

# Inverse Time Power Relay

## Type WDG

### APPLICATION

Type WDG11 relays detect reversal of power flow and are used to give time graded IDMT protection against 'motoring' to diesel and gas turbine driven alternators and to large pass-out turbo alternators, when the 'monitoring' power available is greater than 6% of rated power. For condenser-evacuated sets, where the 'motoring' power is less than 3% of rated power, the more sensitive polyphase relay type WCD is recommended. Reverse power protection can also be given to interconnected feeders. Relays suitable for phase-neutral (Type A) and phase-phase (Type B) connection are available with either standard or sensitive settings.

Type WDG12 power relays detect power increases. Typical applications include the separation of power systems when the flow

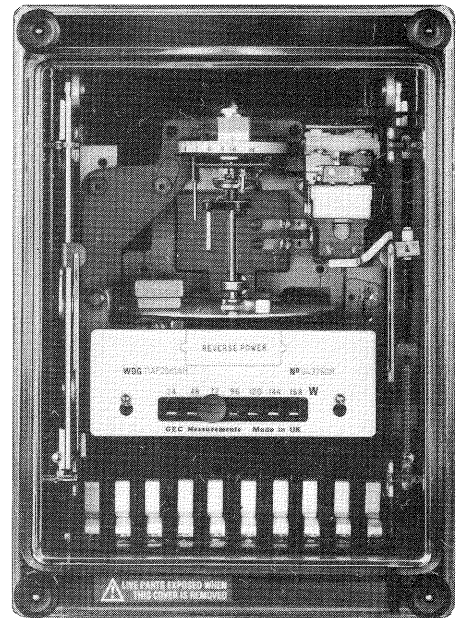
from one system to another exceeds a safe value and the time-graded IDMT protection of unattended generating plant against overload.

A single relay is sufficient for balanced conditions on three phase, three or four wire systems but a relay must be employed on each phase for unbalanced conditions. A triple pole relay WDG31 is available.

### DESCRIPTION

The relay is basically a wattmetric induction disc movement and seven equal taps are provided on a small auxiliary current transformer to obtain desired power setting. The relay measures true watts down to 50% of normal voltage and 0.5 power factor.

Adjustment of the time setting is made by rotating a knurled moulded disc against a graduated time multiplier scale.



### TECHNICAL DATA

Relay			WDG11 type 'A'			WDG11 type 'B'			WDG12		
Application			Reverse power			Reverse power			Over power		
Connection			Phase to neutral			Phase to Phase			Phase to Phase		
Maximum torque angle			0°			30° lead			30° lead		
Frequency Hz.			50		60	50		60	50		60
Current coil rating (C.T. secondary) amps			1 or 5		1 or 5	1 or 5		1 or 5	1 or 5		1 or 5
Voltage coil rating (V.T. secondary) volts			63.5	240	66.5	110	440	115	110		115
Settings 5 A rated relay*	Sensitive	Single phase watts	6-42	24-168	6-42	—	—	—	—	—	—
		3 phase watts	—	—	—	18-126	72-504	18-126	—	—	—
	Standard	Single phase watts	30-210	120-840	30-210	—	—	—	—	—	—
		3 phase watts	—	—	—	90-630	360-2520	90-630	450-1800	450-1800	450-1800
Burdens	Voltage coil VA at rated voltage		10.6		9.0	13.9		10.5	13.9		10.5
	Current coil VA at rated current	Sensitive	11.5-0.4		13.5-0.3	11.5-0.4		13.5-0.3	—		—
		Standard	3.5-0.07		4.5-0.1	3.5-0.07		4.5-0.1	0.14-0.003		0.18-0.004

\*For settings of 1 A rated relay divide figures given by 5

### Thermal rating

The relays will withstand twice rated current continuously or 20 times rated current for three seconds, and 110% rated voltage continuously.

### Auxiliary units and operation indicators

An auxiliary attracted armature unit with a hand reset operation indicator for either shunt reinforcing or series seal in is fitted as standard.

### Standard coil ratings

Voltage operated (shunt) auxiliary units: 30, 48, 50, 110, 125, 220 and 250 V d.c. at nominal burden of 3 W continuously rated or 110, 240 and 440 V a.c. at a nominal burden of 3.5 VA continuously rated.

Current operated (series) auxiliary units:

Minimum operating current in A d.c. (two taps)	0.5 second current rating in A d.c.	Coil resistance in ohms
0.1 and 0.3	18 and 22	9.2 and 2.1
0.2 and 2.0	22 and 92	6.0 and 0.125
0.6 and 2.4	92 and 188	0.29 and 0.031

Other coil ratings can be supplied for both types of auxiliary unit.

### Contacts

Two pairs of self or hand reset contacts are fitted in any combination of normally open or normally closed which will make and carry 7500 VA for 0.5 second with maxima of 30 A and 660 V a.c. or d.c.

### Insulation

The relay will withstand 2 kV 50 Hz for one minute between all terminals connected together and the case, together and 1 kV 50 Hz for one minute between all normally open contacts.

### CASES

The relays are supplied in drawout cases, and can be either flush or projecting mounted. Standard case finish is phenolic black. Relays for use in exceptionally severe environments can be finished to B.S.2011:20/50/56 at extra cost. Standard relays are finished to B.S.2011:20/40/4 and are satisfactory for normal tropical use.

Relay	Case	Maximum Overall Dimensions (mm)		
		Height	Width	Depth*
WDG11 WDG12	1D	237	173	218
WDG31	3D (horiz)	238	458	218

\*Add 7 mm for maximum length of M5 terminal screws.

Dimensioned drawings of case outlines, panel cut-outs and mounting details are available on request.

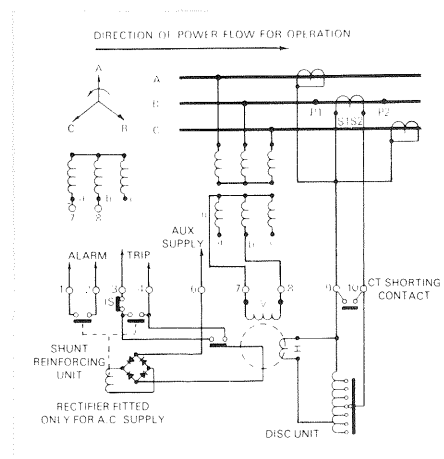


Figure 1. TYPICAL APPLICATION AND SIMPLIFIED INTERNAL CIRCUIT DIAGRAM OF WDG11 TYPE 'A' REVERSE POWER RELAY WITH SHUNT REINFORCING. Alternative V.T. secondary connection for type 'B' relay is shown. Overpower relays are connected in the same way but will restrain for power flow in the direction shown.

### Earthing arrangements

Although not included in the diagram, it is assumed that secondary C.T. and/or V.T. circuits will be earthed as necessary in compliance with standard safety requirements and determined by the switchgear contractor or user. If in doubt please consult GEC Measurements for advice.

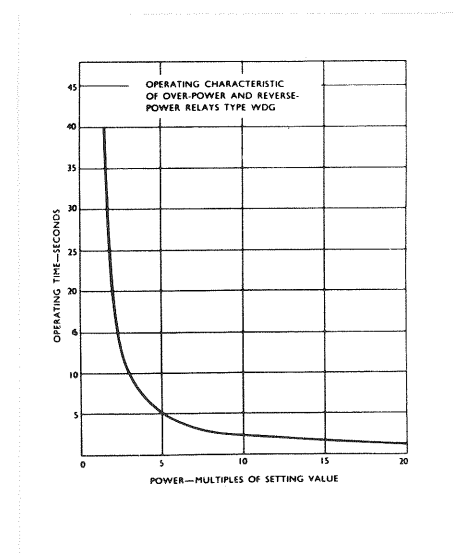


Figure 2. TIME/POWER CHARACTERISTIC

### INFORMATION REQUIRED WITH ORDER

- Relay type
- Power setting range
- Current (C.T. secondary)
- Voltage (V.T. secondary)
- System frequency
- Trip circuit voltage (shunt reinforcing)
- Trip circuit current (series seal in)
- Case mounting

Our policy is one of continuous product development and the right is reserved to supply equipment which may vary slightly from that described.

**GEC Measurements**

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