

**Super-mini Signal Conditioners *Mini-M Series***

**LOW FREQUENCY TRANSMITTER**  
(50 Hz minimum)

MODEL **M2SP**

**MODEL & SUFFIX CODE SELECTION**

M2SP-□□□□

MODEL \_\_\_\_\_

INPUT \_\_\_\_\_

1 : Dry contact  
2 : Voltage pulse

OUTPUT \_\_\_\_\_

<b>Current</b>	<b>Voltage</b>
<b>A</b> : 4 – 20mA DC	<b>1</b> : 0 – 10mV DC
<b>B</b> : 2 – 10mA DC	<b>2</b> : 0 – 100mV DC
<b>C</b> : 1 – 5mA DC	<b>3</b> : 0 – 1V DC
<b>D</b> : 0 – 20mA DC	<b>4</b> : 0 – 10V DC
<b>E</b> : 0 – 16mA DC	<b>5</b> : 0 – 5V DC
<b>F</b> : 0 – 10mA DC	<b>6</b> : 1 – 5V DC
<b>G</b> : 0 – 1mA DC	<b>0</b> : Specify voltage
<b>Z</b> : Specify current	

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

<b>AC Power</b>	<b>DC Power</b>
<b>M</b> : 85 – 264V AC *1	<b>R</b> : 24V DC
<b>M2</b> : 100 – 240V AC	<b>R2</b> : 11 – 27V DC *1
	<b>P</b> : 110V DC

\*1 : Select 'N' for 'Standards & Approvals' code.

**STANDARDS & APPROVALS**

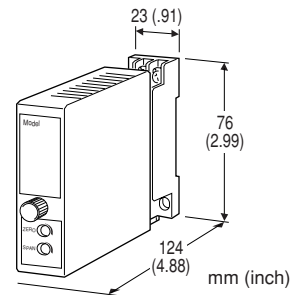
- /N : Without CE or UL
- /CE : CE marking
- /UL : UL approval (CE marking)

**ORDERING INFORMATION**

- Specify code number and variables.
- **Code number** (e.g. M2SP-2A-M2/CE)
  - **Frequency range** (e.g. 0 – 10 kHz)
  - **Special output range** (For codes Z & 0)

**GENERAL SPECIFICATIONS**

- Construction:** plug-in
- Connection:** M3 screw terminals (torque 0.8 N·m)
- Housing material:** flame-resistant resin (black)
- Isolation:** input to output to power
- Input pulse sensing:** DC coupled; detecting pulse rise
- Input filter:** provided with input range <100 Hz (time constant approx. 1 msec.)
- Overrange output:** 0 – 120% at 1 – 5V
- Front adjustments:** zero and span; ±5%
- Low-end cutout:** 2 – 5%



**Functions & Features**

- Converting the output from a pulse-type transducer into a standard process signal
- Universal power input
- High-density mounting
- CE marking
- UL approval

**Typical Applications**

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

**INPUT & OUTPUT**

**INPUT**

**Frequency range:** 0 – 50 Hz through 10 kHz  
**Excitation:** 12V DC @30mA; shortcircuit protection

• **Dry Contact:** mechanical contact or open collector  
**Pulse width time requirement:** 20 μsec. min. for ON and OFF

**Sensing:** approx. 12V DC @3mA  
**ON/OFF level:** ≤200Ω for ON, ≥100kΩ for OFF

• **Voltage Pulse:** square or sine waveforms  
**Pulse width time requirement:** 20 μsec. min. for high and low levels

**Hi level:** 2 – 50V p-p  
**Lo level:** ≤1V  
**Input impedance:** 10kΩ minimum

**OUTPUT**

• **DC Current:** 0 – 20mA DC  
**Minimum span:** 1mA  
**Zero suppression/elevation:** max. 1.5 times span  
**Load resistance:** output drive 15V maximum

Output	Load Resistance
4 – 20mA	: 750 (Ω maximum)
2 – 10mA	: 1500
1 – 5mA	: 3000
0 – 20mA	: 750
0 – 16mA	: 900
0 – 10mA	: 1500
0 – 1mA	: 15k

•DC Voltage: 0 – 12V DC

Minimum span: 5mV

Zero suppression/elevation: max. 1.5 times span

Load resistance: output drive 1mA maximum at  $\geq 0.5V$

Output	Load Resistance
0 – 10mV	: 10k ( $\Omega$ minimum)
0 – 100mV	: 100k
0 – 1V	: 1000
0 – 10V	: 10k
0 – 5V	: 5000
1 – 5V	: 5000

## 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 264V

**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:** W23×H76×D124 mm (0.91"×2.99"×4.88")  
See General Spec. Sheet Figure A-1.

**Weight:** 150 g (0.33 lbs)

**Terminal assignment:** See General Spec. Sheet Figure B-1.

## PERFORMANCE in percentage of span

**Accuracy:**  $\pm 0.1\%$  (output 10 – 100%)

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

**Response time:** (0 – 90%)

approx. 1.8 seconds for 0 – 50 Hz

approx. 0.7 seconds for 0 – 100 Hz

approx. 0.5 seconds for 0 – 500 Hz

approx. 0.5 seconds for 0 – 10 kHz

**Ripple:** 0.2% p-p max. with input  $\geq 10\%$

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

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

**Dielectric strength:** 2000V AC @1 minute

(input to output 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 to power – Reinforced insulation

Input to output – Basic insulation

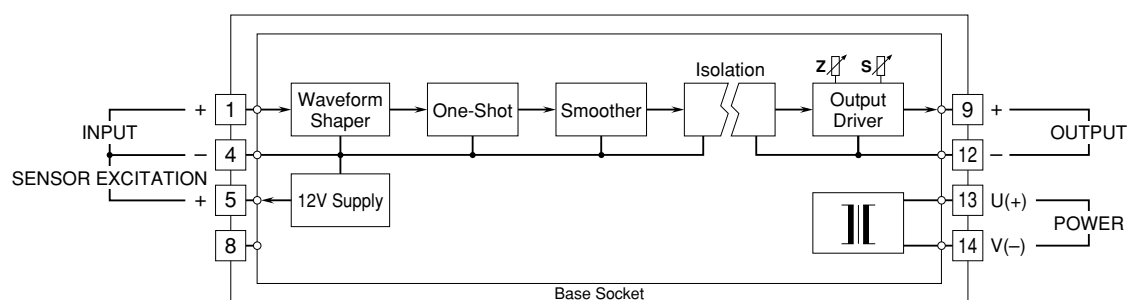
**Approval:** UL/C-UL nonincendive

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

UL/C-UL general safety requirements

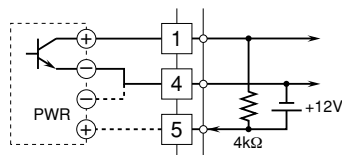
(UL 3111-1, CAN/CSA-C22.2 No.1010-1)

## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



### Input Connection Examples

#### ■ Dry Contact



#### ■ Voltage Pulse

