**Product Data Sheet**
PS-001292, Rev I
August 2022

# Micro Motion™ Model 9739 with MVD™ Technology

Micro Motion Model 9739 transmitters with MVD technology deliver powerful features that make managing your process easier.

### Advanced digital signal processing in a robust, proven design

- Robust housing and power options ideally suited for truck-mounted applications
- Same form factor as legacy Micro Motion RFT9739 transmitters for quick, easy replacement
- Significantly improved performance—such as in accuracy and turndown—compared to the legacy analog RFT9739

### Wide variety of input/output and application capabilities to fit your needs

- High-speed digital signal processing for accuracy under the toughest conditions—high noise, high turndown, and more
- Concentration and net flow measurement eliminates the need for additional instruments
- Petroleum measurement software automatically provides temperature corrected volumes from a single instrument

# Micro Motion 9739 transmitters with MVD technology

Micro Motion 9739 MVD transmitters and controllers utilize MVD technology to deliver accurate, high-speed multivariable signals. Micro Motion transmitters are available with the following communication protocols: 4–20 mA, HART®, *Wireless*HART®, and Modbus®.

You will always be able to receive the process information you need in a format that works for your installation. Micro Motion transmitters also carry advanced diagnostic tools allowing you to rest easy knowing your process is being monitored correctly.

**MVD technology**

MVD technology makes your Micro Motion meter work smarter. Front-end digital processing dramatically reduces signal noise and gives you faster response time compared to analog devices.

Only MVD technology allows you to:

- Measure multiple variables for accurate process control
- Identify and resolve problems easily with built-in smart diagnostics
- Upgrade transmitter functionality as needed

**Model 9739 transmitter with MVD technology**

Micro Motion Model 9739 transmitter with MVD technology (or 9739 MVD) allows you to have advanced digital signal processing in a convenient wall- or pipe-mounted package. With its single front access compartment, you can wire the transmitter easily from one main location.

The 9739 MVD transmitter is ideal for truck-mounted applications with its robust packaging and ability to accept as low as 12 VDC power.

Concentration measurement is easy with the 9739 MVD transmitter, too. You input the concentration curves, and the multivariable transmitter can output mass flow, volume flow, density, temperature, concentration, and more.

Petroleum measurement is also available, and enables the correction for the effect of temperature on liquid volumes. This application calculates and applies a volume correction factor to volume measurement.

You can pair the 9739 MVD transmitter with the Smart Wireless THUM ™Adapter, allowing you to gain access to additional diagnostics and process information without added wiring costs.

**Upgrading your RFT9739 transmitter.**

Because the 9739 MVD transmitter has the same installation requirements as the legacy RFT9739 transmitter, replacing a currently installed RFT9739 transmitter with a new 9739 MVD transmitter couldn't be easier.

Additionally, Micro Motion offers a Ordering information: Micro Motion 9739 MVD electronics retrofit kit that allows you to upgrade existing RFT9739 transmitters to use MVD technology. The 9739 MVD electronics module has the same I/O capabilities as the RFT9739, so no rewiring is necessary to upgrade. And, because the retrofit requires that you use the currently installed transmitter housing base, the existing conduit connections are completely.

## Applications

| Application | Description |
|---|---|
| Concentration measurement | Provides concentration measurement based on either industry-specific or liquid-specific units and relationships. Standard measurement options include:<br>■ Industry specific:<br>— °Brix<br>— °Plato<br>— °Balling<br>— °Baumé at SG60/60<br>— Specific gravity<br>■ Liquid specific:<br>— %HFCS<br>— Concentration derived from reference density<br>— Concentration derived from specific gravity<br>Additionally, the application can be customized for site-specific concentration measurement (such as %HNO3, %Na Oh). |
| Petroleum measurement | Provides process variables, such as temperature-corrected volume flow and API average density, calculated using the American Petroleum Institute (API) equations, specifically tables 5A, 5B, 5D, 6C, 23A, 23B, 23D, 24C, 53A, 53B, 53D, and 54C. |

# User interface

| Model status | Features |
|---|---|
| Models with or without display | ■ User interface module can rotate 360° on the transmitter in 90° increments.<br>■ Three-color status LED on user interface module indicates flow meter condition at a glance, using a solid green, yellow, or red light. Zero in progress is indicated by a flashing yellow light.<br>■ Two clips for service port connections (requires removing transmitter housing cover and disconnecting the RS-485 connections, if connected) an<br>■ Two clips for HART®/Bell 202 connections (requires removing transmitter housing cover)<br>■ HART security switch (requires removing transmitter housing cover) |
| Models with display | ■ Transmitter housing cover is metal with a glass lens.<br>■ User interface module includes LCD display panel.<br>LCD line 1 displays process variable.<br>LCD line 2 displays engineering unit of measure.<br>■ Display update rate is user-configurable: 1 to 10 seconds at 1-second increments.<br>■ Display back lighting may be adjusted or turned off .<br>■ Operator access to transmitter menus is provided through optical switches that are operated through the lens. LED indicators show when a button has been selected. |

| Model status | Features |
|---|---|
| Models without display | ■ Transmitter housing cover is all metal (no lens)<br>■ Access to user interface requires removing transmitter housing cover<br>■ Zero button allows flow meter zero from field (requires removing transmitter housing cover) |

# Input / output signals

**Sensor input**

One nine-wire sensor signal input connection, intrinsically safe

**Two mA Outputs**

- Independently configure for mass flow, volume flow, density, concentration, temperature, pressure, or more
- Not intrinsically safe
- Internally powered
- Can be selected as 4–20 mA or 0–20 mA current outputs
- Galvanically isolated
- Output is linear with process from 3.8 to 20.5 mA, per NAMUR NE43 when selected as 4–20 mA

**One active or passive frequency/pulse output**

- Can report mass flow or volume flow, which can be used to indicate flow rate or total
- Not intrinsically safe
- Scalable to 10,000 Hz
- Output is linear with flow rate to 12,500 Hz
- Fault output at 15,000 Hz (upscale) or 0 Hz (downscale)
- Power:
  - — - Internal (active): 0–15 V square wave, unloaded; internal 2.2 kΩ pull-up resistor to 15 V, galvanically isolated
  - — - External (passive): Sinking capability:
    - 0.1 A in “On” condition (0 V level)
    - 30 VDC compliance in “Off” condition
- Programmable pulse width for low frequencies

**One active or passive Discrete Input**

- Can report five discrete events: flow switch, forward/reverse flow, calibration in progress, or fault.
- Not intrinsically safe
- Power
  - — - Internal (active): digital level 0 to 15 V, with a 2.2 kΩ internal pull-up resistor, galvanically isolated
  - — - External (passive): +30 VDC maximum, +24 VDC typical
- In passive (open collector) configuration: sinking capability is
  - — 0.1 A in “On” condition (0 V level)
  - — 30 VDC compliance in “Off” condition

**One active Discrete Input**

- Internally powered configuration: +24 VDC, 10 mA maximum source current
- Not intrinsically safe
- Can reset all totals, reset mass total, reset volume total, start/stop totals, or start sensor zero

**Communication**

- Bell 202 signal is superimposed on primary variable mA output and is available for host system interface; frequency 1.2 and 2.2 kHz, amplitude 0.8 V peak-to-peak, 1200 baud; requires 250 Ω to 1000 Ω load resistance
- RS-485 signal is a 5 V square wave referenced to transmitter ground; physical layer is auto-detecting and supports baud rates from 1200 baud to 38.4 kilobaud

**Sensor temperature output**

For use with Micro Motion legacy peripheral devices:

- 7.4 V peak-to-peak at sensor natural frequency, referenced to sensor ground
- 10kΩ output impedance

**mA Input**

The mA input can accept a signal from a temperature transmitter for external temperature measurement or pressure transmitter for pressure compensation of flow and density:

- Range: 0–25 mA
- Can be used to power independent temperature, pressure, or differential
- Voltage sourcing capability: 15 V
- Input impedance: 100 Ω

# Power supply

| | Description |
|---|---|
| Self switching | The internal power supply of the Micro Motion 9739 MVD transmitter is self switching between:<br>■ 85 to 250 VAC(1), 48 to 62 Hz, 10 W typical, 15 W maximum<br>■ 12 to 30 VDC(2), 7 W typical, 14 W maximum |

(1) *Complies with low-voltage directive 2006/95/EC per EN 61010-1 (IEC 61010-1) with Amendment 2.*
(2) *At startup, the transmitter power source must provide a minimum of 1.6 A of short-term current at a minimum of 12 V at the transmitter's power input terminals.*

# Environmental limits

| Type | Limits |
|---|---|
| Ambient temperature limits | ■ Operating: -40 °F (-40 °C) to 140 °F (60 °C)<br>■ Storage: -40 °F (-40 °C) to 140 °F (60 °C)<br>Below -4 °F (-20 °C), the LCD display responsiveness decreases so the LCD display may become difficult to read.<br>Above 131 °F (55 °C), some darkening of the LCD display panel may occur.<br>ATEX requires limiting the ambient temperature to below 131 °F (55 °C). |
| Humidity limits | 5 to 95% relative humidity, non-condensing at 140 °F (60 °C) |
| Vibration limits | Meets IEC68.2.6, endurance sweep, 5 to 2000 Hz, 50 sweep cycles at 5.0 g |

# Environmental effects

| Type | Effect |
|---|---|
| Electromagnetic interference (EMI) effects | Complies with EMC directive 2014/30/EU per EN 61326 Industrial |
| | Complies with NAMUR NE-21 (2017-08-01) |
| Ambient temperature effect | ■ On mA Output: ±0.005% of span per °C<br>■ On temperature outputs: ±0.01 °C of span per °C<br>■ On mA input: ±0.01% of span per °C |

# Hazardous area classifications

| Approval Type | Approval | | |
|---|---|---|---|
| UL or CSAc-US without display | C SP® US<br>or<br>UL LISTED | Transmitter | ■ Class I, Div. 1, Groups C and D<br>■ Class II, Div. 1, Groups E, F, and G explosion proof (when installed with approved conduit seals)<br>■ Class I, Div. 2, Groups A, B, C, and D. |
| | | Outputs | ■ Provides nonincendive sensor outputs for use in Class I, Div. 2, Groups A, B, C, and D;<br>■ Provides intrinsically safe sensor outputs for use in both:<br>— Class I, Div. 1, Groups C and D<br>— Class II, Div. 1, Groups E, F, and G. |
| UL or CSAc-US without display | C SP® US<br>or | Transmitter | Class I, Div. 2, Groups A, B, C, and D |

| Approval Type | Approval | | |
|---|---|---|---|
| | UL LISTED | Outputs | ■ Provides nonincendive sensor outputs for use in Class I, Div. 2, Groups A, B, C, and D;<br>■ Provides intrinsically safe sensor outputs for use in both:<br>— Class I, Div. 1, Groups C and D<br>— Class II, Div. 1, Groups E, F, and G. |
| ATEX without display | ATEX ambient temperature range is from -22 °F (-30 °C) to +131 °F (55 °C) without routine testing, and -40 °F (-40 °C) to +131 °F (55 °C) with routine testing. | Flameproof transmitter | II 2G Ex d [ib] IIB/IIC T6 Gb |
| | | Safe-area transmitter | II (2)G [Ex ib Gb] IIB/IIC |
| ATEX with display | ATEX ambient temperature range is from -22 °F (-30 °C) to 131 °F (55 °C) without routine testing, and -40 °F (-40 °C) to 131 °F (55 °C) with routine testing. | | II (2)G [Ex ib Gb] IIB/IIC |
| EAC without display | EAC ambient temperature range is from –22 °F to +131 °F (–30 °C to +55 °C) without routine testing, and –40 °F to +131 °F (–40 °C to +55 °C) with routine testing. | Flameproof transmitter | 1 Ex d [ib] IIB/IIC T6 GbX |
| | | Safe-area transmitter | [Ex ib Gb] IIB/IICX |
| EAC with display | EAC ambient temperature range is from –22 °F to +131 °F (–30 °C to +55 °C) without routine testing, and –40 °F to +131 °F (–40 °C to +55 °C) with routine testing. | | [Ex ib Gb] IIB/IICX |

# Physical specifications

| Specification | Value |
|---|---|
| Housing and mounting | NEMA® 4X (IP65) polyurethane-painted cast aluminum |
| Weight | ■ Transmitter with display: 11.5 lb (5 kg)<br>■ Transmitter without display: 11.8 lb (5 kg) |
| Cable gland entrances | Three ¾-in – 14 NPT on transmitter base |
| Electric connections | ■ Screw teminal blocks for all signal wiring can be unplugged<br>■ Fixed screw terminals for power connections<br>■ Screw terminal on housing for chassis ground<br>■ Screw terminals accept solid or stranded conductors, 0.14 to 2.5 $mm^2$ (16 to 26 AWG) |
| Mounting | May be remotely connected to any nine-wire Micro Motion sensor |

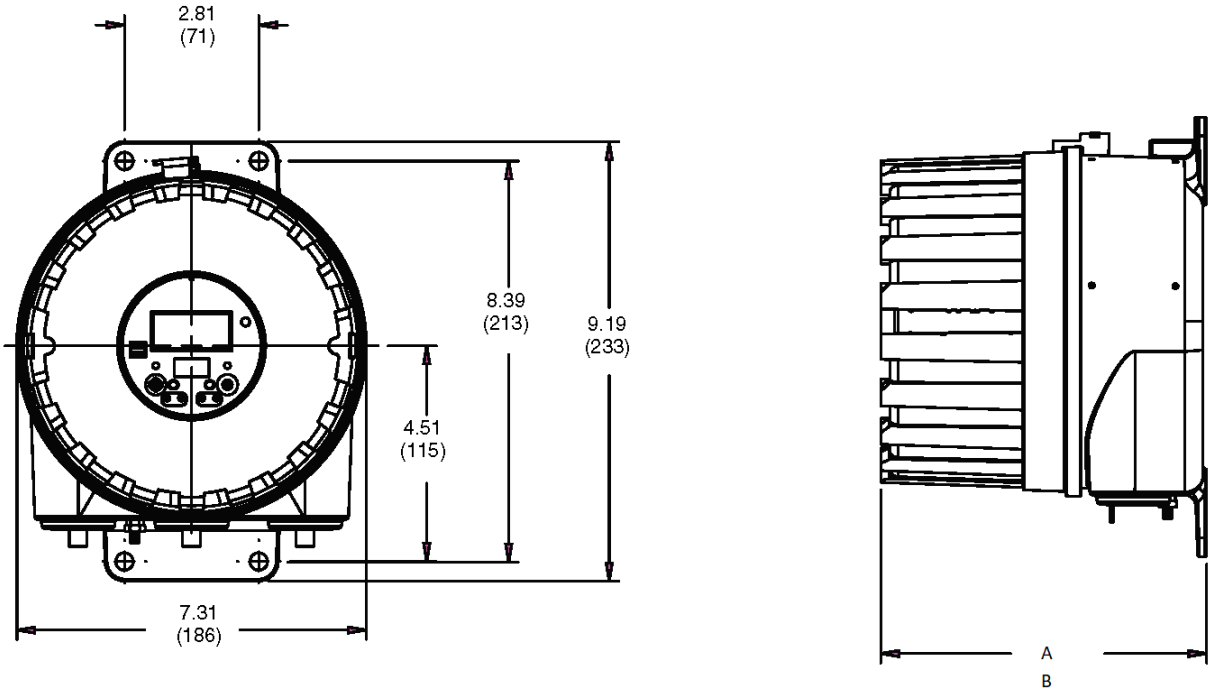
| Specification | Value |
|---|---|
| Maximum cable lengths between sensor and transmitter[1] | 10 ft (3 m) |

(1) *Micro Motion recommends using Micro Motion nine-wire cable. 10 ft (3 m) of Micro Motion nine-wire cable is included.*

## Dimensions

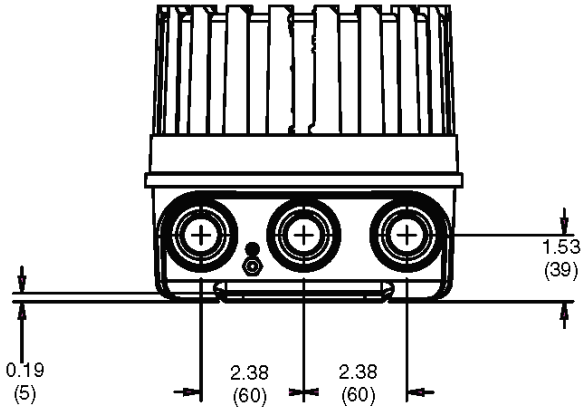
**Front and side views**

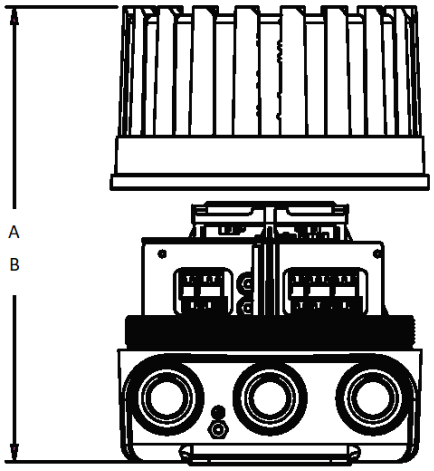
Dimensions are in inches (mm).




*A. With display: 6.82 (173)*
*B. Without display: 7.28 (185)*

**Bottom view**



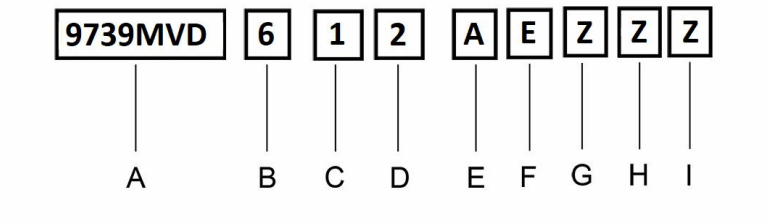




*A. With display: 10.46 (266)*
*B. Without display: 11.50 (292)*

# Ordering information

This section lists the available options and ordering codes for the Micro Motion 9739 MVD™ transmitter.

**Example model code**




A. *Product family*
B. *Power*
C. *Display*
D. *Approvals*
E. *Conduit connections*
F. *Languages*
G. *Software options 1*
H. *Software options 2*
I. *Factory options*

## Base model

**Code descriptions**

The codes below are model designations used to identify the type of meter and material of construction.

| Code | Material |
|---|---|
| 6 | 12 to 30 VDC or 85 to 265 VAC; self switching |
| 1 | Dual line display for process variables and totalizer reset |
| 2 | CSA-US and Canada (Class 1, Div. 2) |
| A | No fittings or glands |
| E | English installation manual and English guide to filling |
| Z | Flow and density variables (standard) |
| Z | No software options 2 |
| Z | Standard product |

## Product description

| Model | Product description |
|---|---|
| 9739MVD | Micro Motion Coriolis multivariable transmitter |

## Power

| Code | Description |
|---|---|
| 6 | 12 to 30 VDC or 85 to 265 VAC; self switching |

## Display

| Code | Display |
|---|---|
| 1[1] | Dual line display for process variables and totalizer reset |
| 3 | No display |

(1) *Transmitter is not flameproof when supplied with display code 1.*

## Approvals

| Code | Approvals |
|---|---|
| For display code 1 (with display): | |
| M | Micro Motion standard (no approval) |
| 2 | CSA-US and Canada (Class 1, Div. 2) |
| Y | ATEX intrinsically safe sensor outputs; Safe area II (2) G |
| For display code 3 (with no display): | |
| M | Micro Motion standard (no approval) |
| A | CSA-US and Canada (Class 1, Div. 1) |
| Y | ATEX intrinsically safe sensor outputs; Safe area II (2) G |
| W | ATEX intrinsically safe sensor outputs; flameproof transmitter II 2 G |
| J | Hardware ready for TIIS approval (EPM Japan only) |
| S | TIIS - IIB sensor (Not available for quote outside of Japan) |
| T | TIIS - IIC sensor (Not available for quote outside of Japan) |

## Conduit connections

**For approval code M (Micro Motion standard)**

| Code | Conduit connections |
|---|---|
| A | No fittings or glands |
| B | 1 gland; nickel-plated brass |
| C | 3 glands; nickel-plated brass |

**For approval codes 2 & A (CSA-US and Canada)**

| Code | Conduit connections |
|---|---|
| A | No fittings or glands |
| J | 1 explosion-proof seal fitting |
| K | 3 explosion-proof seal fittings |

**For approval code Y (ATEX Intrinsically Safe sensor outputs)**

| Code | Conduit connections |
|---|---|
| A | No fittings or glands |
| B | 1 gland; nickel-plated brass |
| Q | 1 gland; stainless steel |
| C | 3 glands; nickel-plated brass |
| W | 3 glands; stainless steel |

**For approval code W (ATEX)**

| Code | Conduit connections |
|---|---|
| A | No fittings or glands |
| D | 1 gland; nickel-plated brass |
| E | 1 gland; stainless steel |
| F | 3 glands; nickel-plated brass |
| G | 3 glands; stainless steel |

**For approval code S and T (TIIS)**

| Code | Conduit connections |
|---|---|
| Y | Japan -- 3 glands, ¾-in NPT stainless steel |

**For approval code J (hardware ready for TIIS approval)**

| Code | Conduit connections |
|---|---|
| A | No fittings or glands |

## Language

| Code | Languages |
|---|---|
| E | English installation manual and English guide to filling |
| F | French installation manual; English configuration manual |
| G | German installation manual; English configuration manual |
| I | Italian CE requirements document; English installation and configuration manual |
| J | Japanese installation manual; English configuration manual |
| M | Chinese installation manual; English configuration manual |
| P | Portuguese CE requirements document; English installation and configuration manual |
| S | Spanish installation manual; English configuration manual |

## Software options 1

| Code | Software options 1 |
|---|---|
| Z | Flow and density variables (standard) |
| G | Concentration measurement |
| A | Petroleum measurement |
| X(1) | Engineered to order (ETO) software option 1 |

(1) *Available only with factory option X.*

## Software options 2

| Code | Software options 2 |
|---|---|
| Z | No software options 2 |
| X(1) | ETO software option 1 |

(1) *Available only with factory option X.*

## Factory options

| Code | Factory options |
|---|---|
| Z | Standard product |
| X | ETO product |
| R | Restocked product (if available) |

## Add on options (optional)

| Code | Add on options (optional) |
|---|---|
| PK | 2 in pipe mount U-Bolt kit for electronics |

# Ordering information: Micro Motion 9739 MVD electronics retrofit kit

| Model | Product description |
|---|---|
| RETRO9739BLNDN | Retrofit kit, 9739 MVD without display (non-ATEX) |
| RETRO9739BLNDNA | Retrofit kit, 9739 MVD without display (non-ATEX) with Petroleum Measurement |
| RETRO9739BLNDNG | Retrofit kit, 9739 MVD without display (non-ATEX) with Concentration Measurement |
| RETRO9739BLNDW | Retrofit kit, 9739 MVD without display (ATEX flameproof) |
| RETRO9739BLNDWA | Retrofit kit, 9739 MVD without display (ATEX flameproof) with Petroleum Measurement |
| RETRO9739BLNDWG | Retrofit kit, 9739 MVD without display (ATEX flameproof) with Concentration Measurement |
| RETRO9739BLNDY | Retrofit kit, 9739 MVD without display (ATEX safe area) |
| RETRO9739BLNDYA | Retrofit kit, 9739 MVD without display (ATEX safe area) with Petroleum Measurement |
| RETRO9739BLNDYG | Retrofit kit, 9739 MVD without display (ATEX safe area) with Concentration Measurement |
| RETRO9739DISPN | Retrofit kit, 9739 MVD with display (non-ATEX) |
| RETRO9739DISPNA | Retrofit kit, 9739 MVD with display (non-ATEX) with Petroleum Measurement |
| RETRO9739DISPNG | Retrofit kit, 9739 MVD with display (non-ATEX) with Concentration Measurement |
| RETRO9739DISPY | Retrofit kit, 9739 MVD with display (ATEX safe area) |
| RETRO9739DISPYA | Retrofit kit, 9739 MVD with display (ATEX safe area) with Petroleum Measurement |
| RETRO9739DISPYG | Retrofit kit, 9739 MVD with display (ATEX safe area) with Concentration Measurement |

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For more information: **www.emerson.com**



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