

Super-mini Signal Conditioners Mini-M Series

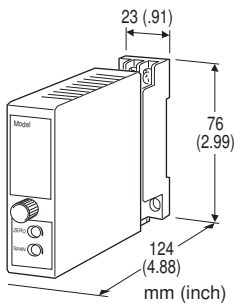
POTENTIOMETER TRANSMITTER

Functions & Features

- Provides a DC output proportional to a potentiometer or slidewire position input
- Constant voltage excitation allows use with pots with total resistances from 100 Ω – 10 k Ω without affecting accuracy
- 50 % zero/span adjustments with minimal interaction
- Fast response type available

Typical Applications

- Tank levels
- Positions



MODEL: M2MS-[1]-[2][3]

ORDERING INFORMATION

- Code number: M2MS-[1]-[2][3]
- Specify a code from below for each [1] through [3].
(e.g. M2MS-A-P/K/CE/Q)
- Special output range (For codes Z & 0)
- Specify the specification for option code /Q
(e.g. /C01/S01)

INPUT

Total resistance 100 Ω – 10 k Ω

[1] 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 1000 Ω min.)
- 4: 0 – 10 V DC (Load resistance 10 k Ω min.)
- 5: 0 – 5 V DC (Load resistance 5000 Ω min.)
- 6: 1 – 5 V DC (Load resistance 5000 Ω min.)
- 4W: -10 – +10 V DC (Load resistance 10 k Ω min.)
- 5W: -5 – +5 V DC (Load resistance 5000 Ω min.)
- 0: Specify voltage (See OUTPUT SPECIFICATIONS)

[2] POWER INPUT

AC Power

M: 85 – 264 V AC (Operational voltage range 85 – 264 V, 47 – 66 Hz)

(Select 'N' for 'Standards & Approvals' code.)

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)

[3] OPTIONS (multiple selections)

Response Time (0 – 90 %)

blank: Standard ($\leq$ 0.5 sec.)

/K: Fast Response (Approx. 25 msec.)

Standards & Approvals (must be specified)

/N: Without CE or UL

/CE: CE marking

/UL: UL approval, CE marking

Custom specification

(Refer to the custom specification list for difference of specification and combination of code numbers.)

blank: none

/X1: Upscale burnout (Total resistance: 1 – 5 k Ω)

(CE or UL not available)

Other Options

blank: none

/Q: Option other than the above (specify the specification)

SPECIFICATIONS OF OPTION: Q

COATING (For the detail, refer to M-System's web site.)

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating (UL not available)

ADJUSTMENT

/VN: Sealed adjustment holes (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 to output to power

Zero adjustment: 0 – 50 % of total resistance (front)

Span adjustment: 50 – 100 % of total resistance (front)

INPUT SPECIFICATIONS

Minimum span: 50 % of total resistance

Excitation: 0.5 V DC

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 ≥ 0.5 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: ± 0.1 %

Temp. coefficient: ± 0.015 %/°C (± 0.008 %/°F)

Line voltage effect: ± 0.1 % over voltage range

Insulation resistance: ≥ 100 M Ω with 500 V DC

Dielectric strength: 2000 V AC @1 minute (input 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

Installation Category II

Pollution Degree 2

Input or output to power: Reinforced insulation (300 V)

Input to output: Basic insulation (300 V)

RoHS Directive

EN 50581

Approval:

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

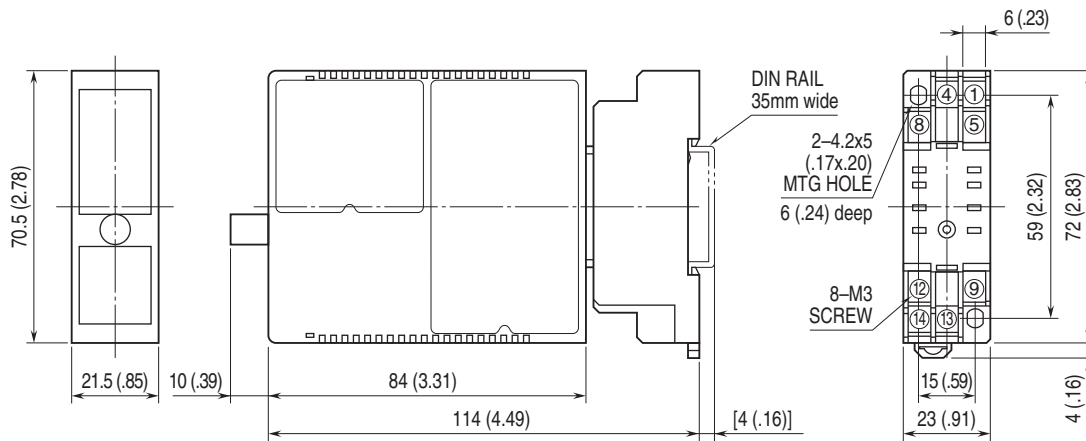
Groups A, B, C, and D

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

UL/C-UL general safety requirements

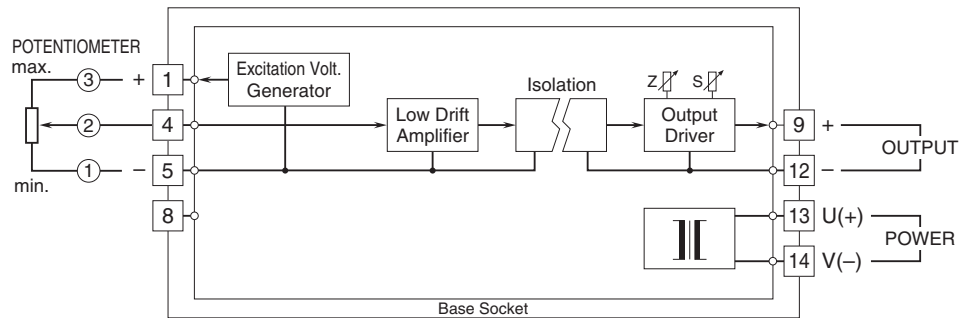
(UL 61010-1, CAN/CSA-C22.2 No.61010-1)

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.

CUSTOM SPECIFICATION LIST

Refer to the following pages for each detailed custom specification.

Custom specification: Option /X1

■ Major specification changes

Burnout: Upscale (Total resistance: 1 - 5 kΩ)

CUSTOM SPECIFICATION : OPTION /X1**Major specification changes**

Burnout: Upscale (Total resistance 1 - 5 k Ω)

MODEL: M2MS-[1]-[2][3]/N/X1[3]

Same as standard specification (without customization)
except followings.

Refer to standard specification pages.

ORDERING INFORMATION

- Code number: M2MS-[1]-[2][3]/N/X1[3]

For [1] and [3] same code as standard specification is available.

(e.g. M2MS-A-P/K/N/X1/Q)

Refer to standard specification pages.

- Specify total resistance (e.g. 1 k Ω).

SPECIFICATION CHANGES

■ Input specifications

Available input range

- Total resistance: 1 - 5 k Ω

■ PERFORMANCE

Accuracy: Refer to the table shown below.

Temp. coefficient: Refer to the table shown below.

Burnout time: $\leq$ 60 sec.

■ ACCURACY, TEMP. COEFFICIENT

TOTAL RESISTANCE	ACCURACY	TEMP. COEFFICIENT
1k Ω	$\pm 0.2\%$	$\pm 0.03\%/^{\circ}\text{C}$
1k Ω < R $\leq$ 2k Ω	$\pm 0.25\%$	$\pm 0.03\%/^{\circ}\text{C}$
2k Ω < R $\leq$ 5k Ω	$\pm 0.3\%$	$\pm 0.04\%/^{\circ}\text{C}$