

NPI800-NPIR800

Phase and Earth Overcurrent Relay



NPI800 provides the three-phase and earth fault overcurrent protection for medium and high voltage electrical networks. This multi-function relay supervises phase to phase and phase to earth faults, negative sequence currents, thermal state of the protected device and the good operating of the circuit breaker and its trip circuit.

As well as the usual protection functions, NP800 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.

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



- Multifonction
- Measurement
- Recording / event log
- Disturbance recording
- Local MMI

Protection function

- Overcurrent with 3 thresholds [51-1] [51-2] [50]
- Earth fault with 2 thresholds [51N] [50N]
- Thermal overload for cable and transformer [49]
- Negative phase sequence overcurrent [46]
- Broken conductor with 2 thresholds [46BC]
- Load reclosing function
- Logical selectivity

Additional functions

- Latching of the output contacts [86]
- Trip circuit supervision of the breaker [74TC]
- Breaker failure [50BF][50N_BF]
- Load shedding – Load Restoration, remote control (communication option)

Additional function NPIR800 only

- Recloser 1 fast cycle and 3 slow cycles [79]

OUR TRADEMARKS



GENERAL CHARACTERISTICS

<p>Auxiliary Supply</p> <ul style="list-style-type: none"> • Auxiliary supply ranges • Typical burden • Memory backup 	<p>19 to 70 – 85 to 255 / Vdc or Vac 50 or 60 Hz 6 W (DC), 6 VA (AC) 72 hours</p>
<p>Analogue inputs</p> <ul style="list-style-type: none"> • Phase CT 	<p>In 1 or 5 A burden at $I_n < 0.2$ VA Continuous rating $3 I_n$, short duration withstand $100 I_n / 1s$ CT setting: primary value from 1 A to 10 kA measurement from 0.05 to $24 I_n$ display of primary current from 0 to 65 kA</p>
<ul style="list-style-type: none"> • Recommended CTs 	<p>5VA 5P20</p>
<ul style="list-style-type: none"> • Earth current CT 	<p>I_{n0} 1 or 5 A burden at $I_{n0} < 0.5$ VA Continuous rating $1 I_{n0}$, short duration withstand $40 I_{n0} / 1s$ measurement from 0.005 to $2.4 I_{n0}$ display of primary current from 0 to 6.5 kA</p>
<ul style="list-style-type: none"> • Earth current from Ring CT 100/1 or Ring CT 1500/1 and BA800 	<p>measurement from 0.1 to 48 A primary</p>
<ul style="list-style-type: none"> • Frequency (50Hz or 60Hz) 	<p>measurement: 45 to 55 Hz or 55 to 65 Hz</p>
<p>Digital inputs 4 or 8 according option</p> <ul style="list-style-type: none"> • Polarizing voltage • Level 0 • Level 1 • Operating of the input by level 1 or 0 • Burden 	<p>20 to 70 Vdc for 19 to 70 V auxiliary supply range 37 to 140 Vdc for 85 to 255 V auxiliary supply range < 10 Vdc range 19 to 70 V – < 33 Vdc range 85 to 255 V > 20 Vdc range 19 to 70 V – > 37 Vdc range 85 to 255 V programmable < 15 mA</p>
<p>Output Relays 3* or 7 according option + 1 WD</p> <ul style="list-style-type: none"> • Relays A*, B*, E, F : (signalling, Shunt Opening Release) 	<p>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 $\cos \varphi = 0.4$: 1,250 VA</p>
<ul style="list-style-type: none"> • Relays C*, D, G et WD: (control, WD: Watchdog) (C, D, G: programmable for CB Shunt Opening Release or Under Voltage Release) 	<p>changeover contact, permanent current 16 A closing capacity 25 A / 4 s short circuit current withstand 250 A / 30 ms breaking capacity DC with L/R = 40 ms: 50W breaking capacity AC with $\cos \varphi = 0.4$: 1,250 VA</p>
<ul style="list-style-type: none"> • Relays pulse, except WD 	<p>adjustable from 100 to 500 ms</p>
<ul style="list-style-type: none"> • Assignment of name to the output maximum of 16 characters 	<p>by the setting software / capital letters or digits</p>
<p>Overcurrent function [51-1] [51-2] [50]</p> <ul style="list-style-type: none"> • Operating range $I>$ - $I>>$ - $I>>>$ • Thresholds accuracy • Reset percentage on the operating level • Instantaneous operating time • Definite time delay • Accuracy of the time delays • Curves [51-1] $I>$ - [51-2] $I>>$ • Curves accuracy and type 	<p>0.3 to $24 I_n$ 1% typical, 2% max from 0.5 to $4 I_n$ 3% typical, 5% max from 0.3 to $0.5 I_n$ and from 4 to $24 I_n$ 95% 60 ms including trip relay for $I \geq 2 I_s$ 40 ms to 300 s: [51-1] $I>$ - [51-2] $I>>$ - [50] $I>>>$ $\pm 2\%$ or 20 ms IEC 60255-3, ANSI IEEE and factory programmable (consult us) class 5 - Time Multiplier Setting: 0.03 to 3 s, type: see functionalities</p>
<p>Earth fault function [51N] [50N]</p> <ul style="list-style-type: none"> • Operating range $I_o>$ - $I_o>>$ • Thresholds accuracy • Reset percentage on the operating level • Instantaneous operating time • Definite time delay • Accuracy of the time delays • Curves [51N] $I_o>$ • Curves accuracy and type 	<p>0.03 to $2.4 I_{n0} / CT$ - 0.6 to 48 A / ring CT 1% typical, 2% max from 0.05 to $0.4 I_{n0} / CT$ 3% typ., 5% max from 0.03 to $0.05 I_{n0}$ and 0.4 to $2.4 I_{n0} / CT$ 5% from 0.6 to 48 A / ring CT 95% 60 ms including trip for $I \geq 2 I_s$ 40 ms to 300 s: [51N] $I_o>$ [50N] $I_o>>$ $\pm 2\%$ or 20 ms IEC 60255-3, ANSI IEEE and factory programmable (consult us) class 5 - Time Multiplier Setting: 0.03 to 3 s, type: see functionalities</p>

GENERAL CHARACTERISTICS

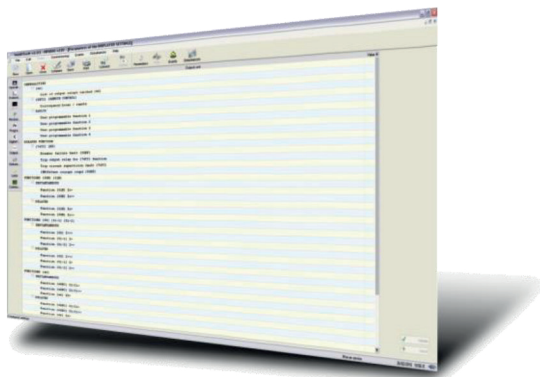
<p>Transformer thermal overload function [49]</p> <ul style="list-style-type: none"> • Tripping curves • Heating-time constant C_{TE} • Cooling time constant • Negative sequence factor • Closing factor F_D • Thermal trip threshold I_b • Thermal alarm threshold • Reclosing thermal threshold inhibition 	<p>IEC 60255-8 4 to 180 min, class 5 1 to 6.0 C_{TE}, in step of 0.1 0 to 9 50 to 100% C_{TE} 40 to 130 % I_n, class 5 80 to 100 % θ thermal, class 5 40 to 100 % θ thermal, class 5</p>
<p>Cable thermal overload function [49]</p> <ul style="list-style-type: none"> • Tripping curves • Heating-time constant CTE • Thermal alarm threshold • Thermal trip threshold I_b 	<p>IEC 60255-8 4 to 180 min, class 5 80 to 100 % θ thermal, class 5 40 to 130 % I_n, class 5</p>
<p>Negative phase sequence overcurrent function [46]</p> <ul style="list-style-type: none"> • Threshold I_{neg}: $I_2 >$ • Instantaneous operating time • Definite time delay • Accuracy of the time delay • Curves • Curves accuracy and type 	<p>0.1 to 2.4 I_n, accuracy 5% for $I_{ph} > 0.3 I_n$ 60 ms including trip relay for $I \geq 2 I_s$ 40 ms to 300 s $\pm 2\%$ or 20 ms IEC 60255-3, ANSI IEEE and factory programmable (consult us) class 5 - Time Multiplier Setting: 0.03 to 3 s, type: see functionalities</p>
<p>Broken conductor function [46BC]</p> <ul style="list-style-type: none"> • Threshold I_{neg}/I_{pos}: $I_2/I_1 >$ - $I_2/I_1 >>$ • Accuracy • Definite time delay • Accuracy of the time delays 	<p>10 to 250% $\pm 5\%$ 40 ms to 300s $\pm 2\%$ or 20 ms</p>
<p>Recloser [79] (NPIR800 only)</p> <ul style="list-style-type: none"> • Dead time delay (1st cycle) • Reclaim time delay (1st cycle) • Dead time delay (2nd, 3rd and 4th cycle) • Reclaim time delay (2nd, 3rd and 4th cycle) • Width of reclosing pulse • Reclaim time for manual reclosing • Accuracy of time delays • N cycles alarm / T min 	<p>0.1 to 360 s 9 to 360 s 15 to 360 s 1 to 360 s 100 to 500 ms 1 to 360 s $\pm 2\%$ or 20 ms N: 4 to 30 and T: 1 to 30 min</p>
<p>Trip circuit supervision and breaker failure [74TC] [50BF] [50N_BF]</p> <ul style="list-style-type: none"> • Trip circuit supervision [74TC] • Operating time (in faulty condition) • Failure threshold [50BF] • Failure threshold [50N_BF] • Breaker failure time delay 	<p>requires four digital inputs (see application guide) 500 ms fixed for [74TC] function 5% to 30 % I_n, step of 1 I_n 0.5% to 3% I_{n0}, step of 0.1 I_{n0} 60 to 1000 ms, step of 10 ms</p>
<p>Latching of the output contacts [86]</p> <ul style="list-style-type: none"> • Manual reset for output relays • Reset 	<p>A, B, C and with option: D, E, F, G (programmable assignment) digital input, digital communication or local MMI</p>
<p>Load reclosing function</p> <ul style="list-style-type: none"> • Application • Operating principle • Ratio « K » of reclosing time • Accuracy • Reclosing time 	<p>threshold adjustment [50] [51] [50N] [51N] [46] [46BC] function activation by digital input 50 à 200% $\pm 5\%$ 40 ms to 300s, $\pm 2\%$ or 20 ms</p>
<p>Logical selectivity</p> <ul style="list-style-type: none"> • Application on radial network • Operating principle • Additional time delay [51] [51N] • Additional time delay [50] [50N] • Operating mode of digital input 	<p>number of relays too important to allow the use of time co-ordination additional time added to the functions [50] [51] [50N] [51N] 60 ms to 120s, $\pm 2\%$ or 20 ms 60 ms to 3s, $\pm 2\%$ or 20 ms negative or positive true-data mode</p>

GENERAL CHARACTERISTICS

<p>Digital inputs assignment</p> <ul style="list-style-type: none"> • By setting software • Setting table selection • Disturbance recording order • Logical selectivity • Interlock o/o • Interlock c/o • Control mode • Reclosing mode • Reset [86] function • Trip circuit supervision • CB trip external order • Circuit breaker ready • Inhibition 1 • Inhibition 2 • RSE A • RSE B • Input – output programmable functions 	<p>set 1 – set 2</p> <p>dedicated to remote control, local / remote</p> <p>acknowledgment of the selected output(s) [74TC] function function [74TC] blocked if external trip order NPIR800 only NPIR800 only NPIR800 only NPIR800 only NPIR800 only</p>
<p>User programmable functions (digital inputs – digital outputs)</p> <ul style="list-style-type: none"> • Status of the function • Tripping mode or report • Operating and release time delays • Assignment of name to the function, maximum of 14 characters • Assignment of one or more output relays (alarm or trip) 	<p>in or out of service, by local MMI or by the setting software report: for time stamping and event recorder tripping mode: 40 ms to 300 s by the setting software by local MMI or by the setting software A, B, C and with option: D, E, F, G</p>
<p>Counters</p> <ul style="list-style-type: none"> • Cumulative breaking current • Operation number of circuit breaker 	<p>maximum 64.106 kA² (phase 1,2 and 3) 0 to 10 000</p>
<p>Load shedding – Load Restoration, remote control (communication option)</p> <ul style="list-style-type: none"> • Load shedding level • Time delay before reclosing • Reclosing pulse • Output relays assigned 	<p>1 to 6 1 to 120 s, ± 2% 100 to 500 ms (remote control) programmable by local MMI or by setting software A, B, C and with option: D, E, F, G</p>
<p>Digital outputs assignment</p> <ul style="list-style-type: none"> • By local MMI or by setting software 	
<p>Signalling LEDs assignment</p> <ul style="list-style-type: none"> • By setting software 	
<p>Man Machine Interface</p> <ul style="list-style-type: none"> • Relay display Language • Configuration and operating software Language 	<p>2 lines of 16 characters French, English, Spanish, Italian Windows® 2000, XP, Vista and 7 compatible French, English, Spanish, Italian</p>
<p>MODBUS® Communication (option)</p> <ul style="list-style-type: none"> • Transmission • Interface • Transmission speed 	<p>asynchronous series, 2 wires RS485 300 to 115 200 bauds</p>
<p>Disturbance recording</p> <ul style="list-style-type: none"> • Number of recordings • Total duration • Pre fault time 	<p>4 52 periods per recording adjustable from 0 to 52 cycles</p>
<p>Climatic withstand in operation</p> <ul style="list-style-type: none"> • Cold exposure • Dry heat exposure • Damp heat exposure • Temperature variation with specified speed 	<p>IEC / EN 60068-2-1: class Ad, -10 °C IEC / EN 60068-2-2: class Bd, +55 °C IEC / EN 60068-2-3: class Ca, 93 % HR, 40 °C, 56 days IEC / EN 60068-2-14: class Nb, -10 °C à +55 °C, 3 °C/min</p>
<p>Storage</p> <ul style="list-style-type: none"> • Cold exposure • Dry heat exposure 	<p>IEC / EN 60068-2-1: class Ad, -25 °C IEC / EN 60068-2-2: class Bd, +70 °C</p>

GENERAL CHARACTERISTICS

<p>Electrical safety</p> <ul style="list-style-type: none"> • Ground bond test current • Impulse voltage withstand • Dielectric withstand (50Hz or 60Hz) • Insulation resistance • Clearance and creepage distances 	<p>IEC / EN 61010-1 : 30 A IEC / EN 60255-5: 5 kV MC, 5 kV MD (waveform: 1.2/50µs) except Digital Output, 1 kV differential mode except RS485, 3 kV common mode IEC / EN 60255-5: common mode $2 \text{ kV}_{\text{rms}} - 1 \text{ min}$ differential mode for Digital Output $1 \text{ kV}_{\text{rms}} - 1 \text{ min}$ (contact open) IEC / EN 60255-5: 500 Vdc - 1 s: > 100 MΩ IEC / EN 60255-5: rated insulation voltage: 250 V pollution degree: 2 overvoltage category: III</p>
<p>Enclosure safety</p> <ul style="list-style-type: none"> • Degree of protection provided by enclosures (IP code) 	<p>IEC / EN 60529: IP51, with front face</p>
<p>Immunity – Conducted disturbances</p> <ul style="list-style-type: none"> • Immunity to RF conducted disturbances • Fast transients • Oscillatory waves disturbance • Surge immunity • Supply interruptions 	<p>IEC / EN 61000-4-6: class III, 10 V IEC / EN 60255-22-4 / IEC / EN 61000-4-4: class IV IEC / EN 60255-22-1: class III, 2.5 kV CM, 1 kV DM except RS485, class II, 1 kV CM IEC / EN 61000-4-5: class III IEC / EN 60255-11: 100% 20 ms</p>
<p>Immunity – Radiated disturbances</p> <ul style="list-style-type: none"> • Immunity to RF radiated fields • Electrostatic discharges • Power frequency magnetic field immunity test 	<p>IEC / EN 60255-22-3 / IEC / EN 61000-4-3: class III, 10 V/m IEC / EN 60255-22-2 / IEC / EN 61000-4-2: class III, 8 kV air / 6 kV contact IEC / EN 61000-4-8: class IV, 30 A/m continuous, 300 A/m 1 to 3 s</p>
<p>Mechanical robustness - energised</p> <ul style="list-style-type: none"> • Vibrations • Shocks 	<p>IEC / EN 60255-21-1: class 1 - 0.5g IEC / EN 60255-21-2: class 1 - 5g / 11 ms</p>
<p>Mechanical robustness - not energised</p> <ul style="list-style-type: none"> • Vibrations • Shocks • Bumps • Free fall 	<p>IEC / EN 60255-21-1: class 1 - 1g IEC / EN 60255-21-2: class 1 - 15g / 11 ms IEC / EN 60255-21-2: class 1 - 10g / 16 ms IEC / EN 60068-2-32: class 1 - 250 mm</p>
<p>Electromagnetic compatibility (EMC)</p> <ul style="list-style-type: none"> • Radiated field emissivity • Conducted disturbance emissivity 	<p>EN 55022: class A EN 55022: class A</p>
<p>Presentation</p> <ul style="list-style-type: none"> • Height • Width • Brackets 19" rack mounting 	<p>4U 1/4 19" option (see drawing D37739)</p>
<p>Case</p> <ul style="list-style-type: none"> • H, W, D without short-circuiting device • H, W, D with short-circuiting devices • Weight 	<p>173 x 106.3 x 250 mm (see drawing D37739) 173 x 106.3 x 305 mm (see drawing D37739) 3.6 kg</p>
<p>Connection - codification</p> <ul style="list-style-type: none"> • NPI800 • NPIR800 • Ring CT • BA800 	<p>See diagram S38018 See diagram S38023 See diagram 142941 See diagram 38766</p>



- 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 and earth currents
- Instantaneous alarm threshold
- Definite time tripping
- Dependent time tripping according to inverse/very inverse/extremely inverse IEC 60255-3 curves
- Tripping according to RI curve (electromechanical)
- Tripping according to moderately inverse/very inverse/extremely inverse ANSI /IEEE curves
- Logical selectivity on the three phase thresholds and the two earth thresholds
- Thermal image according to IEC 60255-8
- Cable (by phase) and transformer (3 phase)
- 2 setting groups, locally or remotely selectable
- CB Monitoring: interlocks discrepancy, local or remote control of closing / tripping
- Circuit breaker maintenance
- Closing function: adjustment of phase, earth, negative sequence current thresholds by external input
- Remote setting and reading of measurements, counters, alarms and parameter settings
- Remote reading of disturbance recording and event log
- Counters of operation number and cut-off amperes² per phase, alarm and threshold
- Monitoring of breaker failure by checking the disappearance of current after opening
- 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

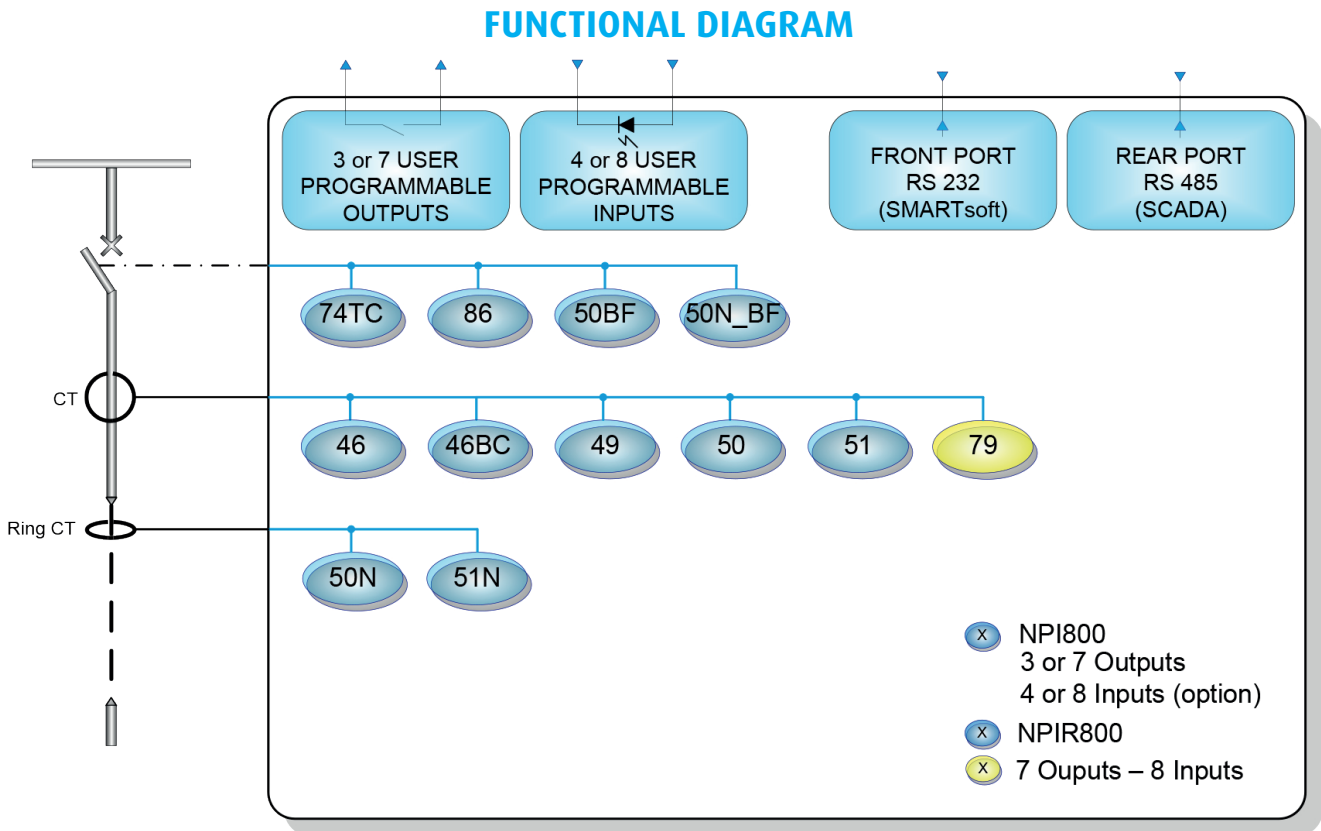
- Recording of measurements and current setting group
- Local / remote events acknowledgment
- Disturbance recording according to Comtrade® format: storage of 4 recordings of 52 periods
- Disturbance recording initiated by digital input, setting software or communication channel

Options

- Communication by Modbus® - (IEC 60870-5-103 protocol: consult us)
- Additional card with 4 assignable output relays and 4 assignable digital inputs (card include for NPIR800)
- 2 inverse time curves, programmable (in factory, consult us) and downloadable

Related equipment

- BA800 for ring CT 1500/1



The specifications and drawings given are subject to change and are not binding unless confirmed by our specialists.

