

## Plug-in Signal Conditioners M-UNIT

### RATIO TRANSMITTER

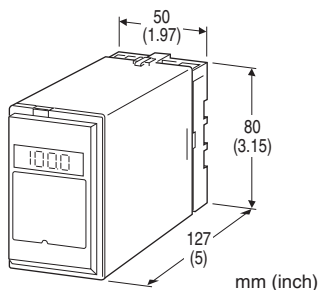
(input bias; isolated)

#### 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 M-System's 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

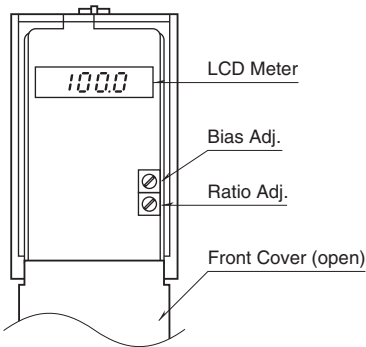
LCD digital display: 0.0 - 100.0 % (min. digit 0.1 %)  
(No scaling)**INPUT SPECIFICATIONS****■ DC Current:**

Shunt resistor attached to the input terminals (0.5 W)

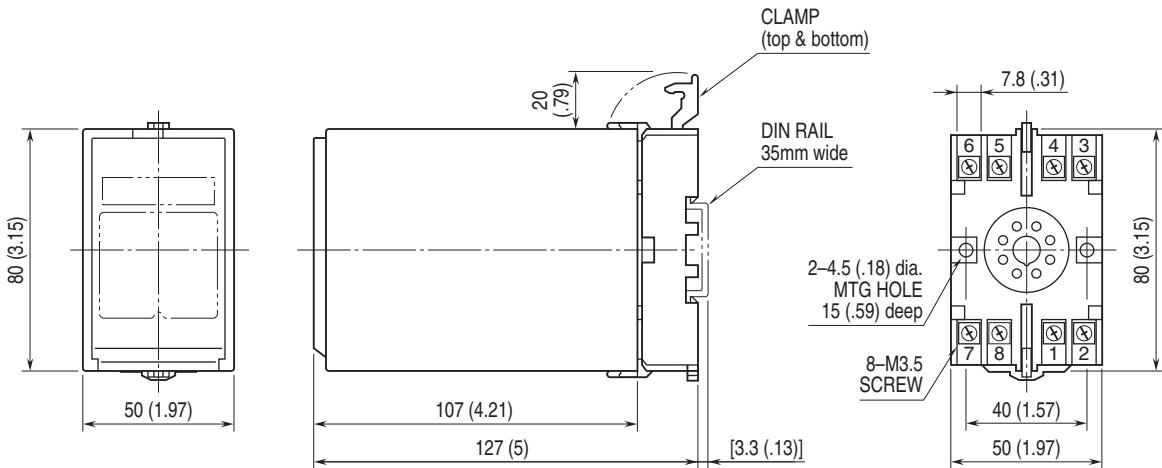
Specify input resistance value for code Z.

**■ 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

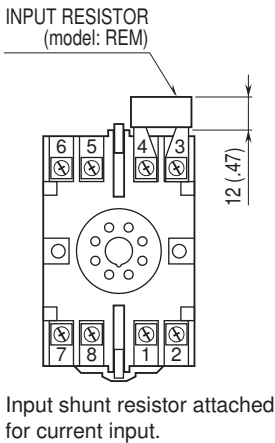


EXTERNAL DIMENSIONS unit: mm (inch)

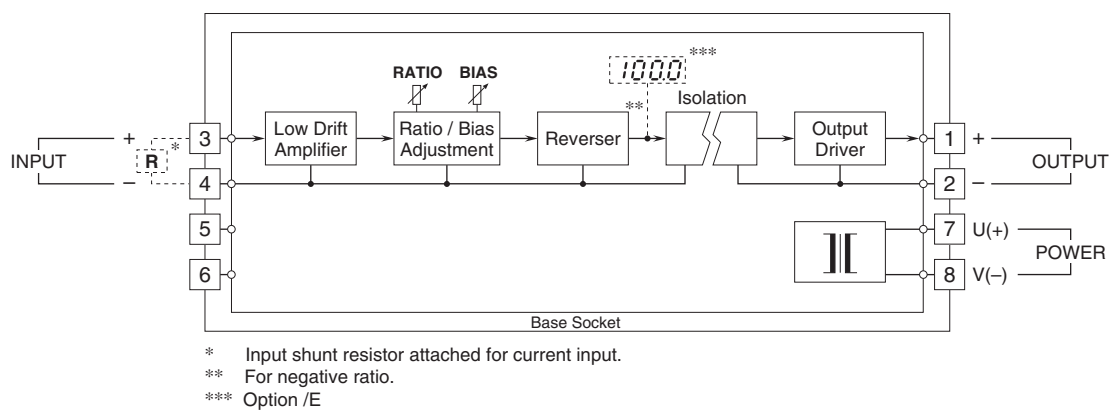


• When mounting, no extra space is needed between units.

TERMINAL ASSIGNMENTS unit: mm (inch)



## SCHEMATIC CIRCUITRY &amp; CONNECTION DIAGRAM



Specifications are subject to change without notice.