

Plug-in Signal Conditioners M-UNIT

SQUARE ROOT EXTRACTOR

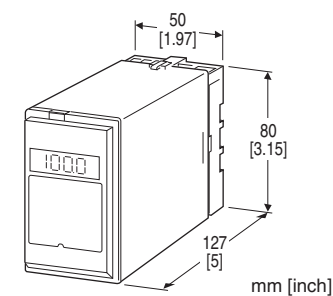
(isolated)

Functions & Features

- Providing a DC output proportional to the root of input signal
- Low-end cutout
- LCD meter indicating root-extracted values
- Isolation up to 2000 V AC
- High-density mounting

Typical Applications

- Converting differential pressure to flow



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

ORDERING INFORMATION

- Code number: FNS-[1][2]-[3][4]
- Specify a code from below for each of [1] through [4]. (e.g. FNS-6A-B/E/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

[4] OPTIONS (multiple selections)

LCD Meter (after function or low-end cutout)

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.)

/CO1: Silicone coating**/CO2:** Polyurethane coating**/CO3:** 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:** 0 - 105 % at 1 - 5 V**Zero adjustment:** -5 to +5 % (front)**Span adjustment:** 95 to 105 % (front)**Low-end cutout:** Approx. 10 % (output)**■ 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)

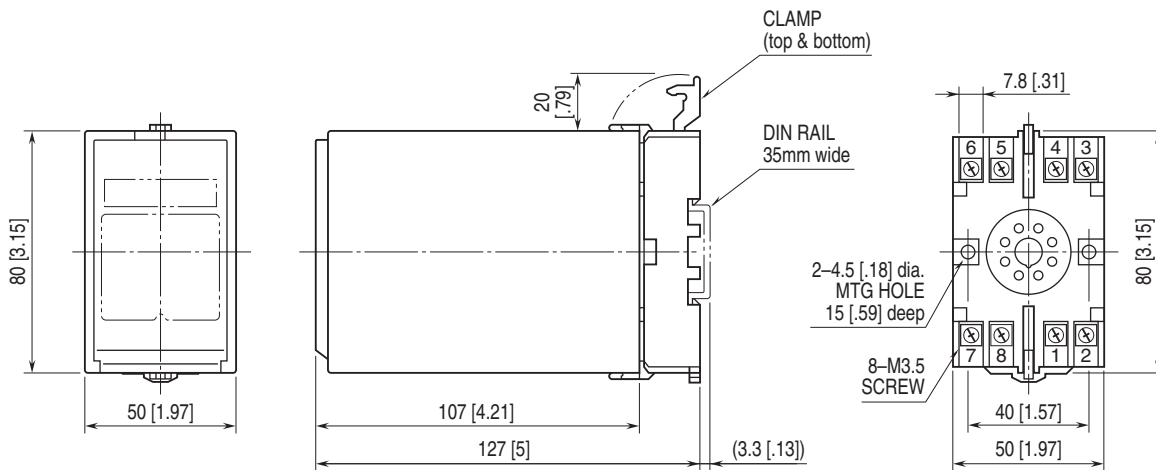
Specify input resistance value for code Z.

■ DC Voltage: -300 - +300 V DC**Minimum span:** 3 mV**Offset:** Max. 1.5 times span**Input resistance**Span 3 - 10 mV : $\geq 10 \text{ k}\Omega$ 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 $\pm 2 \text{ Hz}$, 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 W (80 mA at 24 V)

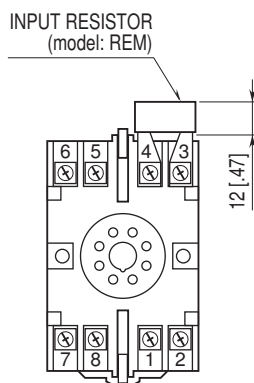
Operating temperature: -5 to +60°C (23 to 140°F)**Operating humidity:** 30 to 90 %RH (non-condensing)**Mounting:** Surface or DIN rail**Weight:** 400 g (0.88 lb)**PERFORMANCE in percentage of span****Accuracy:** $\pm 0.1 \%$ (input 1 - 100 %)**Display accuracy:** $\pm(0.1 \%$ of FS + 1 digit)(input 1 - 100 %)**Temp. coefficient:** $\pm 0.015 \%$ /°C ($\pm 0.008 \%$ /°F)**Response time:** $\leq 0.5 \text{ sec.}$ (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 to output to power to ground)

EXTERNAL DIMENSIONS unit: mm [inch]



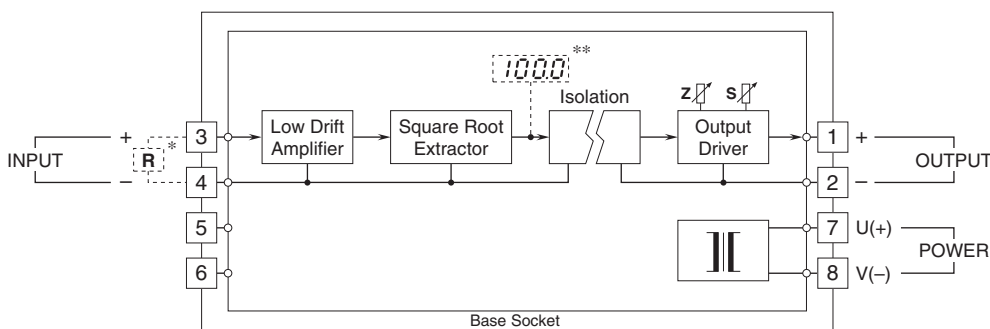
• When mounting, no extra space is needed between units.

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



Specifications are subject to change without notice.