

2-WIRE UNIVERSAL TEMPERATURE TRANSMITTER (HART communication, intrinsically safe)

MODEL **B3HU**

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..... (1)
- Shortcircuit bar (1)
- Terminal block with CJC sensor..... (1)
- CD including the configuration software (1)
- I/O range and tag name label sheet (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.

When using this product in potentially explosive atmosphere or hazardous (classified) location, you have to follow the safety procedure to install it. Please refer to "SAFE INSTALLATION MANUAL" for each type of certification.

⚠ POINTS OF CAUTION

The following are general precautions when using this unit. The safety features and precautions specific to the hazardous locations are explained in "Safe Installation Manual" for each certification.

■ CONFORMITY WITH EC DIRECTIVES

- Functional insulation is maintained between the input and output.
- The equipment must be mounted inside a panel.
- 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.

■ SAFETY PRECAUTION

- Before you remove the unit 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 (non-hazardous location) temperature must be within -40 to +85°C (-40 to +185°F) with relative humidity within 0 to 95% RH in order to ensure adequate life span and operation.
- Be sure that the ventilation slits are not covered with cables, etc.

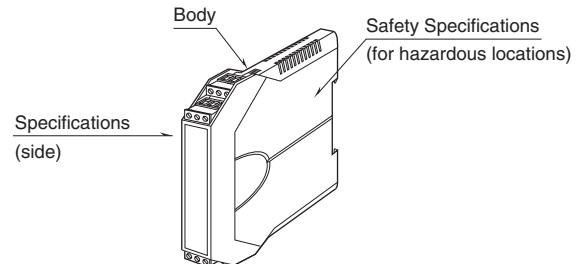
■ WIRING

- Do not install cables (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

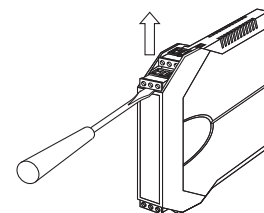
- The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

COMPONENT IDENTIFICATION



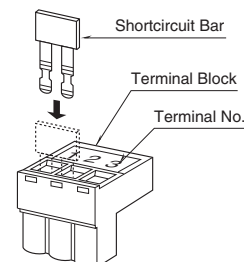
■ HOW TO SEPARATE THE TERMINAL BLOCKS

When you need to separate the terminal blocks from the transmitter body for wiring, insert a minus driver between the terminal block and the housing body, pull up the driver and pull out the terminal block.



■ RTD/RESISTANCE SHORTCIRCUIT BAR

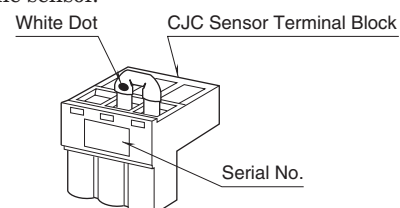
For a RTD/resistance input with 2- or 3-wire connection, short across the terminals 1 and 2 with the shortcircuit bar included in the product package. Remove it for other inputs/connection.



■ CJC SENSOR TERMINAL BLOCK

For a thermocouple input, replace the Terminal Block (4 – 5 – 6) with the one connected with the CJC Sensor included in the package. Be careful not to separate the Sensor from the terminal block. If you did, connect the CJC leg marked with a white dot to the terminal 5 and the other leg to the terminal 6.

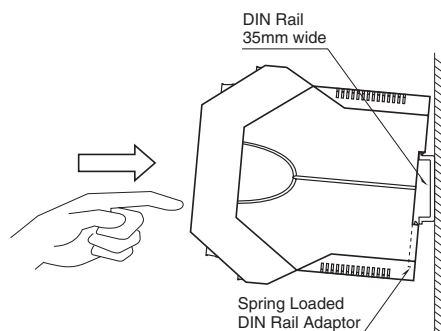
The CJC Sensor is calibrated to a particular unit and not interchangeable with another. Match the Serial No. of the unit and the sensor.



INSTALLATION

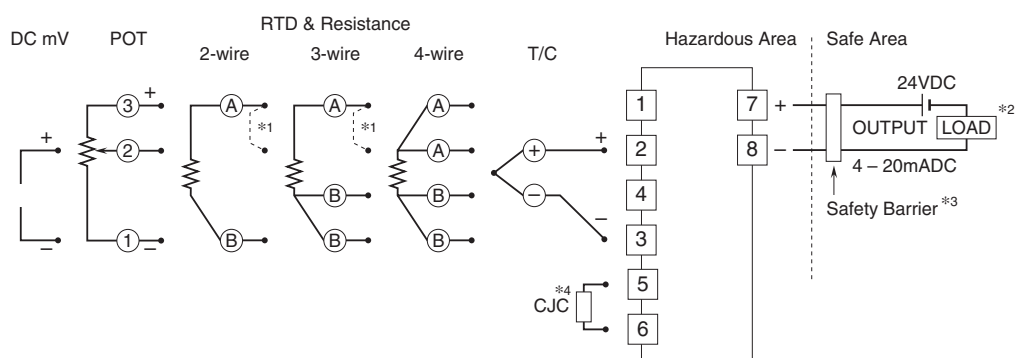
■ DIN RAIL MOUNTING

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



TERMINAL CONNECTIONS

Connect the unit as in the diagram below. For use in a hazardous location, refer to “Installation Diagram” in the “Safe Installation Manual.”



*1. Close across the terminals 1 & 2 for a resistance or RTD input.

*2. Limited to 250 – 1100Ω for HART communication.

*3. A safety barrier must be installed for the intrinsic safety.

The safety barrier must meet the Ex-data of this unit and must be approved for the hazardous location.

*4. Replace the Terminal Block (4 – 5 – 6) with the one connected with the CJC Sensor, included in the package.

■ WIRING INSTRUCTIONS

• Applicable wire size

Solid: 0.2 to 2.5 mm² (0.55 to 1.75 dia.)

Stranded: 0.2 to 2.5 mm²

Tinning wire ends may cause contact failure and therefore is not recommended.

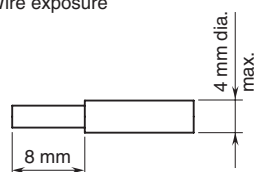
Ferruled: 0.2 to 1.5 mm² (0.55 to 1.35 dia.)

The following Phoenix Contact terminals are recommended:

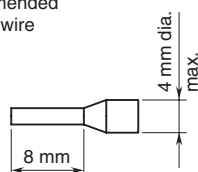
| | |
|-------------|------------------------------|
| AI 0.25-8YE | 0.2 to 0.25 mm ² |
| AI 0.34-8TQ | 0.25 to 0.34 mm ² |
| AI 0.5-8WH | 0.34 to 0.5 mm ² |
| AI 0.75-8GY | 0.5 to 0.75 mm ² |
| AI 1.0-8RD | 0.75 to 1.0 mm ² |
| AI 1.5-8BK | 1.0 to 1.5 mm ² |

• Expose wire conductors by 8 mm (0.31").

Wire exposure



Recommended ferruled wire



CHECKING

⚠ **Warning!** Whenever you need to measure voltage across the terminals or apply a simulated input signal to the terminals, make sure that there is no danger of explosion in the atmosphere.

- 1) Terminal wiring: Check that all cables are correctly connected according to the connection diagram.
- 2) Input: Check that the input voltage is within 0 – 100% of full-scale.
If the thermocouple/RTD or its extension wires are broken, the output goes over 100% (below 0% with down-scale) due to the burnout function. Check leadwires in such a case.
- 3) Output: Check that the load is within the permissible limit including wiring resistance.

$$\text{Load Resistance } (\Omega) = \frac{\text{Supply Voltage (V)} - 12 \text{ (V)}}{0.024 \text{ (A)}}$$

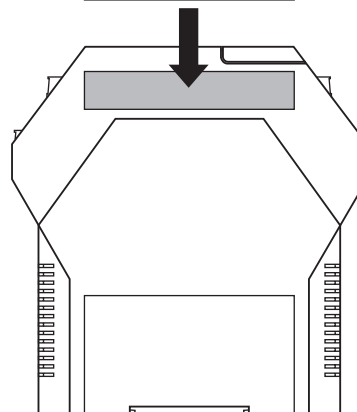
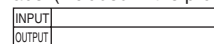
(including leadwire resistance)

ADJUSTMENT PROCEDURE

■ INPUT RANGE LABEL

Blank I/O range labels are included in the product package. Write in the configured ranges and put the label on the side as shown below.

I/O Range Label (included in the product package)



■ USING THE HART COMMUNICATION

Refer to the HART Setup Manual (EM-7502-B) included in the attached CD.

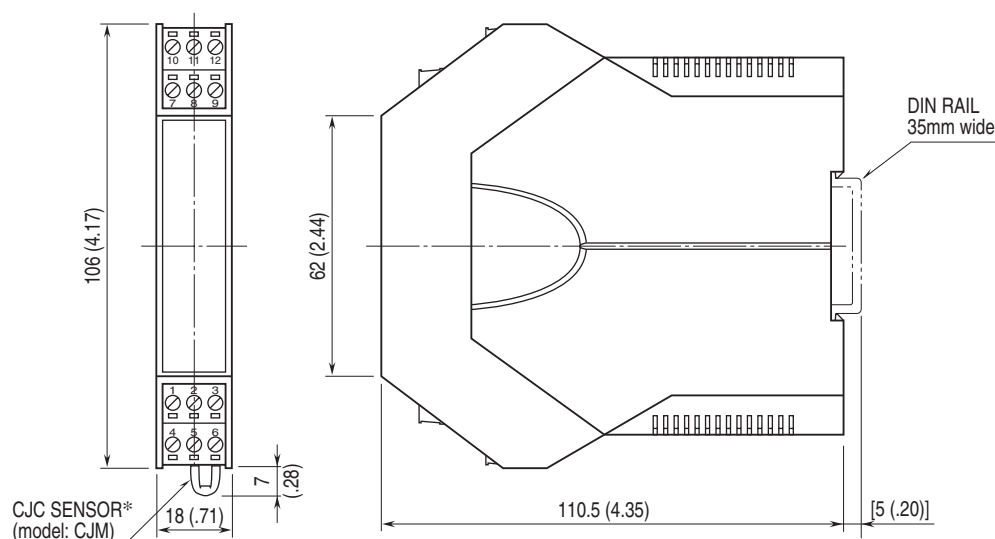
For operating an HHC (Hand-Held Communicator), refer to its instruction manual.

■ USING THE PC CONFIGURATOR

Detailed programming is available by using the PC Configurator Software (model: B3HUCON) installed on a Windows PC via a HART modem connected to the PC.

The PC Configurator Software and its Users Manual are included in the attached CD.

EXTERNAL DIMENSIONS mm (inch)



*Used only with a thermocouple input

• 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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