

**LIGHTNING SURGE PROTECTOR FOR
RS-485 / RS-422 (life monitor)**

MODEL **MDW2A-4R**

BEFORE USE

Thank you for choosing M-System. Before use, please check contents of the package you received as outlined below. If you have any problems or questions with the product, please contact M-System's Sales Office or representatives.

■ PACKAGE INCLUDES:

Surge protector (Head element and Base).....(1)

■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

■ INSTRUCTION MANUAL

This manual describes necessary points of caution when you use this product, including installation, connection and basic maintenance procedures.

LIMITATION APPLICABLE TO M-RESTER

The M-RESTER will protect electronics equipment from damage caused by lightning by absorbing most of the surge voltages.

However, M-RESTER may not be effective against certain extremely high voltages caused by a direct or almost direct hit by lightning.

M-RESTER must be installed according to this installation / instruction manual.

GENERAL

■ FUNCTION & FEATURES

- Designed specifically for RS-485 or RS-422 transmission line
- Life monitor function helps you to decide when you should replace the M-RESTER; reduces maintenance and prevents downtime
- LED indicator and alarm contact output indicate the degradation and life span of the surge protection circuits

■ SPECIFICATIONS

	BETWEEN LINES	LINE TO SG	LINE TO GROUND
Discharge voltage	±5V 7 to 8	5V 7 / 8 to 9	±160V (7 / 8 / 9 to G)
Max. surge voltage*	±25V 4 to 5	25V 4 / 5 to 6	±600V (4 / 5 / 6 to G)
Leakage current	≤ 0.2mA @±5V 7 to 8	≤ 0.2mA @5V 7 / 8 to 9	≤ 10µA @±160V (7 / 8 / 9 to G)
Response time	≤ 4 nsec.	≤ 4 nsec.	≤ 20 nsec.
Capacitance (approx.)	500 pF @10 kHz	500 pF @10 kHz	100 pF @10 kHz
Discharge current	5000A (8 / 20 µsec.)		
Max. load current	100mA		
Internal series resist.	approx. 5Ω including return		
Max. line voltage	±5V		
Input attenuation	-1 dB max. @DC...1 MHz, Z ₀ = 110Ω		

*The maximum voltage that could pass through M-RESTER. Protected equipment must be able to withstand this voltage for a very short time period.

POINTS OF CAUTION

■ POWER INPUT RATING & OPERATIONAL RANGE

- Locate the power input rating marked on the product and confirm its operational range as indicated below:
100 – 240V AC rating: 85 – 264V, 47 – 66 Hz,
approx. 3VA at 100V AC
approx. 4VA at 200V AC
approx. 5VA at 240V AC
24V DC rating: 24V ±10%, approx. 2W
110V DC rating: 85 – 150V, approx. 2W

■ GENERAL PRECAUTIONS

- Before you remove the unit from its base socket or mount it, turn off the power supply and the signal for safety.

■ ENVIRONMENT

- Indoor use.
- When heavy dust or metal particles are present in the air, install the unit inside proper housing and ventilate it.
- Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
- Environmental temperature must be within -5 to +55°C (23 to 131°F) with relative humidity within 30 to 90% RH in order to ensure adequate life span and operation.
- Be sure that the ventilation slits are not covered with cables, etc.

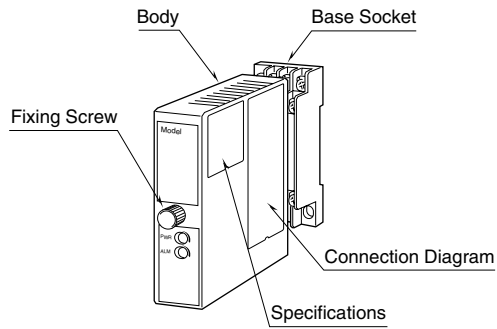
■ WIRING

- Do not install cables close to noise sources (relay drive cable, high frequency line, etc.).
- Do not bind these cables together with those in which noises are present. Do not install them in the same duct.

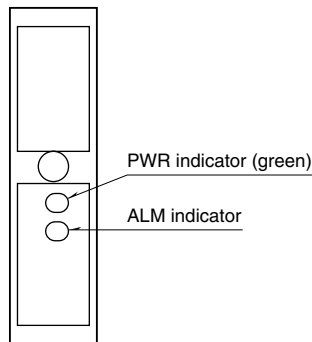
■ AND

- The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.
- Lightning surge can enter not only through signal lines but also through power supply lines. We recommend that you also use the surge protectors for power line for sufficient protection.

COMPONENT IDENTIFICATION



FRONT VIEW



PWR indicator (green)

The green LED turns on while the power is supplied; turns off when the power supply is removed.

ALM indicator

The tricolor LED turns off, then on in green, amber, and red according to the unit status.

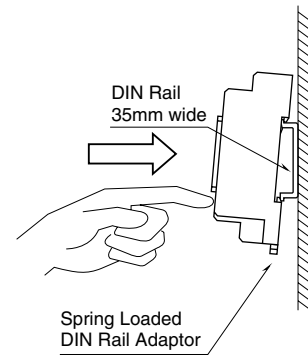
- 1) Remains OFF when the power supply is first turned on.
- 2) Green: The unit has received one or more surges. (The LED does not turn on when the power is not supplied.)
- 3) Amber: Replacement is recommended.
- 4) Red: The life span has ended. Replace the unit immediately. The alarm contact is turned on.

INSTALLATION

Loosen the fixing screw at the front of the unit in order to separate the body from the base socket.

DIN RAIL MOUNTING

Set the base socket so that its DIN rail adaptor is at the bottom. Position the upper hook at the rear side of base socket on the DIN rail and push in the lower. When removing the socket, push down the DIN rail adaptor utilizing a minus screwdriver and pull.



WALL MOUNTING

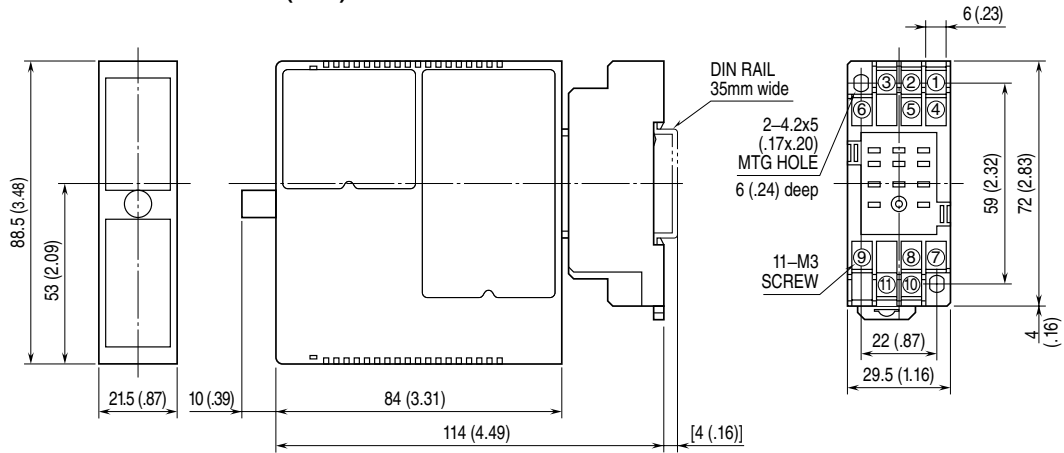
Refer to "EXTERNAL DIMENSIONS."

TERMINAL CONNECTIONS

Connect the unit as in the diagram below or refer to the connection diagram on the side of the unit.

Be sure to make cross-wiring as shown in "GROUNDING". If the protected equipment is not provided with a G terminal, ground only this unit's G terminal.

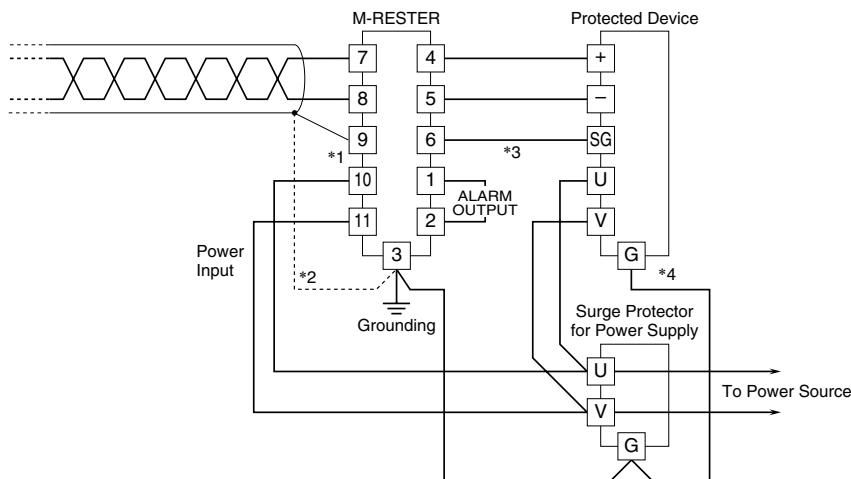
EXTERNAL DIMENSIONS unit: mm(inch)



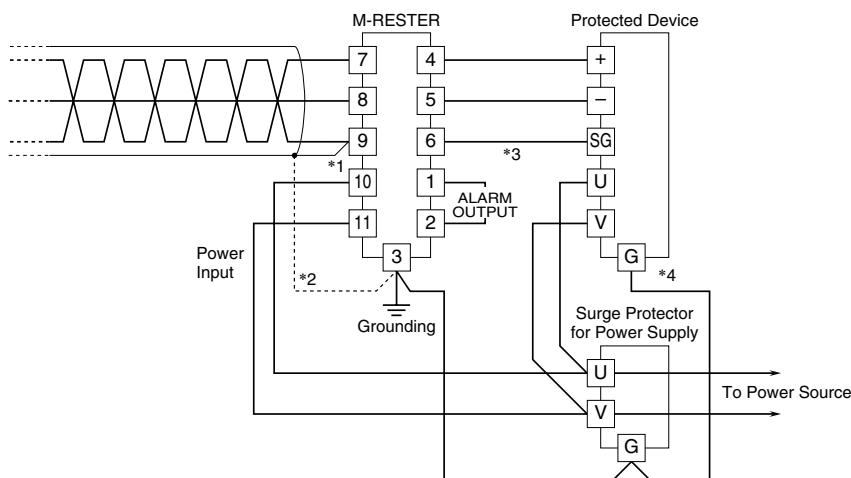
• When mounting, no extra space is needed between units.

CONNECTION DIAGRAM

DUAL-CORE CABLE

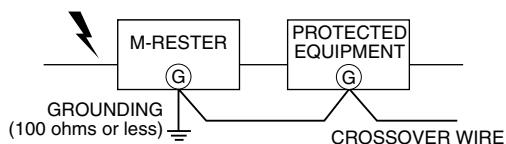


TRIPLE-CORE CABLE



- *1. No need of this part of the wiring if the cable has no shield.
- *2. Ground the shield via Terminal 3 if necessary.
- *3. No need of wiring to Terminal 6 if the protected device has no SG (Signal Ground) Terminal.
- *4. Cross wire from the protected device's G terminal to the surge protector's Terminal 3.
If the protected device has no G terminal, ground only the surge protector.

■ GROUNDING



A crossover wire between M-RESTER ground and the ground or metallic housing of the equipment is required for protection. If the protected equipment has no ground terminal, ground the M-RESTER only.

WIRING INSTRUCTIONS

■ SCREW TERMINAL

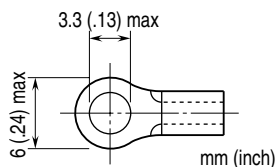
Torque: 0.8 N·m

■ SOLDERLESS TERMINAL

Refer to the drawing below for recommended ring tongue terminal size. Spade tongue type is also applicable.

Applicable wire size: 0.25 to 1.65 mm² (AWG 22 to 16)

Recommended manufacturer: Japan Solderless Terminal MFG.Co.Ltd, Nichifu Co.,Ltd



CHECKING

- 1) Terminal wiring: Check that all cables are correctly connected according to the connection diagram.
- 2) Power input voltage: Check voltage across the terminal 10 – 11 with a multimeter.

The life monitor may be judged incorrectly if the supply voltage is too low. Confirm that the voltage is within the rated voltage range.

MAINTENANCE

While the ALM LED is green, regular inspections are recommended.

When it is turned to amber, replacement of the unit is recommended.

When it is turned to and remain red, replace the unit immediately.

CAUTION

Before replacing the unit, be sure to turn off the power supply for safety. Other factors such like an alarm system connected to the line should also be considered.

The life monitoring circuit remain alive due to the internal backup power even when the external power supply is removed. The LED is turned off in that case. The backup power is normally effective for approximately one week depending upon environmental conditions.