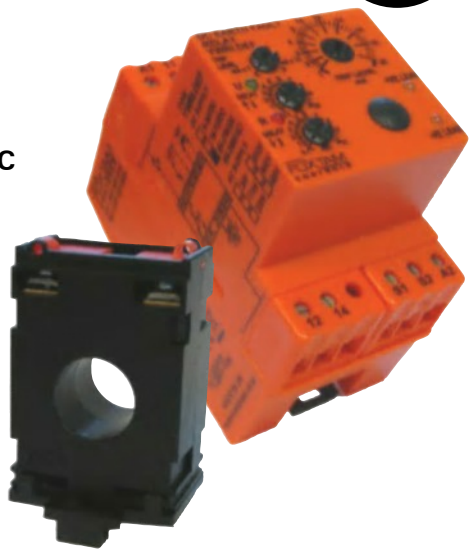
DC EARTH FAULT RELAY COMPLETE WITH DC EARTH FAULT CT

PRODUCT GROUP D

TYPE: YWRI.DEF



FEATURES

- **Range switchable between 1-20mA & 10-200mA**
- **Auxiliary supply voltages between 9VDC & 1200VDC / 24VAC & 480VAC**
- **Fixed hysteresis at 2% (other values on request)**
- **Latching facility (manual or auto reset)**
- **Test input**
- **Time delay 'On' & 'Off' individually adjustable**
- **LED indication for output relay status & supply healthy**
- **LED indication for fault direction (ie, positive or negative leg)**
- **SPCO output rated 10Amps**

DESCRIPTION & MODE OF OPERATION

A Din rail mounted current sensing relay dedicated for DC earth fault monitoring, such as insulation deterioration on a DC system. The unit is supplied complete with a dedicated DC Earth Fault CT type **FOX21.CTD**, this allows the relay to have two switchable earth fault ranges of 1-20mA and 10-200mA. The unit is fitted with four LED's to aid status diagnosis:-

Green LED = Auxiliary supply voltage healthy

Red LED = Output relay energised

Top Amber LED = Positive leg earth fault

Bottom Amber LED = Negative leg earth fault

Both Amber LED's = Open circuit or short circuit between CT & relay (also if Test function is used)

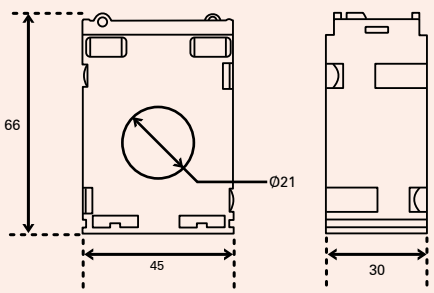
The amber earth fault LED's will start to illuminate at either 1mA or 10mA (depending on which range has been set), but the output relay will not de-energise until the setpoint has been reached, plus any delay "ON" time set, which is adjustable 0.1-10secs. The output relay is fail safe, ie energised when healthy, de-energises on earth fault.

After tripping on an earth fault and the fault level starts to fall below the setpoint it has to fall for a further 2% (hysteresis) plus any delay "OFF" time set before the output relay energises again. This is **"AUTO RESET"**. However, should the optional latch facility be utilised via a NC link between terminals Y1 & Y2 the NC link will need to be opened or the auxiliary supply removed to facilitate a reset, providing the fault is below the setpoint level plus hysteresis, **"MANUAL RESET"**.

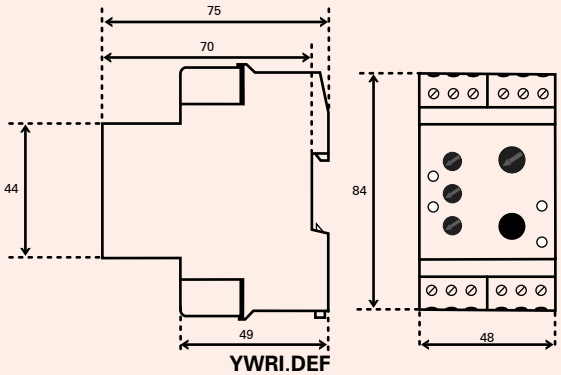
The relay is also fitted with a relay Test input between terminals Y3 & Y4 via a NO input.

For correct operation when using the **FOX.21CTD** both the positive and negative conductors need to pass through the CT from P1 to P2 (load on P2 side), to ensure accurate amber LED indication. It is also possible to position the CT on just the earth leg in which case P2 is the Earth side, when used in this configuration on an earth fault, only the positive fault amber LED will illuminate. In both the above scenarios correct connection between the CT and relay with respect to terminals S1 & S2 is also important to ensure accurate indication.

DIMENSIONS



FOX.21 CTD



YWRI.DEF

SPECIFICATIONS

Auxiliary supply:	9-36VDC, 18-75VDC, 85-370VDC / 85-265VAC, 210-1200VDC (via separate DC to DC converter type YW1000D24D) 24VAC, 110VAC, 230VAC, 415VAC, 440VAC, 480VAC
Power consumption:	Max 3W
Earth Fault ranges:	1-20mA / 10-200mA switchable
Hysteresis:	Fixed at 2% of set value (other values on request)
Tripping delay "ON":	Adjustable 0.1-10sec
Tripping delay "OFF":	Adjustable 0.1-10sec
Repeat accuracy:	±2% at constant ambient
FOX.21CTD internal dia:	21mm
Max distance between CT and relay:	100 metres (200 metre loop in total)
Recommended cable:	1.5mm tri rated
Operating temperature:	-20°C to +65°C
Output relay:	Max power 2200VA, 30W DC 250VACDC @ 10 Amps AC1, 1 Amp DC1
Mechanical Life:	30 Million ops
Electrical life:	200K at 2200VA (resistive)
Max cable size:	4mm
CE marked:	Yes
RoHS compliant:	Yes
In accordance with:	EN61000-6-1: 2007 EN61000-6-3: 2007 EN61010-1: 2002
Housing Material:	Polycarbonate, Auto extinguishable to UL 94 V-0

ORDERING INFORMATION

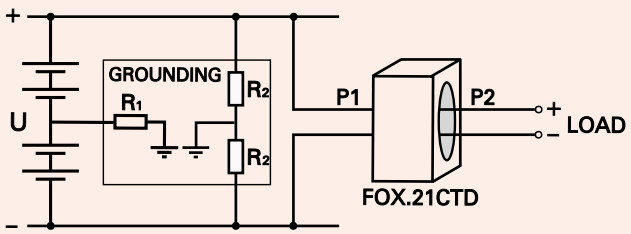
PRODUCT GROUP D

P/No	AUXILIARY SUPPLY OPTIONS
YWRI.DEF	9-36VDC 18-75VDC 85-370VDC/85-265VAC 210-1200VDC (Via separate DC-DC converter type YW1000D24D), page 134 24VAC 110VAC 230VAC 415VAC 440VAC 480VAC
FOX.21CTD	Supplied with relay as a kit.

NOTE

The YWRI.DEF and its associated CT are designed to monitor insulation breakdown. **It must not be used as a safeguard for life protection.**

GROUNDING INFORMATION



If the battery is not grounded at the centre point grounding resistors are required. Use either solution R_1 if possible or the solution with 2 x R_2.

Calculations for grounding resistors

$R_1^* = \text{MAX } \frac{U}{4 \times I_{set}}$ Ohm

Size of resistor $W^{**} = \text{Min } 0.4 \frac{U^2}{R_1}$ Watt

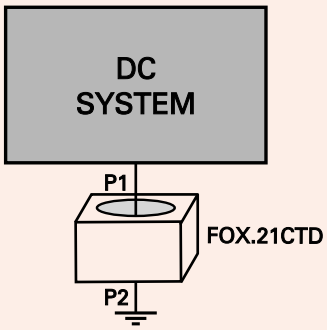
$R_2^* = \text{MAX } \frac{U}{2 \times I_{set}}$ Ohm

Size of resistor $W^{**} = \text{Min } 1.6 \frac{U^2}{R_2}$ Watt

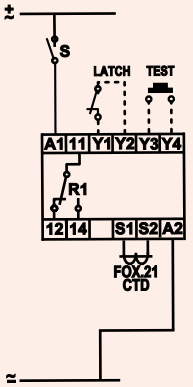
* The calculation of the resistor is based on a safety factor of 2 corresponding to a detection of a short circuit form one pole to ground to half battery voltage. A resistor selected according to the maximum resistor value as calculated above will limit the leak current to 2 times I_{set} in the case of a direct short to ground.
If it is a branched circuit with distributed "acceptable" leaks, it is recommended to use a lower value resistor.

** The calculation of the resistor size is based on a safety factor of 1.6, corresponding to an acceptable increase of battery voltage of 26%.

DC SYSTEMS WITH A SINGLE EARTH



CONNECTIONS



FUNCTION