DC OVERCURRENT RELAY - TYPE ITE-76H

FOR MINING, & OTHER DC APPLCATIONS
350 V OR LOWER

INSTRUCTIONS FOR CIRCUIT-SHIELD SOLID STATE DC OVERCURRENT RELAYS DRAWOUT SEMI-FLUSH MOUNTED DC OVERCURRENT RELAY TYPE ITE-76 (WITH OR WITHOUT A BUILT-IN CALIBRATION TEST FACILITY)

INTRODUCTION

These instructions contain the information requested to properly install, operate, and test the CIRCUIT-SHIELD Solid-State DC Overcurrent Relays, Type ITE-76.

All connections to the relay are made at terminals located on the rear of the case and are clearly numbered from one (1) through the number twelve (12). (See Figure 1.)

Pickup controls are located on the front panel behind a removable clear plexiglass cover. The relays are factory-calibrated for the pickup values described in these instructions; however, the relay may be adjusted for other values of pickup as described in the calibration section.

Target indicator is also mounted on the front panel. The target resets by means of a pushbutton extending through the relay plexiglass cover.

A built-in test that simulates an overcurrent condition is provided with all units.

An optional feature is a built-in calibration test facility. This enables the user to perform a calibration test in the field without the use of external precision voltage sources.

Receiving, Handling, Storage

Upon receipt of the CIRCUIT-SHIELD relay, examine for shipping damage. If damage or loss is evident, file a claim at once and promptly notify the nearest I-T-E Imperial Corporation Sales Office. Use normal care in handling to avoid mechanical damage.

The CIRCUIT-SHIELD system has no practical limit to its operating life if it is kept reasonably clean and dry. Only the highest quality solid-state components are selected for use in Circuit-Shield.

Maintenance and Renewal Parts

No maintenance is required on the CIRCUIT-SHIELD relay. Should the relay be damaged physically or electrically due to improper connections or applications, it is recommended that a new relay be ordered from the factory. When ordering, state the relay type, catalog number, control voltage, and serial number.

APPLICATION
DC Overcurrent Relay, Type ITE-76

This is a dc millivolt-relay used in conjunction with a 50 or 100 mV shunt to provide instantaneous directional overcurrent protection.

Typical applications include fault current protection of dc rapid transit systems and overcurrent protection of dc motor feeder circuits.

Other applications are overload and internal fault protection for dc machinery.

Typical external connections are shown in Figure 2. The relay has a time curve as shown in Figure 3.

Tolerances

Voltage (Pickup)---------- ±5% of Tap Setting
Time Delay---------- Virtually Instantaneous

Ratings

Temperature
Nominal---------- 25°C Ambient
Addition ±5% Tolerance---------- -15°C to +55°C
Must Operate---------- -30°C to +70°C

Models Available

Catalog Number	Sensitivity	Compatible With Shunt	Control Volts	Calibration Test Facility Burden
206A1150	10 to 100 mVdc	50 mVdc	120/240 VAC 60 Hz	No Test
206A1155	10 to 100 mVdc	50 mVdc	120/240 VAC 60 Hz	4 to 100 Ohm
206A1755	20 to 200 mVdc	100 mVdc	120/240 VAC 60 Hz	6 to 100 Ohm
228B0101	10 to 100 mVdc (bidirectional)	50 mVdc	120/240 VAC 60 Hz	4 to 100 Ohm

INPUT CIRCUIT DATA

Relay Type	Catalogue Number	Taps	Burden
ITE-76	206A1150, 206A1155 228B0101	10, 20, 30, 40, 50, 60, 70, 80, 90, 100 mV	1000 Ohm
ITE-76	206A1175	20, 40, 60, 80, 100, 120, 140, 160, 180, 200 mV	2000 Ohm

OUTPUT CIRCUIT DATA

Relay Type	Control Volts	Contacts	Contact Rating Continuous	Interrupt
ITE-76	120/240 VAC 60 Hz	4A*	5A	1A Inductive @325 VAC

NOTE: *The relay is held closed by the control power.

INSTALLATION

Mounting

For outline dimensions, panel drilling and cutout information, refer to Figure 1.

All CIRCUIT-SHIELD relays have metal front panels which are connected through printed circuit board runs and connector wiring to a terminal at the rear of the relay case. The terminal is marked "G" and is located as shown in Figure 1.

In all applications, this terminal should be wired to ground.

Settings

Tap blocks for setting the pickup voltage are located on the front panel. The pickup taps are identified by the actual value of voltage which will cause the output contacts to close.

A calibration test facility rheostat is located on the front panel. It provides a variable calibration voltage from 10 mVdc to 100 mVdc or an optional 20 to 200 mVdc.

These relays are designed to operate on either 120 VAC or 240 VAC control power. This selection is available at the terminal strip mounted to the rear of the case.

SOLID-STATE RELAY PRECAUTIONS

The following precautions should be taken when applying solid-state relays:

1. Do not apply high voltage tests to solid-state relays. If a control wiring insulation test is required, bond all terminals together and disconnect ground wire before applying test voltage.

2. Incorrect wiring may result in damage to solid-state relays. Be sure wiring agrees with the connection diagram for the particular relay before the relay is energized. Be sure control power is applied in the correct polarity before applying control power.

3. Do not touch or probe target vanes on CIRCUIT-SHIELD overcurrent relays.

4. Do not attempt to trouble-shoot or repair solid-state relays. Follow test instructions to verify that relay is in proper working order. If a relay is found to be defective, return to factory for repair. Immediate replacement can be made available from the factory; identify by catalog number. It is suggested that a complete spare relay be ordered as a replacement, and the damaged unit repaired and retained as a spare.

TESTING

High Potential Tests

Do not apply high voltage tests to solid-state relay circuits. If a control wiring insulation test is required, bond all terminals together and disconnect grounding wire before applying test voltage.

A. Operational-Acceptance Tests

In general, it is not necessary to schedule periodic maintenance and testing of this relay. However, if tests are desired to confirm the proper functioning of the system, the following procedure can be used.

Push to Test Feature

All models of the ITE Type 76 DC Overcurrent Relays provide a functional test feature.

Tests should be made on a de-energized main circuit. If tests are to be made on an energized circuit, be sure to take all necessary precautions.

A test voltage is applied to the pickup circuit when the test button is depressed. This will simulate an overcurrent condition which will cause an instantaneous breaker trip.

B. Calibration Tests

The ITE Type 76 DC Overcurrent Relay (catalogue number 206A1150) provides a functional test only. A precision voltage source is required to perform the calibration test on this model. Refer to Figure 4-2 for schematic.

The ITE Type 76 DC Overcurrent Relays (catalogue number 206A1155 and 206A1755) provide both a functional and calibration test feature. These models are provided with an internal precision voltage source and do not need an external source. Refer to Figure 4-1 for the calibration test circuit.

The vernier loacted on the front panel must be in the full CCW position when performing the calibration test.

Pickup may be adjusted to values approximately 10% higher than the factory calibration by adjusting the calibration vernier located on the front panel. After withdrawing the removable element from the case, insert an extender board into the case. Connect the relay element to the extender connector.

Put the tap in a selected pickup voltage position. Push the test button and turn the calibration test rheostat clockwise until the relay just picks up. Turn the calibration test rheostat counter-clockwise until dropout. Check the pickup again by turning the calibration test rheostat gradually clockwise.

Trim the calibration adjust until pickup occurs at exactly the desired value. Use a high impedance precision voltmeter to measure this value.

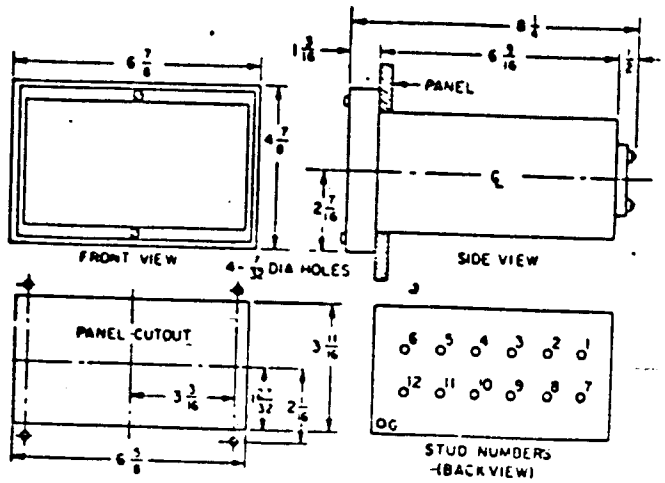

Fig. 1 - Relay Outline, Panel Drilling and Cutout

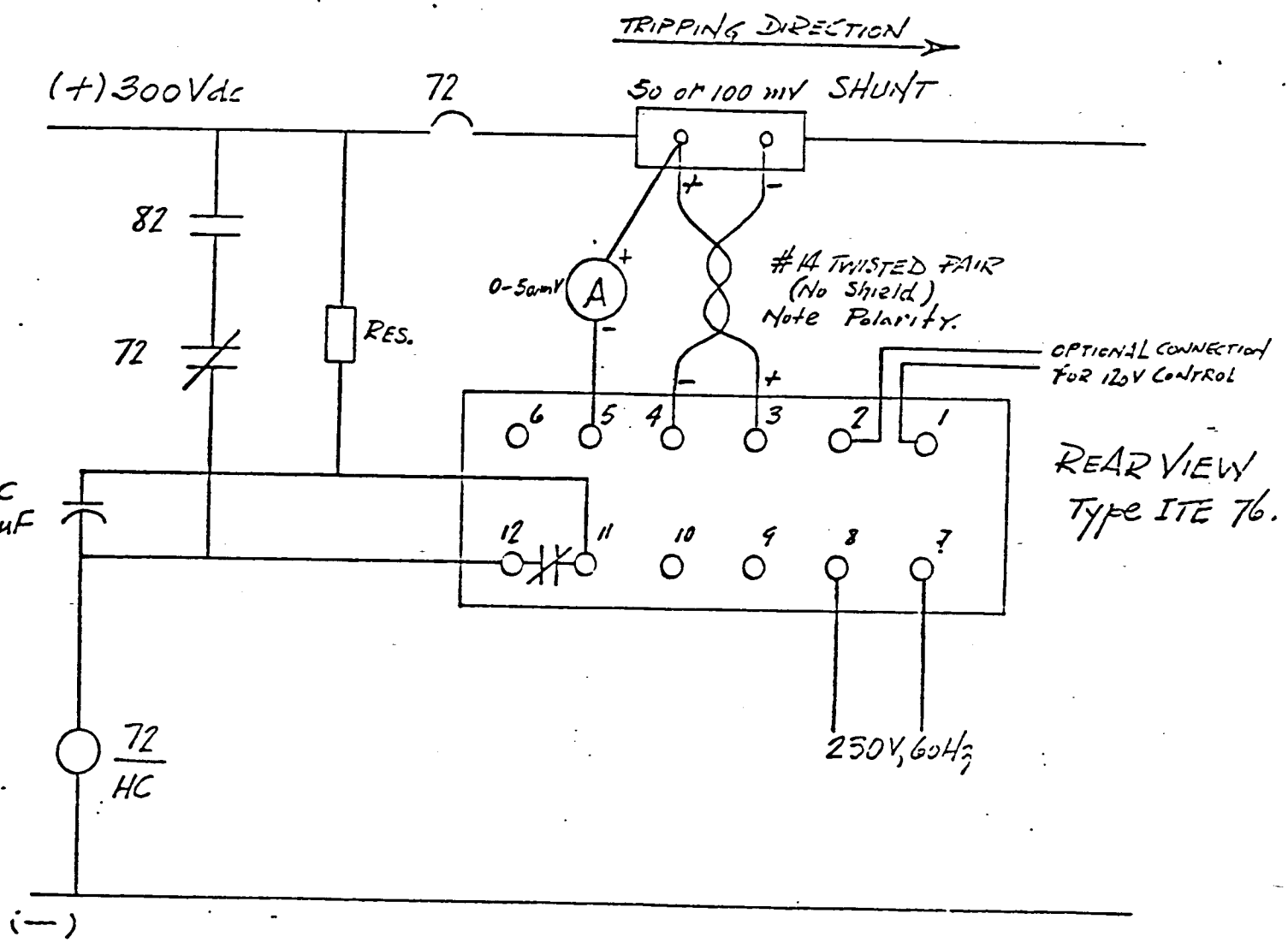

FIGURE 2 - TYPE ITE 76
External Connections

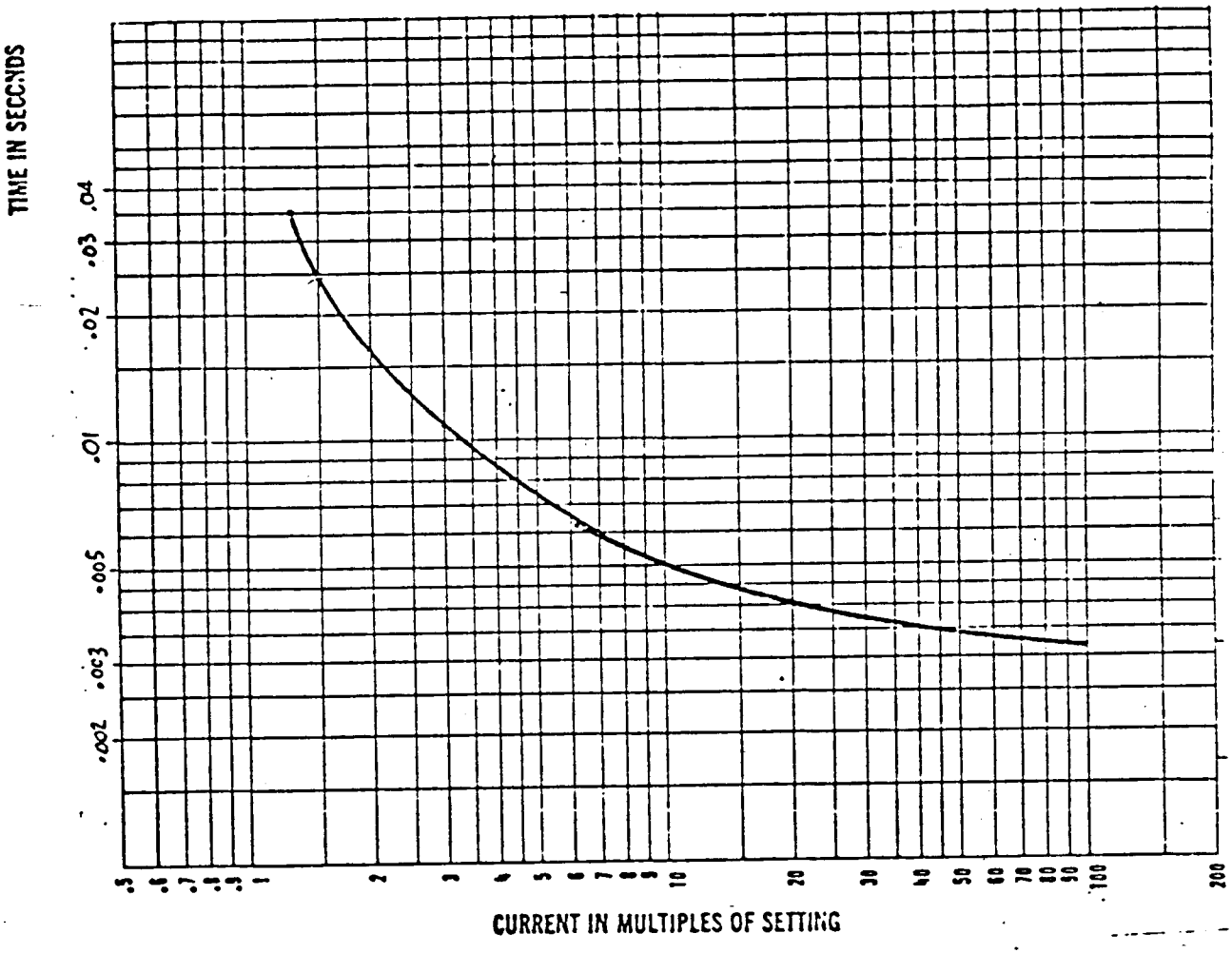

FIG. 3 — TIME-CURRENT CHARACTERISTICS FOR TYPE IT5-76 INSTANTANEOUS, DIRECTIONAL D.C. OVERCURRENT RELAY

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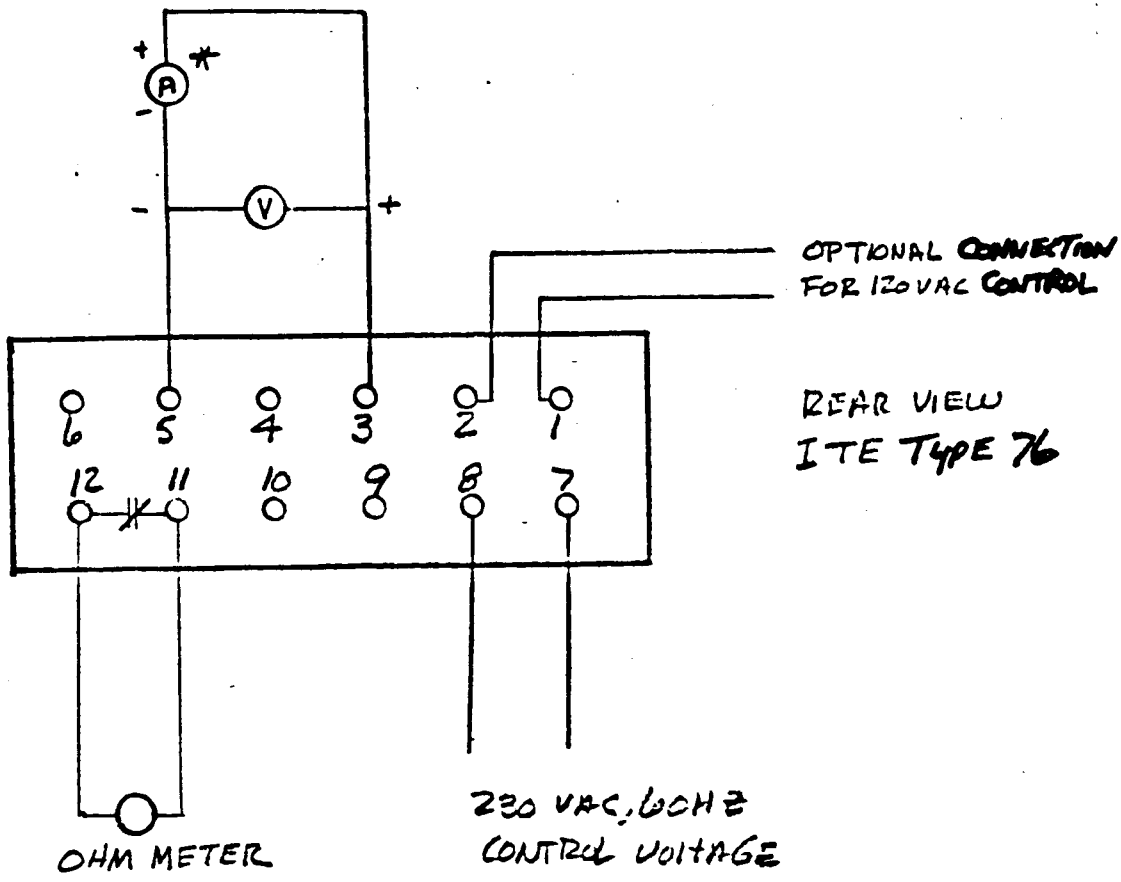

FIGURE 4-1 CALIBRATION TEST SCHEMATIC

NOTE : * THE METER BURDEN MAY VARY FROM 4 TO 100 OHMS.

ABB