

INSTRUCTION MANUAL

LIGHTNING SURGE PROTECTOR FOR POWER SUPPLY USE (5A; high discharge current capacity)	MODEL	MAX
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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
- (body + base socket + surge absorber element)..... (1)

■ MODEL NO.

Confirm that the model number described on the product is 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 AC power supplies up to 5 amps
- Discharge current capacity 10000 A
- Absorbs surges only without affecting instrumentation signal
- No power supply interruption even when the surge absorber is broken
- Relay contact turns ON with surge absorber failure
- Surge absorber element replaceable without power interruption

■ SPECIFICATIONS

	BETWEEN LINES		LINE TO GND
	MAX-100	MAX-200	
Discharge voltage (p-p)	190 V min.	410 V min.	640 V min.
Max. surge voltage*	350 V max.	700 V max.	800 V max.
Leakage current	≤ 1 mA @ 150V DC	≤ 1 mA @ 300V DC	≤ 1 mA @ 300 V DC
Response time	≤ 0.01 μsec.		
Discharge current	10000 A (8 / 20 μsec.)		
Max. load current	5 A		
Internal series resist.	≤ 0.5 Ω 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.

POINTS OF CAUTION

■ ENVIRONMENT

- Indoor use.
- 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 -10 to +55°C (14 to 131°F) with relative humidity within 30 to 90% RH in order to ensure adequate life span and operation.

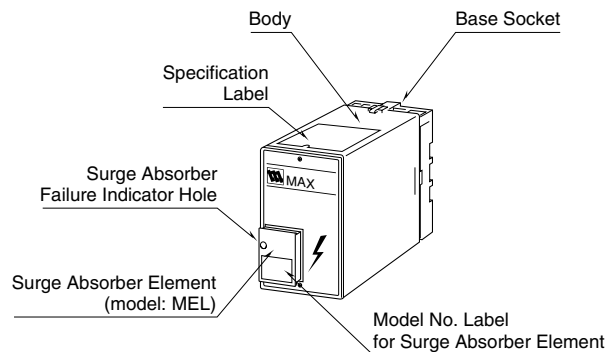
■ WIRING

- Remove cables connected to the ground terminals (2 or 7) from the base socket before insulation 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.

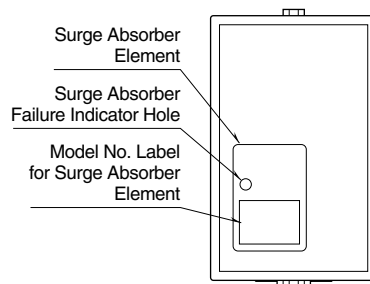
■ RATED CURRENT

- 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



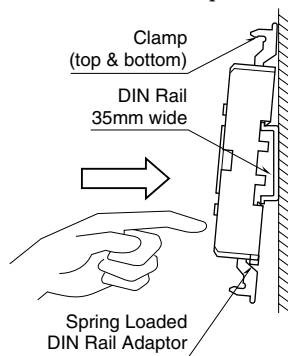
Model suffix code of the surge absorber element (model: MEL) changes according to the line voltage. Use correct model and suffix code when ordering.

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.

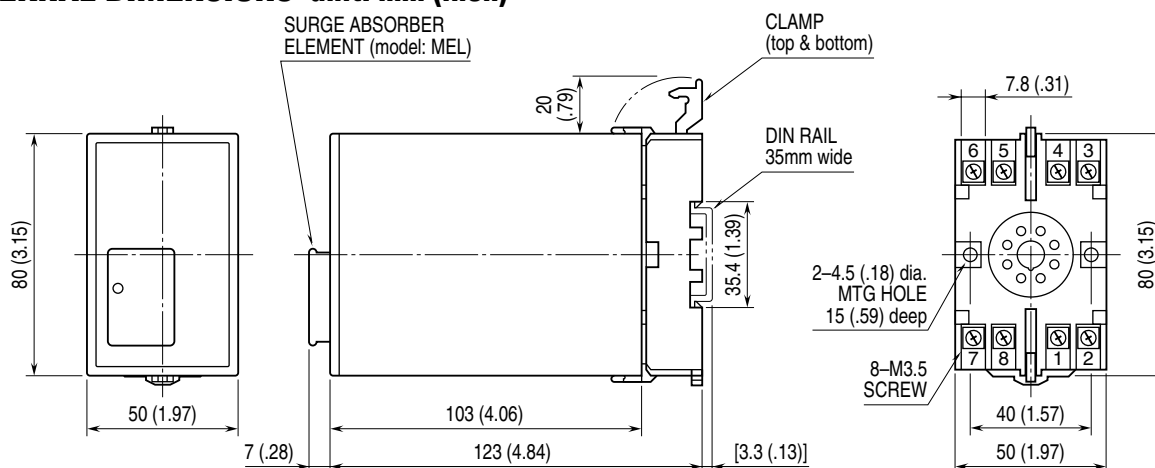
■ WALL MOUNTING

Refer to the next drawings.

■ GROUNDING

A cross-over wire between M-RESTER and ground or metallic

EXTERNAL DIMENSIONS unit: mm (inch)

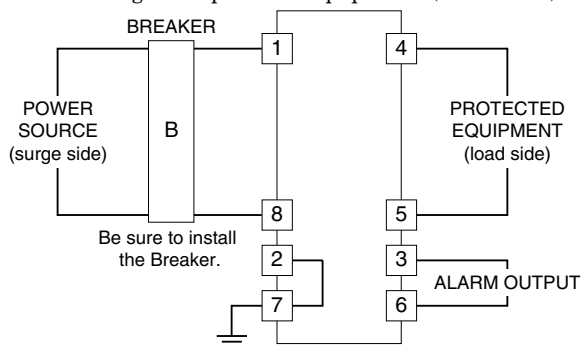


•When mounting, no extra space is needed between units.

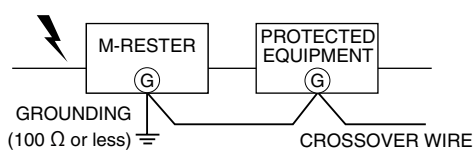
TERMINAL CONNECTIONS

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. (100 Ω max.)



■ GROUNDING



A crossover wire between M-RESTER ground and the ground or metallic housing of the equipment is required for protection.

SURGE ABSORBER ELEMENT

When a strong lightning surge exceeding discharge current capacity of lightning arrester enters to power supply cables, conventional lightning arrester cuts off the supply line with its fuse blown in order to prevent ignition.

The model MAX is designed to separate its surge absorber element (model: MEL) from power supply lines when there is anomaly with the element. It ensures no interruption of power supply and thus the plant itself.

The MEL indicates its failure with contact output (ON) and front indicator (turns white). In such condition, maximum surge voltage may be up to 800 V. Replacing the MEL as soon as possible is recommended.

■ REPLACING THE MEL

Replacing the MEL is very simple without interruption of power supply.

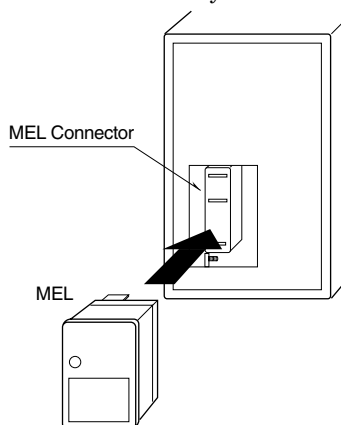
Pull the MEL off from the main body, and replace with a new one. Insert it to the connector. (See the figure below.)

The replacement MEL is available with following model No.

MEL-100: for 100V/110V/120V AC power

MEL-200: for 200V/220V/240V AC power

We recommend that you keep spare MELs so that you can replace them when necessary.



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 (2 or 7) is connected to the metallic housing of protected equipment.
- Make sure that the Ground terminal (2 or 7) is grounded to earth.

ALARM CONTACT AND INDICATOR

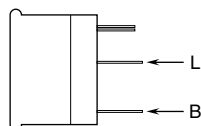
- M-RESTER is designed to protect the equipment even when subjected to a lightning surge exceeding its discharge current capacity to certain extent. However, in such a case, the insulation of its discharge element may fail. When it happens, a relay contact turns ON and the indicator on the front panel of M-RESTER turns white.

Replace the surge absorber element, model MEL according to the procedure described in the left.

DISCHARGE FUNCTION

Remove the MEL and test its discharge capability as follows:

- Check resistance across the terminals (B) – (L) (infinite standard).
- Check that discharging occurs across the same terminals with a 1000 VDC megger. (Indicator of the megger reaches over-scale.)



MEL SIDE VIEW

LEAKAGE CURRENT (between lines)

Return the MEL and apply supply voltage across the terminals (1) – (8) with no load, and measure current at the terminal (1). (≤ 1 mA standard)

- If any of the above tests shows negative, replace the MEL after that you confirm that the main body unit functions properly with the following tests. If the following tests show negative, replace the whole M-RESTER unit.

MAIN BODY UNIT TEST

- Remove the MEL and all wiring and check resistance across the following terminals. ($\leq 0.5 \Omega$ standard)
Terminals (1) – (4), (5) – (8)
- With the MEL and all wiring detached, check resistance across the following terminals. (infinite standard)
Terminals (1) – (8), (1) – (7), (7) – (8)
- Check that discharging occurs across the same terminals with a 1000 VDC megger. (Indicator of the megger reaches over-scale.)