / G	• L / S / I / G
Measurement Function	-	• Current (R/S/T/N)	• Current (R/S/T/N)
Pre Trip Alarm	-	• Overload Protective Relay : DO Output (Alarm)	• Overload Protective Relay : DO Output (Alarm)
Communications	-	-	• Modbus / RS-485
Power	• Self Power (Option) - Power runs when 20% of the load current is In • AC/DC 110~220V	• Self Power (Option) - Power runs when 20% of the load current is In • AC/DC 110~220V	• AC/DC 110~220V
RTC Timer	-	• Available	• Available
LED	• Trip - TLD, STD, INST, FGT, Detection Common LED	• PTA • LTD • STD/INST • GFT • Alarm	• PTA • LTD • STD/INST • GFT • Alarm
Fault Record	-	• 10ea : Display Faults (Phase / Current / Date)	• 10ea : Display Faults (Phase / Current / Date)
Event Record	-	• 10ea : Knob Setting	• 10ea : Knob Setting
Operation Button	Reset	• Reset, S/I, LTD Menu, Move, Enter	• Reset, S/I, LTD Menu, Move, Enter

Normal Type OCR

Overall Appearance & Part Names

- **Basic relay operation**
- **Overload Protection** : Long Time Delay Protection
- **Short-Circuit Protection** : Short Time Delay & Instantaneous Delay Protection
  : I^2t On/Off Selection (Short Time Delay)
- **Ground Fault Protection** : I^2t On/Off Selection

OC(G)R(Over Current(Ground)Relay) / OC(G)R Measurement Function

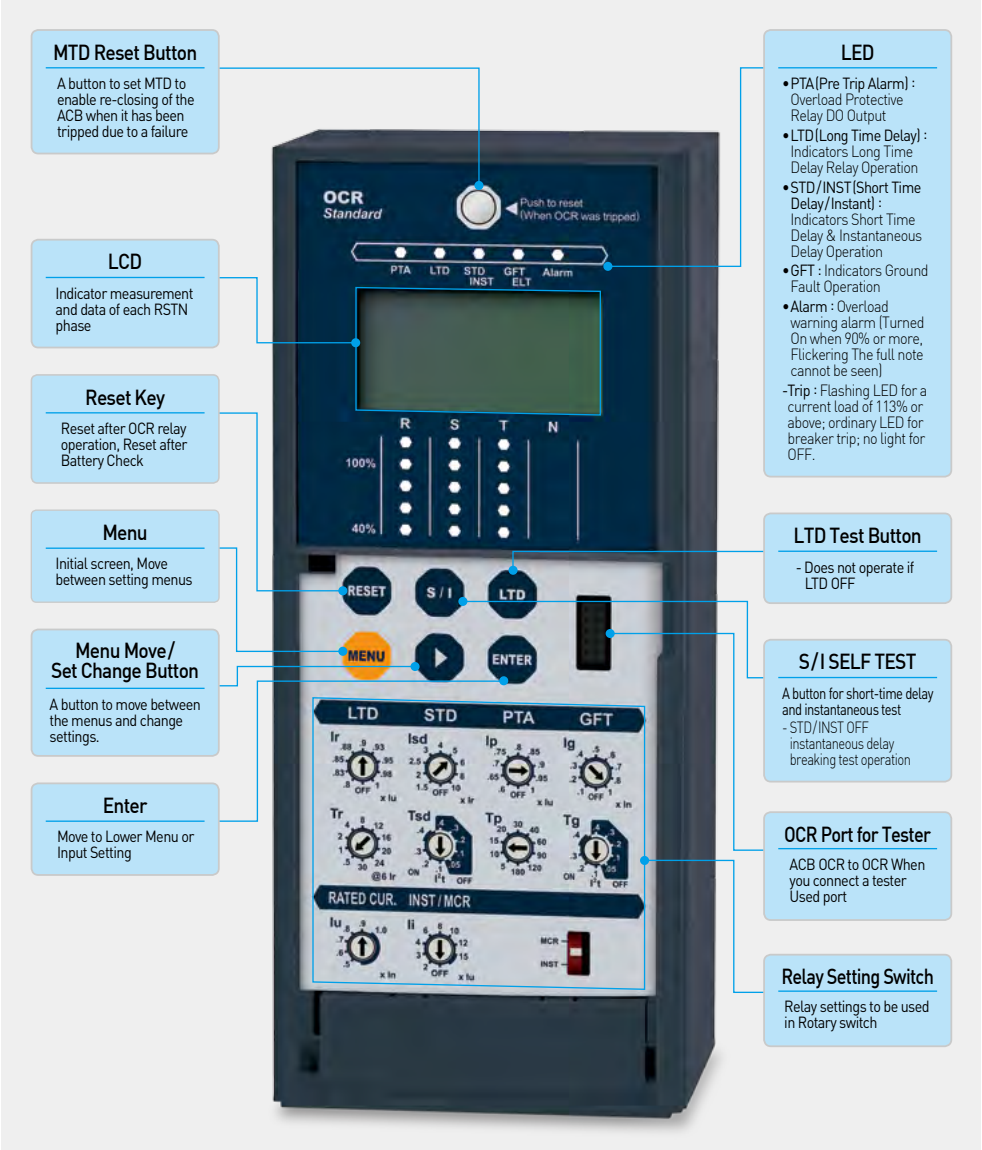
Standard Type

Overall External Configuration & Name

- Enables user to check the current value through LCD, displays a load factor and provides an easy-to-read line status.
- Displays the cause of a trip on the upper LED to allow for user to check failures. (PTA, LTD, STD/INST, GFT/ELT, Alarm)

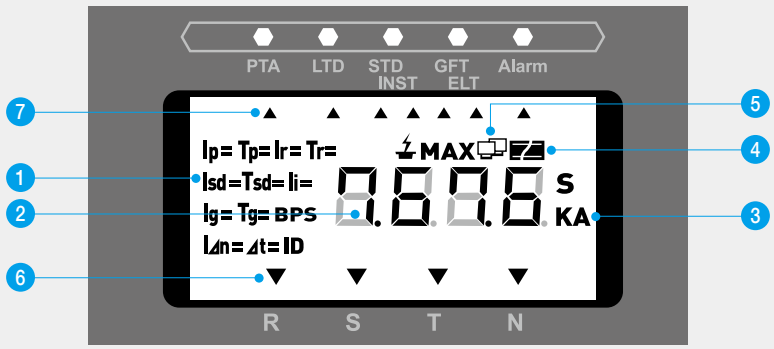
Overload Protection : Long Time Delay Protection

- **Short-Circuit Protection** : Short Time Delay & Instantaneous Delay Protection
  : I^2t On/Off Selection (Short Time Delay)
- **Ground Fault Protection** : I^2t On/Off Selection
- **ZSI (Zone Selective interlocking)** : Function enables easier interlocking for protection
- **Built-in with advanced MCU** : Basic measured current, high-precision measurement
- **Fault Recording Function** : 10 cases of fault type, fault phase, fault value and its generated time
- **4 Digital Outputs (DO) :** Long-time delay/Short-time delay/Instantaneous/Alarm
- **Communication Function** : Modbus/RS485 (Highclass-Type)



LCD Display

LCD



1	② Displays the information on the values displayed in 2 (relay set current/time, etc.).
2	Displays simple characters such as measured current or set current/time and current time.
3	Displays current unit (KA/A) and seconds.
4	Displays the status of 3.6V battery in the OCR. → Flashing in 0.5s intervals : Replace the dead battery.
5	Displayed when communication is connected.
6	Displays the phase status of the current value (②) displayed in the measuring menu status.
7	Displays the trip and alarm information.

Functional Buttons

The functional buttons on the front side of the OCR of the ACB are used to select menus, check the content or change settings.

Button	Function	Description
▶	SETTING CHANGE BUTTON	• Used to check the lower level information of a selected menu or change setting values.
MENU	MENU	• Used to select a menu. • Used to select next menus and the order of menus is same as the menu tree.
S / I	STD/INST SELFTEST	• Used to conduct self-test for STD and INST • INST test is conducted first. • INST test is conducted if STD/INST OFF
LTD	LTD SELFTEST	• Used to conduct self-test for LTD • Does not operate if LTD OFF
ENTER	ENTER	• When modifying the menu values in the currently selected menu, press the ENTER button to change the values. • When applying the changed values, press the ENTER button again to complete the setup.
RESET	RESET	• Used to reset the screen and the failure display. • Used to turn off the screen when the trip information is displayed on backup battery.

OC(G)R Measurement Function

OC(G)R Measurement function

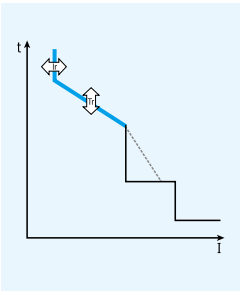
Legend

In	Rated current setting	**Iu**	Set current setting
Ir	Long-time delay current setting	**Tr**	Long-time delay trip delay time
Isd	Short-time delay current setting	**Tsd**	Short-time delay trip delay time setting
Ii	Instantaneous delay current setting		
Ip	PTA current setting	**Tp**	PTA trip delay time setting
Ig	Ground fault current setting	**Tg**	Ground fault trip delay time setting

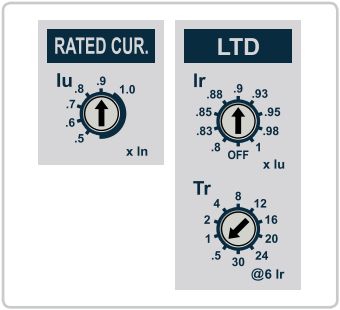
Operating Characteristics

Long Time Delay Protection											
Current Setting (A)		Range	Ir = (0.4 ~ 1.0 / OFF)×In								
		Iu = In×...	0.5	0.6	0.7	0.8	0.9	1.0			
		Ir = Iu×...	0.80	0.83	0.85	0.88	0.90	0.93	0.95	0.98	1.00	OFF
Time delay (s) Accuracy : ±10% or below 100ms		Tr@(1.5×Ir)	12.5	25	50	100	200	300	400	500	600	750
		Tr@(6×Ir)	0.5	1	2	4	8	12	16	20		
		Tr@(7.2×Ir)	0.34	0.69	1.38	2.70	5.50	8.30	11.0	13.8	16.6	21.0
Short Time Delay Protection											
Current Setting (A) Accuracy : ±10%		Range	Isd = (0.6 ~ 10.00 / OFF)×In								
		Isd = Ir×... (However, Ir = off Ir to set up is treated as equal and Iu)	1.5	2.0	2.5	3.0	4.0	5.0	6.0	8.0	10.0	OFF
Time delay (s) @10×Iu	Settings	I^2t off	0.05	0.1	0.2	0.3	0.4					
		I^2t on		0.1	0.2	0.3	0.4					
	(I^2t Off)	Min. Trip time [msec]	20	80	160	255	340					
		Max.Trip time [msec]	80	140	240	345	460					
Instantaneous Delay Protection											
Current Setting (A) Accuracy : ±10%		Range	Ii = (1.0 ~ 15.0 / OFF)×In								
		Ii = Iu×...	2	3	4	6	8	10	12	15	OFF	
Time delay (s)			Max break time : 50ms									
PTA (Pre Trip Alarm)											
Current Setting (A)		Range	Ip = (0.30 ~ 1.00 / OFF)×In								
		Ii = Ir×...	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00	OFF
Time delay (s) Accuracy : ±10%	Alarm	Tp@(1.2×Ip)	5	10	15	20	30	40	60	90	120	180
Ground Fault Protection											
Current Setting (A)		Range	Ig = (0.1 ~ 1.0 / OFF)×In								
Accuracy : ±10% (Ig > 0.4In) ±30% (Ig ≤ 0.4In)		Ig = In× ...	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	1.0	OFF
Time delay (s) @1×In	Tg	I^2t off	0.05	0.1	0.2	0.3	0.4					
		I^2t on		0.1	0.2	0.3	0.4					
	(I^2t Off)	Min. Trip time [msec]	20	80	160	255	340					
		Max.Trip time [msec]	80	140	240	345	460					

OC(G)R Measurement function



Long Time Delay



- A function to protect overload
- Time delay that is inversely proportional to the fault current

1. Standard Current Setting

- Iu Set current setting : (0.5-0.6-0.7-0.8-0.9-1.0) × In
- LTD operating current (Ir) setting range : (0.8-0.83-0.85-0.88-0.93-0.95-0.98-1.0-Off) × Iu

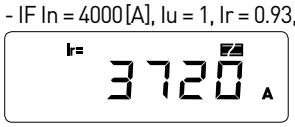
2. Delay Time Setting

- LTD delay time (Tr) setting range : 0.5-1-2-4-8-12-16-20 [s]
- (Operating time : 6 × Ir)

3. Perform the operation on the reference of the largest load current on the R/S/T phase

- Example of LTD Setting

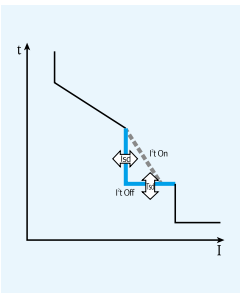
- IF In = 4000 [A], Iu = 1, Ir = 0.93,



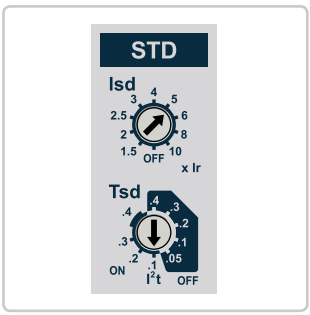
⋯› Iu = In × 1 = 4000 [A]
⋯› Ir = Iu × 0.93 = 3720 [A]

- IF Tr = 20 [s],

⋯› Tr = 20 [s]
(The breaking delay time when current of Ir × 6 is measured)



Short Time Delay



- A function to protect fault current (over-current)
- Time delay and definite time that is inversely proportional to the fault current

1. Standard Current Setting

- However, When set to Ir=OFF, it is the same as Iu

2. Delay Time Setting

- STD delay time (Tsd)
  - Inverse time (I^2t On) : 0.1-0.2-0.3-0.4 [s] (Operating time : 10 × Iu)
  - Definite time (I^2t Off) : 0.05-0.1-0.2-0.3-0.4 [s]

3. Calculation based on the biggest load current among R/S/T

- Example of STD Setting

- IF In = 4000 [A], Iu/Ir = 1, Isd = 5,

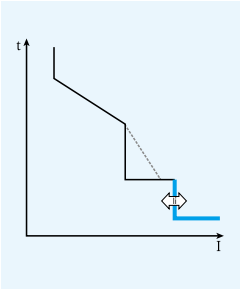
⋯› Ir = Iu × In × I = 4000 [A]
⋯› Isd = Ir × 5 = 20000 [A] = 20.00 [kA]

- IF Tr = Definite time 0.3 [s],

⋯› Tsd = 0.3 [s]
(If inverse time is 0.3s, 0.301 will be displayed.)

OC(G)R Measurement Function

OC(G)R Measurement function



Instantaneous Characteristics (INST)

- function to prevent damage by responding as quickly as possible against a surge caused by a fault.

1. Reference current setting
- Instantaneous operating current (Ii) : (2-3-4-6-8-10-12-15-Off)×Iu

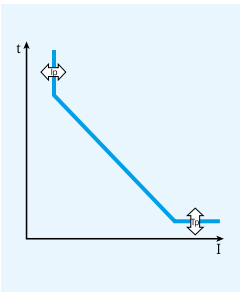
2. Calculation based on the largest load current among R/S/T phase currents

3. Total breaking time of 50ms or lower

- Example of INST setting

- IF In = 4000 [A], Ii = 12,

⋯› Ii = Iu × 12 = 48000 [A] = 48.00 [kA]



PTA (Pre Trip Alarm)

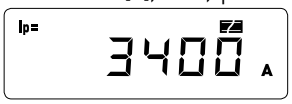
- Pre trip alarm

1. Reference current setting
- PTA operating current (Ip) : (0.6-0.65-0.7-0.75-0.8-0.85-0.9-0.95-1-Off)×Iu

2. Delay time setting
- PTA delay time (Tp) : 5-10-15-20-30-40-60-90-120-180 [s]

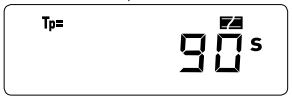
- Example of PTA setting

- IF Iu = 4000 [A], Ir = 1, Ip = 0.85,

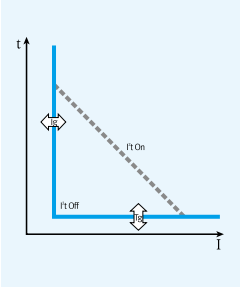


⋯› Ir = Iu × 1 = 4000 [A]
⋯› Ip = Ir × 0.85 = 3400 [A]

- IF Tr = 90 [s],



⋯› Tp = 90 [s]



GFT (Ground Fault Delay)

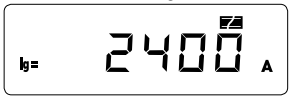
- A function to protect ground fault
- When the ground current is above the set value, it shall be broken after the time delay
- If the fault current flows more than twice the rated current In, the ground fault characteristics will cause the delay action to be performed for the instantaneous operation priority sequence of 500 ms

1. Standard Current Setting
- Ground Operation Current (Ig) Setting Phase : (0.1-0.2-0.3-0.4-0.5-0.6-0.7-0.8-1.0-Off) × In

2. Delay Time Setting
- Ground current delay time (Tg) Setup Steps
  - Inverse Time (I^2t On) : 0.1-0.2-0.3-0.4 [s]
  - Definite Time (I^2t Off) : 0.05-0.1-0.2-0.3-0.4 [s]

- Example of GFT setting

- IF In = 4000 [A], Ig = 0.6,



⋯› Ig = In × 0.6 = 2400 [A]

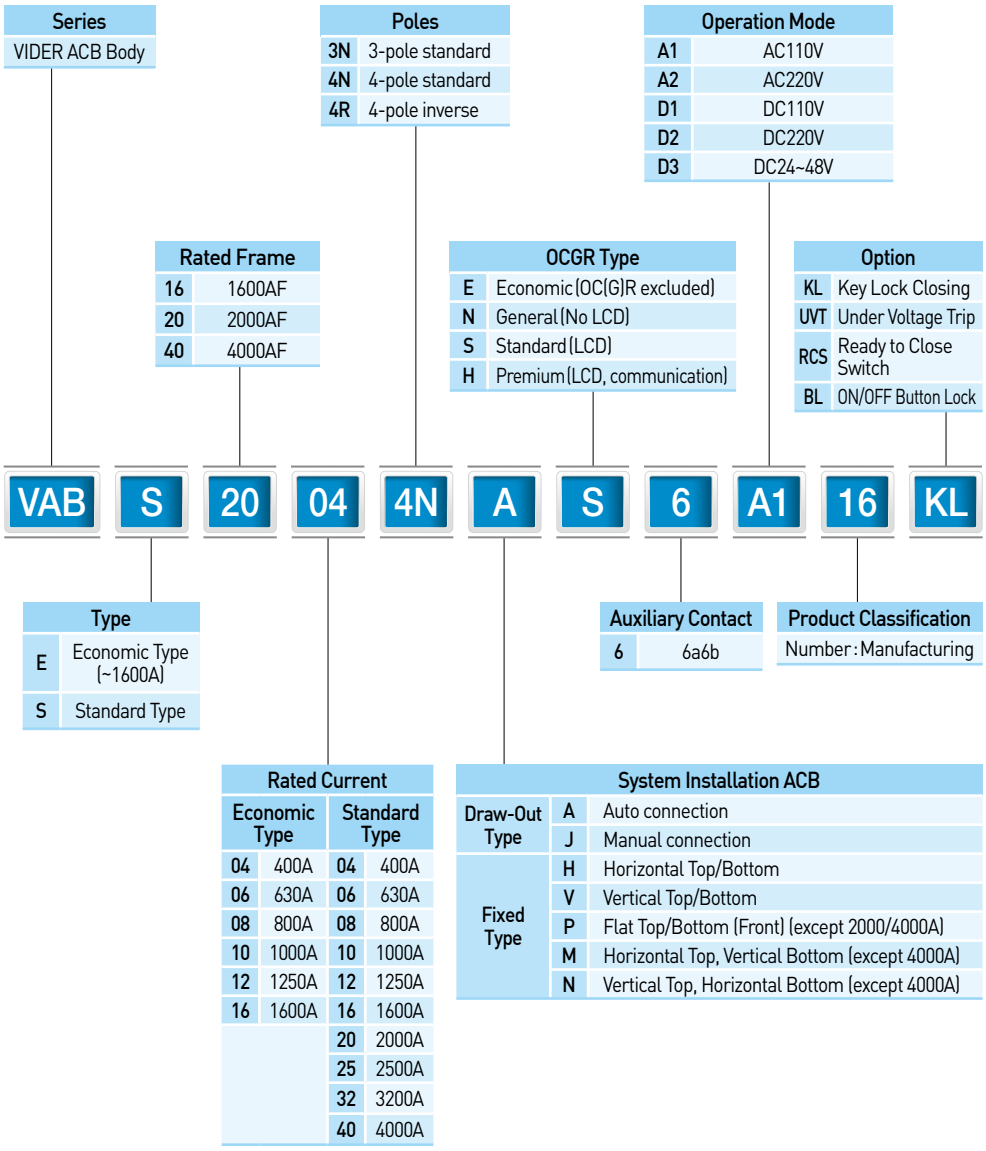
- IF Tr = 0.3 [s],

⋯› Tg = 0.3 [s]

How to Order

How to Order

VIDER Series (Body)

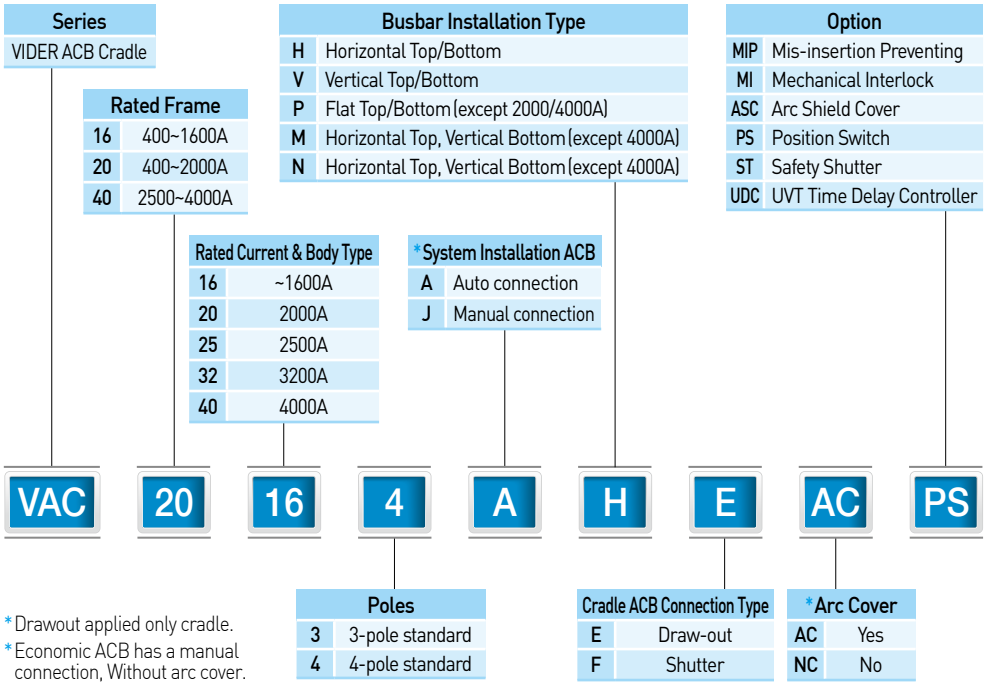


* The product classification marking can be modified without prior notice while improving the specifications.

How to Order

How to Order

VIDER Series (Cradle)



*Drawout applied only cradle.
*Economic ACB has a manual connection, Without arc cover.

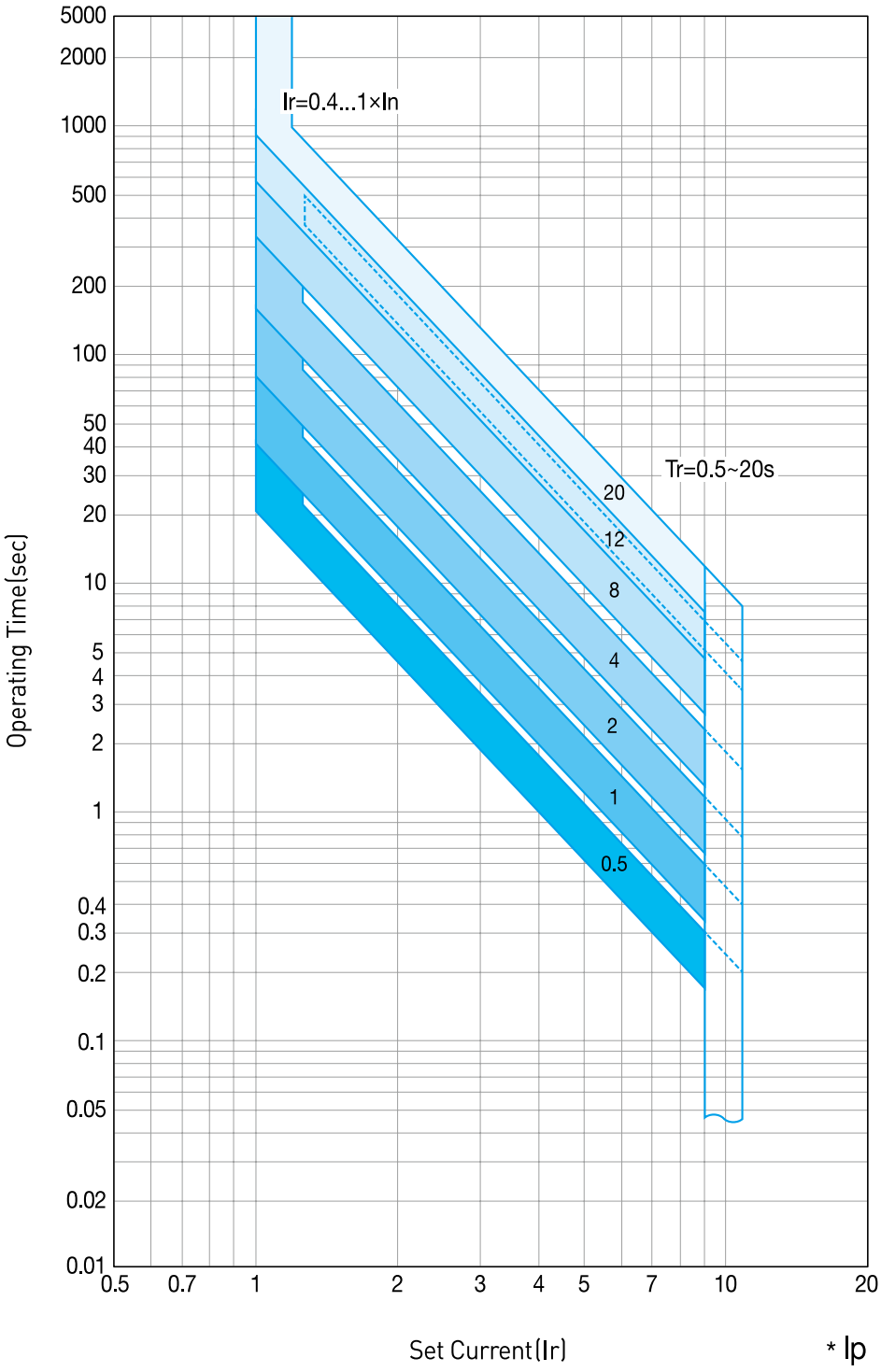
VIDER Series Accessories

OPTION		Supply type		Shipping method
		Economic Type ACB	Standard Type ACB	
CC	Closing Coil	○	○	Attached
TC	Trip Coil	○	○	Attached
OCGR	General Type	Choice 1	Choice 1	Attached
	Standard Type			
	Premium Type			
UVT	Under Voltage Trip Device	Option	Option	Attached
KL	Key Lock	Option	Option	Attached
ASC	Arc Shield Cover	X	○	Attached
AJ	Auto Jack	X	○	Attached
PS	Position Switch	Option	Option	Attached
IB	Insulation Barrier	Option	Option	Separated
MI	Mechanical Interlock	Option	Option	Separated
MIP	Miss Insertion Prevent Device	Option	Option	Separated
LH	Lifting Hook	Option	Option	Separated
OT	OCGR Tester	Option	Option	Separated
RCS	Ready to Close Switch	Option	Option	Separated
BL	ON/OFF Button Lock	Option	Option	Attached

OC(G)R Trip Characteristic Curves

OC(G)R Trip Characteristic Curves

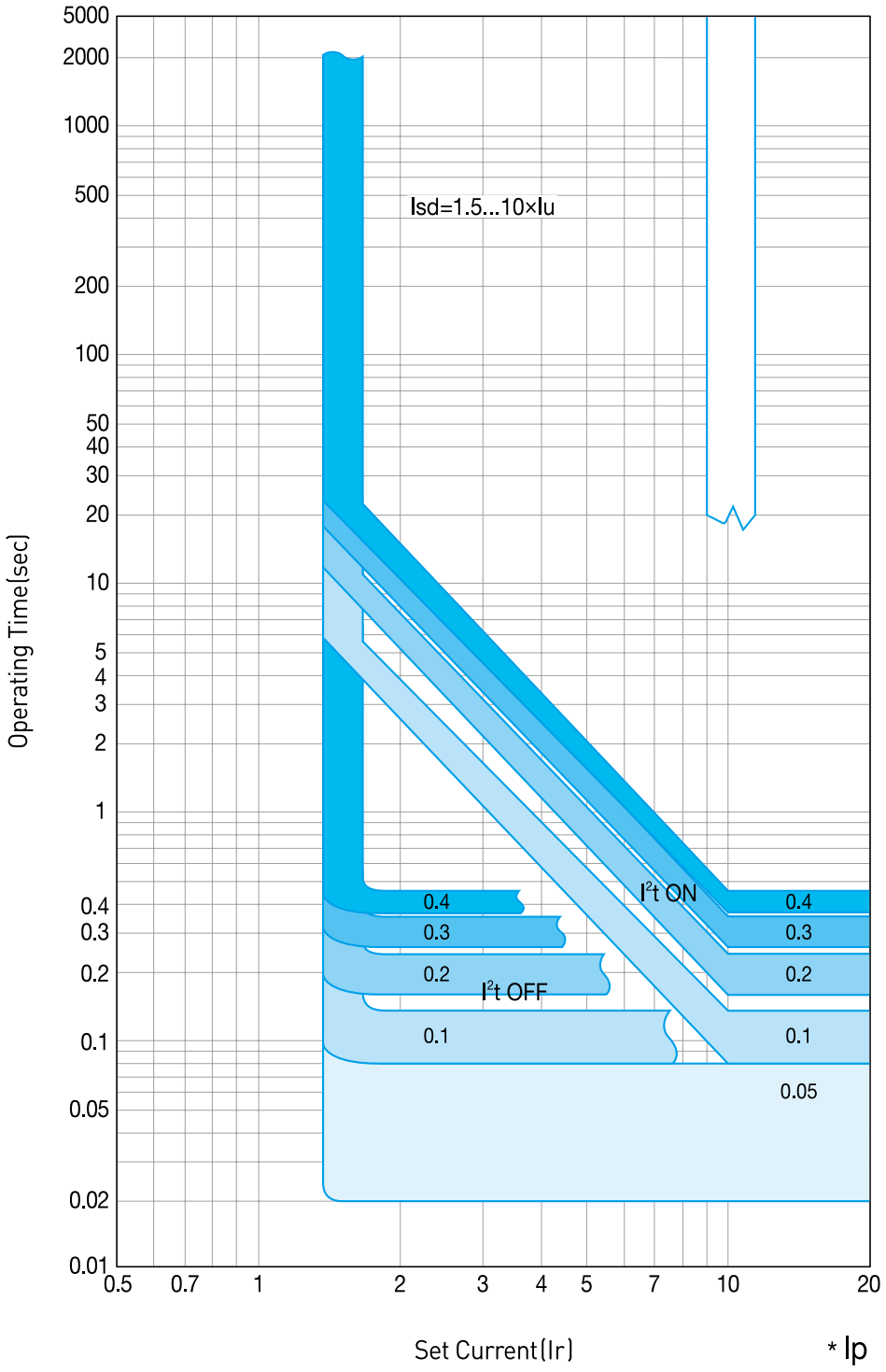
Long Time Delay



OC(G)R Trip Characteristic Curves

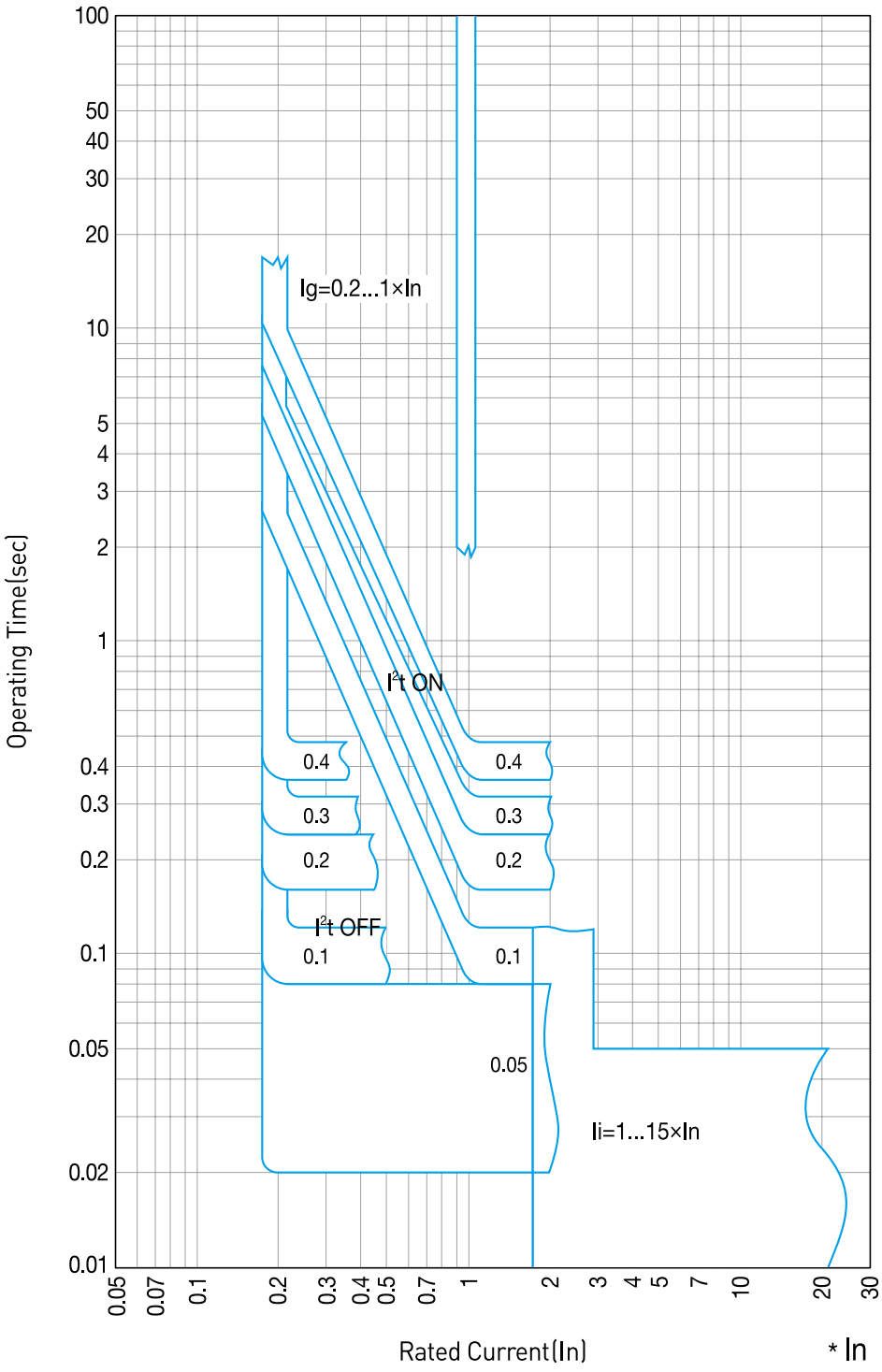
OC(G)R Trip Characteristic Curves

Short Time Delay



OC(G)R Trip Characteristic Curves

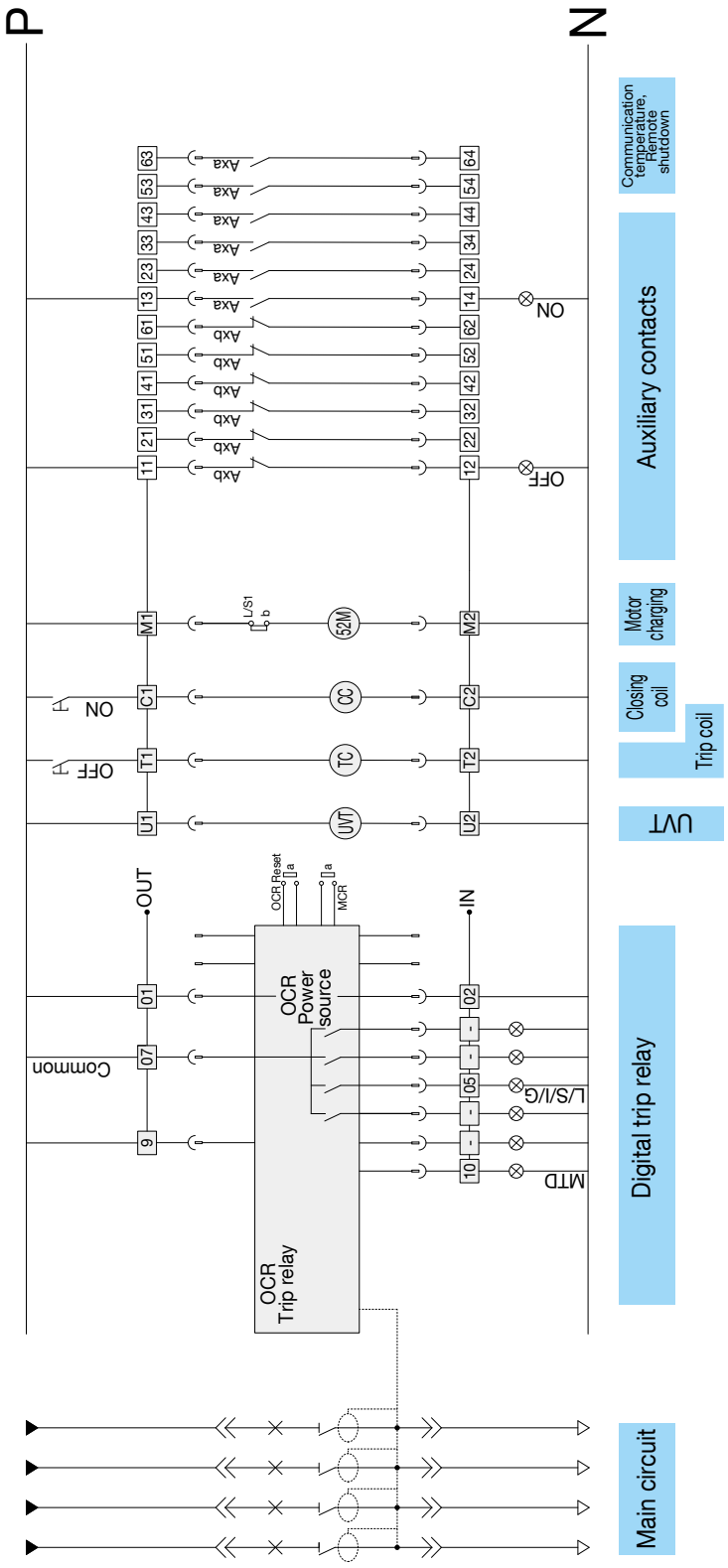
Instantaneous Time Delay, Ground Fault



Electrical Diagram

Electrical Diagram

Normal Type

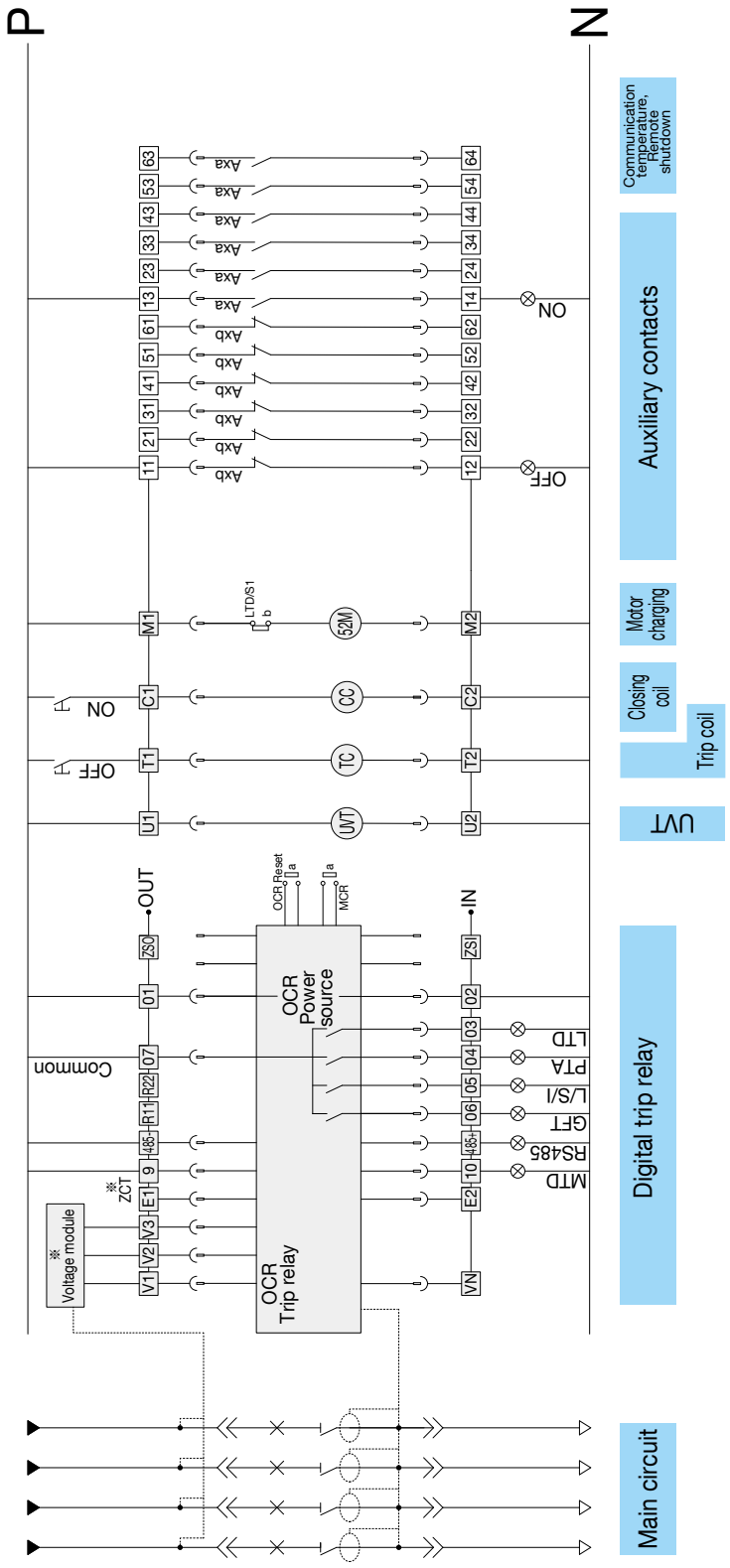


Terminal Symbol

13 14 ~ 63 64	Aux S/W (a Contact)
11 12 ~ 61 62	Aux S/W (b Contact)
01 ~ 02	OCR Power (AC/DC)
05	L/S/I/G
07	Common
T1 ~ T2	Trip coil (TC)
C1 ~ C2	Closing coil (CC)
U1 ~ U2	UVT Coil power supply

Electrical Diagram

Standard Type



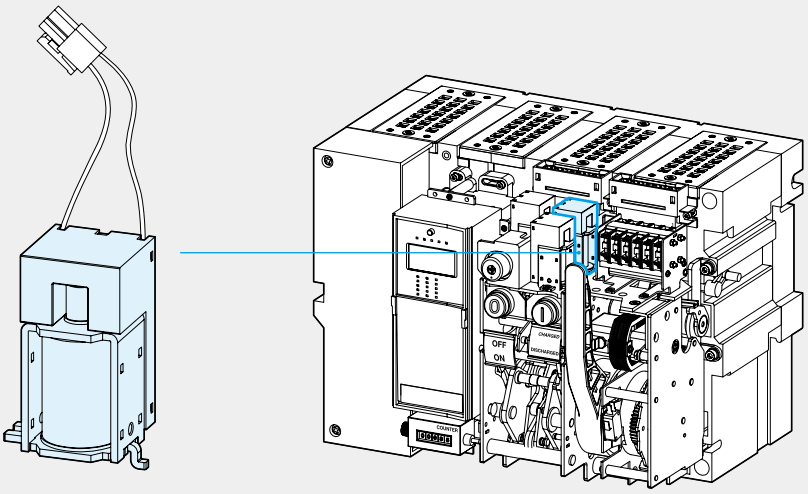
Terminal Symbol

13 14 ~ 63 64	Aux S/W (a Contact)
11 12 ~ 61 62	Aux S/W (b Contact)
01 ~ 02	OCR Power (AC/DC)
05 ~ 07	The cause of the accident OCR - Contact
03	LTD
04	Pre Trip Alram (a)
T1 ~ T2	Trip coil (TC)
C1 ~ C2	Closing coil (CC)
U1 ~ U2	UVT Coil power supply
V1 ~ V3	Voltage Module (Option)
E1 ~ E2	ZCT Connection terminals (Option)
485+ ~ 485-	RS-485 Communication (Option)

Accessories

Trip Coil (TC)

- Controller to trip CB externally.
- Voltage is supplied to C1, C2 of both coil ends with voltage input at 200ms instantaneous time.
- Basic mounting.



1) Shunt Coil Rated Voltage & Characteristics

Rated Voltage (Vn)		Operating Voltage Range (V)	Power Consumption (VA or W)		Trip Time (ms)
DC (V)	AC (V)		Inrush	Steady-state	
*24~30	-	0.7~1.1Vn	200	5	40ms under
*48~60	48				
100~130	100~130				
200~250	200~250				

* Note) The available voltage range is the minimum rating range of each rated voltage(Vn)

2) Specification of the Wire

- Power consumption of about 200VA, rated voltage(Vn) DC 24~30(V), DC/AC 48(V) trip coil used
- Recommended maximum wire length

Wire Type		Rated Voltage (Vn)			
		DC 24~30 (V)		DC/AC 48 (V)	
		#16AWG (1.31mm²)	#18AWG (0.823mm²)	#16AWG (1.31mm²)	#18AWG (0.823mm²)
Operating Voltage	100%	80m	45m	330m	200m
	85%	45m	27m	210m	120m

Pad Lock / Position Lock (PL)

ACB is operated in position(CONNECTED, TEST, DISCONNECTED) when drawn-in/out. When the ACB body is drawn-in/out within the cradle, the handle will be locked without moving at an idle status.

- Locking status when position lock is thrown out.
- To perform an inflow, you must release the Position lock (released by pressing inward) before you can enter.

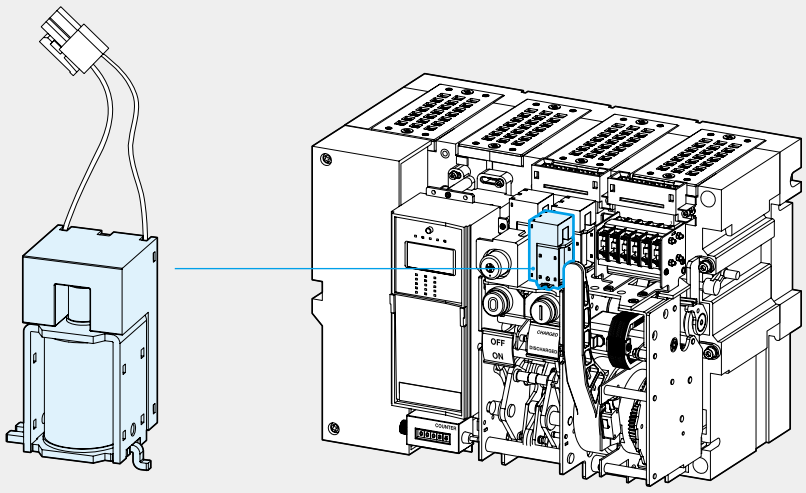
Racking Interlock (RI)

- When Guide interlock is opened, handle does not get inserted and handle can be inserted only when Guide interlock is closed.

Accessories

Closing coil (CC)

- Controller closed externally.
- When the voltage is supplied to A1, A2 of both coil ends with voltage input at 200ms instantaneous time.
- Basic mounting.



1) Closing Coil Rated Voltage & Characteristics

Rated Voltage (Vn)		Operating Voltage Range (V)	Power Consumption (VA or W)		Trip Time (ms)
DC (V)	AC (V)		Inrush	Steady-state	
*24~30	-	0.85~1.1Vn	200	5	90ms under
*48~60	48				
100~130	100~130				
200~250	200~250				

* Note) The operating voltage range is the minimum rating range of each rated voltage(Vn)

2) Specification of the Wire

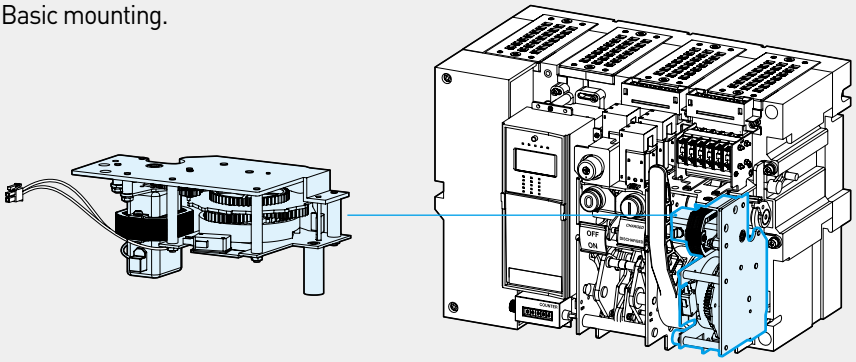
- Power consumption of about 200VA, rated voltage(Vn) DC 24~30(V), DC/AC 48(V) trip coil used
- Recommended maximum wire length

Wire Type		Rated Voltage (Vn)			
		DC 24~30 (V)		DC/AC 48 (V)	
		#16AWG (1.31mm²)	#18AWG (0.823mm²)	#16AWG (1.31mm²)	#18AWG (0.823mm²)
Operating Voltage	100%	30.5m	18m	155m	95m
	85%	25m	15m	135m	80m

Accessories

Motor (M)

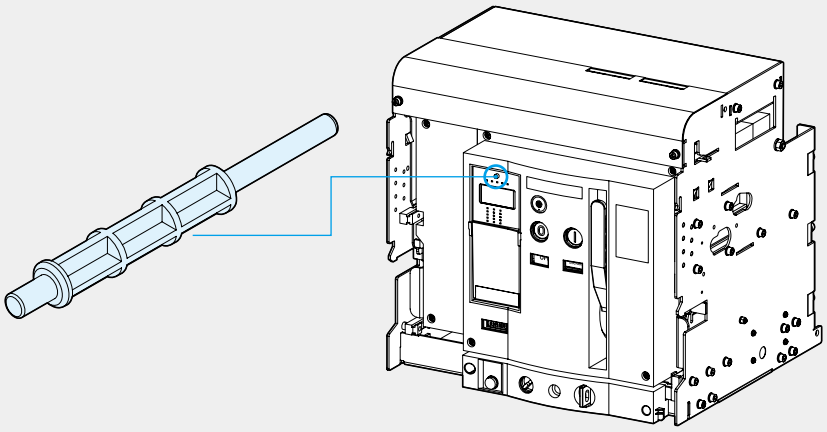
- External operating power is used to charge the CB closing spring.
- Manual charging, if there is no external power.
- Operating Voltage Range : Voltage 85%~110%
- Basic mounting.



Input Power(V)	AC/DC 100~130V	AC/DC 200~250V
Motor Load Current	1A	0.5A
Motor Rotation (RPM)	16,000~19,000rpm	
Insulated Withstand Voltage	2kV/min	
Start Load Current (max.)	Less than 5 times of the load current	
Operating Temperature Range	-20°C~60°C	
Durability	20,000 cycles(Load Continuous Operating Times:2times/min)	
Charge Time	5sec or more	
Charge End Contact	15A at 250V AC	

Manual Reset Button (MRB)

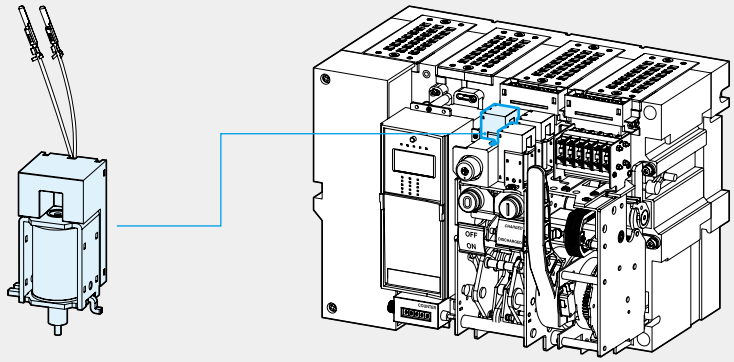
- After tripping by OCR, you can use the machine by pressing RESET BUTTON.
- MTD conducts trip only by the signal from OCR, and is unavailable when the breaker is OFF.
- After trip, the breaker can be re-closed only after resetting the breaker by pressing MRB.



Accessories

Under Voltage Trip device (UVT)

- CB tripping when it falls below the set voltage.
- When the control power is not input, there is no electrical and mechanical closing of CB.
- It is for instantaneous time operation, so when it shall be used for delay operation, it shall be connected to UVT delay controller.
- Apply the rated voltage to both ends of the UVT coil for use.

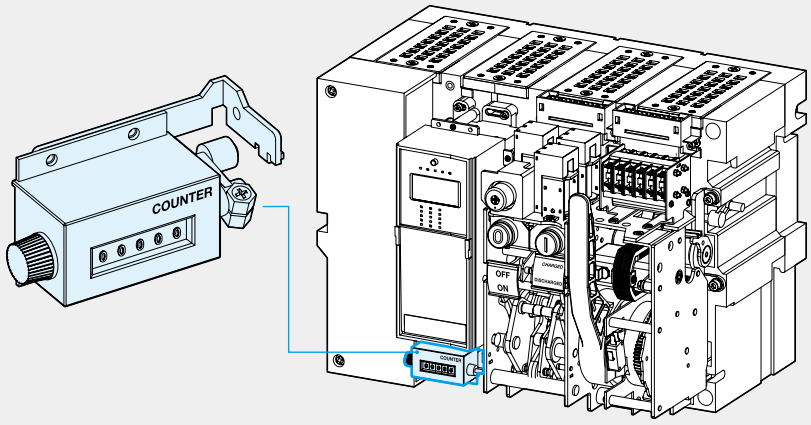


1) UVT Coil Rated Voltage & Characteristics

Rated Voltage(Vn)		Operating Voltage Range(V)		Power Consumption(VA or W)	
DC(V)	AC(V)	Pick up	Drop out	Inrush	Steady-state
100~130	100~130	0.65~0.85Vn	0.4~0.6Vn	200	5
200~250	200~250				

Counter (C)

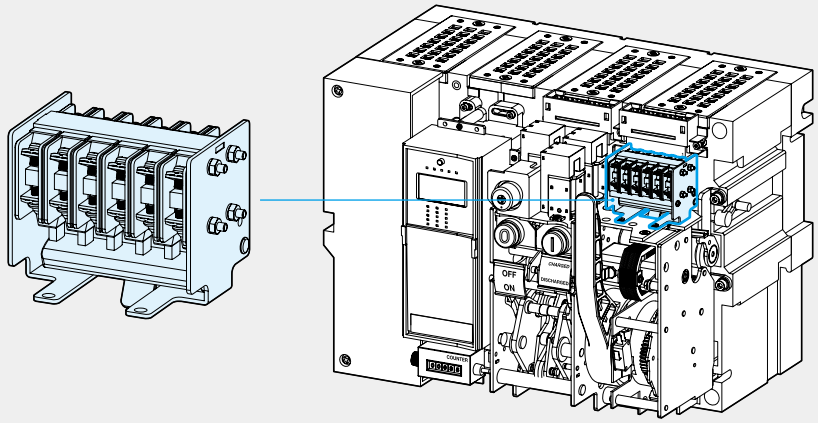
- It is a device to indicator the CB ON/OFF counts.



Accessories

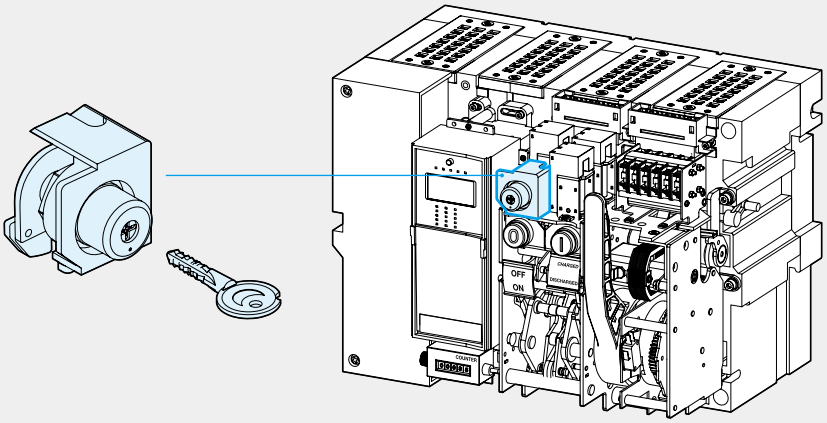
Auxiliary Switch (AX)

- It is a contact used to monitor ON/OFF position of ACB from remote place.
- 6a6b.
- Basic mounting.



Key Lock (KL)

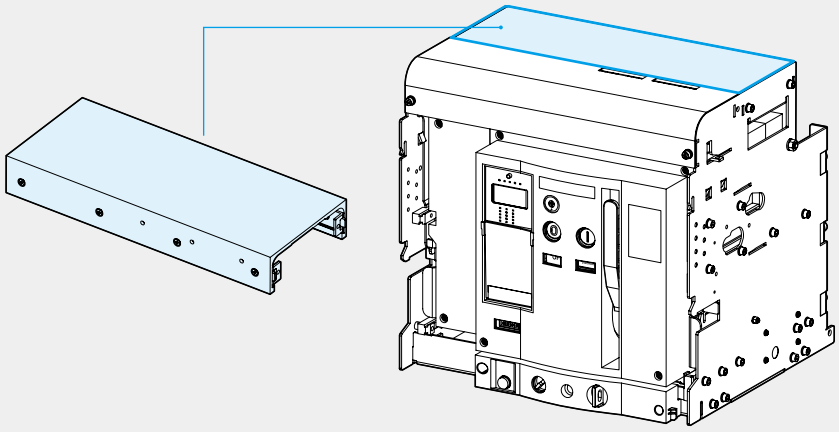
- It is a device for locking which prevents a certain circuit breaker from being operated by user's discretion when two or more circuit breakers are used at the same time.
- Preventing mechanical closing (ON).



Accessories

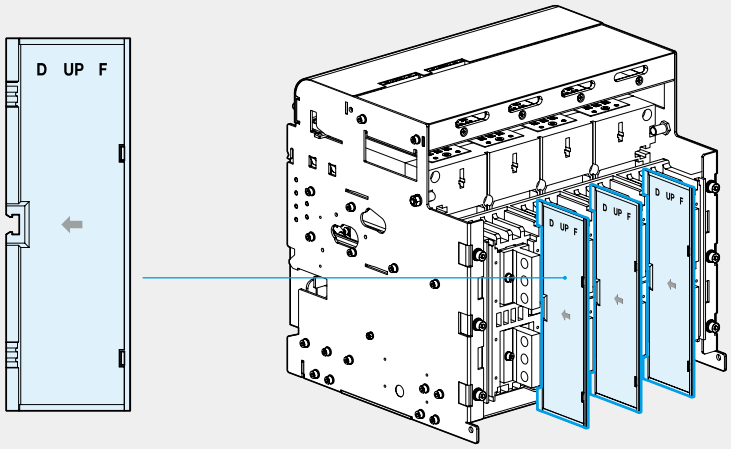
Arc Shield Cover (ASC)

- An arc from breaking is extinguished primarily in the arc chamber and secondarily and completely in the arc shield cover to prevent any arc-related accident.
- The cover length varies depending on the frame and pole.



Insulation Barrier (IB)

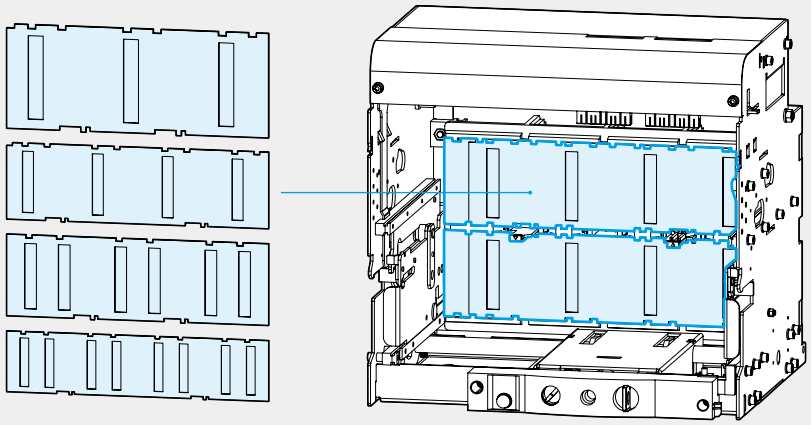
- Prevents interphase short circuit accidents by securing an interphase insulation distance to prevent an interphase arc from occurring.



Accessories

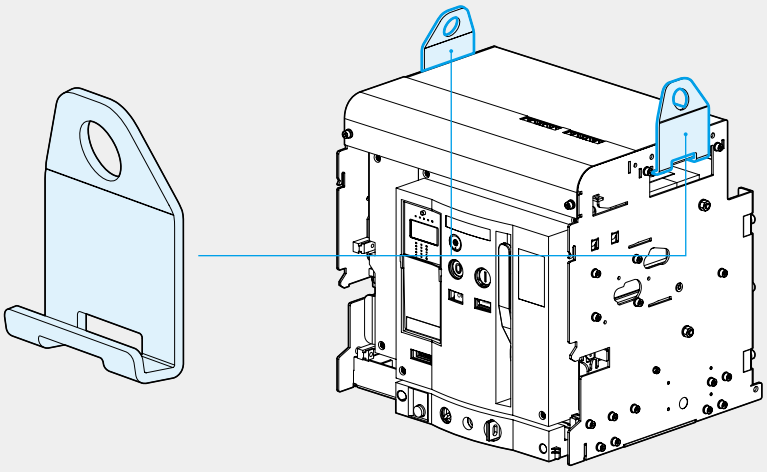
Safety Shutter (ST)

- A device that prevents dangerous contact from outside when entering or exiting ACB, and automatically opening and closing.



Lifting Hook (LH) (Slated for release)

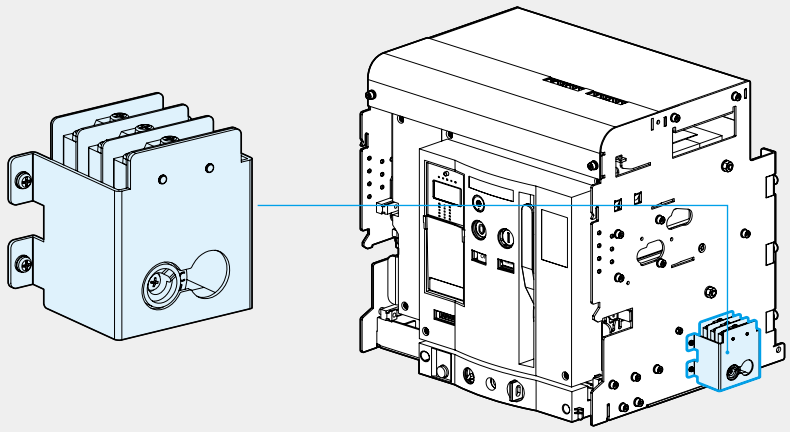
- It is a device to make an ACB easy to shift.
- Please hang it to both handles of the arc cover.



Accessories

Position Switch (PS)

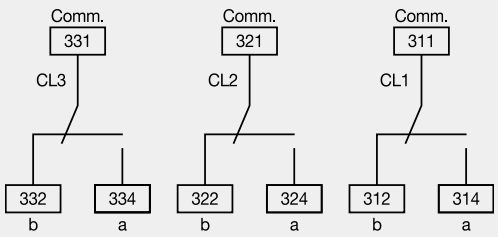
- Contact displaying the position of drawing in/out of the ACB (CONNECTED, TEST, DISCONNECTED)
- Contact composition
  3C : 1CONNECTED+1TEST+1DISCONNECTED



Operating Characteristics

Breaker Position			DISCONNECTED		CONNECTED
Draw In/Out Position			DISCONNECTED	TEST	CONNECTED
Contact Operation	CL - C (CONNECTED)		OFF → ON		
	CL - T (TEST)		OFF → ON → OFF		
	CL - D (DISCONNECTED)		ON → OFF		
Contact Capacity	Voltage (V)		Resistive Load		Inductive Load
	AC	125	15		-
		250			
	DC	125	10		7.5
		250	3		2
Contact Capacity			3C		

Terminal No. (3C)



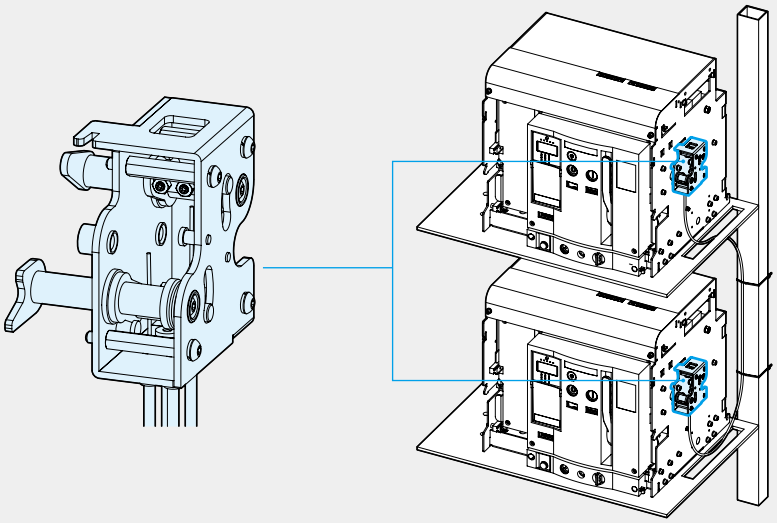
3C attached to the cradle

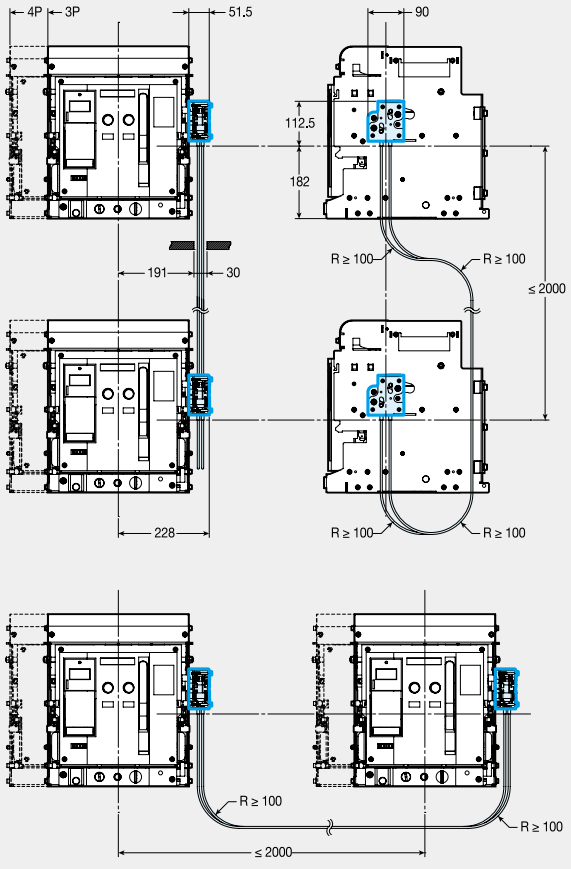
Accessories

Accessories

Mechanical Interlock (MI)

- It is used to interlock closing and trip between two or three breakers mechanically so as to prevent unintended operation at the same time.
- Used for distribution line branches and protection devices. It can be applied upto 3 breakers.

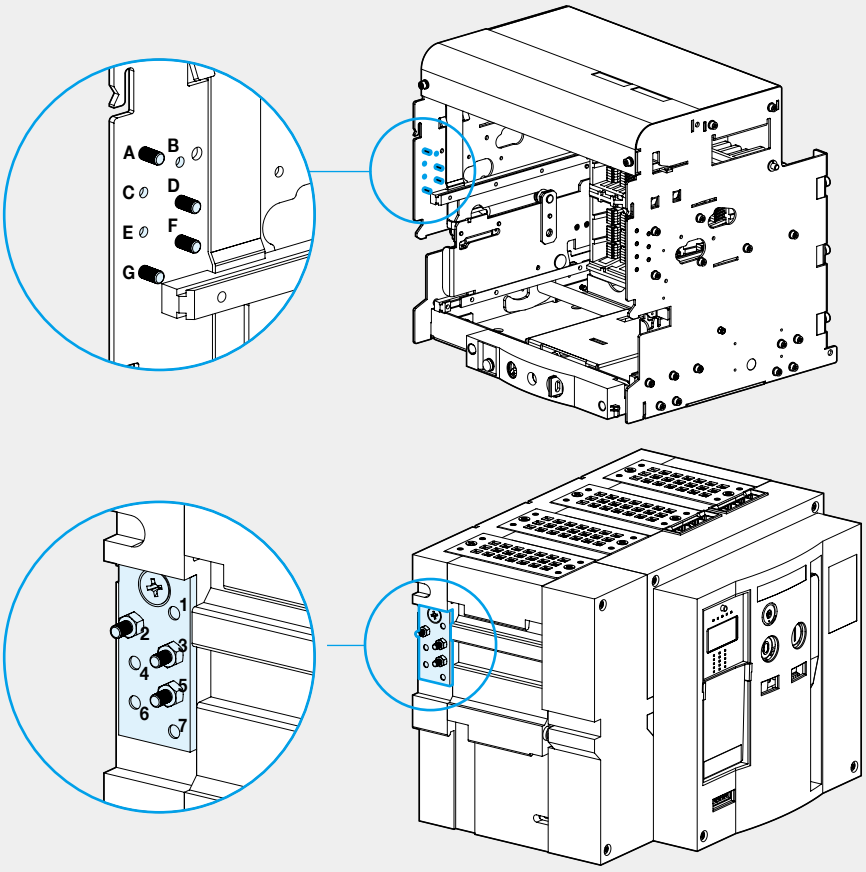




Accessories

Mis-insertion Preventing Device (MIP)

- Device to prevent any parts of the cradle from being rated with the main body.
- The installation method is variable according to ratings.



UVT Time Delay Controller (UDC)

- Unit that tripped when it falls below the set voltage, divided into instantaneous operation type and delay type.
- Instantaneous type : only available with UVT coil.
- Time delay type : available by connecting UVT coil and UVT time delay controller.
- Common use for the all types.

OCR Tester

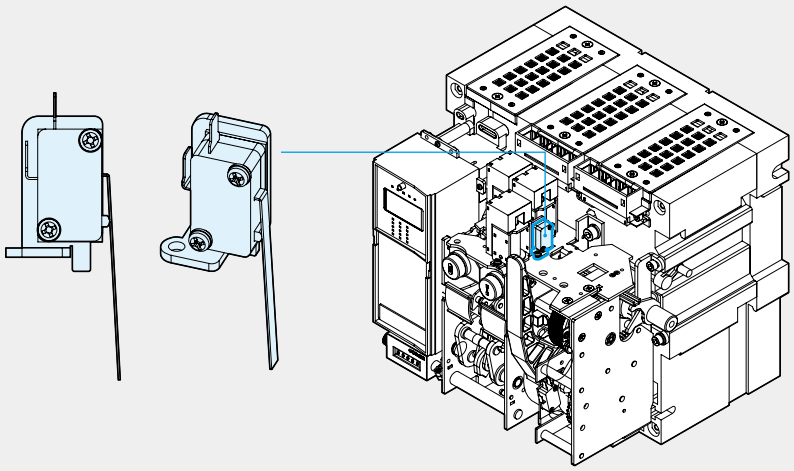
A device to test whether OCR trip relay operates normally without power.

- Possible to input maximum or 17 times the rated current.
- Input each current, value, size and phase of R/S/T/N
- Frequency can be changed.
- Testing long-time delay/Short-time delay/instantaneous/ground fault protection functions.

Accessories

Ready to Close Switch (RCS)

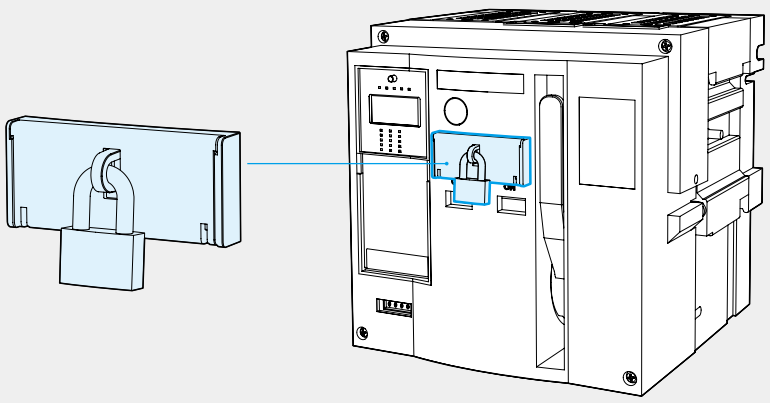
- Works in conjunction with the mechanism of the breaker.
- Indicates that the breaker is ready to closing.
- This means that the contact is switched on when the mechanism is switched off, which enables the closing of the mechanism.



Classification	Standard	
Contactor capacity	250/125Vac	10A
	250Vdc	0.3A
	125Vdc	0.6A
	48Vdc	3A
	24Vdc	5A

ON/OFF Button Lock (BL)

- Locking mechanism to prevent ACB from making and breaking due to improper user operation.
- Manual on/off operation of ACB is not allowed when installing Button Lock.

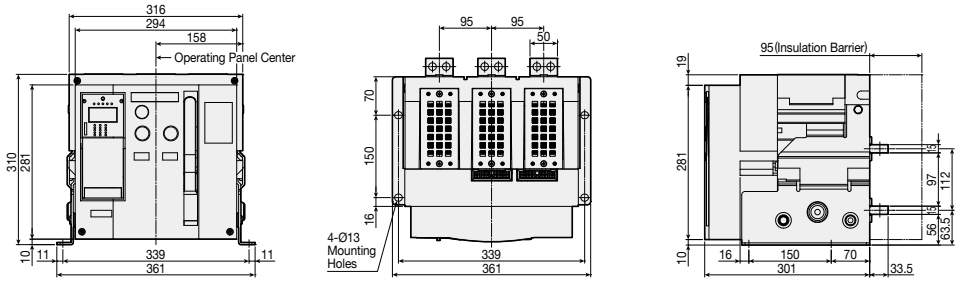


* Note) We do not supply locks and keys (Ø5~Ø6)

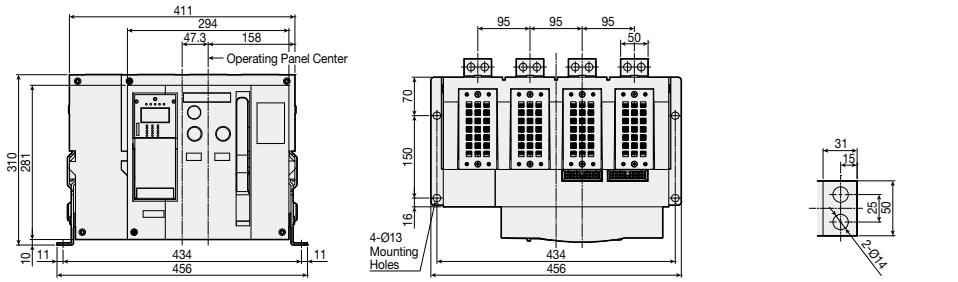
Dimensions

Dimensions

Fixed/ Horizontal Type 1600AF (400~1600A)



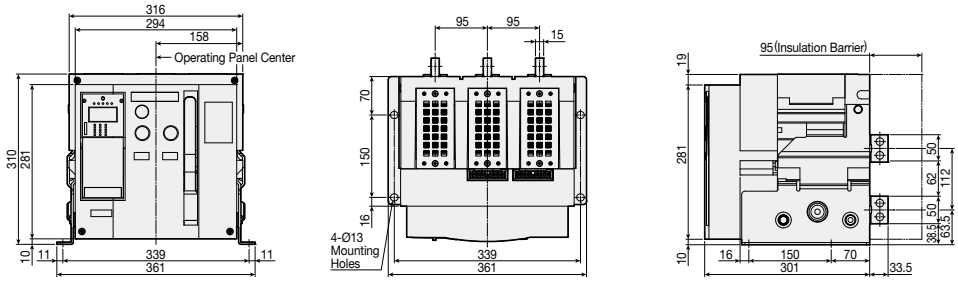
3-Pole Type



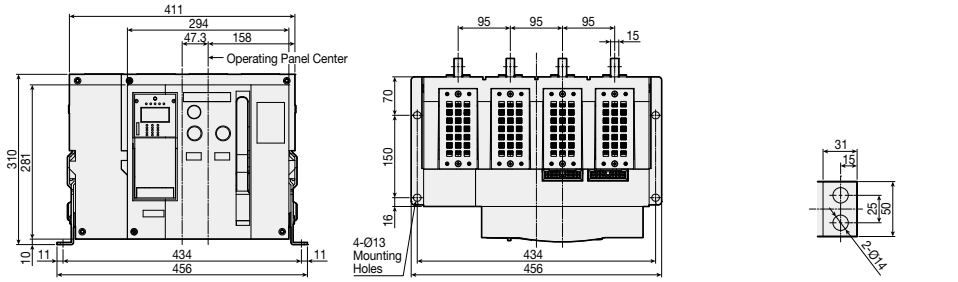
4-Pole Type

Conductor connection

Fixed/Vertical Type 1600AF (400~1600A)



3-Pole Type



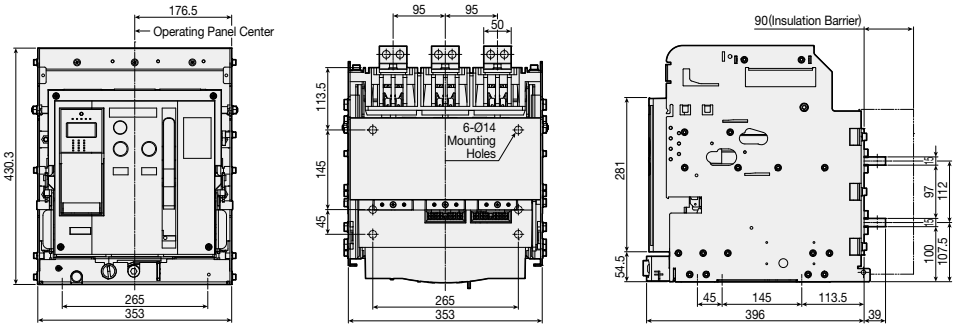
4-Pole Type

Conductor connection

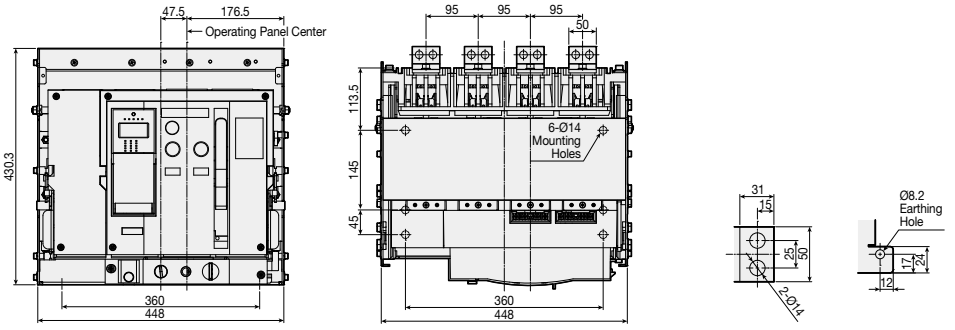
Dimensions

Dimensions

Draw-Out/Horizontal Type 1600AF (400~1600A)



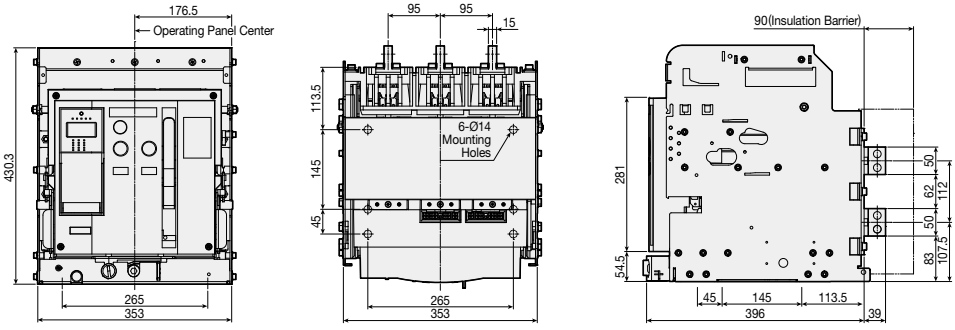
3-Pole Type



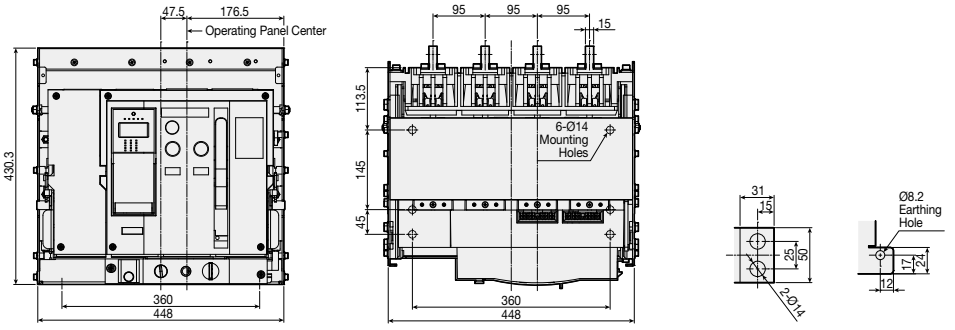
4-Pole Type

Conductor connection

Draw-Out/Vertical Type 1600AF (400~1600A)



3-Pole Type

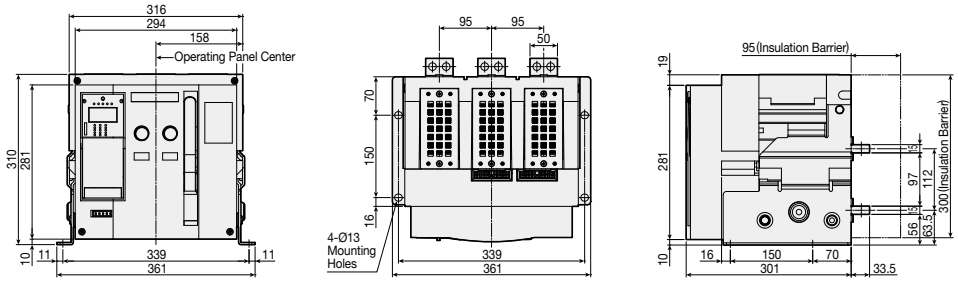


4-Pole Type

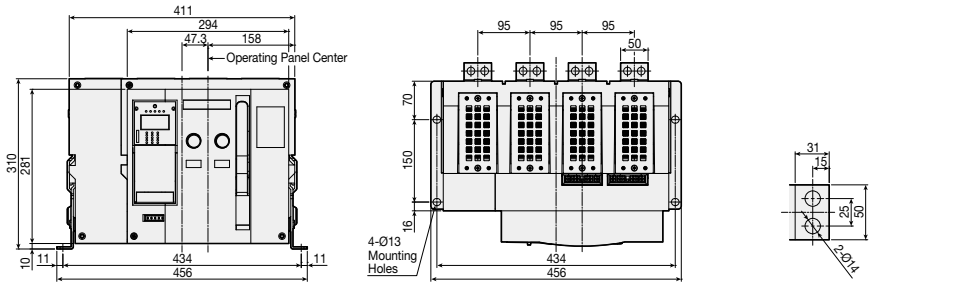
Conductor connection

Dimensions

Fixed/ Horizontal Type 2000AF (630~1600A)



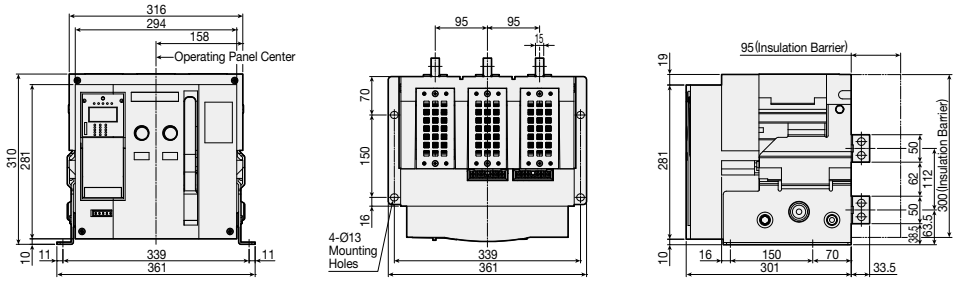
3-Pole Type



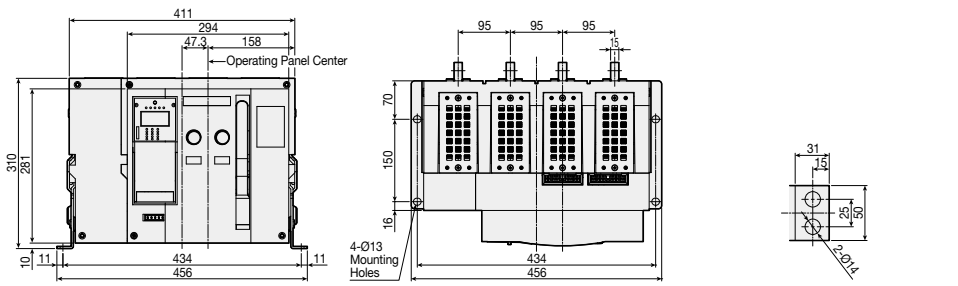
4-Pole Type

Conductor connection

Fixed/Vertical Type 2000AF (630~1600A)



3-Pole Type



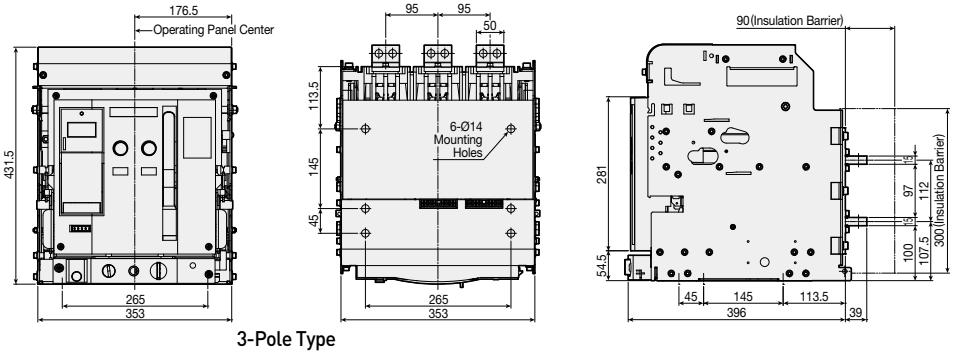
4-Pole Type

Conductor connection

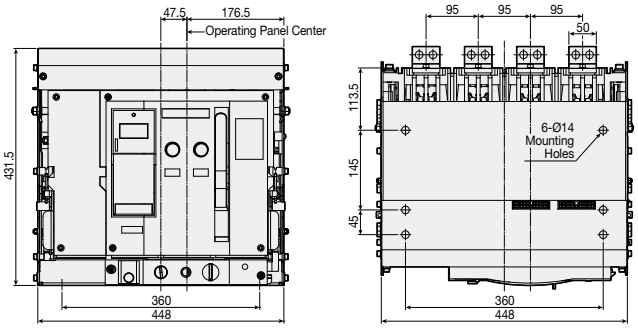
Dimensions

Dimensions

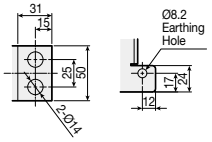
Draw-Out/Horizontal Type 2000AF (630~1600A)



3-Pole Type

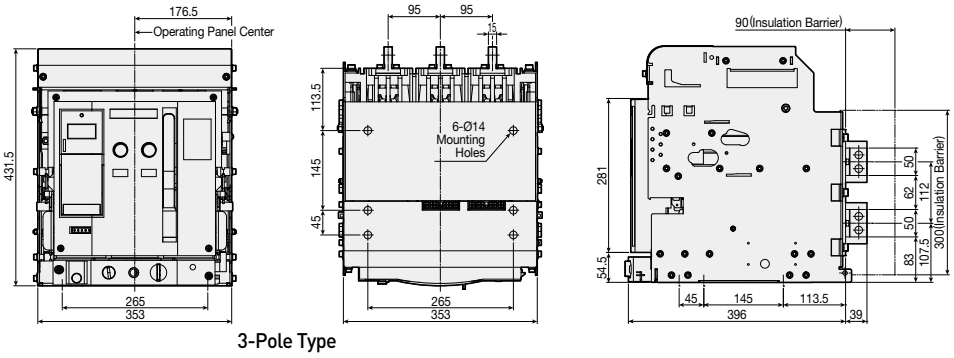


4-Pole Type

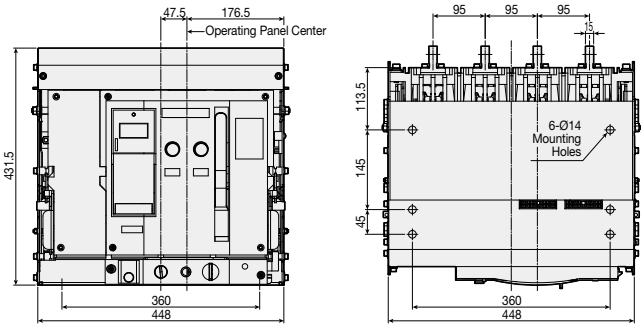


Conductor connection

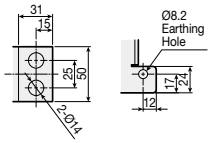
Draw-Out/Vertical Type 2000AF (630~1600A)



3-Pole Type



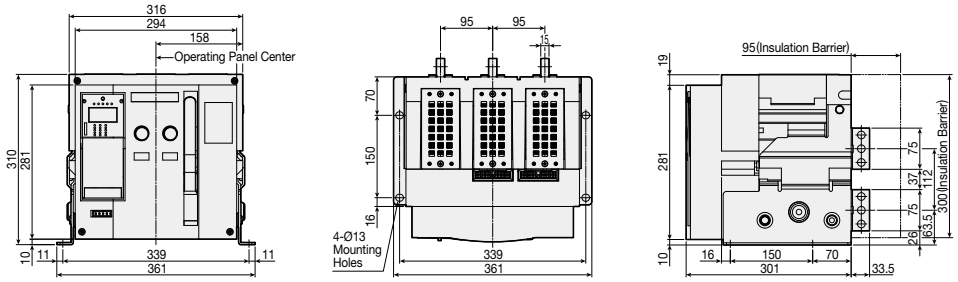
4-Pole Type



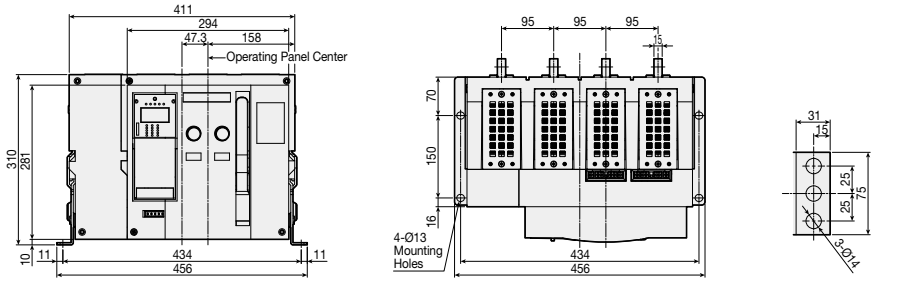
Conductor connection

Dimensions

Fixed/Vertical Type 2000AF (2000A)

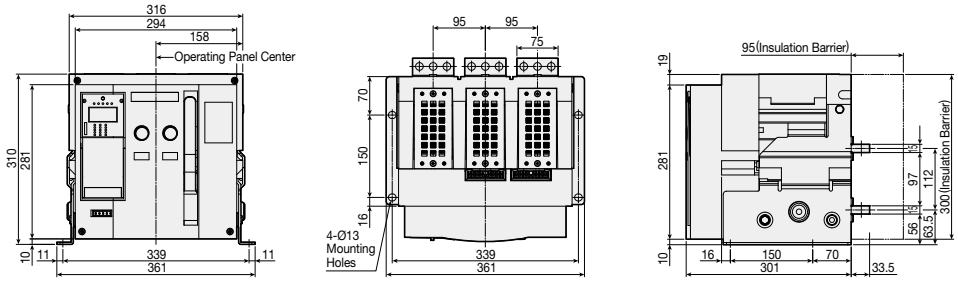


3-Pole Type

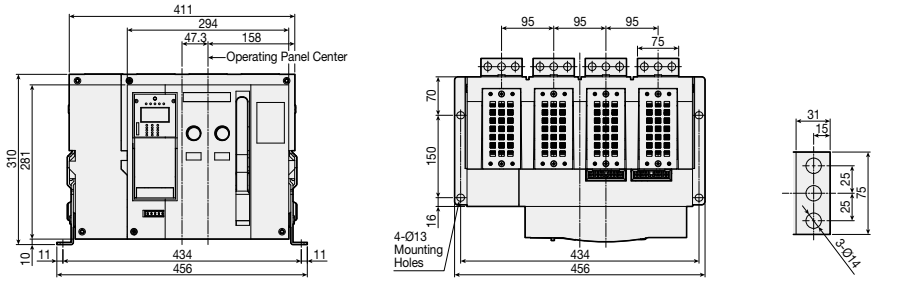


4-Pole Type　　Conductor connection

Fixed/Horizontal Type 2000AF (2000A)



3-Pole Type

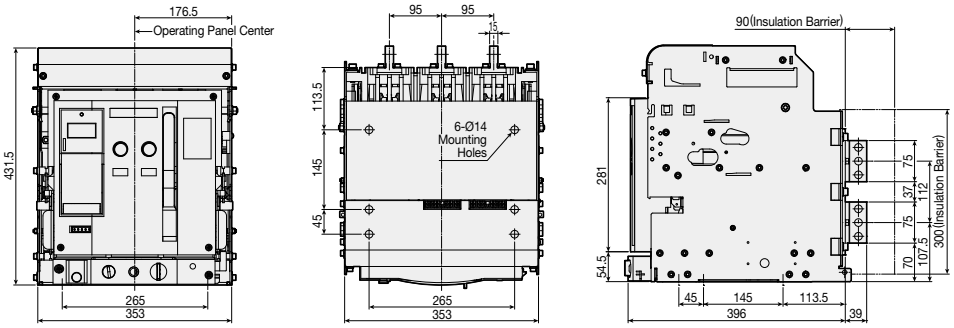


4-Pole Type　　Conductor connection

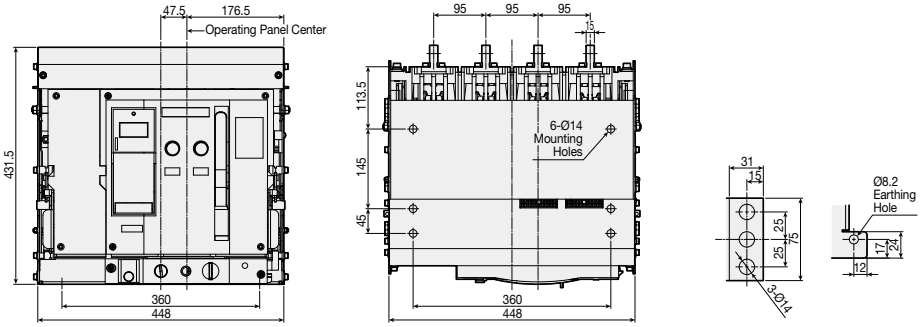
Dimensions

Dimensions

Draw-Out/Vertical Type 2000AF (2000A)



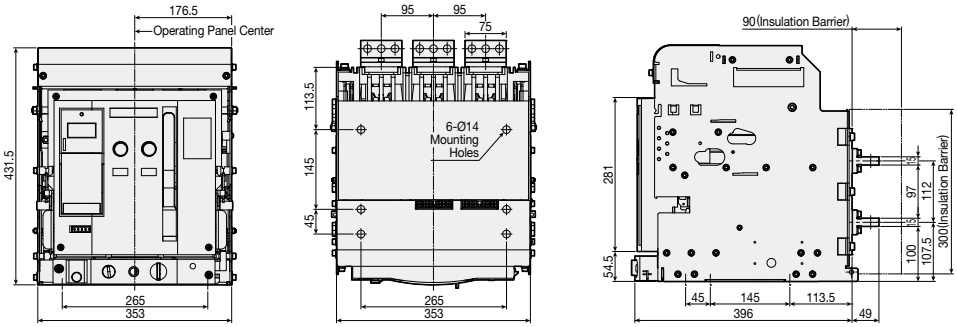
3-Pole Type



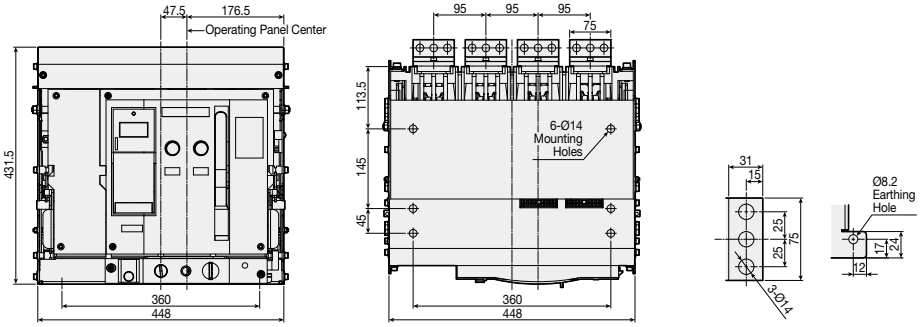
4-Pole Type

Conductor connection

Draw-Out/Horizontal Type 2000AF (2000A)



3-Pole Type

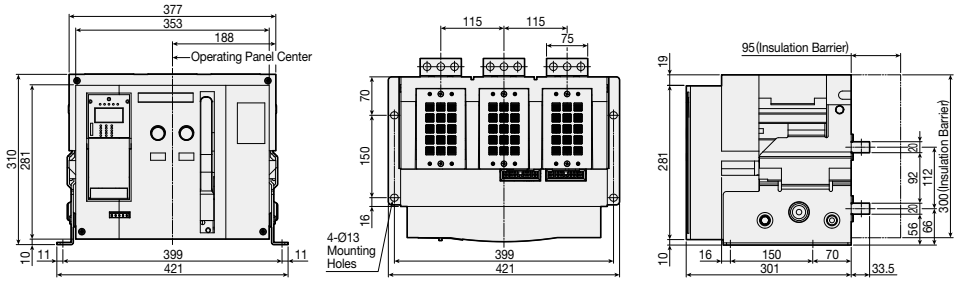


4-Pole Type

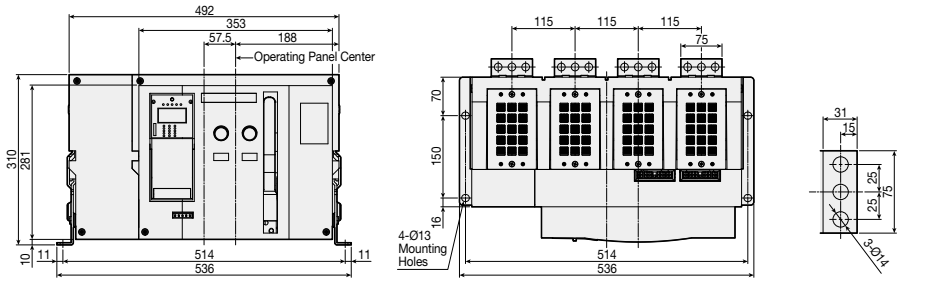
Conductor connection

Dimensions

Fixed/Horizontal Type 4000AF (2500~3200A)

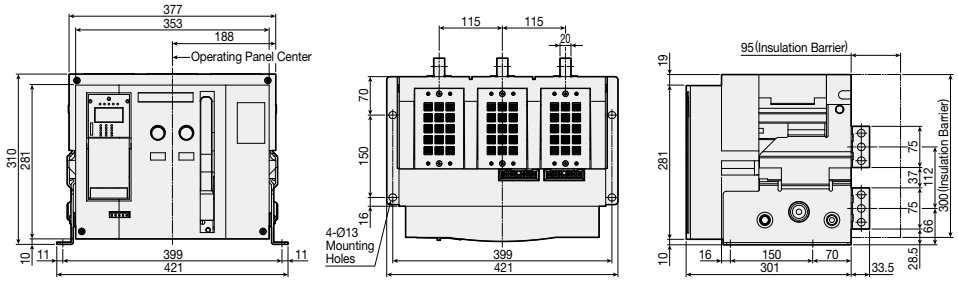


3-Pole Type

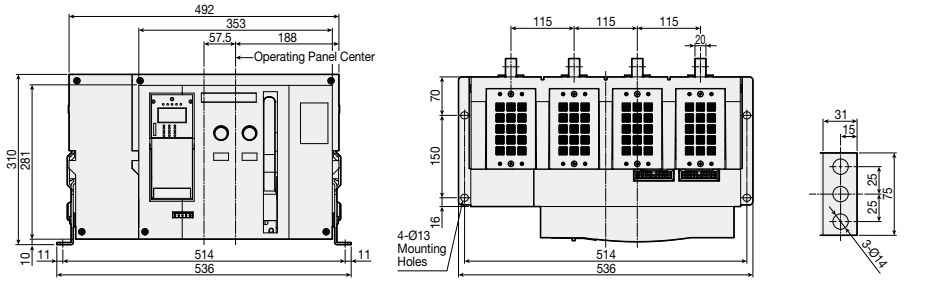


4-Pole Type　　Conductor connection

Fixed/Vertical Type 4000AF (2500~3200A)



3-Pole Type

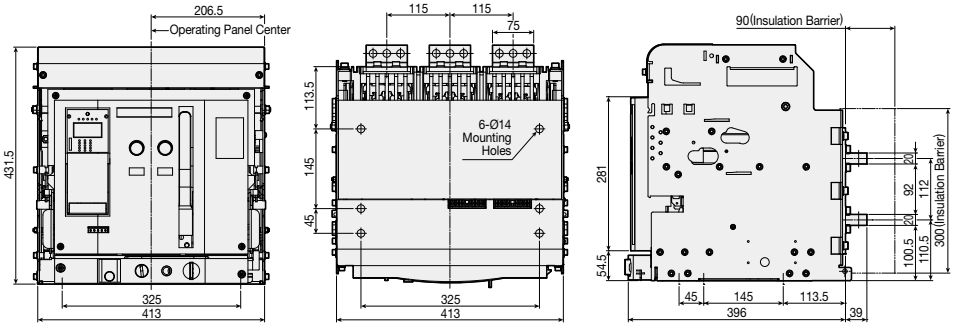


4-Pole Type　　Conductor connection

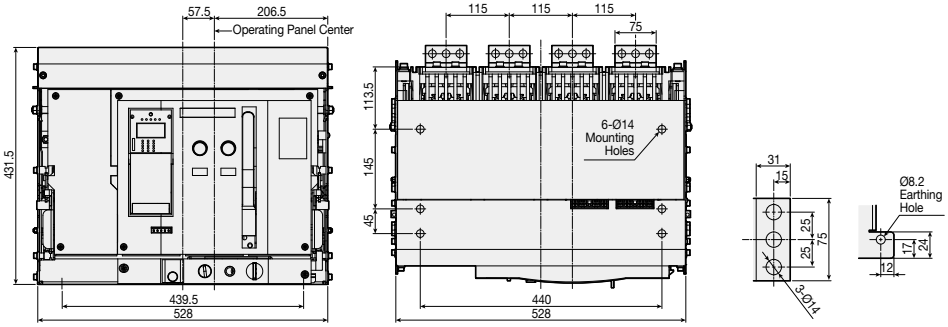
Dimensions

Dimensions

Draw-Out/Horizontal Type 4000AF (2500~3200A)



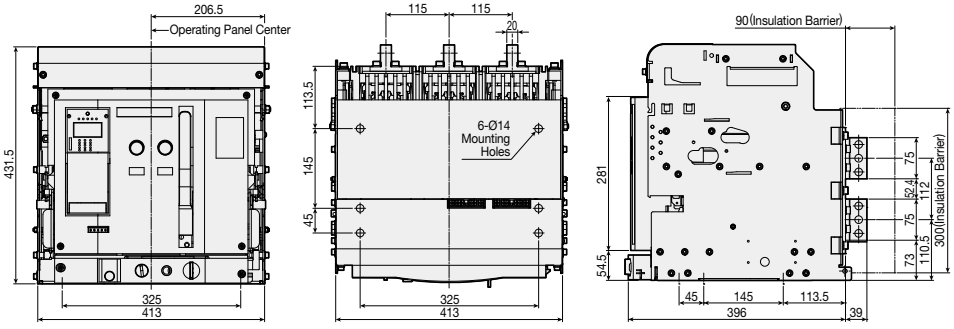
3-Pole Type



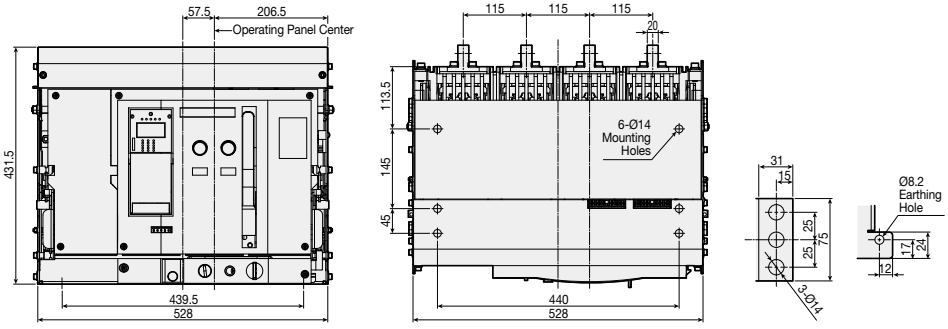
4-Pole Type

Conductor connection

Draw-Out/Vertical Type 4000AF (2500~3200A)



3-Pole Type

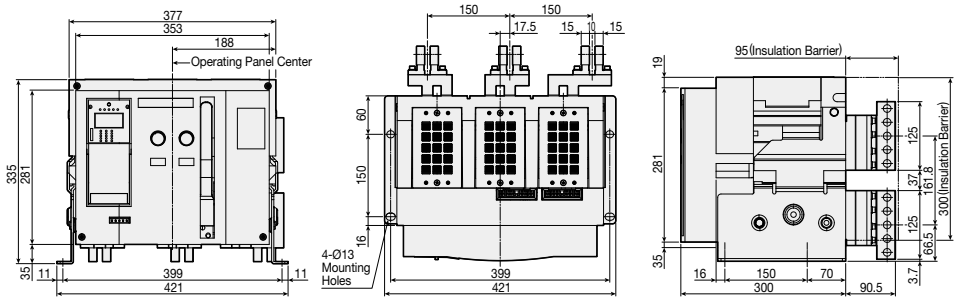


4-Pole Type

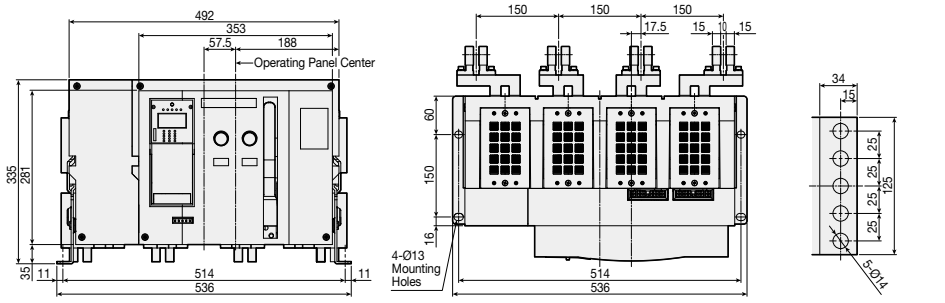
Conductor connection

Dimensions

Fixed/Vertical Type 4000AF (4000A)



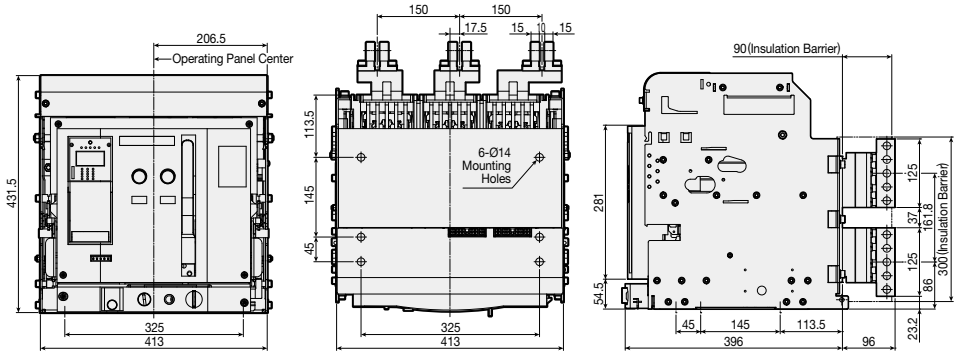
3-Pole Type



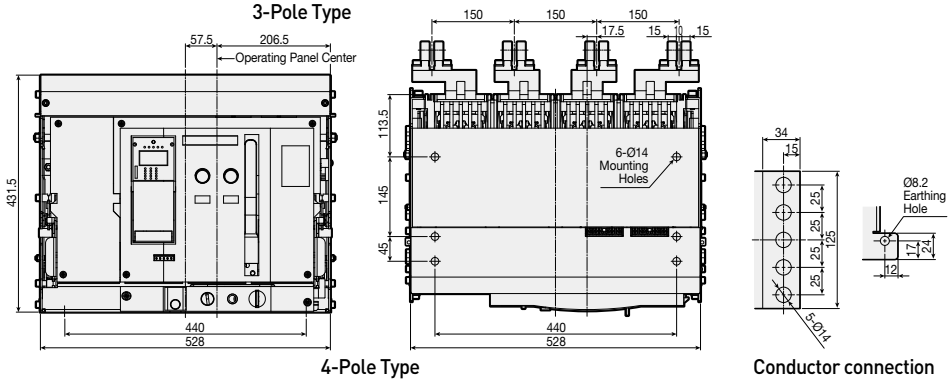
4-Pole Type

Conductor connection

Draw-Out/Vertical Type 4000AF (4000A)



3-Pole Type



4-Pole Type

Conductor connection

Air Circuit Breakers for 5000/6300AF (High Capacity)

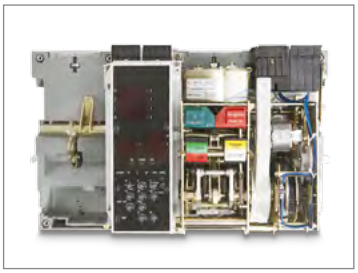
VITRO EM's high-capacity air circuit breaker is certified with IEC's new standard (IEC60947-2).

It is an easy-to-use, premium breaker designed to maximize user safety and protection.

Safety / Reliability / Stored-energy

Provides higher safety and reliability.

- Improved safety and reliability through easy maintenance and repair.
- Double-insulation structure improves safety and allows easy attachment of auxiliary devices.



Uses stored-energy type operation devices.

- Designed to use the 'stored-energy' type operation devices, it offers perfect breaking and making operations.
- The 'charging' type operation device provides the manual type which uses a manual handle and the motor type which uses a motor.

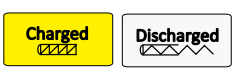
External & Internal Configuration

Exterior Configuration

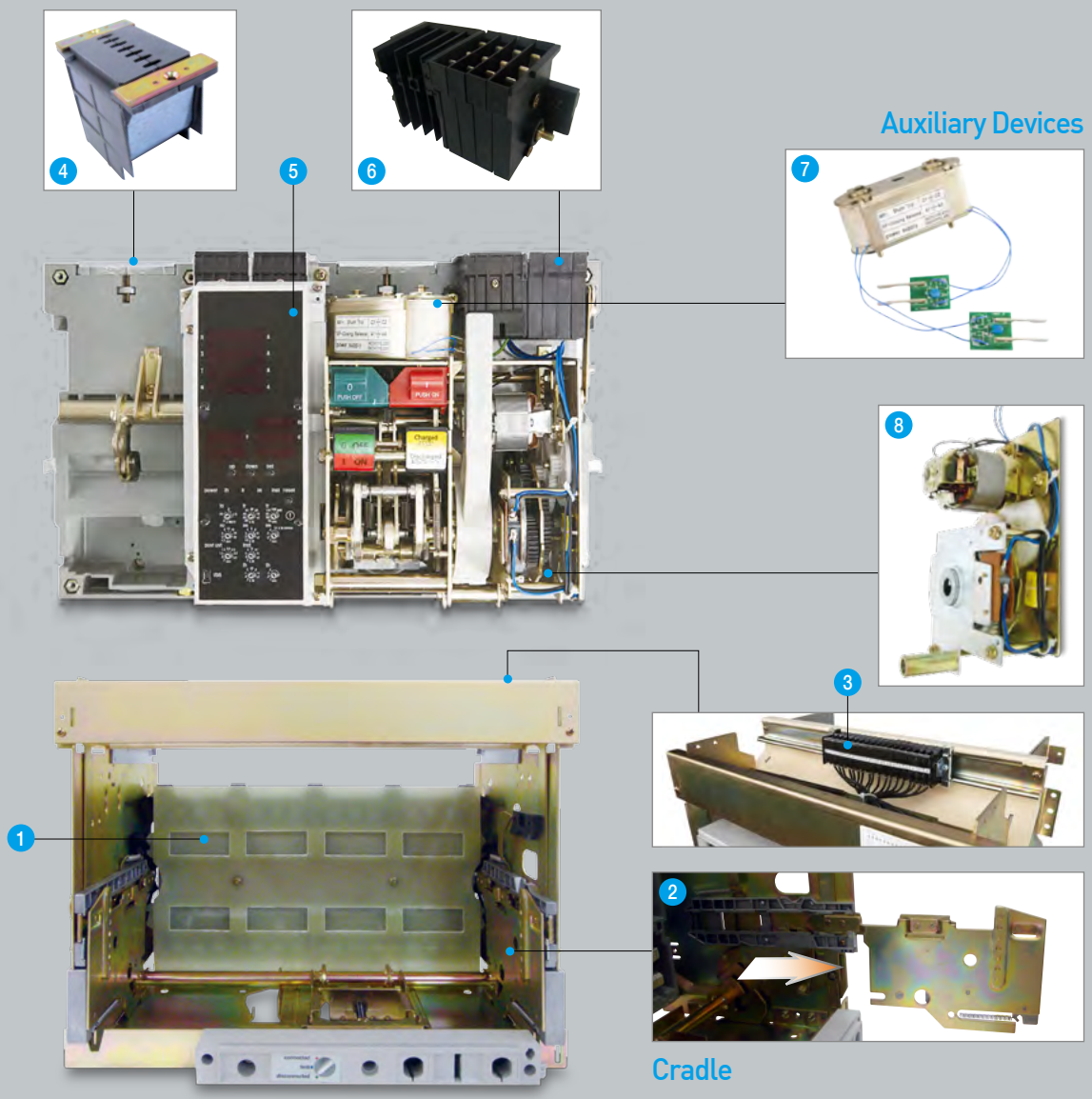
1. Manual charge handle
2. ON button
3. OFF button
4. ON/OFF indicator
5. Charge/Discharge indicator
6. Rated nameplate
7. Padlocking device for operation and short-circuit positions
8. IN/OUT indicator
9. Arc extinguishing chamber cover

On(I)

Off(O)



Charged Discharged



Part Names of Main Body and Cradle

Cradle

1. Safety shutter
2. Draw-out rail
3. Auxiliary terminal block

Main Body

4. Arc extinguishing chamber
5. Protecting relay
6. Auxiliary contact
7. Trip release coil
8. Motor infiltration operation part

Ratings

Ratings

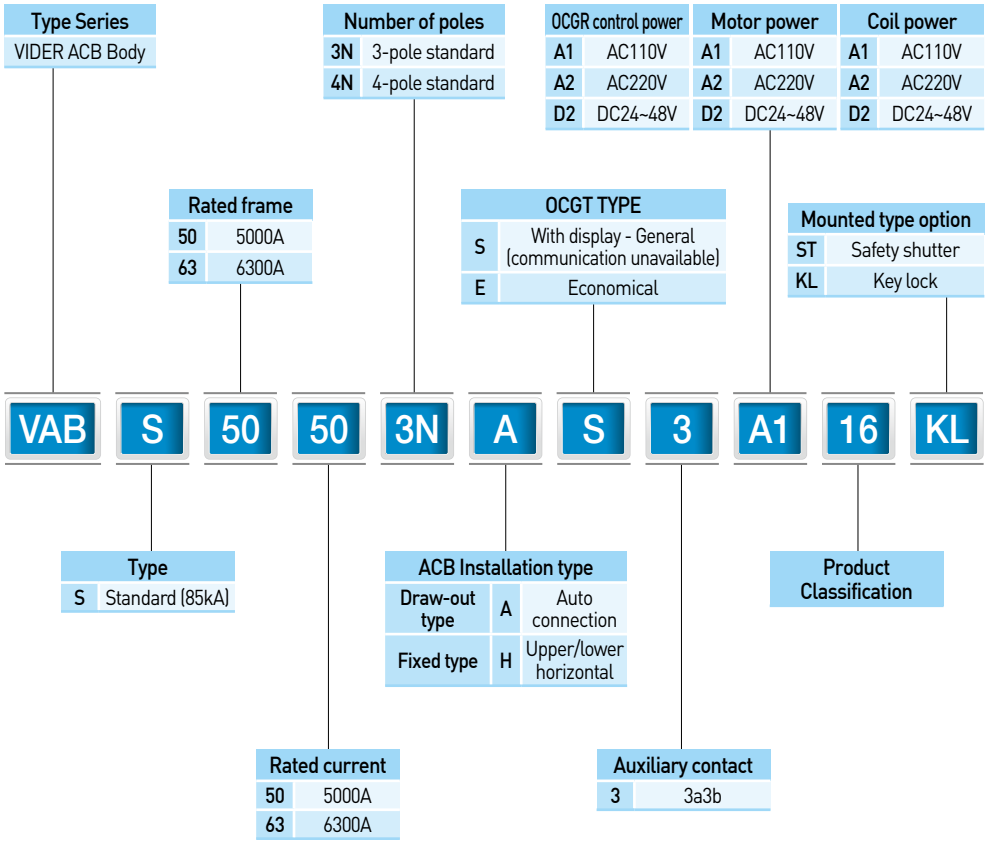
Product name			VABS50	VABS63
Rated current (A)			5000	6300
Rated voltage (Ue)			660	660
Insulation voltage (Ui)			1000	1000
Frequency			3/4	3/4
Type			S	S
Rated making current (Icu)	660/600/550V		85	85
	500/480/460V		100	100
	415/380/230/220V		130	130
Breaking current for time (Icw)	1 sec.		85	85
	3 sec.		52	52
Rated making current (Icm)	690/600/550V		187	187
	500/480/460V		220	220
	415/380/230/220V		286	286
Rated impulse withstand voltage (Uimp)			12kV	12kV
Run time (t)	Breaking time		40ms	40ms
	Making time		80ms	80ms
Mechanical lifetime	Repaired		10000	10000
	Non-repaired		5000	5000
Electrical lifetime	Non-repaired		1000	1000
Dimensions W×H×D (mm)	Fixed type	3P	787×386×326	787×386×326
		4P	1029×386×326	1029×386×326
	Draw-out type	3P	820×470×450	820×470×450
		4P	1050×470×450	1050×470×450
Max. weight (kg)	Fixed type	3P	98	103
		4P	123	130
	Draw-out type	3P	210	235
		4P	230	250

*Dimensions with the arc space (When the Arc extinguishing chamber cover is mounted)

How to Order

How to Order

VIDER Series (High Capacity)



*The product classification can be changed arbitrarily to improve the specifications.

Types of Breaker

Draw-out breaker

- New design, improved technology
- Arc Space removed
  The arch space has been removed as it is not required when the arc extinguishing chamber cover is mounted to the draw-out type breaker.
- Ensures improved safety at the test and short-circuit positions. We guarantee to do our best to improve the safety of our products.

Economical breaker

- Economical breaker is suitable for tie line.
- This product excludes CT and overcurrent relays in draw-out and fixed breakers. Draw-out type & fixed type breaker

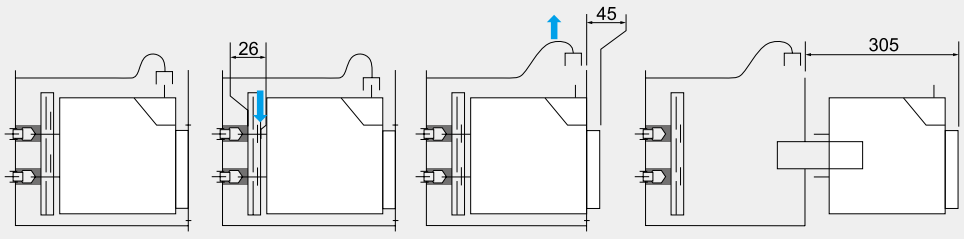
Draw-out & fixed breaker

- The draw-out breaker and the fixed breaker basically have the same structure.
- The fixed type stand can be attached to the main body of the draw-out breaker to make a fixed breaker. No other changes are required.

4P Draw-out Cradle

Economical breaker 3P

Improves safety at the test and short-circuit positions

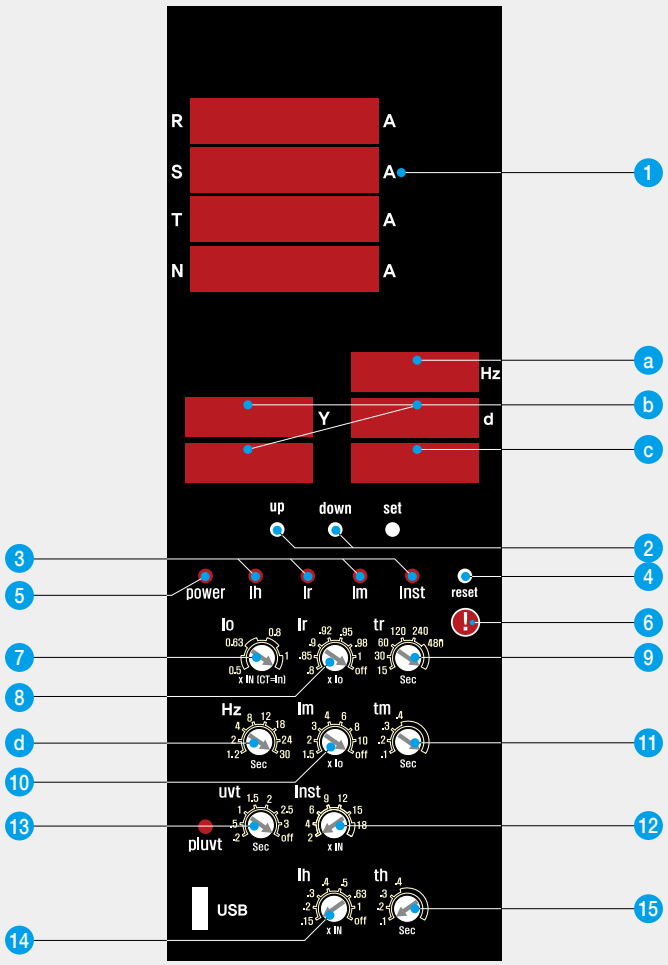


Operation position | Test position | Short-circuit position | Detached

OCR

OCR Control Unit

Protection relays - OCR



1. Displays 3-phase current value and voltage
2. Operation keys: system settings, scale operation
3. Long-time delay trip | Short-time delay trip | Ground | Instantaneous trip of the accident indicator lamp
4. Clear key of accident indicator lamp and LED
5. Power indicator lamp
6. Caution status indicator lamp
7. CT ratio setting switch
8. Terminal for setting the long-time delay trip current
9. Terminal for setting the long-time delay trip time
10. Terminal for setting the short-time delay trip current
11. Terminal for setting the short-time delay trip time
12. Terminal for setting the instantaneous trip current
13. Terminal for setting UVT time delay (optional)
14. Terminal for setting the ground trip current (optional)
15. Terminal for setting the ground trip time (optional)

a. Displays the frequency
b. Displays the date
c. Displays No. 7-15 setting values
d. Tab which detects change of usage frequency Tripped after the setting time when it is higher/lower than ±5Hz

OCR

OCR Control Unit

Main function

Control Unit Functions		VIT-001	VIT-002
		Function	Function
Protection	Long-time delay	○	○
	Short-time delay	○	○
	Instantaneous	○	○
	Ground	○	○
Reset button		○	○
Current indicator lamp		○	○
Trip indicator lamp		○	○
Warning lamp		○	○
UVT time setting		△	△
Voltage indicator lamp		-	○

*"○" Mounted, "-" Not mounted, "△" Optional

Functional description

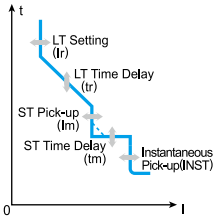
Basic functions	Trip indicator lamp	LED Indicating by Trip cause out of	Ir, Im, Ih breaking
			Press the reset button
			Any external power supply is not required
	Warning lamp	LED Flashes when the set value of	Long-time current, short-time current
			Any external power supply is not required
Additional functions	Voltage	w/ Indicator	Digitally displayed (VIT-002)
			Accuracy ±10%
	UVT time setting	Delayed Tripping by Undervoltage Release	VIT-001, VIT-002
			0.2~3 Set of OFF (8 Steps)

Properties

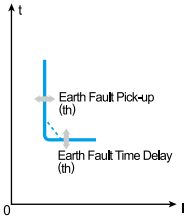
Long-time delay trip	Setting current (A) Ir=Io x	0.8~1.0, Off	8Step
	Trip time Tr (at 1.1 x Ir)	15, 30, 60~480	6Step
	Error	±10%	-
Short-time delay trip	Setting current (A) Im=Iox	1.5, 2, 3~10, Off	8Step
	Trip time Tm (s)	0.1, 0.2, 0.3, 0.4	4Step
	Error	±10%	-
Instanta-neous trip	Setting current (A) Inst=In x	2~18, Off	8Step
	Error	±10%	-
Ground trip	Setting current (A) Ih=In x	0.15~1 Off	8Step
	Trip time Th (s)	0.1, 0.2, 0.3, 0.4	4Step
	Error	±10%	-

Operating Zone

Basic Functions:
Long Time (LT)
Short Time (ST)
Instantaneous (INST)
Protection

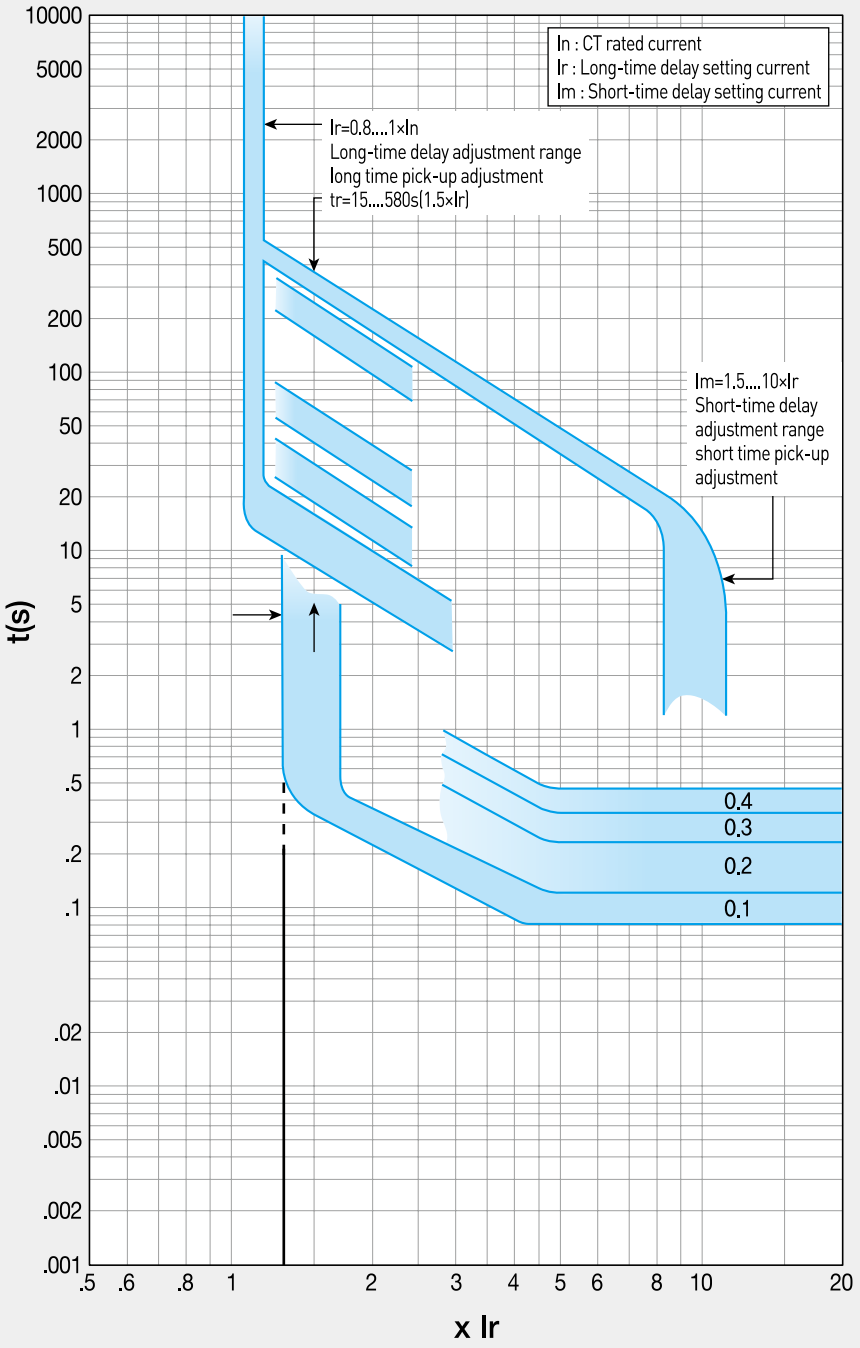


Earth Fault
Protection



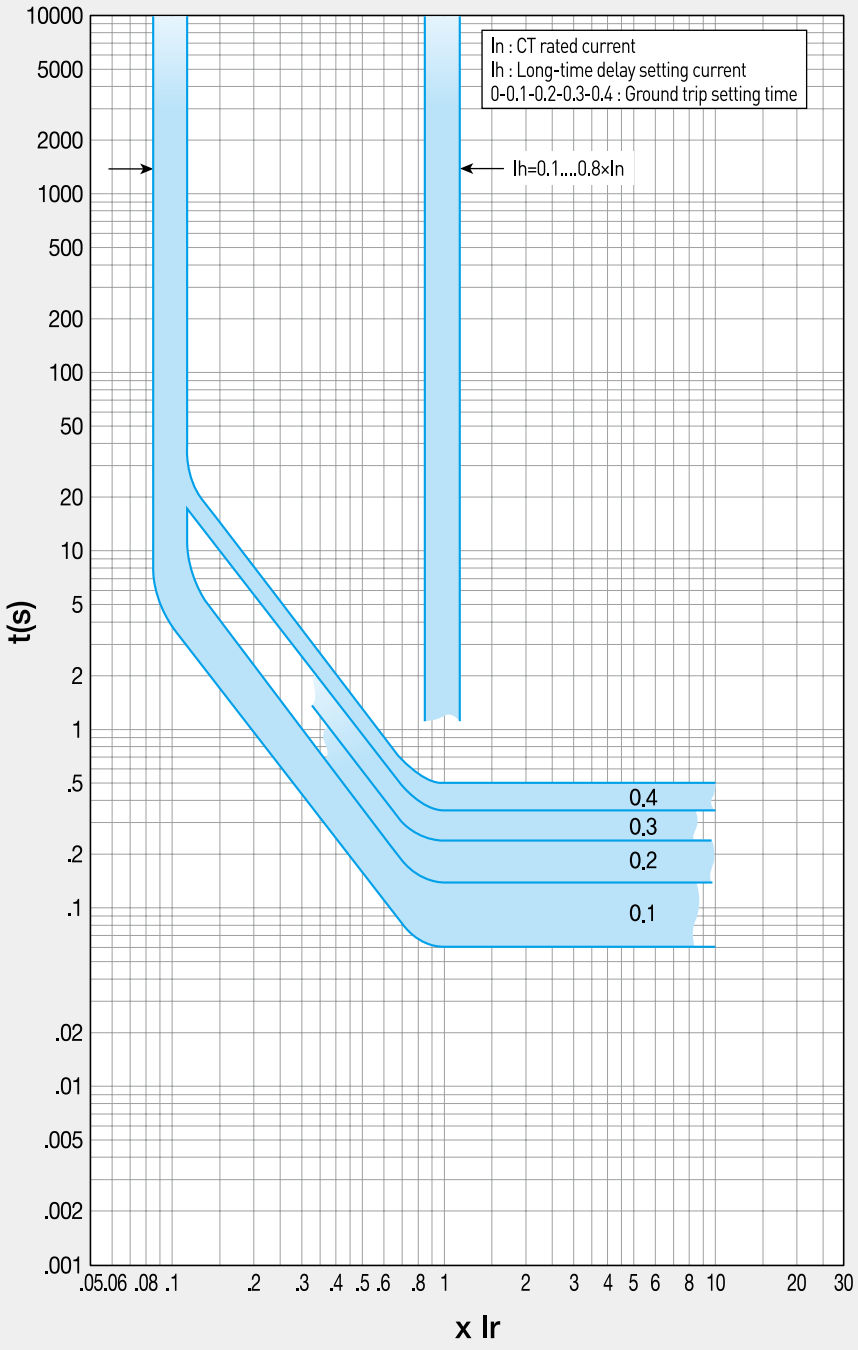
Trip Characteristic Curves

Short-time Delay Properties

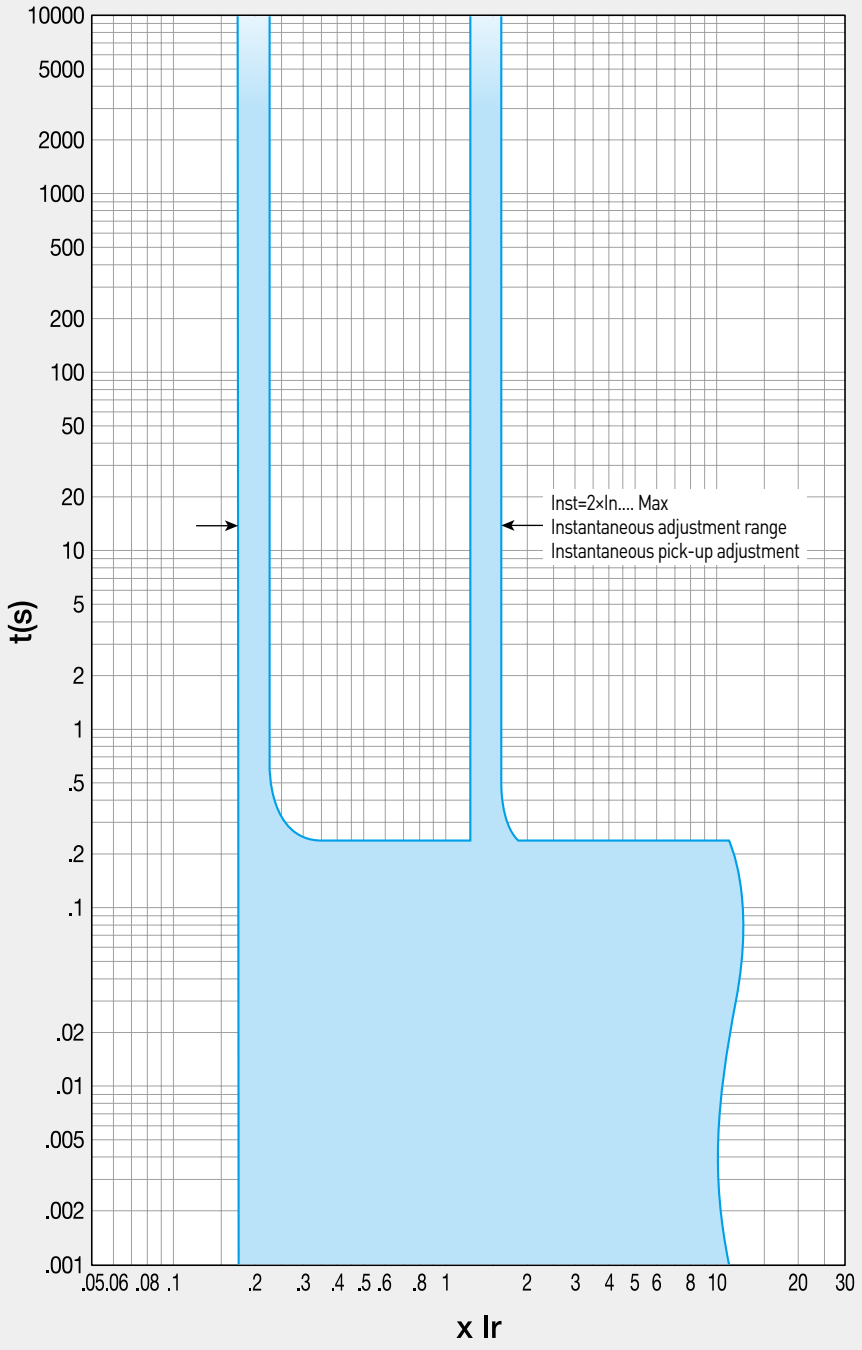


Trip Characteristic Curves

Ground properties

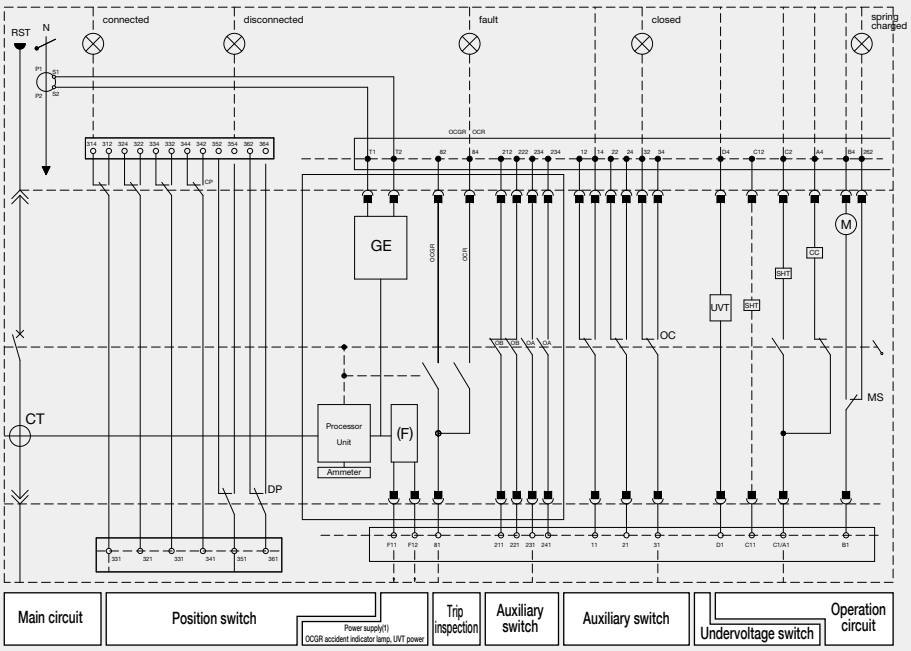


Instantaneous properties



Control Circuit Diagram

Control Circuit Diagram



* The above circuit diagram displays the de-energized status.

- UVT power AC220V : for D1, D4
  (Making prevention type at the de-energized status)
- UVT power AC220V : for F11, F12
  (Tripped at the undervoltage, de-energized status)

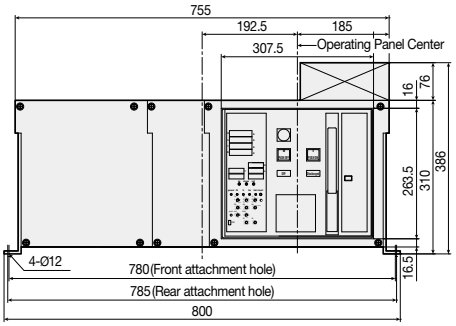
* Accident indicator lamp power: for F11, F12 (AC220V or AC110V)
If there is no other stated voltage, the voltage is AC 220V at the shipment.

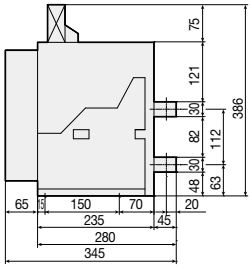
CP	Operation position contact (C contact)
CD	Short-circuit position contact
M	Operation position contact (C contact)
CC	Making relay
SHT	Trip relay / Shunt trip relay
GE	Ground protection device
UVT	De-energized trip relay (Instantaneous)
OC	Auxiliary C contact
OA	2a contact
OB	2b contact
Fl	Accident display contact
MS	Motor cut switch (C contact)

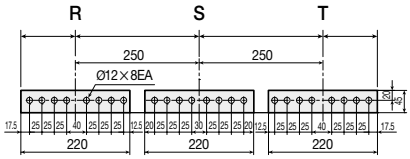
Dimensions

Dimensions

Fixed/Horizontal 6300AF (5000A)



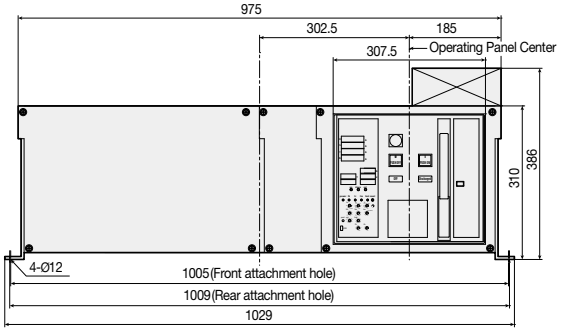


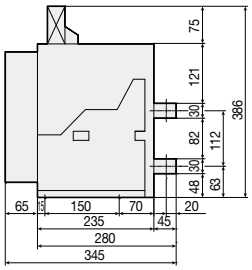


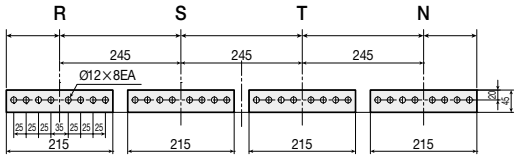
Dimension

Rated current	T(mm)	W(mm)
5000A	33	220

3-pole type







Dimension

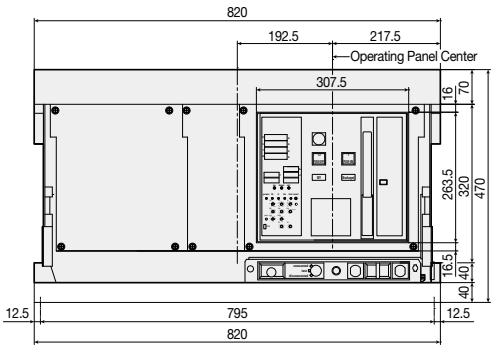
Rated current	T(mm)	W(mm)
5000A	30	215

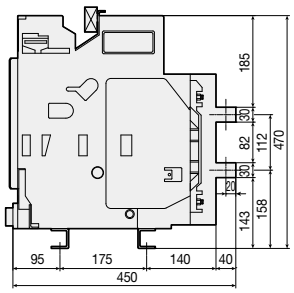
4-pole type

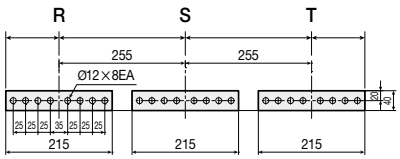
Dimensions

Dimensions

Draw-out/Horizontal 6300AF (5000A)



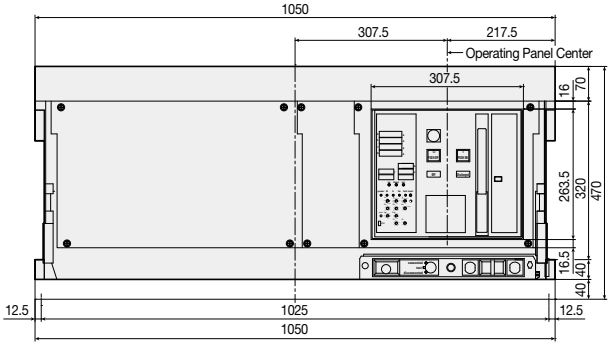


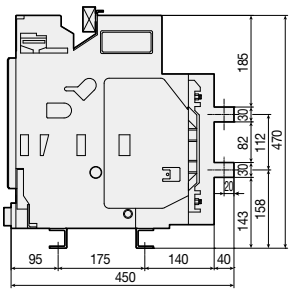


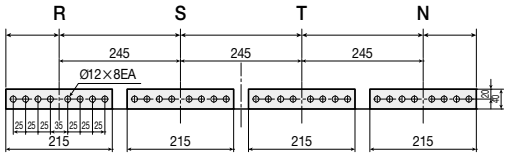
Dimension

Rated current	T(mm)	W(mm)
5000A	30	220

3-pole type







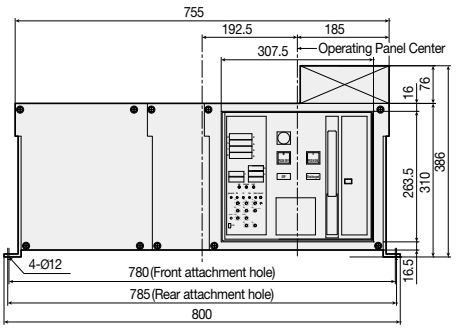
Dimension

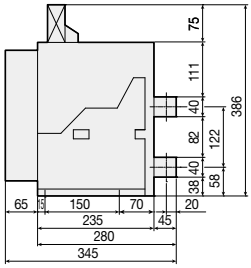
Rated current	T(mm)	W(mm)
5000A	30	215

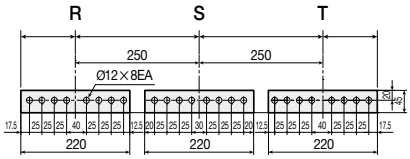
4-pole type

Dimensions

Fixed/Horizontal 6300AF (6300A)



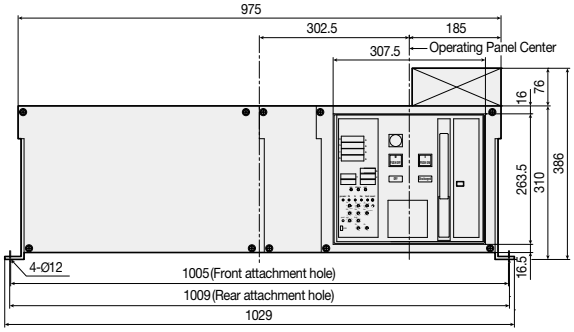


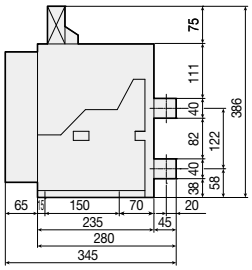


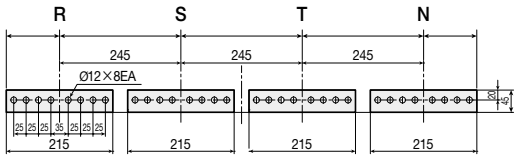
Dimension

Rated current	T(mm)	W(mm)
6300A	40	220

3-pole type







Dimension

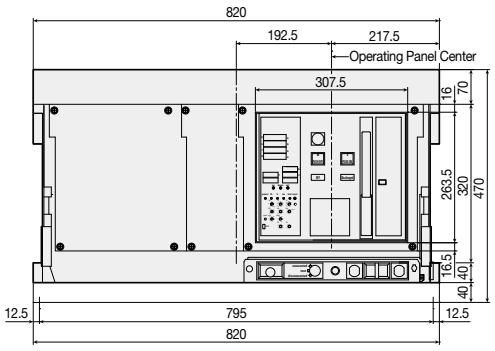
Rated current	T(mm)	W(mm)
6300A	40	215

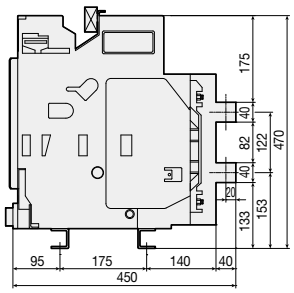
4-pole type

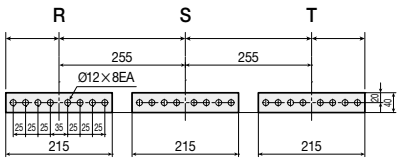
Dimensions

Dimensions

Draw-out/Horizontal 6300AF (6300A)



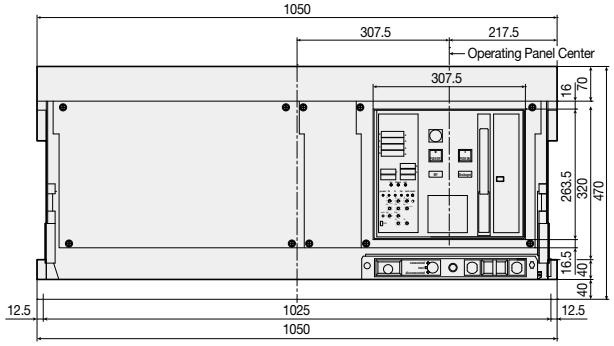


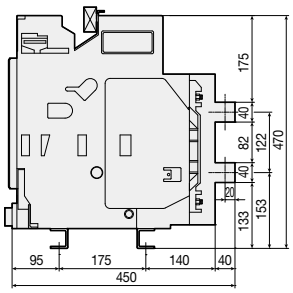


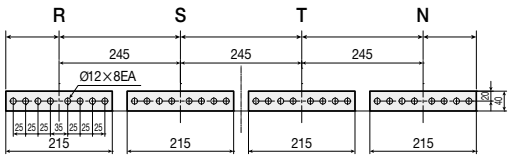
Dimension

Rated current	T(mm)	W(mm)
6300A	40	215

3-pole type







Dimension

Rated current	T(mm)	W(mm)
6300A	40	215

4-pole type

VITZRO EM

A1 Air Circuit Breakers

CONTENTS

For nuclear power plants

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Air Circuit Breakers for Nuclear Power Plant

VITZRO EM Air Circuit Breaker Class 1E for Nuclear Power Plants is produced through a nuclear power quality certification system and development tests were conducted based on KEPI END 1000~3000. In addition, it was recognized for its superior quality via passing development tests based on ANSI C37, 13(1990) and KEPIC EED 1200.

Utility

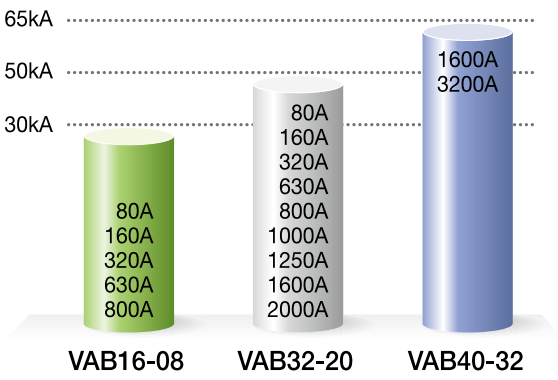
Its performance was certified through a nuclear power test based on an International Standard Certification.

- International Standard Certification.
  It was internationally recognized for its performance by obtaining major domestic and overseas standard certifications including a local nuclear power test (KERI) and an overseas KEMA certificate (IEC60947-2 Test).
- Nuclear Power Performance Verification (KEPIC END 1000-3000)
  - Aging analysis - Operation Cycling Test
  - Seismic Test

KEMA

Safety

ACB for nuclear power plants can be used within the range of 3 poles and 800AF~3200AF and it provides various options.



- Interlock device - Mechanical interlock unit (MI)
- Close/Open push button locking device (BL)
- UVT & UVT controller
- Position switch (TOC)
- Mechanical operating switch (MOC)
- Capacitor Trip device (CTD)
- OCR alarm contact (2a)

Reliability

It is enhanced with the reliability by adopting a high-functional microprocessor over-current trip device.

- It is easy to perform an inspection after the failures using the attached indicator lamp that enables to check which elements were operated during the failures. Also, the contact for each failure is output to be used at a remote control and monitoring station.
- It is resistant to an external surge since it is built-in with a surge protection circuit.
- A test terminal is installed for an easy inspection. Malfunctions are not generated due to a vibration or an impulse since it is designed in a shock-resistant configuration.

Ratings

For Nuclear Power Plant (ANSI C37.13 Applied)

Type		VAB 16-08
Rated Voltage (Ue)		480V
Rated Insulation Voltage (Ui)		690V
Max. Rated Voltage		508V
Number of Poles (P)		3
Rated Current (In)		800A
Rated Frequency		60 Hz
Rated Short Time Withstand Current (Icw)		30 kArms
Rated Short Circuit Breaking Current	Instantaneous Operation	30 kArms (Sym.)
		35.1 kArms (Asym.)
	Short Time Operation (Operation Time : 40ms)	30 kArms (Sym.)
		35.1 kArms (Asym.)
Rated Short Circuit Making Current (Icm)		69kApeak
Rated Breaking Time		≤5 cycle
Nuclear Power Electric Class		Class 1E
Nuclear Power Quality Class		Q
Seismic Performance		I
Operational Duty		O - 15sec - CO
Rated Operation Times (Under Rated Load)		5,000 times
Operation Mode		Motor spring stored energy
Operating Control Voltage		DC 125V
Control Voltage		DC 125V
Spring Charging Time		< 15 sec
Rated Closing Time		< 0.05 sec
Rated Trip Time		< 0.04 sec
Number of Auxiliary Contacts		6a6b
Weight		98 kg
Cirtificate & Approval		ANSI C37.13

*The weight includes the skeleton.

For Nuclear Power Plant
(ANSI C37.13 Applied)

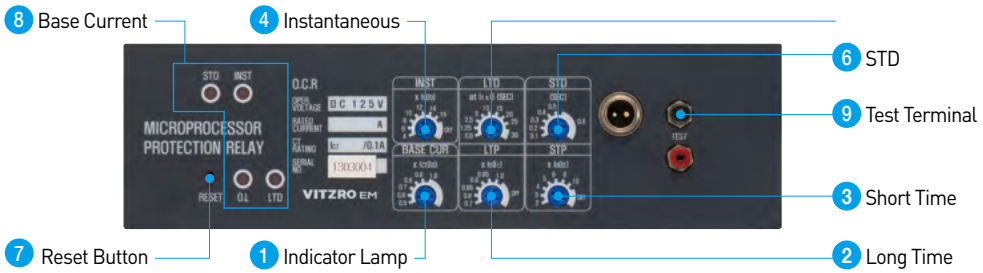
Type		VAB 32-20	VAB 40-32
Rated Voltage (Ue)		480V	
Rated Insulation Voltage (Ui)		690V	
Max. Rated Voltage		508V	
Number of Poles (P)		3	
Rated Current (In)		200A	3200A
Rated Frequency		60 Hz	
Rated Short Time Withstand Current (Icw)		50 kArms	65 kArms
Rated Short Circuit Breaking Current	Instantaneous Operation	50 kArms (Sym.)	65 kArms (Sym.)
		58.5 kArms (Asym.)	76.1 kArms (Asym.)
	Short Time Operation (Operation Time : 40ms)	50 kArms (Sym.)	65 kArms (Sym.)
		58.5 kArms (Asym.)	76.1 kArms (Asym.)
Rated Short Circuit Making Current (Icm)		115 kApeak	149.5 kApeak
Rated Breaking Time		≤5 cycle	
Nuclear Power Electric Class		Class 1E	
Nuclear Power Quality Class		Q	
Seismic Performance		I	
Operational Duty		O - 15sec - CO	
Rated Operation Times (Under Rated Load)		2,000 times	1,000 times
Operation Mode		Motor spring stored energy	
Operating Control Voltage		DC 125V	
Control Voltage		DC 125V	
Spring Charging Time		< 15 sec	
Rated Closing Time		< 0.05 sec	
Rated Trip Time		< 0.04 sec	
Number of Auxiliary Contacts		6a6b	
Weight		136 kg	190 kg
Cirtificate & Approval		ANSI C37.13	

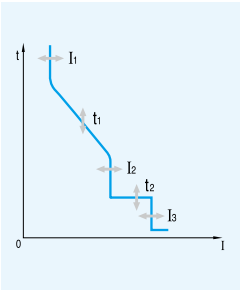
*The weight includes the skeleton.

Trip Relay

For Nuclear Power Plant

Trip Relay - OCR





Base Current [Io]

Type	Current Setting [I_{ct}] (A)	Setting Range [I_o] (A)
VAB 16-08	80	48≤ I_o ≤80
	160	96≤ I_o ≤160
	320	192≤ I_o ≤320
	630	378≤ I_o ≤630
	800	480≤ I_o ≤800
VAB 32-20	80	48≤ I_o ≤80
	160	96≤ I_o ≤160A
	320	192≤ I_o ≤320A
	630	378≤ I_o ≤630
	800	480≤ I_o ≤800
	1000	600≤ I_o ≤1000
	1250	750≤ I_o ≤1250
	1600	960≤ I_o ≤1600
	2000	1200≤ I_o ≤2000
VAB 40-32	2500	1500≤ I_o ≤2500
	3200	1920≤ I_o ≤3200

Function Setting Method

1 Base current (× I_{ct}=I_0)
It is used to set the base current and it can be adjusted to 3 stages up to 60%~100% of CT current.

2 Long time Pickup (× I_0=I_1)
It is used to set the operating current of long time pickup and it can be adjusted to 4 stages up to 70%~100% of Base Current (Io).

3 Short time Pickup (× I_0=I_2)
It is used to set the operating current of short time pickup and it can be adjusted to 4 stages up to 400%~1000% of Base Current (Io).

4 Instantaneous Pickup (× I_0=I_3)
It is used to set the operating current of in stantaneous pickup and it can be adjusted to 4 st ges up to 400%~1600% of Base Current (Io).

5 Long Time Delay
It is used to set the long time delay of long time and it can be adjusted to 9 stages from 600% of the operating current to 0.5 sec~30 sec.

6 Short Time Delay
It is used to set the short time delay of short time and it can be adjusted to 3 stages up to 0.1 sec~0.4 sec.

7 Reset Button
It is used to reset the failure cause indicator lamp after the operation of OCR. (Must reset after the operation of OCR)

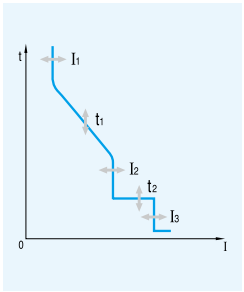
8 Lamp
*O.L (Over Load) Overload Status Indicator Lamp
*LTD : Long Time Operation Indicator Lamp
*INST : Instantaneous Operation Indicator Lamp
*STD : Short Time Operation Indicator Lamp

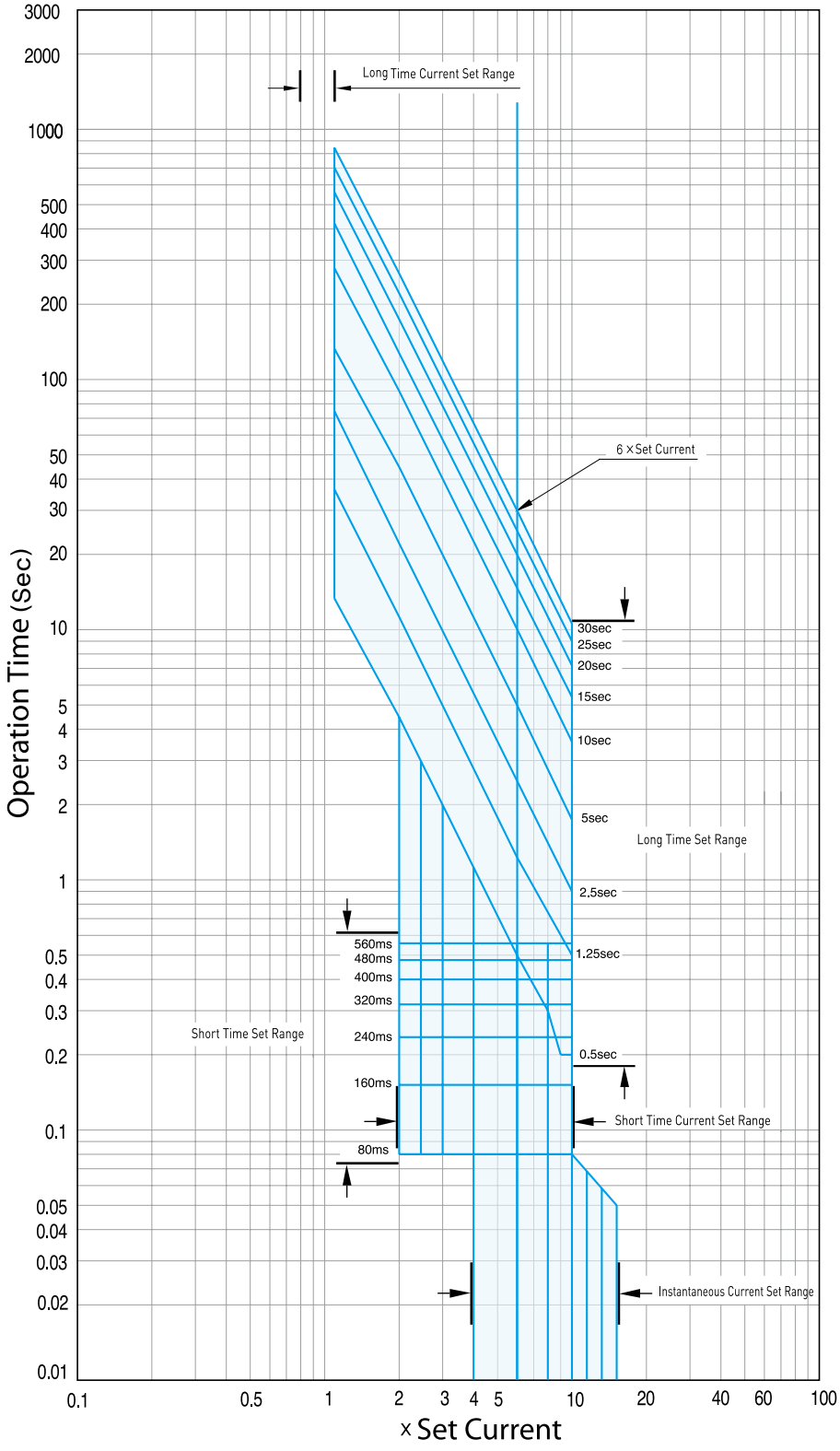
9 Test terminal
It is a terminal to inspect OCR using a Tester. (Testable using an exclusive Tester)

*Note)
1. Customers can select the options on STD, INST, LTD, LAMP and CONTACT.
2. An external contact is output to remote control the failure status of Lamps external contact system.

Performance Characteristic Curve

For Nuclear Power Plant ACB Over Current Trip

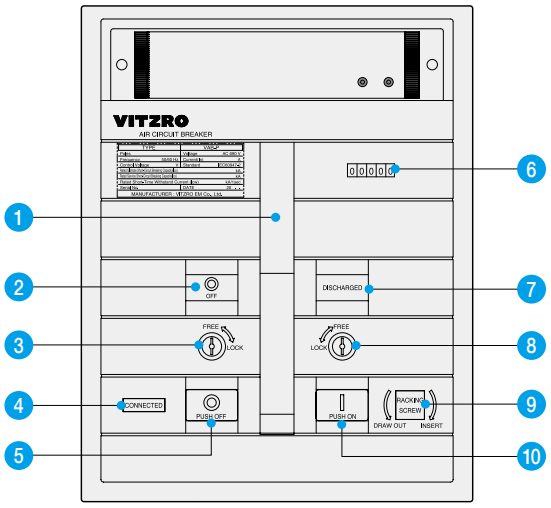




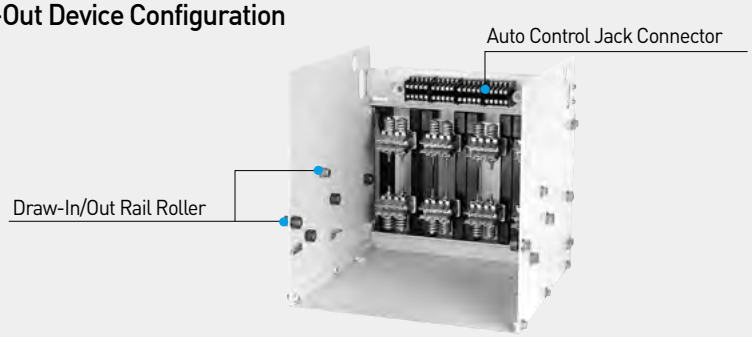
External & Internal Configuration / Draw-Out Location

External Configuration

1. Charging handle
2. Close/Open indicator
3. Key-lock
4. Position indicator
5. Open button
6. Counter
7. Spring charged indicator
8. Key-lock
9. Racking screw & shutter
10. Close button

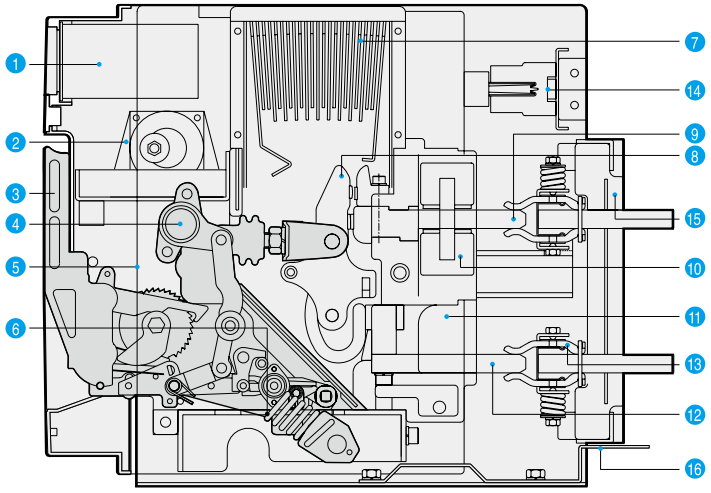


Draw-Out Device Configuration

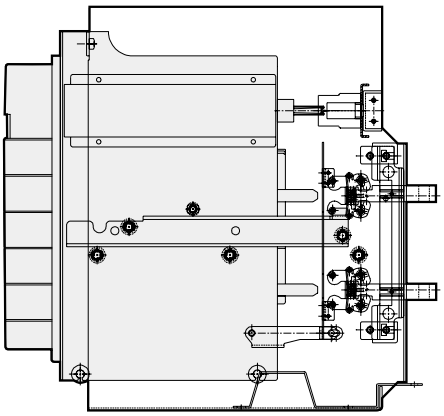


Internal Configuration

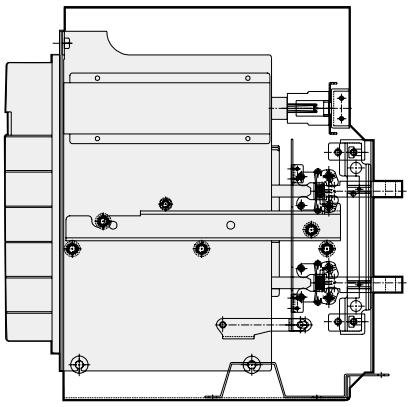
1. O.C.R
2. Motor
3. Manual charge handle
4. Main shaft
5. Mechanism assembly
6. Closing spring
7. Are chute
8. Moving contact
9. Upper terminal
10. C.T
11. Insulation barrier
12. Lower terminal
13. Sliding contact
14. Auto control jack
15. Insulation barrier
16. Earth terminal



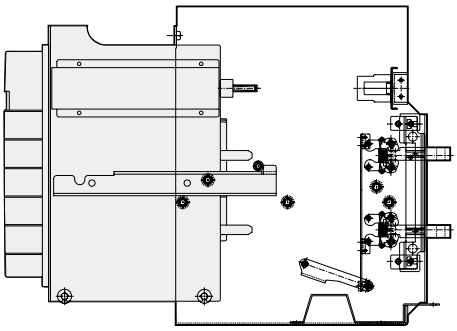
Draw-Out Location



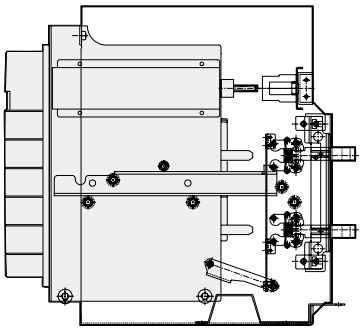
Test
A main circuit is disconnected, a control circuit is connected and an operation test on a circuit breaker is possible.



Connected
A main circuit and a control circuit are connected.



Draw - out position

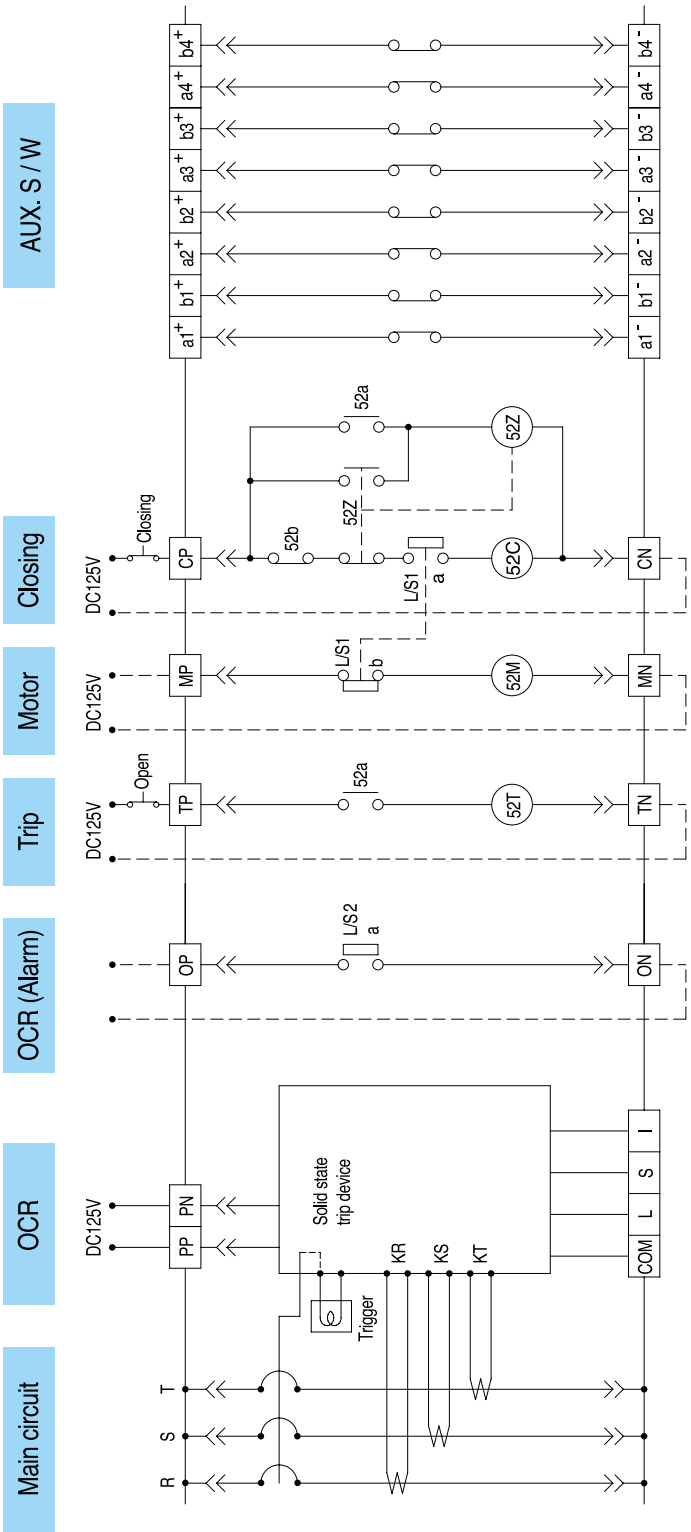


Disconnected
A main circuit and a control circuit are disconnected.

Control Circuit Diagram

Control Circuit Diagram

Control Circuit Diagram for Nuclear Power Plant



* Note) 1. L : LTD, S : STD, I : INST

Accessories

Accessories

Under Voltage Trip	CTD, Capacitor trip device	SST, Safety shutter	OCA, Alam contact	OCC, Trip cause contact	KIT, Key lock
Instantaneous Type (≤0.15sec) Delay Type (≥0.5sec)	It is used at a trip during a power failure or used as a rectifier (for DC power).	Applied to draw-out type	OCR Alarm Contact	OCR External Contact	Lock in open type (Open impossible) Lock in close type (Open impossible)

Key lock, KIT

There are a "Lock in open" type that doesnt allow Closed for a circuit breaker and a "Lock in close" type that doesnt allow Open. Mechanical and electrical operations are possible.

Condenser Trip Device, CTD

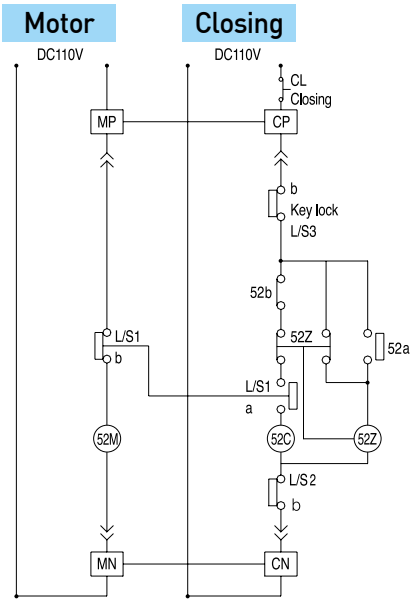
It is used at a trip during a power failure (use as Condenser Trip Device, CTD) or used as a rectifier (for DC power).

1) When used as a CTD

If G, H terminals are connected to a Trip Circuit, it performs TRIP immediately in case of a power failure. If TRIP should be implemented in a certain time, it can be used by adding S/W. (Yet, normal operation is possible within 30 seconds)

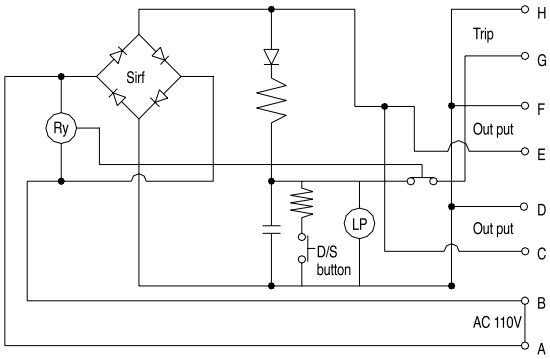
2) When use as a rectifier

C.D and E.F output terminals should be used as DC power. (Close, Open, Motor, OCR Power and etc)

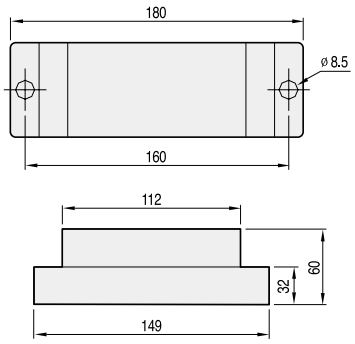


*Note) The above circuit diagram is a "Lock in open" type.

CTD Internal Circuit Diagram



External Dimension



Accessories

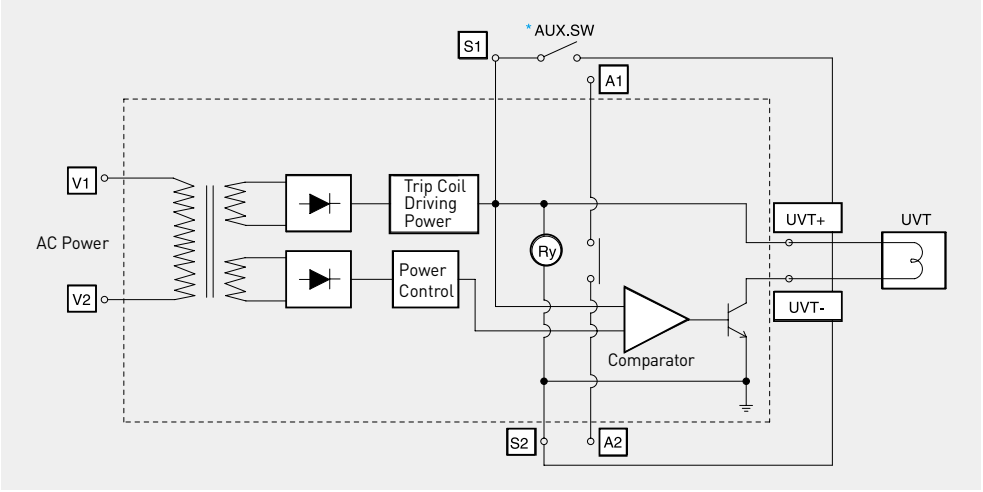
Control Circuit Diagram

Under Voltage Trip (UVT) automatically trips the ACB when the control power is dropped below the working voltage. When the voltage is recovered up to the pick-up voltage, The re-closing of ACB is possible. UVT consists of a trip device and a under voltage trip controller. A coil is built inside the ACB and UVT Controller is installed in the body (fixed type) or in the left side of the draw-out type.
There are an instantaneous-type and a delay-type to be used based on its purpose.

Rating

Type	Rating Voltage 50-60 Hz	Working Voltage		Operating Time	Remarks
		Drop Voltage	Pick-up Voltage		
Instantaneous Type (I)	100-120V	48-60	67.5-80	≤ 0.15 sec	Power Consumption : 5VA Input Power : 50VA
	200-240V	96-120	135-165		
	360-400V	160-207	240-288		
	430-470V	188-245	282-344		
Delay Type (D)	100-120V	48-60	67.5-80	ZZ ≥0.5 sec	
	200-240V	96-120	135-165		
	360-400V	160-207	240-288		
	430-470V	188-245	282-344		

Circuit Diagram



* Note) 1. Combined use of under voltage trip and voltage trip is possible.
2. * marked AUX.SW is not installed and do use the 1a contact of AUX.SW.
3. A1 and A2 are Test contacts and a-contact at pick-up state.

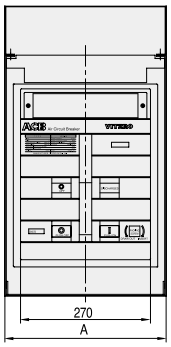
External Terminal Functions

V1, V2	UVT Input Power
S1, S2	External Reset Contact
A1, A2	Test Contact

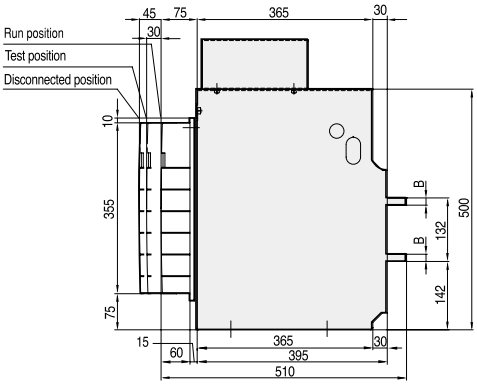
Dimensions

For Nuclear Power Plant

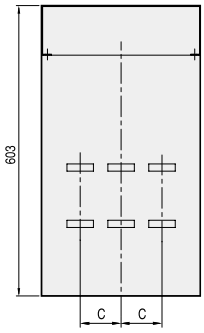
800/2000A



Front View

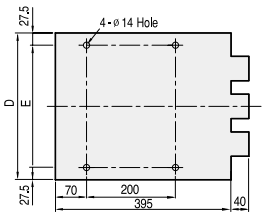


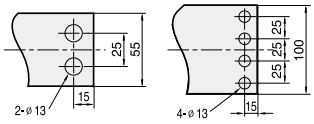
Side View



Back View

Reting	A	B	C	D	E
800A	330	15	85	330	275
2000A	465	25	130	465	410

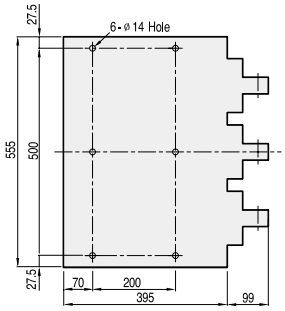


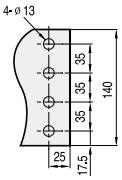


800A 2000A

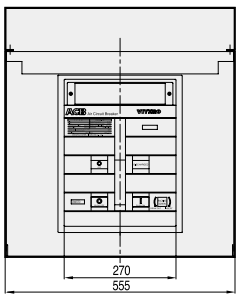
Terminal Dimension

3200A

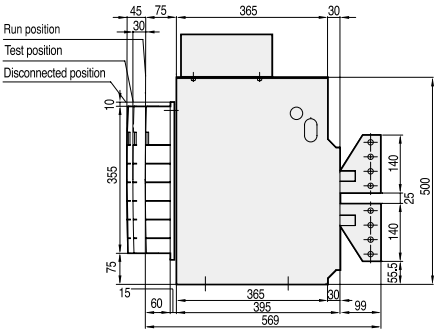




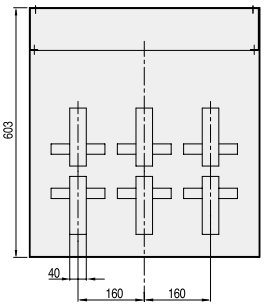
Terminal Dimension



Front View



Side View



Back View

Certifications

Certificate

제 품 인 증 서

인 증 번 호 : 제 11-0084 호

제 조 업 체 명 : (주)비츠로이엠

대 표 자 성 명 : 장택수

공 장 소 재 지 : 경기도 안산시 단원구 별망로 327(성곡동)

인 증 제 품

· 표 준 명 : 저압 기중 차단기

· 표준번호 : KS C 4620

· 종류·등급 또는 호칭 :

3극, 4극, 690V , 전자식과전류보호장치(유, 무):2500~4000A 85kA

3극·4극 : 690V, 630~2000A(2000AF),65KA,전자식 과전류 보호장치(유,무). 끝.

산업표준화법 제17조 제1항에 따른 인증심사를 실시한 결과

한국산업표준(KS)과 인증심사기준에 적합하므로 산업표준화법 제15조에 따라

위와 같이 한국산업표준(KS)에 적합함을 인증합니다.

2017 년 8 월 25 일

한국표준협회장

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Specifications in this catalog are subject to change without notice due
to continuous product development and improvement.

2019.04(E-06)