

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

### LOW FREQUENCY TRANSMITTER

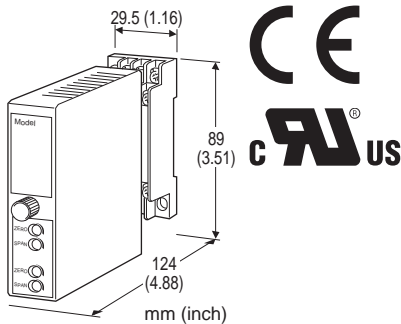
(50 Hz minimum)

#### Functions & Features

- Converts the output from a pulse-type transducer into a standard process signal
- CE marking
- UL approval

#### Typical Applications

- Positive displacement flowmeters, turbine flowmeters and vortex flowmeters
- Proximity switches



### MODEL: W2SP-[1][2][3]-[4][5]

#### ORDERING INFORMATION

- Code number: W2SP-[1][2][3]-[4][5]  
Specify a code from below for each [1] through [5].  
(e.g. W2SP-1AA-M2/CE/Q)
- Frequency range (e.g. 0 - 10 kHz)
- Special output ranges (For codes Z & 0)
- Specify the specification for option code 'Q.'  
(e.g. /C01/S01)

Note: If one of the outputs should be a current range, specify it for the Output 1 to allow a greater load.

#### [1] INPUT

- 1: Dry contact
- 2: Voltage pulse

#### [2] OUTPUT 1

##### 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] OUTPUT 2

Y: None

##### Current

- A: 4 - 20 mA DC (Load resistance 350 Ω max.)
- B: 2 - 10 mA DC (Load resistance 700 Ω max.)
- C: 1 - 5 mA DC (Load resistance 1400 Ω max.)
- D: 0 - 20 mA DC (Load resistance 350 Ω max.)
- E: 0 - 16 mA DC (Load resistance 430 Ω max.)
- F: 0 - 10 mA DC (Load resistance 700 Ω max.)
- G: 0 - 1 mA DC (Load resistance 7000 Ω max.)
- Z: Specify current (See OUTPUT SPECIFICATIONS)

##### Voltage

Same range availability as Output 1

#### [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.)  
(110 V ±10 % for UL)

#### [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

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

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

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

**Input pulse sensing:** DC coupled; detecting pulse rise

**Input filter:** Provided with input range <100 Hz  
(time constant approx. 1 msec.)

**Low-end cutout:** 2 to 5 %

#### INPUT SPECIFICATIONS

**Excitation:** 12 V DC @30 mA; shortcircuit protection

**Frequency range:** 0 - 50 Hz through 10 kHz

■ **Dry Contact:** Mechanical contact or open collector

**Pulse width time requirement:** 20 µsec. min. for ON and OFF

**Sensing:** Approx. 12 V DC @3 mA

**ON/OFF level:** ≤ 200 Ω / 0.6 V for ON, ≥ 100 kΩ / 6 V for OFF

■ **Voltage Pulse:** Square or sine waveforms

**Pulse width time requirement:** 20 µsec. min. for high and low levels

**Hi level:** 2 - 50 V

**Lo level:** ≤ 1 V

**Input impedance:** 10 kΩ 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. for Output 1;  
7 V max. for Output 2

■ **DC Voltage:** -10 - +12 V DC (up to 10 V for Output 2)

**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. 5 VA at 100 V

Approx. 6 VA at 200 V

Approx. 7 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 % (output 10 - 100 %)

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

**Response time:** (0 - 90%)

Approx. 1.8 sec. with 0 - 50 Hz

Approx. 0.7 sec. with 0 - 100 Hz

Approx. 0.5 sec. with 0 - 500 Hz

Approx. 0.5 sec. with 0 - 10 kHz

**Ripple:** 0.2 %p-p max. with input ≥ 10 %

**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,

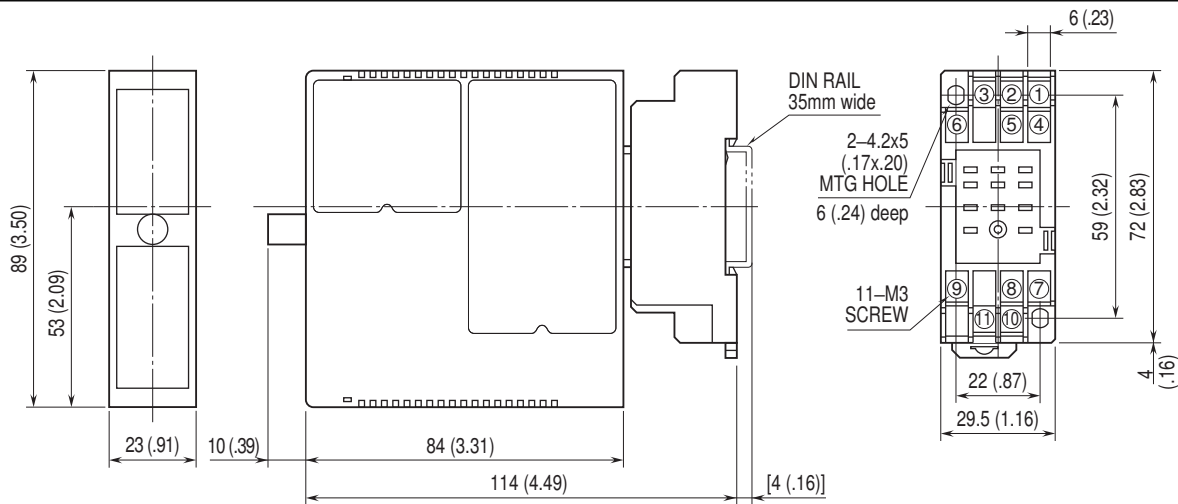
Groups A, B, C, and D hazardous locations

(UL 1604:2004, CAN/CSA-C22.2 No.213:1987)

UL/C-UL general safety requirements

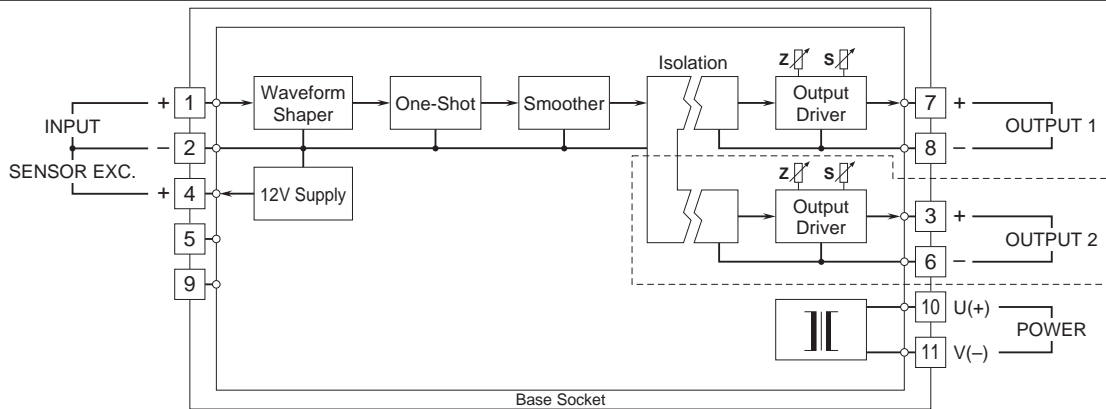
(UL 61010B-1:2003, CAN/CSA-C22.2 No.61010-1:1992)

## DIMENSIONS unit: mm (inch)



When mounting, no extra space is needed between units.

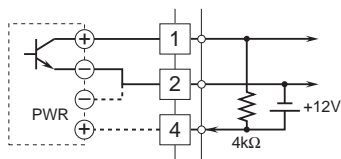
## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



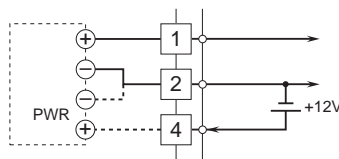
Remark: The section enclosed by broken line is only with 2nd output option.

### Input Connection Examples

#### ■ Dry Contact



#### ■ Voltage Pulse



Specifications are subject to change without notice.