


FN7-12RDLA Series

Indoor AC high-voltage load switch

OPERATION INSTRUCTION

CNC

Deliver
Power For Better Life

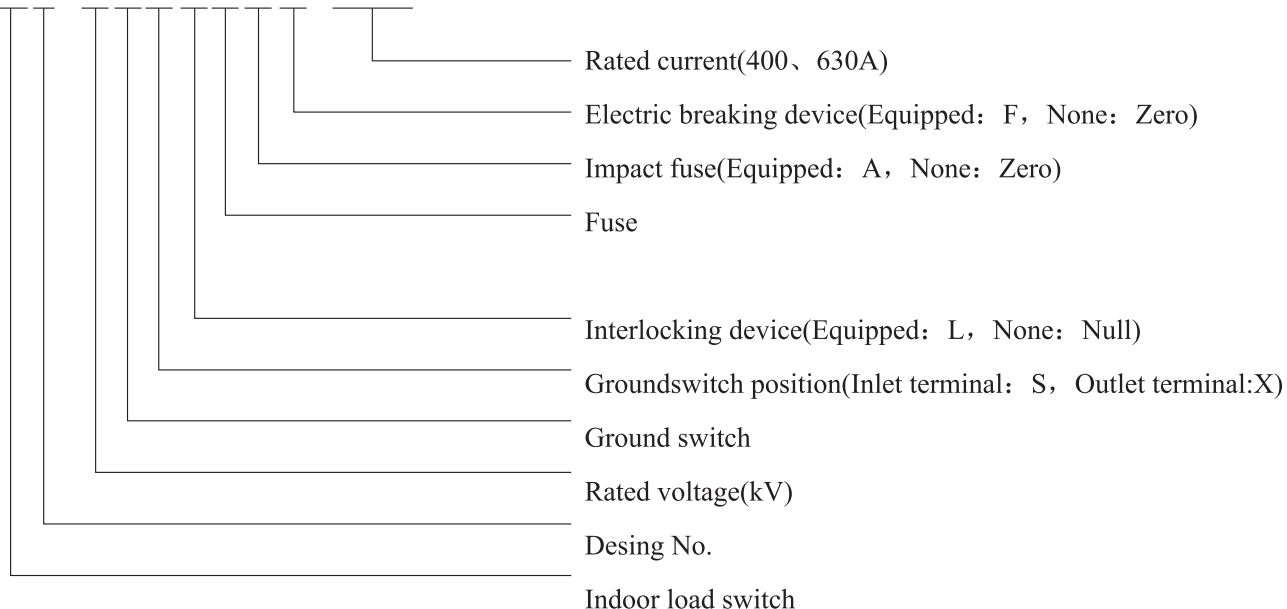
 Before installing and using this product, please read this manual carefully and pay more attention to safety.

Main application

As a new-style aerogenous indoor high-voltage load switch, this FN7-12DR AC high-voltage load switch (hereafter referred to as load switch) applies to 3-phase AC electric system with 50Hz frequency and 12kV rated voltage and acts as the ON/OFF of load current and closing of short circuit current.

Main application

FN 7 - 12 D □ □ R □ □ / □ □ □



Working conditions

Ambient temperature: -25 °C~+40°C

Altitude: within 1000m

Relative humidity: no more than 95% for daily average, and no more than 90% for monthly average.

No corrosive or flammable gas as well as water vapor around

No frequent sharp-shake

Main technical specifications

See List 1 for main specifications

See List 2 for rated parameters

See List 3 for rated parameters of fuse

Structure description

The load switch consists of base、 insulators、 moving/fixed contact、 arcing contact、 arc extinguishing contact and chamber、 driving mechanism、 spring operating mechanism、 fuse and CS6 or disc operating mechanism and so on, in addition, it is available to be combined with groundswitch, and the interlocking device is equipped as well.

Functions

Closing operation: when under manual closing mode, the operating mechanism make the spring be compressed through driving mechanism, then the released spring makes the knife contact close quickly when the spring has been compressed to be a certain degree.

Opening operation and arcing extinguishing principle: when under manual opening mode, the released spring makes the major knife contact open firstly, then arcing knife contact opens the circuit instantaneously. During the opening of arcing knife contact, the arc is generated, at the same time, the arc extinguishing chamber cools down the arc and generate gas under the motivation of electric arc to make the arc extinguish.

For the load switch equipped with impact fuse, when the fuse is burnt out, but there still be some phase line(s), the load switch will open automatically, if want to reclose, fasten the trip device.

For the load switch with groundswitch, the interlocking can be acquired through interlocking mechanism so that the opening or closing by mistaking can be avoided effectively.

If the fuse selected can not match the integrated load switch, it is available to use split type load switch.

For the load switch equipped with automatic trip device, available to be equipped with electric opening device additionally to acquire electric opening.

Overall dimension and installation

See Fig 1-12 for overall dimensions, and for the installation method of CS6 or disc operating mechanism, please refer to Fig 15-19.

If under double power supply modes, please refer to Fig 13-14 for the anti-mislocking control of the two switches.

For the load switch equipped with electric opening device, refer to Fig20 for the electric schematic diagram.

Installation and debugging

Before leave factory, all the products have been inspected completely,so any attempt to regulate or operate these switches isnot permissible.

Generally, only vertical wall or metal frame is allowable to install this load switch, and use 4-6 M12 bolts to fasten it at the mounting holes.

After connect switch bus and copper bars, fasten it with bolts, in addition, all the operations should be implemented softly in case cause damage or distortion to switch so that the conductive performance and contacting effect can be influenced.

If equipped with CS6 type or disc operating mechanism, it is under closing mode when the handle goes upwards, conversely, it is under opening mode.

After the installation of operating mechanisms and bus of load switch, a 5 times opening/closing operations at least should be carried out to check if the moving parts can be rotated flexibly, also check if the contact is under good condition and check if there is misplacement for the moving and fixed contacts due to the installation of bus.

Operation and maintenance

After unpacking, check if the products are completed as the packing list, and check if there is any damage caused in the course of transportation or safekeeping.

Remove the dust on product and clean the insulators as well as grounding position

After installation, check if the connection is correct and if the ground wire has been connected reliably.

When under running mode, carry out inspection and maintenance regularly, one time each year at least. After 20 times opening, it is strongly recommended to carry out inspection completely.

Before carry out maintenance, must cut off the power supply, at the same time, check the contact state of insulators and contact terminals.

Only the personal familiar with the performance、 structure as well as the installation method of this product is allowable to operate this switch.

Attachment papers

One Packing List

One Conformity Certificate

One Operation Manual

Operating mechanisms and other accessories

Ordering Instructions

Please provide us the model、 name and quantity of load switch you want to order

If want to equip fuse, please make a clear indication of the model of fuse and the rated current of fuse.

Major specification: (NOTE: - means none, △ means equipped)

List 1

Type	Model	DS	DX	L	R	RA	F
		Ground switch at inlet end	Ground switch at outlet end	Interlocking device	Fuse	Impact fuse	Electric opening device
No Trip Device	FN7-12	—	—	—	—	—	—
	FN7-12DSL	△	—	△	—	—	—
	FN7-12DXL	—	△	△	—	—	—
	FN7-12R	—	—	—	△	—	—
	FN7-12DSL R	△	—	△	△	—	—
	FN7-12DXL R	—	△	△	△	—	—
Trip device equipped	FN7-12RAF	—	—	—	—	△	△
	FN7-12DSLRAF	△	—	△	—	△	△
	FN7-12DXLRAF	—	△	△	—	△	△

Rated parameters

List 2

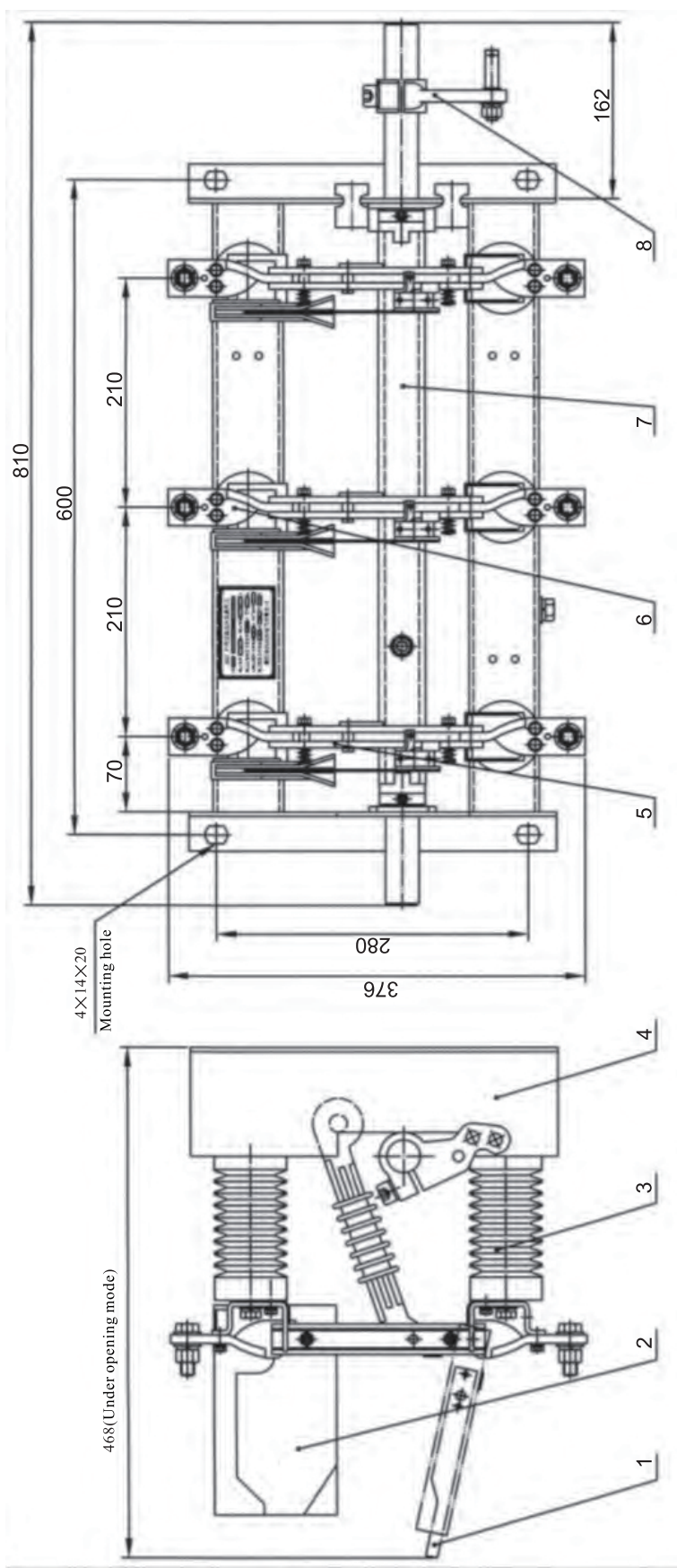
Rated voltage KV	Rated current A	1min Industrial frequency withstand voltage KV	4Sthermal arrest current (effective value) KA	Dynamic stability current (Peak) KA	Short making current KA	Rated breaking current A	Rated transfer current
12	400	42/48	12.5	31.5	31.5	400	1000
	630	42/48	50	50	50	630	1000

Rated parameters of fuse

List 3

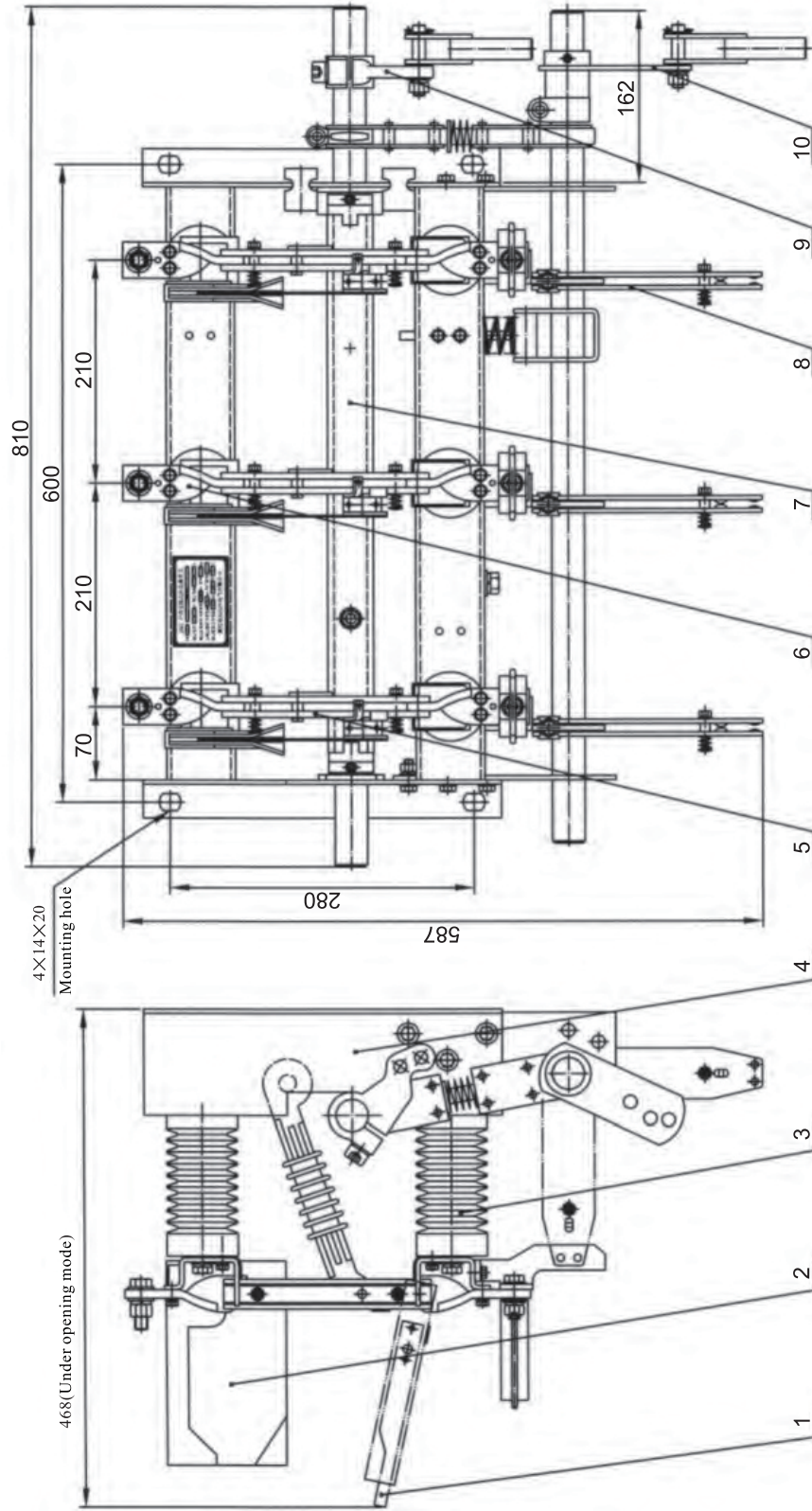
Model	Rated voltage KV	Rated current A	Rated fusing current A
SDLA*J	12	40	6.3, 10, 16, 20, 25, 31.5, 40
SFLA*J	12	100	50, 63, 71, 80, 100
SKLA*J	12	125	125

A*: Impactor equipped



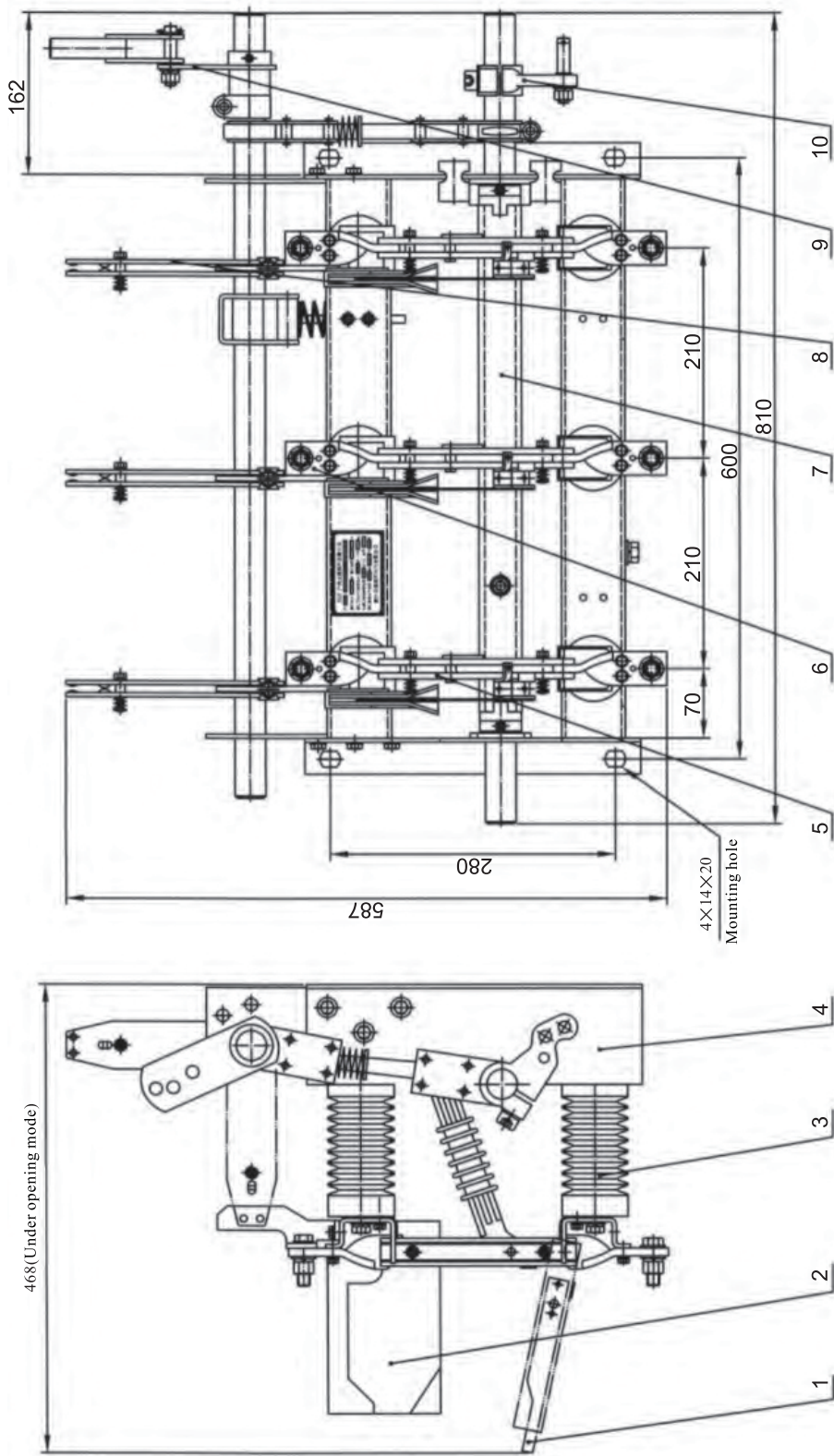
- 1. Arcing knife contact
- 2. Arcing contact and arc extinguishing chamber
- 3. Insulator
- 4. Base
- 5. Moving contact
- 6. Fixed contact
- 7. Spring operating mechanism (in shaft housing)
- 8. Opening/closing turn-arm of main knife contact

● Fig 1 Outline and installation dimension for FN7-12 Load switch



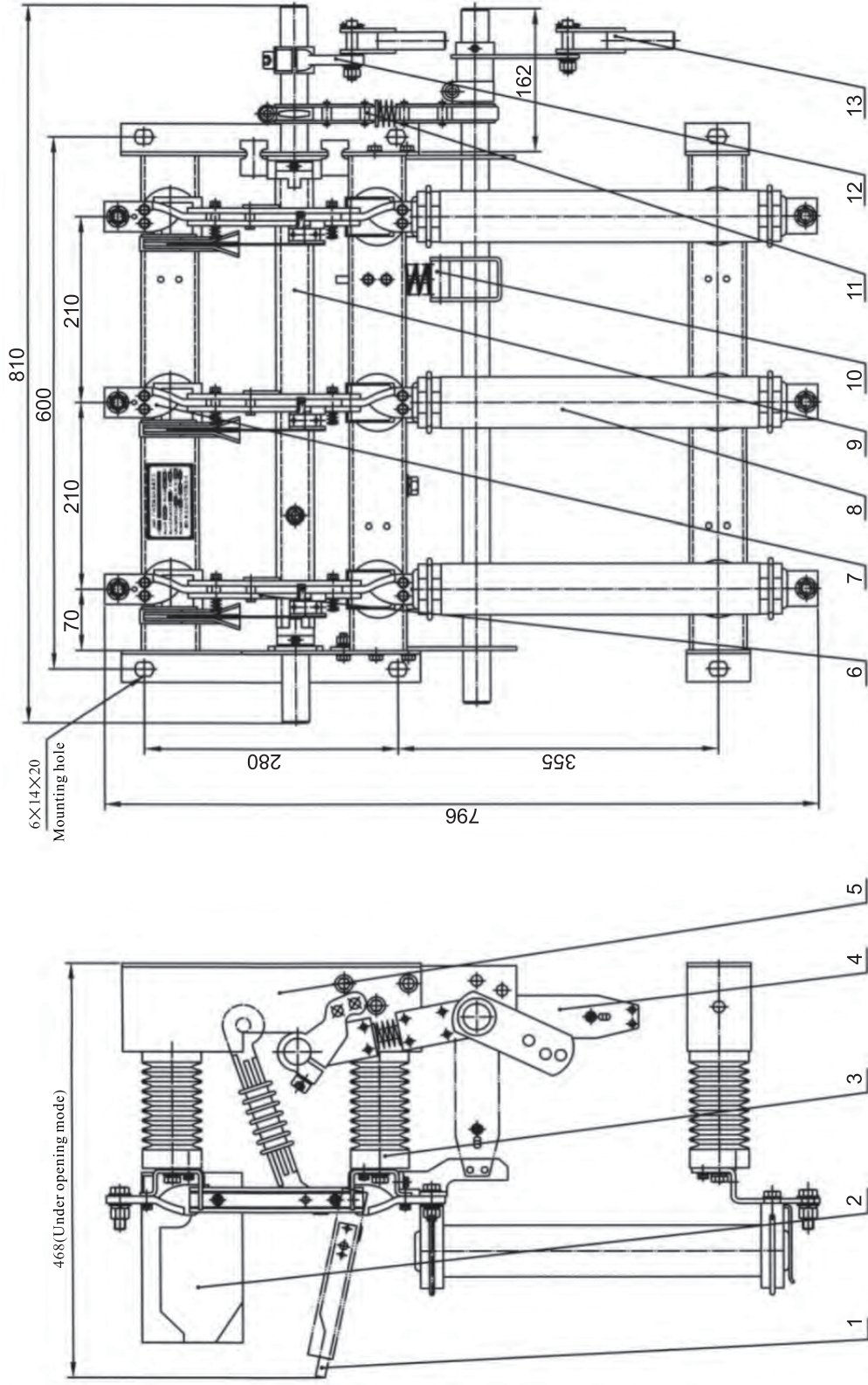
- 1、 Arcing knife contact
- 2、 Arcing contact and arc extinguishing chamber
- 3、 Insulator
- 4、 Base
- 5、 Moving contact
- 6、 Fixed contact
- 7、 Spring operating mechanism (in shaft housing)
- 8、 Grounding knife contact
- 9、 Opening/closing turn-arm of major knife contact
- 10、 Opening/closing turn-arm of grounding knife contact

● Fig.2 Outline and installation dimension for FN7-12 DXL Load switch



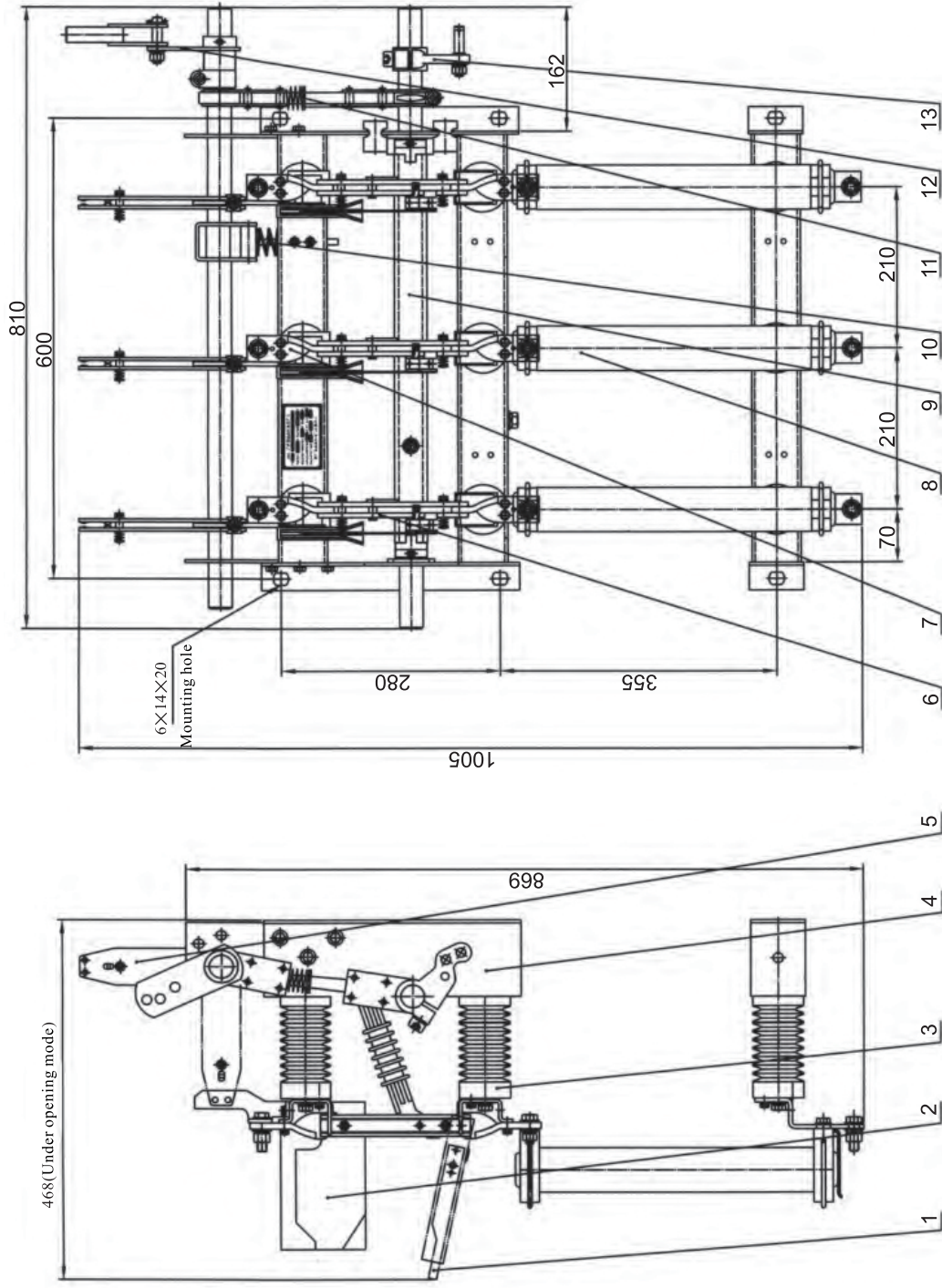
- 1, Arcing knife contact
- 2, Arcing contact and arc extinguishing chamber
- 3, Insulator
- 4, Base
- 5, Moving contact
- 6, Fixed contact
- 7, Spring operating mechanism (in shaft housing)
- 8, Grounding knife contact
- 9, Opening/closing turn-arm of major knife contact
- 10, Opening/closing turn-arm of grounding knife contact

● Fig3 Outline and installation dimension for FN7 – 12 DSL Load switch



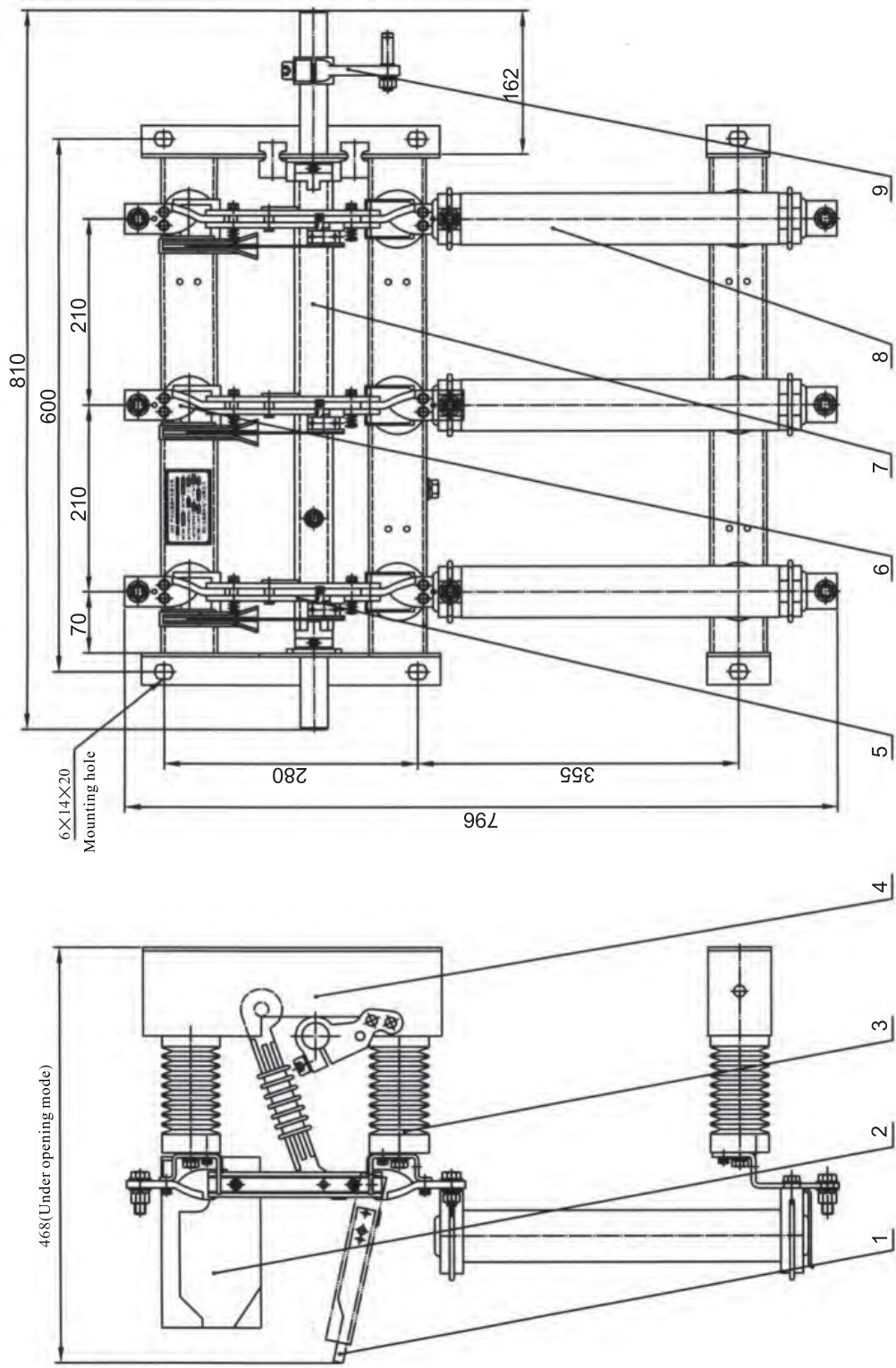
- 1, Arcing knife contact
- 2, Arcing contact and arc extinguishing chamber
- 3, Insulator
- 4, Grounding knife contact
- 5, Base
- 6, Moving contact
- 7, Fixed contact
- 8, Fuse
- 9, Energy-stored spring of major knife contact (In shaft housing)
- 10, Energy-stored spring of grounding knife contact
- 11, Interlocking device
- 12, Opening/closing turn-arm of major knife contact
- 13, Opening/closing turn-arm of grounding knife contact

● Fig 4 Outline and installation dimension for FN7-12DXLR Split-type load switch

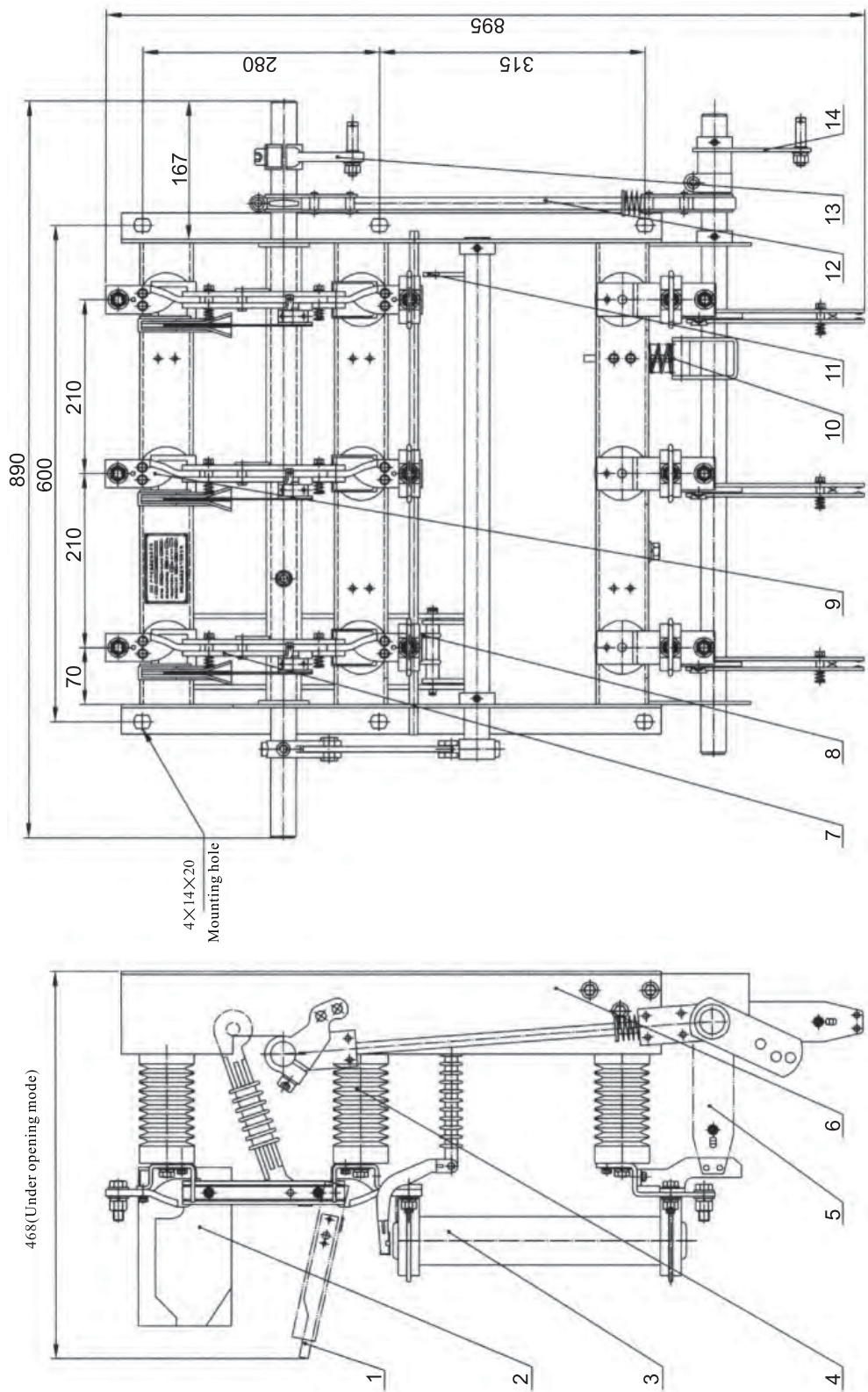


- 1、Arcing knife contact
- 2、Arcing contact
- 3、Insulator
- 4、Base
- 5、Grounding knife contact
- 6、Moving contact
- 7、Fixed contact
- 8、Fuse
- 9、Energy-stored spring of major knife contact (in shaft housing)
- 10、Energy-stored spring of grounding knife contact
- 11、Interlocking device
- 12、Opening/closing turn-arm of grounding knife contact
- 13、Opening/closing turn-arm of major knife contact

● Fig 5 Outline and installation dimension for FN7-12DSLR Split-type load switch

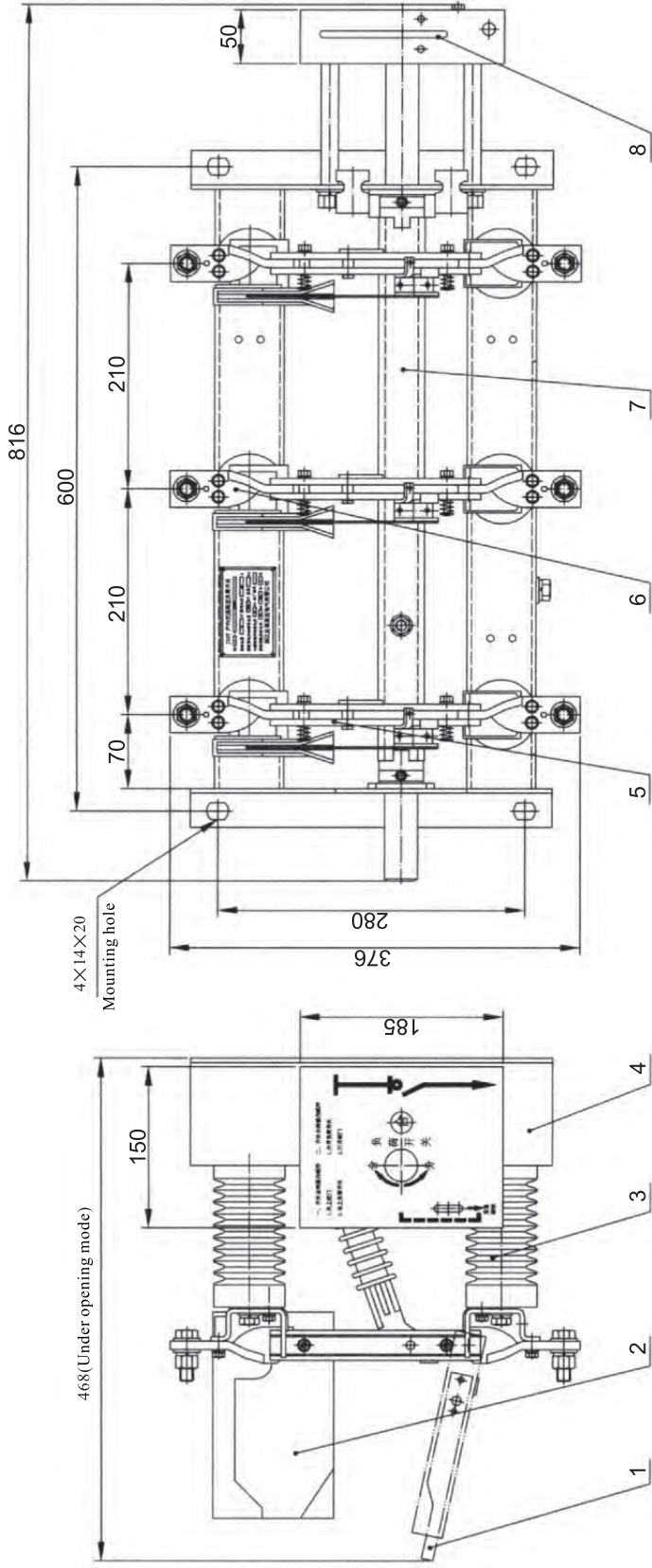


● Fig 6 Outline and installation dimension for FN7-12R Split-type loa



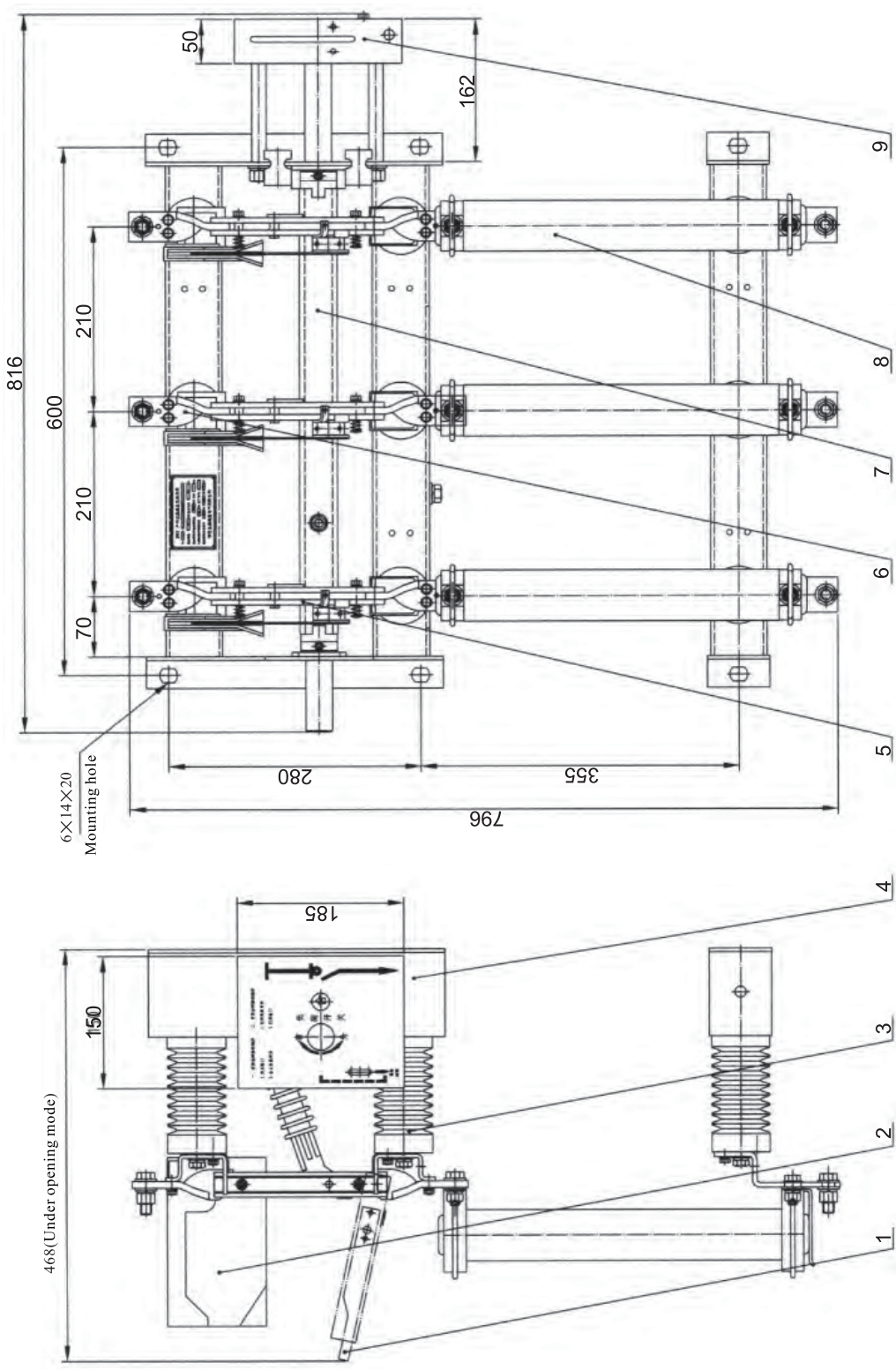
- 1、Arcing knife contact
- 2、Arcing contact and arc extinguishing chamber
- 3、Impact fuse
- 4、Insulator
- 5、Grounding knife contact
- 6、Base
- 7、Moving contact
- 8、Closing spring of major knife contact
- 9、Fixed contact
- 10、Energy-stored spring of grounding knife contact
- 11、Opening spring of major knife contact
- 12、Interlocking device
- 13、Opening/closing turn-arm of major knife contact
- 14、Opening/closing turn-arm of grounding knife contact

● Fig 7 Outline and installation dimension for FN7-12DXLRA Integrated load switch



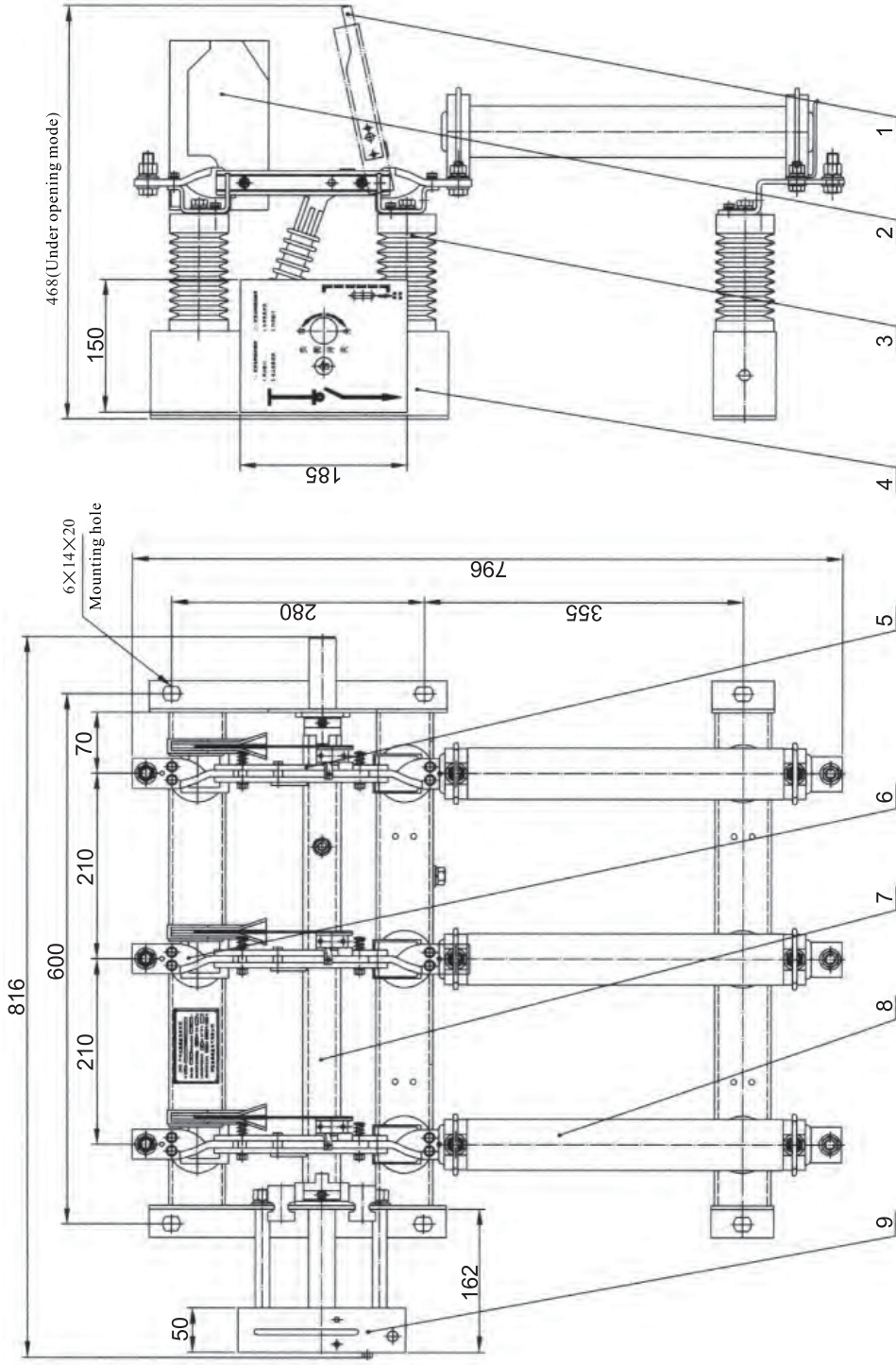
- 1、Arcing knife contact
- 2、Arcing contact and arc extinguishing chamber
- 3、Insulator
- 4、Base
- 5、Moving contact
- 6、Fixed contact
- 7、Spring operating mechanism (in shaft housing)
- 8、Panel

● Fig 8 Outline and installation dimension for FN7-12C Load switch



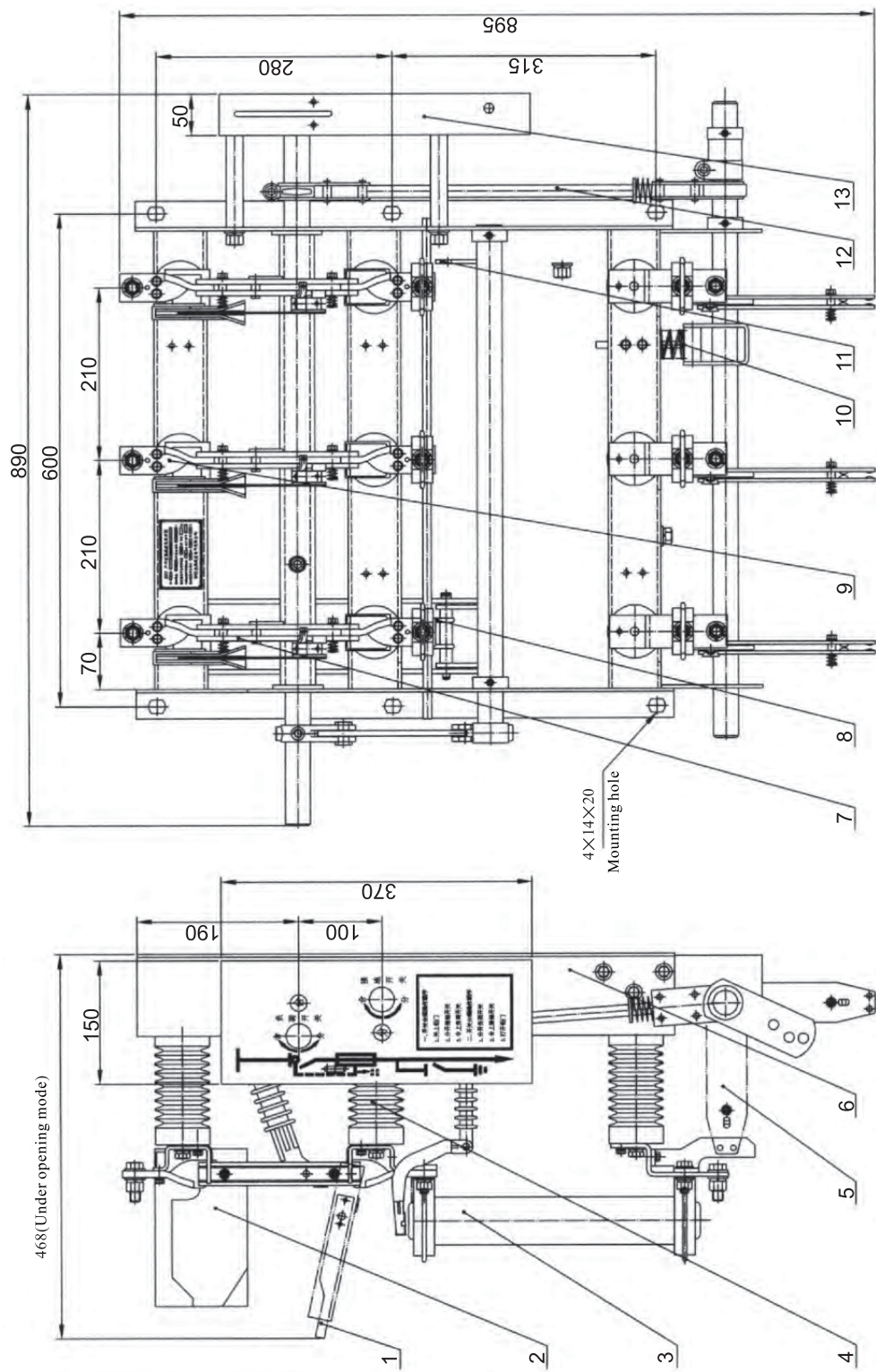
- 1、 Arcing knife contact
- 2、 Arcing contact and arc extinguishing chamber
- 3、 Insulator
- 4、 Base
- 5、 Moving contact
- 6、 Fixed contact
- 7、 Spring operating mechanism (in shaft housing)
- 8、 Fuse
- 9、 Panel

● Fig 9 Outline and installation dimension for FN7-12CR Load switch



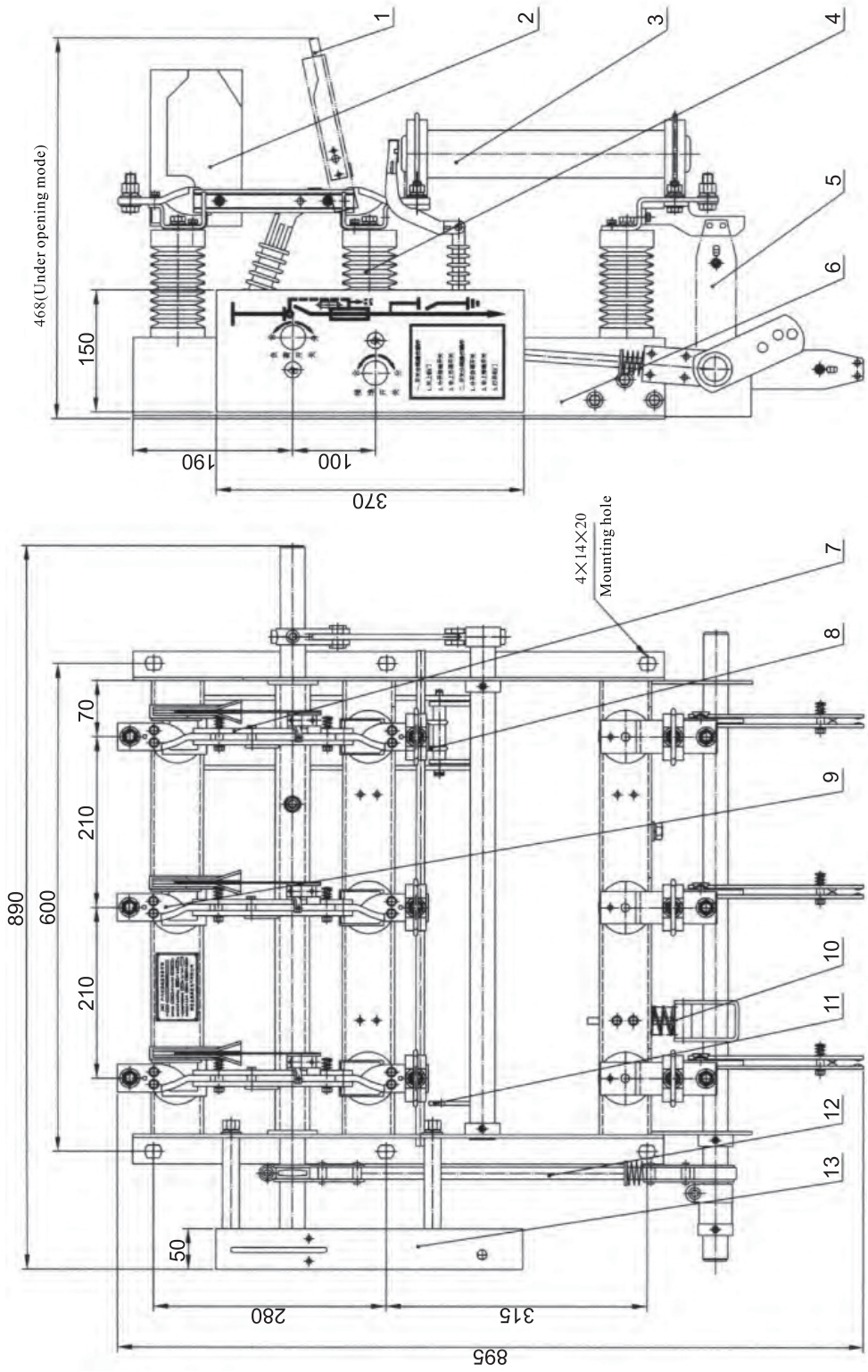
- 1、 Arcing knife contact
- 2、 Arcing contact and arc extinguishing chamber
- 3、 Insulator
- 4、 Base
- 5、 Moving contact
- 6、 Fixed contact
- 7、 Spring operating mechanism (in shaft housing)
- 8、 Fuse
- 9、 Panel

● Fig10 Outline and installation dimension for left FN7-12CR Split-type Load switch



1、Arcing knife contact 2、Arcing contact and arc extinguishing chamber 3、Impact fuse 4、Insulator
 5、Grounding knife contact 6、Base 7、Moving contact 8、Closing spring of major knife contact 9、Fixed contact
 10、Energy-stored spring of grounding knife contact 11、Opening spring of major knife contact 12、Interlocking device 13、Panel

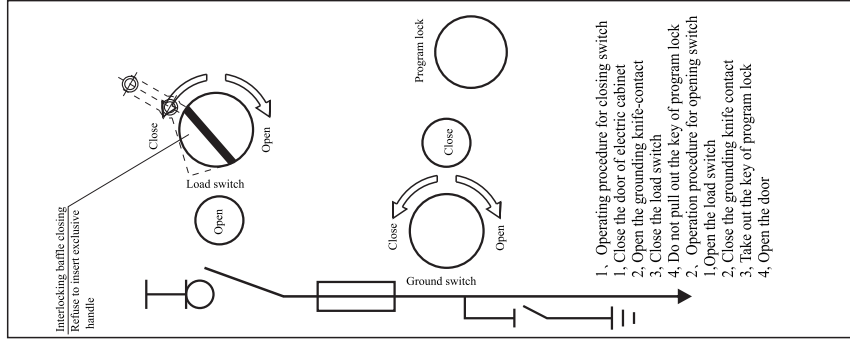
● Fig11 Outline and installation dimension for right FN7-12CDXLRA Integrated Load switch



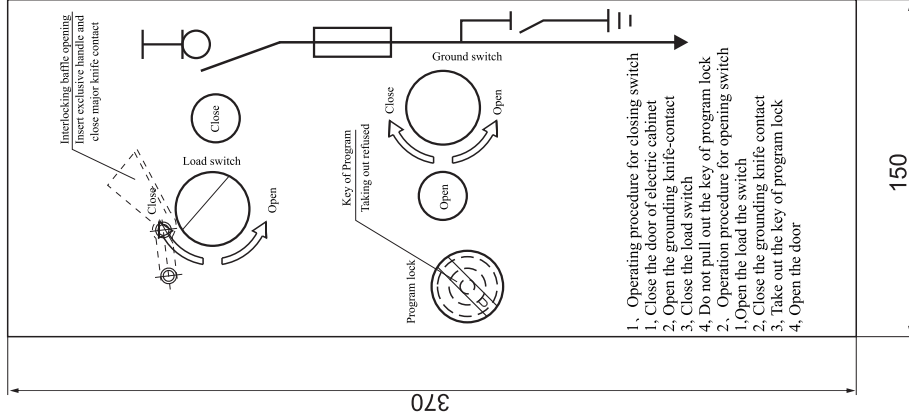
- 1、Arcing knife contact
- 2、Arcing contact and arc extinguishing chamber
- 3、Impact fuse
- 4、Insulator
- 5、Grounding knife contact
- 6、Base
- 7、Moving contact
- 8、Closing spring of major knife contact
- 9、Fixed contact
- 10、Energy-stored spring of grounding knife contact
- 11、Opening spring of major knife contact
- 12、Interlocking device
- 13、Panel

● Fig12 Outline and installation dimension for left FN7-12CDXLRA Integrated Load switch

Switch 2-Left operation panel
(Main contact opening-
Grounding contact closing)



Switch 1-Right operation panel
(Major contact opening-
Grounding contact closing)



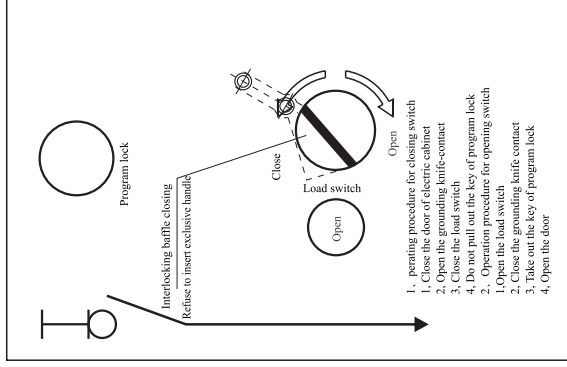
Operation instruction for FN7-12CDXLRA program lock

- Before leave factory, both of the two switches are under the mode that the major knife- contact is opening and the ground knife-contact is closed, also the program lock has been locked, and the common key is placed separately; in addition, equipped with exclusive handle for program lock.
- After install the switch, take out the key to open program lock of one switch to close the load switch, however, do not pull out the key at this time (forbidden to pull out the key forcibly in case cause damage to interlocking mechanism), otherwise, it will be failed to close the other switch.
- If it needs to close the other switch, must open the first switch and lock the program lock, take out the key and open the program lock of the other switch so that the other switch can be closed.
- The opening/closing operation should be carried out as the following procedure:
Closing operation of load switch:
1, Close the door of electric cabinet
2, Open the grounding knife-contact
3, Close the load switch
4, Do not pull out the key of program lock
Operation procedure for opening switch
1, Open the load switch
2, Close the grounding knife contact
3, Take out the key of program lock
4, Open the door
- Please keep the key of lock properly in case lost.

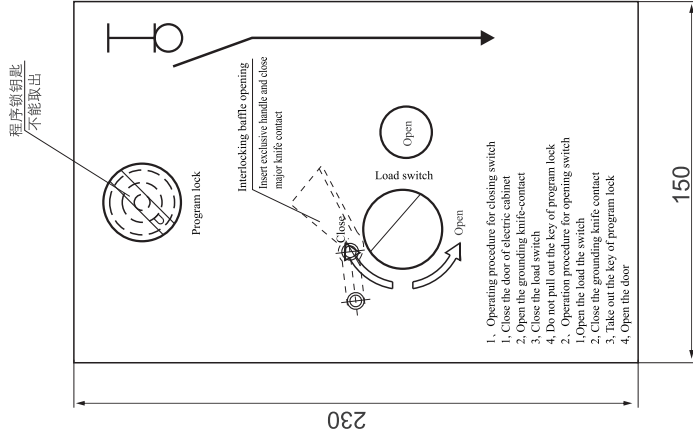
(The hole size between the ordinary panel of C type combined switch and panel with program lock is the same, see above Fig for details)

Fig 13 Anti-mislocking panel schematic diagram for two FN-12CDXLRA Load switch under double power supply mode

Switch 2-Left operation panel
(Main contact opening)



Switch 1-Right operation panel
(Major contact closing)



● Operation instruction for FN7-12C (R) program lock

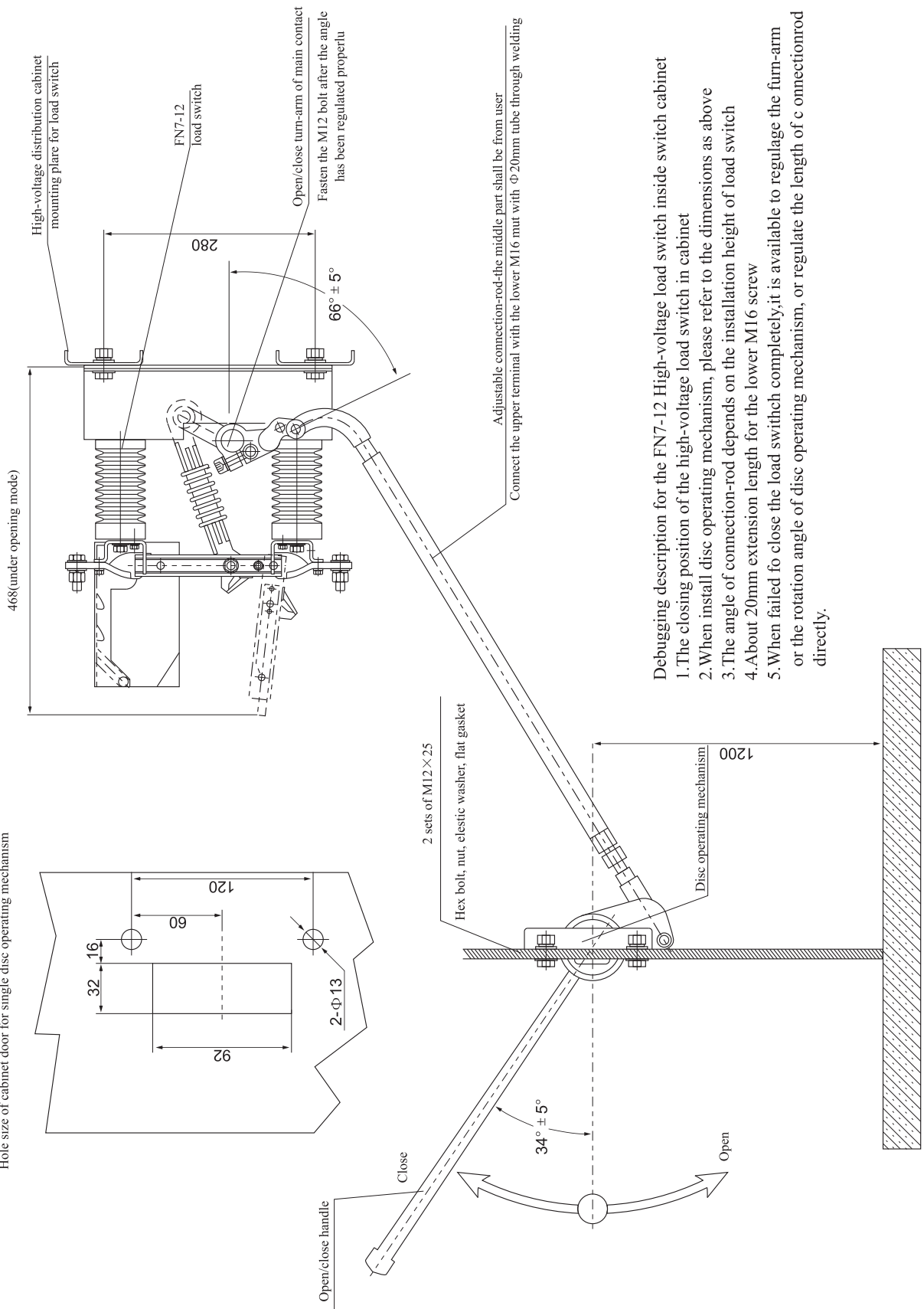
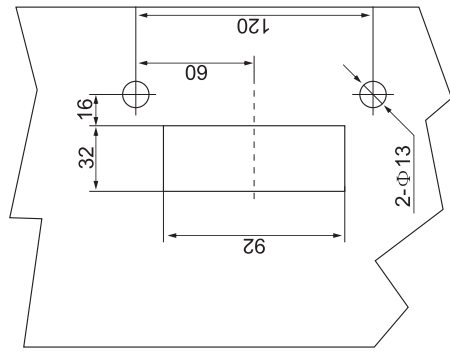
- Before leave factory, both of the two switches are under the closing mode so that the transportation becomes easier, also the program lock has been locked, and the common key is placed separately; in addition, equipped with exclusive handle for program lock.
- After install the switch, take out the key to open program lock of one switch to close the load switch, however, do not pull out the key at this time (forbidden to pull out the key forcibly in case cause damage to interlocking mechanism), otherwise, it will be failed to close the other switch.
- If it needs to close the other switch, must open the first switch and lock the program lock, take out the key and open the program lock of the other switch so that the other switch can be closed.
- The opening/closing operation should be carried out as the following procedure:
- Closing operation of load switch:
 - 1, Close the door of electric cabinet
 - 2, Close the load switch
 - 3, Do not pull out the key of program lock
- Operation procedure for opening switch
 - 1, Open the load switch
 - 2, Take out the key of program lock
 - 3, Open the door
- Please keep the key of lock properly in case lost.

(The hole size of small panel of the C split-type load switch with program lock is shown as above)

(The hole size of small panel of the C split-type load switch with program lock is: 185 mm height, 150mm width)

● Fig14 Anti-mislocking panel schematic diagram for two FN-12C(R) Load switch under double power supply mode

Hole size of cabinet door for single disc operating mechanism

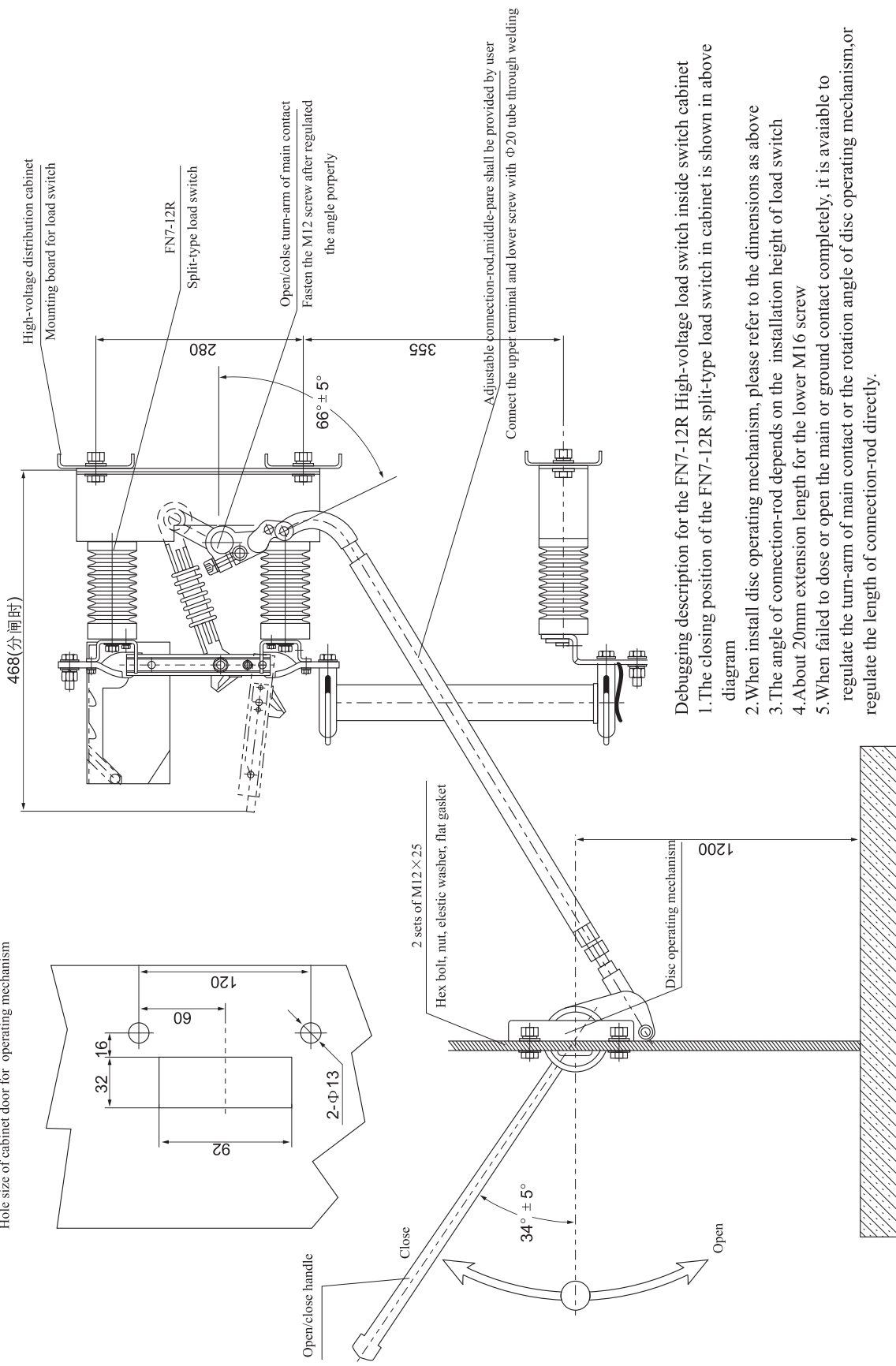


Debugging description for the FN7-12 High-voltage load switch inside switch cabinet

1. The closing position of the high-voltage load switch in cabinet
2. When install disc operating mechanism, please refer to the dimensions as above
3. The angle of connection-rod depends on the installation height of load switch
4. About 20mm extension length for the lower M16 screw
5. When failed to close the load switch completely, it is available to regulate the furn-arm or the rotation angle of disc operating mechanism, or regulate the length of c connectionrod directly.

● Fig 15 Schematic diagram for FN7-12 Load switch installed inside the cabinet

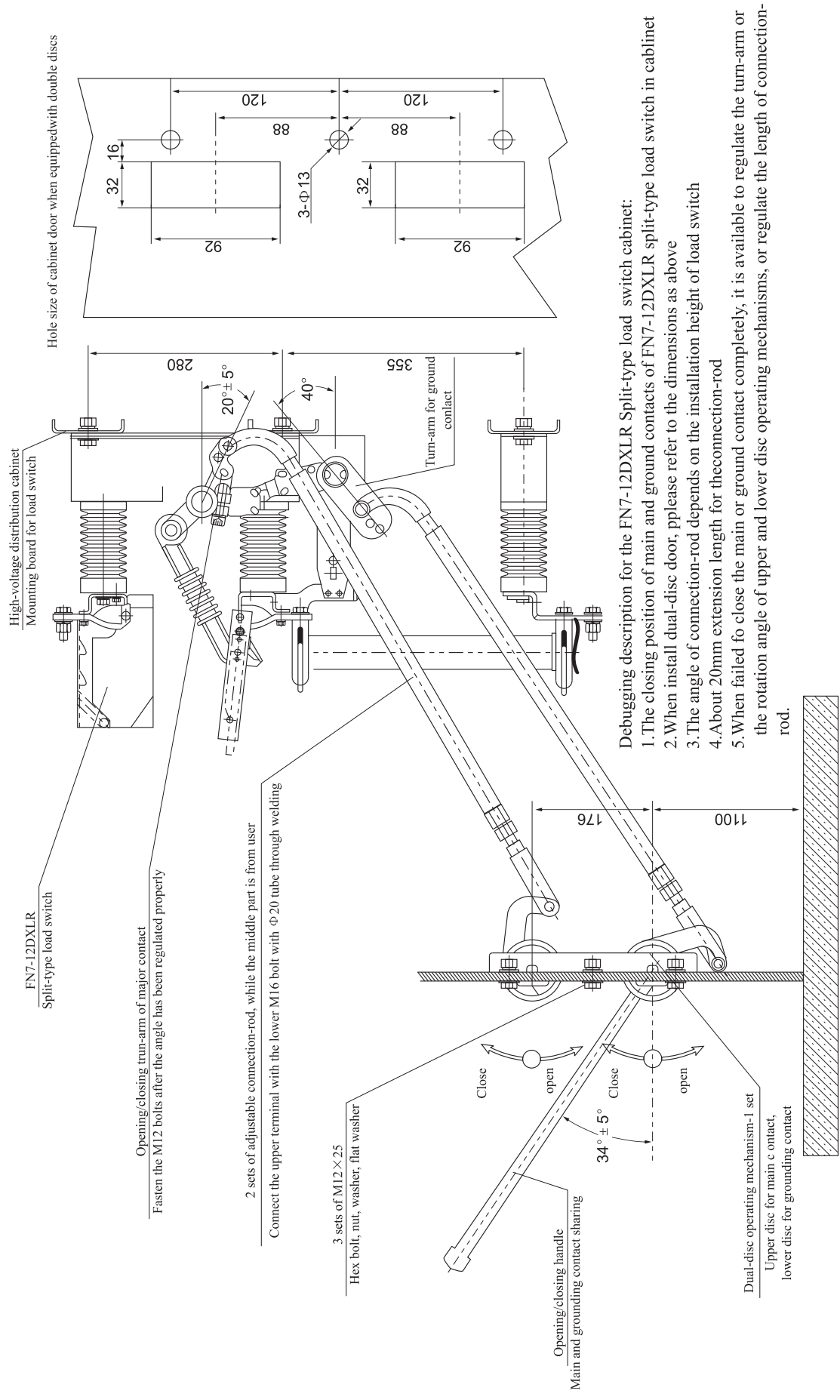
Hole size of cabinet door for operating mechanism



Debugging description for the FN7-12R High-voltage load switch inside switch cabinet

1. The closing position of the FN7-12R split-type load switch in cabinet is shown in above diagram
2. When install disc operating mechanism, please refer to the dimensions as above
3. The angle of connection-rod depends on the installation height of load switch
4. About 20mm extension length for the lower M16 screw
5. When failed to dose or open the main or ground contact completely, it is avaiable to regulate the turn-arm of main contact or the rotation angle of disc operating mechanism, or regulate the length of connection-rod directly.

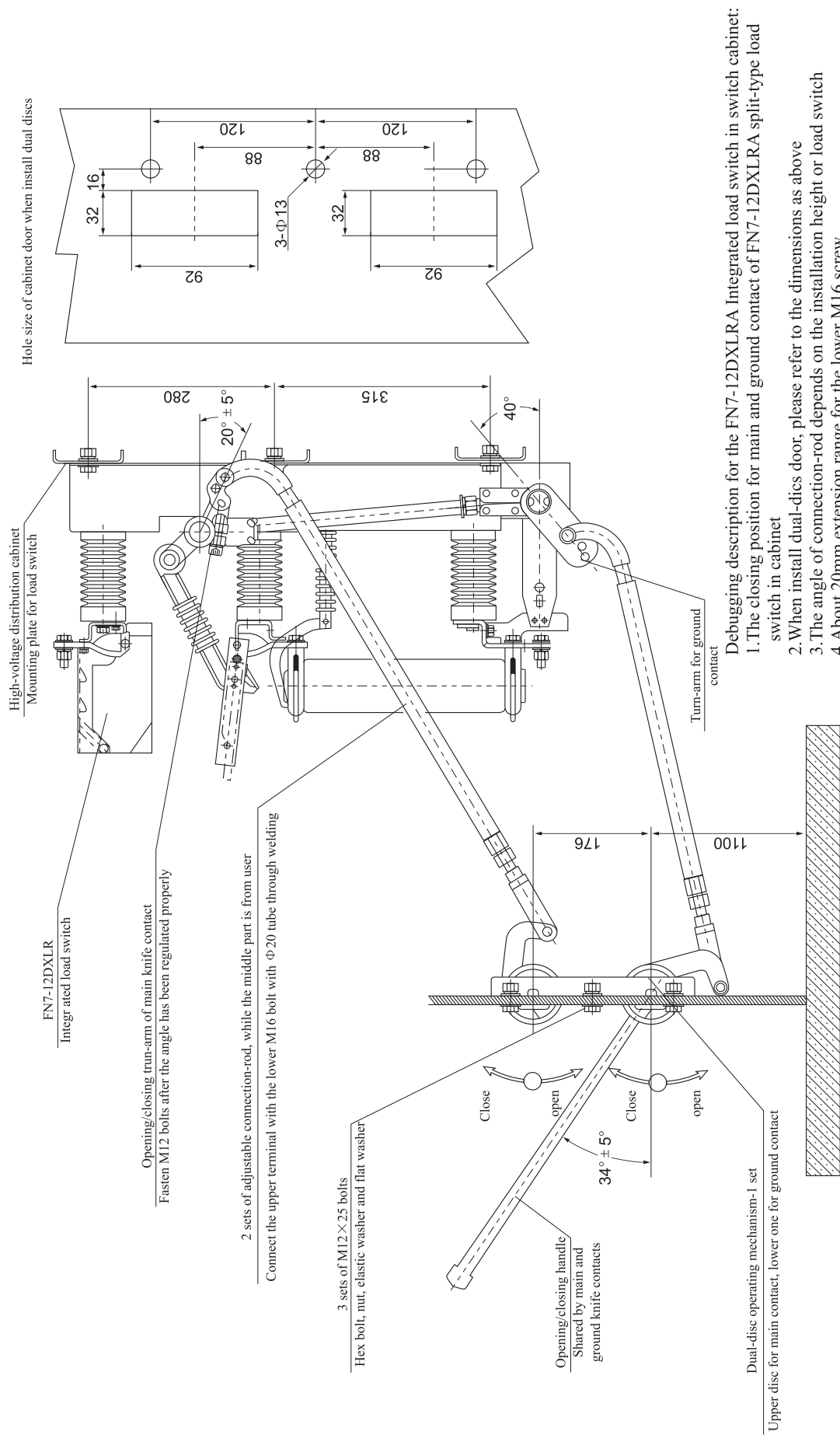
● Fig 16 Schematic diagram for FN7-12R split-type load switch installed inside the cabinet



Debugging description for the FN7-12DXLR Split-type load switch cabinet:

1. The closing position of main and ground contacts of FN7-12DXLR split-type load switch in cabinet
2. When install dual-disc door, please refer to the dimensions as above
3. The angle of connection-rod depends on the installation height of load switch
4. About 20mm extension length for the connection-rod
5. When failed to close the main or ground contact completely, it is available to regulate the turn-arm or the rotation angle of upper and lower disc operating mechanisms, or regulate the length of connection-rod.

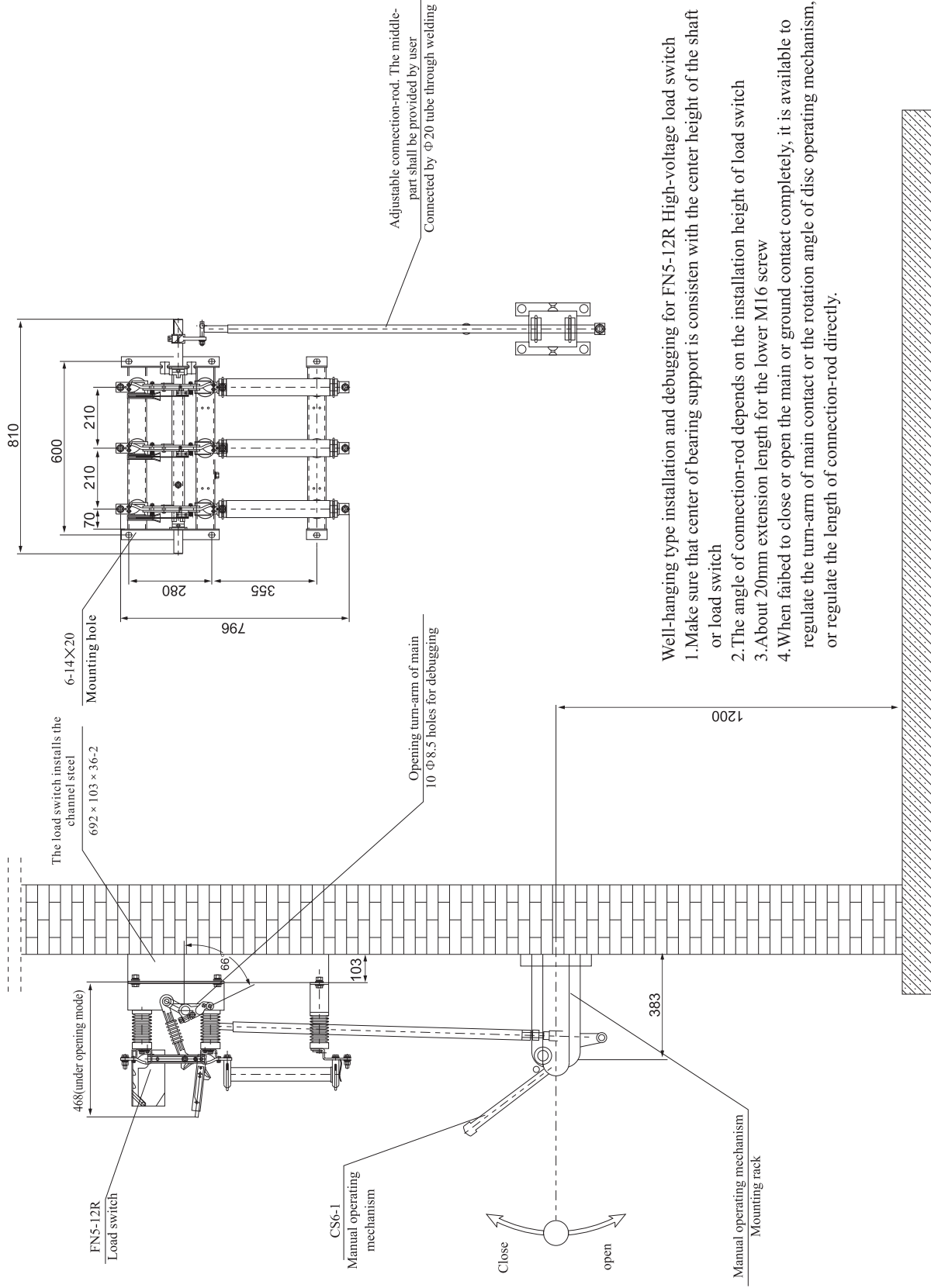
● Fig 17 Schematic diagram for the FN7-12DXLR Split-type load switch in cabinet



Debugging description for the FN7-12DXLRA Integrated load switch in switch cabinet:

1. The closing position for main and ground contact of FN7-12DXLRA split-type load switch in cabinet
2. When install dual-disc door, please refer to the dimensions as above
3. The angle of connection-rod depends on the installation height or load switch
4. About 20mm extension range for the lower M16 screw
5. When failed to close the ground or main contact completely, it is available to regulate the turn=arm of the rotation angle of upper and lower discs operating mechanism, or regulate the length of connection-rod

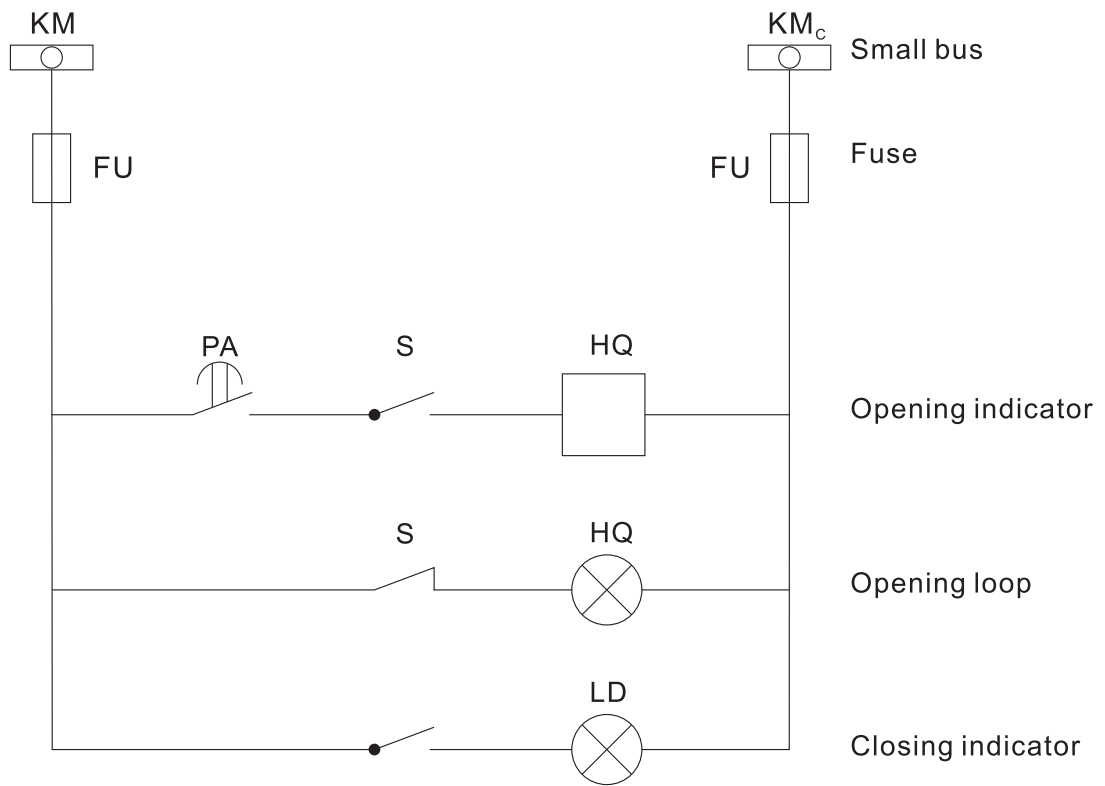
● Fig 18 Schematic diagram for the FN7-12DXLRA Integrated load switch in cabinet



Well-hanging type installation and debugging for FN5-12R High-voltage load switch or load switch

1. Make sure that center of bearing support is consistent with the center height of the shaft
2. The angle of connection-rod depends on the installation height of load switch
3. About 20mm extension length for the lower M16 screw
4. When failed to close or open the main or ground contact completely, it is available to regulate the turn-arm of main contact or the rotation angle of disc operating mechanism, or regulate the length of connection-rod directly.

● Fig 19 Wall-hanging-type installation diagram for FN7-12R Split-type load switch



Number	Code	Name	Spec	Qty	Remark
1	FU	Fuse	FS-10.5A	2	Self-provided
2	PA	Opening button	TE-XB2-EA	1	Self-provided
3	S	Auxiliary switch	F9-4III/L AC 220V 5A	1	2K 2B
4	HQ	Opening magnetic plug	AC 220V	1	6 Kg force
5	HD LD	Indicator lamp	TE-XB2-EA	1	Self-provided

● FN5-12 Electric Schematic Diagram (For your reference only)



CERTIFICATE

Product Model: FN7-12RDLA Series

Inspector : CNC 009

Production date: Printed on the product
or package.

This product is qualified according
to the delivery inspection

CNC ELECTRIC

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CNC

FN7-12RDLA Series