

<b>LIGHTNING SURGE PROTECTOR FOR DC POWER SUPPLY (max. 1.2A; ultra-slim)</b>	MODEL <b>MD7DP</b>
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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:**

Surge protector.....(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**

- High discharge current capacity 20 kA (8 / 20 μs), 1 kA (10 / 350 μs)
- Ultra-thin 7-mm-wide module can be mounted in high density
- Excellent protection employing multi-stage SPD circuits
- DIN rail mounting and grounding
- Shield terminal provided

**■ SPECIFICATIONS**

	LINE TO LINE		LINE TO EARTH
	MD7DP-12	MD7DP-24	
Max. continuous operating voltage (Uc)	14V	27V	±160V
Voltage protection level (Up) @4kV (1.2 / 50 μs)	±150V	±170V	±1200V
Leakage current @Uc	≤6mA	≤6mA	≤5μA
Response time	≤4 nsec.	≤4 nsec.	≤20 nsec.
Max. discharge current (Imax)	20kA (8 / 20 μs) 1.0kA (10 / 350 μs)		
Nominal current (In)	1.2A		
Internal series resistance	≤0.8Ω including return		

## POINTS OF CAUTION

### ■ ENVIRONMENT

- Indoor use.
- When heavy dust or metal particles are present in the air, install the unit inside proper housing with sufficient ventilation.
- Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
- Environmental temperature must be within -25 to +85°C (-13 to +185°F) with relative humidity within 30 to 90% RH in order to ensure adequate life span and operation.
- This unit needs a DIN rail as earth grounding bar. Oxide coating of an aluminium rail may lower the electric conductivity between this module and the ground. Use a steel or copper rail.

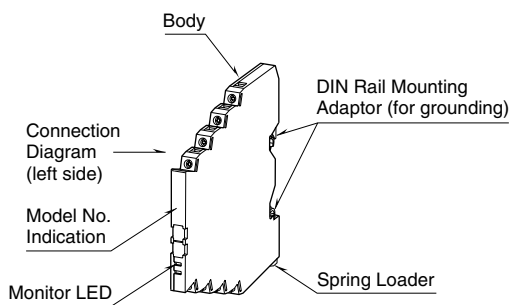
### ■ DIELECTRIC STRENGTH TESTING

- The surge protector starts discharging when 160V or greater voltage is applied between lines and earth. Remove the grounding wire before conducting a test. Be sure to return the wire after the test.

### ■ AND ....

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

## COMPONENT IDENTIFICATION

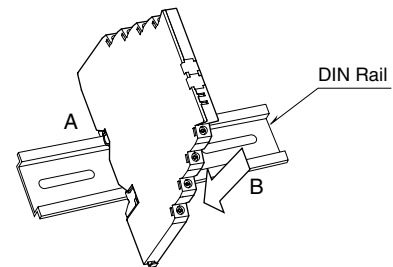


## INSTALLATION

Mount the unit on a DIN rail. Once installed, do not move it to another DIN rail.

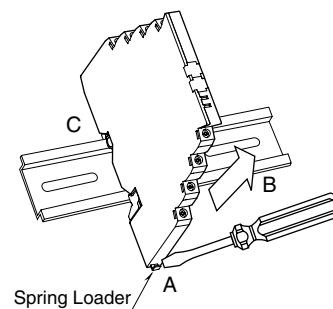
### ■ MOUNTING THE UNIT ON A DIN RAIL

- Hang the upper hook of the DIN rail mounting adaptor at the rear side of unit, on the DIN rail.
- Push in the lower in keeping pressing the unit to the DIN rail.
- DIN rails generally have slight individual variability in size. If you find it difficult to push in the lower part, go back to (A) and hang the upper part more deeply onto the rail and try (B) again.



### ■ REMOVING THE UNIT

- Push down the spring loader utilizing a minus screwdriver.
- Confirm that it is pulled enough down and pull out the lower part of the unit.
- Detach the upper part from the DIN rail.



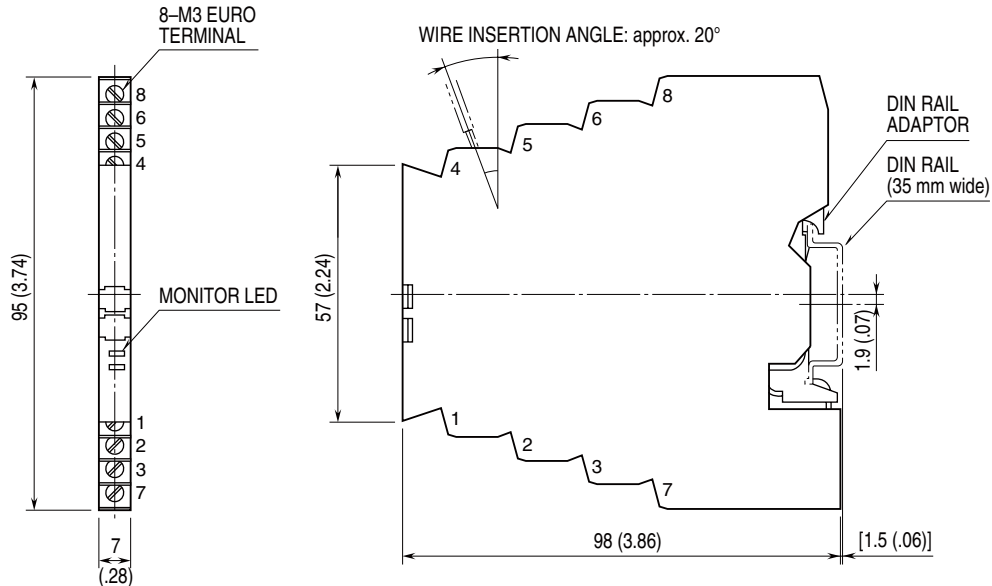
## TERMINAL CONNECTION

Connect the unit as in the diagram below.

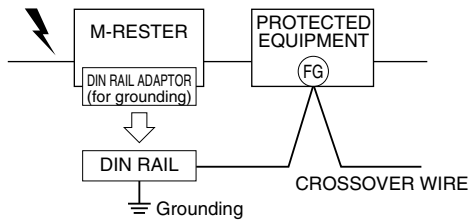
Be sure to ground the DIN rail on which the unit is mounted and cross-wire between the rail and FG terminal of the protected device as shown in Figure 1 in order to equalize the earth potential.

When the unit is connected with a device which has no FG terminal, ground the surge protector only.

### EXTERNAL DIMENSIONS unit: mm (inch)

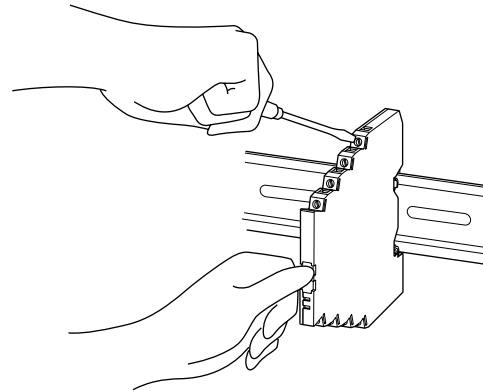


### Figure 1. GROUNDING



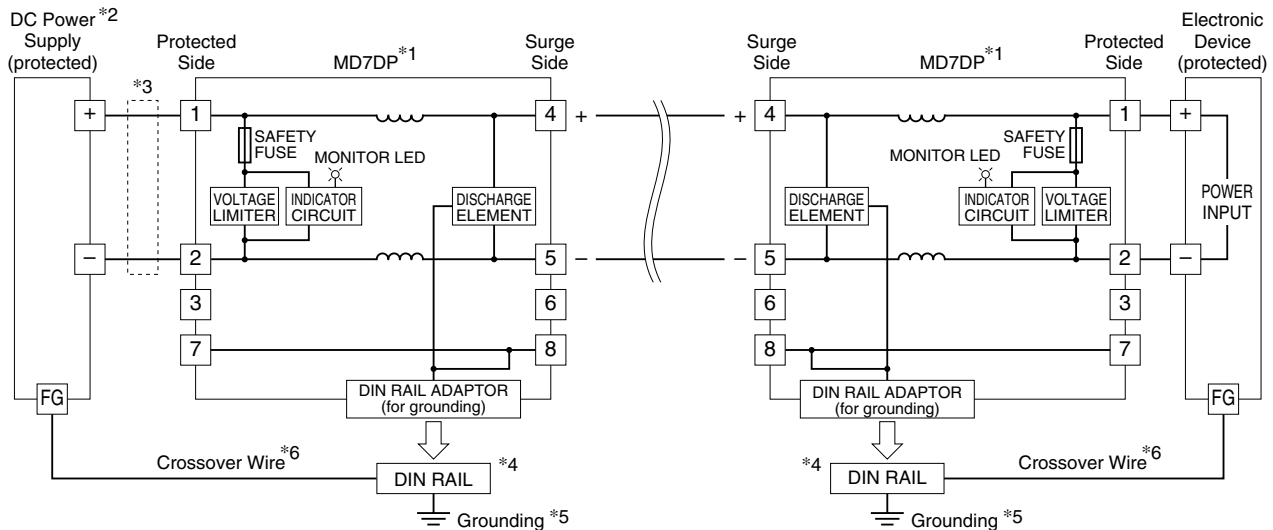
Cross-wire from the DIN rail to the metal housing of the protected device to equalize the ground potential.  
Ground only the surge protector when the protected device has no grounding terminal.

### CAUTION WHEN WIRING



Hold the module steady at the front when you tighten/loosen screw terminals.

## CONNECTION DIAGRAM



- \*1. The MD7DP is not applicable to protect two-wire transmitters. To protect two-wire transmitters, model MD7ST designed to yield only small leakage current is suitable.  
Confirm the polarity of the terminals when connecting this module to a protected device.
- \*2. Use a DC power source with the overload current protection function. (maximum output current 1.2A)
- \*3. Install a current limiting element (capacity 1.2A) when the output current exceeds 1.2A.
- \*4. Oxide coating of an aluminium rail may lower the electric conductivity between this module and the ground.  
Use a steel or copper rail.
- \*5. Be sure to ground the DIN rail. Recommended grounding resistance  $\leq 100\Omega$
- \*6. Cross-wire between the DIN rail and the metal housing of the protected device to equalize the earth potential.  
Ground only the surge protector when the protected device has no ground terminal.

## WIRING INSTRUCTIONS

### EURO TERMINAL

Torque: 0.3 N·m

Applicable wire size: 0.2 – 2.5 mm<sup>2</sup>

Stripped length: 8 mm

## MAINTENANCE

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

We recommend that you check your surge protector 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

- 1) Make sure that wiring is done as instructed in the connection diagram.
- 2) Make sure that the DIN rail is connected to the metal enclosure of protected device.
- 3) Make sure that the surge protector is securely attached to the DIN rail, and that the rail is grounded to earth.

### DISCHARGE ELEMENT

- 1) Front monitor LED

Turn on the power supply and confirm that the LED turns on. If it is off despite that the power is supplied, replace the surge protector.

- 2) Remove all wiring connected to the surge protector when you test the module.
- 3) Check resistance across the following terminals on the high resistance range of multimeter and confirm no conduction.

Terminals (4) – (8), (4) – (DIN rail), (5) – (DIN rail)

The tester should show 10 M $\Omega$  or greater.

- 4) Confirm conduction across the same terminals with a 500 V DC 1000 M $\Omega$  insulation tester. The tester should show 20 M $\Omega$  or less.

Turn on the power supply with no load and measure current flowing into the surge protector. The tester should show 6 mA or less.

- 5) If any of the above tests shows negative, replace the surge protector.