BROYCE CONTROL

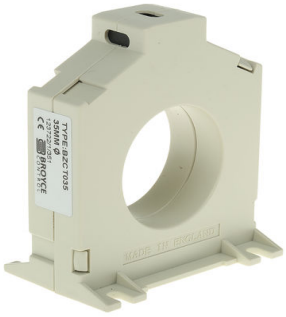
Passionate about protection and control

LXPRC/S
Phase Failure
Under/Over Voltage
& Phase Sequence
Monitoring Relay

LEYD/A
Star/Delta Start Timer

LEDF
Off Delay Timer

ELRM44V30
Earth Leakage Relays



BZCT035
Diameter=35mm

BZCT050
Diameter=50mm

BZCT070
Diameter=70mm

PRICE LIST 2016

BROYCE CONTROL
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3 - Phase Failure, Phase Sequence, Under and Over Voltage plus Time Delay

Made In England

รีเลย์ตรวจสอบและป้องกันระบบไฟฟ้าจากแรงดันไฟฟ้าตกไฟฟ้าเกิน การสลับเฟสทางไฟฟ้าพร้อมการหน่วงเวลา ก่อนตัดการทำงาน ด้วยระบบไมโครโปเซสเซอร์ ที่มีความเที่ยงตรงสูง เหมาะสำหรับการป้องกันระบบการจ่ายไฟฟ้าสำหรับตู้เมนไฟฟ้า ชุดควบคุมมอเตอร์ไฟฟ้าสามเฟส ป้องกันการกลับทางหมุนของมอเตอร์ สินค้าคุณภาพ ผลิตจากประเทศอังกฤษ ใช้กับระบบไฟสามเฟส

Type: LXPRC/S

Phase Failure, Phase Sequence, Under and Over Voltage plus Time Delay

- 17.5mm DIN rail housing
- True R.M.S.
- Microprocessor based (self checking)
- Monitors own supply and detects if one or more phases exceed the set Under or Over Voltage trip levels
- Measures phase to phase voltages
- Detects incorrect phase sequence and phase loss
- Adjustments for under and over voltage trip level
  - Under Voltage Adj. Range : 300 ~ 380V
  - Over Voltage Adj. Range : 420~500V
- Adjustment for time delay 0.2-10 sec. (+/- 5%) (+/- 5%) (from under or over voltage condition)
- 1 x SPDT relay output 8A
- Intelligent LED indication for supply and relay status

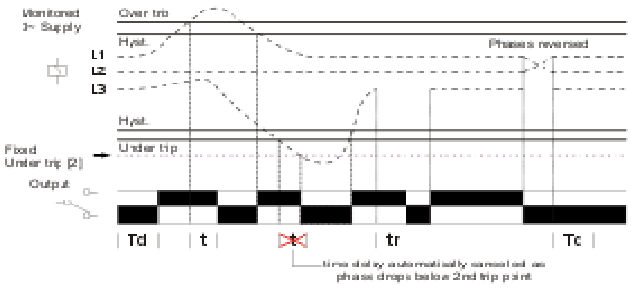
• TECHNICAL SPECIFICATION

Supply / monitoring
voltage Un* (L1, L2, L3): 400V AC
Frequency range: 48 - 63Hz
Supply variation: 70 - 130% of Un
Isolation: Over voltage cat. III
Rated impulse
withstand voltage: 4kV (1.2 / 50µS) IEC 60664
Power consumption: 8VA max.

UL and CE Certified:

Order Type:	Production Descriptions	Unit Price /Pcs. (THB)
LXPRC/S	Phase, Voltage Monitoring Relay with SPDT Contacts, 400 V ac	2,200.00

• FUNCTION DIAGRAM

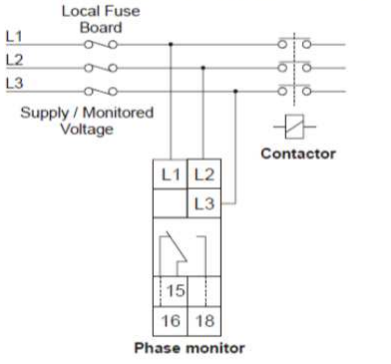


Troubleshooting.

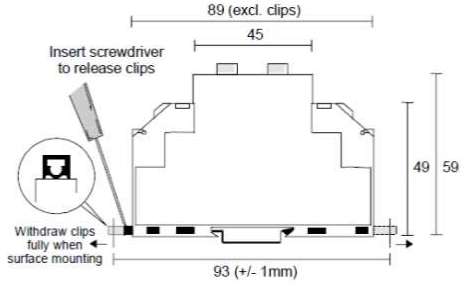
The table below shows the status of the unit during a fault condition.

Supply fault	Green LED	Red LED	Relay
Phase missing	On	Off	De-energised
Phases reversed (no delay)	Flashing	Off	De-energised
Under or Over Voltage condition (during timing)	On	Flashing	Energised for set delay (t)
Under or Over Voltage condition (after timing)	On	Off	De-energised
Phase below 70% of Un (fixed under trip level [2])	On	Off	De-energised

• CONNECTION DIAGRAM



• MOUNTING DETAILS



BROYCE CONTROL
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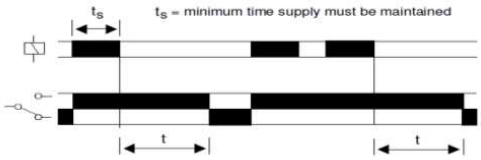
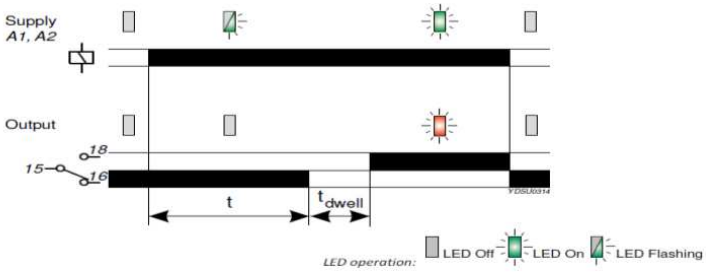
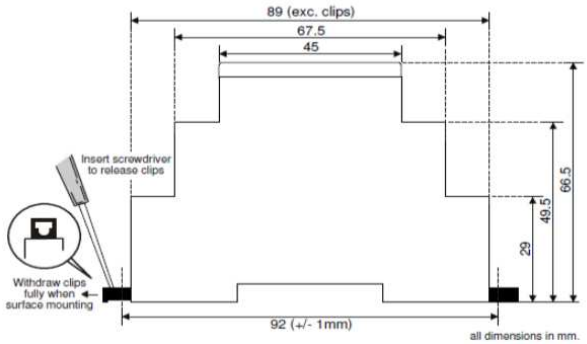
Electronic Timer Delay

Made In England

รีเลย์ตั้งเวลาแบบอีเลคโทรนิคสำหรับตั้งระยะเวลาการควบคุมการทำงาน มีให้เลือกตามความเหมาะสมของการใช้งาน

Order Type:	Production Descriptions	Unit Price /Pcs. (THB)
	**Type: LEDF OFF DELAY TIMER** รีเลย์เริ่มทำงานเมื่อไฟจ่ายเข้าแต่คอนเทคจะเปลี่ยนสถานะหลังจากไฟเลี้ยงหายไป ตามระยะเวลาที่ตั้ง 0.5 - 30 วินาที True Delay Off Single Time Delay Relay 1 x Contacts, SPDT, 230 V ac, 24 V ac/dc Supply Voltage: 24V AC/DC , 230VAC 48~63Hz. Timing function: True Delay Off 0.5-30 Secs. When the power is removed,the green LED will extinguish. The relay will remain energised for delay period"t" then de-energise. 	@1,800.-
	**Type: LEYD/A Star / Delta Timer** รีเลย์ตั้งเวลาสำหรับชุดสตาท์มอเตอร์แบบ สตาร์เดลต้า ที่สามารถหน่วงเวลาเป็นสองช่วง คือตัดการทำงานแบบสตาร์ พร้อมหน่วงเวลาอีกช่วงก่อนต่อเป็นเดลต้า ป้องกันการลัดวงจรโดยรอให้คอนเทคเตอร์สตาร์ เปิดออกก่อน ต่อเป็นเดลต้า 7 Selectable Dwell time settings (40-160mS) 7 Selectable time ranges(0.1Sec. - 100 hours) Multi-voltage input (12-230V AC/DC) 1 x SPDT relay output contact 8A Green LED indication for supply / timing status Red LED indication for relay status Conforms to IEC 61812 	@1,800.-

- ***DIMENSIONS***



BROYCE CONTROL
Passionate about Protection and Control

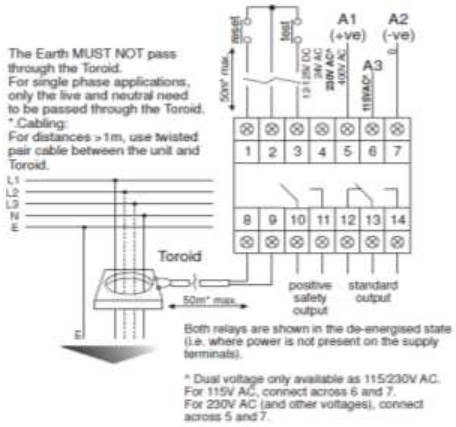
Microprocessor Earth Leakage Relay with external Toroid

Made In England

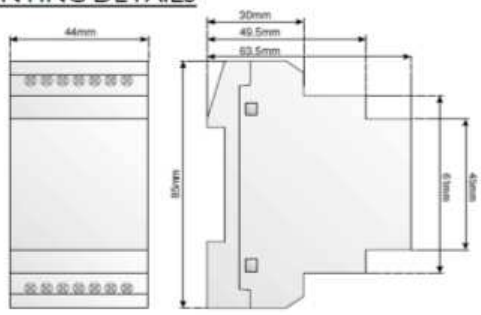
รีเลย์ตรวจสอบการรั่วไหลของกระแสไฟ ใช้ร่วมกันกับหม้อแปลงตรวจจับกระแส(ZCT) เหมาะสำหรับการป้องกันอันตรายจากการรั่วไหลของกระแสไฟฟ้าในระบบการจ่ายไฟ หรือเครื่องจักร์ต่างๆ ใช้ระบบไมโครโปรเซสเซอร์ที่มีความเที่ยงตรงสูง สามารถตรวจจับกระไฟรั่วไหลตั้งแต่ 30mA ถึง 30A ปรับได้ตามความต้องการใช้ เลือกขนาดของตัว ZCT ให้เหมาะกับขนาดสายไฟที่ใช้ตั้งแต่ขนาด 30mm , 50mm และ70mm

Photo	Descriptions	Unit Price (THB)
	**Type: ELRM44V-30** **8 A Instantaneous, Time Delay RCD, Trip Sensitivity 30 → 30000mA,** DIN Rail Mount ELRM Supply voltage Un (5, 6, 7): 12 - 125V DC (85 - 110% of U) Frequency range: 50/60/400Hz (AC supplies) Detect earth fault current : 30, 100, 300, 500mA, 1, 3, 5, 10, 20, 30A (user selectable) Trip level limits: 80 - 90% of IDn Reset Value: » 85% of tripped level Time delay Dt: 0*, 60, 150, 250, 500, 800mS, 1, 2.5, 5, 10 sec. (user selectable) **Approvals:** Conforms to: IEC60755, 60947, 62020, 61543. IEC 61000-4-2, -3, -4, -5 , -6, -12 and -16. CISPR 22. CE and Compliant.	@ 4,400.-
	**Type: BZCT035** Broyce Control BZCT, Circular Toroid, -20 → +60 °C 35mm Cable Diameter หม้อแปลงตรวจจับกระแสไฟรั่วไหล ขนาดช่องเข้าสาย เส้นผ่าศูนย์กลาง 30mm	@ 1,500.--
	**Type: BZCT050** Broyce Control BZCT, Circular Toroid, -20 → +60 °C 50mm Cable Diameter หม้อแปลงตรวจจับกระแสไฟรั่วไหล ขนาดช่องเข้าสาย เส้นผ่าศูนย์กลาง 50mm	@ 1,650.-
	**Type: BZCT070** Broyce Control BZCT, Circular Toroid, -20 → +60 °C 70mm Cable Diameter หม้อแปลงตรวจจับกระแสไฟรั่วไหล ขนาดช่องเข้าสาย เส้นผ่าศูนย์กลาง 70mm	@ 2,400.-

• CONNECTION DIAGRAM



• MOUNTING DETAILS



Type:ELRM44V30

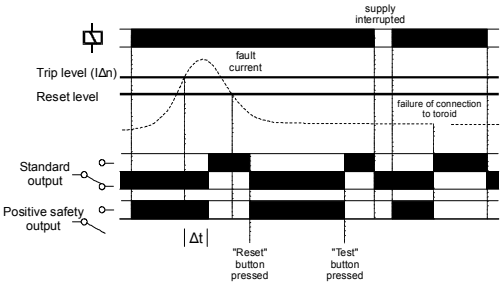
Earth Leakage Relay (Variable) - Type A

Dims:
to DIN 43880
W. 44mm

Terminal Protection to IP20

44mm (2.5 modules) wide DIN rail housing
2 models available (10A or 30A)
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 (IΔn) and Time Delay (Δt) - 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

• 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).
- 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

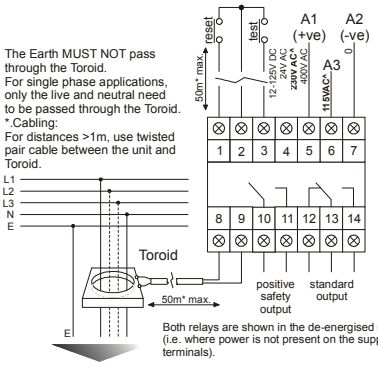
- If the unit fails to operate correctly check that all wiring and connections are good.

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.

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

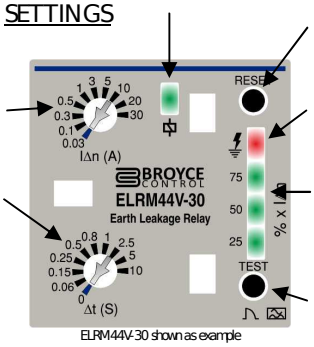
• CONNECTION DIAGRAM



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

^ Dual voltage only available as 115/230V AC.
For 115V AC, connect across 6 and 7.
For 230V AC (and other voltages), connect across 5 and 7.

• SETTINGS



ELRM44V-30 shown as example

Key:
1. Trip setting adjustment (IΔn) in Amps
2. Time delay adjustment (Δt) in Seconds
3. Green "Power On" LED indication
4. Green "Leakage Current" LED indication (% x IΔn)
5. Red "Tripped" LED indication
6. "RESET" button
7. "TEST" button

• 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 Supply and 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:	Up to 30A (15 - 400Hz) (through external toroid with 1000:1 ratio and connected to terminals 8 and 9)
Sensitivity IΔn (see Accessories also)	
ELRM44V-30:	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 IΔn.

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 supplies)
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 C Compliant.

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

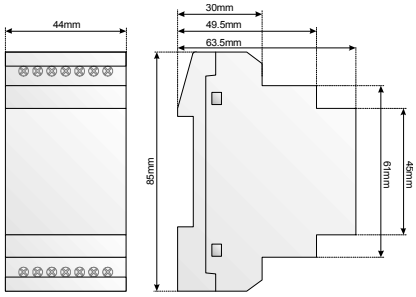
- Options

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	Toroid Type:	Internal diameter:	IΔn (min.) A
BZCT035	35mm∅	0.03	BZCT120	120mm∅	0.1
BZCT050	50mm∅	0.03	BZCT160	160mm∅	0.1
BZCT070	70mm∅	0.03	BZCT210	210mm∅	0.3

• MOUNTING DETAILS



ISO 9001 REGISTERED FIRM

Type: BZCT035, 050, 070, 120, 160 & 210

Circular Toroids

- **For use in conjunction with Broyce "Type A" Earth Leakage Relays**
- **Designed to detect leakage current and transmit a proportional signal to an Earth Leakage Relay**
- **Surface mounting with 4 fixing slots (BZCT160 and 210 supplied with separate mounting feet)**
- **Slim design**

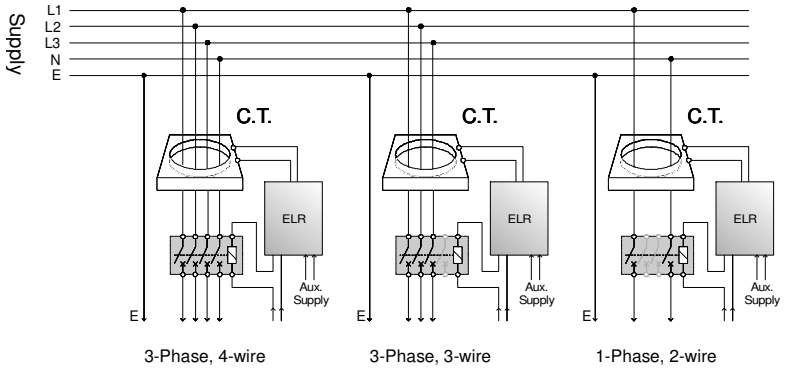
INSTALLATION NOTE

Installation work must be carried out by qualified personnel.

- BEFORE INSTALLATION, ISOLATE THE SUPPLY TO THE CABLES THAT ARE TO BE PASSED THROUGH THE TOROID.
- Installation of the toroid, along with the Earth Leakage Relay must be carried out in accordance with the latest wiring practices and regulations.

FUNCTION DIAGRAM

Typical connection examples are shown below.



TECHNICAL SPECIFICATION

Size availability* and part number:	35mm Ø (BZCT035) 120mm Ø (BZCT120) 50mm Ø (BZCT050) 160mm Ø (BZCT160) 70mm Ø (BZCT070) 210mm Ø (BZCT210)
* internal diameter	
Rated system voltage:	720VAC
Insulation level:	3kVAC
Current ratio: 1/1000	
Maximum permissible current:	1kA continuous 5kA for 1.5Sec. 100kA for 0.05Sec.
Minimum IΔn setting on Earth Leakage Relay for each type of toroid:	0.03A – 35, 50 and 70mm Ø 0.1A – 120mm Ø 0.3A – 160 and 210mm Ø
Distance between toroid and relay:	50 metres (max.)
Ambient temp:	-20 to +60°C
Relative humidity:	+95%
Housing:	Grey ABS
Mounting option:	Surface mount only using fixing slots provided (BZCT160 and 210 require separate mounting feet which are included)
Terminal conductor size:	≤ 2.5mm² solid ≤ 1.5mm² stranded
Approvals:	CE Compliant. Conforms to: IEC44-1, IEC185 & BS7676

INSTALLATION DO's and DONT's

- Correct installation of the Earth Leakage Relay and toroid should ensure trouble free operation, in particular, if this document is followed.

1. Always ensure the Earth conductor DOES NOT pass through the toroid. If it is unavoidable, the Earth must be routed back through the toroid again and around, as shown in Fig.2 below.
2. As a rule, select a toroid that has an inside diameter which is twice that or greater than the outsider diameter of the cable(s) to be passed through.
3. Ensure the cable is central in the toroid.
4. Place the toroid on a straight section of cable, not near a bend.
5. Keep the cable and toroid away from intense magnetic fields from nearby equipment.
6. DO NOT pass individual conductors through separate toroids, as shown in Fig. 3.

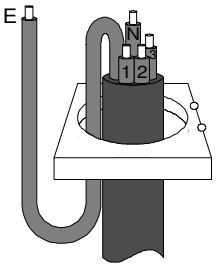


Fig. 1

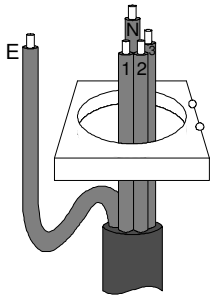


Fig.2

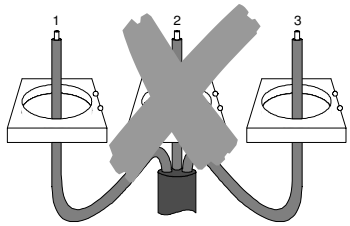
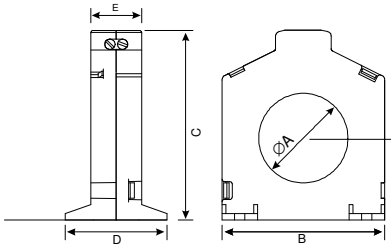


Fig.3

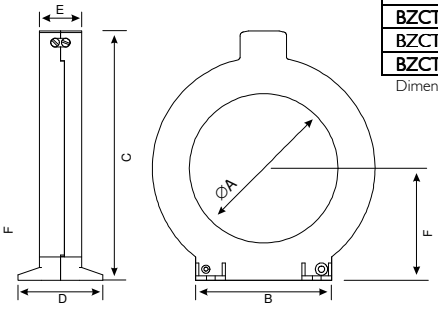
DIMENSIONS

Toroid Type:	AØ	B	C	D	E	F	Weight
BZCT035	35	64	74	40	20	32	77g
BZCT050	50	63	98	40	20	42	88g
BZCT070	70	105	117	40	20	53	135g
BZCT120	120	155	170	40	20	80	265g
BZCT160	160	150	253	60^	33	120	1075g
BZCT210	210	149	304	60^	33	145	1300g

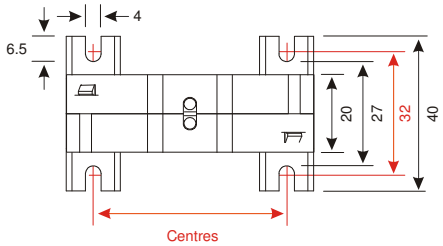
Dimensions in mm ^ exc. mounting feet



BZCT035



BZCT050, 070, 120, 160 & 210mm



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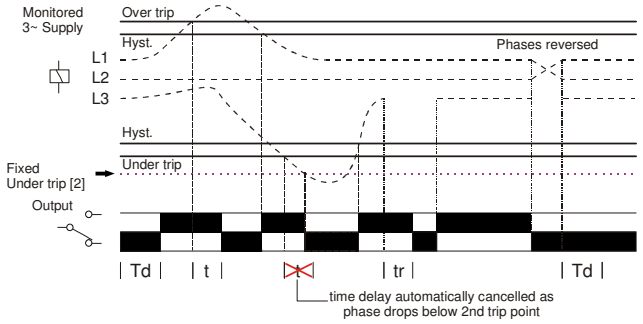
Type: LXPRC/S

Phase Failure, Phase Sequence, Under and Over Voltage plus Time Delay

- ❑ ***NEW*** **17.5mm DIN rail housing**
- ❑ **Microprocessor based**
- ❑ **True R.M.S. monitoring**
- ❑ **Monitors own supply and detects if one or more phases exceed the set Under or Over voltage trip levels**
- ❑ **Measures phase to phase voltages**
- ❑ **Detects incorrect phase sequence and phase loss**
- ❑ **Adjustments for Under and Over voltage trip levels**
- ❑ **Adjustment for Time delay (from an Under or Over voltage condition)**
- ❑ **1 x SPDT relay output 8A**
- ❑ **Green LED indication for supply status**
- ❑ **Red LED indication for relay status**

FUNCTION DIAGRAM

Under and Over Voltage Monitoring



INSTALLATION AND SETTING

Installation work must be carried out by qualified personnel.

- BEFORE INSTALLATION, ISOLATE THE SUPPLY.
- Connect the unit as required. The Connection Diagram below shows a typical installation, whereby the supply to a load is being monitored by the Phase monitoring relay. If a fault should occur (i.e. fuse blowing), the relay will de-energise and assuming control of the external Contactor, de-energise the Contactor as well.

Applying power.

- Set the "Over %" ❸ adjustment to maximum and the "Under %" ❺ adjustment to minimum. Set the "Delay (t)" ❹ to minimum.
- Apply power and the green "Power supply" ❶ and red "Relay" ❷ LED's will illuminate, the relay will energise and contacts 15 and 18 will close. Refer to the troubleshooting table if the unit fails to operate correctly.

Setting the unit (with power applied).

- Set the "Over %" and the "Under %" adjustments to give the required monitoring range.
- If large supply variations are anticipated, the adjustments should be set further from the nominal voltage.
- Set the "Delay (t)" adjustment as required. (Note that the delay is only effective should the supply increase above or drop below the set trip levels. However, if during an under voltage condition the supply drops below the 2nd under voltage trip level, any set time delay is automatically cancelled and the relay de-energises).
  Note: If the supply voltage increases above the maximum "Over %" trip setting by approx. 5% or more, the relay will de-energise immediately.

Troubleshooting.

The table below shows the status of the unit during a fault condition.

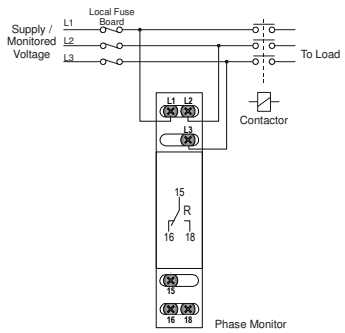
Supply fault	Green LED	Red LED	Relay
Phase missing	On	Off	De-energised
Phases reversed (no delay)	Flashing	Off	De-energised
Under or Over Voltage condition (during timing)	On	Flashing	Energised for set delay (t)
Under or Over Voltage condition (after timing)	On	Off	De-energised
Phase below 70% of Un (fixed under trip level [2])	On	Off	De-energised

TECHNICAL SPECIFICATION

Supply/monitoring voltage			
Un* **(L1, L2, L3):**	110, 208, 220, 380[1], 400[1], 415V[1] AC		
Frequency range:	48 – 63Hz		
Supply variation:	70 – 130% Un		
Overvoltage category:	III (IEC 60664)		
Rated impulse withstand voltage:	[1]4kV (1.2/50µS) IEC 60664		
Power consumption (max.):	8VA		
Monitoring mode:	Under and Over voltage		
Trip levels:			
Under [2]:	70% of Un (fixed) ± 2%		
Under:	75 – 95% of Un		
Over:	105 – 125% of Un		
Measuring ranges:	Under [2]	Under	Over
110V:	77V	83 – 105V	116 – 138V
208V:	146V	156 – 197V	218 – 260V
220V:	154V	165 – 209V	231 – 275V
380V:	266V	285 – 361V	399 – 475V
400V:	280V	300 – 380V	420 – 500V
415V:	290V	311 – 394V	436 – 519V
Hysteresis:	≈ 2% of trip level (factory set)		
Setting accuracy:	± 3%		
Repeat accuracy:	± 0.5% at constant conditions		
Immunity from micro power cuts:	<50mS		
Response time:	≈ 50mS		
Time delay (t):	0.2 – 10 sec. (± 5%)		
	Note: actual delay (t) = adjustable delay + response time		
Delay from Phase loss (tr):	≈ 150mS (worst case = tr x 2)		
Power on delay (Td):	≈ 1 sec. (worst case = Td x 2)		
Power on indication:	Green LED		
Relay status indication:	Red LED		
Ambient temp:	-20 to +60°C		
Relative humidity:	+95%		
Output **(15, 16, 18)**:	SPDT relay		
Output rating:	AC1	250V 8A (2000VA)	
	AC15	250V 5A (no), 3A (nc)	
	DC1	25V 8A (200W)	
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		
Housing:	Orange flame retardant UL94		
Weight:	75g		
Mounting option:	On to 35mm symmetric DIN rail to BS EN 60715 or direct surface mounting via 2 x M3.5 or 4BA screws using the black clips provided on the rear of the unit.		
Terminal conductor size	≤ 2 x 2.5mm² solid or stranded		
Approvals:	Conforms to IEC. CE, ✔ and RoHS Compliant. EMC: Immunity: EN 61000-6-2 (EN 61000-4-3 15V/m 80MHz - 2.7GHz) Emissions: EN 61000-6-4		

* Please state Supply/monitoring voltage when ordering

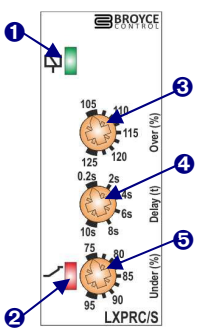
CONNECTION DIAGRAM



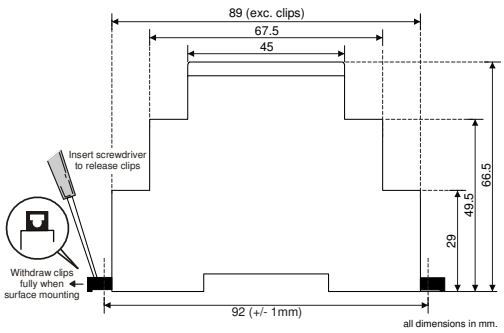
SETTING DETAILS

1. Power supply status (Green) LED
2. Relay output / Timing status (Red) LED
3. "Over %" trip level adjustment^
4. "Delay" adjustment
5. Under %" trip level adjustment^

^scaled as % of the nominal voltage "Un"



DIMENSIONS



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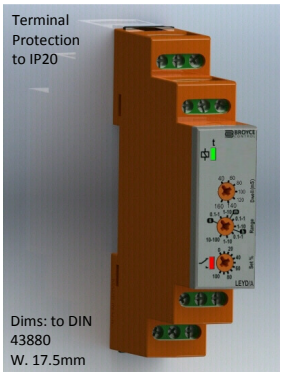
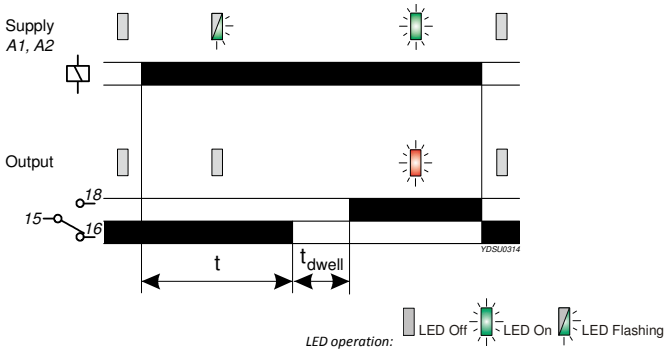
Type: LEYD/A

Star/Delta Start Timer



- ***NEW*** **17.5mm DIN rail housing**
- **Star/Delta timing function**
- **7 Selectable Dwell time settings (40 – 160mS)**
- **7 Selectable time ranges (0.1 seconds – 100 hours)**
- **Fine adjustment of selected time range**
- **Multi-voltage input (12 – 230V AC/DC)**
- **1 x SPDT relay output 8A**
- **Green LED indication for supply / timing status**
- **Red LED indication for relay status**
- **Conforms to IEC 61812**

FUNCTION DIAGRAMS



INSTALLATION AND SETTING

Installation work must be carried out by qualified personnel.

- BEFORE INSTALLATION, ISOLATE THE SUPPLY.
- Connect the unit as required.

Setting the unit.

- Set the "Dwell (ms)" selector ❺ to the required position.
- Set the "Range" ❹ to the required position (depending on whether seconds, minutes or hours are required), then set the "Set %" adjustment ❸ as required. The "Set %" is a % of the selected range, so 60% of the 1 – 10 hour range will give 6 hours.

Applying power.

- Apply power and the green LED ❶ will start flashing to indicate timing is in progress. Contacts 15 and 16 will remain closed during this period.
- At the end of the delay period "t", contacts 15 and 16 will open for the period set by the Dwell time.
- After the Dwell time, contacts 15 and 18 will close and the red relay LED ❷ will illuminate to indicate the relay is in the energised state.
- The relay will remain in the energised state until power is removed. Re-applying power will repeat the whole process again.

Note:

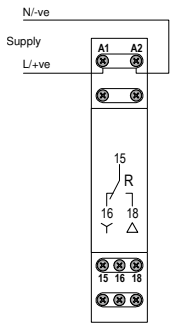
[1] In accordance with IEC 61812, the green LED is permitted to extinguish during a voltage dip or momentary interruption of the power supply providing the state of the output relay does not change. The dip / interruption duration and levels are defined in the product standard.

[2] The dip / interruption (reset) duration and levels are defined in the product standard however, the standard allows for these to be different from the levels actually specified.

TECHNICAL SPECIFICATION

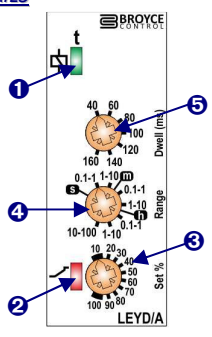
Supply voltage U **(A1, A2)**:	12 – 230V AC/DC			
Frequency range:	48 - 63Hz (AC supplies)			
Supply variation:	AC: +15/-10% DC: +/-15%			
Overvoltage category:	III (IEC 60664)			
Rated impulse withstand voltage:	4kV (1.2/50µS) IEC 60664			
Power consumption (max.):	12V	24V	110V	230V
AC:	0.6VA	0.8VA	2.6VA	6.8VA
DC:	0.52W	0.48W	0.94W	1.9W
Timing function:	Star/Delta Start			
Selectable Dwell (t_{dwell}) time settings (7):	40, 60, 80, 100, 120, 140, 160ms			
Timing ranges (7):	Seconds:	Minutes:	Hours:	
	0.1 – 1	0.1 – 1	0.1 – 1	
	1 – 10	1 – 10	1 – 10	
			10 - 100	
Reset time[2]:	< 100mS			
Accuracy:	± 1% of maximum full scale			
Adjustment accuracy:	< 5% of maximum full scale			
Repeat accuracy:	± 0.5% at constant conditions (IEC 61812)			
Drift with temperature:	± 0.05% / °C			
Drift with voltage:	± 0.2% / V			
Power on indication / Timing[1]:	Green LED			
Relay status	Red LED			
Ambient temp:	-20 to +60°C			
Relative humidity:	+95%			
Output **(15, 16, 18)**:	SPDT relay			
Output rating:	AC1		250V 6A (1500VA)	
	DC1		30V 6A (180W)	
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			
Housing:	Orange flame retardant UL94			
Weight:	≈ 70g			
Mounting option:	On to 35mm symmetric DIN rail to BS EN 60715 or direct surface mounting via 2 x M3.5 or 4BA screws using the black clips provided on the rear of the unit.			
Terminal conductor size	≤ 2 x 2.5mm² solid or stranded			
Approvals:	Conforms to IEC 61812. CE, C-tick and RoHS Compliant. EMC: Immunity: EN 61000-6-2 (EN 61000-4-3 10V/m 80MHz - 2.7GHz) Emissions: EN 61000-6-4			

CONNECTION DIAGRAM

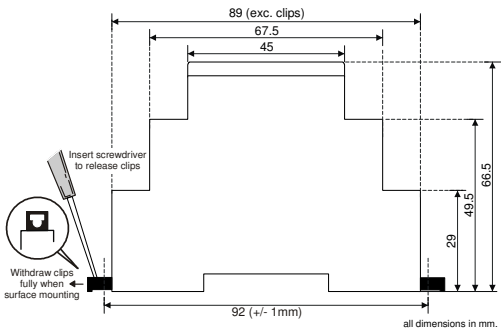


SETTING DETAILS

1. Power supply status / Timing (Green) LED
2. Relay output status (Red) LED
3. "Set %" adjustment selector
4. Time delay "Range" selector
5. "Dwell" time adjustment



DIMENSIONS



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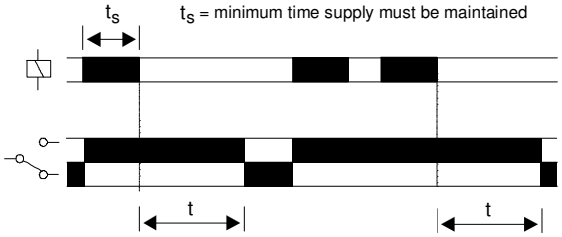
Type: LEDF

True Delay Off Timer (Delay On Release)

- ***NEW* 17.5mm DIN rail housing**
- **True Delay Off timing function**
- **Adjustment of time delay range**
- **Dual-voltage input**
- **1 x SPDT relay output 8A**
- **Green LED indication for supply status**

FUNCTION DIAGRAM



INSTALLATION AND SETTING

Installation work must be carried out by qualified personnel.

- BEFORE INSTALLATION, ISOLATE THE SUPPLY.
- Connect the unit as shown in the diagram below.
- If 24V AC/DC operation is required then terminals "A1" and "A3" must be linked.

Setting the unit.

- Set the "Delay (t)" adjustment ❷ as required.

Applying power.

- Apply power and the green LED ❶ will illuminate.
- The relay will energise and contacts 15 and 18 close.
- When the power is removed, the green LED will extinguish. The relay will remain energised for delay period "t" then de-energise. Contacts 15 and 18 will open.

Note:

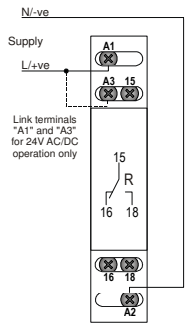
The supply must be maintained for a minimum period of 500mS (t_s) for correct operation. For the 10 minute version, the minimum period is 1 second.

TECHNICAL SPECIFICATION

Supply voltage Un **(A1, A2, A3[1])** *(see note)*	24V AC/DC[1] // 110V AC 24V AC/DC[1] // 230V AC		
	[1] *For 24VAC operation, terminals A1 and A3 are linked*		
Frequency range:	48 - 63Hz		
Supply variation:	+/ - 15%		
Power consumption (@ 1.15 x Un):	24V	110V	230V
AC:	1.3VA	2.7VA	12.8VA
DC:	0.62W	-	-
Timing function:	True Delay Off		
Timing delay (t) options:	Seconds:	Minutes:	
(see note)	0.5 – 10	0.5 – 10	
	1 – 30		
	2 – 60		
Min. power on period (t_s)	500mS		
	1 second (10 minute units)		
Reset time:	200mS		
Repeat accuracy:	± 1% at constant conditions		
Power on indication:	Green LED		
Ambient temp:	-20 to +60°C		
Relative humidity:	+95% max.		
Output **(15, 16, 18)**:	SPDT relay		
Output rating:	AC1		250V 8A (2000VA)
	AC15		250V 3A
	DC1		25V 8A (200W)
Electrical life:	≥ 100,000 ops at rated load (AC1)		
Housing:	Orange flame retardant UL94 V0		
Weight:	≈ 75g		
Mounting option:	On to 35mm symmetric DIN rail to BS EN 60715 or direct surface mounting via 2 x M3.5 or 4BA screws using the black clips provided on the rear of the unit.		
Terminal conductor size	≤ 2 x 2.5mm² solid or stranded		
Approvals:	CE, C-tick and RoHS Compliant.		

Note:
Supply voltage and time delay should be specified at the time of ordering.

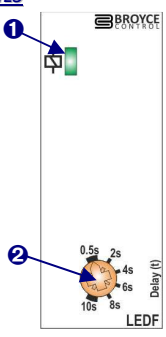
CONNECTION DIAGRAM



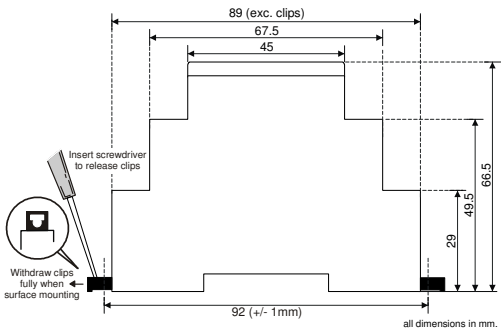
SETTING DETAILS

1. Power supply status (Green) LED
2. Time "Delay (t)" adjustment^

^ 0.5 – 10 second delay version shown on example on the right.



DIMENSIONS



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