

Plug-in Signal Conditioners M-UNIT

RAMP BUFFER

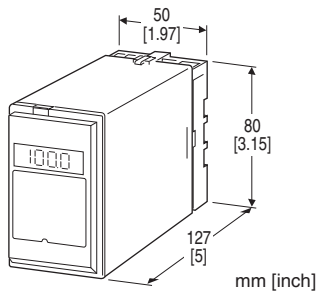
(non-isolated)

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 μA DC (Input resistance 1000 Ω)

- K:** 0 - 100 μA 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 kΩ min.)
 - 15:** 0 - 50 mV DC (Input resistance 10 kΩ min.)
 - 16:** 0 - 60 mV DC (Input resistance 10 kΩ min.)
 - 2:** 0 - 100 mV DC (Input resistance 100 kΩ min.)
 - 3:** 0 - 1 V DC (Input resistance 1 MΩ min.)
 - 4:** 0 - 10 V DC (Input resistance 1 MΩ min.)
 - 5:** 0 - 5 V DC (Input resistance 1 MΩ min.)
 - 6:** 1 - 5 V DC (Input resistance 1 MΩ min.)
 - 4W:** -10 - +10 V DC (Input resistance 1 MΩ min.)
 - 5W:** -5 - +5 V DC (Input resistance 1 MΩ 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 kΩ max.)
 - Z:** Specify current (See OUTPUT SPECIFICATIONS)
- Voltage

- 1:** 0 - 10 mV DC (Load resistance 10 kΩ min.)
- 2:** 0 - 100 mV DC (Load resistance 100 kΩ 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 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 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: $\pm 0.015\% / ^\circ\text{C}$ ($\pm 0.008\% / ^\circ\text{F}$)

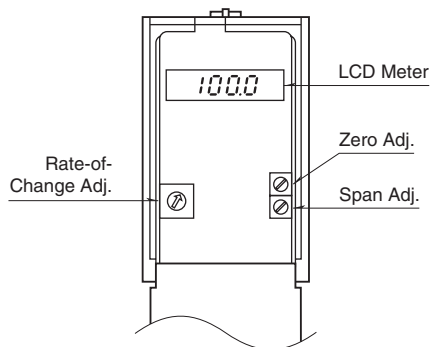
Line voltage effect: $\pm 0.1\%$ over voltage range

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

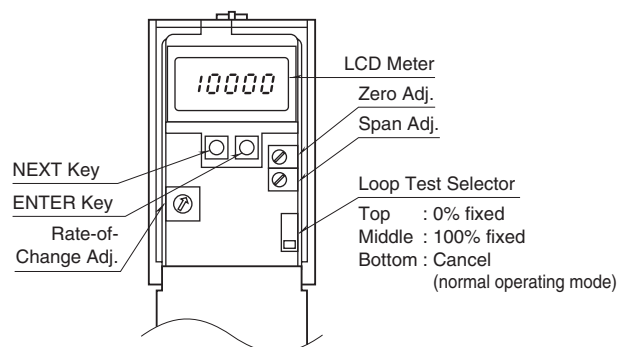
Dielectric strength: 2000 V AC @1 minute (input or output to power to ground)

EXTERNAL VIEW

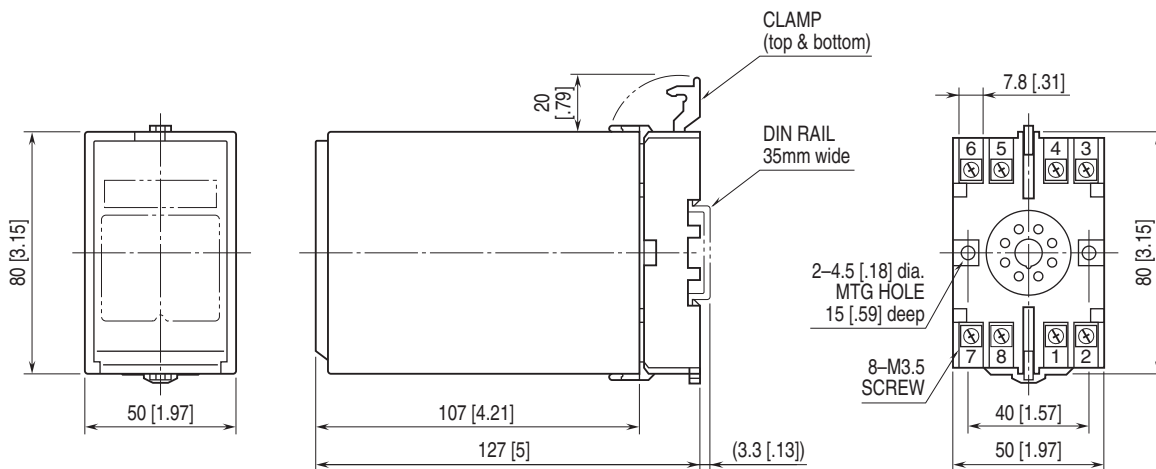
OPTION /E



OPTION /E2

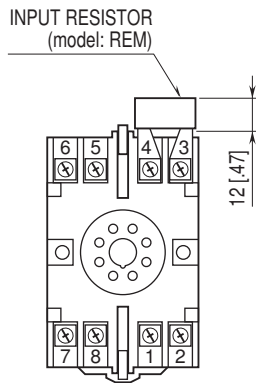


EXTERNAL DIMENSIONS unit: mm [inch]



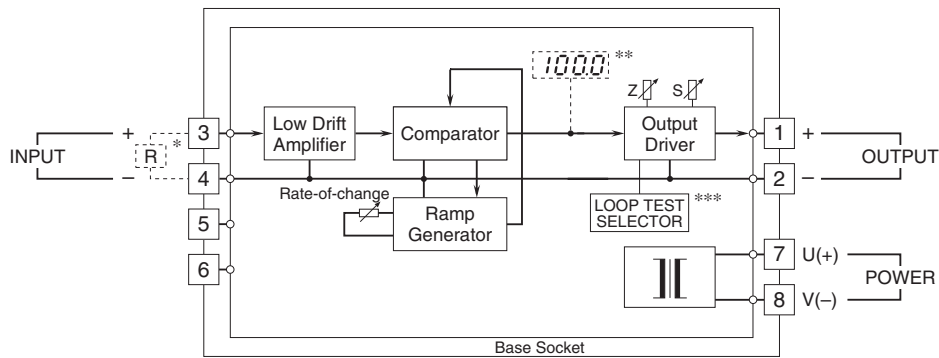
• When mounting, no extra space is needed between units.

TERMINAL ASSIGNMENTS unit: mm [inch]



Input shunt resistor attached for current input.

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



- * Input shunt resistor attached for current input.
- ** Option /E, E2
- *** Option /E2



Specifications are subject to change without notice.