

**Product Data Sheet**

PS-001191, Rev. B  
April 2009

# Micro Motion® 7812 Fiscal Gas Density Meter

Micro Motion density and concentration meters are built to tackle the most demanding process and fiscal applications. For fiscal accuracy of gas density measurements, the 7812 is the industry standard.



7835 Peak performance density meter

7845 High performance general purpose density meter

7847 High accuracy hygienic density meter

7826/28 Direct insertion density meter

3098 Gas specific gravity meter

7812 Fiscal gas density meter

**Best precision gas density measurement**

- Ni-Span-C sensor for a wide-ranging precision measurement
- On-site accredited density laboratory for guaranteed performance

**Industry standard for fiscal hydrocarbon measurement**

- Market leader with the largest installed base
- Compliant with fiscal measurement standards

**Superior reliability and safety**

- Optimized design – insensitive to temperature, pressure, and gas composition variations

# Micro Motion 7812 fiscal gas density meter

---

The 7812 fiscal gas density meter brings you all the benefits of highly accurate, continuous on-line measurements of gas density.

## About the 7812

The 7812 is based on a resonating cylinder. The density of the gas flowing through the meter changes the natural resonant frequency of the cylinder. By maintaining this vibration and measuring its frequency electronically, the density of the gas (which is directly related to mass flow) can be determined.

## Typical applications

- Fiscal gas density measurement to ISO 5167 and AGA 3 standards
- Gas blending
- Direct measurement of Ethylene density

## Advantages

- Intrinsically safe design
- Insensitive to changes in pressure, temperature, and composition
- Better control of product quality
- Highest accuracy of resolution available today
- Faster response to changing conditions
- Reduced waste
- Low maintenance requirement
- Improved safety
- In situ replacement of filters
- Greater profitability
- Overcomes the disadvantages of traditional sampling techniques
- Custody transfer approval

---

## Contents

Performance . . . . .	3	Weight . . . . .	4
Mechanical . . . . .	3	Electrical . . . . .	4
Hazardous area classifications . . . . .	3	Dimensions . . . . .	5
General classifications . . . . .	4	Installation . . . . .	6
Materials of construction . . . . .	4	7812 Ordering information . . . . .	7

# Performance

---

Density range	1 – 400 kg/m <sup>3</sup>
Limits of error (10 to 100% full scale)	<ul style="list-style-type: none"><li>• Nitrogen: ±0,1% of reading</li><li>• Natural gas, Ethylene: ±0,15% of reading</li></ul>
Maximum operating pressure	250 bar <sup>(1)</sup>
Temperature range	–20 °C to +85 °C or as limited by the dewpoint of the gas <sup>(2)</sup>
Temperature coefficient	±0,001 kg/m <sup>3</sup> / °C
Process gas	Must be dry and compatible with Ni-Span C902, Stainless Steel AISI 316, Stycast Catalyst 11, and Permendur Iron
Integral temperature measurement	PT100 Class A
Temperature accuracy	Better than 0,5 °C

---

(1) For applications using the weldolet installation kit, the maximum operating pressure is 150 bar. For pocket installations, the maximum operating pressure is 250 bar.

(2) A 7812 density meter rated for a maximum operating temperature of +125 °C is available as an option. Contact the nearest Micro Motion sales office for more information.

# Mechanical

---

Sample gas connection	1/4" NPT (API) female
Integral filters	2 micron (inlet); 90 micron (outlet)
Maximum dimensions	365 mm (H) x 140 mm (W)

---

# Hazardous area classifications

## ATEX

---

ATEX-approved: Certification for use in Europe

ATEX II 1 G EEx ia IIC T5

---

## CSA

---

CSA-approved: Certification for use in Canada and USA

Class I, Division I, Groups A, B, C & D T4

---

# General classifications

## Electromagnetic compatibility

All versions conform to the latest international standards for EMC, and are certified compliant with:

- Emissions: EN 61326 – 1997 (Heavy Industrial Environment)

## Environment

- Weather rating: IP65

## Materials of construction

---

<b>Main housing</b>	316L stainless steel
<b>Liner</b>	AMS 5643K
<b>Cylinder</b>	Ni-Span C
<b>Spool body</b>	Stycast catalyst 11, Permendur Iron
<b>Amplifier housing</b>	Die cast low copper alloy with Polyurethane paint

---

## Weight

---

<b>Weight</b>	5 kg
---------------	------

---

## Electrical

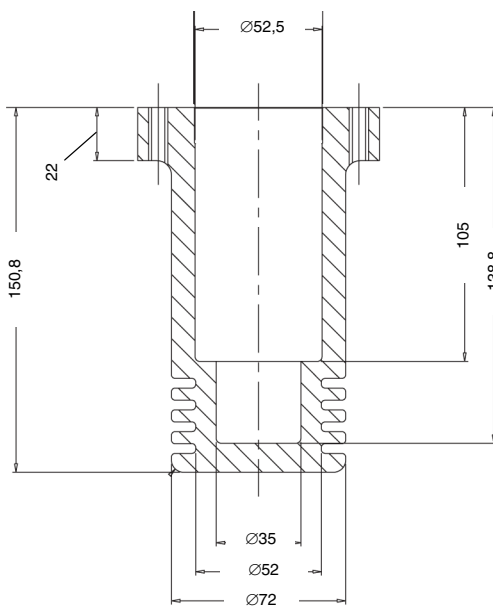
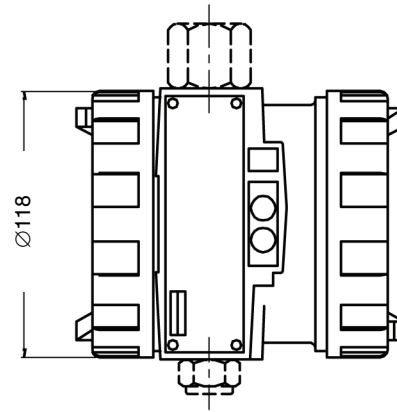
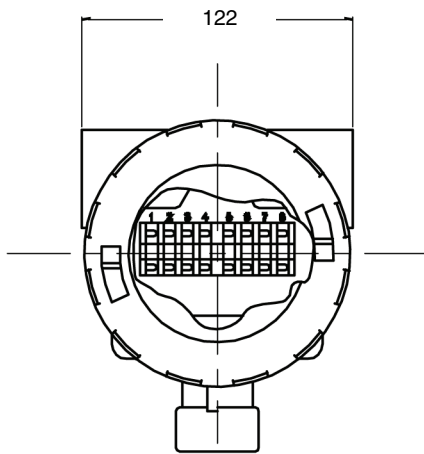
---

<b>Power supply</b>	+15,5 to 33 VDC, 25 mA
<b>Output signal</b>	1960 Hz $\pm 10\%$ at 0 kg/m <sup>3</sup> 1580 Hz $\pm 10\%$ at 60 kg/m <sup>3</sup> Nominal 6 V peak-to-peak for 3-wire Nominal 2 to 3 V peak-to-peak across a 330- $\Omega$ resistor for 2-wire

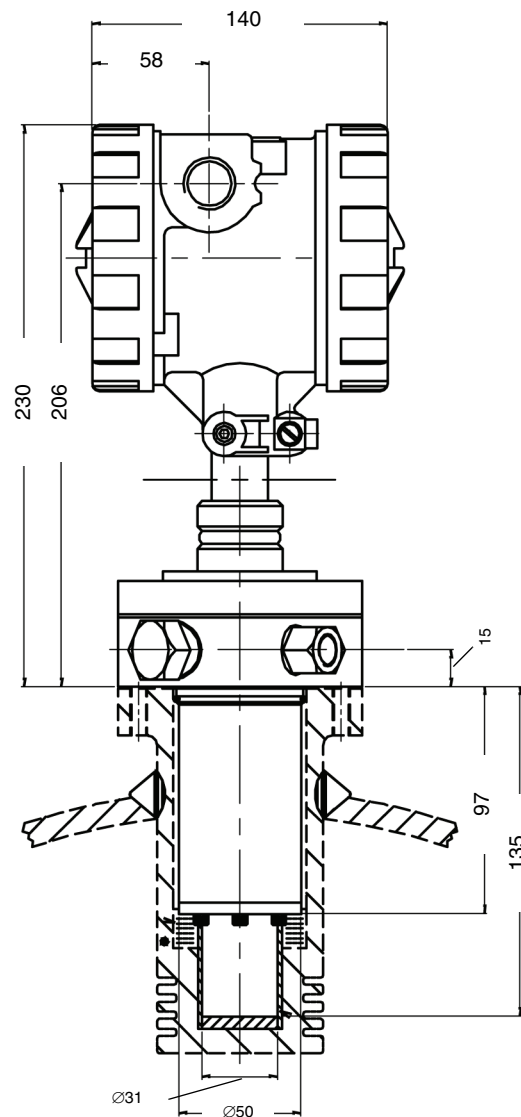
---

# Dimensions

Dimensions in mm



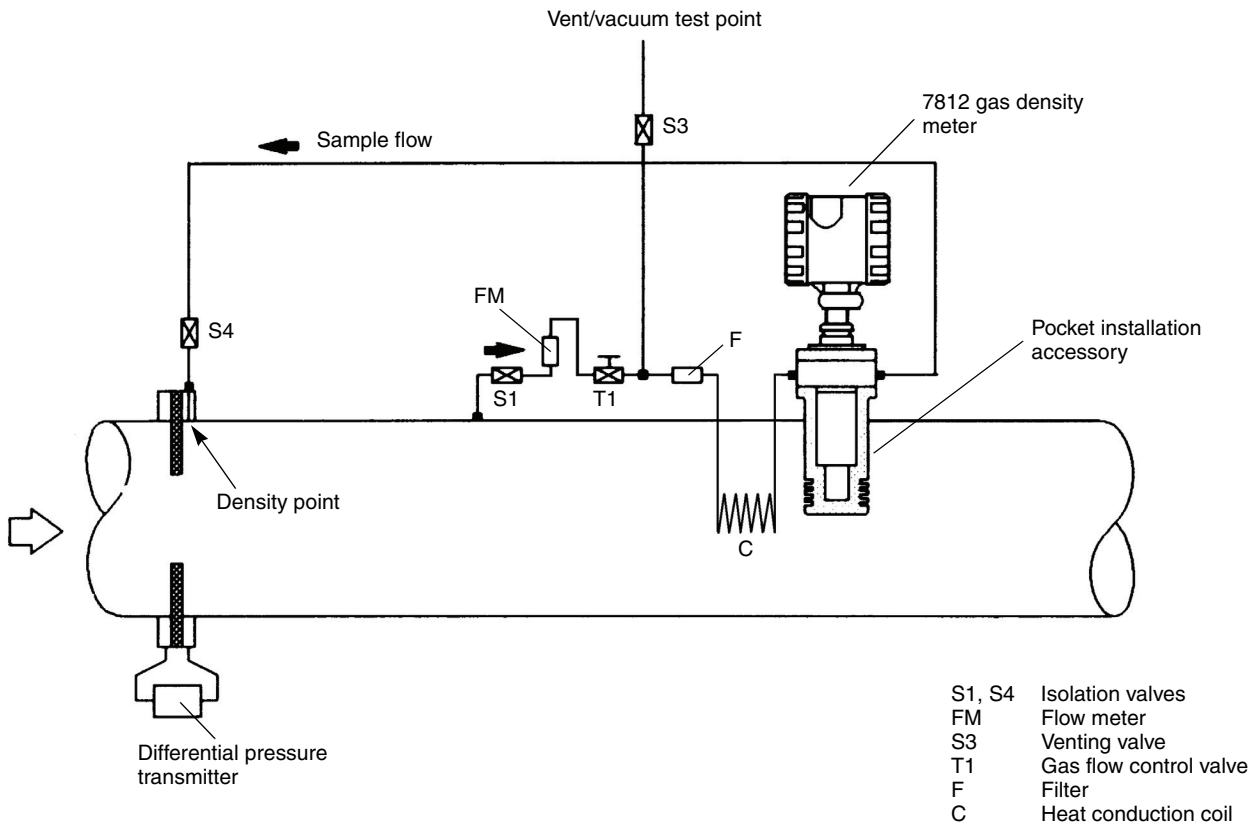
Typical pocket  
(form and material to suit application)



# Installation

The 7812 is a sample bypass meter that can be inserted into the main gas stream. Inserting the meter directly into the gas stream ensures good thermal equalization yet allows the gas to be adequately filtered for reliable measurement. Gas density meters are normally used as part of a mass metering exercise. Therefore, the location of the density meter in relation to the flow meter is important.

Installation accessories, such as for weldolet or pocket installations, are available for installing the 7812. The following figure shows an example of a 7812 pocket installation in a gas pipeline. For further information about ordering 7812 installation accessories, contact your nearest Micro Motion sales office.



# 7812 Ordering information

Model	Product description
7812	Gas density meter
Code	Instrument types
1A	Range 1,5 – 10 kg/m <sup>3</sup> , Viton O-rings
1B	Range 1,5 – 10 kg/m <sup>3</sup> , EP O-rings
2A	Range 9 – 90 kg/m <sup>3</sup> , Viton O-rings
2B	Range 9 – 90 kg/m <sup>3</sup> , EP O-rings
3A	Range 25 – 250 kg/m <sup>3</sup> , Viton O-rings
3B	Range 25 – 250 kg/m <sup>3</sup> , EP O-rings
4A	Range 40 – 400 kg/m <sup>3</sup> , Viton O-rings
4B	Range 40 – 400 kg/m <sup>3</sup> , EP O-rings
5A	Ethylene Range 40 – 400 kg/m <sup>3</sup> , Viton O-rings
Code	Factory set
A	Factory set option
Code	Amplifier housing material
G	Aluminum alloy
Code	Hazardous area certification
J	ATEX Intrinsically safe
L	CSA (US and Canada) Intrinsically safe
Code	Calibration
<b>Available with all instrument types</b>	
A	Standard calibration
<b>Available only with instrument types 1A, 1B</b>	
B	UKAS calibration 1,5 – 10 kg/m <sup>3</sup> Nitrogen
<b>Available only with instrument types 2A, 2B</b>	
C	UKAS calibration 9 – 90 kg/m <sup>3</sup> Nitrogen
<b>Available only with instrument types 3A, 3B</b>	
D	UKAS calibration 25 – 250 kg/m <sup>3</sup> Nitrogen
<b>Available only with instrument types 4A, 4B, 5A</b>	
E	UKAS calibration 40 – 400 kg/m <sup>3</sup> Argon
Code	Factory set
C	Factory set option
Code	Factory set
C	Factory set option
Code	Traceability
A	None
X	Traceability
<b>Typical ordering code: 78121AAGJACCA<sup>(1)</sup></b>	

(1) For correct installation of the 7812 gas density meter, a number of installation kits are available. For further information, please contact your nearest sales office.

## 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

Benefit from expert phone, field, and application service and support made possible by more than 600000 meters installed worldwide and over 30 years of flow and density measurement experience.

 [www.micromotion.com](http://www.micromotion.com)

© 2009 Micro Motion, Inc. All rights reserved. Micro Motion is committed to continuous product improvement. As a result, all specifications are subject to change without notice. ELITE and ProLink are registered trademarks, and MVD and MVD Direct Connect are trademarks of Micro Motion, Inc., Boulder, Colorado. Micro Motion is a registered trade name of Micro Motion, Inc., Boulder, Colorado. The Micro Motion and Emerson logos are trademarks and service marks of Emerson Electric Co. All other trademarks are property of their respective owners.

#### Emerson Process Management Micro Motion Americas

Worldwide Headquarters  
7070 Winchester Circle  
Boulder, Colorado USA 80301  
T: 800 522 6277  
T: +1 (303) 527 5200  
F: +1 (303) 530 8459  
Mexico T: 52 55 5809 5300  
Argentina T: 54 11 4837 7000  
Brazil T: 55 15 3238 3527  
Venezuela T: 58 26 1792 1858

#### Emerson Process Management Micro Motion Europe/Middle East

Central & Eastern Europe T: +41 41 7686 111  
Dubai T: +971 4 811 8100  
France T: 0800 917 901  
Germany T: 0800 182 5347  
Italy T: 8008 77334  
The Netherlands T: (31) 318 495 555  
Belgium T: +32 (0) 2 716 77 11  
Spain T: +34 913 586 000  
U.K. T: 0870 240 1978  
Russia/CIS T: +7 495 981 9811

#### Emerson Process Management Micro Motion Asia Pacific

Australia T: (61) 3 9721 0200  
China T: (86) 21 2892 9000  
India T: (91) 22 6662 0566  
Japan T: (81) 3 5769 6803  
Korea T: (82) 2 3438 4600  
Singapore T: (65) 6 777 8211

For a complete list of contact information and websites, please visit: [www.emersonprocess.com/home/contacts/global](http://www.emersonprocess.com/home/contacts/global).

