



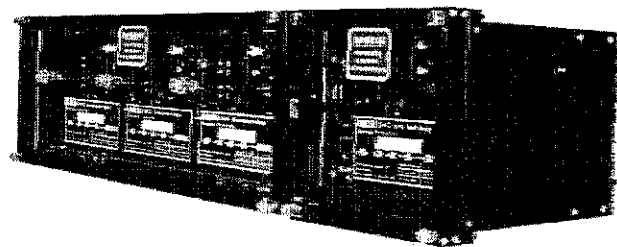
# Extremely Inverse IDMT Form 0.63/10 Relays Type 2TJM30

### 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 2TJM30 range is as follows:

- 2TJM30 Extremely inverse IDMT
- 2TJM31 IDMT + highset element
- 2TJM32 Directional IDMT



Type 2TJM30 single pole & three poles relays

### Application

The operating time characteristic follows the extremely inverse characteristic which is specified in accordance with IEC 255-4 and BS142, 3.2. This characteristic is generally applied in time/current graded schemes for overcurrent and earth fault protection and grading with fuses or similar relays.

### 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 The plug-bridge automatically selects the highest setting when the setting-plug is withdrawn.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 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 ? 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 - IDMT

Ratings  $I_n$  1A or 5A

Setting ranges (7 settings in equal current steps)

Setting range	Step (A)	Ratings (A)	
0.1 - 0.4	0.05	1	
0.2 - 0.8	0.1	1	
0.5 - 2	0.25	1	5
1 - 4	0.5		5
2.5 - 10	1.25		5

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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 90% of setting Typical reset time 35s (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

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.

**Ordering information**

Model reference. Case style & size. Rating. Setting range or ranges.

**Technical information - Highset element**

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

**Setting ranges**

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

Indication Hand reset flag

**Technical Information ? Directional element**

Rating Vn 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 15% at the maximum torque angle of 45° lead. Earth fault 7 1/2% at the maximum torque angle of 12 1/2° lag

Operating time 100ms nominal

**Accuracy (IDMT)**

**Reference Conditions**

Time multiplier,	1.0
Reference tap,	M1 = 2
Reference multiplier,	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.

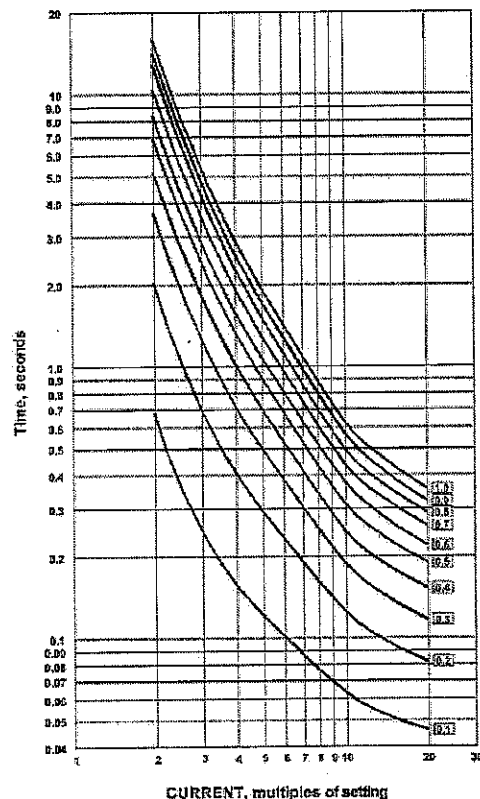


Fig.1 Time / Current Characteristic

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