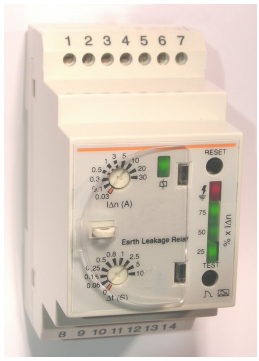
# Type: RCR-V30

## Earth Leakage Relay (Variable) - Type A

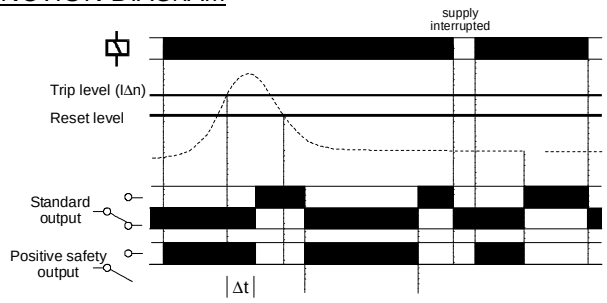
- **44mm (2.5 modules) wide DIN rail housing**
- **Designed to monitor and detect true RMS earth fault currents (up to 30A) in conjunction with a separate toroid**
- **LED bargraph provides constant indication of any leakage current**
- **Microprocessor controlled with internal monitoring (self-checking)**
- **Adjustable Sensitivity (IDn) - 30mA to 30A**
- **Adjustable Time Delay (Dt) - 0 (instantaneous)* to 10 seconds**
- **Separate "Test" and "Reset" push buttons**
- **Connection facility for remote "Test" and "Reset" push buttons or N.O. contacts**
- **Toroid open circuit detection forces unit to trip (Red LED flashes during this condition)**
- **2 Relay outputs - Standard Output (S.O.) and Positive Safety Output (P.S.O.)**
- **LED indication of Supply status and fault condition after unit has tripped**

Dims:
to DIN 43880
W. 44mm




Terminal Protection to IP20

## FUNCTION DIAGRAM




## INSTALLATION

- BEFORE INSTALLATION, ISOLATE THE SUPPLY.

Installation work must be carried out by qualified personnel.

- Connect the unit as shown in the diagram below (N.B. certain features may not be required and therefore do not need to be connected).
- Apply power, the green "supply on" LED will illuminate and the "positive safety output" relay will energise. The relay will de-energise if:
  - a, the fault current level exceeds the set trip level (IΔn) **
  - b, there is a failure of the connection between the relay and the toroid ** (Note the red "tripped" LED will flash during this condition)
  - c, the supply to the unit is removed
  - d, the relay fails internally

  ** causes the "standard output" relay to energise in response to the fault condition.
- Prior to a fault occurring, the LED bargraph will indicate the % of IΔn being detected (the display is scaled between 25, 50, and 75% of the actual trip level). After all 3 LED's have illuminated and the unit trips due to an excessive fault current, the red "tripped" LED will illuminate. The unit will now remain in a latched condition.

### Fault simulation (Test mode)

- The unit can be placed into a fault condition by pressing the "Test" button on the front of the unit (or by pressing the remote "Test" button - if fitted). The output relays operate accordingly.
- Press the "Reset" button on the front of the unit (or remotely - if fitted) to reset the unit. The output relays revert back to their "non-tripped" state.
- The unit can also be reset by interrupting the power supply.
- To satisfy regulations, it is recommended that the device be tested periodically to ensure correct operation.

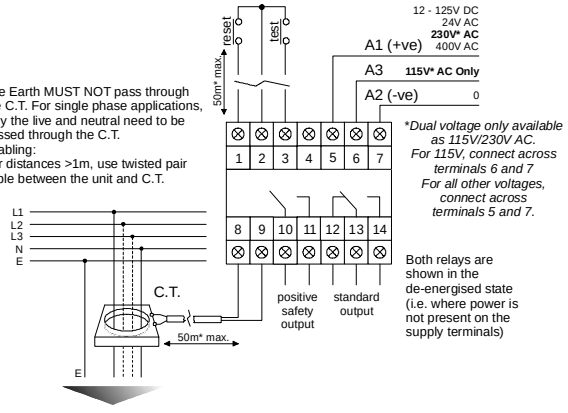
### Troubleshooting

- If the unit fails to operate correctly check that all wiring and connections are good.

### Note:

The operating function of this unit is classed as a Type A for which tripping is ensured for residual sinusoidal alternating currents and residual pulsating direct currents, whether applied suddenly or slowly rising. Additionally, this unit is protected against nuisance tripping. This unit will also satisfy the requirements for Type AC devices which only need to detect residual alternating currents.

## CONNECTION DIAGRAM




The Earth MUST NOT pass through the C.T. For single phase applications, only the live and neutral need to be passed through the C.T.
*Cabling:
For distances >1m, use twisted pair cable between the unit and C.T.

*Dual voltage only available as 115V/230V AC. For 115V, connect across terminals 6 and 7 For all other voltages, connect across terminals 5 and 7.

Both relays are shown in the de-energised state (i.e. where power is not present on the supply terminals)

## TECHNICAL SPECIFICATION

| | |
|---|---|
| Supply voltage Un (5, **6**, 7): | 12 - 125V DC (85 - 110% of U) |
| **(see connection diagram)** | 24, 115/230, 400V AC (85 - 115% of Un) |
| *All AC supplies are galvanically isolated between the supply and the toroid and remote test/reset connections.* | |
| Frequency range: | 50/60/400Hz (AC supplies) |
| Isolation: | Over voltage cat. III |
| Rated impulse withstand voltage: | 800V (24V AC supplies ), 2.5kV (115V AC supplies) |
| (1.2 / 50µS) IEC 60664 | 4kV (230V, 400V AC supplies) |
| Power consumption (max.): | 6VA (AC supplies) 5W (DC supplies) |
| Monitored leakage current: | 0 to 30A (15 - 400Hz) (through external toroid with 1000:1 ratio and connected to terminals 8 and 9) |
| Sensitivity IΔn (see Accessories) | 30, 100, 300, 500mA, 1, 3, 5, 10, 20, 30A (user selectable) |
| Trip level limits: | 80 - 90% of IΔn |
| Reset Value: | ≈ 85% of tripped level |
| Time delay Δt: | 0*, 60, 150, 250, 500, 800mS, 1, 2.5, 5, 10 sec. (user selectable) |
| **Actual delay for "0" or "Instantaneous" is <25mS when fault current @ 5 x IDn.* | |

Please state Supply voltage when ordering.

Note:
1. For IΔn setting of 30mA, the time delay is fixed to 0 (instantaneous) and is not adjustable (i.e. any other time delay cannot be selected when 30mA is set).
2. The unit is factory set to 30mA trip and instantaneous delay. Adjustment of these settings can be made if necessary to suit the requirements of the installation. A seal is supplied allowing the user to secure the clear window and hence prevent any unnecessary adjustment of the settings.

| | |
|---|---|
| Reset time: | ≈ 2S (from supply interruption) |
| LED indication: | |
| Power supply present: | Green |
| Bargraph: | Green x 3 (25, 50 and 75% of actual trip level) |
| Tripped: | Red (see "INSTALLATION" to the left) |
| Memory: | storage of the leakage fault and reset with the "Reset" push button |
| Ambient temp: | -20 to +55°C (-5 to +40°C in accordance with IEC 60755) |
| Relative humidity: | +95% |

| Output : | 1 x SPNO, 1 x SPDT relays | | |
|---|---|---|---|
| Output rating: | | S.O. (12, 13, 14) | P.S.O. (10, 11) |
| | AC1 (250V) | 8A (2000VA) | 6A (1500VA) |
| | AC15 (250V) | 2.5A | 4A |
| | DC1 (25V) | 8A (200W) | 6A (150W) |

| | |
|---|---|
| Electrical life: | ≥ 150,000 ops at rated load |
| Dielectric voltage: | 2kV AC (rms) IEC 60947-1 |
| Rated impulse withstand voltage: | 4kV (1.2 / 50µS) IEC 60664 |
| Remote "Test" / "Reset" (1, 2, 3) | Requires N.O. contacts. (i.e. push buttons) |
| Minimum trigger time: | >80mS (Actual trigger time = 80mS + Δt setting for remote "test") |
| Housing: | Grey flame retardant Lexan UL94 VO |
| Weight: | ≈ 190g (AC power supplies) ≈ 110g (DC power supply) |
| Mounting option: | On to 35mm symmetric DIN rail to BS5584:1978 (EN50 002, DIN 46277-3) |
| Terminal conductor size: | ≤ 2.5mm² stranded, ≤ 4mm² solid |
| Approvals: | Conforms to: IEC60755, 60947, 62020, 61543. IEC 61000-4-2, -3, -4, -5 , -6, -12 and -16. CISPR 22. CE and cULus Compliant. |

( ) Numbers in brackets shown above refer to terminal numbers on the relay housing.

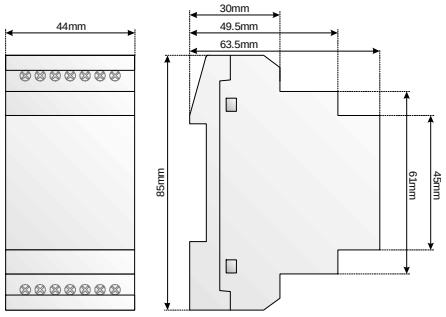
### Options

1. For other supply voltages, alternative trip levels or time delays, please consult the sales office.

### Accessories – Toroids

| Toroid Type: | Internal diameter: | IΔn (min.) A |
|---|---|---|
| CTB035 | 35mm ∅ | 0.03 |
| CTB070 | 70mm ∅ | 0.03 |
| CTB120 | 120mm ∅ | 0.1 |
| CTB210 | 210mm ∅ | 0.3 |

## MOUNTING DETAILS





Howard Butler Ltd., Crown Works, Lincoln Road, Walsall WS1 2EB England
Telephone: 01922 640003 International Telephone: +44 1922 640003 Fax: 01922 723626 Email: sales@hobut.co.uk Web: www.hobut.co.uk



RCR-V30-1-A
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