

# INSTRUCTION MANUAL

## LIGHTNING SURGE PROTECTOR FOR POWER SUPPLY USE (DC power use)

MODEL

**MDH**

### BEFORE USE ....

Thank you for choosing us. 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 our sales office or representatives.

#### ■ PACKAGE INCLUDES:

Lightning surge protector (body + base socket) .....(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.

### GENERAL

#### ■ FUNCTION & FEATURES

- Designed specifically for DC power supplies up to 5 amps
- Discharge current capacity 2000A
- Absorbs surges only without affecting instrumentation signal
- Indicator LEDs ON with surge absorber failure
- Fuse provided for detaching the discharge elements

#### ■ SPECIFICATIONS

|                     | BETWEEN LINES        |                  |                  | LINE TO GND       |
|---------------------|----------------------|------------------|------------------|-------------------|
|                     | MDH-12               | MDH-24           | MDH-48           |                   |
| Discharge voltage   | 24V min.             | 50V min.         | 88V min.         | ±380V min         |
| Max. surge voltage* | 70V max.             | 140V max.        | 210V max.        | ±700V max.        |
| Leakage current     | ≤15mA<br>@15V DC     | ≤15mA<br>@30V DC | ≤20mA<br>@70V DC | ≤1mA<br>@±380V DC |
| Response time       | ≤0.1 μsec.           |                  |                  |                   |
| Discharge current   | 2000A (8 / 20 μsec.) |                  |                  |                   |
| Max. load current   | 5A                   |                  |                  |                   |
| Voltage drop        | ≤1V                  |                  |                  |                   |

\*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

#### ■ ENVIRONMENT

- When heavy dust or metal particles are present in the atmosphere, install M-RESTER inside proper housing and ventilate it.
- Do not install the M-RESTER where it is subjected to continuous vibration. Do not apply physical impact to the M-RESTER.
- Environmental temperature must be within -5 to +55°C in order to ensure adequate life span and operation.

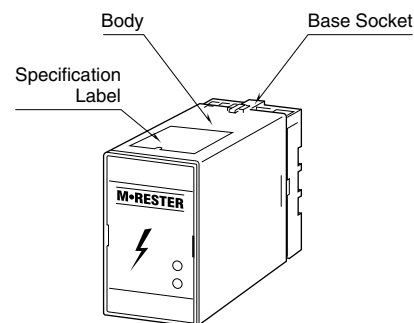
#### ■ WIRING

- Remove cables connected to the ground terminals (2, 3, 6 or 7) from the base socket before conducting a dielectric strength test. Otherwise the element will start discharging at discharge voltage, which can cause insulation failure. Be sure to return the cables as they were after the testing is complete.

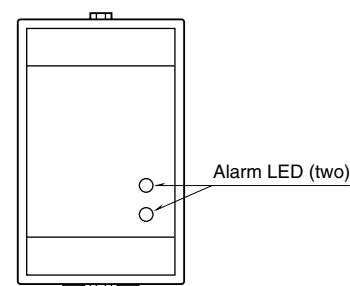
#### ■ RATED CURRENT

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

### COMPONENT IDENTIFICATION



#### ■ FRONT PANEL CONFIGURATION

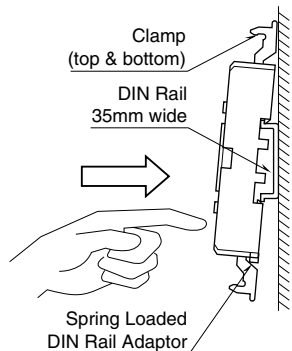


## INSTALLATION

Detach the yellow clamps located at the top and bottom of the unit for separating the body from the base socket.

### ■ DIN RAIL MOUNTING

Set the base socket so that its DIN rail adapter is at the bottom. Hung 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 adapter utilizing screwdriver (-) and pull.

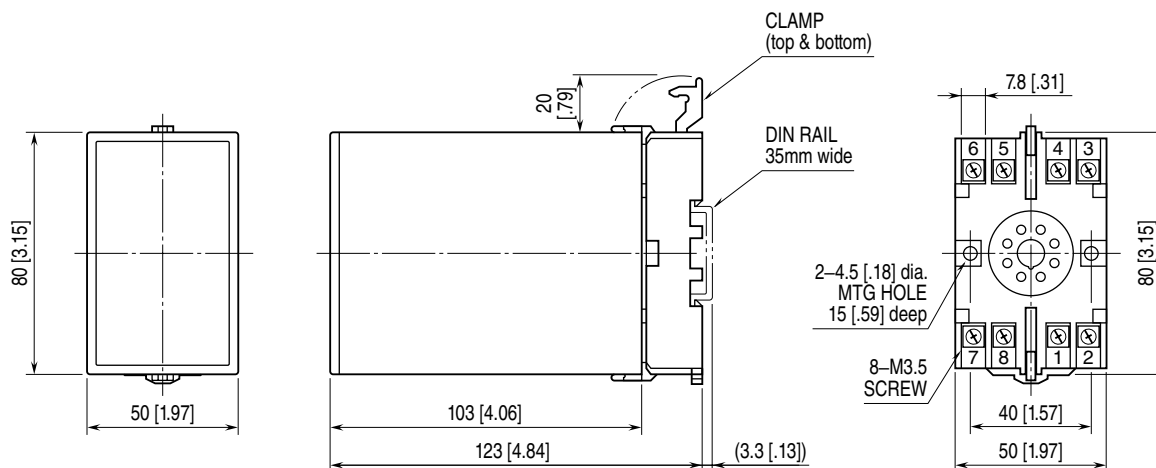


Shape and size of the base socket are slightly different with various socket types.

### ■ WALL MOUNTING

Refer to the drawings below

### ■ EXTERNAL DIMENSIONS mm [inch]

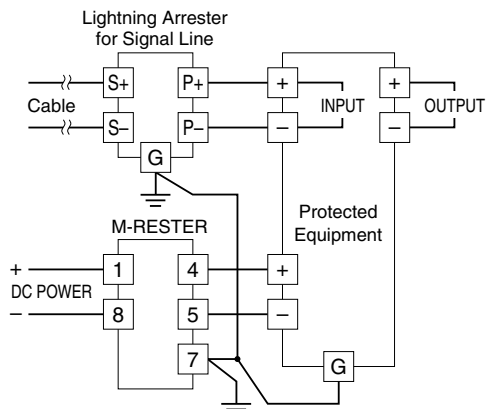


• When mounting, no extra space is needed between units.

## TERMINAL CONNECTIONS

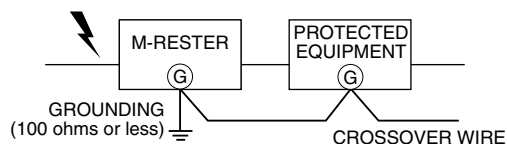
Connect the unit as in the diagram below.

Be sure to cross-wire between the Ground terminal (2 or 7) and metallic housing of the protected equipment. (100Ω max.)



Ground one of the terminals 2, 3, 6 and 7.

### ■ 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.

---

## ALARM INDICATOR LED

The front LEDs turn ON when the power is supplied, and OFF in an abnormality.

When one or more LEDs are OFF, check the following:

- 1) Measure voltage across the power supply terminals with a multimeter.
- 2) When DC power supply is confirmed, replace the M-RESTER with a new one.
- 3) When the voltage is 0V, supply appropriate DC voltage and check the LEDs. If one or more LEDs are OFF, replace the MRESTER with a new one.

---

## MAINTENANCE

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

Even with the alarm indicator LEDs on the MDH unit, 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 (2, 3, 6 or 7) is connected to the metallic housing of protected equipment.
- Make sure that the Ground terminal (2, 3, 6 or 7) is grounded to earth.

### ■ DISCHARGE FUNCTION

Remove all the wires before testing its discharge capability as follows:

- Check resistance across the terminals indicated below. (Indicator of the tester shows  $\geq 10M\Omega$ .)  
(1) – (8), (1) – (2), (8) – (2)
- Check that discharging occurs across the same terminals with a 500V DC megger. (Indicator of the megger shows  $\leq 20M\Omega$ .)
- If any of the above tests shows negative, replace the whole MRESTER unit.