NPU800R - NPU800RE

RETROFITTING
Voltage and Frequency Relay

NPU800R (R2 case) and NPU800RE (R3 case) are dedicated to the refurbishment of 700 and 7000 series (R2 and R3 cases) of CEE relays providing the supervision of the voltage and the frequency of electrical networks. These numerical and multi-function relays supervise the phase to phase or phase to earth faults, the positive sequence and negative sequence voltages, and the good operation of the circuit breaker and its trip circuit. Their voltage and frequency minimum and maximum thresholds intend them as to the simple operations of network supervision than the load management and load-sheddings.

NP800R relays provide monitoring, measurement and recording of the electrical quantities of the network.
The relays can be set locally, using either the keypad and display or the RS232 port, or remotely using the RS485 port.

Two mountings are available, Flush Rear Connection (**EDPAR**) or Projecting Rear Connection (**SDPAR**). A blank cover R1, provide in option, can improve mechanical installation (replacement of CEE case R3 by a NPU800R).

Setting, reading, measurement and recording are all available locally or remotely.

- Minimises retrofitting man hours
- Maximises preservation of existing installation
- Simplifies and reduces re-commissioning time
- Minimises retrofitting costs

NPU800RE / NPU800R - EDPAR

Protection functions

- Undervoltage with 4 thresholds **[27]**
- Positive sequence voltage drops with 3 thresholds **[27P]**
- Max of negative sequence voltage with 2 thresholds **[47]**
- Overvoltage with 2 thresholds **[59]**
- Max of zero sequence voltage with 2 thresholds **[59N]**
- Overfrequency with 4 thresholds **[81O]**
- Underfrequency with 4 thresholds **[81U]**

Additional functions

- Latching of the output contacts **[86]**
- Trip circuit supervision of the breaker **[74TC]**

GENERAL CHARACTERISTICS

Auxiliary Supply	
• Auxiliary supply ranges	19 to 70 – 85 to 255 / Vdc or Vac 50 or 60 Hz
• Typical burden	6 W (DC), 6 VA (AC)
• Memory backup	72 hours
Connection modes	
• 1, 2 or 3 phase to neutral voltages	
• 1, 2 or 3 phase to phase voltages	
• Zero sequence voltage measured if connection mode 1 or 2 voltage(s)	
Analogue inputs	
• VT nominal value	Un: 33 to 120 V input impedance > 80 kΩ Continuous rating 240 V, short duration withstand 275 V - 1 min measurement from 1 to 240 V VT setting: primary value from 220 V to 250 kV
• Frequency (50Hz or 60Hz)	measurement: 45 to 55 Hz or 55 to 65 Hz
Digital inputs (4 for NPU800R ; 8 for NPU800RE)	
• Polarizing voltage	20 to 70 Vdc for 19 to 70 V auxiliary supply range 37 to 140 Vdc for 85 to 255 V auxiliary supply range
• Level 0	< 10 Vdc range 19 to 70 V – < 33 Vdc range 85 to 255 V
• Level 1	> 20 Vdc range 19 to 70 V – > 37 Vdc range 85 to 255 V
• Operating of the input by level 1 or 0	programmable
• Burden	< 15 mA
Output Relays (3* for NPU800R + 1 WD ; 7 for NPU800RE + 1 WD)	
• Relays A*, B*, E, F : (signalling, Shunt Opening Release)	double contact NO, permanent current 8 A closing capacity 12 A / 4 s short circuit current withstand 100 A / 30 ms breaking capacity DC with L/R = 40 ms: 50W breaking capacity AC with cos φ = 0.4: 1,250 VA
• Relays C*, D, G & WD: (control, WD: Watchdog) (C, D, G: programmable for CB Shunt Opening Release or Under Voltage Release)	changeover contact, permanent current 10 A closing capacity 15 A / 4 s short circuit current withstand 250 A / 30 ms breaking capacity DC with L/R = 40 ms: 50W breaking capacity AC with cos φ = 0.4: 1,250 VA
• Relays pulse, except WD	adjustable from 100 to 500 ms
• Assignment of name to the output	by the setting software
• maximum of 16 characters	capital letters or digits
Undervoltage [27]	
• Operating mode	function « Or » or « And » programmable
• Measurement method	phase to neutral or phase to phase, according to wiring
• Setting of thresholds U< - U<< - U<<< - U<<<<	5 à 120 % Un
• Reset percentage on the operating level	103%
• Thresholds accuracy	2%
• Definite time delays	40 ms to 300 s
• Tripping curves	CEI 60255-4, ANSI IEEE
• Accuracy and type of curves	class 5 - Time Multiplier Setting: 0,03 à 3 s, type: see Functionalities
• Instantaneous operating time	60 ms including trip relay
• Blocking of the thresholds	10% Un, programmable: in or out of service (If the blocking is activated, the minimum setting of the thresholds is 20% Un)
• Display accuracy	5% from 3 to 240 V
Note: the functions [27] and [27P] cannot be used simultaneously	

GENERAL CHARACTERISTICS

Positive sequence voltage drops [27P]	
• Measurement method	positive voltage calculated with 3 phase connection mode
• Setting of thresholds Ud<- Ud<< - Ud<<<	5 to 120 % Un
• Reset percentage on the operating level	103%
• Definite time delay	40 ms to 300 s
• Time delays accuracy	± 2% or 20 ms
• Instantaneous operating time	60 ms including trip relay
• Blocking of the thresholds	10% Un, programmable: in or out of service (If the blocking is activated, the minimum setting of the thresholds is 20% Un)
• Display accuracy *Note: the functions [27] and [27P] cannot be used simultaneously*	5% from 3 to 240 V
Max of negative sequence voltage [47]	
• Measurement method	negative voltage calculated with 3 phase connection mode
• Setting of thresholds U_{neg}> - U_{neg}>>	3 to 30 % Un
• Thresholds accuracy	5% Un
• Reset percentage on the operating level	94%
• Definite time delays	40 ms to 300 s
• Time delays accuracy	± 2% or 20 ms
• Instantaneous operating time	60 ms including trip for U ≥ 2 Us
• Accuracy of displayed measures	3% from 3 to 240 V
Overvoltage function [59]	
• Operating mode	function « Or » or « And » programmable
• Measurement method	phase-neutral voltages or phase-phase voltages, according to wiring
• Setting of thresholds U> - U>>	40 to 200 % Un
• Reset percentage on the operating level	97%
• Thresholds accuracy	2% from 40% to 150% Un – 3% above 150% Un
• Definite time delays	40 ms to 300 s
• Accuracy of the time delays	± 2% or 20 ms
• Operating curves	IEC 60255-3, ANSI IEEE and factory programmable (consult us)
• Curves accuracy	class 5 - Time Multiplier Setting: 0.03 to 3 s
• Instantaneous operating time	60 ms including trip relay
• Accuracy of displayed measures	3% from 3 to 240 V
Max of zero sequence voltage [59N]	
• Measurement method (according wiring)	calculated: 3 phase and neutral connection measured: with 1 neutral point VT or 3 VT with broken delta (with V1 or U12 connected)
• Setting of thresholds Vo> - Vo>>	2 to 80 % Un
• Thresholds accuracy	2% of Un
• Reset percentage on the operating level	97%
• Instantaneous operating time	60 ms including trip relay Vo ≥ 2 Vs
• Definite time delays	40 ms to 300 s
• Accuracy of the time delays	± 2% or 20 ms
• Accuracy of displayed measures	3% from 3 to 240 V
Trip circuit supervision of the breaker [74TC]	
• Trip circuit supervision	requires one or two digital inputs (see application guide)
• Operating time (in faulty condition)	500 ms fixed
Latching of the output contacts [86]	
• Manual reset for output relays	A, B, C and and according to version D, E, F, G (programmable assignment)
• Reset	digital input, digital communication or local MMI

GENERAL CHARACTERISTICS

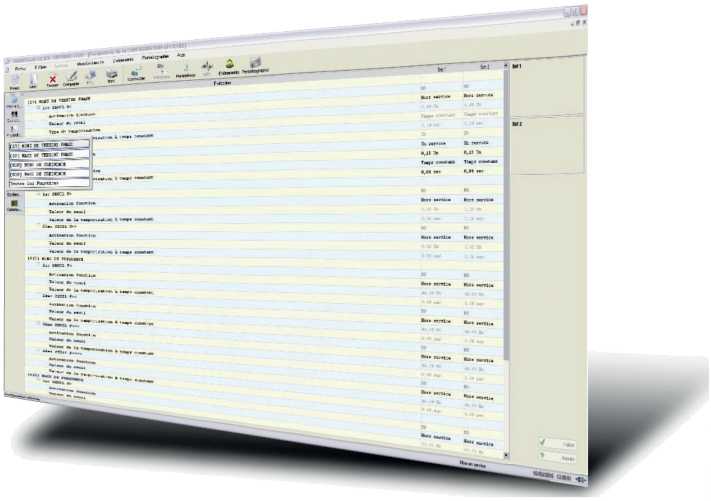
Frequency functions [810] [81U]	
• Setting of the 4 thresholds F< ... F<<<<	50.05 – 54.00 Hz / 60.05 – 64.00 Hz
• Setting of the 4 thresholds F< ... F<<<<	46.00 – 49.95 Hz / 56.00 – 59.95 Hz
• Thresholds accuracy	± 0.1 Hz
• Reset value on the operating level	0.2 Hz
• Voltage inhibition threshold	10% of Un
• Instantaneous operating time	80 ms typical including trip relay, 150 ms maximum
• Adjustment of time delays	80 ms to 10 s
• Accuracy of the time delays	± 2% or 20 ms
• Accuracy of displayed measures	0.1 Hz
Digital inputs assignment	
• By setting software	
• Setting table selection	set 1 – set 2
• Disturbance recording order	
• Interlock o/o	
• Interlock c/o	
• Control mode	dedicated to remote control, local / remote
• Reset [86] function	acknowledgment of the selected output(s)
• Trip circuit supervision	[74TC] function
• CB trip external order •	function [74TC] blocked if external trip order
• Input – output programmable functions	
User programmable functions (digital inputs – digital outputs)	
• Status of the function	in or out of service, by local MMI or by the setting software
• Tripping mode or report	report: for time stamping and event recorder
• Operating and release time delays	tripping mode: 40 ms to 300 s
• Assignment of name to the function, maximum of 14 characters	by the setting software
• Assignment of one or more output relays (alarm or trip)	by local MMI or by the setting software A, B, C and according to D, E, F, G
Load shedding – Load Restoration, remote control	
• Load shedding level	1 to 6
• Time delay before reclosing	1 to 120 s, ± 2%
• Reclosing pulse	100 to 500 ms (remote control)
• Output relays assigned	programmable by local MMI or by setting software A, B, C and according to D, E, F, G
Digital outputs assignment	
• By local MMI or by setting software	
Signalling LEDs assignment	
• By setting software	
Man Machine Interface	
• Relay display	2 lines of 16 characters
Language	French, English, Spanish, Italian
• Configuration and operating software	Windows® 2000, XP, Vista and 7 compatible
Language	French, English, Spanish, Italian
MODBUS® Communication (option)	
• Transmission	asynchronous series, 2 wires
• Interface	RS485
• Transmission speed	300 to 115,200 bauds
Disturbance recording	
• Number of recordings	4
• Total duration	52 periods per recording
• Pre fault time	adjustable from 0 to 52 cycles

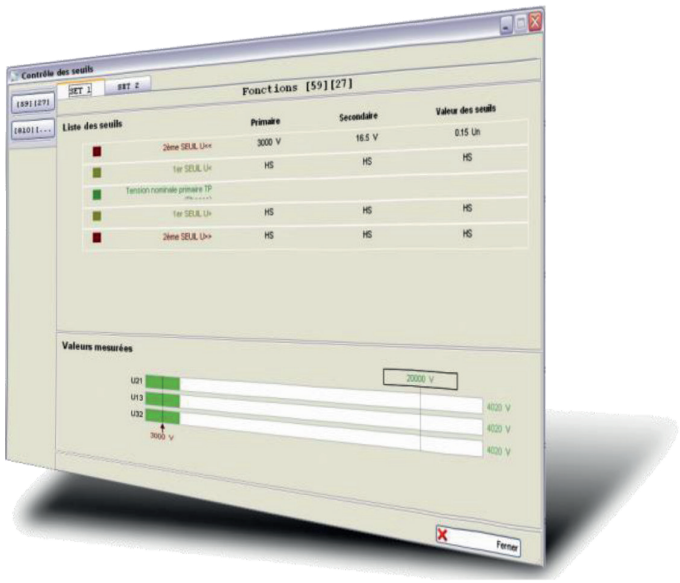
GENERAL CHARACTERISTICS

Presentation	
• Height	4U
• Width	case R2 or R3 according to version
• Brackets 19" rack mounting	see diagram 9954 (7000 series rack definition table)
Case (see drawing D40037)	
• **EDPAR**	
H, W, D (case & base)	NPU800R : 172 x 83 x 222 mm NPU800RE : 172 x 125 x 222 mm
H, W (front face dimensions)	NPU800R : 217 x 98 mm NPU800RE : 217 x 140 mm
• **SDPAR**	
H, W, D (case & base)	NPU800R : 172 x 83 x 227 mm NPU800RE : 172 x 125 x 227 mm
H, W (front face dimensions)	NPU800R : 172 x 83 mm NPU800RE : 172 x 125 mm
• Weight	NPU800R : 3.5 kg NPU800RE : 4.5 kg
Connection - codification	
• NPU800R	see diagram S39968
• NPU800RE	see diagram S39973

SMARTsoft

SMARTsoft, integrated software for the Industry, Railway and Transmission ranges, helps the User get the best from NP800R series relays.



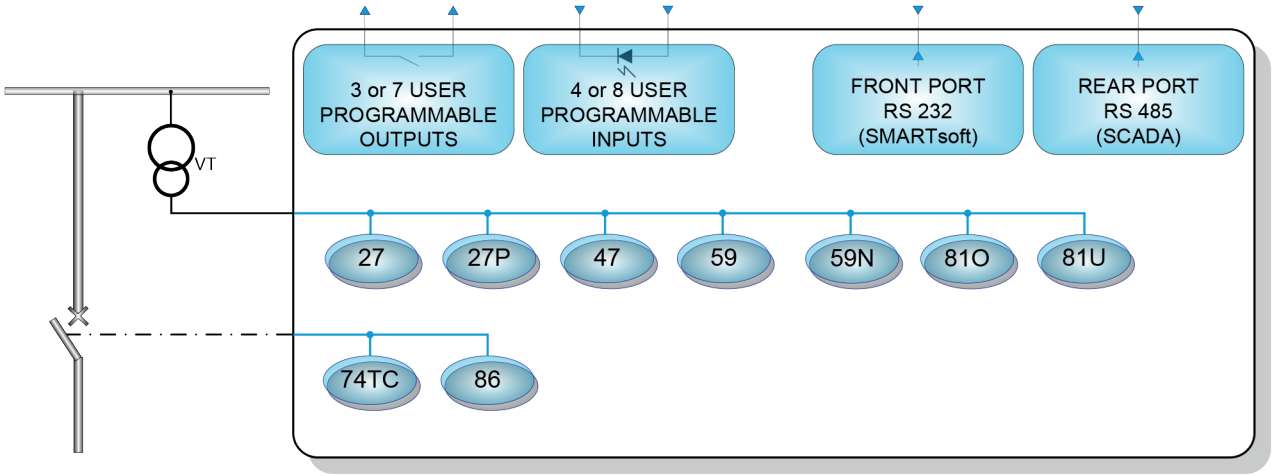


- User friendly
- Diagnosis
- Fault analysis
- Maintenance tools

FUNCTIONALITIES

- 2 ranges of auxiliary supply
- Storage of the lack and the restoration of the auxiliary voltage (time stamped events)
- Configuration and parameter setting by local MMI or off-line / on-line PC
- Measurement of electrical quantities:
  - Display expressed in primary values
  - Instantaneous, integrated and maximum values of phase to neutral voltages V or phase to phase voltages U
  - Positive and negative sequence voltage (according wiring)
  - Frequency
  - Residual voltage and maximum value
- Instantaneous voltage alarm threshold
- Instantaneous frequency alarm threshold
- Definite time tripping for undervoltage and overvoltage thresholds
- Definite time tripping for undervoltage and overvoltage thresholds inverse/very inverse/ extremely inverse time according to IEC inverse/very inverse/extremely inverse time according to ANSI / IEEE
- Definite time tripping for positive sequence voltage drop thresholds
- Tripping on frequency thresholds: programmable definite time
- 2 setting groups, locally or remotely selectable
- CB Monitoring: interlocks discrepancy, local or remote control of reclosing / tripping
- Remote control by communication channel: tripping or closing, load shedding with priority levels and load restoration
- Setting software compatible with Windows® 2000, XP, Vista and 7
- User interface with access to all protection functions
- Time stamping of internal events with 10ms resolution
- Time stamping of digital inputs with 10ms resolution
- Event recording: 250 locally recorded events, 200 saved in case of loss of auxiliary supply
- Recording of logical states of digital I/O, of measures, of faulty phase (phase to neutral voltages only), of current setting group
- Local / remote events acknowledgment
- Disturbance recording according to Comtrade® format: storage of 4 recordings of 52 periods
- Disturbance recording forced by digital input, setting software or communication channel
- Remote setting, remote reading of measurements, counters, alarms and parameters settings
- Remote reading of disturbance recording and event log
- Self-diagnosis: Memories, output relays, A/D converters, auxiliary supply, cycles of execution of software, hardware failure
- Test of wiring, phase order

FUNCTIONAL DIAGRAM



Protection & Control ice
INDUSTRIELLE DE CONTRÔLE ET D'ÉQUIPEMENT - 11 rue Marcel Sembat F-94146 Alfortville cedex
+33 (0)1 41 79 76 00 www.icelec.com contact@icelec.com - - -
• ISO 19443 : 2018 • ISO 9001 : 2015 • ISO 14001 : 2015 certified •