CABLEMATIX TRANSMITTER
TYPE TXOO01

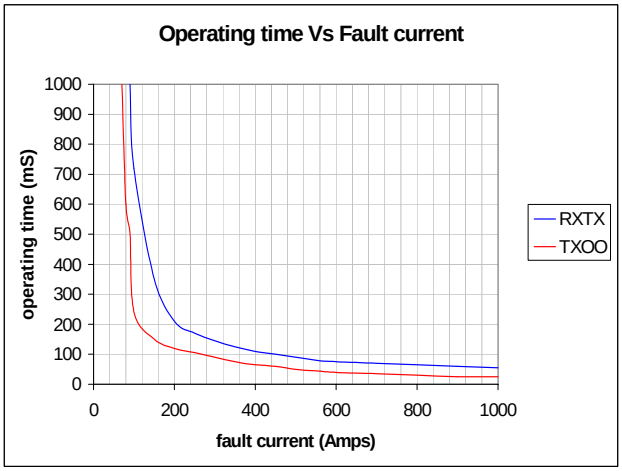
INTRODUCTION

The Transmitter Type TXOO01 is an earth fault current sensing and signalling unit designed for mounting at a Ring Main Unit (RMU) location on the cable feeder.
The TXOO01 measures the passage of fault current in the 11kV cable and signals to a receiver unit at the primary substation via the 11kV power cable.

OPERATION

The TXOO01 uses high frequency current injection technology to provide a data link between the RMU location and the primary substation, the existing 11kV cable is used as the communications medium.
In its normal mode of operation the transmitter sends a digitally encoded test message at regular intervals, this is detected by the receiver and confirms that the communications path is intact. Any loss of the test messages for a period of time causes the receiver unit at the primary substation to raise an alarm.

Indications (LEDs) are provided to show 'healthy' state and data transmission in progress.



When an earth fault occurs on the cable, the transmitters on the 11kV cable which registered the fault current flow transmit a signal back to the receiver unit. In order to remove the possibility of message collision each transmitter on a cable feeder is given a time slot in which to transmit it's data. The data transmission takes in the order of 10mS with a minimum time slot spacing of 160mS between individual transmissions.

The fault detection characteristic is an inverse time curve with a definite minimum operating time of 40mS at 20 times setting.

INSTALLATION

The unit can be located at either indoor or outdoor RMUs. If the unit is installed at an indoor RMU the Cablematix case together with cable termination box are secured to the substation wall, the cable termination box includes Weidmuller RSF3 terminals for connection of the SWA cable.
If the unit is installed at an outdoor RMU a vandal proof steel cabinet and support post are provided. The steel cabinet includes Weidmuller RSF3 terminals for connection of the SWA cable.

Connections to the unit are

- Local 110/250 Vac auxiliary supply e.g. lighting circuit. This provides power for the automatic test function and for the internal thermostatically controlled anti-condensation heater. If the auxiliary supply is not available the fault locator will operate in 'self powered' mode, drawing its power from the fault current.
- Fault current measurement CT
- Communication Signalling CT

The connections to the fault current measurement CT and communication signalling CT are non-intrusive requiring no primary system outage during installation.

- The current sensing CT is of split core construction. This is clamped around the 11kV cable, the internal diameter of the CT is >110mm.
- The signalling CT is of solid core construction, this is connected to the power system by passing the earth strap from the cable through the CT, this can easily be achieved on site with the use of a temporary earth clamp.

COMMISSIONING

The unit has been designed to allow installation and commissioning to be achieved in a single visit to the RMU location.

During commissioning the following are set

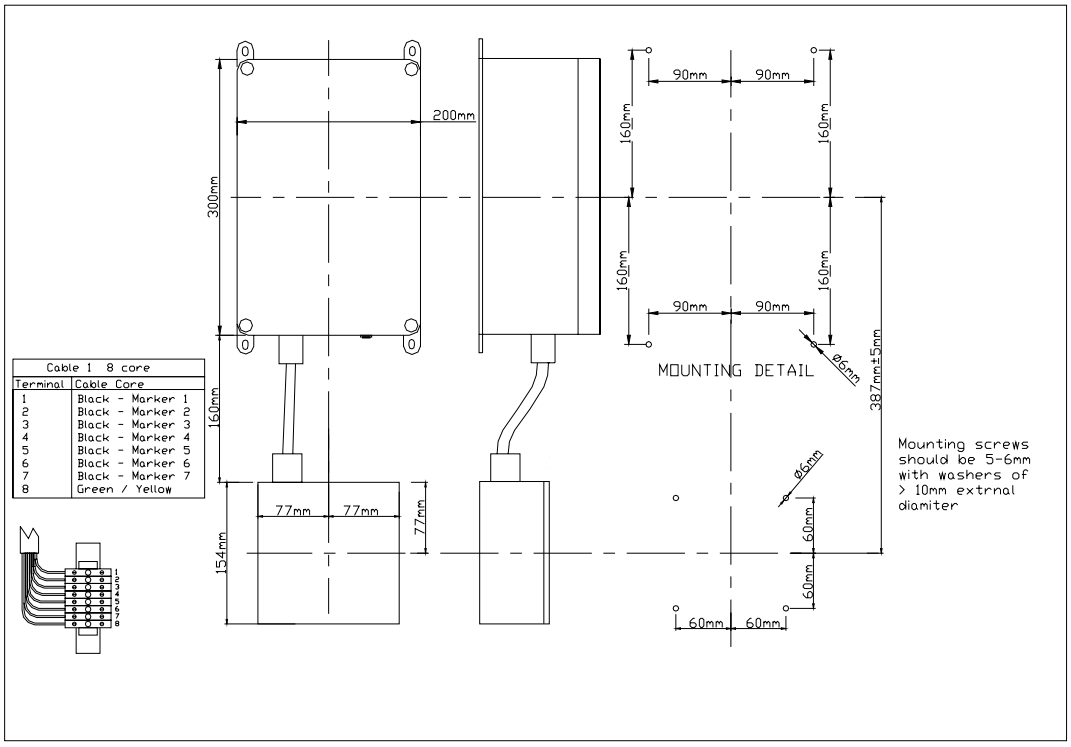
- address code
- transmission time slot
- Thermostat setting (outdoor cabinet only)

A test push button is provided on the transmitter to send a 'test' message to a receiver unit at the primary sub station, this provides confirmation that the communications path is available.

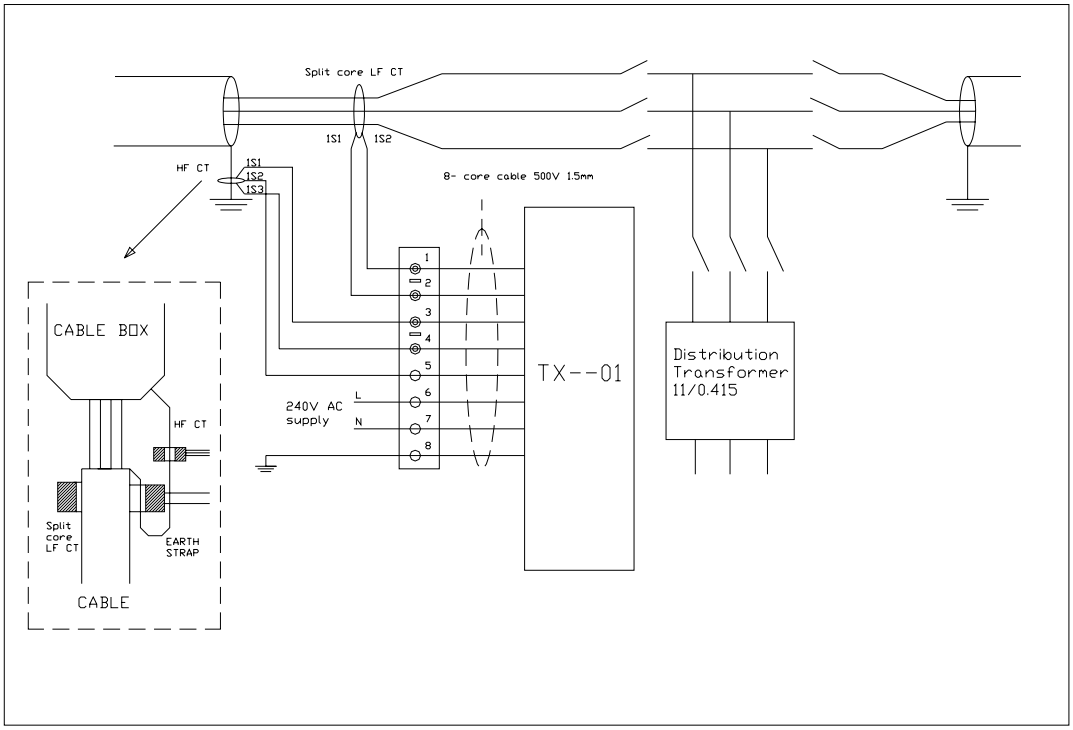
In conjunction with a current injection test set, portable test equipment is available to provide local indication that the TXOO01 unit is transmitting the correct data in response to detecting fault current.

Following commissioning the unit if left in a powered up state, transmitting test messages at regular intervals.

MOUNTING DETAIL (Indoor option)



CONNECTION DETAIL (indoor option)



TECHNICAL DATA:

SETTINGS
Receiver Current Setting Ip: 60Amps rms
Accuracy ±10%
Address Codes: 1 to 254

CT REQUIREMENTS.
Solid core CT for signalling, max earth bar 50mmx5mm
Core balanced, split core CT, max cable diameter 110mm

RATINGS
Auxiliary Voltage (Vn): 110V ac or 240V ac
Operative range 88-132V or 184 – 275V
Frequency : 50/60Hz
Operative range 47 to 62Hz

BURDENS
AC Voltage (Vn) at rated Voltage <6.5VA

ELECTRICAL ENVIRONMENT
- Insulation
  IEC60255-5 :1977
  2kV for 1 minute between case terminals and earth
  2kV for 1 minute between independent circuits
- Insulation Resistance
  IEC60255-5: 1977 >100MΩ
- DC Interruption
  IEC60255-11: 1979
  20ms without de-energising.
- Ripple on DC
  IEC60255-11: 1979
  Withstand 12% ripple
- Electrostatic Discharge
  IEC60255-22-2: 1989
  Class III (8.0kV)- discharge in air with cover in place
  Class III (6.0kV) – point contact discharge
- Radiated Immunity
  IEC61000-4-3:1995
  80 to 1000MHz, level 3 10V/m
  ENV50204:1995
  900MHz and 1.89GHz, level 10V/m
- Radiated Emissions
  EN55011:1991
- Conducted Emissions
  EN55011:1991
- Power frequency
  IEC60255-22-7: Draft

ATMOSPHERIC ENVIRONMENT
- Temperature
  IEC60255-6:1988
  Operating -25°C to 70°C
  Storage -25°C to 70°C
  IEC60068-2-2: 1990/A2 1994
  Cold (96 hours)
  IEC60068-2-2: 1974/A2 1994
  Dry heat (96 hours)
- Humidity
  IEC60068-2-30:1980
- Enclosure protection
  IEC60529:1989
  IP56

MECHANICAL ENVIRONMENT
- Vibration
  IEC60255-21-1:1996
  Response class I, Endurance class I
- Shock and Bump
  IEC60255-21-2:1995
  Shock response class I, Shock endurance class I
  Bump class I
- Seismic

IEC60255-21-3:1995 Class 1

TIMING
- Fault detection time at setting 10 seconds
- Fault detection time, minimum 20mS at 100 times setting
- Max location transmission time 3.5 sec at max time slot setting
- Test data transmission period 4 hours

HOW TO SPECIFY

The information to specify TXOO01 is as follows
- Number of RMU to be equipped.
- Number of outdoor RMU locations
- Rated voltage for transmitter units 110V or 240V ac

Associated equipment
- Signalling CT type CCT01A
- Current measurement CT type MCT01A