



**ICE**  
PROTECTIONS  
& CONTRÔLE  
COMMANDE

**USER'S GUIDE**  
**NPM800 – NPM800R – NPM800RE**  
**MOTOR**  
**MULTI-FUNCTION RELAY**

**ICE - 11, rue Marcel Sembat - 94146 ALFORTVILLE CEDEX - France**  
TEL.: (33) 01 41 79 76 00 - FAX : (33) 01 41 79 76 01 – E-MAIL : [contact@icelec.com](mailto:contact@icelec.com)  
WEBSITE : [www.groupeice.com](http://www.groupeice.com)

<b>User's Guide</b> <b>NPM800 – NPM800R</b> <b>NPM800RE</b>	<b>Issue : f</b>	<b>File : A343F</b> <b>Print : 05/05/2011</b>	<b>Date : 01/2011</b>
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# FOREWORD

The aim of this handbook is to provide to the User information useful for the operation of NPM800 and NPM800R-NPM800RE relays with the local MMI.

We advise you to read it carefully, in order to take note of the available functionalities and to proceed to connection and power of the product in accordance with the provided recommendations.

Locally, setting, commissioning and real time or event readings are accessible from keyboard and displayed on the protection display.

To be fully exploited, the available functions must be parameterized and consulted with the setting software PC – Protection, provided with the product.

Before any use, we recommend you to read the safety instructions of this User's guide.

Info: this guide is the substitute of the A0343E1E. (NPM800 USER'S GUIDE)

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# 1. Safety instructions

For your safety, we recommend you to read the following information carefully. They aim to specify the precautions essential to the good installation and the correct operation of the relays.

## 1.1 Documentation

Following documentations are available for the NP800 and NP800R:

- ◆ Application guide of the NP800 and NP800R series
- ◆ User's Guide of Setting Software
- ◆ User's Guide (for each kind of relay)
- ◆ First Handling Guide (for each kind of relay)
- ◆ Diagram of each relay
- ◆ Dimensions and mounting diagram
- ◆ Matrix choice and dimensions of ring core type C.T.
- ◆ User's Guide and diagram of the BA800

We advise you to read them before any handling.

## 1.2 Connection of the relays

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

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

- ◆ 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 of the relays must imperatively be done with mean of a 2.5 mm<sup>2</sup> wire.

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

- ◆ The value of the voltage rating of the auxiliary supply and its polarization
- ◆ The tightening of the:
  - fixing rods of the current terminal blocks (NPM800)
  - fixing rods of the relay case (NPM800R - NPM800RE)
- ◆ The good realization of connections
- ◆ The integrity of the connection to the earth.

## 1.3 On load withdrawal

With voltage or on load, it is formally misadvised to withdraw the:

- connectors and the current terminal blocks\*
- relay (NPM800R - NPM800RE)

\* for NPM800 relay fitted with short-circuiting devices

## 1.4 Removal and destruction

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The relays should in no case be opened by the User. During their removal, they must be completely isolated from any external polarity and condensers must be discharged by connecting their external terminals to the earth.

Destruction of the relays will have to be carried out in accordance with legislation in force, in particular in compliance with the environment and safety requirements.

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## 2. Protection and operation functions

### 2.1 Protection functions NPM800 and NPM800R - NPM800RE

- ◆ ANSI 49 Thermal overload function, with inhibition of closing on load.
- ◆ Short-circuit protection, with one ANSI 50 threshold
- ◆ Earth fault protection, with one ANSI 51N threshold
- ◆ Minimum load protection (pump unpriming) ANSI 37
- ◆ Inverse over-current protection with one ANSI 46 threshold for the detection of unbalance, loss or inversion of phase ANSI 46
- ◆ Too long starts ANSI 48 and locked rotor Protection ANSI 51LR
- ◆ ANSI 66 number of starts authorisation Function
- ◆ Load-shedding and re acceleration Function by external input
- ◆ ANSI 50BF & 50NBF, circuit breaker failure function by checking of the disappearance of the phase current. (Configuration available only by the setting software)
- ◆ ANSI 86, latching output contacts (Configuration available only by the setting software)
- ◆ ANSI 74TC, trip circuit supervision (Configuration only by the setting software)

### 2.2 Operation functions NPM800 and NPM800R - NPM800RE

- ◆ Two setting groups
- ◆ Assignment of digital inputs
- ◆ Assignment of relay outputs
- ◆ User programmable LEDs
- ◆ Monitoring of trips and reclosings
- ◆ Help in circuit breakers maintenance: number of operations with alarm threshold
- ◆ Storage of the last 250 events
- ◆ Storage of four 52 periods disturbance recordings, according to COMTRADE standard
- ◆ 4 or 8 User configurable generic functions.

### 2.3 Locally available User's functions

Locally, the following functions are available:

- ◆ Choice of language
- ◆ Setting in or out of order of the functions
- ◆ Customized identification of protection
- ◆ Setting of adjustment and primary values for the two tables
- ◆ Assignment of the inputs / outputs
- ◆ Reading of fault values
- ◆ Reading of each memorized value: measurements and counters
- ◆ Reset of counters
- ◆ Reading of events
- ◆ Configuration of disturbance recording and local trigger
- ◆ Configuration of Modbus® communication.

## 2.4 Remotely available User's functions

The following functionalities can be accessed through the RS232 or RS485 links:

- ◆ Saving of configuration
- ◆ Commissioning tests: LCD display, adjustment of contrast, LEDs
- ◆ Commissioning tests: relays, wiring
- ◆ Reading of real time values: measurement and counters
- ◆ Reading of disturbance recordings.
- ◆ ANSI 50BF & 50\_NBF circuit breaker failure function
- ◆ ANSI 86, latching output contacts
- ◆ ANSI 74TC, trip circuit supervision

These functions are however available with the setting software through the RS232.



### 3. First use

When powering the relay, the displays below can appear. The recommended action allows starting the parameter setting of protection.

#### 3.1 Default screen

In absence of a fault, the protection displays the phase 1 current measurement in HV value.

```
CURRENT I1
0.0 A
```

#### 3.2 Presence of a fault or an alarm

If a fault or alarm occurs, a message indicates the type of fault.

```
TRIP
PHASE FAULT
```

This message disappears at once after acknowledgement of the fault and is replaced by the following message.

```
TRIP PH FAULT S
10/12 16:38.15 R
```

This message remains until the acknowledgement of the fault by the User.

Note: if the mode «simplified recording of events" is not chosen, the display will be as follows:

```
TRIP PH FAULT S  INST PH FAULT S  TRIP PH FAULT A  TRIP PH FAULT A
17/08 14:22:28 R  17/08 14:22:28 R  17/08 14:22:27 R  17/08 14:22:26 R
```

#### 3.3 Acknowledgment of latching output relays – ANSI 86

For the Firmware s  $\geq$  V2.20 and  $<$  V3.00, see the « Counters » menu.

For the Firmware s  $>$  V3.00, see the « Maintenance » menu.

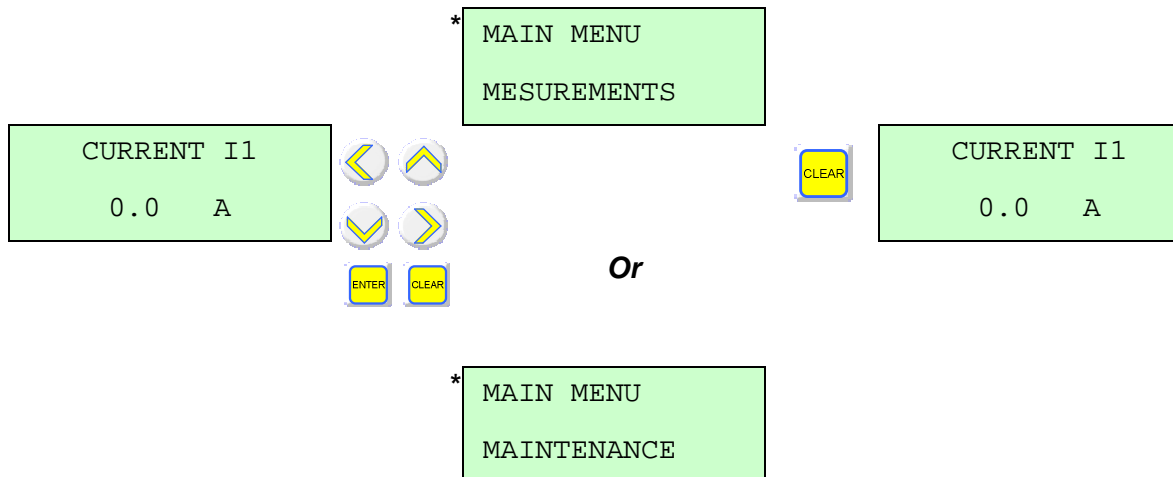
## 4. General information on menus

All parameters can be accessed for reading. On the other hand, parameters are write-protected by an access code requested on the first modification.

### 4.1 Setting mode (In / Out)

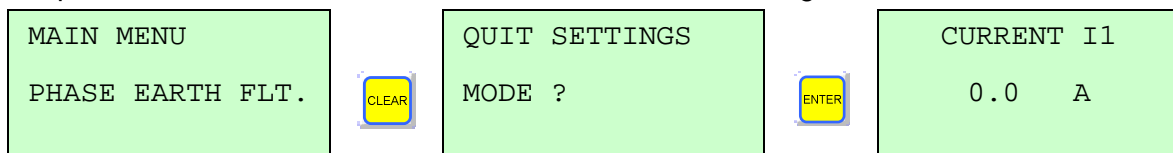
Press any key except CLEAR to enter in setting mode.

If no parameter has been modified, exit the mode by pressing the CLEAR key:





\* « Measurements Menu» for the V1.24 and V2.xx Firmware and, « Maintenance Menu» from the V3.00 Firmware.

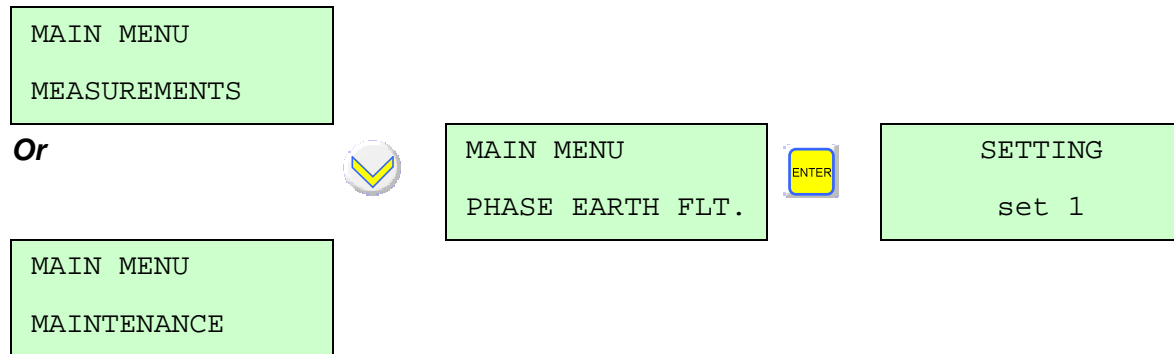
If a parameter has been modified, confirm the exit from setting mode:





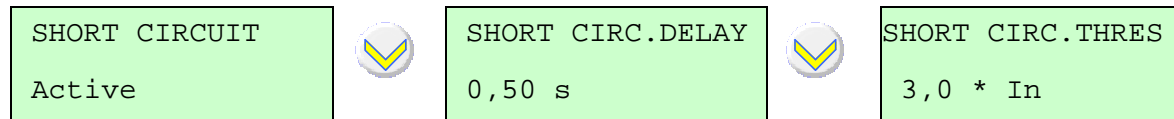
Without any operation, return to default screen is carried out automatically after 5 minutes.



## 4.2 Modification of a parameter

Use the  and  keys to select a menu, then press the ENTER key to access the first parameter.

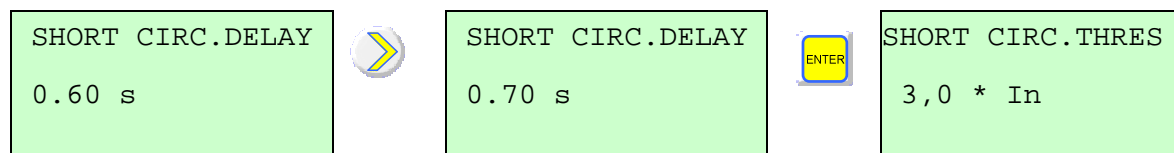


Use the  and  keys to access the various parameters in the menu:

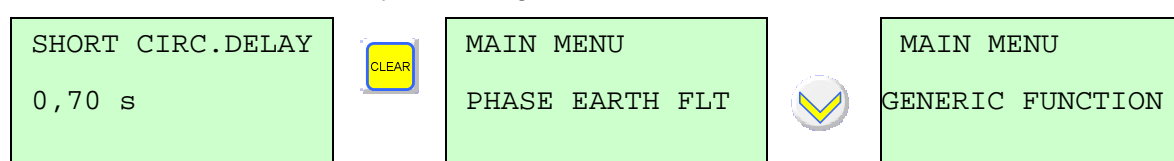


Use the  and  keys to modify the parameter.

You must confirm your change using the ENTER key after each parameter modification. After storing the new parameter value, next parameter is displayed:



Use the CLEAR and  keys to change menu:



Leaving any sub menu with the CLEAR key will lead to the above menu.










### 4.3 Access code

On first modification of a parameter, the software requests the access code.

The factory-programmed code is " ICE1 ".

To enter your own personalised code, use the " CHANGE CODE " menu. The code can be composed up to four alphanumeric characters.


The following example shows how to replace code "AA" with " 99 ":


MAIN MENU CHANGE CODE		Press on « <b>ENTER</b> » to confirm
OLD PASSWORD —		Press on ► until obtaining the letter « <b>A</b> »
OLD PASSWORD I		Press on ▼ to displace the cursor « <b>_</b> »
OLD PASSWORD I_		Press on ► until obtaining the letter « <b>A</b> »
OLD PASSWORD AA		Press on « <b>ENTER</b> » to confirm
NEW PASSWORD —		Press on ◀ until obtaining the letter « <b>9</b> »
NEW PASSWORD 9		Press on ▼ to displace the cursor « <b>_</b> »
NEW PASSWORD 9_		Press on ◀ until obtaining the letter « <b>9</b> »
NEW PASSWORD 99		Press on « <b>ENTER</b> » to confirm
MAIN MENU CHANGE CODE		

In case of loss of the code, contact us to obtain an emergency password for your configuration.

#### 4.4 Assignment of output units


Relays assigned to a function are displayed with « \* ».


Key  allows displacing the cursor « \_ » on the relay(s) to assign.


Key  allows assigning or not the relays used by the functions.

Example: assignment of relay B to TRIP I<sub>o</sub> > low earth function. At the beginning, no function was assigned to this relay.

Caution: do not forget to confirm by ENTER key.

EARTH TRIP RELAY	
A_ B C D	

EARTH TRIP RELAY	
A B_ C D	

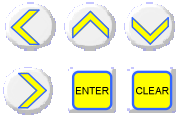








EARTH TRIP RELAY	
A B* C D	

EARTH TRIP RELAY
E F G

## 5. Menu list

### 5.1 Access to main menus

The following menus enable setting of the available functions. Each one allows access to the parameters of adjustment and ensures their coherence.

CURRENT I1 100.0 A	Press on any key other than CLEAR to enter the parameter setting mode	Press on CLEAR key to leave the parameter setting mode
		
MAIN MENU MEASUREMENTS	Real time measures (firmware V1.24 and V2.xx)	Cf. chapter 4 to select a menu
<b>Or</b>		
MAIN MENU MAINTENANCE	Real time measures (since V3.00 firmware)	
		
MAIN MENU PHASE EARTH FLT.	Parameters of the functions 50 and 51N	
		
MAIN MENU GENERIC FUNCTION	Parameters of the customized functions	
		
MAIN MENU THERMAL IMAGE	Parameters of the thermal overload function	
		
MAIN MENU STARTING FCT.	Parameters of the functions 51LR and 66 (starts)	
		
MAIN MENU LOSS OF LOAD	Parameters of the minimum load function (pump unpriming) 37	
		
MAIN MENU UNBALANCE	Parameters of the function 46 (unbalance)	
		
MAIN MENU LOAD SHEDDING	Parameters of the load-shedding function	
		
MAIN MENU TELECONTROL	Parameters of the remote control option	



MAIN MENU  
PERTURBOGRAPHY

Information about disturbance recording



MAIN MENU  
COUNTERS

Information about counters



MAIN MENU  
OPERATION

Operating parameters to be defined at commissioning



MAIN MENU  
RS485 COMMS

Configuration of the Modbus RS485 communication option

(if option available)



MAIN MENU  
CHANGE CODE

Change of the access code



MAIN MENU  
INFORMATION

Information about protection















MAIN MENU  
EVENTS

Reading of the event log





Leaving any sub menu with the CLEAR key will lead to the above menu.

## 5.2 Measurement menu (V1.24 and V2.xx firmware only)

This menu displays any real time measurement of the protection, as well as the values kept in memory.













MAIN MENU MEASUREMENTS	Available real time measures	
 		
CURRENT I1 0.0 A	Measure of the phase 1 primary current	0.0 to 65535A
		
CURRENT I3 0.0 A	Measure of the phase 3 primary current	0.0 to 65535A
		
CURRENT Io 0.00 A	Measure of the earth Io primary current	0.0 to 65535A
		
FREQUENCY 50.00 Hz	Measure of the network frequency	45 to 55 if Fn = 50 Hz 55 to 65 if Fn = 60 Hz
		
THERMAL IMAGE 0.0 %	Measure of the thermal state of motor	0.0 to 500 %
		
NEGATIVE SEQ. 0.0 %	Measure of the rate of negative sequence of current	
		
POSITIVE SEQ. 0.0 %	Measure of the rate of positive sequence of current	
		
CURRENT START 0.0 A	Maximum current measured during last start (firmware 2.xx)	0 to 65535A
		
STARTS ALLOWED 4	number of authorized remaining starts	Inactive if function MAX NBR STARTS inactive.
		
START TIME 3.00 s	Duration of the last start	1 to 200 s
		
AVER. CURRENT I1	Value of the average primary current	0 to 65535A















100.0 A	of phase 1	
		
AVER. CURRENT I3 100.0 A	Value of the average primary current of phase 3	0 to 65535A
		
AVER. CURRENT I0 0.0 A	Value of the average earth-fault primary current	0 to 65535A
		
SETTING set 1	Display of the active setting group	set 1 or set 2
		
02/07/01 10:19:42	Day / Month / Year Hour / minute / second	

### 5.3 Maintenance menu (since V3.00 firmware)

This menu displays any real time measurement of the protection, as well as the values kept in memory.

MAIN MENU MAINTENANCE	Available real time measures	
 		
CURRENT I1 0.0 A	Measure of the phase 1 primary current	0.0 to 65535A
		
CURRENT I3 0.0 A	Measure of the phase 3 primary current	0.0 to 65535A
		
CURRENT Io 0.00 A	Measure of the earth Io primary current	0.0 to 65535A
		
FREQUENCY 50.00 Hz	Measure of the network frequency	45 to 55 if Fn = 50 Hz 55 to 65 if Fn = 60 Hz
		
THERMAL STATE 0.0 %	Measure of the thermal state of motor	0.0 to 500 %
		
NEGATIVE SEQ. 0.0 %	Measure of the rate of negative sequence of current	
		
POSITIVE SEQ. 0.0 %	Measure of the rate of positive sequence of current	
		
LAST START CURR. 0.0 A	Maximum current measured during last start (firmware 2.xx)	0 to 65535A
		
LAST START DATE 01/12 01:52:47	Date of last start Day/Month Hour : Minute : Second	
		
MAX START CURR. 0.0 A	Maximum current measured during all starts	0 to 65535A
		
STARTS ALLOWED 4	number of authorized remaining starts	Inactive if function MAX NBR STARTS inactive.












 <b>LAST START TIME</b> 3.00 s	Duration of the last start	1 to 200 s
 <b>MAX START TIME</b> 0.00 s	Maximum duration measured during all starts	1 to 200 s
 <b>OPERATING TIME</b> 0 h      0 mn	hour(s) and minute(s) counter since the last start	0 to 65535 h 0 to 59 mn
 <b>SERVICE TIME</b> 4h	Counter of running hours since the commissioning	0 to 65535 h
 <b>AVER. CURRENT I1</b> 100.0 A	Value of the average primary current of phase 1	0 to 65535A
 <b>AVER. CURRENT I3</b> 100.0 A	Value of the average primary current of phase 3	0 to 65535A
 <b>AVER. CURRENT I0</b> 0.0 A	Value of the average earth-fault primary current	0 to 65535A
 <b>SETTING</b> set 1	Display of the active setting group	set 1 or set 2
 <b>E1E2E3E4E5E6E7E8</b> 0 0 0 0 0 0 0 0	Display of the digital inputs	0 if inactive or 1 if active
 <b>WD A B C D E F G</b> 1 0 0 0 0 0 0	Display of the digital outputs	0 if inactive or 1 if active
 <b>REL. HOLD. RESET</b> Confirm : ENTER	Reset of latching output relays ANSI 86*	
 02/07/01 10:19:42	Day / Month / Year Hour / minute / second	

\* for ≥V2.20 Firmware , see « Counters » menu

## 5.4 Phase/earth fault menu, after starting

This menu allows the setting of the phases and earth fault over current functions: setting in and out of order, choice of the types of time delay and curves, adjustment of thresholds, assignment of the output units.

This configuration must be carried out successively for each of the two settings groups if they are to be used alternatively.

MAIN MENU PHASE EARTH FLT.	Parameters of the ANSI 50, 51N functions	
 		
SETTING set 1	Choose the setting group	set 1 or set 2
		
SHORT CIRCUIT Active	Choose Active to use the phase to phase short-circuit function	Active or Inactive
		
SHORT CIRC.DELAY 0.06 s	Set the value of time delay of the phase to phase short-circuit function	0.04 to 3 s
		
SHORT CIRC.THRES 3.0 * In	Set the threshold of the phase to phase short-circuit function	3.0 to 12.0 * In
		
SHORT C.INST.REL A B C D	Select relay to assign to the short-circuit instantaneous function	See chap 4 to choose a relay or to modify the assignment
		
SHORT C.INST.REL E F G		(relays D, E, F, G if option available)
		
SHORT C.TRIP.REL A B C D	Select relay to assign to the short-circuit trip function	See chap 4 to choose a relay or to modify the assignment
		
SHORT C.TRIP.REL E F G		(relays D, E, F, G if option available)
		
EARTH FAULT Active	Choose Active to use the earth fault function	Active or Inactive
		
INHIBITION I <sub>o</sub> Active	Choose Active to use the earth fault function during the start	Active or Inactive



EARTH FLT DELAY  
0.06 s

Set the value of the time delay of earth fault function

0.04 to 3 s



EARTH FLT THRESH  
0.1 \* In

Set the value of the threshold of earth fault function

0.03 to 0.4 \* In



EARTH INST. RELAY  
A B C D

Select relay to assign to the earth fault instantaneous function

See chap 4 to choose a relay or to modify the assignment



EARTH INST. RELAY  
E F G

(relays D, E, F, G if option available)



EARTH TRIP RELAY  
A B C D

Select relay to assign to the earth fault trip function

See chap 4 to choose a relay or to modify the assignment











EARTH TRIP RELAY  
E F G

(relays D, E, F, G if option available)

## 5.5 Generic functions menu












This menu allows the parameter setting of 4 or 8 (according option or relay type) customized functions: setting in and out of order, adjustment of the time delays, assignment of the output units and assignment of a digital input.

MAIN MENU GENERIC FUNCTION   	Parameters of the customized functions	
FCT GENERIC 1 Inactive  	Choose Trip or Report to use function 1.	Trip or Disable or Report*
TEMP GENERIC 1 0.06 s  	Set the time delay of function 1	0.04 to 300.00s
RELAY GENERIC 1 A B C D  	Select relay to assign to function 1	See chap 4 to choose a relay or to modify the assignment
RELAY GENERIC 1 E F G  		(relays D, E, F, G if option available)
DIG. INP. GENER. 1 Input 1  	Display of input selected for function 1	No input, Input 1 to 8 (or 1 to 4 according option)
NAME GENERIC 1 ALARM AERO  	Display of label of function 1	No input, Input 1 to 8 (or 1 to 4 according option)
..... .....		

\* The « Report » mode is available since V2.20 firmware.

## 5.6 Thermal overload menu

This menu allows the parameter setting of the thermal overload function: setting in and out of order, type of thermal overload, adjustment of the thermal time-constant, adjustment of the thermal trip and alarm thresholds, assignment of the output units for alarm and trip.

MAIN MENU THERMAL IMAGE   	Parameters of the thermal overload option.	
SETTING set 1  	Choose the setting group	set 1 or set 2
THERMAL OVERLOAD Active  	Choose Active to use thermal overload function	Active or Inactive
HEATING CONST 40 mn  	Set the value of the thermal overload time-constant	4 to 64 minutes
COOLING CONST 4.0 * CST. ECHAUF  	Set the cooling constant	1.0 to 6.0 * heating constant
START FACTOR 50 %  	Set the coefficient calculation of the thermal overload (starting mode)	50 to 100 %
NEG. SEQ. FACTOR 3  	Set the negative sequence factor K (thermal heating)	0 to 9
THERM THR. Iref 0.40 * In  	Set the thermal reference current Iref, used by thermal overload function	0.40 to 1.3 x In
TH. TRIP RELAY A B C D  	Select relay to assign to the thermal overload trip function	See chap 4 to choose a relay or to modify the assignment
TH. TRIP RELAY E F G  		(relays D, E, F, G if option available)
TH. ALARM THRESH 80 %	Set the thermal alarm threshold	80 to 100 %



TH. ALARM RELAY  
A B C D

Select relay to assign to the thermal alarm function

See chap 4 to choose a relay or to modify the assignment














TH. ALARM RELAY  
E F G






(relays D, E, F, G if option available)



## 5.7 Start menu








This menu allows the parameter setting of the too long start, locked rotor, limitation of the number of start and inhibition of hot start functions: setting in and out of order, adjustment of the start motor and inhibition of hot start threshold, adjustment of the time delays (start, locked rotor, restarting), assignment of the output units for the trip (too long start, locked rotor and inhibition of start).

MAIN MENU STARTING FCT.   	Number of starts, too long start, rotor stall after start period	
SETTING set 1  	Choose the setting group	set 1 or set 2
LONG ST/ST.ROTOR Active  	Choose Active for too long start and locked rotor (51 LR)	Active or Inactive
START THRESHOLD 2.0 * Iref  	Detection Threshold of the start of the motor (Iref: thermal current of reference)	1.0 to 10.0 * Iref
START DELAY 20 s  	Maximum duration of start for too long start	2 à 200 s
STALLED DELAY 0.2 s  	Time delay to detect a locked rotor after a start	0.2 to 2.0 s
REL.LONG S/ROT S A B C D  	Select the too long start and locked rotor relays (51 LR)	See chap 4 to choose a relay or to modify the assignment
REL.LONG S/ROT S E F G  		(relays D, E, F, G if option available)
MAX NBR STARTS Active  	Choose Active for the maximum number of starts function	Active or Inactive
MAX NBR STARTS 3  	Maximum number of starts during time delay	1 to 4
AUTHORIS. DELAY	Set the time delay for counting the	15 to 60 min

15 min	number of starts	
		
BLOCKING DELAY 15 min	Duration of the inhibition of restarting	15 to 60 min
		
HOT START Active	Choose Active for the hot motor inhibition of start function	Active or Inactive
		
HOT START THRESH 40 %	Setting of the threshold of inhibition of hot motor starting	40 to 100 %
		
START RELAY A B C D	Select relay to assign to inhibition of hot motor starting	See chap 4 to choose a relay or to modify the assignment
		
START RELAY E F G		(relays D, E, F, G if option available)











## 5.8 Loss of load menu (or pump unpriming)

This menu allows setting operation on loss of load.

MAIN MENU LOSS OF LOAD	Parameters of the minimum load function (pump unpriming) 37	
 		
SETTING set 1	Choose the setting group	set 1 or set 2
		
LOSS OF LOAD Active	Choose Active to use the loss of load function	Active or Inactive
		
MIN THRESHOLD Id 0.20 * In	Minimum direct current for loss of load threshold	0.10 to 2.40 * In
		
LOAD LOSS DELAY 2 s	Set the time delay of the loss of load function	0.05 to 120 s
		
LOAD LOSS RELAY A B C D	Select relay to assign to the loss of load function	See chap 4 to choose a relay or to modify the assignment
		
LOAD LOSS RELAY E F G		(relays D, E, F, G if option available)

## 5.9 Unbalance menu







This menu allows setting the unbalance function.

MAIN MENU UNBALANCE		
 		
SETTING set 1	Choose the setting group	set 1 or set 2
		
UNBALANCE Active	Choose Active to use unbalance and phase reversal function	Active or Inactive
		
NEG. SEQ. THRESH 0.20 * In	Set the negative sequence threshold	0.20 to 0.80 * In
		
NEG. SEQ. DELAY 1 s	Set the dependent time curve	1 to 10 s
		
TRIP. MIN. N. S. DEL 0.06 s	Set the minimum duration of trip	0.04 to 10 s
		
UNBAL. INST. RELAY A B C D	Select relays for the instantaneous unbalance and phase reversal functions	See chap 4 to choose a relay or to modify the assignment
		
UNBAL. INST. RELAY E F G		(relays D, E, F, G if option available)
		
UNBAL. TRIP RELAY A B C D	Select relays for the time delayed unbalance and phase reversal trip functions	See chap 4 to choose a relay or to modify the assignment
		
UNBAL. TRIP RELAY E F G		(relays D, E, F, G if option available)





## 5.10 Load-shedding menu

This menu allows setting the load-shedding function on order external and the restarting of the motor.

### 5.10.1 Load-shedding menu (V1.24 and V2.xx firmware)

MAIN MENU DELOAD	Load-shedding on external order and re acceleration parameters	
 		
SETTING set 1	Choose the setting group	set 1 or set 2
		
DELOAD Active	Choose Active to use the load-shedding function	Active or Inactive
		
DELOAD DELAY 0.10 s	Set time delay of load-shedding	0.06 to 120 s
		
DELOAD RELAY A B C D	Select relay to assign for the load-shedding function.	See chap 4 to choose a relay or to modify the assignment
		
DELOAD RELAY E F G		(relays D, E, F, G if option available)

### 5.10.2 Load-shedding menu (since V3.00 firmware)

MAIN MENU LOAD SHEDDING	Load-shedding on external order and re acceleration parameters	
 		
SETTING set 1	Choose the setting group	set 1 or set 2
		
LOAD SHEDDING Active	Choose Active to use the load-shedding function	Active or Inactive
		
LOAD SHED DELAY 0.10 s	Set time delay of load-shedding	0.06 to 120 s



LOAD SHED RELAY  
A B C D

Select relay to assign for the load-shedding function.

See chap 4 to choose a relay or to modify the assignment



LOAD SHED RELAY  
E F G











(relays D, E, F, G if option available)

## 5.11 Remote control menu

This menu allows enabling the remote control functions, choice of the level of load-shedding, choice of the reclose time delay assignment of the trip and reclose relays and choice of the reclose pulse.


This menu is available if the communication option is present.

### 5.11.1 Telecontrol menu (V1.24 and V2.xx Firmware)





MAIN MENU TELECONTROL	Information about remote control option	
		
TELECONTROL Active	Choose Active to use remote control option	Active or Inactive (Active if communication available)
		
LOAD SHED LEVEL 6	Set the level of load-shedding.	1 to 6 (Level 6 inhibits the load-shedding function)
		
RE-LOAD DELAY 20.00 s	Set the time delay before reclosing	1.00 s to 120.00 s
		
TRIP RELAY A B C D	Select relay to assign to remote control trip	See chap 4 to choose a relay or to modify the assignment
		
TRIP RELAY E F G		(D, E, F, G relay if option available)
		
RECLOSE RELAY A B C D	Select relay to assign to remote control close order	See chap 4 to choose a relay or to modify the assignment
		
RECLOSE RELAY E F G		(D, E, F, G relay if option available)
		
RECLOSE PULSE 200 ms	Setting of the minimum duration of reclosing pulse	100 to 500 ms
		
O/O INPUT Input 1	Display of input assigned to the O/O interlock position (CB closed)	No input, Input 1 to 8 (or 1 to 4 according option)
		

C/O INPUT Input 2	Display of input assigned to the F/O interlock position (CB open)	No input, Input 1 to 8 (or 1 to 4 according option)
LOCAL INPUT Input 3	Display of input assigned to the LOCAL operation mode	No input, Input 1 to 8 (or 1 to 4 according option)
DISTANT INPUT Input 4	Display of input assigned to the DISTANT operation mode	No input, Input 1 to 8 (or 1 to 4 according option)

### 5.11.2 Telecontrol menu (since V3.00 Firmware)






MAIN MENU TELECONTROL	Information about remote control option	
		
TELECONTROL Active	Choose Active to use remote control option (Available if the communication option is present)	Active or Inactive
LOAD SHED LEVEL 2	Set the level of load-shedding. Level 6 inhibits the load-shedding function (Available if the communication option is present)	1 to 6
RE-LOAD DELAY 20.00 s	Set the time delay before reclosing (Available if the communication option is present)	1.00 s to 120.00 s
TRIP RELAY A B C D	Select relay to assign to remote control trip order	See chap 4 to choose a relay or to modify the assignment
TRIP RELAY E F G		(D, E, F, G relay if option available)
RECLOSE RELAY A B C D	Select relay to assign to remote control close order	See chap 4 to choose a relay or to modify the assignment
RECLOSE RELAY E F G		(D, E, F, G relay if option available)



RECLOSE PULSE 200 ms	Setting of the minimum duration of reclosing pulse	100 to 500 ms
		
O/O INPUT Input 1	Display of input assigned to the O/O interlock position (CB closed)	No input, Input 1 to 8 (or 1 to 4 according option)
		
C/O Input Input 2	Display of input assigned to the F/O interlock position (CB open)	No input, Input 1 to 8 (or 1 to 4 according option)
		
LOCAL INPUT No input	Display of input assigned to the LOCAL operation mode (Available if the communication option is present and if the management of input(s) number Local/distant is carried out with 2 digital inputs)	No input, Input 1 to 8 (or 1 to 4 according option)
		
DISTANT INPUT Input 4	Display of input assigned to the DISTANT operation mode (Available if the communication option is present)	No input, Input 1 to 8 (or 1 to 4 according option)












## 5.12 Disturbance menu

This menu is used to configure the parameters of the disturbance recording.

MAIN MENU PERTURBOGRAPHY	Parameters of the disturbance recording function	
 		
PRE-TIME 30 period(s)	Set pre time	1 to 52 periods
		
PERTURBO. INPUT E5	Display of input assigned to the external disturbance recording triggering	No input, Input 1 to 8 (or 1 to 4 according option)
		
REL. DISTURB. A B C D	Select relay to assign to disturbance recording trip (Available from V3.00 Firmware )	See chap 4 to choose a relay or to modify the assignment
		
REL. DISTURB. E F G		(relays D, E, F, G if option available)

## 5.13 Counters menu

This menu allows the parameter setting of the counters: display of cut A<sup>2</sup>, number of circuit breaker operations, current maximeters and reset of the counters.

MAIN MENU COUNTERS	Parameters of the counters function	
 		
A2 CUTOFF I1 100000.0 kA2	Display of cut A <sup>2</sup> of phase 1	
		
A2 CUTOFF I3 100000.0 kA2	Display of cut A <sup>2</sup> of phase 3	
		
RAZ A2 CUTOFF Confirm: ENTER	Reset of cut A <sup>2</sup> with ENTER key	
		
NBER OPERATIONS 100	Display of the number of operations of the circuit breaker	
		
RESET NB OPERAT. Confirm : ENTER	Reset of the number of operations of the circuit breaker	
		
REL. HOLD RESET Confirm : ENTER	ANSI 86*, reset of the latching function for the output relay	
		
MAX. METER I1 100 A	Display of the current maximeter on phase 1	
		
MAX. METER I3 100 A	Display of the current maximeter on phase 3	
		
MAX. METER I0 10.0 A	Display of the current maximeter on earth	
		
MAX. METER RESET Confirm : ENTER	Reset of current maximeter with ENTER key	

\*The “REL.HOLD.RESET” function is available since V2.20 Firmware. (For V3.00, see the « Maintenance » menu).











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## 5.14 Operation menu







This menu allows the parameter setting of the operation function: choice of the language, adjustment of LCD contrast, parameter setting of the values of the phase and earth-fault CTs, display of the digital input corresponding to set 2, trip pulse, maximum of cut A<sup>2</sup> and number of operations of the circuit breaker, assignment of the relays for circuit breaker failure and discrepancy, average current.













### 5.14.1 Operation menu (1.24 and V2.xx firmware)










MAIN MENU OPERATION	Operating parameters to be defined at commissioning	
 		
LANGUAGE English	Choice of the language used locally by protection	French, English, Italian or Spanish
		
ADJUST LCD 200	Adjustment of the angle of vision of the LCD display	70 to 255
		
I NOMINAL PRIM. 1000 A	Set the value of the phase primary rated current of the CTs	1 to 10000 A
		
I <sub>o</sub> NOMINAL PRIM. 100 A	Set the value of the earth primary rated current of the CT	1 to 10000 A
		
SET 2 INPUT E6	Display of input assigned to setting group 2	No input, Input 1 to 8 (or 1 to 4 according option)
		
CLEAR REL. INPUT No input	Display of input assigned to reset of relays	No input, Input 1 to 8 (or 1 to 4 according option)
		
TRIP PULSE 100 ms	Setting of minimum duration of trip pulse	100 to 500 ms
		
MAX A <sup>2</sup> CUTOFF 200000 kA <sup>2</sup>	Adjustment of the maximum of cut A <sup>2</sup>	1 to 64 000 000 KA <sup>2</sup>
		
MAX NBER OPERAT. 9999	Adjustment of maximum number of circuit breaker operations	1 to 10000

 RELAY C.B. FAULT A B C D	Select relay to assign to the circuit breaker failure function	See chap 4 to choose a relay or to modify the assignment
 RELAY C.B. FAULT E F G		(relays D, E, F, G if option available)
 RELAY DISC. L/D A B C D	Select relay to assign to the local/distant discrepancy function	(remote control in service)
 RELAY DISC. L/D E F G		(relays D, E, F, G if option available)
 I AVERAGE in 30 mn	Adjustment of the time for calculation of average values and maximeters	5 to 60 min
 NB OF INPUTS L/D 1 input	Number of input(s), configurable for the management of the Local/Distant mode	1 or 2

### 5.14.2 Operation menu (since V3.00 firmware)








MAIN MENU OPERATION	Operating parameters to be defined at commissioning	
 		
LANGUAGE English	Choice of the language used locally by protection	French, English, Italian or Spanish
		
ADJUST LCD 200	Adjustment of the angle of vision of the LCD display	70 to 255
		
I NOMINAL PRIM. 1000 A	Set the value of the phase primary rated current of the CTs	1 to 10000 A
		
Io NOMINAL PRIM. 100 A	Set the value of the earth primary rated current of the CT	1 to 10000 A
		
SET 2 INPUT E6	Display of input assigned to setting group 2	No input, Input 1 to 8 (or 1 to 4 according option)

 CLEAR REL. INPUT E5	Display of input assigned to reset of relays	No input, Input 1 to 8 (or 1 to 4 according option)
 TRIP PULSE 100 ms	Setting of minimum duration of trip pulse	100 to 500 ms
 MAX A2 CUTOFF 200000 kA <sup>2</sup>	Adjustment of the maximum of cut A <sup>2</sup>	1 to 64 000 000 KA <sup>2</sup>
 MAX NBER OPERAT. 9999	Adjustment of maximum number of circuit breaker operations	1 to 10000
 RELAY C.B. FAULT A B C D	Select relay to assign to the circuit breaker failure function	See chap 4 to choose a relay or to modify the assignment
 RELAY C.B. FAULT E F G		(D, E, F, G relay if option available)
 REL.L/R NO-COMPL A B C D	Select relay to assign to no-complementarity local/distant function	(remote control in service)
 REL.L/R NO-COMPL E F G		(D, E, F, G relay if option available)
 NB OF INPUTS L/R 2 inputs	Number of input(s), configurable for the management of the Local/Remote mode	1 or 2 digital inputs
 CONTROL CB POSIT Inactive	Choose Active to use the management of the CB position	Active or Inactive
 CLOS. LOC. INPUT No input	Display of input assigned to the closing in local (configurable with PC software)	No input, Input 1 to 8 (or 1 to 4 according option)
		

TRIP. LOC. INPUT No input	Display of input assigned to the tripping in local (configurable with PC software)	No input, Input 1 to 8 (or 1 to 4 according option)
		
I AVERAGE in 30 mn	Adjustment of the time for calculation of average values and maximeters	5 to 60 min
		
UVR REL. ASSIG. C      D      G	Select the relay(s) to be assigned in CB under voltage release trip circuit ( <b>D</b> and <b>G</b> if option available)	
		
RELAY A RECLOSE DJ	Display the label of the output unit A	(configurable with the PC software)
		
RELAY B TRIP DJ	Display the label of the output unit B	(configurable with the PC software)
		
RELAY C ALARM 9	Display the label of the output unit C	(configurable with the PC software)
		
RELAY D OUTPUT D	Display the label of the output unit D (if option available)	(configurable with the PC software)
		
RELAY E OUTPUT E	Display the label of the output unit E (if option available)	(configurable with the PC software)
		
RELAY F OUTPUT F	Display the label of the output unit F (if option available)	(configurable with the PC software)
		
RELAY G OUTPUT G	Display the label of the output unit G (if option available)	(configurable with the PC software)

## 5.15 Communication Modbus® menu (if option available)

This menu is used to set the parameters of the Modbus® communication function: slave number, size, speed, activity and loop tests.

MAIN MENU COMMUNIC. MODBUS	Configuration of the Modbus RS485 communication option	V1.24 and V2.xx Firmwares
<b>Or</b>		
MAIN MENU RS485 COMMS	Configuration of the Modbus RS485 communication option	Since V3.00 Firmware
 		
SLAVE NUMBER 2	Slave number of protection	1 to 255
		
FORMAT 8b+0p+ASCII2s	number of bits + parity + bits of stop + ASCII/Binary format	Parity: 1p = pair, 1i = odd, 0p= without p0 = forced to 0, p1 = forced to 1
		
SPEED 9600 bauds	Speed transmission on RS485 link	300, 600, 1200, 1800, 2400, 4800, 9600, 19200 38400, 57 600, 115 200 bauds
		
RECEPT. TIMEOUT 0.10 s	Set the time delay of reception timeout	0.10 to 20 s
		
ACTIVITY TIMEOUT 0.20 s	Set the time delay of activity timeout	0.10 to 20 s
		
ACTIVITY TEST Mes.Not Received	Test of the parameter setting and the wiring of Modbus	message received / not received: correct activity / communication problem

## 5.16 Change of code menu






This menu allows change of code and is described in chapter Access Code.









## 5.17 Information menu

Information menu specifies the factory set characteristics of the protection, as well as the wording assigned by the User.

### 5.17.1 Information menu (V1.24 and V2.xx firmware)

MAIN MENU INFORMATIONS	Information about protection	
 		
NP.M 800 50 Hz	Type of protection Rated frequency	50 or 60 Hz
		
PROC.VER. x.xx	Version of the software of protection	
		
PHASES RAT. 1 A EARTH RAT. 1 A	Display of the phases and earth ratings	1 A, 5 A, or CBCT
		
NP 800 ICE	32 characters zone programmable with the setting software.	

### 5.17.2 Menu informations (à partir de la Version V3.00)

MAIN MENU INFORMATIONS	Information about protection	
 		
NPM800 50 Hz	Type of protection Rated frequency	50 Hz or 60 Hz
		
PROC. VER. 3.xx	Version of the software of protection	
		
PHASES RAT. 5 A EARTH RAT. 5 A	Display of the phases and earth ratings	1 A, 5 A, or CBCT
		
ICE NP800	32 characters zone programmable with the setting software.	
		
SERIAL NUMBER	Serial number of the protection	

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## 6. Content of an event

Events are different according to information recorded when fault occurs. There are three different types of structures of event.








They can be read with the local MMI, the setting software (RS232 link) and the Modbus communication network.

### 6.1 Events generated on 50/51N/37/46 thresholds (NPM800 and NPM800R - NPM800RE)

Events are recorded as soon as a trip or alarm threshold of the current functions is reached:

- ◆ INST PH FAULT
- ◆ TRIP PH FAULT
- ◆ INST Io FAULT
- ◆ TRIP Io FAULT
- ◆ INST UNBALA PH
- ◆ TRIP UNBALA PH
- ◆ TRIP START LON
- ◆ TRIP STALL ROT
- ◆ TRIP LOSS LOAD
- ◆ TRIP DELOAD

Detail of available information can be consulted for each event, in accordance with the list below:

MAIN MENU EVENTS	List of the last 250 events	
 		
TRIP PH FAULT S 17/06 14:22:00 R	Type of fault <b>Start or End of fault</b> Day/Month Hour/Minute/Second - Dated event <b>Relative/</b> <b>Synchronous</b>	
		
17/16/13 14:22:00.990	Day: Month: Year Hour: Minute: Second. Millisecond	
		
SETTING set 1	Active setting group when tripping	set 1 or set 2
		
CURRENT I1 745 A	Current of phase 1 measured during the event	
		
CURRENT I3 743 A	Current of phase 3 measured during the event	
		

CURRENT I<sub>o</sub>  
0.1 A

Earth-fault current measured during the event





NEGATIVE SEQ.  
175,6 %

Rate of negative sequence current measured during the event



THERMAL STATE  
0 °

Motor thermal state measured during the event

Using keys  and  allows to display further information about the fault.








## 6.2 Thermal overload event

Events are recorded as soon as a trip or alarm threshold of the voltage or frequency functions is reached:








- ◆ ALRM THERM REP
- ◆ TRIP THERM REP

Detail of available information can be consulted for each event, in accordance with the list below:

### 6.2.1 Alarm

ALRM THERM REP S 17/06 13:25:55 R	Type of fault <b>Start or End of fault</b> Day/Month Hour/Minute/Second - Dated event <b>Relative/Synchronous</b>	
		
17/06/03 13:25:55.240	Day: Month: Year Hour: Minute: Second. Millisecond	
		
SETTING set 1	Active setting group when tripping	set 1 or set 2
		
CURRENT I1 2484 A	Phase 1 current measured during the event	
		
CURRENT I3 0 A	Phase 3 current measured during the event	
		
CURRENT Io 0.0 A	Earth fault current measured during the event	
		
NEGATIVE SEQ. 90.0 %	Rate of negative sequence current measured during the event	
		
THERMAL STATE 80 %	Motor thermal state measured during the event	

## 6.2.2 Thermal trip


TRIP THERM REP E 17/06 13:25:59 R	Type of fault <b>Start or End of fault</b> Day/Month Hour/Minute/Second - Dated event <b>Relative/Synchronous</b>	
		
17/06/03 13:26:59.920	Day / Month / Year Hour: Minute: Second. Millisecond	
		
SETTING set 1	Active setting group when tripping	set 1 or set 2
		
CURRENT I1 2490 A	Phase 1 current measured at appearance of trip	
		
CURRENT I3 0 A	Phase 3 current measured at appearance of trip	
		
CURRENT Io 0.0 A	Earth fault current measured at appearance of trip	
		
NEGATIVE SEQ. 100 %	Rate of negative sequence current	
		
THERMAL STATE 0 %	Motor thermal state measured at appearance of trip	


## 6.3 Customized inputs events

Events are recorded as soon as one of the customized input status changes.

- ◆ INST GENERIC
- ◆ TRIP GENERIC

Detail of available information can be consulted for each event, in accordance with the list below:

TRIP GENERIC S 25:6 9:35:45 R	Type of fault <b>Start or End of fault</b> Day/Month Hour/Minute/Second - Dated event <b>Relative/Synchronous</b>	
		
25/6/95 9:35:45.011	Day / Month / Year Hour: Minute: Second. Millisecond	

 SETTING set 1	Active setting group when tripping	réglage 1 ou set 2
---	------------------------------------	--------------------

## 6.4 Other events

The contents of the following events can be specified:

- ◆ ALRM NB OPERAS
- ◆ ALRM A2 CUTOFF
- ◆ CB FAIL
- ◆ DISC LOCA/REMO
- ◆ MODE REMOTE
- ◆ UNLISTED EVENT
- ◆ SETTING SET 2
- ◆ TRIP TELECONTR
- ◆ RECLOSE TELECO
- ◆ ALRM COIL
- ◆ ALRM CDE BREAK

Detail of available information can be consulted for each event, in accordance with the list below:

ALRM NB OPERAS S 25:6 9:35:45 R	Type of fault <b>Start or End of fault</b> Day:Month Hour:Minute:Second - Dated event <b>Relative/Synchronous</b>
------------------------------------	---





25/6/95 9:35:45.011	Day / Month / Year Hour: Minute: Second. Millisecond
------------------------	---



SETTING set 1	Active setting group	set 1 or set 2
------------------	----------------------	----------------

## 6.5 Acknowledgement of events

The acknowledgement of the last event is carried out while pressing on CLEAR key:

TRIP THERM REP E 17/06 14:22:00 R		ACKNOWLEDGE ALL Confirm : ENTER		CURRENT I1 100.0 A
--------------------------------------	---	------------------------------------	---	-----------------------

## 6.6 Reading of the last 250 memorized events

After acknowledgement, the memorized events still may be read. It is necessary to use the local sub-menu EVENTS of the MMI.

## 7. List of faults or operation messages

### 7.1 List of faults or operation message (Firmware V1.24 and V2.xx)

The following messages are locally displayed in real time on LCD display throughout fault.

### 7.2 Messages related to instantaneous type functions:

INSTANTANEOUS PHASE FAULT  
INSTANTANEOUS EARTH FAULT  
ALARM THERMAL REPLICIA  
INSTANTANEOUS UNBALANCE

### 7.3 Messages related to trip type functions:

TRIP PHASE FAULT  
TRIP EARTH FAULT  
TRIP THERMAL REPLICIA  
TRIP START TOO LONG  
TRIP STALLED ROTOR  
TRIP UNBALANCE PHASE  
TRIP LOSS OF LOAD  
TRIP DELOAD  
TRIP BY TELECONTROL  
TRIP GENERIC

### 7.4 Messages related to alarm type functions:

ALARM NUMBER OPERATIONS  
ALARM A2 CUTOFF  
CIRCUIT BREAKER FAIL  
DISCORDANCE: LOCAL / REMOTE  
ALARM COIL CIRCUIT BREAKER  
ALARM CURRENT CIRCUIT BREAKER

### 7.5 Various messages:

RECLOSE BY TELECONTROL  
LOSS AUX. SUPP\*  
RET. AUX.SUPP\*  
REMOTE MODE  
UNLISTED EVENT

\* The “**LOSS AUX.SUPP.**” and “**RET.AUX.SUPP.**” events are available since V2.20 version



**Notes:** Disappearance of cut A<sup>2</sup> and number of operations alarms is done by resetting the COUNTERS menu. To cause the disappearance of the last fault or operation message, it is possible to press on CLEAR key of the keyboard.

## 7.6 List of faults or operation messages (Firmware V3.00)

The following messages are locally displayed in real time on LCD display throughout fault.

## 7.7 Messages related to instantaneous type functions:

INSTANTANEOUS PHASE FAULT  
INSTANTANEOUS EARTH FAULT  
ALARM THERMAL REPLICIA  
INSTANTANEOUS UNBALANCE

## 7.8 Messages related to trip type functions:

TRIP PHASE FAULT  
TRIP EARTH FAULT  
TRIP THERMAL REPLICIA  
TRIP START TOO LONG  
TRIP STALLED ROTOR  
TRIP UNBALANCE PHASE  
TRIP LOSS OF LOAD  
TRIP DELOAD  
TRIP BY TELECONTROL  
TRIP GENERIC

## 7.9 Messages related to alarm type functions:

ALARM NUMBER OPERATIONS  
ALARM A2 CUTOFF  
CIRCUIT BREAKER FAIL  
NO COMPLEMENT. LOCAL / REMOTE  
ALARM COIL CIRCUIT BREAKER  
ALARM CURRENT CIRCUIT BREAKER

## 7.10 Various messages:

RECLOSE BY TELECONTROL  
REMOTE MODE  
UNLISTED EVENT  
LOSS AUX.SUPP  
RET. AUX.SUPP.

**Notes:**

Disappearance of cut A<sup>2</sup> and number of operations alarms is done by resetting the COUNTERS menu.

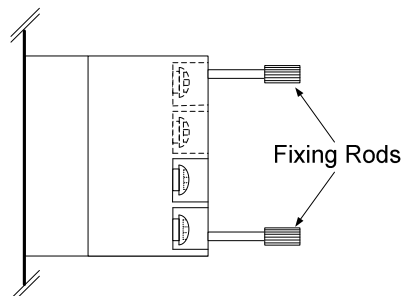
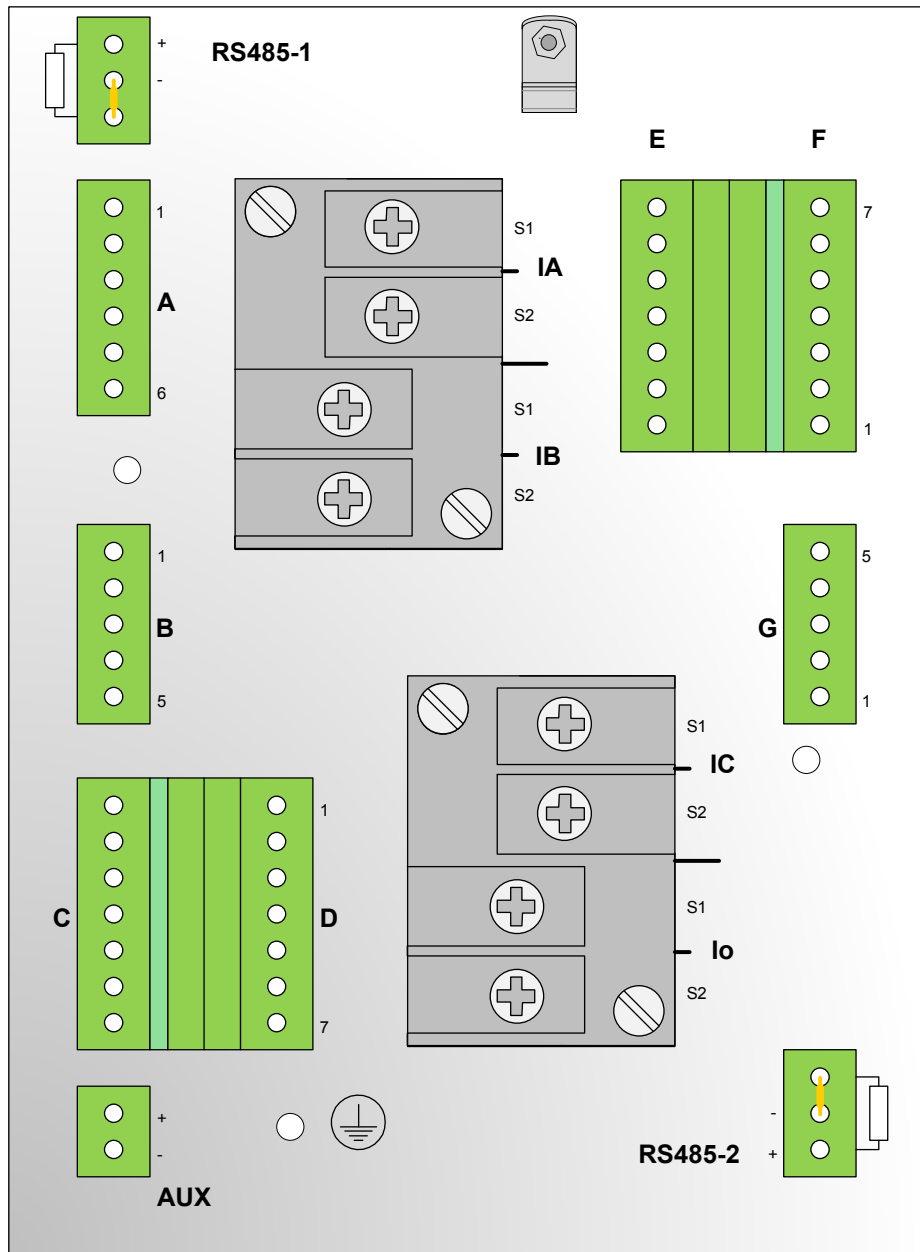
To cause the disappearance of the last fault or operation message, it is possible to press on CLEAR key of the keyboard.

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	Edition :05/05/2011	Indice : f

## 8. Connection of NPM800 relays

### 8.1 Rear view of NPM800 with location of the terminal blocks (with short-circuiting devices)

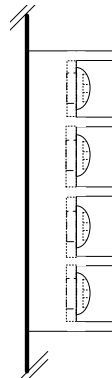
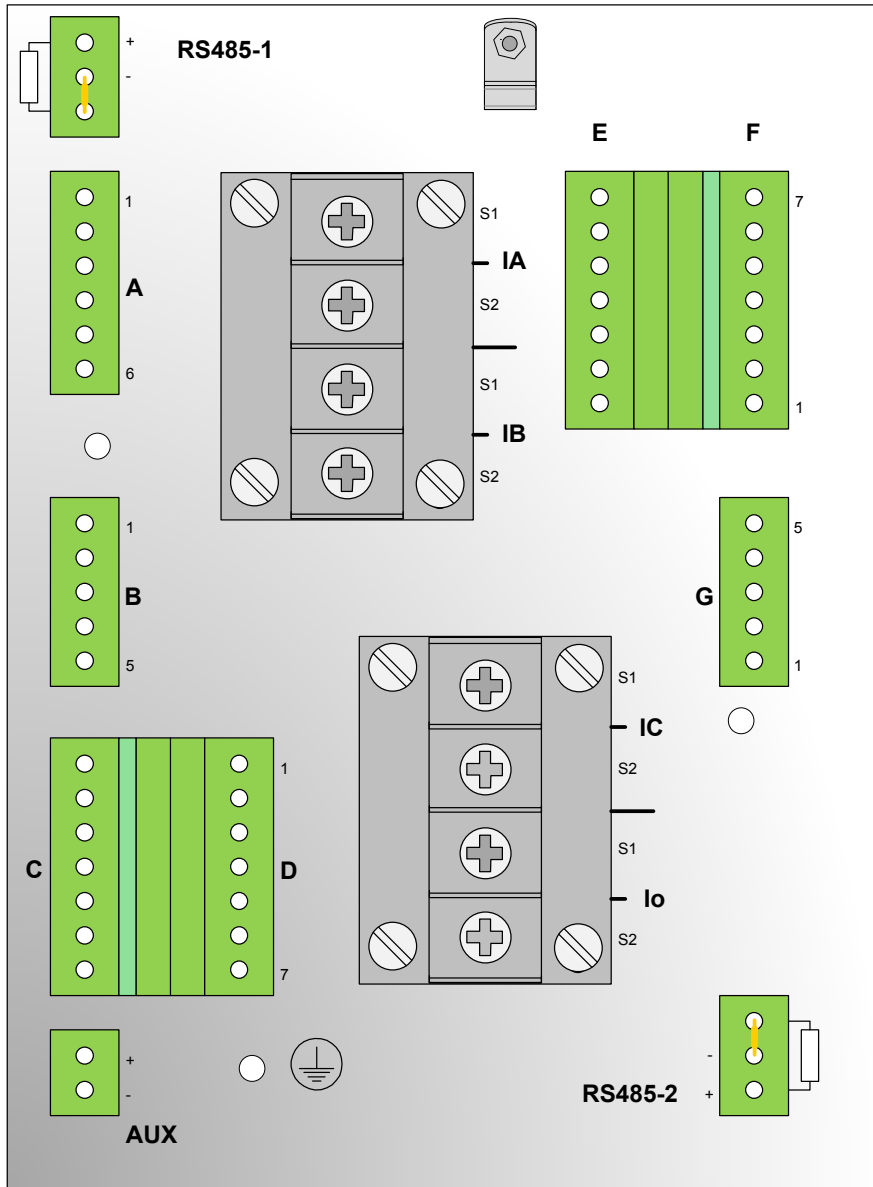
Extension board (connectors E, F, G and RS485-2) is optional on the NPM800 and connector A is not used.



Side view of the current terminal block with short-circuiting devices

## 8.2 Rear view of NPM800 with location of the terminal blocks (without short-circuiting devices)

Extension board (connectors E, F, G and RS485-2) is optional on the NPM800 and connector A is not used.



Side view of the current terminal block without short-circuiting devices

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<p>User's Guide  <b>NPM800 – NPM800R</b>  <b>NPM800RE</b></p>	<p>Date : 01/2011                  Edition :05/05/2011</p>	<p>Folio : 51                  Indice : f</p>
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### 8.3 NPM800 connections

Connections	Location	Characteristics
Modbus® or IEC870-5-103 Communication	RS485-1 RS485-2	Screw terminal block. Section of wire 0.6 to 2.5 mm <sup>2</sup>
	A	Screw terminal block not used
Digital inputs	B	Screw terminal block. Section of wire 0.6 to 2.5 mm <sup>2</sup>
Relays	C and D	Screw terminal block. Section of wire 0.6 to 2.5 mm <sup>2</sup>
Auxiliary supply	AUX	Screw terminal block. Section of wire 0.6 to 2.5 mm <sup>2</sup>
Relays (optional board)	E and F	Screw terminal block. Section of wire 0.6 to 2.5 mm <sup>2</sup>
Digital inputs (optional board)	G	Screw terminal block. Section of wire 0.6 to 2.5 mm <sup>2</sup>
Connection of the CTs	IA to IO	4 mm ring type terminal. Section of wire ≤ 6 mm <sup>2</sup>

For CTs inputs, take care to follow the rotating sense of phases and the direction of the connection of each phase during the wiring.

### 8.4 NPM800 diagram

The diagram is available under the reference S 38024.

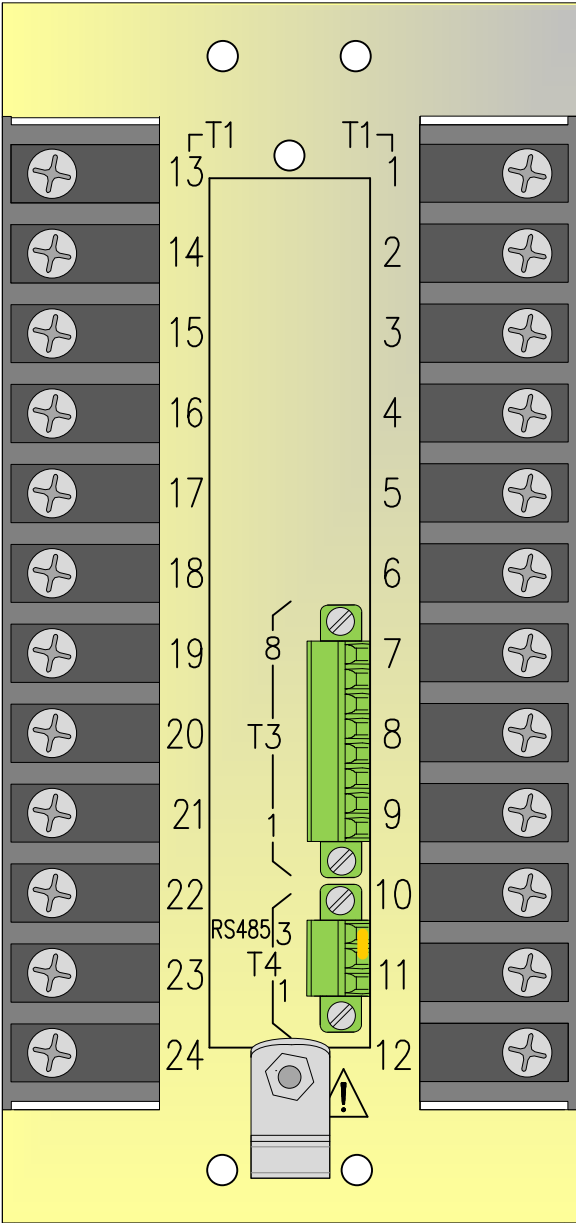
### 8.5 NPM800 connection of the current inputs

Connection is done by 6mm<sup>2</sup> ring terminals for M4 screw. It is identical for all the variants of inputs:

- ◆ Phases CT 1A or 5A
- ◆ Earth-fault CT 1A or 5A or CT Ring.

# 9. Connection of NPM800R – NPM800RE relays

## 9.1 Rear view of NPM800R with location of the terminal blocks

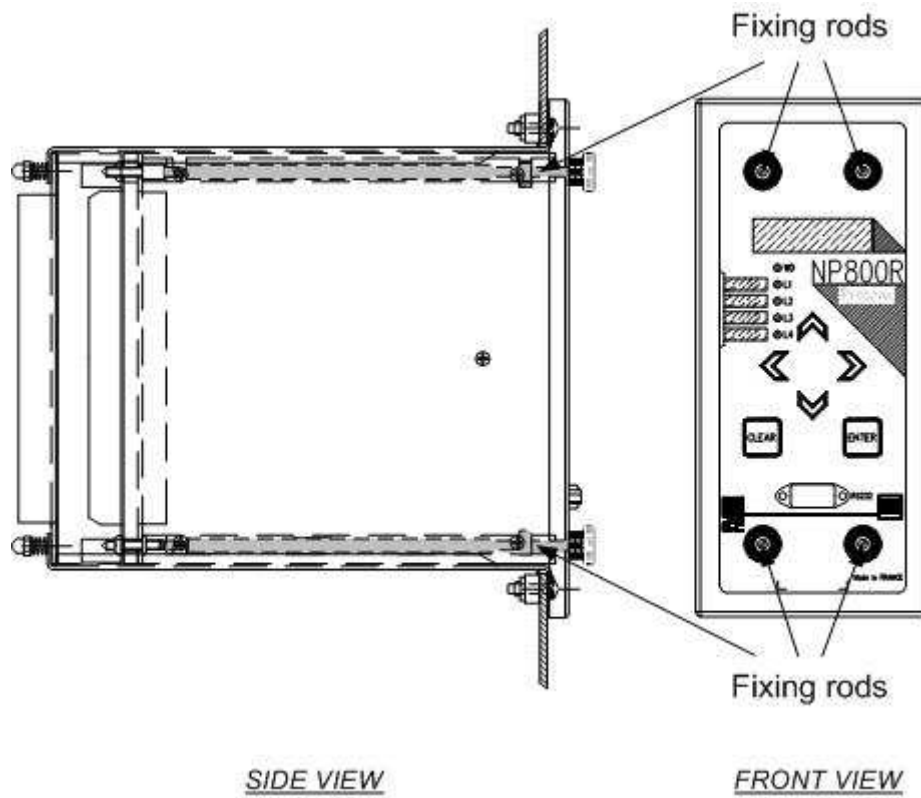


Case R2

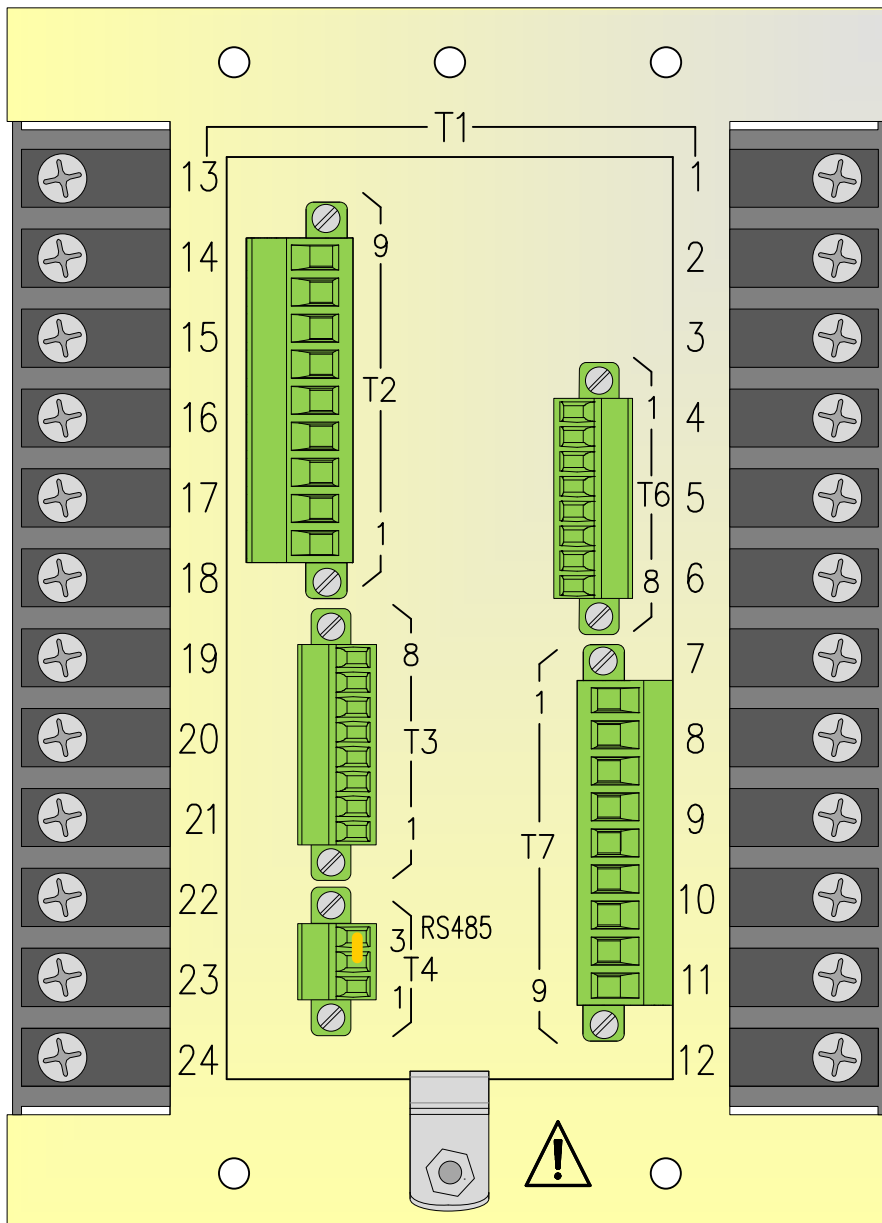
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<p>User's Guide  <b>NPM800 – NPM800R</b>  <b>NPM800RE</b></p>	<p>Date : 01/2011          Edition :05/05/2011</p>	<p>Folio : 53          Indice : f</p>
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## 9.2 NPM800R Fixing rods



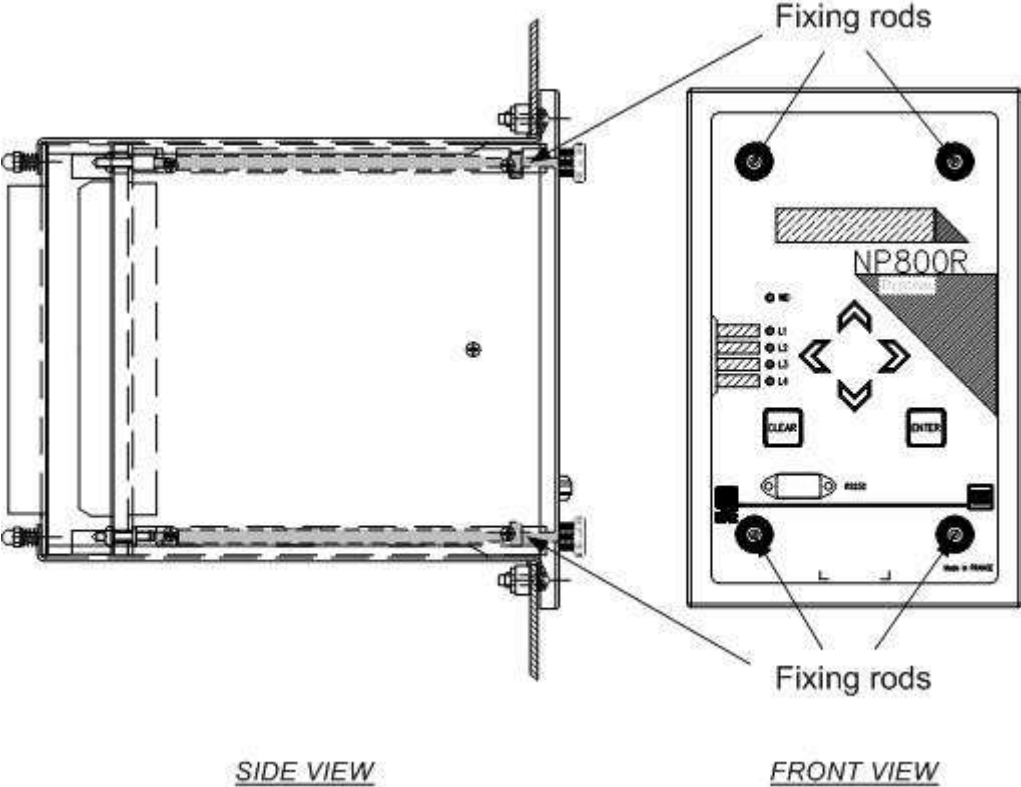
### 9.3 Rear view of NPM800RE with location of the terminal blocks



Case R3



9.4 NPM800RE Fixing rods



<p>User's Guide  <b>NPM800 – NPM800R</b>  <b>NPM800RE</b></p>	<p>Date : 01/2011                  Edition :05/05/2011</p>	<p>Folio : 56                  Indice : f</p>
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## 9.5 NPM800R connections

NPM800R (Case R2)		
Connections	Terminal Blocks	Location
Auxiliary supply	T1	4-5
Connection of the CTs		2-3, 6-7, 10-11, 14-15
Relay A		16-17, 18-19
Relay B		20-21, 22-23
Relay C		8-9, 8-12
Relay WD		13-24
Digital inputs 1 to 4	T3	1-2, 3-4, 5-6, 7-8
Modbus® or IEC870-5-103 Communication (RS485)	T4	1 to 3

For CTs inputs, take care to follow the rotating sense of phases and the direction of the connection of each phase during the wiring.

## 9.6 NPM800RE connections

NPM800RE (Case R3)		
Connections	Terminal Blocks	Location
Auxiliary supply	T1	4-5
Connection of the CTs		2-3, 6-7, 10-11, 14-15
Relays A		16-17, 18-19
Relay B	T2	3-1, 3-2, 6-4, 6-5
Relay C		9-7, 9-8
Relays D	T1	8-9, 8-12
Relays E		20-21, 22-23
Relay F	T7	3-1, 3-2, 6-4, 6-5
Relay G		9-7, 9-8
Relays WD	T1	13-24
Digital inputs 1 to 4	T3	1-2, 3-4, 5-6, 7-8
Digital inputs 5 to 8	T6	1-2, 3-4, 5-6, 7-8
Modbus® or IEC870-5-103 Communication (RS485)	T4	1 to 3

For CTs inputs, take care to follow the rotating sense of phases and the direction of the connection of each phase during the wiring.

## 9.7 NPM800R and NPM800RE wire section

Terminal Blocks	Characteristics
T1	4 mm ring type terminal. Section of wire $\leq 6 \text{ mm}^2$
T2	Screw terminal block. Section of wire 0.2 to 2.5 $\text{mm}^2$
T3	Screw terminal block. Section of wire 0.08 to 1.5 $\text{mm}^2$
T4	Screw terminal block. Section of wire 0.08 to 1.5 $\text{mm}^2$
T6	Screw terminal block. Section of wire 0.08 to 1.5 $\text{mm}^2$
T7	Screw terminal block. Section of wire 0.2 to 2.5 $\text{mm}^2$

## 9.8 NPM800R and NPM800RE diagrams

Type of relay	Observation	Reference of diagram
NPM800R		S 39966
NPM800RE		S 39971

## 10. Connection of the Modbus RS485 communication

### 10.1 Characteristics of the network cable

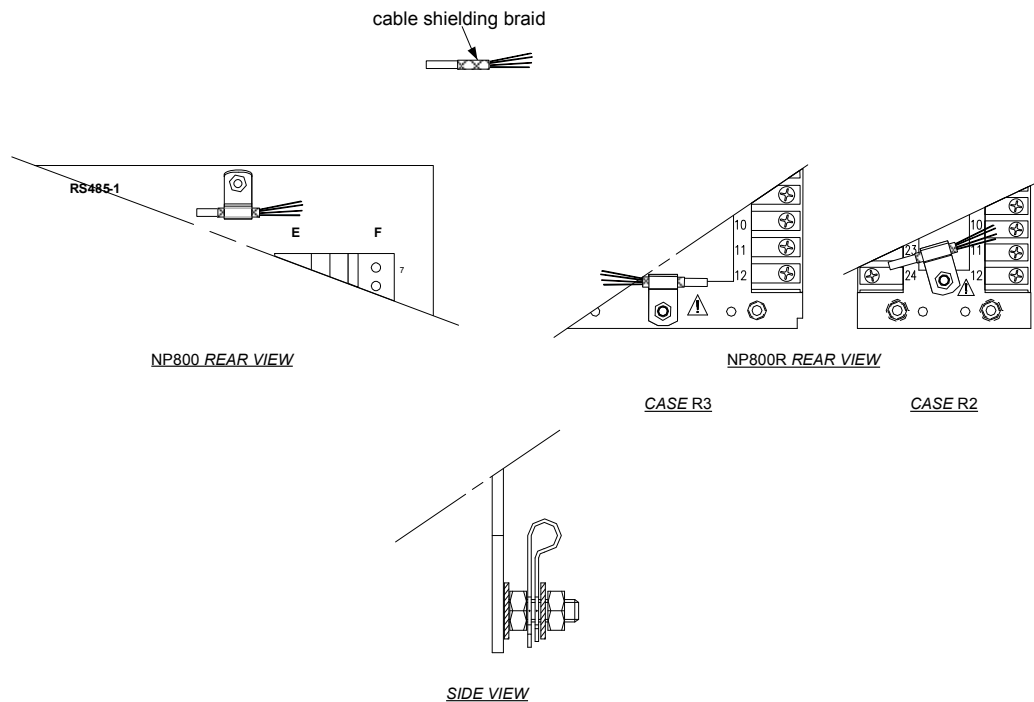
Recommended characteristics for the cable:

- Shielded twisted pairs, maximum length 1000 m.
- resistance < 100 ohms/km
- capacity between wires < 60 pF/m
- capacity between wire and shield < 100 pF/m

The NP800 and NP800R relays are fitted with one fixing clamp to hold the network cable and recover the shielding of the network cable:

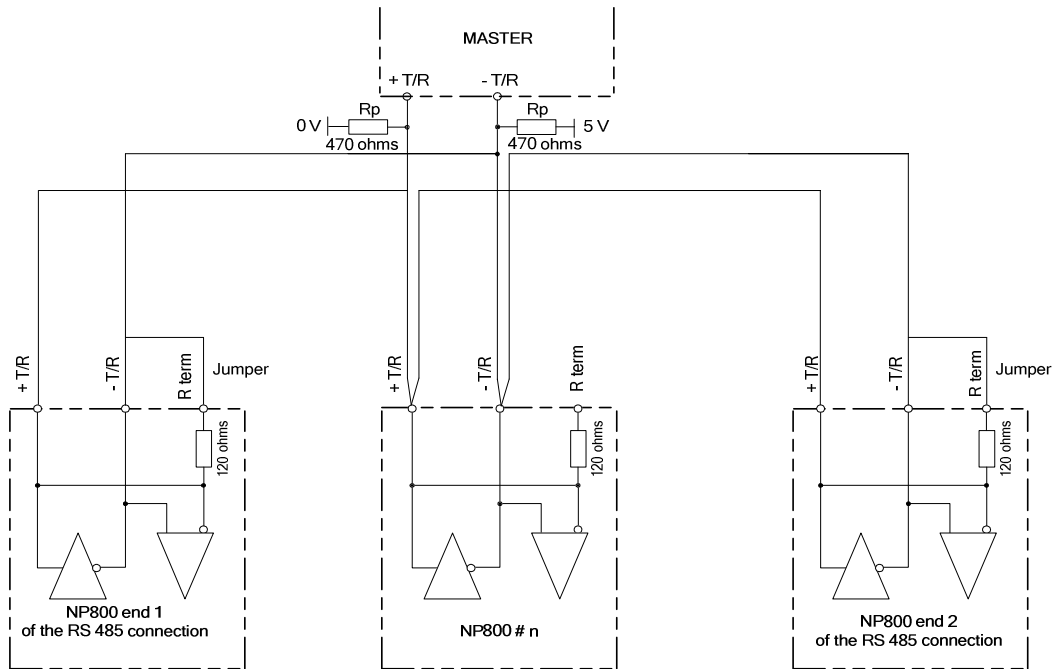
- the network cable must be stripped
- the shielding braid of the cable must be in contact with the clamp

In order to ensure continuity of the cable and its earthing, check that the fixing clamp is tightened on the shield recovering the jacket.

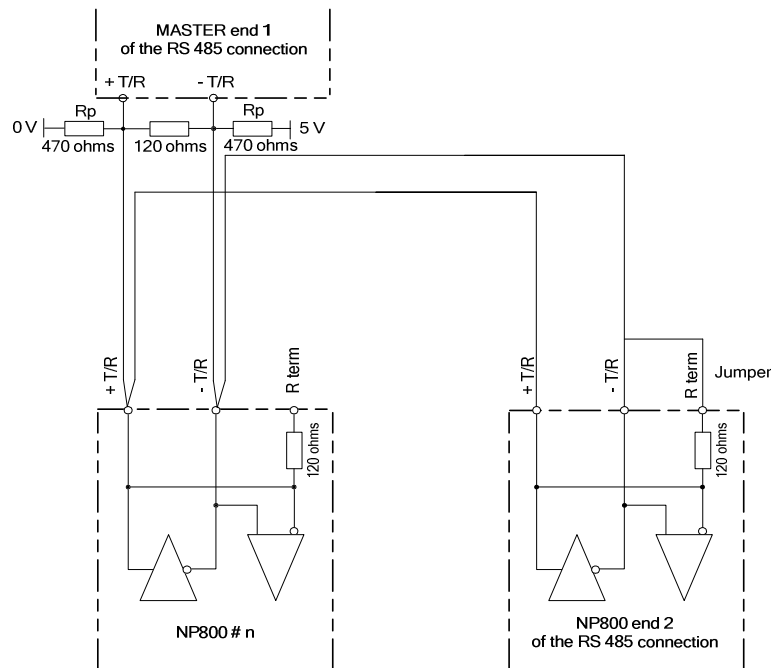


## 10.2 Resistance of adaptation of the RS 485 connection

In order to adapt the impedance of the RS 485 connection, two resistances of 120 ohms are necessary. With this intention, NP800 relays are fitted with a resistance of 120 ohms and a jumper provided for this purpose. To carry out this adaptation, according to the diagram below, connect the terminal "Rterm" to the terminal "- T/R" of the two end relays of the connection thanks to the jumper. The jumpers of the other relays of the connection will have to be removed



If the Master is connected at one end of the network, it is necessary to install a resistance of adaptation, not provided by ICE, then, according to the diagram below, connect the terminal "Rterm" to the terminal "- T/R" of the end relay of the connection thanks to the jumper. The jumpers of the other relays of the connection will have to be removed.



### 10.3 Polarization of the RS 485 connection

Polarization having to be single on a line to prevent the risks of transmission, it is in this case recommended to use the supplies and resistances (470 ohms) of polarization of the Master.

### 10.4 RS 485 connection not used

If the communication is not used, it is necessary to connect the terminal "Rterm" to the terminal "- T/R" of the relay thanks to the jumper(s) fitted for this purpose (RS485-1 and RS485-2).

