

Plug-in Signal Conditioners M-UNIT

RAMP BUFFER

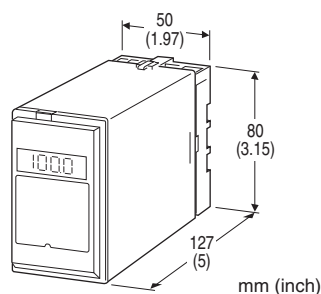
(non-isolated)

Functions & Features

- Limiting the rate of change of the output once the rate of the input exceeds the preset value
- Rate-of-change adjustable up to 40 seconds
- LCD meter (engineering unit display selectable)
- Simple loop test output (0 % and 100 %)
- High-density mounting

Typical Applications

- Reducing the rate of change caused by a step change or spikes on the input signal
- Protecting equipment that cannot withstand rapidly changing process variables



MODEL: CR-[1][2]-[3][4]

ORDERING INFORMATION

- Code number: CR-[1][2]-[3][4]

Specify a code from below for each of [1] through [4].

- (e.g. CR-6A-B/E2/Q)
- Special input and output ranges (For codes Z & 0)
- Specify the specification for option code /Q
- (e.g. /C01/S01)

[1] 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)

[2] 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)

[3] 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 (Not selectable with Option /E2.)

[4] OPTIONS (multiple selections)**LCD Meter (after the ramp filtering)**

blank: Without

/E: With (0.0 - 100.0 % display)

/E2: With (in engineering unit with backlight and the simple loop test output)

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 or output to power**Overrange output:** Approx. -10 to +120 % at 1 - 5 V
Rate-of-change adjustment: 270°-turn screwdriver adjustment (front)**Rate-of-change adjustment range:** Approx. 0.5 to 40 sec. (0 - 100 %; factory set to MIN.)**Zero adjustment:** -5 to +5 % (front)**Span adjustment:** 95 to 105 % (front)**Simple loop test output:** 0 % and 100 % signal simulated by selecting the front switch positions. (Only for option code /E2)**■ DISPLAY (LCD meter)****• Option code: /E****LCD digital display:** 0.0 - 100.0 % (min. digit 0.1 %) (No scaling)**• Option code: /E2****LCD digital display:** Engineering unit**Display scaling:** -10000 - +10000**Decimal position:** 10^{-1} - 10^{-4} or no decimal point**Engineering unit:** %, μ V, mV, V, mA, A, °C, °F, Ω , DEG K, mHz, Hz, kHz, VAC, AAC, mg, g, kg, t, rpm or rps selectable**Back light:** Green at normal, red at loop test output enable**Factory setting:** scaling 0.00 - 100.00, unit: %**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 : ≥ 10 k Ω Span 10 - 100 mV : ≥ 10 k Ω Span 0.1 - 1 V : ≥ 100 k Ω Span ≥ 1 V : ≥ 1 M Ω **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 ≥ 0.5 V**INSTALLATION****Power input****•AC:** Operational voltage range: rating ± 10 %, 50/60 ± 2 Hz, approx. 2 VA

(approx. 3 VA with Option /E2)

•DC: Operational voltage range: rating ± 10 %, or 85 - 150 V for 110 V rating (ripple 10 % p-p max.) approx. 2 W (90 mA at 24 V; approx. 3 W with Option /E2)**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: $\pm 0.2\%$

Display accuracy: $\pm (0.2\% \text{ of FS} + 1 \text{ digit})$

Simple loop test output setting accuracy: $\pm 0.5\%$

Temp. coefficient: $\pm 0.015\% / ^\circ\text{C}$ ($\pm 0.008\% / ^\circ\text{F}$)

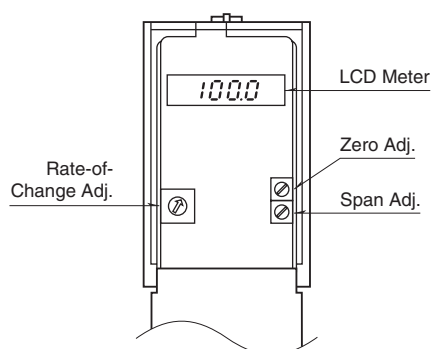
Line voltage effect: $\pm 0.1\%$ over voltage range

Insulation resistance: $\geq 100 \text{ M}\Omega$ with 500 V DC

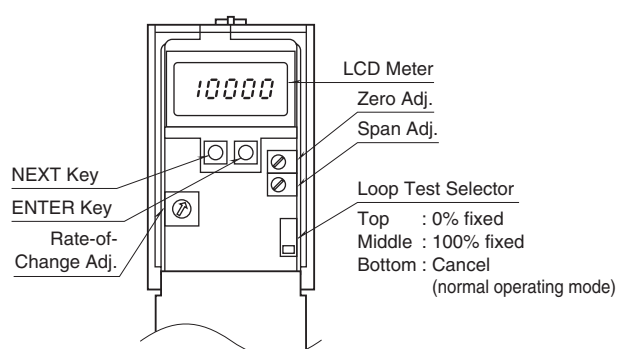
Dielectric strength: 2000 V AC @1 minute (input or output to power to ground)

EXTERNAL VIEW

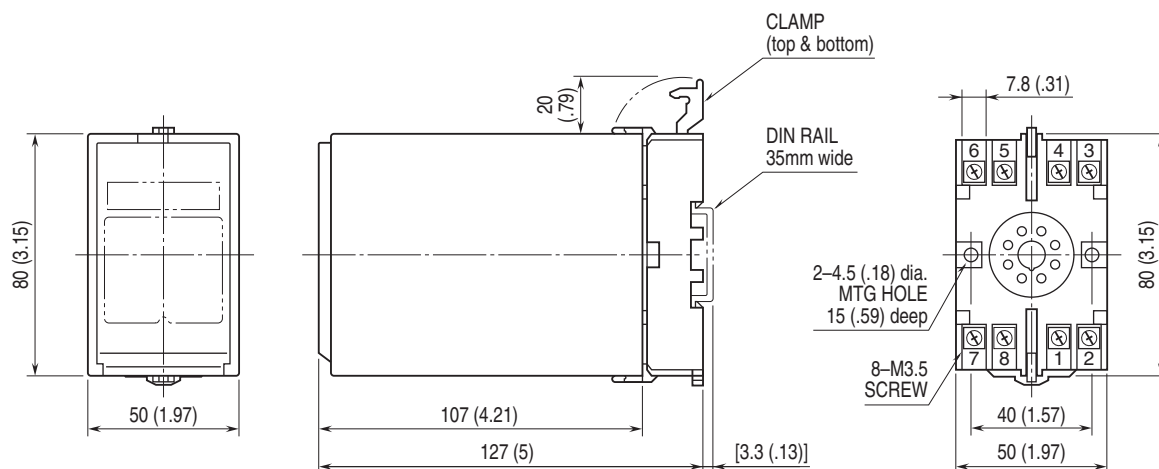
OPTION /E



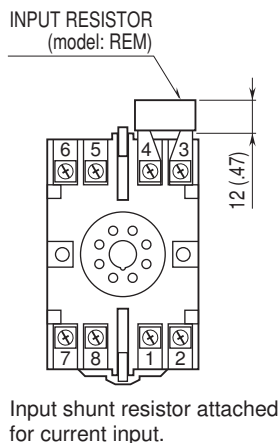
OPTION /E2



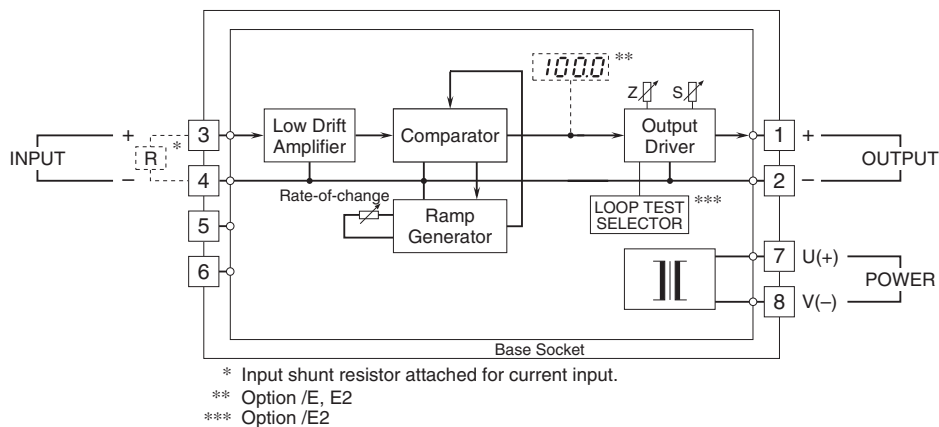
EXTERNAL DIMENSIONS unit: mm (inch)



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

TERMINAL ASSIGNMENTS unit: mm (inch)

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



Specifications are subject to change without notice.