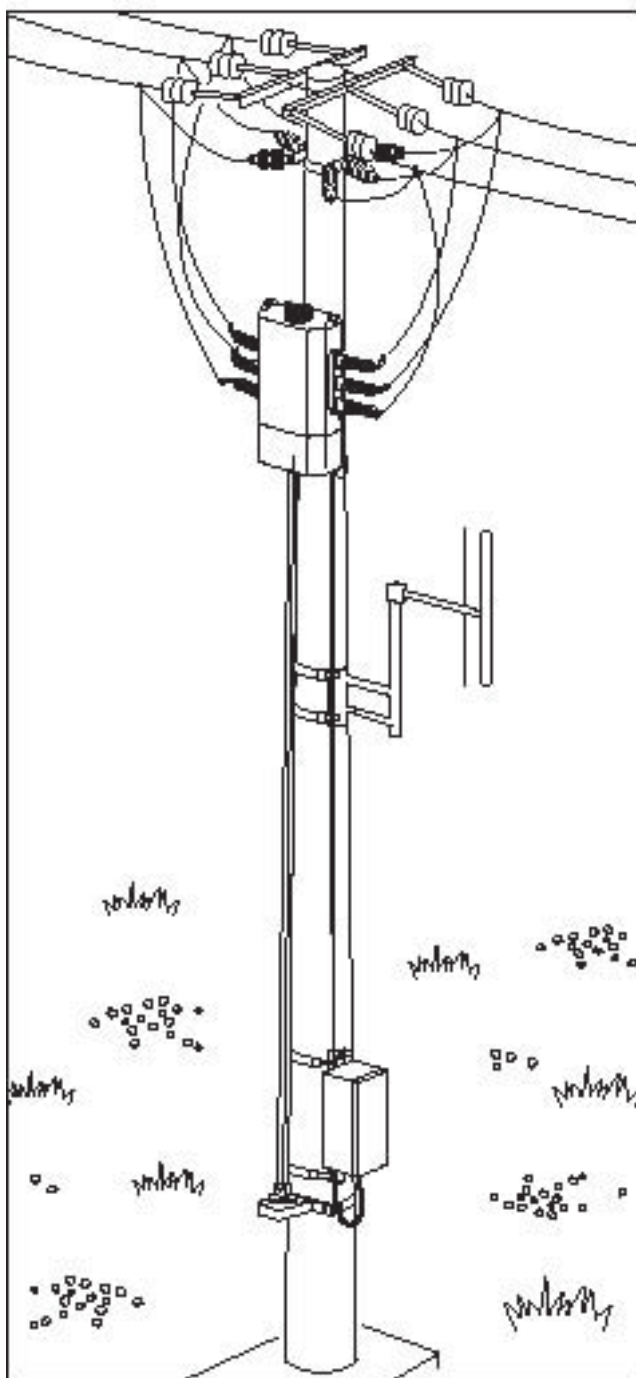


AUGUSTE overhead load break switch Ref : C5032 0000



Contents

| | |
|--|---------|
| recommendations..... | page 2 |
| 1 - presentation..... | page 2 |
| 2 - technical data..... | page 2 |
| 2..1. functional..... | page 2 |
| 2..2. electrical characteristics..... | page 3 |
| 2..3. mechanical characteristics..... | page 3 |
| 2..4. service conditions..... | page 3 |
| 3 - description..... | page 4 |
| 3..1. presentation..... | page 5 |
| 3..2. enclosed breaking system..... | page 5 |
| 3..3. voltage transformer..... | page 5 |
| 3..4. HV connections..... | page 5 |
| 3..5. independent operating mechanism..... | page 5 |
| 3..6. manual switch operation..... | page 5 |
| 3..7. current sensors..... | page 6 |
| 3..8. SF6 pressure alarm (option)..... | page 6 |
| 3..9. control box..... | page 6 |
| 3..10.dimensions..... | page 6 |
| 4 - storage..... | page 6 |
| 5 - installation..... | page 6 |
| 5..1. equipment supplied..... | page 6 |
| 5..2. switch unpacking..... | page 6 |
| 5..3. handling..... | page 7 |
| 5..4. preparation..... | page 7 |
| 5..5. switch installation..... | page 7 |
| 5..6. manual control installation..... | page 8 |
| 5..7. installation of surge arresters..... | page 10 |
| 5..8. network connections..... | page 10 |
| 5..9. control box installation..... | page 10 |
| 5..10.antenna installation..... | page 10 |
| 5..11.earthing..... | page 10 |
| 5..12.operation checkout..... | page 10 |
| 5..13.cable fastening..... | page 11 |
| 6 - putting into operation..... | page 11 |
| 6..1. control box..... | page 11 |
| 6..2. switch positions..... | page 11 |
| 7 - maintenance..... | page 11 |
| 7..1. preventive maintenance..... | page 11 |
| 7..2. switch spare parts..... | page 11 |

recommendations

-Before handling the switchgear, carefully read section 5, "installation".
-The voltage transformer is to be used for powering the control-box provided by us only for any other application, consult us.

-Personnel working on this switchgear (installation, operation) shall be properly trained for this type of operation.



Handle switchgear, bushings and cover, which are fragile, with caution.

1 - presentation

AUGUSTE is a three-phase load break switch fitted with an SF6 breaking system. It is used to sectionalize an overhead line. It can be located at the boundary in between an underground network and an overhead network.

It can be fitted with lightning arresters. The "Remote controlled" AUGUSTE switch can be fitted either with an external voltage transformer or an internal one.

The AUGUSTE switch complies with the following standards: IEC 60265-1, IEC 60694, IEC 60298, IEC 60129, ANSI C37-71 and ESI 41-13.

2 - technical data

2.1 - functional

Enclosed breaking system

The breaking system can break and make rated currents up to 630 A under rated voltages up to 36 kV. The switchgear is fitted with a sealed metal (stainless steel) tank containing a three phase breaking system in SF6 gas. The sulphur hexafluoride ensures the internal insulation across the isolating distance. The breaking device also ensures the insulation across the isolating distance.

The power supply of the control box is made by means of an MV/LV voltage transformer which can be provided inside the sealed switch tank.

Independent operating mechanism:

The mechanism used to operate the switch is of independent operation type. It includes a spring-loaded mechanism coupled with the breaking system.

The switch is operated manually :
- either via a rotary telescopic rod and a lever located at the bottom of the pole and padlockable in three positions : "close – open – electrical mode" ,
- or by means of a hook stick mechanism, fixed onto the switch.

The mechanism is also available with a motorized version allowing the switch to be operated from the control box and remotely

Control box :

The function of the control box located in the lower or middle pole section is to perform the electrical actuation of the switch :

- either locally via pushbuttons on the front panel - or remotely via a SCADA system. The transmission systems to be used in this case, are the following :
-radio
-telephone network
- dedicated telephone line.

A fault detector is included in the control box. It is used to detect and locate a faulty network section. The scada operator collects this information by interrogating the remote controlled switches of the faulty feeder. An automatic device associated to the fault detector allows the switch to sectionalize when voltage disappears after the fault.

The control box is powered by the MV/LV transformer. A built-in battery provides power backup in case of MV loss. The control box power supply is protected against atmospheric and/or switching overvoltages by means of a low voltage surge arrester.

2.2 - electrical characteristics

| | | | |
|--|-----------|--------------|--------------|
| rated voltage (kV) | | 24 | 36 |
| rated current (A) | | 400 - 630 | 400 – 630 |
| breaking capacity (A) | | | |
| - active load | | 400 – 630 | 400 – 630 |
| - cable or line charging | | 40 | 40 |
| rated insulation voltage (kV) | | | |
| - lightning impulse | | 125 | 170 |
| - lightning impulse – across the isolating distances | | 145 | 195 |
| - power frequency | | 50 | 70 |
| - power frequency – across the isolating distances | | 60 | 80 |
| LV circuit voltage (kV) | | | |
| - lightning impulse, common mode | | 5kV | 5kV |
| - lightning impulse, differential mode | | 2kV | 2kV |
| rated frequency | | 50 - 60Hz | 50 - 60Hz |
| short-time withstand current (kA) | (1s) | 20 | 20 |
| | (3s) | 12,5 | 12,5 |
| short-circuit making capacity | (kA rms) | 12,5 | 12,5 |
| | (kA peak) | 31,5 | 31,5 |
| auxiliary power transformer for remote-control box | | 230V or 110V | 230V or 110V |
| | | - 100VA | - 100VA |
| creepage distance to earth on bushings | | 770mm | 900mm |

2.3 - mechanical characteristics

| | |
|----------------------|------------------|
| mechanical endurance | 5000 operations |
| switch dimensions | see section 3.10 |
| switch weight : | 190kg |
| protection levels | |
| - sealed tank : | IP 68 |
| - mechanism : | IP 33 |
| -remote control box | IP 55 |

2.4 – service conditions

| | |
|---------------------|----------------|
| temperature range | -25°C to +55°C |
| operation under ice | 20 mm |
| relative humidity | 95% at 40°C |

3- description

3.1 – presentation

- (A) sealed stainless steel tank
- (B) internal voltage transformer (option)
- (C) hanging bracket (option)
- (D) bushings (with connection lugs or pluggable sockets)
- (E) safety valve
- (F) current transformer (option)
- (G) control mechanism
- (H) external voltage transformer (option)
- (I) surge arresters (option)
- (J) control box (option)
- (K) antenna (option)
- (L) hook-stick operated manual control (option)

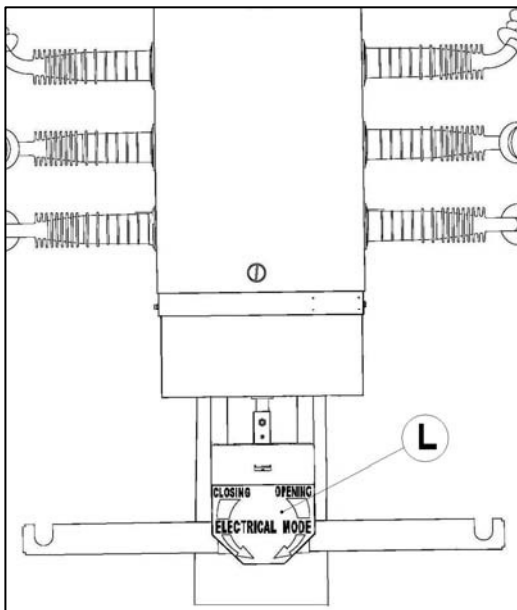


fig. 1-1

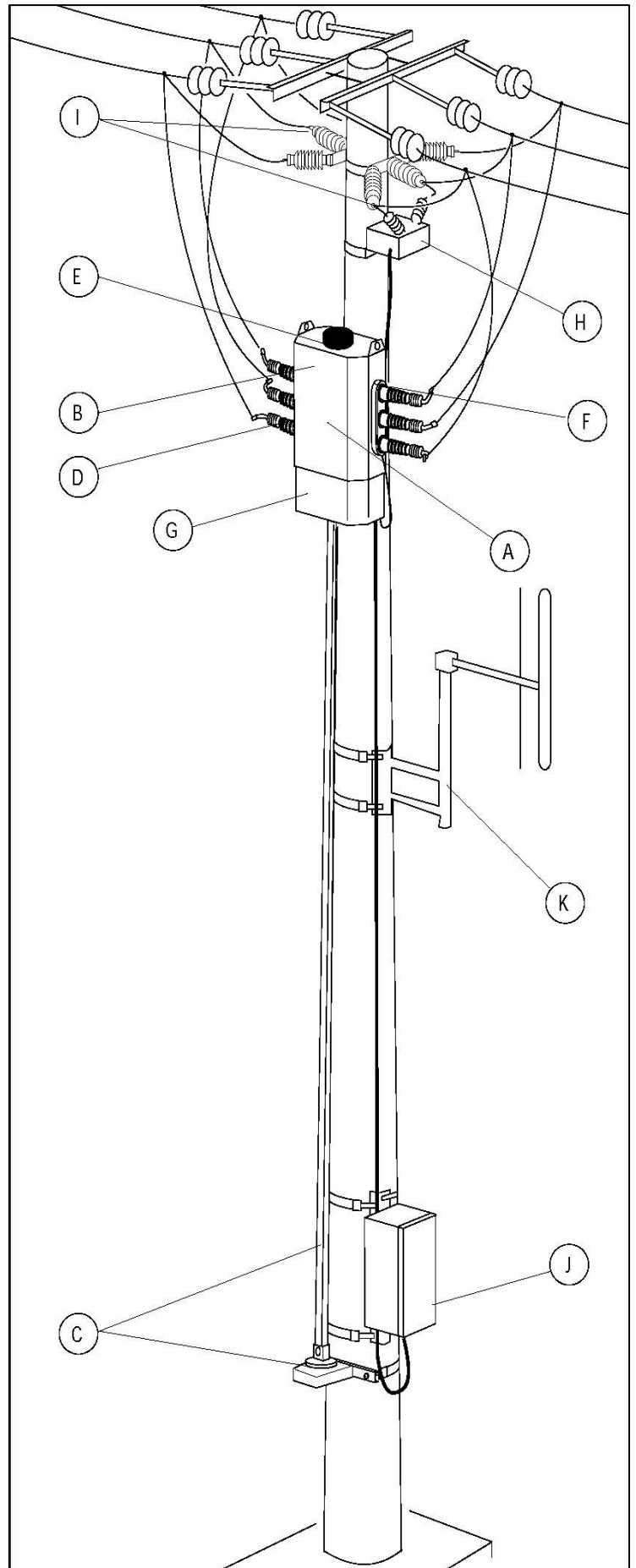


fig. 1

3.2 - enclosed breaking system

The metallic tank contains SF6 gas at low pressure (1.3 bar absolute pressure). It can include a MV/LV transformer.

3.3 – voltage transformer

An optional MV/LV transformer is available to power the control box. It can be installed :

- either on the pole, above the switch (fig. 1, page 4 item (H)).
- or inside the metallic tank of the switch (fig. 6)

3.4-HV connections

The switch can be fitted

- either with pluggable sockets complying to NFC 33 051 (fig. 4).
- or bushings with aluminium 2-hole NEMA connection lugs (fig. 5).

3.5-independent operating mechanism

The mechanism is of TUMBLER type and it performs the opening and closing operations of the switch.

It is maintenance-free and no lubricant is used.

In the case of a motorised mechanism, a motor disengaging system allows the unit to be neutralized in its “open” or “closed” position.

The mechanical position indicator shows the switch position in a definite way.

A motorised mechanism can easily replace a manual one.

3.6-manual switch operation

The switch position is given by a mechanical indicator located in the bottom of the mechanism.

The hook stick operating mechanism in 3 positions (fig. 3.1, 3.2, 3.3).

- mid-position indicates the normal operation or “electrical control”.
- extreme positions: “OPEN” or “CLOSED”.
- In these two positions, any actuations from the control box are inhibited.
- In OPEN position a locking system prevents any manual actuation (see mounting instructions C325090).

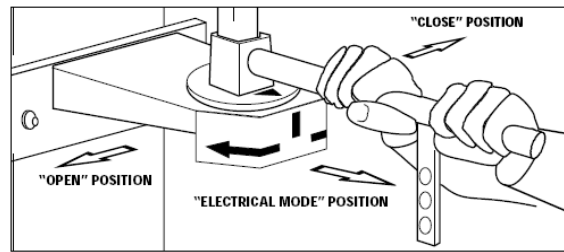


fig. 2

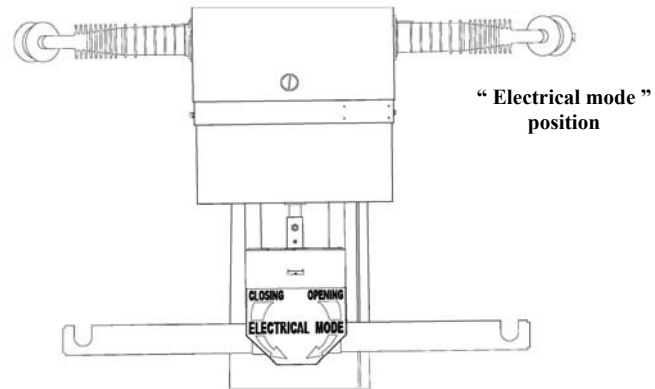


fig. 3-1

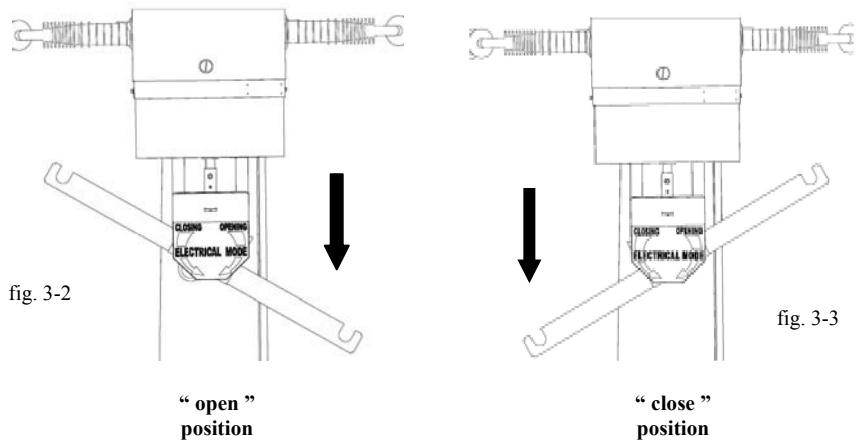


fig. 3-2

fig. 3-3

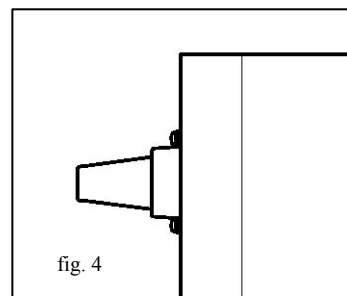


fig. 4

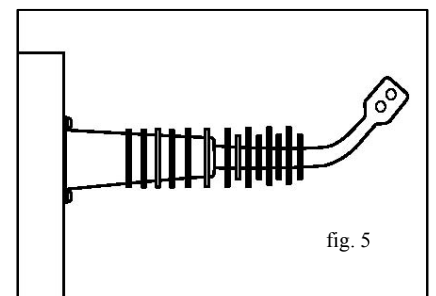


fig. 5

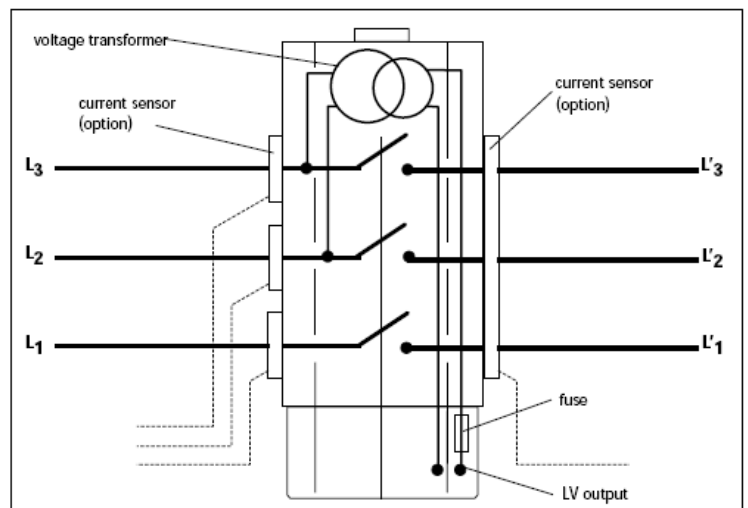


fig. 6

3.7-current sensors

The metallic tank supports the current sensors needed for the operation of the fault detector (see fig. 6) :

- either 3 phase current sensors (for strongly earthed or impedant neutral)
- or 2 phase current sensors and 1 homopolar current sensor (for isolated or compensated neutral)

3.8-SF6 pressure alarm (option)

The switch can be fitted with an optional pressure alarm set. This device is located in the bottom of the tank under the cover of the mechanism. In case of unusual low pressure of the SF6 gas inside the tank, the pressure alarm set generates an alarm (LED in the control box). The information shall only be taken into account in temperature conditions $>0^{\circ}\text{C}$. Only motorised switches can be fitted with this option



Warning : To protect the tightness of the metallic tank keep all sensors protected against shocks during transport and handling.

3.9-control box

See the corresponding instructions brochure.

3.10-dimensions

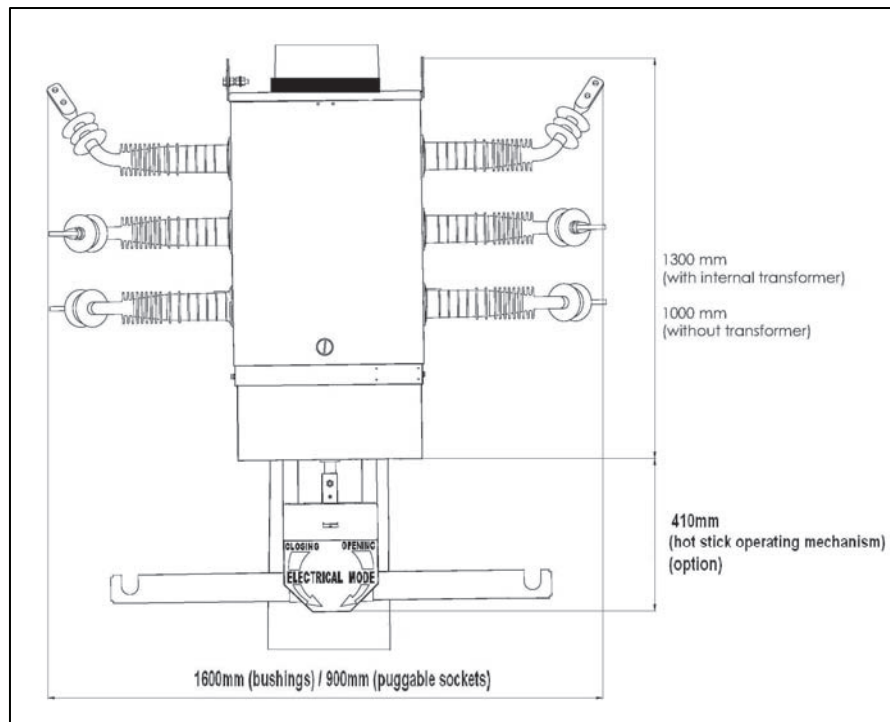
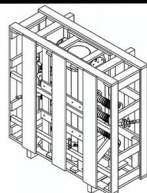


fig. 7

4 - storage

-To prevent water entrance in the control mechanism compartment, the switch must be stored in its original packing in vertical position.



- An appropriate protection against dust is recommended.
- After extended storage period, clean all insulating parts with a dry cloth before putting the unit into service.
- In case of prolonged storage, the battery must be charged every 6 months with a charger adapted to this kind of battery (consult us).

5 - installation

5.1-equipment supplied (see the order)

The equipment supplied will depend on the current/voltage range, operating mechanism type, remote control type. All these data must be specified in the order. Possible list of equipment :

- switchgear
- hanging bracket (option)
- rod assembly + manual control (option)
- external voltage transformer (option)
- surge arrester set(s) (option)
- control box (option)
- radio, antenna
- mounting accessories (option)

5.2 - switch unpacking

After removing the top of the crate, remove the accessories contained in the crate without touching the switch, take

the nails out of the 4 lateral panels without touching the wooden cradle which protects the device (fig. 8).

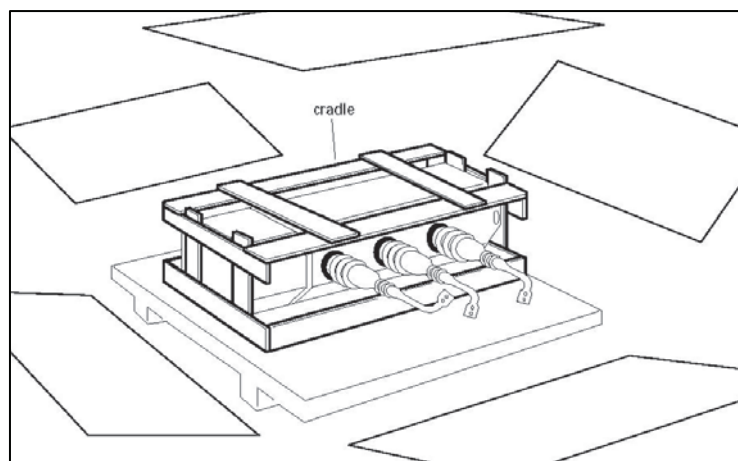


fig. 8

5.3- handling

The wooden cradle allows vertical positioning of the switchgear, protecting the operating mechanism output and the cover. Remove the wooden cradle, after having lifted the switchgear, using the corresponding lifting rings (fig. 8.1).



When handling the unit, take care :

- not to use the operating mechanism cover as a supporting point (fig. 9)
- avoid shocks on bushings

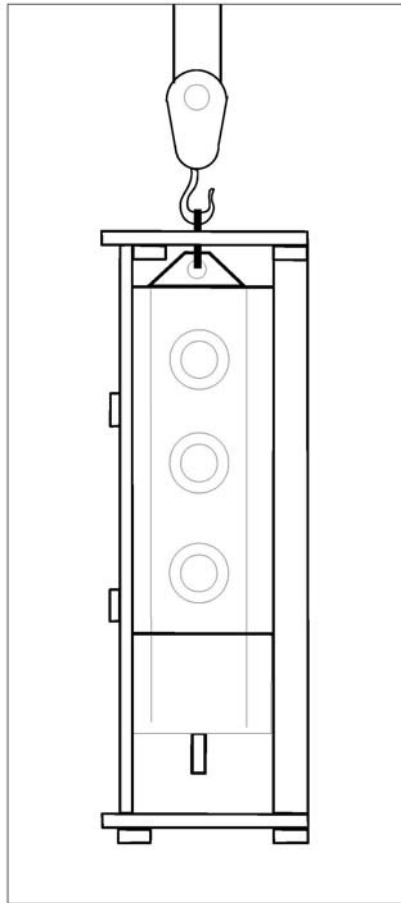


fig. 8-1

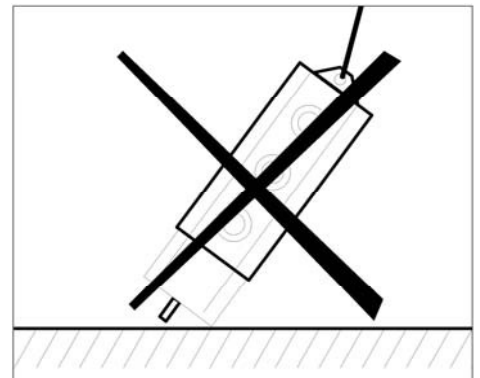


fig. 9

5.4- preparation

Support types :

The unit and its control device can be mounted on any pole with the mounting accessories delivered with the switch.

5.5 - switch installation

Install the device at about 1.2m under the line (fig. 18) using the corresponding mounting accessories delivered.

Note: For switches with integrated voltage transformer, select the side of the pole which will receive the switchgear so that the MV/LV transformer should be powered on source side (fig. 6, page 5). A label marked on the switch allows the visualization of voltage transformer supply side (fig. 10).

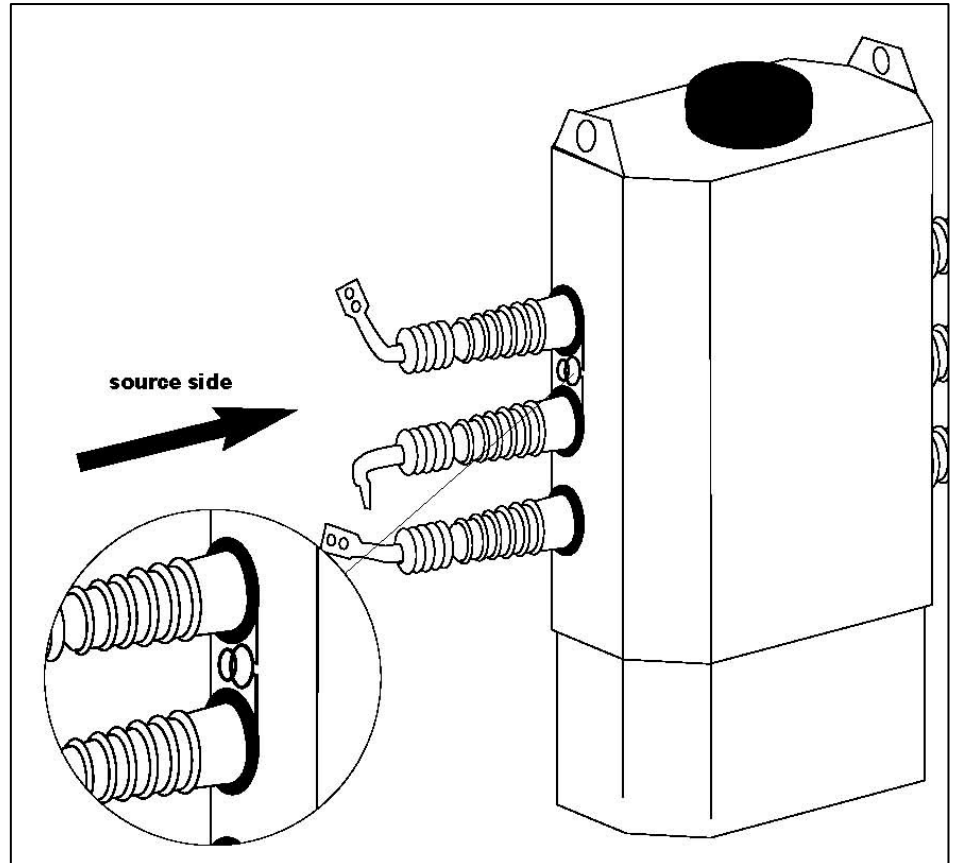


fig. 10

5.6 - Manual control installation

The rotary rod assembly is telescopic. It is made of square tubes fitted into each other. (fig.17).

The delivery of tubes is made:

-either in the switchgear packaging or in a separate packaging. The lever and the screws and bolts are always delivered in the switchgear packaging. The standard rod assembly (poles between 11 and 13m) is made up of 4 tubes. For 14 to 16m poles, a 2-tube additional rod assembly plus a guiding tube are necessary (fig.17 page 9).

- Fix the manual control lever at 1200mm (fig.17) from the ground using the adapted mounting accessories.

- Fit insulator on superior tube of rod assembly (fig.12)

-Connect the whole assembly onto the output shaft of the switchgear mechanism checking the good position of this output shaft according to the label situated under the cover of the mechanism (fig.12).

-Snap the lower end tube in the rotary bearing (fig.13) with the use of the clip fitted onto the tube

-Assemble the required number of tubes, as shown in (fig 15), according to the pole length (fig 17). The last superior tube must be free and sliding inside the tube assembled to the tank (fig 16). All the assembled tubes are supported by the rotary bearing.

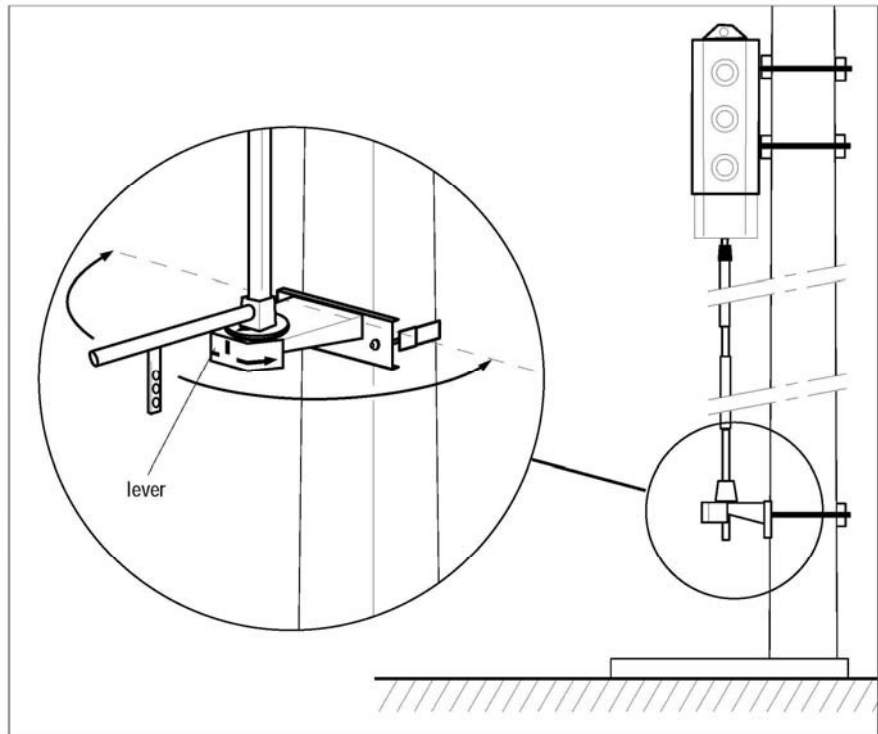


fig. 11

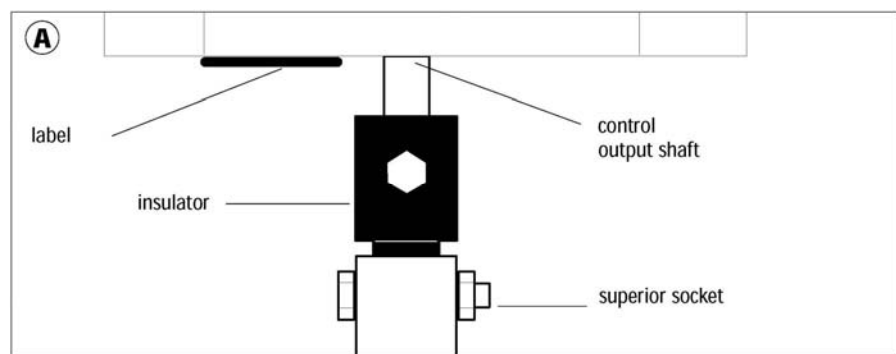


fig. 12

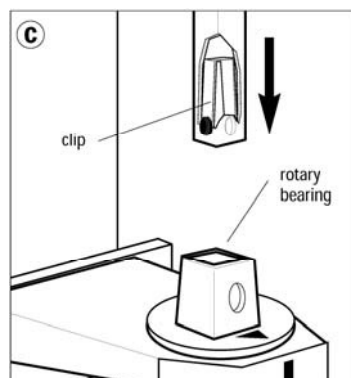


fig. 13

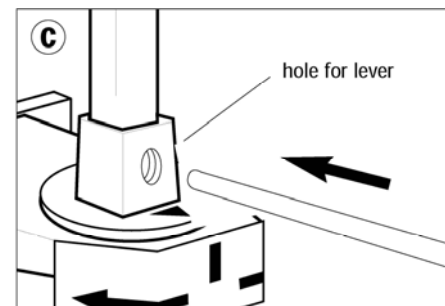


fig. 14

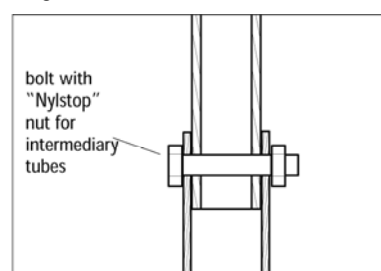


fig. 15

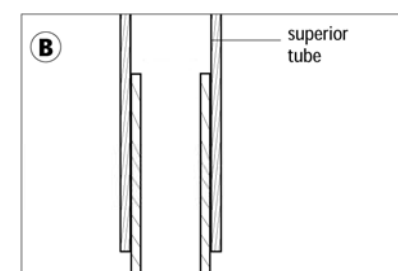


fig. 16

! IMPORTANT.

Before inserting the rod assembly in the lower tube verify that the rotary bearing is in electrical mode position independently of the OPEN or CLOSE position of the switch.

The rod assembly must not force on the switchgear operating mechanism.

-Check that the rod assembly axis is (vertically) on line with the output shaft of the mechanism. The status of the switchgear is not indicated by the position of the activating lever.

rod assembly configurations

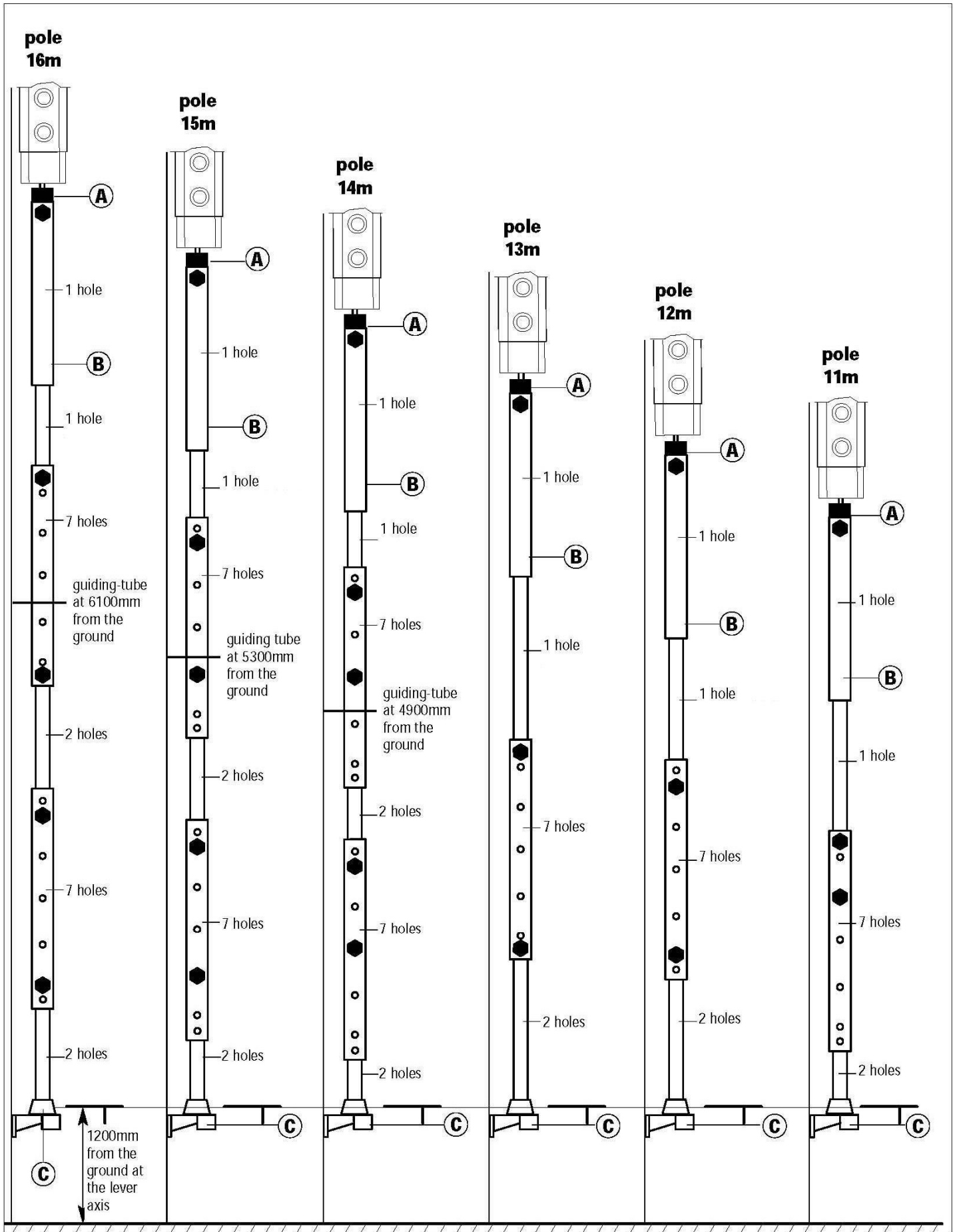


fig. 17

5.7- installation of surge arresters

See assembly instructions of surge arrester set (+see fig. 18).

5.8- network connections

The switch can be fitted either with pluggable sockets (a), or with bushings with NEMA pads (b).

a- installation of separable connectors on fixed sockets

See instructions provided with the separable connectors

b- connection on the bushings

Equip the cables with aluminium terminals. Clean and lubricate the contact surfaces, then fix the cable on the connection lugs of the switch (aluminium). It is preferable to use sheathed cables to assure a sufficient insulation of live parts, even in case of wind.

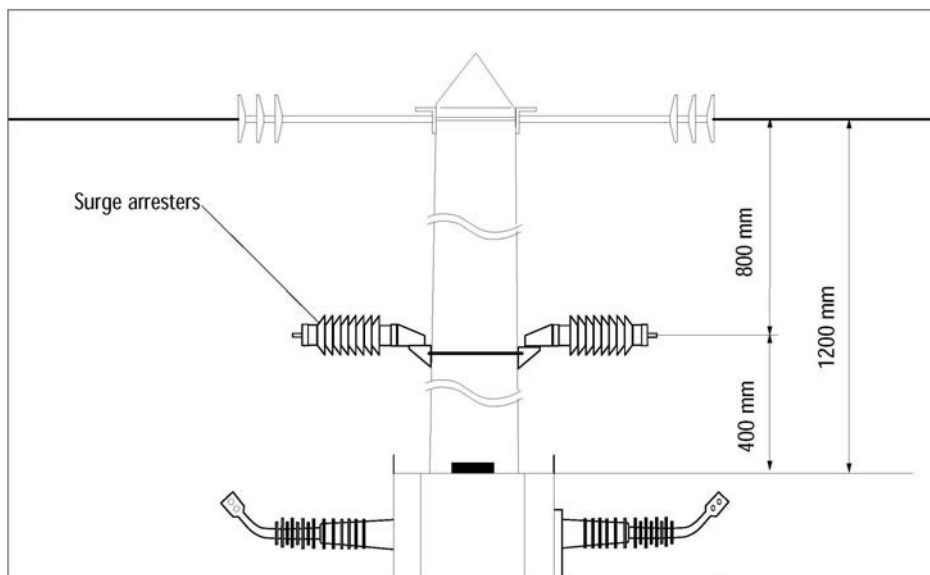


fig. 18



The bushings must not be forced during and after implementation of the bridge.

5.9- control box installation

Mounting on the pole :

Please refer to the control box assembly instructions to install it on the pole. This assembly instruction manual is fitted inside the control box.

5.11- earthing

Earthing points are provided :

- on the metallic tank
- on the manual control
- under the control box
- on the antenna support

This equipment (marked with the symbol) will be connected to the earth connection by a cable (25mm minimum).

Remark : All other equipment which can be provided must also be earthed

5.10- antenna installation

Mounting on the pole:

Possible mounting options.

- Secure the antenna on the bracket and turn it towards the transmitter (for directional antenna).
- Tighten the fastening nuts (fig. 20)

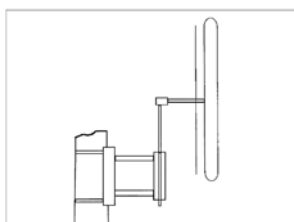


fig. 20

5.12- operation checkout

The AUGUSTE switch is shipped in the open position.

- Make a closing operation. Check that the position indicator displays “closed” position (see §6, fig.22; 23 and 26 page 11).
- Make an opening operation. Check that the position indicator displays “open” position (see §6, fig.24; 25 and 27 page 11).
- If the mechanism is motorised, perform both electrical closing and opening operation (see control box assembly instructions manual).

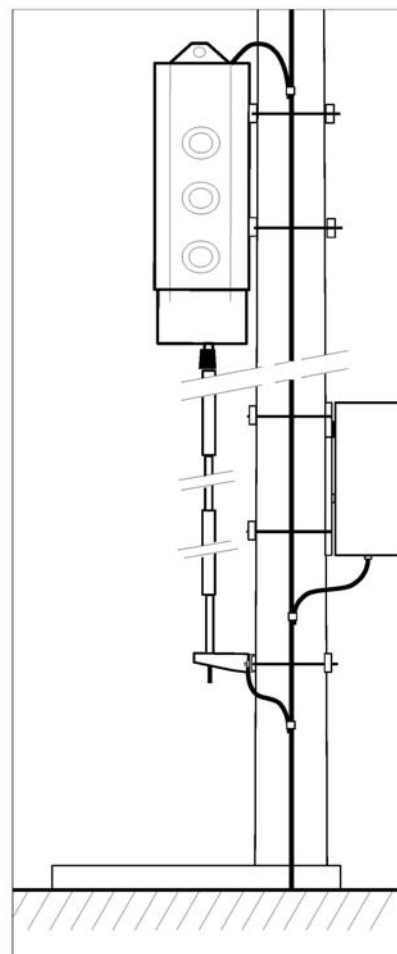
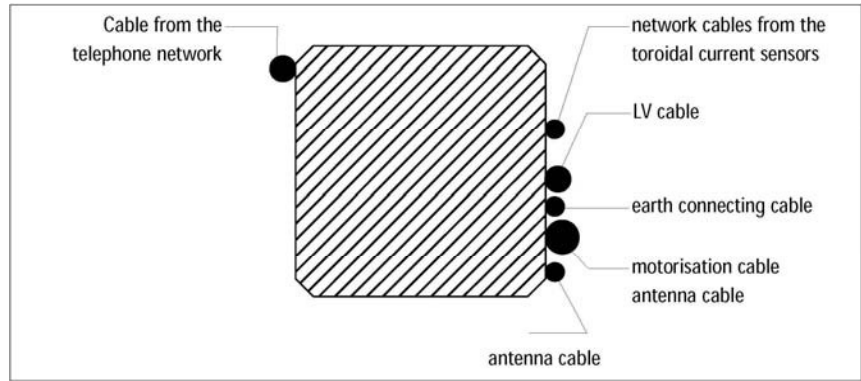


fig. 19

5.13 - cable fastening

-The cable from the telephone network, if any, must be routed away from the earth connection (fig. 21).

fig. 21



6 - putting into operation

6.1- control box

See corresponding instructions.

6.2- switch positions

The switch position is indicated by the indicator located on the mechanism underside.

The CLOSED position is indicated:

- either by a black dash on white background (fig. 22) or white dash on red background (fig 23).

- or by the white or black word "ON" on red background (fig 26).

The OPEN position is indicated:

- either by a white circle on black background (fig. 24) or white circle on green background (fig 25).

- or by white or black word "OFF" on green background (fig 27).

fig. 22

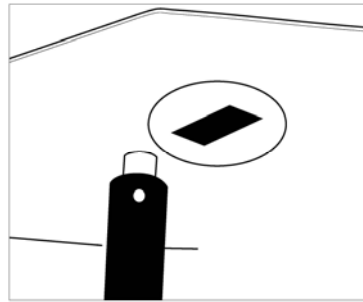


fig. 24

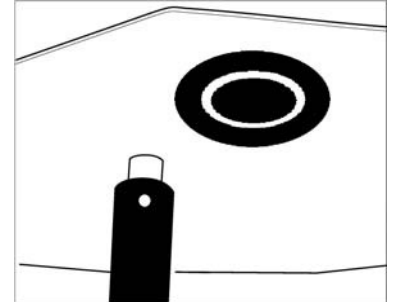


fig. 23

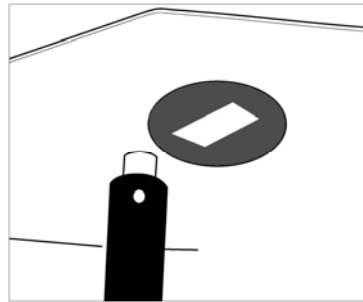


fig. 25

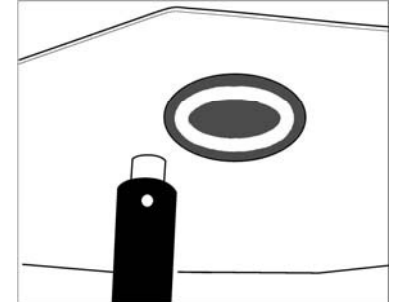


fig. 26

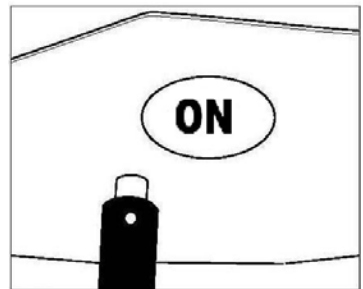
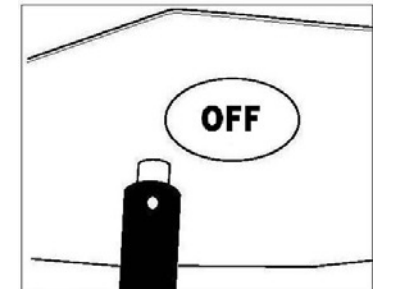


fig. 27



7 - maintenance

7.1 -preventive maintenance

The switch requires no periodical maintenance.

- The MV/LV transformer, if it is internal, is protected by a fuse located under the mechanism cover (bottom of the switch).

- Control box (see instructions): The battery must be replaced every 5 years. A test pushbutton is available for checking purposes in case of faults. Spare fuses are supplied with the control box.



The battery must be recharged every 6 months in case of prolonged storage.

7.2 - switch spare parts switch and control:

- manual control.
- set of telescopic linkage tubes.
- polymeric housing surge arresters.
- polymeric housing surge arrester bracket
- connecting kit for insulated voltage transformer.
- current sensor (unit).
- external voltage transformer.
- operating mechanism.

Control box :

See corresponding instructions.

Adaptation set :

- surge arresters
- various options

Sealed tank containing pressurized SF6 gas (fluorinated greenhouse gas).
Filling pressure = 1.3 bar (Auguste -25°C) and 1.55 bar (Auguste -50°C).
Leakage rate tested < 0.1% / year.

| Total quantity of SF6 - Kg | Equivalent CO2 - Tonne | Switch type |
|----------------------------|------------------------|--------------|
| 1.57 | 35.8 | Export -25°C |
| 1.71 | 39 | Export -50°C |

Very Important>>> Do not puncture the tank.

The dismantling of the tank for recycling or intervention must be performed by personnel trained in the use of SF6.

This equipment contains the fluorinated greenhouse gas SF6 with a global warming potential (GWP) 22200.

SF6 shall be recovered and not released into the atmosphere.

For further information on use or handling of SF6, please refer to: IEC 62271: High-voltage switchgear and controlgear. Part. 303 "Use and Handling of sulphur hexafluoride (SF6)".

Warning of the presence of acidic tailings solids and corrosive gas in the following cases.

- Equipment damaged by an internal fault current.
- Equipment's end of life when it has reached the maximum number of full load interruption.

ENSTO NOVEXIA SAS
Parc d'Activités de Haute Bigorre
Boulevard de l'Adour
65202 Bagnères de Bigorre
Phone : (33) 5 62 95 84 50
Fax : (33) 5 62 95 84 65

Sales administration
Phone : (33) 5 62 91 45 40
Fax : (33) 5 62 95 84 65

After Sales department
Phone : (33) 5 62 91 45 10
Fax : (33) 5 62 95 84 65

ENSTO