

Normal inverse IDMT relays type 2TJM10

Features

- No standing drain on substation battery supplies
- Easy to test and maintain
- Extremely long service life
- Designed to comply with BS142 Sections 2.2(1990) and 3.2(1990) and to IEC 255 specifications (where applicable)

The 2TJM10 range is as follows:

- 2TJM10 Normal inverse IDMT form 3/10
- 2TJM11 IDMT + highset element
- 2TJM12 Directional IDMT
- 2TJM16 Directional IDMT + highset element

Application

The operating time characteristic is based on the normal inverse characteristic of IEC 255-4, BS142, 3.2. This characteristic is generally applied in time/current graded schemes for overcurrent, earth fault protection and standby earth fault protection on solidly earthed systems.

Description

The relay comprises a die-cast frame which carries all the sub-assemblies of induction disc, electro-magnetic system, operating coil, plug bridge and the contact assembly. Instantaneous highset and directional elements can be provided.

The electro-magnetic system comprises primary and secondary magnets arranged with four air gaps each contributing to the driving torque. The primary coil energises the primary magnet and a secondary winding which in turn energises the secondary magnet. Tappings on the primary coil permit various fault settings to be made via a plug-bridge. The plug-bridge automatically selects the highest setting when the setting-plug is withdrawn.

Two normally open contacts are provided of the bridging type, the operating arm being



Type 2TJM20 single pole relay in a modular size 6 case

driven by a cam track at the hub of the induction disc. This gives considerable mechanical advantage and ensures high contact pressures, even at low operating current levels, making the contacts suitable for direct tripping.

Relay operating time is determined by the starting position of the induction disc, this is set by the time multiplier dial calibrated from 0.1 to 1.0. There is also a "T" mark, before the 0.1 setting and in this position the contacts are held closed, locked out. Settings are applied in amps.

$$I_S = I_n \times M1 \times M2$$

where, I_S = Set current

I_n = Relay nominal current rating

M1 = Plug setting

M2 = A marked multiplying factor

Normal inverse IDMT relays type 2TJM10

Technical information - IDMT

Ratings I_n 0.5A, 1A, 2A, or 5A
 Setting ranges (7 settings in equal current steps)

Setting range	Step (A)	Rating In (A)			
		0.5	1	2	5
0.05 - 0.2	0.025	0.5	1		
0.1 - 0.4	0.05	0.5	1	2	
0.2 - 0.8	0.1		1	2	
0.25 - 1	0.125	0.5			5
0.4 - 1.6	0.2			2	
0.5 - 2	0.25		1		5
1 - 4	0.5			2	5
2.5 - 10	1.25				5

Burden 3VA at current setting
 Time multiplier 0.1 to 1.0, continuously adjustable with 0.05 calibration markings
 Pick-up Not greater than 130% of setting
 Reset Not less than 95% of setting. Typical reset time 14s (TM = 1.0 and current switched to zero)
 Overshoot Less than 80ms
 Indication Hand reset flag

Contacts 2 normally open self reset.
 Contact rating Make and carry continuously 5A, or 20A for 0.5s a.c. or d.c. with L/R = 50ms and 300V maximum

Technical information - Highset element

Burden 1-2VA over setting range
 Operating time 20ms at 2 x setting - 12ms at 5 x setting
 Contacts 2 normally open self reset
 Contact rating 10A continuously or 30A for 3s
 Setting ranges

Rating 1A	Rating 2A	Rating 5A
0.4 - 1.6A		2 - 8A
2 - 8A		10 - 40A
4 - 16A	8 - 32A	20 - 80A
8 - 32A		40 - 160A
10 - 40A		50 - 200A

Indication Hand reset flag

Technical information - Directional element

Rating V_n Overcurrent, 110V nominal
 Earth fault, 63.5V or 110V nominal

Earth fault current and voltage coils need to be residually connected. For voltage this will require a five limb voltage transformer with an open delta tertiary winding, alternatively 3 single phase interposing transformers may prove suitable.

Burden Current 0.5VA, voltage 12VA at rating

Settings (Expressed as a percentage of IDMT nominal current)
 Overcurrent at 15% at the maximum torque angle of 45° lead. Earth fault 7^{1/2}% at the maximum torque angle of 12^{1/2}° lag.

Accuracy (IDMT)

Reference conditions

Time multiplier, 1.0
 Reference tap, M1 = 2
 Reference multiple, 10x setting

Accuracy Timing characteristic

Complies with the requirements of IEC 255-4 and BS142. The reference limiting error is the assigned/declared error of 7.5% within the effective range 2x to 20x setting.

Limits of influencing quantities and factors
 The limits shown in BS142 Section 2.2 (1990) table 3 apply, additionally frequency can also be 56Hz to 62Hz and ambient temperature has an increased range of -25°C to +55°C.

Cases

Single Pole, size 6, or Vedette size 2/3V.
 Three pole, size 16 or Vedette size 2V in vertical or horizontal arrangements.

Qualifications

VA TECH Reyrolle-Protection operate a quality system accredited to ISO9001.

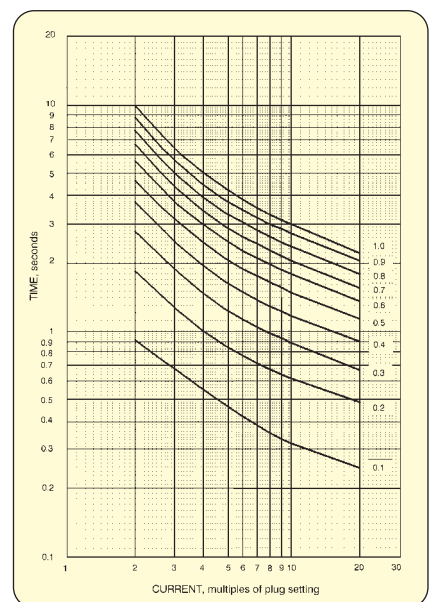


Fig. 1. Time/current characteristic