

**Plug-in Signal Conditioners M-UNIT**

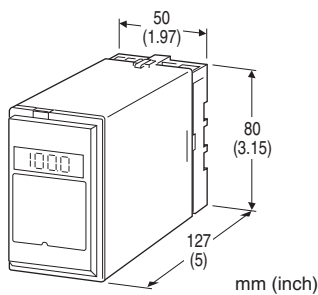
**DIGITAL DIVIDER**

**Functions & Features**

- Accepting two DC inputs and providing a standard process signal proportional to the division of the two signals
- Isolation up to 2000 V AC
- LCD meter
- High-density mounting

**Typical Applications**

- Air-fuel ratio control
- Ratio control in mixing two kinds of liquid



**MODEL: DIS-[1][2][3]-[4][5]**

**ORDERING INFORMATION**

- Code number: DIS-[1][2][3]-[4][5]
- Specify a code from below for each of [1] through [5]. (e.g. DIS-6AA-B/E/Q)
- Special input and output ranges (For codes Z & 0)
- Parameters (e.g.  $K_1 = 0.50$ ,  $K_2 = 0.90$ )
- Specify the specification for option code /Q (e.g. /C01/S01)

**[1] INPUT 1**

**Current**

- A: 4 - 20 mA DC (Input resistance 250  $\Omega$ )
- A1: 4 - 20 mA DC (Input resistance 50  $\Omega$ )
- 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  $\Omega$ )
- 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.)
- 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)

**[2] INPUT 2**

Same range availability as Input 1

**[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

## [5] OPTIONS (multiple selections)

### Division Indicator

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 1 or input 2 to output to power (Negative sides of the input 1 and 2 must be of the same potential.)

**Overrange output:** 0 to 115 % at 1 - 5 V

**Zero adjustment:** -5 to +5 % (front)

**Span adjustment:** 95 to 105 % (front)

**Equation:** Output = (K<sub>1</sub> × Input 1) ÷ (K<sub>2</sub> × Input 2)

K<sub>1</sub>, K<sub>2</sub>: 0.10 - 1.15 (parameters)

$2 \geq (K_1 \div K_2) \geq 0.2$

Input 1: 0 - (115 ÷ (K<sub>1</sub> ÷ K<sub>2</sub>)) % with (K<sub>1</sub> ÷ K<sub>2</sub>) ≥ 1  
Forcibly limited to 0 % or (115 ÷ (K<sub>1</sub> ÷ K<sub>2</sub>)) % with overrange.

0 - 115 % with (K<sub>1</sub> ÷ K<sub>2</sub>) < 1

Forcibly limited to 0 % or 115 % with overrange.

Input 2: 5 - 115 %; forcibly limited to 5 % or 115 % with overrange.

Output: 0 - 120 % (approx.); forcibly limited to 0 % or 120 % with overrange.

K<sub>1</sub>, K<sub>2</sub> are ex-factory specified.

Example:

K <sub>1</sub>	K <sub>2</sub>	INP1	INP2	OUT
0.50	1.00	100 %	50 %	100 %
0.50	1.00	50 %	50 %	50 %
0.50	1.00	-5 %	50 %	0 %

### ■ DISPLAY (Divided values indicator)

**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:** 10 mV

**Offset:** Max. 1.5 times span

### Input resistance

Span 10 - 100 mV : ≥ 10 kΩ

Span 0.1 - 1 V : ≥ 100 kΩ

Span ≥ 1 V : ≥ 1 MΩ

## 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. 3 VA

•**DC:** Operational voltage range: rating ±10 %, 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:** 350 g (0.77 lb)

## PERFORMANCE in percentage of span

**Accuracy:** ±1.0 % (input 2 ≥ 20 %)

**Display accuracy:** ± (0.1 % of FS + 1 digit)

(input 2 ≥ 20 %)

**Temp. coefficient:** ± 0.02 % /°C (± 0.01 % /°F) at Input 2 ≥ 20 %

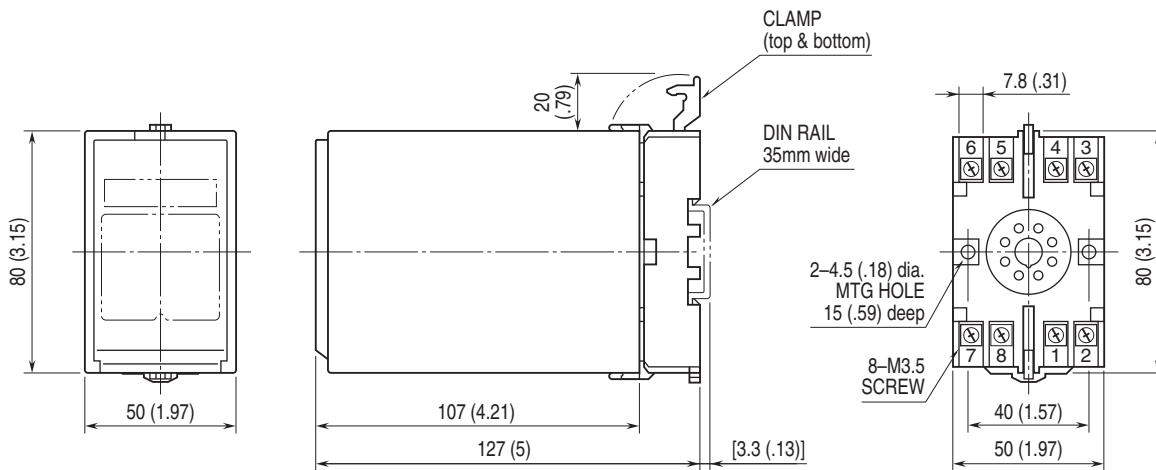
**Response time:** ≤ 0.5 sec. (0 - 90 %)

**Line voltage effect:** ±0.1 % over voltage range

**Insulation resistance:** ≥ 100 MΩ with 500 V DC

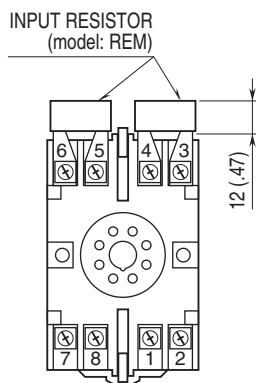
**Dielectric strength:** 2000 V AC @1 minute (input 1 or input 2 to output to power to ground)

## EXTERNAL DIMENSIONS unit: mm (inch)



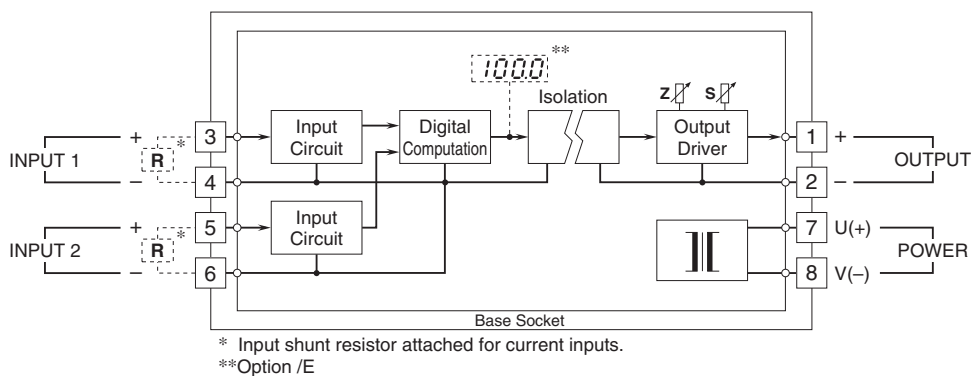
• When mounting, no extra space is needed between units.

## TERMINAL ASSIGNMENTS unit: mm (inch)



Input shunt resistor attached for current input.

## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



Specifications are subject to change without notice.