Changes for the Better

MITSUBISHI ELECTRIC

LOW VOLTAGE AIR CIRCUIT BREAKERS

World Super WS Series

World Super AE

04B

ISO 14001 JACO UKAS ENVIRONMENTAL MANAGEMENT 051

Mitsubishi Electric Corporation's Fukuyama Works, which produces these products, is certified as meeting the ISO 14001 environmental management system standard.

BVQI ISO 9001 UKAS QUALITY MANAGEMENT 008

Mitsubishi Presents the WS Series, Satisfied with the High Demands of the 21 Century Global Market.

World Super

WS

Series

Best-Solution

Various line-up and high flexibility

High-Performance

One-rank higher breaking performance

High-Reliability

Safety and reliability provided

Customer Friendly

Easy handling and retrofitted solution

Global...

World Super AE

Contents

Line up (630 to 6300A)

Rated current (A)	630	1000	1250	1600	2000		2500	3200	4000		5000	6300
SW series	AE630-SW	AE1000-SW	AE1250-SW	AE1600-SW	AE2000-SWA	AE2000-SW	AE2500-SW	AE3200-SW	AE4000-SWA	—	—	—
SS series	—	—	—	—	—		—	—	—	AE4000-SS	AE5000-SS	AE6300-SS
SH series	AE630-SH	AE1000-SH	AE1250-SH	AE1600-SH	AE2000-SH		AE2500-SH	AE3200-SH	—		—	—

Best Solution

Through Flexible and Various Options, to be built up the suitable Functions.

Electronic Trip Relay

Main setting module ❶

Flexible functions built up with interchangeable & add-on module.

WS1 WS2 General use	WM1 WM2 Generator protection use	WB1 WB2 Special use
		
LTD+STD+INST. / MCR	LTD+STD+INST. / MCR	INST. / MCR only

Optional setting module ❷

Optional setting module is for the GFR, ER etc.

G1	E1	AP	N5
			
Ground fault Protection (GFR)	Earth leakage (ER)(1)	2nd Additional Pre-alarm	Neutral pole(2) 50% protection

Note (1) : combination with ZCT
(2) : With "N5" optional module, Neutral pole protection will be changed from 100% (standard) to 50%.

Power supply ❸

It is neccessary for Display,and LEDs. (see page 19, 20.)

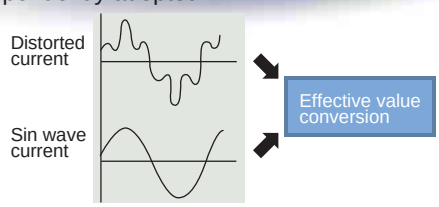
P1	100-240V AC•DC
P2	24-60V DC
P3	100-240V AC / 100-125V DC with output contact
P4	24-60V DC with output contact
P5	100-240V DC with output contact (SSR)

Additional function

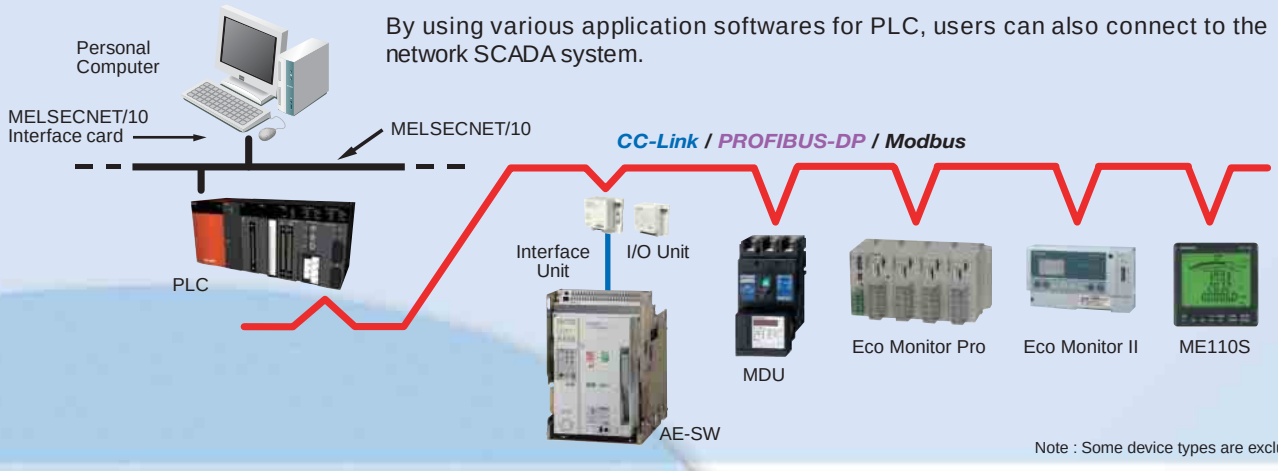
EX1 Extension module	DP1 Display	TAL Temperature alarm
		The TAL is operated by an unusual temperature of the breaker contacts.
Module for display and communication	Current,Voltage,Power, Harmonics,Trip current,etc.	**MCR MCR switch**
		Making current release is possible with MCR switch.

■ Either a ground fault trip or alarm function can be selected by a setting switch. A control supply is not necessary. (Except 0.1 setting)

■ **Secure protection by actual effective value detection**
For spread of electronic devices such as inverter, the actual effective value detection method that is strong against deformed waveform and each phase is independently adopted.



Network



By using various application softwares for PLC, users can also connect to the network SCADA system.

Note : Some device types are excluded.

Interface unit

CC-Link **PROFIBUS-DP** **Modbus(RS-485)**



Communication items

Measurement / alarm	**Current, Voltage, Power, Harmonics, etc**
	Tripping cause/current
	Alarm (PAL,TAL,Self diagnosis)
Breaker control	**Breaker ON,OFF**
	Spring charge
Breaker status	**ON/OFF/spring charge status**
	Drawout position
	ETR characteristics setting

I/O unit

ON, OFF, Spring charge, Digital input

Option to interface unit
It is possible to turn ON/OFF the breaker and the spring charge via network.
And by addition of the drawout position switch, it is possible to transmit the breaker drawout position.

Display unit for Panel board

It has the same function as the breaker display unit.
In the case where the breaker is attached in the panel, it is possible to confirm the measurement information via the panel board.

VT unit

It is possible to measure voltage, electric power and harmonics.

Electronic Trip Relay type code

□□□-□

● Main setting module
- WS1: General use for AE630–1600-SW / AE2000–3200-SW
- WS2: General use for AE2000-SWA / AE4000-SWA
- WM1: Generator protection use for AE630–1600-SW / AE2000–3200-SW
- WM2: Generator protection use for AE2000-SWA / AE4000-SWA
- WB1: INST/MCR only for AE630–1600-SW / AE2000–3200-SW
- WB2: INST/MCR only for AE2000-SWA / AE4000-SWA

● Optional setting module
- G1: Ground fault protection
- N5: Neutral pole 50% protection
- E1: Earth leakage protection
- AP: 2nd Additional Pre-alarm
- NA: Without optional setting

● Power supply
- P1: AC·DC100-240V
- P2: DC24-60V
- P3: AC100-240V / DC100-125V with output contact
- P4: DC24-60V with output contact
- P5: DC100-240V with output contact (SSR)

Additional function
- ☐ Extension module(EX1)
  - ☐ Display(DP1)
  - ☐ Display onto panel board(DP2)
  - ☐ VT unit(VT)
  - Network: ☐ BIF-CC ☐ BIF-PR ☐ BIF-MD
- ☐ Temperature alarm(TAL)
- ☐ MCR switch(MCR-SW)

The safety of valuable circuits can be securely maintained.

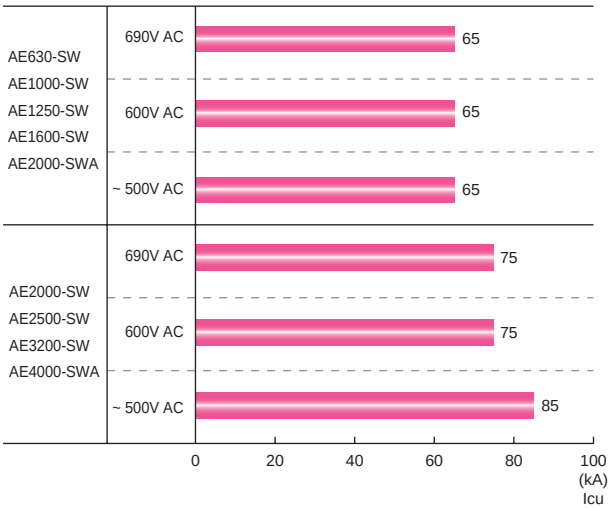
Higher short circuit protection performance attained by improving breaking capacity

In case of 690V AC Icu = Ics, improved from 50 kA to 65 kA for AE630-SW~AE2000-SWA and from 50 kA to 75 kA for AE2000-SW~AE4000-SWA.

Icu=Ics (Rated breaking capacity)

50kA (Former model) ➡ 65kA (New model) (AE630-SW~AE2000-SWA)

50kA (Former model) ➡ 75kA (New model) (AE2000-SW~AE4000-SWA)

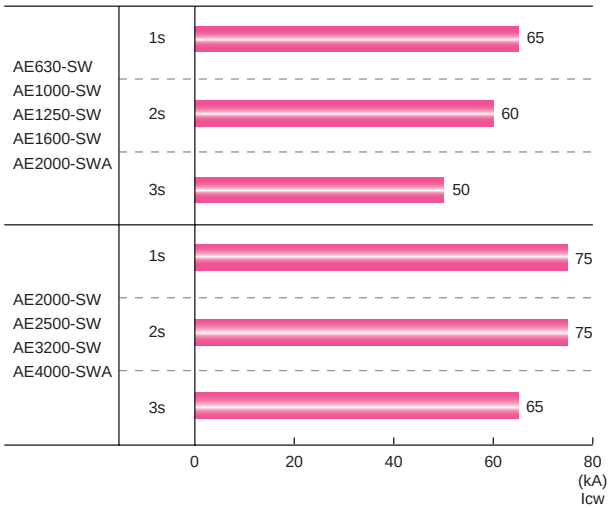


Wider choice coordination range attained by improving rated short-time withstand current

In case of Icw (1s), improved from 65 kA to 75 kA for AE2000-SW~AE4000-SWA.

Icw (1s) (Rated short-time withstand current)

65kA (Former model) ➡ 75kA (New model) (AE2000-SW~AE4000-SWA)



Higher safety attained by improving insulation performance

Rated impulse withstand voltage (Uimp) is improved to change the main circuit from 8 kV to 12 kV.

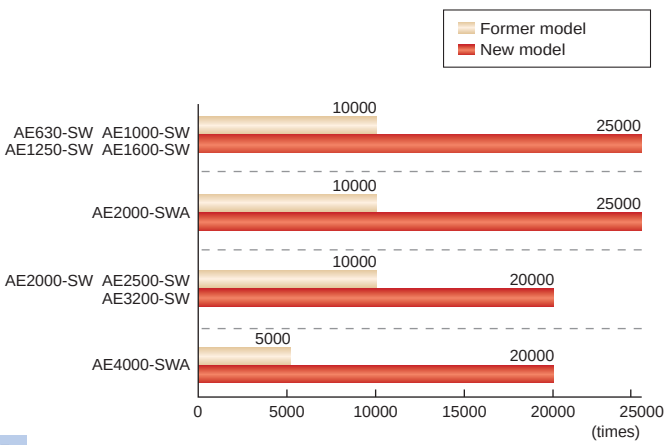
Uimp (Rated impulse withstand voltage)

8kV (Former model) ➡ 12kV (New model)

High operating durability makes high reliability.

■ Mechanical

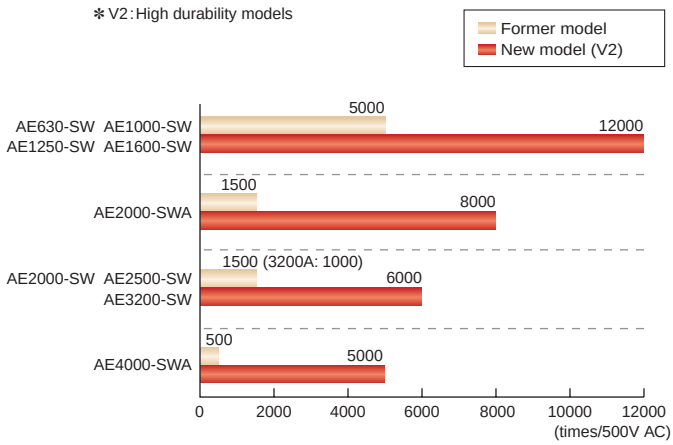
The new models have been sharply improved in mechanical durability compared to the former model.



■ Electrical

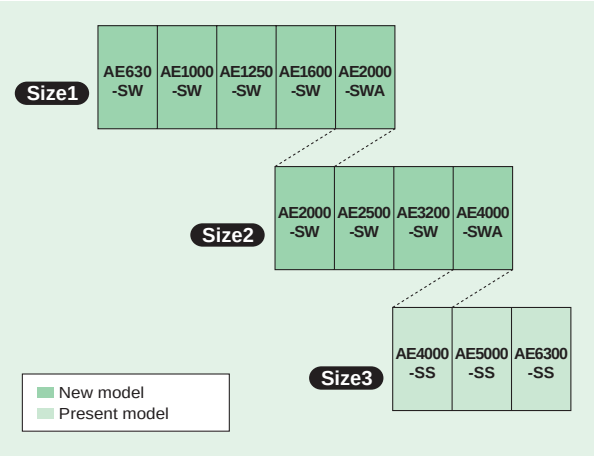
The new models (V2*) have been sharply improved in electrical durability compared to the former model.

*V2: High durability models



For convenience

3 sizes



Note 1) AE4000-SS ~ AE6300-SS and AE-SH series (high breaking models) remain to be supported by the present model.

Compact size AE2000-SWA!

New model

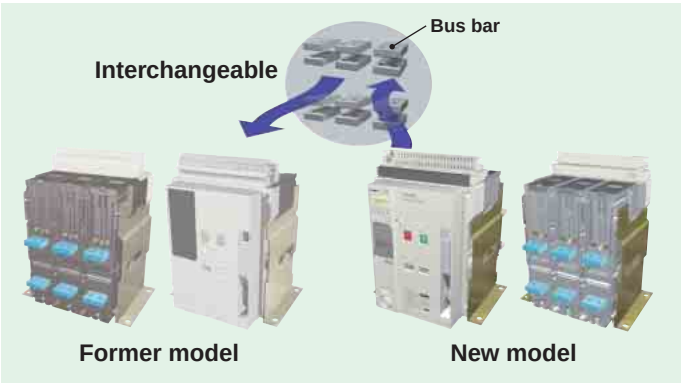
■ The compact AE2000-SWA can reduce the panel size.

The former model (AE-SS) can be retrofitted.

■ It is same as the former model (AE-SS) in installation dimension and outline dimension, and the former model can be replaced with the new one.

■ ACB main body and drawout frame can be replaced.

■ It can be installed to the existing connection bus bar without any special connection kit.
(Except AE2000-SWA, AE4000-SWA)

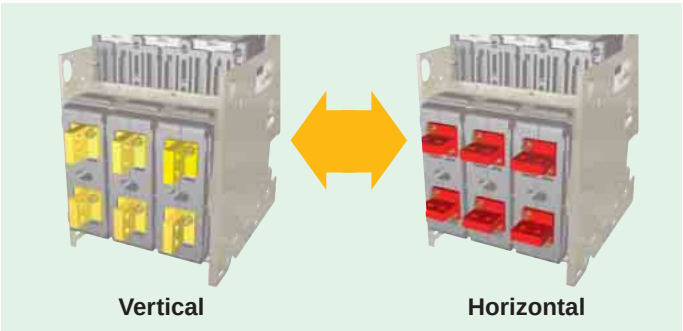


The drawout type terminal can be changed (vertical ↔ horizontal).

Option

Note 1) This drawout frame is a special frame. The standard drawout frame cannot be used. Production is available for AE630-SW - AE1600-SW drawout types. Production is not available for AE2000-SW - AE3200-SW and AE2000-SWA, AE4000-SWA.

Note 2) AE2000-SWA and AE4000-SWA cannot change the vertical ↔ horizontal terminals. Vertical connection only is available.



Zero arc space

Arc exhaust space to the outside of the breaker is drastically reduced for safer operation. (AE-SW models ≤ 600V AC)

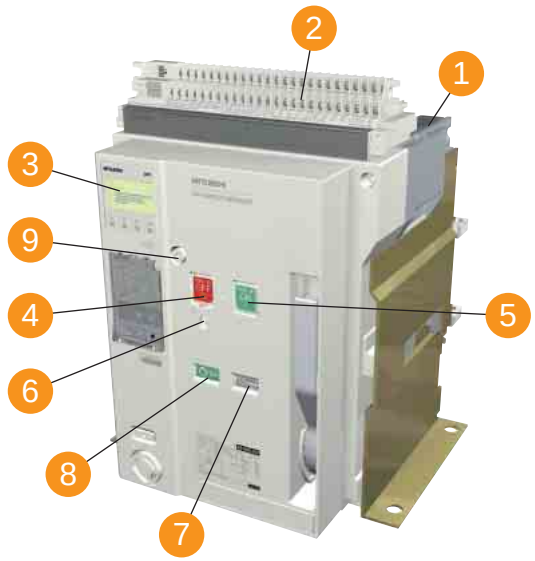
Reverse connection available

Line and Load is not defined on the Main circuit terminals. Therefore reverse connection is available without any limitation.

External appearance and skeleton

Fixed type

AE-SW Series



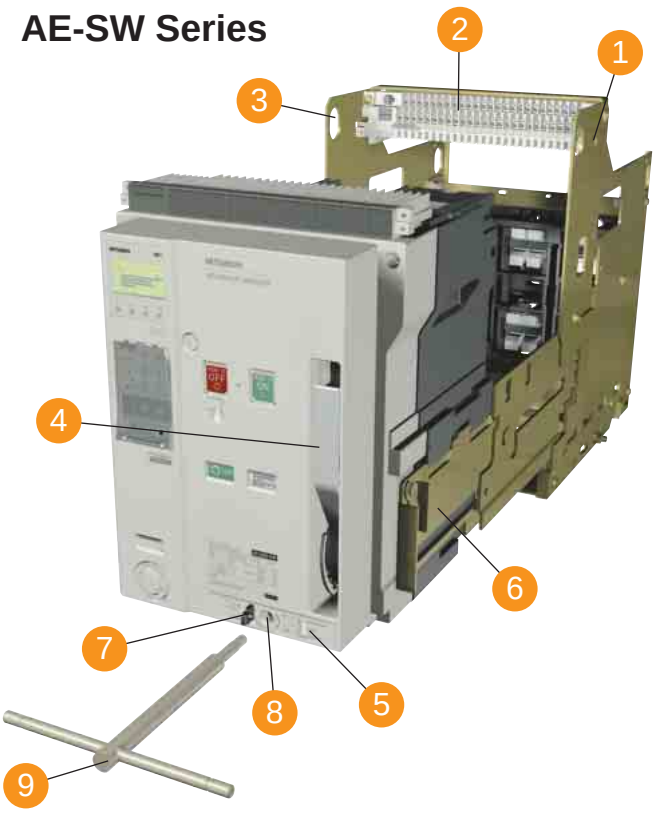
AE1600-SW 3P

1. Arc extinguishing chamber
2. Control circuit terminal block
3. Electronic trip relay
4. OFF button
5. ON button
6. Padlock hook
7. Charging indicator
8. ON/OFF indicator
9. Manual reset button(Optional)

In case of the fixed type,Lifting hooks (HP) are attached.

Drawout type

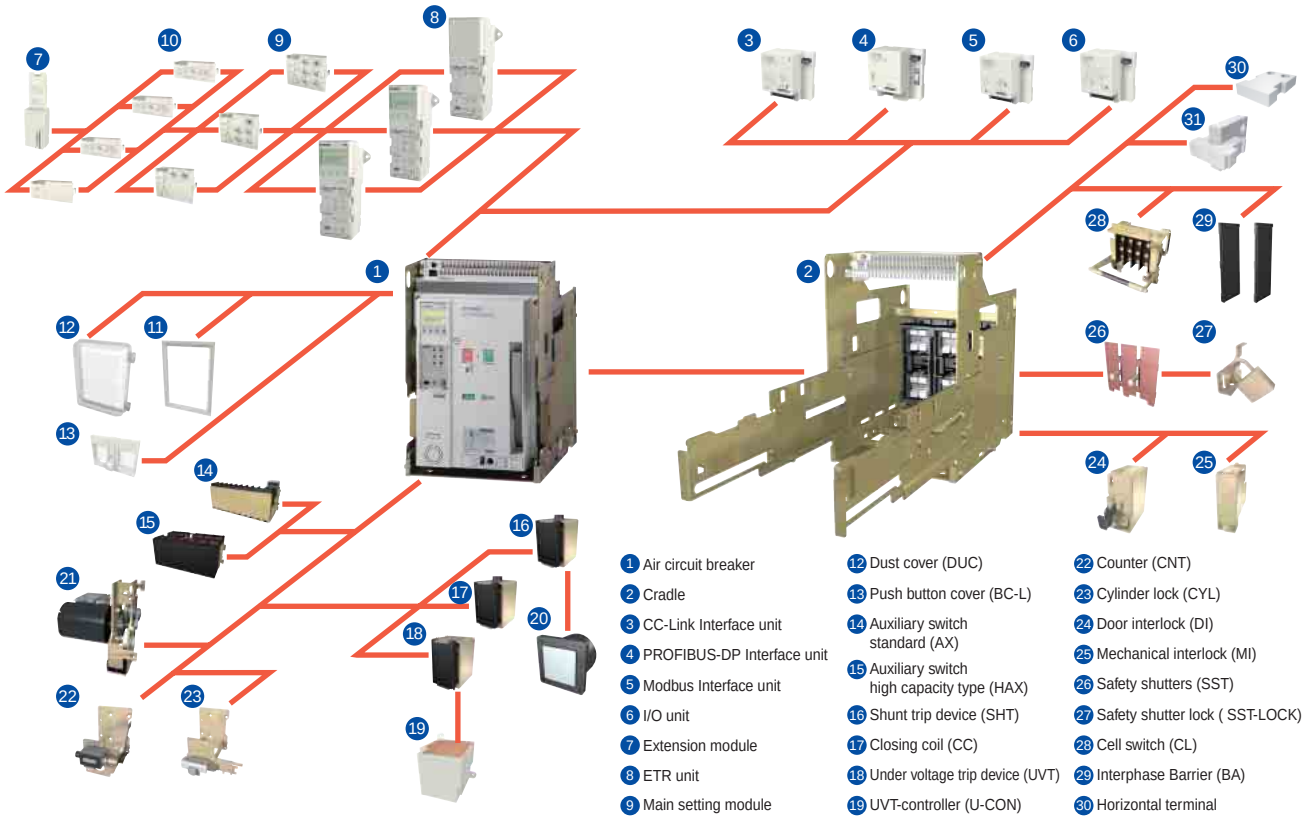
AE-SW Series



AE1600-SW 3P

1. Cradle
2. Control circuit terminal block
3. Lifting hole
4. Charging handle
5. Drawout position indicator
6. Extention rail
7. Position lock
8. Aperture for the drawout handle
9. Drawout handle

Skeleton



1 Air circuit breaker
2 Cradle
3 CC-Link Interface unit
4 PROFIBUS-DP Interface unit
5 Modbus Interface unit
6 I/O unit
7 Extension module
8 ETR unit
9 Main setting module
10 Optional setting module
11 Door frame (DF)
12 Dust cover (DUC)
13 Push button cover (BC-L)
14 Auxiliary switch standard (AX)
15 Auxiliary switch high capacity type (HAX)
16 Shunt trip device (SHT)
17 Closing coil (CC)
18 Under voltage trip device (UVT)
19 UVT-controller (U-CON)
20 Condenser trip device (COT)
21 Motor charging device (MD)
22 Counter (CNT)
23 Cylinder lock (CYL)
24 Door interlock (DI)
25 Mechanical interlock (MI)
26 Safety shutters (SST)
27 Safety shutter lock (SST-LOCK)
28 Cell switch (CL)
29 Interphase Barrier (BA)
30 Horizontal terminal
31 Vertical terminal

Product introduction

1 Type

AE630-SW
AE1000-SW
AE1250-SW
AE1600-SW
AE2000-SWA
AE2000-SW
AE2500-SW
AE3200-SW
AE4000-SWA

2 Standard

IEC 60947-2
EN 60947-2(CE)
VDE
JIS C 8201-2
GB 14048.2(CCC)

Shipping standards are available soon.

LR
GL
BV
DNV
ABS
NK

3 Connection

Drawout type
Horizontal terminal
Vertical terminal
Front terminal

Horizontal-Vertical changeable.

Fixed type

4 Drawout type accessories

Cell switch
Short-circuit B-contact
Lifting hooks
Safety shutter
Safety shutter lock
Mis-insert preventor
Test jumper

5 Electrical accessories

Auxiliary switch
Motor charging device
Closing coil
Shunt trip device
Under voltage trip device
Condenser trip device

6 Mechanical accessories

Push button cover
Counter
Cylinder lock
Terminal cover
Door frame
Dust cover
Interphase barrier
Mechanical interlock
Door interlock

7 Electronic trip relay

General use
WS type

Generator protection use
WM type

Special use
WB type

Optional
G1:Ground fault protection
E1:Earth leakage protection
AP:2nd AdditionalPre-alarm
N5:Neutral pole 50% protection

8 Relay accessories

Extension module
Display
Temperature alarm
MCR switch
Neutral CT
External ZCT
VT unit

9 Network

CC-Link Interface unit
PROFIBUS-DP Interface unit
Modbus Interface unit
I/O unit

10 Special environment

Moisture-fungus treatment
Corrosion resist

● Specification

Type				AE630-SW	AE1000-SW	AE1250-SW
Frame size (A)				630	1000	1250
Rated insulation voltage(Ui) (AC.V)				1000		
Rated operational voltage(Ue) (AC.V)				690		
Rated impulse withstand voltage(Uimp) (kV)				12		
Pollution degree				3		
Number of poles				3, 4		
Rated current In				630	1000	1250
Current setting Ir(A) (40˚C)	General use (Current rating adjustable 0.5 to 1.0 Ir 0.05 step)			315-346.5-378-409.5-441-472.5-504-567-598.5-630 **(Note 5)**	500-550-600-650-700-750-800-850-900-950-1000	625-687.5-750-812.5-875-937.5-1000-1062.5-1125-1187.5-1250
	Generator protection use (Current rating fixed)			150 ≤ Ir ≤ 630	400 ≤ Ir ≤ 1000	800 ≤ Ir ≤ 1250
Rated current of neutral pole (A)				630	1000	1250
IEC60947-2 EN60947-2 BV VDE JIS C 8201-2 GB14048.2	Ultimate breaking capacity Icu (kA rms)		690V AC	65		
			600V AC	65		
			240-500V AC	65		
		with MCR	690V AC	65		
			600V AC	65		
			240-500V AC	65		
		without Instantaneous	690V AC	25 **(Note1)**		
			500V AC	25 **(Note1)**		
	Rated service breaking capacity Ics (kA rms) %Icu			100%		
	Rated making capacity Icm (kA peak)		690V AC	143		
			600V AC	143		
			240-500V AC	143		
		with MCR	690V AC	143		
			600V AC	143		
			240-500V AC	143		
		without Instantaneous	690V AC	52.5		
			500V AC	52.5		
Rated short time withstand current Icw (kA rms)			1s	65		
			2s	60		
			3s	50		
Maximum total breaking time (ms)				40 **(Note 6)**		
Maximum closing time (ms)				80		
Number of operating cycles **(Note 2)**	With rated current		AC500V In	5000		
			AC690V In	5000		
	Without rated current			25000 **(Note 4)**		
Connecting terminal	Horizontal terminal			○		
	Vertical terminal			○		
	Front terminal			○		
Outline dimension (mm) H×W×D	Fixed type	3-pole		410×340×290		
		4-pole		410×425×290		
	Drawout type	3-pole		430×300×368		
		4-pole		430×385×368		
Weight (kg) (without Accessory)	Fixed type	3-pole		40	41	
		4-pole		50	51	
	Drawout type (including cradle)	3-pole		63	64	
		4-pole		77	78	
	Cradle only	3-pole		26		
		4-pole		30		

(Note 1) The columns for "without instantaneous" are the values when the bare main body and the external relay is combined.
(Note 2) The number of operating cycles without rated current also include the number of operating cycles with rated current.
(Note 3) AE2000-SWA and AE4000-SWA apply for only vertical terminal of connecting terminal.
(Note 4) This value means number of operating cycles of ACB's body not including accessories.
(Note 5) Products with low rating types is available.

AE 630-SW 3 kinds of products with low rating types is available.
- 250-275-300-325-350-375-400-425-450-475-500(CT 500A)
- 157.5-173.3-189-204.8-220.5-236.3-252-267.8-283.5-299.3-315(CT 315A)
- 125-137.5-150-162.5-175-187.5-200-212.5-225-237.5-250(CT 250A)

AE 2000-SW 2 kinds of products with low rating types is available.
- 800-880-960-1040-1120-1200-1280-1360-1440-1520-1600(CT 1600A)
- 625-687.5-750-812.5-875-937.5-1000-1062.5-1125-1187.5-1250(CT 1250A)

(Note 6) This value means the instantaneous breaking time at shortcircuit interruption. As for accessories (SHT, UVT), refer to page 14.

	AE1600-SW	AE2000-SWA	AE2000-SW	AE2500-SW	AE3200-SW	AE4000-SWA
	1600	2000	2000	2500	3200	4000
			1000			
			690			
			12			
			3			
			3, 4			
	1600	2000	2000	2500	3200	4000
	800-880-960-1040-1120-1200-1280-1360-1440-1520-1600	1000-1100-1200-1300-1400-1500-1600-1700-1800-1900-2000	1000-1100-1200-1300-1400-1500-1600-1700-1800-1900-2000 **(Note 5)**	1250-1375-1500-1625-1750-1875-2000-2125-2250-2375-2500	1600-1760-1920-2080-2240-2400-2560-2720-2880-3040-3200	2000-2200-2400-2600-2800-3000-3200-3400-3600-3800-4000
	1000 ≤ Ir ≤ 1600	1250 ≤ Ir ≤ 2000	800 ≤ Ir ≤ 2000	1600 ≤ Ir ≤ 2500	2000 ≤ Ir ≤ 3200	2500 ≤ Ir ≤ 4000
	1600	2000	2000	2500	3200	4000
			75			
			75			
			85			
			75			
			75			
			75			
			45 **(Note1)**			
			45 **(Note1)**			
			100%			
			165			
			165			
			187			
			165			
			165			
			165			
			94.5			
			94.5			
			75			
			75			
			65			
			40 **(Note 6)**			
			80			
		1500	1500		1000	500
		1500	1500		1000	500
			20000 **(Note 4)**			
		-	○			-
		○ **(Note 3)**	○			○ **(Note 3)**
		-	○			-
			410×475×290			
			410×605×290			
			430×435×368			430×439×368
			430×565×368			430×569×368
	42	47	60	61	63	81
	52	57	72	73	75	99
	65	70	92	93	95	108
	79	84	113	114	116	136
		31	35		36	49
		35	43		44	61

(Remark) All models conform the isolating functiion according to IEC 60947-2.
Reverse connection is available.

Connections

Over view

Type \ Connections	Horizontal (Standard)	Vertical (VT)	Front (FT)
Fixed type (FIX)		(AE2000/4000-SWA only)  FIX-VT	——
Drawout type (DR)		 DR-VT	 DR-FT
Type \ Connections	**Vertical terminal adapter (VTA)**	**Front terminal adapter (FTA)**	**Horizontal-Vertical changeable (HVT)**
Fixed type (FIX)	 VTA	 FIX-FTA	——
Drawout type (DR)	 VTA	 DR-FTA	 DR-HVT

Available connections

Connections \ Breakers		AE630-SW	AE1000-SW	AE1250-SW	AE1600-SW	AE2000-SWA	AE2000-SW	AE2500-SW	AE3200-SW	AE4000-SWA
Fixed type (FIX)	Horizontal	●	●	●	●	–	●	●	●	–
	FIX-VT	–	–	–	–	●	–	–	–	●
	VTA	○	○	○	○	–	○	○	○	–
	FIX-FTA	○	○	○	○	–	○	○	○	–
Drawout type (DR)	Horizontal	●	●	●	●	–	●	●	●	–
	DR-VT	○	○	○	○	●	○	○	○	●
	DR-FT	○	○	○	○	–	○	○	○	–
	VTA	○	○	○	○	–	○	○	○	–
	DR-FTA	○	○	○	○	–	○	○	○	–
	DR-HVT	○	○	○	○	–	–	–	–	–

Note : The dimensions of the terminal portion of DR-HVT are different from those of the standard part. As for details, refer to the external dimensional drawing.

● Standard ○ Optional

Manual charging

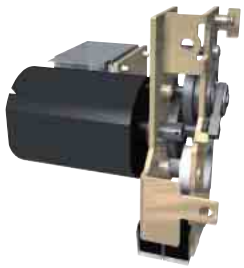
The closing spring is charged by the manual charging handle. The breaker is closed when the ON button is pressed, and opened when the OFF button is pressed.

- When the closing spring is completely charged, the charging indicator will show "CHARGED".
- The indicator shows ON or OFF state of the main contacts.
- The breaker cannot be closed while the OFF button is being pressed. (Safety feature)
- OFF lock is available by padlock (See P7,P17) as standard.

Motor charging device (MD)

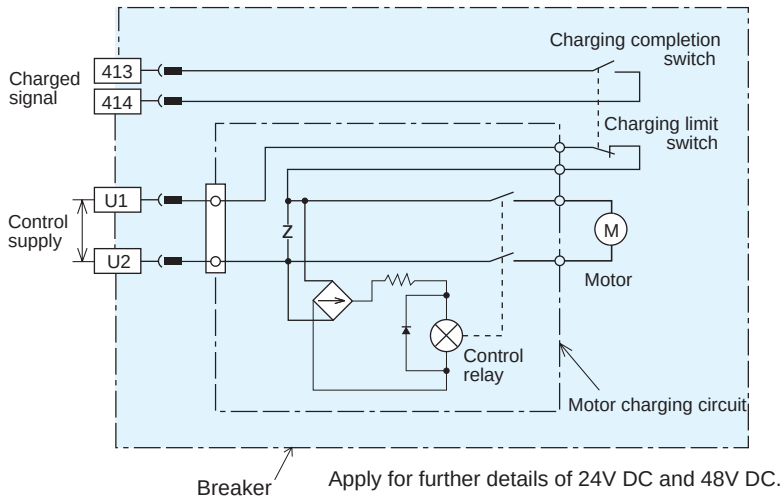
Option

1

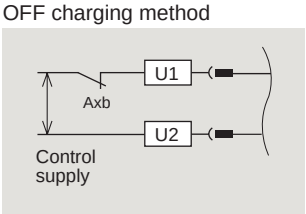


The closing spring is charged by an electric motor. When the breaker is closed, the spring is charged automatically (ON-charge method.) The closing coil (CC) is required to remotely close, and the shunt trip device is required to remotely open the breaker.

- Manual charging operation is also possible.
- Pumping prevention is assured both electrically and mechanically.
- As the charging completion contact is separate from the electrical charging circuit, its function in the control scheme can be arranged as desired.

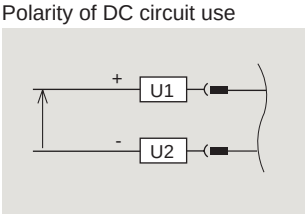


OFF charging method



A OFF charging method is also available. The closing spring is charged automatically when the breaker is opened. this is available only by externally connecting in series b contact (AXb) of the auxiliary switch to the motor charging circuit.
In case of DC power supply, please use high capacity auxiliary switch (HAX).

Polarity of DC circuit use

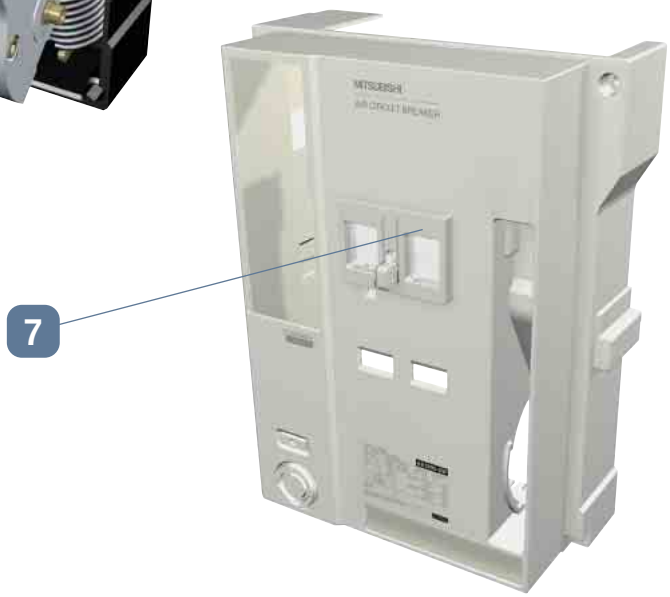


Motor charging rating

Rated voltage (V)	Applicable voltage range (V)	Applied voltage (V)	Inrush current(Peak value) (A)	Steady current (A)	Charging time (s)
DC24	18 ~ 26.4	24	22	6	≤ 5
DC48	36 ~ 52.8	48	14	3	
AC/DC 100-125	85 ~ 137.5	100	10(10)	3(4)	
		125	12(12)	3(4)	
AC/DC 200-250	170 ~ 275	200	5(7)	1(2)	
		250	6(8)	1(2)	

Contents in parentheses show the case of AE4000-SWA 4 pole. DC24 and 48V products of AE4000-SWA 4 pole cannot be manufactured.

Accessories (for breaker unit)



Closing coil (CC)

Option

2

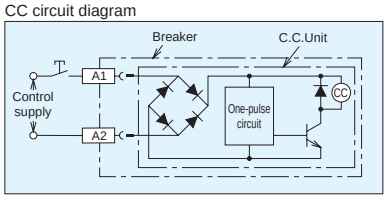
The closing coil is a device to close the breaker by remote control.

- An interlock to prevent pumping is provided electrically.

Rated voltage (Applicable voltage range)	Operating voltage · Operating inrush current (VA)		Closing time (Note1)
	AC	DC	
DC24-48V (18~52.8)	–	DC24V 3.0A (100W)	0.08 s or less
	–	DC48V 6.0A (200W)	
AC · DC common 100-250V (75-275)	AC100V 0.7A (100VA)	DC100V 0.8A (100W)	
	AC250V 1.7A (200VA)	DC250V 1.8A (250W)	

N o t e 1) In case of double rating of rated voltage, it is the value to the lower rating.
Example) In case of DC24 to 48, it is operating time to DC24V.

CC circuit diagram



Diode rectifier is not used for control source 24~48V DC.

- Closing time is from the initial energization of the closing coil to the completion of the closing of the main contacts.
- Do not use AXb contact for a cut-off switch,because pumping prevention is not perfomed.

3 Under voltage trip device (UVT)

Option

This is the device that automatically trips the breaker when the circuit voltage drops below the nominal voltage, and comprises a UVT coil and UVT controller. There are 3 kinds of tripping time, INST, 0.5s and 3.0s.

Rated voltage	Frequency	operatingtime (time delay)	Pickup voltage	Drop-out voltage	Trip function	Power consumption
100-120V AC	50/60Hz	☐ Inst(0.2s) ☐ 0.5s(min) ☐ 3.0s(min)	65~85V	45~70V	With open circuit of DT1,DT2 terminals.	20VA
200-240V AC			130~170V	90~140V		
380-460V AC			247~323V	171~266V		
24V DC	-		15.6~20.4V	10.8~16.8V		
48V DC			31.2~40.8V	21.6~33.6V		
100-110V DC			65~85V	45~70V		
120-125V DC			78~102V	54~84V		

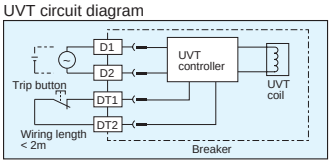
Note1) In case of 380-460V AC,the external transformer is attached.

Note2) The operating time is a guarantee value when it drops from 85% or more of rated voltage.

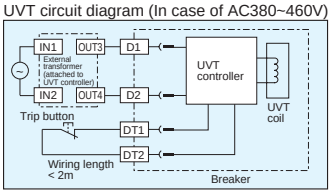
Note3) Time delay should be allowed for 1.5s between applying the voltage to the UVT and closing the breaker.

Note4) If a remote trip function is required,remove the shorting bar (DT1 DT2) and connect a normally closed switch,rated 0.5A at 150VDC across them.

UVT circuit diagram



UVT circuit diagram (In case of AC380~460V)



4 Shunt trip device (SHT)

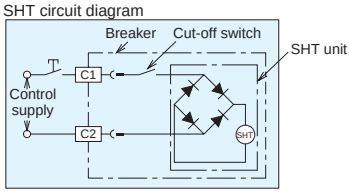
Option

The shunt trip device is a device to open the breaker by remote control. A cut-off switch is included.

Rated voltage (Applicable voltage range)	Operating voltage • Operating inrush current (VA)		Operating time (Note1)
	AC	DC	
DC24-48V (16.8~52.8)	–	DC24V 2.5A (100W)	0.04 s or less
	–	DC48V 6.0A (200W)	
AC・DC common 100-250V(70-275)	AC100V 0.4A (100VA)	DC100V 0.6A (100W)	
	AC250V 1.4A (150VA)	DC250V 1.6A (200W)	
AC380~500V (266~550)	AC380V 0.5A (250VA) AC500V 0.7A (300VA)	-	

Note1) In case of double rating of rated voltage, it is the value to the lower rating.
Example) In case of DC24 to 48, it is operating time to DC24V.

SHT circuit diagram



Diode rectifier is not used for control source 24~48V DC.

5 OCR alarm (AL)

OCR alarm (AL) is a short-time operating switch (more than 30ms(1a)) for the electrical indication of when the breaker trips due to over current.

Contact rating

Contact capacity (A)	Voltage (V)		Resistive load	Inductive load
	AC	240	3	2
		125	5	3
	DC	240	0.2	0.2
		125	0.4	0.4
		30	4	3

Note1) ・The control supply is not required for the operation of the OCR alarm (AL).
・The self-hold circuit is required since the relay out put only operates for 0.03 seconds.

Note2) ・When a continuous output signal is required, please use the output signal from the trip indicator (TI) which is operated by the same causes as the OCR alarm (AL).
・In case of tripping the breaker in TC manual method, the manual reset button located right side of the electronic trip relay projects and the tripping indicative switch moves with continuous output.

6 Auxiliary switch Standard (AX) High capacity type (HAX)

Option

This is the contact that is used to remotely indicate the ON or OFF status of the breaker.

Type			Standard (AX)		High capacity type (HAX)	
			Resistive load	Inductive load	Resistive load	Inductive load
Contact capacity (A)	AC	460V	5	2	5	2.5
		250V	10	10	10	10
		125V	10	10	10	10
	DC	250V	0.3	0.3	3	1.5
		125V	0.6	0.6	10	6
		30V	10	6	10	10
Maximum contacts			5a5b		5a5b	

Change-over sequence	Breaker state	a-contact (NO)	b-contact (NC)
	ON	ON	OFF
	OFF	OFF	ON

- The a and b conacts may turn simultaneously to ON instantaneously at the time of changing the contact; Pay attention to the contact state when designing circuits.
- The chattering time at the time of contact ON-OFF is below 0.025 s.
- For special environment specification, the contact capacity gets deteriorated. Apply for further detail.

Accessories (for breaker unit)

7 Push button cover (BC-L)

Option

The cover is to prevent careless manual operation (ON,OFF) of the push buttons.
BC-L can be locked by a padlock (The padlock should be supplied by the customer.)
For the suitable size of a padlock, refer to Page 17

8 Cylinder lock(CYL)

Option

The breaker is locked OFF with the cylinder lock.

- Since it is an interlock which only allows the key to be removed when the breaker is locked off, it can be used for interlocking two or more breakers.

9 Counter(CNT)

Option

The open/close operations of the breaker are shown by a 5 digit counter.

Door frame(DF)

Option

The door frame improves the appearance, after cutting out the panel door to install the breaker.

Door interlock(DI)

Option

The panel door cannot be opened unless the breaker is open.

- A wire type mechanical interlock is used to allow flexbility in positioning breakers in the switchboard.
- The parts of the Door panel should be supplied by the customer.
- DI can not be installed to combine with "Mechanical interlock(MI)for 3 ACBs."

Interphase Barrier(BA)

Option

This enhances the interphase insulation between the terminal portions of the breaker, and prevents short-circuit due to conductive inclusion or dust. It can be attached and detached easily. As for its availability, refer to the below table.

Type	Connections	AE630-SW~ AE1600-SW	AE2000-SWA	AE2000-SW~ AE3200-SW	AE4000-SWA
Fixed type (FIX)	Horizontal (FIX)	●		●	
	Vertical terminal (FIX-VT)		▲		▲
	Vertical terminal adaptor (VTA)	▲		▲	
	Front terminal adaptor (FIX-FTA)	▲		▲	
Drawout type (DR)	Horizontal (DR)	●		●	
	Vertical terminal (DR-VT)	●	▲	▲	▲
	Front terminal (DR-FT)	▲		▲	
	Vertical terminal adaptor (VTA)	▲		▲	
	Front terminal adaptor (DR-FTA)	▲		▲	
	Horizontal - Vertical changeable terminal (DR-HVT)	●			

● Available for the insulation
▲ Available for separating terminals
Not existing type

IP20-Terminal Cover(IP-TC)

Option

This is a transparent cover to be attached to the terminal block of control circuit, and to prevent the charging portion from being exposed. The protection degree is IP20.

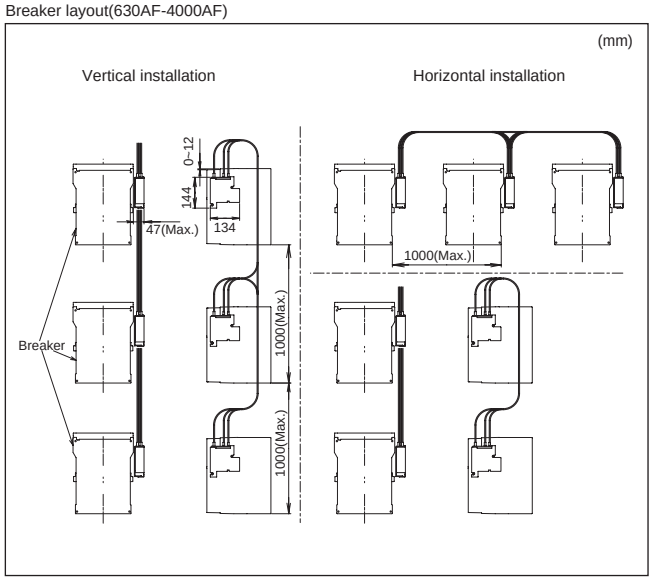
Mechanical interlock (MI)

Option

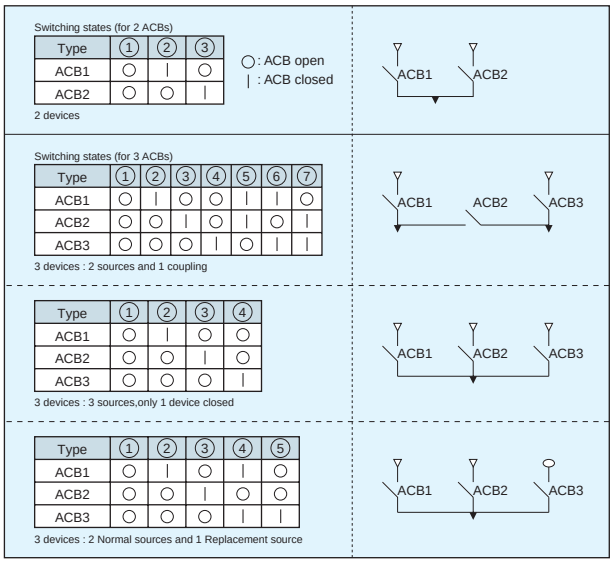
This is the device to prevent parallel charge of 2 or 3 units of breakers, and it can interlock the breakers mechacally without fail.
All combinations are available among any models from AE630-SW to AE4000-SWA.
Further the interlock is possible among the different connection types or poles, such as Fixed type or Drawout type, 3 pole or 4 pole.
In combination with electric interlock, the higher safety interlock system can be secured.

- In case of drawout type,the interlock works at "CONNECTED" position, and in another position the interlock is released, which is convenient for and easy maintenance and inspection of the breaker.
- When to turn OFF one breaker and then turn ON another breakers, please take an interval 0.5 seconds or more.
- MI for 3 breakers can not be installed to combine with Door Interlock (DI).

Breaker layout(630AF-4000AF)



Interlock combinations



Case circuit

Condenser trip device (COT)

Option

Even if the power supply fails, the breaker can be electrically opened by remote operation within a definite time. This device is used in combination with the shunt trip device (SHT).

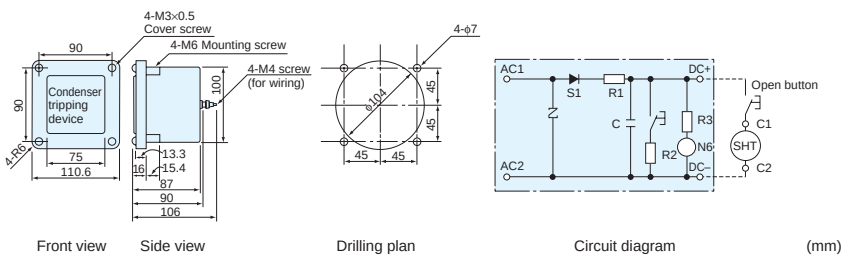
Type	KF-100C	KF-200C
Rated input voltage (V)	AC100/110	AC200/220
Rated frequency (Hz)	50-60	
Rated charging voltage (V) Note1	140/155	140/155
Condenser capacity (μF)	820	
Voltage range	60~125%	
Power supply capacity (VA)	1 VA max	
Charging time (s) Note2	0.5s max	
Trip limit time Note3	30 seconds min.	30 seconds min.
Paint color	Black (N1.5)	
Withstand voltage (1minute)	AC 2000V	
Applicable shunt trip voltage	AC/DC 100-250V	

Note 1: The rated charging voltage is the voltage stored during condenser saturation. It is continuously supplied by the rectified voltage of the rated AC input voltage.

Note 2: The charging time starts from when the capacitor begins to supply power at 85% of the rated AC input voltage, and continues until the capacitor charging voltage reaches 60% of rating.

Note 3: The trip limit time means the time period in which the shunt trip device (SHT) can make a tripping operation once, even after the charged condenser with 100% supply voltage would be stopped to charge.

● **Outline dimensions (mm)**



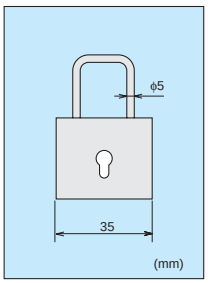
Accessories(for drawout type)

Drawout interlock (standard)

This is the safety device that prevents insertion and drawout operation. When the breaker is ON, the drawout handle cannot be inserted, and insertion and drawout operation cannot be done unless the OFF button is pressed.

Position lock (standard)

This is the device that locks automatically the drawout mechanism at "TEST" or "CONNECTED" positions during insertion and drawout operation. When the lock plate is pushed in, lock is released and operation can be continued.



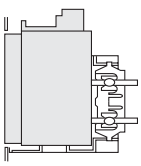
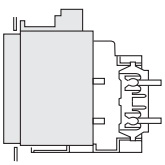
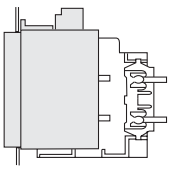
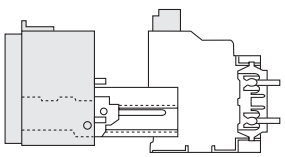
Outline dimensions
(reference)

Padlock

Option

A padlock can be arranged at the lock plate. Thereby, it is possible to prevent the connection position from being changed unnecessarily. A padlock of ϕ5 should be prepared by customer. As for outline dimensions of the padlock, please refer to the left figure.

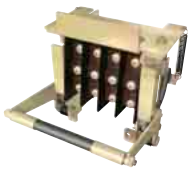
Operating position of drawout type

CONNECTED position	TEST position	DISCONNECTED position	DRAWOUT position
			
● Both main and control circuits are connected. ● Normal in use condition. ● Lock plate is protruding	● Main circuit is disconnected, but the control circuit is connected. ● The breaker operation can be tested with the door closed. ● Lock plate is protruding	● Both main and control circuits are disconnected. ● The door can be closed.	● This is the position for removing the breaker. ● The breaker is drawn out of the cradle on the extension rails.

The earthing points are located on both sides of the cradle.

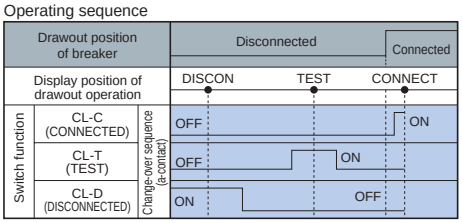
Cell switch (CL)

Option



This is the switch to show the drawout position (CONNECTED, TEST, and DISCONNECTED) of the breaker. An arbitrary combination up to 4 pieces is available.

Operating sequence



Note 1: The setting is available for change by customer later.
A preliminary setting of CL at factory shipment is as follows.
CL1:1C CL2:1C1D CL3:1C1T1D CL4:2C1T1D

Contact rating

Contact capacity (A)	Voltage (V)		Resistive load	Inductive load
	AC	460	5	2.5
		250	10	10
		125		
	DC	250	3	1.5
		125	10	6
		30	10	10
Maximum contacts			Total 4c max.	

Standard pattern

	CL-C	CL-T	CL-D
CL1	1	–	–
CL2	1	–	1
CL3	1	1	1
CL4	2	1	1

Short-circuit B-contact (SBC)

Option

This is the switch that shortcircuits the circuit of the auxiliary switch (AXb) when the drawout type breaker is drawn out from the connection position, and keeps the panel sequence with connected status. It can be arranged for all the auxiliary switch b contact points (AXb).

Lifting hook(HP)

Option

This is the metal fitting to suspend the main body when the breaker is removed from the drawout cradle. The fixed type breaker is equipped with Hp as standard.

Safety shutter(SST)

Option

The safety shutters cover the conductors (cradle side) and prevent contact with them when the breaker is drawn out.

Safety shutter lock(SST-lock)

Option

This kit is used to lock the safety shutters using 2 padlocks (the padlocks to be customer's supply). The safety shutters close when the breakers drawn out to prevent accidental contact with the main contacts.

Mis-insertion preventer(MIP)

Option

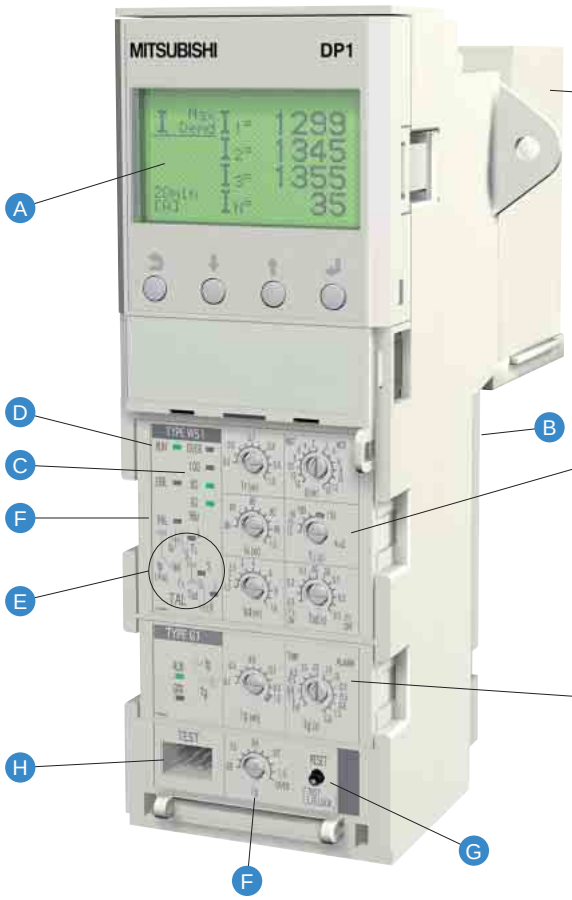
This prevents other breakers than specified from inserting into the breaker, and Max 5 settings are available.

Test jumper(TJ)

Option

With the breaker taken out of its cradle, this device enable the breaker to be electrically opened and closed, and the operating sequence to be checked. 3m length one is equipped as standard shipment.

Electronic trip relay(Feature)



3 Power supply module
This module provide electrical power for DISPLAY module,Trip indicator and several indictor (LEDs).
(Even when the control power source is off, the function of over current protection and ground fault protection are effective.)
There are two types of power supply module, one is only of power supply function, the other is power supply function with output contact (6 contacts)

1 Main setting module
This module provide the function of over current protection.
It is possible to select the three setting module according to application. (see page 21-26)
Neutral protection of rated current (100%) function is standard at 4 pole breaker.

2 Optional setting module (option)
Additional function and characteristic can be selected by these optional setting module.

A Display (option)
Several measuring data (current, voltage, power etc) and alarms can be displayed with this module.

B Extension module (option)
This module is required when installed VT unit, display module and each interface unit.

C Load current LED
This indicator displays the maximum current of phase.

D RUN LED, ERR. LED
This indicator displays the ETR situation (Run or Error)

E Trip indicator LED
This indicator displays the trip cause.

F Pre-alarm(PAL)
This indicator displays the Pre-Alarm situation when exceed the setting current. When it installed power supply module with contact, the output contact of Pre Alarm is available.

G RESET button
When push this reset button, trip indicator, and Pre-Alarm will be reseted. And when the instantaneous test by MITSUBISHI special tester and push this reset button, as a result of LTD and STD function become ineffective.

H TEST terminal
This terminal already installed standard.This terminal is used several test by MITSUBISHI special tester.

OCR alarm (AL)
When it happen to trip by over current, ground fault (GFR) and Earth leakage (ER), it issue a warning alarm.

Neutral pole overcurrent protection (NP)
When harmonics in load current are large, the current on neutral pole exceeding rated current may flow. Harmonics may cause some troubles. Neutral pole overcurrent protection prevents them by operating at 100% of rated current on neutral pole.

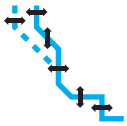
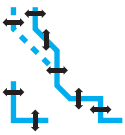
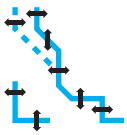
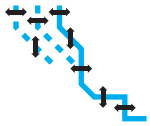
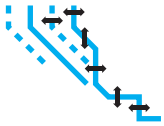
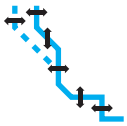
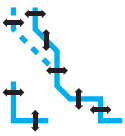
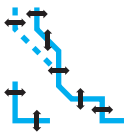
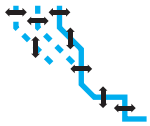
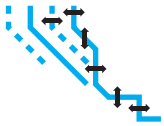
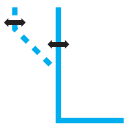
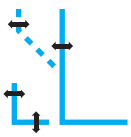
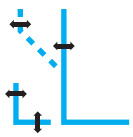
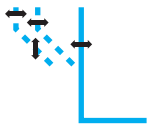
MCR:Making current release (option)
Just under the breaker closing operation (from open to close), In characteristic become effective, but after closing the breaker,instantaneous characteristic become ineffective.
When you order the MCR switch, MCR switch is built in the main body.
If MCR switch is built in the main body and the adjust dial of Inst./MCR on main setting module is set the MCR position,MCR function become effective.

TAL (option)
When the temperature of main contact exceed normal temperature level, temperature alarm is indicated at LED (on main setting module) and output by contact (only installed power supply with output contact).
If TAL is installed in the breaker according your order, Temperature alarm (LED) on main setting module become effective.
When the temperature of main contact goes down within normal tempter level, the temperature alarm (LED and output) is reset.

NCT (option)
Neutral CT is required for Ground fault or Neutral pole protection, when 3 pole breaker is used for 3 phase 4 wires system.

ZCT (option)
This device is necessary when installed earth leakage additional module (ER), for the purpose of effective the earth leakage protect function.

Characteristic table

1 \ 2	NA Nothing	G1 Ground fault	E1 Earth leakage	AP 2nd additional Pre-alarm	N5 Neutral pole 50% protection
WS General use LTD+STD+ INST/MCR					
WM Generator protection use LTD+STD+ INST/MCR					
WB Special use INST/MCR					

Power supply module

Type	Rating	alarm output
P1	100-240V AC•DC	Nothing
P2	24-60V DC	Nothing
P3	100-240V AC 100-125V DC	6 output contacts
P4	24-60V DC	6 output contacts
P5	100-240V DC	6 output contacts by semiconductor

Note1: Over current protection and ground fault protection operates without control power source.

Note2: Factory setting of 6 output contacts is as follows.
①LTD,②STD/INST,③Optional setting module function(G1,E1,AP),
④PAL,⑤TAL,⑥Error(Self diagnosis)

3

Contact capacity(Type code P3, P4)

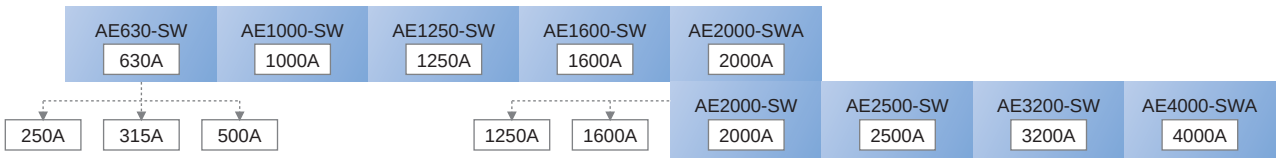
Voltage(V)		Resistive load cosϕ=1.0	Inductive load cosϕ=0.4 L/R=7ms
AC	240	1A	0.5A
	120	1A	1A
DC	125	0.1A	0.05A
	30	1A	1A

Contact capacity(Type code P5)

Voltage(V)		Normal current	Peak overload current	On resistance (max.)
AC	240	0.1A	0.3A	5Ω
	120	0.1A	0.3A	5Ω
DC	245	0.1A	0.3A	5Ω
	30	0.1A	0.3A	5Ω

Low specifications products

AE630-SW and AE2000-SW has low rating type. Please refer to the "ORDERING INFORMATION SHEET."(Page 57-59)



Note1: Low rating type of AE630-SW does not available for the ground fault protection.
Note2: As for details of ratings, refer to page 9 and page 10.

Electronic trip relay(ETR) type code

□ □ – □

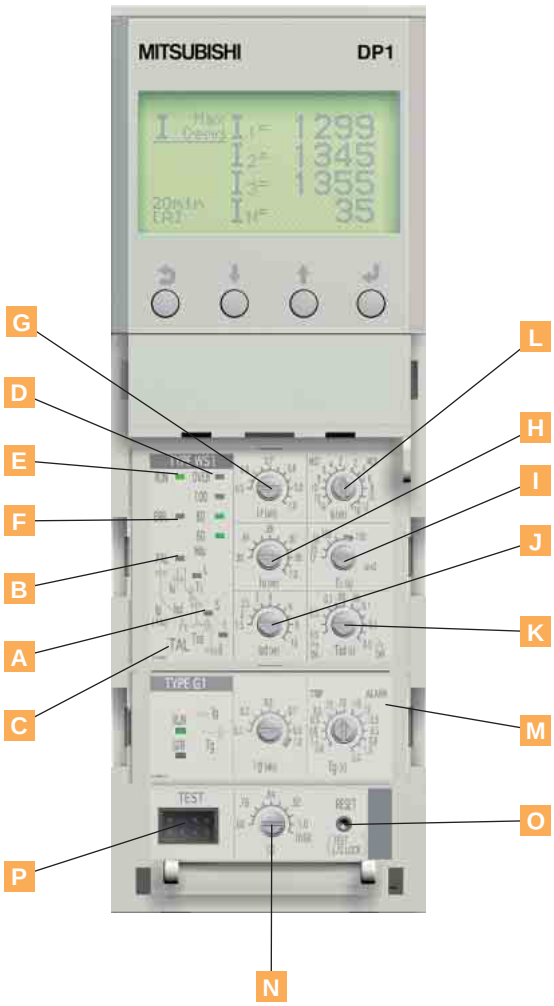
Main setting module
- WS1: General use for AE630–1600-SW / AE2000–3200-SW
- WS2: General use for AE2000-SWA / AE4000-SWA
- WM1: Generator protection use for AE630–1600-SW / AE2000–3200-SW
- WM2: Generator protection use for AE2000-SWA / AE4000-SWA
- WB1: INST/MCR only for AE630–1600-SW / AE2000–3200-SW
- WB2: INST/MCR only for AE2000-SWA / AE4000-SWA

Optional setting module
- G1: Ground fault protection
- N5: Neutral pole 50% protection
- E1: Earth leakage protection
- AP: 2nd Additional Pre-alarm
- NA: Without optional setting

Power supply
- P1: AC·DC100-240V
- P2: DC24-60V
- P3: AC100-240V / DC100-125V with output contact
- P4: DC24-60V with output contact
- P5: DC100-240V with output contact (SSR)

Additional function
- ☐ Extension module(EX1)
  - ☐ Display(DP1)
  - ☐ Display onto panel board(DP2)
  - ☐ VT unit(VT)
  - **Network**
    - ☐ BIF-CC
    - ☐ BIF-PR
    - ☐ BIF-MD
- ☐ Temperature alarm(TAL)
- ☐ MCR switch(MCR-SW)

Electronic trip relay (for general use : WS)



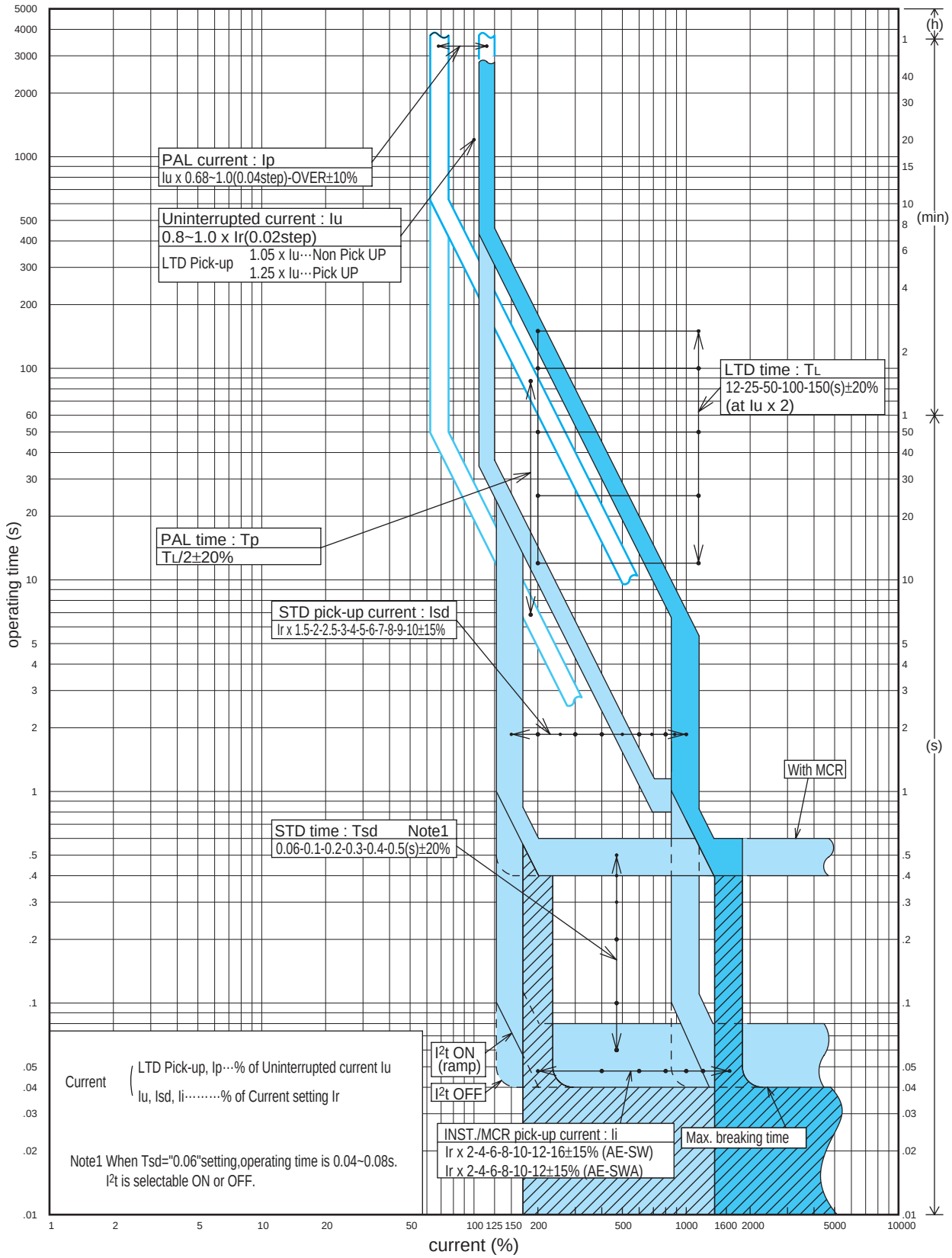
- A Trip indicator LED
- B Pre-alarm LED
- C Temperature alarm LED
- D Load current LED
- E RUN LED
- F ERR. LED
- G Current setting dial
- H Uninterrupted current setting dial
- I LTD time setting dial
- J STD pick up setting dial
- K STD time setting dial
- L INST/MCR pick up current setting dial
- M Optional setting module (Refer P27~29)
- N Pre-alarm current setting dial
- O RESET button (TEST L/S LOCK button)
- P TEST terminal

Adjustable setting range

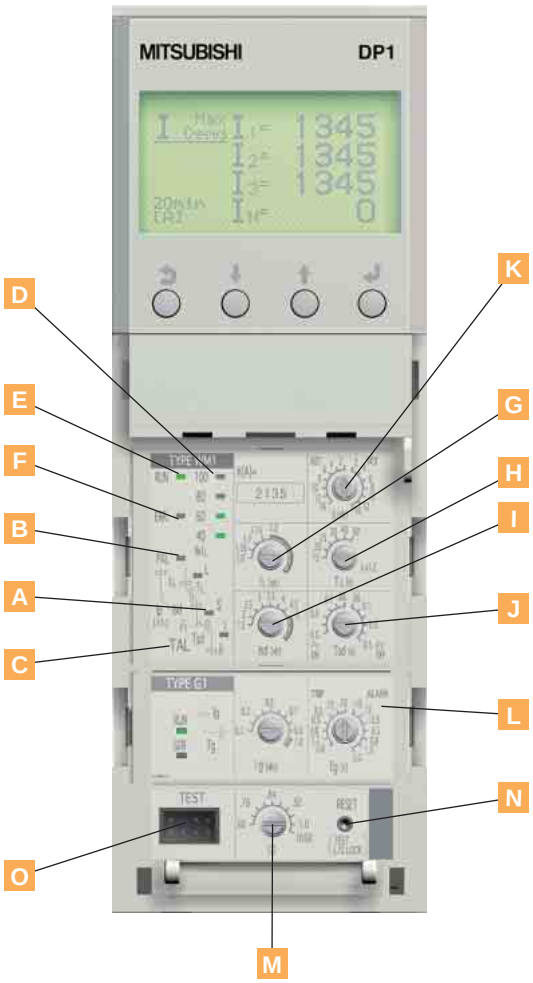
No.	Setting item	Mark	Adjustable setting range		Accuracy	setting for shipment
			AE630-SW~AE1600-SW AE2000-SW~AE3200-SW	AE2000-SWA AE4000-SWA		
G	Current setting	Ir	0.5 ~ 1.0 (0.05step) x In (CT Rating)		—	1.0
H	Uninterrupted current	Iu	0.8 ~ 1.0 x Ir (0.02step), Pick-up current : 1.15 x Iu		1.05 x Iu···Non Pick-up 1.25 x Iu···Pick-up	—
I	LTD time	T_L	12–25–50–100–150s at Iu x 2		± 20%	150
J	STD pick-up current	Isd	1.5–2–2.5–3–4–5–6–7–8–9–10 x Ir		± 15%	10
K	STD time	Tsd	0.5–0.4–0.3–0.2–0.1–0.06 (I^2t ON) – 0.06–0.1–0.2–0.3–0.4–0.5s (I^2t OFF)		± 20% 0.06···0.04-0.08s	0.5 (I^2t ON)
L	INST./MCR pick-up current	Ii	16-12-10-8-6-4-2-2-4-6-8-10-12-16 (INST/MCR) x Ir WS1	12-10-8-6-4-2-2-4-6-8-10-12 (INST/MCR) x Ir WS2	± 15%	WS1···16 (INST) WS2···12 (INST)
N	Pre-alarm current	Ip	Iu x 0.68 ~ 1.0 (0.04step) –OVER		± 10%	OVER
—	Pre-alarm time	Tp	1/2 T_L (after 1/2 T_L, PAL OUT turns on.)		± 20%	—

Upper figure and table denote that are include optional MCR function.

■Operating characteristic curve (for general use : WS)



Electronic trip relay(for generator protection use:WM)



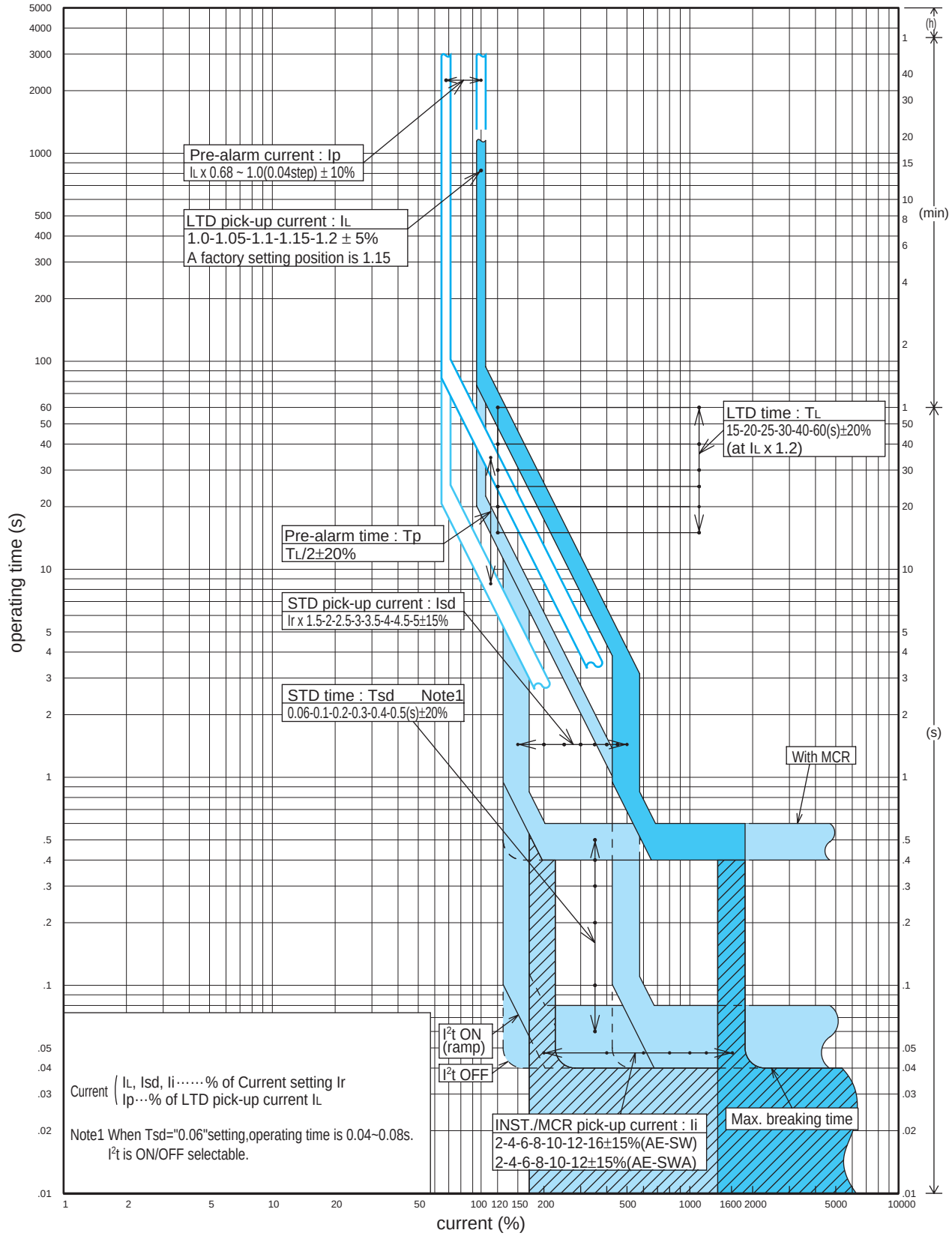
- A Trip indicator LED
- B Pre-alarm LED
- C Temperature alarm LED
- D Load current LED
- E RUN LED
- F ERR. LED
- G LTD pick-up current
- H LTD time setting dial
- I STD pick-up setting dial
- J STD time setting dial
- K INST./MCR pick-up current setting dial
- L Optional setting module (Refer P27~29)
- M Pre-alarm current setting dial
- N RESET button (TEST L/S LOCK button)
- O TEST terminal

Adjustable setting range

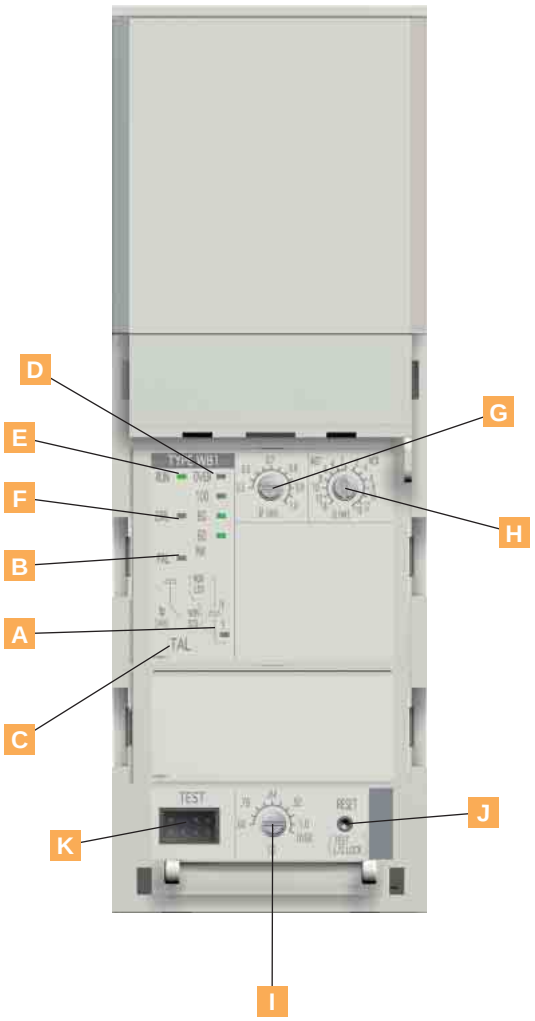
No.	Setting item	Mark	Adjustable setting range		Accuracy	setting for shipment
			AE630-SW~AE1600-SW AE2000-SW~AE3200-SW	AE2000-SWA AE4000-SWA		
—	Current setting	Ir	0.63 ~ 1.0 x In (Adjust by factory)		—	Comply with ordering sheet
G	LTD pick-up current	I_L	1.0–1.05–1.1–1.15–1.2		± 5%	1.15
H	LTD time	T_L	15–20–25–30–40–60s at I_L x 1.2		± 20%	20
I	STD pick-up current	Isd	1.5–2–2.5–3–3.5–4–4.5–5 x Ir		± 15%	5
J	STD time	Tsd	0.5–0.4–0.3–0.2–0.1–0.06 (I^2t ON) – 0.06–0.1–0.2–0.3–0.4–0.5s (I^2t OFF)		± 20% 0.06···0.04-0.08s	0.5 (I^2t ON)
K	INST./MCR pick-up current	Ii	16-12-10-8-6-4-2-2-4-6-8-10-12-16 (INST / MCR) x Ir WM1	12-10-8-6-4-2-2-4-6-8-10-12 (INST / MCR) x Ir WM2	± 15%	WM1···16 (INST) WM2···12 (INST)
M	Pre-alarm current	Ip	I_L x 0.68 ~ 1.0 (0.04step) –OVER		± 5%	OVER
—	Pre-alarm time	Tp	1/2 T_L (after 1/2 T_L, PAL OUT turns on.)		± 20%	—

Upper figure and table denote that are include optional MCR function.
Pre-alarm current “OVER” setting is equal to 1.0.

■Operating characteristic curve (for generator protection use : WM)



Electronic trip relay(for special use : WB)



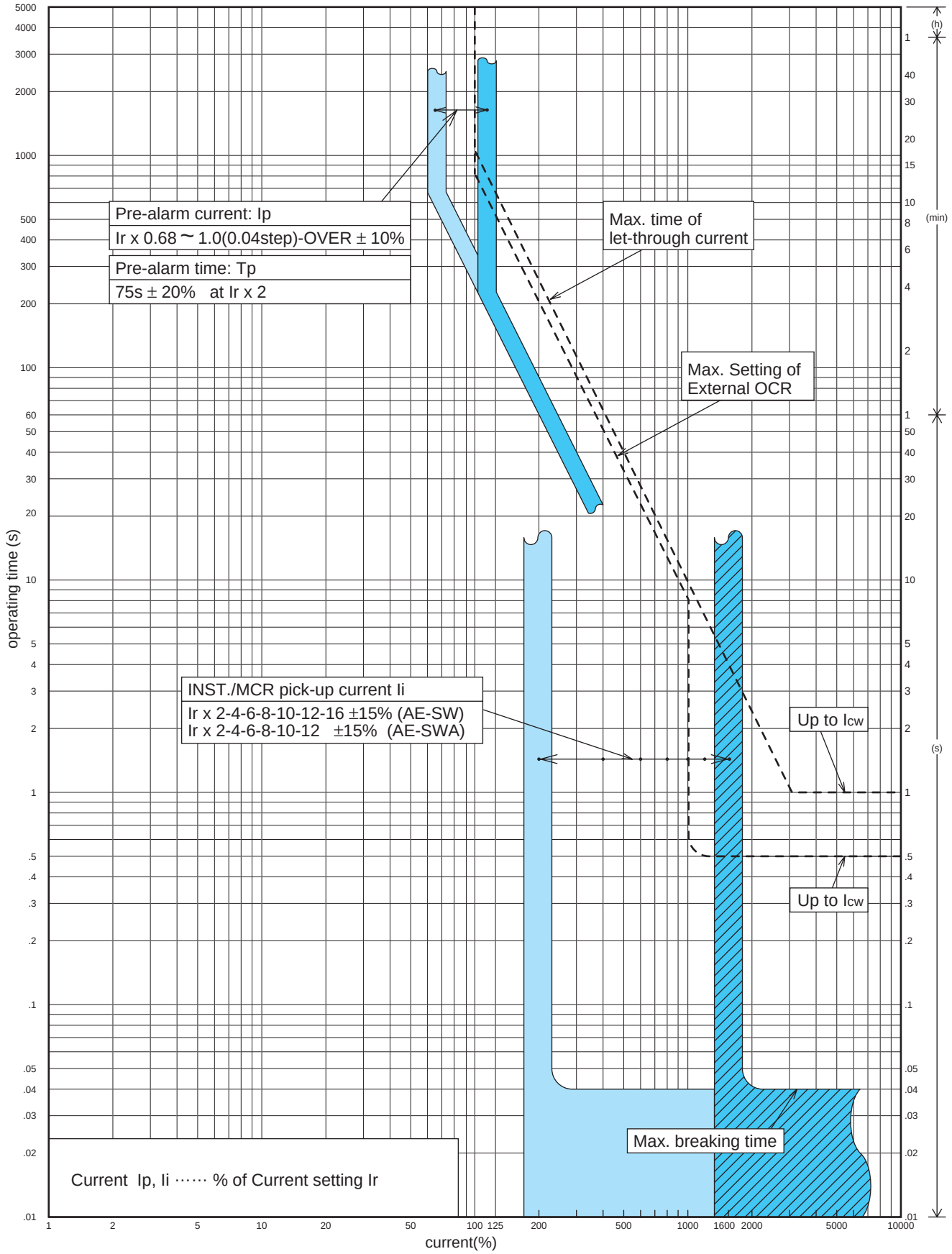
- A Trip indicator LED
- B Pre-alarm LED
- C Temperature alarm LED
- D Load current LED
- E RUN LED
- F ERR. LED
- G Current setting dial
- H INST./MCR pick-up current setting dial
- I Pre-alarm current setting dial
- J RESET button
- K TEST terminal

Adjustable setting range

No.	Setting item	Mark	Adjustable setting range		Accuracy	setting for shipment
			AE630-SW~AE1600-SW AE2000-SW~AE3200-SW	AE2000-SWA AE4000-SWA		
G	Current setting	Ir	0.5 ~ 1.0 (0.05step) x In (CT Rating)		—	1.0
H	INST./MCR pick-up current	Ii	16-12-10-8-6-4-2-2-4-6-8-10-12-16 x Ir (INST) (MCR) WB1	12-10-8-6-4-2-2-4-6-8-10-12 x Ir (INST) (MCR) WB2	± 15%	WB1···16 (INST) WB2···12 (INST)
I	Pre-alarm current	Ip	Ir x 0.68 ~ 1.0 (0.04step) –OVER		± 10%	OVER
	Pre-alarm time	Tp	75s at Ir x 2		± 20%	—

Upper figure and table denote that are include optional MCR function.

■Operating characteristic curve (for special use : WB)



Accessories

Ground fault protection(GFR)

Option

The ground fault protection (GFR) of several hundred amperes is possible. This function can be selected for trip and alarm (no trip). Power supply is necessary for this function, even if there is no power supply, it can function at 0.2xIn or higher.

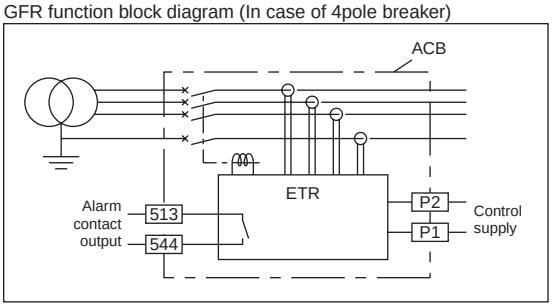
Setting item	Mark	Adjustable setting range	Accuracy	Setting for shipment
GFR pick-up current	Ig	0.1-0.2-0.3-0.4-0.5-0.6-0.7-0.8-0.9-1.0 x In	±20%	1.0
GFR time	Tg	3-1.5-0.8-0.5-0.3-0.15-<0.1 (TRIP) - <0.1-0.15-0.3-0.5-0.8-1.5-3s (ALARM (at 1.5 x Ig))	±20%	3 (TRIP)

Neutral CT(NCT) ※Only use for AE-SW

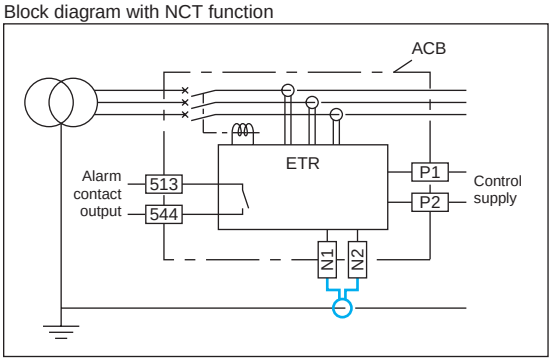
Option

The Neutral CT is used for ground fault protection when the 3 pole breaker is used on a 3 phase 4 wires system and for over current protection on N phase. Please use this CT in combination with ground fault protection (GFR). As for outline dimensions, refer to page 48.

GFR function block diagram (In case of 4pole breaker)



Block diagram with NCT function

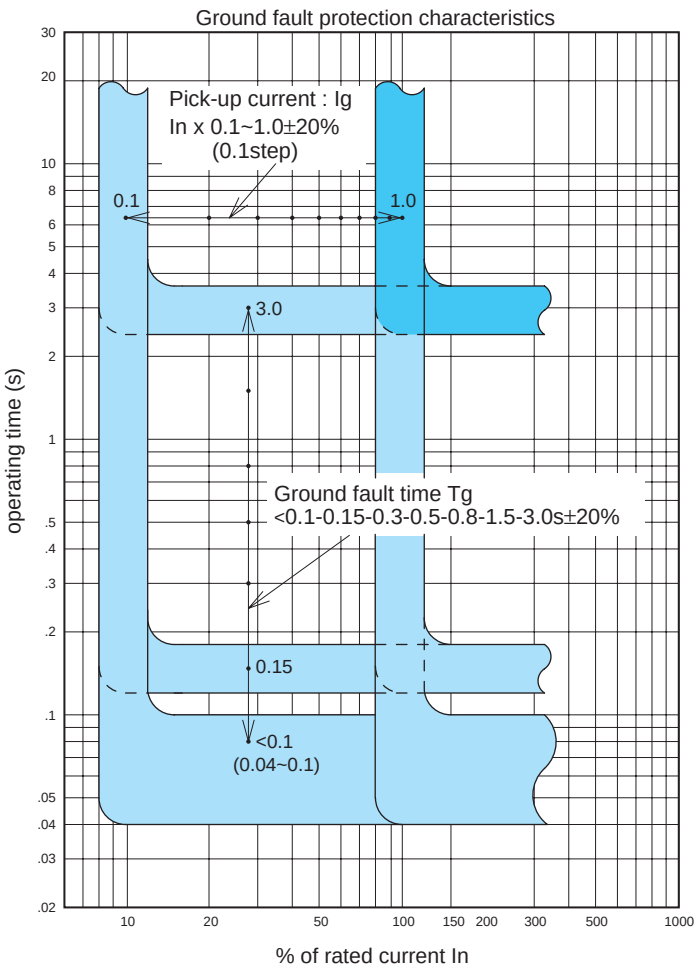


NCT type name

ACB type name / CT rating		Applicable NCT type name
AE630-SW 630A		NCT06
AE1000-SW 1000A		NCT10
AE1250-SW 1250A	AE2000-SW 1250A	NCT12
AE1600-SW 1600A	AE2000-SW 1600A	NCT16
AE2000-SWA 2000A	AE2000-SW 2000A	NCT20
	AE2500-SW 2500A	NCT25
	AE3200-SW 3200A	NCT32
	AE4000-SWA 4000A	NCT40

As for outline dimensional drawing, refer to page 48.

Ground fault protection characteristics



Earth leakage protection(ER)

Option

By combining the ETR with earth leakage protection (ER) and External ZCT, earth leakage protection is possible. Earth leakage protection, earth leakage tripping and earth leakage alarm can be selected. Control supply is necessary for this function.

Setting item	Mark	Adjustable setting range	Accuracy	Setting for shipment
ER pick-up current	I∆n	1A-2A-3A-5A-10A	+0% –30%	10A
ER time	Te	3-1.5-0.8-0.5-0.3-0.15-<0.1 (TRIP) - <0.1-0.15-0.3-0.5-0.8-1.5-3s (ALARM) (at 1.5 x I∆n)	±20%	3 (TRIP)

External ZCT

Option

This option is used to detect several amperes of earth leakage when use in combination with a electronic trip relay that has the earth leakage tripping (ER) option.
Two methods are available. The first is where the all load conductors pass through the ZCT.
The other method uses a smaller ZCT through which the supply transformer's ground wire passes through to earth.

ZCT for load circuit

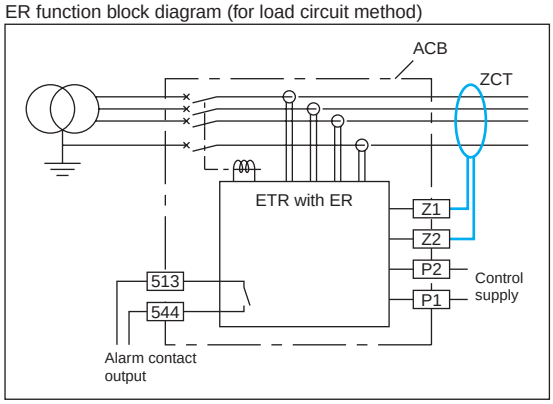
ZCT type name	ACB type name
ZCT163	AE630-SW ~ AE1600-SW 3-pole
ZCT323	AE630-SW ~ AE1600-SW 4-pole AE2000-SW ~ AE3200-SW 3-pole
ZCT324	AE2000-SW ~ AE3200-SW 4-pole

As for external dimensional drawing, refer to page 48, and make your choice in reference to the BUSBAR size.

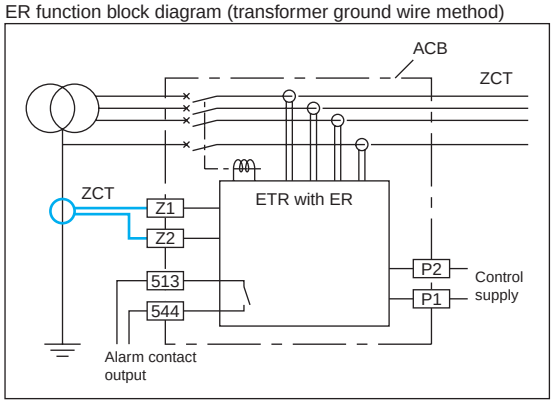
ZCT for transformer ground wire

ZT15B	ZT30B	ZT40B	ZT60B	ZT80B	ZT100B

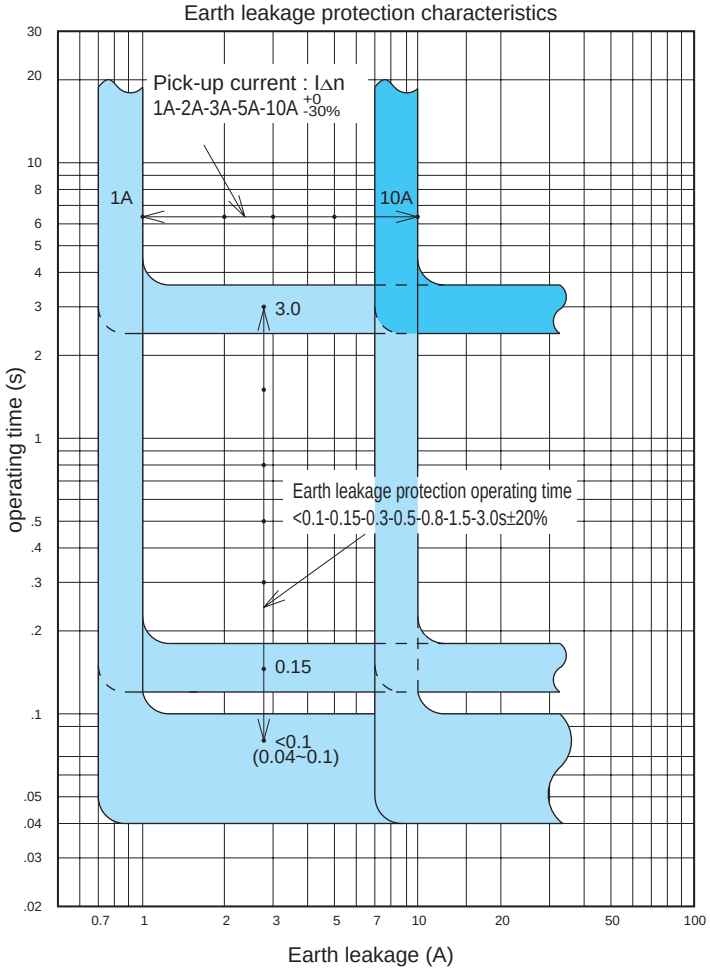
ER function block diagram (for load circuit method)



ER function block diagram (transformer ground wire method)



Earth leakage protection characteristics



Accessories

2nd Additional Pre-alarm (AP)

Option

The Pre-Alarm (1st) function already installed in standard breaker, the 2nd Additional Pre-Alarm function can be installed by option, thereby it is possible to monitor (observer) electric circuit in more detail by 2nd Additional Pre-Alarm function.

2nd Additional Pre-alarm pick-up current Ip2	0.5-0.6-0.7-0.8-0.84-0.88-0.92-0.96-1.0 x Iu
2nd Additional Pre-alarm time Tp2	0.3-0.4-0.5-0.6-0.7-0.8-0.9 x TL / 5-10-15-20-30-40-60s (FLAT)

Neutral pole 50% protection(N5)

Option

Neutral pole overcurrent protection (operating at 100% of rated current) already installed in standard ETR.
But if you would like to operates at 50% of rated current on neutral pole, neutral pole 50% protection realizes it.

MCR Switch (MCR-SW)

Option

If MCR switch is built in the breaker according to your order and the adjust dial of INST./MCR on Main setting module is setting the MCR position, MCR function become effective.

MCR function:
Just under the breaker closing operation (from open to close), Instaneouse characteristics become effective.
But after closing the breaker, Instaneouse characteristics become ineffective.

Temperature alarm (TAL)

Option

When the temperature of main contact exceeds normal level, Temperature alarm is indicated by LED (on main setting module) and output by contact (only installed power supply with output contact).
It is possible to know how situation of contact ware so that it can estimate the maintenance and replacement timing.
When you order TAL, TAL sensor is installed to near contact point of main contact.
If TAL is installed in the breaker according to your order, Temperature alarm (LED) on main setting module become effective.
When the temperature of main contact goes down within normal, temperature alarm turns off.

Field Test device (Y-2000)

The field test device (Y-2000) can be checked the Electronic Trip Relay function at test position and disconnected position.
The breaker will open, when you proceeding to tripping test by Y-2000.

Y-2000 specification

TEST ITEM	LTD,STD,INST,GFR,PAL
TEST SIGNAL RANGE	10% ~ 2500%
OUTLINE DIMENSION	230(W) x 120(H) x 290(D)
TIMER	0.000 ~ 999.999s
POWER SUPPLY	100 – 240V AC 50 / 60Hz

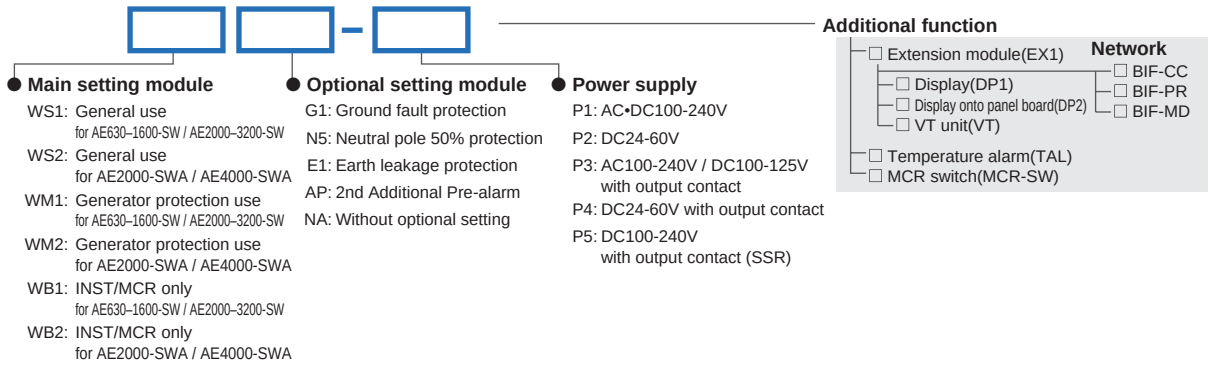
Additional functions

By adding the extension unit in ETR, measuring, display and communication are possible.

List of extension unit

Name	Type	Description
Extension module	EX1	Module for display and interface function (indispensable)
Display module (relay attachment)	DP1	Display module for ETR
Display module (panel attachment)	DP2	Display module for panel board
VT unit	VT	VT for measuring of voltage, active power and active energy
CC-Link interface unit	BIF-CC	Interface unit for CC-Link
PROFIBUS-DP interface unit	BIF-PR	Interface unit for PROFIBUS-DP
Modbus (RS-485) interface unit	BIF-MD	Interface unit for Modbus (RS-485)
I/O unit	BIF-CON	For breaker remote control (interface unit required)
Drawout position switch	BIF-CL	This switch detects the drawout position of the breaker for interface.

Electronic trip relay(ETR) type code



Extension module (EX1)

This is the module that realizes various additional functions combining the display module (DP1 / DP2), the interface unit (BIF-CC / BIF-PR / BIF-MD) and the VT unit (VT).

1 Various measuring elements, high measuring accuracy

By loading the special ASIC, wealth measuring elements of load current, voltage, active power, current harmonics and high measuring accuracy have been realized. By adopting high-performance ASIC, various measuring elememts (load current, voltage, energy, harmonics, etc.) and high measuring accuracy are realized. As for details, refer to page 34.

2 Communication function

2 display modules and 1 interface unit can be connected simultaneously by internal communication.

Display module (DP1/DP2)

This is the module that displays and sets various information, for example, measurement information, trip and alarm information, setting of output contacts and so on.

1 Multi display of measuring element

It enables to easily monitor the comparison of each measuring element by multi display (load current 4 phases multi display and voltage multi display) on one screen.

2 2-colors back light

If trip or alarm occured, back light color changes from green to red instantly.

3 Graphical display

By adopting dot matrix type LCD, graphical display such as bar graph display of load current, current harmonics and characteristic curve are realized.

There are 2 types of this module. One is the ETR attachment type (DPI). Another is the panel attachment type (DP2) and is connected to extension terminals of control circuit by 2m cable. (As for outline dimensions, refer to page 49.)

Note;

- Extension module (EX1) is required.

VT unit (VT)

It is possible to measure voltage, power, energy, current harmonics, etc. Combining the extension module (EX1). (for outline dimensions, refer to page 50.)

Network

Interface unit (BIF-CC/BIF-PR/BIF-MD)

CC-Link

PROFIBUS-DP

Modbus(RS-485)

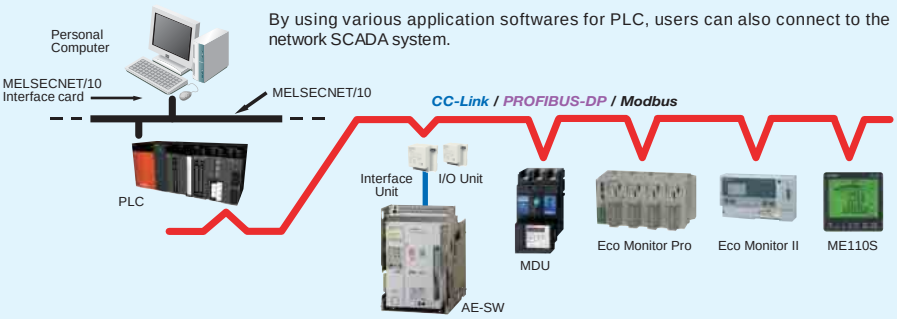
These Interface units can expand the future possibility in various communication and Intelligent control.

1 Applicable to various open networks.

These units are applicable to various open network systems such as CC-Link, PROFIBUS-DP and Modbus (RS-485), which can be built in easily.

2 Intelligent control by Multi-data communication

It comes into being the Intelligent control by Multi-data communication through these interface units to PLC/SCADA, which transfer the measurement Information, setting values, error information and trip and alarm informations.



Note: Some device types are excluded.

Note:

- Extension module (EX1) is required.

I/O unit(BIF-CON/BIF-CL)

The Input & Output Controlling Unit (BIF-CON) is available for the remote controlling and remote monitoring of the breaker condition through the various network systems.
With this BIF-CON unit in addition to the Interface Unit, it become possible to control the breaker remotely, like a ON or OFF operations or Spring-charging.
Further, by combining the Drawout position switch (BIF-CL), the monitoring of drawout position become available in case of the breaker drawout type.

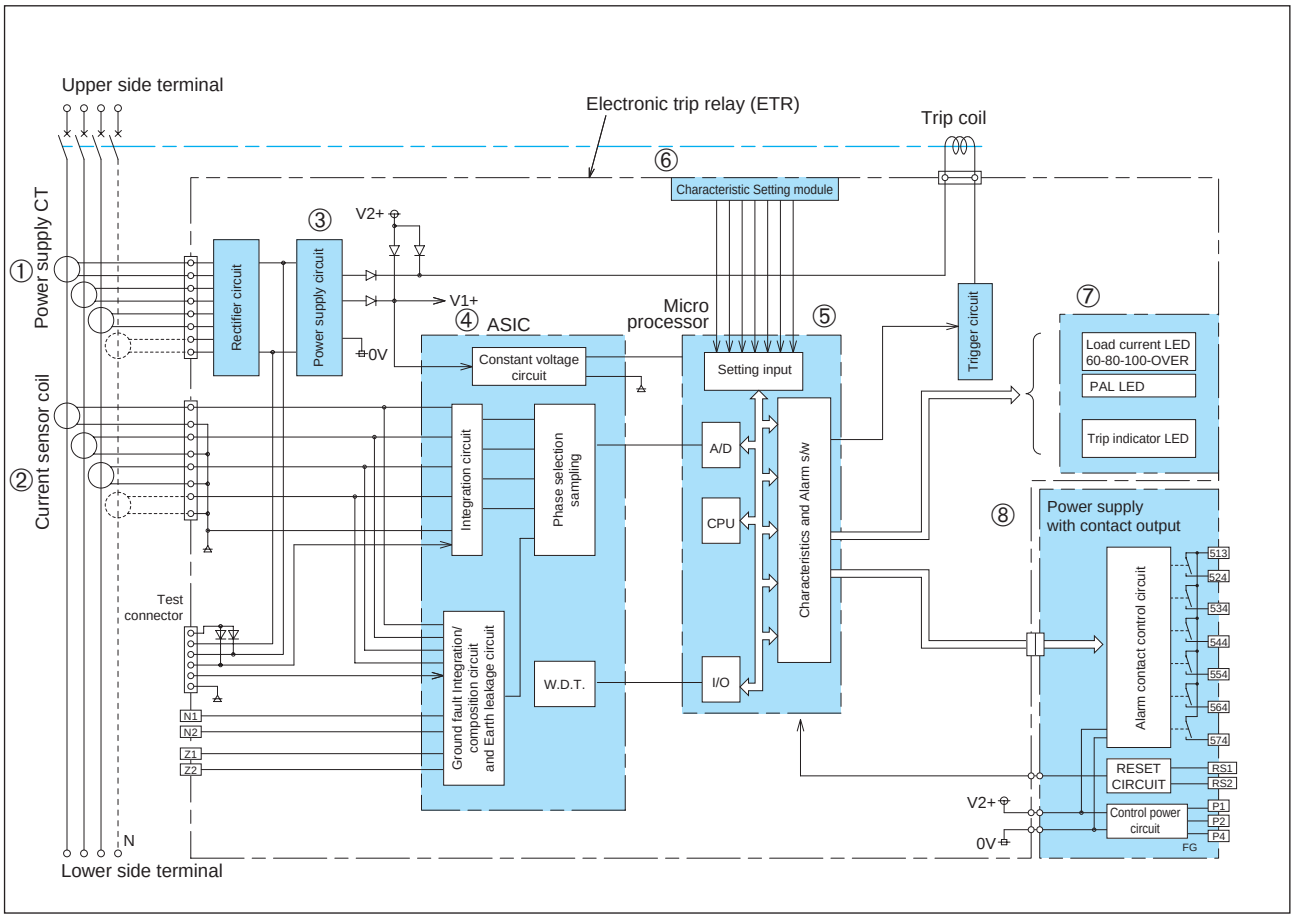
Function	Description	Note
Control	Breaker ON operation	1a contact for CC.
	Breaker OFF operation	1a contact for SHT. (not applicable for AC380～500V rating)
	Spring charge	1a contact for MD.
Monitor	Digital Input (DI) monitoring	In case of BIF-CC and BIF-MD, Max.3 contacts monitoring are available. In case of BIF-PR, 1 contact monitoring is available.
	Breaker drawout position	Position : CONNECTED, TEST and DISCONNECTED BIF-CL is required.

○ : can be displayed by DP1/DP2　　● : can be displayed and set by DP1/DP2

Combination sample																								
Type	① - ② - ③ ;Ex1;DP1(;DP2) Note 1)												① - ② - ③ ;Ex1;DP1(;DP2),VT Note 1)											
①	WS				WM				WB				WS				WM				WB			
②	NP	AP	G1	E1	NP	AP	G1	E1	NP	AP	G1	E1	NP	AP	G1	E1	NP	AP	G1	E1	NP	AP	G1	E1
③	P1~P5												P1~P5											
Measurement																								
Load current (±2.5%)	○												○											
Leakage current (±2.5%) Note 4)	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○
Voltage (±2.5%)	-												○											
power (active,reactive,apparent) (±2.5%)	-												○											
Power factor (±5%)	-												○											
Energy (active,reactive) (±2.5%)	-												○											
Harmonics current (±2.5%)	-												○ (3.5...19th)											
Frequency (±1.0%)	-												○											
Trip history																								
LTD	○				○				-				○				○				-			
STD	○				○				-				○				○				-			
INST	○												○											
GFR	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-
ER	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○
UVT	○ Note 2)												○ Note 2)											
Alarm history																								
PAL1	○												○											
PAL2	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-
OVER	○												○											
GFR	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-
EPAL	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○
ER	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○
TAL	○ Note 3)												○ Note 3)											
Characteristic setting (panel attachment product [DP2] only)																								
LTD	○				○				-				○				○				-			
STD	○				○				-				○				○				-			
INST	○												○											
PAL1	○												○											
PAL2	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-
GFR	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-
EPAL	-	-	-	●	-	-	-	●	-	-	-	●	-	-	-	●	-	-	-	●	-	-	-	●
ER	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○	-	-	-	○
Setting																								
Output contacts	●												●											
Date & Time	●												●											
Demand time	●												●											
Alarm holding method	●												●											
Reset																								
Trip and alarm information	●												●											
Measurement information (minimum and maximum values)	●												●											
ETR information																								
Main / Optional setting module information	○												○											
Error information	○												○											
CT rating	○												○											
Phase line method	○												○											
Normal connection or reverse connection	○												○											

Note 1)　2 units of display modules can be attached.
Note 2)　Display is available only when UVT module is attached.
Note 3)　Display is available only when TAL sensor is attached.
Note 4)　Except the accuracy of ZCT.

Electronic trip relay circuit diagram



① **Power supply CT**
Energy is supplied for the operation of the overcurrent tripping and ground fault tripping(GFR) function of the electronic trip relay.

② **Current sensor coil**
This detects current of each phase flowing through breaker. A coreless coil which has good linearity is a chieved.

③ **Power supply circuit**
This generates action energy of ETR, by energy from power supply CT.

④ **ASIC**
This amplifies signal detected by the current sensor coil, and detects ground fault current by vector composition.

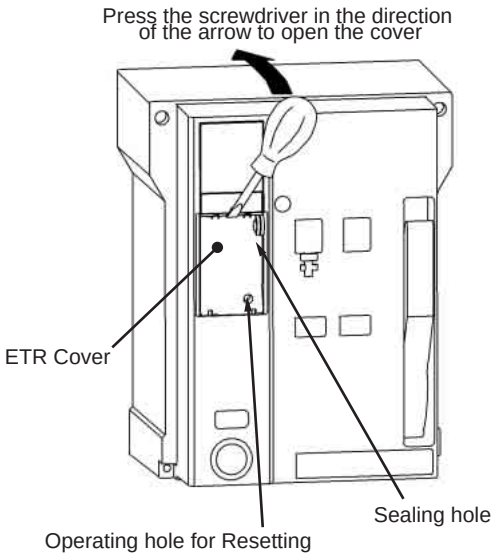
⑤ **Micro processor**
This carries out tripping operation by signal amplified or detected by the exclusive ETR.

⑥ **Characteristic setting module**
This is the circuit for setting the characteristic of ETR.

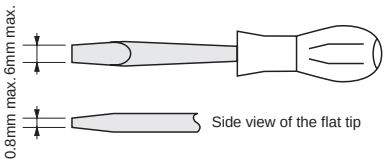
⑦ **Load current , PAL and Trip indicator**
This displays load current and fault cause (including pre-alarm).

⑧ **Power supply with contact output**
This outputs contact signal at fault cause (including pre-alarm) and at other alarms.
A control supply is necessary for this function.

Setting procedure

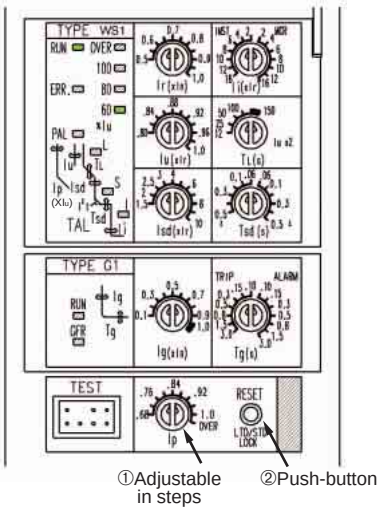


1 Prepare a small flat tipped screwdriver.



2 Insert the flat tipped screwdriver into the opening of the ETR cover. Then, lightly turn the screwdriver to the upside as shown in the left figure, and the relay cover will open.

3 There are 2 kinds of switches for setting up the required tripping characteristics and they should be used as follows.



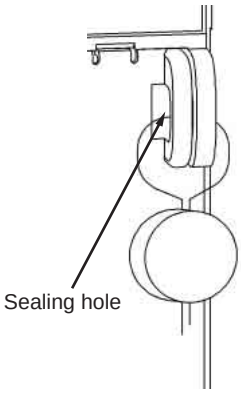
① Adjustable in steps

Rotary code switch is used. Do not set the switch at points between steps. The setting value is same, when the switch is positioned at the thick line. (Set the switch with a torque of 0.02N·m or below.)

② Push-button

This is for temporary operation, and press it with force of 3N or below.

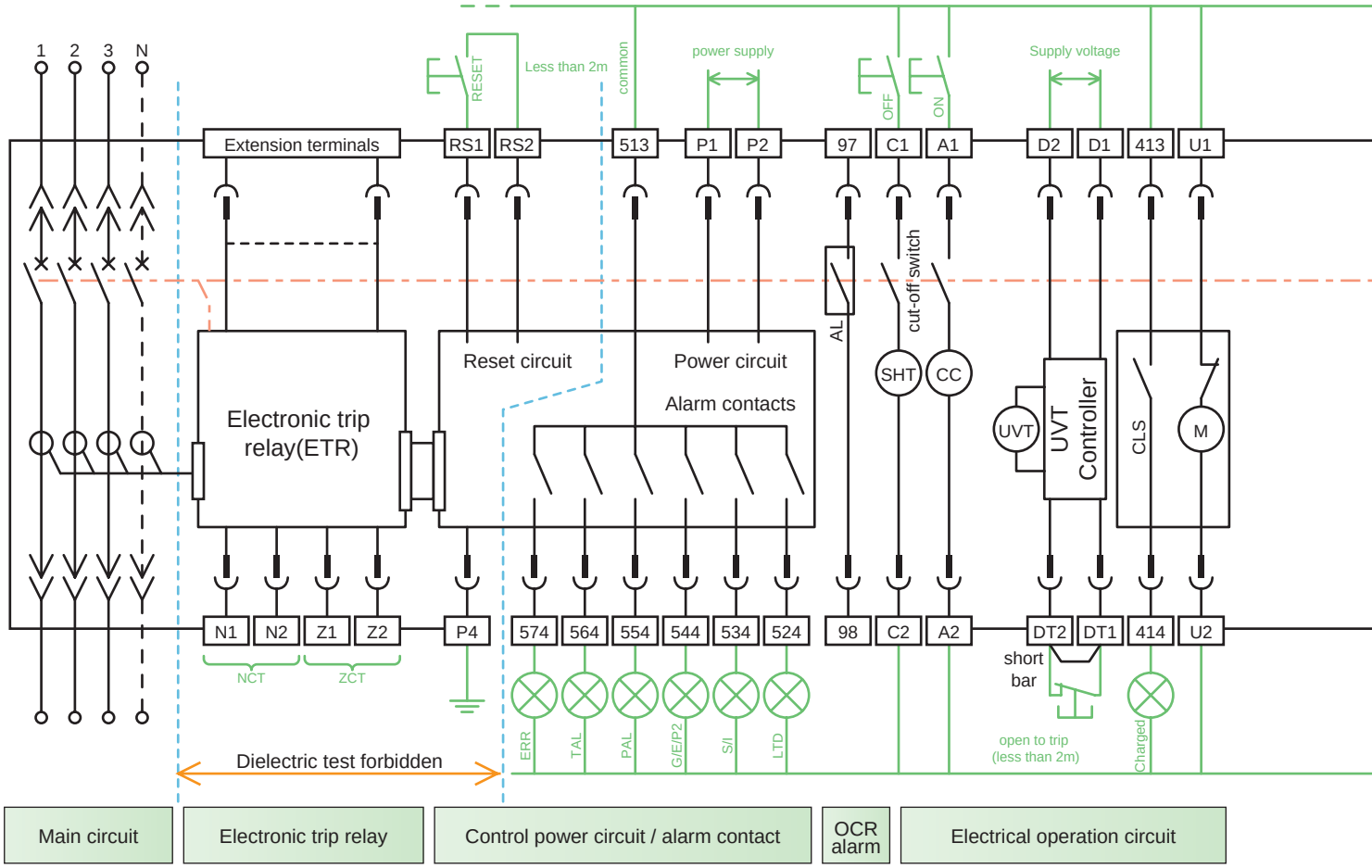
4 When the characteristics is set up, use a device like a field tester, etc to make sure that the required characteristic has been set.



5 At sealing, seal the ETR cover by using the sealing hole at the top of the ETR cover.

Wiring diagram

● The following diagram shown accessories fully equiped.



Terminal description

D1 D2	Voltage Input terminal of UVT
DT1 DT2	Trip terminal of UVT (Remote trip)
13 14 ~ 53 54	Auxiliary switch "a"
11 12 ~ 51 52	Auxiliary switch "b"
U1 U2	Motor charging
413 414	Charged signal
A1 A2	Closing coil
C1 C2	Shunt trip
97 98	OCR alarm
P1 P2	Power supply for ETR
P4	FG of power supply
RS1 RS2	Alarm reset (Trip cause LED, alarm contact)
513 ~ 574	Alarm contacts
Z1 Z2	For external ZCT
N1 N2	For Neutral CT
Extension terminals	For external display DP2
	For Interface unit
	For VT unit

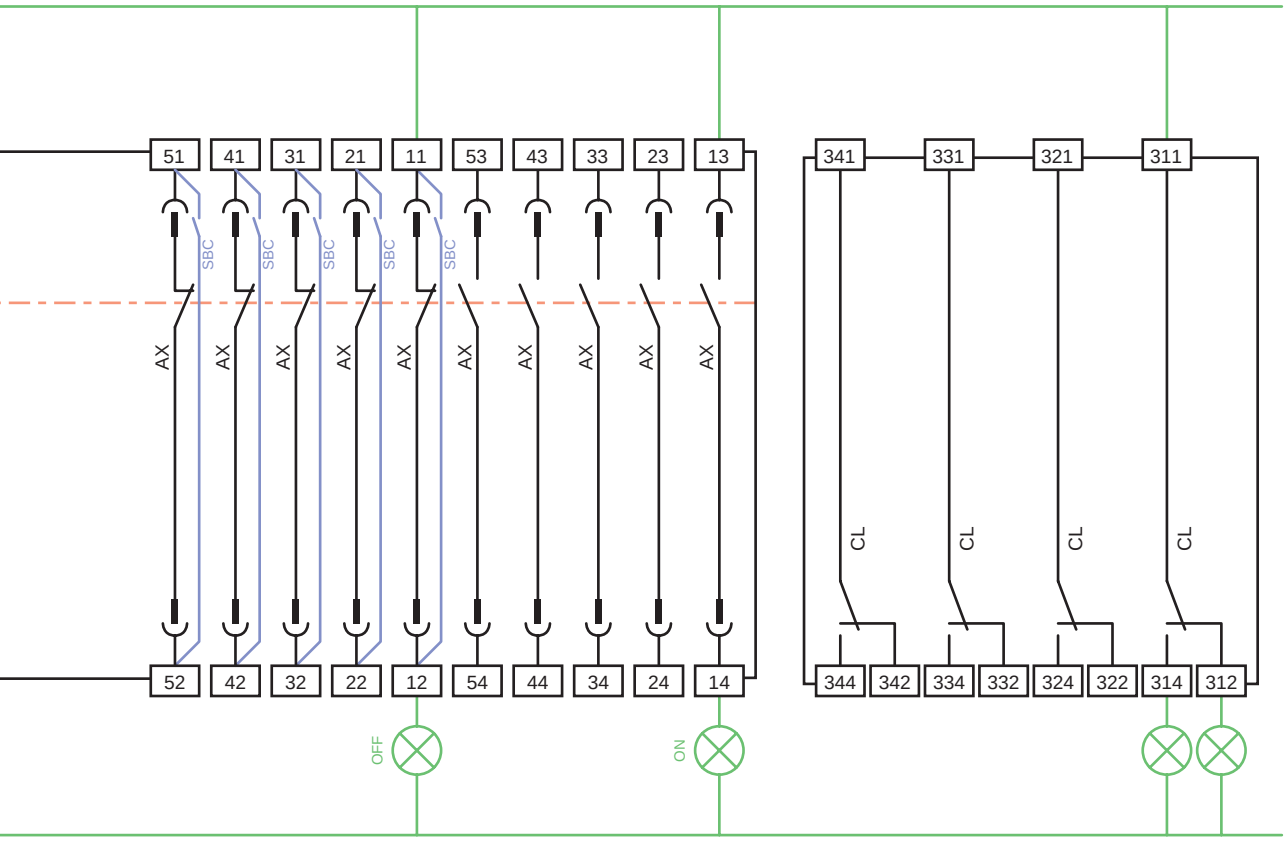
Accessory Symbols

SHT	Shunt tripping device
CC	Closing coil
M	Motor(Motor charing device)
UVT	UVT coil
AX	Auxiliary switch
AL	OCR alarm
CLS	Charge limit switch
SBC	Short-circuit B-contact
CL	Cell switch

Internal wiring

External wiring (user's wiring)

Control circuit connecter (drawout type)



Auxiliary switch(normal close) | Auxiliary switch(normal open) | Cell switch

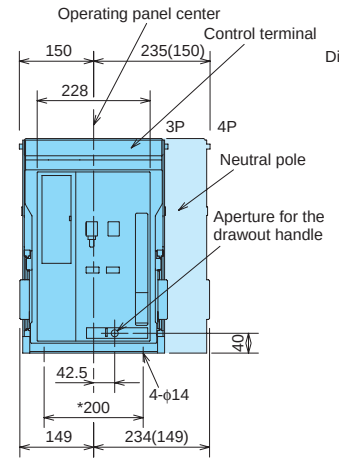
Note;

- On the drawout type, the cables are cut to enough length allow the control circuit terminal block to be moved to the left or right by 5mm.
- When a coil load is connected in the same control circuit as the ETR, surge absorbers are required to absorb the surge voltage.
- OCR alarm
  The contact output of the OCR alarm is the one-pulse output for 30ms.
  For this reason, this output needs self-holding circuit.
- CC (Closing coil)
  Do not use AXb contact for a cut-off switch, because pumping prevention is not performed.
- UVT
  Use the switch that can open and close DC150V, 0.5A to remote trip.
  Remote trip terminal has short bar at shipment, so remove it before use.
  Disconnect the wires in case of main circuit dielectric test.

Outline dimensions

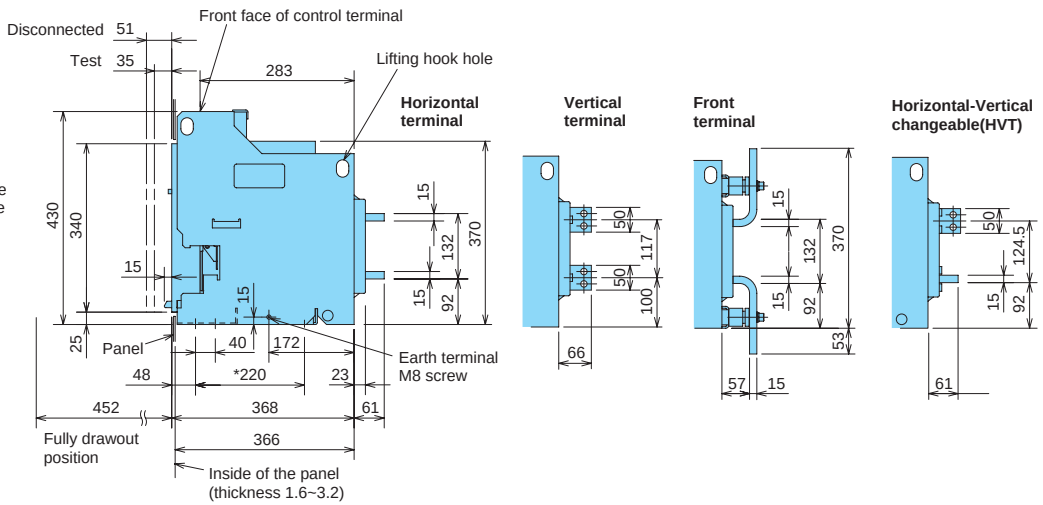
Drawout type AE630-SW,AE1000-SW, AE1250-SW, AE1600-SW

Front view

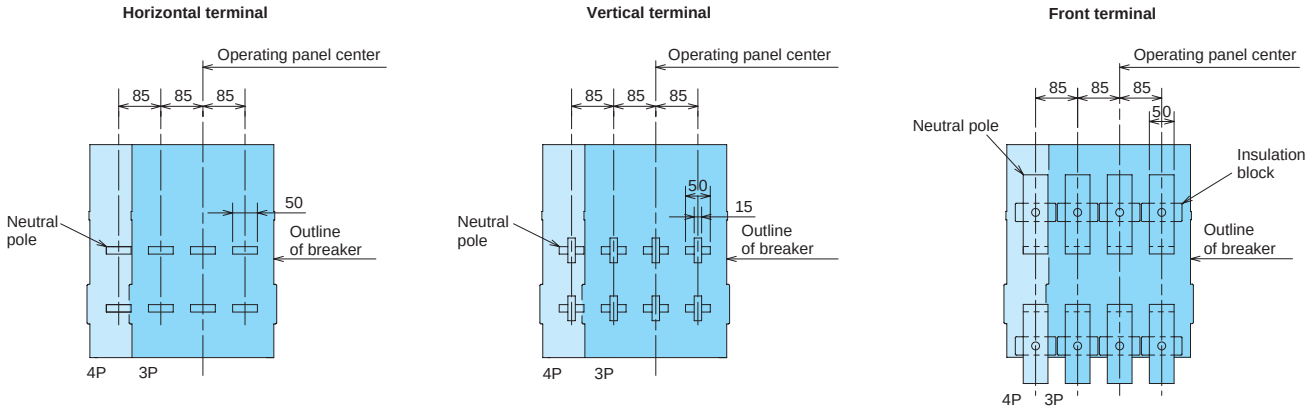


* : Mounting pitch
The numerals shown in parentheses are for 3 poles.

Side view



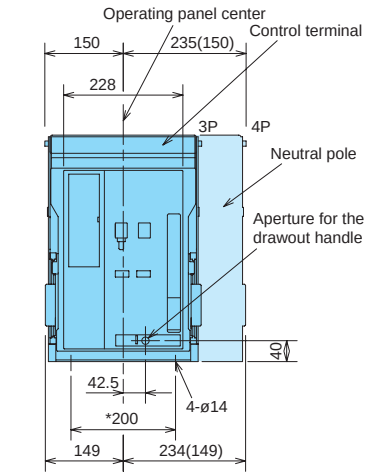
Rear view



Main circuit terminal dimensions

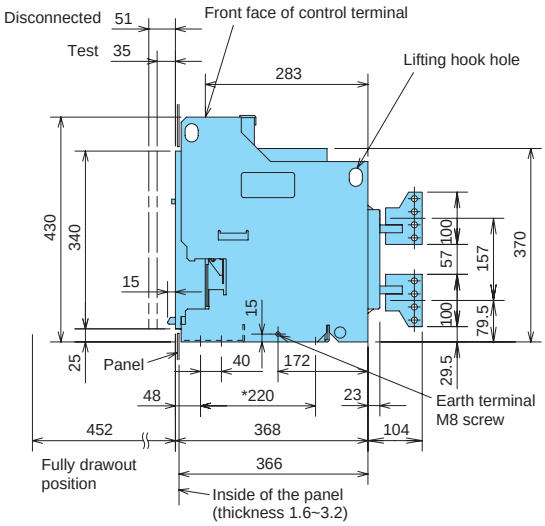
Drawout type AE2000-SWA

Front view

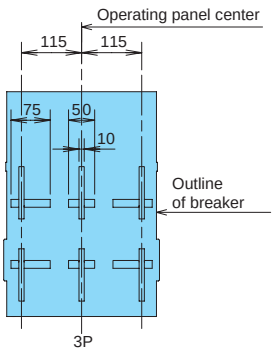


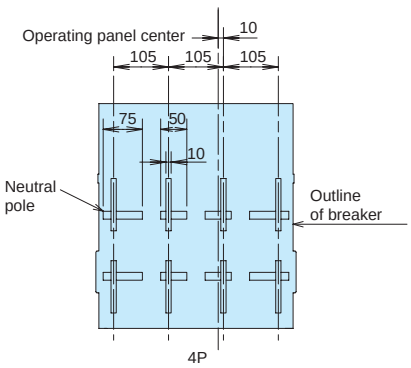
* : Mounting pitch
The numerals shown in parentheses are for 3 poles.

Side view

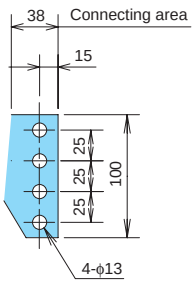


Rear view





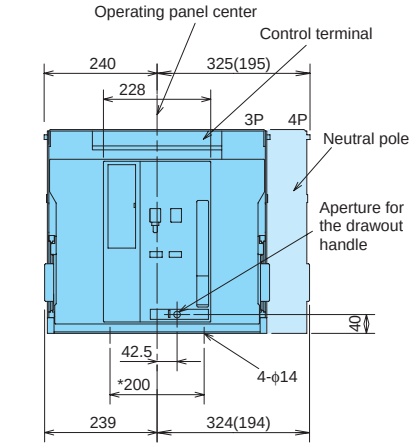
Main circuit terminal dimension



Outline dimensions

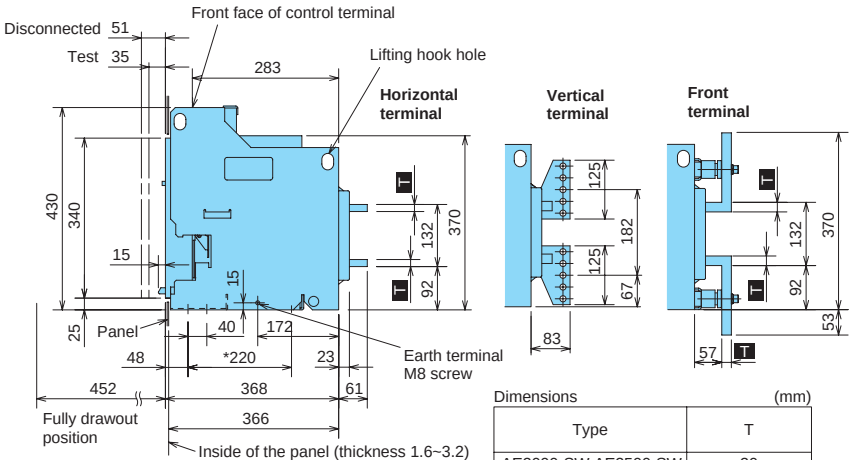
Drawout type AE2000-SW, AE2500-SW, AE3200-SW

Front view



* : Mounting pitch
The numerals shown in parentheses are for 3 poles.

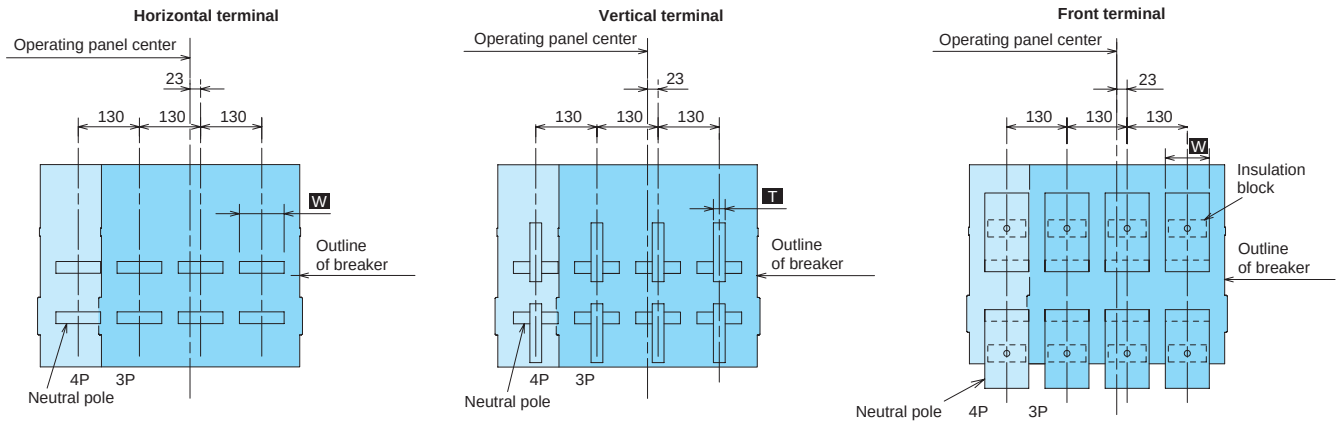
Side view



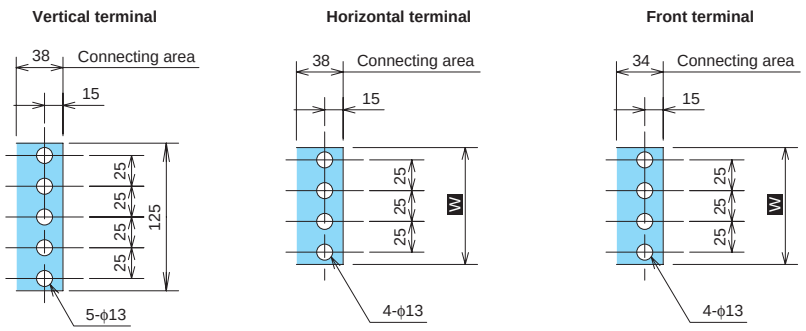
Dimensions (mm)

Type	T
AE2000-SW AE2500-SW	20
AE3200-SW	25

Rear view



Main circuit terminal dimensions

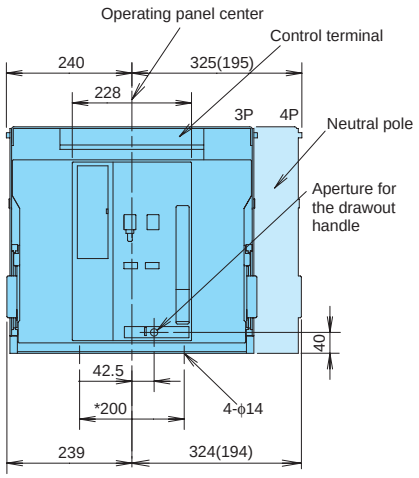


Dimensions (mm)

Type	W
AE2000-SW AE2500-SW	95
AE3200-SW	103

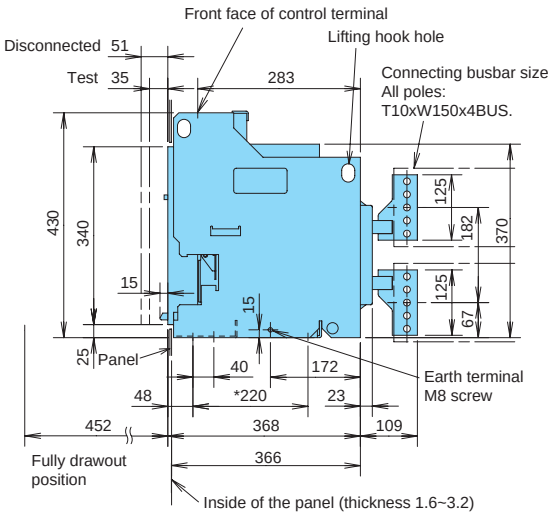
Drawout type AE4000-SWA

Front view

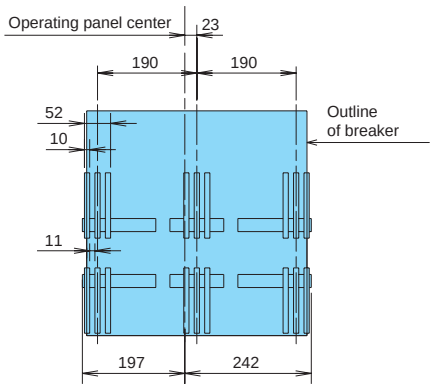


* : Mounting pitch
The numerals shown in parentheses are for 3 poles.

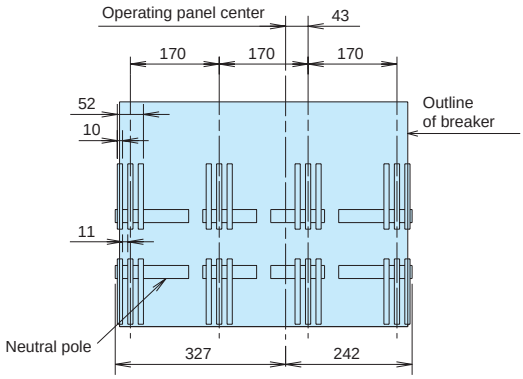
Side view



Rear view

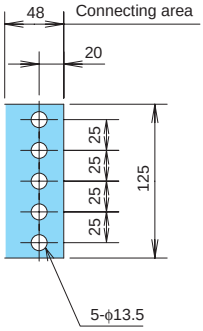


3P



4P

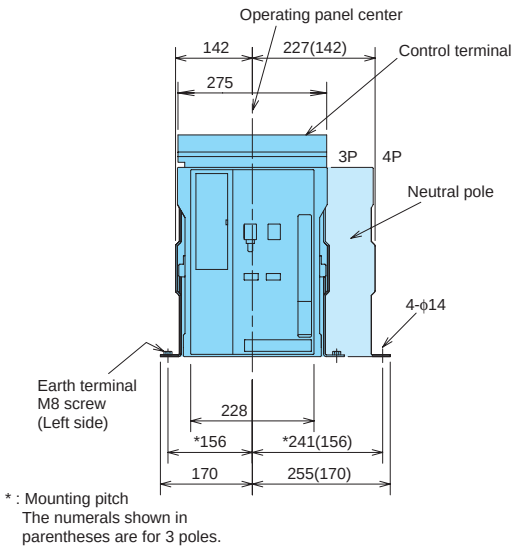
Main circuit terminal dimension



Outline dimensions

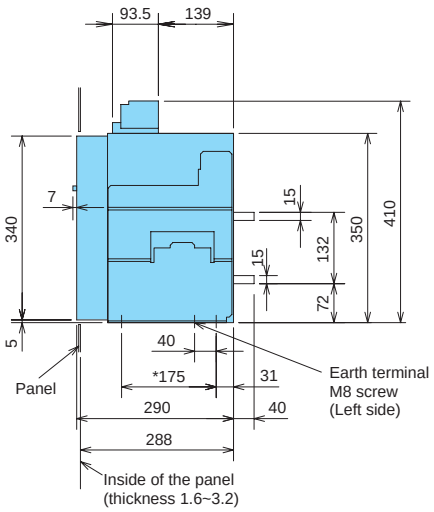
Fixed type AE630-SW, AE1000-SW, AE1250-SW, AE1600-SW

Front view

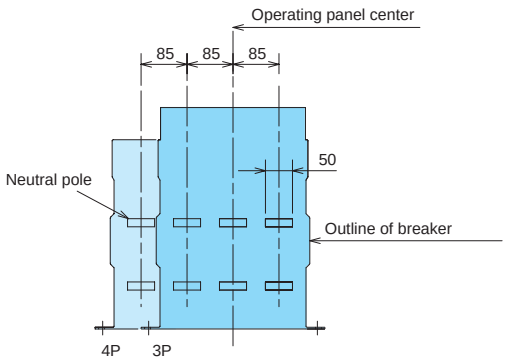


* : Mounting pitch
The numerals shown in parentheses are for 3 poles.

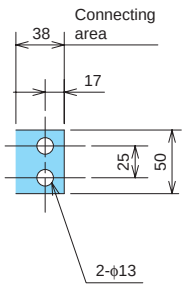
Side view



Rear view

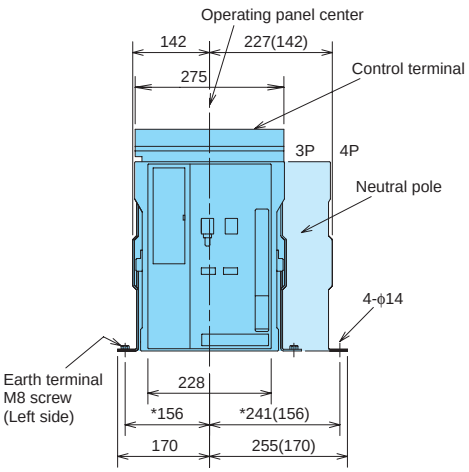


Main circuit terminal dimension



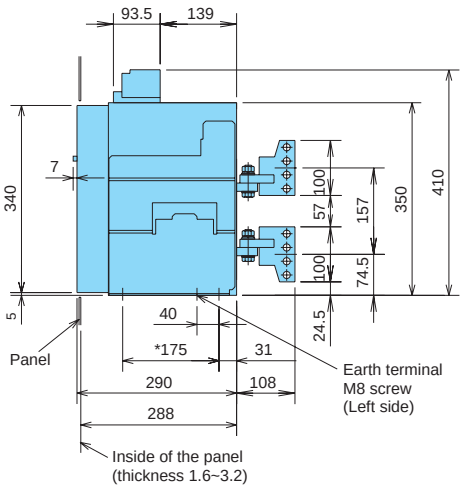
Fixed type AE2000-SWA

Front view

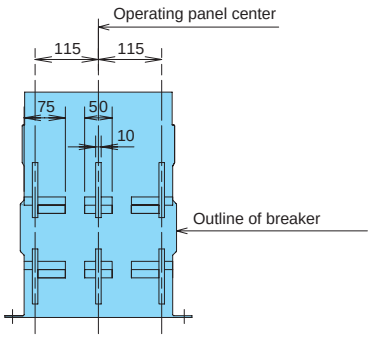


* : Mounting pitch
The numerals shown in parentheses are for 3 poles.

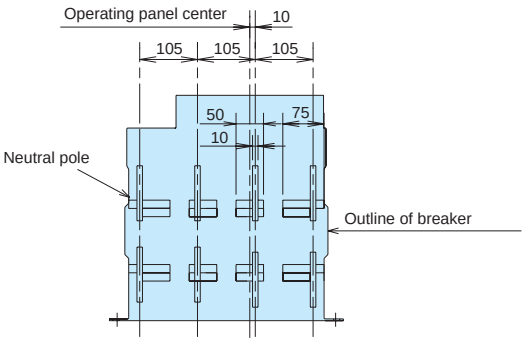
Side view



Rear view

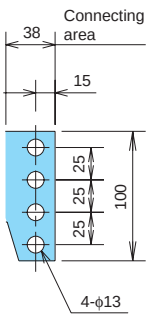


3P



4P

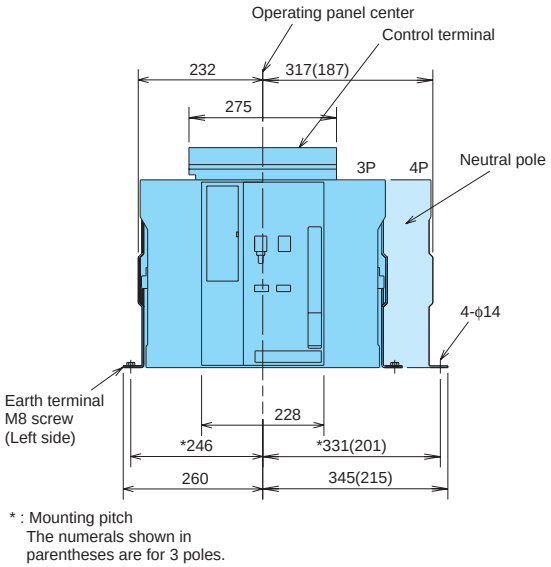
Main circuit terminal dimension



Outline dimensions

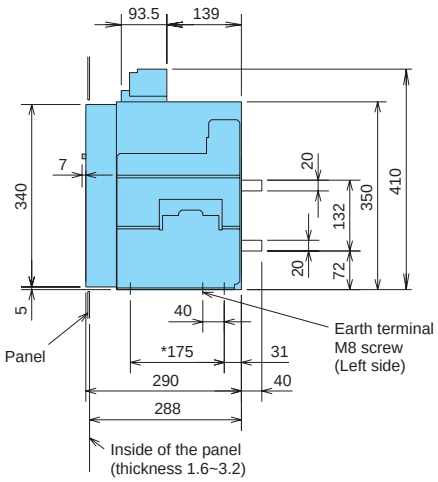
Fixed type AE2000-SW, AE2500-SW, AE3200-SW

Front view

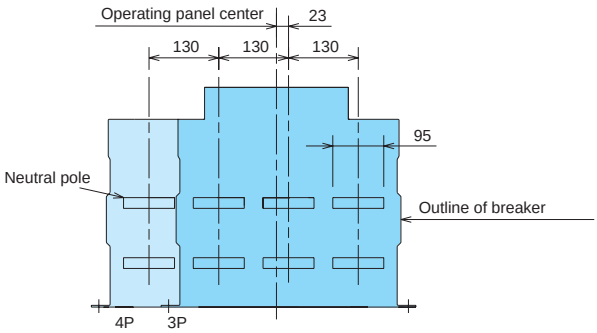


* : Mounting pitch
The numerals shown in parentheses are for 3 poles.

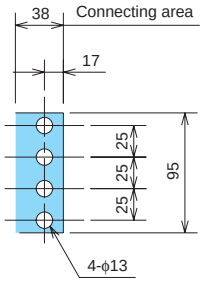
Side view



Rear view

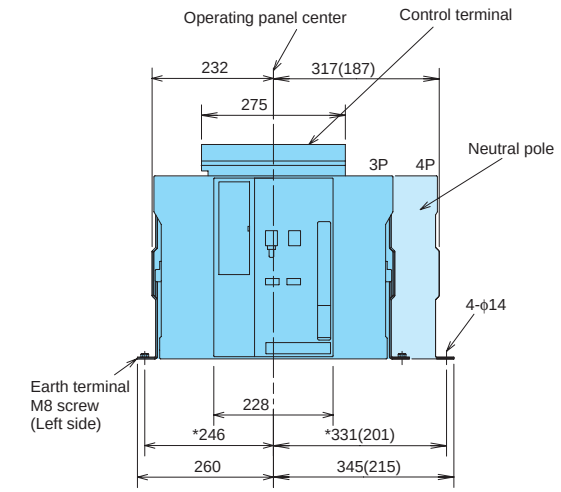


Main circuit terminal dimension



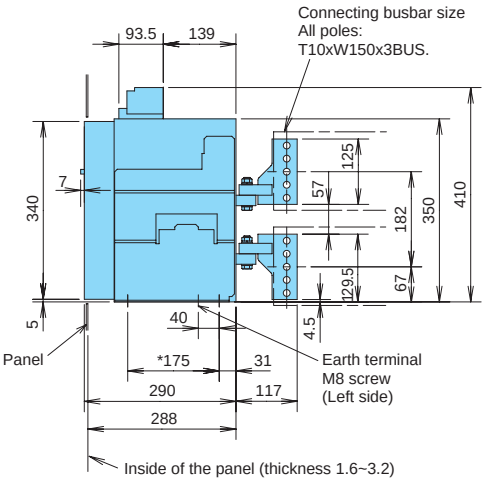
Fixed type AE4000-SWA

Front view

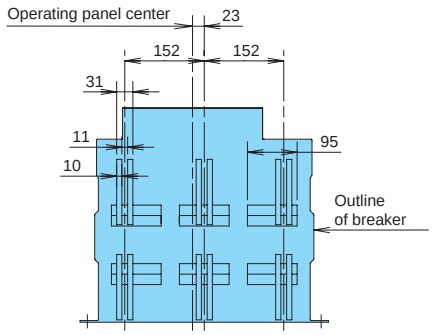


* : Mounting pitch
The numerals shown in parentheses are for 3 poles.

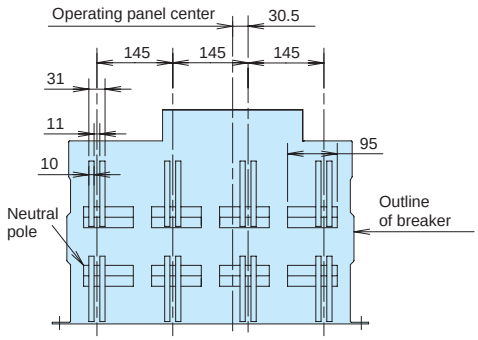
Side view



Rear view

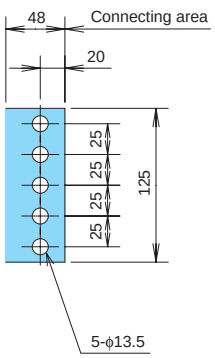


3P



4P

Main circuit terminal dimension

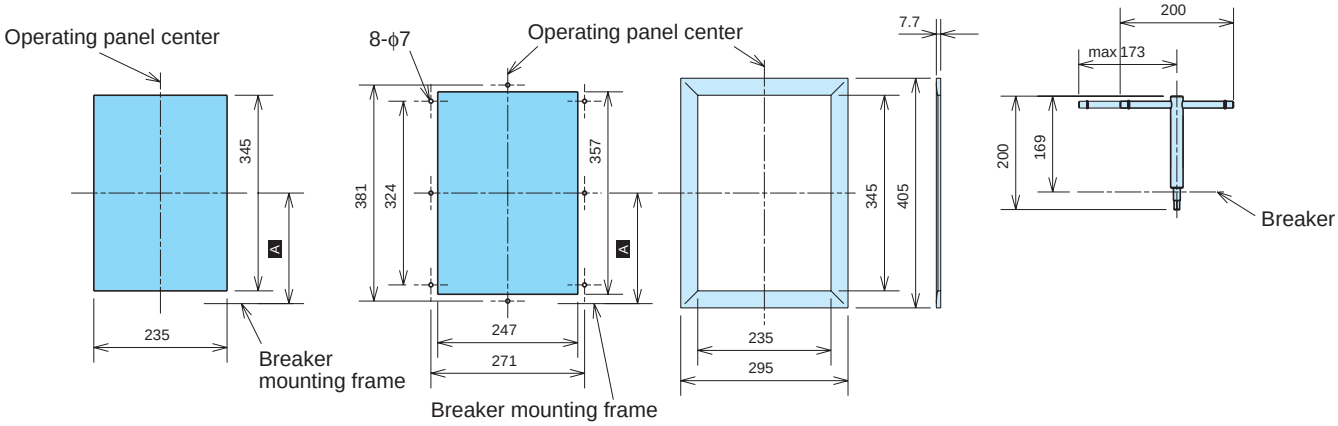


Outline dimensions

Panel-cut, Drawout handle, Terminal adapter

Panel-cut dimensions | Door frame panel-cut dimensions | Drawout handle dimensions

Panel-cut dimensions Outline

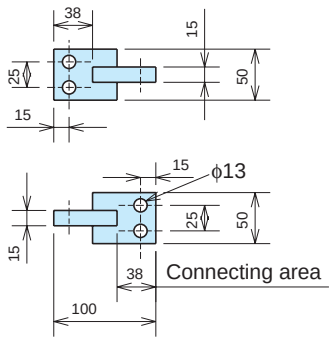


Dimensions (mm)

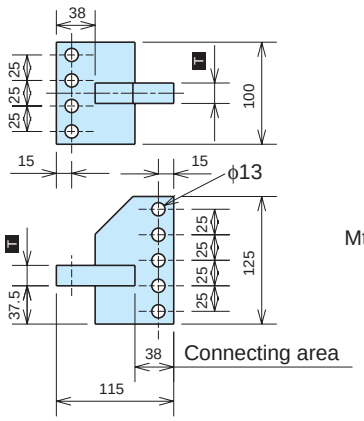
Type	A
Fixed Type	175
Drawout Type	195

Vertial terminal adapter | Front terminal adapter

AE630~1600-SW



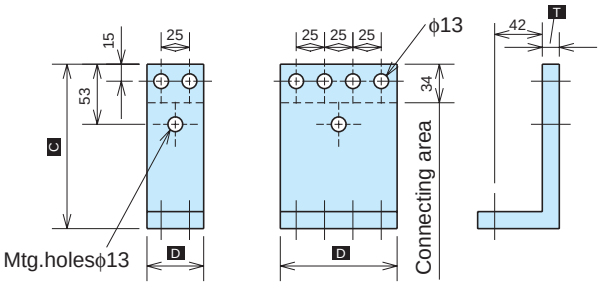
AE2000~3200-SW



Dimensions (mm)

Type	T
AE2000-SW,2500-SW	20
AE3200-SW	25

AE630~1600-SW AE2000~3200-SW

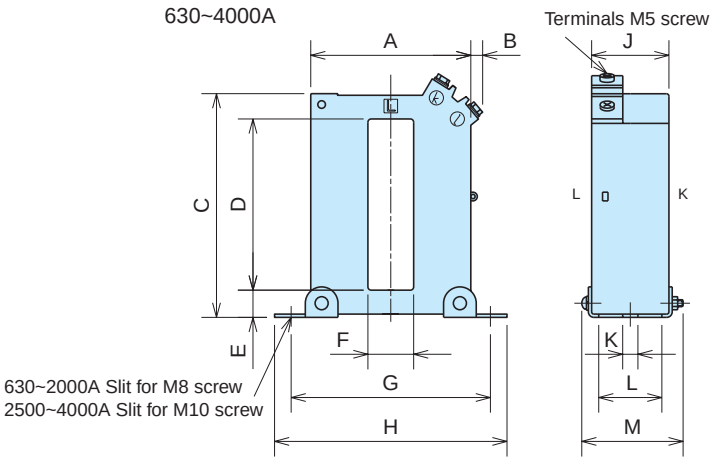


Dimensions (mm)

Type			C	D	T
AE630-SW~1600-SW	Fixed type	Up side	258.5	50	15
		Down side	145	50	15
	Drawout type		145	50	15
AE2000-SW,2500-SW	Fixed type	Up side	258.5	95	20
		Down side	145	95	20
	Drawout type		145	95	20
AE3200-SW	Fixed type	Up side	258.5	95	25
		Down side	145	95	25
	Drawout type		145	103	25

Neutral CT (NCT), External ZCT

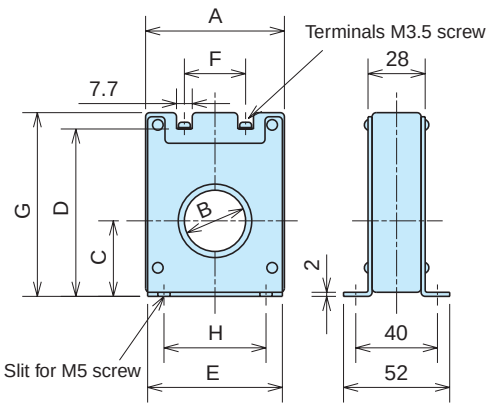
Neutral CT (NCT)



Dimensions (mm)

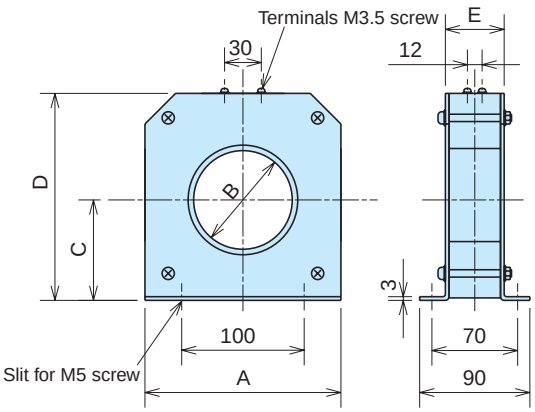
Type	A	B	C	D	E	F	G	H	J	K	L	M
630~2000A	97	5.5	137	105	16.5	28	122	142	51	9	38	66
2500~4000A	162	4	219	160	31	48	192	212	68	11	55	87

External ZCT for transformer ground wire



Dimensions (mm)

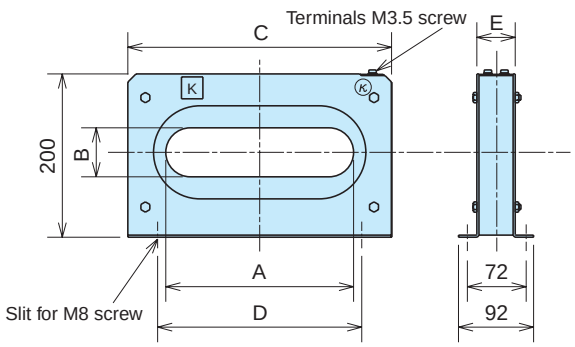
	A	B	C	D	E	F	G	H
ZT15B	48	15	29	62	46	15	70	25
ZT30B	68	30	37	82	66	30	90	50
ZT40B	85	40	43	92	81	40	100	50



Dimensions (mm)

	A	B	C	D	E
ZT60B	140	60	73	150	46
ZT80B	160	80	82	169	48
ZT100B	185	100	93	190	50

External ZCT for load circuits



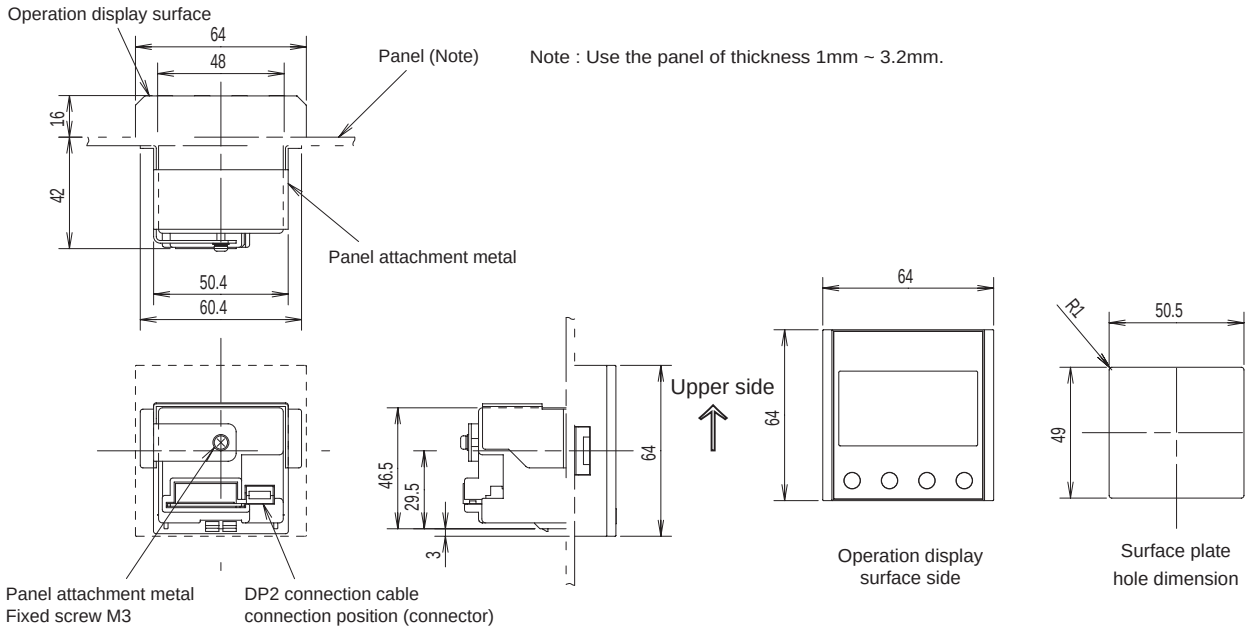
Dimensions (mm)

	A	B	C	D	E
ZCT163	230	60	323	250	47
ZCT323	370	108	460	400	47
ZCT324	500	108	600	550	48

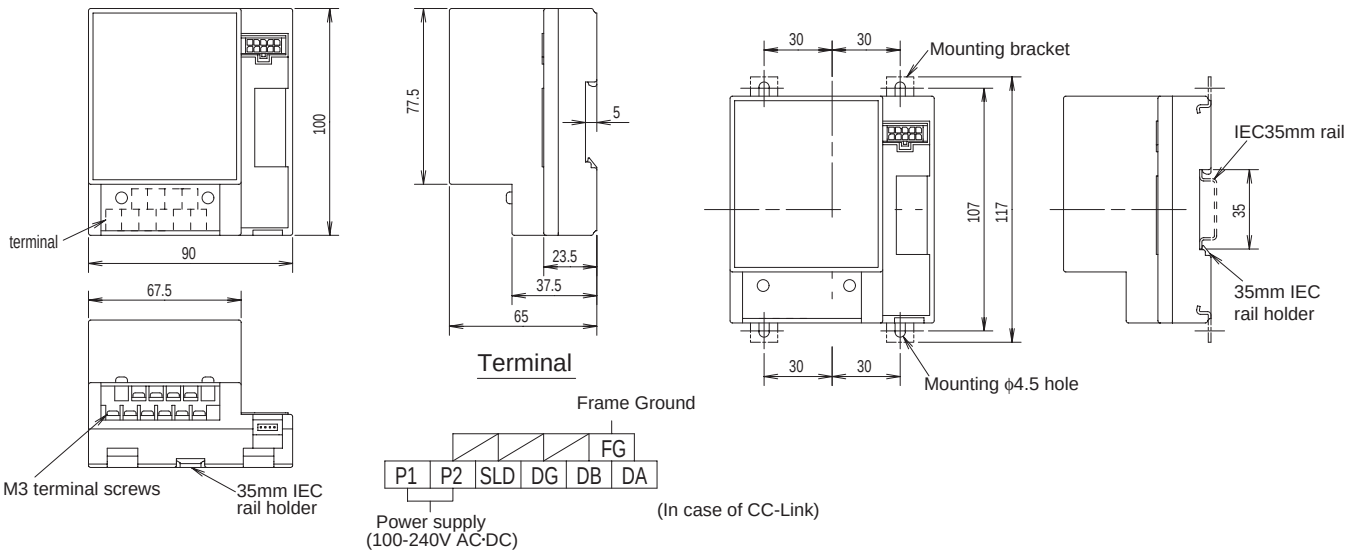
Outline dimensions

ETR external units

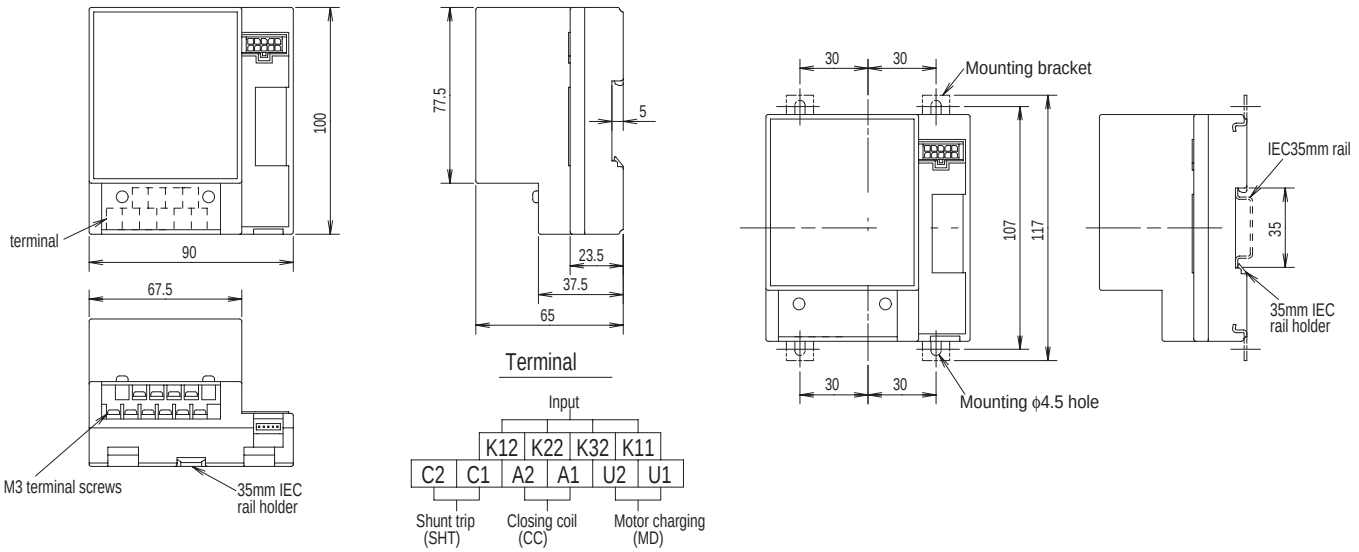
Display onto panel board (DP2)



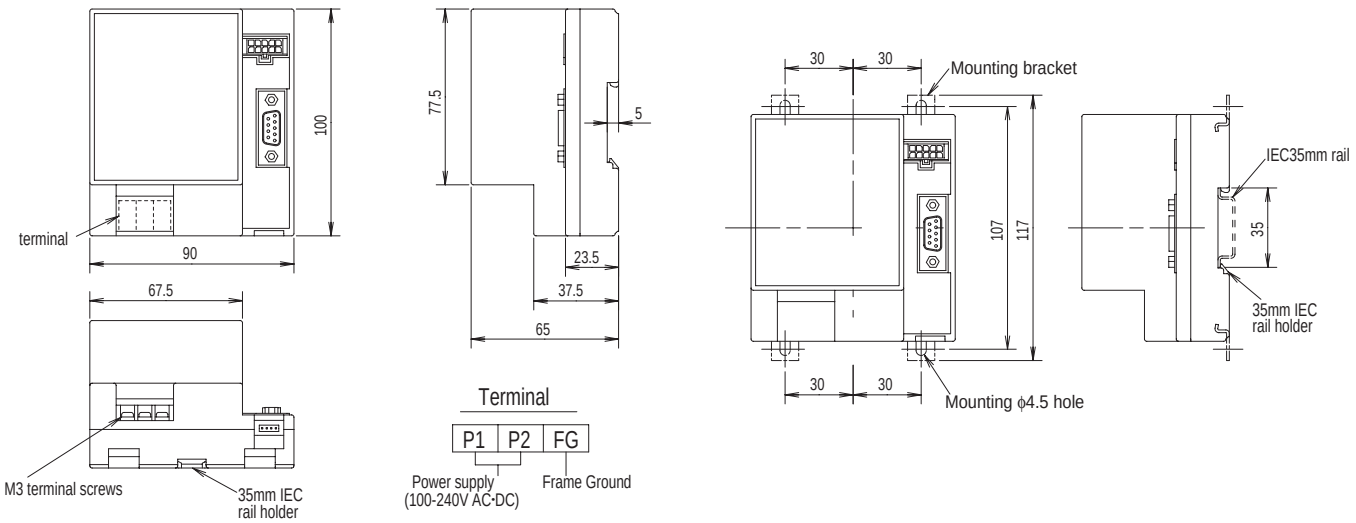
CC-Link, Modbus interface unit (BIF-CC, BIF-MD)



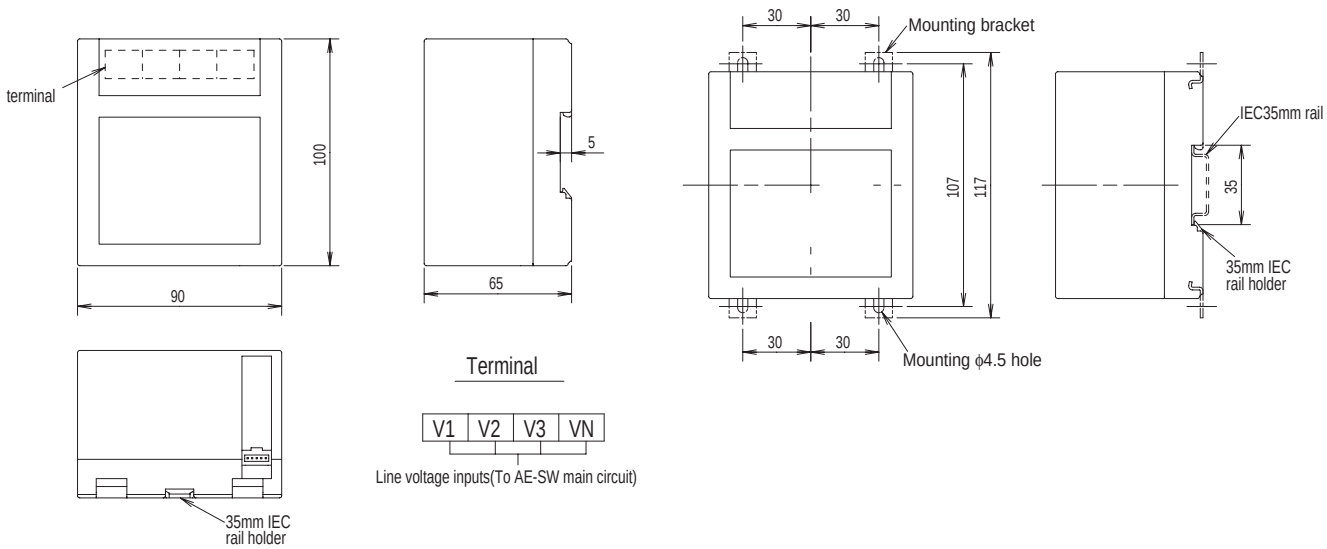
I/O unit (BIF-CON)



PROFIBUS-DP interface unit (BIF-PR)

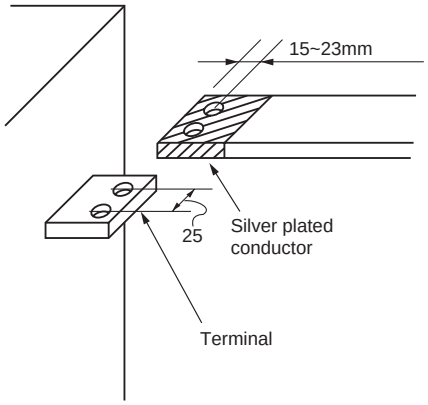


VT unit (VT)



Pre-cautions when making connections

For the terminal connections, use M12 bolts, washers and spring washers.
In order to prevent increased contact resistance due to humidity, silver plating of the contact surface of the conductor which is connected to the terminal of the breaker, is recommended. Also clean the contact surface, and securely connect them at a suitable torque.

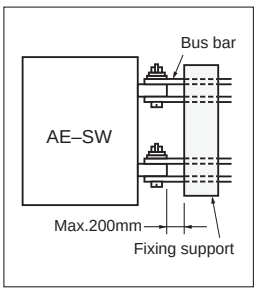


Standard Tightening Torque

Screw size	Tightening Torque(N·m)
M12	40~50
M10 (Note1)	26~33

Note1:In case of Horizontal-Vertical changeable terminal (HVT), use M10 bolt, washer, and spring washer.

Since fault current flowing through the conductors cause large electromagnetic forces,the conductors should be secured firmly, using the values in Table the below as a reference. Max distance between Fixing support and ACB bus bar should be less than 200mm.



Electromagnetic force in N per 1m conductor
(in the case of three phase short circuit) (N)

Type(A) / Conductor distance(mm) / Prospective fault current kA(pf)	AE630-SW~ AE1600-SW	AE2000-SWA		AE2000-SW~ AE3200-SW	AE4000-SWA			
					Drawout type		Fixed type	
		3-Pole	4-Pole		3-Pole	4-Pole	3-Pole	4-Pole
	85	115	105	130	190	170	152	145
30(0.2)	7700	5700	6300	5100	3500	3900	4300	4500
42(0.2)	15100	11200	12200	9900	6800	7600	8500	8900
50(0.2)	21400	15800	17300	14000	9600	10700	12000	12600
65(0.2)	36100	26700	29300	23600	16200	18100	20200	21200
75(0.2)	-	-	-	31500	21500	24100	26900	28200
85(0.2)	-	-	-	40400	27600	30900	34500	36200

When selecting conductors for connection to a Series AE breaker, ensure that they have a sufficient current capacity, refer to the below table.

Conductor Size(IEC-60947-1; Ambient 40°C Temp., Open air)

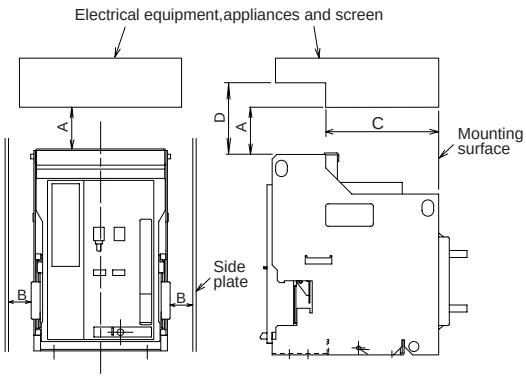
Rated current Max.(A)	Connecting conductors(copper bus bar)		
	Arrangement	Quantity	Conductor size(mm)
630	With long surface vertical	2	40 x 5
1000		2	60 x 5
1250		2	80 x 5
1600		2	100 x 5
2000		3	100 x 5
2500		4	100 x 5
3150(3200)*1		3	100 x 10
4000 (AE4000-SWA Drawout type)		4	150 x 10
4000 (AE4000-SWA Fixed type)		3	150 x 10

*1 The temperature rise of rated current 3200A conforms to the requirement of IEC 60947-1 for the connecting conductor size of a rated current 3150A.In case of more than 3200A, conductor sizes are not defined in IEC 60947-1.

Insulation distance

When a short-circuit current is interrupted, hot gas blows out discharged from the exhaust port of the arc extinguishing chamber, so provide a clearance as shown in the following table.

Note1:On the fixed type, maintenance is possible with following clearance.



Dimensions

Type		AE-SW Series	
Applicable voltage		AC600V or less	AC660V, 690V
Fixed type	A	(Note 1) 0	(Note 1) 100
	B	(Note 3) 50	(Note 3) 50
	C	162	162
	D	(Note 2) 50	(Note 2) 50
Drawout type	A	0	100
	B	(Note 3) 50	(Note 3) 50
	C	240	240
	D	(Note 2) 50	(Note 2) 50

Note1:300mm or more clearance is necessary to inspect the arc-extinguishing chamber and contacts.

Note2:The wiring space reguired for the control terminal block.

Note3:When using mechanical interlock, door interlock ,etc. are installed, dimension B becomes larger.

Service conditions

1. **Normal service condition**

Under ordinary conditions the following normal working conditions are all satisfied, the AE Series air circuit breaker may be used unless otherwise specified.

1.Ambient temperature	A range of max. +40°C to min. -5°C is recommended. And the average over 24 hours must not exceed +35°C.
2.Altitude	2,000m(6,600 feet) or less
3.Environmental conditions	The air must be clean, and the relative humidity must be 85% or less at max. temp. +40°C.Do not use and store in atmospheres with sulfide gas and ammonia gas etc.($H_2S \leq 0.01$ppm, $SO_2 \leq 0.1$ppm, NH_3 < a few ppm.)
4.Installation conditions	When installing the AE Series air circuit breaker, refer to the installation instructions in the catalogue and instruction manual.
5.Storage temperature	A range of max. +60°C to min. -20°C is recommended to be stored. And the average over 24 hours must not exceed +35°C.
6.Guideline for replacement	Within approx. 15 years.Please refer to the instruction manual.

2. **Special service conditions**

In the case of special service condition , modified air circuit breakers are provided.
Please specify when ordering. Service life may be shorter due to service conditions.

1.Special environmental conditions	If it is used under high temperature and/or high humidity, the insulation durability and other electrical/mechanical features may deteriorate. Therefore, the breaker should be specially treated. Moisture fungus treatment with corrosion proofing is recommended. Since some parts may have problems due to corrosion caused by the use in the environments where corrosive gas occurs, the corrosion proof specifications is recommended,in such environments.
2.High ambient temperature	If the ambient temperature exceeds +40°C, the uninterrupted current rating will be reduced. Since the derating value is different depending on the applicable standard, refer to P54.
3.High altitude	Since on the use at the 2,000m or higher, the heat radiation rate is reduced, accordingly the operating voltage, continuous current capacity and breaking capacity are derated.Moreover the insulation durability is also decreased owing to the atmospheric pressure. Please inquire us for further detail.

Internal resistance, reactance and power consumption(per pole)

Type	Connection	Internal resistance (mΩ)	Reactance (mΩ)	Power consumption (W)
AE630-SW	Fixed type	0.028	0.059	11
	Drawout type	0.042	0.089	17
AE1000-SW	Fixed type	0.026	0.060	26
	Drawout type	0.040	0.091	40
AE1250-SW	Fixed type	0.024	0.060	38
	Drawout type	0.038	0.091	60
AE1600-SW	Fixed type	0.016	0.063	41
	Drawout type	0.030	0.095	77
AE2000-SWA	Fixed type	0.016	0.063	64
	Drawout type	0.032	0.095	128
AE2000-SW	Fixed type	0.010	0.047	40
	Drawout type	0.020	0.071	80
AE2500-SW	Fixed type	0.008	0.047	50
	Drawout type	0.018	0.071	113
AE3200-SW	Fixed type	0.007	0.048	72
	Drawout type	0.014	0.072	143
AE4000-SWA	Fixed type	0.009	0.048	144
	Drawout type	0.015	0.072	240

The above values are applicable for one pole. (New breaker)

Deratings by ambient temperature

(A)

Standard	IEC60947-2 , BS , JIS C 8201-2 (Standard:40°C)				
Ambient Temperature	40°C	45°C	50°C	55°C	60°C
AE630-SW	630	630	630	630	630
AE1000-SW	1000	1000	1000	1000	1000
AE1250-SW	1250	1250	1250	1250	1200
AE1600-SW	1600	1600	1600	1550	1500
AE2000-SWA	2000	2000	1900	1800	1700
AE2000-SW	2000	2000	2000	2000	2000
AE2500-SW	2500	2500	2500	2450	2350
AE3200-SW	3200	3200	3200	3000	2900
AE4000-SWA	4000	4000	4000	3800	3600

With Extension module,Display,Network (A)

Standard	IEC60947-2 , BS , JIS C 8201-2 (Standard:40°C)		
Ambient Temperature	40°C	45°C	50°C
AE630-SW	630	630	630
AE1000-SW	1000	1000	1000
AE1250-SW	1250	1250	1250
AE1600-SW	1600	1600	1440
AE2000-SWA	2000	1900	1700
AE2000-SW	2000	2000	2000
AE2500-SW	2500	2500	2500
AE3200-SW	3200	3200	2880
AE4000-SWA	4000	3800	3600

The above table shows the maximum rated current (at new product) of drawout type breaker by vertical connection methods and the ambient temperature of breaker and bus bar.
Connection bus bar is by IEC60947-1. AE3200-SW and AE4000-SWA are by manufacturer recommended size of P51.
Breaker and bus bar show the maximum current value in open air.
As for ambient temperature exceeding 60°C, please inquire us.
In case of with extension module (EX1), display (DP1), and network attached, deratings are the values shown in this table.

Discrimination table

AE-SW Series air circuit breakers provide easy selective co-ordination with branch circuit breakers.
For selective co-crdinations,refer to the following table.

AC230V sym kA

Main circuit breaker / Unit breaking capacity / Branch circuit breaker			AE-SW								
			AE630-SW	AE1000-SW	AE1250-SW	AE1600-SW	AE2000-SWA	AE2000-SW	AE2500-SW	AE3200-SW	AE4000-SWA
			65	65	65	65	65	85	85	85	85
NF|S·H·MB·NV|S·H	NF32-SW MB30-SW MB50-CW	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
	NV32-SW	10	9(10)	10	10	10	10	10	10	10	10
	NF63-SW MB50-SW NV63-SW	15	9(10)	10	10	10	10	10	10	10	10
	NF63-HW NV63-HW	25	9(25)	25	25	25	25	25	25	25	25
	NF125-SW MB100-SW NV125-SW NV100-SEP	50	9(50)	45(50)	50	50	50	50	50	50	50
	NF125-HW NV125-HW	100	9(65)	50(65)	65	65	65	85	85	85	85
	NF250-SW MB225-SW NV250-SW NV250-SEW	50	9(50)	20(50)	22(50)	42(50)	42(50)	50	50	50	50
	NF250-HW NV250-HW	100	9(65)	25(65)	40(65)	65	65	85	85	85	85
	NF400-SP NV400-SP	85	-	-	20(65)	27(65)	27(65)	42(65)	70	85	85
	NF400-SEP NV400-SEP	85	9(65)	15(65)	20(65)	27(65)	27(65)	42(65)	70	85	85
	NF400-HEP NV400-HEP	100	9(65)	15(65)	20(65)	27(65)	27(65)	42(65)	70	85	85
	NF400-REP NV400-REP	125	9(65)	15(65)	20(65)	27(65)	27(65)	42(65)	70	85	85
	NF630-SP NV630-SP	85	-	-	-	24(65)	24(65)	30(65)	40(65)	60(65)	60(65)
	NF630-SEP NV630-SEP	85	-	15(65)	18(65)	24(65)	24(65)	30(65)	40(65)	60(65)	60(65)
	NF630-HEP NV630-HEP	100	-	15(65)	18(65)	24(65)	24(65)	30(65)	40(65)	60(65)	60(65)
	NF630-REP	125	-	15(65)	18(65)	24(65)	24(65)	30(65)	40(65)	60(65)	60(65)
	NF800-SEP NV800-SEP	85	-	-	18(65)	24(65)	24(65)	30(65)	40(65)	60(65)	60(65)
	NF800-HEP NV800-HEP	100	-	-	18(65)	24(65)	24(65)	30(65)	40(65)	60(65)	60(65)
	NF800-REP	125	-	-	18(65)	24(65)	24(65)	30(65)	40(65)	60(65)	60(65)
NF|C·NV|C	NF63-CW NV63-CW	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
	NF125-CW NV125-CW	30	9(30)	15(30)	18(30)	24(30)	24(30)	30	30	30	30
	NF250-CW NV250-CW	35	9(35)	15(35)	18(35)	24(35)	24(35)	35	35	35	35
	NF400-CP NV400-CP	50	-	15(50)	18(50)	24(50)	24(50)	30(50)	37(50)	48(50)	48(50)
	NF630-CP NV630-CP	50	-	-	-	24(50)	24(50)	30(50)	37(50)	48(50)	48(50)
	NF800-CEP	50	-	-	-	24(50)	24(50)	30(50)	37(50)	48(50)	48(50)
NF|U	NF125-RGW	125	65	65	65	65	65	85	85	85	85
	NF125-UGW	200	65	65	65	65	65	85	85	85	85
	NF250-RGW	125	9(65)	65	65	65	65	85	85	85	85
	NF250-UGW	200	9(65)	65	65	65	65	85	85	85	85
	NF400-UEP	200	9(65)	15(65)	18(65)	29(65)	29(65)	48(65)	85	85	85
	NF630-UEP	200	-	15(65)	18(65)	24(65)	24(65)	30(65)	37(65)	68	68
	NF800-UEP	200	-	-	18(65)	24(65)	24(65)	30(65)	37(65)	68	68
NF|C·NV|C	NF30-KC NF50-KC NF100-KC NV30-KC NV50-KC NV100-KC	5	5	5	5	5	5	5	5	5	5

- The values in the table represent the max.rated current for both Series AE-SW air circuit breakers and branch breakers,and the selective co-ordination applies when the AE-SW series air circuit breakers instantaneous pick up is set to maximum.
- The numerals shown in parentheses are for AE-SW with MCR.(When set MCR).

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Main circuit breaker / Unit breaking capacity / Branch circuit breaker			AE-SW								
			AE630-SW	AE1000-SW	AE1250-SW	AE1600-SW	AE2000-SWA	AE2000-SW	AE2500-SW	AE3200-SW	AE4000-SWA
			65	65	65	65	65	85	85	85	85
NF|S·H·MB·NV|S·H	NF32-SW MB30-SW MB50-CW	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	NV32-SW	5	5	5	5	5	5	5	5	5	5
	NF63-SW MB50-SW NV63-SW	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
	NF63-HW NV63-HW	10	9(10)	10	10	10	10	10	10	10	10
	NF125-SW MB100-SW NV125-SW NV100-SEP	25	7(25)	20(25)	25	25	25	25	25	25	25
	NF125-HW NV125-HW	50	9(50)	30(50)	50	50	50	50	50	50	50
	NF250-SW MB225-SW NV250-SW NV250-SEW	25	7(25)	14(25)	19(25)	25	25	25	25	25	25
	NF250-HW NV250-HW	50	7(50)	15(50)	25(50)	42(50)	42(50)	50	50	50	50
	NF400-SP NV400-SP	50	-	-	18(50)	24(50)	24(50)	33(50)	45(50)	50	50
	NF400-SEP NV400-SEP	50	9(50)	15(50)	18(50)	24(50)	24(50)	33(50)	45(50)	50	50
	NF400-HEP NV400-HEP	65	9(65)	15(65)	18(65)	24(65)	24(65)	33(65)	45(65)	65	65
	NF400-REP NV400-REP	125	9(65)	15(65)	18(65)	24(65)	24(65)	33(65)	45(65)	80	80
	NF630-SP NV630-SP	50	-	-	-	24(50)	24(50)	33(50)	45(50)	50	50
	NF630-SEP NV630-SEP	50	-	15(50)	18(50)	24(50)	24(50)	30(50)	40(50)	50	50
	NF630-HEP NV630-HEP	65	-	15(65)	18(65)	24(65)	24(65)	30(65)	40(65)	60(65)	60(65)
	NF630-REP	125	-	15(65)	18(65)	24(65)	24(65)	30(65)	40(65)	60(65)	60(65)
	NF800-SEP NV800-SEP	50	-	-	18(50)	24(50)	24(50)	30(50)	40(50)	60(50)	60(50)
	NF800-HEP NV800-HEP	65	-	-	18(65)	24(65)	24(65)	30(65)	40(65)	60(65)	60(65)
	NF800-REP	125	-	-	18(65)	24(65)	24(65)	30(65)	40(65)	60(65)	60(65)
NF|C·NV|C	NF63-CW NV63-CW	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	NF125-CW NV125-CW	10	9(10)	10	10	10	10	10	10	10	10
	NF250-CW NV250-CW	15	9(15)	15	15	15	15	15	15	15	15
	NF400-CP NV400-CP	25	-	15(25)	18(25)	24(25)	24(25)	25	25	25	25
	NF630-CP NV630-CP	35	-	-	-	24(35)	24(35)	30(35)	35	35	35
	NF800-CEP	35	-	-	-	24(35)	24(35)	30(35)	35	35	35
NF|U	NF125-RGW	125	35(65)	65	65	65	65	85	85	85	85
	NF125-UGW	200	50(65)	65	65	65	65	85	85	85	85
	NF250-RGW	125	9(65)	50(65)	65	65	65	85	85	85	85
	NF250-UGW	200	9(65)	65	65	65	65	85	85	85	85
	NF400-UEP	200	9(65)	15(65)	18(65)	29(65)	29(65)	48(65)	85	85	85
	NF630-UEP	200	-	15(65)	18(65)	24(65)	24(65)	30(65)	37(65)	68	68
	NF800-UEP	200	-	-	18(65)	24(65)	24(65)	30(65)	37(65)	68	68

- The values in the table represent the max.rated current for both Series AE-SW air circuit breakers and branch breakers,and the selective co-ordination applies when the AE-SW series air circuit breakers instantaneous pick up is set to maximum.
- The numerals shown in parentheses are for AE-SW with MCR.(When set MCR).

Ordering information

Ordering information for Mitsubishi AE-SW series air circuit breaker(General use……WS Type,Special use……WB Type)

Customer(name) _____ Order No. _____ Number of units _____ units

Type P9~10 AE 1600 -SW AE _____-SWA

Number of poles ☑ 3P ☐ 4P

Rated current 1600 A CT rating 1600 A Note1 P9,P20

Applicable standard ☑ IEC 60947-2 ☐ CCC

Ambient temperature ☑ 40°C(Standard) ☐ Others _____°C Note2

Reset type ☑ Automatic Reset (Standard) ☐ Manual Reset (MRE)

Connection ☐ Fixed type Note3 ☑ Drawout type Note3

Main circuit terminal P11
- ☐ Horizontal terminal(FIX) (AE630–1600-SW / AE2000–3200-SW)
- ☐ Vertical terminal(FIX-VT) (AE2000-SWA / AE4000-SWA)
- ☑ Horizontal terminals(DR)(standard)
- ☐ Vertical terminals(DR-VT)
- ☐ Front terminals(DR-FT)
- ☐ Horizontal-Vertical Changeable(DR-HVT) Note4

Drawout type accessories P17~18
- ☑ Cell switch(CL- 4 : 1 or 2 or 3 or 4) Note5
- ☐ Short-circuit B-contact(SBC)
- ☐ Lifting hooks(HP)
- ☑ Safety shutter(SST)
  - ☑ Shutter lock(SST-LOCK)
- ☐ Mis-insertion preventer(MIP)
- ☐ Test jumper(TJ)

- ☐ Vertical terminal adapter(VTA)
- ☐ Front terminal adapter(FTA)

Can be connected to the Horizontal terminals.

Electronic trip relay(ETR)

☑ With ETR

Type WS1 G1 – P1

Main setting module
- WS1: General use for AE630–1600-SW / AE2000–3200-SW
- WS2: General use for AE2000-SWA / AE4000-SWA
- WB1: INST/MCR only for AE630–1600-SW / AE2000–3200-SW
- WB2: INST/MCR only for AE2000-SWA / AE4000-SWA

Optional setting module
- G1: Ground fault protection Note6 Note7
- N5: Neutral pole 50% protection Note7
- E1: Earth leakage protection
- AP: 2nd Additional Pre-alarm
- NA: Without optional setting

Power supply
- P1: AC·DC100-240V
- P2: DC24-60V
- P3: AC100-240V / DC100-125V with output contact
- P4: DC24-60V with output contact
- P5: DC100-240V with output contact (SSR)

Additional function P32
- ☑ Extension module(EX1)
  - ☑ Display(DP1)
  - ☐ Display onto panel board(DP2)
  - ☑ VT unit(VT)
  - ☐ Temperature alarm(TAL)
  - ☐ MCR switch(MCR-SW)

Network P33
- ☐ BIF-CC
- ☐ BIF-PR
- ☐ BIF-MD
- ☐ BIF-CON
- ☐ BIF-CL

- ☐ Neutral CT(NCT) Note8
- ☐ External ZCT Note9 P28
  - ZCT ☐
  - ZT ☐ B
  - ZTA ☐

☐ BARE(ETR not required)

Electrical accessories P12~14
- ☑ Auxiliary switch "A"and"B"should be same. Max. 5A5B
  - ☑ Standard(AX 6 : 2 or 4 or 6 or 8 or 10)
  - ☐ High capacity(HAX ☐ : 2 or 4 or 6 or 8 or 10)
- ☑ Motor charging(MD) Note:When specifying MD, be sure to order the closing coil(CC)and shunt trip device(SHT)for remote operation.
  - ☑ AC・DC100–125V
  - ☐ AC・DC200–250V
  - ☐ DC24V Note10
  - ☐ DC48V
- ☑ Closing coil(CC)
  - ☑ AC・DC100–250V
  - ☐ DC24–48V
- ☑ Shunt trip device (SHT)
  - ☑ AC・DC100–250V
  - ☐ AC380–500V
  - ☐ DC24–48V
- ☑ Under voltage trip device(UVT)
  - ☑ AC100–120V
  - ☐ AC200–240V
  - ☐ AC380–460V
  - ☐ DC24V
  - ☐ DC48V
  - ☐ DC100–110V
  - ☐ DC120–125V

  Time delay
  - ☑ Inst(INST)
  - ☐ 0.5s(05)
  - ☐ 3.0s(30)

  Note:In case of 380-460V AC, the external transformer is attached

P16 ☑ Condenser trip device (COT)
- ☑ AC100–110V
- ☐ AC200–220V

Mechanical accessories P15~16
- ☑ Push button cover(BC-L)
- ☑ Counter(CNT)
- ☐ Cylinder lock(CYL)
- ☐ Door interlock(DI) Note11
- ☐ IP20-Terminal cover(IP-TC)
- ☑ Door frame(DF)
- ☐ Dust cover(DUC)
- ☑ Interphase barrier(BA) Note12
- ☐ Mechanical interlock(MI)
  - ☐ for 2units(MI2)
  - ☐ for 3units(MI3) Note11

Special environments P52 ☐ Moisture-fungus treatment ☐ Corrosion resist

Note1: In case of AE630-SW and AE2000-SW Low rating type, please specify CT rating. Refer to Page 9 and Page 20.

Note2: There is a case to be derated by ambient temperature. Refer to Page 54.

Note3: As for the terminal for AE2000-SWA and AE4000-SWA, Vertical terminal type only is available. (FIX-VT or DR-VT)

Note4: DR-HVT is available for AE630-SW~AE1600-SW. It is provided a special "Cradle" and "Terminals", which have adifferent dimensions from the other connection. Refer to Page 11 and Page 39.

Note5: This setting is available for change by customer later.A preliminary setting of CL at factory shipment is as follows.
CL1: 1C CL2: 1C1D CL3: 1C1T1D CL4: 2C1T1D

Note6: Not available for AE630-SW with CT rating : 250A or 315A or 500A.

Note7: Not available for WB1 or WB2 Main setting module.
N5 optional setting module is used for 3phase 4wires system.(4Pole breaker or 3pole breaker with Neutral CT)

Note8: Neutral CT is required for Ground fault or Neutral pole protection,when 3 Pole breaker is used for 3 phase 4 wires system.

Note9: In case of Earth leakage protection, it is required External ZCT.

Note10: DC24V and DC48V are not available for AE4000-SWA 4P.

Note11: The combined installation of DI and MI3 is not available.

Note12: Some module types are not provided BA. Refer to Page15.

Remark

Order Issuer

Ordering information for Mitsubishi AE-SW series air circuit breaker(General use……WS Type,Special use……WB Type)

Customer(name) _____ **Order No.** _____ **Number of units** ____ **units**

Type P9~10 AE _____-SW AE _____-SWA

Number of poles ☐ 3P ☐ 4P

Rated current _____ A CT rating _____ A Note1 P9,P20

Applicable standard ☐ IEC 60947-2 ☐ CCC

Ambient temperature ☐ 40°C(Standard) ☐ Others _____ °C Note2

Reset type ☐ Automatic Reset (Standard) ☐ Manual Reset (MRE)

Connection ☐ Fixed type Note3 ☐ Drawout type Note3

Main circuit terminal P11

- ☐ Horizontal terminal(FIX) (AE630-1600-SW / AE2000-3200-SW)
- ☐ Vertical terminal(FIX-VT) (AE2000-SWA / AE4000-SWA)
  - ☐ Horizontal terminals(DR)(standard)
  - ☐ Vertical terminals(DR-VT)
  - ☐ Front terminals(DR-FT)
  - ☐ Horizontal-Vertical Changeable(DR-HVT) Note4

Drawout type accessories P17~18

- ☐ Cell switch(CL- ☐: 1 or 2 or 3 or 4) Note5
- ☐ Short-circuit B-contact(SBC)
- ☐ Lifting hooks(HP)
- ☐ Safety shutter(SST)
  - ☐ Shutter lock(SST-LOCK)
- ☐ Mis-insertion preventer(MIP)
- ☐ Test jumper(TJ)

- ☐ Vertical terminal adapter(VTA)
- ☐ Front terminal adapter(FTA)

Can be connected to the Horizontal terminals.

Electronic trip relay(ETR)

☐ With ETR

Type ☐☐☐-☐

Main setting module
- WS1: General use for AE630–1600-SW / AE2000–3200-SW
- WS2: General use for AE2000-SWA / AE4000-SWA
- WB1: INST/MCR only for AE630–1600-SW / AE2000–3200-SW
- WB2: INST/MCR only for AE2000-SWA / AE4000-SWA

Optional setting module
- G1: Ground fault protection Note6
- N5: Neutral pole 50% protection Note7
- E1: Earth leakage protection
- AP: 2nd Additional Pre-alarm
- NA: Without optional setting

Power supply
- P1: AC•DC100-240V
- P2: DC24-60V
- P3: AC100-240V / DC100-125V with output contact
- P4: DC24-60V with output contact
- P5: DC100-240V with output contact (SSR)

Additional function P32
- ☐ Extension module(EX1)
  - ☐ Display(DP1)
  - ☐ Display onto panel board(DP2)
  - ☐ VT unit(VT)
- ☐ Temperature alarm(TAL)
- ☐ MCR switch(MCR-SW)

Network P33
- ☐ BIF-CC
- ☐ BIF-PR
- ☐ BIF-MD
- ☐ BIF-CON
- ☐ BIF-CL

- ☐ Neutral CT(NCT) Note8
- ☐ External ZCT Note9 P28
  - ZCT ☐
  - ZT ☐ B
  - ZTA ☐

☐ BARE(ETR not required)

Electrical accessories P12~14

- ☐ Auxiliary switch "A"and"B"should be same. Max. 5A5B
  - ☐ Standard(AX ☐ : 2 or 4 or 6 or 8 or 10)
  - ☐ High capacity(HAX ☐ : 2 or 4 or 6 or 8 or 10)
- ☐ Motor charging(MD)
  - ☐ AC • DC100–125V
  - ☐ AC • DC200–250V
  - ☐ DC24V
  - ☐ DC48V

  Note:When specifying MD, be sure to order the closing coil(CC)and shunt trip device(SHT)for remote operation. Note10
- ☐ Closing coil(CC)
  - ☐ AC • DC100–250V
  - ☐ DC24–48V
- ☐ Shunt trip device (SHT)
  - ☐ AC • DC100–250V
  - ☐ AC380–500V
  - ☐ DC24–48V
- ☐ Under voltage trip device(UVT)
  - ☐ AC100–120V
  - ☐ AC200–240V
  - ☐ AC380–460V
  - ☐ DC24V
  - ☐ DC48V
  - ☐ DC100–110V
  - ☐ DC120–125V

  Time delay
  - ☐ Inst(INST)
  - ☐ 0.5s(05)
  - ☐ 3.0s(30)

  Note:In case of 380-460V AC, the external transformer is attached

P16 ☐ Condenser trip device (COT)
- ☐ AC100–110V
- ☐ AC200–220V

Mechanical accessories P15~16

- ☐ Push button cover(BC-L)
- ☐ Counter(CNT)
- ☐ Cylinder lock(CYL)
- ☐ Door interlock(DI) Note11
- ☐ IP20-Terminal cover(IP-TC)
- ☐ Door frame(DF)
- ☐ Dust cover(DUC)
- ☐ Interphase barrier(BA) Note12
- ☐ Mechanical interlock(MI)
  - ☐ for 2units(MI2)
  - ☐ for 3units(MI3) Note11

Special environments P52 ☐ Moisture-fungus treatment ☐ Corrosion resist

Note1: In case of AE630-SW and AE2000-SW Low rating type, please specify CT rating. Refer to Page 9 and Page 20.

Note2: There is a case to be derated by ambient temperature. Refer to Page 54.

Note3: As for the terminal for AE2000-SWA and AE4000-SWA, Vertical terminal type only is available. (FIX-VT or DR-VT)

Note4: DR-HVT is available for AE630-SW~AE1600-SW. It is provided a special "Cradle" and "Terminals", which have adifferent dimensions from the other connection. Refer to Page 11 and Page 39.

Note5: This setting is available for change by customer later.A preliminary setting of CL at factory shipment is as follows.
CL1: 1C CL2: 1C1D CL3: 1C1T1D CL4: 2C1T1D

Note6: Not available for AE630-SW with CT rating : 250A or 315A or 500A.

Note7: Not available for WB1 or WB2 Main setting module.
N5 optional setting module is used for 3phase 4wires system.(4Pole breaker or 3pole breaker with Neutral CT)

Note8: Neutral CT is required for Ground fault or Neutral pole protection,when 3 Pole breaker is used for 3 phase 4 wires system.

Note9: In case of Earth leakage protection, it is required External ZCT.

Note10: DC24V and DC48V are not available for AE4000-SWA 4P.

Note11: The combined installation of DI and MI3 is not available.

Note12: Some module types are not provided BA. Refer to Page15.

Remark

Order Issuer

Ordering information for Mitsubishi AE-SW series air circuit breaker(Generator protection use……WM Type)

Customer(name) _____ **Order No.** _____ **Number of units** ____ units

Type P9~10 AE _____-SW AE _____-SWA

Number of poles ☐ 3P ☐ 4P

Rated current _____ A CT rating _____ A Note1 P9,P20

Applicable standard ☐ LR ☐ GL ☐ BV ☐ DNV ☐ ABS ☐ NK ☐ IEC 60947-2

Ambient temperature ☐ 40°C(Standard) ☐ Others _____ °C Note2

Reset type ☐ Automatic Reset (Standard) ☐ Manual Reset (MRE)

Connection ☐ Fixed type Note3 ☐ Drawout type Note3

Main circuit terminal P11

- ☐ Horizontal terminal(FIX) (AE630–1600-SW / AE2000–3200-SW)
- ☐ Vertical terminal(FIX-VT) (AE2000-SWA / AE4000-SWA)
- ☐ Horizontal terminals(DR)(standard)
- ☐ Vertical terminals(DR-VT)
- ☐ Front terminals(DR-FT)
- ☐ Horizontal-Vertical Changeable(DR-HVT) Note4

Drawout type accessories P17~18

- ☐ Cell switch(CL-☐: 1 or 2 or 3 or 4) Note5
- ☐ Short-circuit B-contact(SBC)
- ☐ Lifting hooks(HP)
- ☐ Safety shutter(SST)
  - ☐ Shutter lock(SST-LOCK)
- ☐ Mis-insertion preventer(MIP)
- ☐ Test jumper(TJ)

- ☐ Vertical terminal adapter(VTA)
- ☐ Front terminal adapter(FTA)

Can be connected to the Horizontal terminals.

Electronic trip relay(ETR)

☐ With ETR

Type ☐☐☐–☐

Main setting module

- WM1: Generator protection use for AE630–1600-SW / AE2000–3200-SW
- WM2: Generator protection use for AE2000–SWA / AE4000–SWA

Specify a setting value,if required. P23,24,27~29

- LTD pick-up current : IL
- LTD time: TL
- STD pick-up current : Isd
- STD time: Tsd
- INST pick-up current:Ii
- Pre-alarm current:Ip
- Othters ( )

Optional setting module

- G1: Ground fault protection Note6
- N5: Neutral pole 50% protection Note7
- E1: Earth leakage protection
- AP: 2nd Additional Pre-alarm
- NA: Without optional setting

Power supply

- P1: AC･DC100-240V
- P2: DC24-60V
- P3: AC100-240V / DC100-125V with output contact
- P4: DC24-60V with output contact
- P5: DC100-240V with output contact (SSR)

Additional function P32

- ☐ Extension module(EX1)
  - ☐ Display(DP1)
  - ☐ Display onto panel board(DP2)
  - ☐ VT unit(VT)
- ☐ Temperature alarm(TAL)
- ☐ MCR switch(MCR-SW)

Network P33

- ☐ BIF-CC
- ☐ BIF-PR
- ☐ BIF-MD
- ☐ BIF-CON
- ☐ BIF-CL

- ☐ Neutral CT(NCT) Note8
- ☐ External ZCT Note9 P28
  - ZCT ☐
  - ZT ☐ B
  - ZTA ☐

Electrical accessories P12~14

- ☐ Auxiliary switch "A"and"B"should be same. Max. 5A5B
  - ☐ Standard(AX ☐ : 2 or 4 or 6 or 8 or 10)
  - ☐ High capacity(HAX ☐ : 2 or 4 or 6 or 8 or 10)
- ☐ Motor charging(MD)
  - ☐ AC・DC100–125V
  - ☐ AC・DC200–250V
  - ☐ DC24V
  - ☐ DC48V Note10

Note:When specifying MD, be sure to order the closing coil(CC)and shunt trip device(SHT)for remote operation.

- ☐ Closing coil(CC)
  - ☐ AC・DC100–250V
  - ☐ DC24–48V
- ☐ Shunt trip device (SHT)
  - ☐ AC・DC100–250V
  - ☐ AC380–500V
  - ☐ DC24–48V
- ☐ Under voltage trip device(UVT)
  - ☐ AC100–120V
  - ☐ AC200–240V
  - ☐ AC380–460V
  - ☐ DC24V
  - ☐ DC48V
  - ☐ DC100–110V
  - ☐ DC120–125V

Time delay

- ☐ Inst(INST)
- ☐ 0.5s(05)
- ☐ 3.0s(30)

Note:In case of 380-460V AC, the external transformer is attached

P16 ☐ Condenser trip device (COT)

- ☐ AC100–110V
- ☐ AC200–220V

Mechanical accessories P15~16

- ☐ Push button cover(BC-L)
- ☐ Counter(CNT)
- ☐ Cylinder lock(CYL)
- ☐ Door interlock(DI) Note11
- ☐ IP20-Terminal cover(IP-TC)
- ☐ Door frame(DF)
- ☐ Dust cover(DUC)
- ☐ Interphase barrier(BA) Note12
  - ☐ for 2units(MI2)
  - ☐ for 3units(MI3) Note11
- ☐ Mechanical interlock(MI)

Special environments P52 ☐ Moisture-fungus treatment ☐ Corrosion resist

Note1: In case of AE630-SW and AE2000-SW Low rating type, please specify CT rating. Refer to Page 9 and Page 20.

Note2: There is a case to be derated by ambient temperature. Refer to Page 54.

Note3: As for the terminal for AE2000-SWA and AE4000-SWA, Vertical terminal type only is available. (FIX-VT or DR-VT)

Note4: DR-HVT is available for AE630-SW~AE1600-SW. It is provided a special "Cradle" and "Terminals", which have adifferent dimensions from the other connection. Refer to Page 11 and Page 39.

Note5: This setting is available for change by customer later.A preliminary setting of CL at factory shipment is as follows.
CL1: 1C CL2: 1C1D CL3: 1C1T1D CL4: 2C1T1D

Note6: Not available for AE630-SW with CT rating : 250A or 315A or 500A.

Note7: N5 optional setting module is used for 3 phase 4 wires system.(4 Pole breaker or 3 pole breaker with Neutral CT)

Note8: Neutral CT is required for Ground fault or Neutral pole protection,when 3 Pole breaker is used for 3 phase 4 wires system.

Note9: In case of Earth leakage protection, it is required External ZCT.

Note10: DC24V and DC48V are not available for AE4000-SWA 4P.

Note11: The combined installation of DI and MI3 is not available.

Note12: Some module types are not provided BA. Refer to Page15.

Remark

Order Issuer

Memo

Service network

Country / Region	Company	Address	Telephone
Australia	Mitsubishi Electric Australia Pty. Ltd	348 Victoria Road, Rydalmere, N.S.W. 2116, Australia	+61-2-9684-7586
Belgium	Emac S.A.	Industrialaan 1, B-1702 Groot-Bijgaarden, Belgium.	+32-(0)2-4810211
Chile	RHONA S.A.	Vte. Agua Santa 4211 Casilla 30-D (P.O. Box) Viña Del Mar. Chile	+56-32-320652
China	Mitsubishi Electric Automation (Shanghai) Limited	(Shanghai) 3F, Block 5, 103 Cao Bao Road, Shanghai, China	+86-(0)21-6475-3228
	SHANGHAI SETSUYO TRADING CO.,LTD.	Shanghai Everbright Convention & Exhibition Center Room2306. Block D. 80, Cao bao Rd., Xuhui District Shanghai, P. R. Chaina	+86-(0)21-6432-6698
Colombia	Proelectrico Representaciones S.A.	Cra 53 No 29C-73 U.I.C.- Medellin. COLOMBIA.	+57-4-235-00-28
Denmark	Louis Poulsen CO. A/S	Geminivej 32, DK-2670 Greve, Denmark.	+45-(0)43-95-95-95
Egypt	CAIRO ELECTRICAL GROUP	9 Rostoum Street Garden City, APT. 5, P.O. BOX: 165-11516, Cairo-Egypt.	+20-2-7961337
Germany	Mitsubishi Electric Europe B.V. German Branch.	Gothaer Strasse 8, 40880 Ratingen, Germany.	+49-(0)2102-4860
Greece	Drepanias Antonios S.A.	52, Arkadias STR.GR 121 32. Peristeri Athens Greece.	+30-1-57-81-599-699
Hong Kong	Mitsubishi Electric Automation (Hong Kong) Limited	10/F Manulife Tower 169 Electric Road North Point. Hong Kong.	+852-28878870
Indonesia	P.T.SAHABAT INDONESIA.	JL Muara Karang Selatan Blok A/Utara No.1 kav. NO.11 P.O. Box 5045/Jakarta/11050. Jakarta Indonesia.	+62-(0)21-6621780
Ireland	Mitsubishi Electric Europe B.V. Irish Branch.	Westgate Business Park, Ballymount, Dublin 24, Ireland.	+353-(0)1-4505007
Italy	Mitsubishi Electric Europe B.V. Italy	C.D.Colleoni-P.Perseo Ing.2, Via Paracelso 12 1-20041 Agrate Brianza (M1)	+390-39-60-531
Israel	GINO INDUSTRIES LTD.	26, Ophir street, IL-32235 Haifa, Israel	+972-(0)4-867 06 56
Korea	MITSUBISHI ELECTRIC AUTOMATION KOREA CO., LTD.	2 Fl. Dong Seo Game Channel Bldg., 1F 660-11 Deungchon-Dong, Kanguseo-Ku, Seoul, 157-030 Korea	+82-2-3668-6567
Laos	SOCIETE LAO IMPORT-EXPORT	43-47 Lane Xang Road P.O. BOX 2789 VT Vientiane, Laos	+856-21-215043, 21-215110
Lebanon	COMPTOIR D'ELECTRICITE GENERALE INTERNATIONAL	Cebaco Center-Block A. Autostrade Dora, P.O. BOX: 90-1314 Beirut-Lebanon.	+961-1-240430
Malaysia	mittric Sdn Bhd	12A, Jalan Pemberita U1/49, Temasya Industrial Park, Glenmarie, 40150 Shah Alam, Selangor, Malaysia	+603-5569-3748
Myanmer	PEACE MYANMAR ELECTRIC CO., LTD.	NO. 137/139 Botataung Pagoda Road, Botataung Town Ship 11161, Yangon, Myanmar.	+95-(0)1-202589, 202449, 202590
Nepal	Watt & Volt House Co., Ltd.	KHA 2-65, Volt House Dilli Bazar Post Box: 2108, kathmandu, Nepal	+977-1-411330
New Zealand	Melco Sales (N.Z.) Ltd.	1 Parliament Street Lower Hutt. New Zealand.	+64-4-569-7350
Norway	SCANELEC	Leirvikasen 43B, N5020 Bergen, Norway.	+47-55-506000
Pakistan	Prince Electric Co.	16 Brandreth Road Lahore 54000. Pakistan.	+92-(0)42-7654342
Philippines	EDISON ELECTRIC INTEGRATED, INC.	24th Fl. Galleria Corporate Center Edsa Cr, Ortigas Ave. Quezon City, Metro Manila. Philippines.	+63-(0)2-643-8691
Poland	MPL Technology Sp zo.o.	ul. Sliczna 36 31-444 Krakow, Poland.	+48-(0)12-632-28-85
Saudi Arabia	CENTER OF ELECTRICAL GOODS	Al-Nabhaniya Street-4Th Crossing, Al-Hassa Road, P.O. BOX: 15955, Riyadh 11454, Saudi Arabia.	+966-1-4770149
Singapore	MITSUBISHI ELECTRIC ASIA PTE LTD.	307 Alexandra Road #05-01/02 Mitsubishi Electric Building Singapore 159943	+65-473-2308
Slovenia	INEA d.o.o.	Ljubljanska 80, SI-61230 Domzale, Slovenia.	+386-(0)17-21 80 00
South Africa	Circuit Breaker Industries LTD.	Private Bag 2016. Isando 1600, Johannesburg, South Africa	+27-11-928-2000
Spain	Mitsubishi Electric Europe B.V. Spanish Branch.	Caretera De Rubi 76-80, 08190 - Sant Cugat Del Valles (Barcelona) Spain	+34-93-595-3131
Sweden	Euro Energy Components AB	Box 103 48 S-434 24 Kungsbcka, Sweden.	+46-(0)300-69 00 40
Switzerland	Trielec A G	Mühlentalstrasse 136, 8201 Schaffhausen, Switzerland	+41-(0)52-6258425
Taiwan	Setsuyo Enterprise Co., Ltd.	6F, NO. 105 Wu-Kung 3rd rd., Wu-Ku Hsiang, Taipei Hsien Taiwan	+886-(0)2-2298-8889
Thailand	UNITED TRADING & IMPORT CO. LTD.	77/12 Bumrungmuang Road, Klong Mahanak, Pomprab Bangkok 10100.	+66-223-4220-3
The Netherlands	Imtech Marine & Industry	Postbox 5054, NL-3008 AB-Rotterdam, Netherlands.	+31-(0)10-487 19 11
Turkey	GTS	Fahri Gizden Sokak, Hacaloglu Apt. No.22/6 TR-80280 Gayrettepe/Istanbul, Turkey.	+90-(0)212-2674011
U.K.	Mitsubishi Electric Europe B.V. UK-Branch.	Travellers Lane, Hatfield, Herts, AL10 8xB, U.K.	+44-(0)1707-276-100
Uruguay	Fierro Vignoli S.A.	P.O. box 20022/Suc Upae, Montevideo. Uruguay.	+598-2-92-08-08
Venezuela	ADESCO C.A.	Lle 8, Calpon Elinsu, La Urbina-EDO, Miranda P.O. BOX 78034 Caracas 1074A., Venezuela	+58-2-241-7634
Vietnam	SA GIANG TECHNO CO., LTD.	47-49 Hoang Sa St., Da Kao Ward, D.1, HCMC	+84-8-910 4763 / 4758 / 4759

Safety Tips : Be sure to read the instruction manual fully before using this product.

MITSUBISHI ELECTRIC CORPORATION
FACTORY AUTOMATION SYSTEM: OFFICE TOWER "Z" 14F, 8-12 1chome, Harumi CHUO-KU, TOKYO 104-6214, JAPAN

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