TERASAKI
Ensuring Service, Maintaining Quality

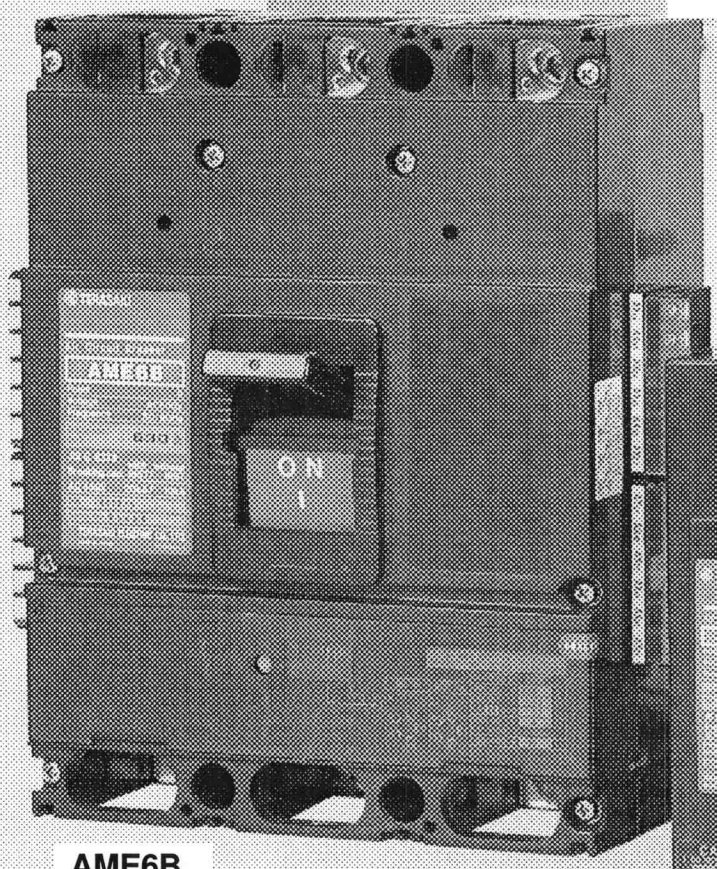
Upgrading your electrical distribution system

New AME Series Air Circuit Breakers

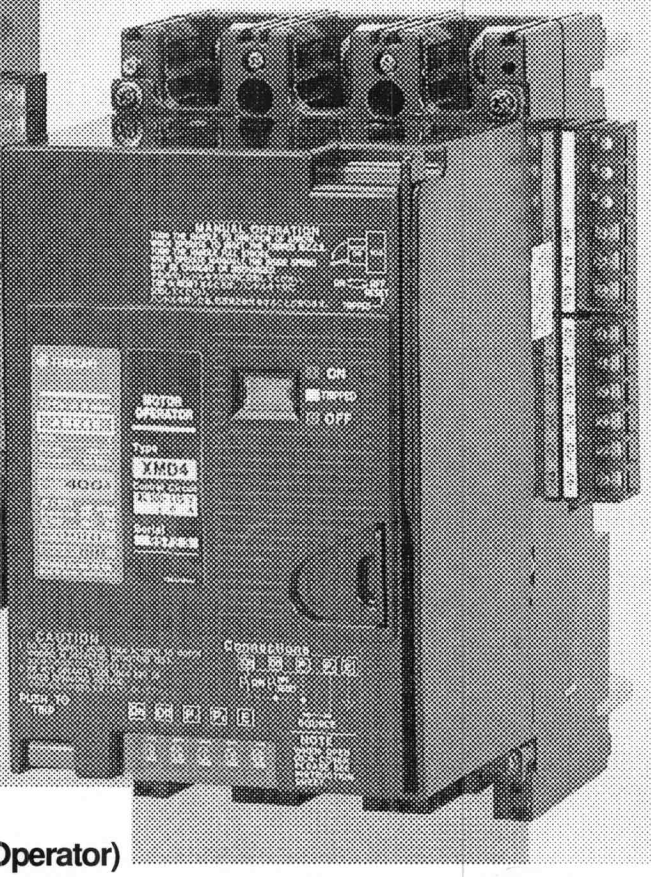
For marine use

The AME series is new and improved

★ ***R.M.S. sensing used***
★ ***New motor operator available***



AME6B



AME4B
(with Motor Operator)

For Generator Protection

Catalogue No. KRG 5136b

TERASAKI ELECTRIC CO., LTD.

FEATURES

The New AME Series Air Circuit Breakers have been improved in the following ways.

R.M.S. SENSING METHOD USED FOR OVERCURRENT TRIPPING DEVICE

Prevents nuisance tripping due to distorted current containing harmonics.

ON-OFF COLOR INDICATION

IEC standard symbols I (ON) and O (OFF) used. I (ON) is diplayed in red and O (OFF) is displayed in green for easy reading.

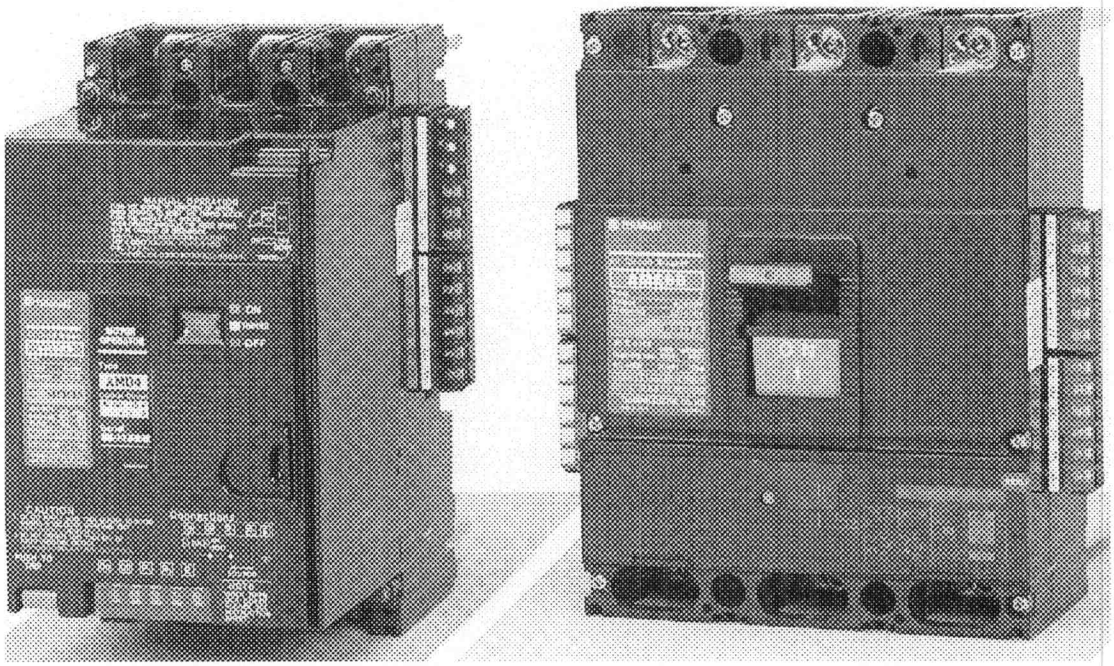
SAFETY DISPLAY MECHANISM

When there is sufficient space between the moving contact and the stationary contact (when the breaker is actually off position), the trip indicator shows O (OFF).

NEW MOTOR OPERATOR

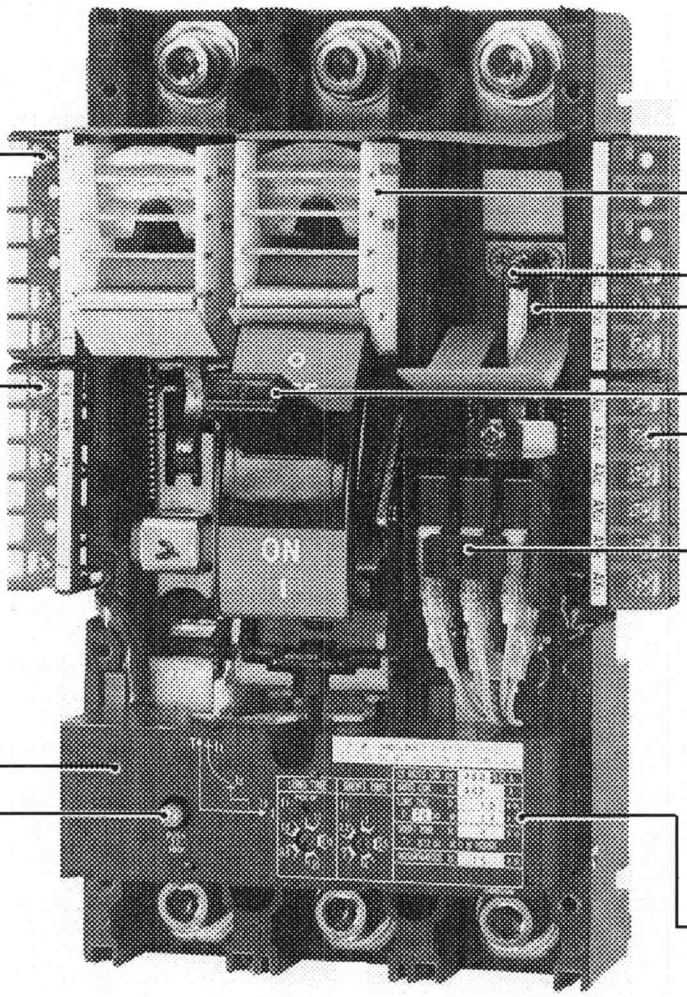
64% smaller than the previous model. OCR setting changes made easily without removing the motor. ON, OFF, and TRIP are clearly displayed.

■ APPEARANCE



AME4B(with Motor Operator) **AME6B**

■ BREAKER COMPONENTS



UVT(SHT) AUXILIARY CIRCUIT TERMINAL
Provided when fitted with UVT or SHT.

OCR TEST TERMINAL (STANDARD)
Field-test terminal for overcurrent tripping device.

UNDERVOLTAGE TRIP
See page 6 for ratings, specifications, and combinations of accessories.

TRIP BUTTON (STANDARD: gray)

ARC CHUTE

MOVING CONTACT

STATIONARY CONTACT

OPERATING HANDLE

AUXILIARY CIRCUIT TERMINAL (STANDARD)
See page 7 for standard terminal arrangements.

AUXILIARY SWITCH (STANDARD)

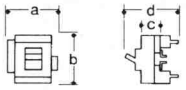
ALARM SWITCH
See page 6 for ratings, specifications, and combinations of accessories.

OVERCURRENT TRIPPING DEVICE (R.M.S. SENSING)

(AME4B rear connected type)

● CONTENTS

RATINGS AND SPECIFICATIONS

Frame (A)		250	400	630	800	1000
Type		**AME3B**	**AME4B**	**AME6B**	**AME8B**	**AME10B**
Number of poles		3	3	3	3	3
Rated current for overcurrent tripping device (A) In is the generator rated current		16 ≦ In ≦ 31.5 31.5 < In ≦ 65 63 < In ≦ 125 125 < In ≦ 250	200 ≦ In ≦ 400	315 ≦ In ≦ 630	500 ≦ In ≦ 800	630 ≦ In ≦ 1000
Rated insulation voltage (VAC)		600	600	600	600	600
Rated frequency (Hz)		50 / 60	50 / 60	50 / 60	50 / 60	50 / 60
Protection characteristics of overcurrent tripping device	LTD+STD+INST	●	●	●	●	●
	LTD+STD	●	●	●	●	●
■ Rated breaking current/Rated making current kA sym. rms. / kA peak AC460V						
NK, LR	with INST	16 / 34.8	16 / 34.8	20 / 42.6	30 / 63.8	30 / 63.8
AB, BV	without INST	4 / 6.87	6 / 10.2	10 / 17.4	15 / 33.0	15 / 33.0
JIS	with INST	16 / 32	16 / 32	20 / 40	30 / 63	30 / 63
	without INST	4 / 6.8	6 / 10.2	10 / 17	15 / 30	15 / 30
Rated short-time current(kA sym. rms.)		4 (150ms)	6 (150ms)	10 (150ms)	15 (150ms)	15 (150ms)
■ Mountings and Connections	Rear-connected RC	●	●	●	●	●
	Plug-in PM	●	●	●	●	●
■ Outline dimensions (mm)	Rear-connected/plug-in					
 a		182 / 161	182 / 161	252 / 231	252 / 231	252 / 231
b		260 / 282	260 / 280	273 / 303	370 / 370	370 / 370
c		121 / 121	121 / 121	121 / 121	120 / 138	120 / 138
d		255 / 245	255 / 245	267 / 270	282 / 336	282 / 336
Weight (kg) Rear-connected/plug-in (including mounting base)		6.5 / 8.2	6.5 / 8.2	10 / 16.1	19.5 / 30.1	19.5 / 30.1
■ Standard specifications	Trip button	●	●	●	●	●
Auxiliary switch (AX)	Rear-connected	● (3c) ①	● (3c) ①	● (4c) ①	● (4c) ①	● (4c) ①
	Plug-in	● (2c) ②	● (2c) ②	● (3c, 1a) ①	● (3c, 1a) ①	● (3c, 1a) ①
■ Accessories (optional)	Code					
Internal	Alarm switch AL	●	●	●	●	●
	Undervoltage trip device UVT ④	●	●	●	●	●
	Shunt trip device SHT ④	●	●	●	●	●
External	Motor operator MOT	●	●	●	●	●
	External operating handle AFB	●	●	●	●	●
	External handle EHA	-	-	● Standard	● Standard	● Standard
	Terminal cover TCR	●	●	●	-	-
	OCR checker ⑤	●	●	●	●	●
	OCR adapter ⑥	●	●	●	●	●
■ Endurance						
Number of operations with current		2000	1000	500	500	500
Number of operations without current		10000 ③	10000 ③	5000 ③	5000 ③	5000 ③
■ NK type-approval number		94T223	94T224	94T225	94T226	94T227

NOTE ● : Available - : Not available

① : Change to 2c when fitted with alarm switch.

② : Change to 1c when fitted with alarm switch.

③ : Includes number of operations with current.

④ : Cannot use UVT and SHT jointly.

⑤ : Used for testing instantaneous trip function (separate mounting). NK standard requires at least one checker per vessel.

⑥ : Used for testing tripping characteristics with secondary current.

SELECTION GUIDE

SELECT THE APPROPRIATE BREAKER AND ACCESSORIES FOR YOUR PARTICULAR APPLICATION

1 Air circuit breaker type — AME3B | AME4B | AME6B | AME8B | AME10B

2 Mountings and connections — Rear-connection | Plug-in

3 Operation type — Direct-manual | External manual (AFB type external operation handle required) | Motorized (Motor operator required)

4 Overcurrent tripping device — LTD+STD+INST | LTD+STD

5 Accessories

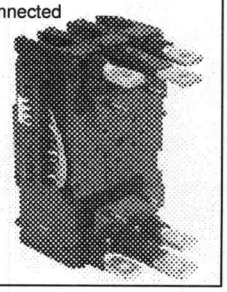
Internal	External
• Auxiliary switch (standard) NOTE ①	• XMD type motor operator
• Alarm switch (1C)	• External handle (standard with AME6B, 8B, 10B, not available for AME3B, 4B)
• Undervoltage trip — cannot use jointly	• Terminal cover
• Shunt trip — cannot use jointly	• AFB type external operating handle
	• ANS1 type OCR checker (separately mounted) NOTE ②
	• ANS1S type OCR adapter

NOTE① : For standard number of mountings and for number of mountings with alarm switch, see Ratings and Standards on page 2.

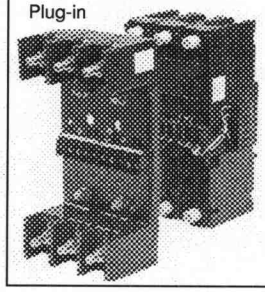
NOTE② : NK standard requires at least one cheker per vessel.

■ MOUNTING TYPES

Rear-connected

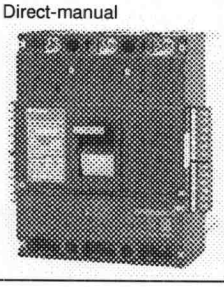


Plug-in

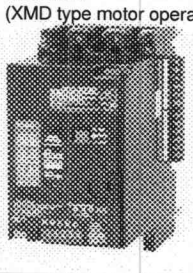


■ OPERATION TYPE

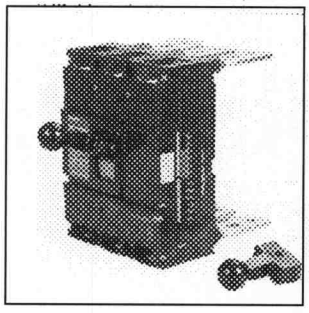
Direct-manual



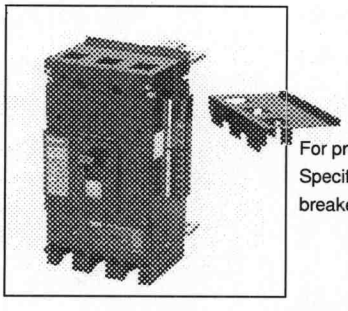
Motorized
(XMD type motor operator)



■ EXTENSION HANDLE

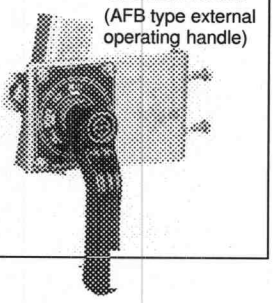


■ TERMINAL COVER



For protection from live parts.
Specify at time of order of the breaker.

External-manual
(AFB type external operating handle)



PROTECTION CHARACTERISTICS

SETTING RANGES FOR OVERCURRENT TRIPPING DEVICE

Protective functions	Setting ranges (In: Rated primary current of generator)
■ Adjustable long time-delay trip characteristic (LTD)	
Pick-up current setting, I_1	In x (0.8 - 1.0 - 1.1 - 1.15 - 1.25) 5 graduations
Pick-up current setting tolerance (%)	± 7.5
Time delay setting, T_1	Fixed setting in the range 15s - 60s at I_1x 120%. • The specified value will be indicated on the label.
Time-delay setting tolerance (%)	± 15
■ Adjustable short time-delay trip characteristic (STD)	
Pick-up current setting, I_2	In x (2.0 - 2.5 - 3.0 - 3.5 - 4.0) 5 graduations
Pick-up current setting tolerance (%)	± 15
Time delay setting, T_2 (opening time)	Fixed at 0.12s for currents ≧ I_2 (definite time-delay characteristic)
■ Instantaneous trip characteristic (INST)	
Pick-up current setting, I_3	In x (4,7,12,15) fixed setting • The specified value will be indicated on the label.
Pick-up current setting tolerance (%)	± 20

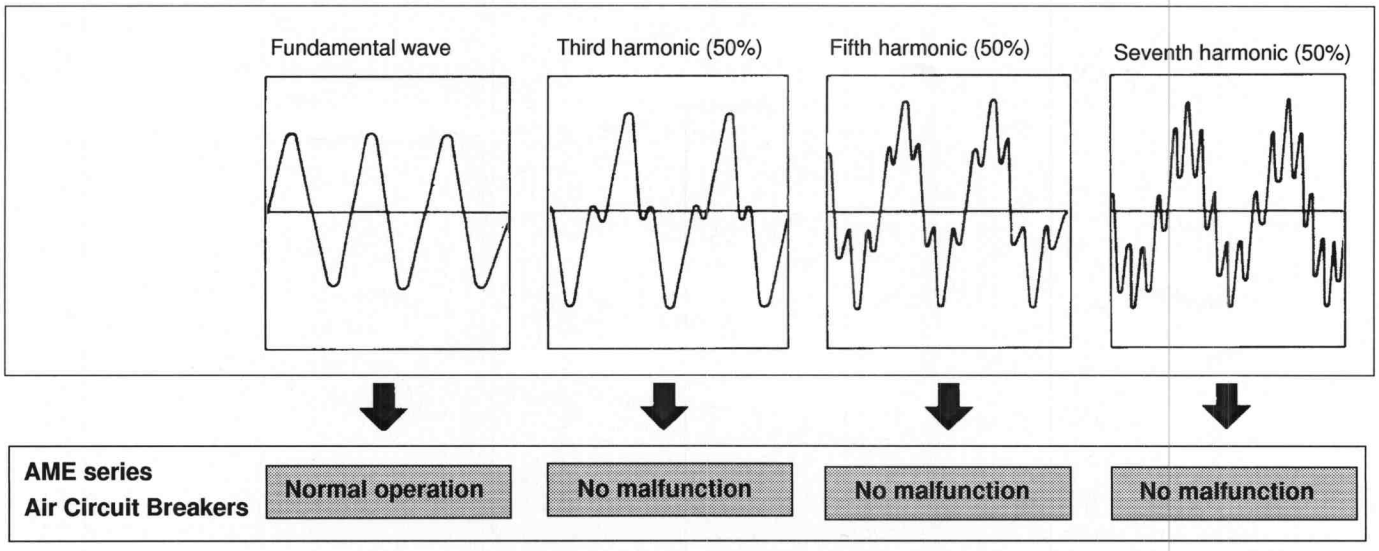
TRUE R.M.S. VALUE SENSING

〈New series〉 AME series air circuit breakers are equipped with an 8-bit microcomputer.

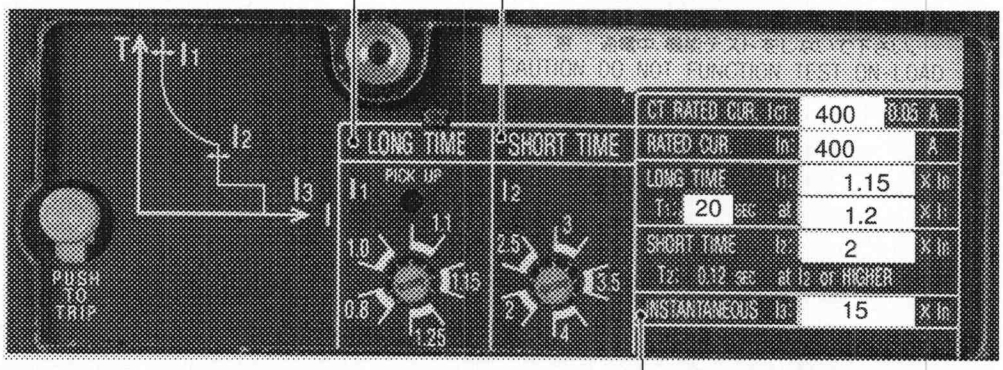
R.M.S. sensing provides a highly dependable LTD protection characteristic.

UNAFFECTEDBYHARMONICS

AME series breakers operate normally in spite of harmonic currents produced by semiconductor devices in the electrical distribution system. Constant R.M.S. value computation is performed by our custom-made IC - a state of the art piece of hardware incorporating high-density double-sided packaging.



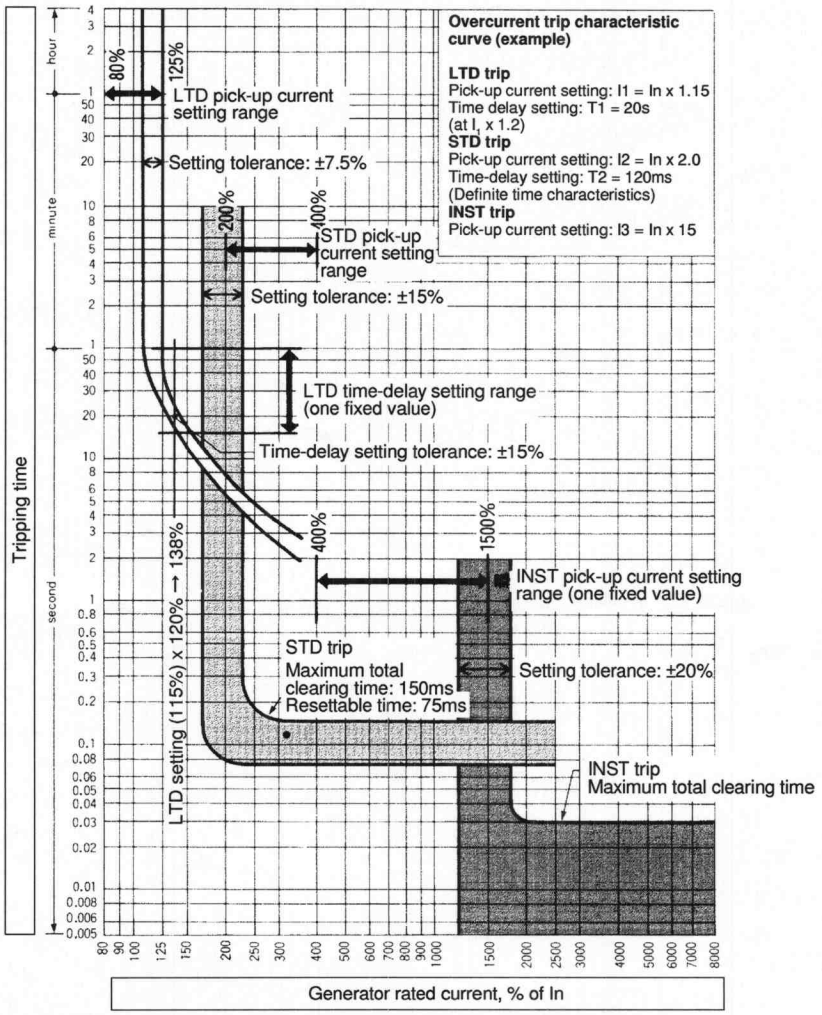
OVERCURRENT TRIPPING DEVICE



PROTECTIVE CHARACTERISTIC CURVES

- The overcurrent trip device comes in two types.

1. With long time-delay (LTD), short time-delay (STD), and instantaneous (INST) trip functions
2. With long time-delay (LTD) and short time-delay (STD) trip functions



RATING, SPECIFICATIONS AND COMBINATIONS FOR INTERNAL ACCESSORIES

RATINGS AND SPECIFICATIONS FOR INTERNAL ACCESSORIES

Auxiliary switch (AX)

Indicates the open-closed status of the breaker electrically.

Alarm switch (AL)

Indicates the trip status of the breaker electrically.

■ Operation of AX and AL

Switch AX	status of breaker ON	OFF or TRIP
AXb AXa / AXc	AXc--AXa closed AXc--AXb open	AXc--AXa open AXc--AXb closed

Switch AL	status of breaker ON or OFF	TRIP
ALb ALa / TRIP / ALc	ALc--ALa open ALc--ALb closed	ALc--ALa closed ALc--ALb open

■ Ratings for AX and AL (switch: V-10-1A4)

Voltage (V)		AC (50/60Hz)			DC		
		480	250	125	250	125	30
Current (A)	Resistive load	1	5	5	0.3	0.6	5
	Lamp load	0.2	1.5	2	0.05	0.1	3
	Inductive load	1	5	5	0.3	0.6	4
	Motor load	0.3	2	3	0.05	0.1	3

Minute current limit	
DC30V	26.7mA
DC5V	160mA

- The ramp load means an inrush current of ten times the rated current.
- The inductive load means a power factor of 0.4 or more (AC) and a time constant of 7ms or less (DC).
- The motor load means an inrush current of six times the rated current.

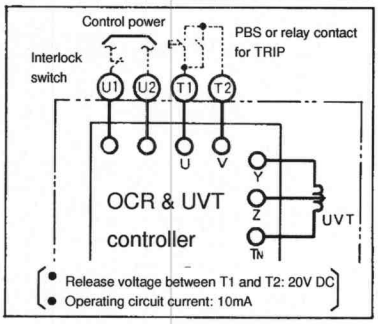
Undervoltage trip device (UVT)

The UVT is a device which trips the breaker when the circuit voltage gets too low. To avoid operating in reaction to instantaneous voltage drops, the UVT incorporates a delayed tripping system with a time lapse of 50ms - 120ms. The UVT is equipped with useful electrical trip terminals (T1, T2) which can be used for remote operation or automated control. If you connect these terminals directly to the control switch or to the relay contact (a-contact), the breaker will trip instantaneously.

■ UVT Ratings

Rated voltage (V)	Opening voltage (V)	Resettable voltage (V)	※ Exciting current (mA)
AC100--115V	58 ± 10	68 ± 12	21
AC200--230V	116 ± 20	135 ± 25	11
AC380--450V	32 ± 26	270 +30/-40	6

※ Values shown at maximum voltage (60Hz).



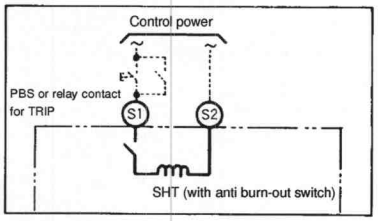
Shunt trip device (SHT)

The SHT is for tripping the breaker electrically from a remote position.

■ SHT Ratings

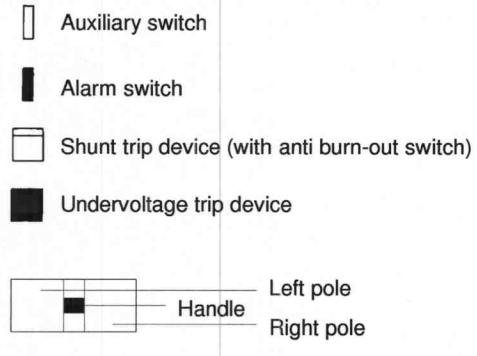
Rated voltage	Exciting current (A) ※	Operational voltage
AC100--115V	1.1	AC70--127V
AC200--480V	0.93	AC140--528V

※ Show the peak values at maximum voltage (60Hz)



COMBINATIONS OF INTERNAL ACCESSORIES

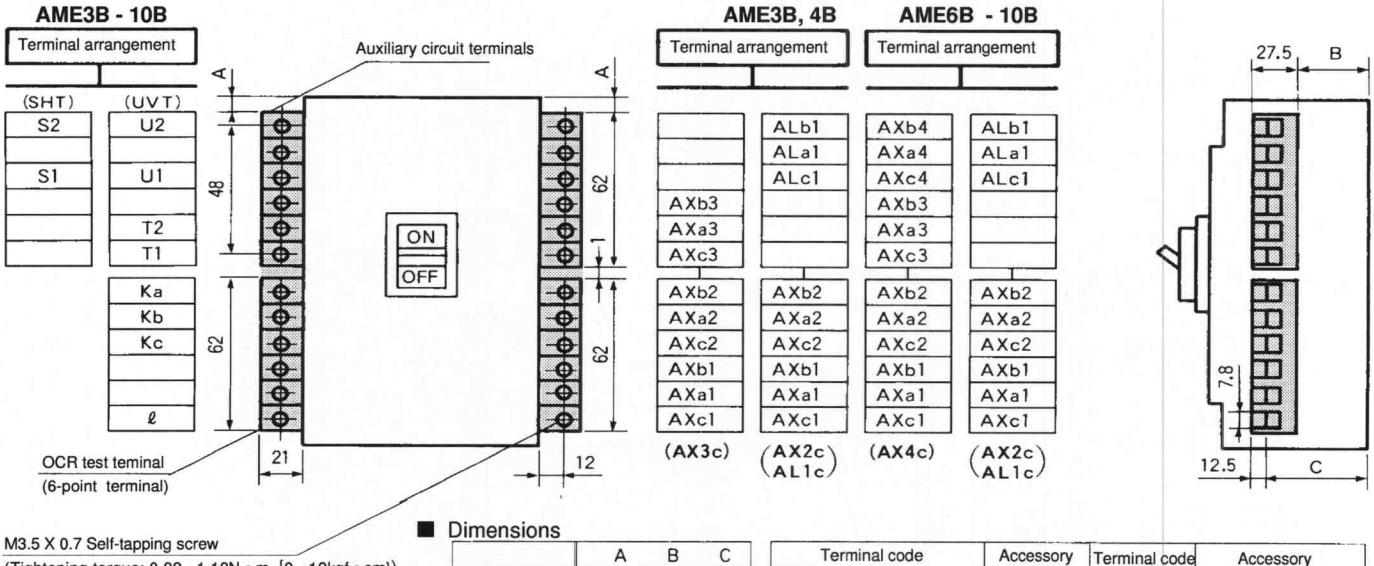
Type		AME3B, 4B		AME6B, 8B, 10B	
Mounting type		Rear-connected	Plug-in	Rear-connected	Plug-in
Accessory combination	AX / AL				
	AX / SHT				
	AX / UVT				
	AX / AL / SHT				
	AX / AL / UVT				



STANDARD ARRANGEMENTS OF AUXILIARY CIRCUIT TERMINALS FOR ACCESSORIES

REAR CONNECTED TYPE

The leads for internally mounted accessories are connected to the auxiliary circuit terminals as shown below.

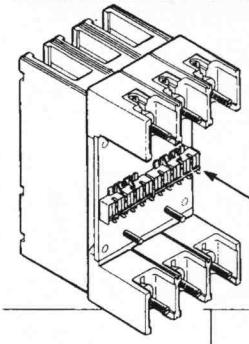


■ Dimensions

	A	B	C
AME 3 B	34	33	48
AME 4 B			
AME 6 B	88	45	60
AME 8 B	51	57	72
AME10B			

Terminal code			Accessory	Terminal code		Accessory
AXa1	AXb1	AXc1	Auxiliary switch	U1	U2	UVT controller (for power supply)
AXa2	AXb2	AXc2				
AXa3	AXb3	AXc3		T1	T2	UVT controller (for electrical trip)
AXa4	AXb4	AXc4				
ALa1	ALb1	ALc1	Alarm switch	S1	S2	SHT

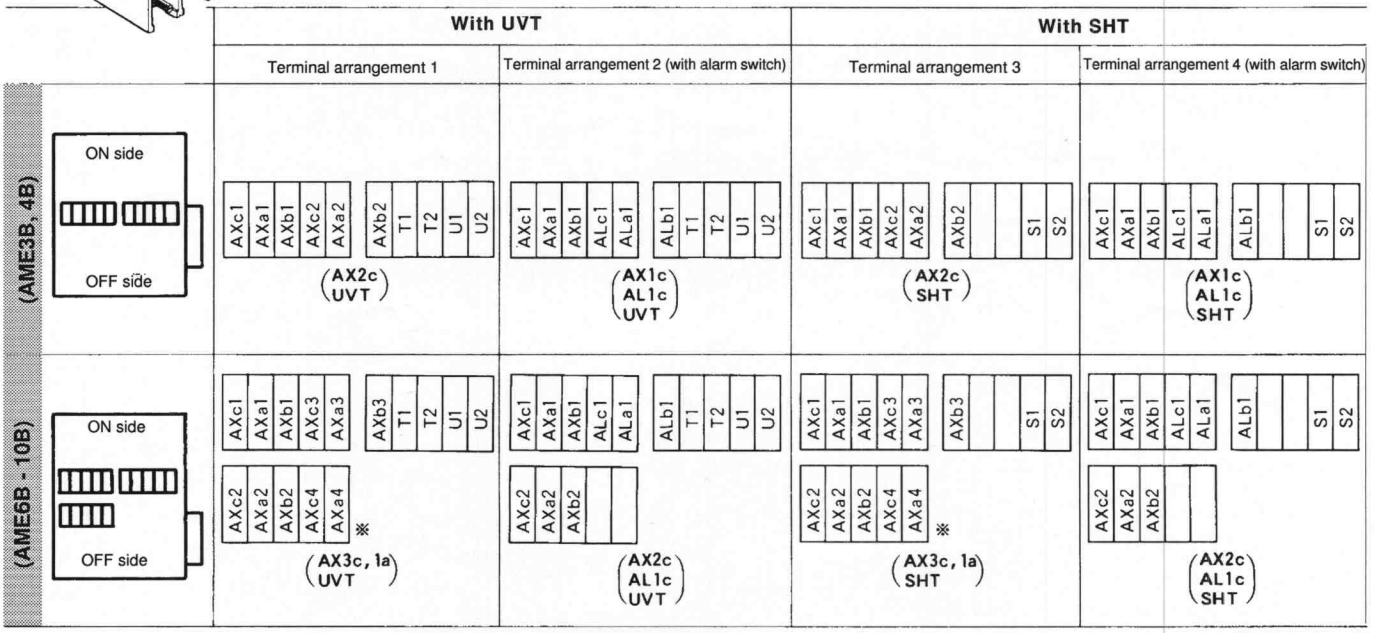
PLUG-IN TYPE



The standard auxiliary circuit terminal arrangements shown below are drawn as seen from the rear side of the plug-in mounting base. The OCR test-terminal arrangements are the same as for the rear-connected type.

Auxiliary circuit terminals (5-point terminal)
M3.5 X 0.7 Self-tapping screw
Tightening torque: 0.88 ~1.18N • m {9 ~12kgf • cm})

Terminal code			Accessory	Terminal code		Accessory
AXa1	AXb1	AXc1	Auxiliary switch	U1	U2	UVT controller (for power supply)
AXa2	AXb2	AXc2				
AXa3	AXb3	AXc3		T1	T2	UVT controller (for electrical trip)
AXa4		AXc4				
ALa1	ALb1	ALc1	Alarm switch	S1	S2	SHT



※ AXb4 not available

RATINGS AND SPECIFICATIONS FOR MOTOR OPERATORS

SPRING CHARGED MOTOR OPERATOR

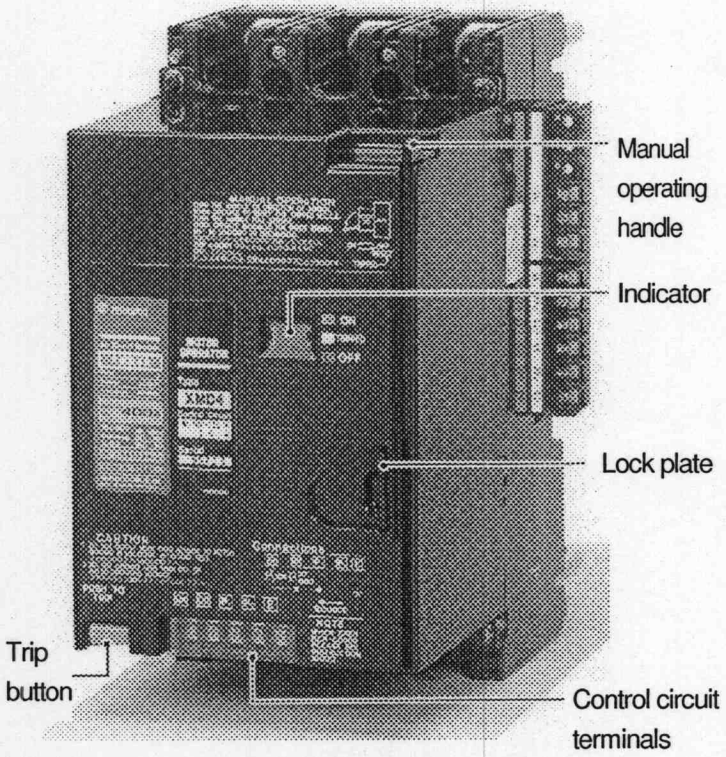
■ **Positive contact indication**
Color coding indicates the true position of the contacts clearly: ON (red), OFF (green), TRIP (white).

■ **Manual ON/OFF operation with one stroke**
Lever pumping is no longer required.

■ **Small and lightweight**
New models are more compact and lighter in weight - size reduced to 64% and weight reduced to 57% of previous models.

■ **Easy maintenance**
Breaker mounting, removal, and even setting changes can be done without removing the motor operator.

■ **Fast closing operation**
Closes in 60 ms or less. The closing time remains stable closing after closing.



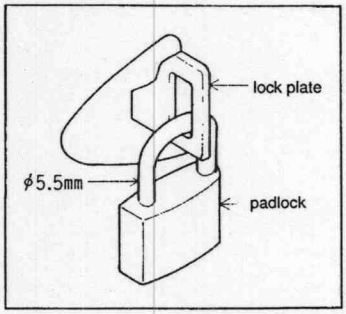
(AME4B with Motor Operator)

■ Ratings and specifications

Motor operator type	XMD4M	XMD6M	XMD9M
Applicable breakers	AME3B AME4B	AME6B	AME8B AME10B
Rated operating voltage AC 110 - 115 V	●	●	●
AC 200 - 230 V	●	●	●
Lock-in-OFF function (standard) ※1	●	●	●
Manual trip button	●	●	●
Steady-state r.m.s. current (A) /starting peak current (A)			
AC100-115V ON ①	- / 3.1	- / 3.1	- / 3.1
OFF, RESET ①	1.2/ 5.7	1.8 / 6.0	1.8/ 6.0
AC220-230V ON ②	- / 1.2	- / 1.2	- / 1.2
OFF, RESET ②	0.7 / 3.0	1.0 / 3.2	1.0 / 3.2
Type of operation	spring charged	spring charged	spring charged
Operating time (s) ON (maximum value)	0.06	0.06	0.06
OFF, RESET (maximum value at rated voltage	3	3	3
Control switch rating	250V, 5A	250V, 5A	250V, 5A
Power source capacity	300VA	300VA	300VA
Dielectric withstand voltage, ( ) indicates value for 24V DC use	AC1500V (AC500V)	AC1500V (AC500V)	AC1500V (AC500V)
Weight (kg)	4.7	5.6	6.4

NOTE
• : Available ① : Maximum values at AC115V/ 50Hz
② : Maximum values at AC230V/50Hz

※ 1: Breaker can be locked into the OFF position by pulling out the lock plate and locking it with a padlock.
• When the breaker is ON, the lock plate cannot be pulled out.
• Up to three locks can be used.
• Padlocks not supplied.



OPERATION

Motorized operation

■ ON

When the ON switch is closed, the latch release coil (LRC) is excited and the closing spring is released. The breaker quickly closes and goes into ON status. When the closing spring is released, the limit switch (LS) is opened and the LRC is de-excited.

■ OFF

When the OFF switch is closed, self-hold control relay (Y) is activated and motor (M) operates to charge the closing spring. The breaker changes to OFF status.

■ RESET

When the relay is in TRIP status, closing the OFF switch activates self-hold control relay (Y) and starts motor (M). Motor (M) charges the closing spring and resets the breaker.

Manual operation

■ ON, OFF (RESET)

The breaker can be opened (OFF or RESET) and closed (ON) alternately by pulling the operating lever down in one full stroke. ON/OFF operation of the breaker is possible without charging or releasing the closing spring.

■ TRIP

The breaker can be tripped by pushing the TRIP button on the motor operator.

(Emergency Trip)

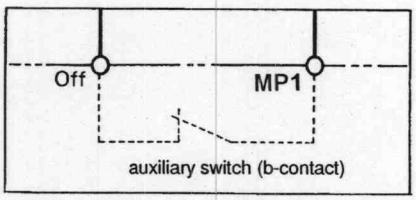
Opening the breaker (OFF) using the motor operator takes up to 3 seconds. If a remote emergency OFF function is necessary, incorporate the shunt trip device (SHT) or the undervoltage trip device (UVT) into the breaker.

Automatic charge/discharge function

If the breaker is closed manually (ON) while the power source is on, the handle switch (HS) induces automatic release of the closing spring. Likewise, if the breaker is opened manually (OFF), the springs are automatically charged.
If the breaker is opened or closed while the power source is off, later when the power source is turned on, the closing spring will automatically be charged or discharged to match the ON/OFF status of the breaker. This automatic charge/discharge function is necessary to prepare the closing mechanism for the next ON/OFF operation. The sound of the charging or discharging of the spring should not be mistaken for a malfunction.

Automatic reset

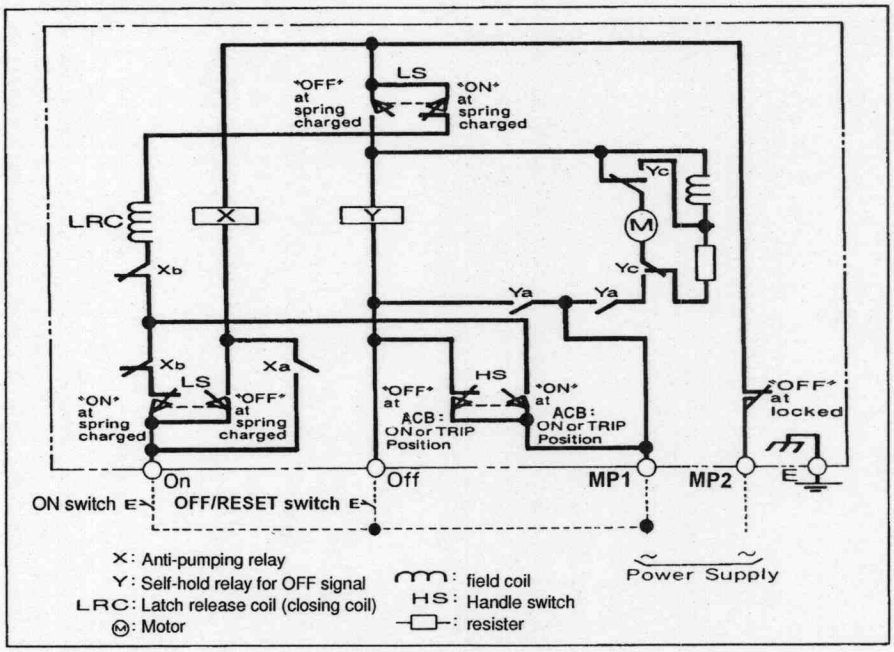
If you use the alarm switch fitted in the breaker, you can induce recharging of the closing spring and go into the reset position automatically. Connect the automatic reset circuit as shown below.
NOTE: When you require an alarm switch with the automatic reset function please specify two alarm switches for the breakers. If the alarm switch is used, a pulse signal will be produced in the automatic reset circuit when the alarm is activated. Be sure to use a self-hold circuit to avoid possible problems caused by this pulse signal.



Anti-pumping function

When the breaker is turned ON and the closing spring is released, self-hold control relay X is activated. Xa- contact is held closed, and Xb-contact is opened. While the ON switch is closed, latch release coil (LRC) will not be excited even if the OFF switch is closed or an automatic reset circuit is being used. Pumping is thus prevented.

▼ Control circuit AC



■ PRECAUTIONS REGARDING USAGE

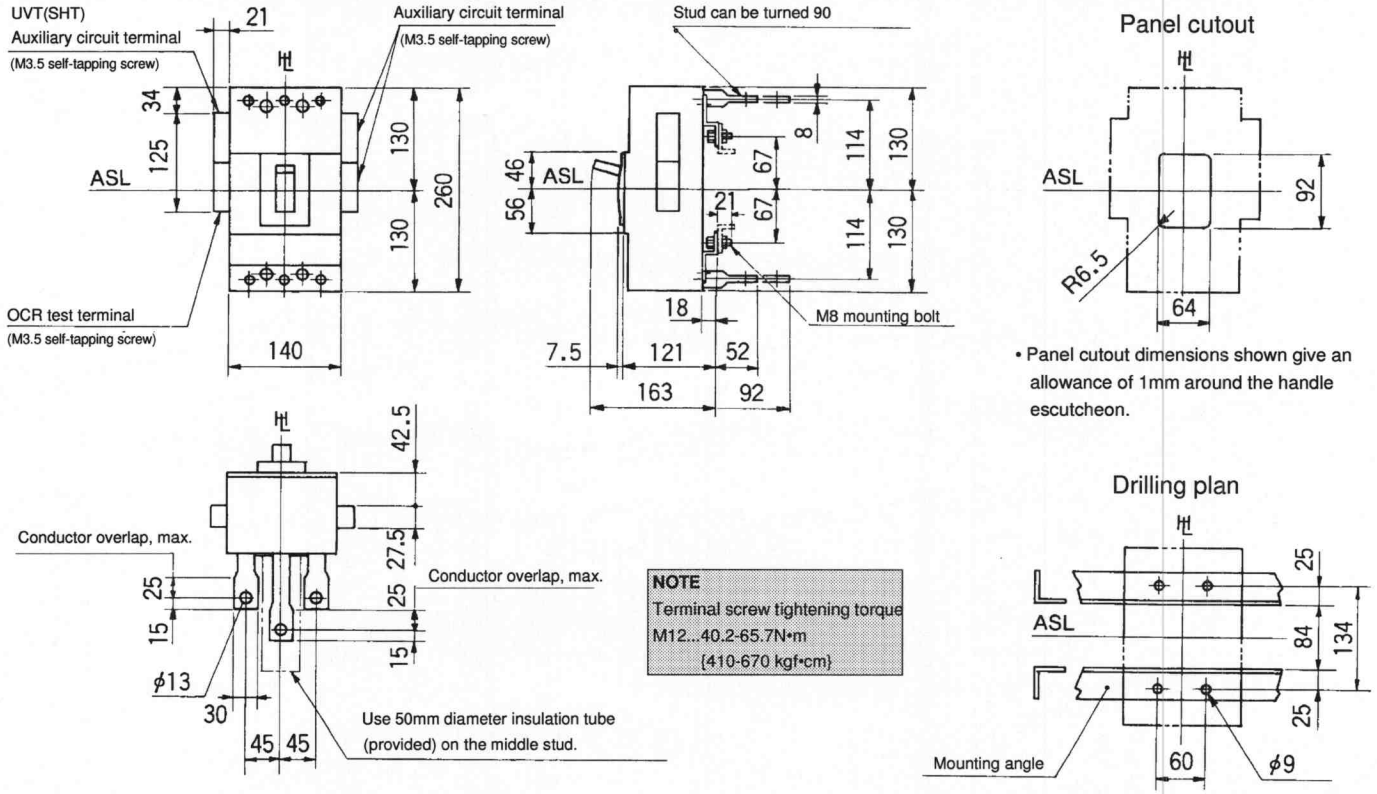
- If using the UVT option, be sure to reset the UVT before closing the breaker.
- The motor operator must be supplied with voltage within the following range.
  DC: 75-110% of rated voltage
  AC: 85-110% of rated voltage
  Operation at low voltage may burn out the motor.

OUTLINE DIMENSIONS (DIRECT MANUAL OPERATION)

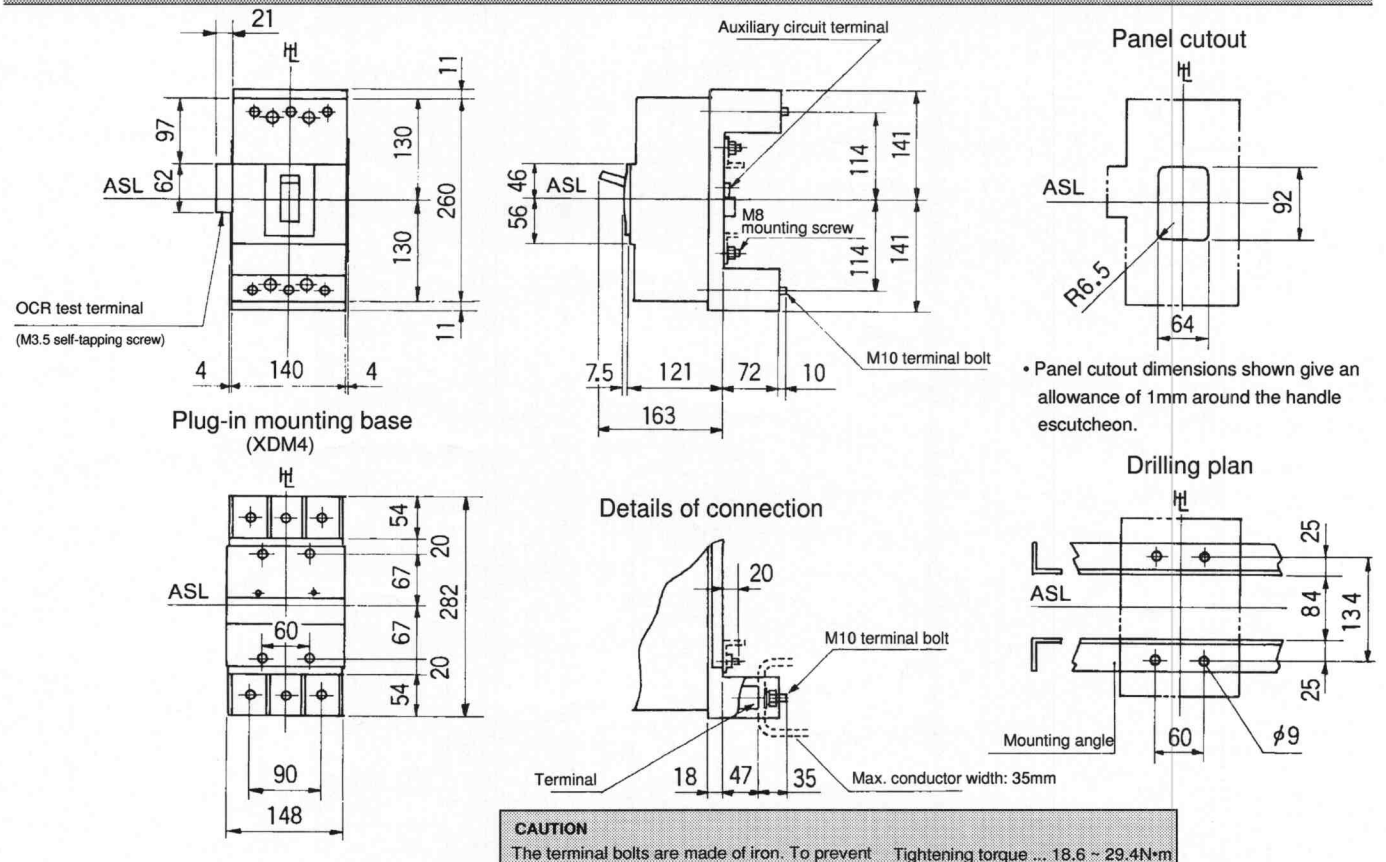
AME3B, AME4B

ASL : Arrangement standard line
卄 : Handle frame center line

Rear-connected type



Plug-in type

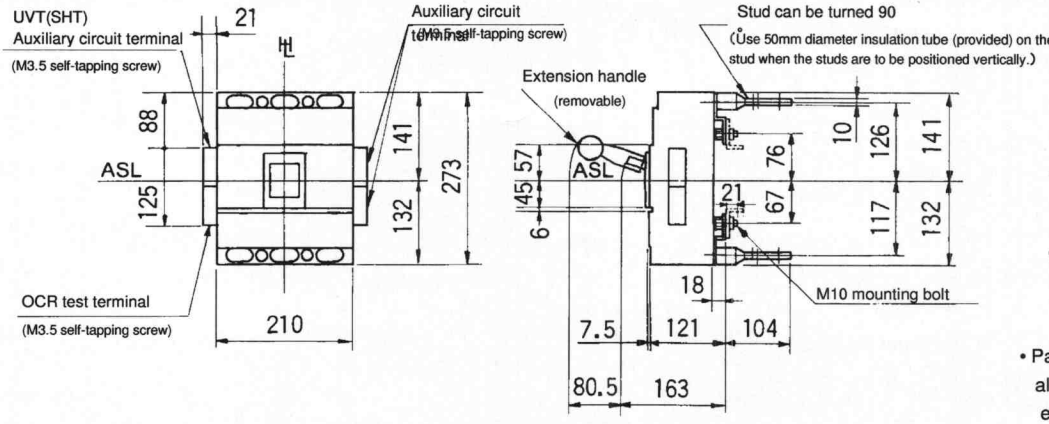


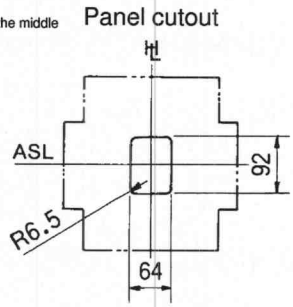
OUTLINE DIMENSIONS (DIRECT MANUAL OPERATION)

AME6B

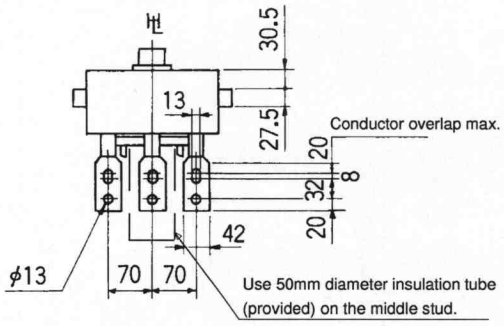
ASL : Arrangement standard line
℄ : Handle frame center line

Rear-connected type

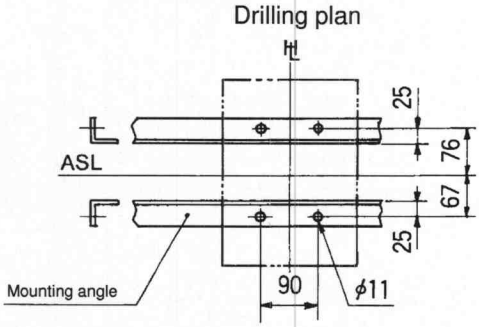




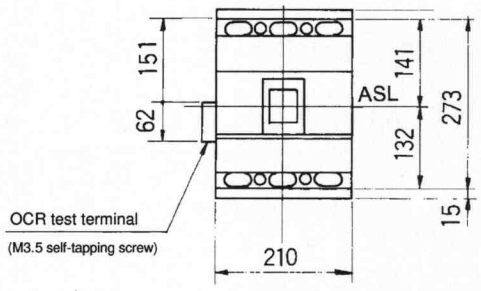
• Panel cutout dimensions shown give an allowance of 1mm around the handle escutcheon.

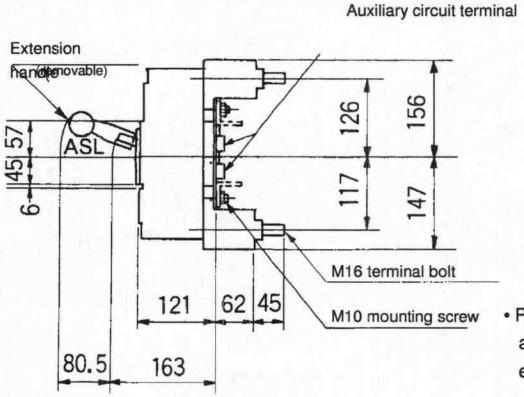


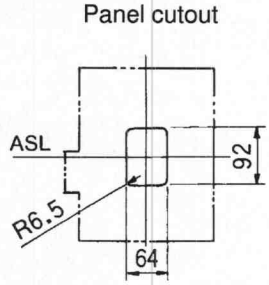
NOTE
Terminal screw tightening torque
M12...40.2-65.7N•m
{410-670 kgf•cm}



Plug-in type

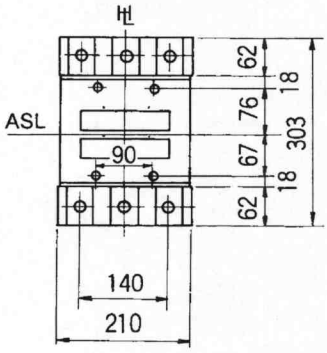




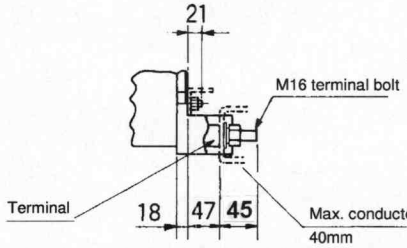


• Panel cutout dimensions shown give an allowance of 1mm around the handle escutcheon.

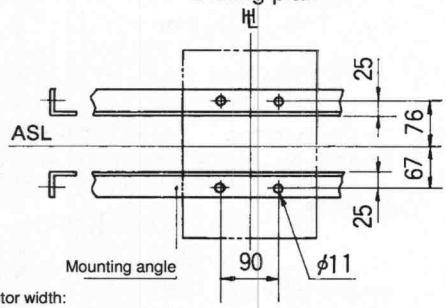
Plug-in mounting base
(XDM6)



Details of connection



Drilling plan



CAUTION
The terminal bolts are made of iron. To prevent conduction of electricity through the bolts, make sure the connecting conductor is in close contact with the mounting base.

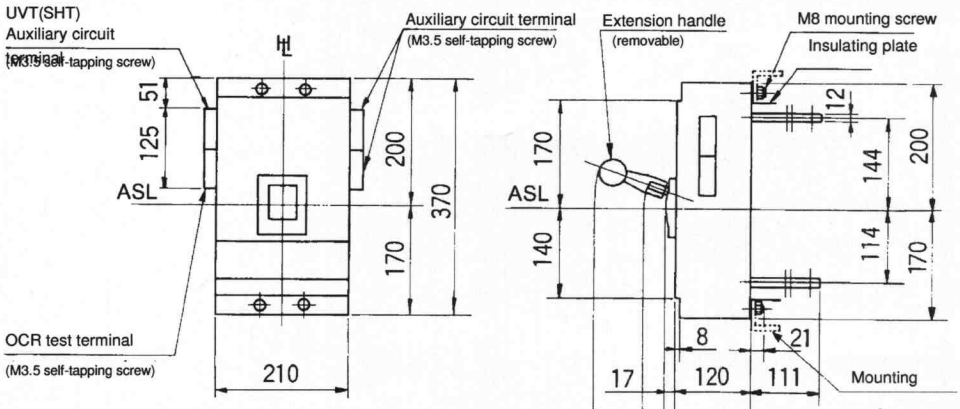
Tightening torque ...51.5 ~ 84.3N•m
{525 ~ 860kgf•cm}

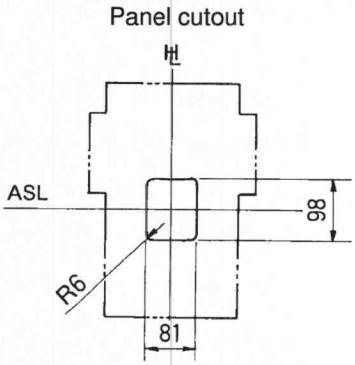
OUTLINE DIMENSIONS (DIRECT MANUAL OPERATION)

AME8B, AME10B

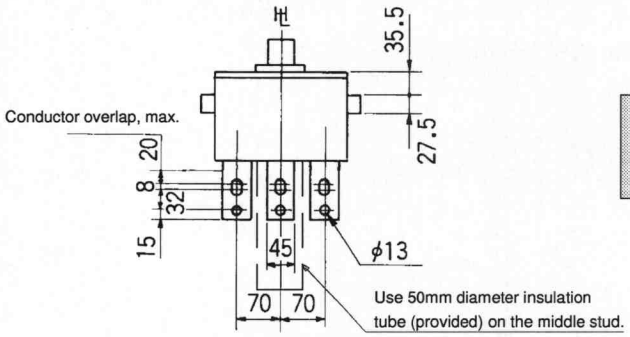
ASL : Arrangement standard line
℄ : Handle frame center line

Rear-connected type

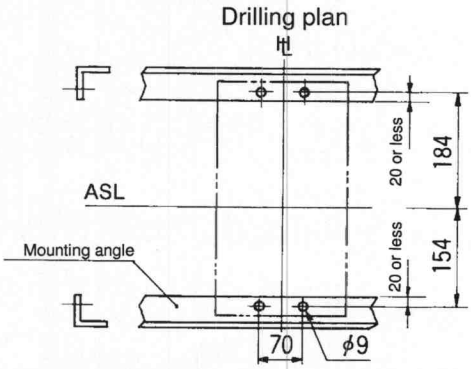




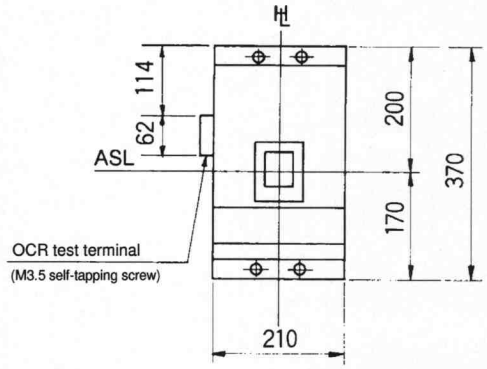
• Panel cutout dimensions shown give an allowance of 1mm around the handle escutcheon.

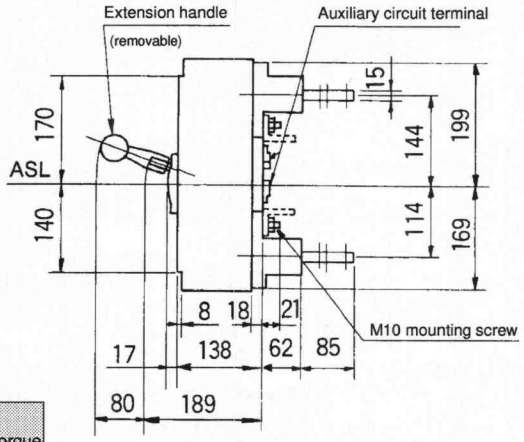


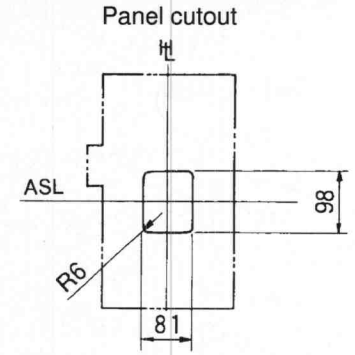
NOTE
Terminal screw tightening torque
M12...40.2-65.7N•m
{410-670 kgf•cm}



Plug-in type



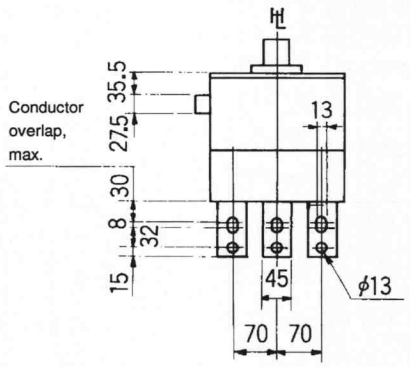


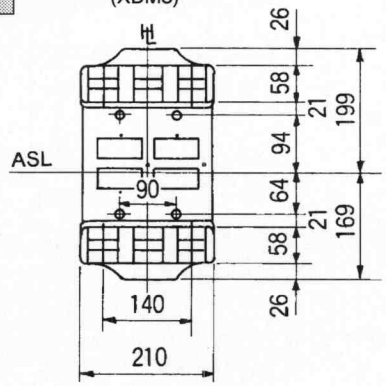


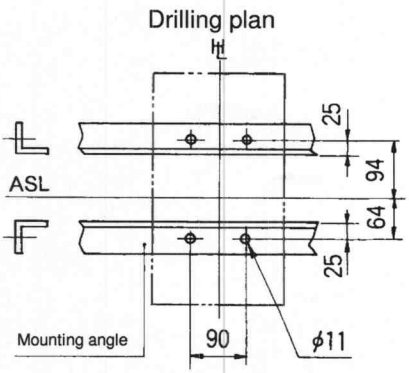
• Panel cutout dimensions shown give an allowance of 1mm around the handle escutcheon.

NOTE
Terminal screw tightening torque
M12...40.2-65.7N•m
{410-670 kgf•cm}

Plug-in mounting base
(XDM8)





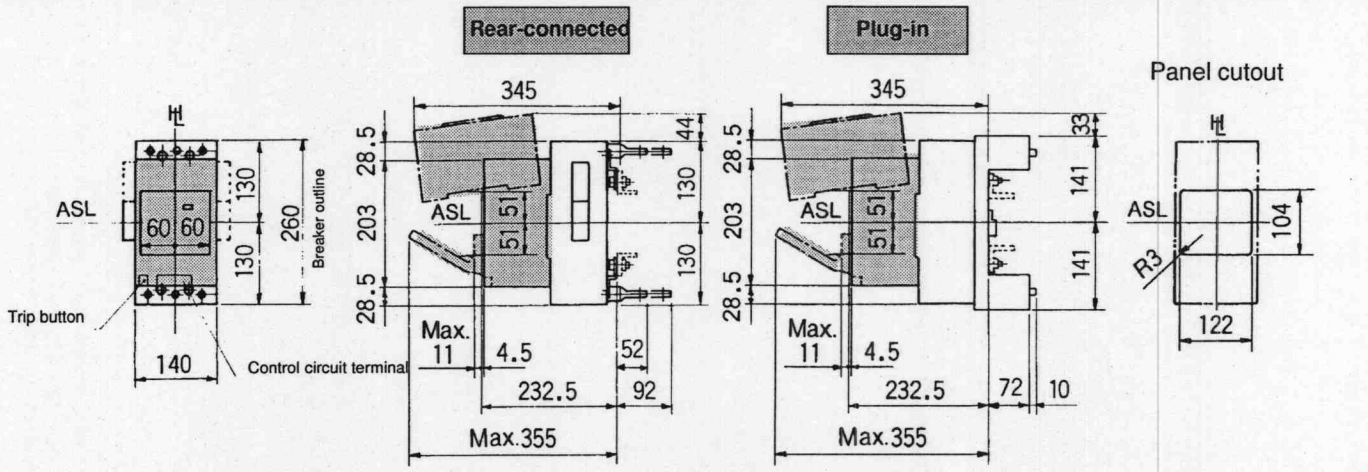


OUTLINE DIMENSIONS

(MOTORIZED OPERATION WITH XMD MOTOR OPERATOR)

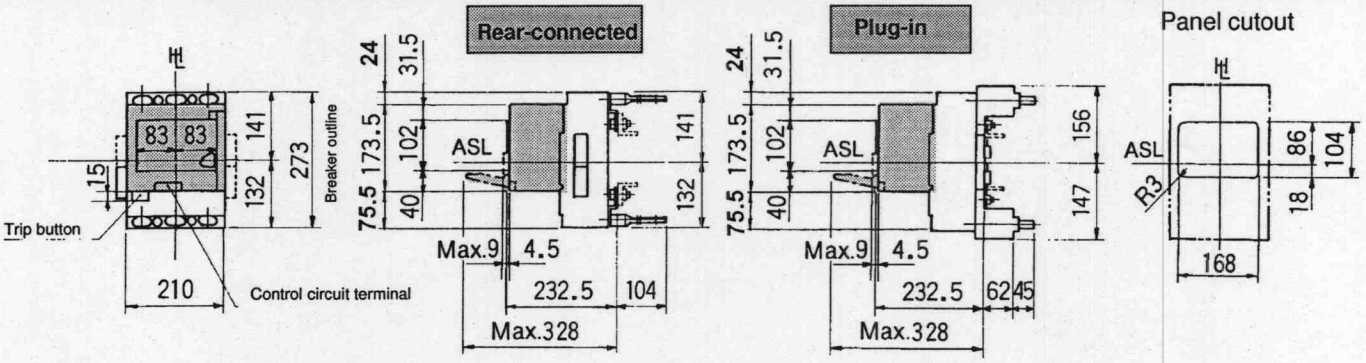
ASL : Arrangement standard line
H : Handle frame center line

AME3B, AME4B



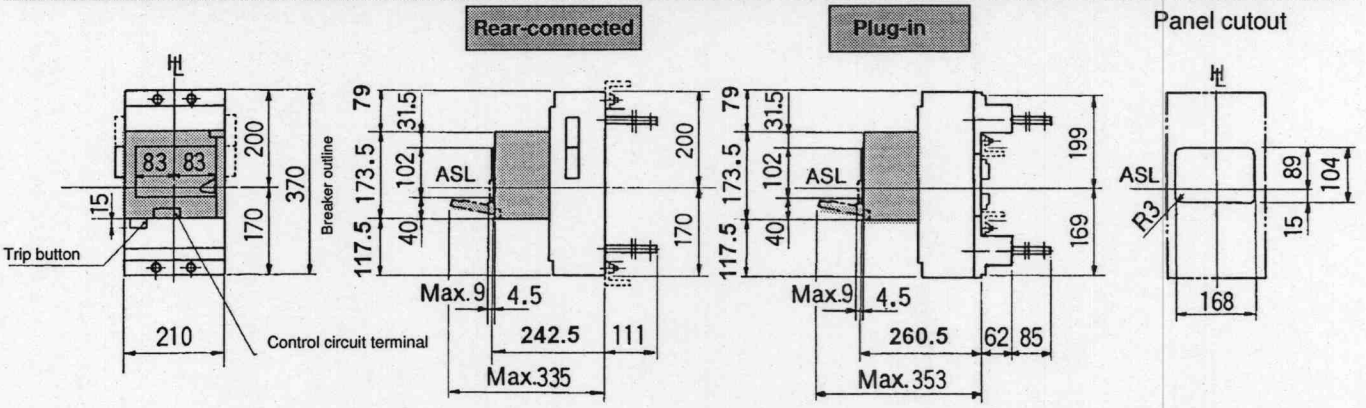
NOTE: See page 10 for details not shown here.

AME6B



NOTE: See page 11 for details not shown here.

AME8B, AME10B

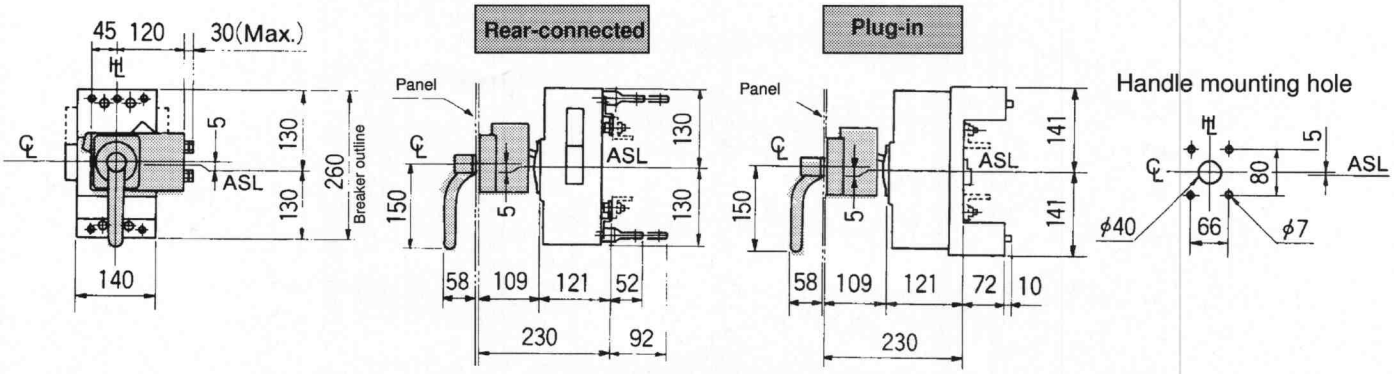


NOTE: See page 12 for details not shown here.

OUTLINE DIMENSIONS (MANUAL OPERATION WITH AFB EXTERNAL OPERATING HANDLE)

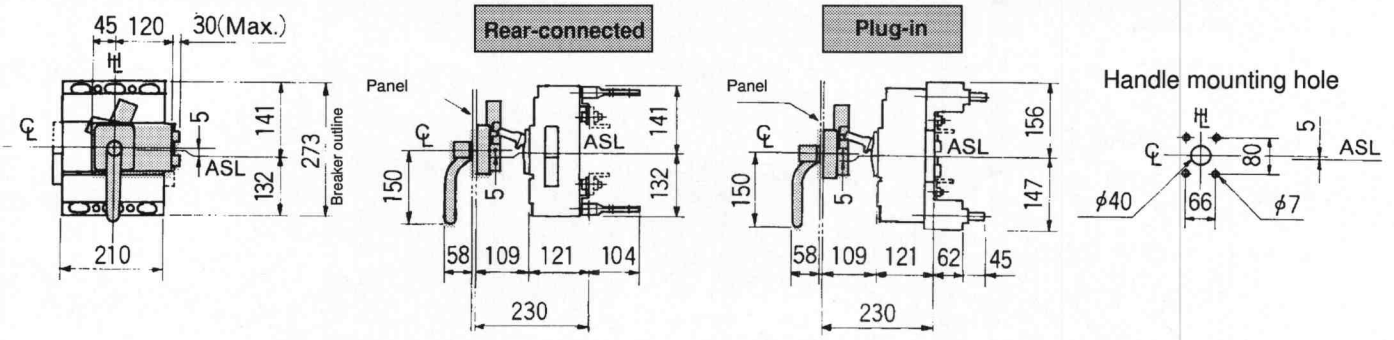
ASL : Arrangement Standard Line
: Handle Frame Center Line
: Handle Center Line

AME3B, AME4B



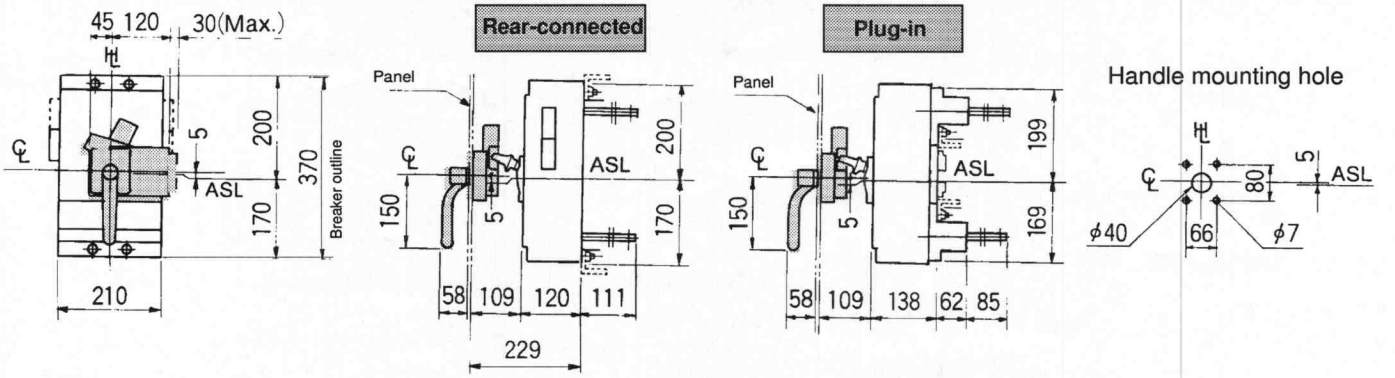
NOTE: See page 10 for details not shown here.

AME6B



NOTE: See page 11 for details not shown here.

AME8B, AME10B

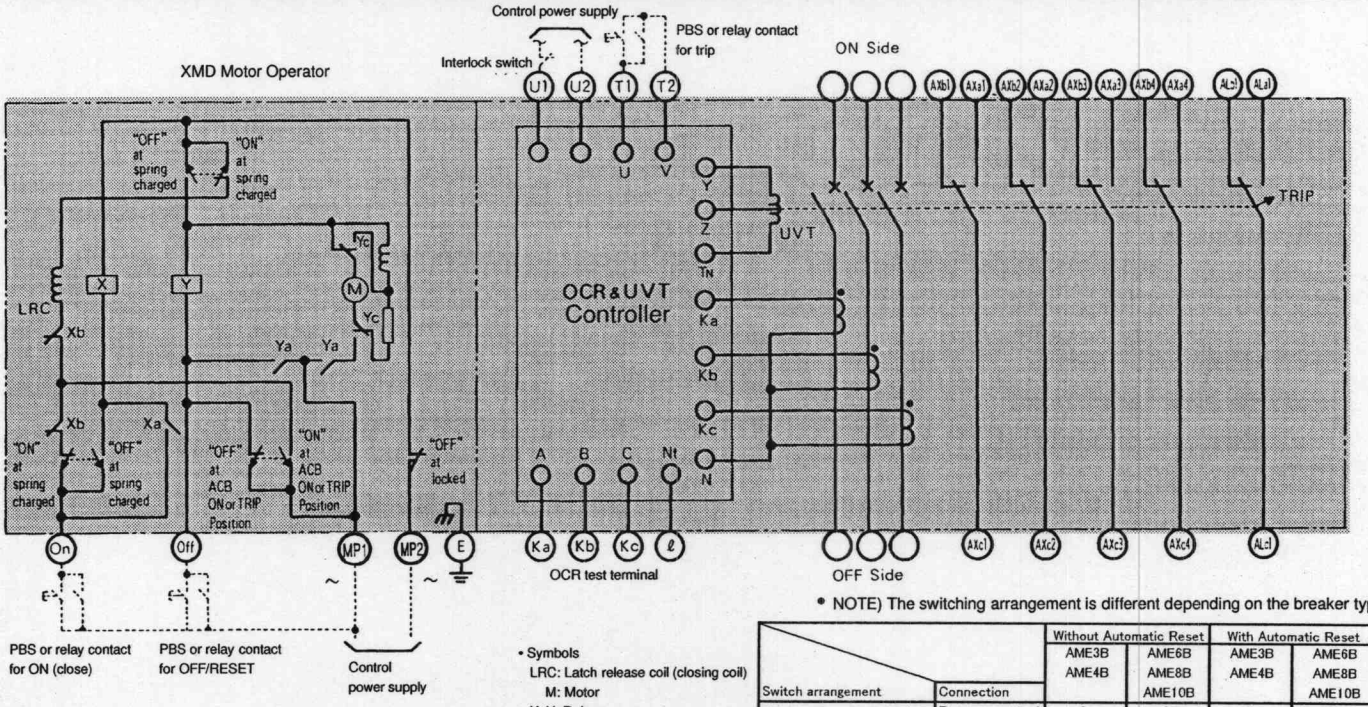


NOTE: See page 12 for details not shown here.

CONNECTION DIAGRAMS

WITH UNDERVOLTAGE TRIP DEVICE (UVT)

Motor operator control circuit	Overcurrent/undervoltage trip device	Main circuit	Auxiliary switch NOTE)	Alarm switch



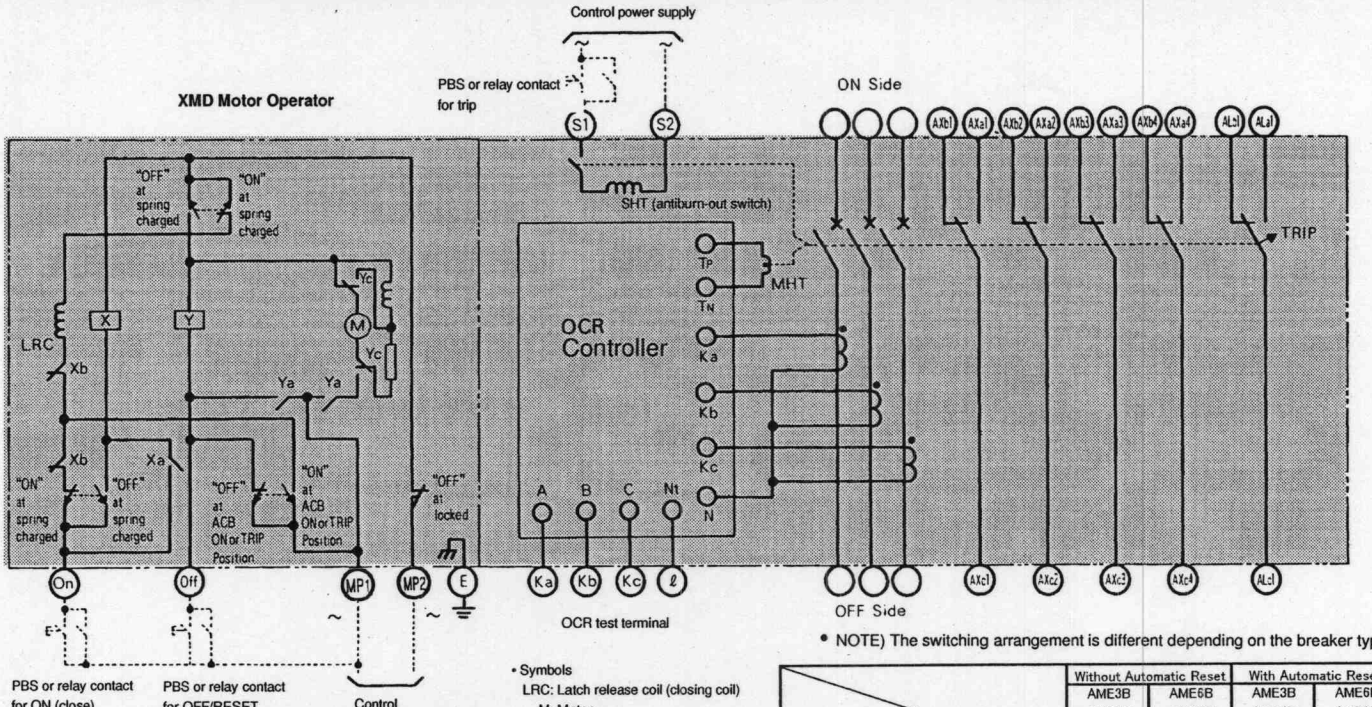
• Symbols
LRC: Latch release coil (closing coil)
M: Motor
X, Y: Relay
UVT: Undervoltage/OCR trip coil

• NOTE) The switching arrangement is different depending on the breaker type.

Switch arrangement	Connection	Without Automatic Reset AME3B AME4B	Without Automatic Reset AME6B AME8B AME10B	With Automatic Reset AME3B AME4B	With Automatic Reset AME6B AME8B AME10B
Number of contacts for AUX SW only	Rear-connected	3c	4c	2c	3c
	Plug-in	2c	3c-1a	2c	3c
contacts when AL SW 1c is used	Rear-connected	2c	2c	1c	2c
	Plug-in	1c	2c	1c	2c

WITH SHUNT TRIP DEVICE (SHT)

Motor operator control circuit	Overcurrent/shunt trip device	Main circuit	Auxiliary switch NOTE)	Alarm switch



• Symbols
LRC: Latch release coil (closing coil)
M: Motor
X, Y: Relay
UVT: Undervoltage/OCR trip coil
MHT: Magnet Hold Trigger (OCR trip coil)
SHT: Shunt trip coil

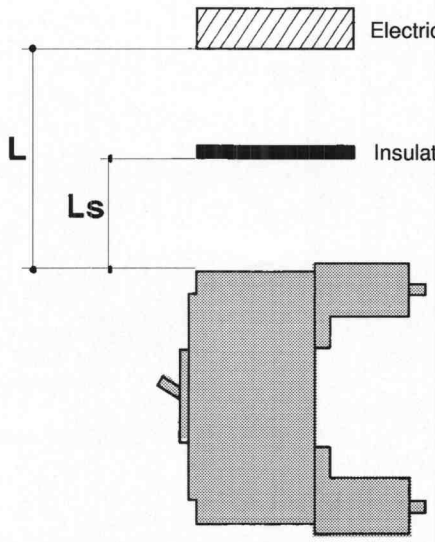
• NOTE) The switching arrangement is different depending on the breaker type.

Switch arrangement	Connection	Without Automatic Reset AME3B AME4B	Without Automatic Reset AME6B AME8B AME10B	With Automatic Reset AME3B AME4B	With Automatic Reset AME6B AME8B AME10B
Number of contacts for AUX SW only	Rear-connected	3c	4c	2c	3c
	Plug-in	2c	3c-1a	2c	3c
contacts when AL SW 1c is used	Rear-connected	2c	2c	1c	2c
	Plug-in	1c	2c	1c	2c

INSULATING DISTANCE FROM LINE-END / INTERNAL RESISTANCE AND POWER CONSUMPTION

INSULATING DISTANCE FROM LINE-END

When the breaker trips due to a short-circuit current, an arc is formed in the arc chute. If other electrical devices or appliances are to be placed above the arc chute, open distance L must be maintained between the device and the breaker. If it is necessary to place the electrical devices closer than distance L, place a heat/fire resistant insulation-plate at distance Ls to shield the devices.



(mm)

Breaker type	L	Ls
AME 3 B **AME 4 B**	120	60
AME 6 B	120	60
AME 8 B	150	75
AME10B	150	75

INTERNAL RESISTANCE AND POWER CONSUMPTION

Breaker type	Rated current In (A)	Internal resistance (mΩ) • Value per pole		Power consumption (W) • Value per pole	
		Rear-connected	Plug-in	Rear-connected	Plug-in
AME3B	16 ≦ In ≦ 31.5	0.25	0.3	0.25	0.29
	31.5 < In ≦ 65	0.15	0.2	0.6	0.79
	63 < In ≦ 125	0.15	0.2	2.34	3.13
	125 < In ≦ 250	0.15	0.2	9.38	12.5
AME4B	200 ≦ In ≦ 400	0.15	0.2	24.0	32.0
AME6B	315 ≦ In ≦ 630	0.08	0.12	31.8	47.6
AME8B	500 ≦ In ≦ 800	0.045	0.053	28.8	33.9
AME10B	630 ≦ In ≦ 1000	0.045	0.053	45.0	53.0

• Power consumption is calculated using the DC internal resistance and the maximum rated current.

FIELD-TESTING THE OVERCURRENT TRIPPING DEVICE

FIELD-TESTING THE LONG TIME-DELAY TRIP CHARACTERISTIC

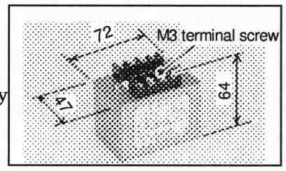
The long time-delay characteristic of the overcurrent tripping device can be tested by sending test current to the OCR test terminal from a separate power source. Testing can be done in each phase.

Prepare the following test equipment

■ **Voltage regulator**
Be sure it produces a clean sine-wave current.

■ **ANS1S type OCR adapter** (optional)
(CT5A/50mA primary/secondary)

CAUTION
Do not disconnect the secondary terminal while the power is on. High voltage will be produced.



■ **AC ammeter**
0 - 100mA

■ **Power supply switch** ■ **Stopwatch**

■ **Resistor: several ohms** (ex.: 8 Ω 150W)

Rated current and CT ratio

Type	Generator rated current [In] (A)	CT ratio
AME3B	16 < In ≦ 31.5	31.5/0.05
	31.5 < In ≦ 65	63 /0.05
	63 < In ≦ 125	125 /0.05
	125 < In ≦ 250	250 /0.05
AME4B	200 ≦ In ≦ 400	400 /0.05
AME6B	315 ≦ In ≦ 630	630 /0.05
AME8B	500 ≦ In ≦ 800	800 /0.05
AME10B	630 ≦ In ≦ 1000	1000/0.05

Test Procedure

❶ Isolate the breaker from the system. (For undervoltage trip device, apply the rated voltage.)

❷ Calculate the test current value.

• Example calculation
For generator rated current [In] = 481 (A), CT ratio 630/0.05, long time-delay pick-up current [I_1] = 115%x[In], and tripping at 20 seconds with an applied current of 120%xI_1, calculate the test current as follows.

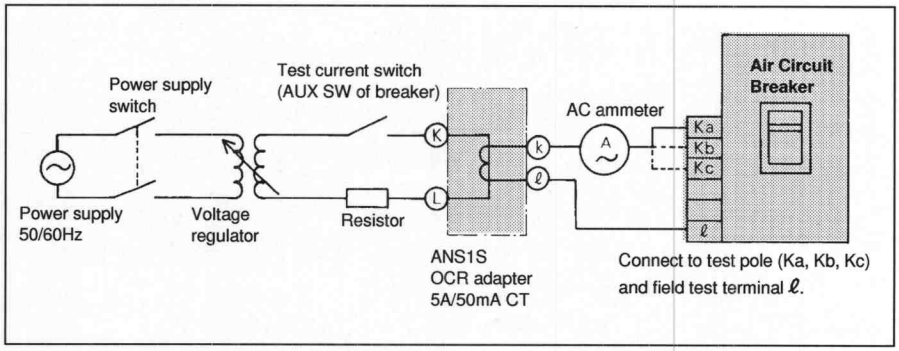
Test current value [I_T] = 481(A)x0.05(A)/630(A)x1.15x1.2 = 0.0526(A)

❸ Remove the OCR test terminal cover and connect an AC ammeter and an OCR adapter between Ka and ℓ for phase A, Kb and ℓ for phase B, or Kc and ℓ for phase C. See the figure below.

❹ Close the breaker (ON), turn up the output of the voltage regulator, and quickly apply the calculated test current, I_T. Measure the time required for the breaker to trip. For the above example, it should be within 20 ± 3 seconds.

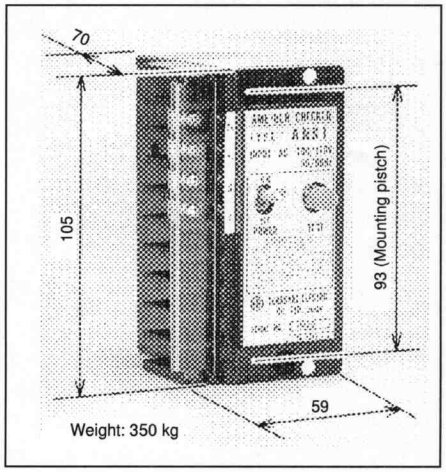
❺ After tripping, turn the output of the voltage regulator to zero and cut off the power. (As shown in the figure, use the auxiliary switch of the breaker to make sure the current is cut off after the test.) Test all phases in the same manner.

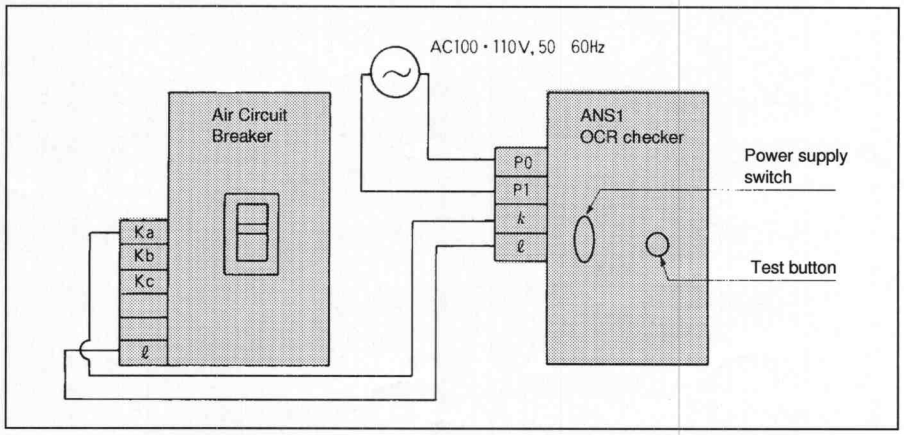
❻ Disconnect the test leads, retighten the terminal screws, and replace the OCR test cover.



OCR CHECKER ANS1 (NK standard requires at least one checker per vessel.)

NK standard requires at least one checker per vessel. The OCR Checker is a device for checking the instantaneous trip mechanism of the overcurrent tripping device. Checking is simple with a power supply of AC100 - 110V, 50/60Hz, and 3VA or more.





CAUTION: DO NOT USE THE OCR CHECKER WHILE CURRENT IS BEING APPLIED TO THE BREAKER

❶ Open the breaker (OFF) and connect ANS1 to the breaker test terminals as shown in the figure above.

❷ Connect the power supply to the terminals P0 and P1 and closed the breaker (ON).

❸ Turn on the ANS1 power supply switch, wait at least three seconds, and then press the test button. The breaker will trip momentarily.

ORDER SHEET

■ **For ☐ , write ✓ for the appropriate item. For __ , write a numerical value.**

Company Name: _____ Order Number: _____

Quantity · Required Delivery Date Quantity _____ Month _____ Day _____ Year _____

Specification Items	
❶ Type	☐ AME3B ☐ AME4B ☐ AME6B ☐ AME8B ☐ AME10B
❷ Number of poles	3-pole
❸ Main circuit voltage/frequency	AC _____ V _____ Hz
❹ Applied standard Ambient temperature	Applied standard _____ ☐ 40 °C ☐ 45 °C
❺ Mounting type	☐ Rear-connected ☐ Plug-in
❻ Type of operation	(1) Manual operation ☐ Direct manual operation ☐ External manual operation (AFB External manual operation handle) (2) Motor operation Rated operating voltage AC___V __ Hz,
❼ Overcurrent tripping device	(1) ☐ LTD, STD, INST tripping ☐ LTD, STD tripping (2) Rated generator current [In] __ A (3) LTD trip pick-up current [I1] __ A ([In] x __ %) __ s at I_1x120% (4) STD trip pick-up current [I2] __ A ([In] x __ %) 120ms for current ≧ I_2 (5) INST trip pick-up current [I3] __ A ([In} x __ %)
❽ Accessories	(1) ☐ Shunt trip device (AC __ V) (2) ☐ Undervoltage trip device (AC __ V) ※ Options (1) and (2) can not be used together. (3) Auxiliary switch (standard) (4) Alarm switch ☐ Required ☐ Not required (5) Extension handle (standard with AME6B, 8B, 10B) (6) Terminal cover ☐ Required (only available for AME3B, 4B, 6B) ☐ Not required
❾ Spare parts	☐ Required (one set according to the applied standard) ☐ Not required
❿ Others	☐ OCR Checker (ANS1) __ pcs. (NK standard requires at least one cheker per vessel) ☐ OCR Adapter (ANS1S) __ pcs. (used for secondary current test)

Sales agent

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