

## Product Data Sheet

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# Micro Motion® Model CNG050 Compressed Natural Gas Flowmeters

Micro Motion® Model CNG050 meters are specifically designed for the CNG industry to meet the challenges of measuring compressed natural gas. The meter's increased rangeability allows customers the flexibility to use the sensor for automobile or light- or heavy-duty vehicle dispenser designs.



### Global industry standard for compressed natural gas metering

- A single-meter solution specifically designed for use in both light and heavy duty vehicle dispensers
- AGA 11-approved for the fiscal transfer of CNG
- Micro Motion MVD™ Direct Connect™ technology for transmitter-less integration into dispenser head electronics
- Variety of transmitter options provide multi-variable outputs to accommodate any dispenser design requirements
- Compact design with no moving parts, no special mounting or flow conditioning required



# Micro Motion Model CNG050 flowmeters

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The Model CNG050 meter pairs Micro Motion MVD technology with measurement engineering specifically designed to address the needs of compressed natural gas metering.

**Coriolis meters.** Coriolis meters offer dramatic benefits over traditional volumetric measurement technologies. Coriolis meters:

- Deliver accurate and repeatable process data over a wide range of flow rates and process conditions.
- Provide direct inline measurement of mass flow and density, and also measure volume flow and temperature—all from a single device.
- Have no moving parts, so maintenance costs are minimal.
- Have no requirements for flow conditioning or straight pipe runs, so installation is simplified and less expensive.
- Provide advanced diagnostic tools for both the meter and the process.

**Model CNG050 meters.** The CNG050 meter was specifically designed for the CNG industry to meet the challenges of measuring compressed natural gas. The meter's increased rangeability allows customers the flexibility to use the sensor for automobile or light- or heavy-duty vehicle dispenser designs.

Micro Motion CNG050 meters feature integral transmitters, making them easy to install. Offered with Series 1000 and 2000 transmitters with MVD technology, customers can choose either single or multivariable output configurations with milliamp, pulse, dual pulse, digital outputs, and an integral display.

Micro Motion MVD™ Direct Connect™ technology is making Coriolis flowmeters from Micro Motion even more suitable for CNG applications. OEMs can benefit from MVD Direct Connect technology, which allows smart sensors to communicate directly with dispenser head electronics via Modbus—no transmitter is required!

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## Contents

Accuracy and repeatability . . . . .	3
Flow range and zero stability . . . . .	3
Pressure ratings . . . . .	4
Environmental limits . . . . .	4
Weight . . . . .	4
Hazardous area classifications . . . . .	5
Dimensions . . . . .	6
Materials of construction . . . . .	7
Fitting options . . . . .	7
Ordering information . . . . .	8

## Accuracy and repeatability

Specification	Value
Batch accuracy <sup>(1)(2)</sup>	±0.50% of batch
Repeatability <sup>(1)</sup>	±0.25% of rate

(1) In terms of percent of total batch delivered on CNG.

(2) Accuracy is under typical CNG batch/dispensing conditions. Typical batch/dispensing conditions are defined as those where the flow rate is greater than 4 lbs/min (109 kg/hr).

## Flow range and zero stability

Specification	Mass		Standard volume <sup>(1)</sup>	
	lb/min	kg/min	SCFM	Nm <sup>3</sup> /hr
Flow range	2 to 220	1 to 100	40 to 4444	68 to 7550
Zero stability	0.02	0.009	18	8

(1) CNG with SG = 0.66 at 60 °F (15.5 °C) and 14.73 psia (1 bar-a).

## Weights and measures approvals

Country	Approval
U.S.A.	NTEP
Germany	PTB
Netherlands	NMI
China	Pattern approval
Malaysia	SIRIM
India	Ministry of Consumer Affairs
Italy	Ufficio Metrico Italiano
Brazil	Inmetro

## Vehicle filling

Because of its clean combustion, CNG is increasingly used as a vehicle fuel in many parts of the world. Micro Motion CNG050 meters used in dispenser stations are routinely verified (proved) against a gravimetric standard, the highest performance rating possible. In addition, the CNG050 meter can be used as a Master Meter standard, thus providing increased safety and eliminating cumbersome scale setup and venting of gas.

## Weights and measures configuration lockout

For applications that require weights and measures approval for legal trade (i.e., public CNG stations), the weights and measures configuration lockout software option for Model 2500 and 2700 transmitters should be ordered with the CNG050 sensor. The configuration lockout software option allows the transmitter to be changed from operating (secure) mode to configuration mode (and back again) using ProLink® II software. The transmitter will register flow only when in the operating (secure) mode. The transmitter will allow configuration changes and zeroing of the meter only when in configuration mode.

When the configuration lockout option is ordered, a means is provided for physically sealing the transmitter housing.

The configuration lockout software option may not be required by certain world area weights and measures authorities. The performance of the CNG050 sensor is not affected by configuration lockout, and the sensor meets batch and accuracy specifications with standard features.

# Pressure ratings

The sensor complies with council directive 97/23/EC of 29 May 1997 on Pressure Equipment. The housing of Model CNG050 sensors is not rated for pressure containment. There is no pressure derating for Model CNG050 sensors due to process temperature.

Component	Rating	
	psi	bar
Flow tube	5000	345
Combined sensor and process fitting <sup>(1)</sup>	5000	345
Union to NPT adapter piece <sup>(2)</sup>	4600	317

(1) All fittings are rated to 5000 psi (345 bar)—the Union SWG type fitting according to ASME B31.3, and the SAE fitting according to SAE J1453.

(2) Pressure rating of the additional adapter piece (#12 O-ring face seal to female NPT) that is provided with process connection option 239.

# Environmental limits



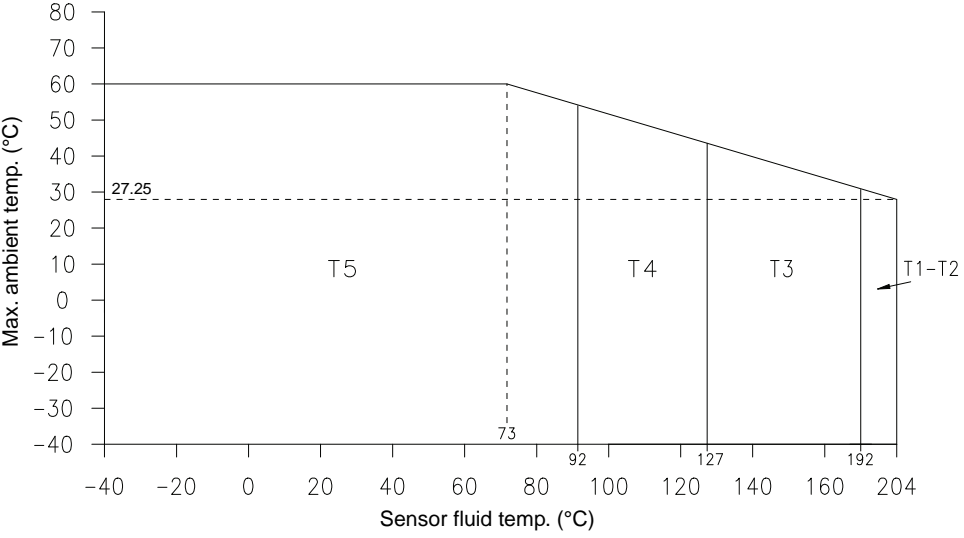
Environmental factor	Limit
Process fluid temperature	−40 to +257 °F (−40 to +125 °C)
Ambient temperature <sup>(1)</sup>	−40 to +140 °F (−40 to +60 °C)
Humidity	5 to 95% relative humidity, non-condensing at 140 °F (60 °C)
Vibration	Meets IEC 68.2.6, endurance sweep, 5 to 2000 Hz, 50 sweep cycles at 1.0 g

(1) Temperature limits may be further restricted by hazardous area approvals. See page 5.

# Weight

Electronics option	Weight	
	lb	kg
Sensor with core processor	16	7
Sensor with integral transmitter	18	8

# Hazardous area classifications

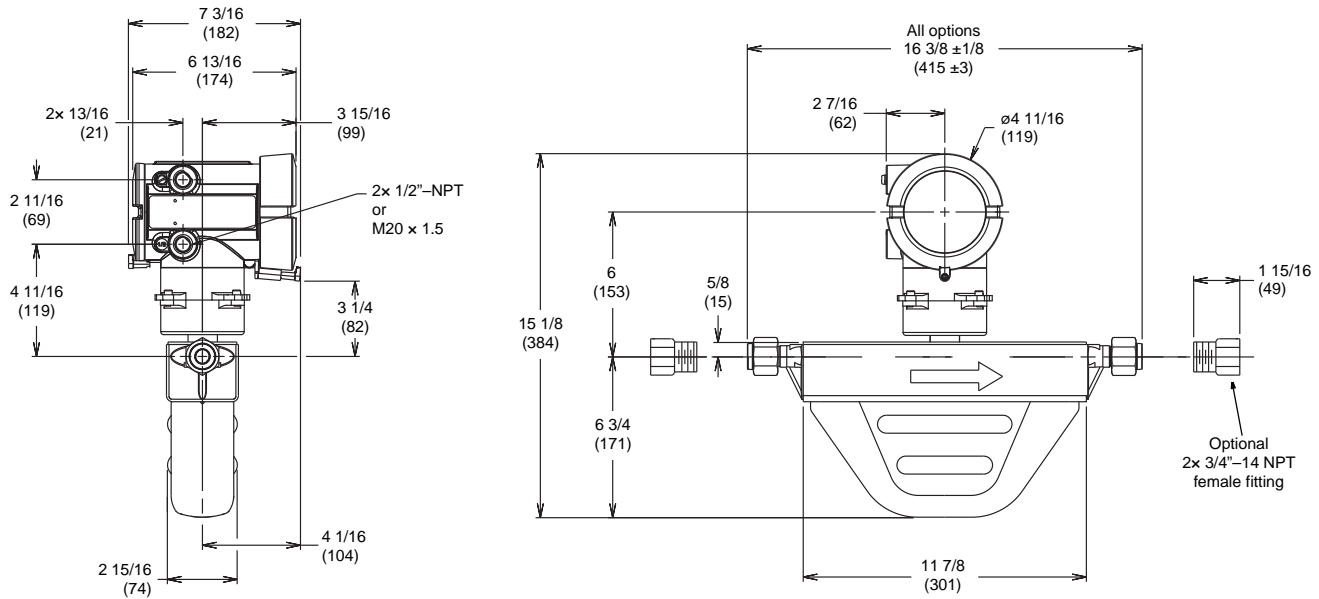
Agency	Approval
CSA	Class I, Div. 1, Groups C and D Class I, Div. 2, Groups A, B, C, and D Class II, Div. 1, Groups E, F, and G
IECEX and NEPSI	Ex ib IIC T1–T5
ATEX	<p data-bbox="578 382 1068 445">  0575  II 2 G Ex ib IIC T1–T5                      II 2 D Ex ib IIIC T<sup>(1)</sup> °C Db IP65                 </p>  <p data-bbox="571 1037 1513 1094">                         Note 1: The maximum surface temperature for dust is as follows: T5:T 95°C, T4:T 130°C, T3:T 195°C, T2 to T1:T 207°C.                     </p>

(1) For dust temperature rating, see temperature graph.

# Dimensions

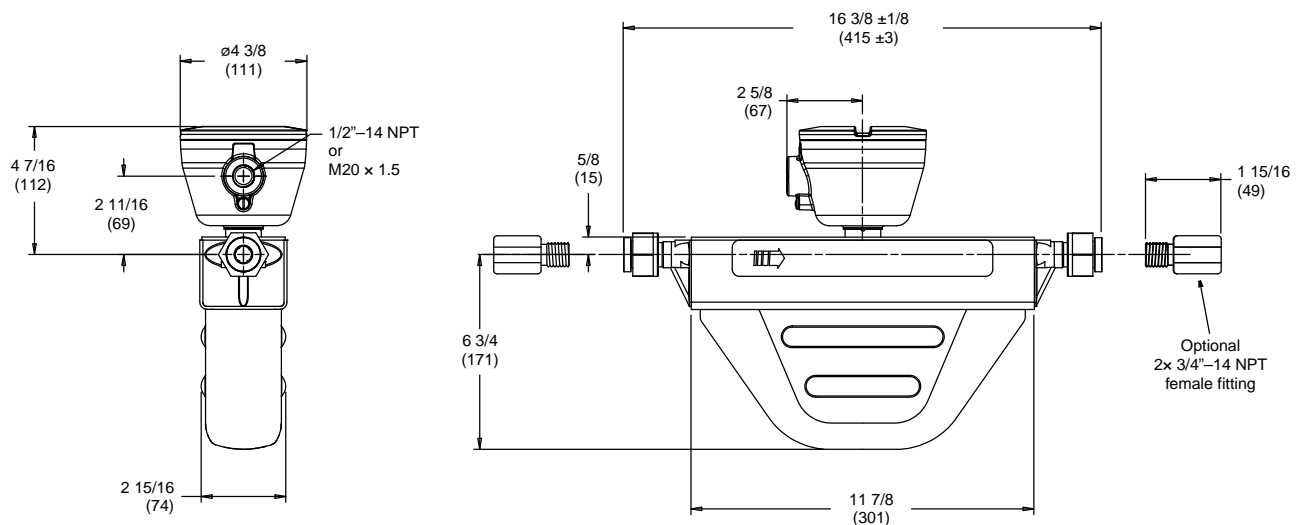
## CNG050 sensor with integrally mounted Model 1700/2700 transmitter

Dimensions in inches  
(mm)



## CNG050 sensor with core processor

Dimensions in inches  
(mm)



# Materials of construction

Component	Material
Wetted parts <sup>(1)</sup>	316L stainless steel
Sensor housing	304L stainless steel
Core processor housing	CF-3M stainless steel or polyurethane-painted aluminum; NEMA 4X (IP66)

(1) General corrosion guidelines do not account for cyclical stress, and therefore should not be relied upon when choosing a wetted material for your Micro Motion flowmeter. Please refer to Micro Motion's corrosion guide for material compatibility information.

# Fitting options

Description	Fitting code <sup>(1)</sup>	Dim. A face-to-face		Dim. B outside diam.	
		in	mm	in	mm
3/4-inch NPT female Swagelok size 12 VCO fitting	239 <sup>(2)</sup>	16 3/8 <sup>(3)</sup>	415	—	—
Swagelok compatible size 12 VCO union fitting	290 <sup>(4)</sup>	16 3/8	415	—	—
Union size 12 SAE fitting (universal thread)	291 <sup>(4)</sup>	16 3/8	415	—	—

(1) Fittings listed here are standard options. Other types of fittings are available. Contact your local Micro Motion representative.

(2) 3/4-inch NPT female adapter to O-ring face seal adapter rated to 4600 psi (317 bar).

(3) Dimension specified in table does NOT include fitting length. For installation, modify Dim. A value to include fitting. See page 6.

(4) Ready for face seal O-ring (not included).

# Ordering information

Model	Product description
CNG050S	Micro Motion Coriolis CNG-Series sensor; 1/2-inch; 316L stainless steel
Code	Process connections
###	See fitting options on page 7
Code	Case options
N	Standard
Code	Electronics interface
Q	4-wire polyurethane-painted aluminum integral core processor for remote mount transmitters
A	4-wire stainless steel integral core processor for remote mount transmitters
C	For integrally mounted 1700/2700 transmitter
W <sup>(1)</sup>	Polyurethane-painted aluminum integral core processor for MVD Direct Connect installation
D <sup>(1)</sup>	Stainless steel integral core processor for MVD Direct Connect installation
Code	Conduit connections
	<b>Electronics interface codes Q, A, W and D</b>
B	1/2-inch NPT — no gland
E	M20 — no gland
F	Brass/nickel cable gland (cable diameter 0.335 to 0.394 inches [8.5 to 10.0 mm])
G	Stainless steel cable gland (cable diameter 0.335 to 0.394 inches [8.5 to 10.0 mm])
	<b>Electronics interface code C (Integrally mounted 1700/2700)</b>
A	No gland
Code	Approvals <sup>(1)</sup>
M	Micro Motion Standard (no approval)
N	Micro Motion Standard / PED compliant
C	CSA (Canada only)
A	CSA C-US (U.S.A. and Canada)
Z	ATEX — Equipment Category 2 (Zone 1) / PED compliant
I	IECEX — Zone 1
P <sup>(2)</sup>	NEPSI
Continued on next page	

(1) When electronics interface W or D is ordered with approval codes C, A, Z, I, or P, an MVD Direct Connect I.S. barrier is supplied. No barrier is supplied when ordered with approval codes M or N.

(2) Available only with language code M (Chinese).



## Ordering information *continued*

<b>Code</b>	<b>Language</b>
A	Danish CE requirements and English installation manual
D	Dutch CE requirements and English installation manual
E	English installation manual
F	French installation manual
G	German installation manual
H	Finnish CE requirements and English installation manual
I	Italian installation manual
J	Japanese installation manual
M	Chinese installation manual
N	Norwegian CE requirements and English installation manual
O	Polish installation manual
P	Portuguese installation manual
S	Spanish installation manual
W	Swedish CE requirements and English installation manual
C	Czech CE requirements and English installation manual
B	Hungarian CE requirements and English installation manual
K	Slovak CE requirements and English installation manual
T	Estonian CE requirements and English installation manual
U	Greek CE requirements and English installation manual
L	Latvian CE requirements and English installation manual
V	Lithuanian CE requirements and English installation manual
Y	Slovenian CE requirements and English installation manual
<b>Code</b>	<b>Future Option 1</b>
Z	Reserved for future use
<b>Code</b>	<b>Future Option 2</b>
Z	Reserved for future use
<b>Code</b>	<b>Factory Options</b>
Z	Standard product
X	ETO product
<b>Typical Model Number: CNG050S 290 N C A A E Z Z Z</b>	





# Micro Motion—The undisputed leader in flow and density measurement



World-leading Micro Motion measurement solutions from Emerson Process Management deliver what you need most:

## Technology leadership

Micro Motion introduced the first reliable Coriolis meter in 1977. Since that time, our ongoing product development has enabled us to provide the highest performing measurement devices available.

## Product breadth

From compact, drainable process control to high flow rate fiscal transfer—look no further than Micro Motion for the widest range of measurement solutions.

## Unparalleled value

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