Terminal Block Dual Output Signal Conditioners W5-UNIT
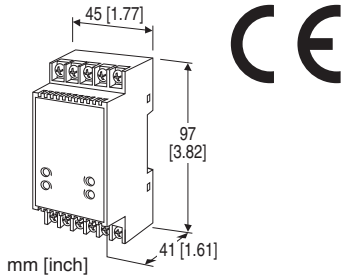
FREQUENCY TRANSMITTER

Functions & Features
• Converts the output from a pulse-type transducer into two isolated process signals
• Two independent output ranges
• Four-way isolation (input to output 1 to output 2 to power)
• High-density mounting

45 [1.77]
97 [3.82]
41 [1.61]
mm [inch]

CE

MODEL: W5PA-[1][2][3][4]-[5][6]

ORDERING INFORMATION
• Code number: W5PA-[1][2][3][4]-[5][6]
Specify a code from below for each of [1] through [6].
  (e.g. W5PA-A144W4W-R/Q)
• Frequency range (e.g. 0 – 1 kHz)
• Special output ranges (For codes Z & 0)
• Specify the specification for option code /Q
  (e.g. /C01/V01/S01)

[1] INPUT
A1: Open collector
A2: Mechanical contact
C: 5 V pulse (sensitivity 2 V)
D: 12 V/24 V pulse (sensitivity 5 V)

[2] EXCITATION
4: 12 V DC / 30 mA
7: 24 V DC / 12 mA

[3] OUTPUT 1
Current
A: 4 – 20 mA DC (Load resistance 550 Ω max.)
B: 2 – 10 mA DC (Load resistance 1100 Ω max.)
C: 1 – 5 mA DC (Load resistance 2200 Ω max.)
D: 0 – 20 mA DC (Load resistance 550 Ω max.)
E: 0 – 16 mA DC (Load resistance 685 Ω max.)
F: 0 – 10 mA DC (Load resistance 1100 Ω max.)
G: 0 – 1 mA DC (Load resistance 11 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 100 Ω min.)
4: 0 – 10 V DC (Load resistance 1000 Ω min.)
5: 0 – 5 V DC (Load resistance 500 Ω min.)
6: 1 – 5 V DC (Load resistance 500 Ω min.)
4W: -10 – +10 V DC (Load resistance 2000 Ω min.)
5W: -5 – +5 V DC (Load resistance 1000 Ω min.)
0: Specify voltage (See OUTPUT SPECIFICATIONS)

[4] OUTPUT 2
Same range availability as Output 1
Y: None

[5] POWER INPUT
AC Power
M: 85 – 264 V AC (Operational voltage range 85 – 264 V, 47 – 66 Hz)
(CE not available)
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.)
(CE not available)
P: 110 V DC
(Operational voltage range 85 – 150 V, ripple 10 %p-p max.)
(CE not available)

[6] OPTIONS
blank: none
/Q: With options (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
ADJUSTMENT
**/V01**: Multi-turn fine adjustment
TERMINAL SCREW MATERIAL
/S01: Stainless steel

CAUTION
The W5PA is designed to accept at the maximum of 100 kHz, which may cause errors due to chattering in the input pulses.
A filter circuitry (time constant: approx. 1 msec.) is incorporated to eliminate unwanted chattering when the

mechanical contact input is specified. It is effective for most relay types, however, an external CR filter as indicated below, could be added if the user needs improvement. Limit the input frequency to 10 Hz at maximum.
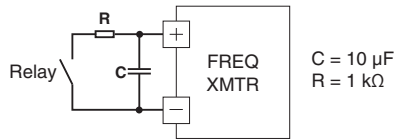
GENERAL SPECIFICATIONS

Construction: Terminal block
Connection
  Input: M3.5 screw terminals (torque 0.8 N·m)
  Output & power: M3 screw terminals (torque 0.8 N·m)
Screw terminal: Nickel-plated steel (standard) or stainless steel
Housing material: Flame-resistant resin (black)
Isolation: Input to output 1 to output 2 to power
Overrange output: Approx. -10 to +120 % at 1 – 5 V
Zero adjustment: -2 to +2 % (front)
(±1 % with the output suffix codes 4W and 5W selected)
Span adjustment: 98 to 102 % (front)
(99 to 101 % with the output suffix codes 4W and 5W selected.)

INPUT SPECIFICATIONS

Sensor excitation:
12 V DC; shortcircuit protection (approx. 35 mA at shortcircuit)
24 V DC; shortcircuit protection (approx. 15 mA at shortcircuit)
■ **Open Collector**
Frequency range: 0 – 0.01 Hz through 100 kHz
Pulse width time requirement: ≥ 4 µsec. for both ON and OFF
Sensing voltage/current: 5 V DC @2 mA
Detecting levels: ≤ 350 Ω / 1 V for ON; ≥ 10 kΩ / 3 V for OFF
■ **Mechanical Contact**
Frequency range: 0 – 0.01 Hz through 30 Hz
Pulse width time requirement: ≥ 10 msec. for both ON and OFF
Sensing voltage/current: 5 V DC @2 mA
Detecting levels: ≤ 350 Ω / 1 V for ON; ≥ 10 kΩ / 3 V for OFF
■ **Voltage Pulse**
Frequency range: 0 – 0.01 Hz through 100 kHz
Pulse width time requirement: ≥ 4 µsec. for both H and L levels
Waveform: Square or sine
Input impedance: ≥ 10 kΩ
Max. voltage between input terminals: ±50 V
Detecting H level

5 V pulse: ≥ 3 V
12 V, 24 V pulse: ≥ 6 V
Detecting L level
5 V pulse: ≤ 1 V
12 V, 24 V pulse: ≤ 4 V

OUTPUT SPECIFICATIONS

■ **DC Current**: 0 – 20 mA DC
Minimum span: 1 mA
Offset: Max. 1.5 times span
Load resistance: Output drive 11 V max.
■ **DC Voltage**: -10 – +12 V DC
Spans: Min. 5 mV, max. 20 V
Offset: Max. 1.5 times span
Load resistance: Output drive 10 mA max.; 5 mA for negative voltage output; at ≥ 0.5 V

INSTALLATION

 Power Consumption
 •**AC**:
 Approx. 6 VA at 100 V
 Approx. 7 VA at 200 V
 Approx. 8 VA at 264 V
 •**DC**: Approx. 3 W
Operating temperature: -5 to +55°C (23 to 131°F)
Operating humidity: 0 to 90 %RH (non-condensing)
Mounting: DIN rail
Weight: 130 g (0.29 lb)

PERFORMANCE in percentage of span

Accuracy: ±0.1 %
Temp. coefficient: ±0.015 %/°C (±0.008 %/°F)
Response time: Max. 0.5 sec. + 1 pulse cycle (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 or output 2 to power to ground)
1000 V AC @1 minute (output 1 to output 2)
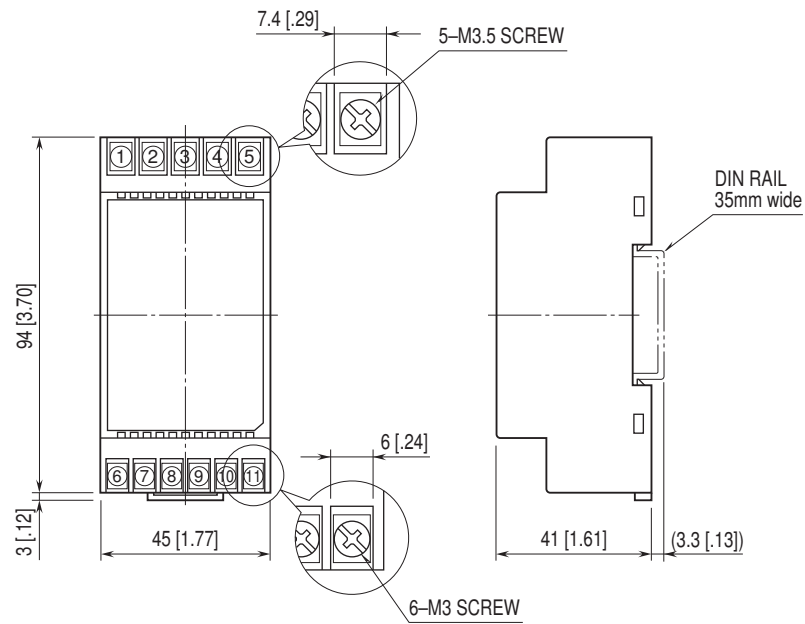
STANDARDS & APPROVALS

EU conformity:
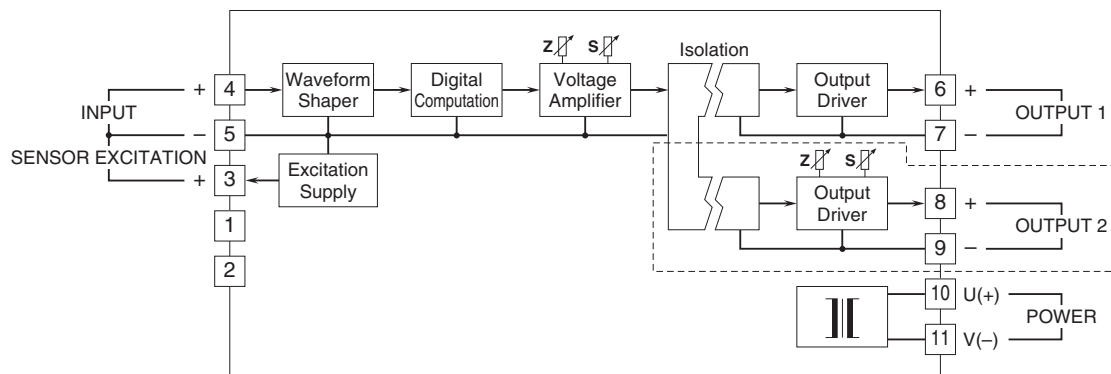EMC Directive
  EMI EN 61000-6-4
  EMS EN 61000-6-2
RoHS Directive

MODEL: W5PA

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS   unit: mm [inch]

7.4 [.29]

5–M3.5 SCREW

94 [3.70]

3 [.12]

45 [1.77]

6 [.24]

6–M3 SCREW

DIN RAIL
35mm wide

41 [1.61]

(3.3 [.13])

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

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

INPUT

SENSOR EXCITATION

+ 4

− 5

+ 3

1

2

Waveform
Shaper

Digital
Computation

z **s**
Voltage
Amplifier

Excitation
Supply

Isolation

Output
Driver

6 +

7 −

OUTPUT 1

z **s**
Output
Driver

8 +

9 −

OUTPUT 2

10 U(+)

11 V(−)

POWER

Note 1: The section enclosed by broken line is only with 2nd output option.
Note 2: DO NOT connect to the terminals 1 and 2.

Input Connection Examples

■ **Open Collector or Mechanical Contact**   ■ **Voltage Pulse**

+5V

2.5kΩ

+ 4

− 5

3

Vsns

+ 4

− 5

3

Vsns
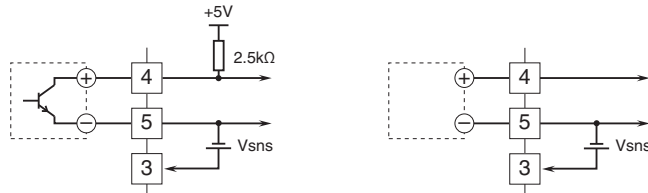
⚠ Specifications are subject to change without notice.