

**LIGHTNING SURGE PROTECTOR FOR POWER SUPPLY USE
(10A; high speed/high discharge current capacity)**

MODEL

MMAH

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:

Lightning surge protector.....(1)

■ MODEL NO.

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

■ INSTALLATION / INSTRUCTION MANUAL

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

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.

POINTS OF CAUTION

■ 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 apply physical impact to the unit.
- 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.

■ DIELECTRIC STRENGTH TEST

- The discharge element incorporated in the M-RESTER is grounded to its housing. Therefore, **DO NOT CONDUCT A DIELECTRIC STRENGTH TEST.** If you do, the element installed across the line and ground will start discharging.

■ RATED CURRENT

- Be sure that the rated current of protected equipment does not exceed the maximum load current specification of the MRESTER.
- Be sure to install a breaker which matches the current rating at the power source side of the M-RESTER.

■ AND

- We recommend that you keep spare M-RESTERs so that you can replace them when necessary.

GENERAL

■ DESCRIPTIONS

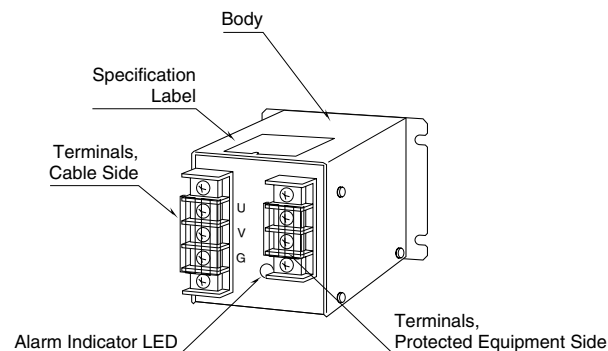
The MMAH protects electronic equipment from induced lightning surges entering through power cables. Even when surges exceeding the MMAH's discharge current capacity hit it, it still protects the equipment, however, the insulation of the discharge element may fail. In this case the fuse is blown and the green Alarm LED turns off. Replacing the M-RESTER is recommended because the maximum surge voltage between lines increases up to 800V.

■ SPECIFICATIONS

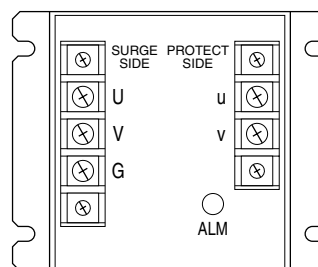
	BETWEEN LINES		LINE TO GND
	MMAH-100	MMAH-200	
Discharge voltage	190V min.	400V min.	680V min.
Max. surge voltage*	350V max.	750V max.	800V max.
Leakage current	≤4mA @150V DC	≤4mA @300V DC	≤0.1mA @300V DC
Response time	4 nanosec.		
Discharge current	20000A (8 / 20 μsec.)		
Max. load current	10A		
Internal series resist.	≤0.5Ω including return		

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

COMPONENT IDENTIFICATION



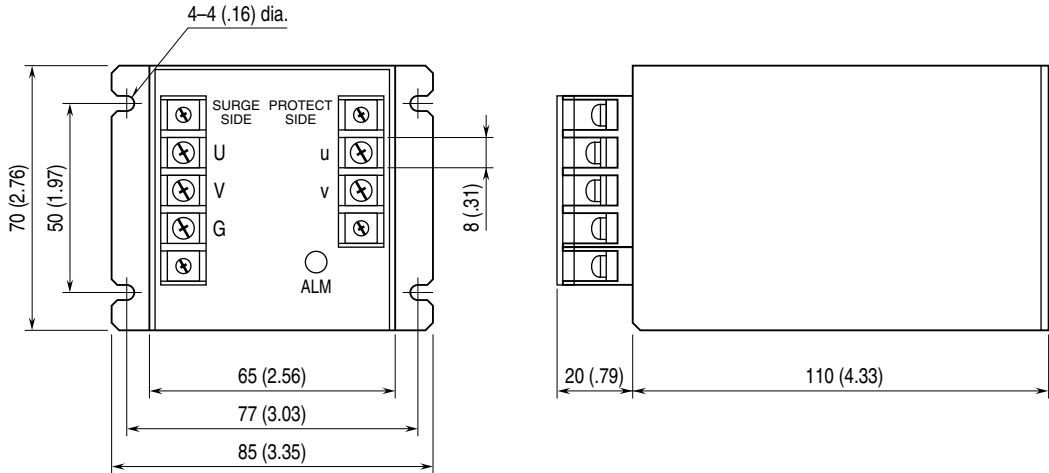
■ FRONT PANEL CONFIGURATION



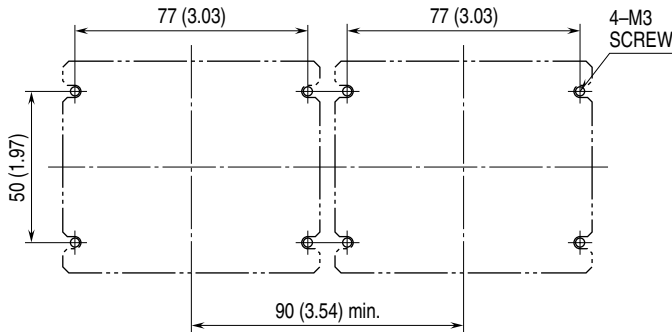
INSTALLATION

Refer to the drawings below.

■ EXTERNAL DIMENSIONS unit: mm (inch)



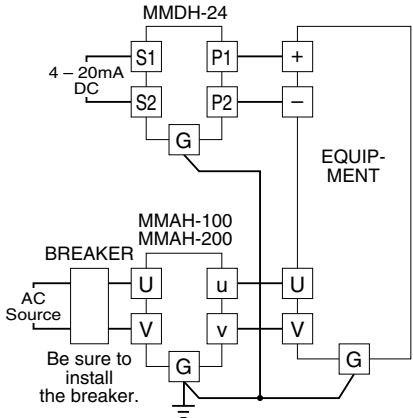
■ MOUNTING REQUIREMENTS mm (inch)



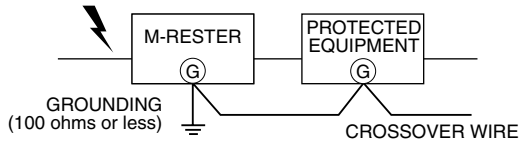
TERMINAL CONNECTIONS

Connect the unit as in the diagram below.

Be sure to cross-wire between the Ground terminal (G) and metallic housing of the protected equipment. (100Ω max.)



■ GROUNDING



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

MAINTENANCE

Check M-RESTER periodically. Many cases of lightning are ignored, and even lightning at a far distance often causes inductive surges.

We recommend that you check your M-RESTER about twice a year, before and after the rainy season. Check whenever you experience a strong lightning occurrence.

Checking procedure is explained in the following:

■ CHECKING

WIRING

- Make sure that wiring is done as instructed in the connection diagram.
- Make sure that the Ground terminal (G) is connected to the metallic housing of protected equipment.
- Make sure that the Ground terminal (G) is grounded to earth.

ALARM INDICATOR LED

- Check that the power is supplied.
- When the green LED is off despite that power is supplied, the discharge element may be failed. Replace the M-RESTER.

DISCHARGE FUNCTION

Remove all wiring connected to M-RESTER and test its discharge capability as follows:

- Check resistance across the following terminals (infinite standard).

Terminals (U) – (V), (U) – (G), (V) – (G)

- Check that discharging occurs across the following terminals with a 1000V DC megger. (Indicator of the megger reaches over-scale.)

Terminals (U) – (V), (U) – (G), (V) – (G)

LEAKAGE CURRENT (between lines)

Apply supply voltage across the terminals (U) – (V) with no load, and measure current at the terminal (U). ($\leq 5\text{mA}$ standard)

- If any of the above tests shows negative, replace the MRESTER.