

Head-mounted Two-wire Signal Conditioners 27-UNIT

2-WIRE UNIVERSAL TEMPERATURE TRANSMITTER (PC programmable)

MODEL **27U**

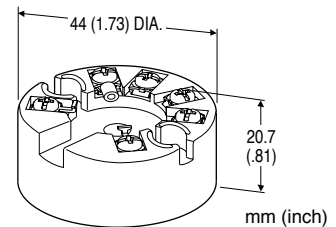
MODEL & SUFFIX CODE SELECTION

27U-□

MODEL _____

SAFETY APPROVAL _____

0 : None
 1 : FM intrinsically safe
 2 : CENELEC intrinsically safe (ATEX)



Functions & Features

- Universal input: mV, T/C, RTD and resistance
- Suitable for Functional Safety applications up to SIL2
- Programming via PC Configurator
- A wide variety of T/C and RTD types
- User's temperature table can be used
- Self diagnostics
- Low temperature drift

ORDERING INFORMATION

Specify code number and suffix codes. Use Ordering Information Sheet (No. ESU-7656). Factory standard setting will be used if not otherwise specified.

Specify the country in which the product is to be used with the Safety Approval code 2.

- Code number (e.g. 27U-0)

RELATED PRODUCTS

- USB interface Bell202 modem (model: COP-HU)*
- PC configurator software (model: 27MCFG)
 Downloadable at M-System's web site:
<http://www.m-system.co.jp>

*Usable in 'non-hazardous' area only.

GENERAL SPECIFICATIONS

Electrical connection: M3 screw terminals
 (nickel-plated brass; torque 0.5 N·m)

Housing material: Flame-resistant resin (black)

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
- Linearization
- Output calibration
- Loop test output

Damping time: 0 to 30 sec. (factory set to: 0)

INPUT

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

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

■ DC mV

Input resistance: 1MΩ minimum

■ THERMOCOUPLE (dual input available)

Input resistance: 1MΩ minimum

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

Input resistance: 1MΩ minimum

Excitation: ≤0.25mA

Allowable leadwire resistance: Max. 10Ω per wire

OUTPUT

Output range: 4 – 20mA DC

Operational range: 3.75 – 23mA

Burnout: 3.75 – 3.8mA or 21.5 – 23mA
 (factory set to: 23mA)

Upper output limit proportional to the input:
 20 – 21.5mA (factory set to: 21.5mA)

Lower output limit proportional to the input:
 3.8 – 4mA (factory set to: 3.8mA)

Update time: 440 msec.

Output characteristics for dual input: Average or Differential selectable

Load resistance vs. supply voltage:

$$\text{Load Resistance } (\Omega) = \frac{\text{Supply Voltage (V)} - 9 \text{ (V)}}{0.023 \text{ (A)}}$$

(including leadwire resistance)

INSTALLATION

Supply voltage: 9 – 35V DC (non-approved)
9 – 28V DC (approved)

Operating temperature: -40 to +85°C (-40 to +185°F)
(See Safety Parameters for use in a hazardous location.)

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

Mounting: Head-mounting (DIN type B head)

Dimensions: 44 dia. × 20.7 mm (1.732 dia. × 0.81")

Weight: 50 g (1.76 oz)

PERFORMANCE

Accuracy: As indicated in Table 1, ±0.075% of span or ±0.075% of max. range, whichever is the greatest. Add the CJC error for T/C input. (max. range = 0% or 100% value, absolute value of whichever is greater.)

Cold junction compensation error: ±0.5°C (±0.9°F)

Temp. coefficient: 0.0075%/°C (0.0004%/°F) of max. range

Response time: ≤1 second (0 – 90%) or ≤2 seconds (4-wire RTD or dual input T/C; 0 – 90%) with damping time set to 0

Supply voltage effect: ≤ ±0.01% of span/V

Insulation resistance: ≥100MΩ with 500V DC (input to output)

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

Safety integrity level according to IEC 61508:
Suitable for use in a safety instrumented system up to SIL2 (together with sensor) if appropriate safety instructions are observed. Consult M-System.

STANDARDS & APPROVALS

CE conformity: ATEX Directive (94/9/EC)
Ex ia EN 60079-11
EMC Directive (2004/108/EC)
EMI EN 61000-6-4
EMS EN 61000-6-2

Safety approval
FM: Intrinsically safe
Class I, Div. 1, Groups A, B, C and D
Class I, Zone 0, AEx ia IIC (US)
Class I, Zone 0, Ex ia IIC (Canada)
T4, T5 and T6
(Class 3610, ANSI/ISA 60079-11,
CAN/CSA-C22.2 No. 157,
CAN/CSA-C22.2 No. 60079-11)
CENELEC: Intrinsically safe (ATEX)
⊕ II 1G, Ex ia IIC; T4, T5 and T6
(EN 60079-11 : 2007)

SAFETY PARAMETERS**Operating temperature for CENELEC (ATEX) / FM:**

T4 -40 to +80°C

T5 -40 to +60°C

T6 -40 to +45°C

Ex-data: U_i (V_{max}) 30V DC U_o (V_{oc}) 30V DC
I_i (I_{max}) 96mA DC I_o (I_{sc}) 24mA DC
P_i (P_{max}) 720mW P_o 180mW
C_i 1 nF C_o (C_a) 50 nF
L_i 0 mH L_o (L_a) 40 mH

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

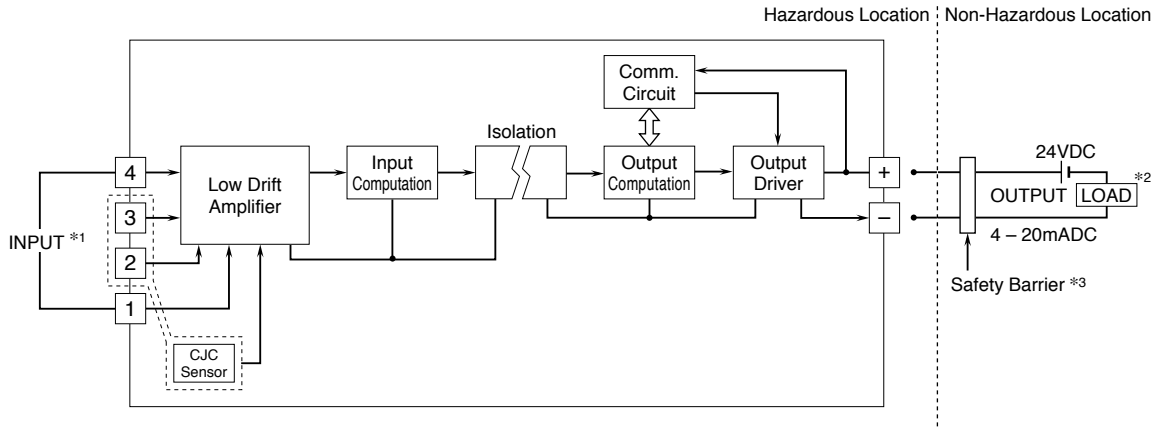
Table 11

INPUT TYPE	MIN. SPAN	MAXIMUM RANGE	ACCURACY			
DC Millivolt	4mV	-10 to +100mV	±10µV			
Resistance	25Ω	0 to 4000Ω	±0.1Ω			
Thermocouple	°C			°F		
	MIN. SPAN	MAXIMUM 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	MAXIMUM 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.

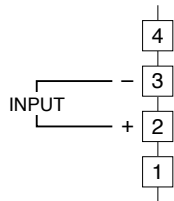
*2. 2°C for -50 to +100°C range, 3.6°F for -58 to +212°F range.

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



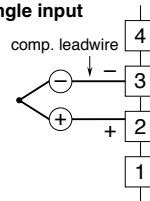
*1. Input Connection Examples

■ DC MILLIVOLT

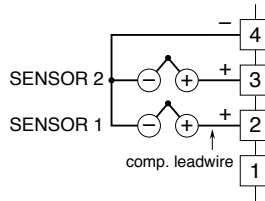


■ THERMOCOUPLE

• Single input

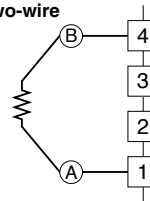


• Dual input

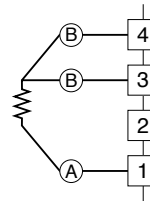


■ RTD & RESISTANCE

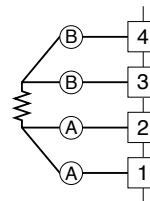
• Two-wire



• Three-wire

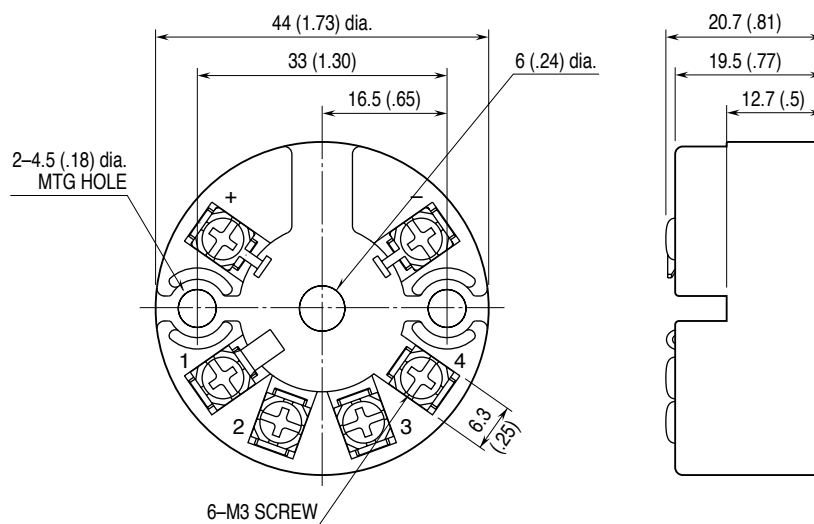
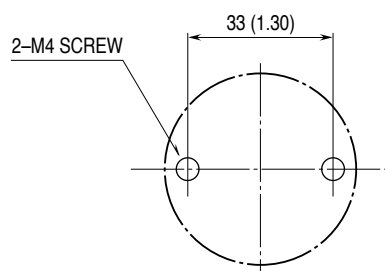


• Four-wire



*2. Limited to 250 – 500Ω when using the communication to configure the module.

*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.

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS mm (inch)**MOUNTING REQUIREMENTS mm (inch)**

По вопросам продаж и поддержки обращайтесь:

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