SPi-OCEF

Electronic Over Current and Earth Fault Indicator

DATA SHEET

Application

The SPi-OCEF (Self Powered Over Current & Earth Fault Indicator) detects the passage of fault current at a point on an underground HV cable distribution network. Indication is by a flashing LED and electrical output contacts. The device does not require a battery.

Operation

The SPi is powered from the local mains supply under system normal conditions. During fault conditions and no supply periods the unit is internally self powered (non-battery).

Measurement of current is made every 1mSec. When current above the threshold setting of the indicator is measured a fault calculation is initiated. The algorithm used for fault measurement allows the indicator to grade with the minimum settings likely to be used by the source protection relays and at the same time avoid possible mis-measurement due to capacitive charge currents.

Fault Definition

The indicator determines a fault as follows: -

IF	supply was on 500mS before the current exceeds the threshold set point
AND	the current exceeds the threshold criteria
AND	the supply is off within 500mS after the current dropping below the threshold set point
THEN	a fault is set

Sensitivity

As standard the SPi-OCEF is factory set to operate for an earth fault of 50A and over current threshold of 250A/600A (selectable). Other thresholds can be factory set by agreement.

CT wiring

The CT should be connected so that the fault return current in the sheath is cancelled.

The SPi-OCEF is designed for use with 3 phase mounted 400/1 CT's, (fig.A) or alternately 2 phase mounted 400/1 CT's and a single 60/1 core balance CT (fig.B).

Fig.A

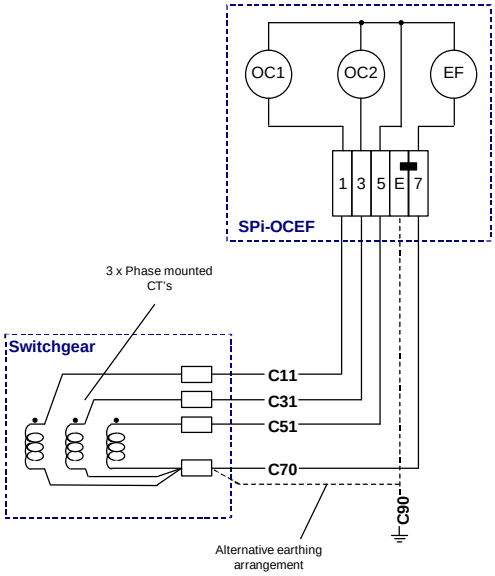
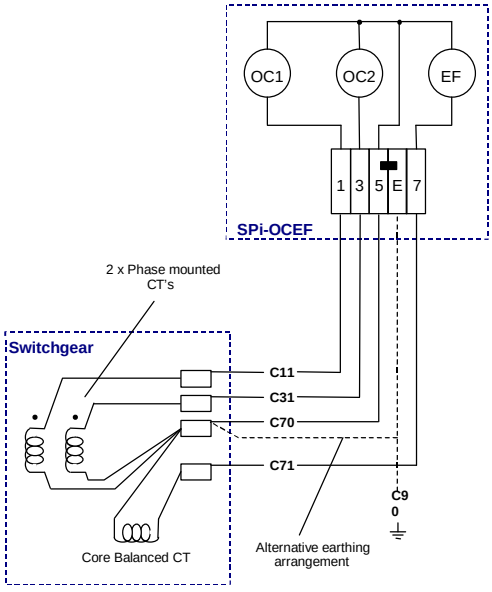


Fig. B



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SPECIFICATION

Power Supply	Option A: 110- 250V ac
	Option B: 40- 65V ac
CT requirements	Option A: [1 x core balanced 60/1] AND [2 x 400/1 phase CTs]
	Option B: 3 x 400/1 phase CTs
	Option C: by agreement, for example 3x1000/1 or 3x500/1
Earth Fault Threshold	50A. *If using a core balanced CT other than 60/1 then 0.833(P/S); where P=number primary turns, S=number secondary turns.*
Over Current Threshold	250A / 600A switch selected
Confirmation Time	Following a fault detection the indicator will not sense a further fault for a period of 3 minutes.
Local Indication	Ultra Bright LED
Flash Rate	1.5 seconds
Indication for Permanent Fault	Factory set 3 to 6 hours (standard = 3hrs)
Indication for Transient Fault	24 hours
Second Fault Alert	While indicating for a Permanent Fault the unit remains alert for subsequent faults.
Auxiliary Contacts	Option A: Fleeting, normally open volt free contacts (2 sec)
	Option B: Latched, normally open
	Alarm is actively biased to the non-operated position during the normal supply-on period and during the fault-measuring period.
Case	Polycarbonate 122mm (H) x 120mm (W) x 105mm (D)
Temperature range	-25°C to +70°C ambient
Weatherproofing	Case construction to IP65. Processor circuitry in lid protected in waterproof epoxy resin moulding.
Optional mounting bracket	Coated Aluminium. 177mm vertical M6 mounting centres.
Charge/Rearm time	From loss of supply: 10 seconds for first 30 minutes and then 60 seconds
Maintenance	The unit does not require maintenance, the button on the front of the unit is used for manual reset and routine operational checks

TESTING

Insulation: Between any terminal and earth	2kV RMS for 1 minute
Insulation: Between independent circuits	2kV RMS for 1 minute
Insulation: Across normally open contacts	1kV RMS for 1 minute
Transient over voltage: Between all terminals band earth or between any two terminals	5kV 1.2/50µSec.
High Hz Disturbance: 2.5kV Common mode (longitudinal)	No mal-operation
High Hz Disturbance: 1kV Series mode (transverse)	No mal-operation
Electrostatic Discharge: 8kV contact	No mal-operation
Fast Transient: 2kV 5/50nSec. 2.5kHz repetitive	No mal-operation, steady state, operated or during fault measurement
EMC: Susceptibility	100kHz to 1gHz, 3V/ metre on all planes, no mal-operation
EMC: Emissions	No significant emissions
Current Injection Tests	50A threshold ± 10% up to at least 20,000A primary current for 3 Sec. through 60/1 current transformer