*INSTRUCTION MANUAL*

# LOW FREQUENCY TRANSMITTER
**(50 Hz minimum)**

MODEL **M2SP**

## 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:

Signal conditioner (body + base socket) ..... (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.

## POINTS OF CAUTION

### ■ NONINCENDIVE APPROVAL OPTION

- This equipment is suitable for use in Class I, Div. 2, Groups A, B, C and D or Non-Hazardous Locations only.
- WARNING! Before You Remove the Unit from Its Base Socket or Mount It, Turn Off the Power Supply and Input Signal for Safety.
- WARNING! – Explosion Hazard –
  Substitution of Components May Impair Suitability for Class I, Div. 2.
- WARNING! – Explosion Hazard –
  Do Not Disconnect Equipment Unless Power Has Been Switched Off or The Area is Known To Be Non-Hazardous.
- The equipment was evaluated for use in the ambient temperature and relative humidity as mentioned in 'ENVIRONMENT' section.
- The input and output wiring must be in accordance with Class I, Div. 2 wiring methods and in accordance with the authority having jurisdiction for use in these hazardous locations.

### ■ CONFORMITY WITH EC DIRECTIVES OR UL

- This equipment is suitable for use in a Pollution Degree 2 environment and in Installation Category II, with the maximum operating voltage of 300V.
  Basic insulation is maintained between signal input and output. 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/UL requirements. Failure to observe these requirements may invalidate the CE/UL conformance.

### ■ POWER INPUT RATING & OPERATIONAL RANGE

- Locate the power input rating marked on the product and confirm its operational range as indicated below:
  100 – 240V and 85 – 264V AC rating: 85 – 264V
  (90 – 264V for UL), 47 – 66 Hz, approx. 4 – 6VA
  24V DC rating: 24V ±10%, approx. 3W
  11 – 27V DC rating: 11 – 27V, approx. 3W
  110V DC rating: 85 – 150V (110V ±10% for UL), approx. 3W

### ■ GENERAL PRECAUTIONS

- Before you remove the unit from its base socket or mount it, turn off the power supply and input signal for safety.

### ■ 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 +55°C (23 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.

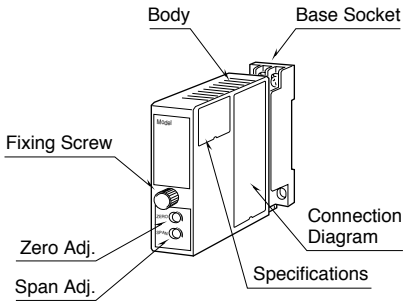
### ■ WIRING

- Do not install cables (power supply, input and output) 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.
- With voltage output, do not leave the output terminals shortcircuited for a long time. The unit is designed to endure it without breakdown, however, it may shorten appropriate life duration.

## COMPONENT IDENTIFICATION

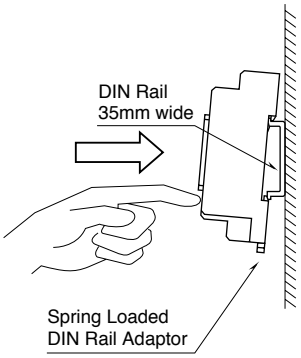



## INSTALLATION

Loosen the fixing screw at the front of the unit in order to separate the body from the base socket.

### ■ DIN RAIL MOUNTING

Set the base socket so that its DIN rail adaptor is at the bottom. Position 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.

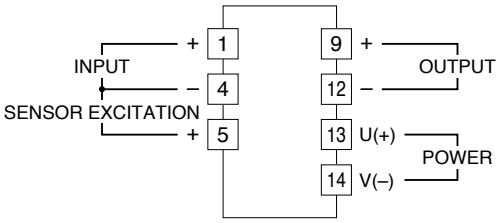



### ■ WALL MOUNTING

Refer to "EXTERNAL DIMENSIONS."

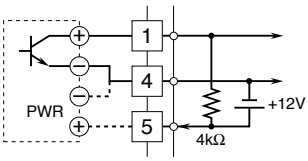
## TERMINAL CONNECTIONS

Connect the unit as in the diagram below or refer to the connection diagram on the side of the unit.

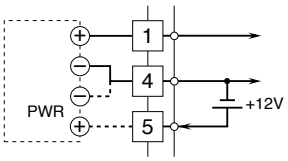



**Input Connection Examples**

■ **Dry Contact**




■ **Voltage Pulse**




## 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 13 – 14 with a multimeter.
3) Input: Check input terminal 1 (+) – 4 (–) with an oscilloscope.
   With voltage pulse input, the signal should be below 1V at L level, while it should exceed 2V at H level.
4) Output: Check that the load resistance meets the described specifications.

## ADJUSTMENT PROCEDURE

This unit is calibrated at the factory to meet the ordered specifications, therefore you usually do not need any calibration.
For matching the signal to a receiving instrument or in case of regular calibration, adjust the output as explained in the following.

### ■ HOW TO CALIBRATE THE OUTPUT SIGNAL

Use a signal source and measuring instruments of sufficient accuracy level. Turn the power supply on and warm up for more than 10 minutes.
1) ZERO: Apply 10% input and adjust output to 10%.
2) SPAN: Apply 100% input and adjust output to 100%.
3) Check ZERO adjustment again with 10% input.
4) When ZERO value is changed, repeat the above procedure 1) – 3).

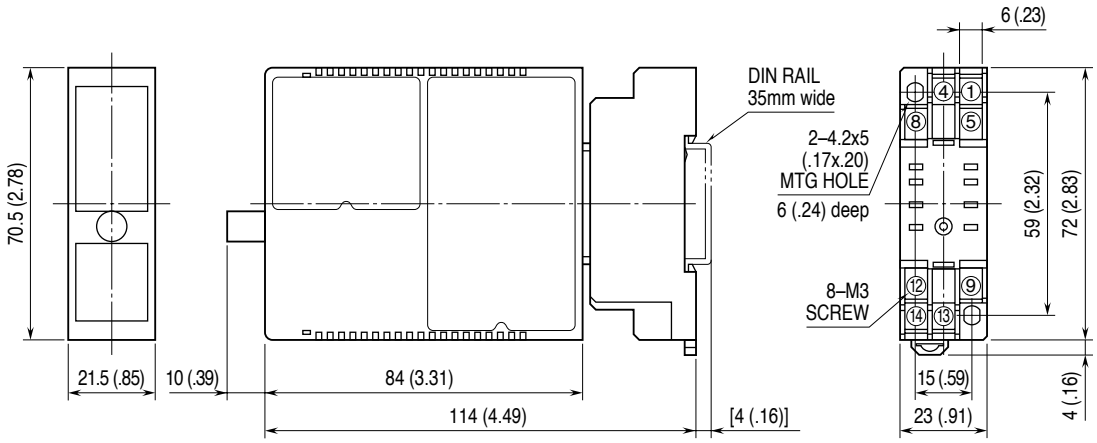
## MAINTENANCE

Regular calibration procedure is explained below:

### ■ CALIBRATION

Warm up the unit for at least 10 minutes. Apply 10%, 25%, 50%, 75% and 100% input signal. Check that the output signal for the respective input signal remains within accuracy described in the data sheet. When the output is out of tolerance, recalibrate the unit according to the "ADJUSTMENT PROCEDURE" explained earlier.

## EXTERNAL DIMENSIONS unit: mm (inch)




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

**M-SYSTEM WARRANTY**

M-System warrants such new M-System product which it manufactures to be free from defects in materials and workmanship during the 36-month period following the date that such product was originally purchased if such product has been used under normal operating conditions and properly maintained, M-System's sole liability, and purchaser's exclusive remedies, under this warranty are, at M-System's option, the repair, replacement or refund of the purchase price of any M-System product which is defective under the terms of this warranty. To submit a claim under this warranty, the purchaser must return, at its expense, the defective M-System product to the below address together with a copy of its original sales invoice.

THIS IS THE ONLY WARRANTY APPLICABLE TO M-SYSTEM PRODUCT AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. M-SYSTEM SHALL HAVE NO LIABILITY FOR CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES OF ANY KIND WHATSOEVER.

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