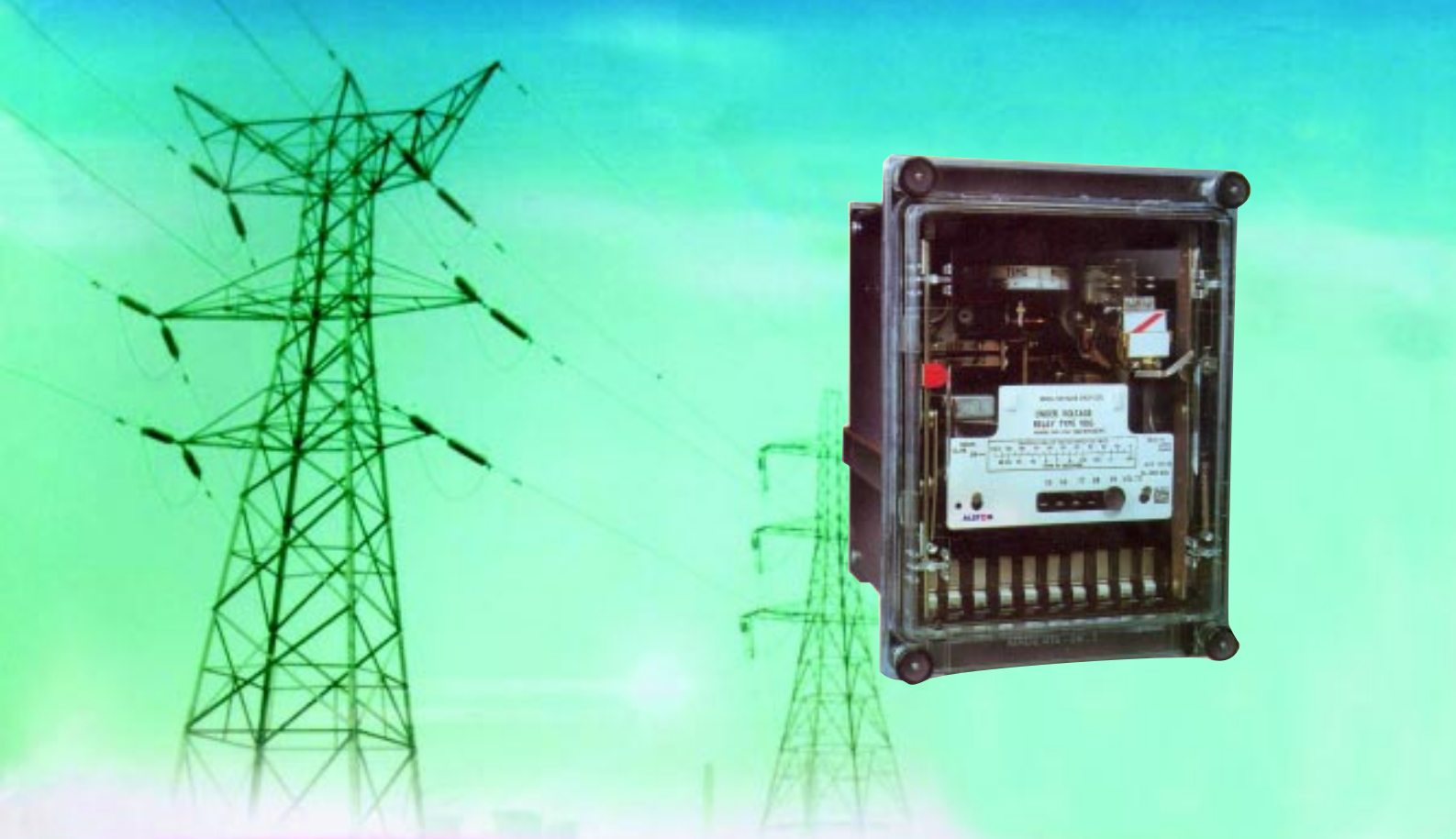

Type VDG 13
Undervoltage Relay

ALSTOM

Type VDG 13
Undervoltage Relay

VDG 13 relay
withdrawn from case

Features

- Identical time/voltage characteristics on all taps.
- Frequency compensated.
- Simple construction, easily accessible.
- Comprehensive range of auxiliary unit ratings.
- Dust tight drawout case and tropicalised finish.

Application

Relay type VDG 13 is an inverse time undervoltage protection of ac circuits, capacitors, rectifiers and machines such as induction motors.

Description

Relay type VDG 13 is a heavily damped, frequency compensated induction disc relay with adjustable inverse time/voltage characteristic. With the relay electro-magnet de-energised, the disc contact is held in the closed position by a spiral control spring. When the rated voltage is applied to the relay coil, a torque is produced in the contact opening direction and when the applied voltage falls below the setting value, the control spring torque overcomes the driving torque and closes the contact. Damping of the disc movement is by a removable high retentivity permanent magnet.

The unique method of winding the operating coil ensures that the time/voltage characteristics are identical on each of the voltage taps. Selection of the required voltage setting is by means of a link board which has a single insulated link. Taps on the operating coil and a series resistance are connected to the link board and provide a constant inductance/resistance ratio on each voltage setting and frequency compensation effect is obtained by using the correct combination of coil reactance and resistance.

The relay operating time can be adjusted by means of the disc back-stop which is controlled by rotating a knurled moulded disc at the base of the graduated time multiplier scale.

Type VDG 13 relay is a single pole relay.

Technical data

Voltage ratings and settings

The relay can be supplied having a voltage rating of 110, 240/250 or 440 V ac, 50 Hz.

For 240/250 or 440V relays, external voltage transformers are supplied.

The following setting range is available:

50 - 90% adjustable in five equal steps at 10%.

Resetting voltage

The disc will completely reset at 105% or less of the voltage setting.

Operating time

0 - 5.0 seconds at zero voltage. Time/voltage characteristic at time multiplier setting 1.0 as given in Figure 1.

Resetting time

With the time multiplier set at 1.0, when the applied voltage suddenly increases from zero to rated voltage, the resetting times are as follows:

Relay setting (%)	30	40	50	60	70	80	90
Resetting time (seconds)	1	1.5	2	4	5	10	12

Burdens

5.0VA at voltage setting

At rated voltage, the burdens are as follows:

Relay Setting (%)	50	60	70	80	90
VA at rated voltage	20	14	10.5	8	6

Thermal rating

The relay will withstand 120% rated voltage on any setting continuously for 60°C rise in coil temperature.

Accuracy

The operating value conforms to error class index E 5.0 as per BS 142 and 5.0 as per IS 3231 at the voltage setting.

The operating time at time multiplier setting 1.0 conforms to the time/voltage characteristic given in Figure 1, subject to a tolerance of ±7.5% at zero voltage.

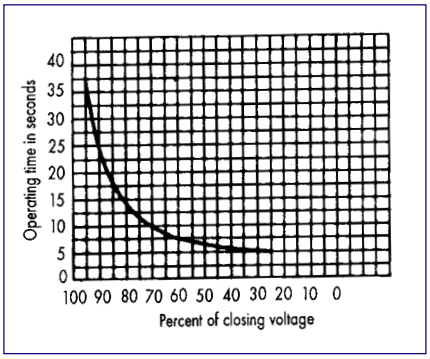

Figure 1:
Time/voltage characteristic at time multiplier setting 1.0

Frequency error

The maximum pick-up variation between 40 and 70 Hz is 7%.

Auxiliary units and operation indicators

The relay has a voltage operated auxiliary unit fitted with two pairs of normally open self reset contacts arranged to reinforce the disc contact.

It is also fitted with an operation indicator which is hand reset by means of a push-rod protruding through the relay case.

Coil ratings

24V dc - 240V dc.

Contact ratings

The single disc contact will make and carry for 0.5 s, 2500VA with maxima of 10A and 660V ac or dc.

The two pairs of electrically separate, self reset contacts provided on the auxiliary unit will make and carry for 0.5 sec 7500VA with maxima of 30A and 660V ac or dc.

Insulation

The relay meets the requirements of IS 3231/IEC 255-5 Series C - 2 kV for 1 minute.

External and internal circuit connections

Typical external and internal connections for type VDG 13 under-voltage relay with shunt reinforcing indicators is shown in Figure 2.

Case

Relays are supplied in drawout cases suitable for flush or projection mounting and are finished eggshell black and tropicalised. The drawout feature considerably simplifies maintenance and permits testing to be carried out easily and quickly. A cradle mounted isolating switch is provided which automatically isolates the trip circuit when the cradle assembly is withdrawn from the case for maintenance. This prevents any inadvertent tripping of the circuit breaker. A filter breather is fitted which equalises pressure inside and outside the case without admitting dust.

Type VDG 13 relays are mounted in size 1D vertical case.

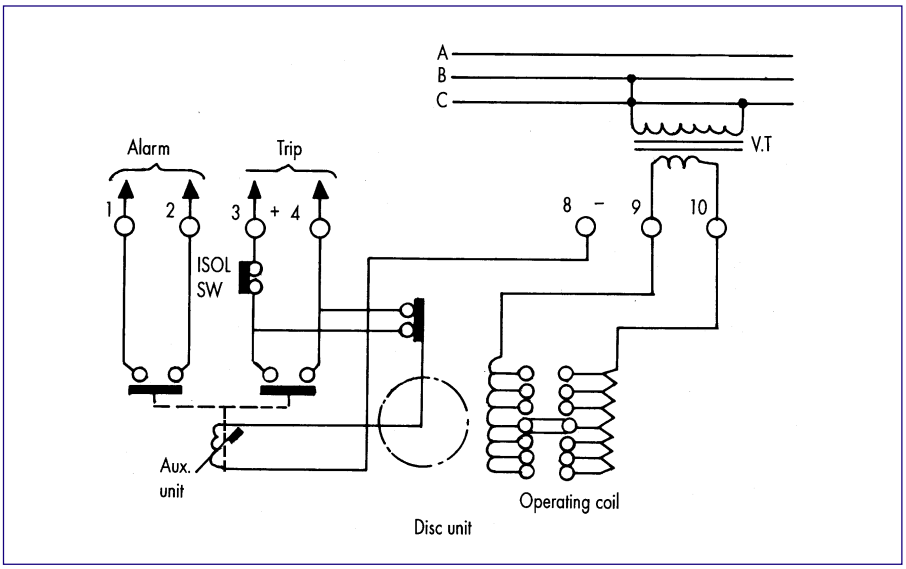

Figure 2:
Typical external and internal connections for relay type VDG 13

Dimensions and weights

Relay	Case size	Maximum overall dimensions			Approximate gross weight Kg.
		Height mm	Width mm	Depth* mm	
VDG 13	1D vert	233	170	203	6.0
External transformers		127	114	114	4.5

* Add 76 mm for maximum length of terminal studs, alternatively, 29 mm for terminal screws.

The approximate gross weights given above are inclusive of cartons, mounting appendages and terminal details.

The relays comply fully with the requirements of IS 3231 and are suitable for use in normal tropical environments.

Information required with order

1. System frequency and application.
2. Voltage rating (110, 240/250 or 440V ac).
3. Auxiliary contacts - hand or self reset.

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