

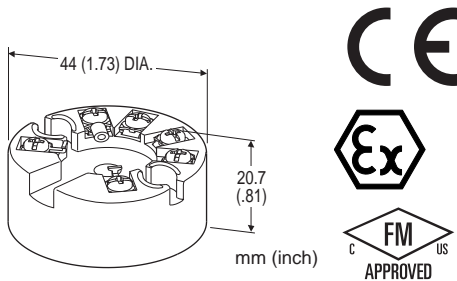
Head-mounted Two-wire Signal Conditioners 27-UNIT

RTD TRANSMITTER

(PC programmable; non-isolated)

Functions & Features

- Accepts direct input from an RTD and provides a standard 4 - 20 mA DC signal
- Suitable for Functional Safety applications up to SIL2
- I/O range programming via PC Configurator
- User's temperature table can be used
- Self diagnostics
- Low temperature drift
- CE marking (conforms to ATEX and EMC)



MODEL: 27R-[1][2]

ORDERING INFORMATION

- Code number: 27R-[1][2]

Specify a code from below for each [1], [2].

(e.g. 27R-0/M)

Use Ordering Information Sheet (No. ESU-7653). 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.

[1] SAFETY APPROVAL

0: None

1: FM intrinsically safe

(Option code /M is not selectable)

2: CENELEC intrinsic safety (ATEX)

(Option code /M is not selectable)

[2] OPTIONS

Function Monitor LED

Blank: Without

/M: With

RELATED PRODUCTS

- USB interface Bell202 modem (model: COP-HU)
Usable in 'non-hazardous' area only.
- PC configurator software (model: 27MCFG)
Downloadable at M-System's web site.

GENERAL SPECIFICATIONS

Construction: Sensor head-mounting

Connection: M3 screw terminals (torque 0.5 N·m)

Screw terminal: Nickel-plated brass

Housing material: Flame-resistant resin (black)

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

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

INPUT SPECIFICATIONS

The input is factory set for use with Pt 100 (JIS '97, IEC), 0 to 100°C.

- RTD (2-wire, 3-wire or 4-wire)

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

Excitation: 0.2 mA

Allowable leadwire resistance: Max. 10 Ω per wire

Temperature Range

RTD	MIN. SPAN		USABLE RANGE
	°C	°F	
Pt 100 (JIS '97, IEC)	10	18	-200 to +850
Pt 500	10	18	-328 to +1562
Pt 1000	10	18	-200 to +850
JPt 100 (JIS '89)	10	18	-200 to +510

OUTPUT SPECIFICATIONS

Output range: 4 - 20 mA DC

Operational range: 3.75 - 23 mA

Load resistance vs. supply voltage:

Load Resistance (Ω) = (Supply Voltage (V) - 9 (V)) / 0.023 (A) (including leadwire resistance)

Burnout: 3.75 - 3.8 mA or 21.5 - 23 mA

(factory set to 23 mA)

Upper output limit proportional to the input:

20 - 21.5 mA (factory set to 21.5 mA)

Lower output limit proportional to the input:

3.8 – 4 mA (factory set to 3.8 mA)

Update time: 440 msec.

INSTALLATION

Supply voltage:

- 9 – 35 V DC (non-approved)
- 9 – 28 V 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)

Weight: 50 g (1.76 oz)

PERFORMANCE

Accuracy: $\pm 0.15^{\circ}\text{C}$ ($\pm 0.27^{\circ}\text{F}$), $\pm 0.075\%$ of span or $\pm 0.075\%$ of max. range, whichever is greater (max. range = 0 % or 100 % value, absolute value of whichever is greater.)

Temp. coefficient: $0.0075\%/^{\circ}\text{C}$ ($0.0004\%/^{\circ}\text{F}$) of max. range (max. range = 0 % or 100 % value, absolute value of whichever is greater.)

Response time: ≤ 1 sec. (2- or 3-wire; 0 – 90 %) or ≤ 2 sec. (4-wire; 0 – 90 %) with damping time set to 0

Burnout response time: ≤ 2 sec.

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

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, Division 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: Intrinsic safety (ATEX)

Ex 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:

• Output circuit

Ui (Vmax): 30 V DC

Ii (Imax): 96 mA DC

Pi (Pmax): 720 mW

Ci: 1 nF

Li: 0 mH

• Sensor circuit

Uo (Voc): 30 V DC

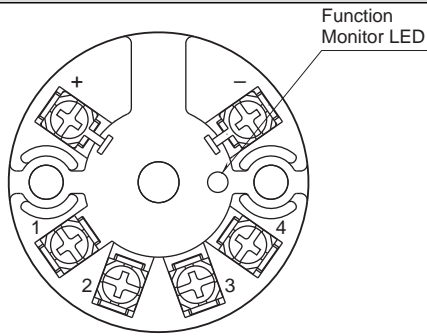
Io (Isc): 24 mA DC

Po: 180 mW

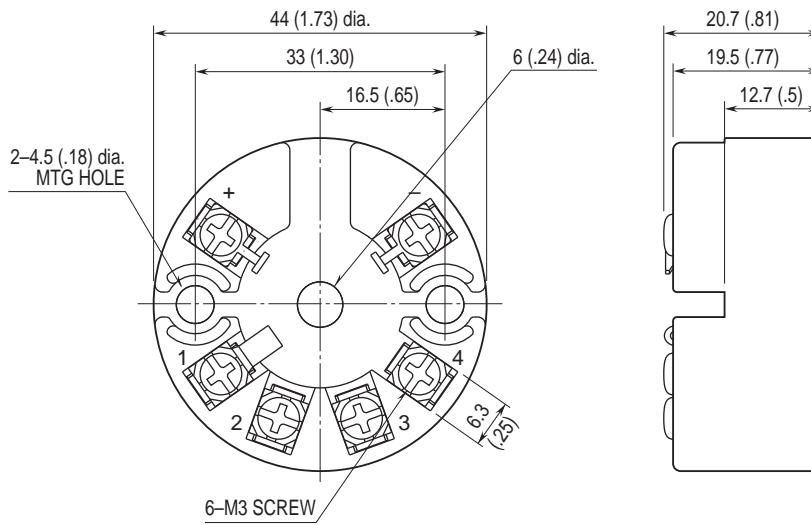
Co (Ca): 50 nF

Lo (La): 40 mH

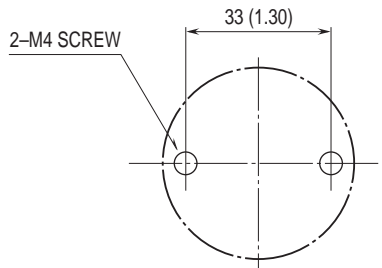
FUNCTION MONITOR LED (option /M)



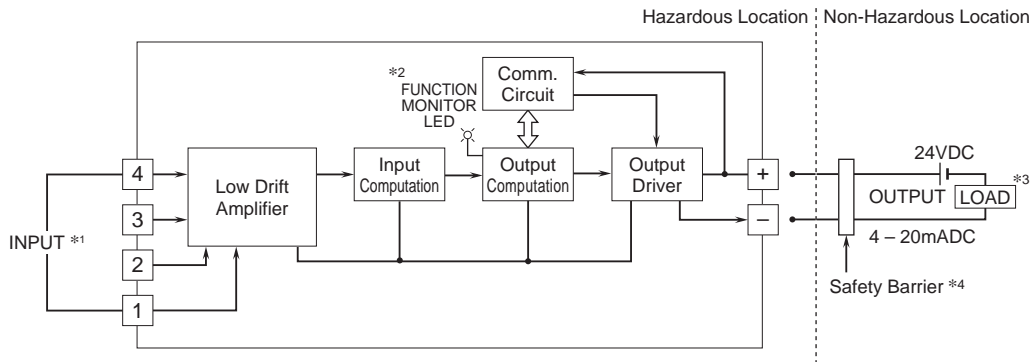
DIMENSIONS unit: mm (inch)



MOUNTING REQUIREMENTS unit: mm (inch)



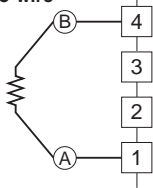
SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



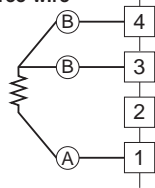
*1. Input Connection Examples

■ RTD & RESISTANCE

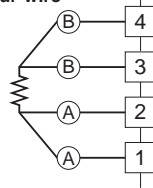
• Two-wire



• Three-wire



• Four-wire



*2. Option /M

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

*4. 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.



Specifications are subject to change without notice.