GGP

Power Directional Relay

For three-phase protection of generators against running light as synchronous motors.

Features and Benefits

- Suitable for unbalanced loads
- Up to 30 second delay included
- Electrically separate main and timing contacts
- Electrically operated target and seal-in unit
- Drawout case

Applications

- Turbine-driven generators
- Prevent turbine damage

Protection and Control

- Three-phase reverse power

Applications

Turbine-driven Generators

The usual application of the GGP relay is to prevent motoring of a turbine-driven generator. The real purpose is to protect the turbine not equipped with integral protective means if its steam supply is lost or reduced. Under such a condition the generator will take power from the bus and run light as a synchronous motor, driving the turbine at normal speed. With no steam or insufficient steam present in the turbine, the blades may be damaged by overheating as developed by windage. Under normal operating conditions, such heat is dissipated into the steam.

Unbalanced Systems

The GGP is a 3-phase relay that is suitable for unbalanced loads and is preferred instead of three single-phase relays, giving full power directional protection for all varying conditions. The GGP should be used wherever phase-balancer action, in the presence of unbalanced loads, may cause the failure of single-phase power relays to trip.

Sensitivity

If motoring occurs, resulting in a power reversal (see Selection Guide next page for the main unit current setting), the directional unit induction cylinder design of the relay will close contacts at once. These contacts energize the operating coil circuit of the timing unit, which starts to time out. This relay measures true watts, and is practically unaffected by the reactive component. Since the directional unit contacts are brought out to studs, they may also be used to energize an alarm.

Timing

The timing unit can be adjusted to operate in any time from 1.5 to 30 sec, at which time the contacts close, tripping the generator breaker. If conditions return to normal at any time during the timing cycle, the power-directional unit opens its contacts, thereby de-energizing the timing unit, which resets. Tripping cannot occur unless the power reversal lasts long enough for the timing unit to complete its full travel and close its contacts.

Contacts

Electrically separate main and timing contacts, both single-circuit normally open. A 0.2/2 A target seal-in is available with seal-in contacts connected across the timing (IAV) unit contacts. Standard contact ratings for the universal seal-in unit are applicable.

Burdens

Model	Terminals	VA	W	PF
CURRENT CIRCUIT, 5 A, 60 Hz				
GGP53C	3-4	22.0	6.4	0.29
	5-6	11.0	3.2	0.29
	7-8	11.0	3.2	0.29
POTENTIAL CIRCUIT, 120, 60 Hz				
GGP53C	2-12	20.3	7.8	0.38
	13-14	21.4	10.7	0.50
	15-16	21.4	10.7	0.50

Selection Guide

THREE-PHASE, 5 A

Frequency (Hz)	Volts	Target and Seal-in (A)	Main Unit Fixed Setting		Timing Unit Adjustment (Sec)		Model Number	Case Size	Approx. Wt. in lbs (kg)	
			V	A①	Min	Max			Net	Ship
60	120	0.2/2.0	120	0.010	1.5	30	GGP53C1A	M2	22 (10)	34 (15.4)
50	120						C3A			

① At unit power factor.