

**Plug-in Signal Conditioners M-UNIT**

**RATIO TRANSMITTER**

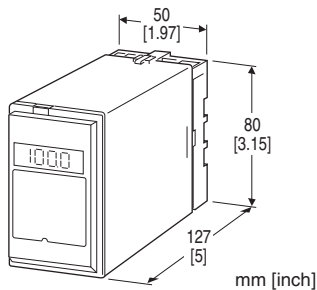
(input bias; isolated)

**Functions & Features**

- Providing precise matching of DC control signals to final control elements in open-or closed-loop systems
- Positive and negative ratio range
- Ratio adjustable from 0.1 to 4.0
- Bias adjustable within  $\pm 100\%$
- Isolation up to 2000 V AC
- High-density mounting

**Typical Applications**

- Ratio control for air/fuel flows
- Negative ratio for split control



**MODEL: RTS-[1][2][3]-[4][5]**

**ORDERING INFORMATION**

- Code number: RTS-[1][2][3]-[4][5]
- Specify a code from below for each of [1] through [5]. (e.g. RTS-16A-B/E/Q)
- Special input and output ranges (For codes Z & 0)
- Specify the specification for option code /Q (e.g. /C01/S01)

**[1] RATIO RANGE**

- 1: Positive 0.1 - 1.1
- 2: Positive 0.5 - 1.5
- 3: Positive 0.2 - 2.2
- 4: Positive 0.5 - 4.0
- 6: Negative -0.1 - -1.1
- 7: Negative -0.5 - -1.5
- 8: Negative -0.2 - -2.2
- 9: Negative -0.5 - -4.0

**[2] INPUT**

Current

A: 4 - 20 mA DC (Input resistance 250  $\Omega$ )

B: 2 - 10 mA DC (Input resistance 500  $\Omega$ )

C: 1 - 5 mA DC (Input resistance 1000  $\Omega$ )

D: 0 - 20 mA DC (Input resistance 50  $\Omega$ )

E: 0 - 16 mA DC (Input resistance 62.5  $\Omega$ )

F: 0 - 10 mA DC (Input resistance 100  $\Omega$ )

G: 0 - 1 mA DC (Input resistance 1000  $\Omega$ )

H: 10 - 50 mA DC (Input resistance 100  $\Omega$ )

J: 0 - 10  $\mu$ A DC (Input resistance 1000  $\Omega$ )

K: 0 - 100  $\mu$ A DC (Input resistance 1000  $\Omega$ )

GW: -1 - +1 mA DC (Input resistance 1000  $\Omega$ )

FW: -10 - +10 mA DC (Input resistance 100  $\Omega$ )

Z: Specify current (See INPUT SPECIFICATIONS)

Voltage

1: 0 - 10 mV DC (Input resistance 10 k $\Omega$  min.)

15: 0 - 50 mV DC (Input resistance 10 k $\Omega$  min.)

16: 0 - 60 mV DC (Input resistance 10 k $\Omega$  min.)

2: 0 - 100 mV DC (Input resistance 100 k $\Omega$  min.)

3: 0 - 1 V DC (Input resistance 1 M $\Omega$  min.)

4: 0 - 10 V DC (Input resistance 1 M $\Omega$  min.)

5: 0 - 5 V DC (Input resistance 1 M $\Omega$  min.)

6: 1 - 5 V DC (Input resistance 1 M $\Omega$  min.)

4W: -10 - +10 V DC (Input resistance 1 M $\Omega$  min.)

5W: -5 - +5 V DC (Input resistance 1 M $\Omega$  min.)

0: Specify voltage (See INPUT SPECIFICATIONS)

**[3] OUTPUT**

Current

A: 4 - 20 mA DC (Load resistance 750  $\Omega$  max.)

B: 2 - 10 mA DC (Load resistance 1500  $\Omega$  max.)

C: 1 - 5 mA DC (Load resistance 3000  $\Omega$  max.)

D: 0 - 20 mA DC (Load resistance 750  $\Omega$  max.)

E: 0 - 16 mA DC (Load resistance 900  $\Omega$  max.)

F: 0 - 10 mA DC (Load resistance 1500  $\Omega$  max.)

G: 0 - 1 mA DC (Load resistance 15 k $\Omega$  max.)

Z: Specify current (See OUTPUT SPECIFICATIONS)

Voltage

1: 0 - 10 mV DC (Load resistance 10 k $\Omega$  min.)

2: 0 - 100 mV DC (Load resistance 100 k $\Omega$  min.)

3: 0 - 1 V DC (Load resistance 100  $\Omega$  min.)

4: 0 - 10 V DC (Load resistance 1000  $\Omega$  min.)

5: 0 - 5 V DC (Load resistance 500  $\Omega$  min.)

6: 1 - 5 V DC (Load resistance 500  $\Omega$  min.)

4W: -10 - +10 V DC (Load resistance 2000  $\Omega$  min.)

5W: -5 - +5 V DC (Load resistance 1000  $\Omega$  min.)

0: Specify voltage (See OUTPUT SPECIFICATIONS)

## [4] POWER INPUT

AC Power  
**B:** 100 V AC  
**C:** 110 V AC  
**D:** 115 V AC  
**F:** 120 V AC  
**G:** 200 V AC  
**H:** 220 V AC  
**J:** 240 V AC  
 DC Power  
**S:** 12 V DC  
**R:** 24 V DC  
**V:** 48 V DC  
**P:** 110 V DC

## [5] OPTIONS (multiple selections)

LCD Meter (for indicating value after ratio/bias adjustment)

**blank:** Without

**/E:** With (0.0 - 100.0 % display)

Other Options

**blank:** none

**/Q:** Option other than the above (specify the specification)

### SPECIFICATIONS OF OPTION: Q (multiple selections)

COATING (For the detail, refer to our web site.)

**/C01:** Silicone coating

**/C02:** Polyurethane coating

**/C03:** Rubber coating

TERMINAL SCREW MATERIAL

**/S01:** Stainless steel

## GENERAL SPECIFICATIONS

**Construction:** Plug-in

**Connection:** M3.5 screw terminals

**Screw terminal:** Chromated steel (standard) or stainless steel

**Housing material:** Flame-resistant resin (black)

**Isolation:** Input to output to power

**Overrange output:** Approx. -10 to +120 % at 1 - 5 V

**Bias adjustment:** -100 - +100 % (front)

**Equation:**  $X_o = K(X_i + B)$  for positive ratio (factory setting:  $K = 1, B = 0$  %);

$X_o = K(X_i + B) + 100$  % for negative ratio (factory setting:

$K = -1, B = 0$  %)

where

$X_o$  : output (%)

$X_i$  : input (%)

$K$  : ratio

$B$  : bias

(-100 - +100 %; added to the input)

■ **DISPLAY (LCD meter)**

• **Option code:** /E

**LCD digital display:** 0.0 - 100.0 % (min. digit 0.1 %)  
 (No scaling)

## INPUT SPECIFICATIONS

■ **DC Current:**

Shunt resistor attached to the input terminals (0.5 W)

Specify input resistance value for code Z.

■ **DC Voltage:** -300 - +300 V DC

**Minimum span:** 3 mV

**Offset:** Max. 1.5 times span

**Input resistance**

Span 3 - 10 mV :  $\geq 10$  k $\Omega$

Span 10 - 100 mV :  $\geq 10$  k $\Omega$

Span 0.1 - 1 V :  $\geq 100$  k $\Omega$

Span  $\geq 1$  V :  $\geq 1$  M $\Omega$

## OUTPUT SPECIFICATIONS

■ **DC Current:** 0 - 20 mA DC

**Minimum span:** 1 mA

**Offset:** Max. 1.5 times span

**Load resistance:** Output drive 15 V max.

■ **DC Voltage:** -10 - +12 V DC

**Minimum span:** 5 mV

**Offset:** Max. 1.5 times span

**Load resistance:** Output drive 10 mA max.; 5 mA for negative voltage output; at  $\geq 0.5$  V

## INSTALLATION

**Power input**

• **AC:** Operational voltage range: rating  $\pm 10$  %, 50/60  $\pm 2$  Hz, approx. 2 VA

• **DC:** Operational voltage range: rating  $\pm 10$  %, or 85 - 150 V for 110 V rating (ripple 10 %p-p max.)

approx. 2.6 W (110 mA at 24 V)

**Operating temperature:** -5 to +60°C (23 to 140°F)

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

**Mounting:** Surface or DIN rail

**Weight:** 400 g (0.88 lb)

## PERFORMANCE in percentage of span

**Accuracy:**  $\pm 0.2$  % (with ratio = 1, bias = 0 %)

**Display accuracy:**  $\pm (0.2$  % of FS + 1 digit) (with ratio = 1, bias = 0 %)

**Temp. coefficient:**  $\pm 0.02$  %/°C ( $\pm 0.01$  %/°F)

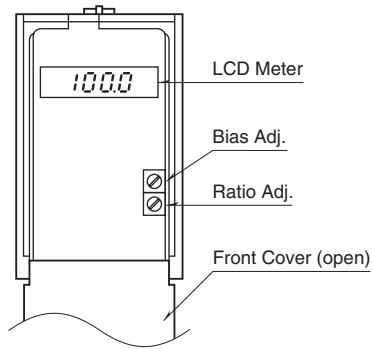
**Response time:**  $\leq 0.5$  sec. (0 - 90 %)

**Line voltage effect:**  $\pm 0.1$  % over voltage range

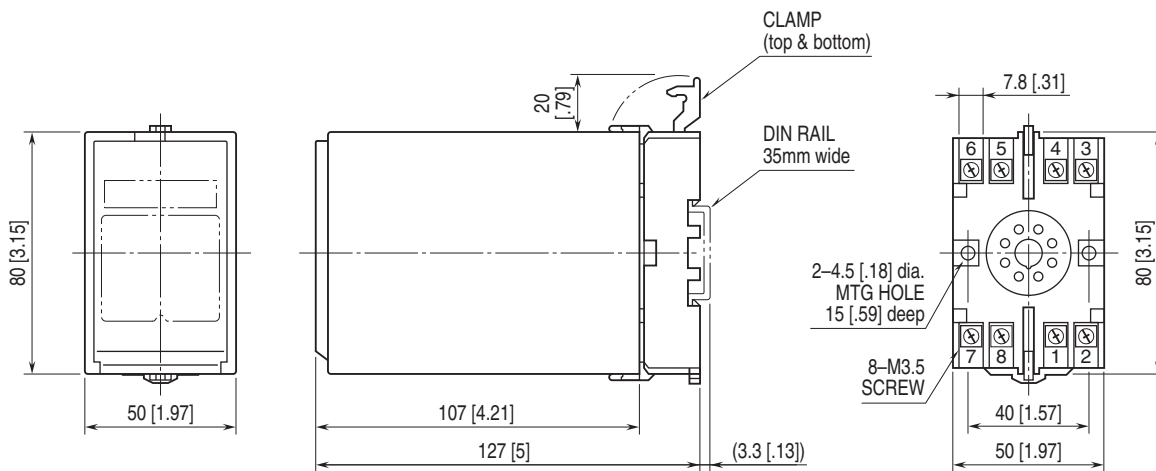
**Insulation resistance:**  $\geq 100$  M $\Omega$  with 500 V DC

**Dielectric strength:** 2000 V AC @1 minute (input to output to power to ground)

## EXTERNAL VIEW

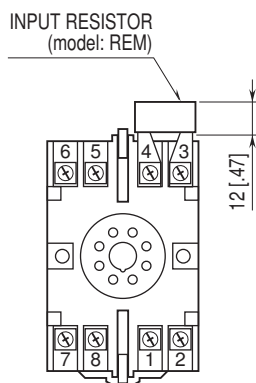


## EXTERNAL DIMENSIONS unit: mm [inch]



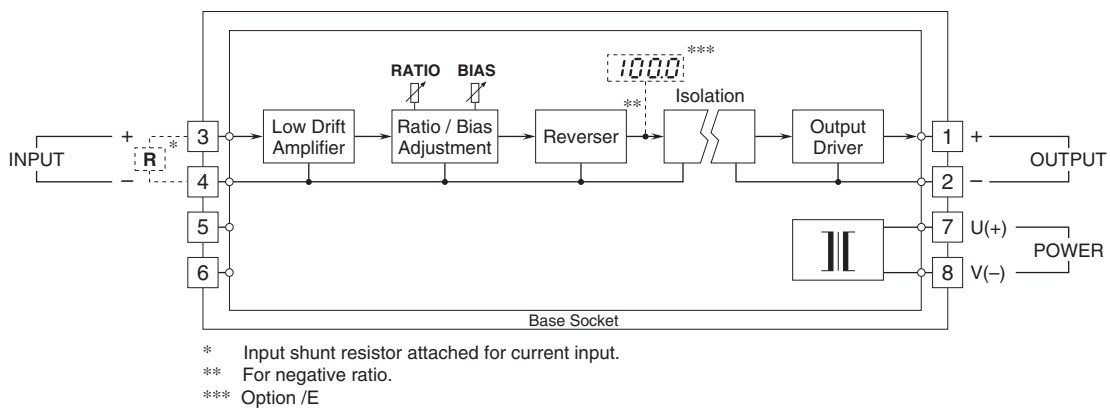
• When mounting, no extra space is needed between units.

## TERMINAL ASSIGNMENTS unit: mm [inch]



Input shunt resistor attached for current input.

**SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM**



Specifications are subject to change without notice.