ELR-6MS
Earth Leakage Relay

User Manual

Version: 1.11

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Read me

When you use ELR-6MS earth leakage relay, be sure to read this user manual carefully, and be able to fully understand the implications, the correct guidance of operations in accordance with user manual, which will help you make better use of ELR-6MS earth leakage relay, and help to solve the various problems at the scene.

1. Before the meter turning on the power supply, be sure that the power supply within the provisions of the instrument;

2. When installation, the current input terminal must non-open, voltage input terminals must Non-short circuit;

3. Communication terminal (RS232/RS485) is strictly prohibited to impose on high pressure;

4. Be sure the instrument wiring consistent with the internal system settings;

5. When communicating with the PC, instrument communication parameters must be consistent with the PC.

- **Please read this user manual carefully**
- **Please save this document**

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1.- SUMMARIZE

The ELR-6MS Earth Leakage Relay is a high-reliability protection device designed specifically for the mining industry, suitable for both underground and surface applications.

Engineered for mobile trailing-cable equipment, it features a microcontroller-based architecture that automatically operates in two protection modes: ground-fault detection, ground resistance check. This advanced design minimizes nuisance tripping while ensuring enhanced safety for personnel and equipment.

-. Ground Fault Detection

Ground fault detection requires the use of current sensors, and the ELR-6MS is designed to operate with current sensors with ratios of 1000:1, 600:1 and 40:1 (200:5).

-. Ground Check Detection

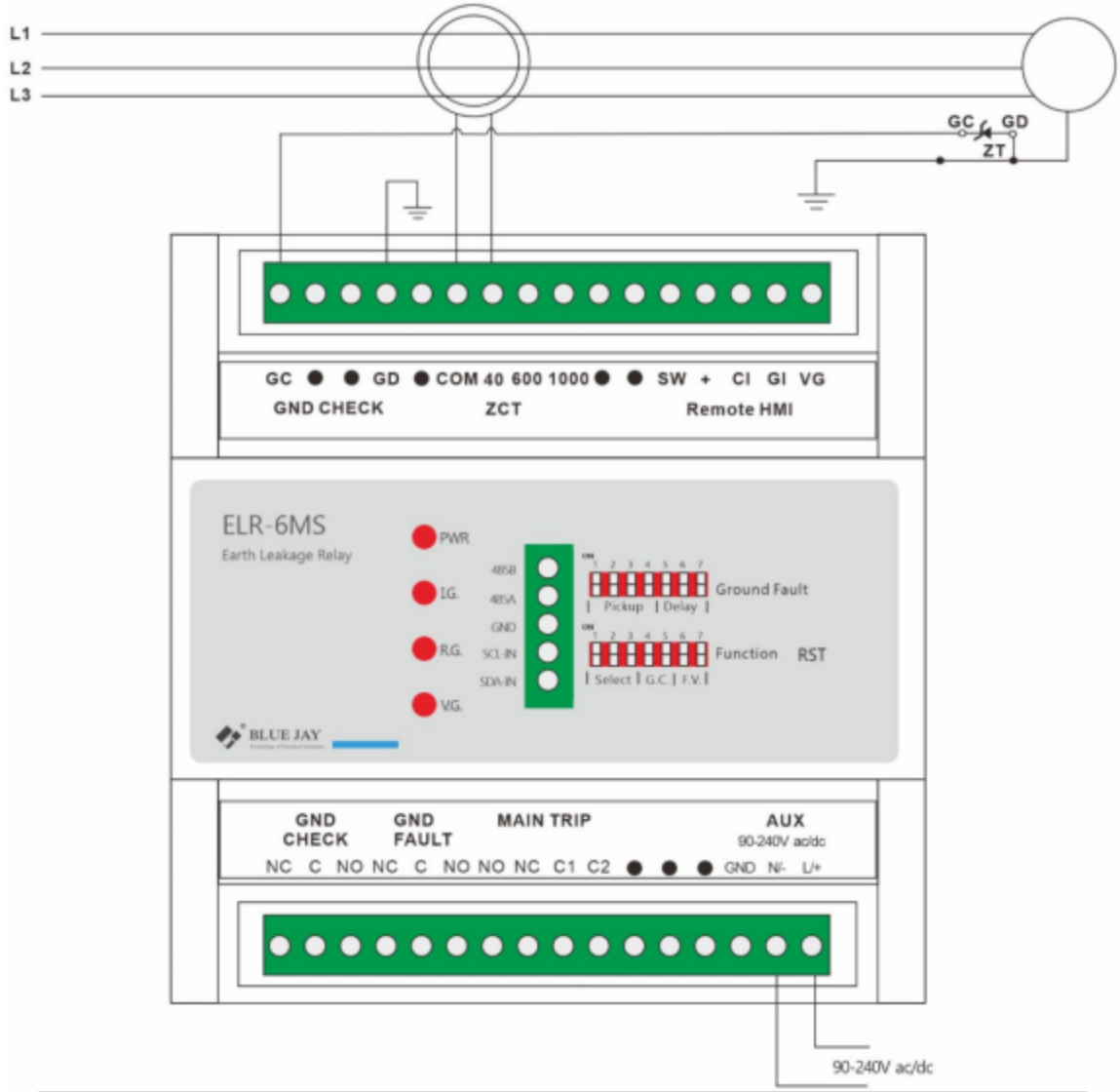
Ground check is achieved using a pilot wire (GC). This wire is usually a part of the power cable. It is used to carry monitoring current to the machine being monitored. The pilot wire must be properly terminated at its end point (the machine being monitored). A Zener diode terminator is required. This terminating diode is standard throughout the industry. It has two terminals marked GC and GD. The GC terminal is connected to the pilot wire inside the mobile equipment enclosure. The GD terminal is connected to the frame ground of the mobile equipment.

The purpose of the diode is to allow the ground fault relay to determine if the ground loop has been shorted. A shorted ground loop would appear as normal loop impedance if this were allowed to happen, while in fact, the mobile equipment may be completely ungrounded. Loss of zener voltage therefore causes the TRIP relay to operate and disconnect the power.

2.- TECHNICAL PARAMETERS

Parameter	Value	
Normal voltage	90-240 Vac/dc, 50/60 Hz Power: 5VAAC or 5W DC	
Ground fault	Range: 10-500mA Delay range: instant - 10 seconds	
Zero sequence sensors	Ratios supported 1000:1, 600:1 and 40:1	
Ground check resistance	Range: 10 - 50Ohms, ±15% Trip delay: 150ms, ±0.1%	
Output contacts (3 DO)	Main trip relay	DPDT Load capacity: 8A@250Vac, 8A@30Vdc
	Auxiliary ground fault relay	SPDT Load capacity: 16A@250Vac, 16A@30Vdc
	Auxiliary ground check relay	SPDT Load capacity: 16A@250Vac, 16A@30Vdc
Dielectric	Relay contacts to chassis - 1500Vrms for 1 minute Control terminals to chassis - 1500Vrms for 1 minute	
Temperature range	Operating temperature: -40°C to +60°C Storage temperature: -40°C to +80°C	
Dimensions	Standard 35mm Din-rail mounting W*H*D: 108*110*66mm	

3.- TERMINAL DEFINITION AND WIRING



Marked	Notes
GND CHECK	**Pilot wire terminator** **GC:** connect to the pilot wire inside the mobile equipment enclosure **GD:** connected to the frame ground of the mobile equipment.
ZCT	**Connect to residual current transformers** **COM:** common terminal **40:** for CT ratio 40:1 **600:** for CT ratio 600:1 **1000:** for CT ratio 1000:1
Remote HMI	Connection to remote HMI (Reserved function, now invalid)
GND CHECK	Auxiliary ground check relay:1 Form C (NO/NC)
GND FAULT	Auxiliary ground fault relay:1 Form C (NO/NC)
MAIN TRIP	Main trip relay, NO and NC pair
AUX	Auxiliary power supply 90-240Vac/dc

4.- DIPSWTICH SETUP

Upper dip switch

1-4 for ground fault pickup value setting
5-7 for ground fault trip delay setting

Note: The direction marked with "ON" represents: 1 switch open, reverse direction represents: 0 switch off.

Ground fault pickup value settings: When a ground fault is detected, two relays are operated, i.e. the main TRIP relay (Form Z) and an auxiliary relay with form C contacts. The pickup setting tolerance: -15% / + 0%

Setting(mA)	1	2	3	4
10	0	0	0	0
20	0	0	0	1
30	0	0	1	0
40	0	0	1	1
50	0	1	0	0
60	0	1	0	1
80	0	1	1	0
100	0	1	1	1
150	1	0	0	0
200	1	0	0	1
250	1	0	1	0
300	1	0	1	1
350	1	1	0	0
400	1	1	0	1
450	1	1	1	0
500	1	1	1	1

Ground fault trip delay settings: This is the interval between detecting a fault and tripping the relay. The delay will be cancelled if the fault clears before the delay expires, thus preventing unnecessary trip operation.

Setting(s)	5	6	7
0.02	0	0	0
0.1	0	0	1
0.2	0	1	0
0.5	0	1	1
1	1	0	0
2	1	0	1
5	1	1	0
10	1	1	1

Lower dip switch

1-3 and 6-7 for reserved function
4-5 for ground check settings

Ground check settings: The trip relay will operate when the ground loop resistance exceeds the setting for a period exceeding 150ms.

Setting(Ω)	4	5
10	0	0
20	0	1
30	1	0
50	1	1