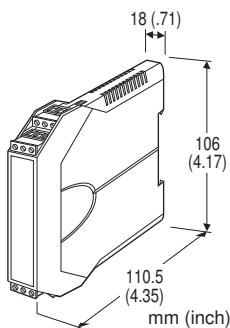


## Space-saving Two-wire Signal Conditioners B3-UNIT

### 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  $\Omega$  per wire

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

**Excitation:** 0.2 mA  $\pm 10 \%$

**Allowable leadwire resistance:** Max. 20  $\Omega$  per wire

##### ■ POTENTIOMETER

**Excitation:** 0.2 mA  $\pm 10 \%$

**Allowable leadwire resistance:** Max. 20  $\Omega$  per wire

#### OUTPUT SPECIFICATIONS

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

**Static current consumption:** 12  $\pm 1$  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:**  $\pm 0.015 \text{ } \%/^\circ\text{C}$  ( $\pm 0.008 \text{ } \%/^\circ\text{F}$ ) at -5 to +55°C

**Start-up time:** Approx. 10 sec.

**Response time:**  $\leq 2$  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

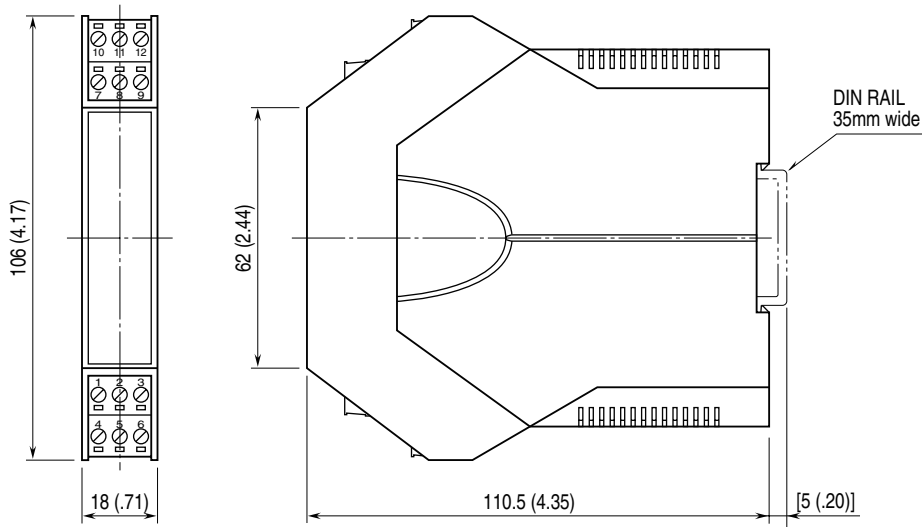
Table 1

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 $\Omega$		$\pm 0.5\%$ (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 $\Omega$ 0 to 500 $\Omega$ 0 to 1000 $\Omega$ 0 to 2000 $\Omega$ 0 to 4000 $\Omega$		$\pm 0.06\Omega$ 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	$\pm 0.25$	-454 to +2498	-238 to +2498	$\pm 0.45$
E (CRC)	-270 to +1000	-170 to +1000	$\pm 0.20$	-454 to +1832	-274 to +1832	$\pm 0.36$
J (IC)	-210 to +1200	-180 to +1200	$\pm 0.25$	-346 to +2192	-292 to +2192	$\pm 0.45$
T (CC)	-270 to +400	-170 to +400	$\pm 0.25$	-454 to +752	-274 to +752	$\pm 0.45$
B (RH)	100 to 1820	400 to 1760	$\pm 0.75$	212 to 3308	752 to 3200	$\pm 1.35$
R	-50 to +1760	200 to 1760	$\pm 0.50$	-58 to +3200	392 to 3200	$\pm 0.90$
S	-50 to +1760	200 to 1760	$\pm 0.50$	-58 to +3200	392 to 3200	$\pm 0.90$
C (WRe 5-26)	0 to 2315	0 to 2315	$\pm 0.80$	32 to 4199	32 to 4199	$\pm 1.44$
N	-270 to +1300	-130 to +1300	$\pm 0.30$	-454 to +2372	-202 to +2372	$\pm 0.54$
U	-200 to +600	-200 to +600	$\pm 0.20$	-328 to +1112	-328 to +1112	$\pm 0.36$
L	-200 to +900	-200 to +900	$\pm 0.25$	-328 to +1652	-328 to +1652	$\pm 0.45$
P (Platinel II)	0 to 1395	0 to 1395	$\pm 0.25$	32 to 2543	32 to 2543	$\pm 0.45$
RTD	$^{\circ}\text{C}$			$^{\circ}\text{F}$		
	MAXIMUM RANGE		ACCURACY*3	MAXIMUM RANGE		ACCURACY*3
Pt 100 (JIS '97, IEC)	-200 to +850		$\pm 0.15$	-328 to +1562		$\pm 0.27$
Pt 200 (JIS '97, IEC)	-200 to +850		$\pm 0.15$	-328 to +1562		$\pm 0.27$
Pt 500 (JIS '97, IEC)	-200 to +850		$\pm 0.15$	-328 to +1562		$\pm 0.27$
Pt 1000 (JIS '97, IEC)	-200 to +850		$\pm 0.15$	-328 to +1562		$\pm 0.27$
Pt 50 (JIS '81)	-200 to +649		$\pm 0.30$	-328 to +1200		$\pm 0.54$
Pt 100 (JIS '81)	-200 to +649		$\pm 0.15$	-328 to +1200		$\pm 0.27$
Ni 120 (Edison curve No. 7)	-80 to +260		$\pm 0.15$	-112 to +500		$\pm 0.27$
Cu 10 (@25 $^{\circ}\text{C}$ )	-50 to +250		$\pm 1.0$	-58 to +482		$\pm 1.8$

\*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.

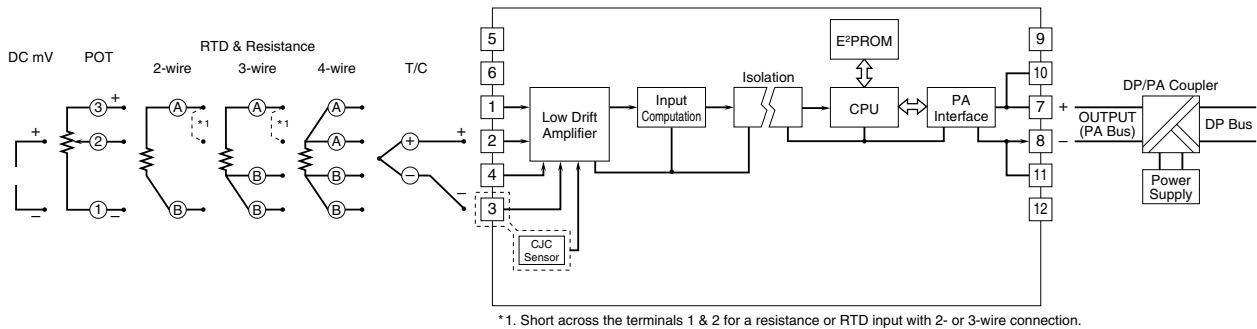


**EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)**



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

**SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM**



\*1. Short across the terminals 1 & 2 for a resistance or RTD input with 2- or 3-wire connection.



Specifications are subject to change without notice.