ORION ITALIA

Protection relays & Metering division

IPR-D

Current Monitoring & Protection

Ground Protection for Feeders, Generators & Industry

The Current Protection Relay (IPR-D) has been designed to measure the ground RMS current under normal conditions or under disturbances. The current signals are sensed throughout a current transformer (CT). This information is internally processed by the microprocessor in order to take the current protection actions defined under ANSI, IAC or IEC standard.

APPLICATIONS

- Primary and backup ground protection for utility feeders, power plants and industrial distribution systems

PROTECTION AND FUNCTIONALITY

- (50G/50N) Instantaneous ground overcurrent
- (51G/51N) Inverse time ground overcurrent
- ANSI, IAC or IEC/BS142 curves included:
  Moderately inverse
  Normal inverse
  Very inverse
  Extremely inverse
  Definite time
- Overload alarm pickup level

COMMUNICATION

- Remote communication using a PC or a PLC by 1 RS232 & 2 RS485 ports
- Remote programming of the setpoints
- Protocol used: Modbus RTU

FEATURES

- CT primary ratio selectable in 5 A steps (5 A to 5000 A)
- Ground RMS current measurement
- 1 trip relay and 3 programmable auxiliary relay
- Control power drop or internal fault relay
- Digital inputs: 1 breaker status & 3 programmable
- Touchpad programming
- Breaker operation & trip failure

SIGNALLING

- LED and LCD display indication
- Ground current indication
- Last trip cause and storage of values
- Indication and storage of fault conditions and their values
- Threshold LED for 50G/N, 51G/N

APPLICABILITY

Systems: Mono phase, 3 or 4-wire three phase system

Frequency: 50 and 60 Hz

SPECIFICATIONS

SUPPLY VOLTAGE
24÷310 Vdc, -15%, +10%
24÷240 Vac, -15%, +20% 50/60Hz

MAX. POWER CONSUMPTION
12 VA (7W)

TEMPERATURE
Operational: 0 °C ÷ 50 °C
Storage: -20 °C ÷ 70 °C

RELATIVE HUMIDITY
Max. 90% (non condensing)

DIELECTRIC WITHSTAND VOLTAGE
2 kVac, 60 s

BURN IN
48 hours at 50°C

CONSTRUCTION
According to VDE, UL, CEI standards

OUTPUT CONTACT
Rated load: 8 A
DC 150W resistive or 90W inductive (L/R=40 ms)
AC 2000VA resistive or 800VA inductive (PF=0.4)
Max. operating voltage: 250 Vac, 125 Vdc

COMMUNICATIONS
Type: 1 RS232 port + 2 RS485 ports, Half duplex, 1200 → 19200 baud
Protocol: Modbus RTU
Functions: Read/Write setpoints
Read actual values/Execute commands

LED INDICATORS
Relay status: Trip
Alarm
Out of Service
System status: Breaker closed, breaker open, breaker earthed, pickup 50, pickup 51, pickup 50N/G, pickup 51N/G
Display (LCD): 16 x 2 digits

DIGITAL INPUT
Type: Dry contact only, 500 Ohm max ON resistance
Output: 12 Vdc @ 10 mA provided by relay

TERMINAL BLOCK
Fixed, back connection terminals with 4-mm2 section cable (10 AWG)

FRAME
In ABS, auto-extinguish, with frontal panel in polycarbonate (IP54)

ASSEMBLY
The relay has to be fixed to the structure with the help of stirrups and screws

DIMENSION
144 x 144 x 141 mm
WEIGHT
1.5 kg

FRONT PANEL CUTOUT
137 x 137 mm

GROUND CT INPUT
Source CT (In): CT (In) 5 A to 5000 A, Steps: 5 A
CT secondary: CT 1 A or 5 A (specified when ordered)
Sampling: True RMS, 16 sample/s
CT burden: 0.25 VA at rated secondary current
Continuous: 2xIn
Current withstand capac.: 20 times In for 1 sec.
Accuracy: at <= 1xCT => ± 0.5% of 1xCT
at > 1xCT => ± 0.5% of 20xCT

GROUND TIME OVERCURRENT
Pickup level: 4% to 300% of CT. Steps: 1%
Time multiplier: 0.1 to 20.0 for each shape curve
Reset: Time reset to zero each time current level falls below pickup threshold
Accuracy: Pickup: ±3% of setting
Time: ±3% of trip time or ±20 ms

INSTANTANEOUS GROUND OVERCURRENT
Pickup level: 4% to 1800% of CT. Steps: 1% or 10%
Delay time: 0 to 2000 ms. Steps: 10 ms
Accuracy: Pickup: ±3%
Time: +35ms max

TIME OVERCURRENT CURVES
Phase and Ground: ANSI, IAC or IEC Moderately Inverse, Normally Inverse, Very Inverse Extremely Inverse, Definite Time

SPECIFICATIONS

EMISSION TEST **Radiated emissions** References: EN 55011; Port : enclosure; Class A, at 10m **Conducted emissions** References: EN 55011; Port: AC mains; Class A	**IMMUNITY TEST** • Conducted disturbances induced by RF field References: EN 61000-4-6; Port: AC mains and signal lines • Radiated electromagnetic field References: EN 61000-4-3; Port: enclosure • Electrostatic discharge References: EN 61000-4-2; Port: enclosure • Fast transients (burst) References: EN 61000-4-4 ; Port: AC mains and signal lines • Surge References: EN 61000-4-5 ; Port: AC mains • Voltage dips and short interruptions References: EN 61000-4-11 ; Port: AC mains

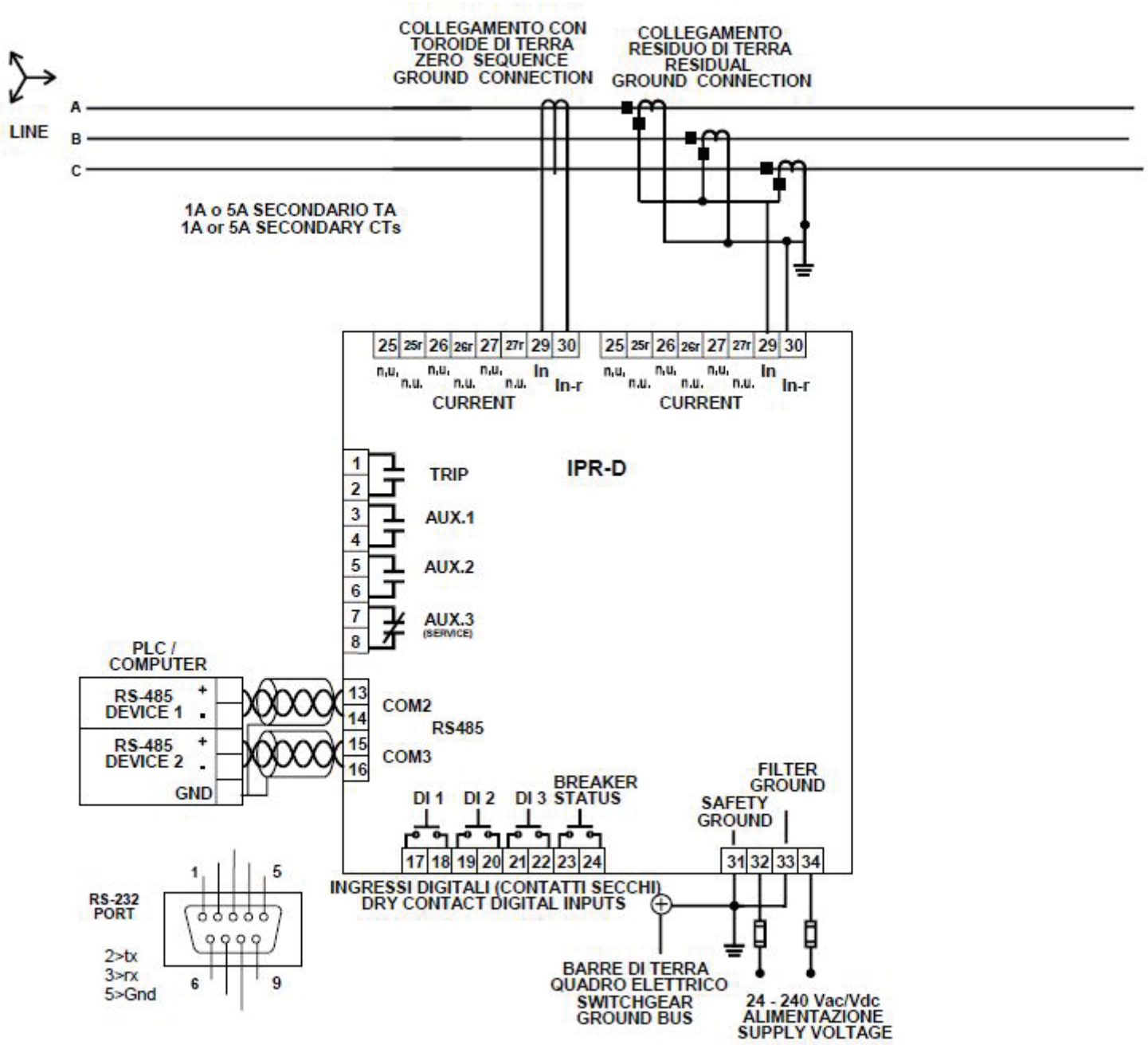
ORDER CODE

IPR – D X X

MODEL
1: Standard
2: Special version

GROUND CT RATED CURRENT
1: 1 A CT
5: 5 A CT

WIRING DIAGRAM



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