# Protection relay
# Serie 7000

## Installation guide
Case R

# CHANGE RECORD

| Rev. | Date | Description of the modification | Written | Checked | Approved |
|---|---|---|---|---|---|
| A | 23/10/2017 | Creation of the document | PBI | SLF | RBI |
| B | 14/12/2017 | Update | SLF | PBI | RBI |

# FOREWORD

## Scope of the present guide :

This guide provides useful information for the installation and wiring of the Serie 7000 protection relays.

We recommend to read carefully this guide in order to be aware of the available functionalities and to carry out the wiring and power up of the equipment according to the instructions provided herein.

# SUMMARY

# 1. GENERAL PRESENTATION

## 1.1. TYPE OF MATERIAL

In order to ensure the continuity of service of your HV electrical network, ICE provides you with the Serie 7000 protection relays.

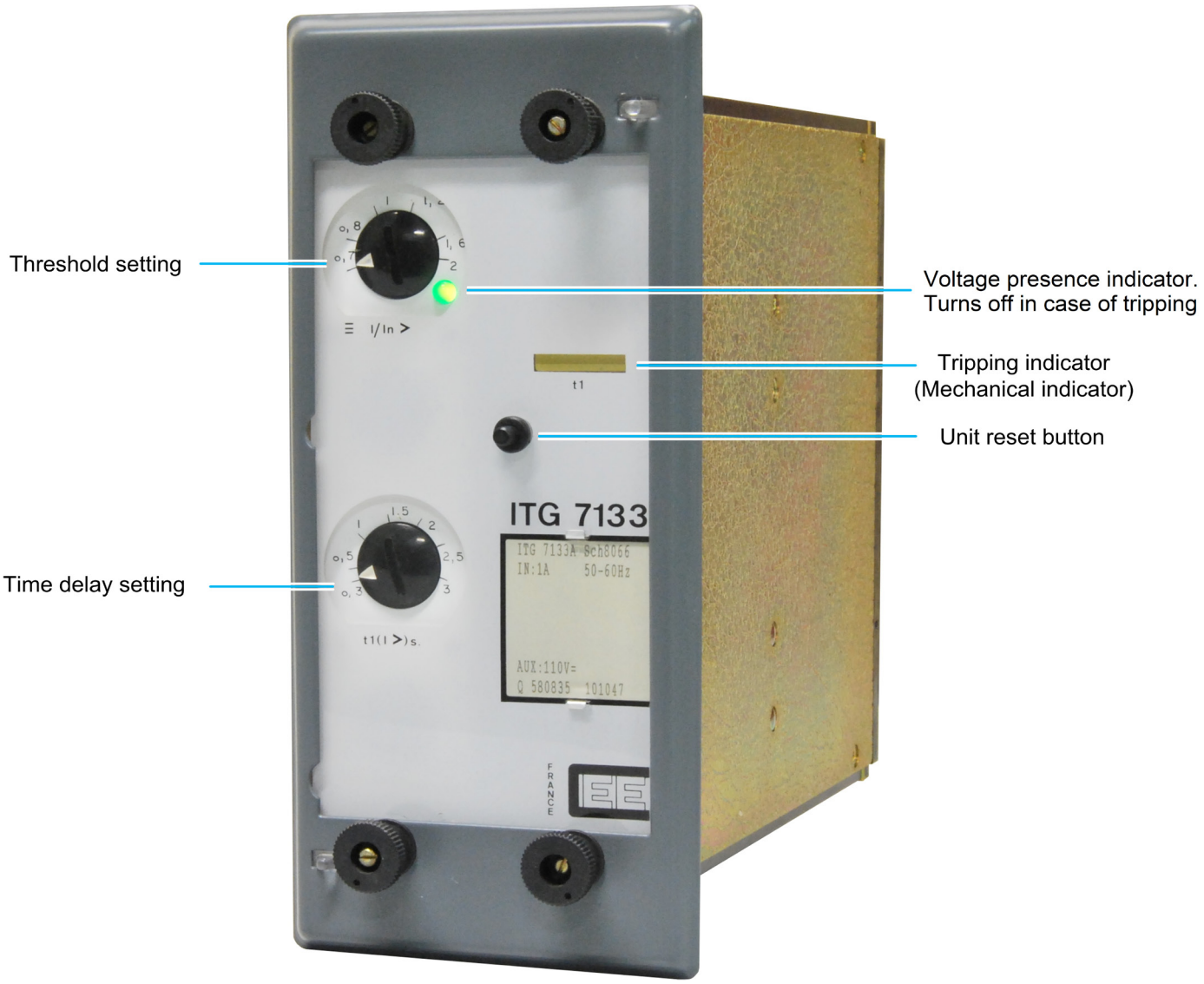



Figure 1-Example of a relay 7000

## 1.2. IDENTIFICATION OF THE PROTECTION RELAY

The label on the front of the relay indicates its characteristics:

- Type of protection (e.g. ITH7111 for the relay below)
- Wiring diagram number (e.g. 8841) and identification of output contact (e.g. A)
- Primary CT current settings (e.g. 1 to 4 A) and Ring CT type
- Auxiliary supply (e.g. 110 VDC)
- Serial and receipt number (e.g. 01.028019 and 702033)

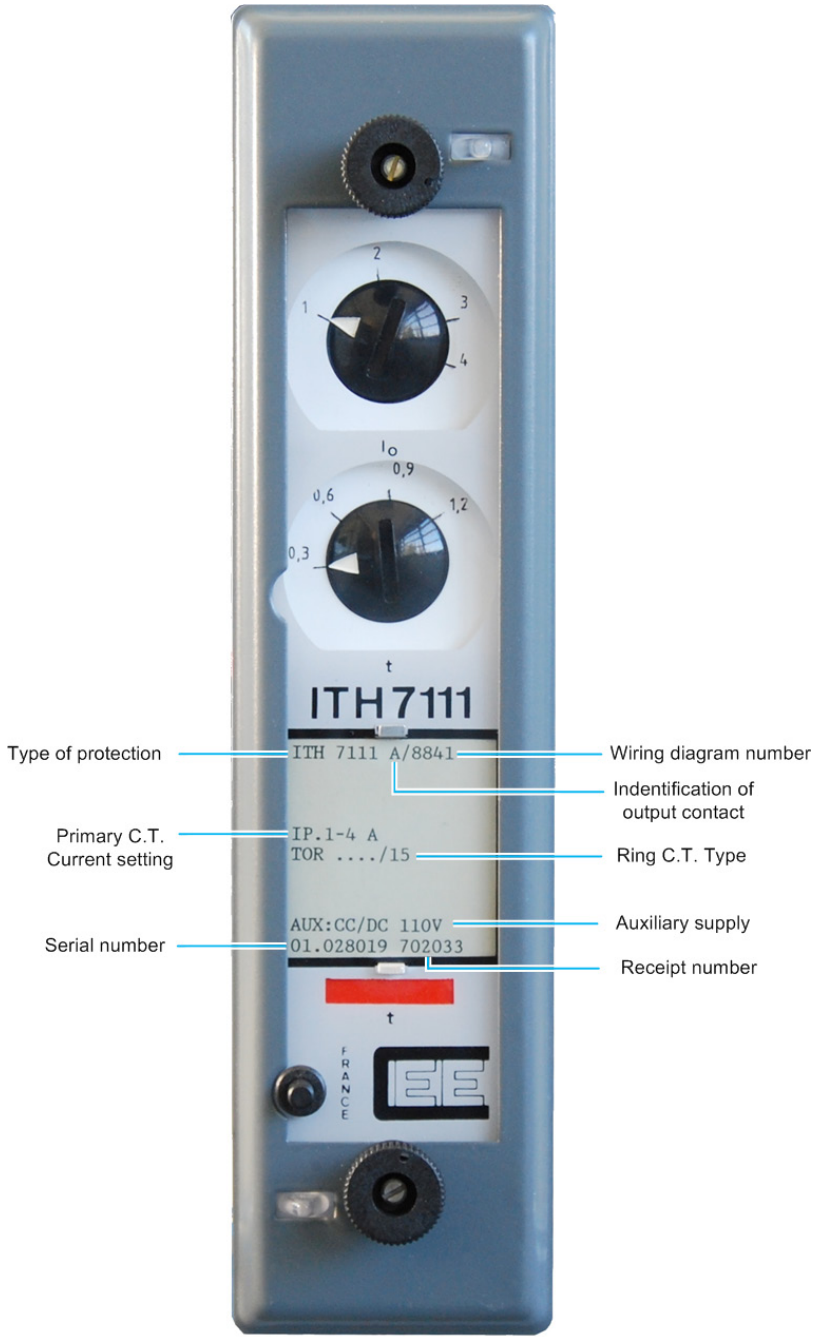



Figure 2–Label of the relay ITH 7111

# 2. SAFETY INSTRUCTIONS

The terminal blocks of the devices are studied to ensure the safety of the people during the operation of the devices.

During installation, commissioning or maintenance, they can however present high voltages and possibly a thermal heating. Consequently, the following precautions must be followed:

- Connection of the terminal blocks at installation must be carried out after having ensured of the absence of any voltage
- Their access during operation must be carried out through adequate means ensuring as well electric as thermal insulation
- The connection of the earth must imperatively be done with mean of a 2.5 $mm^2$ wire.

Before powering the devices, it will be necessary to check in particular:

- The value of the voltage rating of the auxiliary supply and its polarization
- The good realization of connections
- Integrity of the connection to the earth.

# 3. CONDITIONS OF TRANSPORT AND STORAGE

## 3.1. TRANSPORT

The assembly is delivered in a cardboard with dampers in low density Polyethylene that absorb shocks that may occur during transportation.

## 3.2. STORAGE

Equipment must be stored in its packaging in an environment with a temperature within - 5°C and +40°C.

## 3.3. UNPACKING

During the extraction of the protection relay, be careful to avoid shocks and not to distort the case.

Proceed to an inspection of the general appearance of the product before installation.

Consider disposing of the packaging through an appropriate recycling circuit or keeping it in case of an after sale return.

## 3.4. PACKING

To facilitate its transport and to avoid any risk of deterioration, the protection relay must be put in its original packaging, or in a packaging of similar quality.

Put the protection relay front face up in the shipping container.

Ensure that the front face is not in contact with a material able to scratch it.

# 4. ENVIRONMENTAL CONDITIONS

The protection relays « Serie 7000 » are intended to operate indoor, and inserted into a rack or a panel board.

## 4.1. TEMPERATURE

The protection relay must operate in the following conditions:

- Temperature: nominal operating range -10°C à +55°C
- Protected against severe environments such as heat and humidity, saline atmosphere, corrosion, termites

## 4.2. VENTILATION

The top of the relay must be cleared to allow for the air to circulate and to cool it.

# 5. ELECTRICAL REQUIREMENTS

## 5.1. AUXILIARY SUPPLY AND BURDEN

The electrical characteristics are indicated in the sale brochure.

## 5.2. EARTHING DEVICE

The terminal block of the relay is equipped with an earthing terminal on its rear side. It is suitable for a connection with a 4 mm diameter eye wire.

# 6. INSTALLATION OF THE PROTECTION RELAY

The relay can be mounted :

- In flush rear connection (EDPAR connection, refer to §6.1, page 11)
- In projecting connection (SDPAR or SDPAV connection, refer to §6.2, page 17 and §6.3, page 23 respectively)
- Inserted in a standard 19' rack cradle (SDPAR or SDPAV connection, refer to §6.2 and §6.3 respectively).

The mounting possibilities of the relay are specified on its wiring diagram.

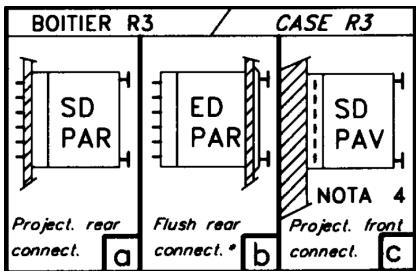



Figure 3–Relay 7000 - Type of mounting

## 6.1. FLUSH REAR CONNECTION - EDPAR

### 6.1.1. Presentation

The protection relay is installed on a panel separated from the other relays. In this case, it is fitted with a front plate and is provided with a base and a cradle.


Figure 4–Relay 7000 - EDPAR case

### 6.1.2. Dimensions

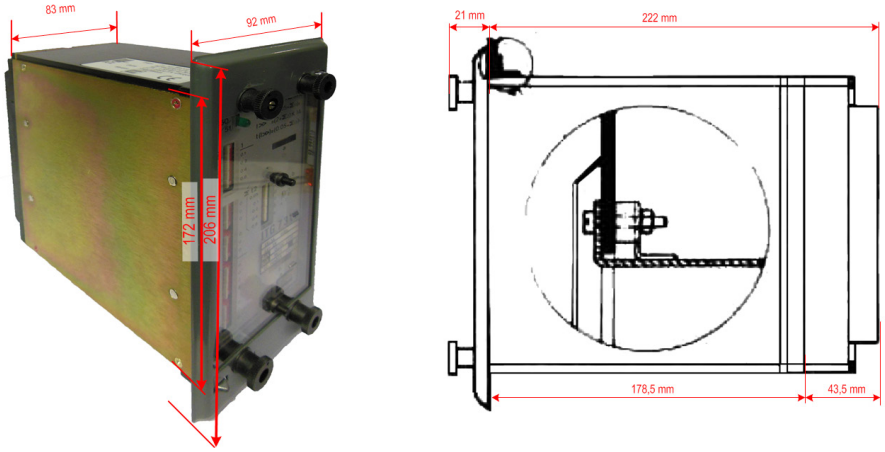



Figure 5 – Relay 7000 - Case EDPAR R2 - Outside dimensions

| CASE | CASE R1 | CASE R2 | CASE R3 | CASE R4 |
|---|---|---|---|---|
| WIDTH | 41 mm | 83 mm | 125 mm | 167 mm |
| HEIGHT / DEPTH | 172 mm / 222 mm (with its base) | | | |
| FRONT FACE | | | | |
| WIDTH | 50 mm | 92 mm | 134 mm | 176 mm |
| HEIGHT / DEPTH | 206 mm / 21 mm | | | |

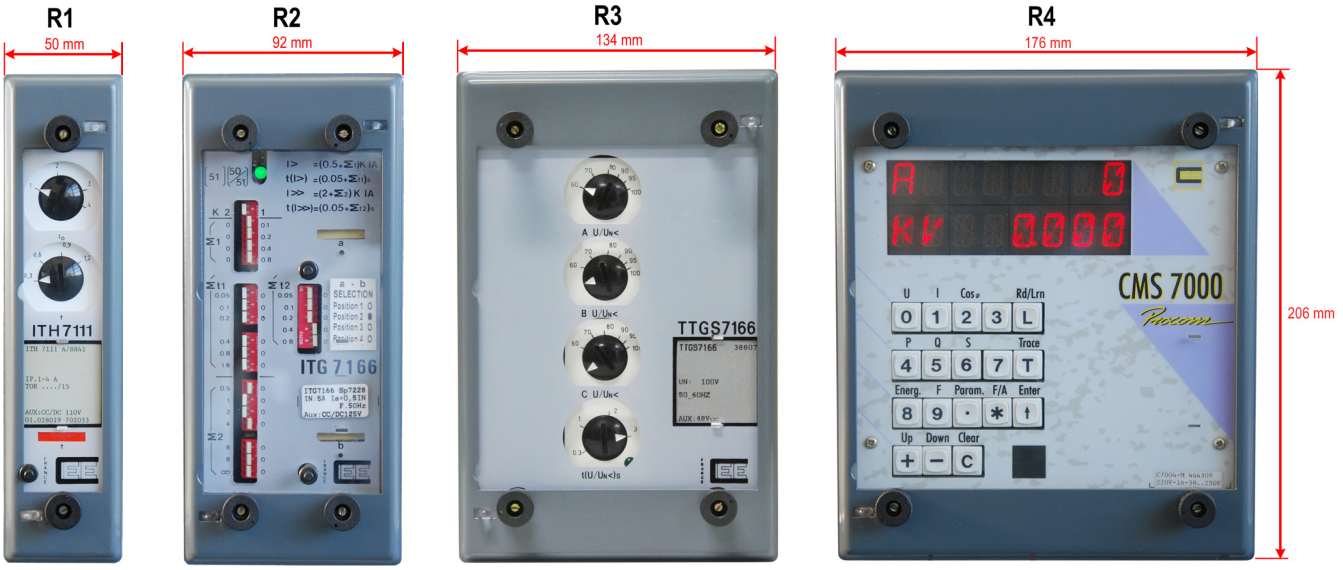


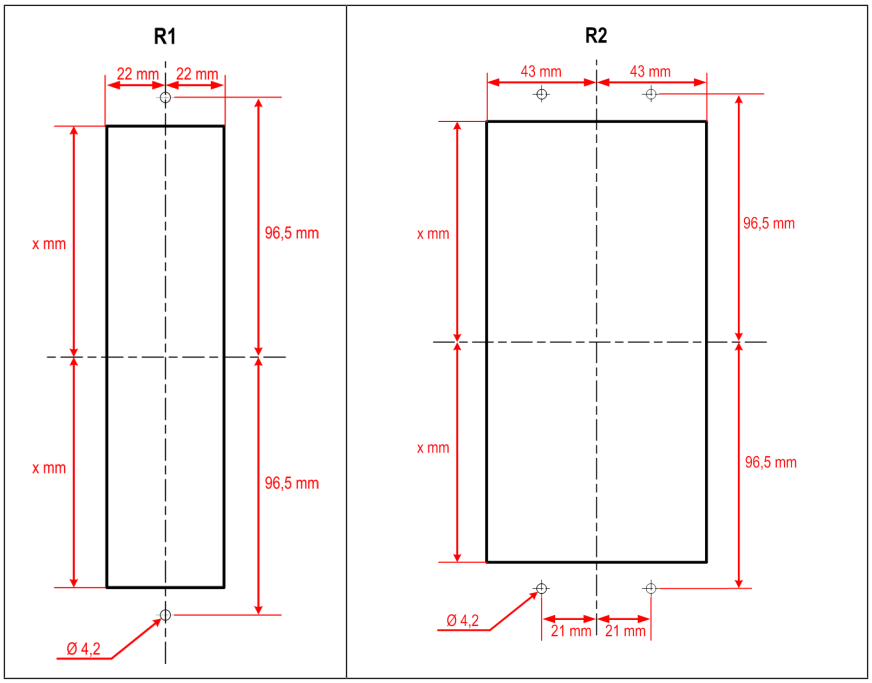

Figure 6 – Relay 7000 - EDPAR - Front face view

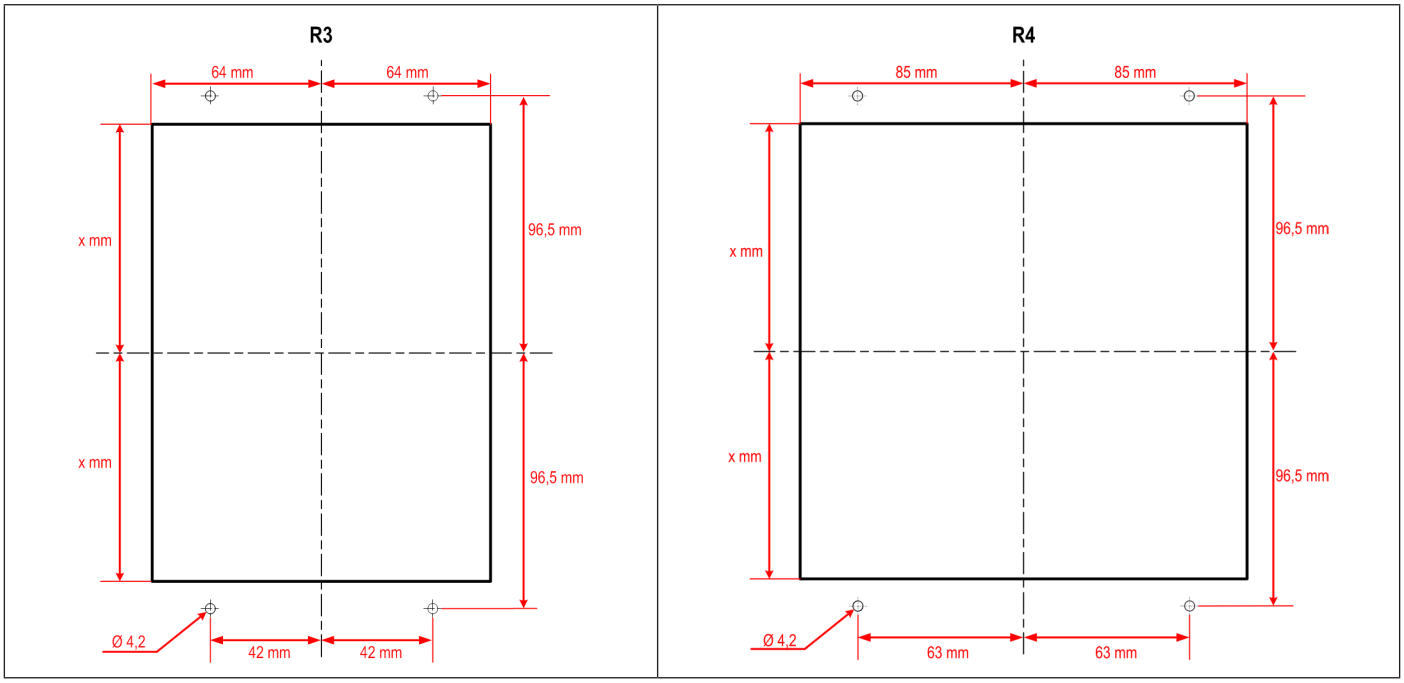
### 6.1.3. Cutting and drilling plans

The protection relay shall be installed in a panel with the cutting and drilling plans shown hereafter.

Note:

- If the relay is installed on a panel with a thickness greater than 2 mm, the height of the cutting shall be 89 mm (x = 89 mm on the drawing here below).
- If the relay is installed on a panel with a thickness that is less than 2 mm, the height of the cutting shall be 90.5 mm (x = 90.5 mm on the drawing here below).



### 6.1.4. Installation of the cradle

For EDPAR mounted relays, the following components are provided:

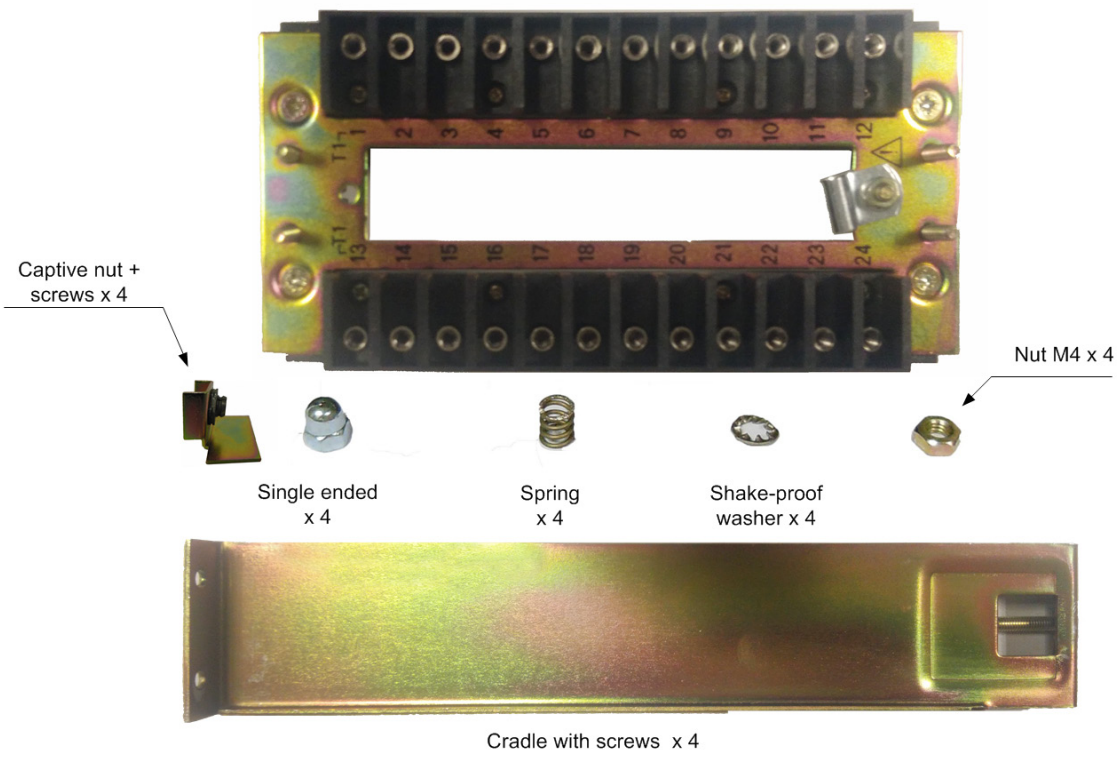



Figure 7–Case EDPAR - Components supplied to install the cradle

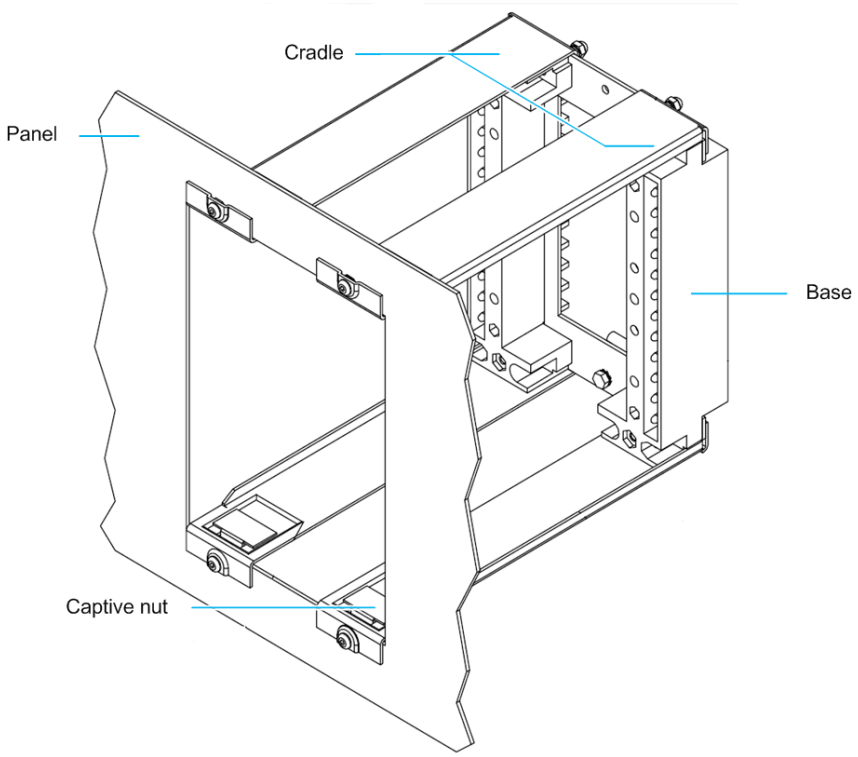



Figure 8–Case EDPAR - Cradle

The cradle must be installed as explained hereafter:

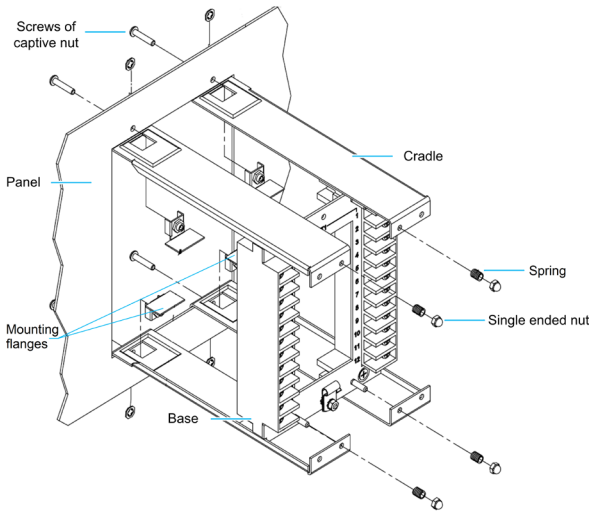
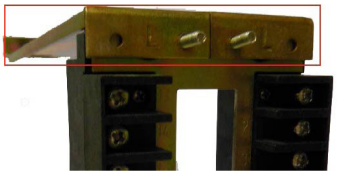
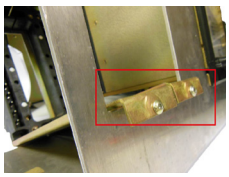
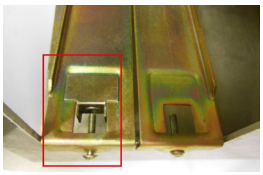
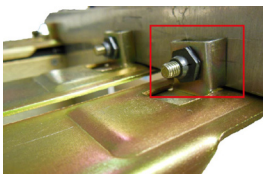
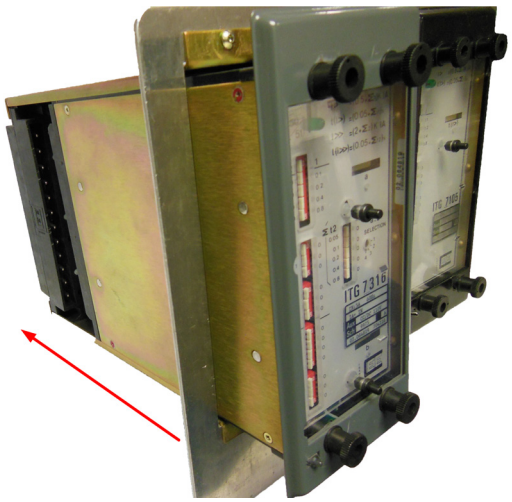
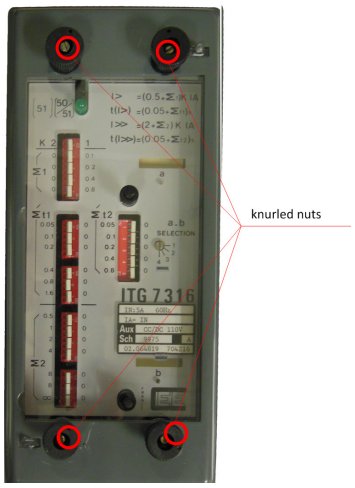
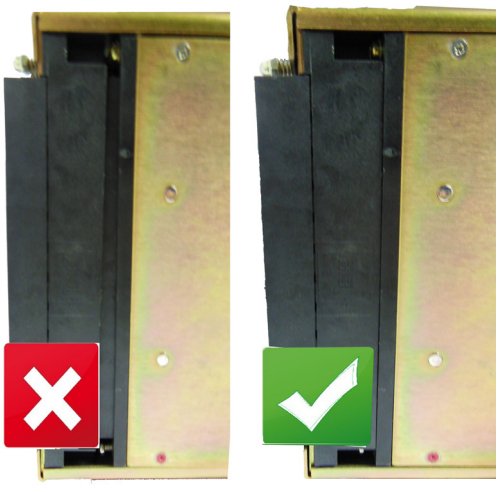



**Figure 9 – Case EDPAR - Cradle mounting**

| STEP | CRADLE MOUNTING | |
|---|---|---|
| 1 | Insert the 2 cradles (Right and left) on the screws located on the back side of the base. |  |
| 2 | Add the cradle springs and screw the nuts.<br>Note: The single ended nut is only suitable for parts with a "L" marking on the back. Otherwise, use M4 nuts. |  |
| 3 | Set the cradle on the panel and add the screws. |  |
| 4 | Add the mounting flanges. |  |
| 5 | Screw the hex head screws in the mounting flanges to clamp the cradle on the panel. |  |

## 6.1.5. Installation of the protection relay

After inserting the relay in its case, the relay is tightened against the front side by using the screws in the knurled nuts.

| Step | Protection relay mounting | |
|---|---|---|
| 1 | Engage the relay in the cradle until it is connected with its base. |  |
| 2 | Tighten the 4 knurled nuts with a flathead screwdriver (3.5 mm). |   |
| 3 | Check the correct mating of the base with the relay. |  |

## 6.2. Projecting rear connection - SDPAR

### 6.2.1. Presentation

The SDPAR relays are installed in a standard 4U 19' rack cradle type 7010 or in pre-wired rack cradle.

These relays are fitted with a front plate and are provided with a base.

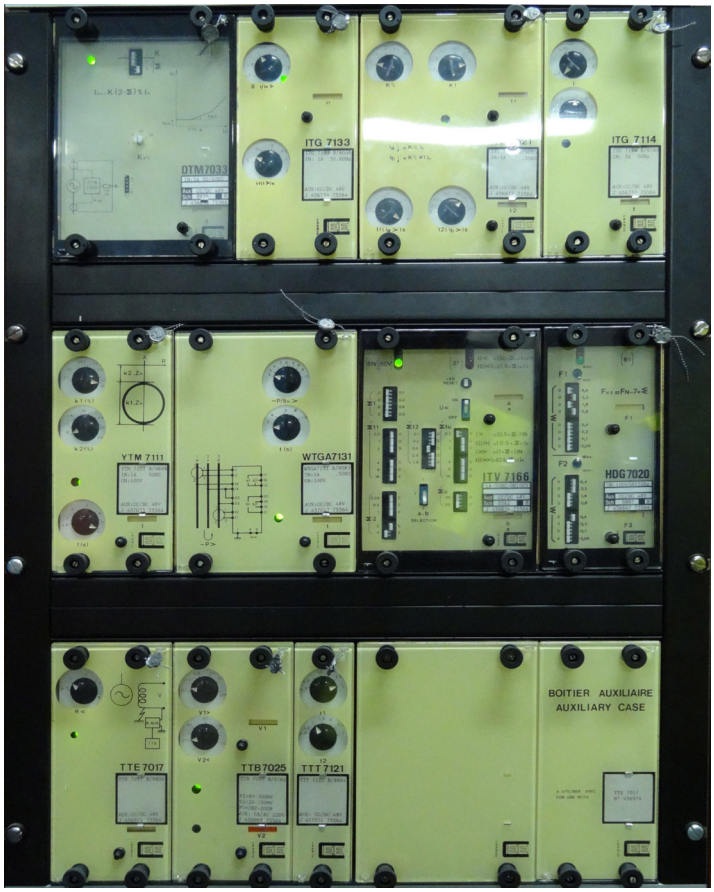



Figure 10–Relay 7000 - Case SDPAR - Installation

## 6.2.2. Dimensions

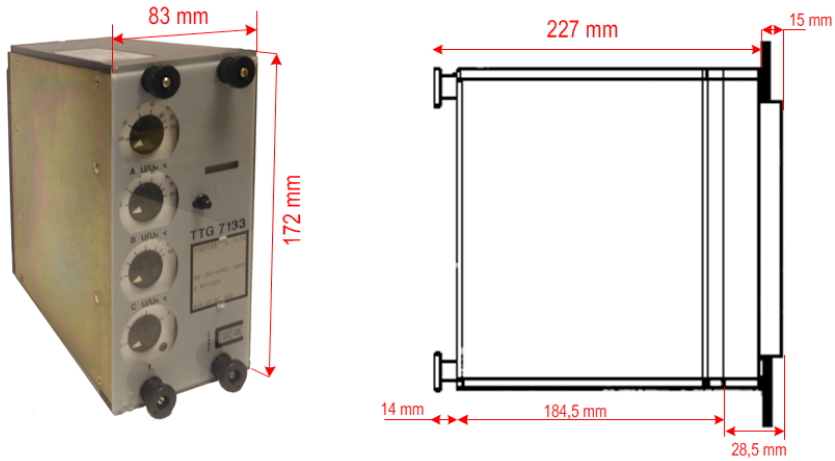



Figure 11–Relay 7000 - Case SDPAR R2 - Outside dimensions

| CASE | CASE R1 | CASE R2 | CASE R3 | CASE R4 |
|---|---|---|---|---|
| WIDTH | 41 mm | 83 mm | 125 mm | 167 mm |
| HEIGHT /DEPTH | 172 mm / 227 mm (with its base) | | | |

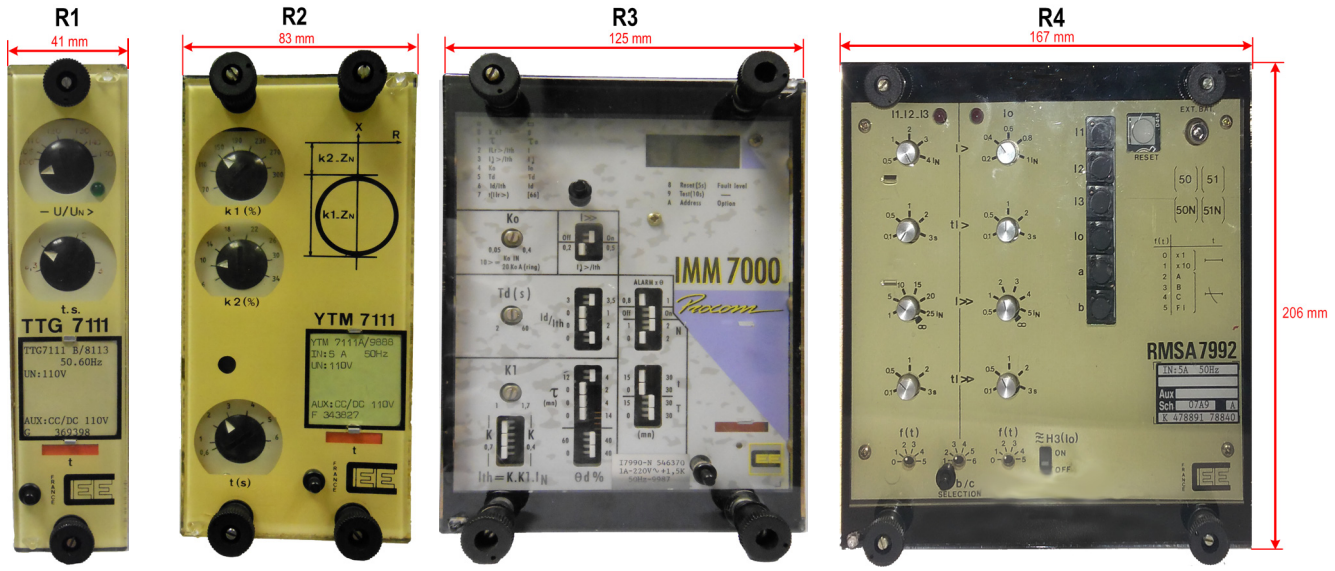



Figure 12–Relay 7000 - Case SDPAR Front face view

### 6.2.3. Cutting and drilling plans

The SDPAR relays can be installed on a panel or in standard 4U 19' rack cradle that can be provided by ICE.

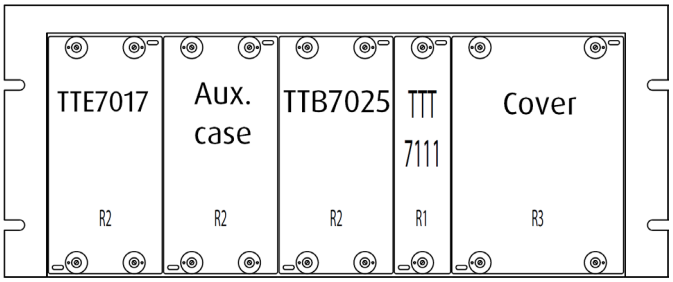
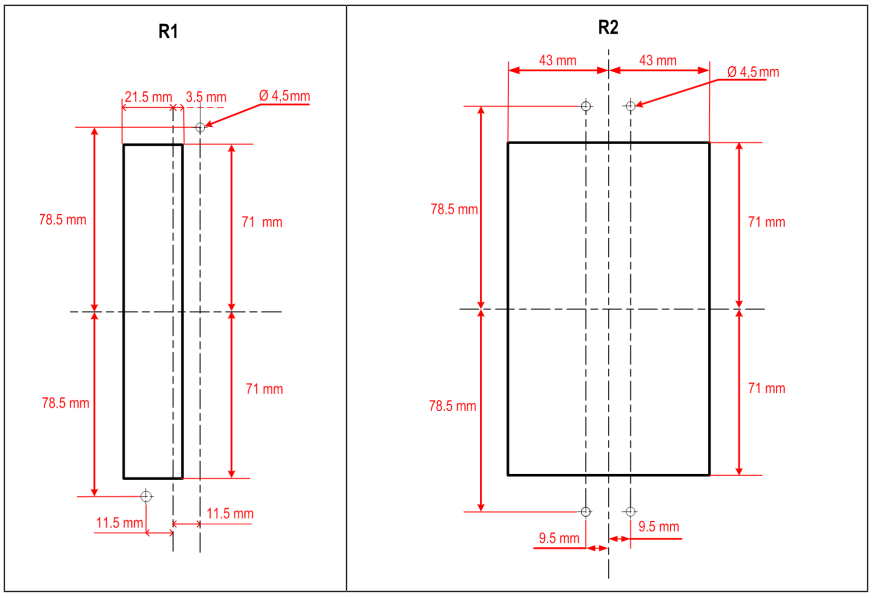
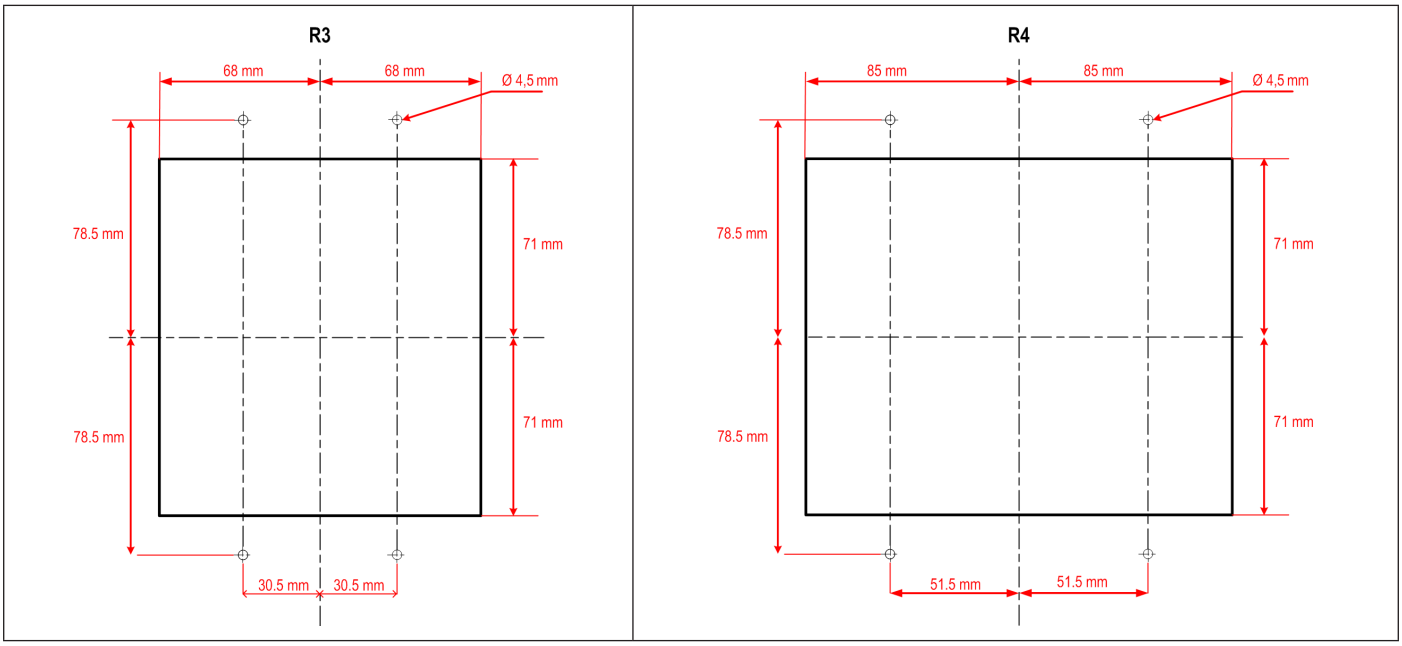



**Figure 13 – SDPAR relays installed on a standard rack**

The following cuttings and drilling must be observed to ensure a correct mounting on the panel.



### 6.2.4. Installation of the base

The SDPAR relays are provided with a base shown hereafter:


Figure 14–SDPAR Case - Elements provided to install the base

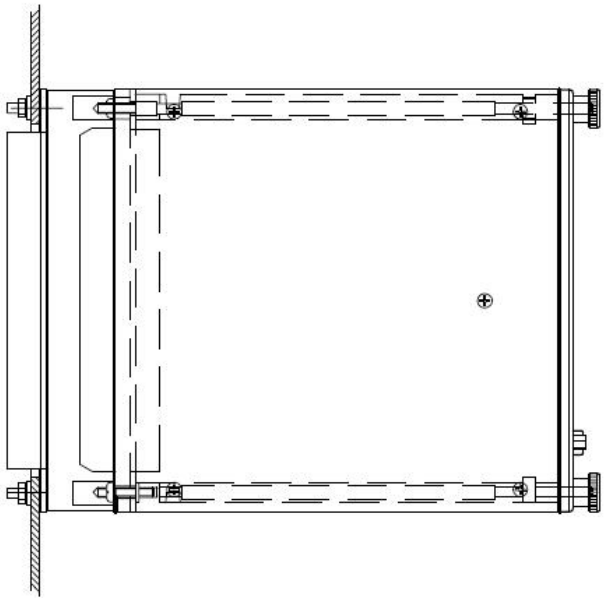
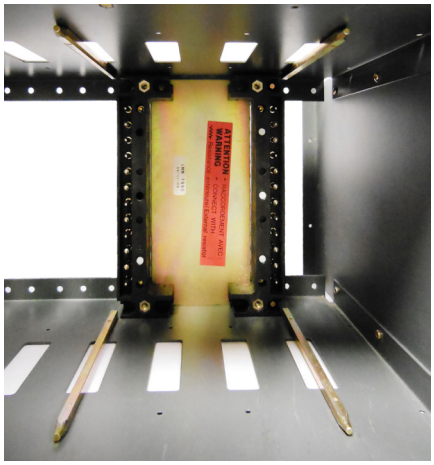
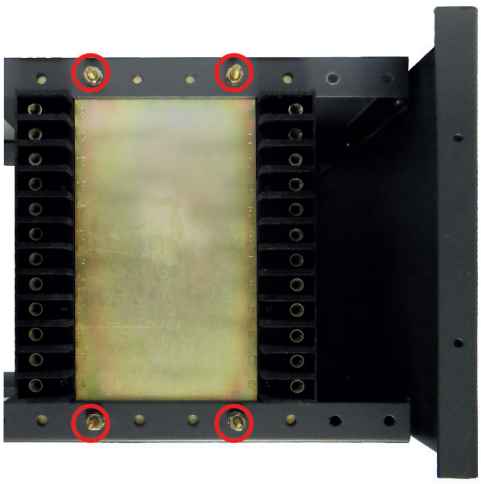


Figure 15– SDPAR Case - Relay and base

The base shall be installed as described hereafter:

| Step | Base mounting | |
|---|---|---|
| 1 | Engage the base in the rack at its intended location. The base fixing screws must enter the bores of the rack.<br><br>Note : The slideways must be have been installed before in the rack to allow a correct support of the relay. |  |
| 2 | Add the washers and screw the nuts that are provided with the SDPAR base. |  |

## 6.2.5. Installation of the protection relay

After that the relay has been set in its location, it shall be tightened by using the knurled nuts.

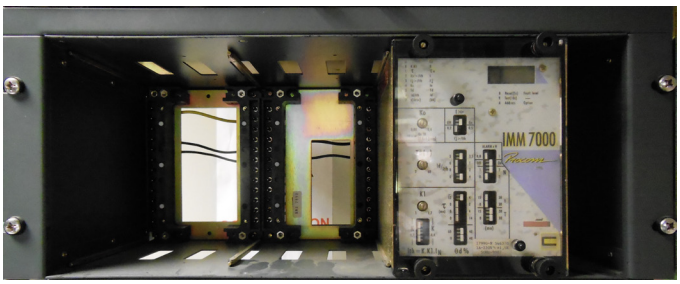
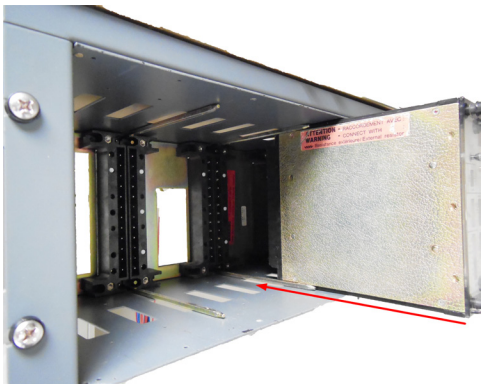
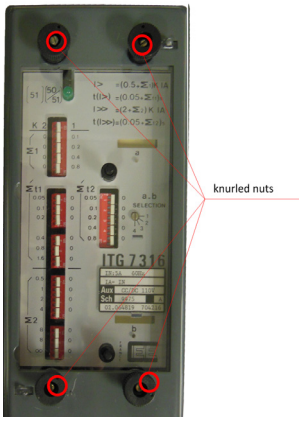
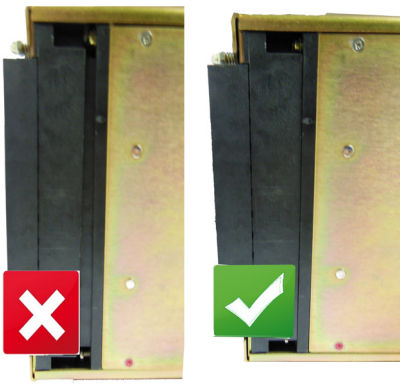



Figure 16–SDPAR case - Standard 19' 4U rack cradle

| Step | Protection relay mounting | |
|---|---|---|
| 1 | Engage the protection relay in the cradle until it mates with the base. |  |
| 2 | Tighten the 4 knurled nuts with a flathead screwdriver (3.5 mm). |   |
| 3 | Check the correct mating of the base with the relay. |  |

## 6.3. PROJECTING FRONT CONNECTION - SDPAV

### 6.3.1. Presentation

SDPAV protection relays can be installed on a panel or on a DIN rail. They are wired from the front side of their base.


Figure 17–Relay 7000 - Case SDPAV - Installation

### 6.3.2. Dimensions

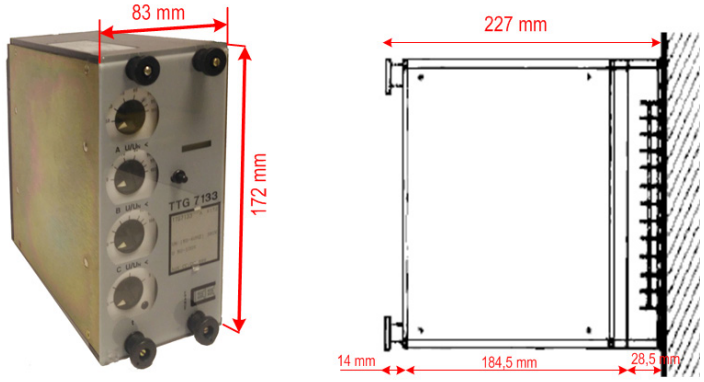



Figure 18–Relay 7000 - Case SDPAV R3 - Outside dimensions

| CASE | CASE R1 | CASE R2 | CASE R3 | CASE R4 |
|---|---|---|---|---|
| WIDTH | 41 mm | 83 mm | 125 mm | 167 mm |
| HEIGHT / DEPTH | 172 mm / 227 mm (with its base) | | | |

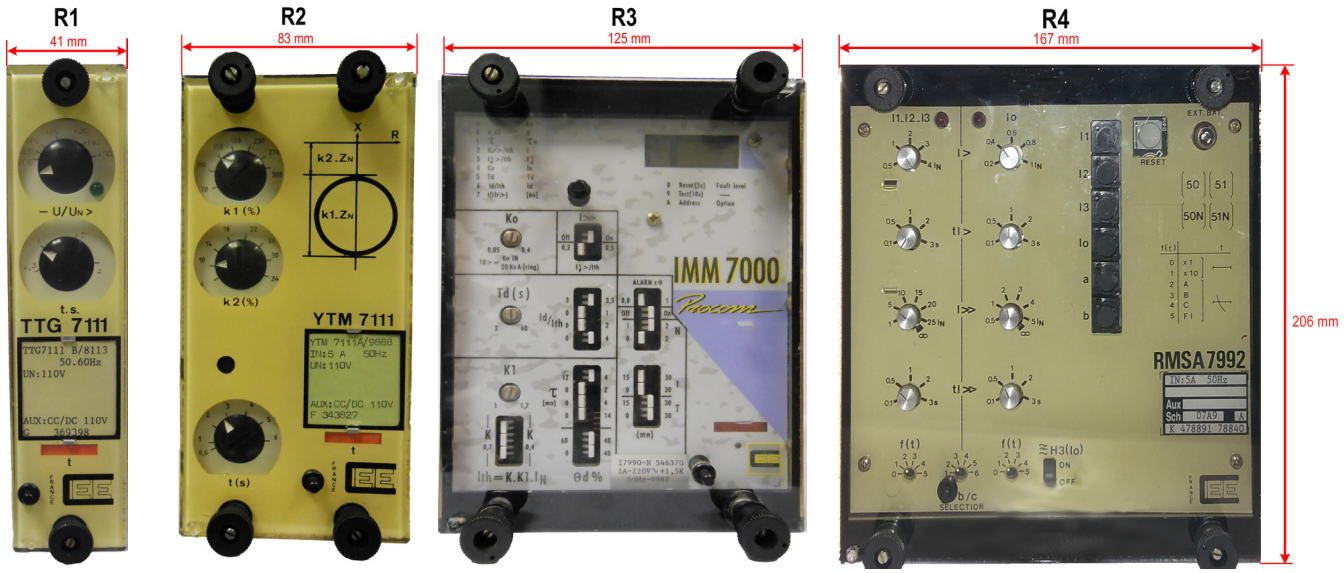



Figure 19–Relay 7000 - Case SDPAV - Front face view

### 6.3.3. Cutting and drilling plans

SDPAV protection relays can be installed on a panel or on a DIN rail.

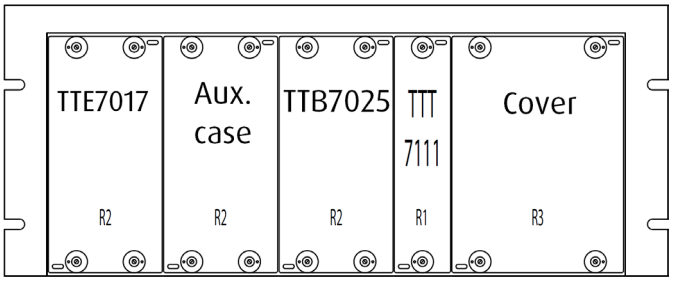
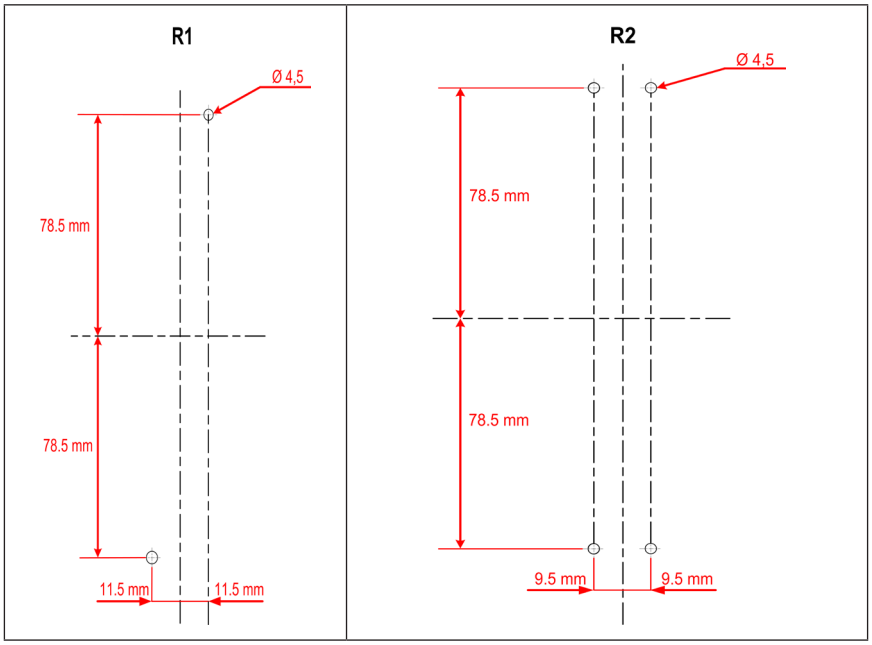
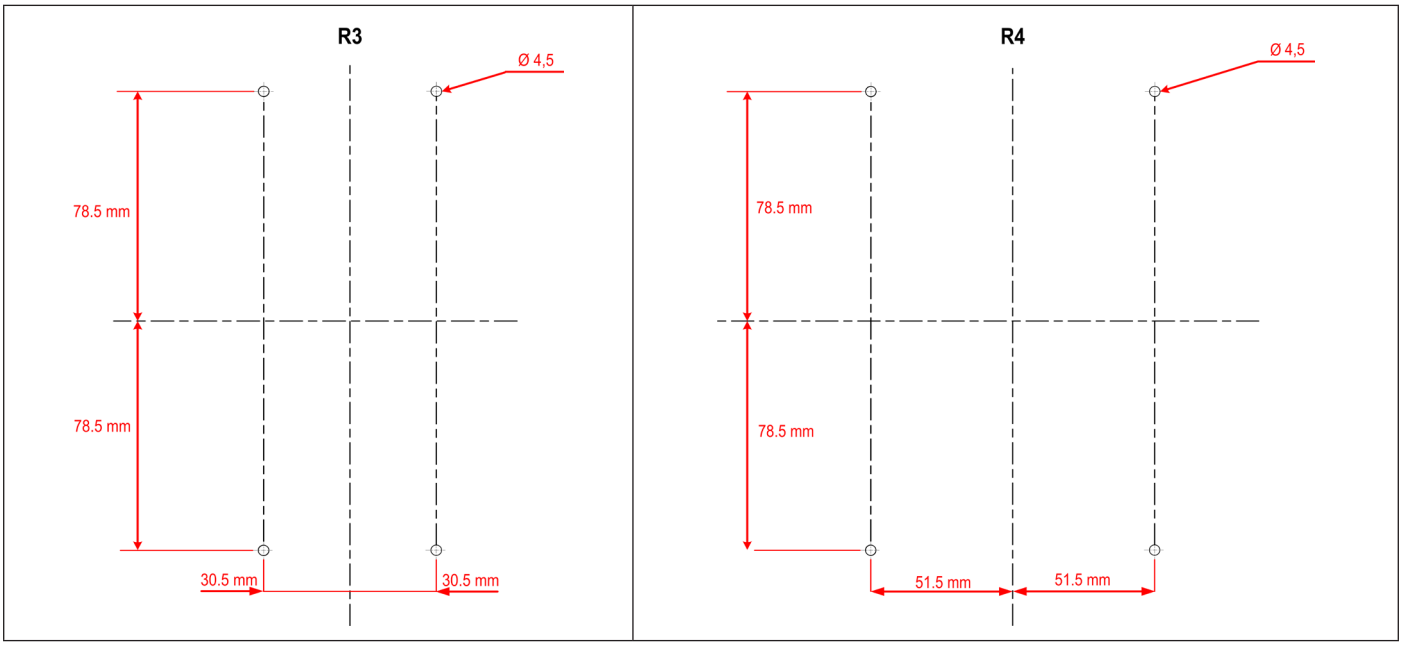



Figure 20 – SPAV relays installed on a standard rack

The cutting plan and following drilling must be observed to ensure a correct mounting on the panel.



### 6.3.4. Installation of the base

SDPAV relays are provided with the following components:

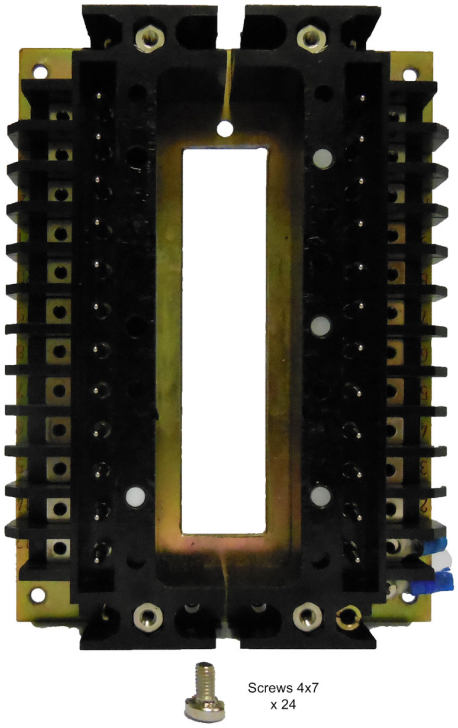



Figure 21–Case SDPAV - Elements provided to install the base

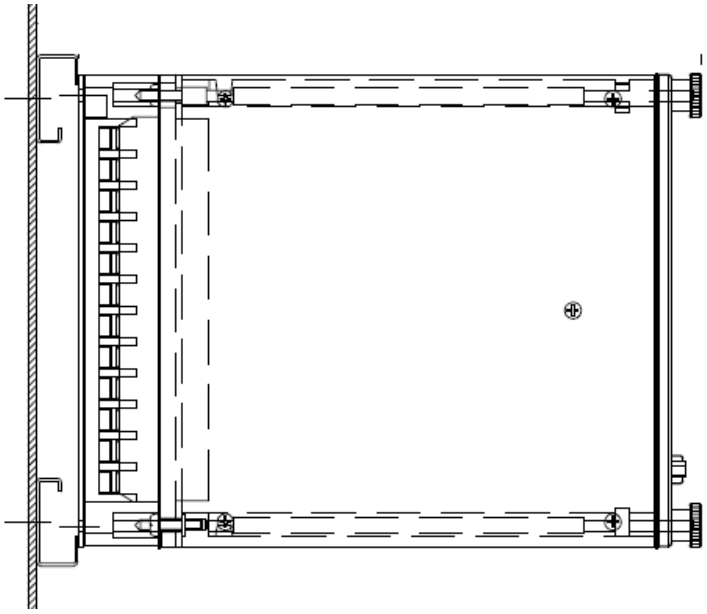
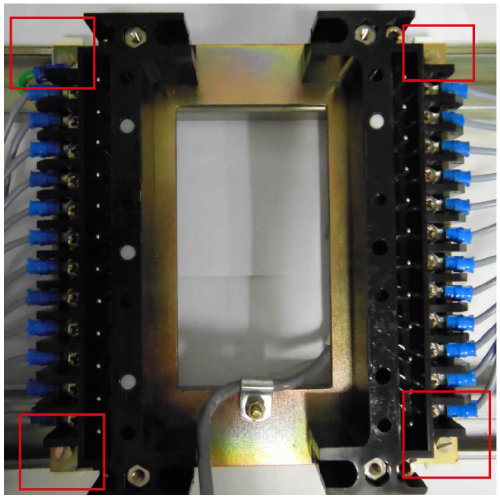
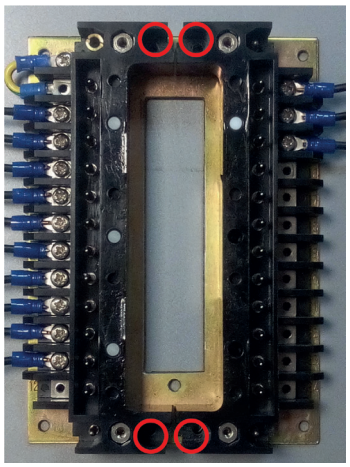


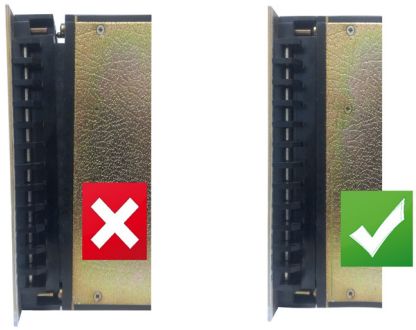
Figure 22–Case SDPAV - Relay with its base

The base shall be mounted as described hereafter:

| Step | Base mounting | |
|---|---|---|
| 1 | To install the base on a DIN rail:<br>• Place the four M4 fixing nuts for DIN rail.<br>• Screw the base on the DIN rail with 4 M4 screws. |  |
| 2 | For panel mounting:<br>• Drill the panel according to the drilling plan of § 6.3.3. Cutting and drilling plans, page 24<br>• Screw the socket on the panel with 4 screws and 4 M4 nuts. |  |

## 6.3.5. Installation of the protection relay

After that the relay has been set in its location, it shall be tightened up from its front side by using the knurled nuts.

| Step | Protection relay mounting | |
|---|---|---|
| 1 | Engage the protection relay in the cradle until it mates with the base. |  |
| 2 | Tighten the 4 knurled nuts with a flathead screwdriver (3.5 mm). |  |
| 3 | Check the correct mating of the base with the relay. |  |

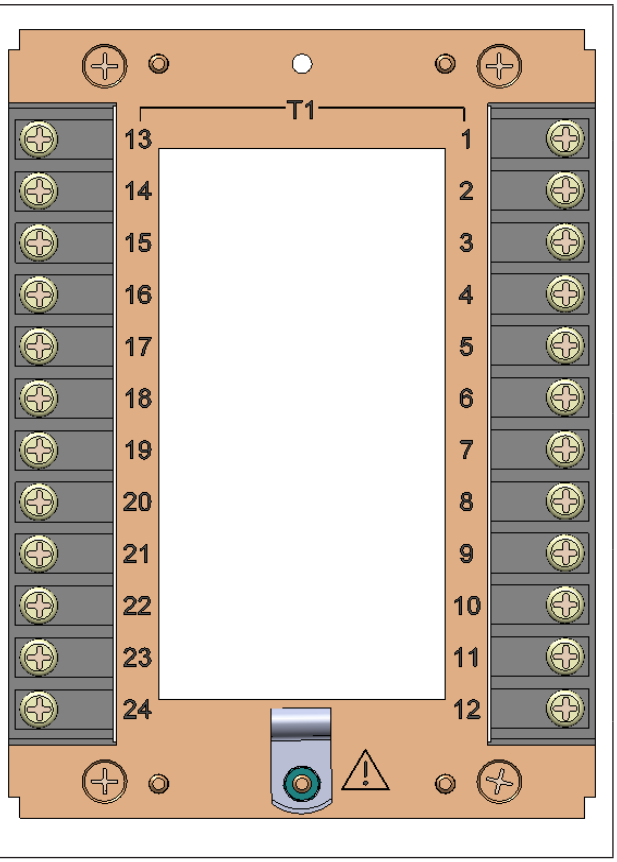
# 7. WIRING OF THE PROTECTION RELAY

Refer to the wiring diagram to carry out the connection of the relay.

The wiring is done from the rear side for EDPAR and SDPAR cases and from the front side for SDPAV case.

Note: The use 4mm diameter eye terminals and cables with a section lower or equal to 6 $mm^2$ is advised.

| | |
|---|---|
| Function | Terminal block |
| Type of terminal | Eye terminal |
| Connection type | Screwed connection |
| Tightening torque | 0,8 to 1,3 Nm |
| Connection. | 2.5 to 6 $mm^2$ conductors with 4 mm eye lug<br>- Current input: 4 to 6 $mm^2$<br>- Voltage input: 2.5 à 6$mm^2$ |
| Type of lug | Eye lug M4 |



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