

Product Data Sheet

PS-00408, Rev. B

October 2004

Micro Motion® CNG050

Compressed Natural Gas Flowmeter

With MVD™ Technology



Micro Motion® CNG050 flowmeters

The first full-range CNG flowmeter designed and tested specifically for compressed natural gas, resulting in better performance in CNG applications.

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!



Like all Micro Motion flowmeters, CNG050 meters offer highly accurate direct mass and volume flow measurement.

Micro Motion CNG050 meters are designed to perform in even the most harsh operating environments, and carry hazardous area approvals for the U.S.A., Canada, and Europe.

Easy to use

CNG050 meters have no moving parts, no need for periodic recalibration, non-intrusive design, and no regular maintenance requirements.

Wide rangeability

The CNG050 meter is used for both car and bus dispenser designs alike. With a 1–100 kg/min flow range, the CNG050 is truly a one-size-fits-all CNG flowmeter.

CNG station reconciliation

The AGA 11 guidelines recently published by the American Gas Association allow for the use of Coriolis meters like the Micro Motion CNG050 in the custody transfer of natural gas. Combining a low pressure check meter (such as a Micro Motion ELITE® or F-Series sensor) on the natural gas inlet with a CNG050 dispensing meter allows for true mass balancing of CNG stations.

MVD™ technology



Reduced fill times

Having a higher flow rate capacity means that vehicles can get back on the road faster than ever.

Proven technology

Micro Motion is known worldwide for increasing plant efficiency, production, and profitability. More than 400,000 Micro Motion meters are installed in applications worldwide, including 15,000 CNG applications.

Greater accuracy and versatility

Micro Motion CNG050 meters have a CNG accuracy of 0.5% of delivered batch over a flow range of 2 to 220 lbs/min (1 to 100 kg/min). This translates to reduced dispenser losses and is approved worldwide by weights and measures authorities.

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
Canada	Measurement Canada (pending)
Brazil	Inmetro (pending)

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.

Micro Motion CNG050 flowmeters *continued*

Software functionality

The CNG050 sensor can be used with Micro Motion transmitter with MVD Technology. The standard software option of the Series 1000 or 2000 is most common.

A Micro Motion MVD Direct Connect pass-through I.S. barrier can also be used in public stations if it is installed in a separate, sealable housing.

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.

Flow specifications

	Mass		Standard volume ⁽¹⁾	
	lb/min	kg/min	SCFM	Nm ³ /hr
Flow range	2 to 220	1 to 100	40 to 4444	68 to 7550
Batch accuracy⁽²⁾⁽³⁾	±0.50% of batch			
Repeatability⁽²⁾	±0.30% of rate			
	lb/min	kg/min		
Zero stability	0.02	0.009		

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

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

(3) 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).

Pressure ratings

	psi	bar
Flow tube rating	5000	345
Pressure limits⁽¹⁾	5000	345
Union to NPT adapter piece rating⁽²⁾	4600	317
Housing rating	Housing is not rated for pressure containment.	
PED compliance	Sensor complies with council directive 97/23/EC of 29 May 1997 on Pressure Equipment	

(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

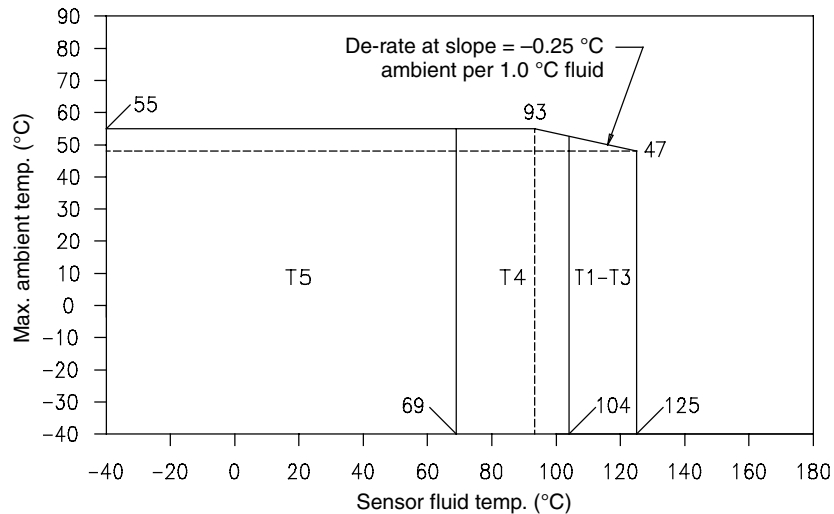
		°F	°C
Process fluid temperature limits		-40 to +257	-40 to +125
Ambient temperature limits	CSA and MMI standard (no approval)	-40 to +140	-40 to +60
	ATEX	Refer to the graph below.	
Humidity limits	5 to 95% relative humidity, non-condensing at 140 °F (60 °C)		
Vibration limits	Meets IEC 68.2.6, endurance sweep, 5 to 2000 Hz, 50 sweep cycles at 1.0 g		

Hazardous area classifications

CSA is a Canadian approvals agency that provides approvals accepted both in the U.S.A (C-US) and in Canada. ATEX is a European directive.

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

ATEX EEx ib IIC T1–T5⁽¹⁾
 Allowable CNG050 sensor temperature rating with core processor or integrally mounted transmitter



(1) The "T" rating is defined as the maximum surface temperature of the flowmeter. The "T" rating of the hazardous area, and ambient temperatures above 47 °C, restrict the allowable temperature of the process fluid as shown in the graph above.

Materials of construction

Wetted parts⁽¹⁾	316L stainless steel
Sensor housing	304L stainless steel
Core processor housing	CF-3M stainless steel or epoxy-painted aluminum; NEMA 4X (IP65)

(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.*

Weight

Sensor with core processor	16 lbs (7 kg)
Sensor with integrally mounted transmitter	18 lbs (8 kg)

Ordering information

Model	Product Description
CNG050S	Micro Motion Coriolis CNG-Series sensor; 1/2-inch; 316L stainless steel
Code	Process Connections
239 ⁽¹⁾	3/4-inch NPT-female adapter; CAJON compatible size 12 VCO union fitting
290 ⁽²⁾	CAJON compatible size 12 VCO union fitting
291 ⁽²⁾	Union size 12 SAE fitting (universal thread)
Code	Case Options
N	Standard
Code	Electronics Interface
Q	4-wire epoxy-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 ⁽³⁾	Epoxy-painted aluminum integral core processor for MVD Direct Connect installation
D ⁽³⁾	Stainless steel integral core processor for MVD Direct Connect installation
Code	Conduit Connections
	Electronics Interface Codes Q, A, W and D
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])
	Electronics interface Code C (Integrally mounted 1700/2700)
A	No gland
Code	Approvals ⁽³⁾
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
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(1) 3/4-inch NPT female adapter to O-ring face seal adapter rated to 4600 psi (317 bar).

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

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

Ordering information *continued*

Code	Language
A	Danish Quick Reference Guide and English Manual
D	Dutch Quick Reference Guide and English Manual
E	English Quick Reference Guide and English Manual
F	French Quick Reference Guide and French Manual
G	German Quick Reference Guide and German Manual
H	Finnish Quick Reference Guide and English Manual
I	Italian Quick Reference Guide and English Manual
J	Japanese Quick Reference Guide and English Manual
N	Norwegian Quick Reference Guide and English Manual
O	Polish Quick Reference Guide and English Manual
P	Portuguese Quick Reference Guide and English Manual
S	Spanish Quick Reference Guide and Spanish Manual
W	Swedish Quick Reference Guide and English Manual
Code	Future Option 1
Z	Reserved for future use
Code	Future Option 2
Z	Reserved for future use
Code	Factory Options
Z	Standard product
R	Restocked product (if available)
Typical Model Number: CNG050S 290 N C A A E Z Z Z	

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