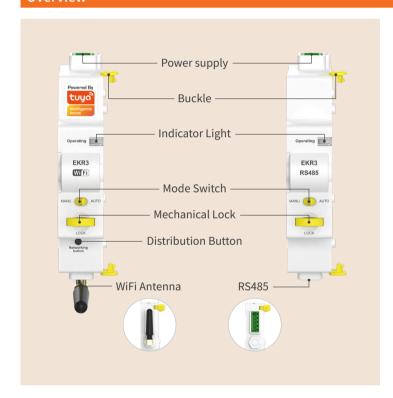


# smart control unit for MCB, RCCB, RCBO



## Overview



EKR3 series remote control mechanism is a compact smart control unit with a width of only 18mm. It can be adapted to MCB, RCCB (under development), and RCBO produced by ETEK Electric. Remote distribution of circuit breaker equipment can be realized through Tuya APP or a platform connected to RS485. Closing and timing switch to obtain the switching status of the equipment. At the same time, the control module can provide automatic reclosing function, when a temporary failure occurs in the power system, the product will automatically reclose after tripping to improve the reliability of the circuit power supply.



## Description of Automatic, Manual Mode Switches and Mechanical Locks



Allow remote control (Tuya APP, RS485).

MANU Mode

Remote operation is prohibited.



When the mechanical lock is pulled out, the device will enter the locked state, and the device will not be closed. Press the mechanical lock to restore it.

# smart control unit for MCB, RCCB, RCBO



## **Functional Characteristics**

- It is matched with a MCB or RCCB or RCBO to provide overload, short circuit and leakage protection. When the switch trips accidentally, it does not need to be closed manually, reducing manual maintenance costs, timely troubleshooting and improving efficiency.
- Remote opening and closing control, timing tasks, and obtaining the current switch status can be realized through Wi-Fi or a platform with RS485 connection.
- Built-in multiple times of reclosing, continuous closing failure within a certain period of time can send an alarm signal through the LED indicator or APP (for specific time and times, please refer to the parameter table, and can also be set and adjusted according to needs).
- With manual/automatic selection switch and mechanical lock function.

## **Automatic Reclosing Function**

#### How Auto-Recloser Works

#### Auto-reclosing

In the auto state, after the fault trips and meets the closing requirements, the equipment will reclose according to the time set by the reclosing switch.

If the device fails to close within the specified time, the device will no longer reclose, and at the same time output an alarm signal (via Tuya App or RS485). In this state, opening and closing can be achieved through remote control or manual control.

#### Auto reclosing successful

If the switch is successfully closed, it will no longer trip within the specified time (15 minutes for EKR3-WiFi, 60 seconds for EKR3-RS485), which is defined as successful switch-on. After successful switch-on, the number of frequency the device has been reclosed is automatically cleared, and the counter restarts count. (Any opening and closing behavior

(Any opening and closing behavior controlled by humans will clear the number of reclosing times)

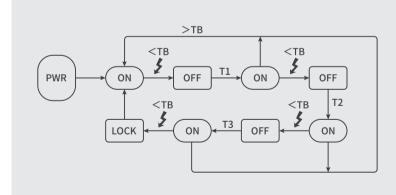
#### Automatic, Manual, Padlock mode

AUTO mode, manually open the circuit breaker, the default is fault trip, and the device will start to automatically reclose according to the program setting.

MANU mode, the automatic reclosing and remote control functions will be invalid, and the brake can be opened or closed manually.

Pull out the mechanical padlock on the module, and the device will enter the locking padlock mode to achieve local locking, ensuring that operators can perform maintenance work in a safe state.

## Reclosing Function Diagram for EKR3-WiFi



TB: 900S, T1: 10S, T2: 60S, T3: 300S. (All times are default values, support customization)

Trip cause: Fault check includes over-voltage, phase loss, neutral disconnection, short circuit, earth leakage, manual opening.

When the circuit breaker is opened by an unknown fault (manual opening, short circuit trip, leakage trip, overload trip), it will automatically reclose, a total of 3 reclosing sequences, and each reclosing sequence time interval (T1, T2, T3).

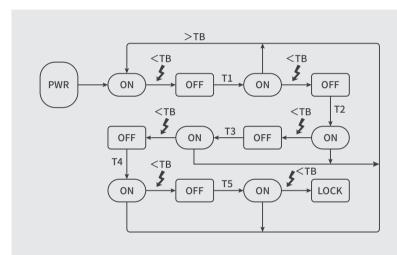
After successful reclosing, if a trip occurs again within the stable time TB, it will enter the next reclosing sequence, otherwise, if no trip occurs within TB, the reclosing sequence will be cleared. If the circuit breaker fails to reclose after 3 times of reclosing, manual closing or remote control closing is required to clear the fault.



# **EKR3 Series** smart control unit for MCB, RCCB, RCBO

Indicator Light Description		
Green light is always on	Connect to cloud server	
Green light flashes for 100ms	Mechanism failure	
Green light flashes on for 100ms and off for 900ms	Manual, Padlock mode	
Green light flashes for 500ms	Configuration network	
Green light flashes for 5000ms	Connect to router	
Green light flashing 100ms off 900ms on	Within the time TB	
Green light flashing 1700ms off 100ms on 100ms off 100ms on	Automatic reclose waiting time T (T2, T3)	

#### **Reclosing Function Diagram for EKR3-RS485**



TB: 60S, T1: 60S, T2: 90S, T3: 1800S, T4: 2700S, T5: 3600S. (Reclosing time "TB" can be set, if you have other needs, please confirm before placing an order.)

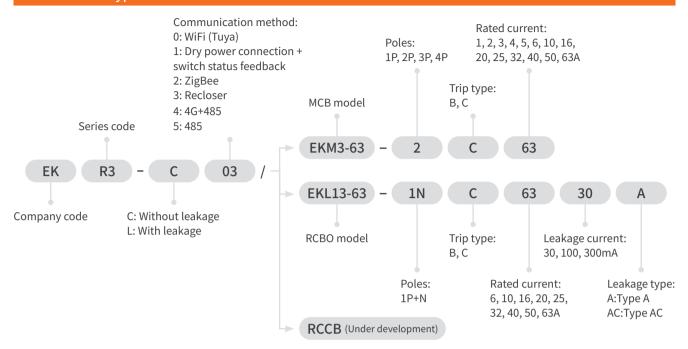
When the circuit breaker is opened by an unknown fault (manual opening, short-circuit tripping, leakage tripping, overload tripping), it will automatically reclose, a total of 5 reclosing sequences, and each reclosing sequence time interval (T1, T2, T3, T4, T5). After successful reclosing, if a trip occurs again within the stable time TB, it will enter the next reclosing sequence, otherwise, if no trip occurs within TB, the reclosing sequence will be cleared. If the circuit breaker fails to reclose after 5 times of reclosing, manual closing or remote control closing is required to clear the fault.

Indicator Light Description		
Red light is always on	Auto Mode Trip	
Red light flashes for 100ms	Auto Mode - Motor Reset Failed or Cycle Close Failed	
Red light flashes for 500ms	Auto mode overvoltage and undervoltage trip	
Green light is always on	Auto mode closing, remote opening, signal opening	
Green light flashes for 100ms	Automatic reclose waiting time	
Yellow light is always on	Manual mode opening, closing	

# smart control unit for MCB, RCCB, RCBO



# Instruction of Type code



# **Technical Parameter**

Model	EKR3-WiFi	EKR3-RS485	
Communication method	WiFi, ZigBee	RS485	
Supply terminals	L-N		
Rated voltage Ue	AC 230V		
Power consumption	AC max.1VA (standby), max.20VA (action)		
Supply voltage tolerance	±10%		
Status Indicator	Green LED	Red, green and yellow tri-color LED	
Trip time	≤ 1s		
Reclosing times	3 times (customizable)	5 times	
Reclosing time	First time: 10 seconds; Second time: 60 seconds; Third time: 300 seconds; Customizable, cannot be changed after initial setup  First time: 60 seconds Second time: 90 second The third time: 1800 second Fourth time: 2700 second Fifth time: 3600 second Adjustable time setting range: 60-3		
Reset reclosing times	No more tripping or manual reset within 15 minutes after successful closing	No tripping or manual reset within 60 seconds after successful closing, Adjustable time setting range: 5-600 seconds.	
Mechanical life	10000 Cycles		
Electrical life	4000 Cycles		
Ambient temperature	-20°C to +55°C (-4 °F to 131 °F )		
Storage temperature	-35°C to +75°C (-22 °F to 158 °F )		
Installation	Mounting on 35mm DIN rail		
Pollution degree	IP20		
Supply terminal size for cable	Max. 2.5mm <sup>2</sup>		
Dimensions	91×18×61mm		
Compatible Device	MCB (EKM3-63), RCBO (EKL3-63, EKL13-63), from ETEK (More compatible devices are in development)		



# **EKR3 Series** smart control unit for MCB, RCCB, RCBO

Auto mode closing, remote opening, signal opening

Automatic reclose waiting time

## **Fault Description**

#### 1. The Device Cannot be Closed Remotely?

Check whether the remote lock is turned on in the APP.

Check whether manual opening has been carried out First, manually close and then operate on the APP to check if it can be closed and opened.

Whether the mechanical padlock is pulled out or not.

#### 2. 485 Device cannot communicate, send opening/closing command, no action?

Please ensure that the device is in normal operation, and then check whether A and B of the RS485 line are reversed, whether the communication baud rate is set correctly, and whether there is any abnormality in the communication connection.

#### 3. Operation Without Feedback?

Check whether the product terminals have been tightened.

Check the APP settings, notification type and whether the message notification is enabled.

### 4. After Power On, The Indicator Light Does Not Light Up?

Green light is always on

Green light flashes for 100ms

Check whether the power interface is reversed, whether the switching power supply output has power or not.

#### 5. LED light status description (Without reclosing)

. LED light status asserbation (manoact ectosing)		
WiFi, ZIGBEE		
Green light is always on	Connect to cloud server	
Green light flashes for 100ms	Mechanism failure	
Green light flashes for 100ms	Padlock mode	
Green light flashes for 500ms	Configuration network	
Green light flashes for 5000ms	Connect to router	
RS485, Dry contact		
Red light is always on	Auto Mode Trip	
Red light flashes for 100ms	Auto Mode - Motor Reset Failed or Cycle Close Failed	
Red light flashes for 500ms	Auto mode overvoltage and undervoltage trip	

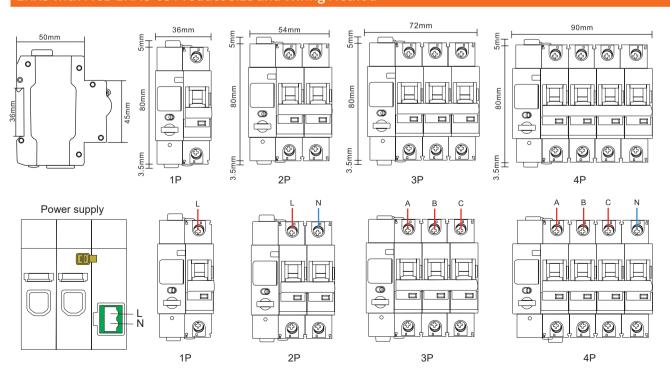
smart control unit for MCB, RCCB, RCBO



# MCB EKM3-63 Technical Parameters

Standard	IEC/EN60898-1	IEC/EN60947-2
Protection	Overcurrent and short circuit	
Type of trip	Thermo-magnetic	
No.of poles	1P,2P,3P,4P	
Rated currents (In)	1,2,3,4,5,6,10,16,20,25,32,40,50,63A	
Rated voltage (Ue)	240/415V~	
Rated frequency	50/60Hz	
Rated breaking capacity	6,000A	
Energy Limiting Class	3	
Rated impulse withstandard voltage(1.5/50) Uimp	6,000V	
Dielectric test voltage at Ind. Freq.for 1 min	2kV	
Thermal release characteristic	(1.13-1.45) x In	(1.05-1.30) x In
Magnetic release characteristic	B: (3-5) x In, C: (5-10) x In	(8-12) x In
Electrical life	8,000 Cycles	
Mechanical life	20,000 Cycles	
Contact position indicator	Yes	
Protection degree	IP20	
Ambient temperature	-5°C to +40°C Max.95%humidity	
Terminal connection type	Cable/Pin-type busbar	
Max.terminal size for cable	25mm²	
Max.tightening torque	2.5N.m	
Installation	Mounting on 35mm DIN rail	
Connection	From top and bottom	

# EKR3 with MCB EKM3-63 Product Size and Wiring Method





# smart control unit for MCB, RCCB, RCBO

# RCBO EKL13-63 Technical Parameters

Standard	IEC/EN61009-1	
Protection	Ground fault, Overcurrent and short circuit, Over-voltage(selectable	
Type of trip	Ground fault: Electronic	
	Overload and short circuit: Thermo-magnetic	
Type of protection (electric leakage)	AC,A	
No.of poles	1P+N 2module, N line with disconnected	
Rated currents (In)	6,10,16,20,25,32,40,50,63A	
Rated sensitivity currents I $\triangle$ n	10,30,100,300mA	
Residual current off-time under I $\triangle$ n	≤ 0.1s	
Rated residual making and breaking capacity(I $\triangle$ m)	500A (In ≤ 50A), 10In (In>50A)	
Rated voltage (Ue)	230/240V~	
Rated frequency	50/60Hz	
Rated breaking capacity	6,000A	
Energy Limiting Class	3	
Rated impulse withstandard voltage(1.5/50) Uimp	4,000V	
Dielectric test voltage at Ind. Freq.for 1 min	2kV	
Thermal release characteristic	(1.13-1.45) x In	
Magnetic release characteristic	B: (3-5) x In, C: (5-10) x In	
Electrical life	4,000 Cycles	
Mechanical life	10,000 Cycles	
Contact position indicator	Yes	
Ground fault indicator	Yes	
Protection degree	IP20	
Ambient temperature	-25°C to +40°C , Max.95% humidity	
Terminal connection type	Cable/Pin-type busbar/Fork-type busbar	
Max.terminal size for cable	25mm²	
Max.tightening torque	2.5N.m	
Installation	Mounting on 35mm DIN rail	
Connection	From top and bottom	

# EKR3 with MCB EKL13-63 Product Size and Wiring Method

