

Inverse Definite Minimum Time (IDMT) Overcurrent Relay

- * True R.M.S. measurements
- * Adjustable Low-set and High-set tripping threshold (with option to disable High-set tripping)
- * Adjustable Time Multiplier for defining curve tripping characteristic (applicable to Low-set only)
- * Normal Inverse 3/10 tripping characteristics (Low-set threshold only)
- * Instantaneous tripping on High-set triggering
- * Test and Reset button for simulating and clearing of fault condition
- * Red LED indication of Low-set or High-set triggering and tripping
- * Green LED indication for Auxiliary power supply presence
- * Microprocessor based (self checking) with non-volatile memory
- * Terminals suitable for 2 x 2.5mm² wires (complete with protective cover)



Dimensions:
W x H. 96 x 96mm (front)
W x H. 89.5 x 89.5mm (rear)
D. 107mm

OPERATION

Example 1.

When an over current occurs in one of the phases and the level of the current exceeds the LOW-SET I> trip threshold, the corresponding red LED above the adjustment illuminates. The time out then commences, no matter the point at which tripping occurred either by:

A) the level of current that is above the trip threshold.

B) the Time Multiplier Setting.

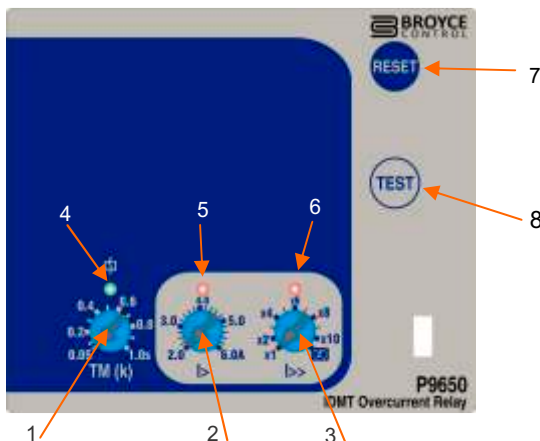
When tripping finally occurs, the red LED will then flash indicating a tripped condition. If the fault current has been removed, pressing the RESET button will return the relay back to normal operation & the red LED will then extinguish.

Example 2.

If a fault current occurs such that it exceeds the HIGH-SET I>> trip threshold, the relay will de-energise with no delay & the red LED above the HIGH-SET I>> adjustment will flash indicating a TRIPPED condition.

If the fault current has been removed, pressing the RESET button will return the relay back to normal operation. The red LED will then extinguish. In the event of an **over current** condition, the basic sequence of events is shown below assuming HIGH-SET trip is enabled.

PRESENTATION

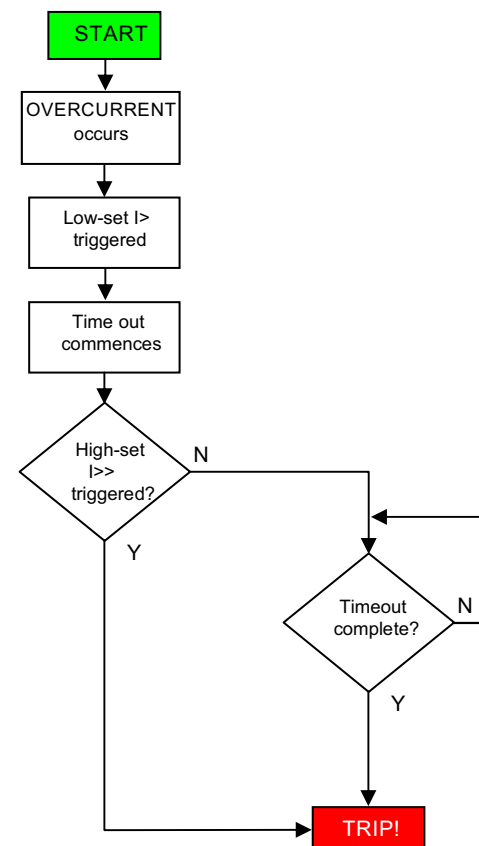


- | | |
|--------------------------------------|------------------------------------------|
| 1. Time Multiplier adjustment* | 5. Low-Set triggered red LED indication |
| 2. Low-Set I> trip adjustment* | 6. High-Set triggered red LED indication |
| 3. High-Set I>> trip adjustment* | 7. RESET button |
| 4. Power Supply green LED indication | 8. TEST button |

* accessible only when the front cover is open

GENERAL OVERVIEW

The P9650 (from the P9600 series family of IDMT/DT relays) is a microprocessor based relay designed to monitor and detect **over currents** in 3-phase applications. Typically the P9650 is wired in conjunction with external current transformers (1 per phase) of the feeder to be protected. Adjustments & indicators are laid out in a way to help the user during set-up and fault finding. eg. The adjustment for the LOW SET has its corresponding red LED positioned above it so it is clear which function this LED relates to. The same applies to the HIGH SET adjustment & LED. Adjustment and LED operation is explained further on the next page. The adjustment for TM (k), which defines the curve response to tripping, is assigned to the LOW SET triggering only. The HIGH SET does not have any additional adjustments nor does the HIGH TRIP INSTANTANEOUS if triggered. The HIGH SET can be set to disabled, if required. A TEST mode is provided to confirm the correct operation of the internal relays. The relay will energize when the TEST button is pressed and de-energise when the RESET button is pressed.



INSTALLATION






Installation work must be carried out by qualified personnel.

BEFORE INSTALLATION, ISOLATE THE SUPPLY. THIS PRODUCT IS DESIGNED TO CONNECT TO SEVERAL TYPES OF CIRCUITS. ENSURE ALL ARE ISOLATED.

Lift the raised part of the side clip in order to remove from the housing. Insert the P9650 into the panel cut-out and fit side clips back onto the housing. Slide the clips towards the front of the unit until they come in to contact with the reverse side of the door. The unit is now secured in place. Connect wires to the rear terminals as required. The P9650 is now ready for powering and setting. The front window of the P9650 is supplied with a clear protective film which can be removed as and when necessary.











TEST MODE

Press and hold the  button and the relay will energize. Both the red I> & I>> LED's will illuminate. Release the  button and the relay will remain energized. Press the  button to de-energise the relay. Both red LED's will extinguish. Testing should be carried out on a regular basis to check the integrity of the P9650. **DO NOT** use this product to provide a means of isolating circuits in order to work on when placed in the **TEST** mode. This should only be done by means of operating isolators, circuit breakers or other methods of removing power in this application.







LED FUNCTION SUMMARY

The green LED will remain illuminated for as long as power is applied to the Aux. connections (terminals 1 and 2).

In response to an **over current** condition:

Status	I>	I>>
Normal		
Low-set triggered		
Low-set Tripped		
High-set triggered		
High-set Tripped		

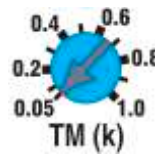
In response to **Test** and **Reset** button operation:

Button press	I>	I>>
		
		

 = LED off  = LED on  = LED flashing

SETTING & OPERATION

Setting of the P9650 is carried out using the 3 potentiometers located behind the transparent cover.




1. TIME MULTIPLIER (TM (k)) defines the tripping characteristic when the LOW-SET threshold "I>" has been exceeded. The lower the setting, the faster the response to tripping. The higher the setting, the slower the response.



2. LOW-SET TRIP threshold (I>) can be set from 2 to 6A. When the threshold is exceeded due to an over current condition, the corresponding red LED above the adjustment illuminates indicating activity. When tripping finally occurs, the red LED will then flash.



3. High-Set Trip threshold (I>>) adjustment can be set from x1 to x10 or disable = 


The scale markings are multipliers of what has been set on the LOW-SET threshold. For example if the LOW-SET is set to 4A and HIGH-SET to 8, this will be the equivalent of 4 x 8 or 32A. When the threshold is exceeded due to an **over current** condition, the corresponding red LED above the adjustment illuminates indicating activity. When tripping finally occurs, the red LED will then flash. If tripping occurs whereby the HIGH-SET level is exceeded, only the LED for the HIGH-SET will flash. This allows the user to clearly identify which threshold was triggered causing the trip. There is no delay associated with HIGH-SET therefore, tripping is instantaneous.

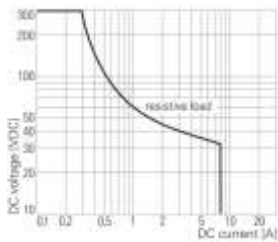
NORMAL OPERATION

Apply power to the unit and the green **power supply** LED will illuminate.

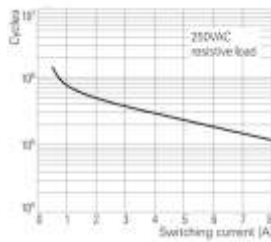


TECHNICAL SPECIFICATIONS


Supply voltage Un (1, 2):	115VAC ±15% 230VAC ±15%
(Voltage should be specified at time of ordering)	
Rated frequency:	50/60Hz
Isolation:	Over voltage cat. III
Rated impulse withstand voltage:	4kV (1.2 / 50µS) IEC 60664
Power consumption:	3W max.
Rated current input In:	5A (directly connected)
Rated frequency:	50Hz
Burden:	<0.4VA @ In
Overload:	4 x In (continuous)
External CT terminals 9, 10, 11, 12, 13, 14	Class C recommended with 5A secondary
Overcurrent settings:	
Low-set trip (>):	2.0 – 6.0A (40 – 120%)
Time multiplier (TM):	0.05 – 1.0
High-set trip (>>):	x1 – x10 or disable 
High-set definite time:	Instantaneous (<50ms)
Pick up value:	+2% of trip setting
Accuracy:	
Protection thresholds:	± 5%
Response time:	± 5% (with a minimum of 50ms)
Repeat accuracy:	± 0.5% @ constant conditions
Ambient temperature:	-10 to +60°C
Relative humidity:	+95% (non-condensing)
Output:	
RL1 (3, 4, 5):	1 x SPDT relay
Output rating:	AC1 250V 8A (2000VA) AC15 250V 5A (1250VA) DC1 25V 8A (200W)
Electrical life:	≥ 150,000 ops at rated load
Dielectric voltage:	2kV AC (rms) IEC 60947-1
Rated impulse withstand voltage:	4kV (1.2 / 50µS) IEC 60664



Max. DC Load Breaking Capacity



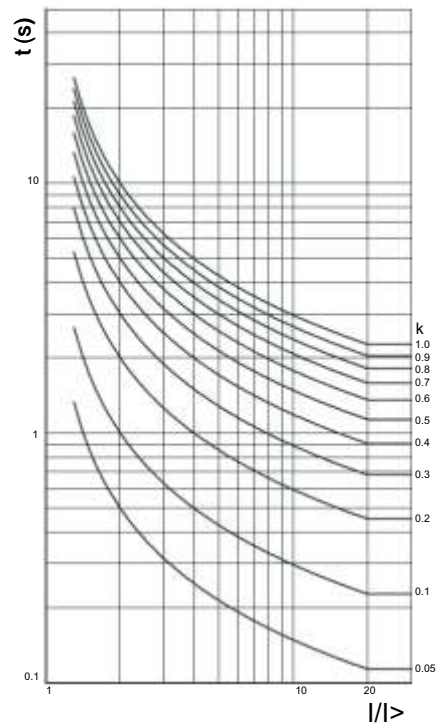
Electrical Endurance

Housing:	Flame retardant Lexan
Protection:	IP55 / IP20 (rear)
Weight:	≈ 590g
Mounting:	Panel mounting. Cutout = 91 x 91mm (± 0.5mm)
Max. panel thickness:	12mm
Terminal conductor size:	0.05 - 2.5mm ² (30 - 12AWG)
Recommended tightening torque:	10in lb (1Nm)
Wire stripping length:	0.24 – 0.30in (6 – 7.5mm)
Approvals:	Conforms to IEC, CE and  and RoHS Compliant. EMC: Immunity: EN/IEC 61000-6-2 Emissions: EN/IEC 61000-6-4 Generic: IEC 60255-26 (EMC), IEC 255-3, IEC 60255-151

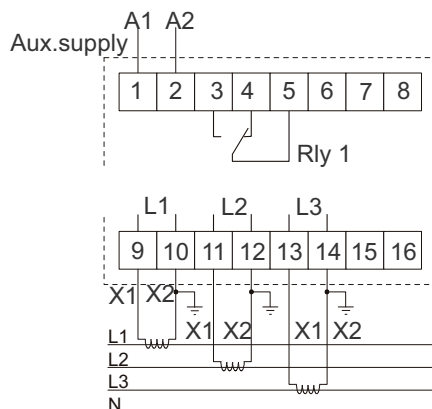
Options:

The P9600 range also includes individual Overcurrent or Earth fault relays available with either IDT or IDMT tripping characteristics. Please refer to separate data sheets.

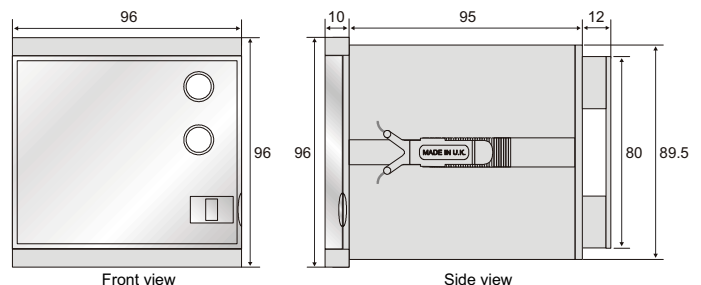
Tripping Curve Characteristics (Normal Inverse 3/10).



CONNECTION DIAGRAM



DIMENSIONS



All dimensions are in mm.