

ICE

PROTECTION
& CONTROL
COMMAND

NPSC800

ICE Group



TECHNIREL

NETWORK CHECK SYNCHRONIZING RELAY

NPSC800-1 performs check of synchronism between two power supplies. It is usually used to authorize the closing order of a paralleling circuit breaker. NPSC800-2 allows in addition the operating of live (or dead) line and live (or dead) bus. It also allows, with a dedicated output relay, the reconnection of two bus sections fed by the same supply.

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 by the RS232 port, or remotely using the RS485 port. Reading, measurement and recording are all available locally or remotely.



Multifunction
Measurement
Recording / event log
Disturbance recording
Local MMI

Common functions for NPSC800-1 and NPSC800-2

- Synchro- check [25]

Specific functions for NPSC800-2

- Dead Line – Dead Bus (DLDB)
- Dead Line – Live Bus (DLLB)
- Live Line – Dead Bus (LLDB)
- **Reconnection** of two bus section from the same source



CHARACTERISTICS NPSC800

Auxiliary Supply

- Auxiliary supply ranges
- Typical burden
- Memory backup

19 to 70 – 85 to 255 / Vdc or Vac 50 or 60 Hz
6 W (CC), 6 VA (CA)
72 hours

Analogue Inputs

- Phase voltage inputs

Un: 55 to 120 V
input impedance > 80 K Ω
continuous rating 240 V, short duration withstand 275V - 1 mn
measurement from 3 to 240 V
VT setting: primary value from 220 V to 250 kV
measurement: 45-55 Hz or 55-65 Hz

- Frequency (50Hz or 60Hz)

Digital Inputs (4 for NPSC800-1, 8 for NPSC800-2)

- Polarizing voltage

19 to 70 Vcc, range 19 to 70 V
37 to 125 Vcc, range 85 to 255 V
< 10V range 19 to 70 Vcc – < 33V range 85 to 255 Vcc
> 20V range 19 to 70 Vcc – > 37V range 85 to 255 Vcc
< 15 mA

- Level 0
- Level 1
- Burden

Relay Outputs (3* for NPSC800-1 + 1 WD, 7 for NPSC800-2 + 1 WD)

- Relays A*, B*, E, F

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: 50 W
breaking capacity AC with $\cos \varphi = 0,4$: 1250 VA
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 : 50 W
breaking capacity AC with $\cos \varphi = 0,4$: 1250 VA

- Relays C*, WD, D, G

Characteristics of the function [25]

- Blocking of the output relay C
- Threshold U line mini for authorisation [25]
- Threshold accuracy
- Setting of voltage difference: ΔU
- Voltage difference accuracy
- Setting of angular difference: $\Delta \varphi$
- Angular difference accuracy
- Setting of frequency difference: ΔF
- Frequency difference accuracy
- Setting of rate of frequency change: $\Delta F/dt$
- Rate of frequency change accuracy
- Time lag before authorisation
- Accuracy of the time delays
- Accuracy of displayed measures

possible by digital input (output relay use for paralleling authorisation)
50 to 100 % Un

2% of Un
thresholds +/- : 1% to 15% Un, with step of 1% Un
 $\pm 5\%$ of the set value
thresholds +/- : 1° to 20°, with step of 1°
 $\pm 2\%$
thresholds +/- : 0.01 to 1.5 Hz, with step of 0.01 Hz
 $\pm 5\%$ of the set value
thresholds +/- : 0.01 to 0.2 Hz/s, with step of 0.01 Hz/s
 $\pm 2\%$
0 ms to 300 s
 $\pm 2\%$ or 20 ms
3% from 3 to 240 V

Characteristics of line and bus functions** : DLDB - DLLB – LLDB

- Activation of functions
- Information function activated
- Operating mode
- Threshold U> Live Line
- Threshold U< Dead Line
- Threshold U> Live Bus
- Threshold U< Dead Bus
- Thresholds accuracy
- Time lag before authorisation
- Accuracy of the time delays

by setting software and dedicated DI (non exclusive mode)
HMI, dedicated DO, communication and setting software with PC
paralleling authorisation by the output relay C
5 to 120 % Un
5 to 120 % Un
5 to 120 % Un
5 to 120 % Un
2% of Un
0 ms to 300 s (3 settings: DLDB, DLLB and LLDB)
 $\pm 2\%$ or 20 ms

Characteristics of the reconnection function**

- Active only in synchronous mode
- Activation of the function
- Setting of ΔU and $\Delta \varphi$
- Information function activated
- Setting of voltage difference : $\pm \Delta U$
- Time delay for controlling the reconnection conditions
- Hold time of the output relay G function)
- Accuracy of the time delays

concomitance of Line and Bus frequencies
by setting software and dedicated DI
common settings with function [25]
HMI, dedicated DO, communication and setting software with PC
1% to 15% Un, step of 1% Un
40 ms to 300 s
100 ms to 500 ms (output relay dedicated to the reconnection
 $\pm 2\%$ or 20 ms

** **only NPSC800-2**

CHARACTERISTICS NPSC800

Phase shift

- Line voltage / bus voltage

0 to 360°, step of 1°

Digital inputs assignment

- Input 1
- Input 2
- Input 3

- Input 4
- Input 5 (NPSC800-2 only)
- Input 6 (NPSC800-2 only)
- Input 7 (NPSC800-2 only)
- Input 8 (NPSC800-2 only)

(see application guide)

activation set 2

inhibition of the function [25]

paralleling order (management of disturbance recording and events)

contact o/o of the Circuit Breaker (management of events)

enable mode DL-DB

enable mode DL-LB

enable mode LL-DB

enable mode reconnection

Digital output assignment

- Relays A
- Relays B
- Relays C
- Relays D (NPSC800-2 only)
- Relays E (NPSC800-2 only)
- Relays F (NPSC800-2 only)
- Relays G (NPSC800-2 only)

(see application guide)

set 2 activated

function [25] inhibited

paralleling authorisation (permanent order if conditions are valid)

mode DL-DB selected

mode DL-LB selected

mode LL-DB selected

reconnection order

Signalling LEDs assignment

- LED 1
- LED 2
- LED 3
- LED 4

info ΔU OK

info $\Delta \varphi$ OK

info ΔF OK

paralleling authorised

Setting

- Display
- Configuration and operating software

English, French, Spanish, Italian

compatible with Windows® 2000, XP and Vista

English, French, Spanish, Italian

MODBUS® Communication (option)

- Transmission
- Interface
- Transmission speed

asynchronous series, 2 wires

RS 485

300 to 115 200 bauds

Disturbance recording

- Number of recordings
- Total duration
- Pre fault time

4

170 periods per recording (12 samples / cycle)

adjustable from 0 to 170 cycles

Climatic withstand in operation

- Cold exposure
- Dry heat exposure
- Damp heat exposure
- Temperature variation with specified variation rate

CEI / EN 60068-2-1 : class Ad, -10 °C

CEI / EN 60068-2-2 : class Bd, +55 °C

CEI / EN 60068-2-3 : class Ca, 93 % HR, 40 °C, 56 days

CEI / EN 60068-2-14 : class Nb, -10 °C à +55 °C, 3 °C/min

Storage

- Cold exposure
- Dry heat exposure

CEI / EN 60068-2-1 : class Ad, -25 °C

CEI / EN 60068-2-2 : class Bd, +70 °C

Electrical safety

- Ground bond test current
- Impulse voltage withstand

- Dielectric withstand : 50Hz

- Insulation resistance
- Clearances and creepage distances

CEI / EN 61010-1 : 30 A

CEI / EN 60255-5 : 5 kV MC, 5 kV MD

except outputs TOR, 1 kV MD

except RS485, 3 kV MC

CEI / EN 60255-5 : common mode 2 kV_{rms} – 1 min

Differential outputs mode TOR 1 kV_{rms} – 1 min

(open contact type)

CEI / EN 60255-5 : 500 Vcc - 1 s : > 100 MΩ

CEI / EN 60255-5 : rated insulation voltage : 250 V

Pollution degree: 2

Overvoltage category: III

CHARACTERISTICS NPSC800

Enclosure safety

- Degrees of protection provided by enclosures (IP code)

CEI / EN 60529 : IP51, with front face

Immunity – Conducted disturbances

- Immunity to RF conducted disturbances
- Fast transients
- Oscillatory waves disturbance 1 MHz

CEI / EN 61000-4-6 : class III, 10 V
CEI / EN 60255-22-4 / CEI / EN 61000-4-4 : class IV
CEI / EN 60255-22-1 : class III, 2.5 kV MC, 1 kV MD
except RS485, class II, 1 kV MC
CEI / EN 61000-4-5 : class III
CEI / EN 60255-11 : 100% 20 ms

Immunity – Radiated disturbances

- Immunity to RF radiated fields
- Electrostatic discharges
- Power frequency magnetic field immunity test

CEI / EN 60255-22-3 /
CEI / EN 61000-4-3 : class III, 10 V/m
CEI / EN 60255-22-2 /
CEI / EN 61000-4-2 : class III, 8 kV air / 6 kV contact
CEI / EN 61000-4-8 : class IV, 30 A/m permanent, 300 A/m 1 to 3 s

Mechanical robustness - energised

- Vibrations
- Shocks

CEI / EN 60255-21-1 : class 1, 0.5 Gn
CEI / EN 60255-21-2 : class 1, 5 Gn / 11 ms

Mechanical robustness - not energised

- Vibrations
- Shocks
- Bumps
- Free falls

CEI / EN 60255-21-1 : class 1, 1 Gn
CEI / EN 60255-21-2 : class 1, 15 Gn / 11 ms
CEI / EN 60255-21-2 : class 1, 10 Gn / 16 ms
CEI / EN 60068-2-32 : class 1, 250 mm

Electromagnetic compatibility (EMC)

- Radiated field emissivity
- Conducted disturbance emissivity

EN 55022 : class A
EN 55022 : class A

Presentation

- Height
- Width
- Brackets 19" rack mounting
- Display

4U
¼ 19"
option (see drawing D37739)
2 lines of 16 characters

Case

- H, W, D without connectors
- Net weight

173 x 106,3 x 250 mm (see drawing D37739)
3,6 kg

Connection - codification

- NPSC800-1
- NPSC800-2

see diagram S38893
see diagram S39609

SMARTsoft

SMARTsoft, integrated software for the Industry, Railway and Transmission ranges, helps the User get the best from NP800 series relays.



Functionalities

- 2 ranges of auxiliary supply
- Storage of lack and the restoration of the auxiliary voltage (events recorded)
- Configuration and parameter setting by off-line / on-line PC
- Reading and recording of configuration by PC
- Measurement of electrical quantities:
 - Phase voltages U_L, U_B
 - Frequency F_L, F_B
 - Voltage difference ΔU ($U_L - U_B$)
 - Angular difference $\Delta \phi$
 - Frequency difference ΔF ($F_L - F_B$)
 - Acceleration (Hz / s)
- Display expressed in primary values
- 2 setting groups, remotely selectable by a digital input
- Setting software compatible with Windows® 2000, XP and Vista
- User interface with access to all functions
- Commissioning facilitated, the inhibition of the output relay of the [25] function allow the validation of the wiring.
- Time stamping of internals 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 the auxiliary supply
- Local / remote events acknowledgment
- Disturbance recording according to Comtrade® format: storage of 4 recordings of 170 periods. Wiring of the paralleling order requested, except for reconnection function
- Remote setting, remote reading of measurements, alarms and parameters settings
- Remote reading of disturbance recording and events log
- Self-diagnosis: Memories, output relays, A/D converters, auxiliary supply, cycles of execution of the software, hardware anomaly

Options

- Communication by Modbus® RS 485
- Communication by Modbus® RS 485 with redundancy (NPSC800-2 only)

Functional diagram

