

MANUAL DE UTILIZARE

INTRERUPĂTOR JOASĂ TENSIUNE



RE
SIUNE

Air Circuit Breaker Usage Manual

Ex9A16 (400A~1600A)

Ex9A32 (1600A~3200A)

Ex9A40 (2000A~4000A)



Installation manual

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Smart Unit Operating Instruction

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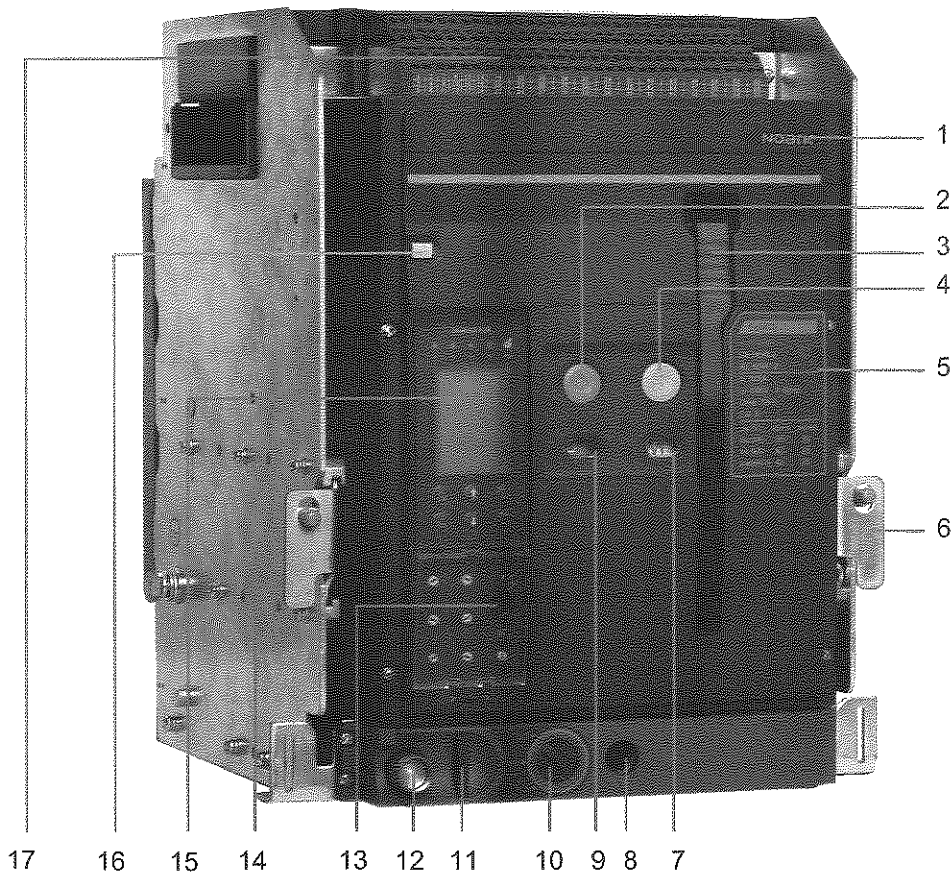
Note

This equipment should only be mounted by professionals. The manufacturer shall not be held responsible for any unfavourable consequence to comply with the instructions given in this manual.

- The device should only be installed and serviced by professionals
- Switch off the general and auxiliary power supply to the device prior to any work on or in the device
- Always use an appropriate voltage detection device to confirm the absence of voltage

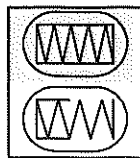
Failure to take these precautions could expose intervener and people round to serious corporal injuries.

Appearance



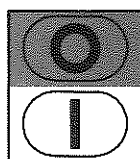
Appearance Introduction

- | | |
|-------------------------------------------|---------------------------------------------|
| 1 Brand | 10 "Seperate"/"Test"/"Connect"Indicator |
| 2 On Button (O) | 11 Padlock |
| 3 Manual Energy Storage Handle | 12 Handle and its Storage Hole |
| 4 Off Button (I) | 13 Interface of Experimental Test |
| 5 Name Plate | 14 Slideway |
| 6 Withdrawable Bar | 15 Smart Control Unit |
| 7 Energy Storage/Energy Release Indicator | 16 Reset Button |
| | 17 Wiring Terminal On the Secondary Circuit |



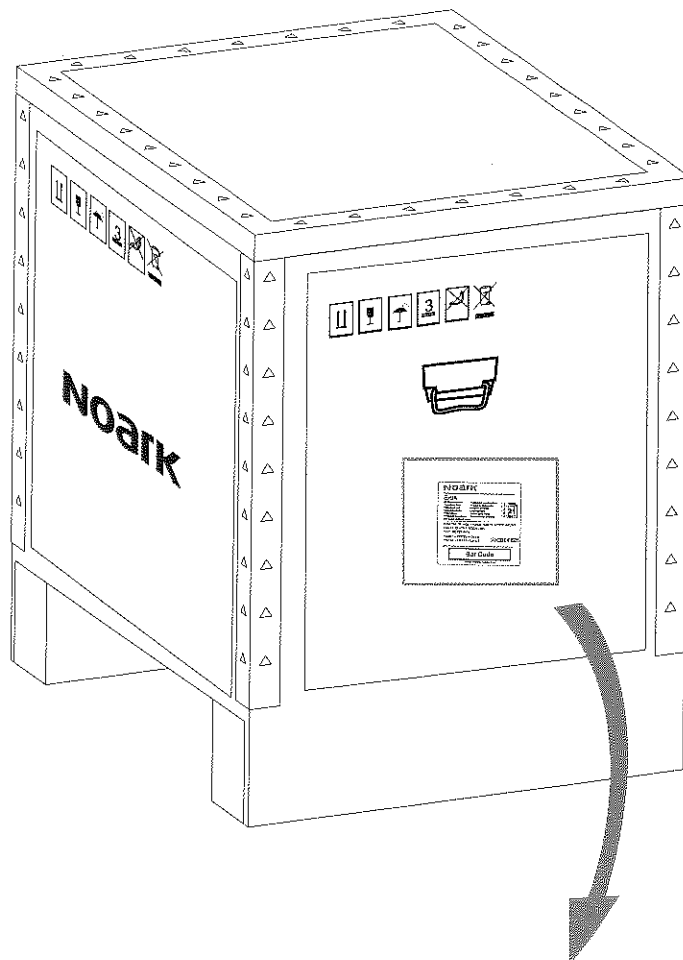
- a Energy Storage
- b Energy Release

- 8 Working Hole of Handle
- 9 Main Contact Indicator



- a ON
- b OFF

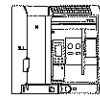
Package Identification



NOARK

Ex9A

Air Circuit breaker	Воздушный выключатель
Vzduchový jistič	Въздушни прекъсвачи
Vzduchový listič	Vazdušni prekidači
Leistungsschalter	Légmegszakító
Disjoncteurs	Jaudas gaisa slēdzis
Wyłącznik powietrzny	Автоматичний вимикач
Intreuptor automat in aer	



Ex9A16N 3P 1600 +SU30A +MD 11 AC230-AC380
 +AX 11 22 +SHT AC220-240V
 +UVT AC220-240V

104867 +105025 +105136
 105144 +105119 +105127

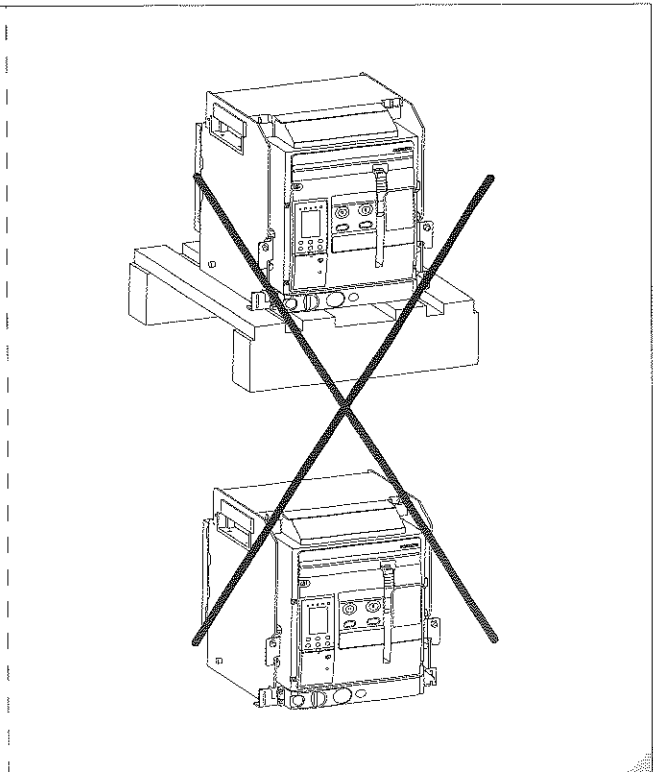
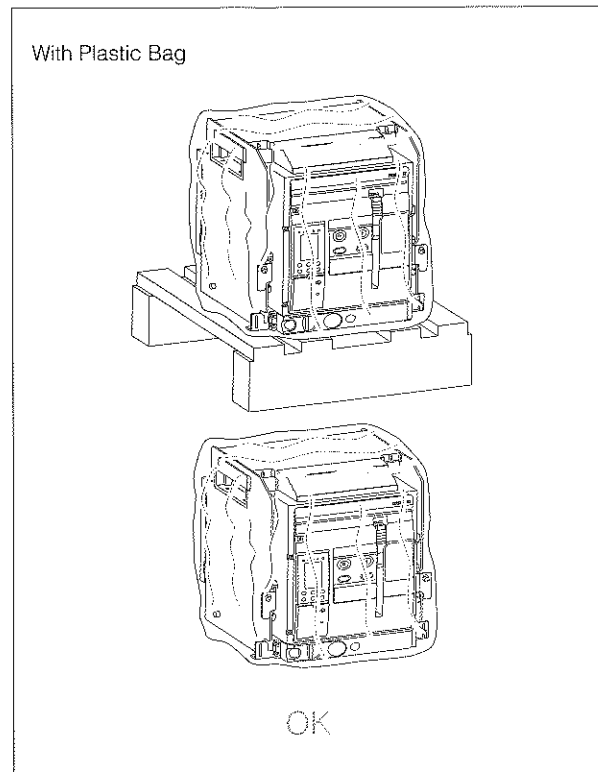
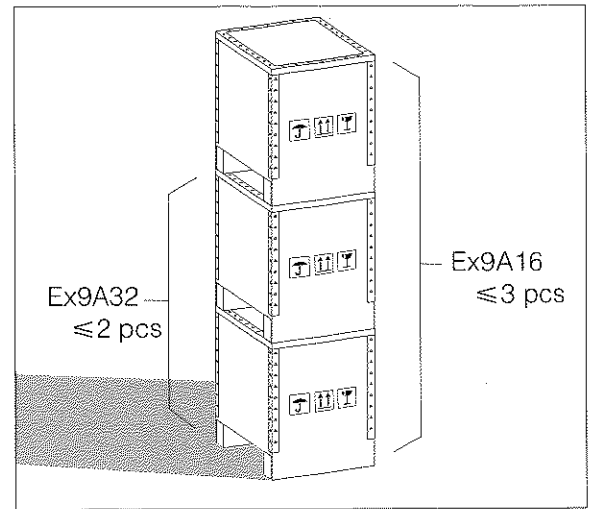
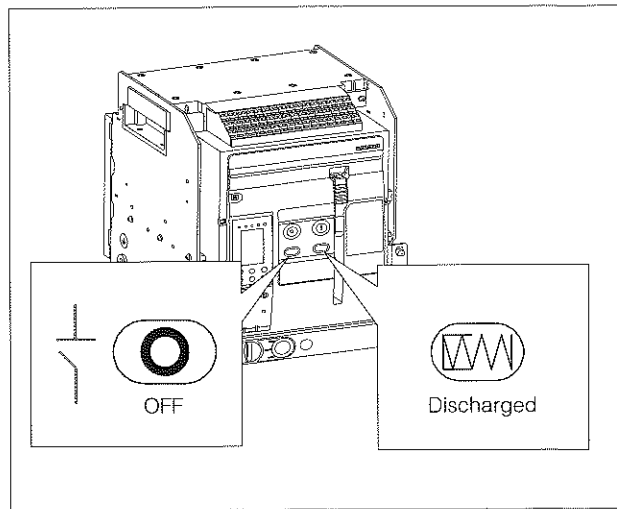
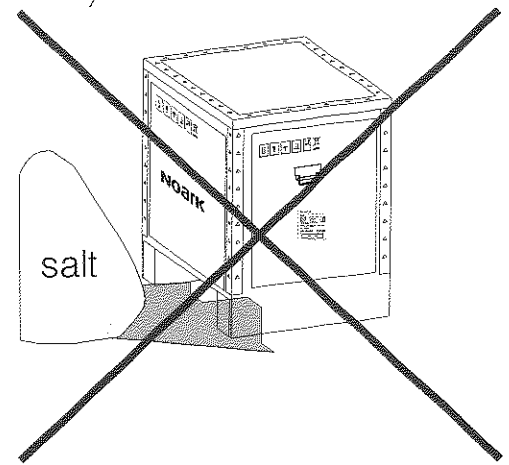
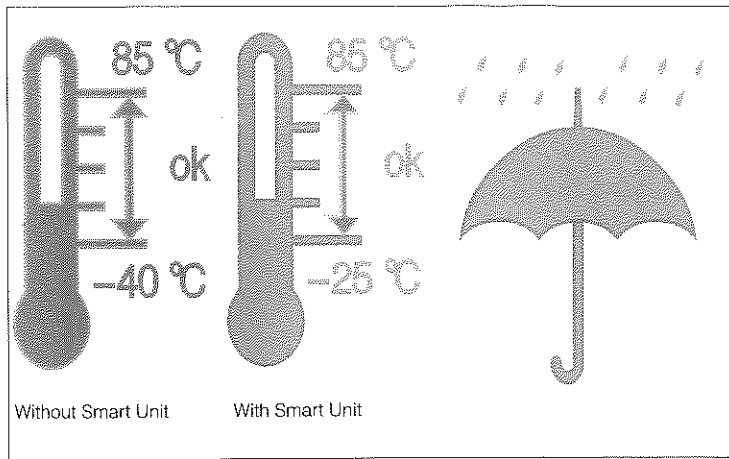


8 592765 104868 4

Noark Electric Europe s.r.o.

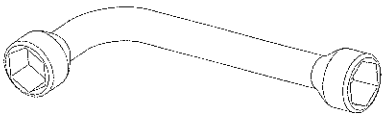
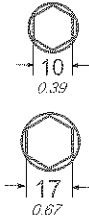
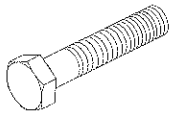



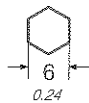
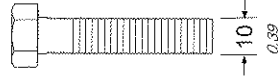
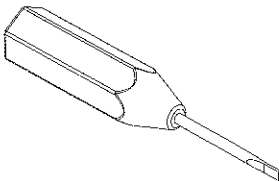
Side Face

Storage

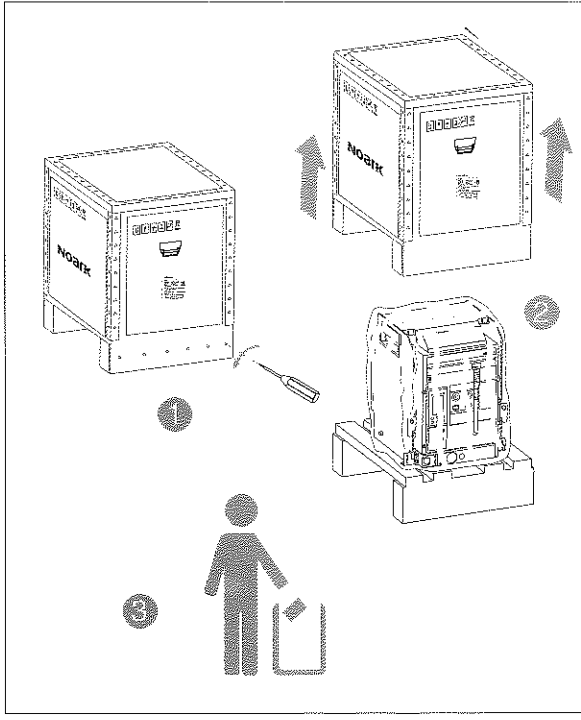


Necessary tools

Angled socket wrench, hex key, screwdriver

		mm in.	
	M6		Class 8.8
Installation Bolt	M10		
			
Terminal Connection Bolt	M10		Class 8.8
Application in Secondary Circuit Wiring			
			

Unpacking



Nameplate Hint

Ex9A16

GB 14048.2 KEMA CB CE

IEC/EN 60947-2

In 1600A

Ui 1000V f 50/60Hz

Uimp 12kV

Cat B

Ue (V)	380/400/415	660/690
Icu (kA)	55	30
Ics (kA)	42	30
Icw(kA)1s	42	25

Ex9A16
Ex9A32
Ex9A40
Withdrawable

Connect

Test

Separate

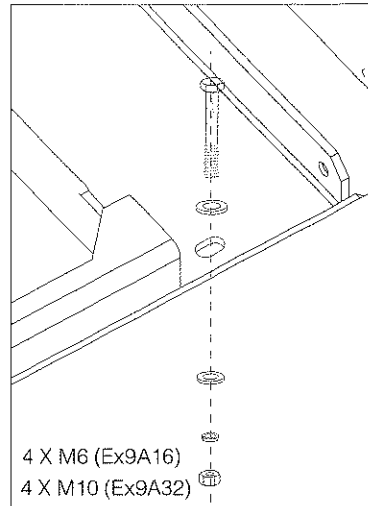
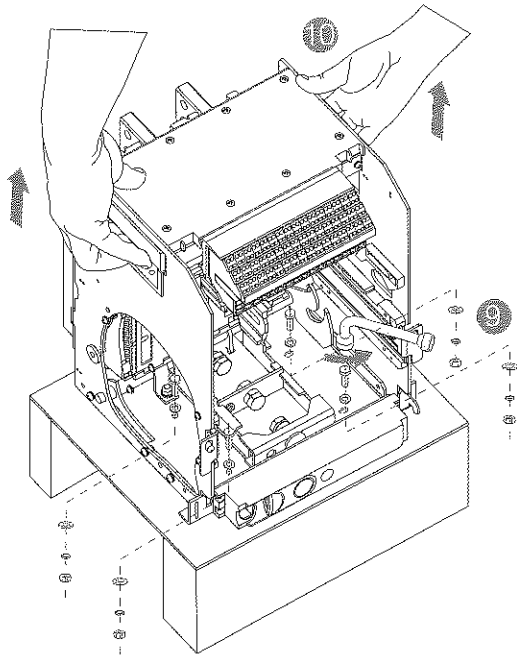
5 Turn the Handle Indicator to "Separate"

5. Press the button of plank 6. Pull body outward

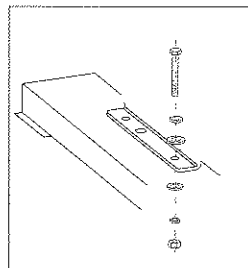
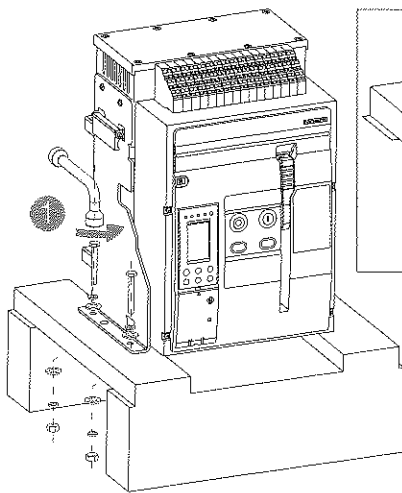
7. Pull the body to ultimate position

Unpacking

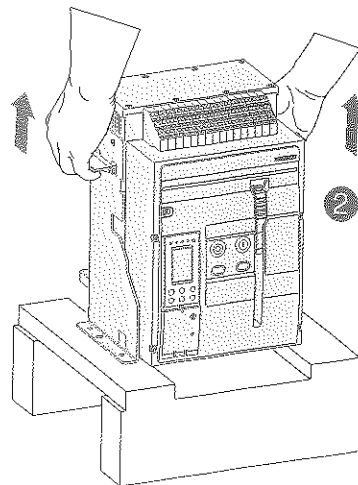
Ex9A16
Ex9A32
Ex9A40
Withdrawable



Ex9A16
Ex9A32
Ex9A40
Fixed

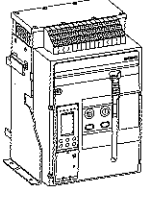
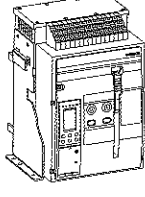
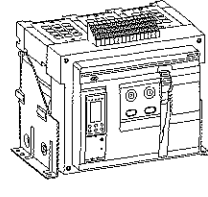
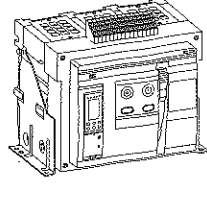
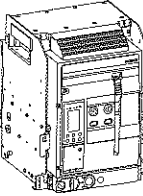
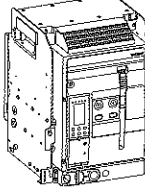
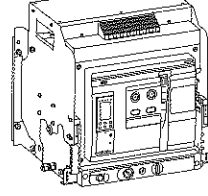
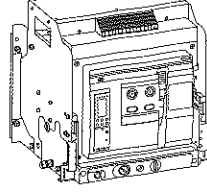
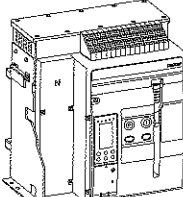
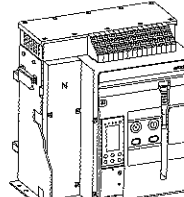
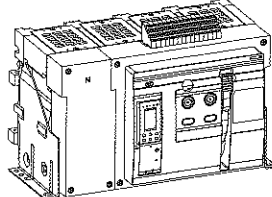
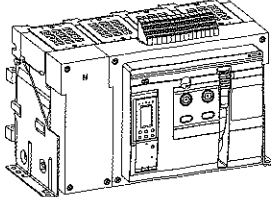
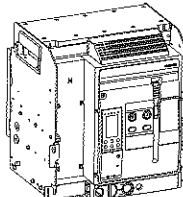
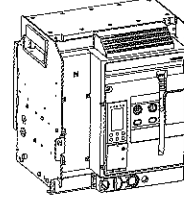
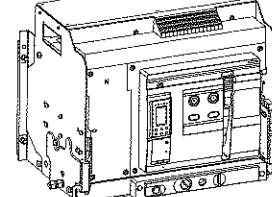
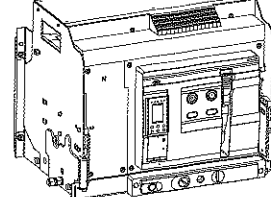


4 X M6 (Ex9A16)
4 X M10 (Ex9A32)

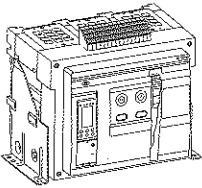
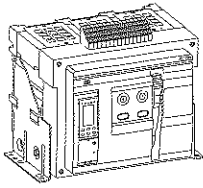
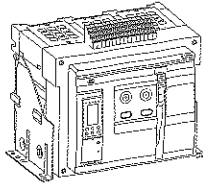
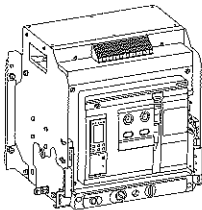
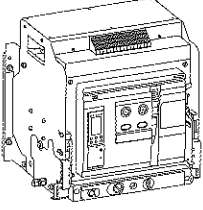
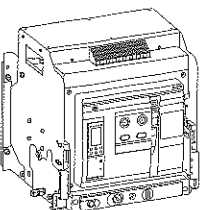
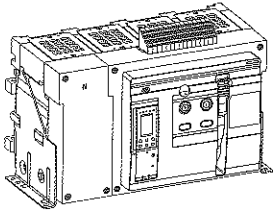
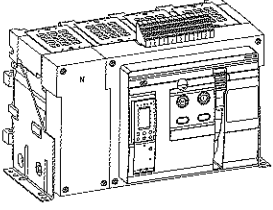
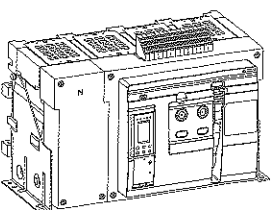
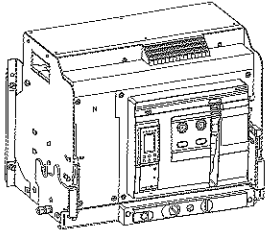
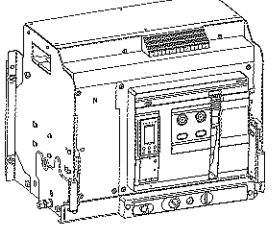
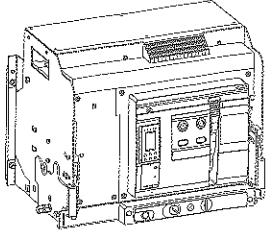


3P

Handing

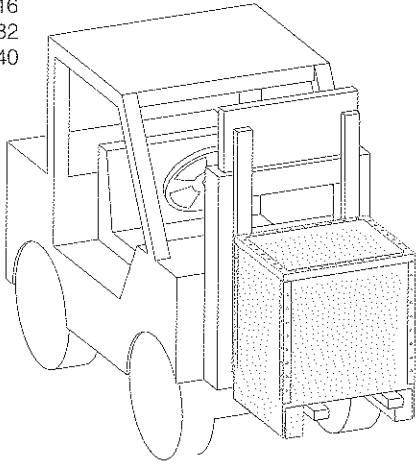
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		400A~630A	800A~1600A	1600A~2500A	2900A~3200A
3P	Fixed	 22kg	 22.8kg	 51kg	 52.5kg
	Withdrawable	 38kg	 39kg	 96.5kg	 98kg
4P	Fixed	 26.5kg	 27.5kg	 64.5kg	 66.5kg
	Withdrawable	 55kg	 55.8kg	 119kg	 121kg

Handing

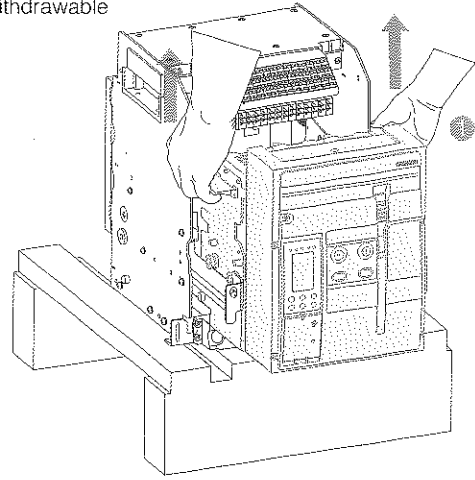
		Ex9A40		
		2000A~2500A	2900A~3200A	4000A
3P	Fixed	 <p>52kg</p>	 <p>53.5kg</p>	 <p>57kg</p>
	Withdrawable	 <p>110.5kg</p>	 <p>112kg</p>	 <p>115kg</p>
4P	Fixed	 <p>68kg</p>	 <p>70kg</p>	 <p>74.5kg</p>
	Withdrawable	 <p>138.5kg</p>	 <p>140.5kg</p>	 <p>145kg</p>

Handling

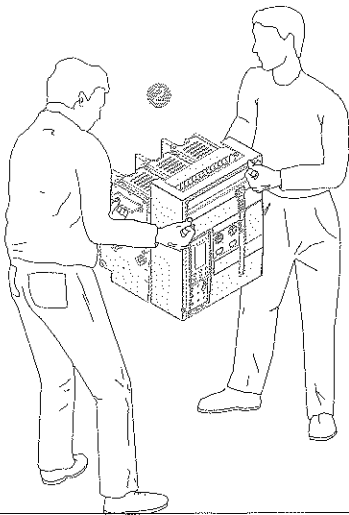
Ex9A16
Ex9A32
Ex9A40



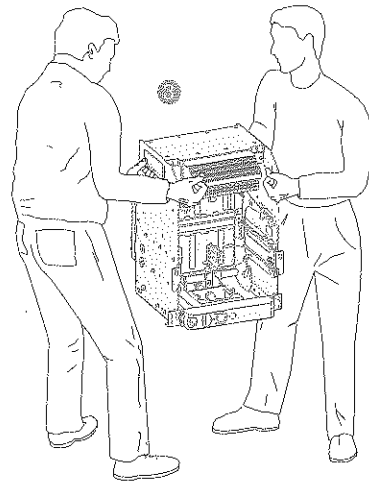
Ex9A16
Withdrawable



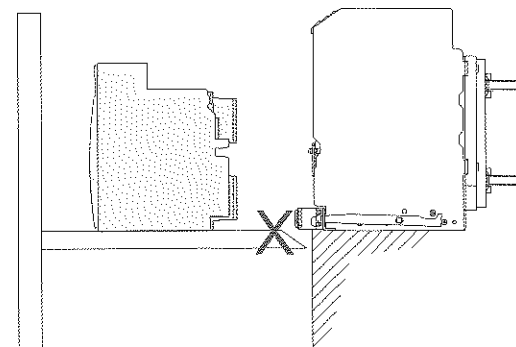
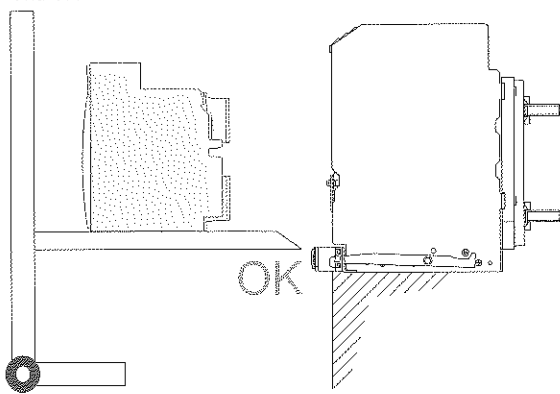
Ex9A16
Body only



Ex9A16
Chassis only



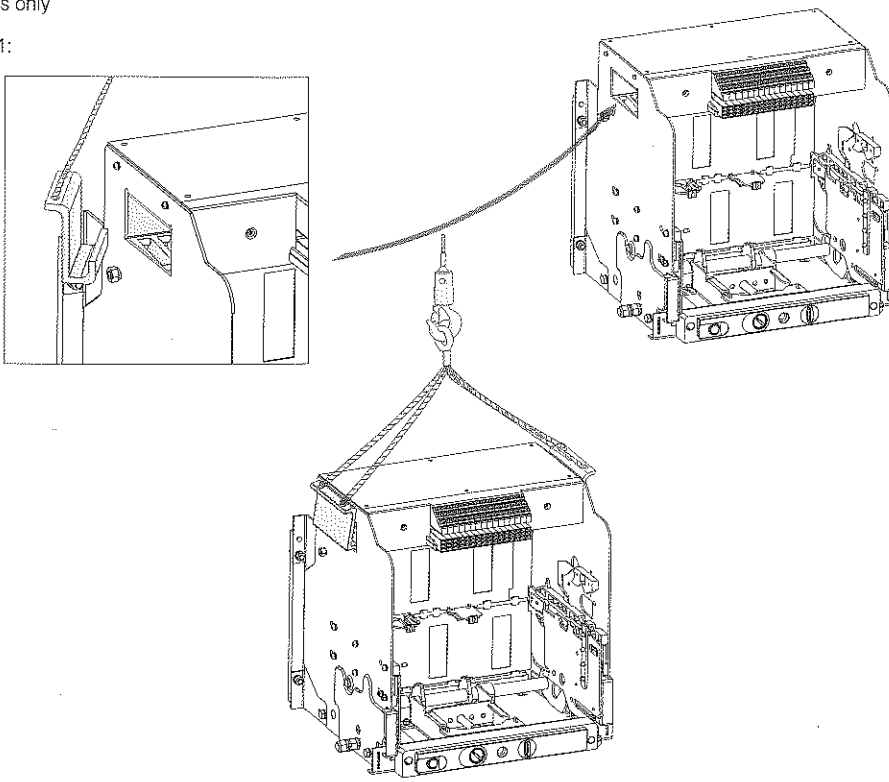
Ex9A16
Ex9A32
Ex9A40
Withdrawable



Handing

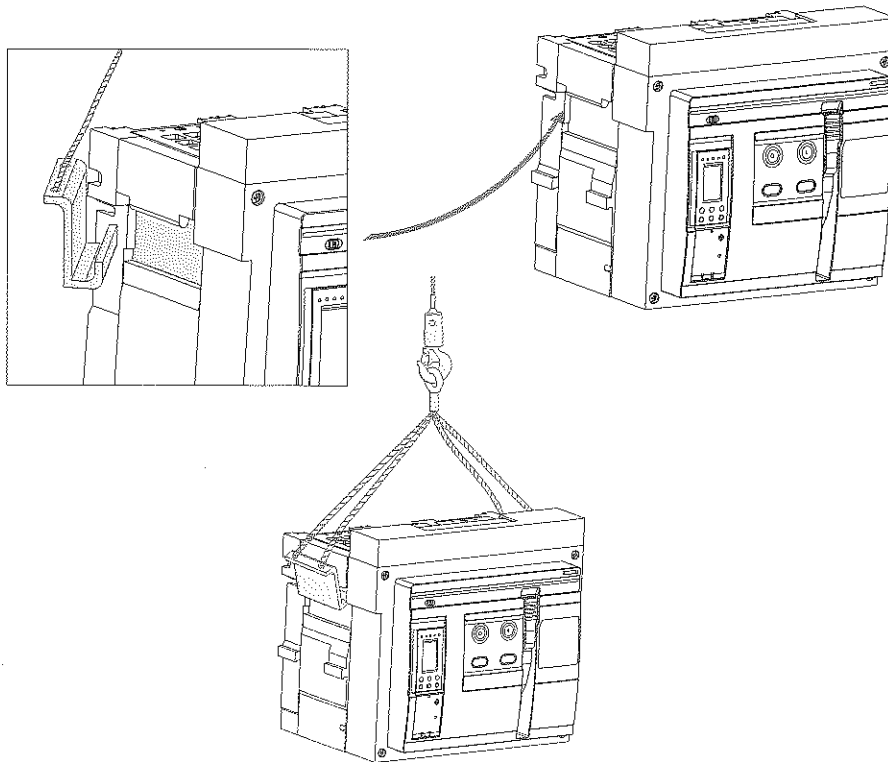
Ex9A32 / Ex9A40
Chassis only

Mode 1:



Ex9A32 / Ex9A40
Body only

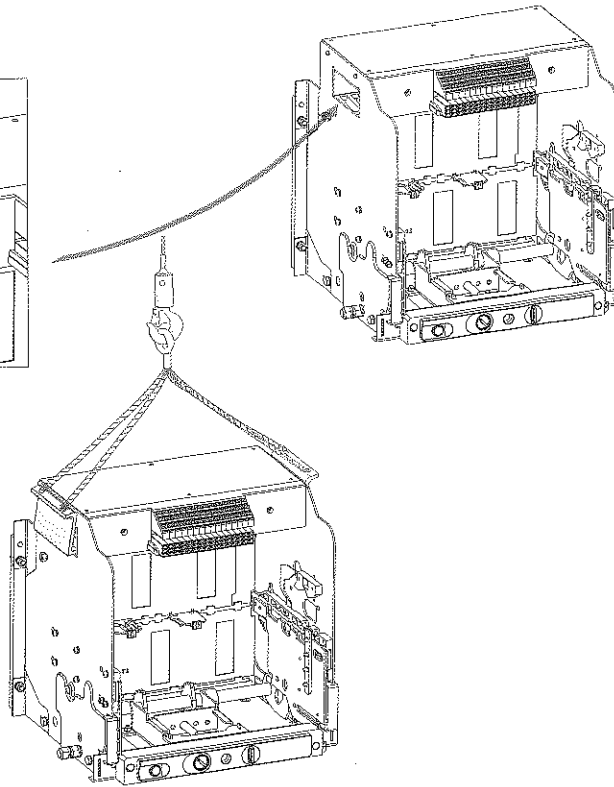
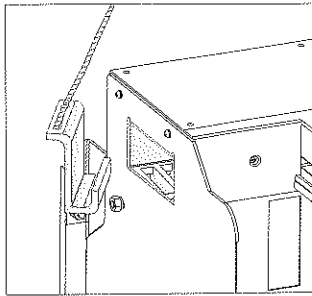
Mode 1:



Handing

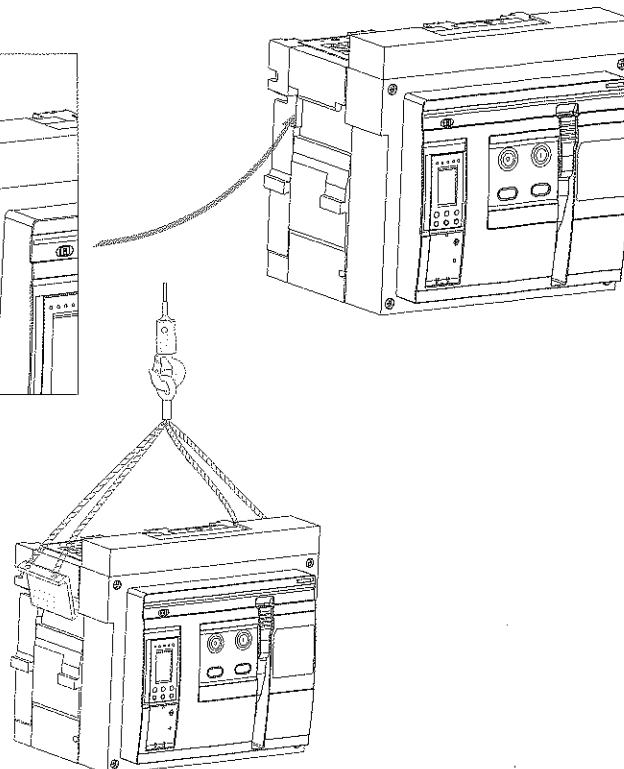
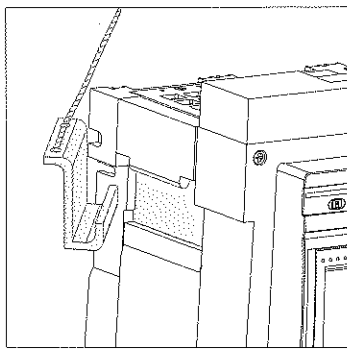
Ex9A32 / Ex9A40
Chassis only

Mode 1:



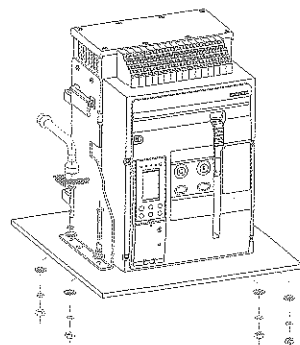
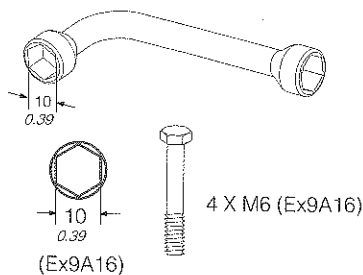
Ex9A32 / Ex9A40
Body only

Mode 1:

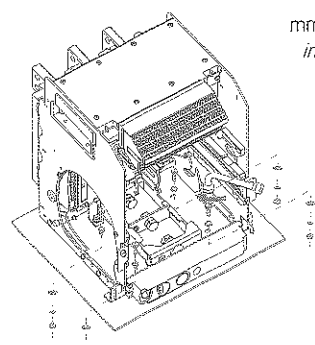


Installation

Ex9A16(400A~630A)
To fasten ACB



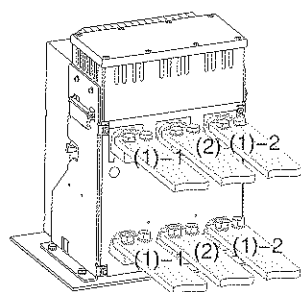
Fixed



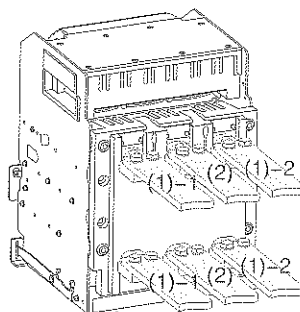
Withdrawable

mm
in.

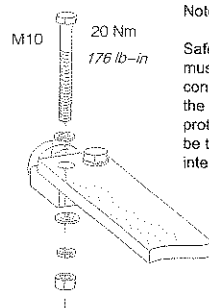
Ex9A16 (400A~630A)
Horizontal Busbar



Fixed



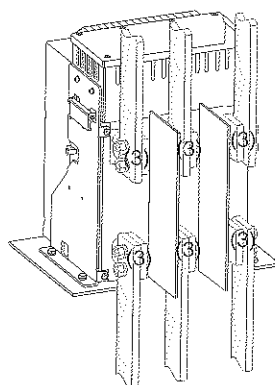
Withdrawable



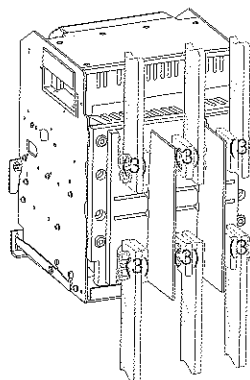
Note:
Safe electrical distance must be guaranteed when connection. If can't meet the demand, insulating protected measures should be taken, such as increasing interphase barriers

mm
in.

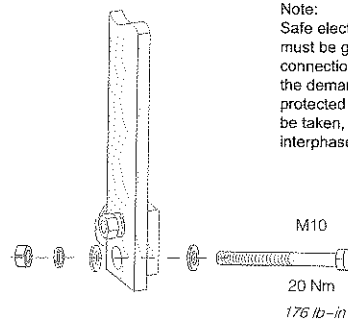
Ex9A16 (400A~630A)
Vertical Busbar



Fixed



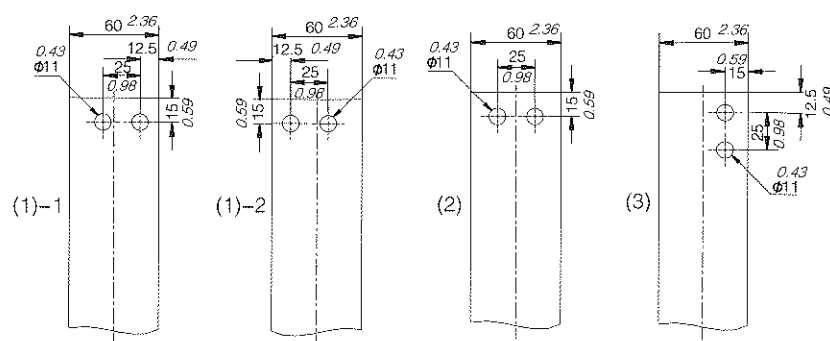
Withdrawable



Note:
Safe electrical distance must be guaranteed when connection. If can't meet the demand, insulating protected measures should be taken, such as increasing interphase barriers

mm
in.

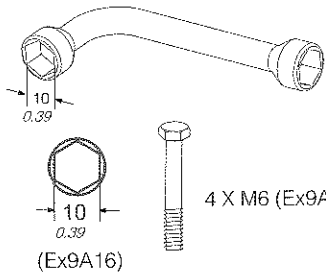
Ex9A16 (400A~630A)
Busbar Dimension



mm
in.

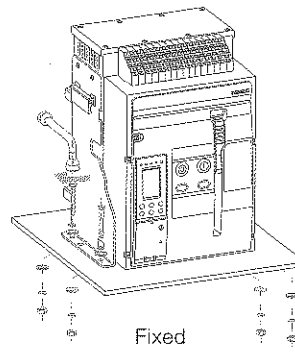
Installation

Ex9A16 (800A~1600A)
To fasten ACB

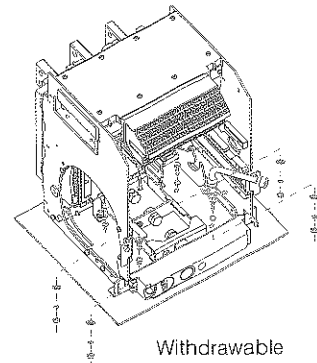


4 X M6 (Ex9A16)

(Ex9A16)



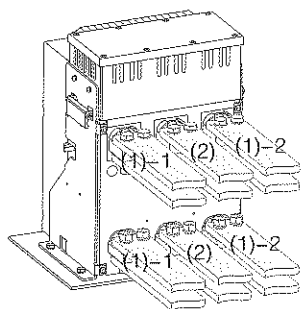
Fixed



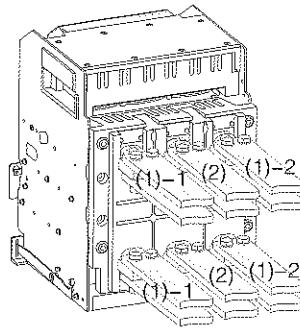
Withdrawable

mm
in.

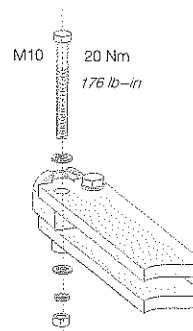
Ex9A16 (800A~1600A)
Horizontal Busbar



Fixed



Withdrawable

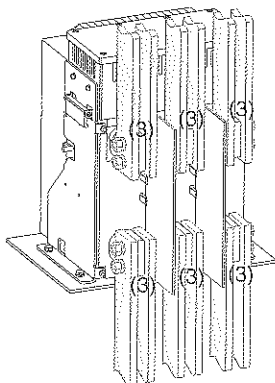


Pay Attention:

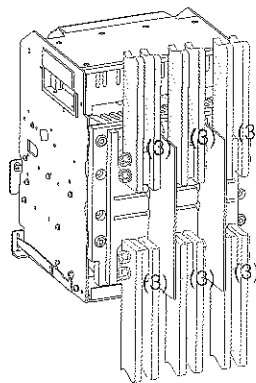
Safe electrical distance must be guaranteed when connection. If can't meet the demand, insulating protected measures should be taken, such as increasing interphase barriers

mm
in.

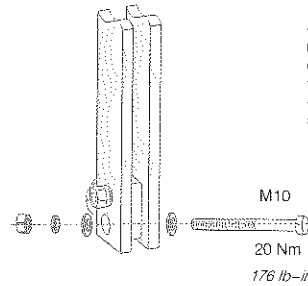
Ex9A16 (800A~1600A)
Vertical Busbar



Fixed



Withdrawable

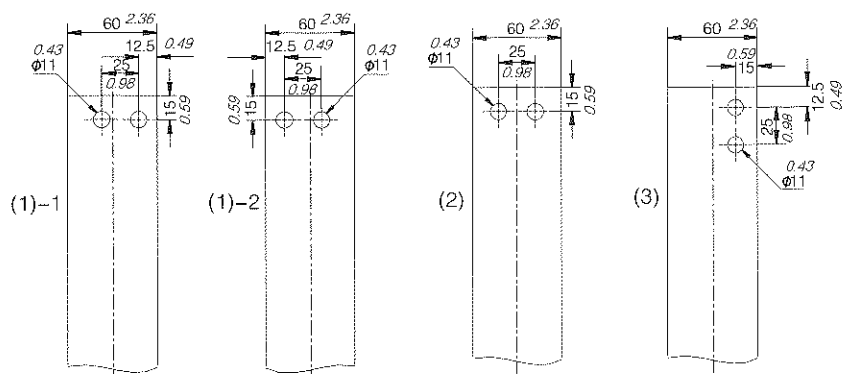


Pay Attention:

Safe electrical distance must be guaranteed when connection. If can't meet the demand, insulating protected measures should be taken, such as increasing interphase barriers

mm
in.

Ex9A16 (800A~1600A)
Busbar Dimension

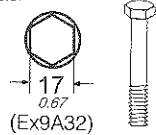
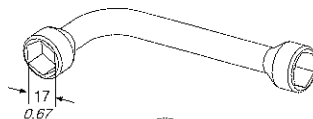


mm
in.

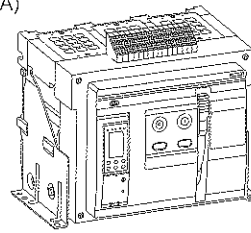
Installation

Ex9A32 (1600A~2500A) / Ex9A40 (2000A~2500A)
To fasten ACB

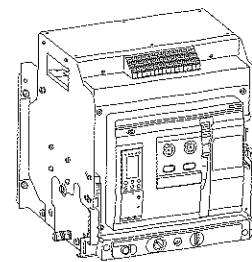
mm
in.



4 X M10 (Ex9A32)



Fixed

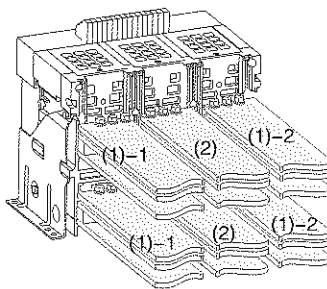


Withdrawable

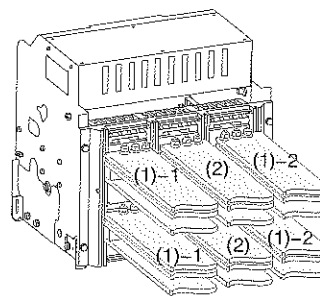
The fix way is the same as Ex9A16 on P12

Ex9A32 (1600A~2500A) / Ex9A40 (2000A~2500A)
Horizontal Busbar

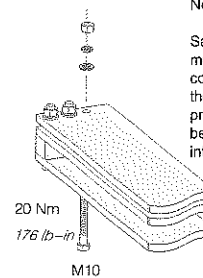
mm
in.



Fixed



Withdrawable



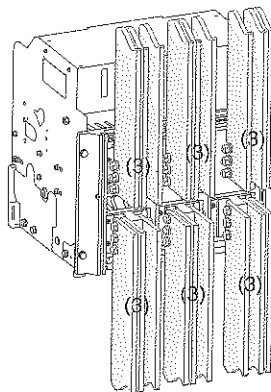
M10

Note:

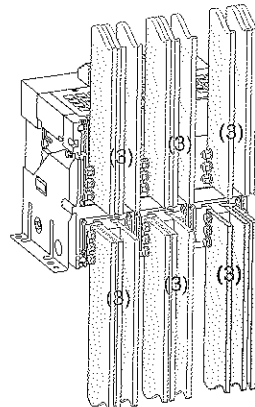
Safe electrical distance must be guaranteed when connection. If can't meet the demand, insulating protected measures should be taken, such as increasing interphase barriers

Ex9A32 (1600A~2500A) / Ex9A40 (2000A~2500A)
Vertical Busbar

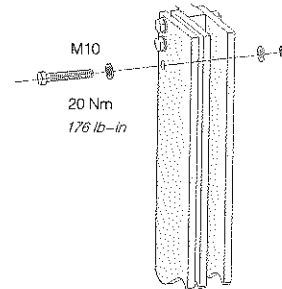
mm
in.



Fixed



Withdrawable



M10

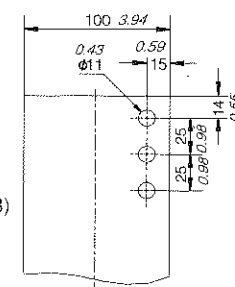
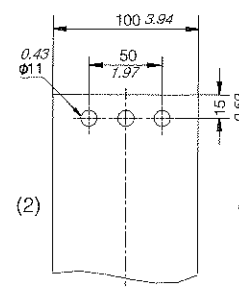
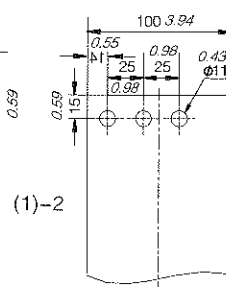
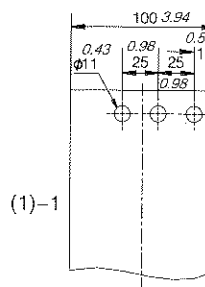
20 Nm
176 lb-in

Note:

Safe electrical distance must be guaranteed when connection. If can't meet the demand, insulating protected measures should be taken, such as increasing interphase barriers

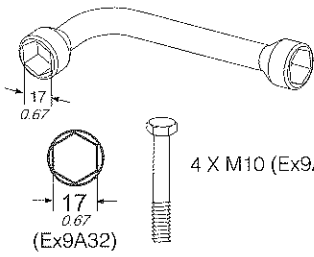
Ex9A32 (1600A~2500A) / Ex9A40 (2000A~2500A)
Busbar Dimension

mm
in.

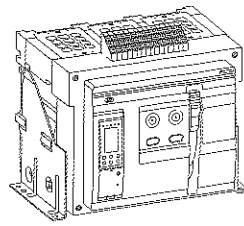


Installation

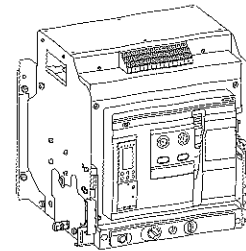
Ex9A32 (2900A~3200A) / Ex9A40 (2900A~3200A)
To fasten ACB



4 X M10 (Ex9A32)



Fixed

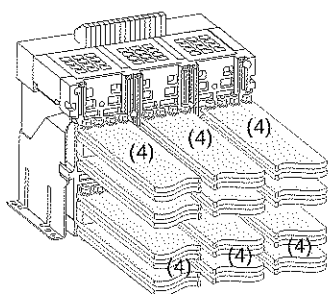


Withdrawable

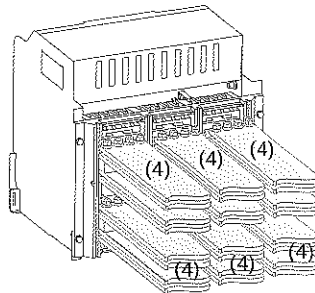
The fix way is the same as Ex9A16 on P12

mm
in.

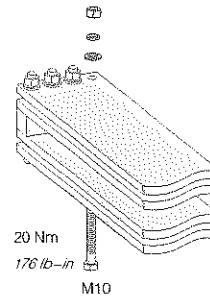
Ex9A32 (2900A~3200A) / Ex9A40 (2000A~2500A)
Horizontal Busbar



Fixed



Withdrawable

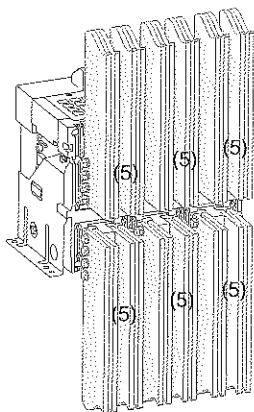


Pay Attention:

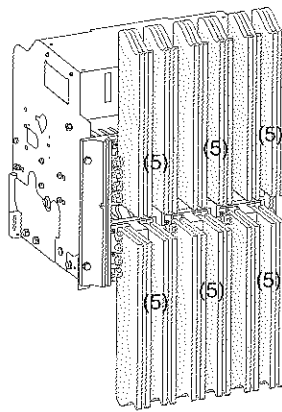
Safe electrical distance must be guaranteed when connection. If can't meet the demand, insulating protected measures should be taken such as increase interphase barriers

mm
in.

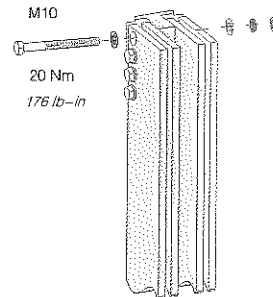
Ex9A32 (2900A~3200A) / Ex9A40 (2000A~2500A)
Vertical Busbar



Fixed



Withdrawable

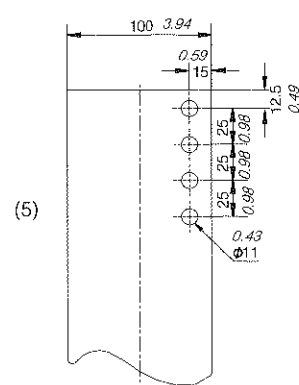
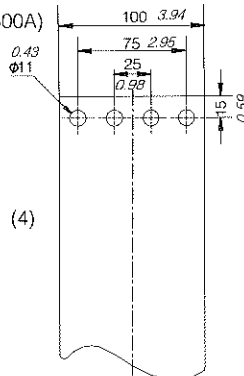


Pay Attention:

Safe electrical distance must be guaranteed when connection. If can't meet the demand, insulating protected measures should be taken such as increase interphase barriers

mm
in.

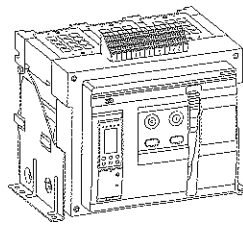
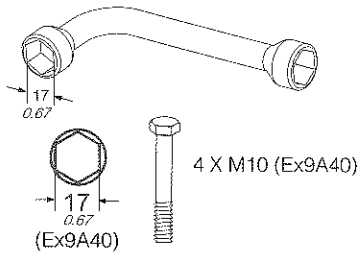
Ex9A32 (2900A~3200A) / Ex9A40 (2000A~2500A)
Busbar Dimension



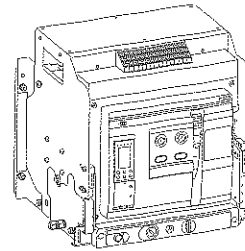
mm
in.

Installation

Ex9A40 (4000A)
To fasten ACB



Fixed

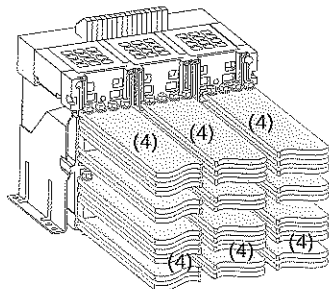


Withdrawable

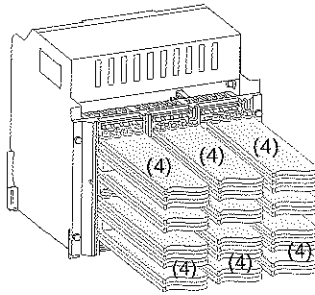
mm
in.

The fix way is the same as Ex9A16 on P12

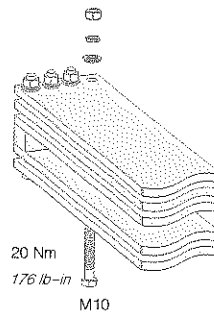
Ex9A40 (4000A)
Horizontal Busbar



Fixed



Withdrawable

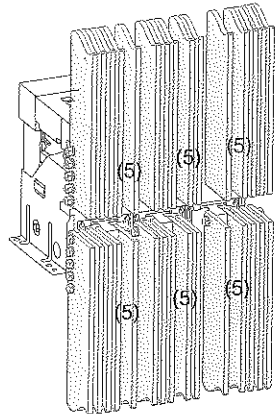


Note:

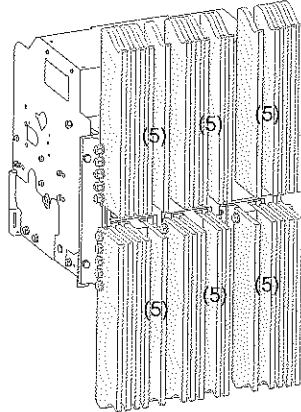
Safe electrical distance must be guaranteed when connection. If can't meet the demand, insulating protected measures should be taken, such as increasing interphase barriers

mm
in.

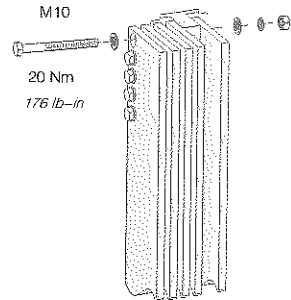
Ex9A40 (4000A)
Vertical Busbar



Fixed



Withdrawable

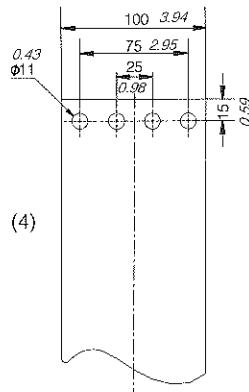


Note:

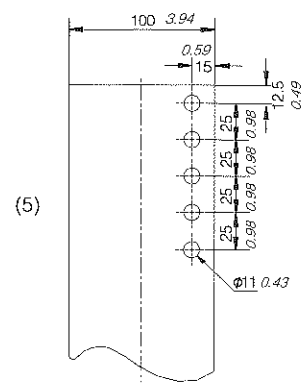
Safe electrical distance must be guaranteed when connection. If can't meet the demand, insulating protected measures should be taken, such as increasing interphase barriers

mm
in.

Ex9A40 (4000A)
Busbar Dimension



(4)

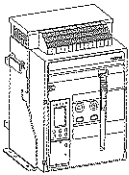
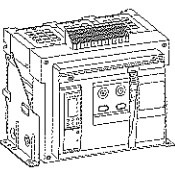
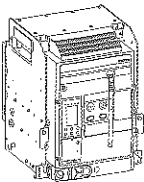
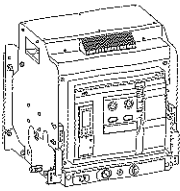


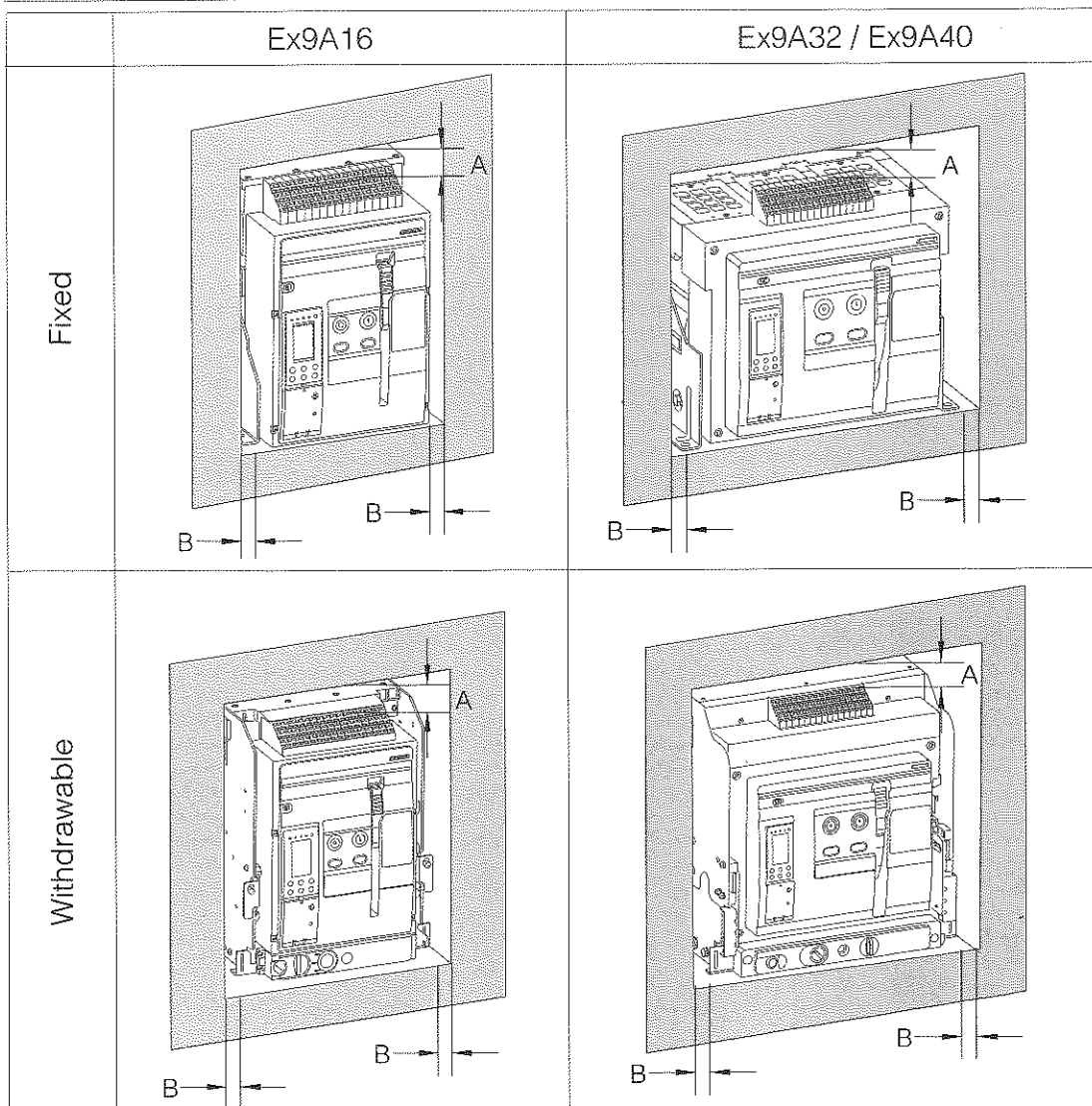
(5)

mm
in.

Installation

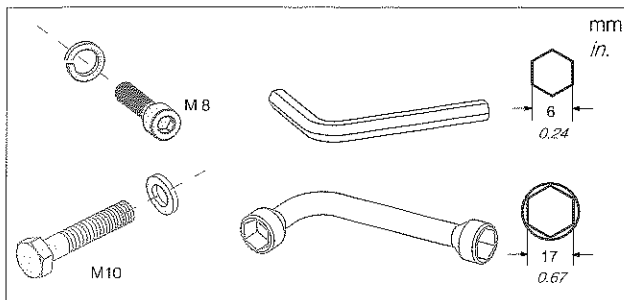
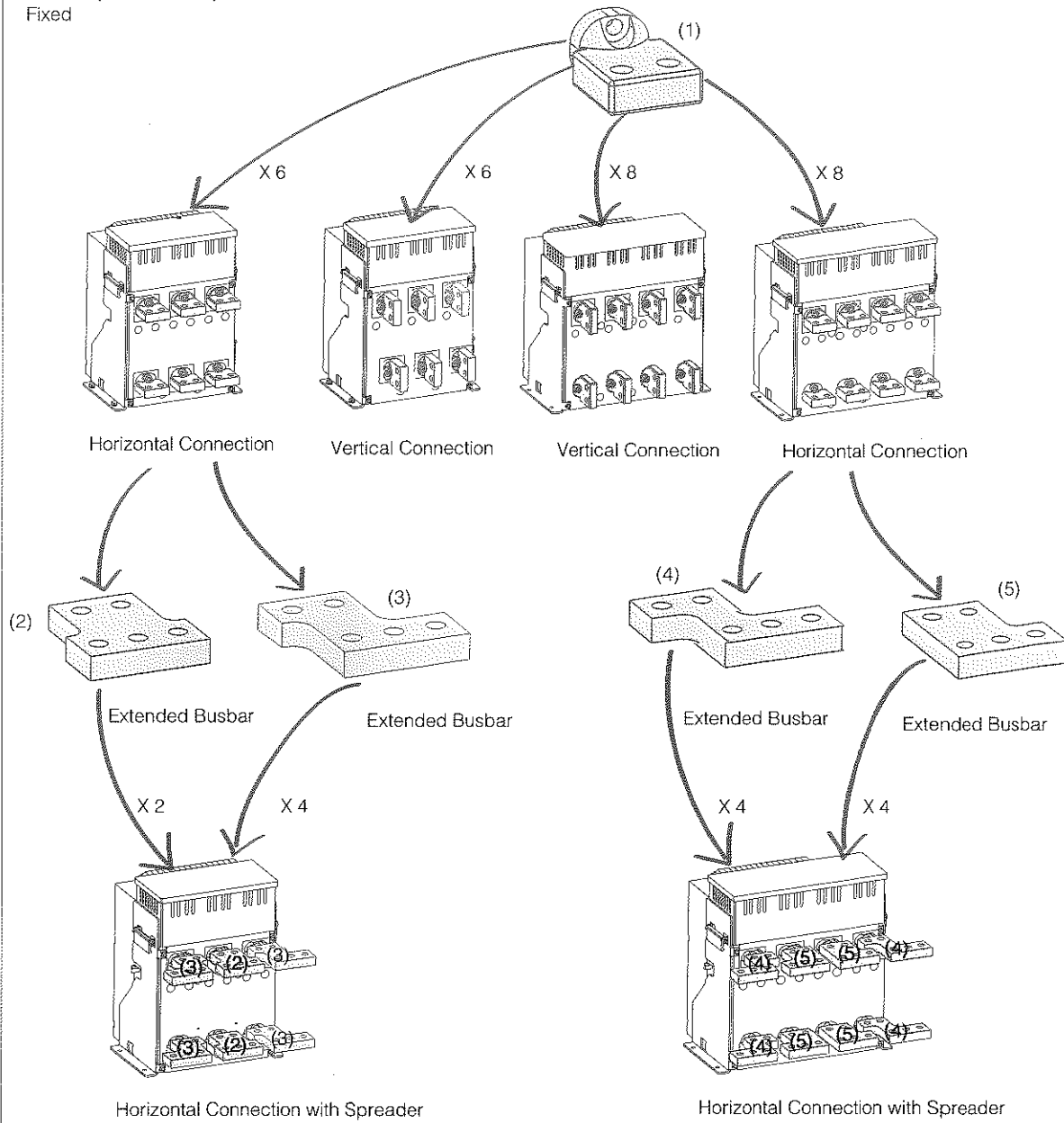
Safety distance

Safety distance (mm)				
	Ex9A16 Fixed	Ex9A32 / Ex9A40 Fixed	Ex9A16 Withdrawable	Ex9A32 / Ex9A40 Withdrawable
	A	B	A	B
Insulated	0	0	0	0
Uncharged metal	0	0	0	0
Live conductor	100	60	100	60



Power connections

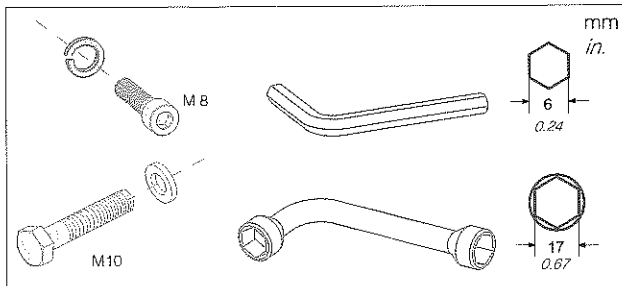
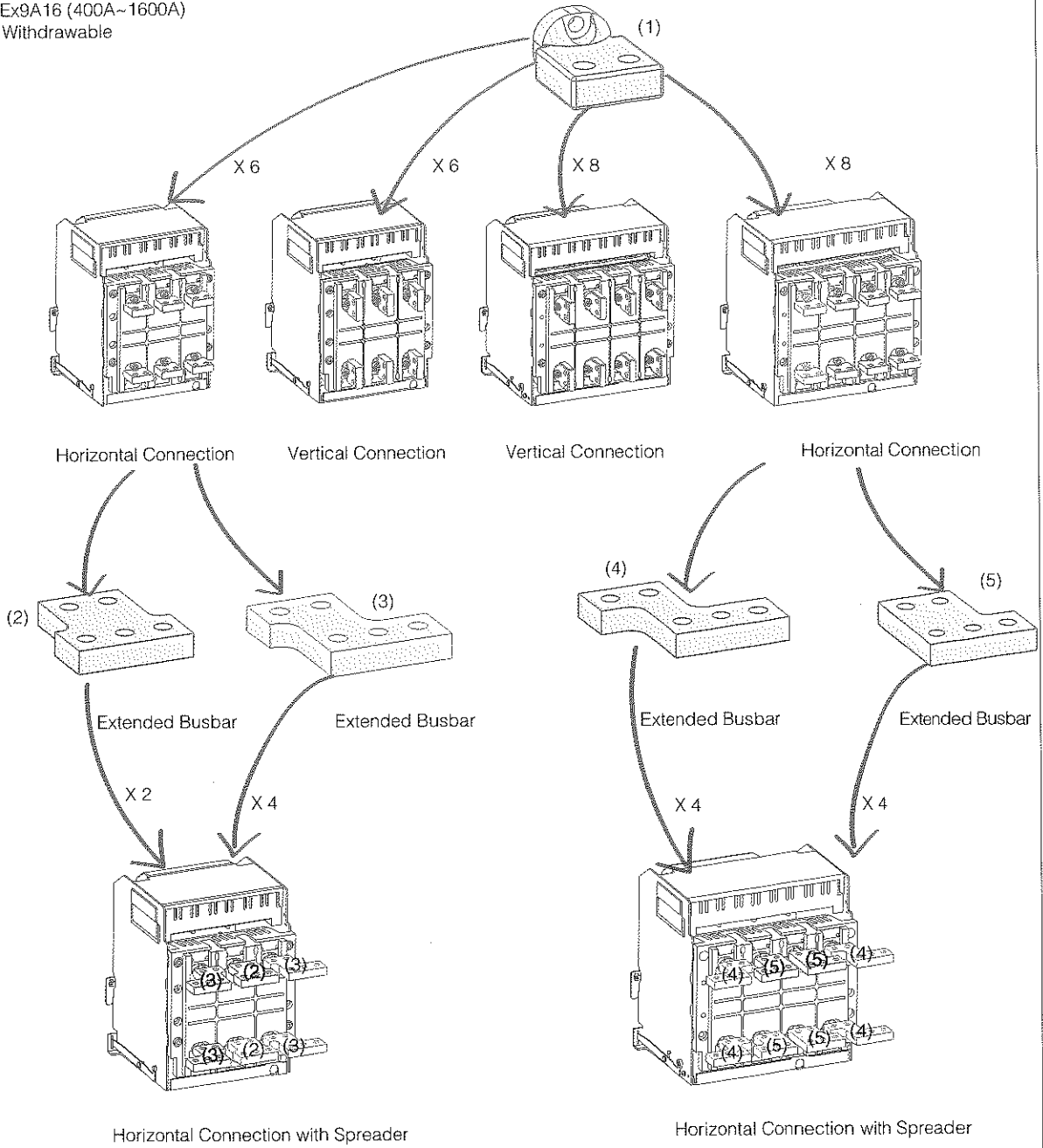
Ex9A16 (400A~1600A)
Fixed



NO.	Rated current	Thickness
(1)	400~630A	10mm
	800~1600A	16mm
(2)	400~630A	10mm
	800~1600A	15mm
(3)	400~630A	10mm
	800~1600A	15mm
(4)	400~630A	10mm
	800~1600A	15mm
(5)	400~630A	10mm
	800~1600A	15mm

Power connections

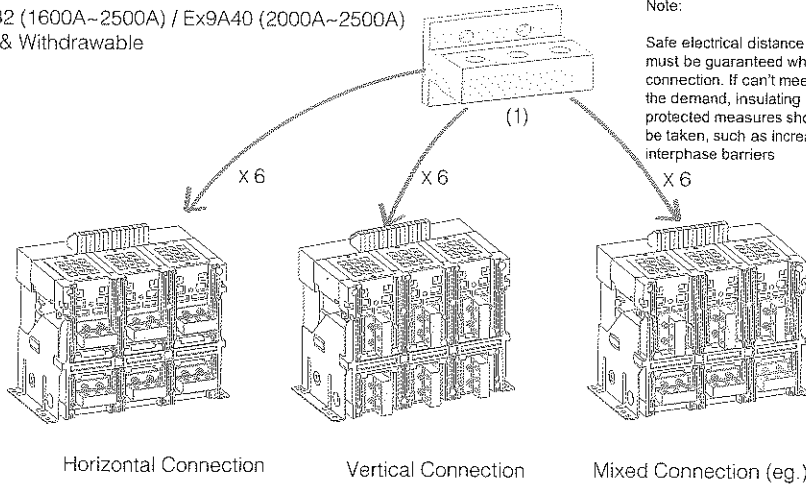
Ex9A16 (400A~1600A)
Withdrawable



NO.	Rated current	Thickness
(1)	400~630A	10mm
	800~1600A	16mm
(2)	400~630A	10mm
	800~1600A	15mm
(3)	400~630A	10mm
	800~1600A	15mm
(4)	400~630A	10mm
	800~1600A	15mm
(5)	400~630A	10mm
	800~1600A	15mm

Power connections

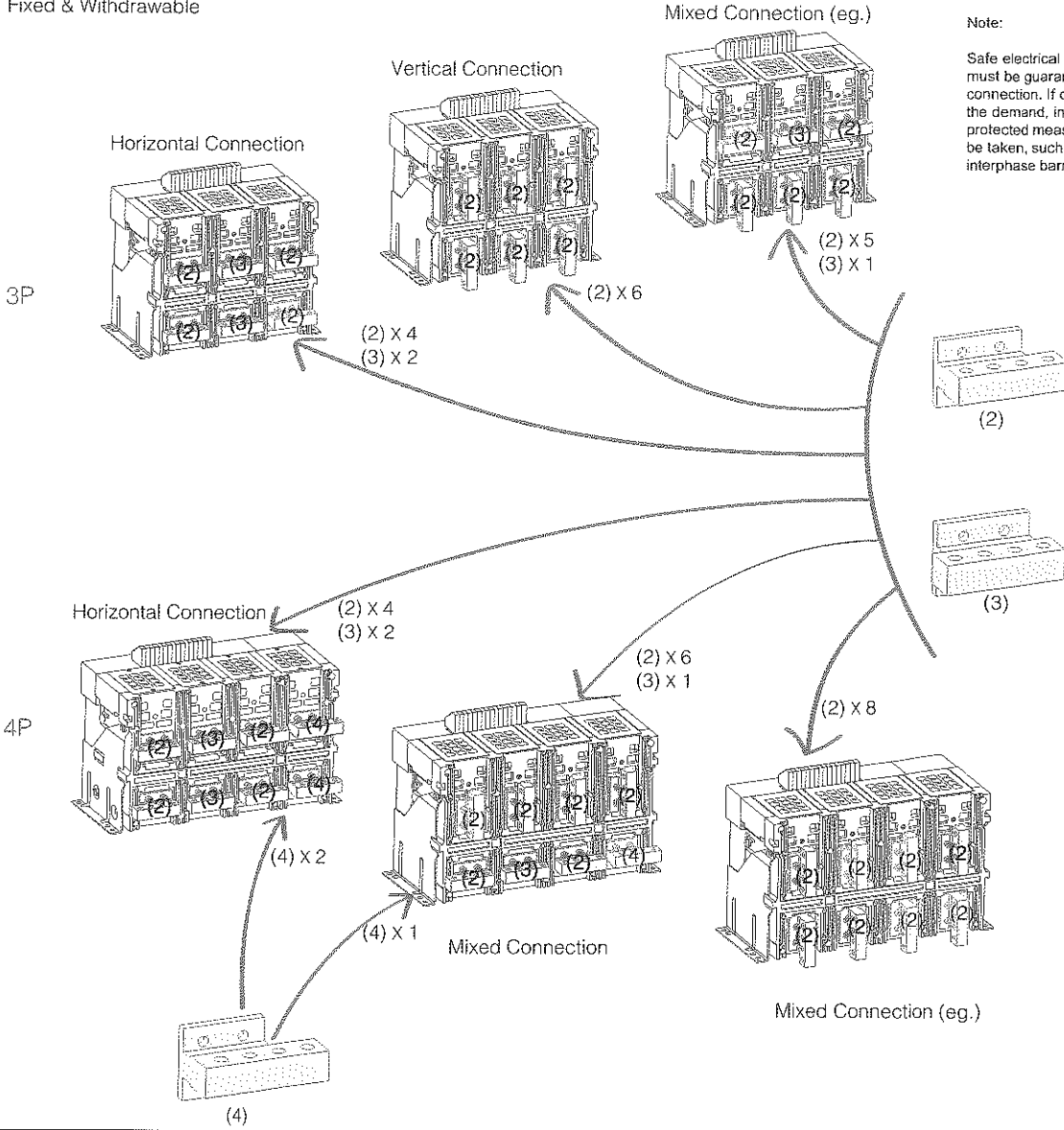
Ex9A32 (1600A~2500A) / Ex9A40 (2000A~2500A)
Fixed & Withdrawable



Note:
Safe electrical distance must be guaranteed when connection. If can't meet the demand, insulating protected measures should be taken, such as increasing interphase barriers

NO.	Rated current	Thickness
(1)	1600A~2500A (9A32) 2000A~2500A (9A40)	25mm
(2)	2900A~3200A	25mm
(3)	2900A~3200A	25mm
(4)	2900A~3200A	only N pole horizontal connection

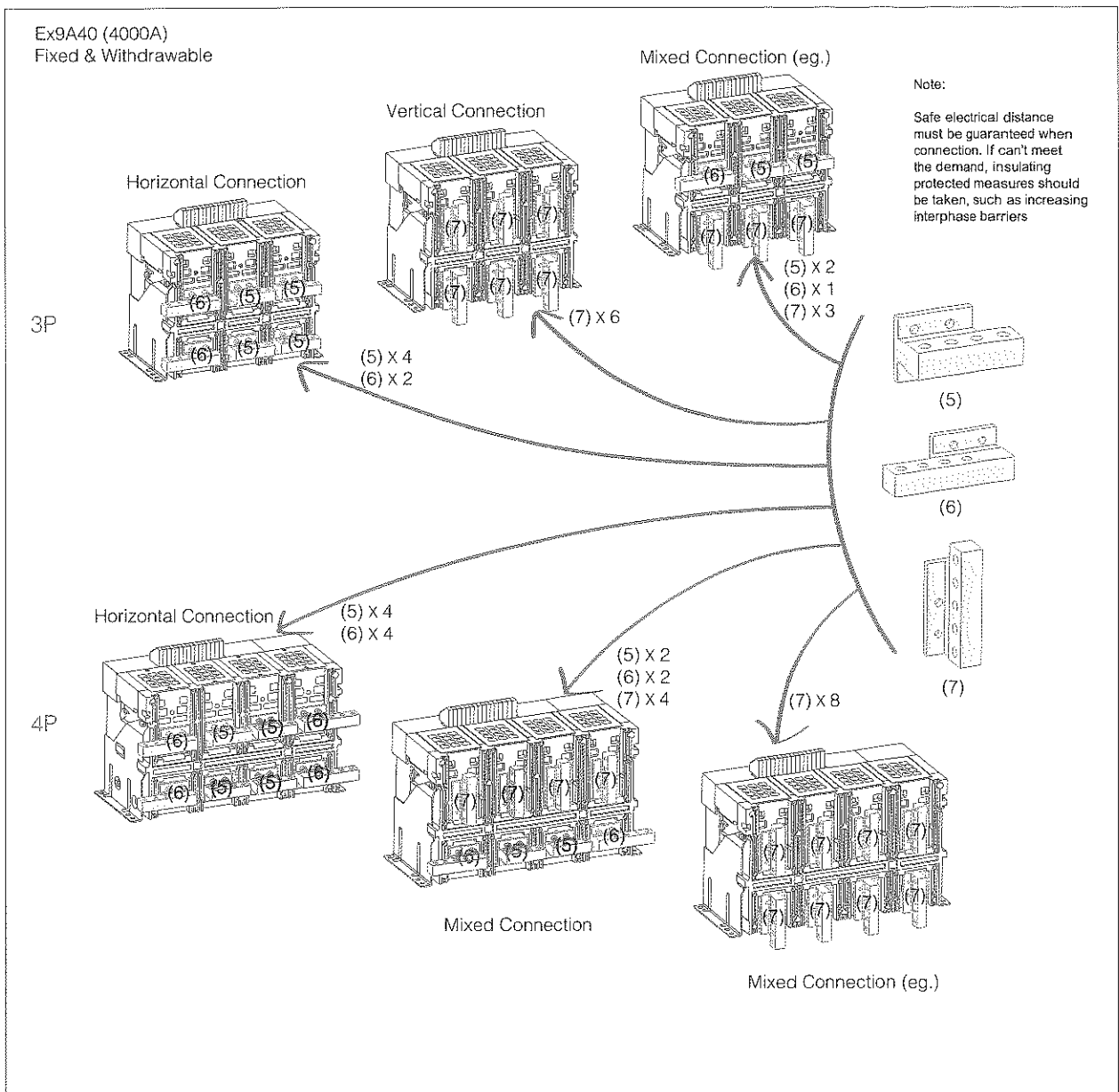
Ex9A32 (2900A~3200A) / Ex9A40 (2900A~3200A)
Fixed & Withdrawable



Note:
Safe electrical distance must be guaranteed when connection. If can't meet the demand, insulating protected measures should be taken, such as increasing interphase barriers

Power connections

NO.	Rated current	Thickness
(5)	4000A	25mm
(6)	4000A	25mm
(7)	4000A	25mm



Power connections

Ex9A32 Front Connection

Fixed

Mixed Connection (eg.)

mm
in.

M 8

6
0.24

M 10

17
0.67

NO.	Rated current	Thickness
(1)	1600A~2000A	20mm
	2500A	25mm
	2900A~3200A	30mm
(2)	1600A~2000A	20mm
	2500A	25mm
	2900A~3200A	30mm

Front Connection

Withdrawable

Mixed Connection (eg.)

mm
in.

M 8

6
0.24

M 10

17
0.67

NO.	Rated current	Thickness
(1)	1600A~2000A	20mm
	2500A	25mm
	2900A~3200A	30mm

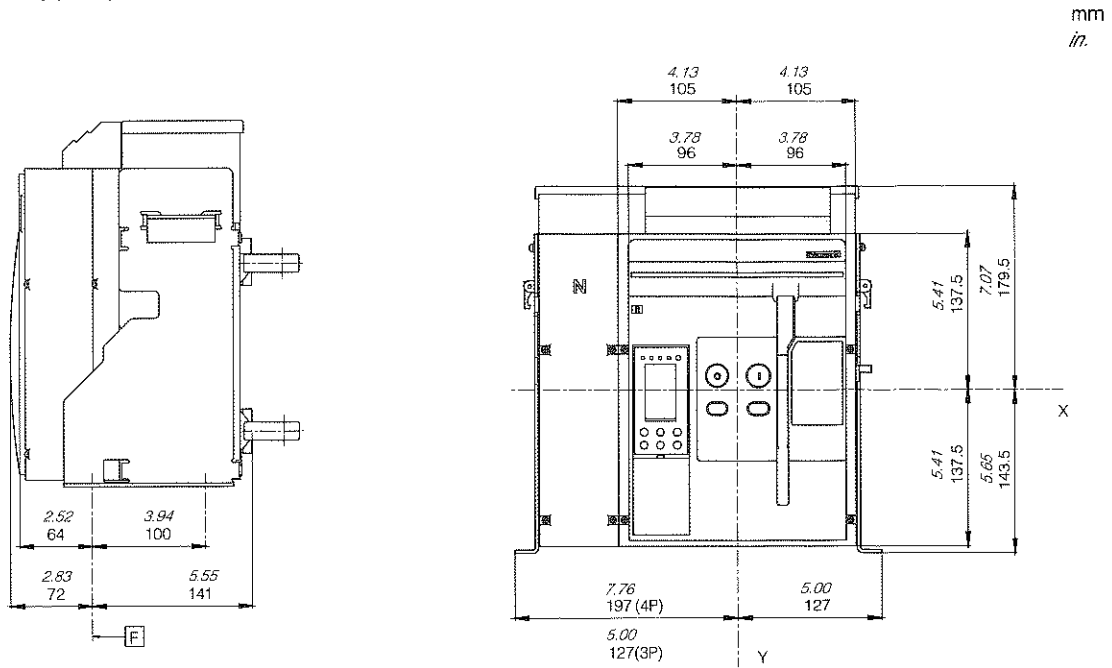
Front Connection

Installation Dimension

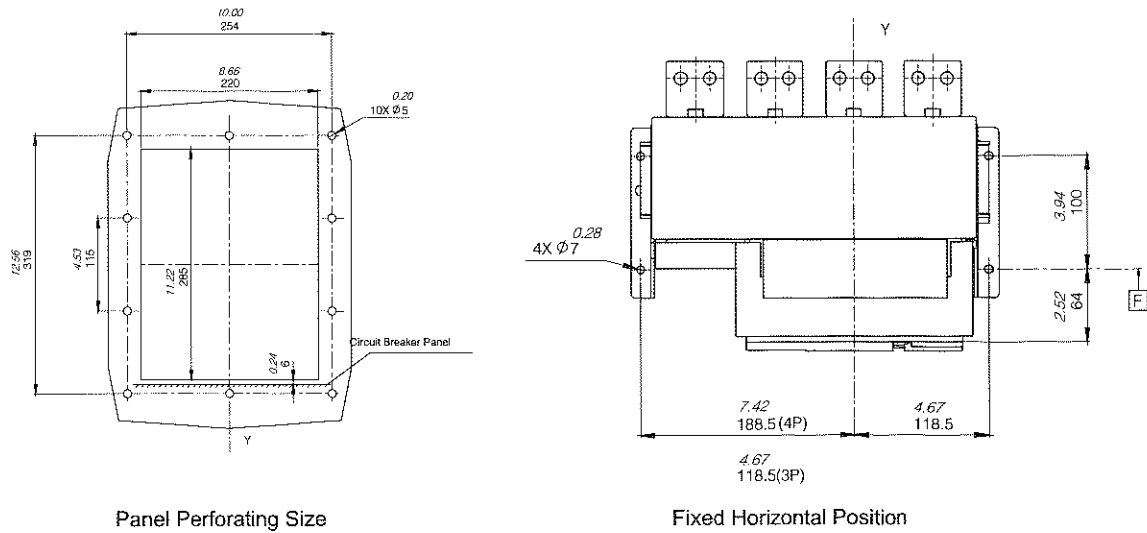
Ex9A16 Fixed

Ex9A16 Outline & Installation Dimension

Outline



Installation Dimension

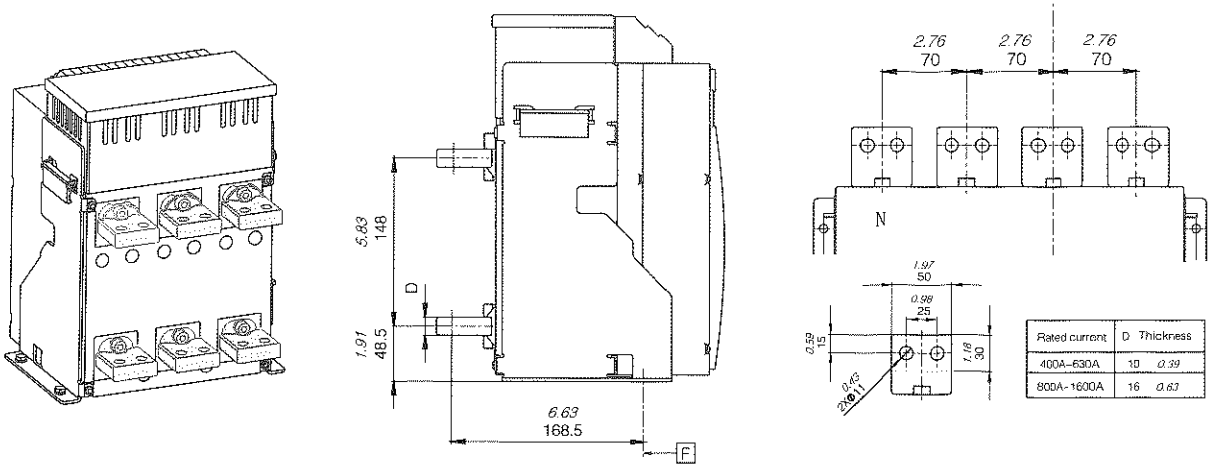


Installation Dimension

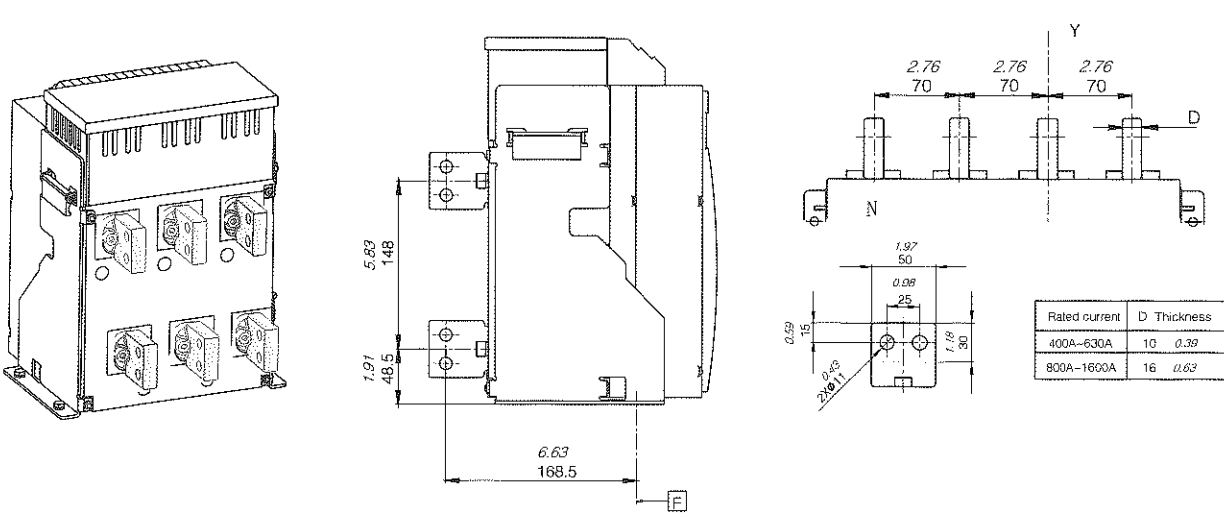
Ex9A16 Fixed

Horizontal Connection

mm
in.

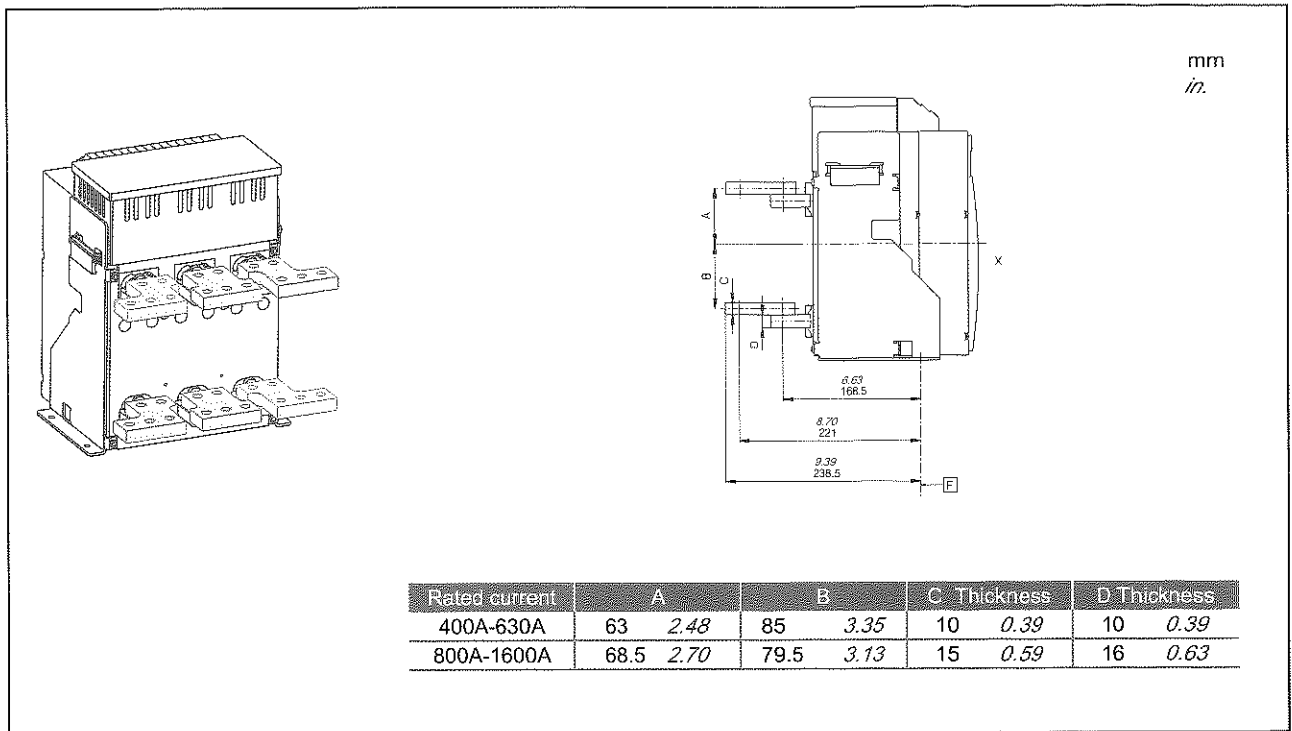


Vertical Connection

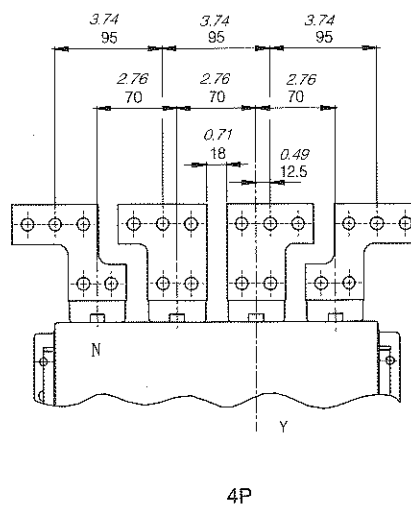
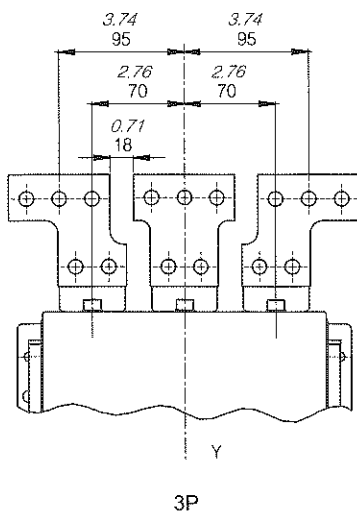


Installation Dimension

Horizontal Connection of Extended Busbar



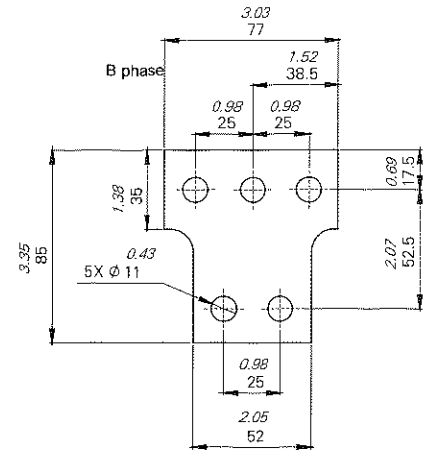
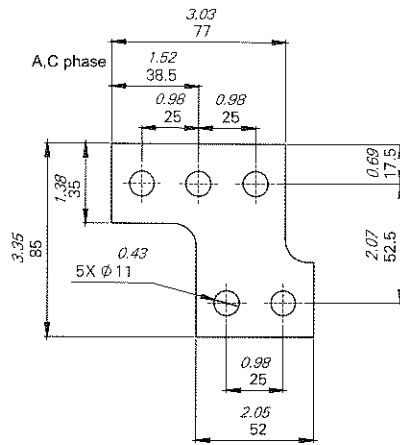
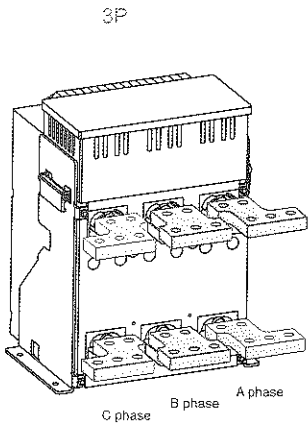
Extended Busbar



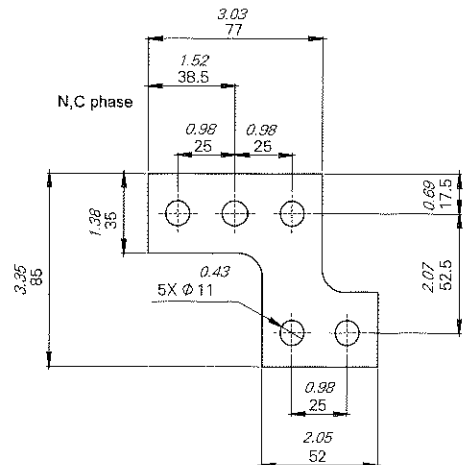
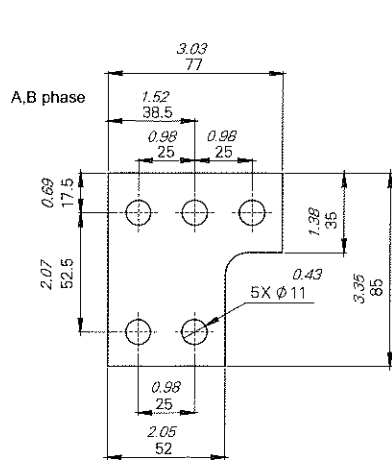
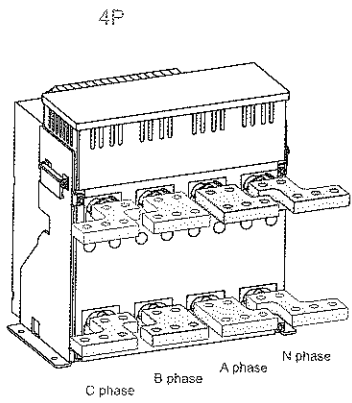
Installation Dimension

Ex9A16 3P Extended Busbar

mm
in.



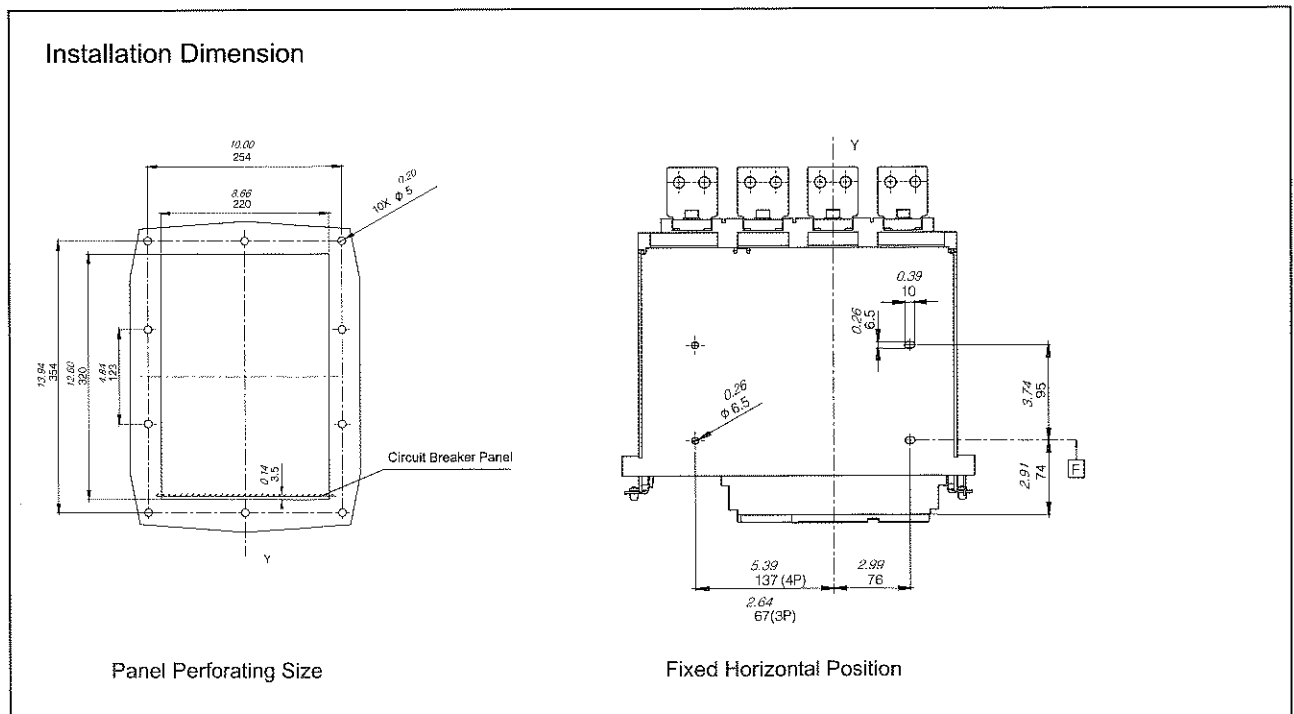
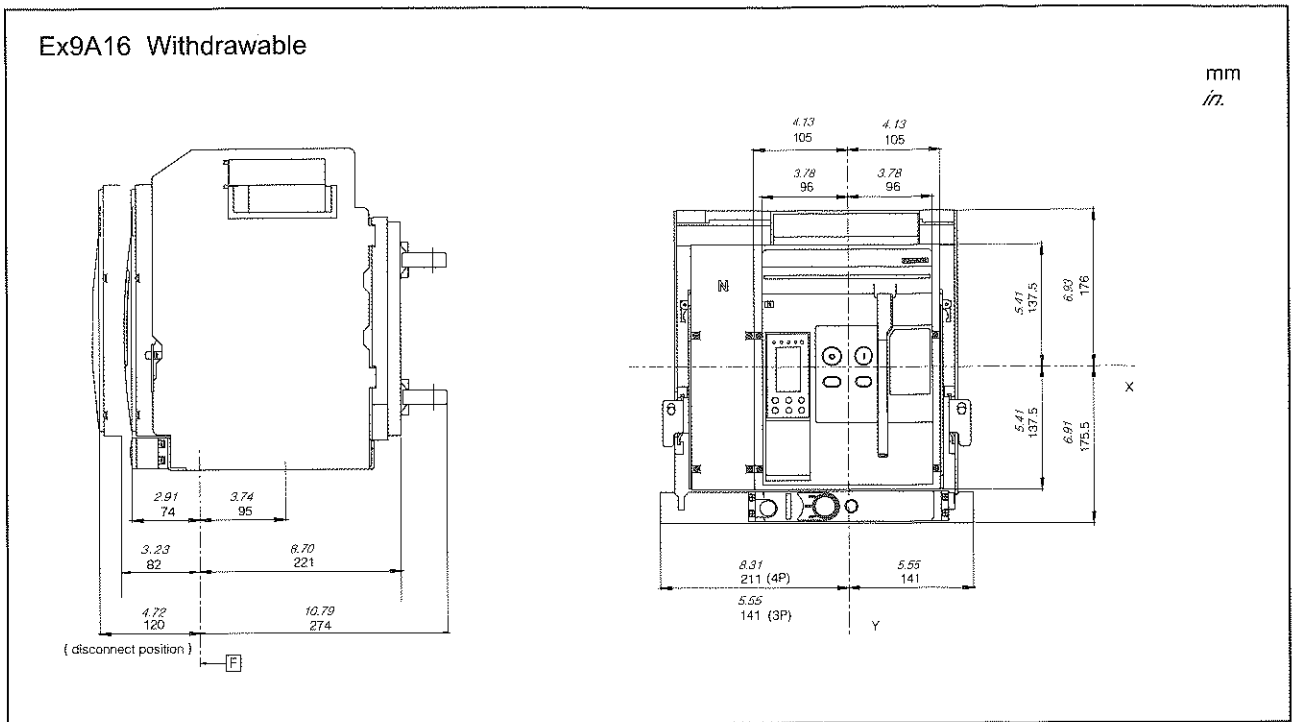
Ex9A16 4P Extended Busbar



Installation Dimension

Ex9A16 Withdrawable

Ex9A16 Outline & Installation Dimension

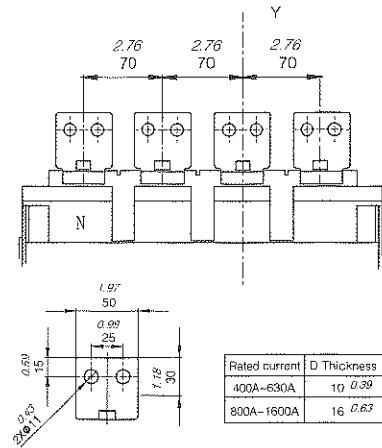
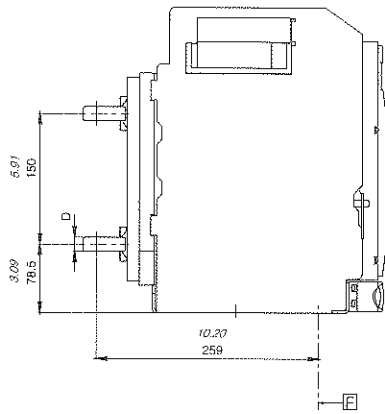
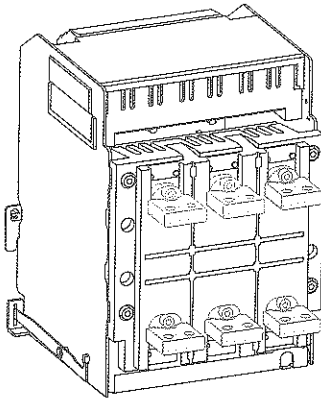


Installation Dimension

Ex9A16 Outline & Installation Dimension

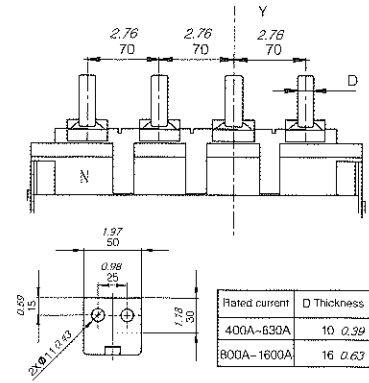
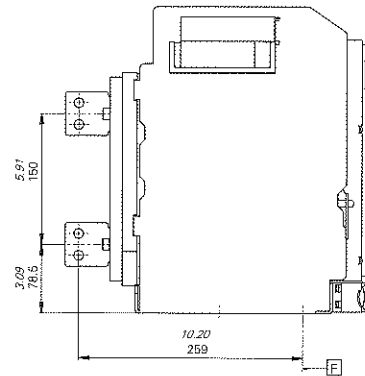
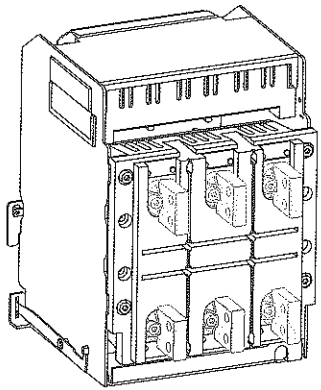
Horizontal Connection

mm
in.



Rated current	D Thickness
400A-630A	10 0.39
800A-1600A	16 0.63

Vertical Connection



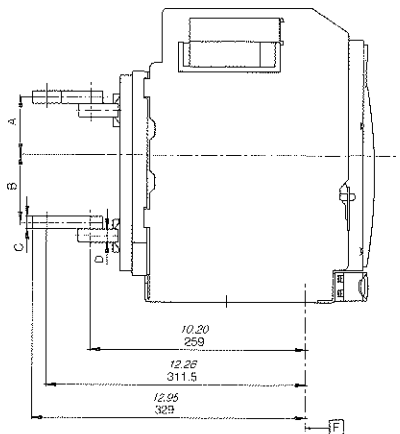
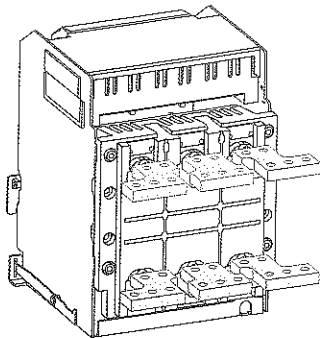
Rated current	D Thickness
400A-630A	10 0.39
800A-1600A	16 0.63

Installation Dimension

Ex9A16 Withdrawable

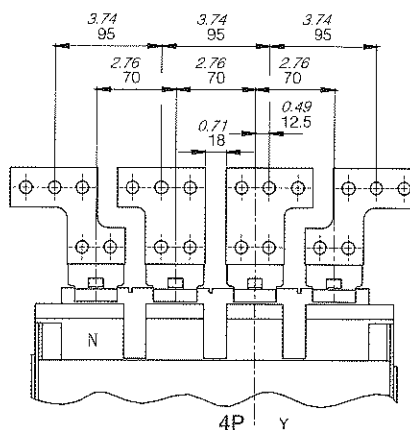
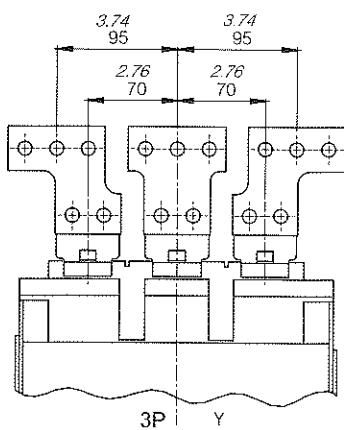
Horizontal Connection of Extended Busbar

mm
in.



Rated current	A		B		C Thickness		D Thickness	
400A-630A	63	2.48	85	3.35	10	0.39	10	0.39
800A-1600A	68.5	2.70	79.5	3.13	15	0.59	16	0.63

Extended Busbar



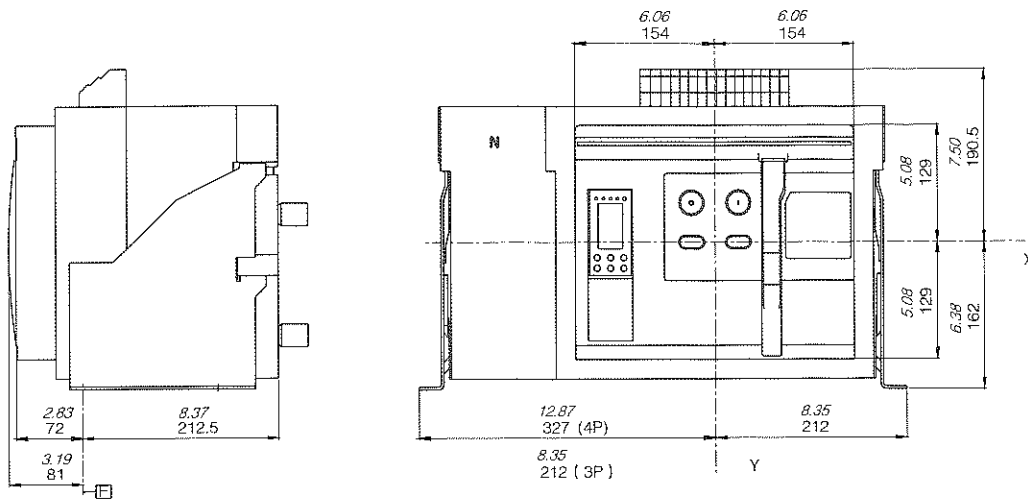
Installation Dimension

Ex9A32 Fixed

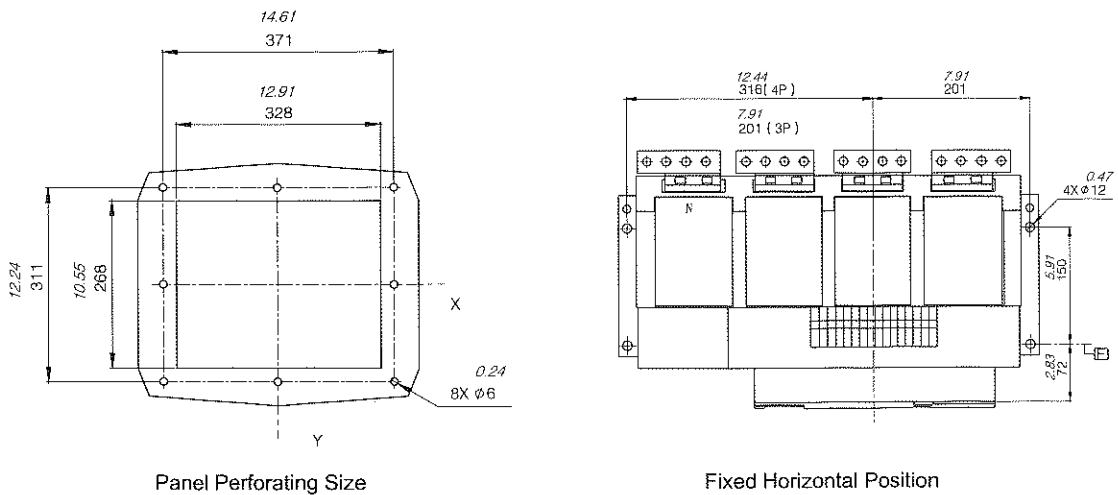
Outline & Installation Dimension

Outline

mm
in.



Installation Dimension



Panel Perforating Size

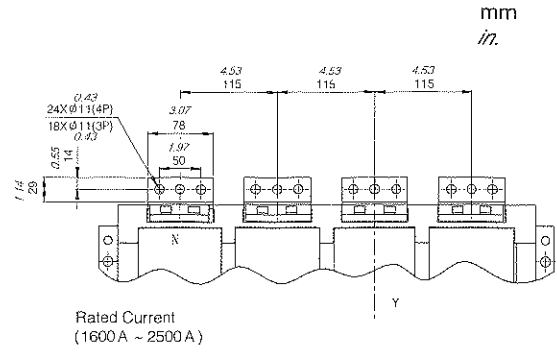
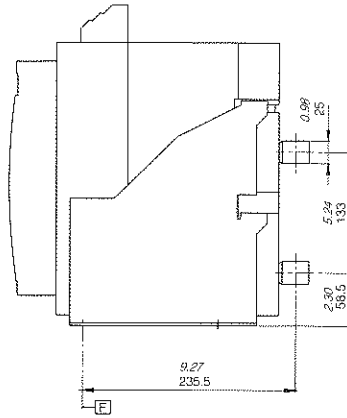
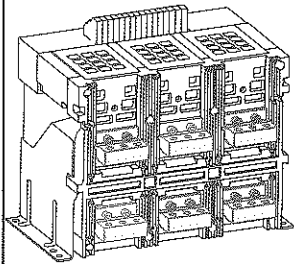
Fixed Horizontal Position

Installation Dimension

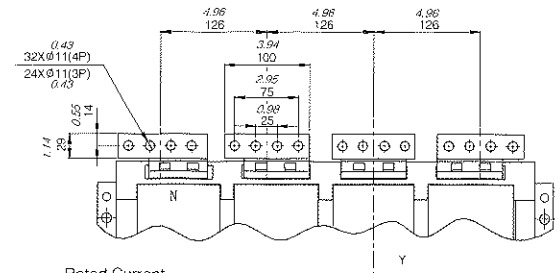
Ex9A32 Fixed

Outline & Installation Dimension

Horizontal Connection

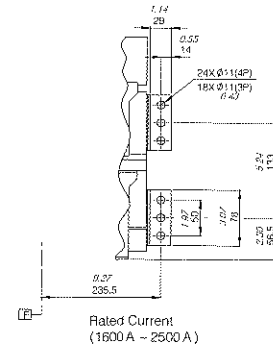
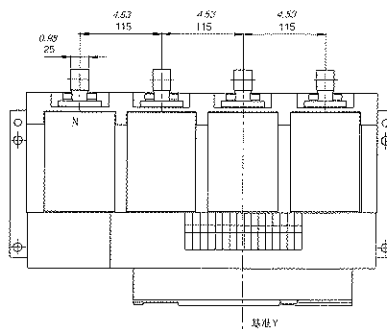
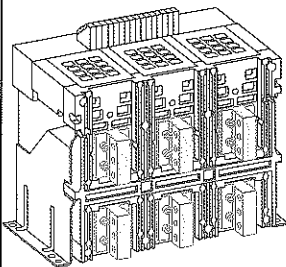


Rated Current
(1600 A - 2500 A)

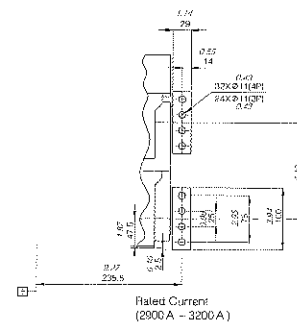


Rated Current
(2900 A - 3200 A)

Vertical Connection



Rated Current
(1600 A - 2500 A)

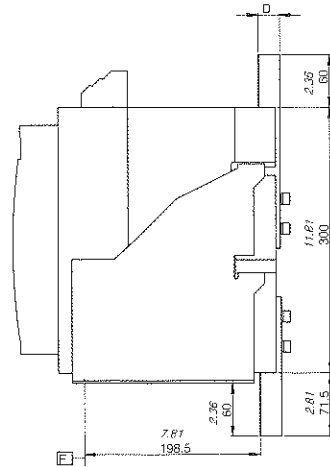
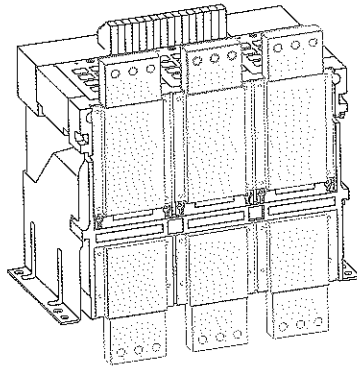


Rated Current
(2000 A - 3200 A)

Installation Dimension

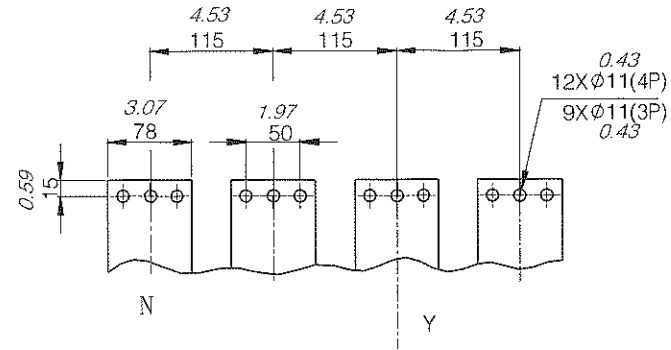
Ex9A32 Fixed

mm
in.

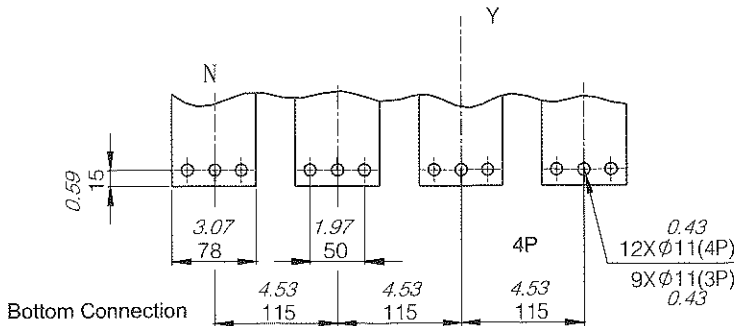


Rated current	D Thickness
1600A-2000A	20 0.79
2500A	25 0.98
2900A-3200A	30 1.18

Top Connection



3P



Bottom Connection

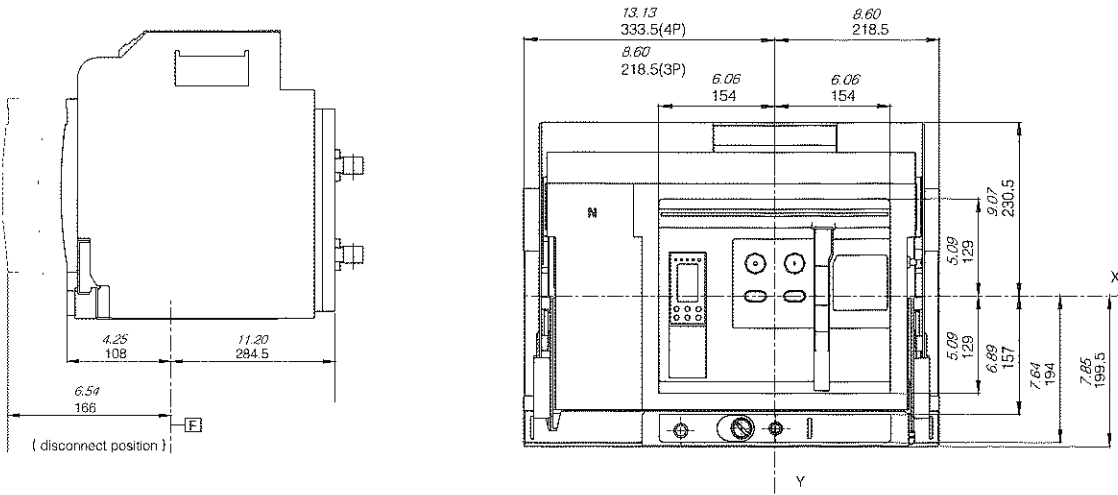
Installation Dimension

Ex9A32 Withdrawable

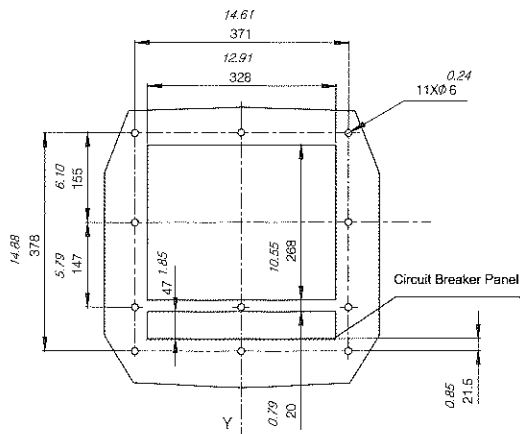
Outline & Installation Dimension

Outline

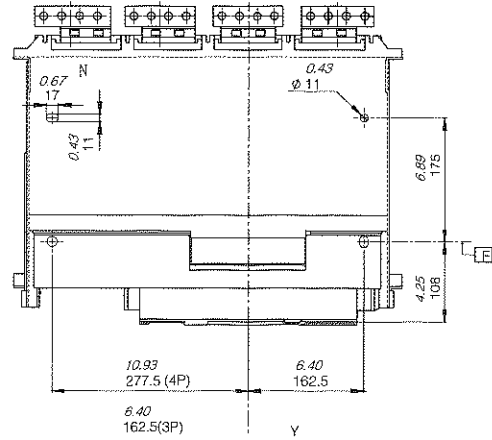
mm
in.



Installation Dimension



Panel Perforating Size



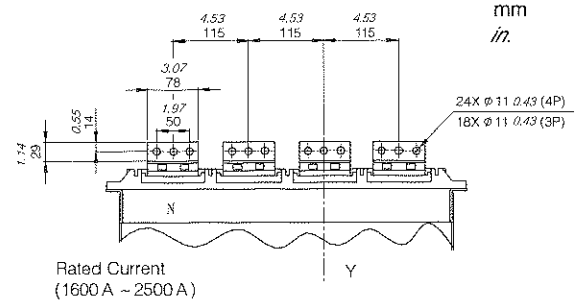
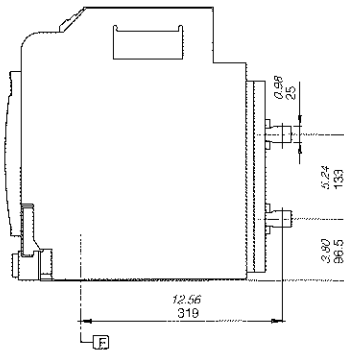
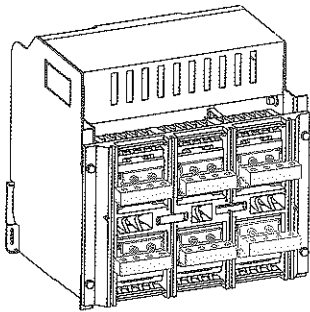
Fixed Horizontal Position

Installation Dimension

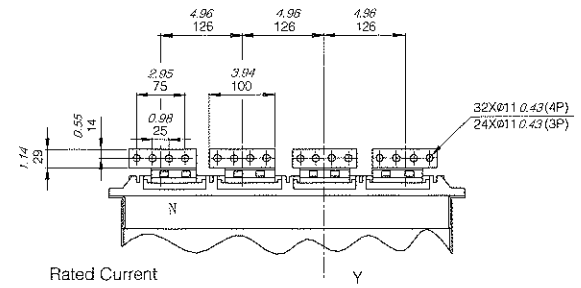
Ex9A32 Withdrawable

Outline & Installation Dimension

Horizontal Connection

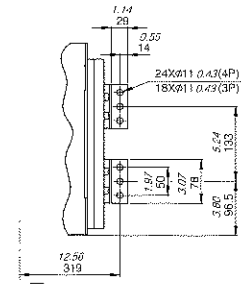
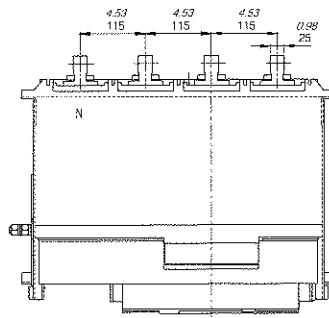
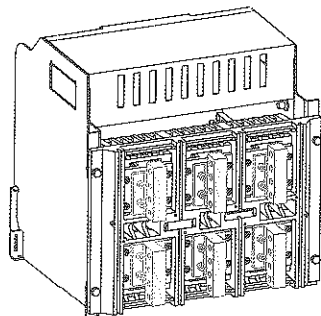


Rated Current
(1600 A ~ 2500 A)

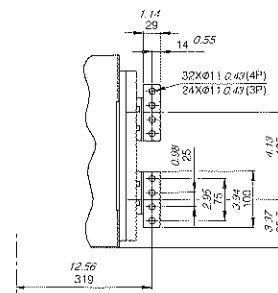


Rated Current
(2900 A ~ 3200 A)

Vertical Connection



Rated Current
(1600 A ~ 2500 A)

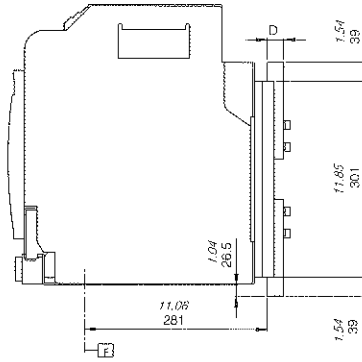
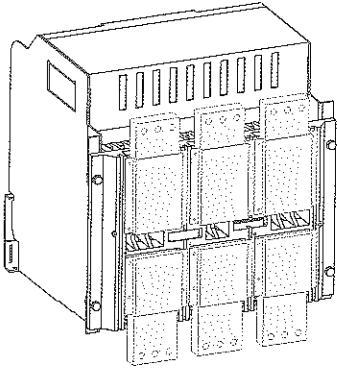


Rated Current
(2900 A ~ 3200 A)

Installation Dimension

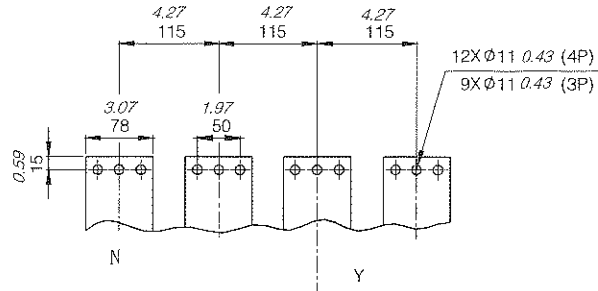
Ex9A32 Withdrawable

mm
in.

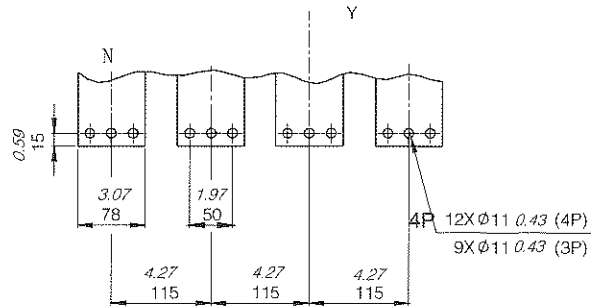


Rated current	D Thickness
1600A-2000A	20 0.79
2500A	25 0.98
2900A-3200A	30 1.18

Top connections



3P

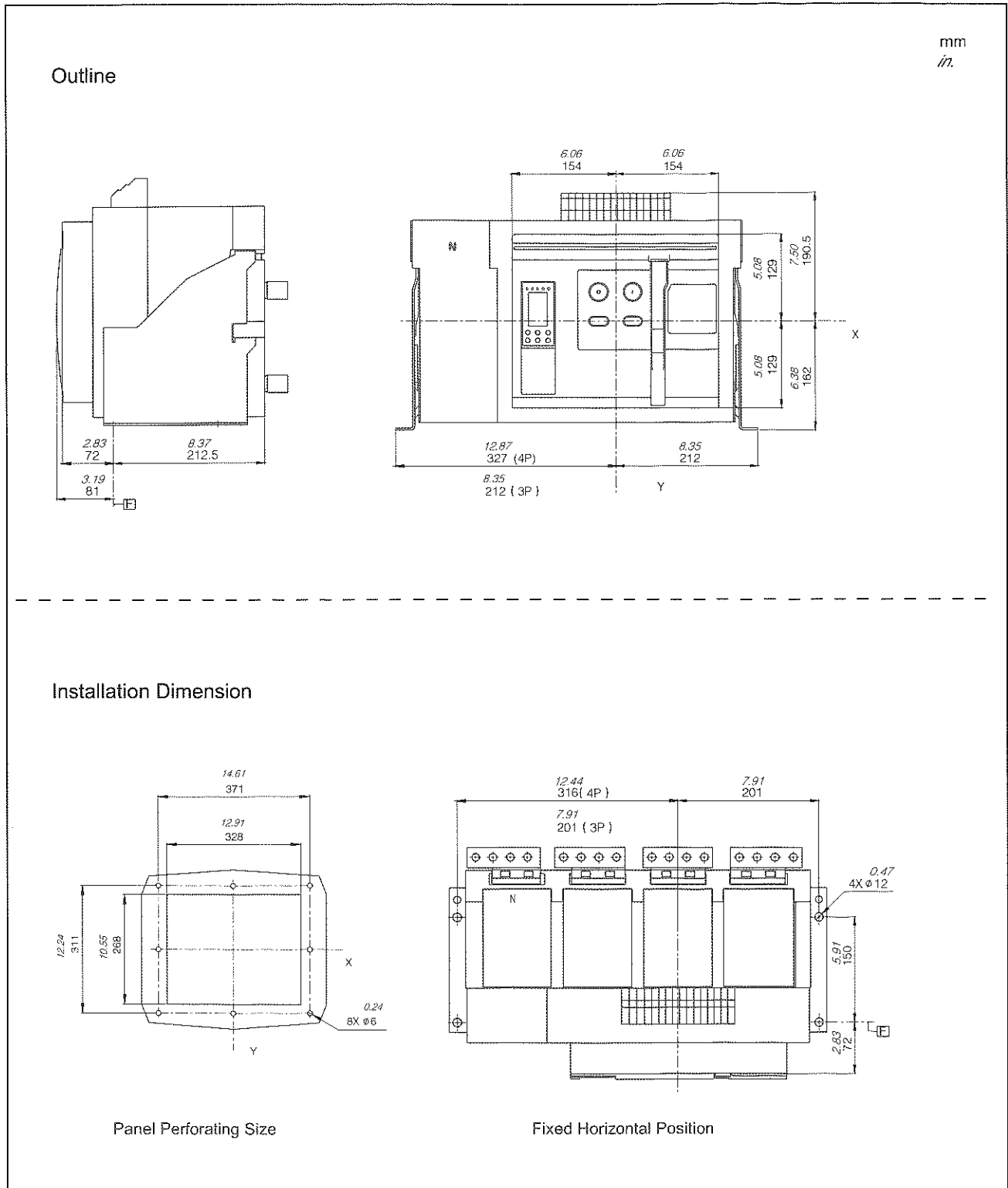


Bottom Connection

Installation Dimension

Ex9A40 Fixed

Outline & Installation Dimension



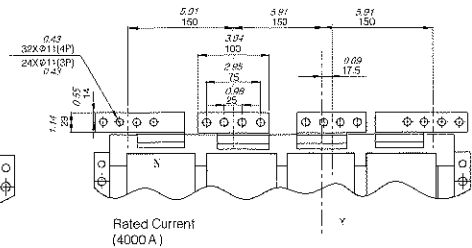
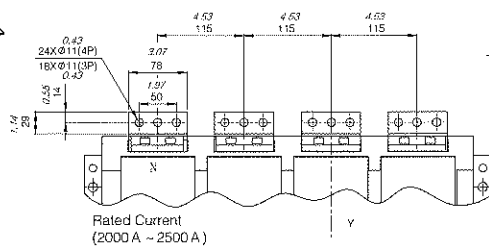
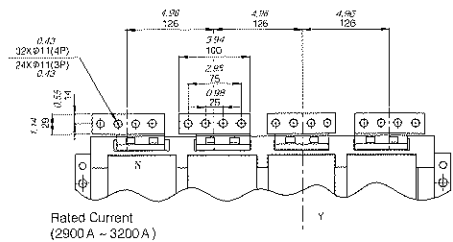
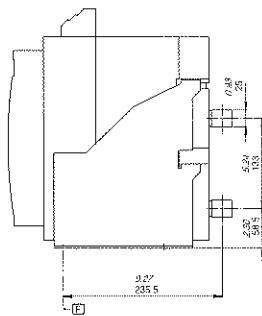
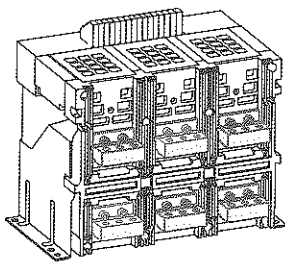
Installation Dimension

Ex9A40 Fixed

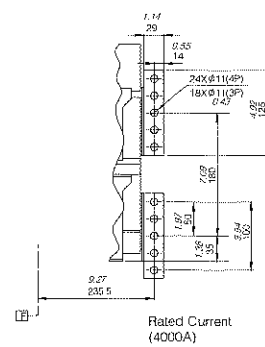
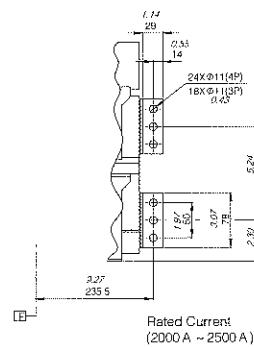
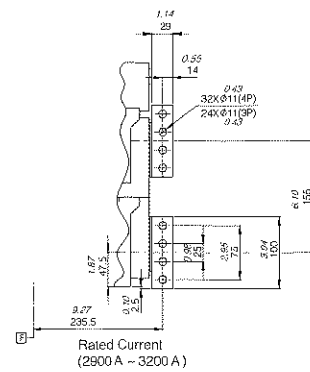
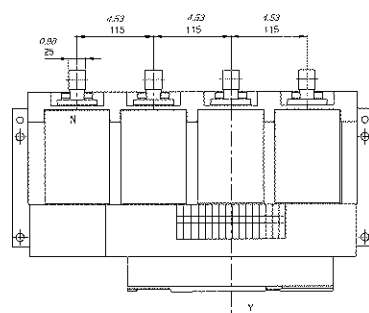
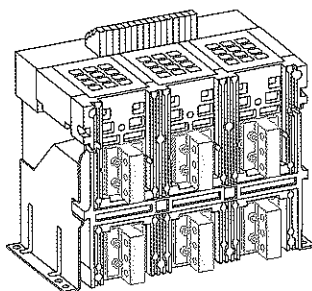
Outline & Installation Dimension

Horizontal Connection

mm
//



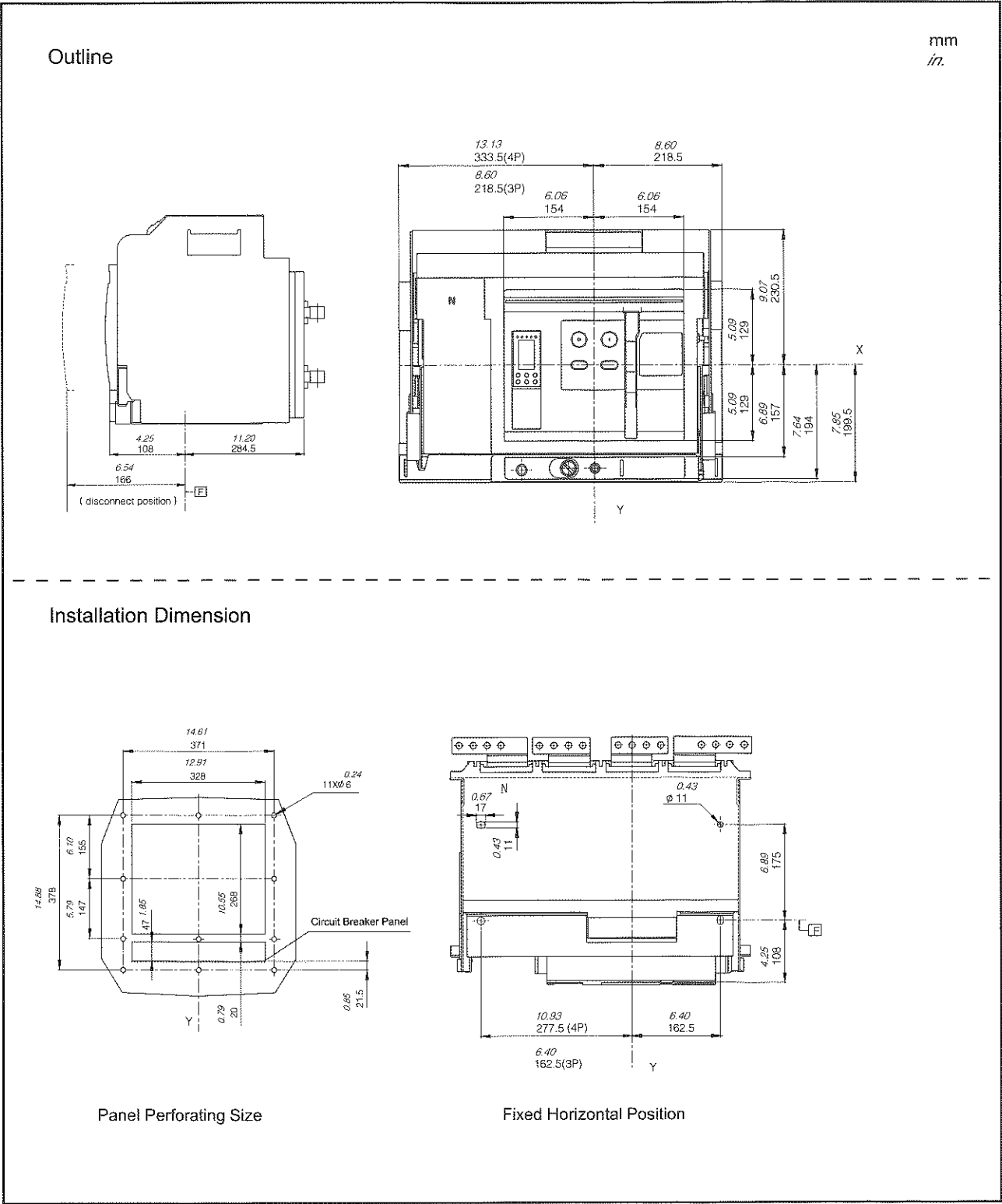
Vertical Connection



Installation Dimension

Ex9A40 Withdrawable

Outline & Installation Dimension



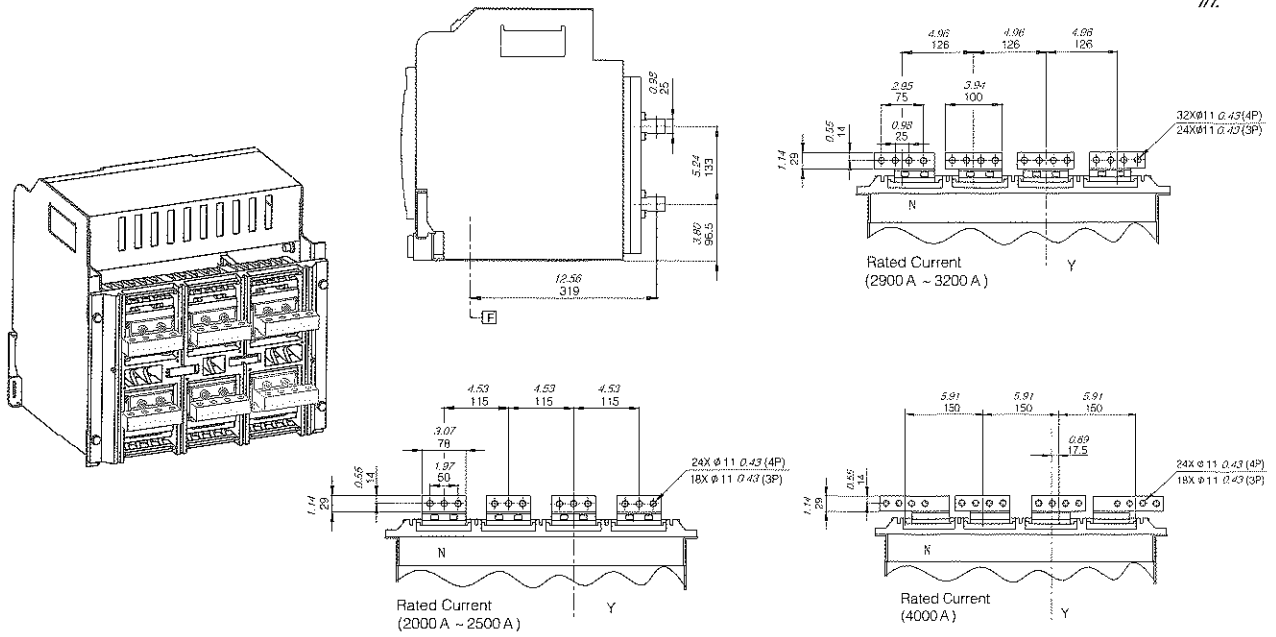
Installation Dimension

Ex9A40 Outline & Installation Dimension

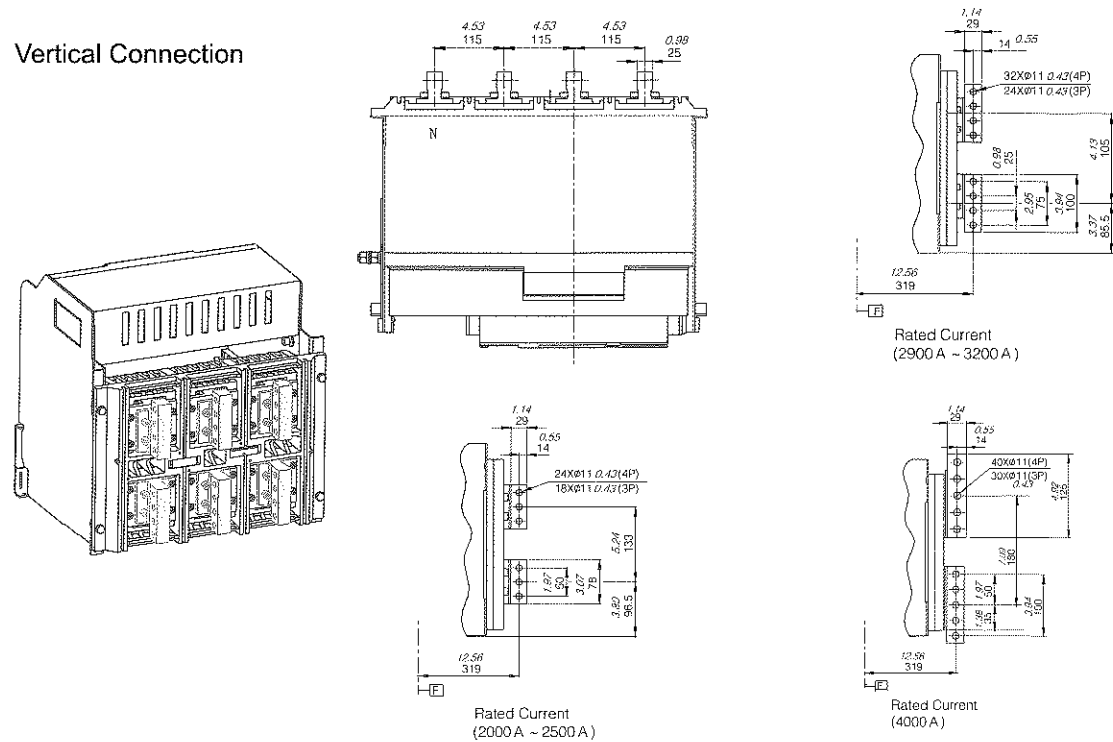
Ex9A40 Withdrawable

Horizontal Connection

mm
in.



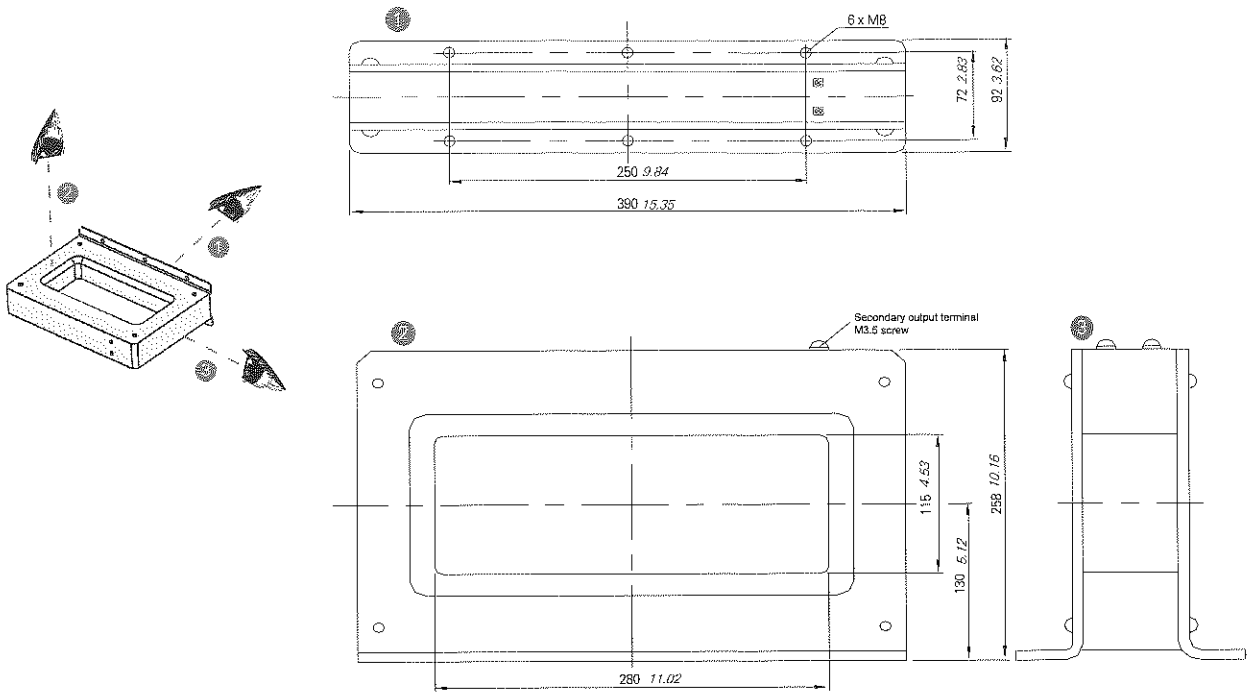
Vertical Connection



Installation Dimension

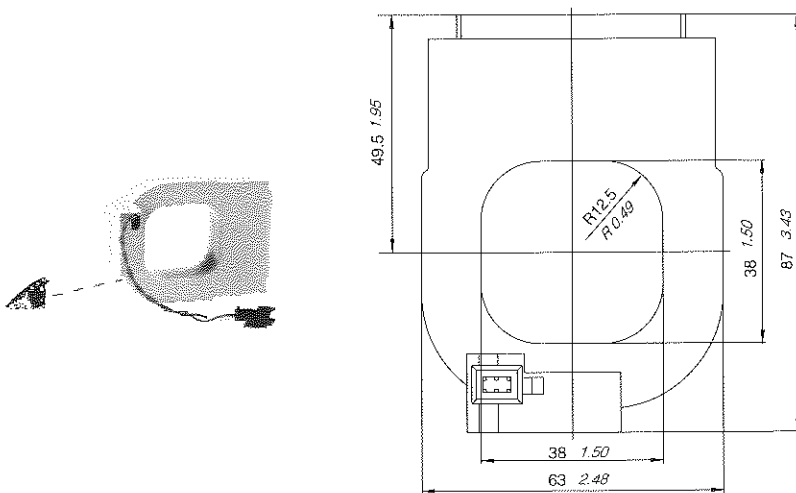
Accessory Dimensions

External Leakage Transformer(LEC)



Remarks: The circuit breaker with leakage transformer should be vertical busbar connected.

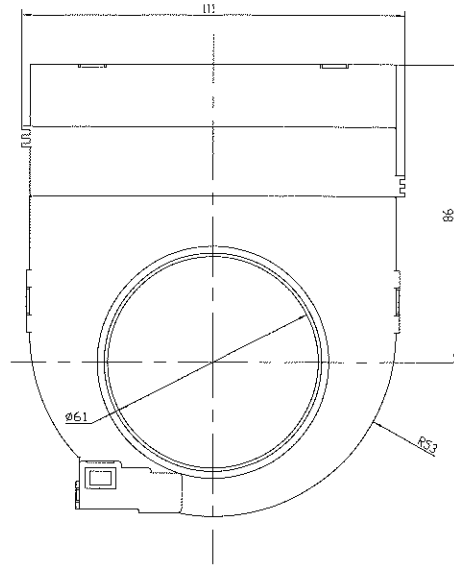
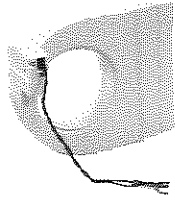
Neutral line transformer(NEC) 400A~1600A



Ex9A16

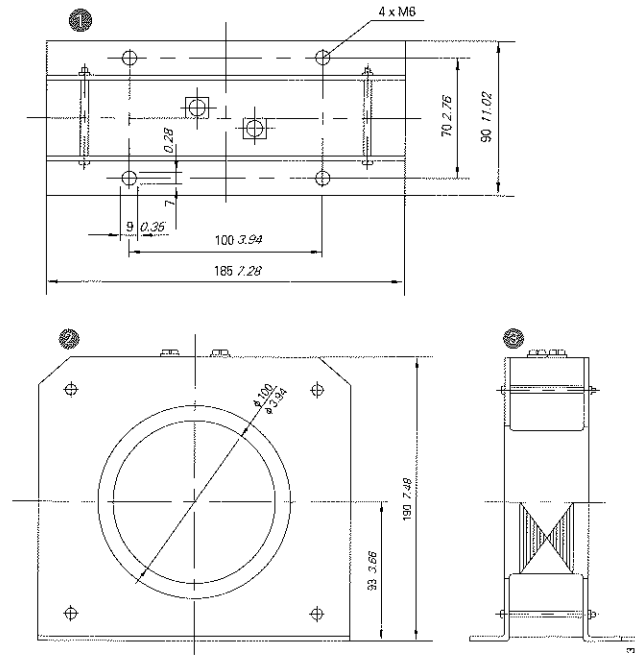
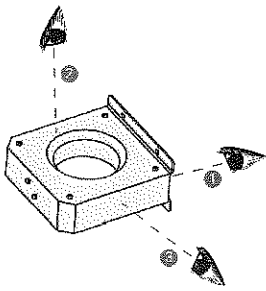
Installation Dimension

Neutral line transformer(NEC)



Ex9A32/Ex9A40

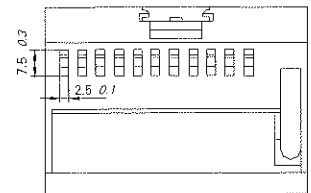
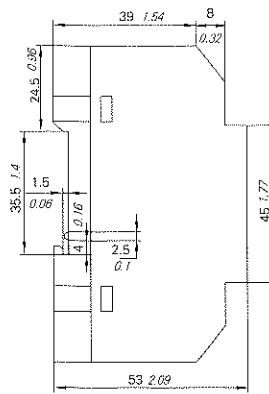
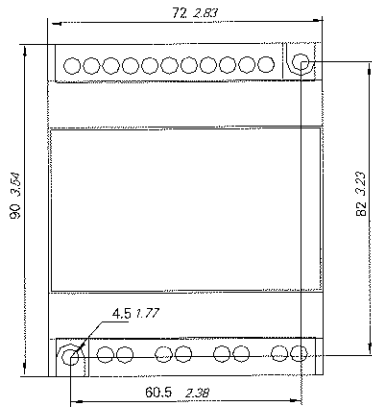
Ground transformer



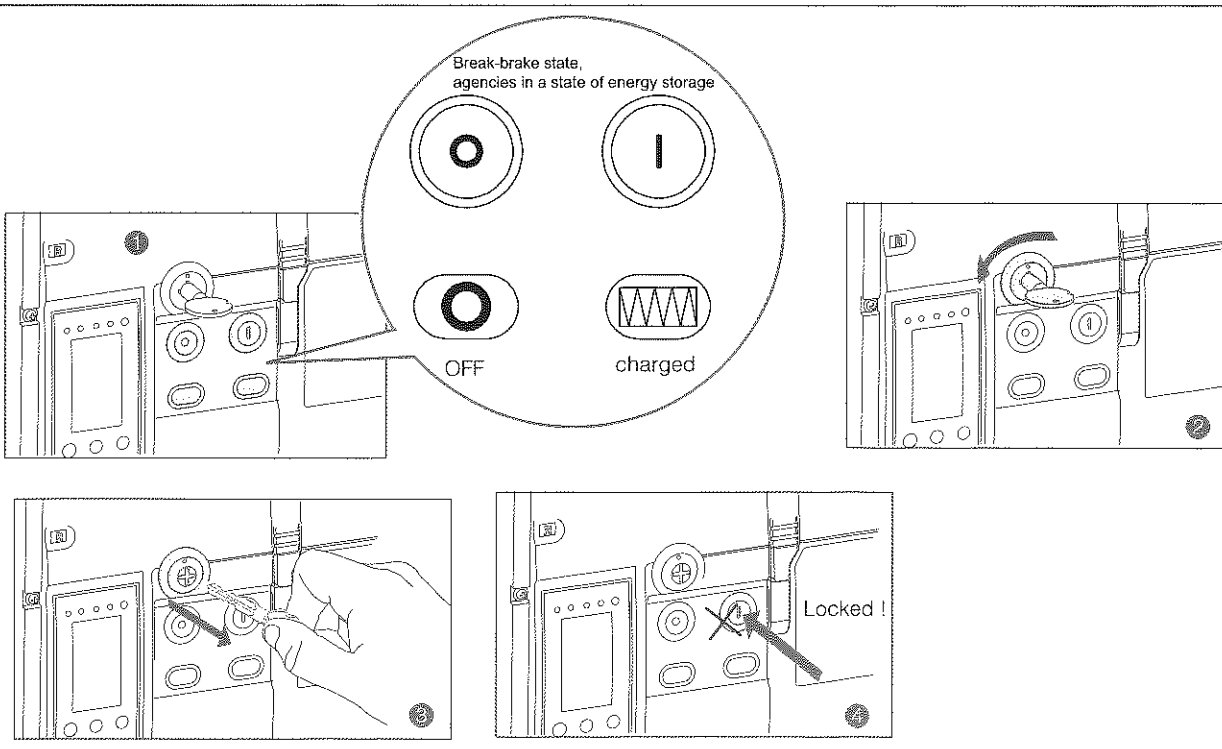
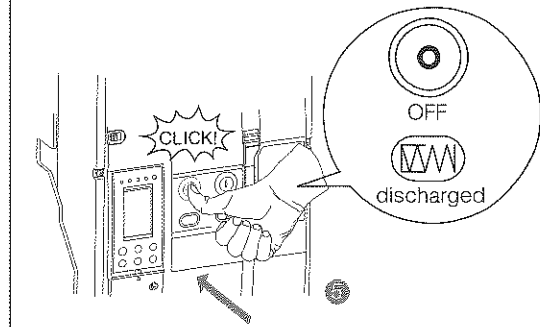
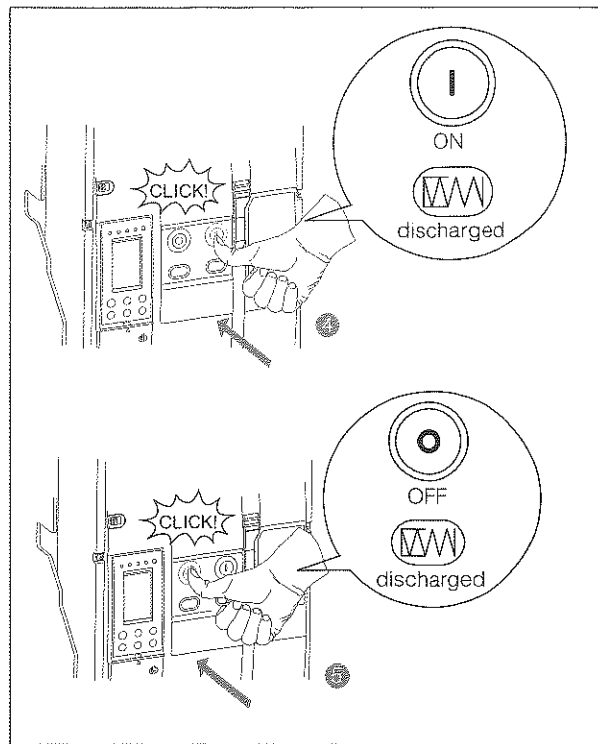
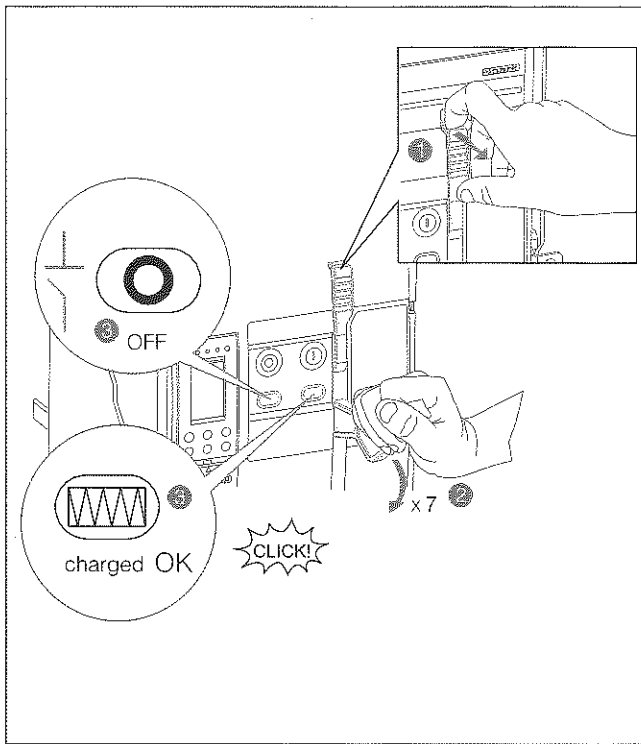
Installation Dimension

Relay Signal Module (M6C) and Power Module (AD):

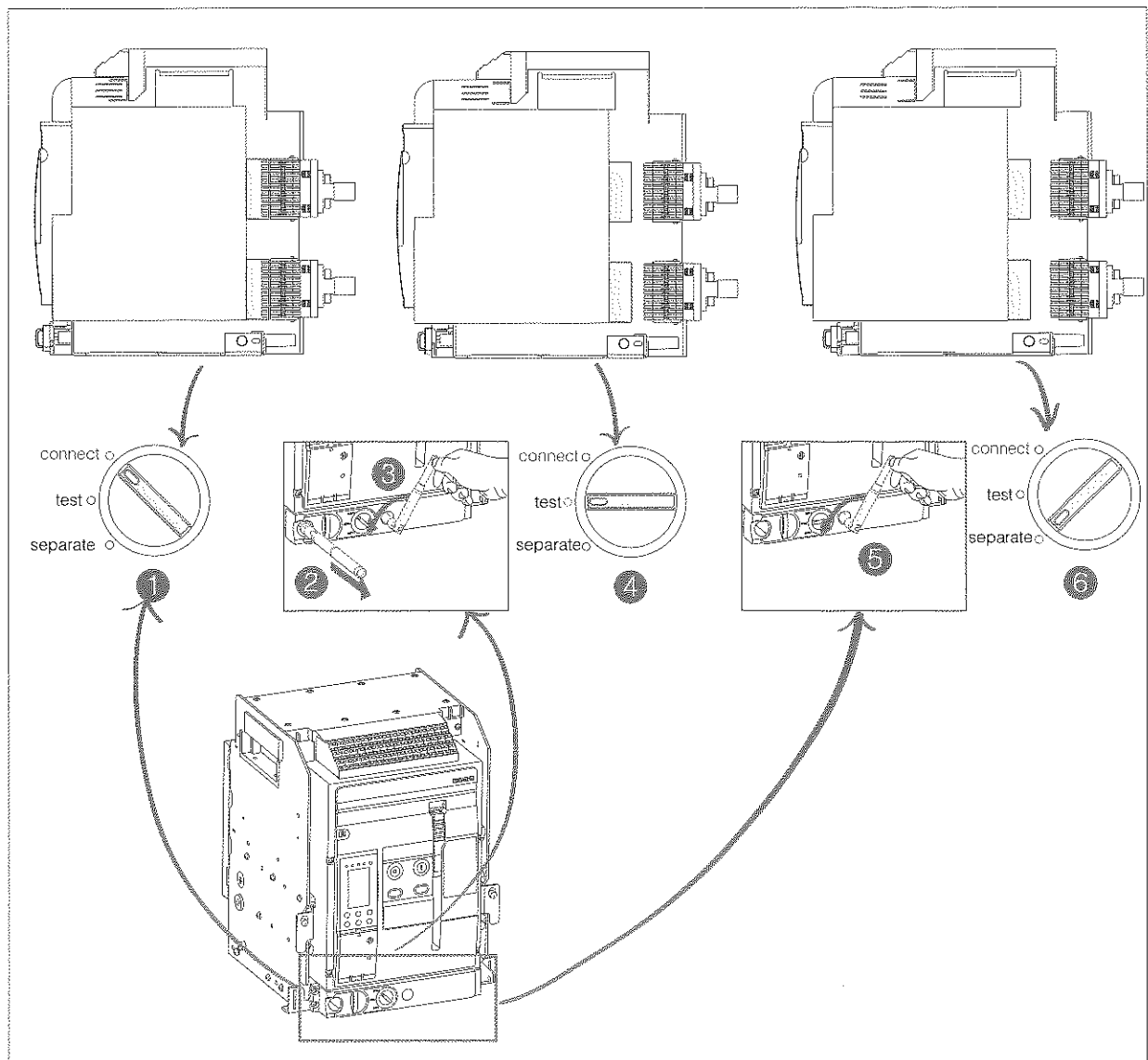
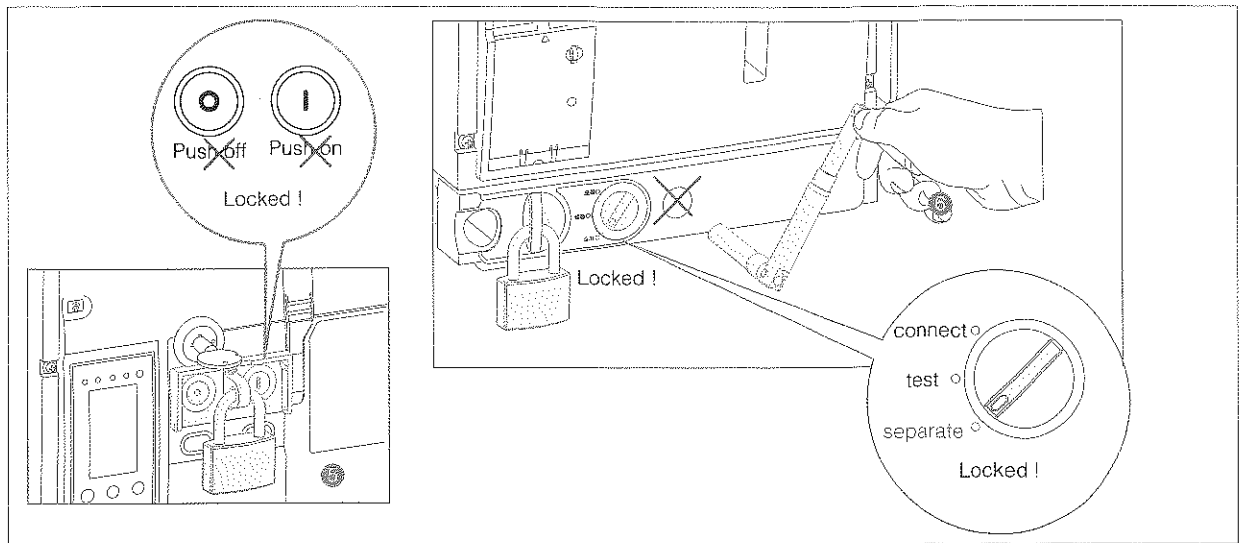
Both modules adopt two installation methods of 35mm standard rail and directly fixed, and the dimensions of two modules are the same.



Operating principle

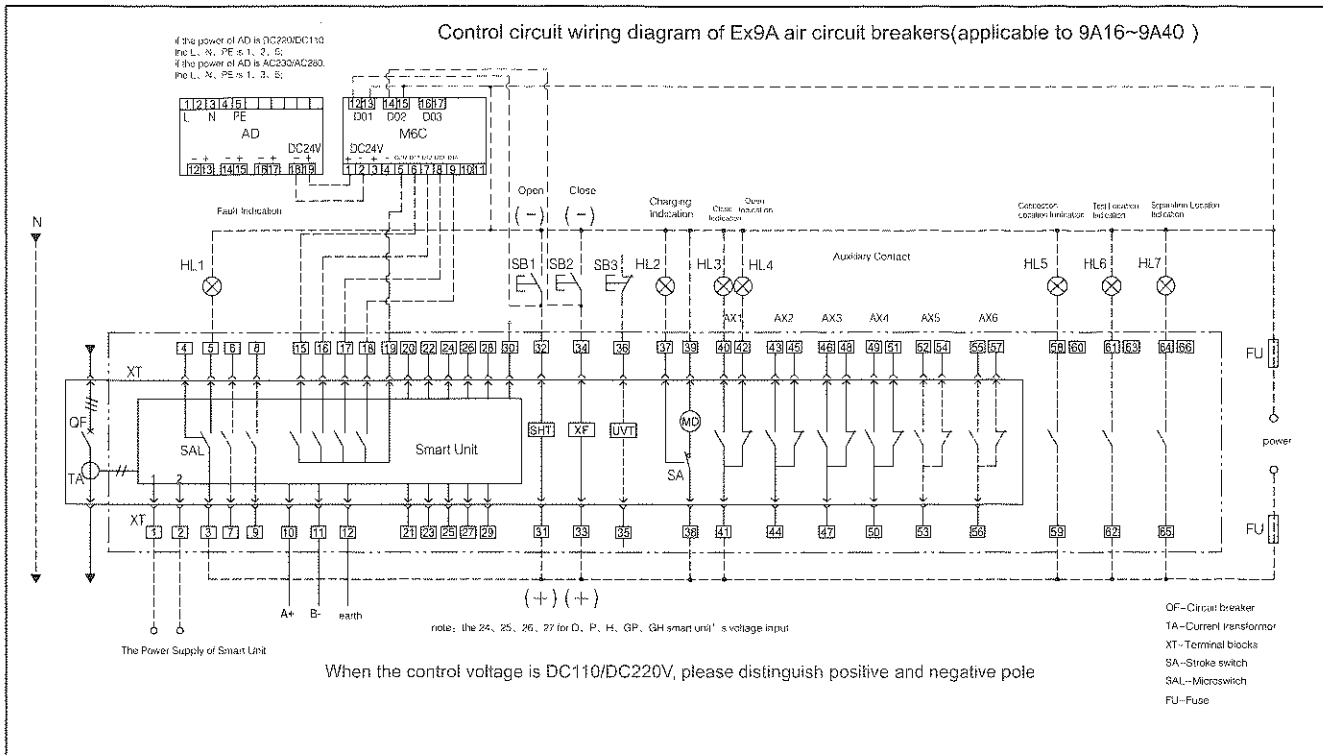


Operating principle



Auxiliary Connections

Ex9A16~Ex9A40 Auxiliary Connections



◆ Input of Auxiliary Power Supply

1#, 2#: Input of Auxiliary Power Supply (AC220V/400V). When the working power supply is direct voltage, it has to convert through the power modules and output before connecting 1# and 2#.

◆ The Auxiliary Signal of Fault Trip;

3#, 4#, 5#: output of fault trip signal.
The capacity of auxiliary signal contact: AC380V, 2A; DC250V, 0.3A;

◆ The fault signalling light HL1 is user-owned.

The Synchronization Auxiliary Signal to Circuit Breaker (optional)
6#, 7#: output of circuit breaker signal status (N.O.); 8#, 9#: output of circuit breaker signal status (N.O.).

The capacity of auxiliary signal contact: AC380V, 1A; DC250V, 0.15A; N.C signal is optional, but users have to give special explanation when making an order; this is optional configuration, and 6#~9# is none in common condition.

Output of Communication (only for communication type smart unit)
10#, 11#: output of communication interface, 10# is A+, 11# is B-, 12# is communication shield ground wire.

Output interface of Programmable Signal (optional) (for signal unit and communication smart unit)

15#~18#: 4 programmable output contact, 15# output signal of telecontrol open, 16# output signal of telecontrol close, and 19# is public point of programmable contact. The function of signal output can be realized when the signal output contact connecting to the IO signal modules.

The capacity of DO output contact: DC110V, 0.5A; AC250V, 5A. And the IO signal modules is AC250V, 10A; DC28V, 10A.

Input Interface of Programmable Signal (optional) (for signal element and communication type smart unit)

20#, 21#: input interface of programmable signal DI1; 22#, 23#:

input interface of programmable signal DI2;

The capacity of DI input contact is DC110V~130V or AC110V~250V.

◆ Input of Voltage Indicate Signal (for D, P, H, GP, GH smart unit)

24#, 25#, 26#, 27# respectively A, B, C, N three phase voltage input.

◆ Input of External Transformer (optional)

28#, 29#: for input of external transformer; When the ground protection is 3P+N, the pin is for the signal input of external N phase transformer; when it is W, it connect to the output of external transformer WEC; when ground protection is leakage protection, it is for connecting the output of external transformer LEC.

L-PE

30#: L-PE, connect to outer panel of circuit breaker body.

SHT Shunt Release

31#, 32#: the working power supply input of SHT shunt release; Open button SB1 is for user-owned.

XF Closing Coil

33#, 34#: the working power supply input of XF closing coil; Close button SB2 is user-owned.

UVT Undervoltage Release (optional)

35#, 36#: the working power supply input of UVT undervoltage release; Urgent trip button SB3 is user-owned; when it is undervoltage delay release circuit breaker trips after pressing SB3 and delaying some time. The UVT is special order configuration, so there is no wiring for common

The Working Power Supply of MD Charging Motor

37#, 38#, 39#: the working power supply input of MD; The charging indicator HL2 is user-owned.

AX1~AX6 Auxiliary Contact

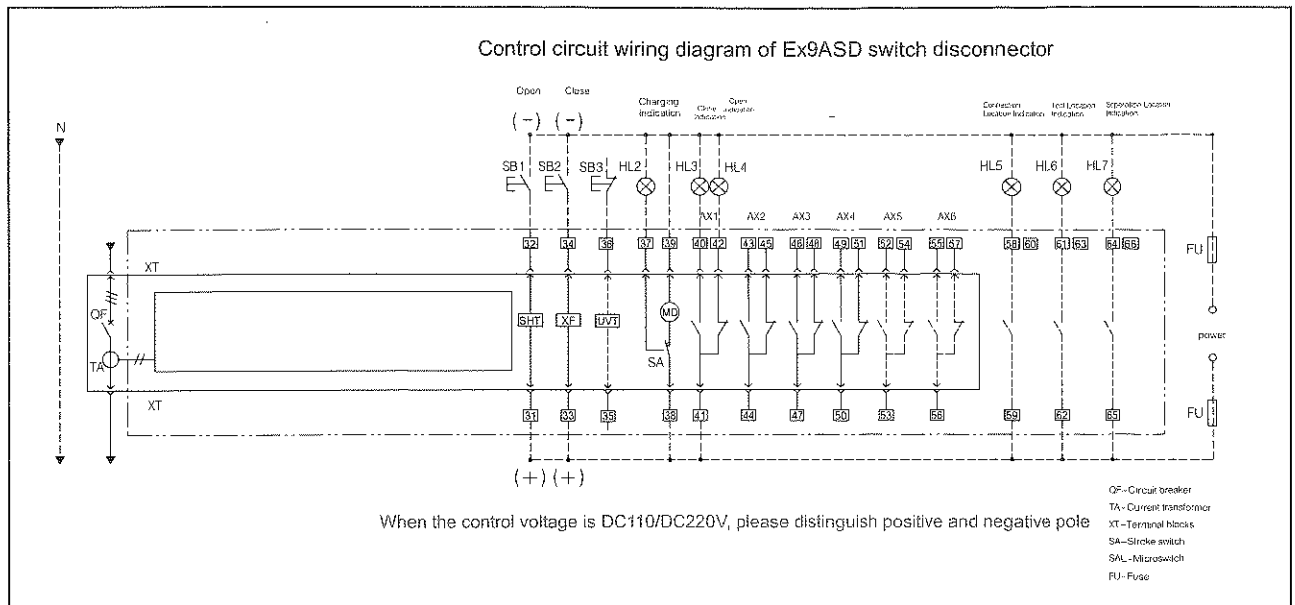
40#~51# (AX1~AX4): 4 groups of auxiliary contacts; 52#~57# (AX5~AX6): groups of auxiliary contacts, and the special 6 groups of auxiliary contacts, no wiring for common supplement. HL3, HL4 indicators are user-owned.

The Position Indication of Withdrawable Circuit Breaker (optional)

58#~60#: connection location indication; 61#~63#: test location indication; 64#~66#: signal indicator LED are user-owned, it is only for withdrawal not provided for common supplement.

Auxiliary Connections

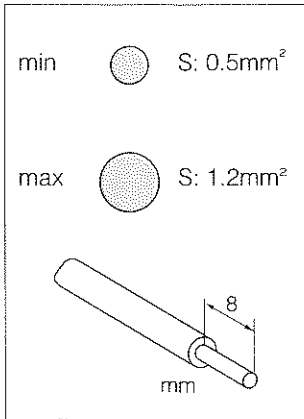
Ex9ASD Isolating switch secondary wiring



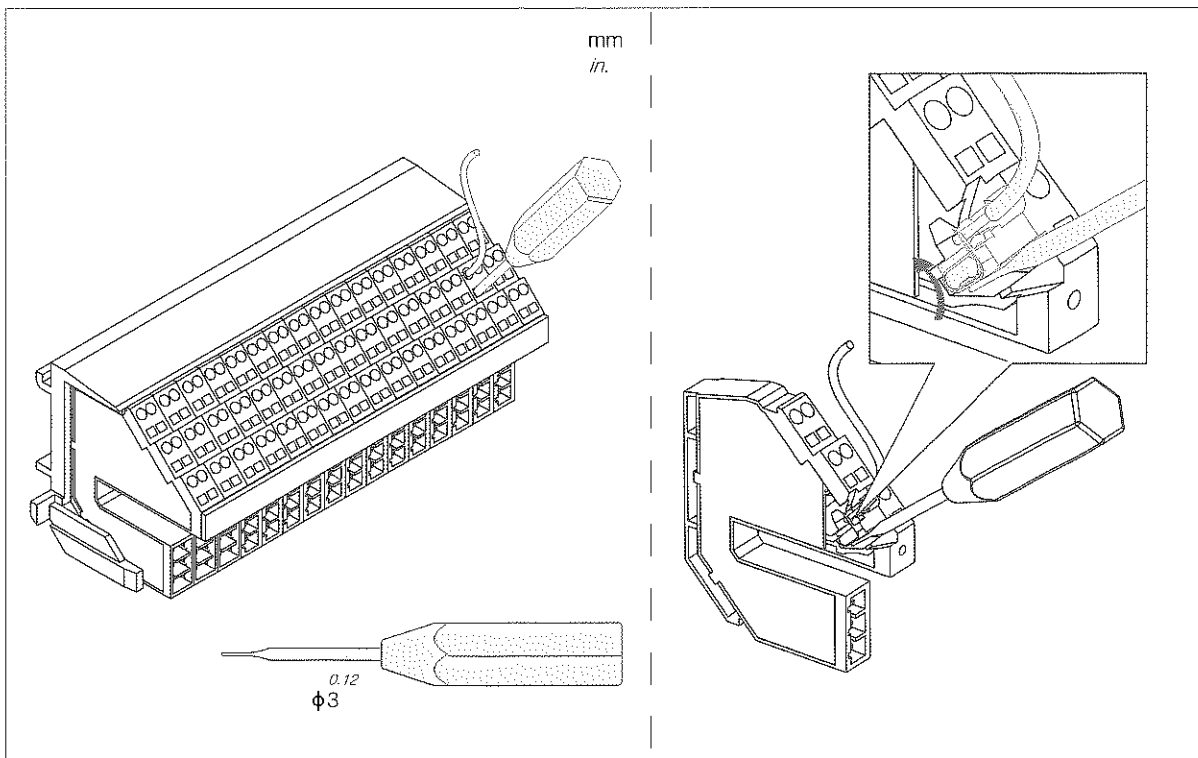
- SHT Shunt Release
 31#,32#:the working power supply input of SHT shunt release;
 Open button SB1 is for user-owned.
- XF Closing Coil
 33#,34#:the working power supply input of XF closing coil;
 Close button SB2 is user-owned.
- UVT Undervoltage Release(optional)
 35#,36#:the working power supply input of UVT undervoltage release;
 Urgent trip button SB3 is user-owned;when it is undervoltage delay relea
 The UVT is special order configuration,so there is no wiring for common s
- The Working Power Supply of MD Charging Motor
 37#,38#,39#:the working power supply input of MD;
 The charging indicator HL2 is user-owned.
- AX1~AX6 Auxiliary Contact
 40#~51#(AX1~AX4):4 groups of auxiliary contacts;52#~57#(AX5~AX6):o
 of auxiliary contacts,no wiring for common supplement.
 HL3,HL4 indicators are user-owned.
- The Position Indication of Withdrawable Circuit Breaker(optional)
 58#~60#:connection location indication;61#~63#:test location indication;64:
 HL5,HL6,HL7 signal indicator LED are user-owned,it is only for withdrawabl
 not provided for common supplement.

Auxiliary Connections

Cross-section of wires

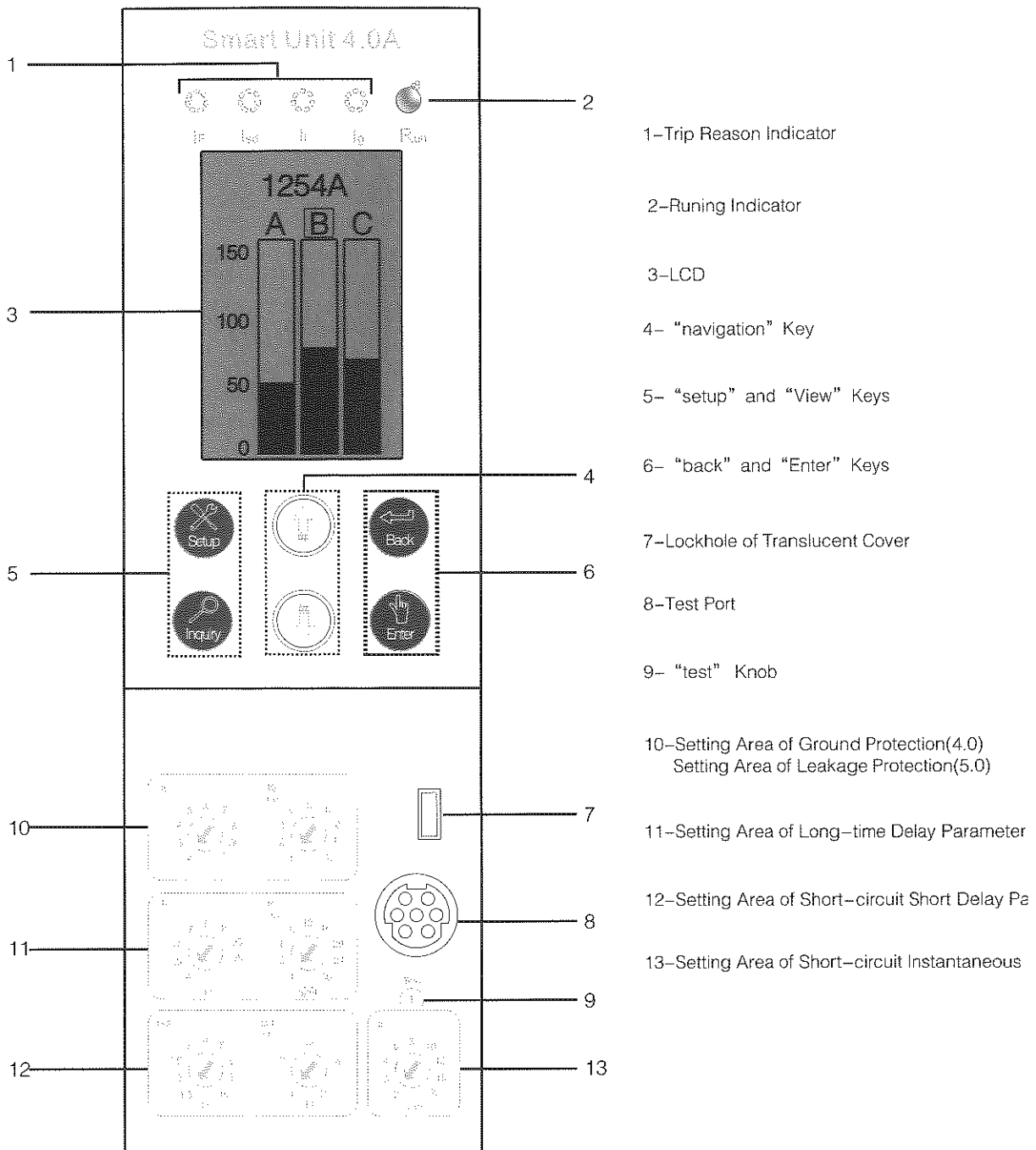


Remove Insulation



Operation interface

Ex9A smart unit uses electronic chip with the 32-bit DSP(digital signal processor),which makes protection faster and more reliat. Advanced type is in multi-color backlight: normal operation is green, the overload is yellow and the fault tripped is red; Achieve double setting function, setting knob achieves coarse-tuning, button achieves fine-tuning;Achieve overall measuremer maintaining the function of which makes operation easier and easier to do configuration of function according to using situation.



Note:

Press "setup" key to show menu interface of "System parameter setting", and then press "setup" key on this interface to show the interface of "Protection parameter setting"; Press "View" key to show menu interface of "Measurement", and then press "View" key on this interface to show the interface of "History record and maintaining".
Smart Unit is equipped with a standard translucent cover.

Operation interface

Introduction of operation interface

1 Trip reason

"IR"Indicator	This indicator lights to alarm in case of long-delay overloads
	This indicator lights in case of long-delay fault until getting the reset instruction.
"isd"Indicator	This indicator lights in case of Short-circuit short delay fault until getting the reset instruction.
"ii"Indicator	This indicator lights in case of Short-circuit instantaneous fault until getting the reset instruction.
"I _g or I _{Δn} "Indicator	This indicator lights in case of grounding fault,neutral conductor fault or current leak fault until getting the reset instruction.

2 Running Indicator

This indicator lights all the time during normal running.

3 LCD

The standard type is in white backlight and the advanced type is in three-color backlight, normal operation in green, overload in yellow and fault tripped in red.

4 "navigation"key

"Up"key	At the current menu,move the submenu in the selection box to change the position of the selection box upward,and perform a parameter setting "+" at the parameter setup menu.
"Down"key	At the current menu,move the submenu in the selection box to change the position of the selection box downward and perform a parameter setting "-" at the parameter setup menu.

5 "Setup"and "View"keys

"Setup"key	Shift to the default menu: "System parameter setting" or "Protection parameter setting" (on the setup interface,if it could move left/right, push the"Left"key).
"View"key	Shift to the default menu: "Measurement" or "History record and maintaining" (on the setup interface,if it could move left/right, push the"Right"key).

6 "Return"and "Enter"keys

"Return"key	Exit from the current menu and return to the previous menu or cancel the parameter currently set.
"Enter" key	Go to the next menu in the selection box currently selected; or activate the box which will be thicker and then the numbers of box can be changed.

7 Lockhole of Translucent Cover

Translucent cover of lead sealing.

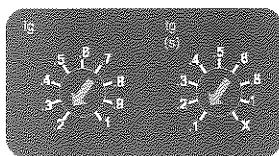
8 Test Port

8-pin S port,used to connect with a hand-held programming or test device.

9 "test"Knob

For an instantaneous trip test

10 Setting area of ground protection(for 4.0) ,including setting knob of grounding fault current I_g and setting knob of grounding fault delay t_g.



Setting Range I _g	Error	Current I	Action Time t _g (s)	Time Error
(0.2~1) I _n	±20%	≤0.8I _g	No Trip	10% ±
		>1.2I _g	Delay Trip	
		I/I _g ≥C _r	0.1 0.2 0.3 0.4 0.5 0.6 0.8 1 X	
		I/I _g <C _r	(Time of delay trip)T= t _g ×C _r ×I _g /I	

trip current of grounding fault has: I_g=(0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1) × I_n to switch

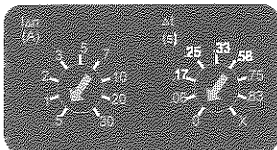
delay time of grounding fault has: t_g=(0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.8, 1, X) to switch and "X" is OFF.

For example: I_n=800A is known, and set I_g=0.4× I_n=320A, C_r=2, t_g=0.4S, if grounding fault happens, the faulty current is 400A,andthe Control Unit will has judgement:400A>1.2×320A, delay trip, judge that 400A<C_r × I_g is reverse time limit, and T=t_g × C_r × I_g/I=0.64s.

Note: C_r can be set as (OFF, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6) by pressing key. When it is set as OFF,it show the definite time limit.

Operation interface

10 Setting area of leakage protection(for 5.0), including setting knob of leakage fault current $I_{\Delta n}$ and setting knob of leakage fault delay Δt .



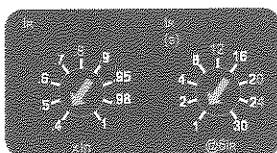
Setting Range $I_{\Delta n}$	Error	Current I	Action Time t_g (s)	Time Error
0.5-30A	±10%	$\leq 0.8I_{\Delta n}$	No Trip	±10%
		$> 1.0I_{\Delta n}$	Delay trip(delay time in the table below)	

Trip current of leakage protection has $I_{\Delta n}=(0.5, 1, 2, 3, 5, 7, 10, 20, 30)A$ to switch.

Delay time of leakage protection has $\Delta t=(0, 0.06, 0.17, 0.25, 0.33, 0.58, 0.75, 0.83, X)$ to switch, and X is OFF.

Setting Range	0	0.06S	0.17S	0.25S	0.33S	0.58S	0.75S	0.83S
Fault Current	Maximum of break time S							
$1I_{\Delta n}$	0.04	0.36	1	1.5	2	3.5	4.5	5
$2I_{\Delta n}$	0.04	0.18	0.5	0.75	1	1.75	2.25	2.5
$5I_{\Delta n}$	0.04	0.072	0.2	0.3	0.4	0.7	0.9	1
$10I_{\Delta n}$								

11 Setting area of long-delay parameter, including setting knob of long delay current I_R and setting knob of long delay action time t_R .



Setting Range I_R	Error	Current I	Action Time t_R (s)	Time Error
(0.4-1) I_n	±10%	$\leq 1.05I_R$	2h no trip	±15%
		$> 1.30I_R$	<1h trip	
		$1.5I_R$	16 32 64 128 192 256 320 384 480	
		$2.0I_R$	9 18 36 72 108 144 180 216 270	
		$6.0I_R$	1 2 4 8 12 16 20 24 30	

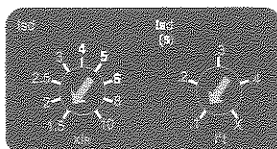
Distribution Protection: Setting value of long delay current has $I_R=(0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 0.95, 0.98, 1)I_n$ to switch;

Generator Protection: Setting value of long delay current has $I_R=(0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 1.1, 1.2)I_n$ to switch;

Trip time of long delay has $t_R=(1, 2, 4, 8, 12, 16, 20, 24, 30)S$ to switch and t_R has the feature of reverse time limit;

For example: $t_R=2s$, and current $I=1.5I_R$, then the actual trip time T is 32s according to $(1.5I_R)^2 \times T = (6I_R)^2 \times 2$

12 Setting area of short delay parameter, including setting knob of short delay current I_{sd} and setting knob of short delaying trip time.



Setting Current I_{sd}	Error	Current	Trip Time t_{sd} (s)	time error
$(1.5-10)I_R+OFF$	±10%	$\leq 0.90I_{sd}$	No Trip	±10%
		$> 1.10I_{sd}$	Delay Trip	
		Definite Time Limit	0.1 0.2 0.3 0.4 OFF	
		Reverse Time Limit	Reverse Time Limit is the same as long delay, but the time of it is one tenth of long delay time.	

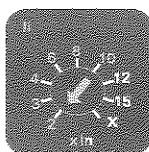
Setting value of short delay current $I_{sd}=(1.5, 2, 2.5, 3, 4, 5, 6, 8, 10) \times I_R$ to switch.

Setting value of short delay trip time $t_{sd}=(0.1, 0.2, 0.3, 0.4, X)$ to switch, and X is OFF.

The setting value of setting knob is definite time limit, the setting current value of reverse time limit (I_s) need to be set by pressing. System only allows that setting value of reverse time limit \leq setting value of definite time limit.

For example, setting value of long delay: I_R , value of short delay: $I_s=I_{sd}=8I_R$; If the fault current is $6I_R$, and the fault delay time is T, action type is overload long delay: now switch the value of short delay reverse time limit to $I_s=4I_R$, and when the fault current is $6I_R$, trip delay time is $T/10$, the action type is short delay reverse time limit, when fault current is $10I_R$, and trip delay time is t_{sd} , the action type is short delay definite time limit.

13 Setting area of instantaneous parameter, including setting knob of instantaneous current I_i



Setting Current I_i	Error	Current	Action Characteristic
$(2-15)I_n+OFF$	±15%	$\leq 0.85I_i$	No Trip
		$> 1.15I_i$	Instantaneous Trip

Setting value of instantaneous current has $I_i=(2, 3, 4, 6, 7, 10, 12, 15, X) \times I_n$ to switch, and X is OFF.

Operation interface

Introduction of operation interface

1 Trip reason

- "Ir"Indicator This indicator lights to alarm in case of long-delay overloads
This indicator lights in case of long-delay fault until getting the reset instruction.
- "Isd"Indicator This indicator lights in case of Short-circuit short delay fault until getting the reset instruction.
- "Ii"Indicator This indicator lights in case of Short-circuit instantaneous fault until getting the reset instruction.
- "I_g or I_{Δn}"Indicator This indicator lights in case of grounding fault, neutral conductor fault or current leak fault until getting the reset instruction.

2 Running Indicator This indicator lights all the time during normal running.

3 LCD The standard type is in white backlight and the advanced type is in three-color backlight, normal operation in green, overload in yellow and fault tripped in red.

4 "navigation"key

- "Up"key At the current menu, move the submenu in the selection box to change the position of the selection box upward, and perform a parameter setting "+" at the parameter setup menu.
- "Down"key At the current menu, move the submenu in the selection box to change the position of the selection box downward and perform a parameter setting "-" at the parameter setup menu.

5 "Setup"and "View"keys

- "Setup"key Shift to the default menu: "System parameter setting" or "Protection parameter setting" (on the setup interface, if it could move left/right, push the "Left"key).
- "View"key Shift to the default menu: "Measurement" or "History record and maintaining" (on the setup interface, if it could move left/right, push the "Right"key).

6 "Return"and "Enter"keys

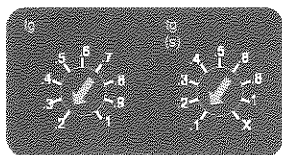
- "Return"key Exit from the current menu and return to the previous menu or cancel the parameter currently set.
- "Enter" key Go to the next menu in the selection box currently selected; or activate the box which will be thicker and then the numbers of box can be changed.

7 Lockhole of Translucent Cover Translucent cover of lead sealing.

8 Test Port 8-pin S port, used to connect with a hand-held programming or test device.

9 "test"Knob For an instantaneous trip test

10 Setting area of ground protection(for 4.0), including setting knob of grounding fault current I_g and setting knob of grounding fault delay t_g.



Setting Range I _g	Error	Current I	Action Time t _g (s)	Time Error
(0.2~1) In	±20%	≤0.8I _g	No Trip	10% ±
		>1.2I _g	Delay Trip	
		I/I _g ≥Cr	0.1 0.2 0.3 0.4 0.5 0.6 0.8 1 X	
		I/I _g <Cr	(Time of delay trip)T= t _g ×Cr×I _g /I	

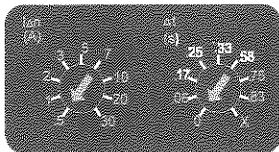
trip current of grounding fault has: I_g=(0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1) x I_n to switch
 delay time of grounding fault has: t_g=(0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.8, 1, X) to switch and "X" is OFF.

For example: I_n=800A is known, and set I_g=0.4x I_n=320A, Cr=2, t_g=0.4S, If grounding fault happens, the faulty current is 400A, and the Control Unit will have judgement: 400A>1.2x320A, delay trip, judge that 400A<Cr x I_g is reverse time limit, and T=t_g x Cr x I_g/I=0.64s.

Note: Cr can be set as (OFF, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6) by pressing key. When it is set as OFF, it shows the definite time limit.

Operation interface

10 Setting area of leakage protection(for 5.0), including setting knob of leakage fault current $I_{\Delta n}$ and setting knob of leakage fault delay Δt .



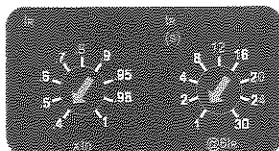
Setting Range $I_{\Delta n}$	Error	Current I	Action Time t_g (s)	Time Error
0.5-30A	±10%	$\leq 0.8I_{\Delta n}$	No Trip	±10%
		$> 1.0I_{\Delta n}$	Delay trip(delay time in the table below)	

Trip current of leakage protection has $I_{\Delta n}=(0.5, 1, 2, 3, 5, 7, 10, 20, 30)A$ to switch.

Delay time of leakage protection has $\Delta t=(0, 0.06, 0.17, 0.25, 0.33, 0.58, 0.75, 0.83, X)$ to switch, and X is OFF.

Setting Range	0	0.06S	0.17S	0.25S	0.33S	0.58S	0.75S	0.83S
Fault Current	Maximum of break time S							
1 $I_{\Delta n}$	0.04	0.36	1	1.5	2	3.5	4.5	5
2 $I_{\Delta n}$	0.04	0.18	0.5	0.75	1	1.75	2.25	2.5
5 $I_{\Delta n}$	0.04	0.072	0.2	0.3	0.4	0.7	0.9	1
10 $I_{\Delta n}$	0.04	0.072	0.2	0.3	0.4	0.7	0.9	1

11 Setting area of long-delay parameter, including setting knob of long delay current I_R , and setting knob of long delay action time t_R .



Setting Range I_R	Error	Current I	Action Time t_R (s)	Time Error
(0.4-1) I_n	±10%	$\leq 1.05I_R$	2h no trip	±15%
		$> 1.30I_R$	<1h trip	
		1.5 I_R	16 32 64 128 192 256 320 384 480	
		2.0 I_R	9 18 36 72 108 144 180 216 270	
6.0 I_R		1 2 4 8 12 16 20 24 30		

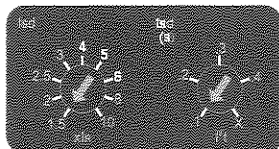
Distribution Protection: Setting value of long delay current has $I_R=(0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 0.95, 0.98, 1)I_n$ to switch;

Generator Protection: Setting value of long delay current has $I_R=(0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 1.1, 1.2)I_n$ to switch;

Trip time of long delay has $t_R=(1, 2, 4, 8, 12, 16, 20, 24, 30)S$ to switch and t_R has the feature of reverse time limit;

For example: $t_R=2s$, and current $I=1.5I_R$, then the actual trip time T is 32s according to $(1.5I_R)^2 \times T = (6I_R)^2 \times 2$

12 Setting area of short delay parameter, including setting knob of short delay current I_{sd} and setting knob of short delaying trip time.



Setting Current I_{sd}	Error	Current	Trip Time t_{sd} (s)	time error
(1.5~10) I_R +OFF	±10%	$\leq 0.90I_{sd}$	No Trip	±10%
		$> 1.10I_{sd}$	Delay Trip	
		Definite Time Limit	0.1 0.2 0.3 0.4 OFF	
		Reverse Time Limit	Reverse Time Limit is the same as long delay, but the time of it is one tenth of long delay time.	

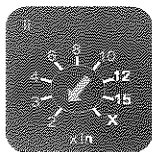
Setting value of short delay current $I_{sd}=(1.5, 2, 2.5, 3, 4, 5, 6, 8, 10) \times I_R$ to switch.

Setting value of short delay trip time $t_{sd}=(0.1, 0.2, 0.3, 0.4, X)$ to switch, and X is OFF.

The setting value of setting knob is definite time limit, the setting current value of reverse time limit (I_s) need to be set by pressing. System only allows that setting value of reverse time limit \leq setting value of definite time limit.

For example, setting value of long delay: I_R , value of short delay: $I_s=I_{sd}=8I_R$; If the fault current is $6I_R$, and the fault delay time is T, action type is overload long delay; now switch the value of short delay reverse time limit to $I_s=4I_R$, and when the fault current is $6I_R$, trip delay time is $T/10$, the action type is short delay reverse time limit, when fault current is $10I_R$, and trip delay time is t_{sd} , the action type is short delay definite time limit.

13 Setting area of instantaneous parameter, including setting knob of instantaneous current I_i



Setting Current I_i	Error	Current	Action Characteristic
(2~15) I_n +OFF	±15%	$\leq 0.85I_i$	No Trip
		$> 1.15I_i$	Instantaneous Trip

Setting value of instantaneous current has $I_i=(2, 3, 4, 6, 7, 10, 12, 15, X) \times I_n$ to switch, and X is OFF.

Menu structures

Menu Structures(Continue)

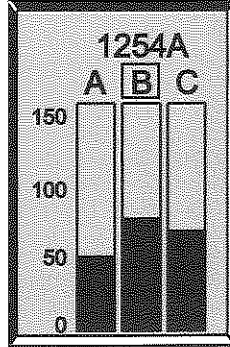
Pole 1	Pole 2	Pole 3	Pole 4	Pole 5
Interface for Protective Function (Continue)	Other Protective Functions	Underfrequency	Close	
			Trip:Starting Value &Time Set	
			Alarm:(Starting Value,Time)&(Return Value,Time) Setup	
		Overfrequency	Close	
			Trip:Starting Value &Time Set	
			Alarm:(Starting Value,Time)&(Return Value,Time) Setup	
		Phase Protection	Close	
			Trip:Starting Value &Time Set	
			Alarm:(Starting Value,Time)&(Return Value,Time) Setup	
		Reverse Active Power	Close	
			Trip:Starting Value &Time Set	
			Alarm:(Starting Value,Time)&(Return Value,Time) Setup	
		Temperature	Close	
			Trip:Starting Value &Time Set	
			Alarm:(Starting Value,Time)&(Return Value,Time) Setup	
Measuring Interface	Current	Instantaneous	Ia Ib Ic In	Display Ia Ib Ic In Ig
			Max Value	Display Max Value of Ia Ib Ic In Ig
			Unbalance Percent	Display Unbalance Percent of Ia Ib Ic In Ig
	Voltage	Instantaneous Value	Instantaneous Value	Display Uab Ubc Uca Uan Ubn Ucn
			Average Value	Display U Average Value
			Unbalance Percent	Display U Unbalance Percent
			Phase Protection	Display Phase
	Electric Energy	Total Electric Energy	Total Electric Energy	Display E.P.E.Q.E.S
			Input Energy	Display Input Energy E.P.E.Q
			Output Energy	Display Output Energy E.P.E.Q
			Energy Reset	Quit/Enter
	Power	Instantaneous Value	P Q S	Display P Q S
			PF	Display Power Factor
			Pa Qa Sa	Display Pa Qa Sa
			Pb Qb Sb	Display Pb Qb Sb
			Pc Qc Sc	Display Pc Qc Sc
		PFa PFb PFC	Display PFa PFb PFC	
	Needed Value	P Q S	Display P Q S	
		Max Value	Display Max Value of P Q S	
	Harmonic	Waveform	Ia Ib Ic	Display Ia Ib Ic
			Uan Ubn Ucn	Display Uan Ubn Ucn
fundamental wave		I(A)	Display Ia Ib Ic	
		U(V)	Display Uab Ubc Uca Uan Ubn Ucn	
THD		I(%)	Display Ia Ib Ic	
		U(%)	Display Uab Ubc Uca Uan Ubn Ucn	
thd		I(%)	Display Ia Ib Ic	
		U(%)	Display Uab Ubc Uca Uan Ubn Ucn	
FFT		I	Display Ia Ib Ic	
		U	Display Uab Ubc Uca	
Temperature	Temperature Display			
Memorizing Record & Maintenance	Current Alarming	Display Current Alarming Type		
	Operating Times	Display Operating Times		
	Contacting Wearing	Display Status of Contacting Wearing		
	Record of Changing Position	Display 8 times of Changing Position		
	Tripping Record	Display 8 Times of Tripping Record		
	Alarming Record	Display 8 Times of Alarming Record		
	Product Information	Display Product Information		


Main menu


Smart Unit Controller provide with 4 main menus and 1 default interface

- Default Interface


Display current bar chart of each phase under no functional movement

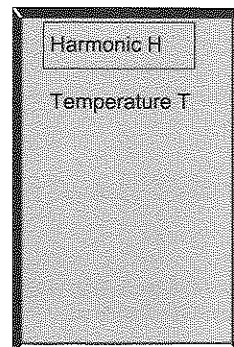
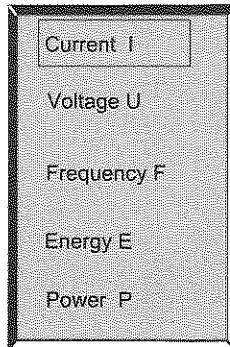



- Press  to enter the menu 'system parameter setup'


- Press  to enter the menu 'measuring'




- Measuring Menu

Press  to enter the menu 'measuring'



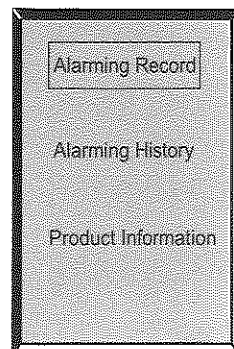
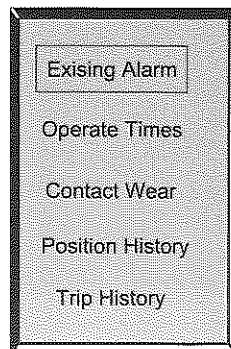
- Press  again to enter the menu 'Memorizing record and maintenance'


- Press  to enter the default interface


- Press   to adjust the menu you want, then press  to enter the submenu as the left picture




- Menu 'Memorizing Record & Maintenance'

Press  to enter the menu 'Measuring', then press  to enter the menu 'Memorizing Record & Maintenance'



- Press  again to enter the menu 'Measuring'

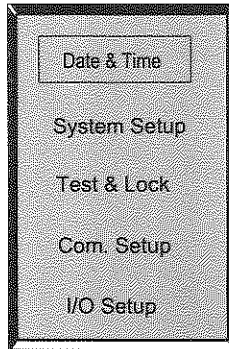
- Press  to enter the default interface


- Press   to adjust the menu you want, then press  to enter the submenu as the left picture


Main menu




● Menu 'System Parameter Setup'

Press  to enter the menu 'System Parameter Setup'





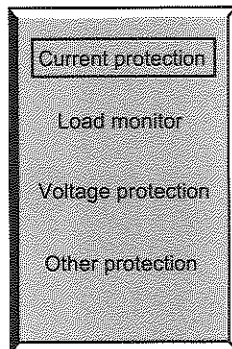
▫ Press  again to enter the menu 'Protective Parameter Setup'


▫ Press  to return to the default interface


▫ Press   to adjust the menu you want, then press  to enter the submenu as the left picture




● Menu 'Protective Parameter Set'

Press  to enter the menu 'System Parameter Set', then press  to enter the menu 'Protective Parameter Set'

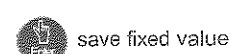
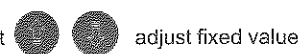
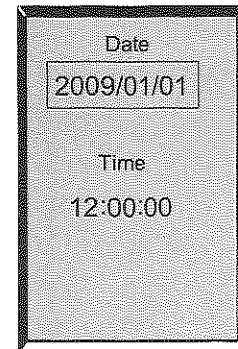
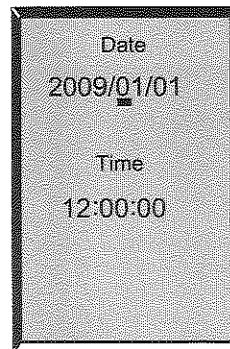
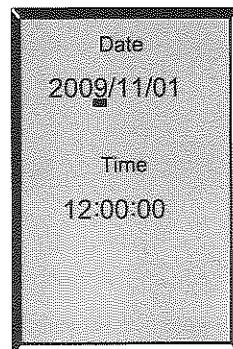
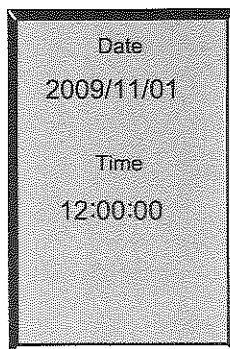


▫ Press  again to enter the menu 'System Parameter Set'

▫ Press  to enter the default interface

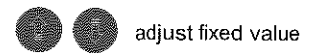
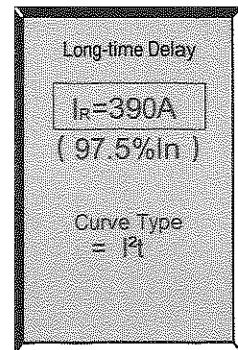
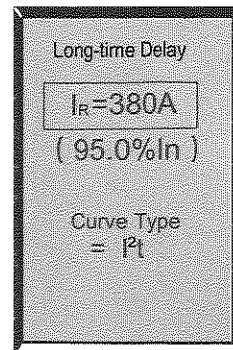
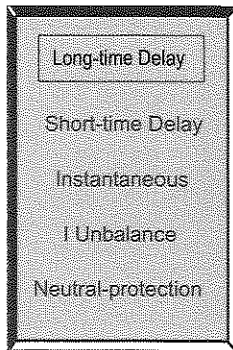
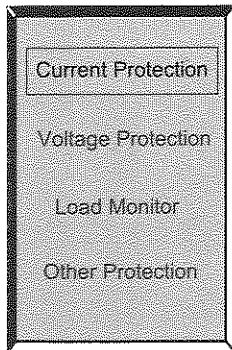
▫ Press   to adjust the menu you want, then press  to enter the submenu as the left picture

● Operational demonstration of the submenu 'System Parameter Set': Time Setting



Main menu

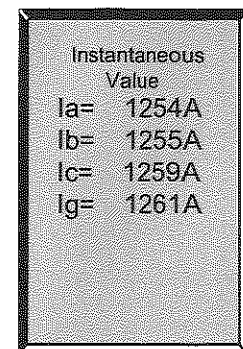
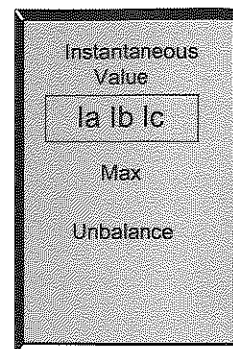
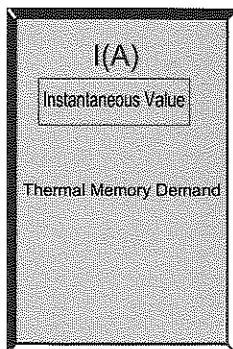
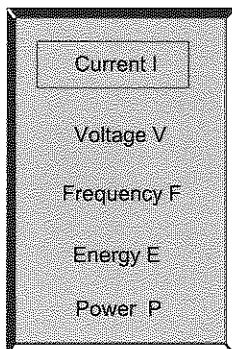
● Operational demonstration of the submenu 'Protection Parameter Set': Ir Set (Over-current long time delay)



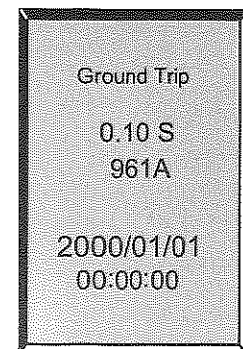
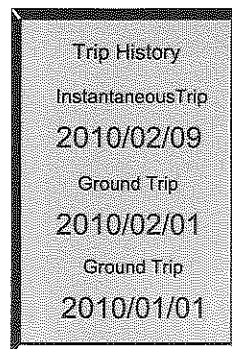
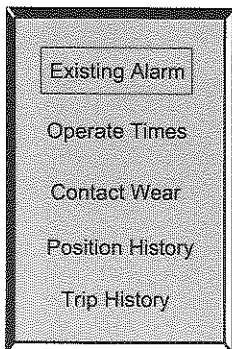
adjust fixed value

save fixed value

● Operational demonstration of the submenu 'Measuring': Current Inquire

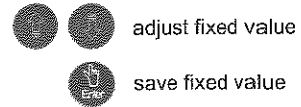
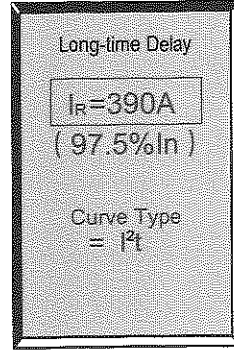
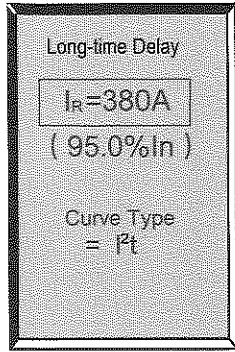
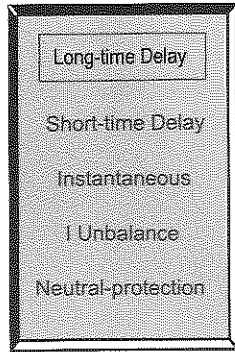
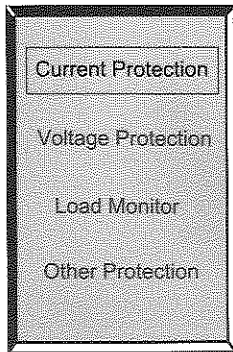


● Operational demonstration of the submenu 'Memorizing Record & Maintenance': Tripping Record

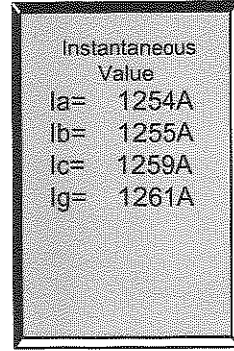
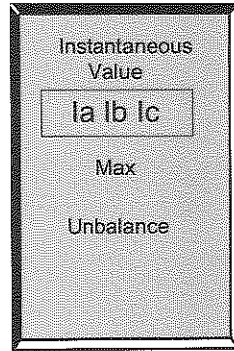
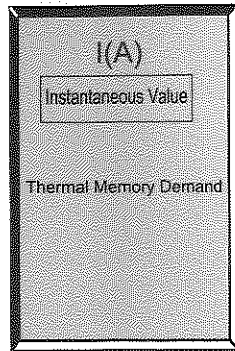
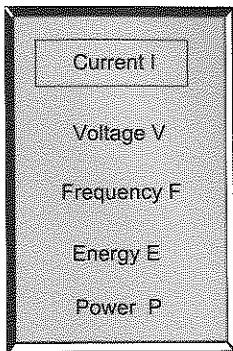


Main menu

● Operational demonstration of the submenu 'Protection Parameter Set': IR Set (Over-current long time delay)



● Operational demonstration of the submenu 'Measuring': Current Inquire



● Operational demonstration of the submenu 'Memorizing Record & Maintenance': Tripping Record

