

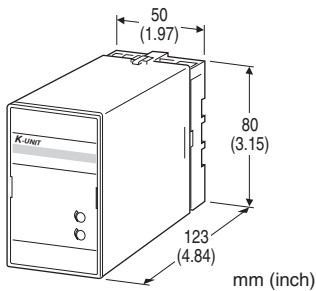
Plug-in Signal Conditioners K-UNIT

RATIO TRANSMITTER

(input bias; non-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 $\pm 100\%$
- High-density mounting



MODEL: KRTB-[1][2][3]-[4][5]

ORDERING INFORMATION

- Code number: KRTB-[1][2][3]-[4][5]
Specify a code from below for each of [1] through [5].
(e.g. KRTB-16A-B/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 Ω)
- A1: 4 - 20 mA DC (Input resistance 50 Ω)
- B: 2 - 10 mA DC (Input resistance 500 Ω)
- C: 1 - 5 mA DC (Input resistance 1000 Ω)
- D: 0 - 20 mA DC (Input resistance 50 Ω)

- E: 0 - 16 mA DC (Input resistance 62.5 Ω)
- F: 0 - 10 mA DC (Input resistance 100 Ω)
- G: 0 - 1 mA DC (Input resistance 1000 Ω)
- H: 10 - 50 mA DC (Input resistance 100 Ω)
- J: 0 - 10 μ A DC (Input resistance 1000 Ω)
- K: 0 - 100 μ A DC (Input resistance 1000 Ω)
- GW: -1 - +1 mA DC (Input resistance 1000 Ω)
- FW: -10 - +10 mA DC (Input resistance 100 Ω)
- Z: Specify current (See INPUT SPECIFICATIONS)

Voltage

- 1: 0 - 10 mV DC (Input resistance 10 k Ω min.)
- 15: 0 - 50 mV DC (Input resistance 10 k Ω min.)
- 16: 0 - 60 mV DC (Input resistance 10 k Ω min.)
- 2: 0 - 100 mV DC (Input resistance 100 k Ω min.)
- 3: 0 - 1 V DC (Input resistance 1 M Ω min.)
- 4: 0 - 10 V DC (Input resistance 1 M Ω min.)
- 5: 0 - 5 V DC (Input resistance 1 M Ω min.)
- 6: 1 - 5 V DC (Input resistance 1 M Ω min.)
- 4W: -10 - +10 V DC (Input resistance 1 M Ω min.)
- 5W: -5 - +5 V DC (Input resistance 1 M Ω min.)
- 0: Specify voltage (See INPUT SPECIFICATIONS)

[3] OUTPUT

Current

- A: 4 - 20 mA DC (Load resistance 750 Ω max.)
- B: 2 - 10 mA DC (Load resistance 1500 Ω max.)
- C: 1 - 5 mA DC (Load resistance 3000 Ω max.)
- D: 0 - 20 mA DC (Load resistance 750 Ω max.)
- E: 0 - 16 mA DC (Load resistance 900 Ω max.)
- F: 0 - 10 mA DC (Load resistance 1500 Ω max.)
- G: 0 - 1 mA DC (Load resistance 15 k Ω max.)
- Z: Specify current (See OUTPUT SPECIFICATIONS)

Voltage

- 1: 0 - 10 mV DC (Load resistance 10 k Ω min.)
- 2: 0 - 100 mV DC (Load resistance 100 k Ω min.)
- 3: 0 - 1 V DC (Load resistance 100 Ω min.)
- 4: 0 - 10 V DC (Load resistance 1000 Ω min.)
- 5: 0 - 5 V DC (Load resistance 500 Ω min.)
- 6: 1 - 5 V DC (Load resistance 500 Ω min.)
- 4W: -10 - +10 V DC (Load resistance 2000 Ω min.)
- 5W: -5 - +5 V DC (Load resistance 1000 Ω 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

[5] OPTIONS

blank: none

/Q: With options (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 or 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)

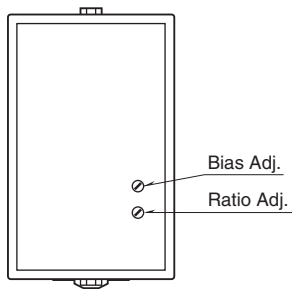
INPUT SPECIFICATIONS**DC Current:**

Shunt resistor attached to the input terminals (0.5 W)

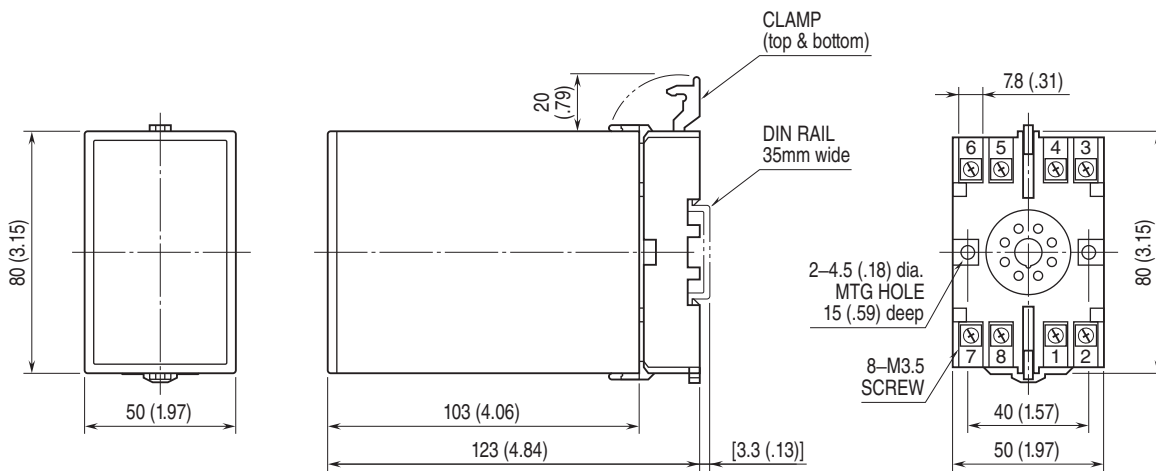
Specify input resistance value for code Z.

DC Voltage: -300 - +300 V DC**Minimum span:** 3 mV**Offset:** Max. 1.5 times span**Input resistance**Span 3 - 10 mV : $\geq 10 \text{ k}\Omega$ Span 10 - 100 mV : $\geq 10 \text{ k}\Omega$ Span 0.1 - 1 V : $\geq 100 \text{ k}\Omega$ Span $\geq 1 \text{ V}$: $\geq 1 \text{ M}\Omega$ **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 $\geq 0.5 \text{ V}$ **INSTALLATION****Power input**• **AC:** Operational voltage range: rating $\pm 10 \%$, 50/60 ± 2 Hz, approx. 2 VA• **DC:** Operational voltage range: rating $\pm 10 \%$ ripple 10 %p-p max., approx. 2.6 W (110 mA at 24 V)**Operating temperature:** -5 to +55°C (23 to 131°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 %)**Temp. coefficient:** $\pm 0.02 \%$ /°C ($\pm 0.01 \%$ /°F)**Response time:** ≤ 0.5 sec. (0 - 90 %)**Line voltage effect:** $\pm 0.1 \%$ over voltage range**Insulation resistance:** $\geq 100 \text{ M}\Omega$ with 500 V DC**Dielectric strength:** 2000 V AC @1 minute (input or output to power to ground)

EXTERNAL VIEW

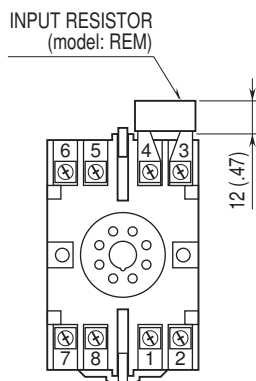


EXTERNAL DIMENSIONS unit: mm (inch)



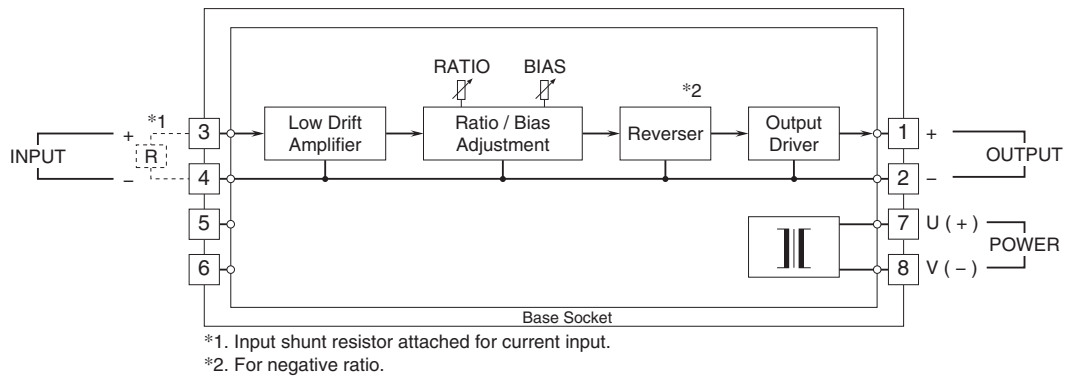
• When mounting, no extra space is needed between units.

TERMINAL ASSIGNMENTS unit: mm (inch)



Input shunt resistor attached for current input.

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



Specifications are subject to change without notice.