

GEC Measurements

SENSITIVE POWER RELAY

Type WCD

The type WCD power relay is a sensitive polyphase induction cup unit intended to provide reverse or under power interlocking. When a turbo-generator set is shut down in an emergency, there is a risk of overspeed if the circuit breaker opens before the steam valves are completely closed. Even if these actions are simultaneous, steam trapped in the casing of a large turbine may be sufficient to cause overspeed. A sensitive power relay retains the generator on load until the onset of 'motoring' and then operates to open the circuit breaker.

To prevent operation due to power swings when the machine is being synchronised, it is desirable to employ a definite time delay unit (VAT).

CONSTRUCTION

The electrical quantities are fed to windings on the eight poles of a laminated stator with a central fixed core. The moving contact is carried on a cup-shaped aluminium rotor which turns on jewel bearings in the air gap between stator and core. Only a small travel is needed to close the contacts, and with the low inertia of the rotor and unusually large operating torque, a high speed of operation is ensured.

CHARACTERISTICS

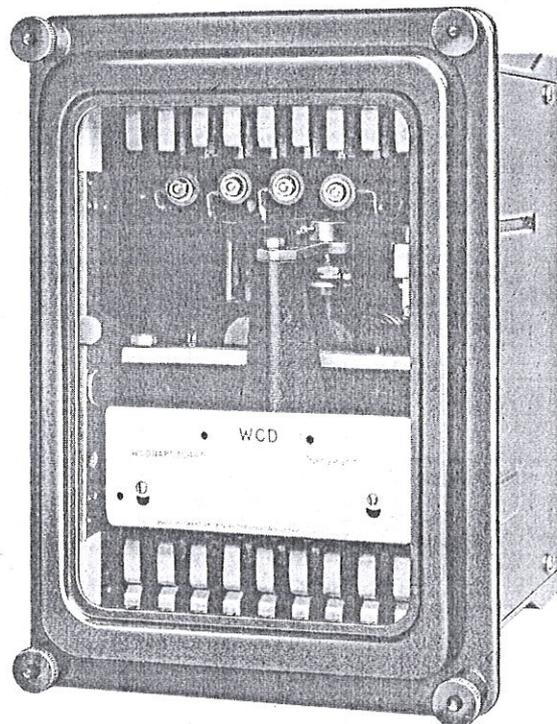
Current Rating	1 or 5 amps (C.T. secondary at 50 or 60 Hz)
Voltage Rating	110 volts at 50 Hz or 115 volts at 60Hz
Thermal Rating	The relay will withstand twice rated current continuously or 20 times rated current for three seconds and 110% of rated voltage continuously.
Sensitivity	Less than 0.5% of rated power at unity power factor and less than 1.0% of rated power at 75° phase angle
Operating Time	35 milliseconds at 5.0% of rated power
Directional Stability	The relay remains unoperated at forward powers of over five times rated power.

BURDENS

Phase	Burden at rated current and voltage (VA)	
	Current	Voltage
Red ..	6.5	9.0
Yellow ..	3.6	9.0
Blue ..	2.8	18.0

AUXILIARY UNIT

The induction cup unit contact energises an attracted armature auxiliary unit (VAA).



Contacts Up to four pairs of electrically separate self reset contacts in any combination of normally open or normally closed can be provided. Each pair is rated as follows:—

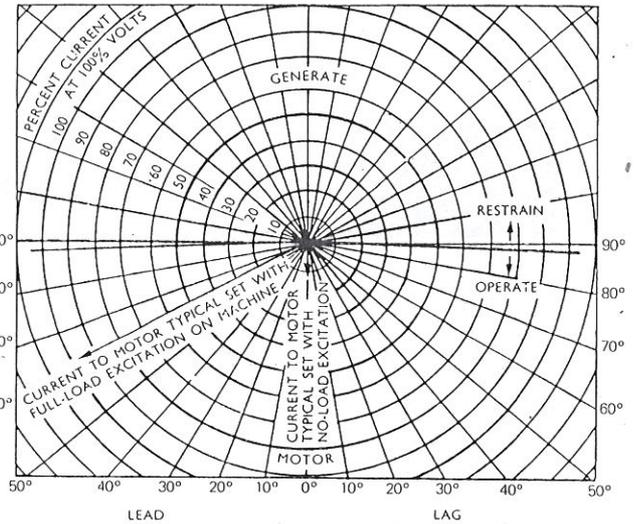
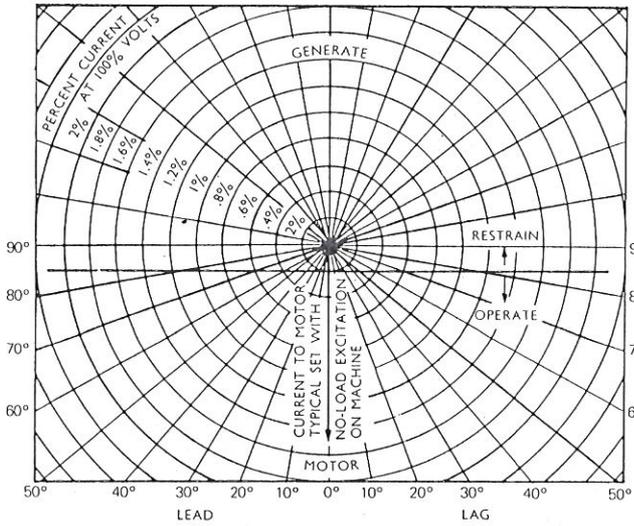
	Make and carry continuously	Make and carry for 3 seconds	Break
a.c.	1250 VA with maxima of 5 amps and 660 volts	7500 VA with maxima of 30 amps and 660 volts	1250 VA with maxima of 5 amps and 660 volts
d.c.	1250 watts with maxima of 5 amps and 660 volts	7500 watts with maxima of 30 amps and 660 volts	100 watts (resistive) 50 watts (inductive) with maxima of 5 amps and 660 volts

Standard Voltages 30, 110, 125 or 220 volts* d.c. at 3 watts. Other voltage ratings either a.c. or d.c. can be supplied.

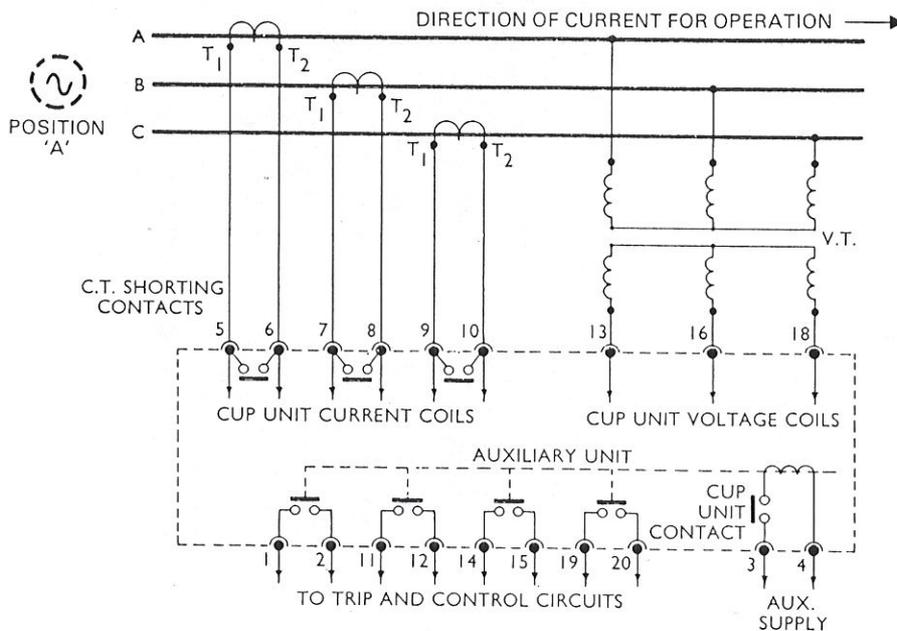
CASE

The relay is supplied in a size 1 double ended drawout case which is available for either flush or projecting mounting finished 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.



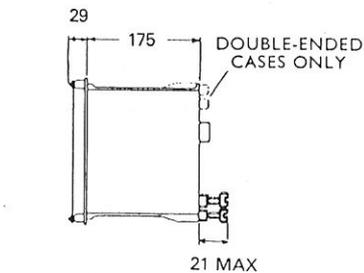
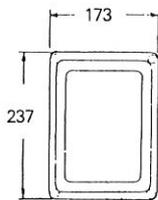
Typical operating characteristics showing (left) performance at very low current and (right) performance at large currents



POSITION 'B'

Relay Type	Relative Position of Generator
Under Power	Position A
Reverse Power	Position B

Typical application and internal diagram



Case outline

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 contact GEC Measurements for advice.

INFORMATION REQUIRED WITH ORDER

- Current rating
- Voltage rating
- Frequency
- Auxiliary supply voltage
- Number and arrangement of auxiliary contacts
- Case finish and mode of mounting

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

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Publication R-5119D