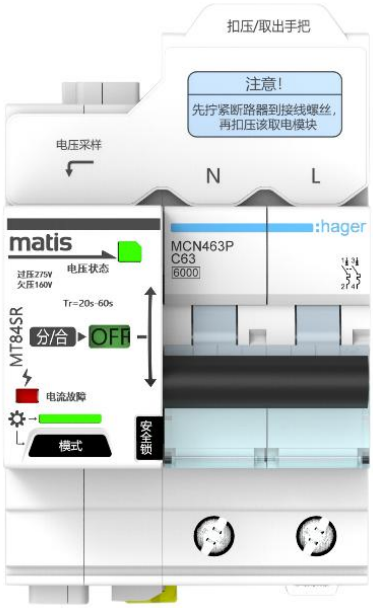

Smart Remote Control Device MT84SR
Instruction Manual

Document version v1.1

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FOREWORD

Overview

This manual includes: parts introduction, panel and interface introduction, installation and operation, module replacement, and introduction to the operation of the host computer software. The manual describes the complete functions of the MT84SR.

The pictures of the device on the following pages are provided for reference only. Actual device features and specifications may vary.

Target Persons

This manual is mainly applicable to the following:

- Sales Engineer
- Technical Support Engineer
- Maintenance Engineer

Precautions

The following symbols may appear in this manual, and the meanings they represent are as follows.

Symbols	Meanings
	A hazard which, if not avoided, will result in a high risk of death or serious injury.
	A hazard with medium risk which, if not avoided, could result in death or serious injury.
	A hazard with a low risk which, if not avoided, could result in minor or moderate injury.
	Transmit device or environmental safety warning information. Failure to avoid it may result in device damage, data loss, reduced device performance or other unpredictable results. "Notice" does not involve personal injury.

Reversion Record

The revision record accumulates the description of each document update. The

latest version of the documentation contains updates from all previous versions.

Document Version 1.1 (2021-03-17)

This is the first official release.

CONTENTS

1. PRODUCT INTRODUCTION

1.1 Product Overview

Over and Under Voltage Protective MCB with Auto-Reclosing Function MT84SR can distinguish between manual open and overcurrent tripping, and provide different solutions for two different methods; it can provide over and under voltage protection when the grid voltage is too low or too high. At the same time, it can protect the overload and short circuit faults of the line, and the device can automatically close to restore power after it.

This device can match 1P~4P Hager circuit breakers, realize remote control through RS485 bus, and local control through dry contacts. The device has various operation modes, as well as the function of overcurrent automatic reclosing. The green LED light is on, which indicating that the device is in normal use. And if the LED is alternately red and green, it means the device is in maintenance mode.

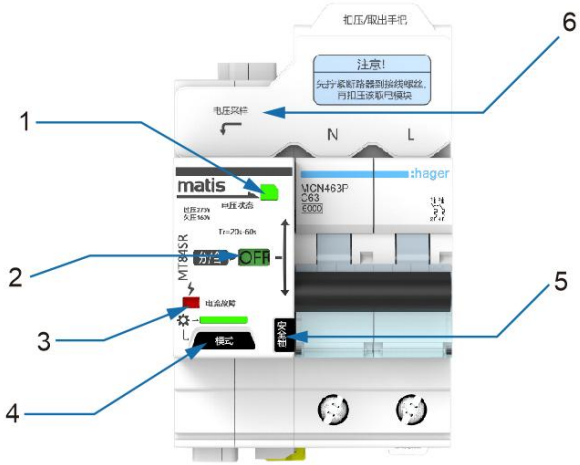
Long press the mode button on the panel to enter different working status.

1.2 Specifications & Model

MT	**84**	**SR**		**-**	**R**	**H**	**OU**
Enterprise Code	Design Number	Control Method	Voltage		Company Code	Adaptive Device	Function
		RS485 control	AC230V		R-Ruiqi	H-Hager circuit breaker	OU-over and under voltage protection

Hager Circuit Breaker	Type	MCB
	Pole	1P, 2P, 3P, 4P
	Trip Characteristics	B, C, D
	Rated Current	6, 10, 16, 20, 25, 32, 40, 50, 63

1.3 Appearance



(1) Voltage status indicator (2) ON/OFF indication

(3) Current fault indicator (4) Working mode selection and indication

(5) Safety lock (6) Voltage acquisition unit

1.4 Features

- Reclosing customization: it can distinguish whether the device is manually open or overcurrent trip;
- With the functions of voltage acquisition, current fault acquisition and ON/OFF signal acquisition;
- Reliable performance: mechanical life is above 20000 times; It is more than double that of domestic and foreign devices;
- Operating quickly: compared with similar devices at home and abroad, the speed is more than doubled;
- Multiple working modes: manual and automatic modes for option, physical lock of the recloser;

- Double fulcrum parallel drive to effectively ensure the reliable synchronous close of 3P and above circuit breakers;
- Good fitness: DIN-rail side assembly;
- Energy saving and environmental protection, in line with RoHS requirements.

1.5 Indicator

Table1-1 the Description of Status Indicator

Name	Color	Status	Description
Voltage Status Indicator		Green light on	Normal work
		Red light on	Overvoltage fault
		Orange light on	Undervoltage fault
		Red light flashing	Overvoltage recovery
		Orange light flashing	Undervoltage recovery
Current Fault Indicator		Red indication	Current fault
		White indication	Current-free fault
Working Mode Indicator		Green light on	Mode 1: dry contact control +RS485 control+ over and under voltage protection
		Red light on	Dry contact control +RS485 control+ over and under voltage protection + overcurrent auto-reclosing
		Green and red light flashing alternately	Maintenance mode

1.6 Port Instructions

Table1-2 Port Instructions

Category	Name	Status & Description
Input terminal	4	Dry contact - control open
	5	Dry contact - control close
	6	Common terminal
	7	RS485 shield port GND
	8	RS485-A
	9	RS485-B
Output terminal	1	Common terminal
	2	Overcurrent fault signal output
	3	ON/OFF status output

2. DEVICE INSTALLATION

2.1 Installation Instructions

WARNING

MT84SR must be installed by professional electrician.

The device manufacturer is not responsible for any damage caused by the user or installer's failure to follow warnings or recommendations in this manual, or damage caused by the use of non-original devices or accessories or by the quality of the device itself.

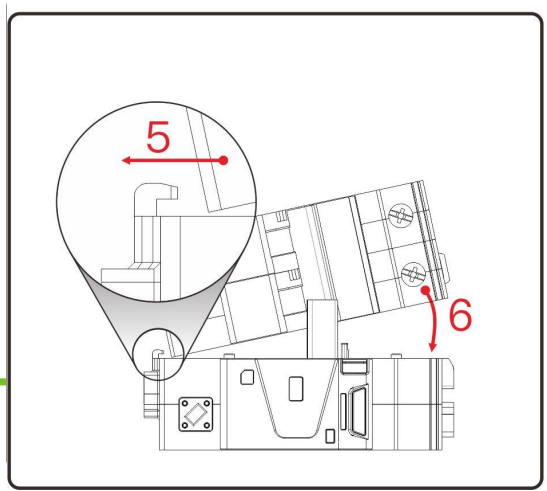
DANGER

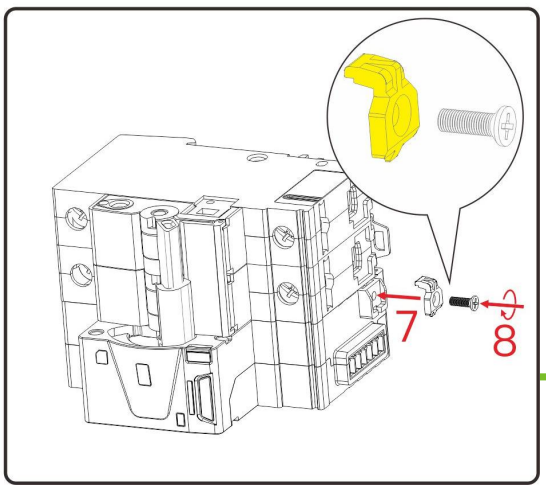
- The device must be switched to the mechanical lock status first when overhauling, and the padlock should be at the safety lock position for safety.
- In maintenance mode, it must also be padlocked in the safety lock position.
- After the safety lock is pulled out, the device will in the logical self-locking status, and the handle will be constrained automatically to the OFF position.

2.2 Installation and Fixing

MT84SR is the unit specially designed for installation in distribution boxes or device cabinets with DIN rail fixing elements.

1. Assemble the circuit breaker and the recloser through accessories. (If you





purchase a complete set, please ignore this step);

① Place the recloser flat on the plane and turn the handle to the OFF position shown in the figure

② Place the M2.5 mechanical nut in the position and press it into the hole shown in the figure

③ Use a screwdriver to pry out the plastic part of the circuit breaker shown in the picture

④ Discard the plastic that was pried out in the previous step

⑤ Place the processed circuit breaker on the recloser, push it to the left, and let the hook of the recloser catch the circuit breaker

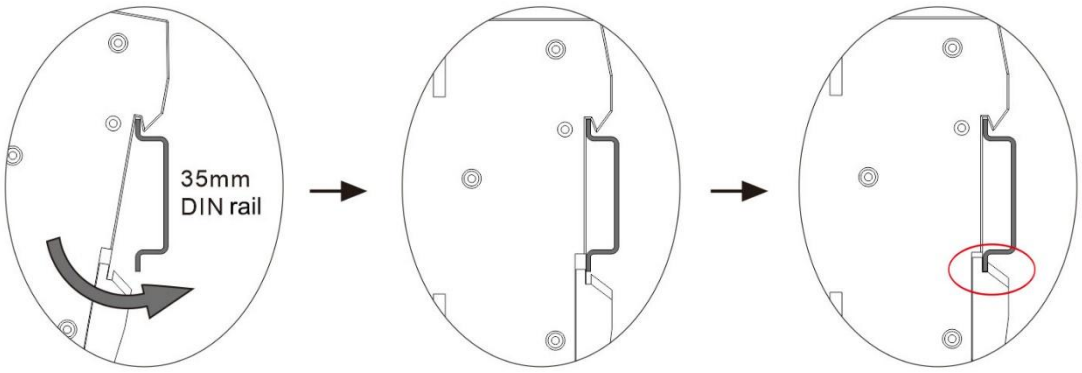
⑥ Close the circuit breaker with the recloser

⑦ Put the yellow clip in the position shown in the picture

⑧ Use a screwdriver to tighten the M2.5x8 machine screws and fix the yellow clip

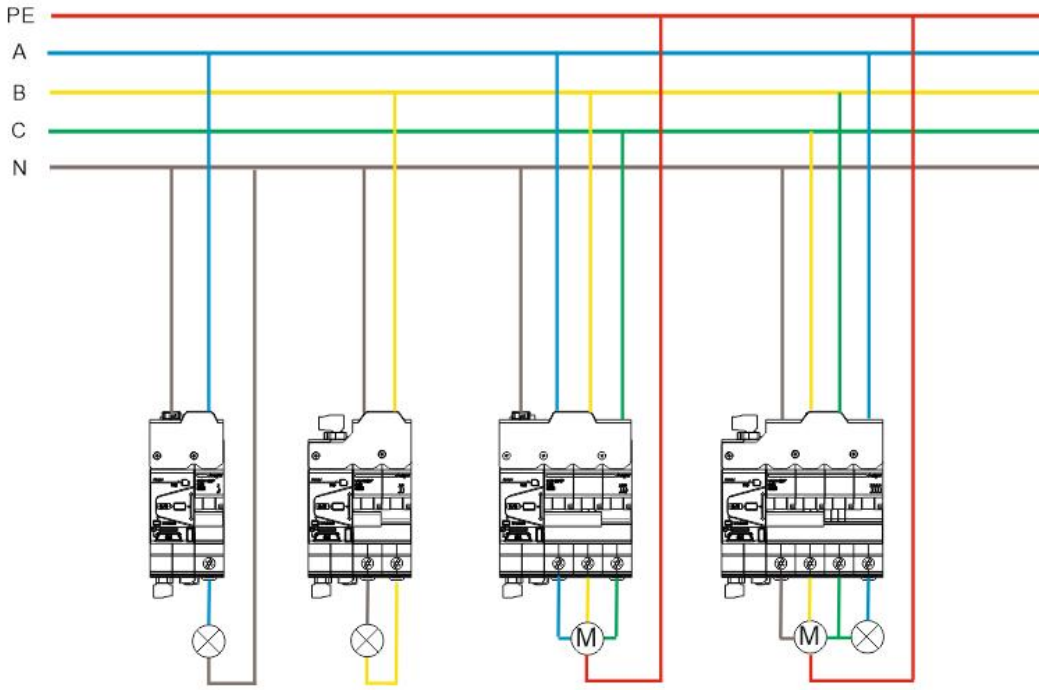
ATTENTION The safety lock must be pulled out and locked when wiring; The N pole neutral line is connected to the left end of the circuit breaker.

2. Pull out the metal clip at the bottom;
3. Snap the device into the rail and release the metal buckle to ensure it is stuck.



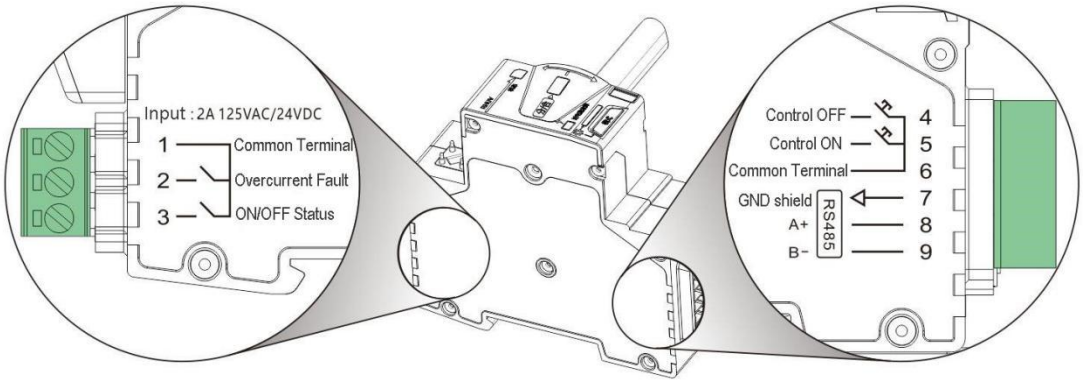
2.3 Main Circuit Wiring

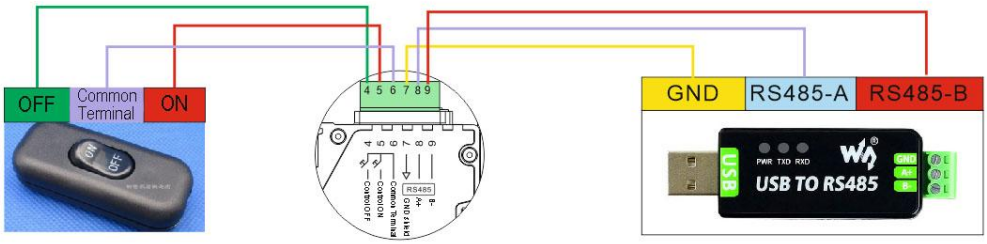
The circuit breaker of remote control device MT84SR must be connected to the



power circuit according to its voltage range.

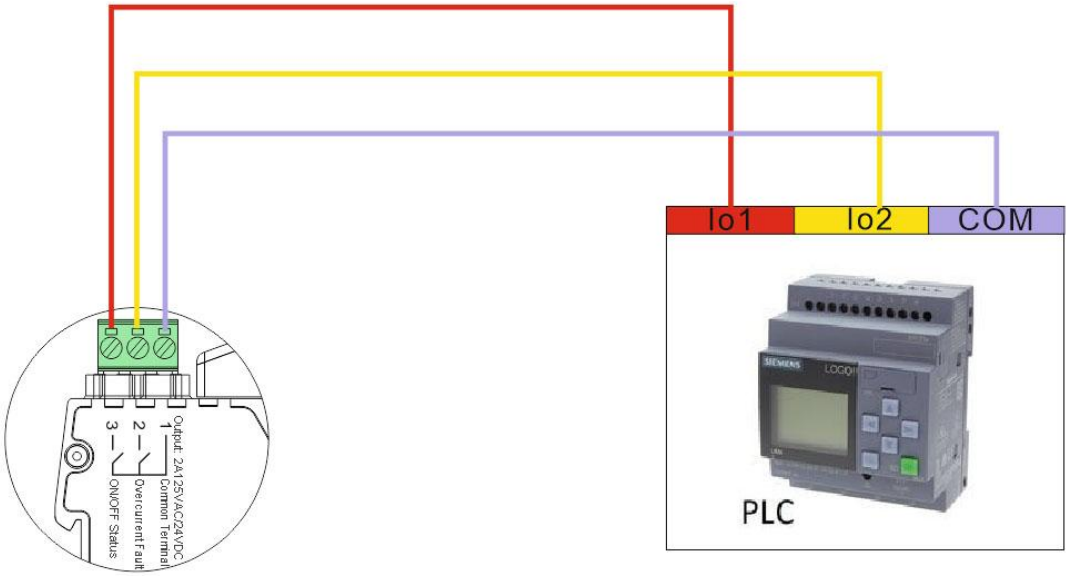
2.4 Terminal and Wiring





Picture 2-4-1 Input port wiring instructions

Picture 2-4-1 Output port wiring instructions



3. DEVICE USE

3.1 Working Mode③

3.1.1 Mode One: Dry Contact Control + RS485 Control + Over/Under Voltage + Auto-recloser

- The status indicator in this mode is red light on
- Auto-reclosing after current fault (short circuit or overload)
- Remote ON/OFF of the device by dry contact/RS485 control
- Over and under voltage protection with auto-reclosing function

Reclosing execution logic:

- After the auto-reclosing is successful: if any one reclosing succeeds in 3 reclosing operations of the device, the reclosing count will be automatically cleared after 15 minutes; or the "last command to close" is successful (the port releases the fault output), the reclosing count will be automatically cleared after 15 minutes.
- After auto-reclosing failure: When the device fails to perform reclosing 3 times, the mode indicator is still in "mode 1", and manual close is required in this time: the reclosing failure logic is released, and the reclosing count is cleared (port releases the fault output); after manual close is successful and there is no fault open for 30s, the device automatically returns to "mode 1".
- The last command to close fails, and the mode indicator still in "mode 3", and the voltage indicator flashes at the same time; then, manual close is required, the failure logic of reclosing (command close) is released, and the reclosing count is cleared, (port releases the fault output); after the manual close is successful, if there is no fault open for 30s, the device will automatically return to "mode 1".

3.1.2 Mode Two: Dry contact control + RS485 Control + Over / Under Voltage Control

- The status indicator in this mode is green light on
- Turn off the auto-reclosing function
- Dry contact/RS485 control can be performed
- Over/Under voltage protection with auto-reclosing function

Control logic:

- Dry contact control logic: When the common terminal 6 is connected with the normal open contact 4, the recloser will close; when the common terminal 6 is connected with the normal open contact 5, the recloser will open.
- The ON/OFF of the device by RS485 communication control; see RS485 protocol.

3.1.3 Mode Three: Maintenance Mode

- The status light in this mode will alternate between red and green
- Turn off the auto-reclose function
- The device does not respond to RS485 or dry contact control
- The device does not automatically reset after identifying the current fault or tripping due to the current fault, and manual reset is in need

3.2 Lock Mode②

MT84SR must be in Lock mode during long-term maintenance.

Perform the following steps when run the device in auto mode:

1. Push the button to the Lock mode, the device is in OFF status.
2. At this time, the device must be locked with a safety lock.

3.2.1 Working Logic

- The device is OFF and the lock is attached. This mode is used for long-term maintenance away from the switch site to prevent safety accidents caused by misoperation and power-on.

NOTICE

① Maintenance mode： RS485 ON/OFF and auto-reclosing function are not available. The RS485 communication address and the RS485 baud rate allows reading and writing.

② Lock mode：It is lockable (aperture 4.5mm).

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4. RS485 COMMUNICATION

MT84SR can be connected by interface port RS485 and Modbus-RTU communication protocol.

4.1 Communication

The twisted-pair cable with mesh shielding (at least 3 wires) must be used in RS485, and the maximum distance between the MT84SR and the main device is 1200 meters.

Up to 20 MT84SR devices can be connected to this bus.

Use an intelligent RS485 protocol converter to establish communication with a master device.

4.2 MODBUS Protocol

In the Modbus protocol, the MT84SR uses the RTU (Remote Terminal Unit) mode. For the Modbus functions implemented in the device, see "MT84SR Protocol Appendix".

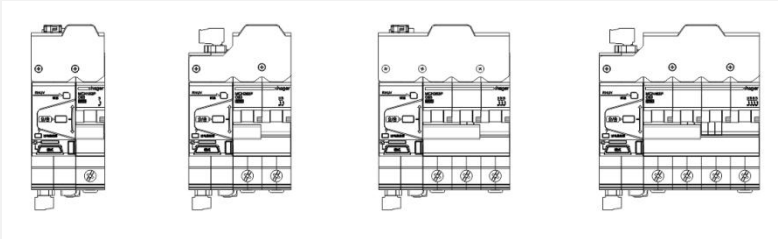
4.3 MODBUS Communication Parameter Setting

The prerequisite for the communication between the device and the master station is that the settings of the communication parameters must be accurate. The communication parameters of MT84SR include:

- Communication address: 01 by default, which can be modified by the host computer in the range of 01~247 in decimal.
- Baud rate: 9600 by default, which can be modified by the host computer software.
- Communication parameters can be freely set if necessary.

5. TECHNICAL FEATURES

5.1 Technical Parameter Table

Picture		
Function Description		
Manual/Auto Switch	●	●
Open Safety Padlock	●	●
ON&OFF Status Indication	●	●
ON/OFF	RS485 control	RS485 control
Current Fault Auto-recloser	Auto-reclosing in mode1	Auto-reclosing in mode1
Over/Under Voltage Protection	●	●
Poles	1P, 2P	3P, 4P
Electrical Characteristics		
Applicable to Case Current of MCB (A)	63A	
Rated Voltage (Un)	AC230V/Three Phase 400V	

Rated Insulation Voltage (Ui)	300V	
Rated Frequency	50Hz 60Hz	
Standby Power Consumption	≤ 1.2W	
Mechanical Characteristics		
Open Time	≤0.2s	
Close Time	≤0.3s	
Operation Life	≥10000	
Weight	88g	89g
Module	18mm	18mm
Environment Characteristics		
Operating Temperature	-25℃~+55℃	
Storage Temperature	-35℃~+65℃	
Relative Humidity (non-condensing)	5%-95%	
Highest Altitude	2000 m	
Protection Grade	IP20	
Communication Parameters		
Baud Rate	The default is 9600, and it can be set	
Check Bit	No check	
Data Bit	8	

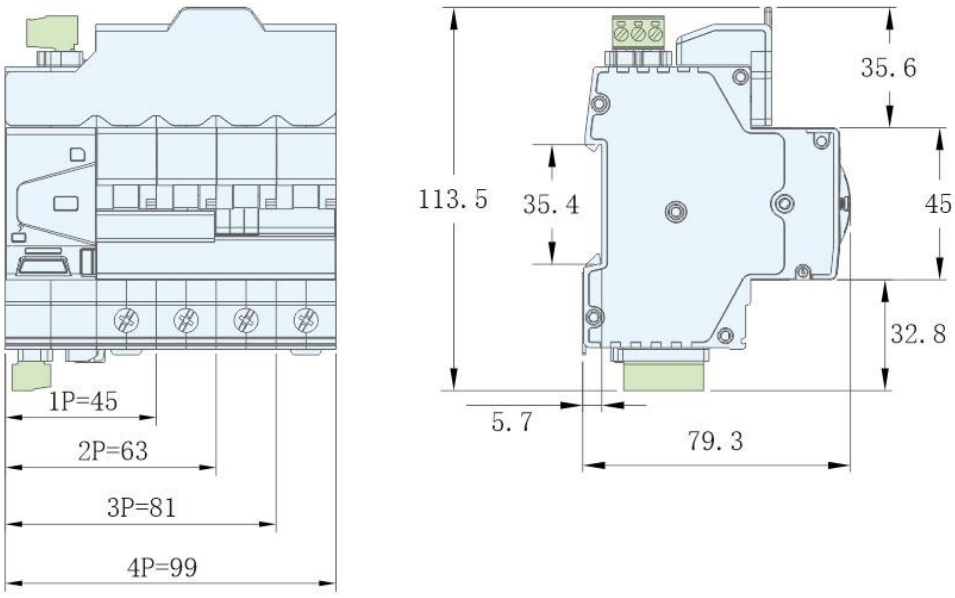
Stop Bit	1
Device Address	Default address 1

Over and Under Voltage Parameters					
Project	**Judgment Voltage**	**Judgment Time**	**Description**	Data bit	8
Overvoltage L1	≥275V	5s	When voltage ≥ 275V, overvoltage L1 will be triggered, and after 5s continuous overvoltage, the protection will be executed	Stop bit	1
Overvoltage L2	≥300V	1.5s	When voltage ≥ 300V, overvoltage L2 will be triggered, and after 1.5s continuous overvoltage, the protection will be executed	Device address	Default address 1
Overvoltage L3	≥350V	0.3s	When voltage ≥ 350V, overvoltage L3 will be triggered, and after 0.3s continuous overvoltage, the protection will be executed		

Overvoltage L4	≥400V	0.1s	When voltage ≥ 400V, overvoltage L4 will be triggered, and after 0.1s continuous overvoltage, the protection will be executed		
Undervoltage L1	≤160V	3s	When voltage ≤ 160V, undervoltage L1 will be triggered, and after 3s continuous undervoltage, the protection will be executed		

5.2 Frame Size

Unit: mm



6. FAQ

Problems	Possible Causes	Solutions
Auto-close fails	Incorrect mode selection	Check whether it is in the mode 1 status (the red light on)
	The safety lock buckle not fully reset	Make sure the safety lock is fully reset
Send ON/OFF command but no response	Incorrect setting of safety lock button	Make sure the safety lock button indication in the "Auto" position.
	Abnormal communication line	Check whether the communication cable is disconnected.
The host computer cannot communicate with the device	Incorrect RS485 communication address	Check whether the device address is consistent with the definition
	Incorrect RS485 baud rate	Check whether the device communication rate is consistent with the definition
	The 485 bus is long and does not use terminal adaptation resistors, so the current signal reflection will interfere with the bus.	Check whether the 120 ohm resistor is added
	Communication link is disturbed	Check whether the communication shield is well grounded
	Abnormal communication line	Check whether the communication cable

		is disconnected

7. TECHNICAL SREVICE

Anyone who purchases this remote control device MT84SR enjoys a 24-month warranty period from the date of purchase. During the warranty period, if the quality of the device itself affects the normal use, you can enjoy free repair and replacement. In case of irreversible damage caused by improper use, drop, installation and wiring errors, it can be repaired or replaced with money during the warranty period. If you disassemble and modify it yourself, you will not enjoy the warranty service.

If you have any questions about the operation or malfunction of the device, please contact Matis technical support service.

Statement:

- The information provided in this manual can be changed without prior notice.
- Shanghai Matis Electric Co., Ltd. reserves the right to interpret the foregoing information.

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