



**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

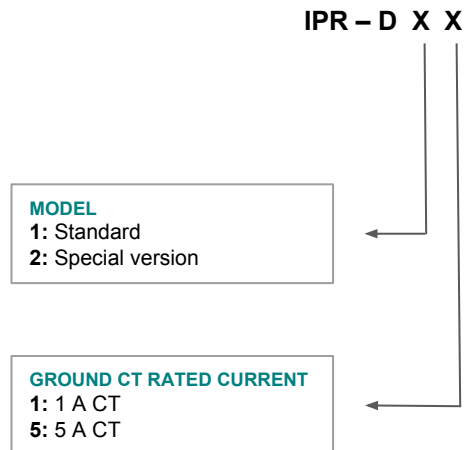
## SPECIFICATIONS

<b>SUPPLY VOLTAGE</b> 24÷310 Vdc, -15%, +10% 24÷240 Vac, -15%, +20% 50/60Hz	<b>MAX. POWER CONSUMPTION</b> 12 VA (7W)
<b>TEMPERATURE</b> Operational: 0 °C ÷ 50 °C Storage: -20 °C ÷ 70 °C	<b>RELATIVE HUMIDITY</b> Max. 90% (non condensing)
<b>DIELECTRIC WITHSTAND VOLTAGE</b> 2 kVac, 60 s	<b>BURN IN</b> 48 hours at 50°C
<b>CONSTRUCTION</b> According to VDE, UL, CEI standards	<b>OUTPUT CONTACT</b> <i>Rated load:</i> 8 A DC 150W resistive or 90W inductive (L/R=40 ms) AC 2000VA resistive or 800VA inductive (PF=0.4) <i>Max. operating voltage:</i> 250 Vac, 125 Vdc
<b>COMMUNICATIONS</b> <i>Type:</i> 1 RS232 port + 2 RS485 ports, Half duplex, 1200 → 19200 baud <i>Protocol:</i> Modbus RTU <i>Functions:</i> Read/Write setpoints Read actual values/Execute commands	<b>LED INDICATORS</b> <i>Relay status:</i> Trip Alarm Out of Service <i>System status:</i> Breaker closed, breaker open, breaker earthed, pickup 50, pickup 51, pickup 50N/G, pickup 51N/G <i>Display (LCD):</i> 16 x 2 digits
<b>DIGITAL INPUT</b> Type: Dry contact only, 500 Ohm max ON resistance Output: 12 Vdc @ 10 mA provided by relay	<b>TERMINAL BLOCK</b> Fixed, back connection terminals with 4-mm <sup>2</sup> section cable (10 AWG)
<b>FRAME</b> In ABS, auto-extinguish, with frontal panel in polycarbonate (IP54)	<b>ASSEMBLY</b> The relay has to be fixed to the structure with the help of stirrups and screws
<b>DIMENSION</b> 144 x 144 x 141 mm <b>WEIGHT</b> 1.5 kg	<b>FRONT PANEL CUTOUT</b> 137 x 137 mm
<b>GROUND CT INPUT</b> <i>Source CT (In):</i> CT (In) 5 A to 5000 A, Steps: 5 A <i>CT secondary:</i> CT 1 A or 5 A (specified when ordered) <i>Sampling:</i> True RMS, 16 sample/s <i>CT burden:</i> 0.25 VA at rated secondary current <i>Continuous:</i> 2xIn <i>Current withstand capac.:</i> 20 times In for 1 sec. <i>Accuracy:</i> at ≤ 1xCT => ± 0.5% of 1xCT at > 1xCT => ± 0.5% of 20xCT	<b>GROUND TIME OVERCURRENT</b> <i>Pickup level:</i> 4% to 300% of CT. Steps: 1% <i>Time multiplier:</i> 0.1 to 20.0 for each shape curve <i>Reset:</i> Time reset to zero each time current level falls below pickup threshold <i>Accuracy:</i> Pickup: ±3% of setting Time: ±3% of trip time or ±20 ms
<b>INSTANTANEOUS GROUND OVERCURRENT</b> <i>Pickup level:</i> 4% to 1800% of CT. Steps: 1% or 10% <i>Delay time:</i> 0 to 2000 ms. Steps: 10 ms <i>Accuracy:</i> Pickup: ±3% Time: +35ms max	<b>TIME OVERCURRENT CURVES</b> <i>Phase and Ground:</i> ANSI, IAC or IEC Moderately Inverse, Normally Inverse, Very Inverse Extremely Inverse, Definite Time

## SPECIFICATIONS

<p><b>EMISSION TEST</b></p> <p><b>Radiated emissions</b> References: EN 55011; Port : enclosure; Class A, at 10m</p> <p><b>Conducted emissions</b> References: EN 55011; Port: AC mains; Class A</p>	<p><b>IMMUNITY TEST</b></p> <ul style="list-style-type: none"><li>• <u>Conducted disturbances induced by RF field</u> References: EN 61000-4-6; Port: AC mains and signal lines</li><li>• <u>Radiated electromagnetic field</u> References: EN 61000-4-3; Port: enclosure</li><li>• <u>Electrostatic discharge</u> References: EN 61000-4-2; Port: enclosure</li><li>• <u>Fast transients (burst)</u> References: EN 61000-4-4 ; Port: AC mains and signal lines</li><li>• <u>Surge</u> References: EN 61000-4-5 ; Port: AC mains</li><li>• <u>Voltage dips and short interruptions</u> References: EN 61000-4-11 ; Port: AC mains</li></ul>
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## ORDER CODE



## WIRING DIAGRAM

