

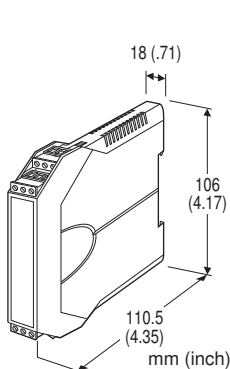
Space-saving Two-wire Signal Conditioners B3-UNIT

2-WIRE UNIVERSAL TEMPERATURE TRANSMITTER

(HART communication, low temp. drift)

Functions & Features

- Universal input: Voltage, T/C, RTD and resistance
- High accuracy
- HART communication
- Programming via hand-held communicator or via PC
- A wide variety of T/C and RTD types
- User's temperature table can be used
- Self diagnostics
- Input-output isolated



MODEL: B3HU2-0[1]

ORDERING INFORMATION

- Code number: B3HU2-0[1]
- Specify a code from below for [1].
(e.g. B3HU2-0/Q)
- Specify the specification for option code /Q
(e.g. /C01/SET)

SAFETY APPROVAL

0: None

[1] OPTIONS

blank: none

/Q: With options (specify the specification)

SPECIFICATIONS OF OPTION: Q (multiple selections)

COATING (For the detail, refer to M-System's web site.)

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

EX-FACTORY SETTING

/SET: Preset according to the Ordering Information Sheet
(No. ESU-7501)

RELATED PRODUCTS

- USB interface Bell202 modem (model: COP-HU)
- PC configurator software (model: B3HU2CFG)

GENERAL SPECIFICATIONS

Construction: Stand-alone; terminal access at the front

Degree of protection: IP20

Connection: Euro type connector terminal
(applicable wire size: 0.2 to 2.5 mm², stripped length 8 mm)

Housing material: Flame-resistant resin (gray)

Isolation: Input to output

Cold Junction Compensation: CJC sensor incorporated

Self diagnostics: Detects internal error, burnout

User-configurable items: PC and the transmitter are connected with the COP-HU.

- Input sensor type
- Input range
- Burnout
- Output limits (Upper / Lower)
- Damping time (factory set to 0)
- Linearization
- Output calibration
- Loop test output

HART COMMUNICATION

Protocol: HART communication protocol

HART version: 7

HART address range: 0 - 63 (factory set to 0)

Transmission speed: 1200 bps

Digital current: Approx. 1 mA_{p-p} when communicating

Character format: 1 Start Bit, 8 Data Bits, 1 Odd Parity Bit, 1 Stop Bit

Distance: 1.5 km (0.9 miles)

HART communication mode: Master-Slave Mode and Burst Mode (factory set to Master-Slave)

HART network mode: Point-to-Point Mode and Multi-drop Mode; automatically set to Multi-drop Mode when the address is set to other than 0.

INPUT SPECIFICATIONS

The input is factory set for use with K thermocouple, single input, 0 to 100°C, internal CJC sensor.

See Table 1 for the available input type, the minimum span and the maximum range.

■ Voltage

Input resistance: ≥ 1 MΩ

■ Thermocouple (dual input available)

Input resistance: $\geq 1 \text{ M}\Omega$

■ RTD (2-wire, 3-wire or 4-wire)

Input resistance: $\geq 1 \text{ M}\Omega$

Excitation: $\leq 0.25 \text{ mA}$

Allowable leadwire resistance: Max. 10Ω per wire

■ Resistance (2-wire, 3-wire or 4-wire)

Input resistance: $\geq 1 \text{ M}\Omega$

Excitation: 0.25 mA

Allowable leadwire resistance: Max. 10Ω per wire

STANDARDS & APPROVALS

EU conformity:

EMC Directive

EMI EN 61000-6-4

EMS EN 61000-6-2

RoHS Directive

OUTPUT SPECIFICATIONS

Output range: $4 - 20 \text{ mA DC}$

Operational range: $3.75 - 23 \text{ mA}$

Load resistance vs. supply voltage:

Load Resistance (Ω) = (Supply Voltage (V) - 9 (V)) \div 0.023

(A) (including leadwire resistance)

Burnout: $3.75 - 3.8 \text{ mA}$ or $21.5 - 23 \text{ mA}$

(factory set to 23 mA)

Upper output limit proportional to the input:

$20 - 21.5 \text{ mA}$ (factory set to 21.5 mA)

Lower output limit proportional to the input:

$3.8 - 4 \text{ mA}$ (factory set to 3.8 mA)

Update time: 440 msec. (660 msec. with dual input)

Output characteristics for dual input:

Average or Differential selectable

INSTALLATION

Supply voltage

•DC: $9 - 35 \text{ V DC}$

Operating temperature: -40 to $+85^\circ\text{C}$ (-40 to $+185^\circ\text{F}$)

Operating humidity: 0 to 95 \%RH (non-condensing)

Mounting: DIN rail

Weight: 80 g (2.8 oz)

PERFORMANCE

Accuracy: As indicated in Table 1^{*1}, $\pm 0.075 \text{ \%}$ of span or $\pm 0.075 \text{ \%}$ of max. range^{*2}, whichever is the greatest.

Add the CJC error for T/C input.

*1: max. range = 0 \% or 100 \% input setting value, absolute value of whichever is greater.

(e.g. 100°C for -10 to $+100^\circ\text{C}$, 200°C for -200 to $+50^\circ\text{C}$)

Cold junction compensation error (thermocouple input):

$\pm 1.0^\circ\text{C}$ ($\pm 1.8^\circ\text{F}$)

Temp. coefficient: $0.0075 \text{ \%}/^\circ\text{C}$ ($0.004 \text{ \%}/^\circ\text{F}$) of max. range

Response time: $\leq 1 \text{ sec.}$ ($0 - 90 \text{ \%}$) or $\leq 2 \text{ sec.}$ (4-wire RTD , 4-wire resistance or dual input T/C; $0 - 90 \text{ \%}$) with damping time set to 0

Supply voltage effect: $\pm 0.01 \text{ \%}$ of span/V

Insulation resistance: $\geq 100 \text{ M}\Omega$ with 500 V DC

Dielectric strength: 1500 V AC @1 minute (input to output)

INPUT TYPE, RANGE & ACCURACY**■ INPUT TYPE, RANGE & ACCURACY**

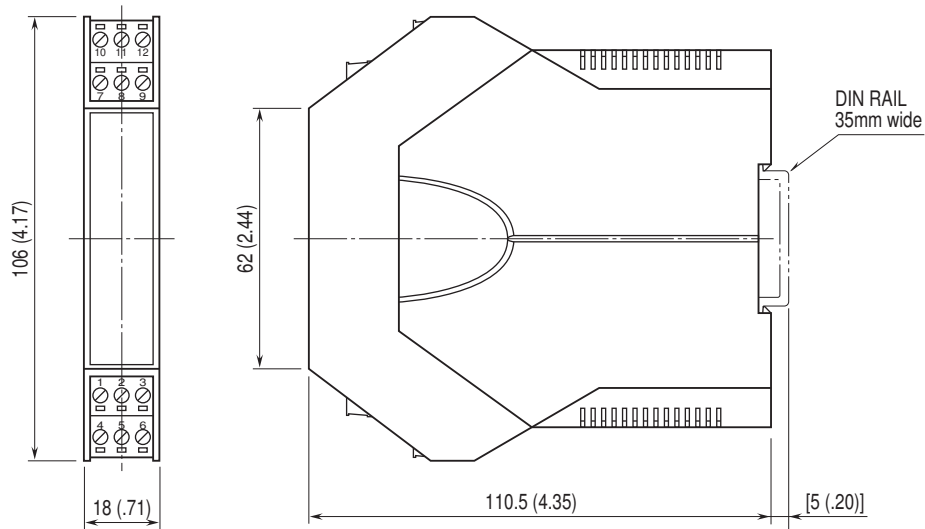
Table 1

INPUT TYPE	MIN. SPAN	INPUT RANGE	ACCURACY			
Voltage	4 mV	-10 to +100 mV	±10 μV			
Resistance	25 Ω	0 to 4000 Ω	±0.1 Ω			
THERMOCOUPLE	°C			°F		
	MIN. SPAN	INPUT RANGE	ACCURACY	MIN. SPAN	MAXIMUM RANGE	ACCURACY
K (CA)	50	-180 to +1372	±0.5	90	-292 to +2501	±0.9
E (CRC)	50	-100 to +1000	±0.5	90	-148 to +1832	±0.9
J (IC)	50	-100 to +1200	±0.5	90	-148 to +2192	±0.9
T (CC)	50	-200 to +400	±0.5	90	-328 to +752	±0.9
B (RH)	100	400 to 1820	±1 *1	180	752 to 3308	±1.8 *1
R	100	-50 to +1760	±1 *2	180	-58 to +3200	±1.8 *2
S	100	-50 to +1760	±1 *2	180	-58 to +3200	±1.8 *2
C (WRe 5-26)	100	0 to 2300	±1	180	32 to 4172	±1.8
D (WRe 3-25)	100	0 to 2300	±1	180	32 to 4172	±1.8
N	50	-180 to +1300	±0.5	90	-292 to +2372	±0.9
U	50	-200 to +600	±0.5	90	-328 to +1112	±0.9
L	50	-100 to +900	±0.5	90	-148 to +1652	±0.9
RTD	°C			°F		
	MIN. SPAN	INPUT RANGE	ACCURACY	MIN. SPAN	MAXIMUM RANGE	ACCURACY
Pt 100 (JIS '97, IEC)	10	-200 to +850	±0.15	18	-328 to +1562	±0.27
Pt 500	10	-200 to +850	±0.15	18	-328 to +1562	±0.27
Pt 1000	10	-200 to +850	±0.15	18	-328 to +1562	±0.27
JPt 100 (JIS '89)	10	-200 to +510	±0.15	18	-328 to +950	±0.27

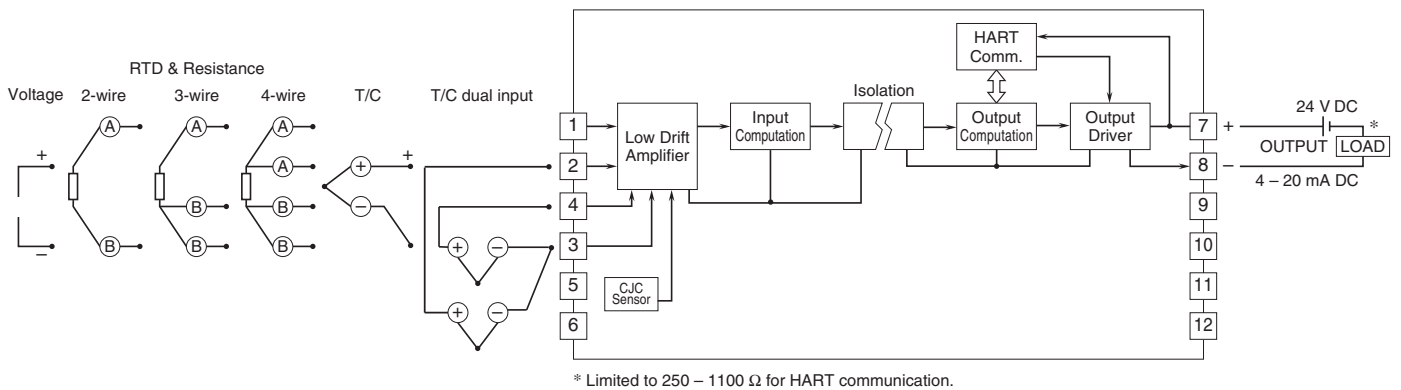
*1. 2°C for 400 to 850°C range, 3.6°F for 752 to 1562°F range.

*2. 2°C for -50 to +100°C range, 3.6°F for -58 to +212°F range.

DIMENSIONS unit: mm (inch)



SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



Specifications are subject to change without notice.