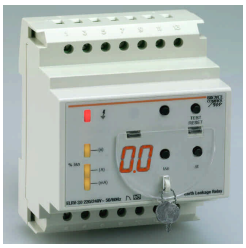
Type: ELRV-30

Earth Leakage Relay (Variable) - Type A

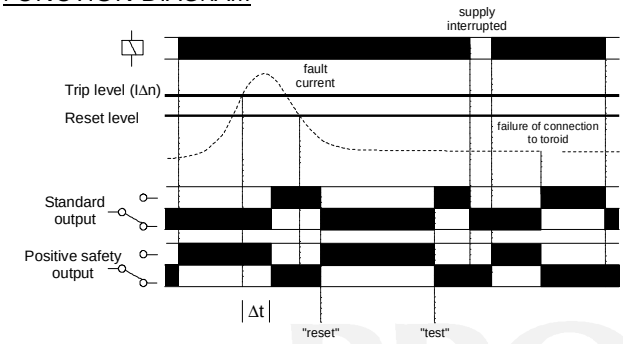


- 70mm DIN rail housing
- Designed to monitor and detect earth fault currents (up to 30A) in conjunction with a separate toroid
- Digital LED Display shows measured leakage current as well as various user settings
- Microprocessor controlled with internal monitoring (self-checking)
- Sensitivity (IDn) and time delay (Dt) adjustable using simple 2-button operation
- "Display" push button allows user to view settings without needing to open the tamperproof cover
- Single button operation for "Test / Reset" and connection facility for remote "Test" and "Reset" push buttons
- Connection for remote lamp facility warning user prior to a trip condition (level adjustable by user)
- Toroid open circuit detection forces unit to trip
- 2 x SPDT relay output 8A
- LED indication of user settings and fault condition after unit has tripped

Dims:
to DIN 43880
W. 70mm

Terminal Protection to IP20

FUNCTION DIAGRAM



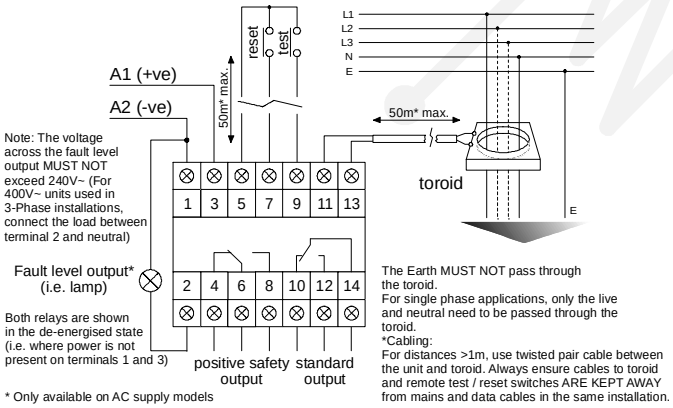
INSTALLATION

Installation work must be carried out by qualified personnel.

- BEFORE INSTALLATION, ISOLATE THE SUPPLY.
- 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).
- Operational and setting information can be found on the reverse of this data sheet.

This unit should be installed in conjunction with the latest wiring regulations and practices (IEE, etc)

CONNECTION DIAGRAM



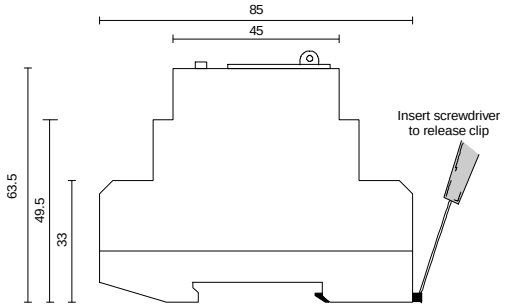
Note: The voltage across the fault level output MUST NOT exceed 240V~ (For 400V~ units used in 3-Phase installations, connect the load between terminal 2 and neutral)

Both relays are shown in the de-energised state (i.e. where power is not present on terminals 1 and 3)

* Only available on AC supply models

The Earth MUST NOT pass through the toroid.
For single phase applications, only the live and neutral need to be passed through the toroid.
*Cabling:
For distances >1m, use twisted pair cable between the unit and toroid. Always ensure cables to toroid and remote test / reset switches ARE KEPT AWAY from mains and data cables in the same installation.

MOUNTING DETAILS



TECHNICAL SPECIFICATION

Supply voltage Un (1, 3):	10- 85V DC (85 - 115% of U) 24, 115V, 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:	50/60Hz (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 (50/60Hz)(through external toroid with 1000:1 ratio and connected to terminals 11 and 13)
Sensitivity IΔn:	6, 10, 30, 50, 75, 100, 300, 500, 750mA 1, 3, 5, 7.5, 10, 15, 20, 25, 30A (user selectable)
Trip level limits:	70 - 80% of IΔn
Reset Value:	<7% of tripped level
Time delay Δt:	inst., 50, 250, 500mS, 1, 2.5, 5, 10 sec. (user selectable)
Measured current:	0.0005 to <30A displayed on auto ranging 2 digit 7-segment red LED display
Resolution:	100uA min. to 1A max.
Display accuracy:	±15% of actual measured leakage current
Reset time:	<120mS (from supply interruption)
Self test duration:	<5 secs. (operates at power on only)
Memory:	storage of the leakage fault and reset with "test / reset" button
Ambient temp:	-5 to +60°C -5 to +40°C (in accordance with IEC 755)
Relative humidity:	+95%
Output :	2 x SPDT relay (4, 6, 8 / 10, 12, 14)
Output rating:	AC1 250V 8A (2000VA) AC15 250V 2.5A DC1 25V 8A (200W)
Electrical life:	≥ 150,000 ops at rated load
Dielectric voltage:	2kV AC (rms) IEC 60947-1
Rated impluse withstand voltage:	4kV (1.2 / 50µS) IEC 60664
Remote "test" / "reset" (5, 7, 9)	Requires two N.O. contacts. (i.e. push buttons)
Minimum trigger time:	>50mS
Fault level output (1, 2):	50% of IΔn (factory set) User adjustable from 10 - 60% in 5% increments
Load (resistive):	40mA max. @ 240V Note: A remote lamp can only be connected when terminals 1 and 3 are being supplied with an AC supply
Housing:	Grey flame retardant Lexan UL94 VO
Weight:	≈ 250g
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: IEC 755. 50081-1, 50081-2, 50082-1 & 50082-2. and pending. CE and Compliant.

Please state Supply voltage when ordering.

Note: For IΔn settings of 30mA or less, the time delay is fixed to inst. (instantaneous, <40mS) and is not adjustable.

Options

1. For other supply voltages, alternative trip levels or time delays, please consult the sales office.
2. The ELRV30 is available with a double-pole relay output:
   ELRV30/2/P - Output relay will de-energise on fault condition
   ELRV30/2/S - Output relay will energise on fault condition
3. Analogue outputs and communications based versions are also available; please refer to separate data sheets.

Accessories

Toroids: BZCT035 - 35mm ∅, BZCT070 - 70mm ∅
BZCT120 - 120mm ∅, BZCT210 - 210mm ∅

Note: The 120 and 210mm toroids **MUST NOT** be used if sensitivity settings of less than 300mA are required.

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

Broyce Control Ltd., Pool Street, Wolverhampton, West Midlands WV2 4HN. England
Telephone: +44 (0) 1902 773746 Facsimile: +44 (0) 1902 420639 Email: sales@broycecontrol.com Web: http://www.broycecontrol.com

- ## OPERATING INSTRUCTIONS AND SETTINGS

Description

- 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.

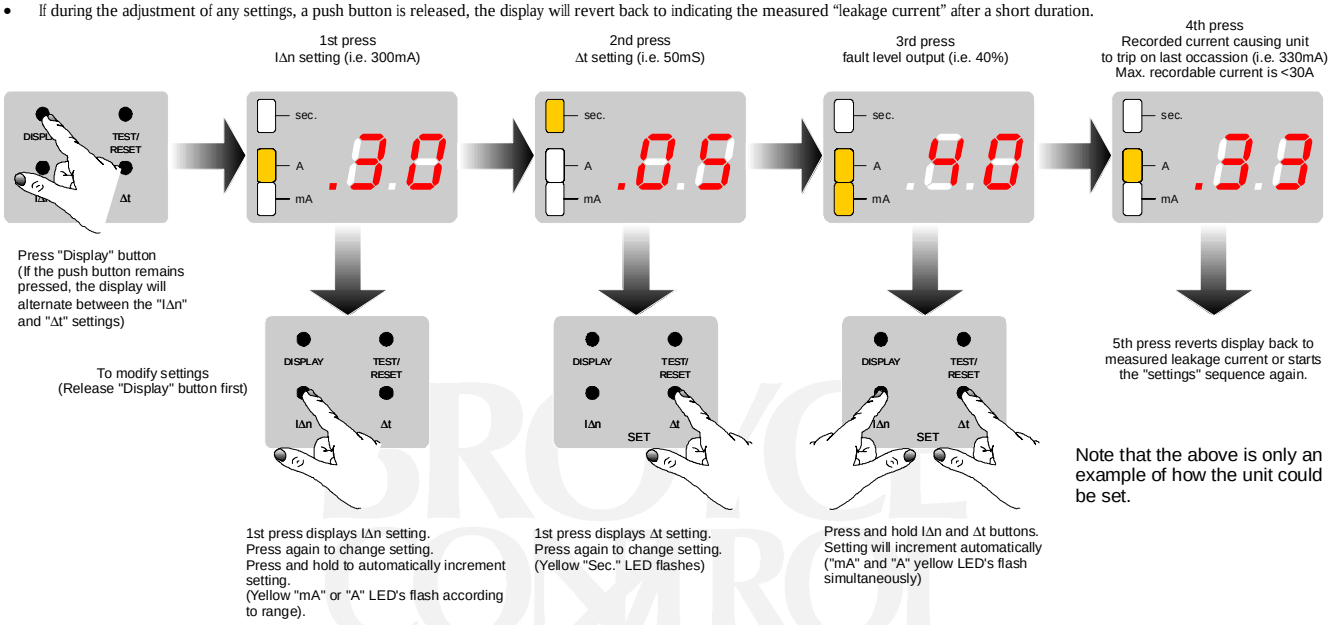
Applying power (assuming no leakage current present)

- Apply power and the "positive safety output" relay will energise and contacts 6 and 8 will close. The "standard output" relay will remain de-energised (contacts 12 and 14 open).
- After carrying out a self test (all segments illuminate on the LED display for a short period), then indicate the IΔn setting, followed by the measured "leakage current" that may be present in the installation. The yellow LED's to the left of the display show whether the current is "mA" or "A".

Viewing and changing the user settings.

Note: The unit is factory set to 30mA trip and instantaneous delay. The remote fault level output is set to 50%. Adjustment of these settings is prevented by the tamperproof cover, which is sealed at the factory. Access to the push buttons, which are used to change the settings, can only be made once the factory seal is broken. A spare seal is supplied with the unit and should be fitted if any adjustments are made.

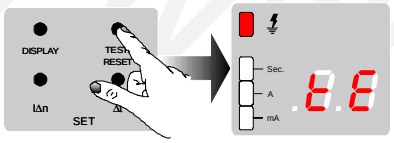
- The settings can be viewed and checked by pressing the "Display" push button as shown. Carrying out adjustments to these settings requires the tamperproof cover to be lifted in order to gain access to the two push buttons underneath.
- If during the adjustment of any settings, a push button is released, the display will revert back to indicating the measured "leakage current" after a short duration.



Note: After a change to a setting has been made, the new setting will only be stored once the yellow LED has stopped flashing.

Fault simulation (Test mode)

- The unit can be placed into a fault condition by pressing the "Test/Reset" button on the front of the unit (or by pressing the remote "Test" button - if fitted). If the unit is already in a "no fault" condition, i.e., not tripped, the first press will trip the unit. The output relays operate accordingly. The display shows the following characters.



- Press the same button again to reset the unit. The display reverts back to any measured leakage current that may be present.
- The unit can also be reset using the external "Reset" button (if fitted) or by interrupting the power supply.
- To satisfy regulations, it is recommended that the device be tested periodically to ensure correct operation.

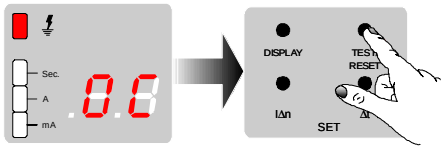
Fault conditions

Leakage currents

- If during normal service, the leakage current increases above the setting for the fault level output, the remote lamp will illuminate (if fitted) and the display will flash to give the user early warning of a possible fault condition. If the fault persists and the level of leakage current exceeds the trip level setting, the unit will trip. The "positive safety output" relay will de-energise and contacts 6 and 8 will open. The "standard output" relay will energise and contacts 12 and 14 will close. The red "fault" LED will illuminate and the display will stop flashing.
- Pressing the "Test/Reset" button returns the unit back to normal operation, assuming the fault has cleared. Note that the level of current that caused the unit to trip is now stored and can be re-called by pressing the "Display" button (see above). Note also that the recorded trip current is only stored whilst power is applied and cleared if the power supply is interrupted.

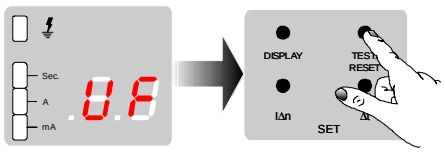
Toroid open circuit

- If the wiring between the unit and toroid becomes damaged (open circuit), the unit will trip.
- The display shows the following characters (see right).
- After the fault has cleared, press the "Test/Reset" button to return the unit back to normal operation.



Supply voltage fault

- If the applied supply voltage is <80% of Un, the unit will not operate and the display shows the following characters (see right). Both relays remain in the de-energised condition.
- After the correct voltage has been established, the same display test sequence occurs as if power were being applied in a normal manner.



Troubleshooting

- If the unit fails to operate correctly other than that described above, then the fault will more than likely be with the wiring to the unit. Check all wiring and that the connections are good.
- Ensure the supply to the unit is present on terminals 1 and 3 and is within the operational limits specified.

Broyce Control Ltd., Pool Street, Wolverhampton, West Midlands WV2 4HN. England
Telephone: +44 (0) 1902 773746 Facsimile: +44 (0) 1902 420639 Email: sales@broycecontrol.com Web: http://www.broycecontrol.com