

## Super-mini Signal Conditioners Mini-M Series

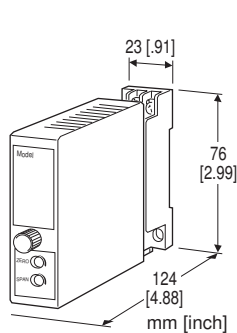
### DIVIDER

#### Functions & Features

- Receives two DC inputs and provides an output proportional to the division of the inputs

#### Typical Applications

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



### MODEL: M2DIS-[1][2][3]-[4][5]

#### ORDERING INFORMATION

- Code number: M2DIS-[1][2][3]-[4][5]
- Specify a code from below for each of [1] through [5].  
(e.g. M2DIS-6AA-M2/CE/Q)
- Ratios (e.g.  $K_1 = 0.80$ ,  $K_2 = 2.00$ )
- Special input and output ranges (For codes Z & 0)
- 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  $\Omega$ )
- J:** 0 - 10  $\mu$ A DC (Input resistance 1000  $\Omega$ )
- 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 1000  $\Omega$  min.)
- 4:** 0 - 10 V DC (Load resistance 10 k $\Omega$  min.)
- 5:** 0 - 5 V DC (Load resistance 5000  $\Omega$  min.)
- 6:** 1 - 5 V DC (Load resistance 5000  $\Omega$  min.)
- 4W:** -10 - +10 V DC (Load resistance 10 k $\Omega$  min.)
- 5W:** -5 - +5 V DC (Load resistance 5000  $\Omega$  min.)
- 0:** Specify voltage (See OUTPUT SPECIFICATIONS)

#### [4] POWER INPUT

AC Power

- M2:** 100 - 240 V AC (Operational voltage range 85 - 264 V, 47 - 66 Hz)  
(90 - 264 V for UL)

DC Power

- R:** 24 V DC  
(Operational voltage range 24 V  $\pm$ 10 %, ripple 10 %p-p max.)
- R2:** 11 - 27 V DC  
(Operational voltage range 11 - 27 V, ripple 10 %p-p max.)  
(Select 'N' for 'Standards & Approvals' code.)
- P:** 110 V DC  
(Operational voltage range 85 - 150 V, ripple 10 %p-p max.)  
(110 V  $\pm$ 10 % for UL)

**[5] OPTIONS (multiple selections)**

Standards &amp; Approvals (must be specified)

/N: Without CE or UL

/CE: CE marking

/UL: UL approval, CE marking

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 (UL not available)

/C04: Polyolefin coating (UL not available)

TERMINAL SCREW MATERIAL

/S01: Stainless steel (UL not available)

**GENERAL SPECIFICATIONS**

Construction: Plug-in

Connection: M3 screw terminals (torque 0.8 N·m)

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 120 % (approx.) at 1 - 5 V

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

Span adjustment: 95 to 105 % (front)

Equation: Output =  $(K_1 \times \text{Input 1}) \div (K_2 \times \text{Input 2})$  $K_1, K_2$ : 0.10 to 2.00 specified when ordering  
 $(0.40 \leq (K_1 \div K_2) \leq 2.00)$ 

Input 1, Input 2: 0 to 120 %

Forcibly limited to 0 % and 120 % respectively when the signal is out of range.

**INPUT SPECIFICATIONS**

■ DC Current: Input resistor incorporated

Specify input resistance value for code Z.

 $(R \leq 0.25 \text{ W} \div [\text{F.S. Current}]^2)$ 

■ DC Voltage: -300 - +300 V DC

Minimum span: 10 mV

Offset: Max. 1.5 times span

Input resistance

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 1 mA max.; at  $\geq 0.5 \text{ V}$ **INSTALLATION**

Power Consumption

•AC:

Approx. 3 VA at 100 V

Approx. 4 VA at 200 V

Approx. 5 VA at 264 V

•DC: Approx. 3 W

Operating temperature: -5 to +55°C (23 to 131°F)

Operating humidity: 30 to 90 %RH (non-condensing)

Mounting: Surface or DIN rail

Weight: 150 g (0.33 lb)

**PERFORMANCE in percentage of span**Accuracy:  $\pm 1.0 \%$  at  $[K_1 \div K_2 \leq 1]$  $\pm 2.0 \%$  at  $[K_1 \div K_2 > 1]$ at Input 2  $\geq 20 \%$ Temp. coefficient:  $\pm 0.02 \%$  /°C ( $\pm 0.01 \%$  /°F) at Input 2  $\geq 20 \%$ Response time:  $\leq 0.5 \text{ sec.}$  (0 - 90 %)Line voltage effect:  $\pm 0.1 \%$  over voltage rangeInsulation resistance:  $\geq 100 \text{ M}\Omega$  with 500 V DC

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

## STANDARDS & APPROVALS

### EU conformity:

EMC Directive

EMI EN 61000-6-4

EMS EN 61000-6-2

Low Voltage Directive

EN 61010-1

Measurement Category II (input)

Installation Category II (power)

Pollution Degree 2

Input 1 or input 2 or output to power input:

Reinforced insulation (300 V)

Input 1 or input 2 to output: Basic insulation (300 V)

RoHS Directive

### Approval:

UL/C-UL nonincendive Class I, Division 2,

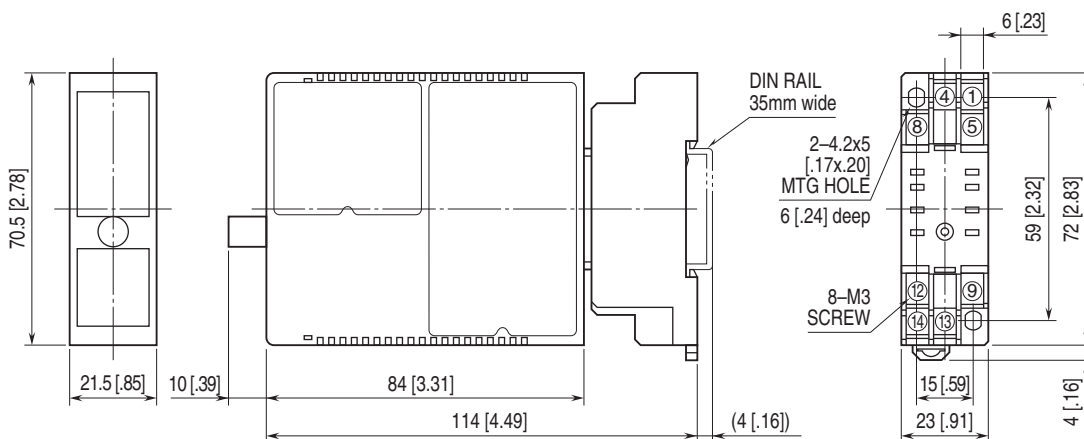
Groups A, B, C, and D

(ANSI/ISA-12.12.01, CAN/CSA-C22.2 No.213)

UL/C-UL general safety requirements

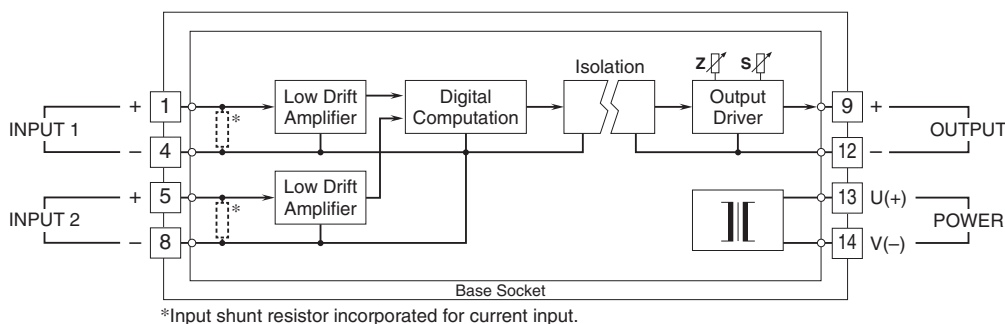
(UL 61010-1, CAN/CSA-C22.2 No.61010-1)

## EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



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

## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM





Specifications are subject to change without notice.