Product Data Sheet
PS-00838, Rev. D
July 2015

Micro Motion® MVD™ Direct Connect™ Coriolis Meters with MVD™ Technology

The Micro Motion® MVD™ Direct Connect™ solution combines the accuracy, reliability, and performance of Micro Motion Coriolis meters with the simplicity of a direct Modbus® interface. The MVD Direct Connect I.S. barrier option enables installation of the meter into hazardous areas and provides the same power conditioning benefits that a transmitter offers.

- Unique MVD Direct Connect architecture simplifies installation and reduces cost and complexity through direct integration into a Modbus host
- Complete solution provides access to all Micro Motion process variables, embedded diagnostics, and full sensor configuration
- Optional compact DIN rail barrier allows hazardous-area installation and provides power conditioning

ELITE	F-Series	H-Series	T-Series	R-Series	LF-Series
Peak performance	Exceptional performance compact drainable	Hygienic compact drainable	Straight tube full bore	General purpose flow and density	Extreme low flow

Micro Motion®

EMERSON™
Process Management

Micro Motion® MVD™ Direct Connect™ Coriolis Meters with MVD™ Technology

Micro Motion Coriolis meters from Emerson Process Management meet a vast range of application needs, ranging from extreme low-flow up to high-flow, high-capacity lines. Cryogenic, hygienic, high-temperature, and high-pressure — Micro Motion meters can handle them all. Micro Motion meters are available with a variety of wetted parts to ensure the best material compatibility

MVD technology makes your Micro Motion meter work smarter

- Front end signal processing gives faster response time and dramatically reduces signal noise
- Provides reduced wiring costs through use of standard 4-wire instrument cable
- On-board signal processing results in the cleanest, most accurate signal delivered, even with tough measurement conditions such as entrained gas

Micro Motion MVD Direct Connect Coriolis meters

The unique architecture of Micro Motion MVD technology lowers the power requirements and distributes safe DC power to the sensor, dramatically lowering installed costs compared to traditional analog meters. The MVD Direct Connect I.S. barrier conditions the power and provides intrinsically safe DC power and Modbus communications to the sensor in the field.

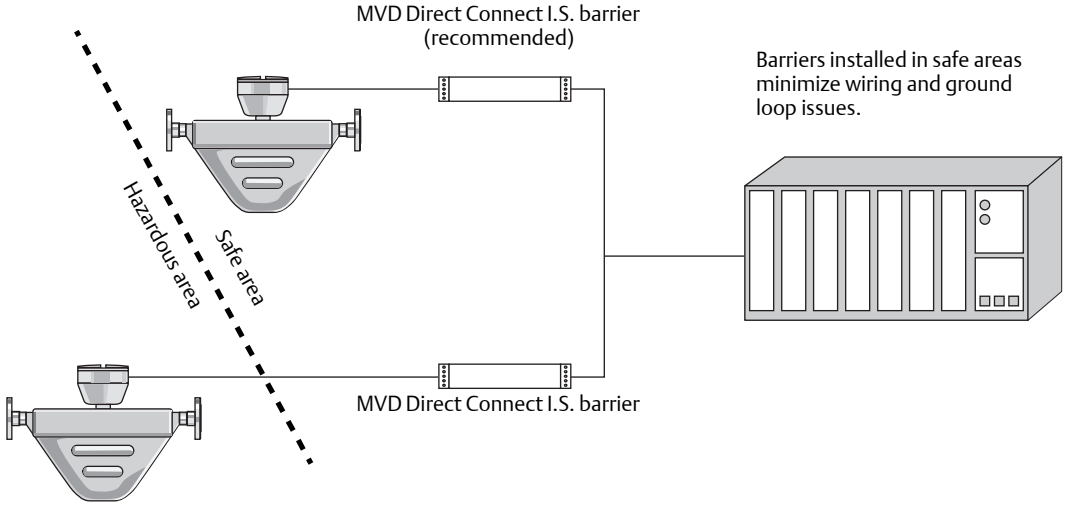
In a typical Micro Motion MVD meter, the core processor performs the Coriolis signal processing functions. The transmitter then transduces the digital data to traditional analog or frequency outputs for use by the control system. Without the transmitter, you still have all the sensor and flow rate data, plus management controls such as events, two-phase flow limits, and totalizers — accessible via Modbus communications.

Micro Motion MVD Direct Connect meters are the ideal solution for systems integrators and OEMs looking for the most efficient and cost-effective way to provide MVD technology to their customers for a variety of fluids including toothpaste, vegetable oils, vinegar, ketchup, mayonnaise, and additives, in applications like:

- Material blending skids
- Juice blending
- CNG dispensers
- Remote flow monitoring

Table of Contents

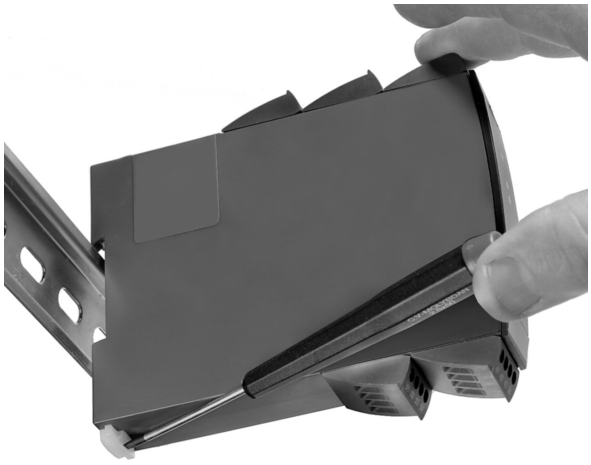
MVD Direct Connect architecture



Easy on space

MVD Direct Connect architecture eliminates transmitters, interface cards, wiring, and cabinet space.

The MVD Direct Connect barrier snaps onto a 35 mm DIN rail, and measures less than 5 x 5 x 1 inches (105 x 110 x 25 mm).



Easy on cabling

Use 4-wire cable between the core processor and the barrier, and use standard RS-485 cable between the barrier and the host.

Easy on installation

Streamlined installation procedures make it easy to put your Micro Motion meter in your pipeline and integrate it with your control system.

Micro Motion meters and the MVD Direct Connect solution

Micro Motion leads the industry with the widest selection of meter types and sizes available. Match the meter to your requirements: sanitary, improved surface finish, hazardous area, high temperature, secondary containment, explosion-proof, and more.

MVD Direct solutions can be installed with any Micro Motion meter that accepts an integral core processor.

For meters that cannot accept an integral core processor, the MVD Direct Connect solution can be installed with a remote core processor, as long as hazardous area approvals are not required.

Micro Motion is continually expanding its meter line. For information on a specific meter, consult the meter product data sheet or contact Micro Motion.

Modbus communications and MVD Direct Connect

ProLink® III software

For configuration, management, and viewing process variables, Micro Motion offers ProLink® III, a Windows-based software program.

ProLink III automatically recognizes the meter it is connected to, retrieves process data, reports status and alarms, and provides data logging and meter fingerprinting capabilities.

ProLink III provides full support for MVD Direct Connect installations with or without the barrier.

Custom software

Your custom process management software can perform the same functions and then translate process data into process control. Using industry-standard Modbus protocol, you can read flow rates and totals, start and stop batches, and respond to process fluctuations and error conditions.

Micro Motion has published its Modbus interface, providing complete access to meter functionality.

Specifications

MVD Direct Connect I.S. Barrier

Electrical	**Supply voltage**	24 VDC±20%
	Maximum consumption	3.5 W
	Protection	Polarity
	Isolation test voltage	Supply to safe side: 500 VAC
		I.S to supply/safe side: 3750 VAC
	Sensor supply voltage	15.3 V nominal
	Sensor current limit	145 mA nominal
Communications	**LEDs**	Power
		RS-485
	Baud half-duplex	1200 to 38,400
	Protocol	TIA/EIA-485 (RS-485)
Physical	**Dimensions (H x W x D)**	4.29" x 0.93" x 4.10" (109 x 23.5 x 104 mm)
	Weight	0.34 lb (152 g)
	Ingress protection enclosure	IP50
	Ingress protection terminals	IP20
	Screw terminal torsion	0.5 N-m
Environmental	**Temperature**	–40 to +140 °F (–40 to +60 °C)
	Relative humidity	< 95% (non-condensing)
	EMC Effects	Complies with EMC directive 2004/108/EC based on EN-61326 Industrial
		Complies with NAMUR NE-21 (09.05.2012)

Meter system

Cable	Cable type	Wire size	Max length
Core processor to host or barrier Micro Motion recommends using Micro Motion 4-wire cable	Signal wire (RS-485)	22 AWG (0.35 mm^2) or larger	5000 ft (150 meters)
	Power wire – must be sized to provide a minimum of 15 V at the core processor. See the installation manual for details	22 AWG (0.35 mm^2) 20 AWG (0.35 mm^2) 28 AWG (0.35 mm^2)	300 feet (90 meters) 500 feet (150 meters) 500 feet (150 meters)
Barrier to host	Signal wire (RS-485)	22 to 18 AWG (0.35 to 0.8 mm^2)	1000 feet (300 meters)
Barrier to power supply	Power wire	As required	1000 feet (300 meters)
Communications	Autodetects incoming signal and switches to match		
	Protocol	Modbus RTU (8-bit) Modbus ASCII (7-bit)	
	Baud	1200 to 38,400	
	Parity	Even, odd, none	
	Stop bits	1, 2	
Physical	See product data sheet for selected sensor		
Environmental	See product data sheet for selected sensor		

Hazardous area classifications

ATEX

BVS 11 ATEX E 039 X

II (2) G [Ex ib Gb] IIC (Device must be installed in a safe area, but has an intrinsic safe output to a sensor that is installed in Zone 1).

II 3 (2) G Ex nA [ib Gb] IIC T4 Gc (For installation in areas where category 3G equipment is required, the module must be mounted in an enclosure in accordance with EN 60079-15).

IECEx

IECEx BVS 07.0024 X

[Ex ib Gb] IIC (Device must be installed in a safe area, but has an intrinsic safe output to a sensor that is installed in Zone 1).

Ex nA [ib Gb] IIC T4 Gc (For installation in Zone 2, the module must be mounted in an enclosure in accordance with IEC 60079-15).

CSA

Suitable for installation in:	Class I, Division 2, Groups A, B, C, D
Providing intrisically safe outputs for:	Class I, Division 1, Groups C, D and Class II, Division 1, Groups E, F, G

UL

Suitable for installation in:	Class I, Division 2, Groups A, B, C, D
Providing intrisically safe outputs for:	Class I, Division 1, Groups C, D and Class II, Division 1, Groups E, F, G

NEPSI

GYJ12.1554	[Ex ib Gb] IIC
GYJ12.1555U	Ex nA [ib Gb] IIC T4 Gc

The MVD Direct Connect I.S. barrier must be installed in IP 54 (GB4208-1993) housing to be used in a hazardous location. The housing should observe the requirements of GB3836.1-2010 and GB3836.4-2010.

Provisions shall be made to prevent the rated voltage being exceeded by transient disturbances of more than 40%.

End users are not permitted to change any components inside. For installation, use, and maintenance of the MVD Direct Connect I.S. barrier, observe the instruction manual and the following standards:

- GB3836.13-1997 “Electrical apparatus for explosive gas atmospheres. Part 13: Repair and overhaul for apparatus used in explosive gas atmospheres”
- GB3836.15-2000 “Electrical apparatus for explosive gas atmospheres. Part 15: Electrical installations in hazardous area (other than mines)”
- GB3836.16-2006 “Electrical apparatus for explosive gas atmospheres. Part 16: Inspection and maintenance of electrical installation (other than mines)”
- GB50257-1996 “Code for construction and acceptance of electric device for explosion atmospheres and fire hazardelectrical equipment installation engineering”

Ordering Information

To order an MVD Direct Connect meter, specify the appropriate "direct host connection" electronics interface (code W, D, Y, E, 6, 7, 8, or 9) when ordering the sensor.

To order the MVD Direct Connect I.S. barrier with the meter, specify electronics interface code W, D, Y, E, 6, 7, 8, or 9, in combination with approval code U, C, A, Z, I, P, 6, 7, 8, 2, or G.

Example model number: CMF050M313NWBAEZZZ

Base model, process connection, case options

Refer to the sensor PDS.

Electronics interface

Code	MVD Direct Connect electronics interface options
W	Polyurethane-painted aluminum integral core processor for MVD Direct Connect installation
D	Stainless steel integral core processor for MVD Direct Connect installation
Y	Extended-mount polyurethane-painted aluminum integral core processor for MVD Direct Connect installation
E	Extended-mount stainless steel integral core processor for MVD Direct Connect installation
6(1)	Polyurethane-painted aluminum integral enhanced core processor for MVD Direct Connect installation
7(1)	Stainless steel integral enhanced core processor for MVD Direct Connect installation
8(1)	Extended-mount polyurethane-painted aluminum integral enhanced core processor for MVD Direct Connect installation
9(1)	Extended-mount stainless steel integral enhanced core processor for MVD Direct Connect installation

(1) Available only with sensors that are equipped with an enhanced core processor.

Approvals

Code	MVD Direct Connect approval options
U(1)	UL
C	CSA (Canada only)
A	CSA C-US (U.S.A. and Canada)
Z	ATEX
I(1)	IECEx Zone 1
P(1)	NEPSI (Only available in China)
6	ATEX - Equipment Category 2 (Zone 1 - IIC modified) / PED compliant - 260
7	IECEx Zone 1 IIC modified
8	NEPSI IIC modified
2	CSA (US and Canada): Class I, Division 2, Groups A,B,C,D
G	Country Specific Approval – Requires a selection from the Approvals section of the 'Certificate, Tests, Calibrations and Services' model code option

(1) Available only for certain product configurations. Consult factory for detailed information.

Measurement application software

Code	MVD Direct Connect measurement application software options
A(1)	Petroleum measurement software
Z	No measurement application software

(1) Available only with CMF, F-Series, and T-Series sensors.

Country specific approvals

Select one from the following if approval code G is selected.

Code	Factory option
R1	EAC Zone 1 – Hazardous Area Approval
R2	EAC Zone 1 - IIC modified - Hazardous Area Approval
R3	EAC Zone 2 – Hazardous Area Approval
B1	INMETRO Zone 1 - Hazardous Area Approval
B2	INMETRO Zone 1 - IIC modified - Hazardous Area Approval
B3	INMETRO Zone 2 – Hazardous Area Approval

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