

Space-saving Dual Output Signal Conditioners *Mini-MW Series*

**DC/FREQUENCY CONVERTER**

MODEL **W2AP**

**MODEL & SUFFIX CODE SELECTION**

MODEL \_\_\_\_\_ W2AP-□□□□□□

INPUT \_\_\_\_\_

<b>Current</b>	<b>Voltage</b>
<b>A</b> : 4 – 20mA DC	<b>3</b> : 0 – 1V DC
<b>D</b> : 0 – 20mA DC	<b>4</b> : 0 – 10V DC
<b>G</b> : 0 – 1mA DC	<b>5</b> : 0 – 5V DC
<b>H</b> : 10 – 50mA DC	<b>6</b> : 1 – 5V DC
<b>Z</b> : Specify current *1	<b>0</b> : Specify voltage *1

**OUTPUT 1** \*2 \_\_\_\_\_

**1** : Open collector (max. frequency 10 kHz)  
**2** : 5V pulse (max. frequency 10 kHz)  
**3** : Dry contact AC/DC switch (max. frequency 30 Hz)

**OUTPUT 2** \*2 \_\_\_\_\_

Same range availability as Output 1

**Y** : None

**POWER INPUT** \_\_\_\_\_

<b>AC Power</b>	<b>DC Power</b>
<b>M2</b> : 100 – 240V AC	<b>R</b> : 24V DC
	<b>R2</b> : 11 – 27V DC *3
	<b>P</b> : 110V DC

**STANDARDS & APPROVALS**

- /N : Without CE or UL
- /CE : CE marking
- /UL : UL approval (CE marking)

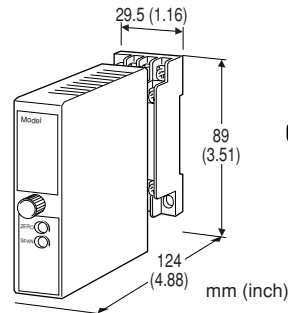
\*1 : 0% input must be 0mA or 0V.  
 \*2 : Frequencies of Output 1 and 2 are the same.  
 When the dry contact AC/DC switch is selected as one of the outputs, the frequency of the other output is limited to max. 30 Hz.  
 \*3 : Select 'N' for 'Standards & Approvals' code.

**ORDERING INFORMATION**

- Specify code number and variables.
- **Code number** (e.g. W2AP-612-M2/K/CE)
  - **Special input range** (For codes Z & 0)
  - **Output frequency range** (e.g. 0 – 500 Hz)

**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  
**Front adjustments:** 0 – 5% for zero; ±5% for span



**Functions & Features**

- Providing two pulse rate outputs in proportion to DC input signal
- Universal power input
- Fast response type available
- High-density mounting
- CE marking
- UL approval

**Typical Applications**

- Totalizing applications in combination with a counter

**INPUT & OUTPUT**

**INPUT**

- **DC Current:** shunt resistor attached to input terminals (0.5W)

**Input resistance:** For resistance values other than listed below, specify when ordering.

Input	Input Resistance
4 – 20mA	: 250 (Ω)
0 – 20mA	: 50
0 – 1mA	: 1000
10 – 50mA	: 100

- **DC Voltage:** 0 – 300V DC

**Minimum span:** 1V

**Input resistance:** 1MΩ minimum

**OUTPUTS (two)**

- **Open Collector:** 30V DC @100mA (resistive load)
- Frequency range:** 0 – 10 pulses/hour through 10 kHz
- Saturation voltage:** 0.6V DC

**5V Pulse**

- Frequency range:** 0 – 10 pulses/hour through 10 kHz
- Hi level:** 3.0 – 5.5V
- Lo level:** ≤0.5V
- Load resistance:** 250Ω minimum

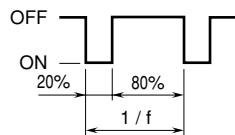
**Dry Contact AC/DC Switch**

- Frequency range:** 0 – 10 pulses/hour through 30 Hz
- Timer:** limits ON time ≤75 ±25 millisec.
- Rated load:** 132V AC @200mA (cosφ=1)  
30V DC @200mA (resistive load)
- Saturation voltage:** 0.6V DC

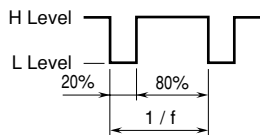
## OUTPUT PULSE WIDTH TIME

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

• Open Collector

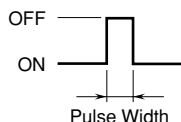


• Voltage Pulse

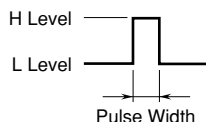


- Frequency greater than 500 Hz at 100% input  
→ See the figure and equation below.

• Open Collector



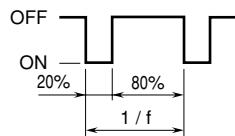
• Voltage Pulse



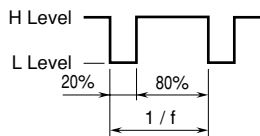
$$\text{Pulse Width [millisec.]} = \frac{1}{2.09 \times 100\% \text{ Frequency [kHz]}}$$

- 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  $75 \pm 25$  ms when the output frequency is low.

• Open Collector  
Dry Contact AC/DC Switch



• Voltage Pulse



## INSTALLATION

### Power input

- AC:** operational voltage range 85 – 264V;  
(90 – 264V for UL);  
47 – 66 Hz; approx. 4VA at 100V  
approx. 5VA at 200V  
approx. 6VA at 240V
- DC:** operational voltage range for R: 24V  
 $\pm 10\%$ , R2: 11 – 27V, or P: 85 – 150V;  
(110V  $\pm 10\%$  for UL);  
ripple 10% p-p max.; approx. 3W

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

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

**Mounting:** surface or DIN rail

**Dimensions:** W29.5×H89×D124 mm (1.16"×3.51"×4.88")

See General Spec. Sheet Figure A-1.

**Weight:** 200 g (0.44 lbs)

**Terminal assignment:** See General Spec. Sheet Figure B-2.

## PERFORMANCE in percentage of span

**Accuracy:**  $\pm 0.1\%$

**Temp. coefficient:**  $\pm 0.015\%/^{\circ}\text{C}$  ( $\pm 0.008\%/^{\circ}\text{F}$ )

**Response time:** approx. 3 seconds (0 – 90%)

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

**Insulation resistance:**  $\geq 100\text{M}\Omega$  with 500V DC

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

## STANDARDS & APPROVALS

**CE conformity:** EMC Directive (89/336/EEC)

EMI EN61000-6-4

EMS EN61000-6-2

Low Voltage Directive (73/23/EEC)

EN61010-1

Installation category II

Pollution degree 2

Max. operating voltage 300V

Input or output 1 or output 2 to power  
– Reinforced insulation

Input to output 1 to output 2 – Basic insulation

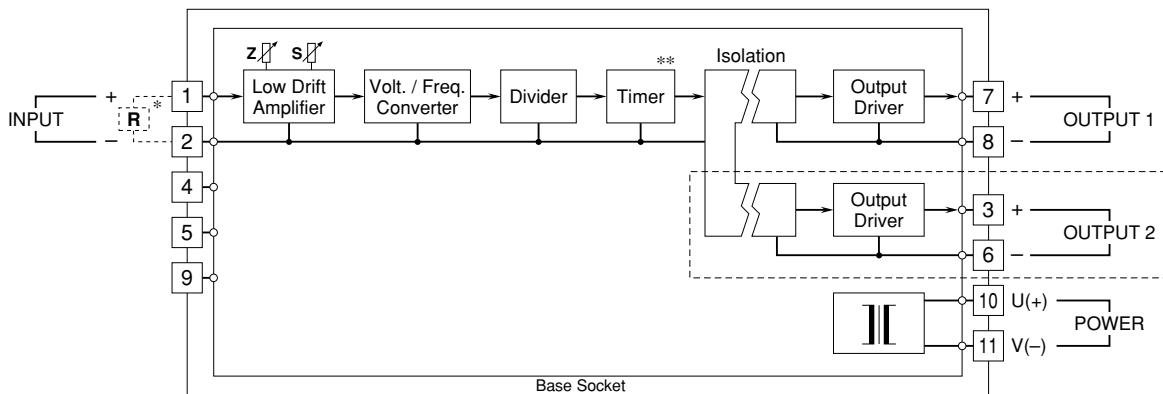
**Approval:** UL/C-UL nonincendive

Class I, Division 2, Groups A, B, C, and D  
(UL 1604, CAN/CSA-C22.2 No.213)

UL/C-UL general safety requirements

(UL 3111-1, CAN/CSA-C22.2 No.1010-1)

# SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



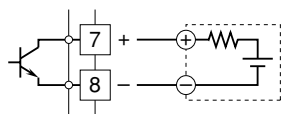
\* Input shunt resistor attached for current input.

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

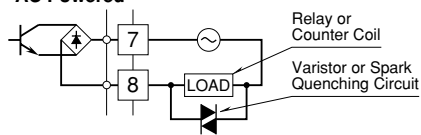
Remark: The section enclosed by broken line is only with 2nd output option.

### Output Connection Examples

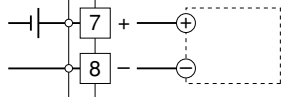
#### ■ Open Collector



#### ■ Dry Contact AC/DC Switch •AC Powered



#### ■ Voltage Pulse



#### •DC Powered

