

TWR: Transformer Watchdog Relay

FEATURES

Each of the 6 sources for output activation has its own indicator blinking 2-3 days without power

- Continuous monitoring of earthing resistor integrity
- The Earth Fault (E/F) current is calculated from two independent measurements:
 - the resistance of the Neutral Earthing Resistor (NER) and the 50Hz voltage across the NER
- four isolated inputs from other contacts, either by contact closure or application of 110V ac will cause activation of the solid state output
- separate non-volatile LED-indication for each function

- trip times and -levels for resistance and Earth Fault current can be pre-set to values other than default for discrimination
- trip times for the discrete inputs can be set to other than the 100msec default
- separate LED indication for out-of-range-resistance trip and high earth-fault condition
- separate LED indication for each contact input
- LED indications continue for at least 2 days after power is lost
- Earth Fault current trip level and delay can be doubled by internal jumpers

- With an extra feature the shunt trip can be operated even when the control voltage is lost for fail safe operation.
- An optional N/C solid state output can be provided

- Completely solid state and shock-proof



OPERATION

A short burst of limited current and duration is applied to the local earth bond once per second.

During this burst the voltage response at the earth bond is measured and interpreted as resistance in Ohms. This is compared to an upper and optionally lower limit.

When the pre-set resistance limit is exceeded a solid state output is activated after a default delay of 7 sec (settable)

The output stays activated for a default period of 5 sec (settable) to allow sluggish breakers to work.

With the optional fail-safe passive E/F function, in the absence of the control/supply voltage the shunt trip coil will be operated in the event of an E/F current.

For this purpose a special CT is fitted in series with the NER and connected to the unit with this option. The trip delay will be instantaneous.

When any of the trip LED's is flashing and power is restored it will continue flashing for approximately 5 seconds after a healthy condition is detected.

The green LED only lights up while the unit is powered and in the following ways:

- [Solid Green LED = Healthy Earth Connection
- [Fast Blink Green LED = faulty Earth Wire or excessive E/F current is detected
- [Slow Blink Green LED = System Voltage Faulty

SPECIFICATIONS

Control voltage
 110V ac $\pm 25\%$, single-phase 50 Hz, burden: approx. 3VA
 Available in alternative voltages as requested

Excitation
 burst of 3 pulses, 750Hz at 60mA peak every second
 Continuous leakage: less than 1 mA
 Neutral – Earth max. voltage withstand: 380Vac.

Resistance measurement
 Range: 0 – 200 Ohms
 measurement resolution: 1 Ohm
 Accuracy: ± 3 Ohms or $\pm 5\%$

Earth Fault current measurement range:
 10 – 380 Vac on NER

discrete input internal excitation voltage: 60 Vdc
 discrete input internal resistance: 33 kOhms
 Internal watchdog activates the output on internal failure
 after 0.5 sec.s

Trip output:

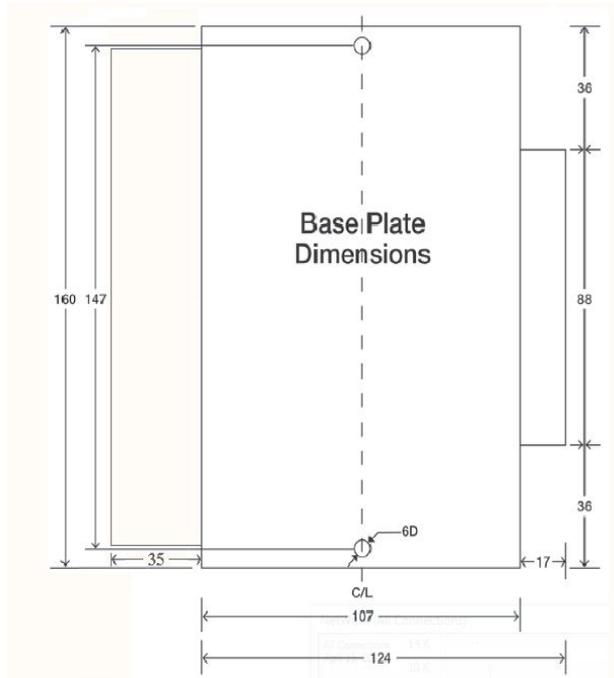
N/O solid state contact
 N/C solid state contact, optional (can only close while TWR is powered)
 Nominal switching voltage: 110 - 240Vac, 50 - 60 Hz
 Current rating: 3A continuous, 15A for 0.2 sec
 N/O output leakage: less than 1 mA at 110V, 50Hz
 Dielectric strength between contacts and NER: 2500Vac

Operating temperature range: -5 to +60degC
 Storage temperature range: -40 to +85degC

Environmental conformity: IP524

Enclosure dimensions (excl. Terminals or Weidmüller socket)
 127 x 108 x 60

Optional SCADA communication module: Modbus RS485
 Product-specific data is available on request



<u>activating function</u>	<u>factory default setting</u>	<u>setting resolution</u>
NER trip level	63 Ohms	2 Ohms
NER trip time	7 sec	1 sec
Trip output pulse width	5 sec	100 msec
Earth Fault (E/F) current level	2 A	typically 40mA
E/F current trip delay	1.6 sec	20 msec
discrete input trip delay	100 msec	10 msec