INSTRUCTION MANUAL

DC ALARM
(front control button adjustment)

MODEL **MSEF**

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:

DC alarm (body + base socket + input resistor) .....(1)
Input resistor is provided only with current input type.

■ 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.

POINTS OF CAUTION

⚠ WARNING

- Risk of Electrical Shock: The Front Cover is to be Opened Only by Qualified Service Personnel.
- Before You Remove the Unit from its Base Socket or Mount it, Turn Off the Power Supply and Input Signal for Safety.

■ CONFORMITY WITH EU LVD DIRECTIVE

- This equipment is suitable for Pollution Degree 2, Measurement Category II (output, transient voltage 2500V) and Installation Category II (transient voltage 2500V). Basic insulation (signal input to output to power input: 300V) is maintained. Prior to installation, check that the insulation class of this unit satisfies the system requirements.
- Altitude up to 2000 meters.
- The equipment must be mounted inside a panel.
- The equipment must be installed such that appropriate clearance and creepage distances are maintained to conform to CE requirements. Failure to observe these requirements may invalidate the CE conformance.

■ CONFORMITY WITH EU EMC DIRECTIVE

- Insert noise filters for the power source and the signal I/O connected to the unit. TDK-Lambda Model RSAN-2006, TDK ZCAT 3035-1330 or equivalent is recommended.
- The actual installation environments such as panel configurations, connected devices, connected wires, may affect the protection level of this unit when it is integrated in a panel system. The user may have to review the CE requirements in regard to the whole system and employ additional protective measures* to ensure the CE conformity.
  * For example, installation of noise filters and clamp filters for the power source, input and output connected to the unit, etc.
- Install lightning surge protectors for those wires connected to remote locations.

■ POWER INPUT RATING & OPERATIONAL RANGE

- Locate the power input rating marked on the product and confirm its operational range as indicated below:
  AC power: Rating ±10%, 50/60 ±2 Hz, approx. 3VA
  DC power: Rating ±10%, approx. 3W

■ 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 -5 to +60°C (23 to 140°F) with relative humidity within 30 to 90% RH in order to ensure adequate life span and operation.

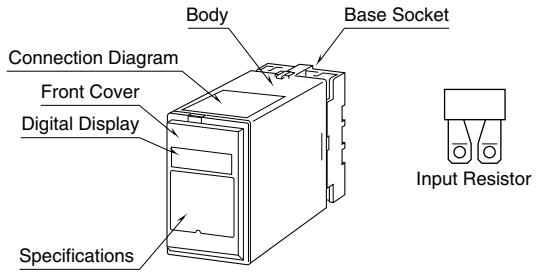
■ WIRING

- 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.

■ AND ....

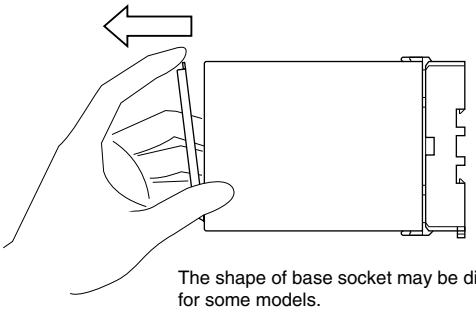
- The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

COMPONENT IDENTIFICATION



■ HOW TO OPEN THE FRONT COVER:

Risk of Electrical Shock: The Front Cover is to be Opened Only by Qualified Service Personnel.
Hang your finger on the hook at the top of front cover and pull.



The shape of base socket may be different for some models.

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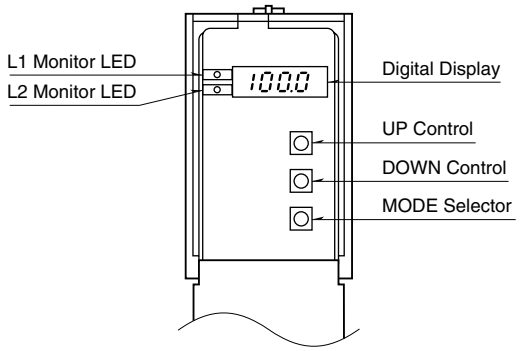
FRONT VIEW & PROGRAMMING



The MSEF has three function modes for checking and programming parameters:

Run mode: Normal operating mode.
Either one or both LEDs are OFF or turned to red.

Check mode: Parameters can be indicated on the display in turn.
Either one or both LEDs turns to green.
Normal output as in the Run mode.

Set mode: Used to change parameters.
Either one or both LEDs turns to red/green.
The output is held at the status just before the MSEF is turned into the Set mode.

- **L1 Monitor LED:** Red: Run mode. Indicates the Output 1 alarm is tripped.
  Green: Check mode. Indicates parameters for the Output 1.
  Red/Green: Set mode. Parameters for the Output 1 is modifiable.

- **L2 Monitor LED**: The L2 LED is for the Output 2.

- **Digital Display**: Run mode: The 4-digit display indicates the input percentage.
  Check/Set mode: Indicates the setting item ID and set values.
  Alarm setpoints are represented in 4-digit numbers. The other items are shown with its item ID (alphanumerical characters) followed by set values.

- **UP/DOWN Controls**: Pressing UP/DOWN Control Button briefly changes parameter in minimum increments.
  Keeping pressing UP/DOWN Control Button increases the speed of change.

- **MODE Selector**: Switches the three function modes and the set items.
  Run ⇒ Check: Press briefly the MODE Selector.
  Run/Check ⇒ Set: Press the MODE Selector for 2 seconds.
  Next item: In Check/Set mode, press briefly the MODE Selector. Items appear in the order shown in the table below. In Check mode, the unit automatically returns to the Run mode after all the items are displayed in turn.
  Set ⇒ Run: Pressing the MODE Selector for 2 seconds stores the parameter modification and return the unit to the Run mode.

■ Programmable items and default settings

	ITEM	L1	L2	DISPLAY	SELECTABLE RANGE	INCRE.	DEFAULT
1	Output 1 trip point	ON	----	-10.0 – 110.0	-10.0 to 110.0%	0.5	80%
2	Output 2 trip point	----	ON				20%
3	Output 1 deadband / latching	ON	----	H 0.5 – H 15.0 HLCH	0.5 to 15.0% *1 Latching enabled / disabled *2	0.5	1.0% Disabled
4	Output 2 deadband / latching	----	ON				
5	Output 1 trip action	ON	----	A H1 A H2	High trip, coil energized at alarm High trip, coil de-energized at alarm	----	H1
6	Output 2 trip action	----	ON	A L1 A L2	Lo trip, coil energized at alarm Lo trip, coil de-energized at alarm	----	L1
7	ON delay time	ON	ON	d 0.5 – d 5.0	0.5 to 5.0 seconds	0.5	0.5 sec.
8	Power ON delay time	ON	ON	Pd 1 – Pd 5	1 to 5 seconds	1	2 sec.

*1. (Hi trip point) – (Deadband) ≥ -14.0 (Lo trip point) + (Deadband) ≤ 113.5
*2. Latching relays are enabled by setting "HLCH" instead of deadband.
In order to reset the relays, turn power supply off and on.

■ HOW TO MODIFY THE PARAMETERS

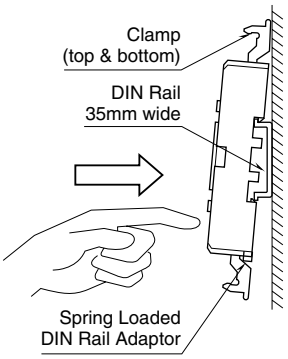
1) Press MODE Selector briefly one or more times until the item you need to modify turns up.
Confirm the set value (Check mode).
2) Press MODE Selector for 2 seconds to turn the unit into the Set mode.
[(1) and (2) can be performed in a reverse order.]
3) Press UP or DOWN Control Buttons until the display shows a desired setting.
4) Repeat (1) and (3) to change more parameters.
5) Keep pressing MODE Selector for 2 seconds to store the setting and return the unit to the Run mode.
If the buttons are left untouched for longer than 20 seconds, the unit automatically returns from the Check/Set mode to the Run mode, however, no parameter change performed in the Set mode is effectuated.

INSTALLATION

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

■ DIN RAIL MOUNTING

Set the base socket so that its DIN rail adaptor is at the bottom. Hang 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 adaptor utilizing a minus screwdriver and pull.



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

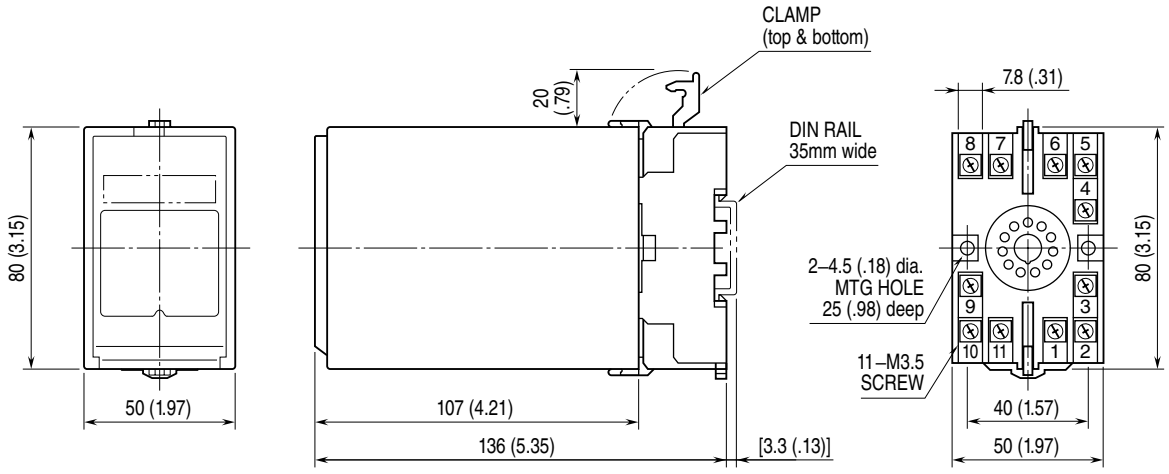
■ WALL MOUNTING

Refer to "EXTERNAL DIMENSIONS."

TERMINAL CONNECTIONS

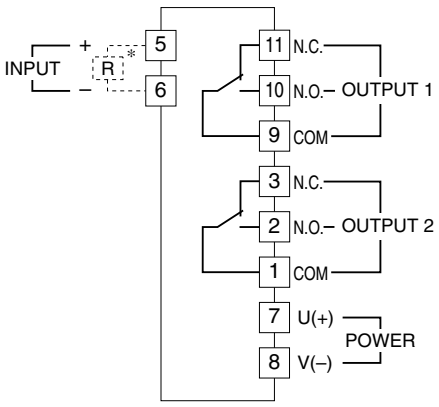
Connect the unit as in the diagram below or refer to the connection diagram on the top of the unit.
When an input resistor is provided with the module, attach it together with input wiring to the input screw terminals.

■ EXTERNAL DIMENSIONS unit: mm (inch)



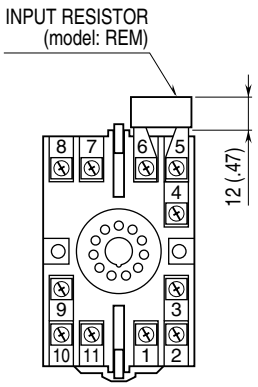
• When mounting, no extra space is needed between units.

■ CONNECTION DIAGRAM



*Input shunt resistor attached for current input.

■ TERMINAL ASSIGNMENTS unit: mm (inch)



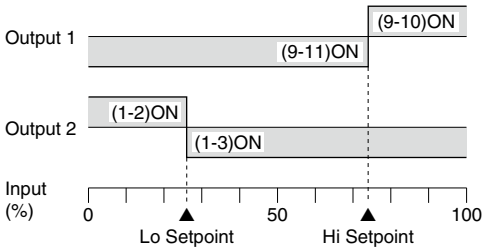
Input shunt resistor attached for current input.

CHECKING

1) Terminal wiring: Check that all cables are correctly connected according to the connection diagram.
2) Power input voltage: Check voltage across the terminal 7 – 8 with a multimeter.
3) Input: Check that the input signal is within 0 – 100% of the full-scale.
4) Alarm operations: Check the alarm operations referring to the figure below.
5) Output load: Check that the output load is 300V AC/600VA or 125V DC/150W at the maximum. For maximum relay life with inductive load, external protection is recommended.

Alarm Trip Operation Terminal No. in parentheses

[Example]
Output 1: High trip, coil energized at alarm
Output 2: Low trip, coil energized at alarm



Trip Operation in Power Failure: Terminals 1 – 3, 9 – 11 turn on.

MAINTENANCE

Regular calibration procedure is explained below:

■ CALIBRATION

Warm up the unit for at least 10 minutes.

- **High Setpoint**

  Increase the input signal from a value lower than the setpoint and check that the relay trips at the Hi setpoint within the setpoint accuracy described in the data sheet.

- **Low Setpoint**

  Decrease the input signal from a value higher than the setpoint and check that the relay trips at the Lo setpoint within the setpoint accuracy described in the data sheet.

When the trip points are shifted, please contact M-System's Sales Office or representatives.

LIGHTNING SURGE PROTECTION

M-System offers a series of lightning surge protector for protection against induced lightning surges. Please contact M-System to choose appropriate models.