

Reyrolle  
Protection  
Devices

## **7PG16 – VR**

Over and Undervoltage Relay

**Answers for energy**

**SIEMENS**  
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# 7PG16 – VR

Over and Undervoltage Relay

## Description

Type VR are a range of electro-mechanical under and over voltage relays.

## Safety

The commissioning and future maintenance of this equipment should only be carried out by skilled personnel trained in protective relay operation and capable of observing all the necessary safety precautions and regulations appropriate to this equipment and also the associated primary plant.

Equipment should be isolated from auxiliary supplies and the circuit breaker trip circuit prior to commencing any work on an installed product.

## Unpacking, handling & storage

On receipt unpack the relay and inspect for any obvious damage.

If damage has been sustained a claim should immediately be made against the carrier, also inform Siemens Protection Devices Limited.

When not immediately required return the relay to its carton and store in a clean, dry place.

## Preliminary Tests

For routine maintenance proceed from paragraph 3.

On receipt of the relay check that the packing is not damaged and that there are no visible signs of any damage to the relay.

Check that the operating voltage is correct for the auxiliary voltage to be used. In some instances relays are to be used with the coil in series with a voltage dropper resistor this is advised on our Order Acknowledgement and shown on the relay label as "+Ext R", suitable resistors are supplied with the relay, ensure that such resistors are mounted vertical, are securely fixed, wired to the correct relay, and the correct relay terminals.

Isolate from the auxiliary supply(s) by removing fuses and links as necessary.

Physically check the wiring to the relay terminals for security and to prove that it is wired correctly to the circuit schematic/wiring diagrams.

## Insulation Tests

Using a 500V insulation test set:

- a) Connect all relay terminals together and measure the resistance to earth
- b) Connect the d.c. input terminals together and measure the resistance between these terminals and all other terminals connected together and to earth.
- c) Connect the relay output contacts together and measure the resistance between these terminals and all other terminals connected together including earth.

A value of 2.5 to 3.0 megohms obtained from the above tests is considered satisfactory, a value of less than 1.0 megaohm is not satisfactory and the cause of such a low reading should be determined and corrected.

## Mechanical Settings

It should not be necessary to adjust settings during routine tests unless parts have been replaced or other repairs carried out. Adjustment of one setting will often influence another, therefore all settings must be checked after the final adjustment.

The table of Mechanical Settings provides the basic settings necessary before finally setting the relay to obtain its performance, they are generally minimum figures.

## Electrical Tests

Check that the relay operates over its operating range, it should operate smoothly and the armature go fully home.

Electrical settings.

VR121 rated 220V a.c, 60% drop-off setting

Check that the relay picks up at 80%  $V_n$ , i.e.  $176\text{ V} \pm 3\frac{1}{2}\%$ . Adjust to this value if necessary. The relay must drop-off cleanly with a single action.

Re-seal any setting screws that have been adjusted using an air drying enamel paint, preferably coloured red..

## Power Frequency Tests:-

Relays should withstand 2.0kV rms 50Hz applied for 1 minute between:-

a) coil and contacts connected together and earth.

b) coil to contacts and earth connected together.

1.0kV 50Hz rms applied for 1 minute across normally opened contacts.

1	Residual gap measured at the top edge of the core	0.6 mm
2	Armature gap measured under the residual screw	2.00 mm
3	<b>Normally closed contacts</b>	
	3.1 Clearance between the comb and moving contact	0.1 - 0.2 mm
	3.2 Force required to separate closed contacts	12 – 15 gms
	3.3 The single blade fixed contact should be set in parallel with the main moulding	
	3.4 Minimum contact separation	1.8 mm
4	<b>Normally open contacts</b>	
	4.1 Minimum remaining armature travel, measured at residual pip.	0.4 mm
	4.2 Minimum contact separation	1.8 mm
	4.3 Minimum force required to lift moving contact off comb	8 gms
	4.4 The single blade fixed contact should be set in parallel with the main moulding	

Table 1. Basic mechanical settings

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Power Distribution Division Order No. C53000-G7076-C57-1  
Printed in Fürth

Printed on elementary chlorine-free bleached paper.

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