PGR-5330 SERIES

Resistance Grounded Relay

Description

The PGR-5330 is an advanced ground-fault and grounding-resistor-monitoring relay. It measures neutral current, neutral-to-ground voltage, and neutral-to-ground resistance. It provides continuous monitoring of the neutral-to-ground path to verify that the neutral-grounding resistor (NGR) is intact. This is of utmost importance because an open NGR renders current-sensing ground-fault protection inoperative. The PGR-5330 can be used with low- and medium-voltage transformers and generators used in processing, manufacturing, chemical, pulp and paper, petroleum, and water-treatment facilities.

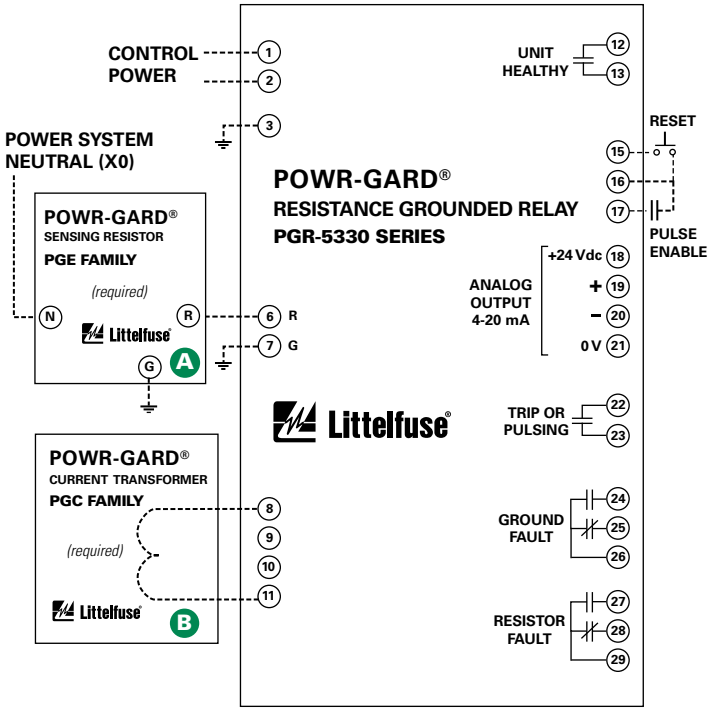
Resistor Monitoring

The PGR-5330 combines the measured values of resistance, current, and voltage to continuously determine that the NGR is intact. It is able to detect a resistor failure with or without a ground fault present. Voltage-rated sensing resistors are used to monitor NGRs on systems up to 35 kV.

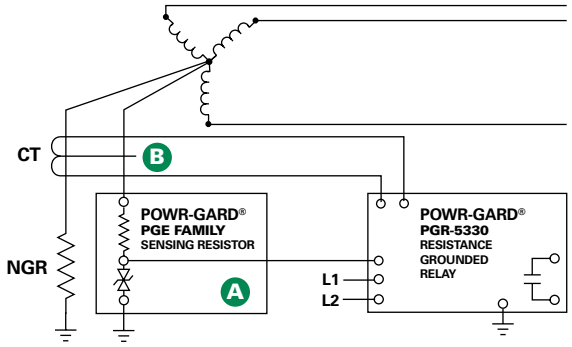
Ground-Fault Monitoring

The PGR-5330 uses an application-appropriate current transformer to reliably detect ground-fault currents as small as 100 mA. DFT filtering ensures that false trips due to harmonic noise from adjustable-speed drives do not occur. Should the resistor open and a ground fault subsequently occur, the PGR-5330 will detect the fault through voltage measurement, while other current-sensing relays will be ineffective.

Wiring Diagram



Simplified Circuit Diagram



Accessories

A 

PGE Family Sensing Resistors
Required interface between the power system and the PGR-5330. Eliminates hazardous voltage levels at the relay.

B 

PGC-3000 Ground-Fault Current Transformers
Sensitive ground-fault current detection (5 A primary)

PGC-5000 Ground-Fault Current Transformers
Sensitive ground-fault current detection (30 A primary)

Other Current Transformers
For low resistance NGRs choose a CT primary approximately equal to the NGR rating.

Features & Benefits

FEATURES	IEEE #	BENEFITS
Continuous NGR Monitoring	3GC	Detects resistor failure within seconds, reduces transient-overvoltage risk, removes risk of ground-fault-detection failure
Ground-Fault Detection	50G/N, 51G/N	Main or backup protection to detect a ground fault anywhere on the monitored system
Adjustable Pickup (unlimited)		Select greatest sensitivity without false operation
Adjustable Time Delay (0.1–10 s)		Adjustable trip delay allows quick protection and system coordination
Universal CT Compatibility		Allows the use of a CT that gives required ground-fault settings
Output Contacts		Two form C output contacts (ground-fault and resistor fault)
Analog Output (4–20 mA)		Allows for connecting an optional PGA-0500 meter or control system
Pulsing Output		Control the operation of a pulsing ground-fault-location circuit
Data Logging		On-board 10-event recorder helps with system diagnostics
Harmonic Filtering (DFT)		Eliminate false trips due to harmonic noise from ASDs
Local Communications		RS-232 port to view measured values, log to a PC & check event records
Network Communications		Remotely view measured values, event records & reset trips
Software		PC-interface software is included
Selectable Contact Operating Mode		Selectable fail-safe or non-fail-safe operating modes allows connection to shunt or undervoltage breaker coil
Auto-Reset Switch		Selectable latching or auto-reset operation
Calibrate Push Button		Ensures resistor-failure sensitivity is correct
Unit-Healthy Output		Verifies PGR-5330 is operating correctly
Conformal Coating		Internal circuits are conformally coated to protect against corrosion and moisture

Typical Values

SYSTEM VOLTAGE (VOLTS)	NEUTRAL-GROUNDING RESISTOR		SENSING RESISTOR		GROUND-FAULT PICKUP LEVEL (AMPERES)	V_N PICKUP LEVEL (VOLTS)
	CURRENT (AMPERES)	RESISTANCE (OHMS)	MODEL	RESISTANCE (SWITCH S5 SETTING)		
480	5	55	PGE-600V	20 kΩ	2.5	170
600	5	69	PGE-600V	20 kΩ	2.5	200
2,400	5	277	PGE-05KV	20 kΩ	2.5	800
4,160	5	480	PGE-05KV	20 kΩ	3	1,700
7,200	10	416	PGE-15KV	100 kΩ	4.5	2,000
14,400	15	554	PGE-15KV	100 kΩ	6.5	800 x 5 = 4,000

NOTE: The above table is for illustrative purposes only. Actual values may differ based on a variety of individual system considerations, such as capacitive charging current and coordination study results.

Ordering Information

CATALOG/SYSTEM NUMBER	COMMUNICATIONS	VOLTAGE
PGR-5330-00-00	RS-232	80–265 Vac/dc
PGR-5330-01-00	RS-232 & DeviceNet™	80–265 Vac/dc
PGR-5330-02-00	RS-232 & Profibus®	80–265 Vac/dc
PGR-5330-03-00	RS-232 & Ethernet	80–265 Vac/dc

NOTE: For 36-72 Vdc Control Power use part numbers PGR-5330-20-00, PGR-5330-21-00, PGR-5330-22-00 or PGR-5330-23-00 respectively.

ACCESSORIES	REQUIREMENT	PAGE
PGE Family	Required	42
Current Transformers	Required	38

Specifications

IEEE Device Numbers	Ground fault (50G/N, 51G/N), Check relay (3GC)
Input Voltage	See ordering information
Dimensions	**H** 150 mm (5.9"); **W** 109 mm (4.3"); **D** 100 mm (4.0")
GF Trip-Level Settings	2–100% of CT-Primary Rating
GF Trip-Time Settings	0.1–10 s
RF Trip-Level Settings	20–2000 Vac (≤5 kV systems) 100–10000 Vac (>5 kV systems)
Contact Operating Mode	Selectable fail-safe or non-fail-safe
Harmonic Filtering	Standard feature
Reset Button	Standard feature
Output Contacts	Two Form A and Two Form C
Pulsing Circuit	1.0–3.0 s in 0.2 s increments
Approvals	CSA certified to US and Canadian standards
Communications	RS-232; DeviceNet™, Profibus®, Ethernet
Analog Output	4–20 mA, self or loop powered
Conformally Coated	Standard feature
Warranty	5 years
Mounting	Panel, Surface

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