

**LIGHTNING SURGE PROTECTOR FOR
LonWORKS (life monitor, FTT-10A)**

MODEL **MDW5ALW**

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 or 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 the network
- Life monitor function helps you to decide when you should replace the surge protector
- LED and alarm contact output indicate the degradation and life span of the surge protection circuits
- Easy maintenance thanks to discharge elements installed on the element module
- No interruption of signal even unplugging head element
- DIN rail mounting

■ SPECIFICATIONS

- Max. continuous operating voltage (Uc)
Line to line: ±1.5 V
Line to earth: ±100 V
SHLD to earth: ±160 V
- Voltage protection level (Up) @ 4 kV (1.2/50 µsec.)
Line to line: ±30 V
Line to earth: ±370 V
SHLD to earth: ±800 V
- Response time:
Line to line: ≤ 4 nsec.
Line or SHLD to earth: ≤ 20 nsec.
- Leakage current @ max. continuous operating voltage
Line to line: ≤ 50 µA
Line to earth: ≤ 20 µA
SHLD to earth: ≤ 5 µA

- Max. discharge current (Imax)
10 kA (8/20 µsec.)
1.0 kA (10/350 µsec.)
- Nominal current (In): 100 mA
- Internal series resistance:
≤ 3.8 Ω (including return)
≤ 4.2 Ω (for only base, including return)
- Capacitance @ 1 MHz:
Line to line: Approx. 100 pF
Line to earth: Approx. 100 pF
SHLD to earth: Approx. 100 pF

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: 90 – 264V, 47 – 66 Hz,
approx. 2VA at 100V AC
approx. 3VA at 200V AC
approx. 4VA at 240V AC
24V DC rating: 24V ±10%, ≤ 2W
110V DC rating: 85 – 150V, ≤ 2W

■ ENVIRONMENT

- When heavy dust or metal particles are present in the air, install the surge protector inside proper housing with sufficient ventilation.
- Do not install the surge protector where it is subjected to continuous vibration. Do not subject the unit to physical impact.
- 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.
- Be sure that the ventilation slits are not covered with cables, etc.

■ NETWORK SPECIFICATIONS

- This surge protector is applicable to networks which consist only of FTT-10A. Not applicable to the ones connected to Link Power network.
- For detailed information on the network, refer to LonWORKS FTT-10A Free Topology Transceiver User's Guide provided by Echelon.

■ 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.

■ DIELECTRIC STRENGTH TEST

- Loosen the screw that tightens the element and remove the head element from the base before conducting a dielectric strength testing. Otherwise the element will start discharging at a voltage exceeding the max. continuous operating voltage (Uc), which can cause insulation failure of the module.
Be sure to return the element and fasten securely after the test.

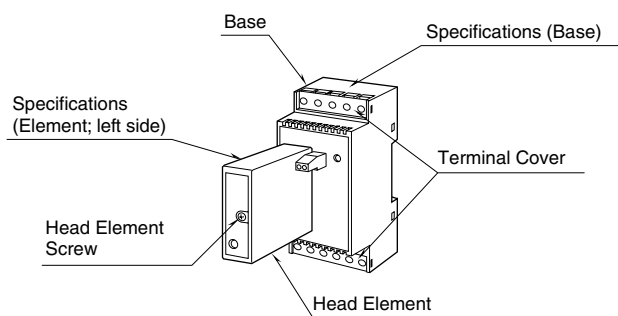
■ BATTERY LIFE

- The battery's life is assured for 10 years from the manufacturing date indicated at the right-top of the specification label.
- The battery continues to discharge even while it is unused. We recommend not to store the Element module for a long period of time.

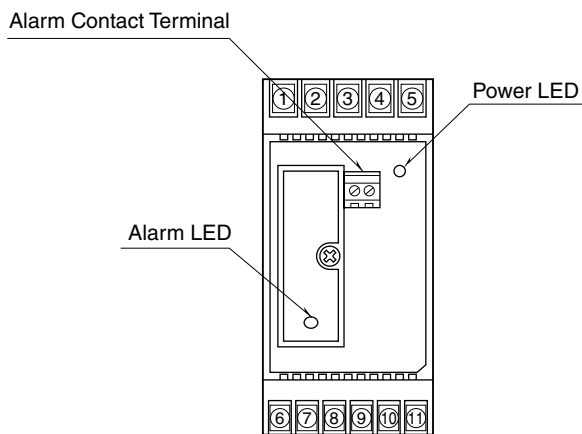
■ AND

- We recommend that you keep spare surge protectors so that you can replace them when necessary.
- 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



The MDW5ALW consists of a head element and base. The head element incorporates surge suppression circuit, life monitoring circuit and a battery for memorizing the life. The base incorporates power circuit and a relay for alarm output. When the surge suppression circuit is damaged or the battery is weakened, replace the head element to recover the surge protector's performance. Replacing the head element does not disturb the communication.

Alarm (ALM) contact terminal

An N.C. (break) contact that closes in the following condition.

- Alarm LED turns on in red, or
- Power LED turns off, or
- The power is not supplied.

Alarm (ALM) LED on head element

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 head element immediately. The alarm contact is turned on.

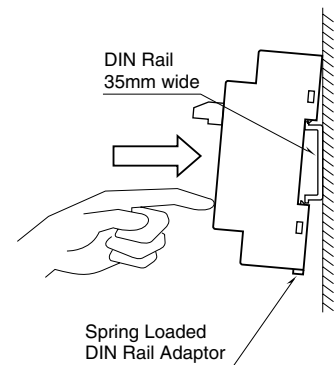
Power (PWR) LED on base

The green LED turns on while the power is supplied; turns off when the power supply is removed or the power circuit is damaged, and the alarm contact turns on. In that case, replace the base immediately.

INSTALLATION

■ DIN RAIL MOUNTING

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

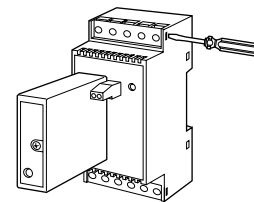


■ MOUNTING HEAD ELEMENT

- Before mounting a head element, remove the sealing label of the base. Insert the head element into the opening of the base and tighten the head element screw.
- To remove the head element, loosen the head element screw, then pull out the element.

■ TERMINAL COVER

- To remove the terminal cover, insert the minus tip of a screw driver into the square hole on the side of base and pull up the cover at the centre of it.



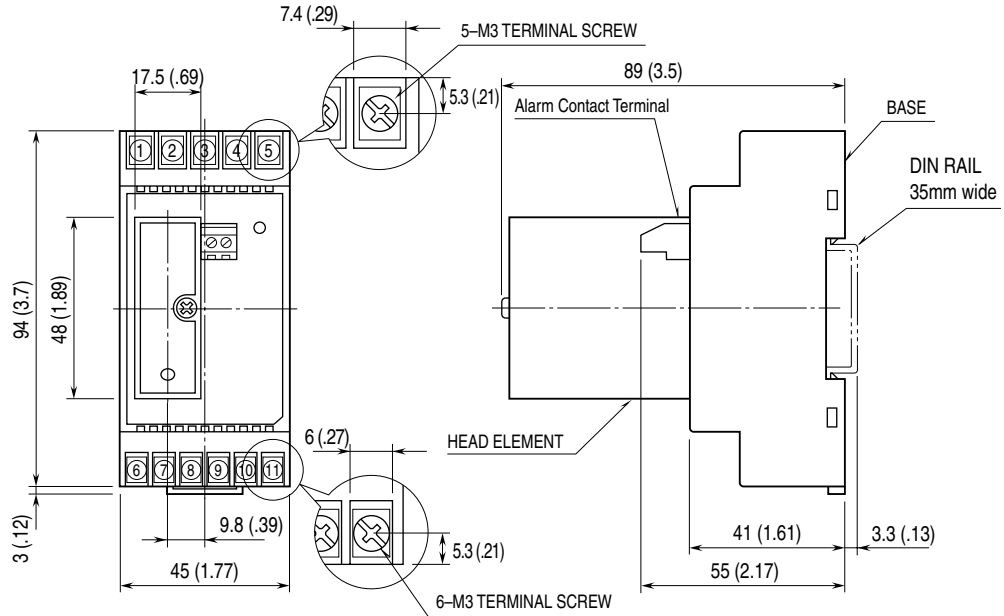
- To attach the cover, insert one projection of the cover into the square hole of the base, then insert the other projection into the opposite square hole with bending the cover. The shapes of covers, for which surge side and device side, are different. Be sure to attach the cover adequately. Be sure to attach the cover in order to prevent electrical shock from power line.

TERMINAL CONNECTION

Connect the unit as in the diagram below.

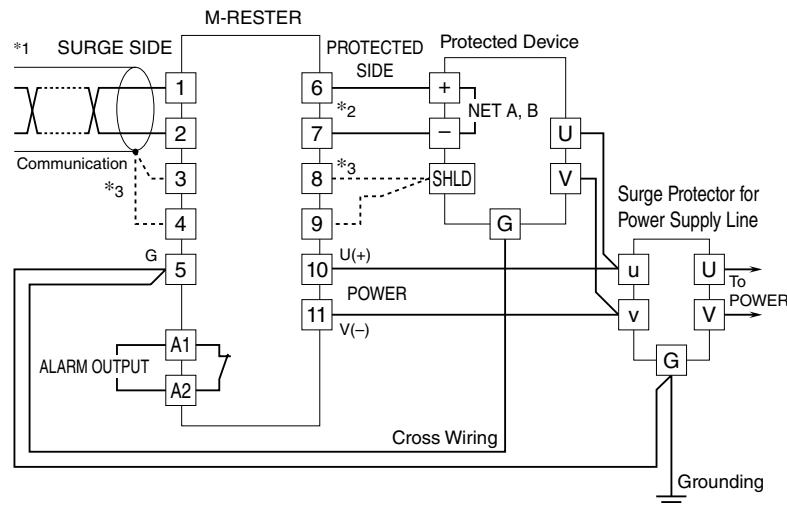
Be sure to cross-wire between the Ground terminal (G) and that of the protected equipment. When the surge protector is connected with a device which has no ground terminal such like M-System's (See figure below), ground the M-RESTER Ground terminal (G) only.

EXTERNAL DIMENSIONS unit: mm (inch)



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

CONNECTION DIAGRAM



*1. Be sure to use twisted-pair cables.

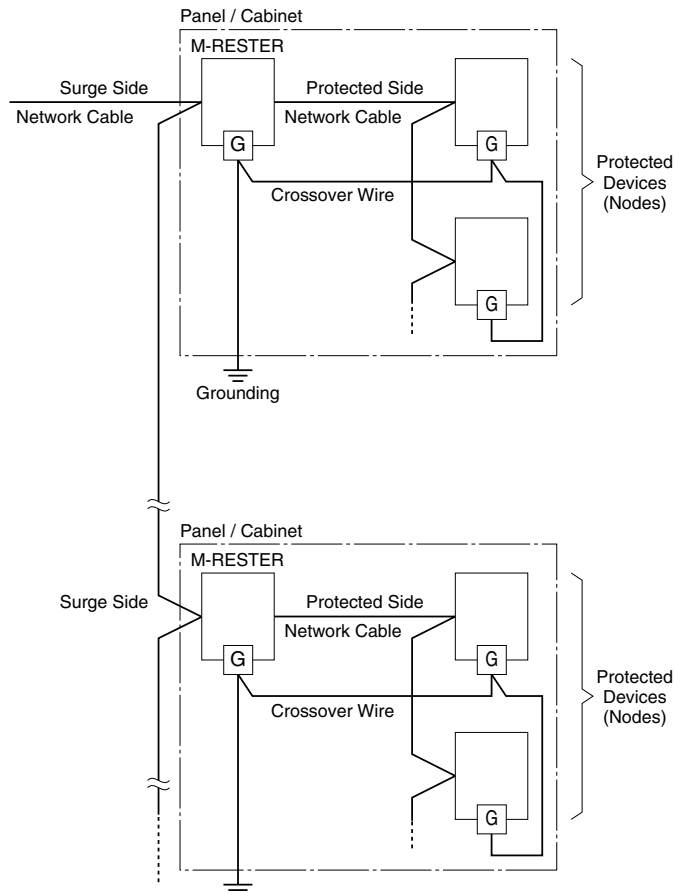
*2. No polarity.

*3. With shielded twisted-pair cables, connect the shield of the cable to the '3' terminal of the M-RESTER for floating, and with the '4' terminal for grounding.

Follow instructions provided with the protected device whether '8' and '9' terminals should be connected or not.

However, if the shield terminal of the protected device is not isolated from NET A / B, DO NOT connect '8' and '9' terminals to the protected device.

NETWORK CONFIGURATION



- The M-RESTER is applicable to networks which consist only of FTT-10A. Not applicable to the ones connected to Link Power network.
- The maximum number of nodes connectable to the network segment is reduced by one when one unit of M-RESTER is added.
- When the distance between nodes are relatively long (e.g. grouped and separated by cabinets), install the M-RESTER by each group of devices. Insert the M-RESTER at the surge side of the network.
- For detailed information on the network, refer to LONWORKS FTT-10A Free Topology Transceiver User's Guide provided by Echelon.

WIRING INSTRUCTIONS

SCREW TERMINAL

Torque: 0.8 N·m

CHECKING

WIRING

- 1) Make sure that wiring is done as instructed in the connection diagram.
- 2) Make sure that the Ground terminal (G) is connected to the metallic housing of protected equipment.
- 3) Make sure that the Ground terminal (G) is grounded to earth.
- 4) 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

HEAD ELEMENT

- When the Alarm (ALM) LED turns on in amber, replacement of the head element is recommended.
- When the Alarm LED turns on in red, the life span has ended. Replace the head element immediately.
- If it is difficult to remove the head element due to deposit between pins and contacts at the connector, or the pins are stained in brown, the base also damaged.

BASE

- If the Power (PWR) LED turns on in any color other than red, replace the base immediately.