

## Super-mini Signal Conditioners Mini-M Series

(0 % input must be 0 V.)

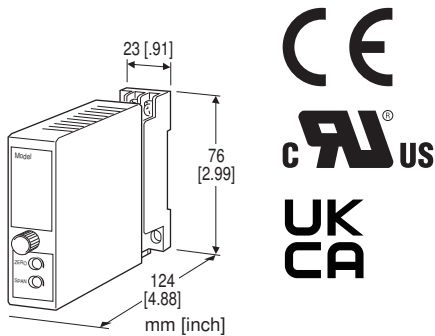
### AC TRANSMITTER

#### Functions & Features

- Converts an alternating current/voltage input into a standard process signal
- True RMS sensing

#### Typical Applications

- Converting high AC current in combination with a shunt resistor, or narrow span AC voltage



### MODEL: M2AC-[1][2]-[3][4]

#### ORDERING INFORMATION

- Code number: M2AC-[1][2]-[3][4]
- Specify a code from below for each of [1] through [4].  
(e.g. M2AC-A1A-M2/CE/Q)
- Special input and output ranges (For codes AZ, A8, Z & 0)
  - Specify the specification for option code /Q  
(e.g. /C01/S01)

#### [1] INPUT

Current

- AA:** 0 - 10 mA AC (Input resistance 100 Ω)
- AB:** 0 - 50 mA AC (Input resistance 20 Ω)
- AC:** 0 - 100 mA AC (Input resistance 10 Ω)
- AD:** 0 - 500 mA AC (Input resistance 1 Ω)
- AZ:** Specify current (See INPUT SPECIFICATIONS)

(0 % input must be 0 mA.)

Voltage

- A1:** 0 - 100 mV AC (Input resistance Approx. 100 kΩ min.)
- A2:** 0 - 500 mV AC (Input resistance Approx. 100 kΩ min.)
- A3:** 0 - 1 V AC (Input resistance Approx. 100 kΩ min.)
- A4:** 0 - 5 V AC (Input resistance Approx. 100 kΩ min.)
- A5:** 0 - 10 V AC (Input resistance Approx. 100 kΩ min.)
- A6:** 0 - 120 V AC (Input resistance Approx. 100 kΩ min.)
- A7:** 0 - 150 V AC (Input resistance Approx. 100 kΩ min.)
- A8:** 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 1000 Ω min.)
- 4:** 0 - 10 V DC (Load resistance 10 kΩ 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 kΩ min.)
- 5W:** -5 - +5 V DC (Load resistance 5000 Ω min.)
- 0:** Specify voltage (See OUTPUT SPECIFICATIONS)

#### [3] 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 ±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 ±10 % for UL)

#### [4] OPTIONS (multiple selections)

Standards & Approvals (must be specified)

**/N:** Without CE, UKCA or UL

**/CE:** CE marking

**/UK:** CE, UKCA 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 to output to power

**Input waveform**

**RMS sensing:** Up to 15 % of 3rd harmonic content

**Overrange output:** 0 to 120 % at 1 - 5 V

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

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

**INPUT SPECIFICATIONS**

**Frequency:** 40 Hz min., 1 kHz max.

■ **AC Current:** 0 - 1 A AC; input resistor incorporated

**Minimum span:** 1 mA

**Input resistance**

Span 1 mA: 1 k $\Omega$

Span  $\leq$  2 mA: 500  $\Omega$

Span  $\leq$  5 mA: 200  $\Omega$

Span  $\leq$  10 mA: 100  $\Omega$

Span  $\leq$  20 mA: 50  $\Omega$

Span  $\leq$  50 mA: 20  $\Omega$

Span  $\leq$  100 mA: 10  $\Omega$

Span  $\leq$  500 mA: 1  $\Omega$

Span  $\leq$  1 A: 0.5  $\Omega$

■ **AC Voltage:** 0 - 250 V AC

**Minimum span:** 50 mV

**Input resistance:** Approx. 100 k $\Omega$  min.

**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 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:**  $\pm 0.4$  %

**Temp. coefficient:**  $\pm 0.05$  %/°C ( $\pm 0.03$  %/°F)

**Response time:**  $\leq 0.7$  sec. (0 - 90 %)

**Ripple:** 0.5 %p-p max. (50/60 Hz)

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

**Insulation resistance:**  $\geq 100$  M $\Omega$  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

Measurement Category II (input)

Installation Category II (power)

Pollution Degree 2

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

Input to output: Basic insulation (300 V)

RoHS Directive

**UK conformity (UKCA):**

The UK legislations and designated standards are equivalent to the applicable EU directives.

(Refer to our website for more information about the legislations and designated standards.)

**Approval:**

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

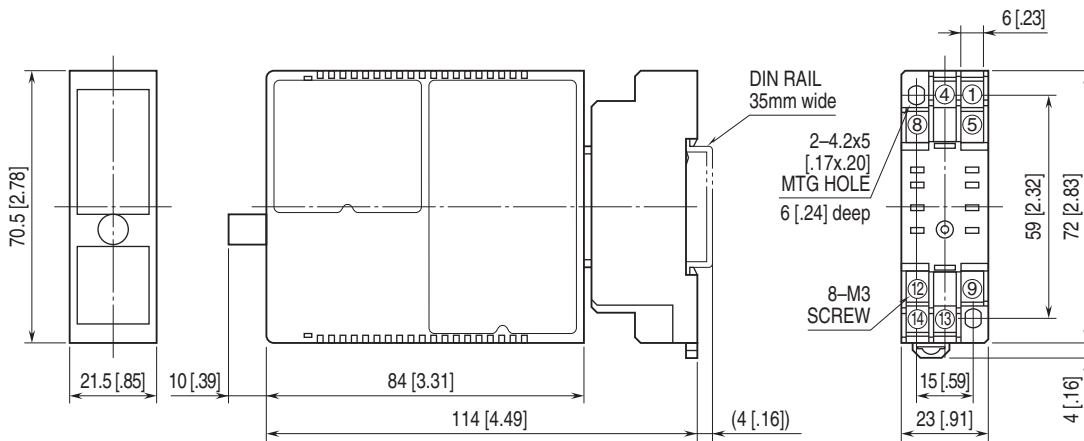
Groups A, B, C, and D

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

UL/C-UL general safety requirements

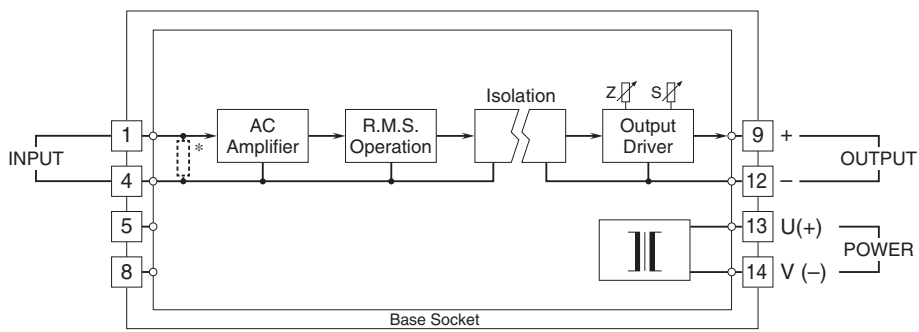
(UL 61010-1, CAN/CSA-C22.2 No.61010-1)

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



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

## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



\*Input shunt resistor incorporated for current input.



Specifications are subject to change without notice.