

Space-saving Dual Output Signal Conditioners Mini-MW Series

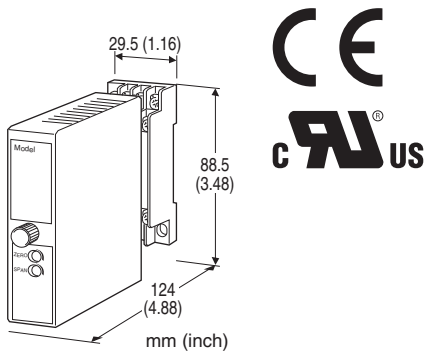
DC/FREQUENCY CONVERTER

Functions & Features

- Provides a pulse rate output in proportion to DC input signal

Typical Applications

- Totalizing applications in combination with a counter



MODEL: W2AP-[1][2][3]-[4][5]

ORDERING INFORMATION

- Code number: W2AP-[1][2][3]-[4][5]
Specify a code from below for each of [1] through [5].
(e.g. W2AP-612-M2/CE/Q)
- Special input range (For codes Z & 0)
- Output frequency range (e.g. 0 – 500 Hz)
Frequencies of Output 1 and 2 are the same.
- Specify the specification for option code /Q
(e.g. /C01/S01)

[1] INPUT

Current

- A: 4 – 20 mA DC (Input resistance 250 Ω)
- D: 0 – 20 mA DC (Input resistance 50 Ω)
- G: 0 – 1 mA DC (Input resistance 1000 Ω)
- H: 10 – 50 mA DC (Input resistance 100 Ω)
- Z: Specify current (See INPUT SPECIFICATIONS)
(0 % input must be 0 mA.)

Voltage

- 3: 0 – 1 V DC (Input resistance 1 M Ω min.)
- 4: 0 – 10 V DC (Input resistance 1 M Ω min.)
- 5: 0 – 5 V DC (Input resistance 1 M Ω min.)
- 6: 1 – 5 V DC (Input resistance 1 M Ω min.)
- 0: Specify voltage (See INPUT SPECIFICATIONS)
(0 % input must be 0 V.)

[2] OUTPUT 1

- 1: Open collector (max. frequency 10 kHz)
(When the dry contact AC/DC switch is selected as one of the outputs, the frequency of the other output is limited to max. 30 Hz.)
- 2: 5 V pulse (max. frequency 10 kHz)
(When the dry contact AC/DC switch is selected as one of the outputs, the frequency of the other output is limited to max. 30 Hz.)
- 3: Dry contact AC/DC switch (max. frequency 30 Hz)

[3] OUTPUT 2

- Same range availability as Output 1
- Y: None

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

[5] OPTIONS (multiple selections)

Standards & 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 M-System's web site.)

- /C01: Silicone coating
- /C02: Polyurethane coating
- /C03: Rubber 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 1 to output 2 to power
Zero adjustment: 0 - 5 % (front)
Span adjustment: 95 to 105 % (front)

INPUT SPECIFICATIONS

■ **DC Current:**
 Shunt resistor attached to the input terminals (0.5 W)
 Specify input resistance value for code Z.
 ■ **DC Voltage:** 0 - 300V DC
Minimum span: 1V
Input resistance: 1 MΩ min.

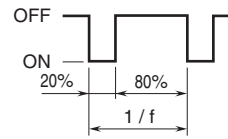
OUTPUT SPECIFICATIONS

• **Open Collector:** 30 V DC @100 mA (resistive load)
Frequency range: 0 - 10 pulses/hour through 10 kHz
Saturation voltage: 0.6 V DC
 ■ **5 V Pulse**
Frequency range: 0 - 10 pulses/hour through 10 kHz
Hi level: 3.0 - 5.5 V
Lo level: ≤ 0.5 V
Load resistance: 250 Ω min.
 ■ **Dry Contact AC/DC Switch**
Frequency range: 0 - 10 pulses/hour through 30 Hz
Timer: Limits within 75 ±25 msec.
 for wider than 75 msec. pulses
Rated load: 132 V AC @200 mA (cos φ = 1)
 30 V DC @200 mA (resistive load)
Saturation voltage: 3 V DC

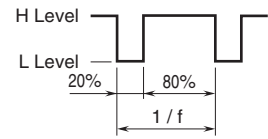
OUTPUT PULSE WIDTH

■ **Frequency less than 500 Hz at 100% input**
 → See the figure below.

• **Open Collector**

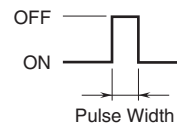


• **Voltage Pulse**

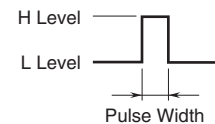


■ **Frequency greater than 500 Hz at 100% input**
 → See the figure and equation below.

• **Open Collector**



• **Voltage Pulse**



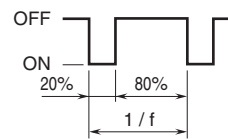
$$\text{Pulse Width [millisec.]} = \frac{1}{2.09 \times 100\% \text{ Frequency [kHz]}}$$

■ **When the dry contact AC/DC Switch is selected as either OUTPUT 1 or OUTPUT 2**

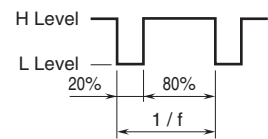
→ See the figure below. ON or L pulse width is limited within 75 ±25 msec. when the output frequency gets low (below 2 to 4 Hz).

• **Open Collector**

Dry Contact AC/DC Switch



• **Voltage Pulse**



INSTALLATION

Power Consumption

• **AC:**

Approx. 4 VA at 100 V
 Approx. 5 VA at 200 V
 Approx. 6 VA at 240 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: 200 g (0.44 lb)

PERFORMANCE in percentage of span

Accuracy: ±0.1 %

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

Response time: Approx. 3 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 to output 1 to output 2 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, output)

Installation Category II (power)

Pollution Degree 2

Input or output 1 or output 2 to power input:

Reinforced insulation (300 V)

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

RoHS Directive

EN 50581

Approval:

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

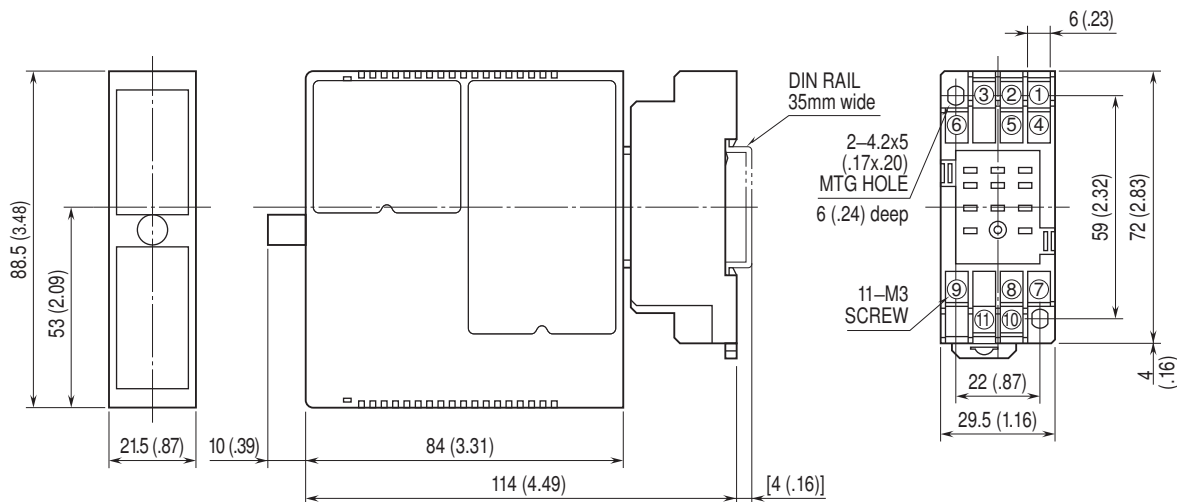
Groups A, B, C, and D

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

UL/C-UL general safety requirements

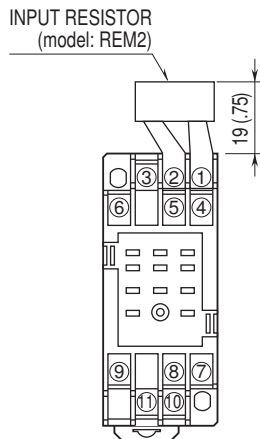
(UL 61010-1, CAN/CSA-C22.2 No.61010-1)

EXTERNAL DIMENSIONS unit: mm (inch)



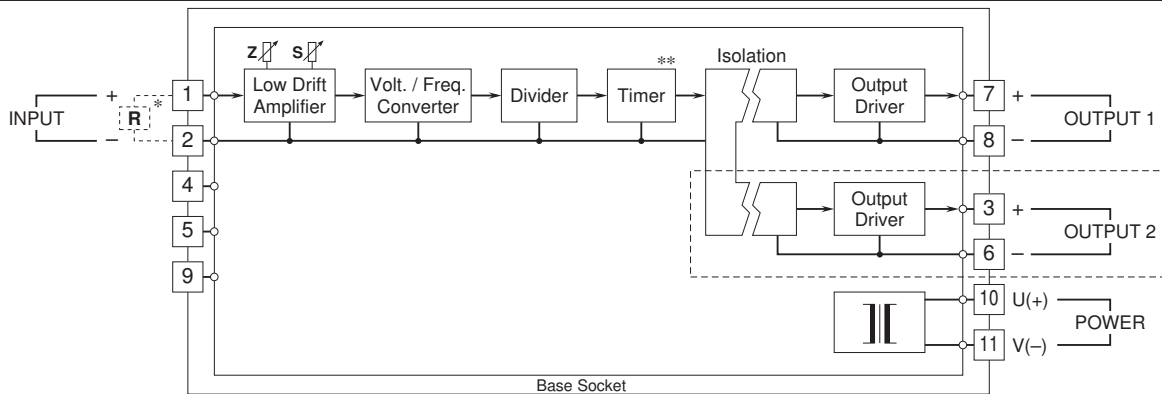
• When mounting, no extra space is needed between units.

TERMINAL ASSIGNMENTS unit: mm (inch)



Input shunt resistor attached for current input.

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



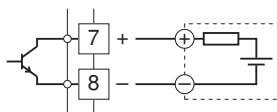
* Input shunt resistor attached for current input.

** Provided only when the dry contact AC/DC switch is selected as one of the outputs.

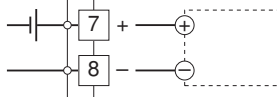
Note: The section enclosed by broken line is only with 2nd output option.

Output Connection Examples

Open Collector

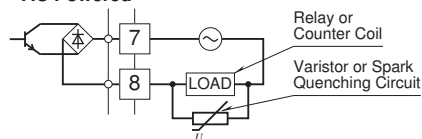


Voltage Pulse

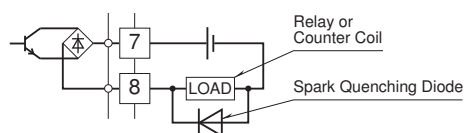


Dry Contact AC/DC Switch

• AC Powered



• DC Powered



Specifications are subject to change without notice.