

## Long time inverse IDMT relays type 2TJM60

### 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 full 2TJM range has the following IDMT characteristics:

- 2TJM10 series Normal inverse, form 3/10
- 2TJM20 series Very inverse
- 2TJM30 series Extremely inverse.
- 2TJM60 Long time inverse, form 30/5
- 2TJM70 series Normal inverse, form 1.3/10

### Application

The operating time characteristic follows the form of the long time inverse characteristic of IEC 255-4, BS142, 3.2. This characteristic is generally applied in time/current graded schemes for stand-by earth fault protection on resistance or impedance 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.

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 The plug-bridge automatically selects the highest setting when the setting-plug is withdrawn.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, one for trip duty of the bridging type and the other a series operated reed relay energised by the circuit breaker trip coil current. If the trip coil takes less than 0.8amp a voltage



Type 2TJM60 relay in a modette case

operated repeat relay can be fitted. A flag indicator is released at contact touch and shows a high luminance red indicator.

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

### Technical information

Ratings  $I_n$  1A, 2A, or 5A

Setting ranges (7 settings in equal current steps)

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

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Burden	2VA at current setting
Time multiplier	0.1 to 1.0, continuously adjustable with 0.05 calibration markings
Pick-up	Not greater than 110% of setting
Reset	Not less than 60% of setting Typical reset time 70s (TM = 1.0 and current switched to zero)
Overshoot	Less than 80ms
Indication	Hand reset flag
Contacts	1 normally open self reset trip duty 1 normally open self reset auxiliary duty
Trip duty contact	Make and carry 5A continuously or 20A for 0.5s, a.c. or d.c. with L/R = 50ms and 300V maximum
Auxiliary duty contact	Reed relay contact ratings Make and carry continuously 3A 110Vd.c. or 2.5A 250Vd.c. Break 0.125A 110Vd.c. or 0.1A 250Vdc with L/R = 0.04s. The reed coil has a resistance of 0.18ohms and an operating range of 0.8 to 25Adc
Auxiliary duty contact	Repeat relay ratings Voltage $V_n$ 24V, 30V, 50V, 125V or 250Vdc Contact rating 10A continuously, 30A for 3s

## Accuracy (IDMT)

### Reference conditions

Time multiplier,	1.0
Reference tap,	M1 = 4
Reference multiple,	7 x setting

### Accuracy Timing characteristic

Complies with the requirements of IEC 255-4 and BS142. The reference limiting error is the assigned error of 7.5% multiplied by the factors given in BS142 Section 3.2 (1990) table 2.

### 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.

### Effects of ambient temperature change

Over a range of -25°C to +55°C, at reference tap setting, and at 10x setting, the temperature coefficient is 0.25%/°C, operating time increases with an increase in temperature.

### Effects of frequency change

Relay labels give performance figures at both 50Hz and 60Hz reference frequencies. Operating time is within +12% to - 6.5% of time at the reference frequency over the range of 47Hz to 51Hz or 56Hz to 62Hz. Time/Current graded schemes maintain their discrimination since frequency has an equal effect on all similar relays.

## Insulation

2kVrms for 1 minute (2.5kV for 1 second)  
between all terminals and earth  
5kV 1.2/50 waveform applied as specified in IEC 255-5 Class III  
1kV rms for 1minute across normally open contacts to IEC 255-5 and BS142

## Environmental

Storage temperature -40°C to +70°C  
Humidity IEC 68-2-3, BS2011  
Will withstand without damage 56 days at RH 95% and +40°C.

## Operational/Mechanical life

In excess of 10,000 operations

## Cases

Single pole, size 6, or Vedette size 2/3V

## Qualifications

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

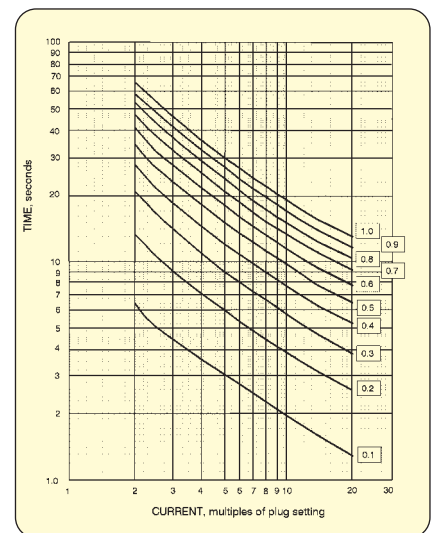


Fig. 1. Time/current characteristic