

Operating Recommendations

Types AR and FR instantaneous relays

1. DESCRIPTION

Type AR are a range of armature relays with up to 8 contacts:

Product Designations.

First Digit:	Number of identical elements
Second Digit:	Type of Flag
	0 – No flag
	1 – Hand reset flag
	2 – Hand reset reverse acting flag
	3 – Self reset flag
	4 – Self reset reverse acting flag

Reverse acting flags show on de-energisation

Third Digit:	Type of contact reset
	1 – Self reset contacts
	2 – Hand reset contacts
	3 – Electrical and hand reset contacts
	4 – Hand and self reset
	5 – Electrical reset

Suffixes after the number identity – “D” – a suppression diode fitted in series with the coil. “SB” – relay with a series break contact. “T” – a time delay relay. It should be noted that there are two methods of obtaining hand reset contacts, either operated from the flag or held in the operated position by a latch mechanism.

2. 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.

2. UNPACKING, HANDLING & STORAGE

On receipt unpack the relay and inspect for any obvious damage. It is not normally necessary to remove the relay from its polythene bag unless some damage is suspected or if it is required for immediate use.

If damage has been sustained a claim should immediately be made against the carrier, also inform Reyrolle Protection and the nearest Reyrolle agent.

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

4. PRELIMINARY TESTS

Check that the relay operating voltage (and reset voltage if a reset coil is fitted) are correct for the auxiliary voltage to be used. In some instances relays are 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 the 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 secure and wired to the correct relay coil.

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 and wiring diagrams.

5. INSULATION TESTS

Using a 500V insulation test set:

- Connect all relay terminals together and measure the resistance to earth
- Connect the d.c. input terminals together and measure the resistance between these terminals and all other terminals connected together and to earth.
- 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.

6. 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 values.

7. ELECTRICAL TESTS

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

Operating Range:-

D.C. relays 70% to 115% of rated voltage

A.C. relays 80% to 110% of rated voltage

The relay has a guaranteed minimum performance range as stated above within which it must always operate

The relay may exceed this performance and operate across a wider range.

Relays must reset when the applied voltage is reduced to not less than 5% of rated voltage.

Power Frequency Tests:-

Relays should withstand 2.0kV 50 Hz r.m.s. applied for 1 minute between:-

- coil and contacts connected together and earth.
- coil to contacts and earth connected together.

Also 1.0kV 50Hz r.m.s. applied for 1 minute across normally opened contacts.

Table 1 Mechanical Settings for types AR101, AR111, AR112, AR121, AR131, AR141, FR111, FR111T AND FR111S

1 Armature gap measured at residual pip, mm		2
2 Break contact	a) Clearance between comb and moving contact, mm	0.1-0.2
	b) Force to separate closed contact, gms	12 min
	c) Force required to lift fixed contact off its backing strip, gms	10 min
	d) Contact separation, minimum in mm	1.8
3 Make contact	a) Remaining armature travel, measured at the residual pip, minimum in mm	0.4
	b) Contact separation, minimum in mm	1.8
	c) Force required to lift moving contact off the comb, gms	10 min
	d) Force required to lift the fixed contact off its backing strip gms	10 min

Type AR112SB has a latch assembly operated series break contact and according to the contact configuration it may also have an armature control leaf spring fitted. The basic mechanical settings are:

Armature control spring

all break contacts 40-45 gms.

1 make contact 20-24 gms.

Latch setting, use a 1mm shim between the core and the armature and adjust the latch screw to allow it to just engage the latch block.

Adjust the moving contact so that a 12-15gm force applied at the tip is required to open the contact.

Adjust the eccentric roller to just touch the moving contact prior to just touch the moving contact prior to operation of the latch.

Latch the relay and check the contact separation, it should be no less than 1.0mm

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