

# 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.

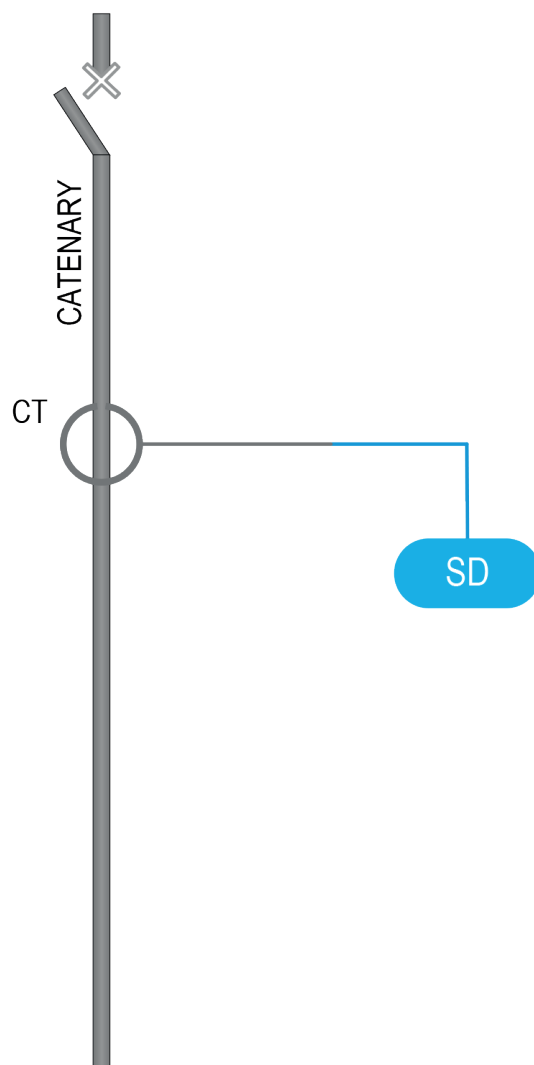


- Multifunction
- Measurement
- Recording / event log
- Disturbance recording
- Local MMI

#### OUR TRADEMARKS



## 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
  - $I_{n0}$  1 or 5 A
  - CT setting: primary value from 50 A to 10 kA
  - 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
  - 5 VA 5P10
  - measurement: 45 to 55 Hz or 55 to 65 Hz
- Recommended CTs
- Frequency (50Hz or 60Hz)

### 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
  - < 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
- Level 0
- Level 1
- Operating of the input by level 1 or 0
- Burden

### 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  $\cos \varphi = 0.4$ : 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  $\cos \varphi = 0.4$ : 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%  $I_{max}$
- 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 1 <sup>st</sup> beat detection |
| • Relay C | trip                                     |

### Signalling LEDs assignement

- By settings software

### Man Machine Interface

- |  |   |
|--|---|
| • Relay display                        | 2 lines of 16 characters                  |
| Language                               | French, English                           |
| • Configuration and operating software | Windows® 2000, XP, Vista and 7 compatible |
| Language                               | 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)<br>except Digital Output, 1 kV differential mode<br>except RS485, 3 kV common mode         |
| • Dielectric withstand (50Hz or 60Hz) | IEC / EN 60255-5: common mode 2 kV <sub>rms</sub> – 1 min<br>differential mode for Digital Output 1 kV <sub>rms</sub> –<br>1 min<br>(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<br>pollution degree: 2<br>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 1/4 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

