Super-mini Signal Conditioners Mini-M Series

SIGNAL TRANSMITTER
(high speed response)

Functions & Features
• Converts DC input from a sensor into a standard process signal
• Isolation between input and output
• 180-microsecond response

Typical Applications
• Isolation for a vibration analyzing system

MODEL: M2VF-[1][2][3][4]

ORDERING INFORMATION
• Code number: M2VF-[1][2][3][4]
Specify a code from below for each [1] through [4].
(e.g. M2VF-6A-M2/CE/Q)
• Special input and output ranges (For codes Z & 0)
• Specify the specification for option code /Q
(e.g. /C01/V01)

[1] INPUT
Current
A: 4 – 20 mA DC (Input resistance 250 Ω)
B: 2 – 10 mA DC (Input resistance 500 Ω)
C: 1 – 5 mA DC (Input resistance 1000 Ω)
D: 0 – 20 mA DC (Input resistance 50 Ω)
E: 0 – 16 mA DC (Input resistance 62.5 Ω)
F: 0 – 10 mA DC (Input resistance 100 Ω)
G: 0 – 1 mA DC (Input resistance 1000 Ω)
H: 0 – 10 mA DC (Input resistance 1000 Ω)
GW: -1 – +1 mA DC (Input resistance 1000 Ω)
FW: -10 – +10 mA DC (Input resistance 100 Ω)
Z: Specifying current (See INPUT SPECIFICATIONS)

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.)

[2] OUTPUT
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 900 Ω max.)
G: 0 – 1 mA DC (Load resistance 15 kΩ max.)
FW: -10 – +10 mA DC (Load resistance 700 Ω max.)
GW: -1 – +1 mA DC (Load resistance 7000 Ω max.)
Z: Specifying 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] POWER INPUT
AC Power
M: 85 – 264 V AC (Operational voltage range 85 – 264 V, 47 – 66 Hz)
(Select ‘/N’ for ‘Standards & Approvals’ code.)
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.)
[4] OPTIONS (multiple selections)

Standards & Approvals (must be specified)
/N: Without CE or UL
/CE: CE marking
/UL: UL approval, CE marking

Custom specification
(Refer to the custom specification list for difference of specification and combination of code numbers.)
blank: none
/X1: Response time (CE or UL not available)
/X2: Input (CE or UL not available)

Other Options
blank: none
/Q: Option other than the above (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 (UL not available)

ADJUSTMENT
/V01: Multi-turn fine adjustment (UL not available)

TERMINAL SCREW MATERIAL
/S01: Stainless steel (UL not available)

GENERAL SPECIFICATIONS

Construction: Plug-in
Connection: M3 screw terminals (torque 0.8 N·m)
Screw terminal: Chromated steel (standard) or stainless steel

Housing material: Flame-resistant resin (black)
Isolation: Input to output to power
Overrange output: Approx. -10 to +120 % at 1 – 5 V
Zero adjustment: -5 to +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: -300 – +300 V DC
(-30 – +30 V for the input code 01. Span 60 V max.)
- Minimum span: 1 V
- Offset: Max. 1.5 times span
- Input resistance: ≥ 1 MΩ

OUTPUT SPECIFICATIONS

- DC Current: -10 – +20 mA DC
- Minimum span: 1 mA
- Offset: Max. 1.5 times span
- Load resistance: Output drive 15 V max.;
  7 V for bidirectional outputs
- DC Voltage: -10 – +12 V DC
- 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. 3 VA at 100 V
  Approx. 4 VA at 200 V
  Approx. 5 VA at 264 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: 150 g (0.33 lb)

PERFORMANCE in percentage of span

Accuracy: ±0.1 %
Temp. coefficient: ±0.015 %/°C (±0.008 %/°F)
Response time: ≤ 180 μsec. (0 – 90 %)
Line voltage effect: ±0.1 % over voltage range
Insulation resistance: ≥ 100 MΩ with 500 V DC
Dielectric strength:
1000 V AC @1 minute (input to output)
2000 V AC @1 minute (input or output to power to ground)

STANDARDS & APPROVALS

EU conformity:
EMC Directive
  EMI EN 61000-6-4
  EMS EN 61000-6-2
Low Voltage Directive
  EN 61010-1
Installation Category II
Pollution Degree 2

RoHS Directive
  EN 50581
Approval:
UL/C-UL nonincendive Class I, Division 2,
Groups A, B, C, and D
(ANSI/ISA-12.12.01, CAN/CSA-C22.2 No.213)
UL/C-UL general safety requirements
(UL 61010-1, CAN/CSA-C22.2 No.61010-1)
EXTERNAL 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

- The M2VF, by its fast-response feature, is not designed to eliminate noise present in the input signal. Use a shielded twisted-pair cable for preventing noise entering through the input wiring.

Specifications are subject to change without notice.
CUSTOM SPECIFICATION LIST

Refer to the following pages for each detailed custom specification.

**Custom specification**: Option /X1
- Major specification changes
  Response time: 5.3 ms ±30 % (0 - 90 %)

**Custom specification**: Option /X2
- Major specification changes
  Input: 0 - 0.5 V DC (Input resistance 200 kΩ min.)
CUSTOM SPECIFICATION : OPTION /X1

Major specification changes
Response time: 5.3 msec. ±30 %

MODEL: M2VF–4W4W–[3]/N/X1[4]

Same as standard specification (without customization) except followings.
Refer to standard specification pages.

ORDERING INFORMATION
• Code number: M2VF-4W4W-[3]/N/X1[4]
For [3] and [4] same code as standard specification is available.
(e.g. M2VF-4W4W-M2/N/X1/Q)
Refer to standard specification pages.

SPECIFICATION CHANGES
■ Performance in percentage of span
Response time: 5.3 msec. ±30 % (0 – 90 %)
CUSTOM SPECIFICATION : OPTION /X2

<table>
<thead>
<tr>
<th>Major specification changes</th>
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<tr>
<td>Input: 0 - 0.5 V DC (input resistance 200 kΩ)</td>
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MODEL: M2VF-0[2]-[3]/N/X2[4]

Same as standard specification (without customization) except followings.
Refer to standard specification pages.

ORDERING INFORMATION

- **Code number**: M2VF-0[2]-[3]/N/X2[4]
  - For each each [2] through [4] same code as standard specification is available.
  - (e.g. M2VF-04W-M2/N/X2/Q)
  - Refer to standard specification pages.

SPECIFICATION CHANGES

- Input specifications
  - Input 0 - 0.5 V DC
  - Input resistance: 200 kΩ min.