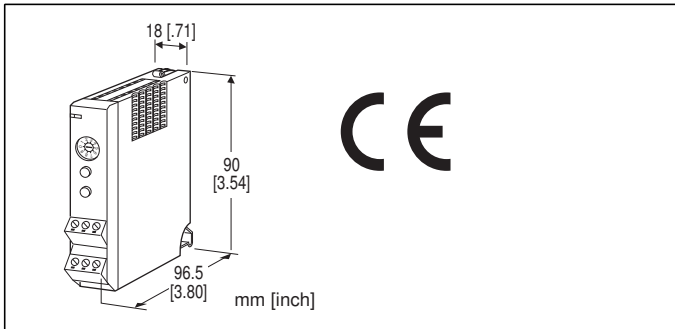


## Remote I/O R5 Series

### THERMOCOUPLE INPUT MODULE

(re-transmitted output)



### MODEL: R5-TS1A[1][2]

#### ORDERING INFORMATION

- Code number: R5-TS1A[1][2]
- Specify a code from below for each of [1] and [2].  
(e.g. R5-TS1AW/Q)
- Specify the specification for option code /Q  
(e.g. /C01)

#### NO. OF CHANNELS

1: 1 channel

#### OUTPUT

##### Current

A: 4 - 20 mA DC (Load resistance 600 Ω max.)

#### [1] COMMUNICATION MODE

S: Single

W: Dual

#### [2] OPTIONS

blank: none

/Q: With options (specify the specification)

#### SPECIFICATIONS OF OPTION: Q

**COATING (For the detail, refer to M-System's web site.)**

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

#### GENERAL SPECIFICATIONS

##### Connection

**Internal bus:** Via the Installation Base (model: R5-BS)

**I/O:** Euro type connector terminal

(Applicable wire size: 0.2 - 2.5 mm<sup>2</sup> (AWG24 - 12),  
stripped length 7 mm)

**Internal power:** Via the base (model: R5-BS)

**Isolation:** Input to output to internal bus or internal power

**Zero/Span adj. mode selector:** Rotary switch; monitor mode,  
adj. mode and simulated output mode selectable

**Sensor type:** Selectable with the side DIP SW

**Temperature unit:** °C, °F or absolute temperature selectable  
with the side DIP SW

**Burnout detection:** Upscale or downscale selectable with the  
side DIP SW

**Linearization:** Standard

**Cold junction compensation:** CJC sensor attached to the  
input terminals

**RUN indicator:** Bi-color (red/green) LED;

Red when the bus A operates normally;

Green when the bus B operates normally;

Amber when both buses operate normally.

#### INPUT SPECIFICATIONS

**Input resistance:** 30 kΩ min.

**Burnout sensing:** ≤ 0.1 μA

**Temperature range**

T/C	°C	
	USABLE RANGE	CONFORMANCE RANGE
K (CA) (*)* <sup>1</sup>	-272 to +1472	-150 to +1370
E (CRC) * <sup>1</sup>	-272 to +1120	-170 to +1000
J (IC)	-260 to +1300	-180 to +1200
T (CC) * <sup>1</sup>	-272 to +500	-170 to +400
B (RH) * <sup>1</sup>	24 to 1920	400 to 1760
R	-100 to +1860	200 to 1760
S	-100 to +1860	0 to 1760
C (WRe 5-26)	-52 to +2416	0 to 2315
N * <sup>1</sup>	-272 to +1400	-130 to +1300
U	-252 to +700	-200 to +600
L	-252 to +1000	-200 to +900
P (Platinel II)	-52 to +1496	0 to 1395
(PR)	-52 to +1860	0 to 1760
T/C	°F	
	USABLE RANGE	CONFORMANCE RANGE
K (CA) * <sup>1</sup>	-458 to +2682	-238 to +2498
E (CRC) * <sup>1</sup>	-458 to +2048	-274 to +1832
J (IC)	-436 to +2372	-292 to +2192
T (CC) * <sup>1</sup>	-458 to +932	-274 to +752
B (RH) * <sup>1</sup>	75 to 3488	752 to 3200
R	-148 to +3380	392 to 3200
S	-148 to +3380	32 to 3200
C (WRe 5-26)	-62 to +4381	32 to 4199
N * <sup>1</sup>	-458 to +2552	-202 to +2372
U	-422 to +1292	-328 to +1112
L	-422 to +1832	-328 to +1652
P (Platinel II)	-62 to +2725	32 to 2543
(PR)	-62 to +3380	32 to 3200

(\*): Factory setting. Set the input range within 0-1000°C corresponding to the output range 0-10000.

\*1. Accuracy degrades at temperatures close to the lower limit of the usable range.

Max. (upscale) or min. (downscale) value of the usable range when a burnout is detected.

## OUTPUT SPECIFICATIONS

**Operational range:** Approx. 0 – 24 mA DC

## INSTALLATION

**Operating temperature:** -10 to +55°C (14 to 131°F)

**Operating humidity:** 30 to 90 %RH (non-condensing)

**Atmosphere:** No corrosive gas or heavy dust

**Mounting:** Installation Base (model: R5-BS)

**Weight:** 100 g (0.22 lb)

## PERFORMANCE

### Conversion accuracy

**Input:**  $\pm 0.4^{\circ}\text{C}$  ( $\pm 0.6^{\circ}\text{C}$  for C thermocouple)

$\pm 0.8^{\circ}\text{F}$  ( $\pm 1.1^{\circ}\text{F}$  for C thermocouple)

**Output:**  $\pm 0.1$  % of the retransmitted range + input conversion accuracy (May exceed  $\pm 0.1$  % depending upon the input temperature range.)

**Conversion data:** Temperature data scaled and converted into 0 – 100 % data and supplied to the internal network bus

**Data allocation:** 1

**Cold junction compensation error:**  $\pm 0.5^{\circ}\text{C}$  or  $\pm 0.9^{\circ}\text{F}$   
(at  $20^{\circ}\text{C} \pm 10^{\circ}\text{C}$  or  $68^{\circ}\text{F} \pm 18^{\circ}\text{F}$ )

### Temp. coefficient

**Input:**  $\pm 0.015$  %/ $^{\circ}\text{C}$  ( $\pm 0.008$  %/ $^{\circ}\text{F}$ )

**Output:**  $\pm 0.02$  %/ $^{\circ}\text{C}$  ( $\pm 0.01$  %/ $^{\circ}\text{F}$ )

**Response time:**  $\leq 0.4$  sec. (0 – 90 %)

**Burnout response time:**  $\leq 2$  sec.

**Insulation resistance:**  $\geq 100$  M $\Omega$  with 500 V DC

**Dielectric strength:** 1500 V AC @ 1 minute (input to output to internal bus or internal power)

2000 V AC @ 1 minute (power input to FG; isolated on the power supply module)

## STANDARDS & APPROVALS

### EU conformity:

EMC Directive

EMI EN 61000-6-4

EMS EN 61000-6-2

RoHS Directive

## FUNCTIONS

### • Zero/Span Adjustment Modes

#### Monitor Mode

Re-transmits the input signal as output in proportion.

#### Output 0 % Adjustment Mode

Adjusts the 0 % output signal using the front UP/DOWN buttons, in monitoring the output value with a multimeter. SW1 through SW3 switch the internal increments by 1, 5 and 10.

#### Output 100 % Adjustment Mode

Adjusts the 100 % output signal using the front UP/DOWN buttons, in monitoring the output value with a multimeter. SW4 through SW6 switch the internal increments by 1, 5 and 10.

#### Simulated Output Mode

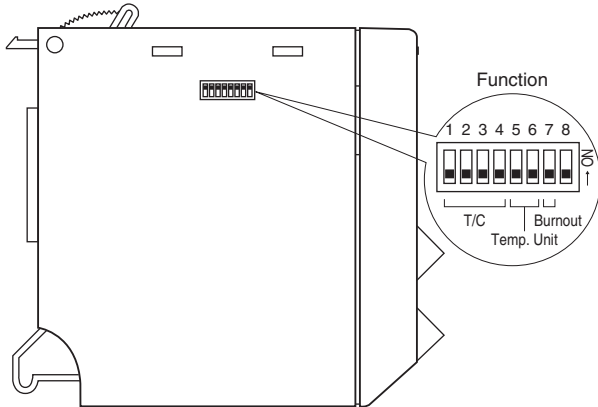
Outputs the simulated signals of 0 %, 50 % and 100 %.

##### • How to Operate

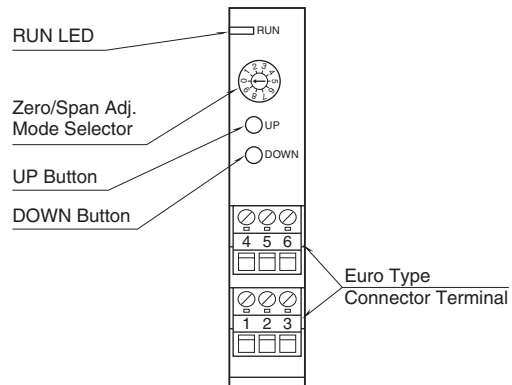
- 1) Start up in Monitor Mode (SW position = 0) and wait for 2 or 3 seconds.
- 2) Switch to another mode and go through the adjustments.
- 3) Reset the switch to the position '0' so that the new setting is stored in the internal memory.

## EXTERNAL VIEW

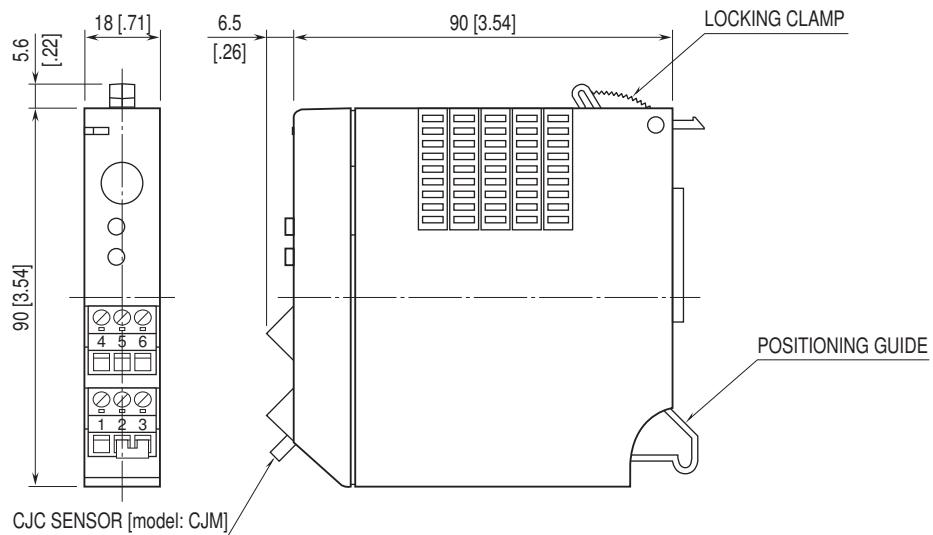
### ■ SIDE VIEW



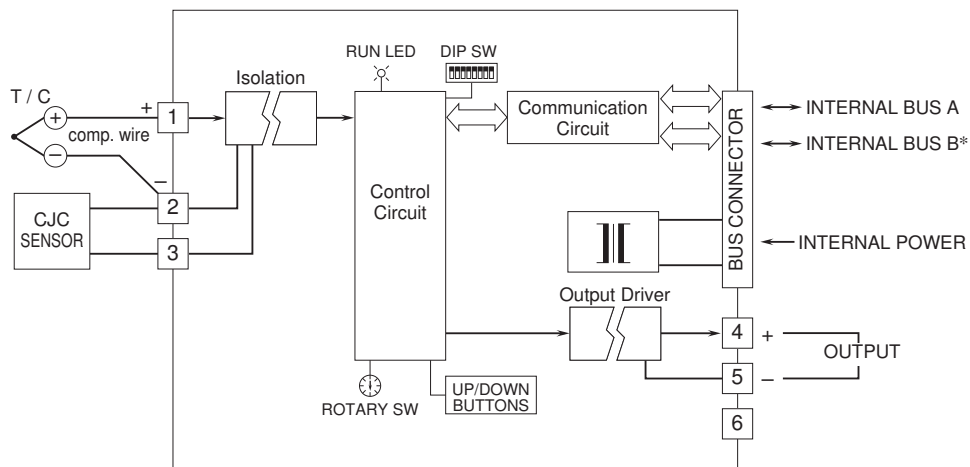
### ■ FRONT VIEW



## EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



\*For dual redundant communication.



Specifications are subject to change without notice.