

**Product Data Sheet**

PS-001162, Rev. E

April 2013

# 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 direct gas density measurement**

- Ni-Span-C sensor for a wide-ranging precision measurement
- On-site accredited density laboratory for guaranteed performance
- Up to  $\pm 0.1\%$  of reading over the range of 0.06–25 lb/ft<sup>3</sup> (1–400 kg/m<sup>3</sup>)

**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

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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.

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 system. Therefore, the location of the density meter in relation to the flow meter is important.

Installation accessories, such as for pocket installations, are available for installing the 7812. To view an example of a 7812 pocket installation, see “Installation Example” on page 7.

## Typical applications

- Fiscal gas density measurement to ISO 5167 and AGA 3 standards
- Fuel gas density measurement
- Hydrogen purity measurement
- Direct measurement of ethylene density

## Advantages

- Custody transfer approval
- Optional UKAS-certified calibration (ISO 17025)
- Intrinsically safe design
- Insensitive to changes in pressure, temperature, and composition
- Highest measurement accuracy and resolution available today
- Enables quality control improvements
- Fast response to changing conditions
- Low maintenance requirement
- In situ replacement of filters
- Greater profitability
- Overcomes the disadvantages of traditional sampling techniques

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# Performance

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<b>Density range</b>	0.06 – 25 lb/ft <sup>3</sup> (1 – 400 kg/m <sup>3</sup> )
<b>Limits of error (10 to 100% full scale)</b>	<ul style="list-style-type: none"><li>• Nitrogen: ±0.1% of reading</li><li>• Natural gas, Ethylene: ±0.15% of reading</li></ul>
<b>Maximum operating pressure</b>	3625 psi (250 bar)
<b>Temperature range</b>	–4 °F to +185 °F (–20 °C to +85 °C) or as limited by the dewpoint of the gas <sup>(1)</sup>
<b>Temperature coefficient</b>	±0.00003 lb/ft <sup>3</sup> / °F (±0.001 kg/m <sup>3</sup> / °C)
<b>Process gas</b>	Must be dry and compatible with Ni-Span C902, Stainless Steel AISI 316, Stycast Catalyst 11, and Permendur Iron
<b>Integral temperature measurement</b>	PT100 Class A
<b>Temperature accuracy</b>	Better than 0.9 °F (0.5 °C)

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(1) A 7812 density meter rated for a maximum operating temperature of +257 °F (+125 °C) is available as an option. Contact the nearest Micro Motion sales office for more information.

# Mechanical

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<b>Sample gas connection</b>	1/4" NPT (API) female
<b>Integral filters</b>	2 micron (inlet); 90 micron (outlet)
<b>Maximum dimensions</b>	14.4 in (H) x 5.5 in (W) [365 mm (H) x 140 mm (W)]

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# Hazardous area classifications

## ATEX

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ATEX-approved: Certification for use in Europe	ATEX II 1 G Ex ia IIC T5 Ga
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## CSA

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CSA-approved: Certification for use in Canada and USA	Class I, Division I, Groups A, B, C & D T4
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## IECEx

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IECEx-approved: International Certification	Ex ia IIC T5 Ga
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# General classifications

## Electromagnetic compatibility

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

- EN 61326

## Environment

- Weather rating: IP65

## Materials of construction

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<b>Main housing</b>	316L stainless steel
<b>Liner</b>	AMS 5643
<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

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## Weight

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<b>Weight</b>	11 lbs (5 kg)
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## Electrical

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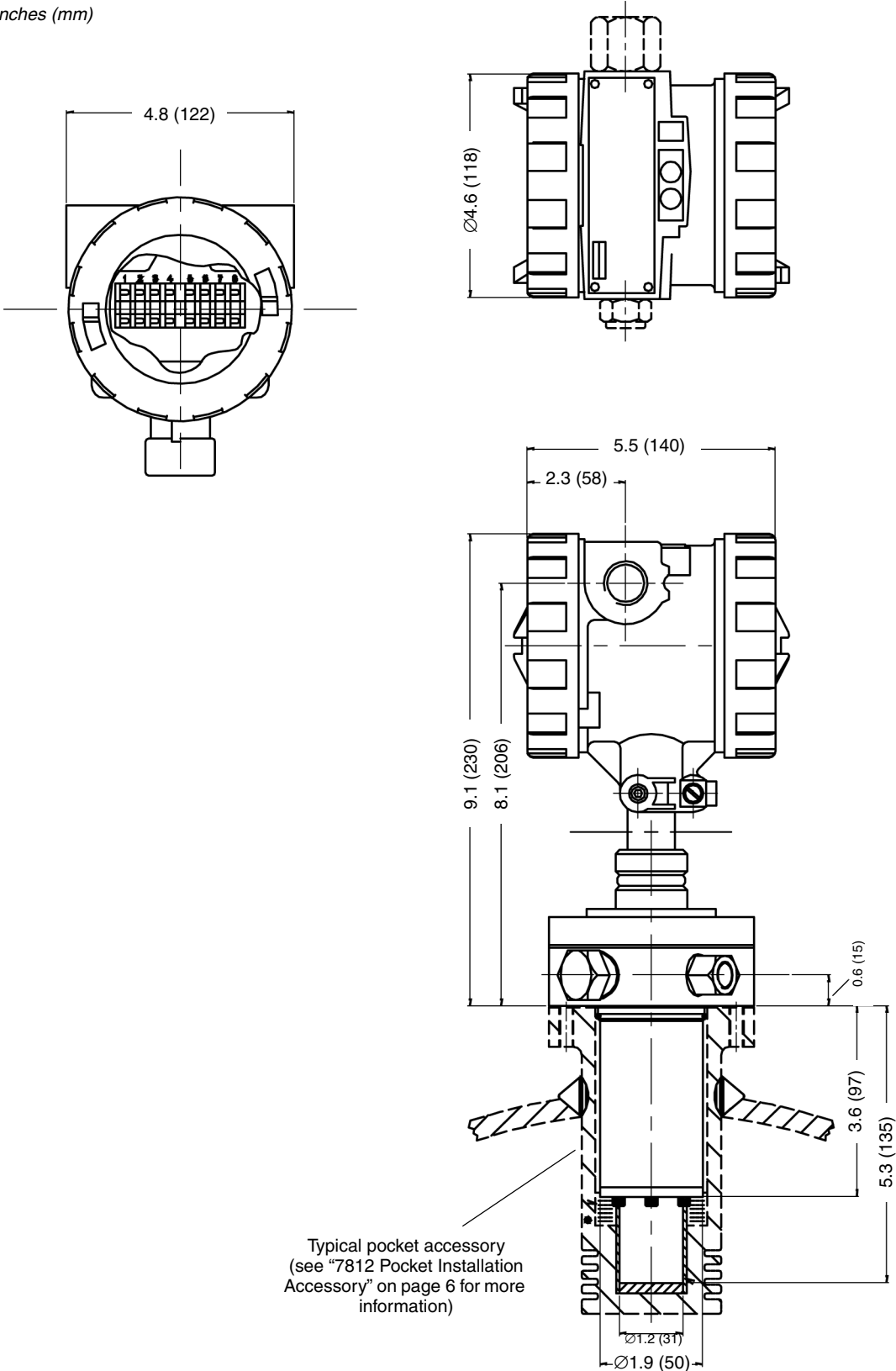
<b>Power supply</b>	+15.5 to 33 VDC, 25 mA
<b>Output signal</b>	1960 Hz $\pm$ 10% at 0 lb/ft <sup>3</sup> (0 kg/m <sup>3</sup> ) 1580 Hz $\pm$ 10% at 3.8 lb/ft <sup>3</sup> (60 kg/m <sup>3</sup> ) Nominal 6 V peak-to-peak for 3-wire Nominal 2 to 3 V peak-to-peak across a 330- $\Omega$ resistor for 2-wire

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# Dimensions

## 7812 Gas Density Meter

Dimensions in inches (mm)

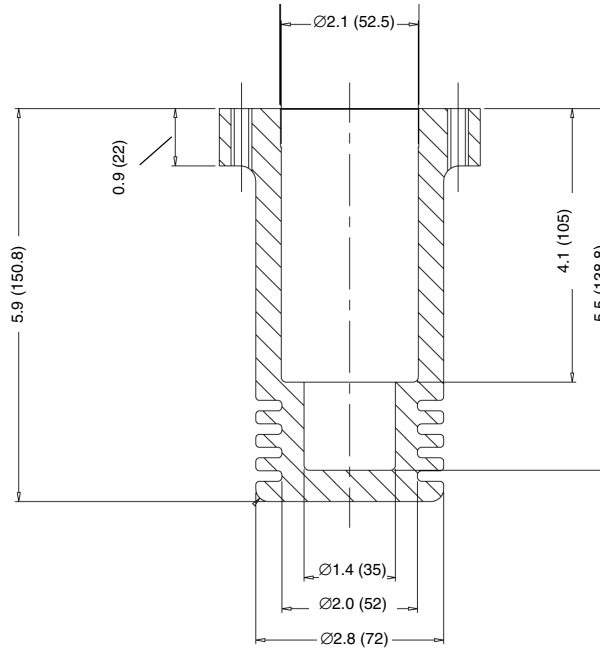


# 7812 Pocket Installation Accessory

## Typical Pocket (Direct Insertion)

Dimensions in inches (mm)

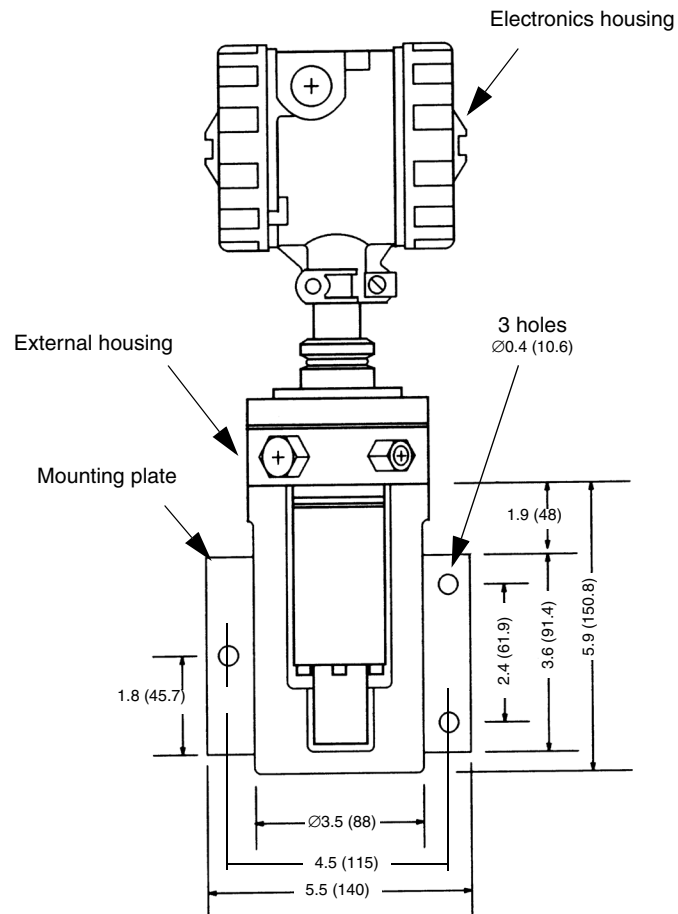
Form and material to suit application



## External Pocket (Remote Installation)

Dimensions in inches (mm)

Form and material to suit application



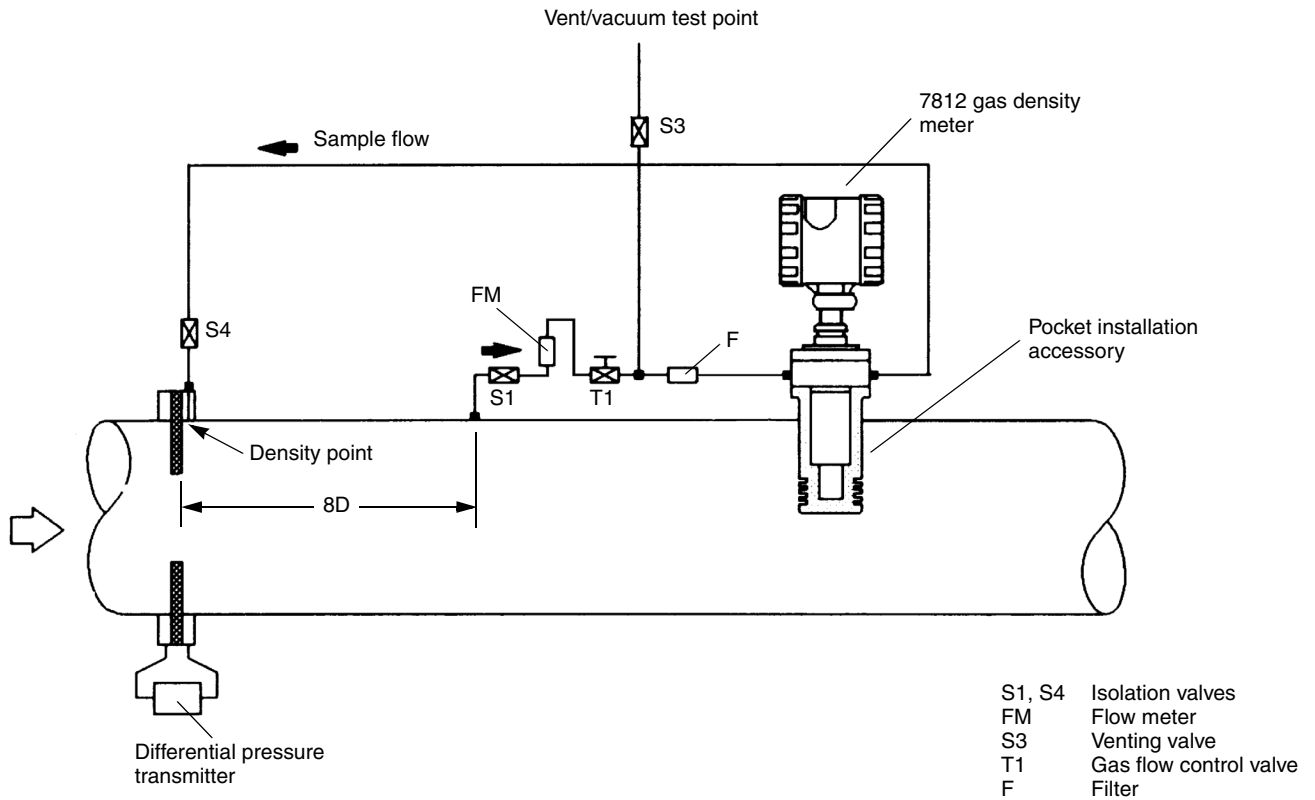
# Installation Example

## Pressure Recovery Method

The following diagram shows an example of a 7812 pocket installation in a gas pipeline. For further information about ordering 7812 installation accessories, see “Accessories Ordering Information” on page 9.

### IMPORTANT

For optimum performance, the sample inlet pipework and the 7812 meter must be thermally insulated.



# 7812 Gas Density Meter 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/IECEX Intrinsically safe
L	CSA (US and Canada) Intrinsically safe
Code	Calibration
<b><u>Available with all instrument types</u></b>	
A	Standard calibration
<b><u>Available only with instrument types 1A, 1B</u></b>	
B	UKAS calibration 1.5 – 10 kg/m <sup>3</sup> Nitrogen
<b><u>Available only with instrument types 2A, 2B</u></b>	
C	UKAS calibration 9 – 90 kg/m <sup>3</sup> Nitrogen
<b><u>Available only with instrument types 3A, 3B</u></b>	
D	UKAS calibration 25 – 250 kg/m <sup>3</sup> Nitrogen
<b><u>Available only with instrument types 4A, 4B, 5A</u></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.



# Accessories Ordering Information

Model <sup>(1)</sup>	Product description
78109AXXX	Pocket kit ASTM A350LF2 carbon steel (includes anti-vibration gaskets)
78109BXXX	Weldolet carbon steel
78109DX	Anti-vibration kit (Weldolet kit only)
78109HAXX	External pocket A350LF2 carbon steel (includes anti-vibration gaskets)
78109LXXX	Pocket ASTM 316L stainless steel (includes anti-vibration gaskets)

(1) The pocket accessories are only available for 7812 instrument types 1A, 1B, 2A, 2B, 3A, 3B, 4A, and 4B.





# 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 750,000 meters installed worldwide and over 30 years of flow and density measurement experience.

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