

PC Based Portable Overload Relay Functional Trip Tester

Product Information Brochure - Rev0

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Application	Incoming inspection and preventive maintenance of thermal overload relays

Overview

The PC Based Portable Overload Relay Functional Trip Tester is designed for panel builders, electrical consumers, and maintenance teams who need a practical method to verify the trip health of thermal overload relays during incoming material inspection and preventive maintenance.

The tester provides user-selectable controlled AC test current up to 60A and records overload relay trip response using PC-based software. The operator can select a test current directly or enter the overload relay current setting and select a required test multiple.

The test result includes applied current, trip time, I²t value, and relay trip status.



Figure 1: Illustrative image of PC Based Portable Overload Relay Functional Trip Tester



1. Intended Use

The equipment is suitable for:

- Incoming quality inspection of purchased thermal overload relays
- Preventive maintenance checks of spare or removed overload relays
- Functional trip checking of overload relays before panel assembly
- Random health verification of overload relays as part of maintenance schedules
- Maintenance workshop and panel shop use

Typical users include:

- Panel builders
- Electrical maintenance departments
- Utility and plant maintenance teams
- Incoming material quality inspection teams

2. Basic Test Philosophy

The tester applies an overcurrent condition to the overload relay and verifies whether the relay trips within a practical time period.

The tester is not restricted to a single fixed current point. The operator may select the required test current as per the inspection or maintenance procedure.

Common test selections may include:

- $1.5 \times I_r$ for routine functional trip checking
- $7.2 \times I_r$ for lower-current overload relay ranges where the required current is within tester capacity
- Direct current entry in amperes

Where I_r is the current setting on the overload relay.

The tester automatically raises current to the selected target value, monitors the overload relay auxiliary contact, measures trip time, records I^2t , and stops the test after trip.

The maximum available test current is 60A. If a selected test multiple requires more than 60A, the software shall indicate that the selected current is beyond tester capacity.

3. Main Features

- 19-inch rack-mount, 5U dimensions
- PC software based test operation
- Automatic current control
- User-selectable test current up to 60A
- Test by multiple of I_r or direct current entry
- Common test points such as $1.5 \times I_r$ and $7.2 \times I_r$, subject to current range
- Trip time measurement
- I^2t recording
- TRMS current measurement
- Overload relay auxiliary contact monitoring
- Provision for testing all three overload relay poles in series
- Provision for contactor operation when overload relay is mounted with contactor
- Emergency switch and safety healthy indication
- External current verification terminals



4. Overload Relay Functions Supported

The tester is suitable for checking basic overload relay trip response as part of a practical functional health check.

Function	Typical Check
Current carrying path	Test current flows through all three overload relay poles in series
Thermal trip operation	Overload relay trips under controlled overcurrent condition
Auxiliary NC contact	Contact opens after overload relay trip
Trip time	Time from test current application to trip is recorded
I ² t value	Thermal exposure value is recorded for reference
Contactor interface	External contactor coil can be switched during test, where required

5. PC Software Operation

The tester is operated through PC software installed on the customer's laptop or PC.

Typical software functions:

Function	Purpose
Test setup	Enter overload relay Ir setting, test multiple, or direct test current
Current control	Automatically regulate test current
Live display	Show measured current and test status
Trip detection	Detect overload relay auxiliary contact change
Timer	Measure trip time
I ² t calculation	Record I ² t value during the test
Result summary	Display pass/fail observation and measured values
Report / record	Store or export test results as required

The software allows repeatable testing without manual current adjustment during the test.

6. Overload Relay Pole Connection

During the test, all three overload relay poles are connected in series. This allows the same current to flow through all three bimetal elements using a single-phase current source.

Typical connection:

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Tester output
-> overload relay pole 1
-> overload relay pole 2
-> overload relay pole 3
-> Tester return
  
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This arrangement is simple, repeatable, and suitable for functional health verification.



7. Contactor Testing Provision

In many panels, the overload relay is mounted below a contactor. For such cases, the tester provides a provision to switch the external contactor coil supply.

The customer may connect the required contactor coil supply externally as per the contactor coil rating. The tester switches this external supply during the test, allowing the contactor and overload relay assembly to be checked in a practical workshop setup.

8. Typical Test Procedure

1. Connect all three overload relay power poles in series with the tester output terminals.
2. Connect the overload relay auxiliary NC contact to the tester status input.
3. If required, connect the contactor coil supply and contactor coil through the tester contactor interface.
4. Set the required I_r value on the overload relay, where applicable.
5. Enter the required test current or select the required multiple of I_r in the PC software.
6. Start the test from the PC software.
7. The tester automatically raises current to the target value.
8. Observe live current and test status on the PC software.
9. After overload relay trip, the tester stops current automatically.
10. Review trip time, current, I^2t value, and trip status in the result summary.
11. Record or export the result as per maintenance or inspection format.

9. Product Positioning

This tester is best described as:

A PC based portable functional trip tester for checking overload relay trip health during incoming inspection and preventive maintenance.



10. Technical Configuration

Item	Configuration
Dimensions	19-inch rack-mount, 5U
Input supply	230 VAC, 1 phase, 50 Hz
Test current output	Up to 60A AC
Test voltage	Low-voltage AC current source
Test current selection	User-selectable up to 60A; by multiple of Ir or direct current entry
Practical overload relay range	Approximately 2A and above
Current measurement	TRMS current feedback
Trip measurement	Trip time and I2t
Overload relay contact input	Auxiliary NC contact monitoring
Operator interface	PC software
Communication	USB / RS485 based communication
Safety	Emergency switch, safety healthy indication, fused input, earthing
Contactor support	External contactor coil supply switching provision
Construction	Workshop-grade metal enclosure

11. Summary

The PC Based Portable Overload Relay Functional Trip Tester provides a practical and repeatable way to verify overload relay trip health. It is especially suitable for users who purchase overload relays, build panels, and need a reliable incoming inspection and preventive maintenance check with measured trip time and I2t records.

