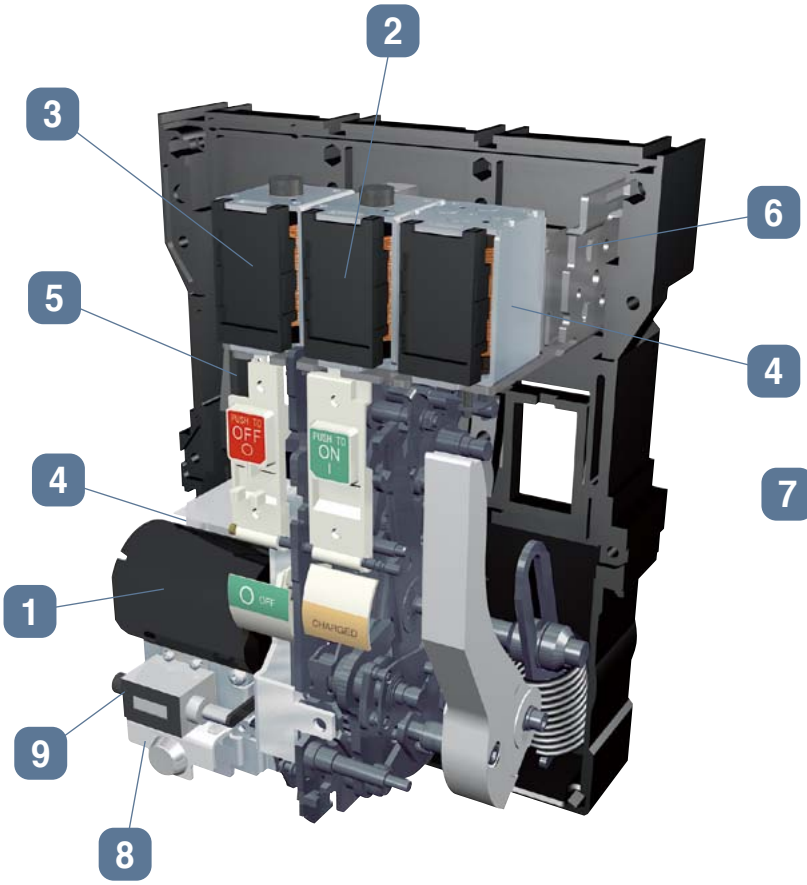
Accessories (for breaker unit)



Closing coil (CC)

Option

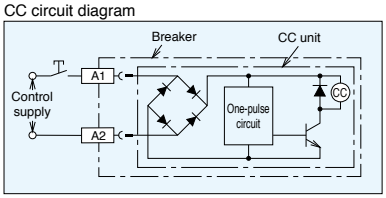
2

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	
24-48V DC (18~52.8)	–	24V DC 3.0A (100W)	0.08 s or less
	–	48V DC 6.0A (200W)	
100-250V AC · DC common (75-275)	100V AC 0.7A (100VA)	100V DC 0.8A (100W)	
	250V AC 1.7A (200VA)	250V DC 1.8A (250W)	

CC circuit diagram



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

Note 1) In case of double rating of rated voltage, it is the value for the lower rating. (Example) In case of 24-48V DC, it is operating time for 24V DC.
Note 2) After completing closing spring charging, wait for an interval of at least 0.5 seconds before applying the closing instruction to CC.
Note 3) When closing again after applying voltage to SHT, an interval of at least 0.5 seconds is required.
Note 4) These values are for reference, not guaranteed values.
Note 5) Common use for 50 and 60Hz in AC.

- Closing time means time from the initial energization of the closing coil up to the complete closing of the main contacts.
- As CC is one-pulse driven, it is not necessary to insert AXb for burning prevention purposes. Inserting AXb will cause anti-pumping function to be ineffective.

Shunt trip device (SHT)

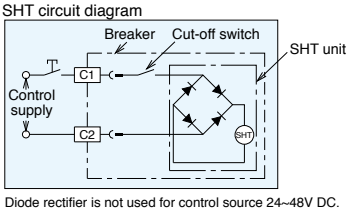
Option

3

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	
24-48V DC (16.8~52.8)	–	24V DC 2.5A (100W)	0.04 s or less
	–	48V DC 6.0A (200W)	
100-250V AC · DC common (70-275)	100V AC 0.4A (100VA)	100V DC 0.6A (100W)	
	250V AC 1.4A (150VA)	250V DC 1.6A (200W)	
380~500V AC (266~550)	380V AC 0.5A (250VA) 500V AC 0.7A (300VA)	-	

SHT circuit diagram



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

Note 1) In case of double rating of rated voltage, it is the value for the lower rating. (Example) In case of 24-48V DC, it is operating time for 24V DC.
Note 2) Operating time for AE4000-SW~AE6300-SW is 0.05s or less.
Note 3) These values are for reference, not guaranteed values.
Note 4) Common use for 50 and 60Hz in AC.

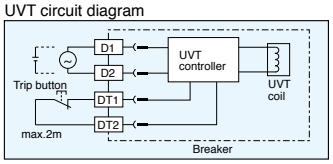
4 Under voltage trip device (UVT)

Option

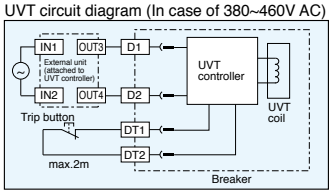
This is the device that automatically trips the breaker when the circuit voltage drops below the nominal voltage, and comprises UVT coil and UVT controller. There are 3 kinds of tripping time, INST, 0.5s and 3.0s. A trip terminal for forced OFF function is included as standard equipment.

Rated voltage	Frequency	operating time (time delay)	Pick-up voltage	Drop-out voltage	Trip function	Power consumption
100-120V AC	50/60Hz	☐ Inst(0.2s)	65~85V	45~70V	With open circuit of DT1,DT2 terminals.	Steady: 20VA Inrush : 200VA ≦ 0.4S (100-120V AC 24V DC Inrush:100VA ≦ 1S)
200-240V AC			130~170V	90~140V		
380-460V AC			247~323V	171~266V		
24V DC	-	☐ 0.5s(Min.)	15.6~20.4V	10.8~16.8V		
48V DC		☐ 3.0s(Min.)	31.2~40.8V	21.6~33.6V		
100-110V DC			65~85V	45~70V		
120-125V DC			78~102V	54~84V		

UVT circuit diagram



UVT circuit diagram (In case of 380~460V AC)



Note1) In case of 380-460V AC, the external unit is attached additionally.
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 150V DC across them.
Note5) If a forced OFF function is used, the shorting (signal input to DT1 and DT2) should be held for 0.2 sec. and more.
Note6) When an ambient temperature is at 60ºC, this device is installed outside of the ACB body.
Note7) The operating time in the above table does not include the operating time of the ACB.
Note8) Common use for 50 and 60Hz in AC.

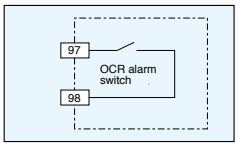
5 OCR alarm (AL) [Automatic reset type Short-time operation (30ms)]

Standard if ETR is equipped

OCR alarm (AL) is provided as standard if ETR is equipped. OCR alarm (AL) is the contact (1a) of short-time operation (30ms), being output when the breaker is tripped by the electronic trip relay. Two types of automatic reset type (standard) and manual reset type (optional) are available. When ordering, specify either automatic reset or Manual reset.

Switch rating

Voltage (V)		Current (A)	
		Resistive load	Inductive load
AC (50/60Hz)	240	3	2
	125	5	3
DC	240	0.2	0.2
	125	0.4	0.4
	30	4	3



Note1) Though the control power supply is unnecessary to activate OCR alarm (AL), the self-holding circuit is necessary since the contact output is activated for the short time (30ms).
Note2) This works when tripping occurs in LTD, STD, INST, GFR or ER.
Note3) If any continuous output of OCR alarm (AL) is necessary, use the trip indicator (TI) output contact of the electronic trip relay. Choose P3, P4 or P5 for power supply type.

OCR alarm (AL) [MRE : Manual reset type]

Option

On the manual reset type (optional), the gray manual reset button on the front side of the breaker will stick out to continuously output OCR alarm (AL) if the breaker is tripped by the electronic trip relay. After tripping, the breaker can not be turned on unless the manual reset button is pressed for resetting.

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

Option

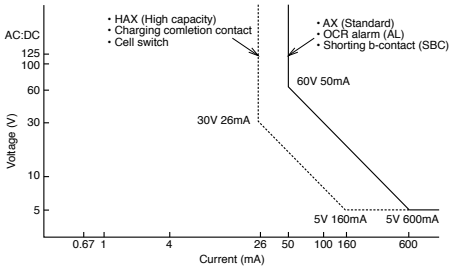
This is the contact that remotely indicates the ON or OFF status of the breaker.

Switch rating

Voltage (V)		Current (A)			
		Standard (AX)		High capacity type (HAX)	
		Resistive load	Inductive load	Resistive load	Inductive load
AC (50/60Hz)	250	10	10	10	10
	125	10	10	10	10
DC	250	0.3	0.3	3	1.5
	125	0.6	0.6	10	6
	30	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

Min. load range graph



- 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.

Accessories (for breaker unit)

7 Push button cover (BC-L)

Option

The cover prevents 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 19.

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 number of 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.
As for panel cut-out dimensions, refer to page 55.

Door interlock (DI)

Option

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

- A wire type mechanical interlock allows flexibility in positioning breakers in the switchboard.
- The parts of the Door panel should be supplied by the customer.
- DI can not be installed with "Mechanical interlock(MI)for 3 breakers."

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 following table.

Type	Connections	AE630-SW~ AE1600-SW	AE2000-SW~ AE3200-SW	AE2000-SWA	AE4000-SWA	AE4000-SW~ AE6300-SW
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)	▲	▲			

● Available for the insulation ▲ Available for separating terminals – Attachment is impossible Not existing type

* No insulation function between upper and lower terminal.

Note) This cannot be used to separate the power supply and load sides.

Terminal Cover (TTC)

Option

The transparent terminal cover prevents from careless touching to the live control terminals.
Protection degree is IP20.

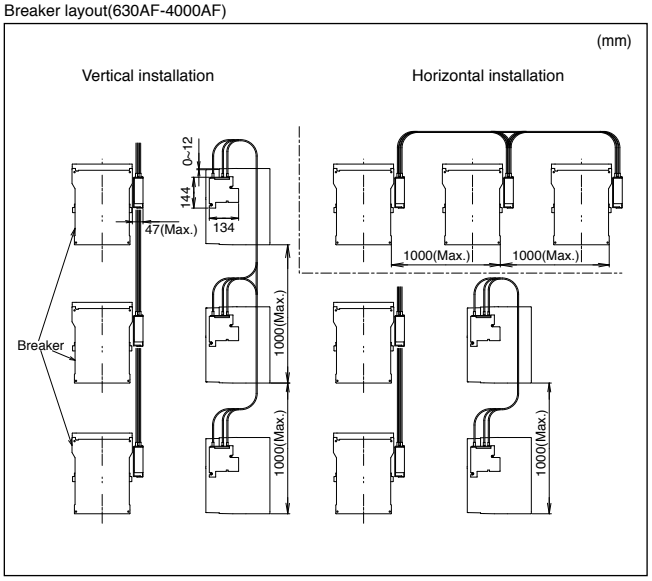
Mechanical interlock (MI)

Option

This is the device to prevent parallel charge of 2 or 3 units of breakers, and it can interlock the breakers mechanically without fail.
All combinations are available among any models from AE630-SW to AE6300-SW.
Please make inquiries about installation to AE4000-SW~AE6300-SW.
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.

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

Breaker layout(630AF-4000AF)



Interlock combinations

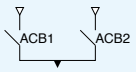
Switching states (for 2 ACBs)

Type	①	②	③
ACB1	○	|	○
ACB2	○	○	|

○ : ACB open
| : ACB closed

2 devices : 1 normal power supply and 1 emergency power supply

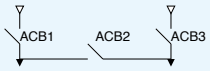
Case circuit



Switching states (for 3 ACBs)

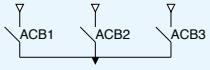
Type	①	②	③	④	⑤	⑥	⑦
ACB1	○	|	○	○	|	|	○
ACB2	○	○	|	○	|	○	|
ACB3	○	○	○	|	○	|	|

3 devices : 2 sources and 1 coupling



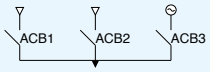
Type	①	②	③	④
ACB1	○	|	○	○
ACB2	○	○	|	○
ACB3	○	○	○	|

3 devices : 3 sources,only 1 device closed



Type	①	②	③	④	⑤
ACB1	○	|	○	|	○
ACB2	○	○	|	○	○
ACB3	○	○	○	|	|

3 devices : 2 normal power supplies and 1 emergency power supply



Condenser trip device (COT)

Please prepare by the customer. Refer to Page 15 for the specifications of combined SHT.

Dust cover (DUC)

Option

Dust cover prevents the dust or water entering into the panel board from the breaker panel cut.
Protection degree is IP54.

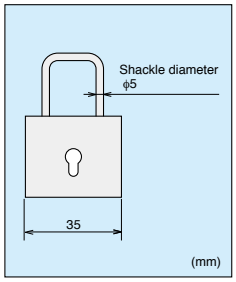
Accessories(for drawout type)

Drawout interlock (standard equipment)

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 equipment)

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)

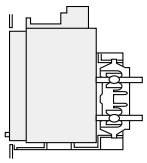
Padlock

* This padlock should be supplied by customer.

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

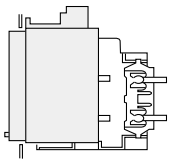
Operating position of drawout type

CONNECTED position



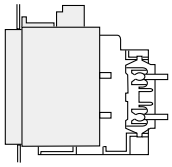
- Both main and control circuits are connected.
- Normal in use condition.
- Lock plate is protruding

TEST position



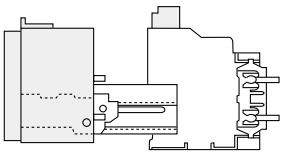
- Main circuit is disconnected, but the control circuit is connected.
- The breaker operation can be tested with the door closed.
- Lock plate is protruding

DISCONNECTED position



- Both main and control circuits are disconnected.
- The door can be closed.

DRAWOUT position



- This is the position for removing the breaker.
- The breaker is drawn out of the cradle on the extension rails.

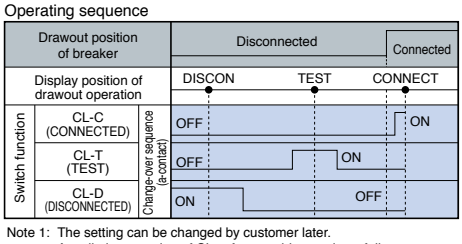
Ground terminal is on right side of the cradle.

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 can be changed by customer later.
A preliminary setting of CL at factory shipment is as follows.
CL1:1C CL2:1C1D CL3:1C1T1D CL4:2C1T1D

Switch rating

Voltage (V)		Current (A)	
		Resistive load	Inductive load
AC	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

Shorting b-contact (SBC)

Option

When moving the breaker from the connected to the test positions, this contact is used to short circuit auxiliary switch (AXb), thus maintaining the correct sequence of operation of the external control circuit. When ordering, SBC with the same number of contacts as auxiliary switches (AXb) will be provided. SBC can be provided for all AX b contacts. At the time of shipment from factory, SBC is already connected to control circuit terminal block.
Only one more crimp terminal can be added on contact, overlapping with SBC's contact on Terminal: 11~51.

Operating sequence

Main circuit	Disconnected		Connected
Display position of drawout operation	DISCON	TEST	CONNECT
Change-over sequence of SBC (b-contact)	ON		OFF

Switch rating

Voltage (V)		Current (A)	
		Resistive load	Inductive load
AC (50/60Hz)	250	10	2
	125	10	3
DC	250	0.2	0.2
	125	0.4	0.4
	30	4	3

Refer to the Min. load range graph in Page 16.

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.
This is attached to the left and right sides of the main body to suspend it. One set contains two products.

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 are drawn out to prevent accidental contact with the main contacts.

Mis-insertion preventor (MIP)

Option

This prevents other breakers unspecified from inserting into the cradle, and 5 patterns in maximum are available.
Not available for AE4000-SW~AE6300-SW

Test jumper (TJ)

Option

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