

General

The Swartz Type 32 Reverse Current Relay is an isolated current monitor which is used with either the positive or negative conductors in D.C. power distribution networks. The primary function of the detector is to monitor low levels of reverse feeder current. All front panel controls are calibrated in millivolts so that the detector can be used with any shunt.

Front Panel Calibration & Controls Test

A built-in calibration control (CAL) with variable settings from 0 to 20 mV and a momentary pushbutton switch (TEST) allow functional check of reverse threshold. Test current can be read on the meter or at "SIG OUT" test jacks where 0.5V at test jacks equals 50mV at shunt. Test current adds to any current already present at shunt leads.

Digital Meter

The meter reads from 0 to 20mV.

Power

The green light emitting diode (LED) indicates that the detector has power and is operational. If this LED is off, either input power is off or internal 1 A fuse is blown. In either case, the output is fail safe and should cause substation trip.

Zero

This adjustment compensates for slight offsets in the high voltage isolator and should only require adjustment when the overcurrent unit is initially installed in the substation. With zero shunt current (DC breaker open or zero loads) measure "SIG OUT" voltage with a Fluke 8024A digital voltmeter or equal. Adjust zero for .000 + .002 volts. For best results, a five minute or greater warm-up period should be allowed. Note that offset varies slightly depending on installation. For example, offset will change by up to 1mV when the detector is bench tested outside of its enclosure.

Instant Overcurrent Channel

This channel responds to reverse "instantaneous" current levels between 0 and 20mV as set by the control. Input from the isolator is RC filtered so that current spikes or noise are suppressed to prevent nuisance tripping. A buffered test jack is provide for highly accurate adjustment of trip threshold with a digital voltmeter. A red LED latches on to indicate that a trip has occurred.

Setting "Pickup" Threshold

Connect digital voltmeter common lead to "SIG OUT-COM". Connect positive lead (+) to instant test jack. Using the 200mV range on the DVM, adjust pickup control for desired trip level. Note that knob calibration for this control is only approximate (+10%). As an alternate method of setting this control, apply trip level to shunt leads or by using "CAL/TEST" controls. While pressing CAL/TEST switch adjust PICKUP knob until instant LED is just turned on. Press RESET to reset LED



Outputs

SCR Output

SCR output for substation control is available on rear terminal strip of detector. This 6 amp, 200 volt SCR is optically isolated and floating for connection anywhere in a relay control ladder. An external load of 50mA or more should be provided, at least part of which is resistive, i.e., a 25k Ohm relay coil paralleled with a 2.5k Ohm, 5 watt resistor will provide minimum SCR latching and holding currents. This example is for a system with a 125VDC supply.

Signal Output (SIG OUT)

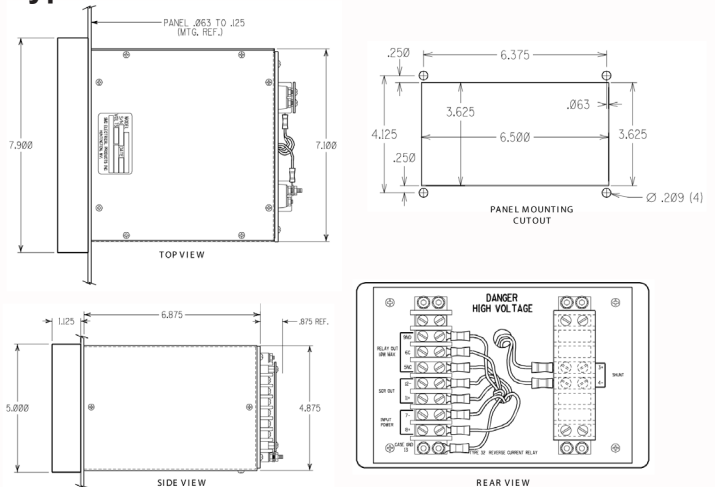
Front panel jacks are provided for analog output current, (0.5V equals 50mV). This output is not floating, but is tied to internal power supplies so that when connected to external

instrumentation, differential amplifiers should be used.

Trip Output (TRIP OUT)

A current limited trip output 15V / 6k Ohm is provided to directly drive a galvanometer event marker while making oscillograph recordings.

Type 32 REVERSE CURRENT RELAY CASE



Specifications

Parameter	Performance
Isolator Error	±1mV
Isolator Dielectric Capability	5400V, 60Hz, 1min.
Ambient Temperature	-20 to +55 °C
Threshold Setting Error	±0.5mV inst. and time pickup
Supply Voltage Range	20-140V DC
Supply Current	200mA @ 24VDC 40mA @ 125VDC