

Basic Auto Recloser Series

MT56AR Series

Product Manual

March 1, 2026

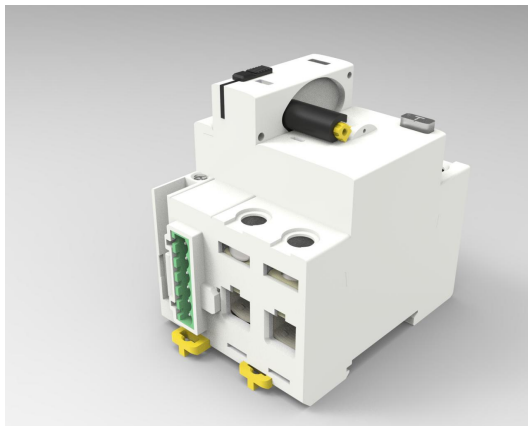
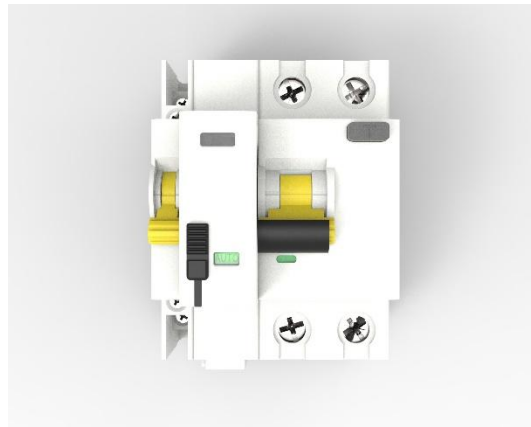
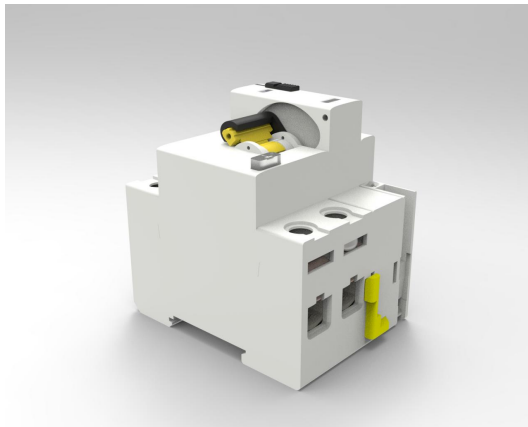


Table of Contents

1	Basic Definitions and Application Scenarios	1
1.1	Series Product Model Descriptions	1
1.2	Product Definition	2
1.3	Core Features	2
1.4	Application Scenarios	2
2	Electrical Specifications	2
3	Operating Modes and Safety Lock	4
3.1	AUTO (Automatic Mode)	4
3.2	MANU (Manual Mode)	4
3.3	LOCK (Mechanical Lock Mode):	4
4	Automatic Reclosing Function	4
4.1	Automatic Reclosing Strategy	4
4.2	Reclosing Process	6
5	LED Indication Logic	6
6	Terminal Definitions	7
6.1	Wiring Diagram	7
7	Dimensional Drawings	8
8	Auxiliaries	8
8.1	Accessory Specifications	8
8.2	Recommended Wiring Configuration	9
9	EMC Standards	9

1 Basic Definitions and Applicable Scenarios

1.1 Series Product Model Descriptions

MT56 architecture products are divided into three series based on functionality: **Basic (MT56AR)**, **Multi-function (MT56AI/AS)**, and **High-end Self-healing (MT56SD)**.

Model Series	Core Feature Descriptions	Suitable Scenarios
MT56AR Series (Basic)	Supports only automatic reclosing after tripping, with a fixed reclosing strategy (3 attempts).	Residential and basic commercial power distribution.
MT56AI/AS Series (Multifunctional)	Active I/O control / RS485 Modbus communication, remote tripping and closing, real-time status feedback, and reclosing count.	Smart buildings, data centers, and energy-saving monitoring projects.
MT56SD Series (Insulation Monitoring Type)	Pre-reclosing self-test, permanent fault lockout, and insulation detection reclosing.	Unmanned base stations, cold chain logistics, public lighting.

1.1.1 Basic Model (MT56AR)

Model	Compatible RCCB Specifications Details
MT56AR-R225AC30	2P, 25A, AC type, 30mA
MT56AR-R240A30	2P, 40A, Type A, 30mA
MT56AR-R263A100	2P, 63A, Type A, 100mA
MT56AR-R440AC30	4P, 40A, AC Type, 30mA
MT56AR-R463A30	4P, 63A, Type A, 30mA
MT56AR-R480A300	4P, 80A, Type A, 300mA
MT56AR-R4100A300	4P, 100A, Type A, 300mA

Note: The RCCB specifications listed in the table are common configuration models; for other specifications compatible with the MT56AR, please refer to the RCCB product specification table.

1.2 Product Definition

The **MT56AR** is a motor-driven intelligent automatic reclosing module suitable for use with RCCBs, RCBOs, and MCBs.

It can automatically identify the nature of power faults and, after a trip caused by non-permanent faults (such as induced lightning or grid fluctuations), achieve fully automatic power restoration, significantly improving system high availability.

1.3 Core Features

- Automatically identifies trip type (manual/fault)
- Automatic reclosing to restore power
- Permanent fault lockout protection

1.4 Application Scenarios

- Telecom base stations and unmanned equipment rooms
- Cold-chain logistics and temperature-controlled warehouses
- Municipal Lighting and Traffic Monitoring Systems
- Critical production lines and alarm systems
- Residential Power Distribution Systems

2 Electrical Parameters

Characteristics	Technical Specifications	MT56AR-R (ML56)
Electrical Characteristics	Leakage Type	AC Type / Type A / Type A+S
	Rated Voltage (Un)	2P: 230 V~ / 4P: 400 V~
	Rated Current (In)	16, 25, 40, 63, 80, 100 A
	Rated frequency	50 / 60 Hz (±5%)
	Rated residual operating current (IΔn)	10, 30, 100, 300 mA
	Rated Making and Breaking Capacity	500 A or 10×In
	Rated residual making and	500 A (≤40 A), 630 A (63 A), 800 A (80 A), 1000 A

	breaking capacity ($I_{\Delta m}$)	(100 A)
	Rated impulse withstand voltage (U_{imp})	4 kV
	Auxiliary power consumption	<20 VA (during operation) / <1.5 VA (standby)
Reclosing system	Number of reclosing attempts	3 times
	Reclosing Delay Time	1st attempt: 10 s / 2nd attempt: 60 s / 3rd attempt: 180 s
	Reset Time (Restart)	15 minutes (time until the counter resets after a successful reclosing)
	Short-circuit fault recognition time	≤ 700 ms (If tripping occurs immediately after closing, it is deemed a permanent fault; the reclosing circuit () is locked)
Mechanical characteristics	Mechanical Life	6,000 cycles
	Electrical life	4,000 operations
	Number of poles	2-pole (2P) or 4-pole (4P)
	Modular size (footprint)	2P: 54 mm / 4P: 90 mm
	Weight	2P: 296 g / 4P: 496 g
	Mounting	DIN rail
Environmental parameters	Operating temperature	-25 °C...+55 °C
	Maximum Altitude	2000 m
	Protection rating	IP20
Certifications	Compliance with Standards	EN 61008-1, EN 50557, EN 63024
	Certification Mark	CE

3 Operating Modes and Safety Lock

The MT56AR features a physical dial to ensure strict management of operating permissions:

3.1 AUTO (Automatic Mode)

Application: Normal operating condition.

Function: Enables automatic reclosing logic after a fault

Safety Interlock: If a field operator manually trips the circuit breaker, the system interprets this as a maintenance request and automatically enters "Safety Interlock Mode," **preventing remote closing commands** until the switch is manually returned to the ON position.

3.2 MANU (Manual Mode)

Application: Remote dispatch scenarios.

Function: **Disables the automatic reclosing function.**

3.3 LOCK (Mechanical Lockout Mode):

Application: Maintenance with power off.

Function: Locked by sliding the panel switch downward; compatible with a **4mm padlock**. In the locked state, both electrical and manual operations are physically blocked, fully complying with **LOTO (Lockout-Tagout)** safety standards.

4 Automatic Reclosing Function

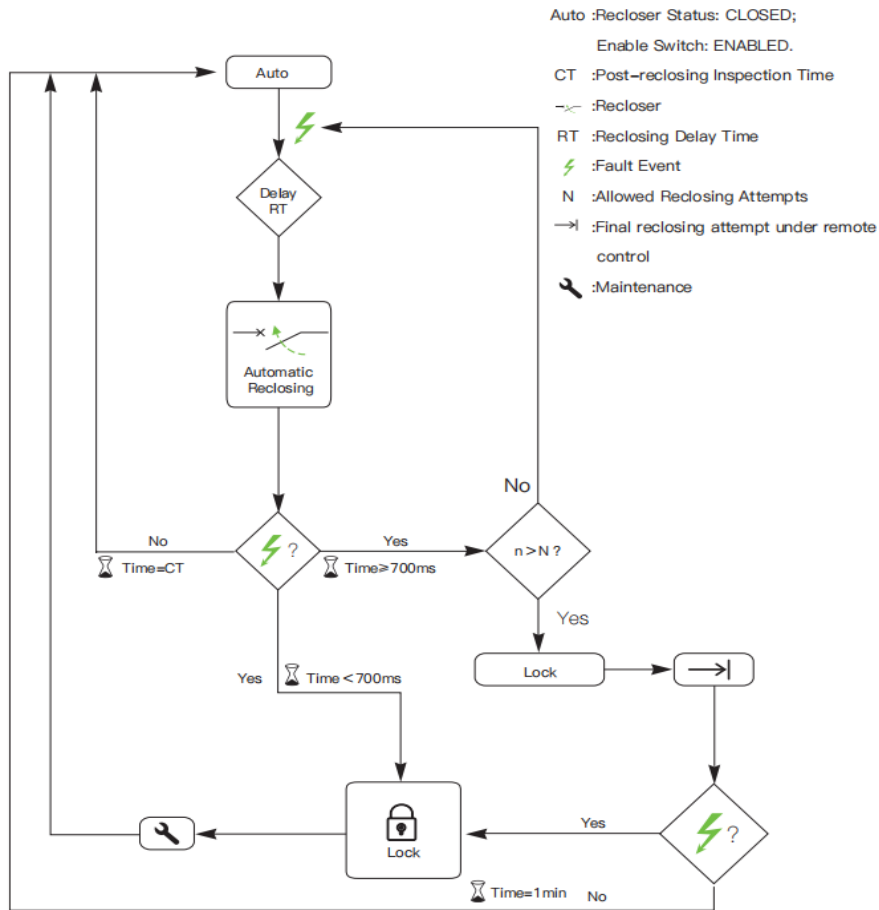
4.1 Automatic Reclosing Strategy

The MT56AR module features a built-in fault counter that records the tripping frequency within the detection time (CT).

Program No.	Strategy	Attempts	Delay Sequence
1	Short-3	3	10 s / 1 min / 3 min

- **Reclosing Delay:**
 - **Initial Reclosing Delay:** In all preset modes (Short-1, Short-3, Long-fixed, Progressive), the first automatic reclosing attempt following a trip is typically executed after **10 seconds**.
 - **Subsequent Reclosing Sequence:** Depending on the selected strategy, the delay is gradually increased, including **1 minute and 3 minutes**.
- **Counter Reset Time:**
 - The system operates for **the set monitoring time (CT)**. If no new fault occurs within this time, **the fault counter is automatically reset**, and the system returns to its initial standby state.
- **Permanent Fault Determination Time:**
 - If a trip occurs again within **< 700 ms** after a reclosing attempt, the system will determine it to be a permanent fault and enter a program lockout state, requiring manual or command reset.

4.2 Reclosing Process



5 LED Indication Logic

The module panel features integrated multi-color LEDs that provide real-time feedback on the device's operating status:

Status	Indicates
Solid green light	AUTO mode, normal operation
Green light flashing	MANU mode, waiting for manual or communication control
Red light flashing	Reclosing timing sequence in progress
Red light steady	A permanent fault has been detected or the reclosing limit has been reached; the system is locked out

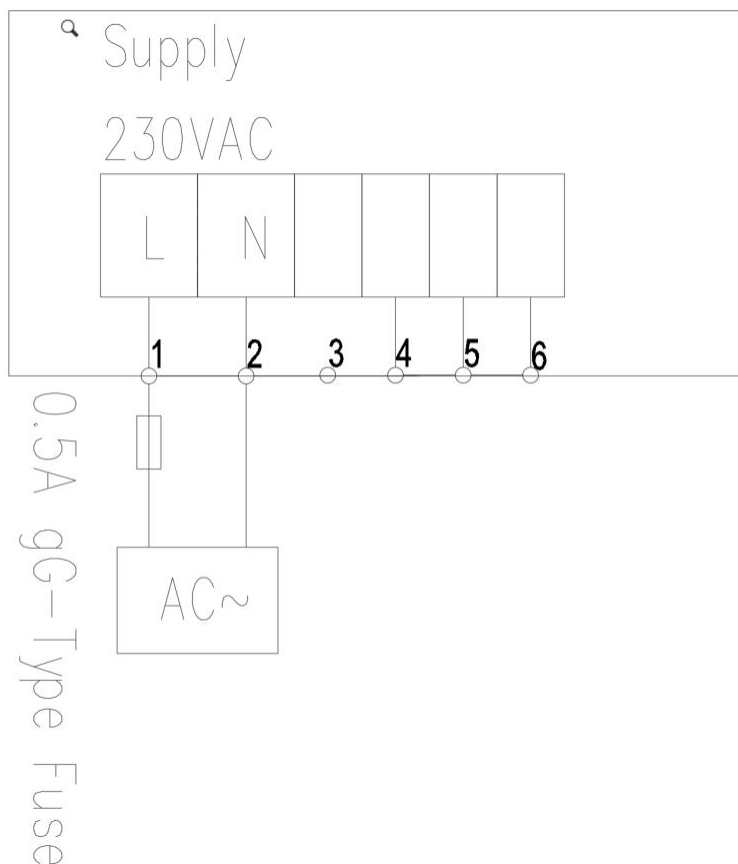
Yellow light steady	The device is in a mechanical lockout state
---------------------	---

6 Terminal Definitions

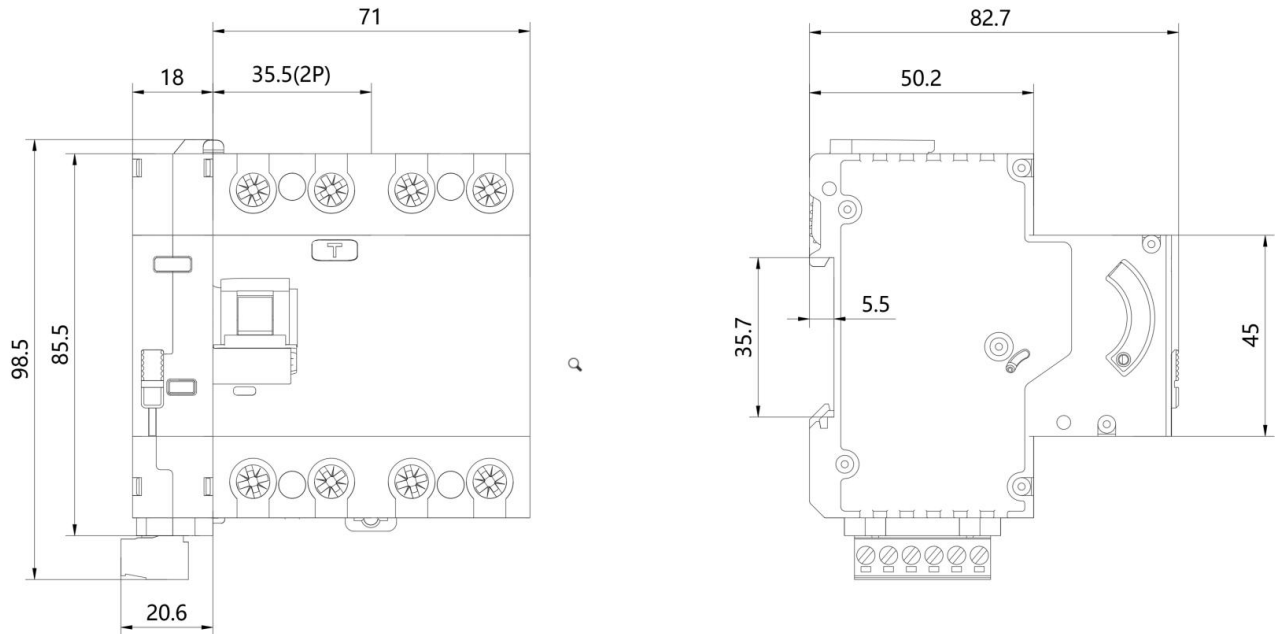
Terminal Number	Function Definition	Description
1, 2	Power Input	230 V AC ($\pm 15\%$)
3		
4		
5		

- Auxiliary Module Connection:** The side expansion port supports connection of up to 2 signal auxiliary modules (OF & SD) for outputting dry contact signals or triggering the local alarm system.

6.1 Wiring Diagram



7



8 Auxiliary Accessories

The MT56 series supports the installation of signal auxiliary modules to transmit the switch's real-time status to a monitoring system. The auxiliary module is mounted on **the left side** of the recloser module.

Accessory Name	Model	Core Function	Trigger Conditions
Status Auxiliary Contacts	OF	Feedback on the actual position of the switch	The contacts operate whenever the switch is closed or opened (manually, automatically, or due to a fault).
Fault alarm contact	SD	Abnormal tripping of the feedback circuit	Operates only when the circuit trips due to leakage, short circuit, or overload; does not operate when lights or power are turned off manually.

8.1 Accessory Features

- Easy installation: Features a side-mounted snap-fit design that allows for

integration with the reclosing module without screws.

- **Signal Type:** Provides 1 set of changeover contacts (1 NO + 1 NC), supporting connection to a PLC, backend monitoring system, or local buzzer.
- **Width Requirement:** Each module occupies 0.5 module units (9 mm).

8.2 Typical Wiring Recommendations

- **OF Contact:** Connect to the monitoring center to indicate whether "remote closing was successful."
- **SD contact:** Connect to an alarm light to notify maintenance personnel that "a line fault has occurred and requires inspection."

9 EMC Standards

Testing	Basic Standards	Test Level Description
Electrostatic Discharge Immunity (ESD)	IEC 61000-4-2	Level 3 Air 8 kV, Contact 6 kV
Radio Frequency Electromagnetic Immunity (RS/RFI)	IEC 61000-4-3	Level 3 10 V/m, 80 MHz–1000 MHz
Electrical Fast Transient (EFT)	IEC 61000-4-4	Level 2 2 kV (power line), 5/50 ns
Surge immunity	IEC 61000-4-5	Level 3 4 kV common-mode, 2 kV differential-mode
Conducted immunity (CS)	IEC 61000-4-6	Level 2 3 V, 150 Ω, 0.15–80 MHz
Power frequency magnetic field immunity	IEC 61000-4-8	Level 4 30 A/m, continuous wave
Less than 150 Common-mode conducted disturbance within the frequency range	Test values taken from IEC 61000-4-16	Test segment Level 3

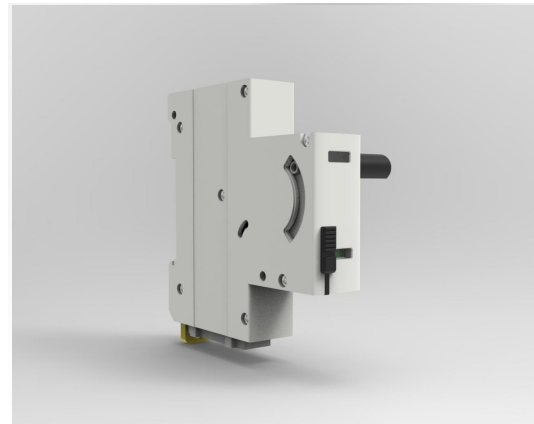
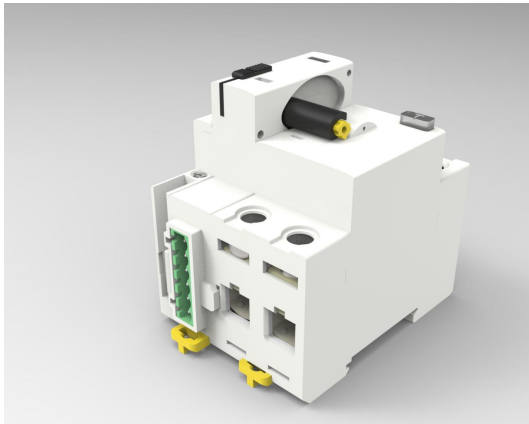
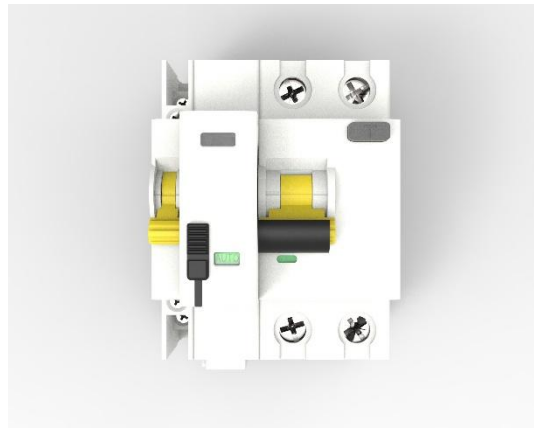
Radiated emissions (EMI) RE	EN 55022 / CISPR 22	Class B
Conducted emissions CE	EN 55022 / CISPR 22	Class B

Circuit Breaker Series (RS485)

MT56AS Series

Product Manual (RS485 Version)

March 1, 2026



1	Basic Definitions and Application Scenarios	1
1.1	Series Product Model Descriptions	1
1.2	Product Definition	2
1.3	Core Features	2
1.4	Application Scenarios	2
2	Electrical Specifications	2
3	Operating Modes and Safety Lock	4
3.1	AUTO (Automatic Mode)	4
3.2	MANU (Manual Mode)	4
3.3	LOCK (Mechanical Lock Mode):	4
4	Automatic Reclosing Function	5
4.1	Automatic Reclosing Strategy	5
4.2	Reclosing Process	6
5	LED Indication Logic	6
6	Terminal Definitions	7
6.1	Wiring Diagram	8
7	Dimensional Drawings	8
8	Auxiliaries	9
8.1	Accessory Features	9
8.2	Typical Wiring Recommendations	9
9	EMC Standards	9

1 Basic Definitions and Applications

1.1 Series Product Model Descriptions

MT56 architecture products are divided into three series based on functionality: **Basic (MT56AR)**, **Multi-function (MT56AI/AS)**, and **High-end Self-healing (MT56SD)**.

Model Series	Core Feature Descriptions	Suitable Scenarios
MT56AR Series (Basic)	Supports only automatic reclosing after tripping, with a fixed reclosing strategy (3 attempts).	Residential and basic commercial power distribution.
MT56AI/AS Series (Multifunctional)	Active I/O control / RS485 Modbus communication, remote tripping and closing, real-time status feedback, and reclosing count.	Smart buildings, data centers, and energy-saving monitoring projects.
MT56SD Series (Insulation Monitoring Type)	Pre-reclosing self-test, permanent fault lockout, and insulation detection reclosing.	Unattended base stations, cold chain logistics, public lighting.

1.1.1 Multifunctional Type (MT56AI/AS)

Model	Function Interface	Compatible Handle	Power Type
MT56AS-1N	Automatic Recloser + RS485	1P	AC
MT56AS-1E	Automatic Recloser + RS485	1P	DC
MT56AS-2N	Automatic Recloser + RS485	2P	AC
MT56AS-2E	Automatic Recloser + RS485	2P	DC
MT56AI-1N	Automatic Recloser + IO	1P	AC
MT56AI-1E	Automatic Recloser + IO	1P	DC
MT56AI-2N	Automatic Recloser + IO	2P	AC
MT56AI-2E	Automatic Recloser + IO	2P	DC

Note: AI and DC versions are not yet available

1.2 Product Definition

The **MT56AS** is a motor-driven smart automatic reclosing module designed for use with RCCBs, RCB0s, and MCBs.

It automatically identifies the nature of power faults and, following a trip caused by non-permanent faults (such as induced lightning or grid fluctuations), restores power supply fully automatically, significantly enhancing system high availability.

1.3 Core Features

- Automatically identifies trip type (manual/fault)
- Automatic reclosing to restore power
- Permanent fault lockout protection

1.4 Application Scenarios

- Telecom base stations and unmanned equipment rooms
- Cold-chain logistics and temperature-controlled warehouses
- Municipal Lighting and Traffic Monitoring Systems
- Critical production lines and alarm systems
- Residential Power Distribution Systems

2 Electrical Specifications

Performance Category	Technical Parameter Items	MT56AI Specifications	MT56AS Specifications
Electrical Characteristics	Rated operating voltage (Un)	230 V [~] (Supports 50 / 60 Hz ±5%)	230 V [~] (supports 50 / 60 Hz ±5%)
	Rated impulse withstand voltage (Uimp)	4 kV	4 kV
	Power consumption	Active: <20 VA / Standby: <1.5 VA	Operating: <20 VA / Standby: <1.5 VA

Automatic Reclosing System	Reclosing Mode	Fixed to Program 1 (Short-3)	Supports 4 selectable programs (0 / 1 / 2 / 3)
	Number of Reclosing Attempts (NR)	3 times	Determined by the selected program (1-5 attempts)
	Reclosing delay time sequence	1st attempt: 10 s / 2nd attempt: 60 s / 3rd attempt: 180 s	Determined by the selected program (refer to the reclosing sequence)
	Counter reset time (Restart)	15 minutes (time required for the system to stabilize after a successful reclosing)	15 minutes (time required for the system to stabilize after a successful reclosing)
	Permanent Fault Determination/Lockout Time	≤ 700 ms (If a trip occurs immediately after closing, it is deemed a permanent fault, and the program enters a deadlock)	≤ 700 ms (If tripping occurs immediately after closing, it is determined to be a permanent fault, and the system enters a program deadlock)
Mechanical and Structural Characteristics	Mechanical Life	10,000 operations (motor drive mechanism life)	10,000 operations (motor drive mechanism life)
	Compatible Pole Count	MCB MM56 1-4P RCCB ML56 2P/4P Type A/AC RCBO MR56 1-4P	MCB MM56 1-4P RCCB ML56 2P/4P Type A/AC RCBO MR56 1-4P
	Mounting	Standard 35mm DIN rail mounting	Standard 35mm DIN rail mounting

Environmental parameters	Operating Temperature Range	-25 ° C to +55 ° C	-25 °C to +55 °C
	Maximum operating altitude	2,000 m	2,000 m
	Protection rating	Terminal block IP20 / Housing IP40	Terminal block IP20 / Housing IP40
Standards and Certifications	Compliance	EN 50557 (Standard for automatic reclosing devices), EN 63024	EN 50557 (standard for automatic reclosing devices), EN 63024

3 Operating Modes and Safety Lockout

The MT56AS features a physical dial to ensure strict management of operating permissions:

3.1 AUTO (Automatic Mode)

Application: Normal operating state.

Function: Enables automatic reclosing logic after a fault and supports remote RS485 closing and tripping control.

Safety Interlock: If on-site personnel manually open the circuit breaker, the system interprets this as a maintenance request and automatically enters "Safety Lockout Mode," **prohibiting remote closing commands** until the switch is manually returned to the ON position.

3.2 MANU (Manual Mode)

Application: Remote dispatch scenarios.

Function: **Disables the automatic reclosing function.** In this mode, manual operation does not override remote permissions; remote RS485 commands have the highest priority, making it suitable for BMS centralized dispatch applications.

3.3 LOCK (Mechanical Lockout Mode):

Application: Power-off maintenance.

Function: Locked by sliding the panel switch downward; compatible with a **4mm padlock**. In the locked state, both electrical and manual operations are physically blocked, fully complying with **LOTO (Lockout-Tagout)** safety standards.

4 Automatic Reclosing Function

4.1 Automatic Reclosing Strategies

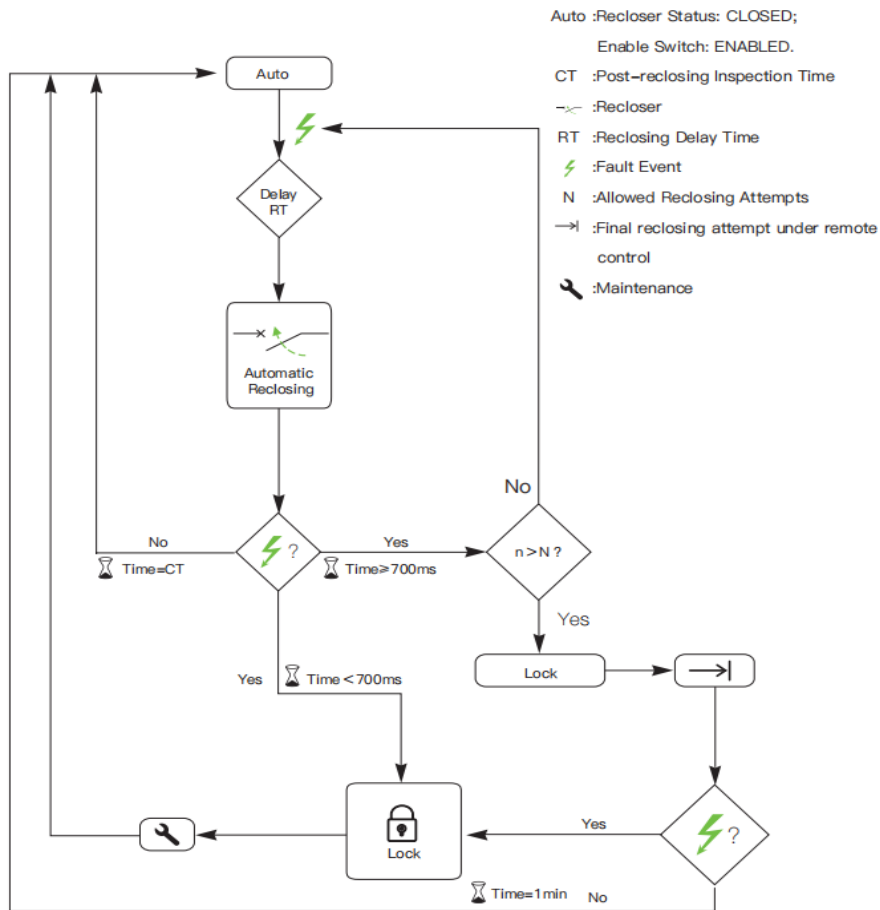
The MT56AS module features a built-in fault counter that records the tripping frequency within the detection time (CT) and offers four preset reclosing strategies to accommodate different environments: **configuration** is selected via **the RS485 Modbus protocol**.

Program No.	Strategy	Attempts	Delay Sequence
0	Short-1	1	10 s
1	Short-3	3	10 s / 1 min / 3 min
2	Long-Fixed	5	10 s / 1 min / 3 min × 3
3	Progressive	5	10 s / 1 min / 3 min / 4 min / 5 min

- **Reclosing Delay:**
 - **Initial Reclosing Delay:** In all preset modes (Short-1, Short-3, Long-fixed, Progressive), the first automatic reclosing attempt following a trip is typically executed after **10 seconds**.
 - **Subsequent Reclosing Sequence:** Depending on the selected strategy, the delay is incrementally increased, including **1 minute, 3 minutes, 4 minutes, and 5 minutes**.
- **Counter Reset Time:**
 - The system operates for **the set monitoring time (CT)**. If no new fault occurs within this time, **the fault counter is automatically reset**, and the system returns to its initial standby state.
- **Permanent Fault Determination Time:**



- If a trip occurs again within **< 700 ms** after a reclosing attempt, the system will determine it to be a permanent fault and enter a program lockout state, requiring manual or command reset.

4.2 Reclosing Process



5 LED Indication Logic

The module panel features integrated multi-color LEDs that provide real-time feedback on the device's operating status:

Status	Indicates
 Solid green light	AUTO mode, normal operation
 Green light flashing	MANU mode, waiting for manual or communication control

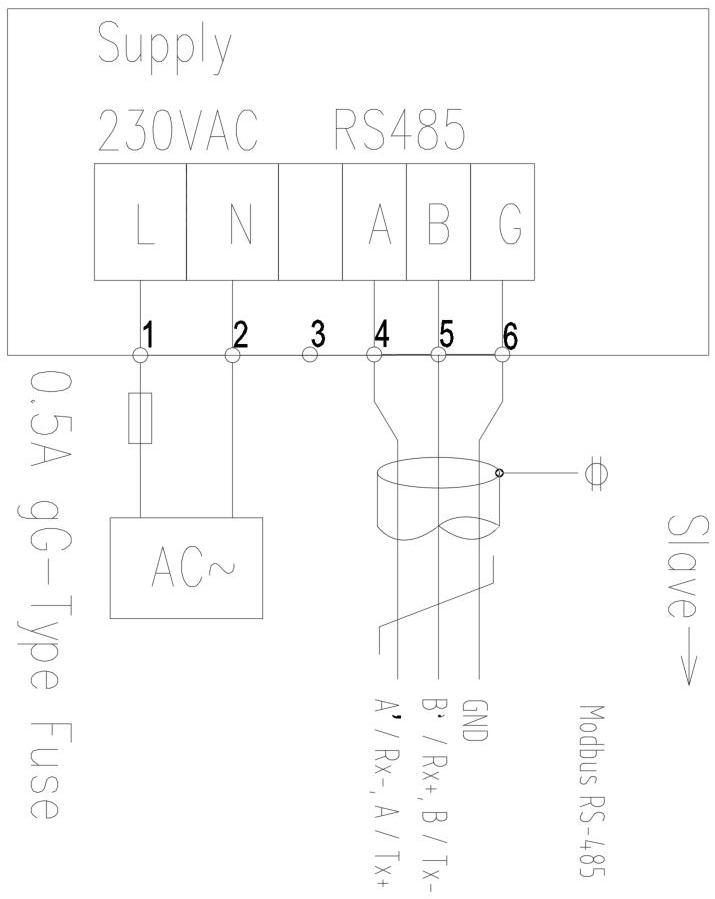
● Red light flashing	Reclosing timing sequence in progress
● Red light steady	A permanent fault has been detected or the maximum number of reclosing attempts has been reached; the system is locked out
○ Yellow light steady	The device is in a mechanical lockout state

6 Terminal Definitions

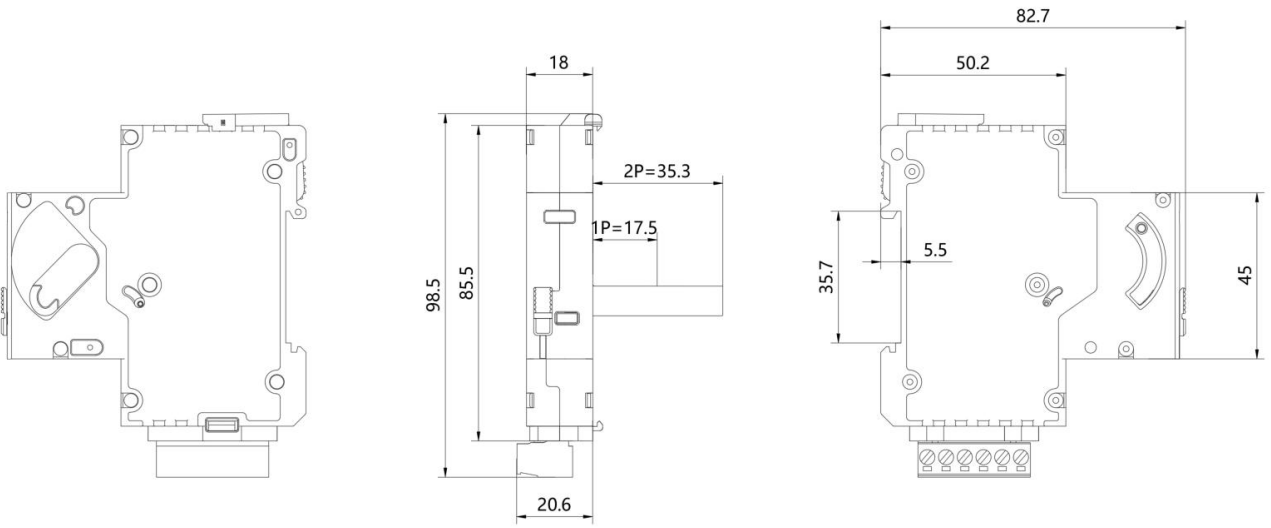
Terminal Number	Function Definition	Description
1, 2	Power Input	230 V AC ($\pm 15\%$)
3	RS-485 A	Communication Interface A
4	RS-485 B	Communication Interface B
5	RS-485 GND	Communication Ground (Optional Connection)

- **RS-485 Communication (Modbus):** Enables bidirectional communication with the monitoring platform via terminals 3/4, supporting real-time retrieval of trip counts and fault causes, as well as remote reset commands.
- **Auxiliary Module Connection:** The side expansion interface supports connection of up to 2 signal auxiliary modules (OF & SD), used for outputting dry contact signals or triggering the local alarm system.

6.1 Wiring Diagram



7



8 Auxiliaries

The MT56 series supports the installation of signal auxiliary modules, which are used to transmit the switch's real-time status to the monitoring system. The auxiliary module is mounted on **the left side** of the recloser module.

Accessory Name	Model	Core Function	Trigger Conditions
Status Auxiliary Contacts	OF	Feedback on the actual position of the switch	The contacts operate whenever the switch is closed or opened (manually, automatically, or due to a fault).
Fault alarm contact	SD	Abnormal tripping of the feedback circuit	Operates only when the circuit trips due to leakage, short circuit, or overload; does not operate when lights or power are turned off manually.

8.1 Accessory Features

- **Easy installation:** Features a side-mounted snap-fit design that allows for integration with the reclosing module without screws.
- **Signal Type:** Provides 1 set of changeover contacts (1 NO + 1 NC), supporting connection to a PLC, backend monitoring system, or local buzzer.
- **Width Requirement:** Each module occupies 0.5 module units (9 mm).

8.2 Typical Wiring Recommendations

- **OF Contact:** Connect to the monitoring center to indicate whether "remote closing was successful."
- **SD contact:** Connect to an alarm light to notify maintenance personnel that "a line fault has occurred and requires inspection."

9 EMC Standards

Testing	Basic Standards	Test Level Description
---------	-----------------	------------------------

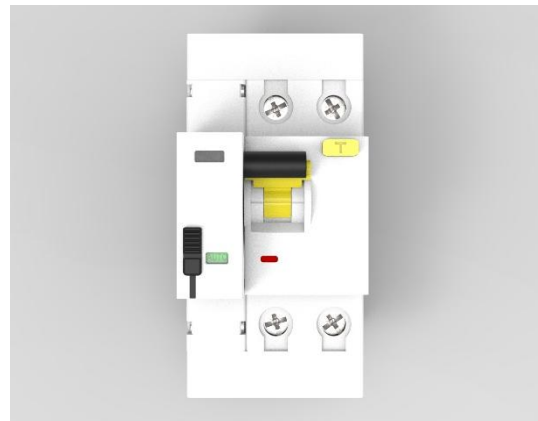
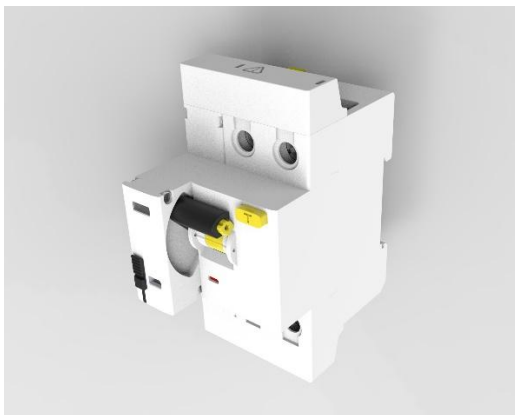
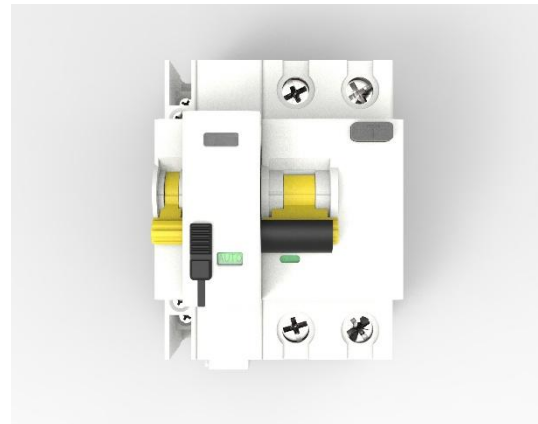
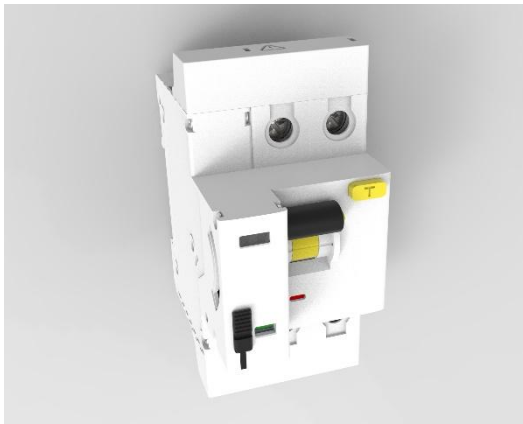
Electrostatic Discharge Immunity (ESD)	IEC 61000-4-2	Level 3 8 kV air, 6 kV contact
Radio Frequency Electromagnetic Field Immunity (RS/RFI)	IEC 61000-4-3	Level 3 10 V/m, 80 MHz - 1000 MHz
Electrical Fast Transient (EFT)	IEC 61000-4-4	Level 2 2 kV (power line), 5/50 ns
Surge immunity	IEC 61000-4-5	Level 3 4 kV common-mode, 2 kV differential-mode
Conducted immunity (CS)	IEC 61000-4-6	Level 2 3 V, 150 Ω , 0.15 - 80 MHz
Power frequency magnetic field immunity	IEC 61000-4-8	Level 4 30 A/m, continuous wave
Less than 150 Common-mode conducted disturbance within the frequency range	Test values taken from IEC 61000-4-16	Test segment Level 3
Radiated emissions (EMI) RE	EN 55022 / CISPR 22	Class B
Conducted emissions CE	EN 55022 / CISPR 22	Class B

Insulation Monitoring Recloser Series

MT56SD Series

Product Manual

March 1, 2026



1	Basic Definitions and Application Scenarios	1
1.1	Series Product Model Descriptions	1
1.2	Product Definition	2
1.3	Core Features	2
1.4	Application Scenarios	2
2	Electrical Specifications	2
3	Operating Modes and Safety Lock	5
3.1	AUTO (Automatic Mode)	5
3.2	MANU (Manual Mode)	5
3.3	LOCK (Mechanical Lock Mode):	5
4	Automatic Reclosing Function	6
4.1	Automatic Reclosing Strategy	6
4.2	Reclosing Process (<i>Redrawn</i>)@2026-03-16)	7
5	LED Indication Logic	7
6	Terminal Definitions	8
6.1	Wiring Diagram	8
7	Dimensional Drawings	9
8	Auxiliaries	9
8.1	Accessory Features	9
8.2	Typical Wiring Recommendations	10
9	EMC Standards	10

1 Basic Definitions and Applications

1.1 Series Product Model Descriptions

MT56 architecture products are divided into three series based on functionality: **Insulation Monitoring (MT56SD)**, **Multi-Function (MT56AI/AS)**, and **High-End Self-Healing (MT56SD)**.

Model Series	Core Function Descriptions	Suitable Scenarios
MT56SD Series (Insulation Detection Type)	Supports only automatic reclosing after tripping, with a fixed reclosing strategy (3 attempts).	Residential and basic commercial power distribution.
MT56AI/AS Series (Multifunctional Type)	Active I/O control/RS485 Modbus communication, remote tripping and closing, real-time status feedback, and reclosing count.	Smart buildings, data centers, and energy-saving monitoring projects.
MT56SD Series (Insulation Monitoring Type)	Pre-reclosing self-test, permanent fault lockout, and insulation detection reclosing.	Unattended base stations, cold chain logistics, public lighting.

1.1.1 Insulation Detection Type (MT56SD)

Model	Compatible RCCB Specifications
MT56SD -R225AC30	2P, 25A, AC type, 30mA
MT56SD -R240A30	2P, 40A, Type A, 30mA
MT56SD -R263A30	2P, 63A, Type A, 30mA
MT56SD -R240B30	2P, 40A, Type B, 30mA (for new energy applications)
MT56SD -R263B300S	2P, 63A, Type B, 300mA, Delay Type
MT56SD -R440A30	4P, 40A, Type A, 30mA
MT56SD -R463A30	4P, 63A, Type A, 30mA

MT56SD -R4100A300S	4P, 100A, Type A, 300mA, Delay Type
MT56SD -R463B30	4P, 63A, Type B, 30mA
MT56SD -R480B300S	4P, 80A, Type B, 300mA, Delayed-action

Note: The RCCB specifications listed in the table are common configuration models; please refer to the RCCB product specification table for other specifications compatible with the MT56SD.

1.2 Product Definition

The **MT56SD** is a motor-driven intelligent automatic reclosing module designed for use with RCCBs (residual current circuit breakers).

It can automatically identify the nature of power faults and, after a trip caused by non-permanent faults (such as induced lightning or grid fluctuations), achieve fully automatic power restoration, significantly improving system high availability.

1.3 Core Features

- Automatically identifies trip type (manual/fault)
- Automatic reclosing to restore power
- Permanent fault lockout protection

1.4 Application Scenarios

- Telecom base stations and unmanned equipment rooms
- Cold-chain logistics and temperature-controlled warehouses
- Municipal Lighting and Traffic Monitoring Systems
- Critical production lines and alarm systems
- Residential Power Distribution Systems

2 Electrical Specifications

Performance Category	Technical Specifications	MT56SD-R (ML56)
Electrical	Leakage Type	AC Type / Type A / Type A+S

Characteristics		
	Rated Voltage (Un)	2P: 230 V~
	Rated Current (In)	16, 25, 40, 63, 80, 100 A
	Rated frequency	50 / 60 Hz ($\pm 5\%$)
	Rated residual operating current ($I_{\Delta n}$)	30 mA
	Rated Making and Breaking Capacity	500 A or $10 \times I_n$
	Rated residual making and breaking capacity ($I_{\Delta m}$)	500 A (≤ 40 A), 630 A (63 A), 800 A (80 A), 1000 A (100 A)
	Rated impulse withstand voltage (U_{imp})	4 kV
	Auxiliary power consumption	<20 VA (during operation) / <1.5 VA (standby)
Reclosing system	Number of reclosing attempts	48 attempts (24-hour monitored self-healing type)
	Reclosing Delay	10s \rightarrow 1min \rightarrow 3min \rightarrow (30min \times 45)

	Time	
	Reset Time (Restart)	15 minutes (time for counter reset after successful reclosing)
	Reclosing Mode	30mA Model: Insulation Reclosing
	Short-circuit fault detection time	≤ 700 ms (If tripping occurs immediately after closing, it is deemed a permanent fault, and reclosing is locked out)
	Non-reclosing threshold (Rd)	When the monitored downstream insulation resistance $R_d < 8 \text{ k}\Omega$, the device determines that the fault persists and will not perform a reclosing operation.
	Reclosing Permission Threshold (Rd0)	When the insulation resistance recovers to $R_{d0} > 16 \text{ k}\Omega$, the device determines that the fault has cleared and permits reclosing.
Mechanical Characteristics	Mechanical Life	6,000 cycles
	Electrical life	4,000 cycles
	Number of poles	2-pole (2P)
	Module size (footprint)	2P: 54 mm
	Weight	2P: 296 g
	Mounting	DIN rail
	Operating	-25 °C to +55 °C

Environmental parameters	temperature	
	Maximum Altitude	2000 m
	Protection rating	IP20
Certifications	Compliance with Standards	EN 61008-1, EN 50557, EN 63024
	Certification Mark	CE

3 Operating Modes and Safety Lock

The MT56SD features a physical dial to ensure strict management of operating permissions:

3.1 AUTO (Automatic Mode)

Application: Normal operating condition.

Function: Enables automatic reclosing logic after a fault.

Safety Interlock: If on-site personnel manually trip the circuit breaker, the system interprets this as a maintenance request and automatically enters "Safety Lockout Mode," **prohibiting remote closing commands** until the switch is manually returned to the ON position.

3.2 MANU (Manual Mode)

Application: Remote dispatch scenarios.

Function: Disables the automatic re-engagement feature.

3.3 LOCK (Mechanical Lock Mode):

Application: Power-off maintenance.

Function: Locked by sliding the panel switch downward; supports a **4mm padlock**.

In the locked state, both electrical and manual operations are physically blocked, fully complying with **LOTO (Lockout-Tagout)** safety standards.

4 Automatic Reclosing Function

4.1 Automatic Reclosing Strategy

MT56SD High-Availability 24H Monitoring (Professional-Grade 24-Hour Self-Healing Mode)

This mode is specifically designed for unmanned sites in harsh environments where manual maintenance costs are extremely high (such as communication base stations and photovoltaic power plants). Its core logic lies in utilizing a 24-hour monitoring window to capture line self-healing opportunities through an insulation pre-inspection mechanism.

- **Reclosing Logic Sequence:**

1. Rapid Response Phase: The first three pre-test reclosings are performed 10 seconds, 1 minute, and 3 minutes after tripping, respectively, to address transient faults.

2. Long-term monitoring phase: If the first three attempts fail, the system enters a 30-minute fixed-interval detection cycle, continuing to attempt 45 times.

- **Total number of attempts (NR):** 48.

- **Total cycle duration:** Approximately 23 hours, enabling nearly 24-hour automatic patrols.

- **Insulation Pre-test Mechanism:** Insulation testing must be a prerequisite for every closing operation:

- Logic criteria: At the end of each round of the 48-attempt cycle, the module must first measure the line-to-ground insulation resistance.

- Action determination: If $R_d < 15 \text{ k}\Omega$ is detected (using the 30 mA model as an example), the system determines that the fault has not been cleared, skips the current closing operation, and continues waiting for the next timing cycle.

- Conclusion: The physical closing operation is executed only when $R_d > 23 \text{ k}\Omega$.
- **Permanent Fault Determination Time: (Short-Circuit Detection)**
 - If a trip occurs again within **<700 ms** after reclosing, the system will determine it to be a permanent fault and enter a program lockout state, requiring manual or command reset.

4.2 Reclosing Process *(Redrawn on 2026-03-16)*

5 LED Indication Logic

The module panel integrates multi-color LEDs to provide real-time feedback on the device's operating status:

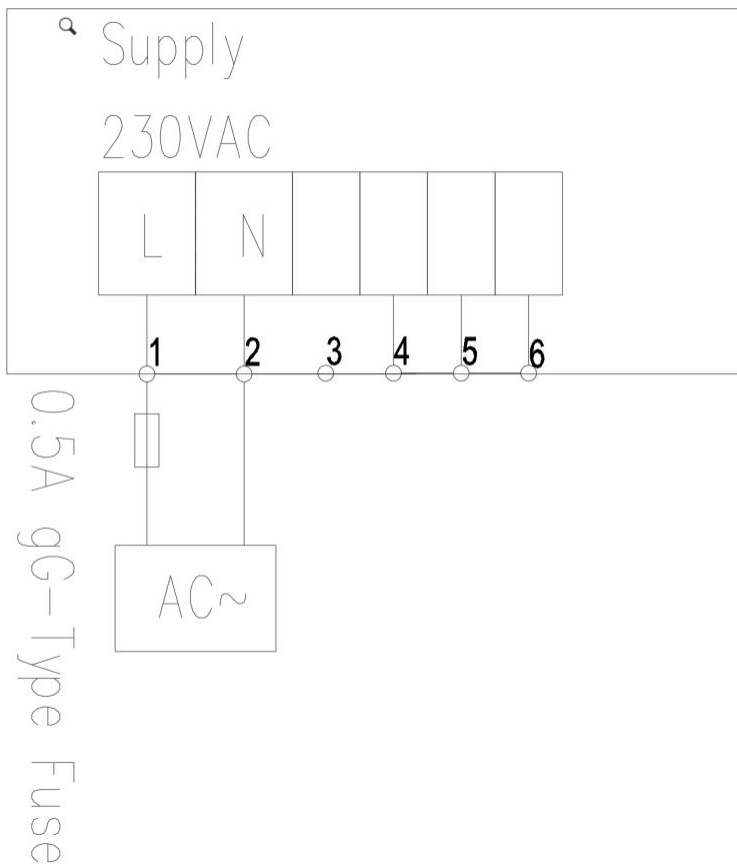
Status	Indicates
● Solid Green Light	AUTO mode, normal operation
● Green light flashing	MANU mode, waiting for manual or communication control
● Red light flashing	Reclosing timing sequence in progress
● Red light steady	A permanent fault has been detected or the maximum number of reclosing attempts has been reached; the system is locked out
● Yellow light steady	The device is in a mechanical lockout state
● Yellow light flashing	Device insulation test failure

6 Terminal Definitions

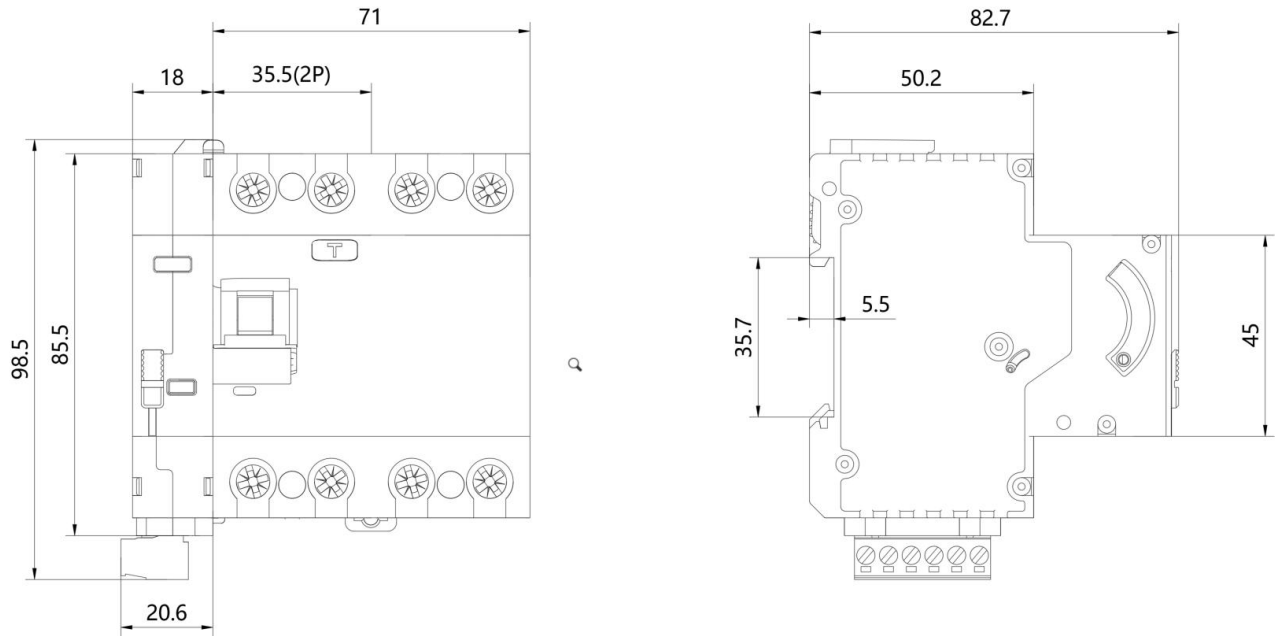
Terminal Number	Function Definition	Description
1, 2	Power Input	230 V AC ($\pm 15\%$)

- Auxiliary Module Connection:** The side expansion port supports connection of up to 2 signal auxiliary modules (OF & SD) for outputting dry contact signals or triggering the local alarm system.

6.1 Wiring Diagram



7



8 Auxiliary Accessories

The MT56 series supports the installation of signal auxiliary modules to feed the switch's real-time status into a monitoring system. The auxiliary card is mounted on **the left side** of the recloser module.

Accessory Name	Model	Core Function	Trigger Conditions
Status auxiliary contacts	OF	Indicates the actual position of the switch	The contacts operate whenever the switch is closed or opened (manual/automatic/fault).
Fault alarm contacts	SD	Abnormal tripping of the feedback circuit	Operates only when the circuit trips due to leakage, short circuit, or overload; does not operate when lights are turned off or power is turned off manually.

8.1 Accessory Features

- Easy installation: Features a side-mounted snap-fit design that allows for

integration with the reclosing module without screws.

- Signal Type: Provides 1 set of changeover contacts (1 NO + 1 NC), supporting connection to a PLC, backend monitoring system, or local buzzer.
- Width Requirement: Each module occupies 0.5 module units (9 mm).

8.2 Typical Wiring Recommendations

- OF Contact: Connect to the monitoring center to indicate whether "remote closing was successful."
- SD contact: Connect to an alarm light to notify maintenance personnel that "a line fault has occurred and requires inspection."

9 EMC Standards

Testing	Basic Standards	Test Level Description
Electrostatic Discharge Immunity (ESD)	IEC 61000-4-2	Level 3 8 kV air, 6 kV contact
Radio Frequency Electromagnetic Field Immunity (RS/RFI)	IEC 61000-4-3	Level 3 10 V/m, 80 MHz - 1000 MHz
Electrical Fast Transient (EFT)	IEC 61000-4-4	Level 2 2 kV (power line), 5/50 ns
Surge immunity	IEC 61000-4-5	Level 3 4 kV common-mode, 2 kV differential-mode
Conducted immunity (CS)	IEC 61000-4-6	Level 2 3 V, 150 Ω, 0.15 - 80 MHz
Power frequency magnetic field immunity	IEC 61000-4-8	Level 4 30 A/m, continuous wave
Less than 150 Common-mode conducted disturbance within the frequency range	Test values taken from IEC 61000-4-16	Test segment Level 3

Insulation Monitoring Recloser_MT56SD_Product Manual

Radiated emissions (EMI) RE	EN 55022 / CISPR 22	Class B
Conducted emissions CE	EN 55022 / CISPR 22	Class B