



Data Sheet

Earth Leakage Relay-ELPR



Measure



Control



Record



Analyze

RISH ELPR is earth leakage relay (ELR), a protection device to be used in electrical installations against electric shock and / or damage to equipment caused by punctured or weak insulations or contact to live parts. Instrument operates by monitoring the earth leakage current through CBCT and disconnecting the circuit in case of hazardous levels of earth leakage currents.

RISH ELPR is available in two versions, Smart and Smart+

Applications:

The application include Motor protection, Mining equipment , Industrial premises , Substation premises.

Product Features:

Easy operation :

Front access potentiometer with marking are provided to set desired value of leakage current and trip time.

CBCT connection fault detection:

CBCT connection at the device terminals is monitored so leakage detection is always faithful.

PON LED indicates CBCT fault status.

True RMS Measurement

The instrument measures distorted waveform up to 15th harmonic and categorized under Type A ELR.

Programmable parameter through potentiometer:

1. Leakage current:

The measured leakage current value is continuously compared with this set value. Fault is condition said to occurred if leakage current exceeds this set value of current. (30mA, 100mA, 300mA, 500mA, 1A,3A, 5A, 10A, 20A or 30A programmable)

2. Trip Delay:

The time in seconds for which fault leakage current should persist so that relay will be driven to fault state. Zero trip delay corresponds to instantaneous tripping. (0s, 0.06s, 0.15s, 0.25s, 0.5s, 0.8s, 1s, 2.5s, 5s, 10s programmable)

Test and Reset Key :

Test Key - Pressing this key trigger the fault state operation of the device.

Reset Key - Pressing this key trigger the Normal working state operation of the device. Reset will restore the normal operation of alarm and main relay only if leakage current is in normal range (Below reset value of leakage current of corresponding relay) reset operation has memory function till device is powered on Press timing for both keys is 3 seconds approximately.

Remote Reset:

Two contacts are provided at terminal block, can be used for remote reset operation, These contact function are similar to reset key operation

LED indications:

1. Bar graph - Measured leakage current in terms of percentage of set leakage current (I_n), and indicated by 4 LED's as per 30%, 45%, 60%, 75% of set value.

2. PON - Indicates device is powered on and working.

Additionally it shows CBCT fault condition by blinking

3. Trip - Indicates relay fault state.

Operation table LED:

1. PON LED ON - Device is powered on and functioning

2. PON LED Blinking - CBCT Open detected

3. Trip LED ON - Relay is in fault state

4. Trip LED blinking - Alarm relay is activated

Relay output :

1. Relay1: This is main ELR relay having 3 terminal (COM, NO, NC) to signal the fault condition. This relay is default normally de-energize in Smart version, whereas in advance version its configuration can be changed by DIP switch.

2. Relay2 (Optional) : This is additional relay having 2 terminal (COM, NO). This relay function as alarm relay in Smart version and default normally de-energize. Alarm relay activates when leakage increase above 50% of set I_n value.

This relay can be configured as either fail safe relay or Alarm relay through DIP switch in Smart+ version.

DIP switch for settings (Smart+ version only)

1. Auto Re-closure (Reset) :

If enabled, device automatically resets the fault condition for preset time and measure leakage current so as to decide operating state of device. 3 attempts are made to reset fault.

Manual reset is disabled in this case.

2. Fail safe or Alarm Relay :

Configures additional 1 NO relay provided as either

Fail safe relay : Relay represents the state of power on condition and energized if power is applied.

Alarm relay : Relay is energized upon 50% of set leakage current is reached. Relay can be used to trigger devices for indication purpose or maintenance actions.

3. ELPR relay configuration :

Configures main relay state in either Energized or De-energized state.

Parameter Characteristics:

1. Reset Hysteresis : 15% of Trigger value (ELR , Alarm relay)

2. Power On, Reset Delay : Approx. 1 Second

Wide Auxiliary selection :

20-60 VDC / 20-40VAC, 60-300 VAC/VDC to suit all grid conditions.

Compliance to Standards:

EMC Compatibility: Compliance to International standard IEC 61326.

IEC 60947-2 : Annex - M

IEC60755 (Optional)

Safety standards: Compliance to International Safety standard IEC 61010-1- 2001

Mounting:

Dinrail mount 2U flame retardant housing standard for universal Installations



Measure



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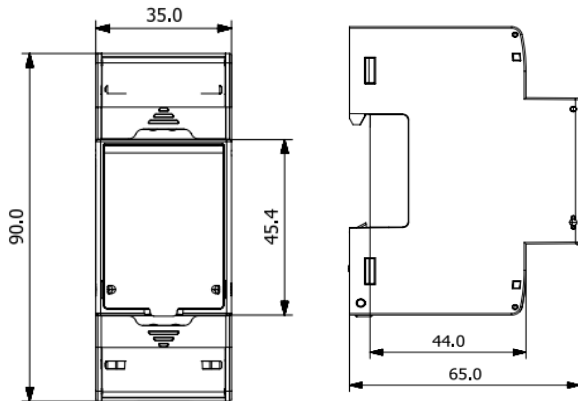


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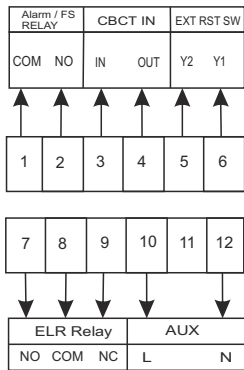


Analyze

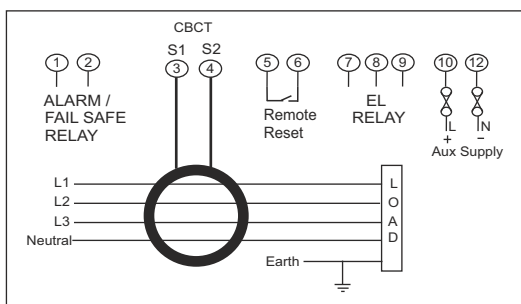
Dimensions Details:



Terminal Details:



Connection Diagram:



Technical Specifications:

Input characteristics :

Leakage current (In)	30mA to 30A (Type A)
Tripping operating range	80 % to 100% of In
Alarm operating range	> 50 % of In
Resetting value	- 15 % of operating range

Auxiliary Supply:

Auxiliary supply option1	60V-300V AC / DC
Auxiliary supply option 2	20-60V DC / (20-40 VAC)
Auxiliary supply frequency	45 to 66 Hz range
Auxiliary supply burden	< 4 VA approx.

Accuracy:

Leakage current	± 5% of full scale
Trip Delay	± 5% of set trip time or 50ms
(Including Setting Accuracy)	(whichever is greater)
Instantaneous Trip function	< 25 millisecond for leakage current greater than 5 times (5x) set In*.

Reference Conditions for Accuracy:

Reference temperature	23°C +/- 2°C
Input Waveform	Sinusoidal (distortion factor 0.005)
Input frequency	50/60 Hz ± 2%
Auxiliary supply voltage	230 ± 1%
Auxiliary supply frequency	50 or 60 Hz ± 2%

Applicable Standards:

EMC	IEC 61326-1:2012 Table2
Terms, definitions & Test method	IEC 60688
Immunity	IEC 61000-4-3 10 V/m Min - Level 3
Safety	IEC 61010-1-2001, Permanently connected use
IP for water & dust	IEC60529
Pollution degree	2
Installation category	III 300 V
High Voltage Test	2.2 kV AC, 50Hz for 1 minute between all electrical circuits

Environmental:

Operating temperature	- 20 to + 65°C
Storage temperature	- 40 to + 70°C
Relative humidity	0... 90% (non condensing)
Shock (As per IEC60068-2-27)	Half sine wave, Peak acceleration 30 gn (300 m/s^2), duration 18ms.
Vibration	10... 150... 10 Hz, 0.15mm amplitude
Number of Sweep cycles	10 per axis
Enclosure	IP40 (Front face) IP 20 (Terminals)

Relay Contacts:

Relay 1 (ELR) output	1 NO + 1 NC (1 CO)
Relay 2 (Alarm / FS) output	1 NO
Contact rating	5A / 250 VAC or 30VDC
Mechanical endurance	1 x 10^7 OPS
Electrical endurance	5 x 10^4 OPS (Resistive Load)

Remote Reset:

Operation:	Non potential free (Voltage level 12 VDC Approx.) , Isolated contacts for remote resetting of ELR and alarm relay.
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Mechanical:

Housing dimensions:	90 x 65 x 35 mm As per DIN 43880
Weight	125 Gram Approx.

*Note : 5x current measurement not applicable for 30A range



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Order Code:

Ordering Information:

Product Code : ELR2 - XX - X - XX - 00000000

Earth Leakage Relay POT

Auxiliary Supply :

L - 20 - 60 DC / 20 - 40 AC

M - 60 - 300 AC / DC

Model and Additional Outputs:

BZ - Smart

BR - Smart with Alarm Relay

AR - Smart+* with 1 NO Relay Output

* Smart+ model with DIP switch. Following configurations possible through DIP switch.

1. Auto-reclousure (Reset) or manual reset selection for reset of relay when currents are normal after fault condition is removed
2. Configuration option of 1 NO relay (Alarm Relay or Fail Safe Relay)
3. Main Relay configuration as Energized or De-energised

Note:

1. Energized configuration : Relay Pole and NO contacts become energized (ON) upon fault.
2. De-Energized configuration : Relay Pole and NO contacts become De-energized (OFF) upon fault.



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TEST REPORT – Rish ELPR

Sr. No	Test procedures	Requirement	Observation	Remark
1.3	Trip delay time of set ELR / Pre alarm. To determine the steady state errors of the operate time, current shall be applied to the relay with no intentional delay and d.c. Component, and the start and operate output contacts of the element monitored. The switching point of the current from initial test value to end test value shall be at the zero crossing of the waveform. Sufficient test points should be used to assess the performance over the entire time delay setting range at various operating current values and throughout the effective range of dependent time portion of the characteristic. Each test point shall be repeated at least 3 times to ensure the repeatability of the results.	Error should be within specified accuracy limits.	For test readings see Table 3 and 4, Delay time is applicable to ELR only(Relay1) and not for Pre-Alarm (Relay2)	Conforms
1.4	Measurement of Supply Voltage Consumption. A. Quiescent state burden. Measure the consumption of aux supply at rated supply voltage without any input energizing qty. Five consecutive testes shall be used for burden claim. B. Maximum load Measure the consumption of aux supply at rated supply voltage, relay is energized with input energizing qty that cause the relay to operate and drive at least 50% of all outputs. Five consecutive testes shall be used for burden claim.	Consumption should be less than 4.0 VA	For test readings see Table 5. max. Load	Conforms
2. PERFORMANCE TESTS				
2.1	Influence due to Frequency of input quantity. Relay functionality check shall be carried out at upper and lower limits of input frequency. 45...66Hz.	Error should be within specified accuracy limits.	For test readings See Table 6.1 to 6.4	Conforms
2.2	Influence due to Auxiliary Supply Voltage : Relay functionality check shall be carried out at upper and lower limits of auxiliary supply voltage. 60...300V AC/DC	Error should be within specified accuracy limits.	For test readings See Table 7.1 to 7.4 DC Aux, Table 8.1 to 8.4 AC Aux,	Conforms

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TEST REPORT – Rish ELPR

Sr. No	Test procedures	Requirement	Observation	Remark
2.3	Influence due to frequency of Auxiliary Supply Voltage : Relay functionality check shall be carried out at upper and lower limits of Auxiliary supply voltage frequency. 45...66Hz.	Error should be within specified accuracy limits.	For test readings See Table 9.1 to 9.4	Conforms
2.4	Operating Temperature test. Relay functionality check shall be carried out at reference temperature and repeated for the upper and lower limits of the specified Operating temperature range. At each temperature subject the meter for a period of 2hrs minimum.	Error should be within specified accuracy limits.	For test readings See Table 10.1 to 10.4	Conforms
2.5	Relative Humidity. Relay functionality check shall be carried out at reference humidity (50%RH) and repeated for the upper limits of the specified humidity range. At each step subject the meter for a period of 4hrs minimum.	Error should be within specified accuracy limits..	For test readings See Table 11.1 to 11.2	Conforms
2.6	Effect of Vibration. Subject the meter to the vibration as specified below. After the test check relay functionality. Sweep frequency range : 10-150-10Hz, Amplitude +/-0.15mm. Scanning speed 1octave/min. Number of scanning cycles : 10 in each axes. Vibration axes : X, Y and Z.	Vibrations should not cause any damage to the meter. Error should be within specified accuracy limits.	For test readings See Table 12.1 to 12.2.	Conforms
2.7	High Voltage test Apply 2.2kV AC for 1 min between 1. All the terminals Vs Case. 2. Aux terminals Vs All other terminals. 3. Input terminals Vs All other. 4. Relay 1 and 2 Vs All other terminals	No breakdown should occur.	No breakdown observed	Conforms
2.8	Storage temperature test : 1. Subject the relay in de-energized condition for at least 4Hrs to the Higher storage temperature 70 +/-2°C. 2. After test, recover the relay at reference conditions for 2Hrs . 3. Subject the relay in de-energized condition for at least 4Hrs to the lower storage temperature -40 +/-2°C. 4. Repeat step 2. 3. Final measurement to be done after the recovery period.	The initial and final measurement consists of visual check and Error should be within specified accuracy limits.	After test, No any damage observed. Relay functions properly and found well within limits.	Conforms

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