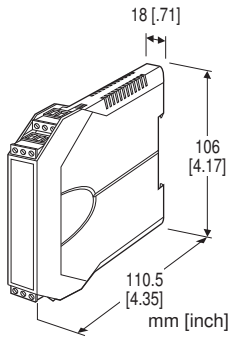
Space-saving Two-wire Signal Conditioners B3-UNIT

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



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MODEL: B3PU-0[1]

ORDERING INFORMATION

• Code number: B3PU-0[1]
Specify a code from below for [1].
(e.g. B3PU-0/Q)
• Specify the specification for option code /Q
(e.g. /C01)

SAFETY APPROVAL

0: None

[1] OPTIONS

blank: none
/Q: With options (specify the specification)

SPECIFICATIONS OF OPTION: Q

COATING (For the detail, refer to our web site.)
/C01: Silicone coating
/C02: Polyurethane coating
/C03: Rubber coating

RELATED PRODUCTS

• GSD (General Station Description) file
• EDDL (Electronic Device Description Language) file
GSD and EDDL files are downloadable at our web site

GENERAL SPECIFICATIONS

Construction: Small-sized front terminal structure
Connection: Euro type connector terminal
(applicable wire size: 0.2 to 2.5 mm^2, stripped length 8 mm)
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: ≥ 1 MΩ
■ **Thermocouple**
Input resistance: ≥ 1 MΩ
Burnout sensing: 130 nA ±10 %
■ **RTD** (2-wire, 3-wire or 4-wire)
Excitation: 0.2 mA ±10 %
Allowable leadwire resistance: Max. 20 Ω per wire
■ **Resistance** (2-wire, 3-wire or 4-wire)
Excitation: 0.2 mA ±10 %
Allowable leadwire resistance: Max. 20 Ω per wire
■ **Potentiometer**
Excitation: 0.2 mA ±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

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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: ±0.5℃ (±0.9°F)
Temp. coefficient: ±0.015 %/°C (±0.008 %/°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: ±0.003 % / 1 V
Insulation resistance: ≥ 100 MΩ with 500 V DC
Dielectric strength: 1500 V AC @1 minute (input to output)

STANDARDS & APPROVALS

EU conformity:
EMC Directive
EMI EN 61000-6-4
EMS EN 61000-6-2
RoHS Directive

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INPUT TYPE, RANGE & ACCURACY

Table 1

INPUT TYPE	MAXIMUM RANGE	ACCURACY
DC mV & V	-16 to +16mV	±10μV or ±0.04% of reading, whichever is greater
	-32 to +32mV	±15μV or ±0.04% of reading, whichever is greater
	-50 to +64mV	±25μV or ±0.04% of reading, whichever is greater
	-50 to +128mV	±40μV or ±0.04% of reading, whichever is greater
	-50 to +256mV	±60μV or ±0.04% of reading, whichever is greater
	-50 to +500mV	±100μV or ±0.04% of reading, whichever is greater
	-50 to +1000mV	±120μV or ±0.04% of reading, whichever is greater
Potentiometer	0 to 4000Ω	±0.5% (total resistance ≥10Ω)
		±0.2% (total resistance ≥40Ω)
		±0.1% (total resistance ≥80Ω)
Resistance	0 to 200Ω	±0.06Ω or ±0.04% of reading, whichever is greater *1
	0 to 500Ω	±0.1Ω or ±0.04% of reading, whichever is greater *1
	0 to 1000Ω	±0.2Ω or ±0.04% of reading, whichever is greater *1
	0 to 2000Ω	±0.4Ω or ±0.04% of reading, whichever is greater *1
	0 to 4000Ω	±0.6Ω or ±0.04% of reading, whichever is greater *1

Thermocouple	°C			°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	°C		°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 Ω (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°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 ±0.04% of reading, whichever is greater. Add Cold Junction Compensation Error 0.5°C (0.9°F).
*3. Or ±0.04% of reading, whichever is greater.
For 2- or 3-wire RTD, the value is valid by the sensor calibration after the wiring.

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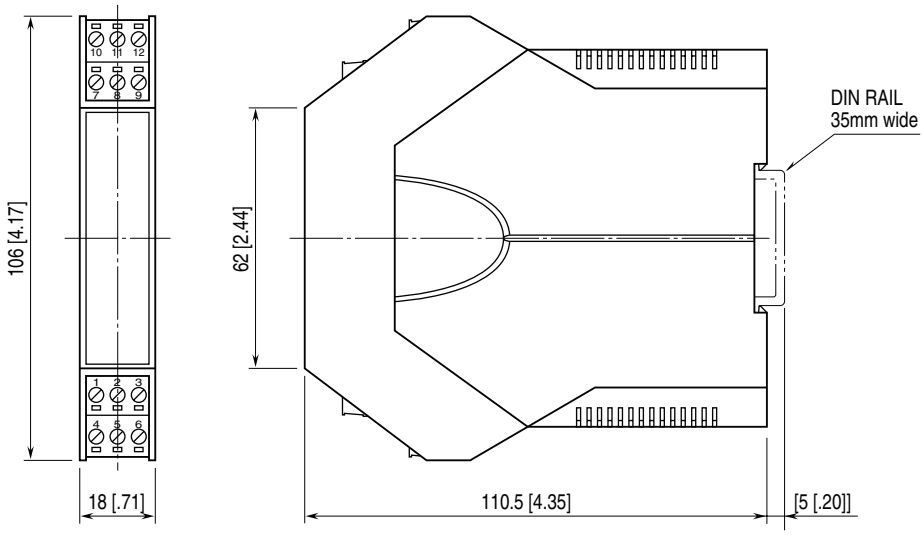
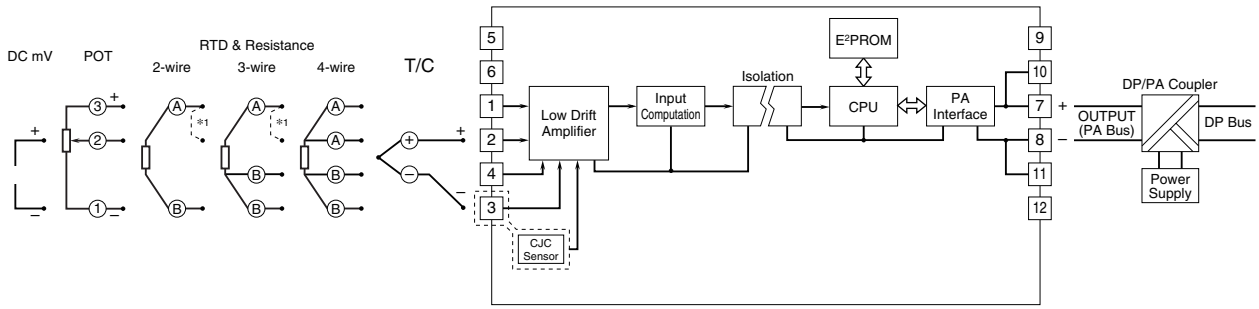
EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



• 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.

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