Product Data Sheet PS-00385 June 2001

Now available with MVD[™] Technology!

F-Series Mass and Volume Flowmeters







Micro Motion F-Series Meters

Micro Motion F-Series flowmeters offer all the benefits of Coriolis technology in applications where you need multi-variable capabilities, but you do not need the highest precision.

The four sizes of Micro Motion F-Series meters offer direct mass and volumetric flow, temperature, and density of liquids, gases, and slurries, without the need for additional equipment, manual calculations, or estimations.

Outstanding performance

Micro Motion F-Series flowmeters offer good accuracy over wide flow ranges and under varying fluid conditions. In fact, Micro Motion F-Series meters perform better than any volumetric meter, and give you multi-variable capabilities.

Micro Motion F-Series meters have no moving parts, and no special mounting or flow conditioning requirements. They feature a wide variety of process connection options to fit virtually any application, and like all our flowmeters, Micro Motion F-Series meters are easy to install and require no maintenance.

Choose any transmitter

You can use any of our transmitters to complement your Micro Motion F-Series meter. Choose models that can be installed integrally or remotely, in the control room or in the same hazardous area as the sensor. F-Series meters are able to communicate using the FOUNDATION[™] fieldbus, Profibus PA, Modbus[®], or HART[®] protocols.

Micro Motion is known worldwide for increasing plant efficiency, production, and profitability. More than 300,000 Micro Motion meters are installed and working in processes just like yours. Contact us, and discover why you should use Micro Motion F-Series flowmeters in your process.

Performance specifications

Liquid flow speci	fications	Mass		Volume	Volume		
Nominal flow range ⁽¹⁾	F025 F050 F100 F200	<i>Ib/min</i> 0 to 40 0 to 125 0 to 500 0 to 1600	kg/h 0 to 1090 0 to 3400 0 to 13,600 0 to 43,550	gal/min 0 to 4.8 0 to 15 0 to 60 0 to 192	<i>I/h</i> 0 to 1090 0 to 3400 0 to 13,600 0 to 43,550		
Maximum flow rate ⁽²⁾	F025 F050 F100 F200	<i>Ib/min</i> 80 250 1000 3200	kg/h 2180 6800 27,200 87,270	gal/min 9.6 30 120 384	<i>l/h</i> 2180 6800 27,200 87,270		
Accuracy ⁽³⁾	Series 1000/2000 transmitters All other transmitters	±0.20% of rate ±0.20% ± [(zet	o stability / flow rate	e) x 100]% of rate			
Repeatability ⁽³⁾	Series 1000/2000 transmitters	±0.10% of rate ⁽⁴⁾					
	All other transmitters	$\pm 0.10\% \pm [\frac{1}{2}$ (zero stability / flow ra		e) x 100]% of rate			
Zero stability	F025 F050 F100 F200	<i>Ib/min</i> 0.0065 0.020 0.080 0.256	kg/h 0.1765 0.544 2.177 6.965	gal/min 0.0008 0.002 0.010 0.031	<i>I/h</i> 0.1765 0.544 2.177 6.965		
Density — liquid	only ⁽⁵⁾						
Accuracy	All models	g/cc ±0.002	kg/m³ ±2.0				
Repeatability	All models	±0.001	±1.0				
Range	All models	0 to 5	0 to 5000				
Temperature ⁽⁵⁾							
Accuracy	All models	±1°C ± 0.5% c	of reading in °C				
Repeatability	All models	±0.2°C					
Range	All models	See Temperat	<i>ure limits</i> , page 5				

reference conditions causes approximately 15 psig (1 bar) of pressure drop for Micro Motion F-Series flowmeters. (2) The maximum flow rate for volume measurement is based on a process fluid density of 1 g/cc. For fluids with density other than

1 g/cc, the maximum volume flow rate equals the maximum mass flow rate divided by the fluid's density.

⁽³⁾Flow accuracy includes the combined effects of repeatability, linearity, and hysteresis. All specifications for liquids are based on reference conditions of water at 68 to 77 °F (20 to 25°C) and 15 to 30 psig (1 to 2 bar), unless otherwise noted.

⁽⁴⁾When flow rate is less than (zero stability/.002), accuracy equals ±[(zero stability/flow rate) x 100]% of rate and repeatability equals ±[½(zero stability/flow rate x 100]% of rate.

⁽⁵⁾With an IFT9701 or Model 1700 transmitter, density and temperature measurement are available only via digital communications.

Performance specifications continued

Gas flow specification	ons	Standard	Volume ⁽¹⁾
Nominal flow range ⁽²⁾	5005	scfm ⁽³⁾	Nm ³ /h ⁽⁴⁾
	F025 F050	0 to190 0 to 605	0 to 330 0 to 1055
	F100	0 to 2385	0 to 4170
	F200	0 to 7775	0 to 13,620
Maximum flow rate		scfm	Nm³/h
	F025	390	663
	F050	1000	1699
	F100	4400	7476
	F200	13,400	22,767
Accuracy ⁽⁵⁾	Series 1000/2000 transmitter	±0.70% of	rate ⁽⁶⁾
	All other transmitters	±0.70% of	rate ± [(zero stability/flow rate) x 100]% of rate
Repeatability ⁽⁵⁾	Series 1000/2000 transmitter	±0.35% of	rate ⁽⁶⁾
	All other transmitters	±0.35% of	rate ± [(zero stability/flow rate) x 100]% of rate
Zero stability		scfm	Nm³/h
	F025	0.0864	0.1753
	F050	0.2660	0.5402
	F100	1.0638	2.1619
	F200	3.4043	6.9166

⁽¹⁾Air density at standard conditions, 14.73 psia (1.016 bara), 60 °F (15.5°C), equals 0.077 lb/ft³ (1.200 kg/m³).

⁽²⁾Micro Motion has adopted the terminology "nominal flow range." The upper limit of this range is the flow rate at which air at 60 °F (15.5°C) and 1000 psig (70 bar) causes approximately 15 psid (1 bar) of pressure drop for Micro Motion F-Series flowmeters.

⁽³⁾Air at 60°F and 1000 psi causes approximately 14.7 psi pressure drop.

⁽⁴⁾Air at 0°C and 70 bar causes approximately 1 bar pressure drop.

⁽⁵⁾Flow accuracy includes the combined effects of repeatability, linearity, and hysteresis. All specifications for liquids are based on air at 60 °F (15.5°C) and 1000 psig (70 bar), unless otherwise noted.

⁽⁶⁾When flow rate is less than (zero stability/.007), accuracy equals ±[(zero stability/flow rate) x 100]% of rate and repeatability equals ±[zero stability/flow rate x 100]% of rate.

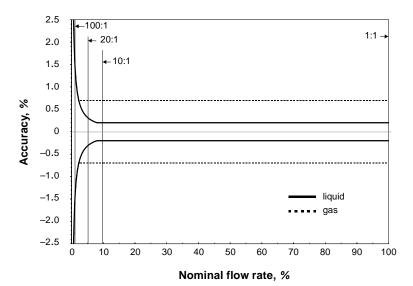
Performance specifications continued

Temperature limit	S					
		Transmitter remotely mounted from sensor	Transmitter integrally mounted to sensor			
Process fluid	All models	–400 to 300°F (–240 to 150°C)	-40 to 257°F (-40 to 125°C)			
Ambient temperature	All models	No ambient temperature limits for sensor	Refer to transmitter specifications			
Process fluid vs. ambient	For sensors with an integrally mounted transmitter, process fluid temperature and ambient temperature restrict each other at their upper limits.					
temperature	CENELEC "		ess fluid and ambient temperature is –40°C. The n depend on the maximum process fluid and			
Pressure						
Flow tube rating ⁽¹⁾	All models	1450 psi 100 bar				
Housing rating	All models	Housing is not rated for pressure cont	ainment.			

⁽¹⁾Over entire temperature range, per ASME B31.3.

Performance specifications continued

Typical accuracy, turndown, and pressure drop with 1700/2700 transmitters



To determine accuracy, turndown, and pressure drop using your process variables, use the Micro Motion flowmeter selection guide. Download a free copy from our Web site at **www.micromotion.com**, or contact your local Micro Motion representative.

Turndown	100:1	20:1	10:1	1:1
Accuracy, ±%				
liquid	1.60	0.32	0.20	0.20
gas	1.60	0.70	0.70	0.70
Pressure drop				
liquid (psi)	<0.1	0.1	0.2	11.1
liquid (bar)	<0.005	0.007	0.014	0.766
gas (psi)	<0.1	<0.1	0.2	14.7
gas (bar)	<0.005	<0.005	0.014	1.014

Functional specifications

Environmental influences

Process temperature effect			is defined as the worst-c rom the zeroing tempera		ue to process fluid		
	F025 F050 F100 F200		erature effect ⁽¹⁾ flow rate per °C				
Pressure effect			s the change in sensor fl ration pressure. Pressure				
	F025 F050 F100 F200	Pressure effer % of rate per psi none -0.0007 -0.001 -0.0005	ct on flow accuracy % of rate per bar none -0.010 -0.015 -0.007	Pressure effe g/cc per psi 0.000007 0.000007 0.000007 -0.000004	ect on density accuracy <i>kg/m³</i> <i>per bar</i> 0.10 0.10 0.10 -0.05		
Hazardous area cla	assification	IS					
			ors are intrinsically safe by on sensor approval tag		nnected to an approved ncy on transmitter approval		
	UL is a U.S European s	.A. approvals ag standards organi	jency, CSA is a Canadiar zation.	n approvals agenc	y, and CENELEC is a		
UL ⁽²⁾ and CSA		erly mounted int g hazardous are		Model 5300 trans	mitter, can be installed in		
		Div. 2, Groups A Div. 2, Groups I					
		•	o a core processor or inte be installed in the followi	• •			
	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						
			emotely to a Micro Motio can be installed in the fo				
	Class I,	Div. 1, Groups C Div. 2, Groups A Div. 1, Groups I	, B, C, and D				

⁽¹⁾Nominal flow rate is the upper limit of the nominal flow range.

⁽²⁾At time of printing, UL approval for Micro Motion F-Series meters with Model 1700 and 2700 transmitters is pending.

Functional specifications continued

CENELEC

flowmeters with integral IFT9701 or 5300 transmitters

70 slope = -.50°C ambient per °C fluid max. ambient temp. (°C) 255 60 F025, F050, F100 50 50 EEx ib IIC T1-T6 40 30 20 10 115 F200 0 EEx ib IIB T1-T6 -10 -20 -30 60 120 125 75 -40 -40 -20 20 40 60 80 100 120 140 160 180 0 sensor fluid temp. (°C) flowmeters with core processor 90 de-rate at 80 slope = -.12°C ambient per °C fluid z 70 F025, F050, F100 max. ambient temp. (°C) 60 55 EEx ib IIC T1-T5 50 40 50 30 107 F200 20 10 EEx ib IIB T1-T5 0 Т5 Т4 T1-T3 -10 -20 -30 64 99 150 -40 120 140 -40 -20 0 20 40 60 80 100 160 180 sensor fluid temp. (°C) flowmeters with j-box 90 80 F025, F050, F100 70 55 60 EEx ib IIC T1-T6 max. ambient temp. (°C) 50 40 F200 30 20 EEx ib IIB T1-T6 10 Т6 Т5 Т4 T1-T3 0 -10 -20 60 ,75 ,150 -30 ,120 -40 -40 -20 0 20 40 60 80 100 120 140 160 180 sensor fluid temp. (°C)

90 80

de-rate at

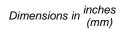
Physical specifications

Wetted parts ⁽¹⁾	316L stai	nless steel		
Sensor housing	304L stai	nless steel		
Core processor	CF-3M st	ainless stee		
Transmitter housing	Ероху ро	lyester paint	ed cast aluminum	
Junction box	Ероху ро	lyester paint	ed cast aluminum	
Weight ⁽²⁾				
		lb	kg	
Sensor with j-box	F025	14	7	
	F050	15	7	
	F100	26	12	
	F200	62	28	
Sensor with local	F025	17	8	
core processor	F050	17	8	
	F100	28	13	
	F200	64	29	
Sensor with	F025	18	8	
integrated	F050	19	9	
IFT9701/5300	F100	30	14	
transmitter	F200	66	30	
Sensor with	F025	26	12	
integrated	F050	27	13	
1700/2700	F100	38	18	
transmitter	F200	60	27	

⁽¹⁾General corrosion guides 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.

⁽²⁾Weight of flowmeter with 150 lb weld neck raised face flanges.

Dimensions — F-Series sensors with integrally mounted 1700/2700 transmitter



œ

CO

 \bigcirc

-

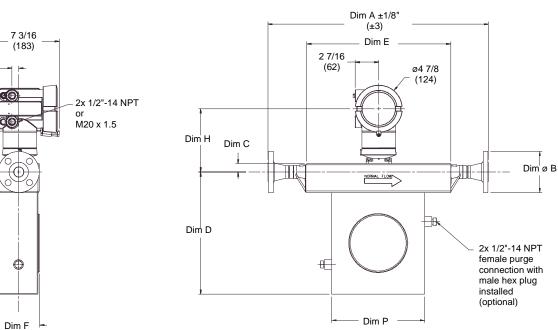
2x 13/16

(21)

2 11/16

(69)

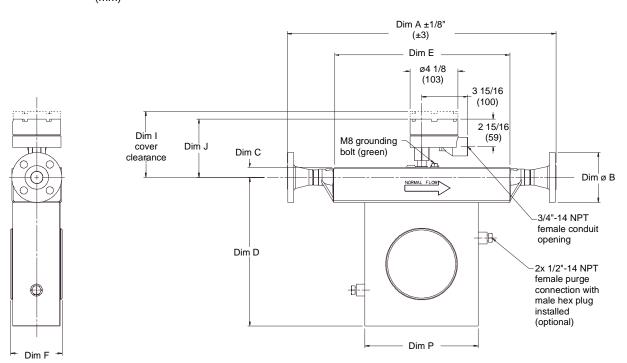
Dim ^IG



		Dimensions ⁽¹⁾								
Model		С	D	E	F	G	Н	Р		
F025	inches	5/8	10 3/8	9 3/4	3 3/16	6 3/8	7 11/16	8		
	(mm)	(15)	(264)	(247)	(80)	(161)	(196)	(203)		
F050	inches	5/8	10 3/8	11 7/8	3 3/16	4 15/16	8 3/4	8		
	(mm)	(15)	(264)	(301)	(80)	(126)	(222)	(203)		
F100	inches	7/8	12 5/8	14 7/8	4 3/8	5 3/16	6 9/16	9 5/8		
	(mm)	(22)	(321)	(378)	(111)	(132)	(166)	(244)		
F200	inches	1 3/4	19 1/4	17 7/8	5 9/16	6 1/16	7 7/16	17 1/4		
	(mm)	(44)	(489)	(454)	(141)	(155)	(189)	(438)		

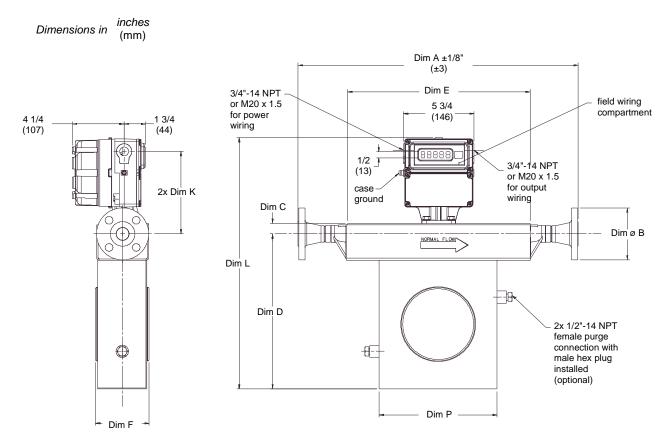
Dimensions — F-Series sensor with j-box

Dimensions in inches (mm)



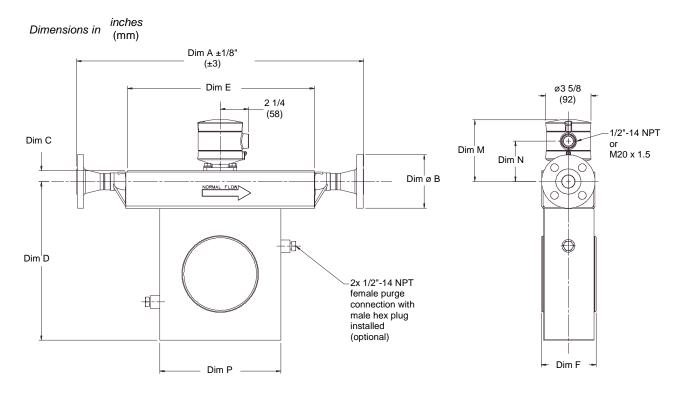
		Dimensions ⁽¹⁾									
Model		С	D	Ε	F	I	J	Р			
F025	inches	5/8	10 3/8	9 3/4	3 3/16	5 5/16	4 5/8	8			
	(mm)	(15)	(264)	(247)	(80)	(134)	(118)	(203)			
F050	inches	5/8	10 3/8	11 7/8	3 3/16	5 1/4	4 9/16	8			
	(mm)	(15)	(264)	(301)	(80)	(133)	(116)	(203)			
F100	inches	7/8	12 5/8	14 7/8	4 3/8	5 5/8	4 15/16	9 5/8			
	(mm)	(22)	(321)	(378)	(111)	(143)	(126)	(244)			
F200	inches	1 3/4	19 1/4	17 7/8	5 9/16	6 7/16	5 3/4	17 1/4			
	(mm)	(44)	(489)	(454)	(141)	(163)	(146)	(438)			

Dimensions — F-Series sensor with integrally mounted IFT9701 or 5300 transmitter



Dimensions⁽¹⁾

Model		С	D	Ε	F	Κ	L	Р
F025	inches	5/8	10 3/8	9 3/4	3 3/16	6 1/2	18	8
	(mm)	(15)	(264)	(247)	(80)	(165)	(457)	(203)
F050	inches	5/8	10 3/8	11 7/8	3 3/16	6 1/2	18	8
	(mm)	(15)	(264)	(301)	(80)	(165)	(457)	(203)
F100	inches	7/8	12 5/8	14 7/8	4 3/8	6 3/4	20 1/2	9 5/8
	(mm)	(22)	(321)	(378)	(111)	(171)	(521)	(244)
F200	inches	1 3/4	19 1/4	17 7/8	5 9/16	7 5/8	28	17 1/4
	(mm)	(44)	(489)	(454)	(141)	(194)	(711)	(438)



Dimensions — F-Series sensor with local core processor

		Dimensions ⁽¹⁾								
Model		С	D	E	F	М	N	Р		
F025	inches	5/8	10 3/8	9 3/4	3 3/16	6 1/6	4 3/8	8		
	(mm)	(15)	(264)	(247)	(80)	(154)	(111)	(203)		
F050	inches	5/8	10 3/8	11 7/8	3 3/16	4 5/8	2 15/16	8		
	(mm)	(15)	(264)	(301)	(80)	(118)	(75)	(203)		
F100	inches	7/8	12 5/8	14 7/8	4 3/8	4 7/8	3 3/16	9 5/8		
	(mm)	(22)	(321)	(378)	(111)	(125)	(82)	(244)		
F200	inches	1 3/4	19 1/4	17 7/8	5 9/16	5 13/16	4 1/8	17 1/4		
	(mm)	(44)	(489)	(454)	(141)	(147)	(104)	(438)		

	Fitting	Dim. A face-to-face	Dim. B outside diameter	
F025 fitting options ⁽¹⁾	code	inches (mm)	inches (mm)	
1/2-inch 150 lb ANSI weld neck raised face flange	113	16 1/16 (408)	3 1/2 (89)	
1/2-inch 300 lb ANSI weld neck raised face flange	114	16 7/16 (418)	3 3/4 (95)	
1/2-inch 600 lb ANSI weld neck raised face flange	115	16 15/16 (430)	3 3/4 (95)	
1/2-inch NPT female CAJON size 8 VCO fitting	319	14 1/16 (358)		
1/2-inch sanitary fitting (Tri-Clamp compatible)	121	14 1/16 (358)	1 (25)	
15 mm DIN PN40 weld neck, DIN 2635, type C face	116	15 5/16 (389)	3 3/4 (95)	
15 mm JIS 10K weld neck raised face flange	216	14 7/8 (377)	3 3/4 (95)	
F050 fitting options ⁽¹⁾				
1/2-inch 150 lb ANSI weld neck raised face flange	113	18 3/16 (462)	3 1/2 (89)	
1/2-inch 300 lb ANSI weld neck raised face flange	114	18 9/16 (471)	3 3/4 (95)	
1/2-inch 600 lb ANSI weld neck raised face flange	115	19 1/16 (484)	3 3/4 (95)	
3/4-inch NPT CAJON size 12 VCO fitting	239	16 7/16 (418)		
3/4-inch sanitary fitting (Tri-Clamp compatible)	322	15 15/16 (405)	1 (25)	
15 mm DIN PN40 weld neck, DIN 2635, type C face	116	17 7/16 (443)	3 3/4 (95)	
25 mm DIN PN40 weld neck, DIN 2635, type C face	131	17 9/16 (446)	4 1/2 (115)	
15 mm JIS 10K weld neck raised face flange	216	17 (431)	3 3/4 (95)	
F100 fitting options ⁽¹⁾				
1" ANSI 150 lb weld neck raised face flange	128	23 3/4 (578)	4 1/4 (108)	
1" ANSI 300 lb weld neck raised face flange	129	23 1/4 (591)	4 7/8 (124)	
1" ANSI 600 lb weld neck raised face flange	130	23 3/4 (603)	4 7/8 (124)	
1" sanitary fitting (Tri-Clamp compatible)	138	21 3/8 (543)	2 (50)	
25 mm DIN PN40 weld neck, DIN 2635, type C face	131	21 1/2 (546)	4 1/2 (115)	
25 mm JIS 10K weld neck raised face flange	212	21 1/8 (536)	4 15/16 (125)	
F200 fitting options ⁽¹⁾				
1 1/2" ANSI 150 lb weld neck raised face flange	341	24 13/16 (630)	5 (127)	
1 1/2" ANSI 300 lb weld neck raised face flange	342	25 5/16 (642)	6 1/8 (155)	
1 1/2" ANSI 600 lb weld neck raised face flange	343	25 13/16 (655)	6 1/8 (155)	
2" ANSI 150 lb weld neck raised face flange	418	24 15/16 (633)	6 (152)	
2" ANSI 300 lb weld neck raised face flange	419	25 7/16 (645)	6 1/2 (165)	
2" ANSI 600 lb weld neck raised face flange	420	26 3/16 (665)	6 1/2 (165)	
1 1/2" sanitary fitting (Tri-Clamp compatible)	351	23 5/16 (592)	2 (50)	
2" sanitary fitting (Tri-Clamp compatible)	352	22 15/16 (582)	2 1/2 (64)	
40 mm DIN PN40 weld neck, DIN 2635, type C face	381	23 9/16 (599)	5 15/16 (150)	
· · ·	382	23 11/16 (601)	6 1/2 (165)	
50 mm DIN PN40 weld neck, DIN 2635, type C face	302	(000.)		
50 mm DIN PN40 weld neck, DIN 2635, type C face 40 mm JIS 10K weld neck raised face flange	385	23 7/16 (596)	5 1/2 (140)	

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

Ordering Information

Micro Motion F-Series sensor model number matrix

Model	Product Description
F025S	Micro Motion Coriolis F-Series sensor; 1/4-inch; 316L stainless steel
F050S	Micro Motion Coriolis F-Series sensor; 1/2-inch; 316L stainless steel
F100S	Micro Motion Coriolis F-Series sensor; 1-inch; 316L stainless steel
F200S	Micro Motion Coriolis F-Series sensor; 2-inch; 316L stainless steel
Code	Process Connections
###	See fittings table on page 14
Code	Case Options
S	Standard case
P	Purge fittings (two 1/2-inch NPT female)
Х	CEQ case option
Code	Electronics Interface
A	Local core processor for remote mount Series 1000/2000 transmitters
С	For integral mount 1700/2700 transmitter
I	Integral IFT9701
R	9-wire J-box
Code	Conduit Connections
	Electronics Interface Code 'A' (Local core Processor)
В	1/2-inch NPT - no gland
С	1/2-inch NPT with brass nickel cable gland (cable diameter 0.335 to 0.394 inches)
D	1/2-inch NPT with stainless steel cable gland (cable diameter 0.335 to 0.394 inches)
E	M20 - no gland
F	M20 with brass nickel cable gland (cable diameter 8.5 to 10 mm)
G	M20 with stainless steel cable gland (cable diameter 8.5 to 10 mm)
	Electronics Interface Code 'C' : (Integral mount 1700/2700 - no conduit connections)
A	No gland
	Electronics Interface Code 'R' : (9-wire J-box)
A	3/4-inch NPT - no gland
Н	3/4-inch NPT with brass nickel cable gland
J	3/4-inch NPT with stainless steel cable gland
Code	Approvals
Μ	Micro Motion Standard (no approval)
U	UL
С	CSA (Canada only)
А	CSA (US and Canada)
Z	CENELEC
Code	Language
А	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
Н	Finnish Quick Reference Guide and English Manual
I	Italian Quick Reference Guide and English Manual
J	Japanese Quick Reference Guide and English Manual
Μ	Chinese Quick Reference Guide and English Manual
Ν	Norwegian Quick Reference Guide and English Manual
0	Polish Quick Reference Guide and English Manual
Р	Portuguese Quick Reference Guide and English Manual
R	Russian Quick Reference Guide and English Manual
S	Spanish Quick Reference Guide and English Manual
W	Swedish Quick Reference Guide and English Manual
Code	Future Options
ZZZ	Reserved for future use
Code	Factory Options
Z	Standard product
X	CEQ product
	odel Number: F025S 113 S A B U E ZZZ Z

For the latest Micro Motion product specifications, view the PRODUCTS section of our Web site at www.micromotion.com

Micro Motion Europe

Groeneveldselaan 8 3903 AZ Veenendaal The Netherlands Tel +31 (0) 318 549 549 Fax +31 (0) 318 549 559

Micro Motion Inc. USA Worldwide Headquarters

7070 Winchester Circle Boulder, Colorado 80301 Tel 303-530-8400 800-522-6277 Fax 303-530-8459

© 2001, Micro Motion, Inc. All rights reserved PS-00385 (6/01)

Micro Motion Asia

1 Pandan Crescent Singapore 128461 Republic of Singapore Tel (65) 777-8211 Fax (65) 770-8003

Micro Motion Japan

Shinagawa NF Bldg. 5F 1-2-5, Higashi Shinagawa Shinagawa-ku Tokyo 140-0002 Japan Tel (81) 3 5769-6803 Fax (81) 3 5769-6843

