

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..... (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, 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

- 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.

■ DIELECTRIC STRENGTH TEST

- The MAH starts discharging at 380V or more voltage applied across power supply terminals and metallic housing. DO NOT conduct a dielectric strength test with the MAH connected to a power source.
- For confirming insulation of the unit, conduct the dielectric strength test WITH ALL WIRES REMOVED, or conduct an insulation resistance test (@250V DC).

■ 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.

GENERAL

■ FUNCTION & FEATURES

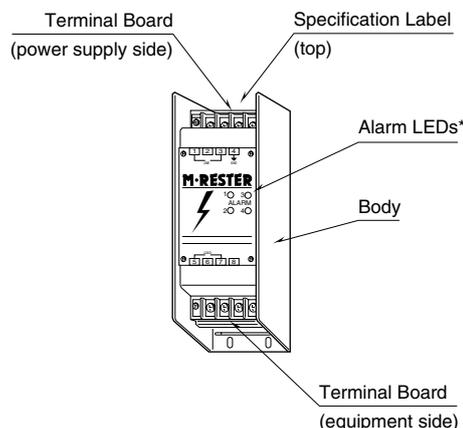
- Designed specifically for AC power supplies up to 20 amps
- Usable for 3-phase/3-wire configuration
- Discharge current capacity 10000A
- Absorbs surges only without affecting instrumentation signal
- Indicator LED turns off with surge absorber anomaly
- Detaching the discharge elements from the power supply circuits when fuses are blown

■ SPECIFICATIONS

	BETWEEN LINES		LINE TO GND
	MAH-121, 123	MAH-221, 223	
Discharge volt. (p-p)	190V min.	380V min.	380V min.
Max. surge voltage*	350V max.	700V max.	700V max.
Leakage current	≤40mA @110V AC	≤40mA @220V AC	≤1mA @220V AC
Response time	≤0.1 μsec.		
Discharge current	10000A (8 / 20 μsec.)		
Max. load current	20A		
Voltage drop	≤1V (50/60 Hz)		

*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



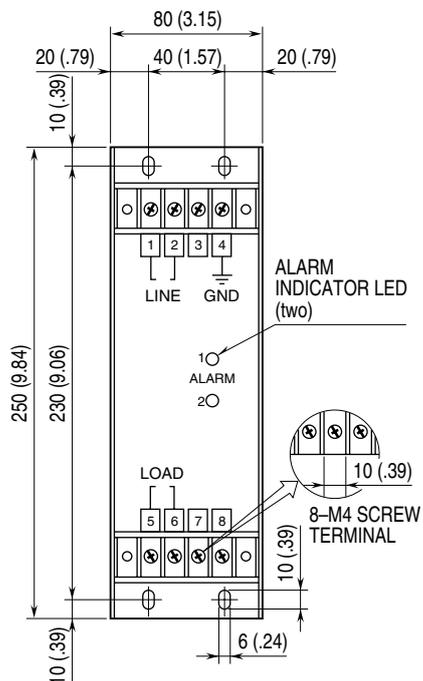
*Two LEDs for two-wire power line

INSTALLATION

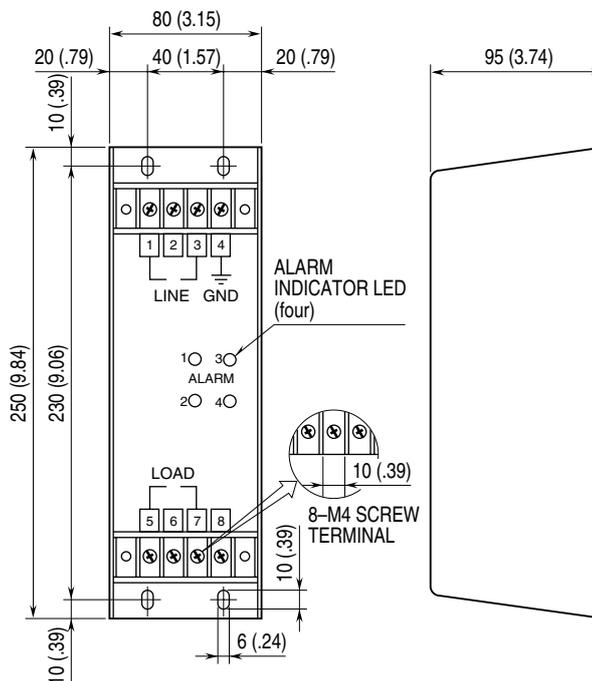
Refer to the drawings below.

■ DIMENSIONS mm (inch)

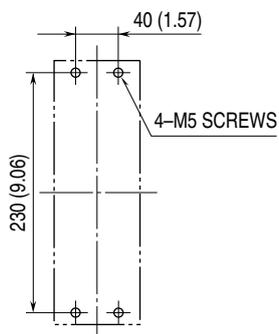
■ 2-WIRE



■ 3-WIRE



■ MOUNTING REQUIREMENTS mm (inch)

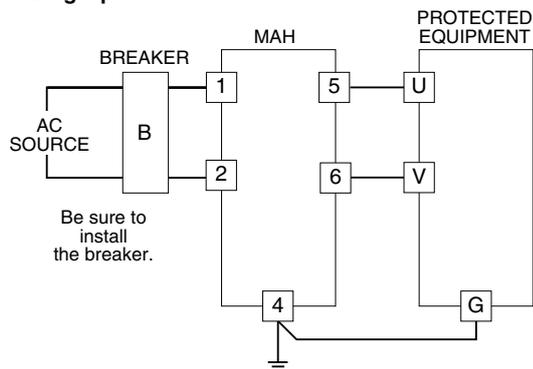


TERMINAL CONNECTION

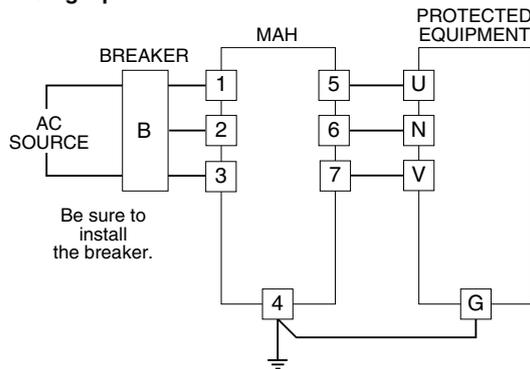
Connect the unit as in the diagram below.

Be sure to cross-wire between the Ground terminal (4) and metallic housing of the protected equipment. (100Ω max.)

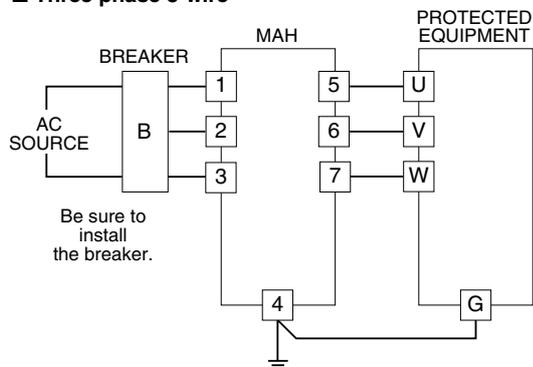
■ Single phase 2-wire



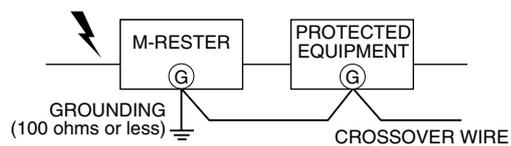
■ Single phase 3-wire



■ Three phase 3-wire



■ 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 M-RESTER according to the checking procedure in the following section.

Before checking the M-RESTER, be sure to turn off the breaker at the power supply side of the M-RESTER for protecting from an electrical shock.

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 MAH 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 (4) is connected to the metallic housing of protected equipment.
- Make sure that the Ground terminal (4) is grounded to earth.

ALARM INDICATOR LED

- Supply appropriate AC voltage through the M-RESTER and check the LEDs.
- When one or more LEDs are off despite that power is supplied, replace the M-RESTER.

DISCHARGE FUNCTION

Turn off the power supply and remove all wiring connected to M-RESTER before testing its discharge capability as follows:

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

MAH-121 Terminals (1) – (2), (1) – (4), (2) – (4)

MAH-221 Terminals (1) – (2), (1) – (4), (2) – (4)

MAH-123 Terminals (1) – (2), (2) – (3)

(1) – (4), (2) – (4), (3) – (4)

MAH-223 Terminals (1) – (2), (2) – (3), (1) – (3)

(1) – (4), (2) – (4), (3) – (4)

- Check that discharging occurs across the same terminals with a 500V DC megger. (Indicator of the megger reaches over-scale.)
- If any of the above tests shows negative, replace the M-RESTER.