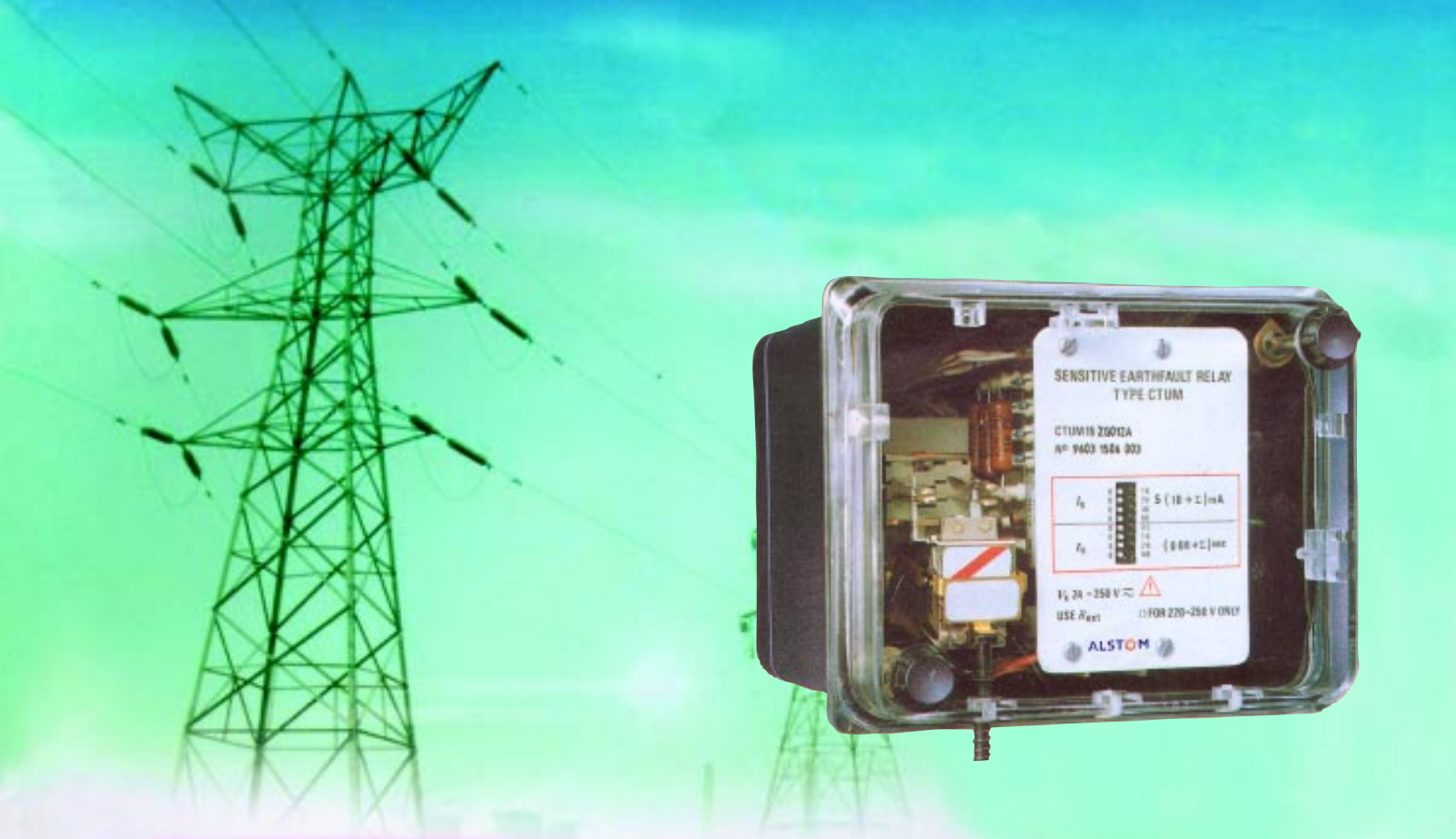
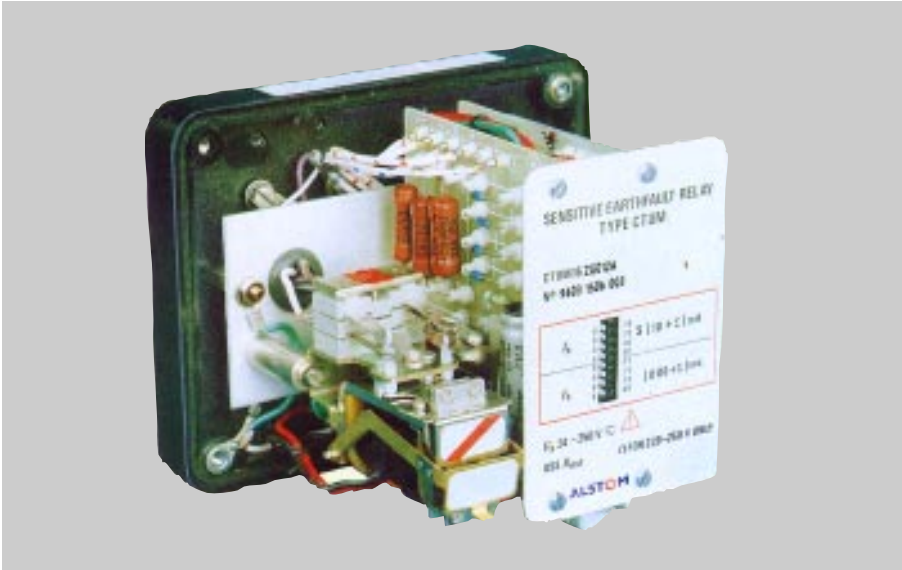


Type CTUM 15 & CTIGM 15
Sensitive Earth Fault Relays

ALSTOM

Type CTUM 15 & CTIGM 15
Sensitive Earth Fault Relays



CTUM 15 relay
withdrawn from the case

Features

- Wide/sensitive current setting range.
- Wide range of time settings.
- Extremely low burden.
- Settings adjustable on relay front panel.
- Suitable for a wide range of ac and dc auxiliary supplies.
- Immunity against transients.
- Compact case.

Application

It may not be always possible to detect high resistance faults by conventional earthfault relaying. In such cases a very sensitive current relay will be required. CTUM 15 can be used for this purpose. It can be connected residually since it has an adjustable definite time delay provided to take care of transient spills in the residual circuit due to CT mismatch. Also, its low burden enables it to be used with existing CTs/relays without affecting the latter's performance.

Another application of type CTUM 15 is the detection of low earth leakage currents in fire sensitive locations (like mines). Here, when used with suitably designed core balance current transformers (CBCT), the overall sensitivity achieved could be as low as 2A (primary) or lower. In such applications, sometimes a longer time delay may not be warranted and therefore the relay type CTUM 15 may be set for instantaneous operation. There will still be a built-in delay of about 60 ms. to overcome effects of transients, if any. Type CTIGM 15 is another variation of CTUM 15, without the adjustable time delay. It is exclusively intended for CBCT application and provides a cost effective alternative to CTUM 15.

Description

Figure 1 shows the typical block diagram of relay type CTUM 15. The incoming current is stepped down by an internal current transformer and converted to voltage by a variable resistor network. The signal is compared with an internal reference. When this reference level is exceeded, a time delay is initiated. After the time delay has elapsed, a relay operates two sets of contacts and a hand reset mechanical flag.

In case of relay type CTIGM 15, the adjustable time delay circuit (t_s) is eliminated and the relay has an operating time of about 100 ms (at two times the setting).

Technical data

Current rating

1A or 5A for CTUM 15
1A for CTIGM 15

Current setting range (I_s)

- For CTUM 15 relay
  10 mA to 160mA in steps of 10 mA (for 1A relay)
  50 mA to 800 mA in steps of 50 mA (for 5A relay)
- For CTIGM 15 relay
  5 mA to 515 mA in steps of 2 mA.

Time setting range (t_s)

- CTUM 15 relay:
  0.56 s to 7.56 s in steps of 0.5 s and also an instantaneous setting of 60 ms.
- CTIGM 15 relay:
  100 ms at two times the setting current (factory set).

Rated auxiliary voltage(V_x)

The relay will be suitable for use with any of the following supply voltages:

24,30/34,48/54,110/125, 220/250V dc.

110/125,220/250V ac, 50/60 Hz.

Thermal withstand

- Continuous
  2.4 x I_n
- Short time
  57 x I_n for 3s for 1A relay.
  230A for 3s for 5A relay.
  100 x I_n for 1s for 1A relay.
  400A for 1s for 5A relay.

Rated frequency

50/60 Hz.

Limits of operative frequency range

47 Hz to 62 Hz.

Limits of operative range

Vx (V)	Operating range (V)
24 dc	19.2 to 28.8
30/34 dc	24.0 to 37.5
48/54 dc	37.5 to 60.0
110/125 ac/dc	87.5 to 150.0
220/250 ac/dc	175.0 to 275.0

The same relay can be used with different Vx ratings (Refer Figure 1 and Table 1).

Reset current

Relay resets at greater than 95% of operating current.

Reset time

Typically 150 - 250 msecs.
(This is the time measured between switching off of a fault current and the resetting of output contacts.)

Operation indicator

The output unit is fitted with a hand reset mechanical flag.

AC burden (CTUM 15)

Less than 0.0001VA at min. setting current (10 mA/50 mA).

Less than 0.002VA at max. setting current (160 mA/800 mA).

Auxiliary burden

Vx V	Quiescent condition mA	Operated condition mA
24 dc	12	43
30/34 dc	20	47
48/54 dc	32	43
110/125 dc/ac	45 (49)	48 (52)
220/250 dc/ac	46 (47)	47 (49)

Note:

1. Quantities in brackets correspond to ac auxiliary supply.
2. Burden of CTIGM 15 relay will be furnished on request.

Operating temperature range

–25°C to +55°C

Storage

The relay meets the requirements of BS 2011 (IEC 68) to class 25/070/56, that is, storage and transport temperature range –25°C to +70°C and 56 days withstand of 40°C and 95% relative humidity.

Contacts

Two pairs of self reset contacts.
2 N/O or 2 N/C or 1 N/O & 1 N/C.

Accuracy

Reference conditions

Ambient temperature: 27°C ± 2°C
Frequency: Rated value ± 0.5% (50/60 Hz)
Aux. voltage: Rated value
Current setting (Is) :
160 mA/800 mA
Time setting (ts): 7.56 sec.

Contact ratings

Current	Make and carry continuously	Make and carry for 0.5 second	Break
AC	1250VA with maxima of 5A and 660V	7500VA with maxima of 30A and 660V	1250VA with maxima of 5 A and 660V
DC	1250W with maxima of 5A and 660V	7500W with maxima of 30A and 660V	100W (resistive) 50W (inductive) with maxima of 5A and 660V

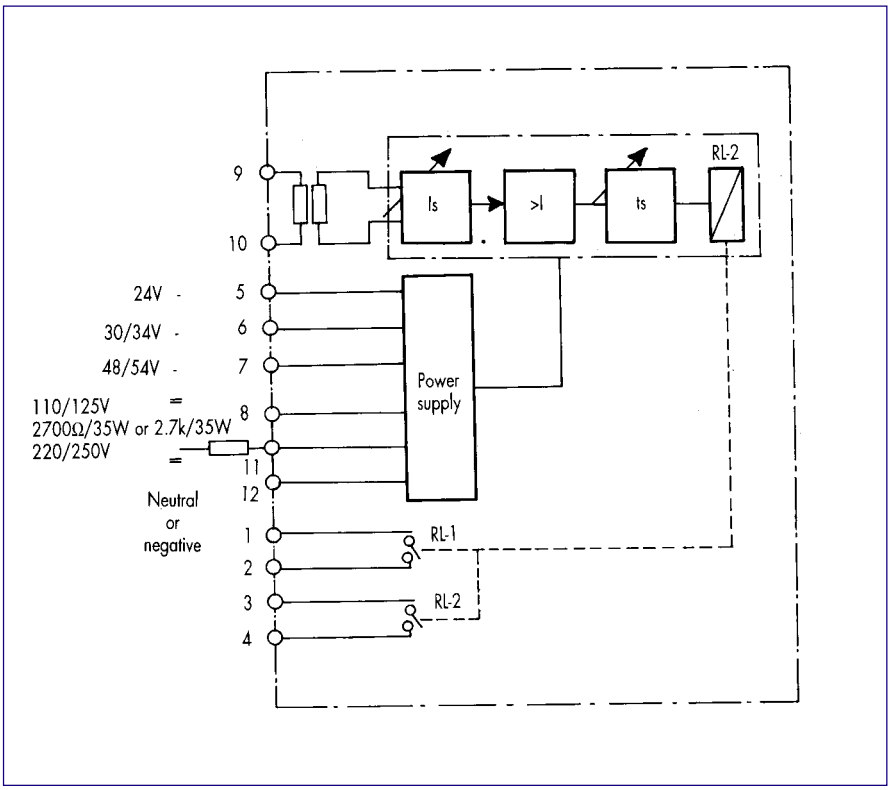


Figure 1:
Block diagram of relay type CTUM 15 (½N case)

Notes:

1. For 220/250V ac/dc auxiliary supply applications, an external series resistance of 2.7K, 35W should be connected to terminal 11.
2. The indicated terminal details are applicable for CTUM 15/CTIGM 15 relays housed in ½N case.
3. For the terminal details of ID case version, please refer Table-1(version 2&3).

Table - 1

Version	Auxiliary supply	Terminal	Case size
1	24V dc 30/34V dc 48/50V dc 110/125V ac/dc 220/250V ac/dc Neutral/Negative	5 6 7 8 11 12	½N
2	24V dc 30/34V dc 48/54V dc Negative	5 6 7 8	1D
3	110/125V ac/dc 220/250V ac/dc Negative/Neutral	6 7 8	1D

Note: For 220V/250V ac/dc auxiliary supply, an external resistance of 2.7K, 35W should be connected to terminal II (Refer Figure 1).

Accuracy under reference conditions

Pick-up error over the entire range: ±5%
Time error over the entire range: ±5% or 35 ms whichever is greater.

Additional allowable errors due to influencing quantities

- Temperature: –25°C to +55°C
  Pick-up error: ±3%
  Time error: ±3%.
- Frequency: 47 Hz to 62 Hz.
  Pick-up error: ±1%
  Time error: No additional error
- Auxiliary voltage
  Pick-up error: ± 2%
  Time error: No additional error

Mechanical durability

The relay will perform a minimum of 10,000 operations.

Vibration

The relay meets the requirements of BS 142 Section 22, Clause 8.2 to Class S2.

Insulation

The relay meets the requirements of IEC 255-5/IS 3231, 2 KV for 1 minute.

Impulse voltage

The relay complies with the requirements of IEC 255-4/IS 8686.

High frequency interference

The relay complies with IEC 255-6
Appendix C to Class III/IS 8686.

Case

Size 1D, 10 terminal or size ½ N, 12 terminal. Both flush mounting.

Information required with order

1. Aux. supply.
2. Contact combination required.
3. Current rating (for CTUM 15 relay only).
4. Case.

ALSTOM Limited Pallavaram Works: 19/1, GST Road, Pallavaram, Chennai-600 043. India.
Tel: 91-044-2368621 Fax: 91-044-2367276 Email: plw.applications@alstom.sprintrpg.eml.vsnl.net.in.

PR:022:0799:A

Printed in India.