DPR800

AC Power Swing Detection

The emergence of new locomotive engines revealed disturbances of the electrical feeding to the railway network. These disturbances are noticed in traffic areas or locomotive engines parking involving their concentration. Recording in real highlight reveals an obvious place phenomena of pumping. Just as it appeared, it may disappear spontaneously.

DPR800, power swing detector, is dedicated to railway AC network. It analyses the evolution of the substation current and voltage and detects any pulsation characteristic of a power swing.

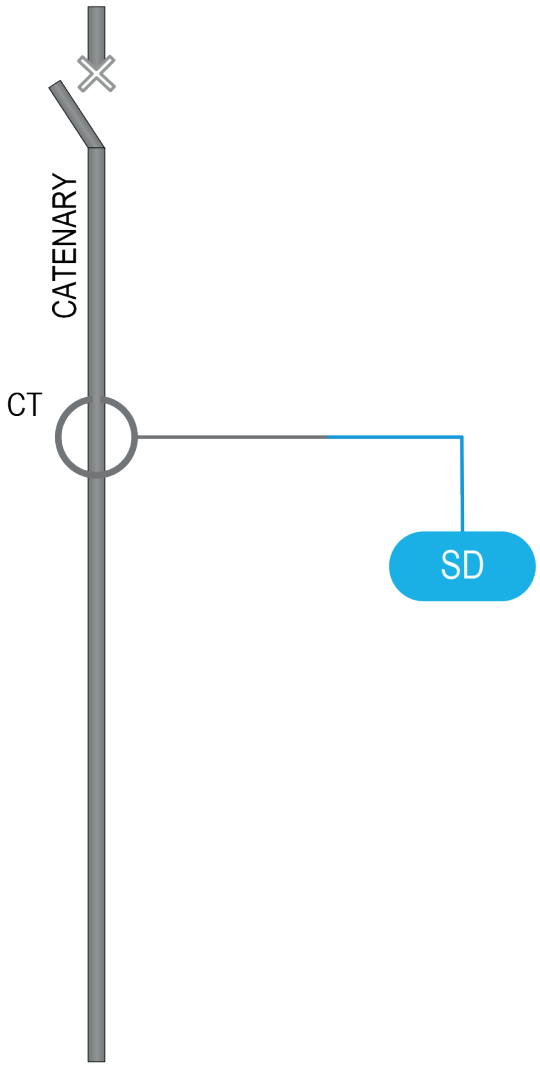
As well as the usual protection functions, NP800 relays provide monitoring, measurement and recording of the electrical quantities of the network.

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.

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

FUNCTIONAL SCHEME



PROTECTION FUNCTION

- **[SD]** Power swing detection

TECHNICAL 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

Analogue inputs

• CT	In_0 1 or 5 A CT setting: primary value from 50 A to 10 kA burden at In_0 < 0.5 VA continuous rating 1 In_0, short duration withstand 40 In_0 / 1s measurement from 0.005 to 2.4 In_0 display of primary current from 0 to 6.5 kA
• Recommended CTs	5 VA 5P10
• Frequency (50Hz or 60Hz)	measurement: 45 to 55 Hz or 55 to 65 Hz

Digital inputs (4)

• Polarising 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

Outputs relays (3 + 1 WD)

• Relays A, B (signalling)	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, WD: (control, WD: Watchdog) (C: programmable for CB Shunt Opening Release or UVR)	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 φ = 0.4: 1,250 VA

Power swing detection [SD]

• Beat number	1 to 100
• Time-delay monitoring beat	1 to 100 s
• Time-delay monitoring first beat	50 to 500 ms
• Current drop (depth)	5 to 90% Imax
• Minimum number of decrease	5 to 15
• Minimum number of increase	3 to 15
• Time-delay for tripping	100 to 10,000 ms
• Gap between decrease / increase	1 to 5%
• Reset percentage on the operating level	95%
• Accuracy	2%
• Instantaneous operating time	60 ms

Digital inputs assignement

• Input 1	not used
• Input 2	disturbance trip
• Input 3	not used
• Input 4	not used

TECHNICAL CHARACTERISTICS

Digital output assignement

• Relay A	alarm trip
• Relay B	alarm for 1st beat detection
• Relay C	trip

Signalling LEDs assignment

- By settings software

Man Machine Interface

• Relay display Language	2 lines of 16 characters French, English
• Configuration and operating software Language	Windows® 2000, XP, Vista and 7 compatible French, English

MODBUS® Communication

• Transmission	asynchronous series, 2 wires
• Interface	RS485
• Transmission speed	300 to 115,200 bauds

Disturbance recording

• Number of recordings	4
• Total duration	26 seconds
• Pre fault time	adjustable from 1 to 25 seconds

Climatic withstand in operation

• Cold exposure	IEC / EN 60068-2-1: class Ad, -10 °C
• Dry heat exposure	IEC / EN 60068-2-2: class Bd, +55 °C
• Damp heat exposure	IEC / EN 60068-2-3: class Ca, 93 % HR, 40 °C, 56 days
• Temperature variation with specified speed	IEC / EN 60068-2-14: class Nb, -10 °C to +55 °C, 3 °C/min

Storage

• Cold exposure	IEC / EN 60068-2-1: class Ad, -25 °C
• Dry heat exposure	IEC / EN 60068-2-2: class Bd, +70 °C

Electrical safety

• Ground bond test current	IEC / EN 61010-1: 30 A
• Impulse voltage withstand	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
• Dielectric withstand (50Hz or 60Hz)	IEC / EN 60255-5: common mode 2 kV_{rms} – 1 min differential mode for Digital Output 1 kV_{rms} – 1 min (contact open)
• Insulation resistance	IEC / EN 60255-5: 500 Vdc - 1 s: > 100 MΩ
• Clearance and creepage distances	IEC / EN 60255-5: rated insulation voltage: 250 V pollution degree: 2 overvoltage category: III

Enclosure safety

• Degree of protection provided by enclosures (IP code)	IEC / EN 60529: IP51, with front face

TECHNICAL CHARACTERISTICS

Immunity – Conducted disturbances

• Immunity to RF conducted disturbances	IEC / EN 61000-4-6: class III, 10 V
• Fast transients	IEC / EN 60255-22-4 / IEC / EN 61000-4-4: class IV
• Oscillatory waves disturbance	IEC / EN 60255-22-1: class III, 2.5 kV CM, 1 kV DM except RS485, class II, 1 kV CM
• Surge immunity	IEC / EN 61000-4-5: class III
• Supply interruptions	IEC / EN 60255-11: 100% 20 ms

Immunity – Radiated disturbances

• Immunity to RF radiated fields	IEC / EN 60255-22-3 / IEC / EN 61000-4-3: class III, 10 V/m
• Electrostatic discharges	IEC / EN 60255-22-2 / IEC / EN 61000-4-2: class III, 8 kV air / 6 kV contact
• Power frequency magnetic field immunity test	IEC / EN 61000-4-8: class IV, 30 A/m continuous, 300 A/m 1 to 3 s

Mechanical robustness - energised

• Vibrations	IEC / EN 60255-21-1: class 1 - 0.5g
• Shocks	IEC / EN 60255-21-2: class 1 - 5g / 11 ms

Mechanical robustness - not energised

• Vibrations	IEC / EN 60255-21-1: class 1 - 1g
• Shocks	IEC / EN 60255-21-2: class 1 - 15g / 11 ms
• Bumps	IEC / EN 60255-21-2: class 1 - 10g / 16 ms
• Free fall	IEC / EN 60068-2-32: class 1 - 250 mm

Electromagnetic compatibility (EMC)

• Radiated field emissivity	EN 55022: class A
• Conducted disturbance emissivity	EN 55022: class A

Presentation

• Height	4U
• Width	¼ 19"
• Brackets 19" rack mounting	option (see drawing D37739)

Case

• H, W, D without short-circuiting device	173 x 106.3 x 250 mm (see drawing D37739)
• Weight	3.6 kg

Raccordement - codification

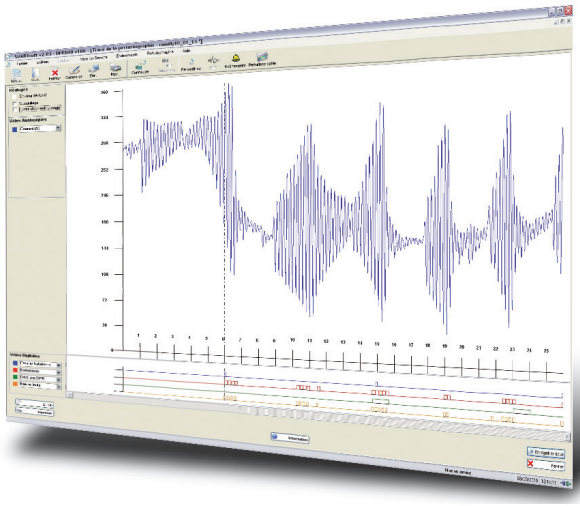
- See diagram S38016

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
- Configuration and parameter setting by local MMI or off-line / on-line PC
- Measurement of electrical quantities:
  Display expressed in primary values
  Instantaneous values of current phase
  Frequency
- Instantaneous alarm threshold
- Setting software compatible with Windows® 2000, XP, Vista and 7
- User interface with access to all protection functions
- Time stamping of internal events with 10 ms resolution
- Time stamping of digital inputs with 10 ms resolution
- Event recording: 60 locally recorded events, 50 saved in case of loss of auxiliary supply
- Recording of logical states of digital I/O, of measures, of faulty phase, of current
- Local / remote events acknowledgment
- Disturbance recording according to Comtrade® format: storage of 4 recordings of 26 seconds
- 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 by activation of each output relay



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