

Space-saving Dual Output Signal Conditioners Mini-MW Series

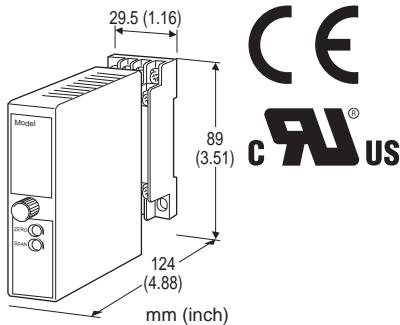
DC/FREQUENCY CONVERTER

Functions & Features

- Provides a pulse rate output in proportion to DC input signal
- CE marking
- UL approval

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 [1] through [5]. (e.g. W2AP-612-M2/CE/Q)
- Special input ranges (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 MΩ min.)
- 4: 0 - 10 V DC (Input resistance 1 MΩ min.)
- 5: 0 - 5 V DC (Input resistance 1 MΩ min.)
- 6: 1 - 5 V DC (Input resistance 1 MΩ 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 ±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)
(UL not available)

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 screw terminals (torque 0.8 N·m)
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.

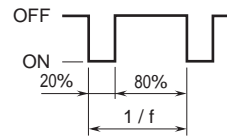
OUTPUT SPECIFICATIONS

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 ON time ≤ 75 ± 25 millisecond.
Rated load: 132 V AC @200 mA (cos φ = 1)
 30 V DC @200 mA (resistive load)
Saturation voltage: 3 V DC

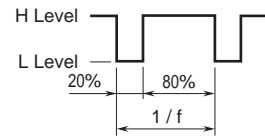
OUTPUT PULSE WIDTH

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

• **Open Collector**

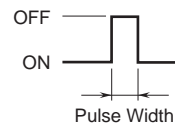


• **Voltage Pulse**

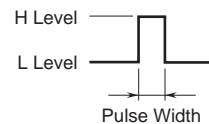


Frequency greater than 500 Hz at 100% input
 → See the figure and equation below.

• **Open Collector**



• **Voltage Pulse**



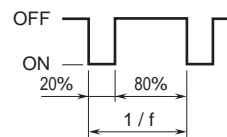
$$\text{Pulse Width [millisec.]} = \frac{1}{2.09 \times 100\% \text{ Frequency [kHz]}}$$

When the dry contact AD/DC switch is selected as one of the outputs:

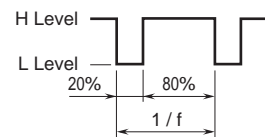
→ See the figure below. ON or L pulse width is limited within 75 ± 25 ms when the output frequency is low.

• **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 lbs)

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

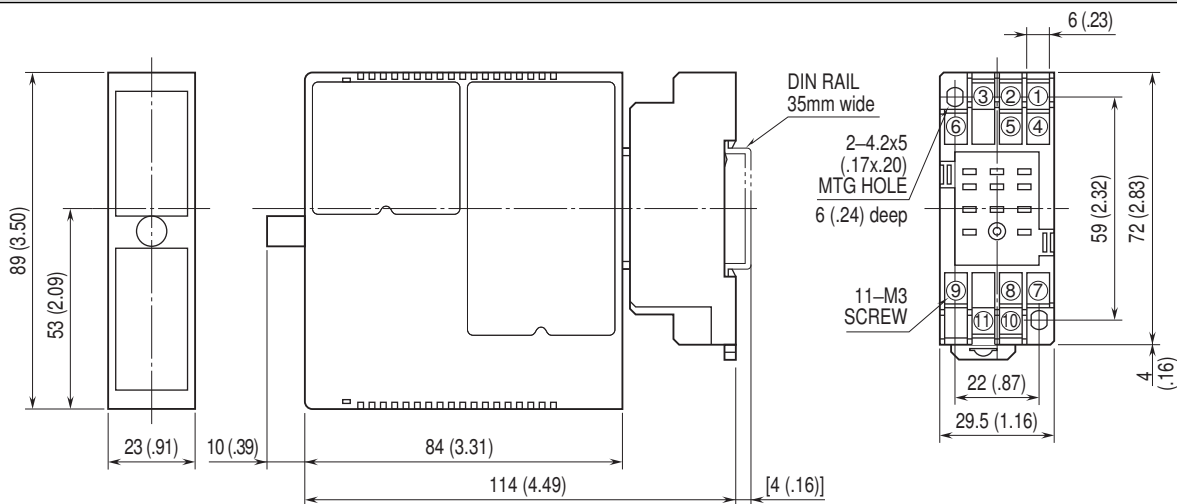
CE conformity:

- EMC Directive (2004/108/EC)
- EMI EN 61000-6-4: 2007
- EMS EN 61000-6-2: 2005
- Low Voltage Directive (2006/95/EC)
- EN 61010-1: 2001
- Installation Category II
- 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)

Approval:

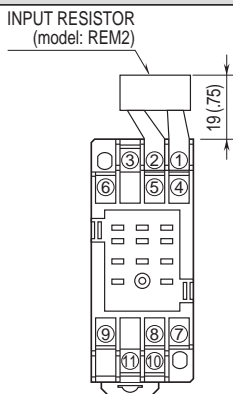
- UL/C-UL nonincendive Class I, Division 2,
- Groups A, B, C, and D hazardous locations
- (UL 1604:2004, CAN/CSA-C22.2 No.213:1987)
- UL/C-UL general safety requirements
- (UL 61010B-1:2003, CAN/CSA-C22.2 No.61010-1:1992)

DIMENSIONS unit: mm (inch)



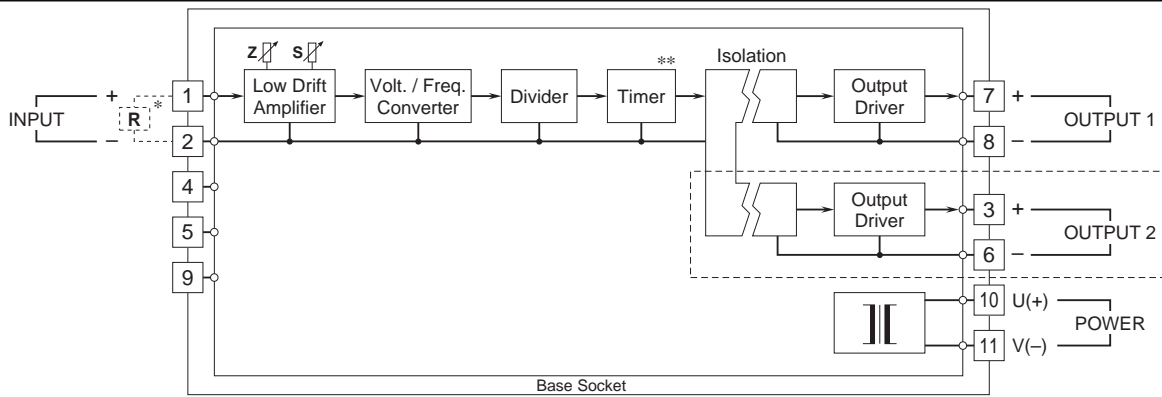
When mounting, no extra space is needed between units.

TERMINAL ASSIGNMENTS unit: mm (inch)



Input shunt resistor attached for current input.

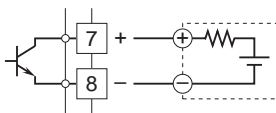
SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



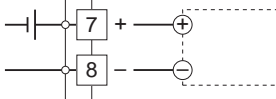
* Input shunt resistor attached for current input.
 **Provided only when the dry contact AC/DC switch is selected as one of the outputs.
 Remark: The section enclosed by broken line is only with 2nd output option.

Output Connection Examples

■ **Open Collector**

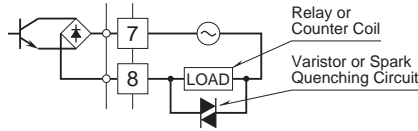


■ **Voltage Pulse**

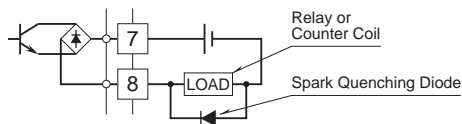


■ **Dry Contact AC/DC Switch**

• **AC Powered**



• **DC Powered**



Specifications are subject to change without notice.