

Instruction for EKL4 Short Circuit and Earth Fault Indicator

1. General

EKL4 series short circuit and earth fault indicators have been widely used in Ring Main Units, high-voltage switchgears and cable branching units of power distribution networks. The indicators can precisely detect and alarm exact section where fault happens and determine fault type. Using short circuit and earth fault indicator is an effective way to find out the cable fault, as well as an effective way to improve the operation level of the distribution network and the efficiency of dealing with faults. The product adopts the technologies of electro-magnetic induction, photovoltaic conversion, optical fiber transmission and single chip microcomputer which make the product with high accuracy and antijamming capability. Remote transmission relay contact for transmitting fault signals and low power alarming function are suitable for power distribution network automation. With a low-power consumption design, the product can be powered by built-in high-capacity lithium battery or external power supply. It is easy to install and uninstall.

2. Main Functions

(1).Short circuit fault alarm indication: Short-circuit fault sensors installed on 3 single phase cables, monitoring the current changes of the power supply lines, when the current change value reach or exceed threshold currents for short circuit alarm (this value can be set as per user's requirement), the short circuit fault sensors output alarm signal, through optical fiber the signal will be sent to the indicator host, the corresponding fault indicator light L1,L2,L3 will flash to alarm the short circuit fault.

(2). Earth fault alarm indication: Earth fault sensor installed on the bifurcation unshielded part of three-phase cable, detection the zero sequence current value of the three-phase cable, when its value reach or exceed threshold currents for grounding fault alarm (this value can be set as per user requirement), the earth fault sensor outputs alarm signal, through optical fiber the signal will be sent to the indicator host, the earth fault indicator light will flash to alarm the earth fault.

(3). Low Power Alarm Indication (battery used): When battery is running out of power, the "Low power" lamp on the indicator panel will light up to prompt battery replacement and the indicator will stop working.

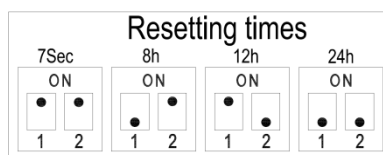


Figure 1

Fault Status	Automatic Reset Time	System Reset	Lamps
Not Cleaned	in the reset time	no manual reset	quick flashing
	out of reset time	system reset	no flashing
Cleaned	in the reset time	manual reset	no flashing
		not manual reset	slow flashing
	out of reset time	automatic Reset	no flashing

Sheet 1

(4). Resetting and Test: Please refer to Sheet 1 for the relationship among alarming indicating, fault status and resetting status.

Resetting and test: When faults are cleaned, the “Reset/Test” button (or “Reset/Test” button externally connected to Terminal 11&12) on the panel can be pressed to reset or clean the alarming status manually. When the reset is done, the indicator will conduct a self-test at the same time. Alarming lamp and “LowPower” lamp flashing 3 times and relay shutting mean that it’s in a normal state. Once the resetting time runs out, the resetting will be conducted automatically by the system, no matter the fault is cleaned or not.

Setting reset time: reset time can be set through DIP switch on the front panel of indicator. Please refer to Figure 1 for details.

(5).External wiring for fault alarm indicating: Connect LED light to Terminal 10 and Terminal 11(Terminal 10 is for positive and Terminal 11 is for negative)

(6). Remote transmission of fault alarming signals: The indicator drives corresponding relays into action according to different alarming signals to realize the remote transmission of signals.

3. Technical data

- Actuating current:

Short circuit current: 150A~2000A

Earth current: 10A~100A

Accuracy:±10%

- Response time: short circuit fault 40ms, earth fault 80ms

- Indicator operating current.: standby status ≤10μA alarming Status ≤0.5mA

- Working environment: temperature -25℃~+70℃ humidity≤95 %

- Power supply:

lithium battery 3.6V 2.25Ah (default configuration)

external power supply: AC/DC 24~230V

- Capacity of remote transmission relay contact:

Rated load	2A/30VDC; 1A/125VAC
Maximum load current	5A
Max opening and shutting voltage	220VDC/250VAC
Max opening and shutting current	2A
- Protection Level: indicator IP40 sensor IP67
- Voltage Range: $\leq 40.5\text{kV}$
- Applicable conductor diameter:

Short Circuit Sensor	
Type A	$\phi 20\text{mm} \sim 40\text{mm}$ (default configuration)
Or Type B	$\phi 30\text{mm} \sim 50\text{mm}$
Or Type C	$\phi 50\text{mm} \sim 70\text{mm}$

Earth Sensor	
Type A	$\phi 60\text{mm} \sim 100\text{mm}$ (default configuration)
Or Type C	$\phi 80\text{mm} \sim 130\text{mm}$
- Size:

Indicator	96(W)*48(H)*59(D)
Panel window size (WxH)	92(W)*45(H)
Sensor	40(W)*44(H)*27(D)

4. Installation

(1).Product Image

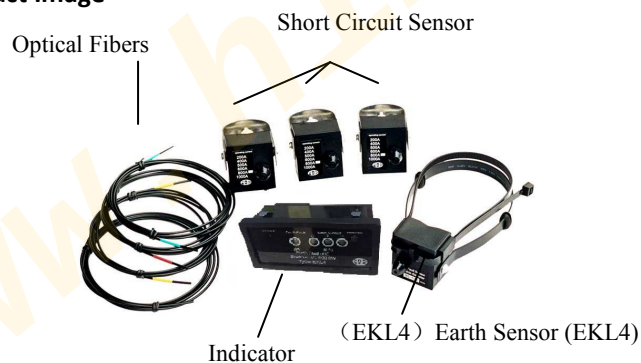


Figure 2

(2).Wiring Diagram

Please wire terminals on the rear cover of indicator according to Figure 3, before installing indicator.

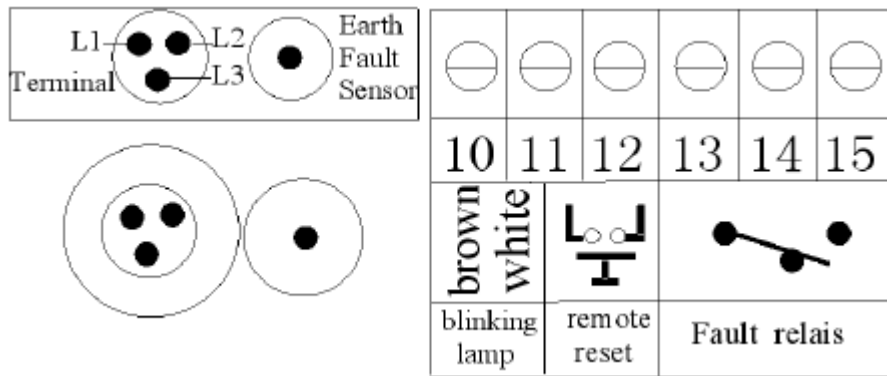


Figure 3: EKL4 Wiring Diagram

(3).Installation of indicator

Please make sure the wires are fastened and then install the indicator on the cabinet.

Please press the metal shrapnel on indicator for uninstalling it.

(4).Installation of short circuit sensor

Firstly, take the U shaped magnetic conducting ring off the iron core. Secondly, install the ring on the cable. Thirdly, connect the ring back to the core. Finally, fasten the sensor to the cable by using tight fit screw (Note: to ensure the accuracy of the indicator, the screw of the ring must be tightened [tightening torque = 3.5n •m])

(5).Installation of earth sensor

Earth fault sensor detects the sum current of the three-phase cable only. The reading value should be zero, therefore, the earth fault sensor can only detect zero sequence current, excluding the current of cable shield network. The sensor should be installed on the shielding layer of the cable. The earth wire of the shielding layer above the indicator must pass through the indicator.(Figure 4)

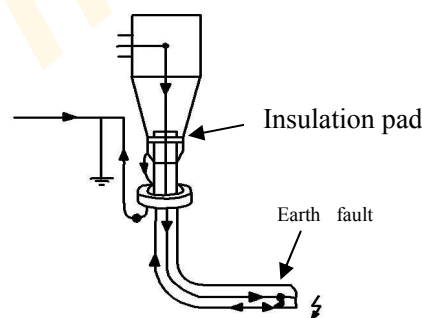


Figure 4:

5. Packing list

- | | | | |
|------------------|---|---------------------------|---|
| • Indicator | 1 | • Short circuit sensor | 3 |
| • Earth sensor | 1 | • Certificate of approval | 1 |
| • Optical fibers | 4 | • Instruction | 1 |