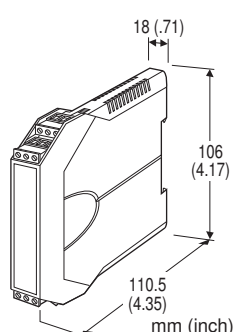


Space-saving Two-wire Signal Conditioners B3-UNIT

2-WIRE UNIVERSAL TEMPERATURE TRANSMITTER (PROFIBUS-PA)

Functions & Features

- Universal input: mV, V, T/C, RTD, resistance and potentiometer
- High accuracy
- PROFIBUS-PA communication
- A wide variety of T/C and RTD types
- Self diagnostics
- Input-output isolated
- CE marking



MODEL: B3PU-0

ORDERING INFORMATION

- Code number: B3PU-0

SAFETY APPROVAL

0: None

RELATED PRODUCTS

- GSD (General Station Description) file
 - EDDL (Electronic Device Description Language) file
- GSD and EDDL files are downloadable at M-System's web site

GENERAL SPECIFICATIONS

Construction: Small-sized front terminal structure

Connection: Euro type connector terminal

Housing material: Flame-resistant resin (gray)

Isolation: Input to output

Cold Junction Compensation (thermocouple input): CJC sensor incorporated

Device address: 0 to 126 (factory set to 126)

Data transmission: MBP (Manchester-coded Bus Powered)

Mode

Device profile: PROFIBUS-PA Profile V3.0, Compact Class B

PROFIBUS COMMUNICATION

Digital signal: Manchester-coded signal (conforms to IEC 61158-2)

Baud rate: 31.25 kbps

Protocol: PROFIBUS-DP-V1

Device profile: PROFIBUS-PA Profile V3.0, Compact Class B

INPUT SPECIFICATIONS

The input is factory set for use with K thermocouple. See Table 1 for the available input type and the maximum range.

- DC mV & V

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

■ THERMOCOUPLE

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

Burnout sensing: 130 nA $\pm 10 \%$

■ RTD (2-wire, 3-wire or 4-wire)

Excitation: 0.2 mA $\pm 10 \%$

Allowable leadwire resistance: Max. 20 Ω per wire

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

Excitation: 0.2 mA $\pm 10 \%$

Allowable leadwire resistance: Max. 20 Ω per wire

■ POTENTIOMETER

Excitation: 0.2 mA $\pm 10 \%$

Allowable leadwire resistance: Max. 20 Ω per wire

OUTPUT SPECIFICATIONS

Output signal: Digital signals (refer to 'PROFIBUS COMMUNICATION')

Static current consumption: 12 ± 1 mA

INSTALLATION

Supply voltage: 9 - 30 V DC (automatic polarity detection)

Operating temperature: -40 to +85°C (-40 to +185°F)

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

Mounting: DIN rail

Weight: 80 g (2.8 oz)

PERFORMANCE

Accuracy: See Table 1.

Cold junction compensation error: $\pm 0.5^\circ\text{C}$

Temp. coefficient: $\pm 0.015 \text{ }^\circ\text{C}/^\circ\text{C}$ ($\pm 0.008 \text{ }^\circ\text{F}/^\circ\text{F}$) at -5 to +55°C

Start-up time: Approx. 10 sec.

Response time: ≤ 2 sec. (0 - 90 %) with damping time set to 0

Supply voltage effect: $\pm 0.003\%$ / 1 V

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

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

STANDARDS & APPROVALS

CE conformity:

EMC Directive (2004/108/EC)

EMI EN 61000-6-4: 2007

EMS EN 61000-6-2: 2005

INPUT TYPE, RANGE & ACCURACY

Table 1

INPUT TYPE	MAXIMUM RANGE		ACCURACY			
DC mV & V	-16 to +16mV -32 to +32mV -50 to +64mV -50 to +128mV -50 to +256mV -50 to +500mV -50 to +1000mV		$\pm 10\mu\text{V}$ or $\pm 0.04\%$ of reading, whichever is greater $\pm 15\mu\text{V}$ or $\pm 0.04\%$ of reading, whichever is greater $\pm 25\mu\text{V}$ or $\pm 0.04\%$ of reading, whichever is greater $\pm 40\mu\text{V}$ or $\pm 0.04\%$ of reading, whichever is greater $\pm 60\mu\text{V}$ or $\pm 0.04\%$ of reading, whichever is greater $\pm 100\mu\text{V}$ or $\pm 0.04\%$ of reading, whichever is greater $\pm 120\mu\text{V}$ or $\pm 0.04\%$ of reading, whichever is greater			
Potentiometer	0 to 4000 Ω		$\pm 0.5\%$ (total resistance $\geq 10\Omega$) $\pm 0.2\%$ (total resistance $\geq 40\Omega$) $\pm 0.1\%$ (total resistance $\geq 80\Omega$)			
Resistance	0 to 200 Ω 0 to 500 Ω 0 to 1000 Ω 0 to 2000 Ω 0 to 4000 Ω		$\pm 0.06\Omega$ or $\pm 0.04\%$ of reading, whichever is greater ^{*1} $\pm 0.1\Omega$ or $\pm 0.04\%$ of reading, whichever is greater ^{*1} $\pm 0.2\Omega$ or $\pm 0.04\%$ of reading, whichever is greater ^{*1} $\pm 0.4\Omega$ or $\pm 0.04\%$ of reading, whichever is greater ^{*1} $\pm 0.6\Omega$ or $\pm 0.04\%$ of reading, whichever is greater ^{*1}			
Thermocouple	$^{\circ}\text{C}$			$^{\circ}\text{F}$		
	MAXIMUM RANGE	CONFORMANCE RANGE	ACCURACY ^{*2}	MAXIMUM RANGE	CONFORMANCE RANGE	ACCURACY ^{*2}
K (CA)	-270 to +1370	-150 to +1370	± 0.25	-454 to +2498	-238 to +2498	± 0.45
E (CRC)	-270 to +1000	-170 to +1000	± 0.20	-454 to +1832	-274 to +1832	± 0.36
J (IC)	-210 to +1200	-180 to +1200	± 0.25	-346 to +2192	-292 to +2192	± 0.45
T (CC)	-270 to +400	-170 to +400	± 0.25	-454 to +752	-274 to +752	± 0.45
B (RH)	100 to 1820	400 to 1760	± 0.75	212 to 3308	752 to 3200	± 1.35
R	-50 to +1760	200 to 1760	± 0.50	-58 to +3200	392 to 3200	± 0.90
S	-50 to +1760	200 to 1760	± 0.50	-58 to +3200	392 to 3200	± 0.90
C (WRe 5-26)	0 to 2315	0 to 2315	± 0.80	32 to 4199	32 to 4199	± 1.44
N	-270 to +1300	-130 to +1300	± 0.30	-454 to +2372	-202 to +2372	± 0.54
U	-200 to +600	-200 to +600	± 0.20	-328 to +1112	-328 to +1112	± 0.36
L	-200 to +900	-200 to +900	± 0.25	-328 to +1652	-328 to +1652	± 0.45
P (Platinel II)	0 to 1395	0 to 1395	± 0.25	32 to 2543	32 to 2543	± 0.45
RTD	$^{\circ}\text{C}$			$^{\circ}\text{F}$		
	MAXIMUM RANGE		ACCURACY ^{*3}	MAXIMUM RANGE		ACCURACY ^{*3}
Pt 100 (JIS '97, IEC)	-200 to +850		± 0.15	-328 to +1562		± 0.27
Pt 200 (JIS '97, IEC)	-200 to +850		± 0.15	-328 to +1562		± 0.27
Pt 500 (JIS '97, IEC)	-200 to +850		± 0.15	-328 to +1562		± 0.27
Pt 1000 (JIS '97, IEC)	-200 to +850		± 0.15	-328 to +1562		± 0.27
Pt 50 (JIS '81)	-200 to +649		± 0.30	-328 to +1200		± 0.54
Pt 100 (JIS '81)	-200 to +649		± 0.15	-328 to +1200		± 0.27
Ni 120 (Edison curve No. 7)	-80 to +260		± 0.15	-112 to +500		± 0.27
Cu 10 (@25 $^{\circ}\text{C}$)	-50 to +250		± 1.0	-58 to +482		± 1.8

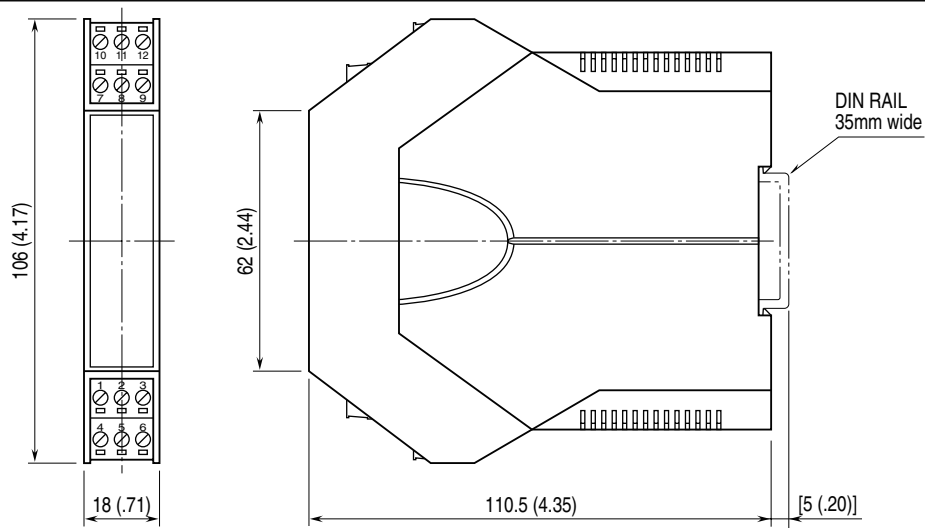
*1. For 2- or 3-wire resistance, the value is valid by the sensor calibration after the wiring.

*2. Or $\pm 0.04\%$ of reading, whichever is greater. Add Cold Junction Compensation Error 0.5 $^{\circ}\text{C}$ (0.9 $^{\circ}\text{F}$).

*3. Or $\pm 0.04\%$ of reading, whichever is greater.

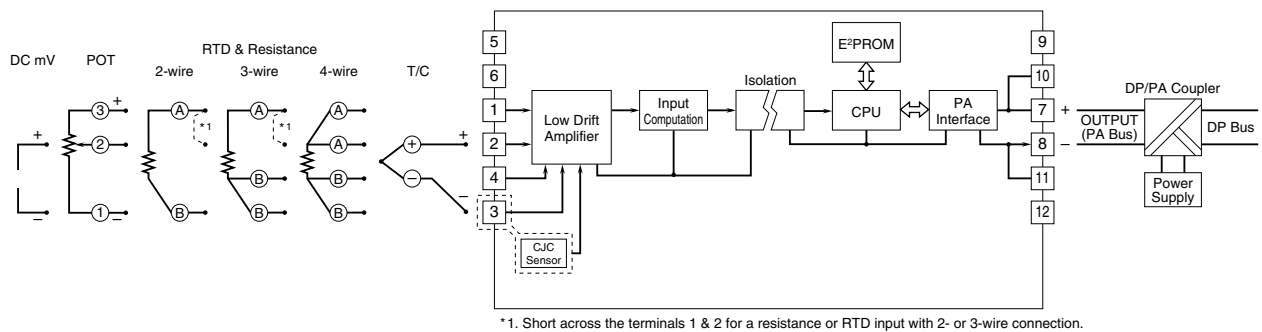
For 2- or 3-wire RTD, the value is valid by the sensor calibration after the wiring.

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)



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

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



Specifications are subject to change without notice.