

PRODUCT USER INFORMATION



Electrical Distributors



EARTH LEAKAGE PROTECTION EL-SEC RELAY & EL-COR SENSOR



Author	Revision	Date	Description
Erich Smith	01v05	2017-07-27	Removed Sensor model: AC61x233E (page 6)
Erich Smith	01v06	2018-04-12	Added IP rating

EL-SEC SENSITIVE EARTH FAULT RELAY & EL-COR SENSOR

The EL-SEC name, Earth Leakage - Sensitive Electrical current

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PUTTING INTO SERVICE

The product is panel mounted in the client's enclosure:

1. ⓘ Note: the relay requires an auxiliary power supply to operate. Ref: Specifications

PRODUCT INFORMATION

1. The EL-SEC ELECTRONIC monitors the ELCOR sensor to trip under earth leakage conditions. One basic EL-SEC is manufactured and is factory calibrated to suit the milliamps and curves designed to work with the ELCOR sensors; the EL-SEC must be ordered with the pre-set mA range and curves to suit the ELCOR point of application.
 - 1.1. PLEASE NOTE: The superseded Transcore and the new ELCOR sensors are **not** interchangeable.
 - 1.2. All the ELCOR sensors are fitted standard with a trip test winding.
 - 1.3. The user can press EL-SEC trip test button to unbalance the ELCOR sensor and trip the EL-SEC to test the tripping of the system.
 - 1.3.1. Trip Reset: Red button.
 - 1.3.2. Trip test: Yellow button.

TRIP TESTING

1. ⚠ Cannot detect when the motor mechanical and electrical earths are faulty till trip current is flowing, i.e. a shock path could exist before an operator bridges an earth path break between the machine metal parts and the electrical earth by touching both locations.
2. ⚠ Will not confirm the relay mA calibrated trip point.
3. ⓘ To correctly test the trip level of the relay, the user needs to pass the calibrated mA current through the core of the ELCOR sensor.

TRIP-TEST CONDITIONS

- ⚠ The user must note that the EL-SEC supply must be greater than 100V to operate correctly.

PLEASE NOTE: The superseded Transcore's are not compatible with the new EL-SEC electronic relay, only the ELCOR sensors can be matched with the new EL-SEC relay.

EL-SEC ELECTRONIC RELAY FUNCTIONS

1. **Variations on output relay operation;** the customer may use two methods to source the auxiliary power, these connection methods of installation that will dictate the operation of the EL-SEC relay. Ref: Fig 4.
 - 1.1. **Method A:** Trip condition - with auxiliary supply live and the EL-SEC in a fault condition.
 - Relay contact output: will hold in trip condition until reset.
 - Fault LED: continuously flashes until reset.
 - 1.2. **Method B:** Trip condition - with EL-SEC relay in fault condition, the machine & the auxiliary supply tripped.
 - Relay output: contact will operate once, then de-energise.
 - Relay contact output: On auxiliary power return, relay output will re-energise until reset.
 - Fault LED: continuously flashes until reset.
2. After a trip the EL-SEC will not reset until earth fault is corrected.

3. RELAY POWER UP

- 3.1. On power-up with no machine fault condition...
 - 3.1.1. With power supply below specification, the EL-SEC relay will indicate the trip relays cannot function by flashing the green 'Healthy' LED at one second intervals. *NOTE: There is no protection in this state.*
 - 3.1.2. Power supply within specification, the green 'Healthy' LED will illuminate in a steady state, then after 1.5 seconds the EL-SEC relay will extinguish the green 'Healthy' LED for 400ms indicating the EL-SEC is checking the ELCOR sensor for connection integrity, then will return to a steady ON state if integrity check is successful. This cycle will reoccur approximately every 20 minutes checking integrity of the ELCOR circuit.

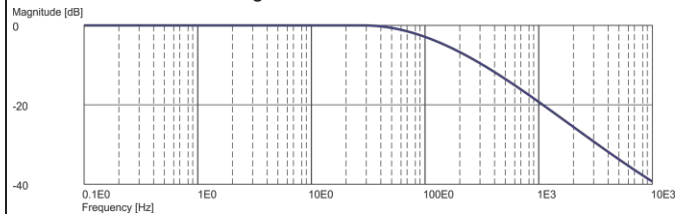
4. ELCOR CIRCUIT INTEGRITY CHECK.

- 4.1. On integrity check failure the relay outputs will change to the trip state.
 - 4.1.1. This condition is indicated by the continuous alternate flashing between the red and green LED's.
 - 4.1.2. Cause of the ELCOR sensor circuit failing the integrity check...
 - 4.1.2.1. Sensor circuit: open circuit, the EL-SEC will trip.
 - 4.1.2.2. Sensor circuit: short circuit, the EL-SEC will trip.
 - 4.1.2.3. Sensor circuit: out of specification, the EL-SEC will trip.
 - 4.1.2.3.1. Connecting the EL-SEC ELECTRONIC to a Transcore will be determined as out of specification.

SPECIFICATIONS

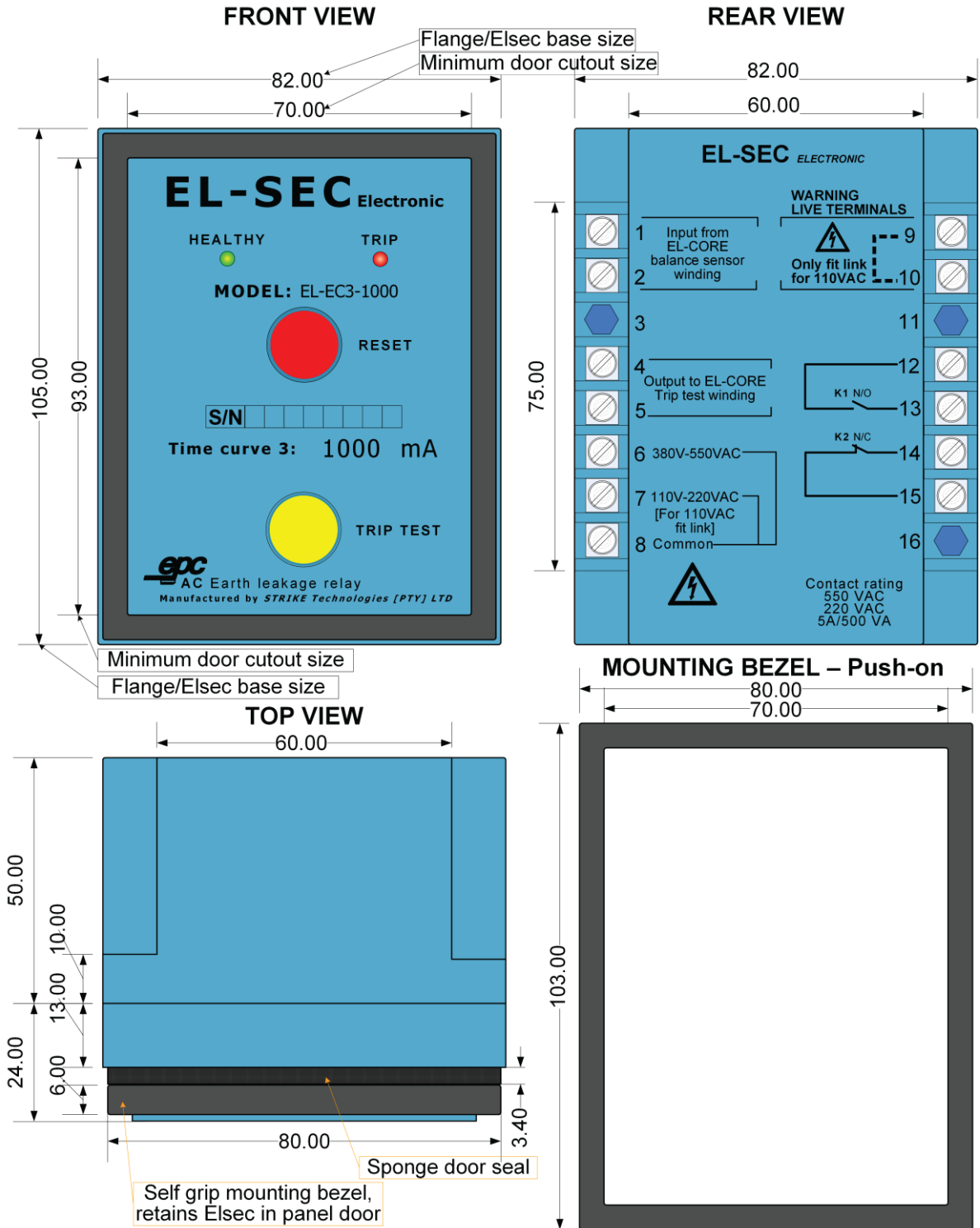
System and auxiliary parameters

1. TRIP ACCURACY: = ± 20%.
2. VOLTAGE:
 - 2.1. Maximum voltage: through core = 690Vac.
 - 2.2. Auxiliary supply: 88-264VAC or 304-660VAC ± 20%.
3. Maximum auxiliary supply burden = 25VA @ 550V.
= 5VA @ 220V.
4. Relay outputs: Contact form = 1 x N/O & 1 x N/C
Contact load = 5A 550V AC (cosΦ @ 1).
= 5A 32V DC (L/R = 0ms).
 Contactor coil operation. AC15 = 1.5A 480V AC
Solenoid operation. DC13 = 2A 60V DC, 50ms
5. LED trip indication will continue for approximately 3hrs after power failure. Note relays will be de-energised during this period.
6. Ingress Protection: IP 54
7. Harmonic Filtering



LAYOUT & ELECTRICAL INFORMATION

Fig 1: Dimensions & relay layout.



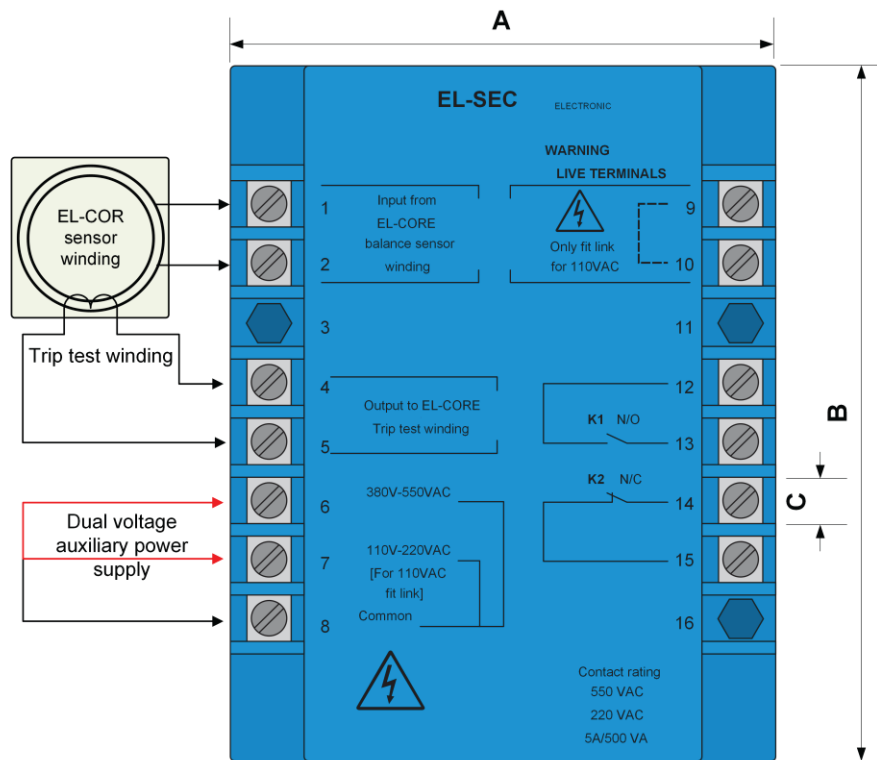
EL-SEC ELECTRONIC – DIMENSIONS & LAYOUT

RELAY FRONT, TOP & REAR VIEW WITH DIMENSIONS & TERMINAL DETAILS

SIZE A4	FSCM NO	DWG NO EPC ELSEC DIM 01v01 10-10-26 (1)	REV 00V01
SCALE NTS	TonyW	SHEET	1 OF 3

Fig 2: Termination & connection layout details.

ITEM	SIZE	DESCRIPTION - FUNCTION
Terminal 1	Screw 3.5 mm Ø	Input signal from EL-CORE balance sensor winding.
Terminal 2	Screw 3.5 mm Ø	Input signal from EL-CORE balance sensor winding.
Terminal 3	----	Not used.
Terminal 4	Screw 3.5 mm Ø	Output to EL-CORE trip test winding.
Terminal 5	Screw 3.5 mm Ø	Output to EL-CORE trip test winding.
Terminal 6	Screw 3.5 mm Ø	Auxiliary power supply range 380V - 550VAC.
Terminal 7	Screw 3.5 mm Ø	Auxiliary power supply range 110V - 220VAC.
Terminal 8	Screw 3.5 mm Ø	Auxiliary power supply common connection.
Terminal 9	Screw 3.5 mm Ø	Auxiliary power supply: link when 110VAC range is used.
Terminal 10	Screw 3.5 mm Ø	Auxiliary power supply: link when 110VAC range is used..
Terminal 11	----	Not used.
Terminal 12	Screw 3.5 mm Ø	Output relay K1 Potential free normally open contact.
Terminal 13	Screw 3.5 mm Ø	Output relay K1 Potential free normally open contact.
Terminal 14	Screw 3.5 mm Ø	Output relay K2 Potential free normally closed contact.
Terminal 15	Screw 3.5 mm Ø	Output relay K2 Potential free normally closed contact.
Terminal 16	----	Not used
Dimension A	82.00 mm	Width at rear of EL-SEC base. (Not cutout dimensions – Refer to dimension DWG)
Dimension B	105.00 mm	Height at rear of EL-SEC base. (Not cutout dimensions – Refer to dimension DWG)
Dimension C	7.00 mm	Maximum termination/lug aperture



Elssec Electrical Install DWG 01v03 2017-12-7.vsd

EL-SEC <small>ELECTRONIC</small> – INSTALLATION CONNECTIONS			
RELAY BASE REAR LAYOUT AND TERMINAL DETAILS			
SIZE A4	FSCM NO	DWG NO EPC ELSEC ELCONN 01v03 2016-12-7 (1)	REV 01V03
SCALE NTS	ErichS	SHEET	1 OF 2



PRODUCT TECHNICAL INFORMATION
EL-SEC Electronic Relay & ELCOR Sensor - Earth Leakage Protection

PRODUCT TYPES

EL-SEC RELAY & MATCHING ELCOR SENSORS

RELAY TRIP ALGORITHM

- Model: EIN indicates the electronic relay calibrated for instantaneous trip.
- Model: EC1 indicates the electronic relay calibrated using curve 1 time delay to trip.
- Model: EC2 indicates the electronic relay calibrated using curve 2 time delay to trip.
- Model: EC3 indicates the electronic relay calibrated using curve 3 time delay to trip.

SENSOR TYPES

- Model: AC30E indicates alternating current sensor 25mm ID, working with the EL-SEC ELECTRONIC relay.
- Model: AC55E indicates alternating current sensor 50mm ID, working with the EL-SEC ELECTRONIC relay.
- Model: AC100E indicates alternating current sensor 90mm ID, working with the EL-SEC ELECTRONIC relay.
- Model: AC59x254E indicates alternating current sensor 59 x 254mm internal rectangular dimensions, working with the EL-SEC ELECTRONIC relay.
- Model: AC107x352E indicates alternating current sensor 107 x 352mm internal rectangular dimensions, working with the EL-SEC ELECTRONIC relay.

MATCHING THE RELAY MODEL WITH THE SENSOR TYPE TO BE USED

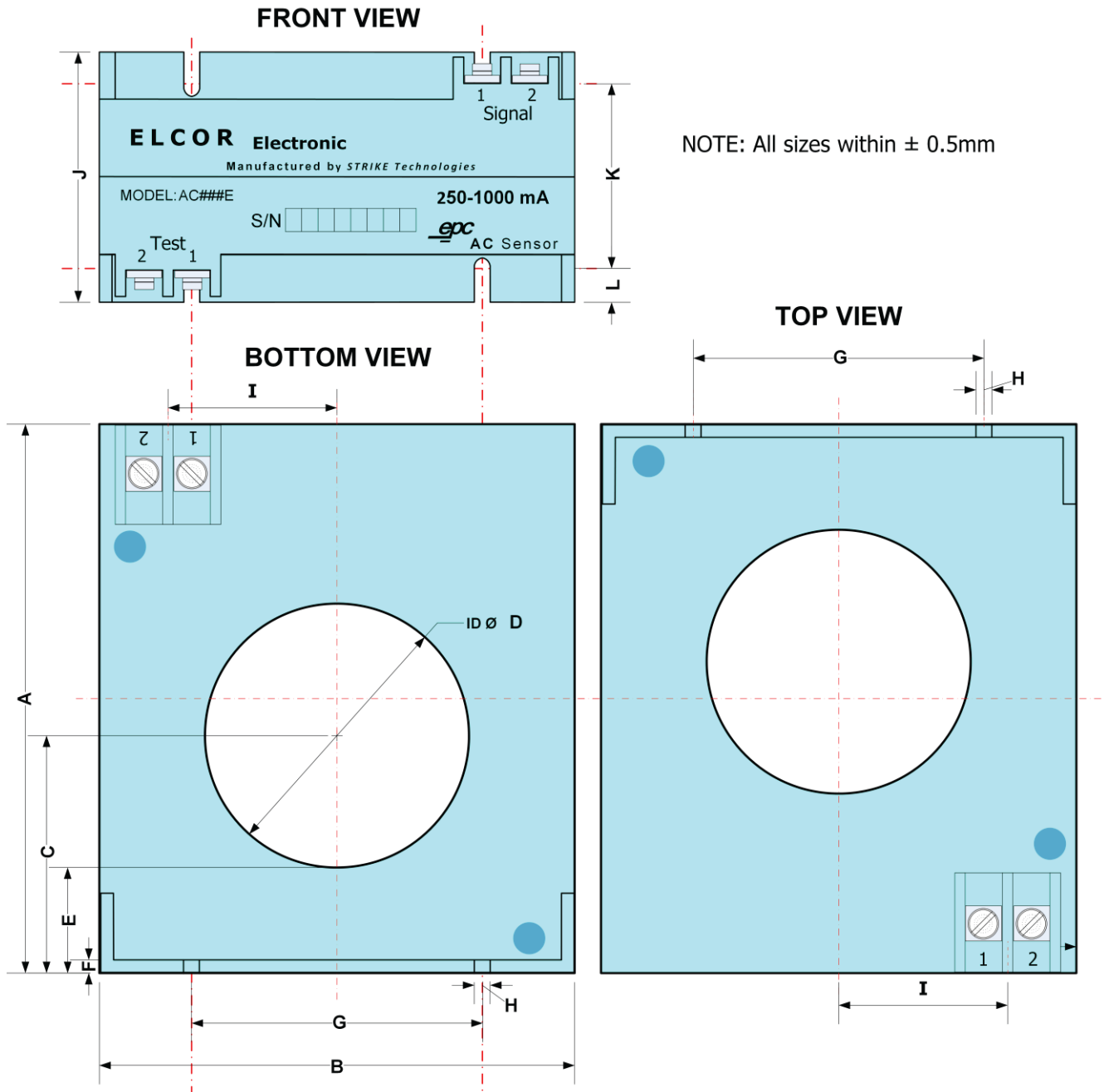
RELAY				SENSOR					
Start code	Trip algorithm	mA		Start code	Sensor selection				
					Round core sensors			Rectangular sensors	
EL	EIN	30	Matching sensors	ELCOR	AC30E	AC55E			
EL	EIN	125	Matching sensors	ELCOR	AC30E	AC55E	AC100E		
EL	EIN	250	Matching sensors	ELCOR	AC30E	AC55E	AC100E		
EL	EIN	500	Matching sensors	ELCOR	AC30E	AC55E	AC100E		
EL	EIN	1000	Matching sensors	ELCOR	AC30E	AC55E	AC100E		
EL	EIN	2000	Matching sensors	ELCOR	AC30E	AC55E	AC100E		
EL	EIN	5000	Matching sensors	ELCOR	AC30E	AC55E	AC100E		
EL	EC1	375	Matching sensors	ELCOR	AC30E	AC55E	AC100E		
EL	EC2	500	Matching sensors	ELCOR	AC30E	AC55E	AC100E	AC59x254E	
EL	EC3	1000	Matching sensors	ELCOR	AC30E	AC55E	AC100E	AC59x254E	AC107x352E

ELCOR

TABLE OF ELCOR DIMENSIONS

DESCRIPTION - FUNCTION	ELCOR AC30E	ELCOR AC55E	ELCOR AC100E
	Dimensions	Dimensions	Dimensions
A = Height	A = 78mm	A = 104mm	A = 161mm
B = Width	B = 64mm	B = 90mm	B = 138mm
C = Base to core ID centre	C = 33mm	C = 45mm	C = 75mm
D = Core ID	D = 25mm	D = 50mm	D = 90mm
E = Base to ID circumference	E = 20mm	E = 20mm	E = 30mm
F = Base mounting feet thickness	F = 3mm	F = 3mm	F = 2mm
G = Base mounting hole centers	G = 40mm	G = 55mm	G = 89mm
H = Base mounting hole slot size	H = 5.8mm	H = 5.8mm	H = 6mm
I = Core centre to terminal block centre	I = 18mm	I = 30mm	I = 46mm
J = Mounting base height	J = 53mm	J = 56mm	J = 66mm
K = Base mounting hole centers	K = 41mm	K = 44mm	K = 54mm
L = Mounting hole slot length from radius	L = 6mm	L = 6mm	L = 6mm
DESCRIPTION - FUNCTION	ITEM		SIZE
Sensor winding output signal to EL-SEC relay.	Signal Term 1		Screw 3.5 mm ∅
Sensor winding output signal to EL-SEC relay.	Signal Term 2		Screw 3.5 mm ∅
Trip test winding input to EL-COR (standard).	Test Term 1		Screw 3.5 mm ∅
Trip test winding input to EL-COR (standard).	Test Term 2		Screw 3.5 mm ∅

FIG 3: ELCOR DIMENSION REFERENCE DIAGRAM



EL-SEC & EL-COR APPLICATION DIAGRAM

FIG 4: AUXILIARY POWER CONNECTION METHODS

