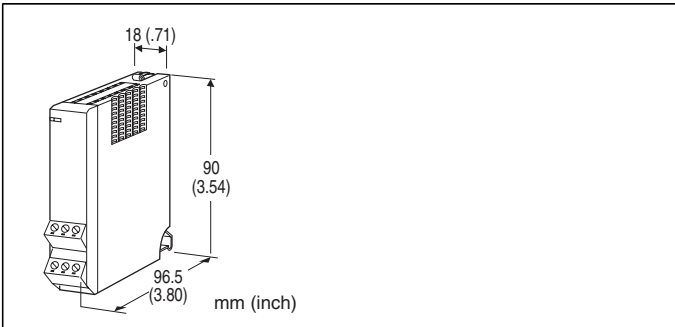


## High Accuracy Remote I/O R5H Series

### 4-WIRE RTD INPUT MODULE



### MODEL: R5H-RS1[1][2][3]

#### ORDERING INFORMATION

- Code number: R5H-RS1[1][2][3]
- Specify a code from below for each of [1] through [3]  
(e.g. R5H-RS1A1W)

#### NO. OF CHANNELS

1: 1 channel

#### [1] INPUT RTD (4-wire)

A: Pt 100

B: Pt 200

Refer to 'Reference resistance factory setting' under 'Input' specifications for more information.

#### [2] TEMPERATURE RANGE

1: 0 - 100°C

3: 0 - 300°C

#### [3] COMMUNICATION MODE

S: Single

W: Dual

#### RELATED PRODUCTS

- Remote I/O R5 series
- Base (model: R5-BS)  
Power supply module (model: R5-PS)  
Network module (model: R5-Nx)  
Blank filler module (model: R5-DM)
- Please refer to the data sheet for the respective models for detailed information about the software and I/O modules.
- PC configurator software (model: R5HCFG)
- Downloadable at our web site.  
A dedicated cable is required to connect the module to the

PC. Please refer to the internet software download site or the users manual for the PC configurator for applicable cable types.

#### GENERAL SPECIFICATIONS

##### Connection

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

**Input:** 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 internal power

**Temperature unit:** °C

**Burnout protection:** Upscale standard; downscale selectable using the PC Configurator.

**Linearization:** Standard

**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

**Maximum leadwire resistance:** 10 Ω per wire

**Sensing current:** ≤ 1 mA

**Temperature range:** 0 - 100°C, 0 - 300°C

**Value at burnout:** -274 - 323°C

**Reference resistance factory setting**

**Pt 100:**  $R_t = R_o (1 + At + Bt^2)$

where

$$A = 3.9083 \times 10^{-3} [^{\circ}\text{C}^{-1}]$$

$$B = -5.775 \times 10^{-7} [^{\circ}\text{C}^{-2}]$$

$$R_o = 100 [\Omega]$$

IEC 751-1995 (JIS C1604-1997)

**Pt 200:** Same equation except  $R_o = 200 [\Omega]$

#### INSTALLATION

**Current consumption:** 50 mA (21 V DC from power supply module)

**Operating temperature:** 20 to 40°C (68 to 104°F)

**Operating humidity:** 30 to 80 % RH (non-condensing)

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

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

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

#### PERFORMANCE

**Temperature range 0 - 100°C**

**Resolution:** ±0.01°C @ 25 ±3°C

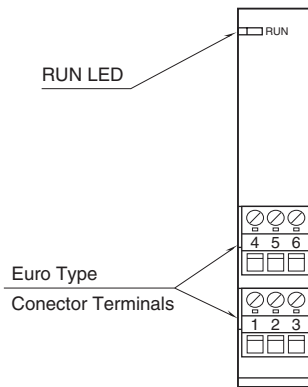
**Conversion accuracy:** ±0.03°C @ 25 ±3°C

**Temperature range 0 - 300°C**

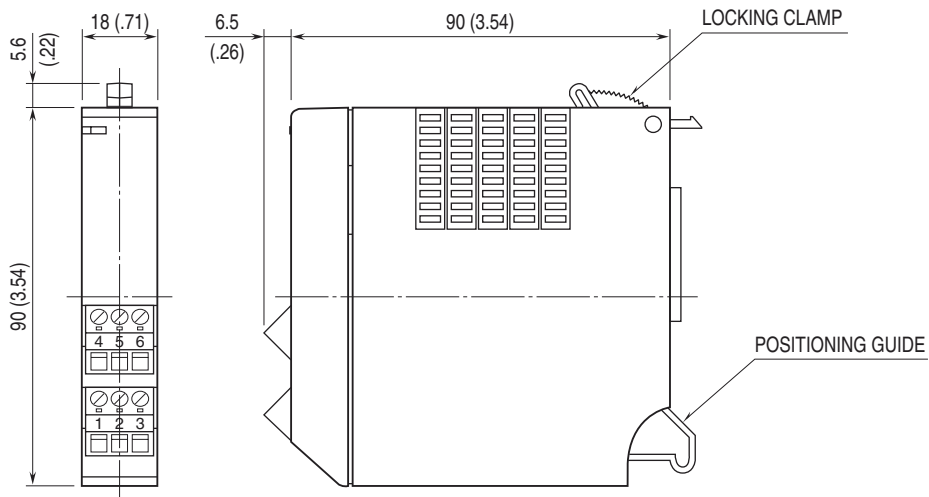
**Resolution:** ±0.01°C @ 25 ±3°C

**Conversion accuracy:**  $\pm 0.1^{\circ}\text{C}$  @  $25 \pm 3^{\circ}\text{C}$   
**Data range:** Engineering unit value  $\times 100$  (integer)  
**Data allocation:** 1  
**Temp. coefficient:**  $\pm 0.004\%$  /  $^{\circ}\text{C}$  ( $\pm 0.003\%$  /  $^{\circ}\text{F}$ ) of max. span  
**Response time:**  $\leq 0.5$  sec.  
**Burnout response:**  $\leq 10$  sec.  
**Insulation resistance:**  $\geq 100\text{ M}\Omega$  with 500 V DC  
**Dielectric strength:** 1500 V AC @ 1 minute  
 (input to internal power)  
 2000 V AC @ 1 minute (power input to FG; isolated on the  
 power supply module)

## EXTERNAL VIEW

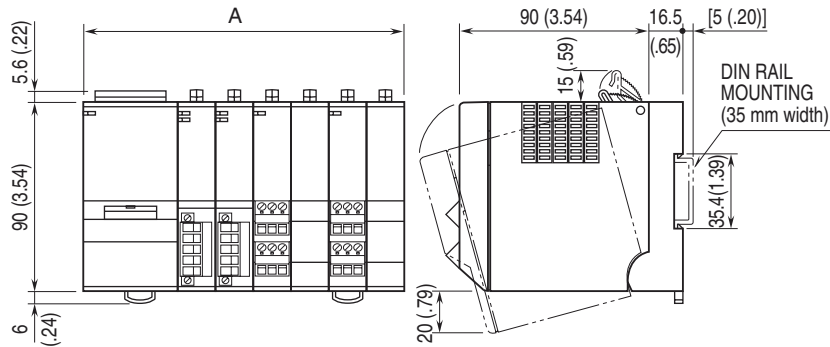


## EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



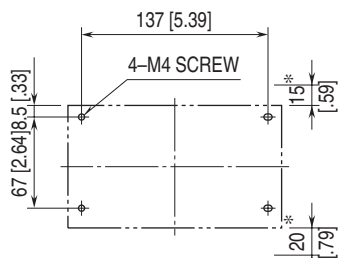
## MOUNTING REQUIREMENTS unit: mm [inch]

### ■ BASE



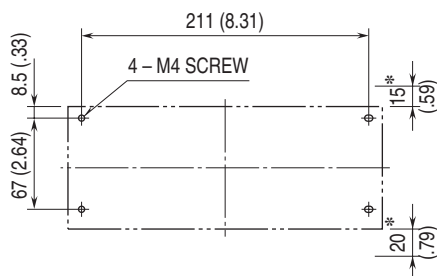
MODEL	DIM. A
R5-BS04	157 (6.18)
R5-BS05	
R5-BS08	231 (9.09)
R5-BS09	
R5-BS16	379 (14.92)

### ■ R5-BS04, BS05



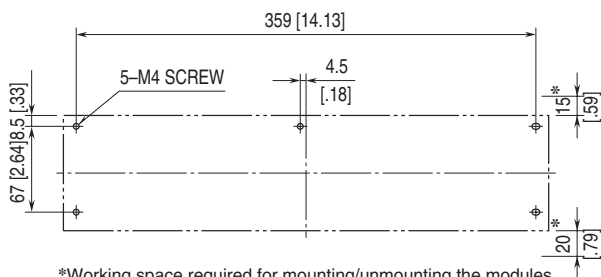
\*Working space required for mounting/unmounting the modules.

### ■ R5-BS08, BS09



\*Working space required for mounting/unmounting the modules.

### ■ R5-BS16

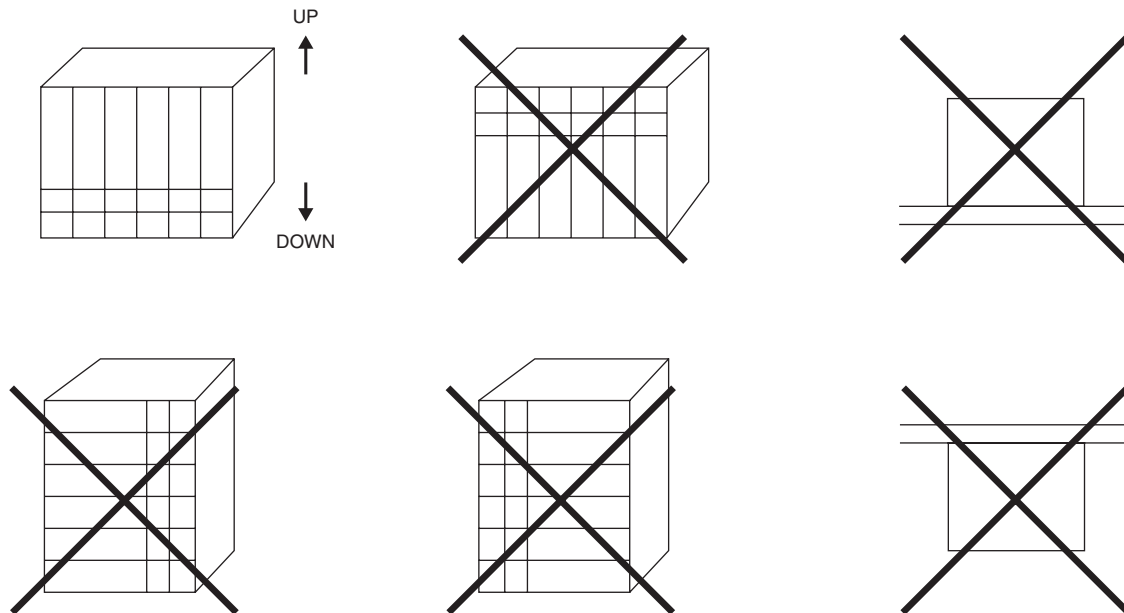


\*Working space required for mounting/unmounting the modules.

## MOUNTING

### ■ MOUNTING DIRECTION

The unit must be mounted on a vertical panel. Mounting in any other angle will cause internal temperature to rise, may shorten the product's life expectancy or deteriorate its performance.

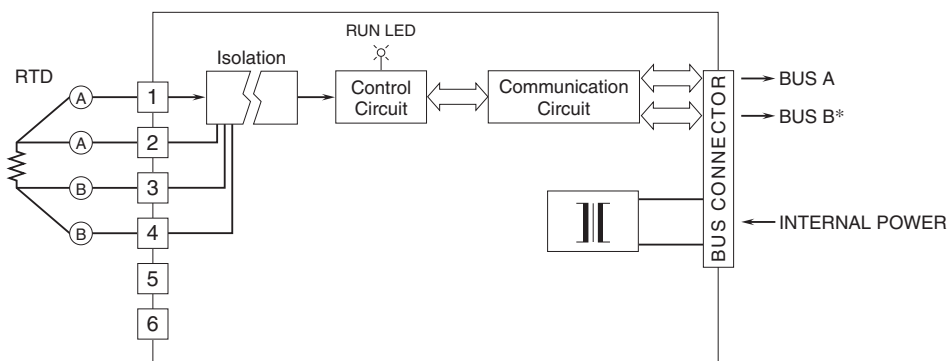


### ■ VENTILATION & MAINTENANCE SPACE

Maintain sufficient ventilation space. Do not mount the unit directly above devices which radiate great heat such as heaters, transformers or resistors.

Maintenance space is also required above and below the unit.

## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



\*For dual redundant communication.

## SYSTEM DESCRIPTIONS

### ■ GENERAL

The R5H Series Remote I/O consists of a power supply module, network interface module(s), I/O module(s) and a backplane (base). An extender base for an additional power supply module is available.

#### • Power Supply Module

Converts AC or DC power inputs for use in the network modules, I/O modules and for exciting discrete I/O.

#### • Communication Module

Converts data between the open network fieldbus (DeviceNet, etc.) and the internal communication bus, functioning as a

Gateway between two buses.

- **I/O Module**

The model R5H-RS is a high accuracy 4-wire RTD input module. Performs A/D conversion of field analog inputs; D/A conversion of data received through the internal bus into analog/discrete outputs.

Temperature input is converted into signed binary data which equals 100 times its engineering unit value (°C). e.g. 25.53°C is converted to 2553.

- **Base**

Backplane with communications and power supply buses.

An extender base is available for an additional power supply module for dual redundancy.

The R5-BS04, -BS08 and -BS16 can mount two network modules for dual redundant communication. Single mode is also usable.

The R5-BS05 and -BS09 can mount only one network module for single communication mode only.

- **SINGLE COMMUNICATION MODE**

When the single communication mode is employed, the input modules send out via the internal bus analog inputs to the network module. The network module outputs the data to the field bus.

- **DUAL COMMUNICATION MODE**

A dual redundant communication system can be easily achieved by employing two network modules and using dual communication type I/O modules (model suffix code "W").

Each I/O module is equipped with two independent communication ports, which are connected to the separate network modules.

Input modules continuously respond to request-to-send from the both lines. This secures two independent communications.

- **HOT INSERTION/REMOVAL OF I/O MODULES**

Each I/O and network module has an independent CPU. Data is renewed by serial communications between modules.

Therefore no momentary lapse or bumping of analog output occurs when switching communication buses in the dual communication mode.

Furthermore, removing or replacing modules does not affect other modules on the same backplane. It is possible to replace them without removing the power supply. However, replacing multiple modules at once may greatly change line voltage levels. We recommend that you replace them one by one.

PROFIBUS Standard requires that all outputs be turned off when turning the power supply on. Therefore remove the power before replacing the PROFIBUS modules.

- **USABLE R5 MODULES**

- **Network Interface Module**

R5-ND1: DeviceNet

R5-NM1: Modbus

R5-NC1: CC-Link

R5-NP1: PROFIBUS-DP

R5-NE1: Ethernet (Modbus/TCP)

R5-NF1: T-Link

- **Base**

R5-BS04: 4 I/O modules

R5-BS05: 5 I/O modules (single communication mode)

R5-BS08: 8 I/O modules

R5-BS09: 9 I/O modules (single communication mode)

R5-BS16: 16 I/O modules

R5-EX1: Extender base for Power Supply Module

- **Power Supply Module**

R5-PSK: 100 - 120 V AC

R5-PSL: 200 - 240 V AC

R5-PSR: 24 V DC

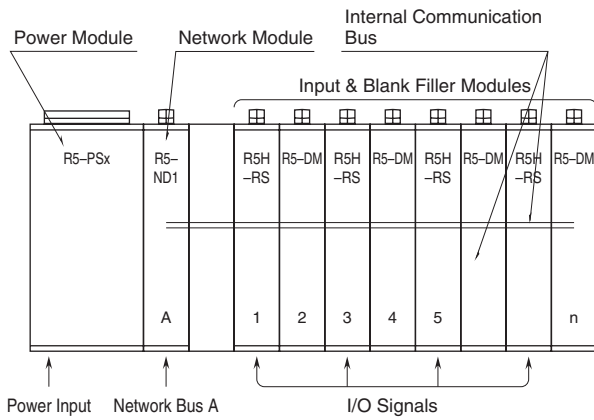
- **Blank Filler Module**

R5-DM: Blank filler

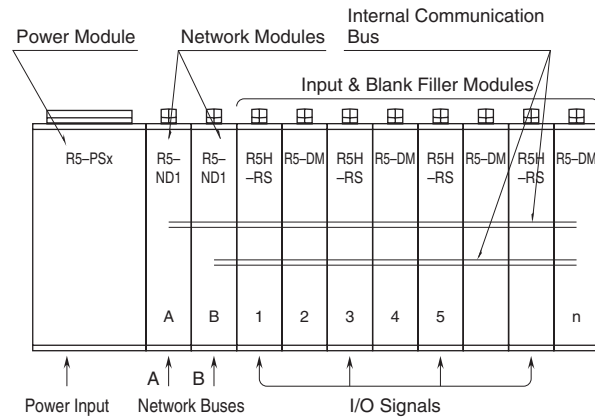
Mount Input Modules at odd number slots, and Blank Filler Modules at even number slots. The R5 series I/O modules cannot be mixed with the R5H series.

## ■ R5-BS04, -BS08, -BS16

### •Single Communication Mode (one Network Module)



### •Dual Communication Mode (two Network Modules)



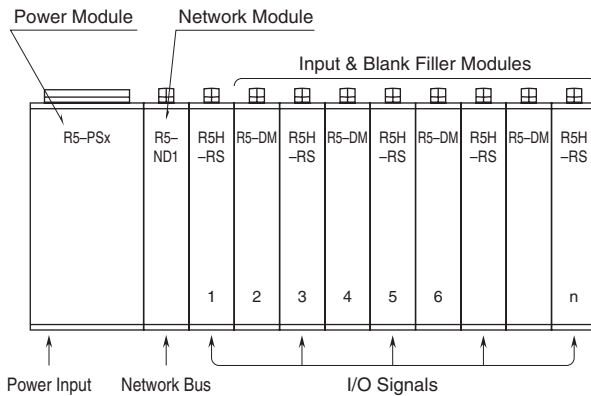
### •Dual Redundant Power Supply

An extender base is available for an additional power supply module for dual redundancy.

Dual mode I/O modules can be used in single mode, while the communication bus B does not operate if single mode modules are used in dual mode.

## ■ R5-BS05, -BS09

### •Single Communication Mode (one Network Module)



Specifications are subject to change without notice.