Product Data Sheet
PS-001482, Rev D
June 2014

Micro Motion® Compact Density Meters

Peak performance precision density meter

Unparalleled real-world performance

- Superior application performance via traceable calibrations, performed at combined pressure and temperature conditions
- OIML R117-1 approved for MID conformance (pending)

Superior multi-variable I/O, meter health, and application capabilities

- Flow rate indication (velocity) ensures sample integrity
- Internal diagnostics for fast verification of meter health and installation
- Application-specific factory configurations ensure fit-for-purpose operation

Installation flexibility and compatibility

- Fluid, process and environmental effects are minimized to ensure superb measurement confidence
- Supports multiple protocols for connection to DCS, PLC, and flow computers
- Drop-in replacement option available for Micro Motion 7835 and 7845 liquid density meters

Micro Motion®

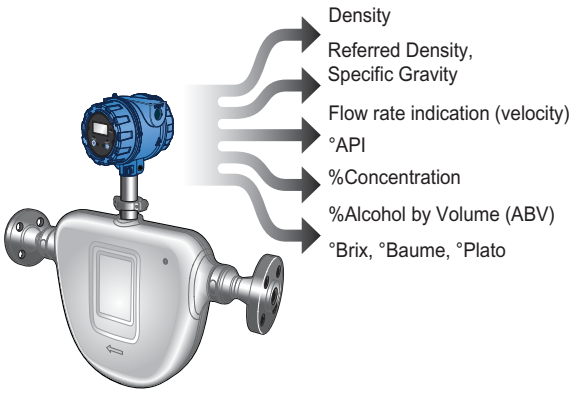
EMERSON™
Process Management

Micro Motion® Compact Density Meters

Micro Motion® compact density meters use the Micro Motion dual curved-tube meter technology to measure density. These meters use a multi-variable measurement system, designed for fiscal metering of high-value products such as crude oil, refined hydrocarbons, alcohol, and many aggressive process liquids.

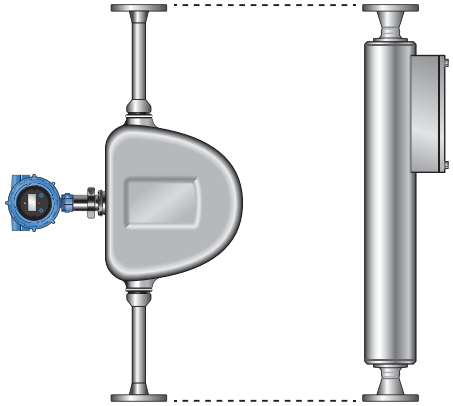
Application configurations

Allows you to preselect an application-specific configuration for your meter from a wide range of options.



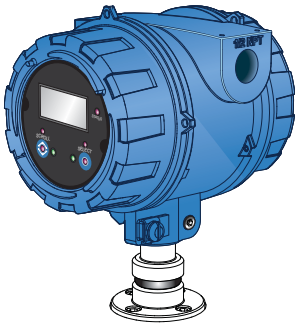
Retrofit capabilities

Drop-in replacement option has the same face-to-face dimensions as the Micro Motion 7835 and 7845 density meters.



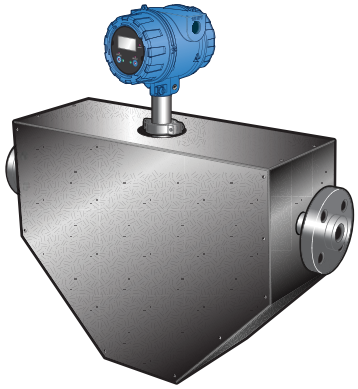
Integral transmitter

Supports Time Period Signal (TPS), Analog (4–20 mA), HART, WirelessHART®, and Modbus RS-485 communications.



Thermal insulation

A soft, weather-proof insulating jacket that is easily fitted to all CDM versions.



Meter diagnostics

Ensure measurement health through known density verification (KDV) and other meter and installation diagnostic capabilities.

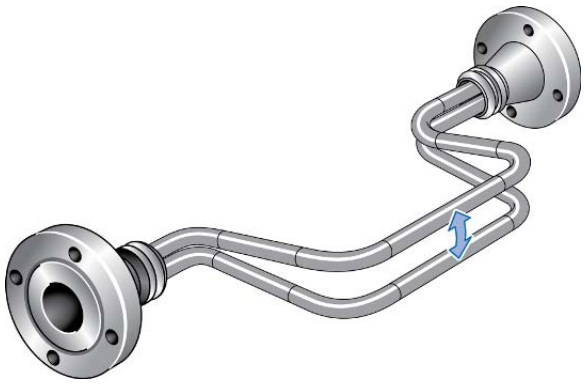
Accreditation and standards

Accredited calibrations and compliance with domestic and international standards.

✓	ATEX, CSA, IECEx
✓	OIML R117-1 (MID) (pending)
✓	HART, WirelessHART, Modbus, FOUNDATION fieldbus
✓	NACE

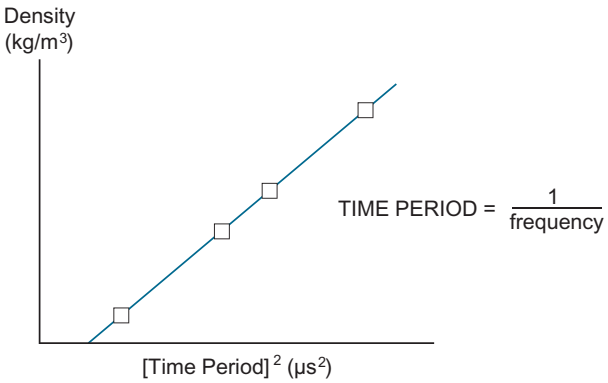
Operating principle

Compact density meters use the Micro Motion dual curved-tube meter technology to measure density and flow rate (velocity).



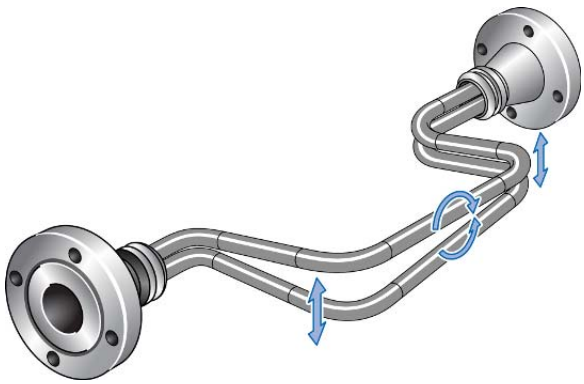
Tube vibration

- Dual, parallel tubes vibrate at their natural frequency.
- The natural frequency changes with the density of the liquid inside the tubes.



Density calibration

- Micro Motion transmitters accurately measure time period.
- Measured time periods are converted into density readings using meter calibration coefficients.
- Multiple calibration points ensure optimum meter performance.



Flow rate indication (velocity)

- Measuring the twist in the vibrating tubes gives an indication of the liquid flow rate (velocity).

Performance specifications

Density measurement

Specification	CDM100P (Peak performance fiscal density meter)	CDM100M (General purpose precision density meter)
Accuracy (liquid)	±0.1 kg/m^3 (±0.0001 g/cm^3)	±0.2 kg/m^3 (±0.0002 g/cm^3)
Repeatability	±0.02 kg/m^3 (±0.00002 g/cm^3)	±0.02 kg/m^3 (±0.00002 g/cm^3)
Operating density range	0–3000 kg/m^3 (0–3 g/cm^3)	■ **TPS transmitter version:** 0-1000 kg/m^3 (0–1 g/cm^3) ■ **Analog/Discrete transmitter versions:** 0–3000 kg/m^3 (0–3 g/cm^3)
Calibration range	300–1300 kg/m^3 (0.3–1.3 g/cm^3)	300–1300 kg/m^3 (0.3–1.3 g/cm^3)
Process temperature effect (corrected)(1)	■ ±0.005 kg/m^3 per °C ■ ±0.278 kg/m^3 per 100 °F	■ ±0.015 kg/m^3 per °C ■ ±0.834 kg/m^3 per 100 °F
Sensor maximum working pressure	150 bar (2175 psi) or flange limit	100 bar (1450 psi) or flange limit
Process pressure effect (corrected)(2)	■ ±0.003 kg/m^3 per bar ■ ±0.021 kg/m^3 per 100 psi	■ ±0.006 kg/m^3 per bar ■ ±0.042 kg/m^3 per 100 psi

(1) Process temperature effect is the maximum measurement offset due to process fluid temperature changing away from the density calibration temperature.
(2) Process pressure effect is defined as the change in the sensor density sensitivity due to process pressure changing away from the calibration pressure. To determine the factory calibration pressure, refer to the calibration document shipped with the meter.

Temperature measurement

Specification	Value
Operating temperature range	–58 °F to +400 °F (–50 °C to +204 °C)
Integral temperature sensor	■ Traceable calibration ■ Technology: 100 Ω RTD ■ Accuracy: BS1904 Class, DIN 43760 Class A (±0.15 +0.002 x Temp °C)
Case temperature sensors(1)	■ Technology: 3 x 100 Ω RTD ■ Accuracy: BS1904 Class, DIN 43760 Class B (±0.30 +0.005 x Temp °C)

(1) Case temperature sensors are used for environmental temperature effect correction in applications where the case temperature measurement does not need to be traceable and/or accredited. Where accreditation and measurement traceability are required, these sensors are used for diagnostics purposes only and do not perform any correction on the density measurement.

Flow rate indication (velocity)

Specification	Value
Accuracy	±5% of reading with 10:1 turndown
Nominal flow rate (bidirectional)	13 m^3/h
Nominal velocity (bidirectional)	10 m/sec (32.8 ft/sec)

Case pressure

Specification	Value
Maximum case working pressure	27 bar (389 psig)
Typical burst pressure (case)	195 bar (2824 psig)

Transmitter specifications

Available transmitter versions

Typical application	Transmitter version[1]	Output channels		
		A	B	C
■ General purpose measurement ■ DCS/PLC connection	Analog	4–20 mA + HART (passive)	4–20 mA (passive)	Modbus/RS-485
	Processor for remote-mount 2700 FOUNDATION fieldbus™ transmitter	Disabled	Disabled	Modbus/RS-485
■ General purpose measurement with output switch ■ DCS/PLC connection	Discrete	4–20 mA + HART (passive)	Discrete output	Modbus/RS-485
■ Fiscal/Custody Transfer ■ Flow Computer connection	Time Period Signal (TPS)	4–20 mA + HART (passive)	Time Period Signal (TPS)	Modbus/RS-485

(1) For more information on the transmitter outputs and ordering codes, see the product ordering information.

Local display

Design	Features
Physical	■ Segmented two-line LCD screen. ■ Can be rotated on transmitter, in 90-degree increments, for ease of viewing. ■ Suitable for hazardous area operation. ■ Optical switch controls for hazardous area configuration and display. ■ Glass lens. ■ Three-color LED indicates meter and alert status.
Functions	■ View process variables. ■ View and acknowledge alerts. ■ Configure mA and RS-485 outputs. ■ Supports Known Density Verification (KDV). ■ Supports multiple languages.

Process measurement variables

Variables	Value[1]
Standard	■ Density ■ Time period ■ Temperature ■ Drive gain ■ External temperature input ■ External pressure input ■ Flow rate (velocity)
Derived	The derived output variables vary, depending on the application configuration of the meter. ■ Referred density (API Tables 53A, 53B) ■ Referred density (Concentration) ■ Specific gravity (Concentration) ■ %Alcohol by Volume (ABV) ■ Alcohol proof ■ °API ■ °Balling ■ °Baume ■ °Brix ■ °Plato ■ %Mass ■ %Solids ■ °Twaddle ■ User-defined calculation output

(1) Density and all derived variables based on density are unavailable from the Time Period Signal (TPS) transmitter version. These calculations are performed by an external flow computer or signal converter.

Additional communication options

The following communications accessories are purchased separately from the meter.

Type	Description
FOUNDATION fieldbus™	Micro Motion® remote-mount Model 2700 transmitter with FOUNDATION fieldbus ■ One Foundation fieldbus H1 connection provided.
WirelessHART®	Wireless HART is available via the THUM adapter
HART® Tri-Loop	Three additional 4–20 mA outputs are available via connection to a HART Tri-Loop

Hazardous area approvals

Ambient and process temperature limits are defined by temperature graphs for each meter and electronics interface option. Refer to the detailed approval specifications, including temperature graphs for all meter configurations, and safety instructions that can be found on the product page at the Micro Motion web site (at *www.micromotion.com*).

ATEX	
Zone 1 Intrinsically safe	**With display (Analog, TPS, Discrete versions only)** ■ II 2G Ex ib IIC T1-T4 Gb (–40 °C to +65 °C) ■ II 2D Ex ib IIIC T[(1)] °C Db ■ IP 66/67
	Without display (All transmitter versions) ■ II 2G Ex ib IIC T1-T6 Gb (–40 °C to +65 °C) ■ II 2D Ex ib IIIC T[(1)] °C Db ■ IP 66/67
Zone 1 Flameproof	**Without display (All transmitter versions)** ■ II 2G Ex d [ib] IIC T1-T6 Gb (–40 °C to +65 °C) ■ II 2D Ex tb IIIC T[(1)] °C Db ■ IP 66/67
CSA	
Intrinsically safe	**With or without display (Analog, TPS, Discrete versions only)** ■ Class I, Division 1, Groups A, B, C & D ■ Class I, Division 2, Groups A, B, C & D ■ Class II, Division 1, Groups E, F, & G
Explosion proof	**Without display (all transmitter versions)** ■ Class I, Division 1, Groups C & D ■ Class I, Division 2, Groups A, B, C & D ■ Class II, Division 1, Groups E, F & G
IECEx	
Zone 1 Intrinsically safe	**With display (Analog, TPS, Discrete versions only)** ■ Ex ib IIC T1-T4 Gb (–40 °C to +65 °C) **Without display (All transmitter versions)** ■ Ex ib IIC T1-T6 Gb (–40 °C to +65 °C)
Zone 1 Flameproof	**Without display (All transmitter versions)** ■ Ex d [ib] IIC T1-T6 Gb (–40 °C to +65 °C)

(1) See the ATEX instructions shipped with the product for the maximum surface temperature (T) for dust.

Environmental specifications

Specification	Value
Ambient temperature limits	–40 °C to +65 °C (–40 °F to +149°F)
Vibration limits	Meets IEC 68.2.6, endurance sweep, 5 to 2000 Hz, 50 sweep cycles at 1.0 g
Ingress protection rating	IP66/67, NEMA4

Power requirements

Following are the DC power requirements to operate the meter:

Meter type	Description
Explosion-proof/flameproof meters	■ 24 VDC, 0.65 W typical, 1.1 W maximum ■ Minimum recommended voltage: 21.6 VDC with 1000 ft of 24 AWG (300 m of 0.20 mm2) power-supply cable ■ At startup, power source must provide a minimum of 0.5 A of short-term current at a minimum of 19.6 V at the power input terminals.
Intrinsically safe meters	■ 24 VDC, 0.7 W typical with 250 Ω barrier, 0.96 W maximum with 250 Ω barrier ■ Minimum recommended voltage: 22.8 VDC with 1000 ft of 22 AWG (300 m of0.25 mm2) power-supply cable

Physical specifications

Materials of construction

Wetted parts	
Process connections	316L stainless steel
Measurement tubes	■ Nickel alloy C-22 (or UNS 06022) — *CDM100P option* ■ 316L stainless steel — *CDM100M option*
Non–wetted parts	
Sensor housing	316L stainless steel
Transmitter housing	Polyurethane-painted aluminum

Weight

Meter weights assume ANSI CL600 weld-neck, raised-face flanges, and integral transmitter electronics. Meters with other options may have weights that differ slightly from those listed.

Meter type	Weight
Compact density meter (standard option)	Approximately 28 lbs (13 kg)
Compact density meter (7835/7845 retrofit model with spools)	Approximately 31 lbs (14 kg)

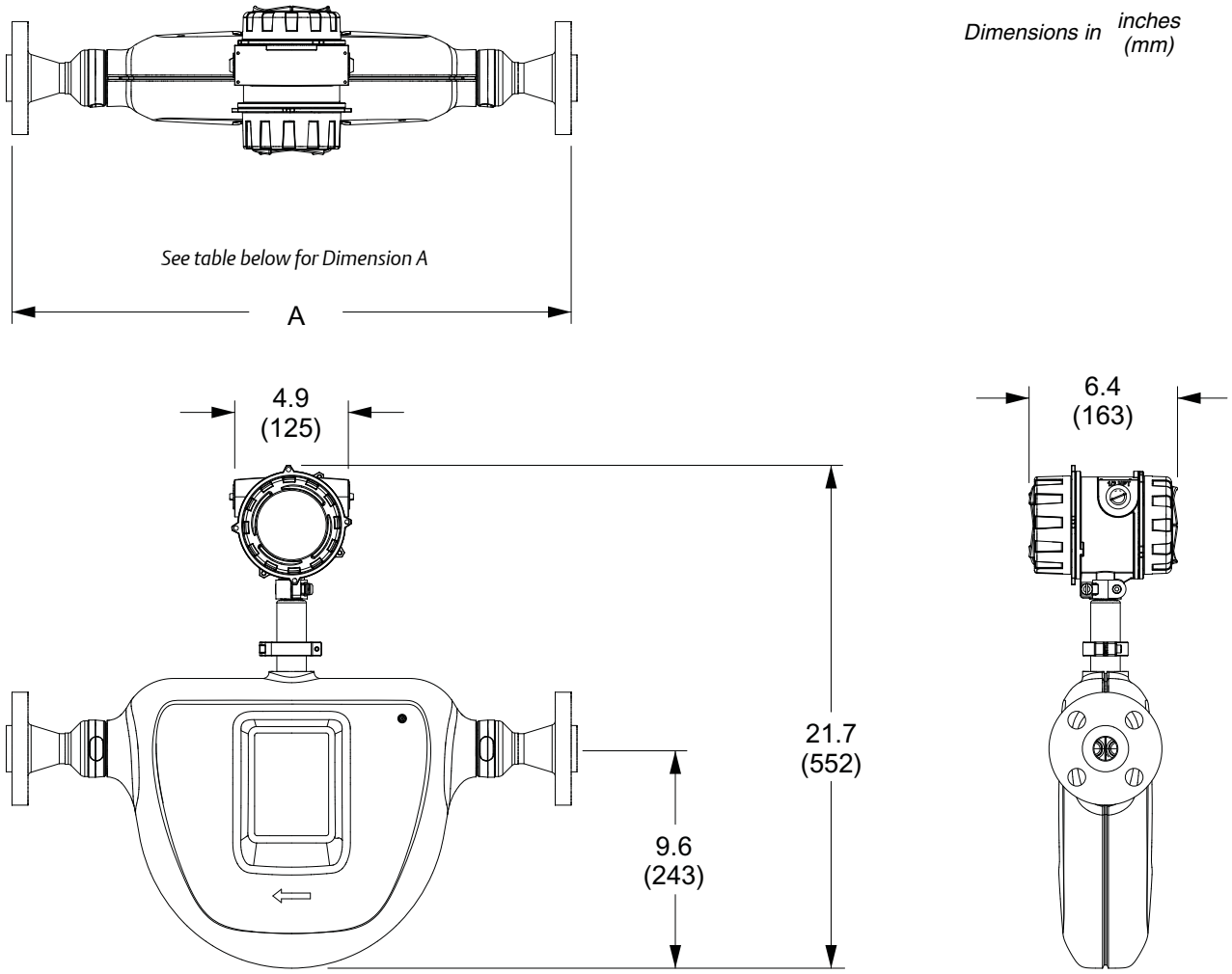
Dimensions

These dimensional drawings are intended to provide a basic guideline for sizing and planning. Complete and detailed dimensional drawings can be found through the product drawings link in our online store (*www.micromotion.com/onlinestore)*.

Depending on the flange connection, the face-to-face dimension may vary for the CDM standard option.

Compact density meter dimensions – standard option

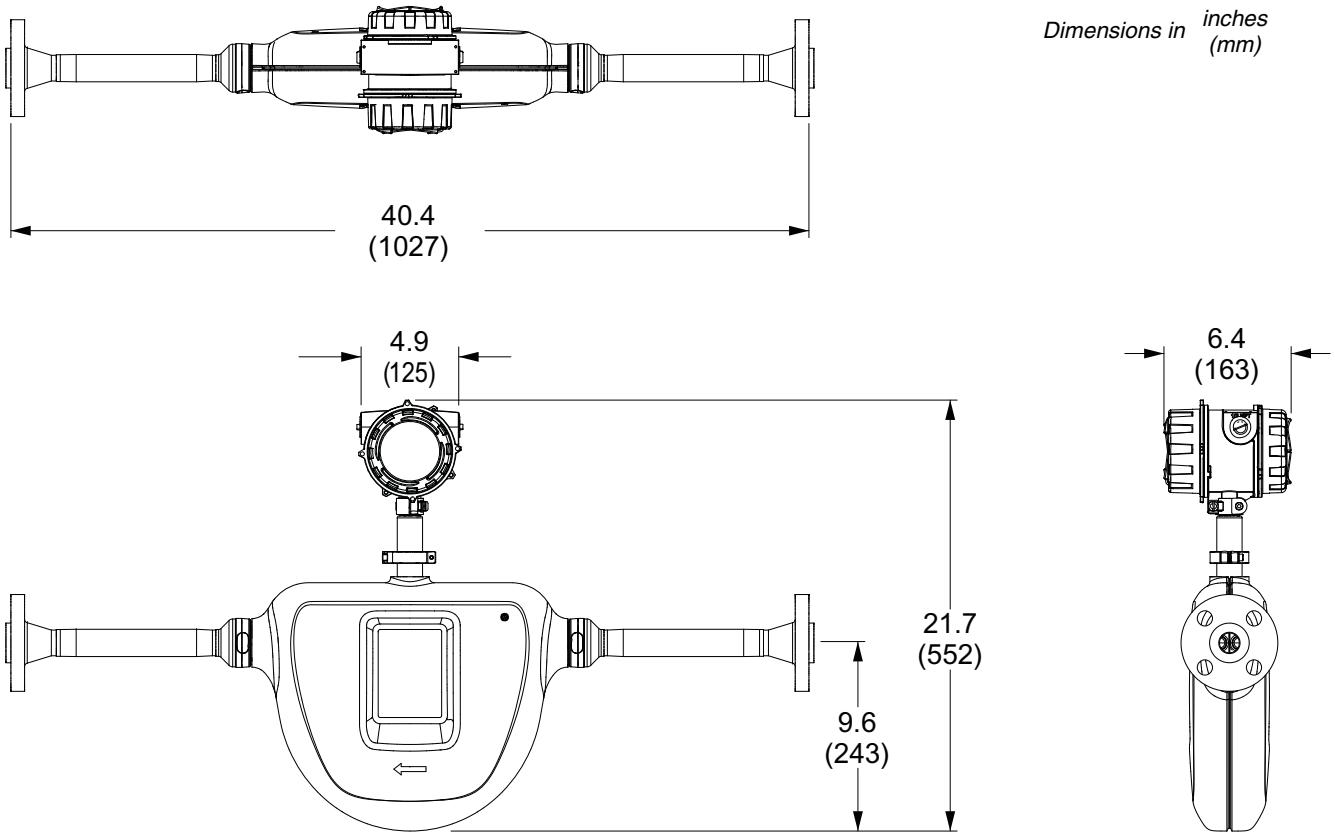
Dimensions in inches (mm)



Flange fitting type	Dim. A [± 0.125 in (3 mm)] in inches (mm)
1-inch, CL900, ASME B16.5, F316/316L, Weld neck flange	26.9 (683)
1-inch, CL900, ASME B16.5, F316/316L, Weld neck flange, RTJ face	26.9 (683)
1-inch, CL600, ASME B16.5, F316/316L, Weld neck flange	24.5 (623)
1-inch, CL300, ASME B16.5, F316/316L, Weld neck flange	24.0 (610)
1-inch, CL600, ASME B16.5, F316/316L, Weld neck flange, RTJ face	24.8 (627)
1-inch, CL600, ASME B16.5, F316/316L, Weld neck flange, Raised face 63-125, Raised face finish	24.8 (627)
1-inch, CL150, ASME B16.5, F316/316L, Weld neck flange	23.5 (597)
DN25, PN40, EN 1092-1, F316/316L, Weld neck flange, Type B1	22.5 (573)
DN25, PN40, EN 1092-1, F316/316L, Weld neck flange, Type D	22.5 (573)
DN25, PN100, EN 1092-1, F316/316L, Weld neck flange, Type B2	23.9 (608)

Compact density meter dimensions – 7835/45 retrofit option

Dimensions in inches (mm)



Additional options for installation and configuration

Required barriers and isolators for hazardous area installations

When installing the meter in a hazardous area, safety barriers and galvanic isolators must be installed between the meter and the signal processing equipment. Micro Motion provides the required barriers and isolators for purchase according to the transmitter output type.

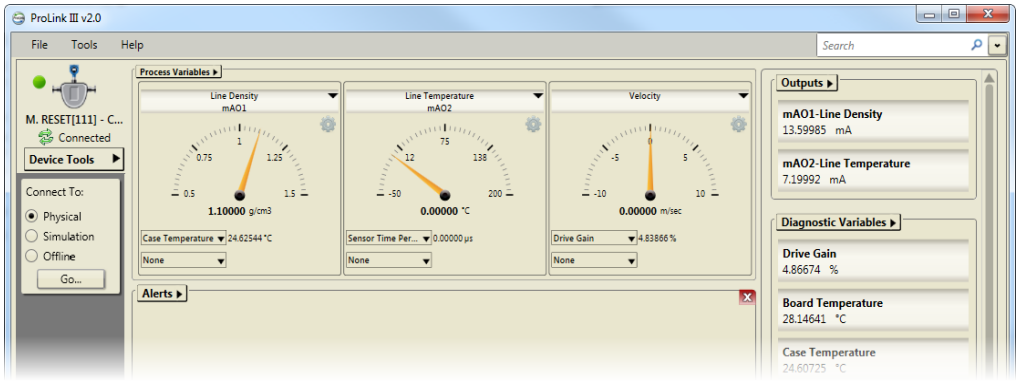
Safety barrier/galvanic isolator kits ordering information

The following kits are available for purchase through Micro Motion. For more information on ordering these barriers, contact your local sales representative or Micro Motion Customer Support at *flow.support@emerson.com*.

Model code	Description	Barrier/Isolator	Output	Notes
BARRIERSETAA	Barrier set, including barriers for all intrinsically safe transmitter versions (CH B: mA, TPS, or DO)	MTL7728P+	mA + HART	
		MTL7728P+	mA / TPS / DO	
		MTL7761AC	RS-485	
		MTL7728P+	Power	
ISOLATORSETBB	Isolator set, including isolators for intrinsically safe Analog version (CH B: mA)	MTL5541	mA + HART	RS-485 barrier is not isolated.
		MTL5541	mA	
		MTL7761AC	RS-485	
		MTL5523	Power	
ISOLATORSETCC	Isolator set, including isolators for intrinsically safe Time Period Signal (TPS)/Discrete versions (CH B: TPS or DO)	MTL5541	mA + HART	RS-485 barrier is not isolated.
		MTL5532	TPS/DO	
		MTL7761AC	RS-485	
		MTL5523	Power	

ProLink® III software: a configuration and service tool

ProLink® III software is an easy-to-use interface that allows you to view key process variables and diagnostics data for your meter. For more information on ordering the software, contact your local sales representative or Micro Motion Customer Support at *flow.support@emerson.com*.



Ordering information

Peak performance fiscal density meter (CDM100P)

Model	Description
CDM100P	Micro Motion compact density meter, 1-inch (25 mm), Nickel alloy C22 (N06022) manifold and measurement tubes
Code	**Process connection**
A18	1-inch, CL900, ASME B16.5, F316/316L, Weld neck flange
A25	1-inch, CL900, ASME B16.5, F316/316L, Weld neck flange, RTJ Face
330	1-inch, CL600, ASME B16.5, F316/316L, Weld neck flange
329	1-inch, CL300, ASME B16.5, F316/316L, Weld neck flange
A24	1-inch, CL600, ASME B16.5, F316/316L, Weld neck flange, RTJ Face
A21	1-inch, CL600, ASME B16.5, F316/316L, Weld neck flange, Raised face 63-125, Raised face finish
179	DN25, PN40, EN 1092-1, F316/316L, Weld neck flange, Type B1
311	DN25, PN40, EN 1092-1, F316/316L, Weld neck flange, Type D
180	DN25, PN100, EN 1092-1, F316/316L, Weld neck flange, Type B2
999[1]	ETO process connection
Code	**Case option**
M	316L stainless steel case
K	316L stainless steel case with purge fittings (one 1/2-inch NPT female)
C[2]	7835/45 retrofit model with standard 316L stainless steel sensor case
D[2]	7835/45 retrofit model with purge fittings (1/2-inch NPT) 316L stainless steel sensor case
Code	**Transmitter output option**
A[3] [4]	Integral processor for remote mount 2700 FOUNDATION fieldbus™ transmitter (Channels A & B inactive)
B	Integral transmitter, Channel B = Time Period Signal, Channel A = mA + HART, Channel C = Modbus/RS-485
C	Integral transmitter, Channel B = mA output, Channel A = mA + HART, Channel C = Modbus/RS-485
D	Integral transmitter, Channel B = Discrete output, Channel A = mA + HART, Channel C = Modbus/RS-485
Code	**Display option**
A	No display
B[5][6]	Two-line display (non-backlit)
Code	**Approvals**
For all Transmitter output options	
Z	ATEX – Intrinsically safe (zone 1)
B	CSA (US and Canada) – Intrinsically safe Class 1 Div. 1 Groups B, C, D
E	IECEx – Intrinsically safe (zone 1)
M	Micro Motion standard (no approval)
For Transmitter output options B, C, and D	
A	CSA (US and Canada) – Explosion-proof Class 1 Div. 1 Groups C, D
F	ATEX – Zone 1 flameproof
I	IECEx – Zone 1 flameproof
T	TIIS – IIC sensor (Not available for quotes outside of Japan)

Code	Application configuration[7]
Available with all Transmitter output options	
00	No Application configuration
95	Process temperature (4 mA = 0 °C, 20 mA = 200 °C)
96	Process temperature (4 mA = –50 °C, 20 mA = 200 °C)
97	Process temperature (4 mA = –50 °C, 20 mA = 150 °C)
98	Process temperature (4 mA = 0 °C, 20 mA = 100 °C)
XX[8]	ETO analog output configuration (customer data required)
Available with Transmitter output options A, C & D	
11	Degrees API (4 mA = 0°, 20 mA = 100°) (Process temperature = 0 °C to 60 °C)
12	Line Density (4 mA = 500 kg/m^3, 20 mA = 1500 kg/m^3) (Process temperature = –40 °C to +140 °C)
13	Base Density to API tables (metric) (4 mA = 500 kg/m^3, 20 mA = 1500 kg/m^3) (Process temperature = –40 °C to +140 °C)
21	% Alcohol (4 mA = 0%, 20 mA = 20%) (Process temperature = 0 °C to 40 °C)
22	% Alcohol (4 mA = 50%, 20 mA = 100%) (Process temperature = 40 °C to 70 °C)
23	% Alcohol (4 mA = 80%, 20 mA = 100%) (Process temperature = 50 °C to 90 °C)
24	Alcohol proof (4 mA = 100, 20 mA = 200) (Process temperature = 50 °C to 70 °C)
25	Alcohol proof (4 mA = 160, 20 mA = 200) (Process temperature = 50 °C to 90 °C)
26	% Methanol concentration (4 mA = 35%, 20 mA = 60%) (Process temperature = 0 °C to 40 °C)
27	% Ethylene Glycol concentration (4 mA = 10%, 20 mA = 50%) (Process temperature = –20 °C to 40 °C)
31	°Brix (4 mA = 0°, 20 mA = 40°) (Process temperature = 0 °C to 100 °C)
32	°Brix (4 mA = 30°, 20 mA = 80°) (Process temperature = 0 °C to 100 °C)
41	°Balling (4 mA = 0°, 20 mA = 20°) (Process temperature = 0 °C to 100 °C)
51	% NaOH Concentration (4 mA = 0%, 20 mA = 20%) (Process temperature = 0 °C to 50 °C)
52	% H2SO4 Concentration (4 mA = 0%, 20 mA = 10%) (Process temperature = 0 °C to 38 °C)
53	% H2SO4 Concentration (4 mA = 75%, 20 mA = 94%) (Process temperature = 24 °C to 38 °C)
64	% HFCS – 42 (4 mA = 0%, 20 mA = 50%) (Process temperature = 0 °C to 100 °C)
65	% HFCS – 55 (4 mA = 0%, 20 mA = 50%) (Process temperature = 0 °C to 100 °C)
66	% HFCS – 90 (4 mA = 0%, 20 mA = 50%) (Process temperature = 0 °C to 100 °C)
71	°Plato (4 mA = 0°, 20 mA = 30°) (Process temperature = 0 °C to 100 °C)
Code	**Language (manual and software)**
Transmitter display language English	
E	English installation manual and English configuration manual
I	Italian installation manual and English configuration manual
M	Chinese installation manual and English configuration manual
R	Russian installation manual and English configuration manual
Transmitter display language French	
F	French installation manual and English configuration manual
Transmitter display language German	
G	German installation manual and English configuration manual
Transmitter display language Spanish	
S	Spanish installation manual and English configuration manual

Code	Calibration options
A	Standard [±0.1 kg/m^3 (±0.0001 g/cm^3) density accuracy]
Code	**Thermal insulation**
Z	No thermal insulation (For CDM thermally insulating jacket, order part number INSJKTCDM100)
Code	**Conduit connections**
Z	Standard 1/2-inch NPT fittings (no adapters)
B	M20 stainless steel adapters
Code	**Factory options**
Z	Standard product
X	ETO product
Code	**Special tests and certificates(9)**
Material Quality Examination Tests and Certificates (select any from this group)	
MC	Material Inspection Certificate 3.1 (Supplier Lot Traceability per EN 10204)
NC	NACE Certificate 2.1 (MR0175 and MR0103)
Pressure Testing (select any from this group)	
HT	Hydrostatic Test Certificate 3.1
Radiographic Examination (select only one from this group)	
RT	X-Ray Package 3.1 (Radiographic Examination Certificate with digital image; Weld map; Radiographic Inspection NDE Qualification)
Dye Penetrant Examination (select only one from this group)	
D1	Dye Penetrant Test Package 3.1 (Sensor only; Liquid Dye Penetration NDE Qualification)
D2	Dye Penetrant Test Package 3.1 (Case only; Liquid Dye Penetration NDE Qualification)
Weld Examination	
WP	Weld Procedure Package (Weld Map, Weld Procedure Specification, Weld Procedure Qualification Record, Welder Performance Qualification)
Positive Material Testing (select only one from this group)	
PM	Positive Material Test Certificate 3.1 (without carbon content)
PC	Positive Material Test Certificate 3.1 (including carbon content)
Sensor Completion Options (select any from this group)	
WG	Witness General
SP	Special Packaging
Instrument Tagging	
TG	Instrument Tagging – customer information required (max. 24 characters)

(1) Requires Factory option X.
(2) Available only with process connection codes 329, 330 & A18.
(3) Requires remote-mount Model 2700 transmitter with mounting option H - 4 wire connection option (power and communications).
(4) With Transmitter Output Options code A, all signal outputs on the integrally mounted transmitter are disabled, except for the Modbus/RS-485 communications which is used for communication to the Model 2700 transmitter.
(5) Available only with approvals codes Z, B & E.
(6) Not available with Transmitter Output Option code B.
(7) When Transmitter output options code is B, C or D, the chosen Application configuration low & high limits are also programmed as the Channel A mA output 4 mA and 20 mA.
(8) Requires factory option X.
(9) Multiple test or certificate options may be selected.

General purpose precision density meter (CDM100M)

Model	Description
CDM100M	Micro Motion compact density meter, 1-inch (25 mm), 316L stainless steel manifold and measurement tubes
Code	**Process connection**
330	1-inch, CL600, ASME B16.5, F316/316L, Weld neck flange
329	1-inch, CL300, ASME B16.5, F316/316L, Weld neck flange
A24	1-inch, CL600, ASME B16.5, F316/316L, Weld neck flange, RTJ Face
A21	1-inch, CL600, ASME B16.5, F316/316L, Weld neck flange, Raised face 63-125, Raised face finish
179	DN25, PN40, EN 1092-1, F316/316L, Weld neck flange, Type B1
311	DN25, PN40, EN 1092-1, F316/316L, Weld neck flange, Type D
180	DN25, PN100, EN 1092-1, F316/316L, Weld neck flange, Type B2
328	1-inch, CL150, ASME B16.5, F316/316L, Weld neck flange
999[1]	ETO process connection
Code	**Case and hygienic option**
M	316L stainless steel case
K	316L stainless steel case with purge fittings (one 1/2-inch NPT female)
C[2]	7835/45 retrofit model with standard 316L stainless steel sensor case
D[2]	7835/45 retrofit model with outer containment (1/2-inch NPT) 316L stainless steel sensor case
Code	**Transmitter output option**
A[3] [4]	Integral processor for remote mount 2700 FOUNDATION fieldbus™ transmitter (Channels A & B inactive)
B	Integral transmitter, Channel B = Time Period Signal, Channel A = mA + HART, Channel C = Modbus/RS-485
C	Integral transmitter, Channel B = mA output, Channel A = mA + HART, Channel C = Modbus/RS-485
D	Integral transmitter, Channel B = Discrete output, Channel A = mA + HART, Channel C = Modbus/RS-485
Code	**Display option**
A	No display
B[5][6]	Two-line display (non-backlit)
Code	**Approvals**
Available with all transmitter output options	
Z	ATEX – Intrinsically safe (zone 1)
B	CSA (US and Canada) – Intrinsically safe
E	IECEx – Intrinsically safe (zone 1)
M	Micro Motion standard (no approval)
Available with transmitter output option codes B, C, and D	
A	CSA (US and Canada) – Explosion-proof Class 1 Div. 1 Groups C & D
F	ATEX – Zone 1 flameproof
I	IECEx – Zone 1 flameproof
T	TIIS – IIC sensor (Not available for quotes outside of Japan)

Code	Application configuration[7]
Available with all transmitter output options	
00	No Application configuration
95	Process temperature (4 mA = 0 °C, 20 mA = 200 °C)
96	Process temperature (4 mA = –50 °C, 20 mA = 200 °C)
97	Process temperature (4 mA = –50 °C, 20 mA = 150 °C)
98	Process temperature (4 mA = 0 °C, 20 mA = 100 °C)
XX[1]	ETO analog output configuration (customer data required)
Available with transmitter output option codes A, C & D	
11	Degrees API (4 mA = 0°, 20 mA = 100°) (Process temperature = 0 °C to 60 °C)
12	Line Density (4 mA = 500 kg/m^3, 20 mA = 1500 kg/m^3) (Process temperature = –40 °C to +140 °C)
13	Base Density to API tables (metric) (4 mA = 500 kg/m^3, 20 mA = 1500 kg/m^3) (Process temperature = –40 °C to +140 °C)
21	% Alcohol (4 mA = 0%, 20 mA = 20%) (Process temperature = 0 °C to 40 °C)
22	% Alcohol (4 mA = 50%, 20 mA = 100%) (Process temperature = 40 °C to 70 °C)
23	% Alcohol (4 mA = 80%, 20 mA = 100%) (Process temperature = 50 °C to 90 °C)
24	Alcohol proof (4 mA = 100, 20 mA = 200) (Process temperature = 50 °C to 70 °C)
25	Alcohol proof (4 mA = 160, 20 mA = 200) (Process temperature = 50 °C to 90 °C)
26	% Methanol concentration (4 mA = 35%, 20 mA = 60%) (Process temperature = 0 °C to 40 °C)
27	% Ethylene Glycol concentration (4 mA = 10%, 20 mA = 50%) (Process temperature = –20 °C to 40 °C)
31	°Brix (4 mA = 0°, 20 mA = 40°) (Process temperature = 0 °C to 100 °C)
32	°Brix (4 mA = 30°, 20 mA = 80°) (Process temperature = 0 °C to 100 °C)
41	°Balling (4 mA = 0°, 20 mA = 20°) (Process temperature = 0 °C to 100 °C)
51	% NaOH Concentration (4 mA = 0%, 20 mA = 20%) (Process temperature = 0 °C to 50 °C)
52	% H2SO4 Concentration (4 mA = 0%, 20 mA = 10%) (Process temperature = 0 °C to 38 °C)
53	% H2SO4 Concentration (4 mA = 75%, 20 mA = 94%) (Process temperature = 24 °C to 38 °C)
54	% HN03 Concentration (4 mA = 0%, 20 mA = 40%) (Process temperature = 10 °C to 50 °C)
55	% KOH Concentration (4 mA = 0%, 20 mA = 40%) (Process temperature = 0 °C to 90 °C)
64	% HFCS – 42 (4 mA = 0%, 20 mA = 50%) (Process temperature = 0 °C to 100 °C)
65	% HFCS – 55 (4 mA = 0%, 20 mA = 50%) (Process temperature = 0 °C to 100 °C)
66	% HFCS – 90 (4 mA = 0%, 20 mA = 50%) (Process temperature = 0 °C to 100 °C)
71	°Plato (4 mA = 0°, 20 mA = 30°) (Process temperature = 0 °C to 100 °C)
Code	**Language (manual and software)**
Transmitter display language English	
E	English installation manual and English configuration manual
I	Italian installation manual and English configuration manual
M	Chinese installation manual and English configuration manual
R	Russian installation manual and English configuration manual
Transmitter display language French	
F	French installation manual and English configuration manual
Transmitter display language German	
G	German installation manual and English configuration manual
Transmitter display language Spanish	
S	Spanish installation manual and English configuration manual

Code	Calibration options
A	Standard [±0.2 kg/m^3(±0.0002 g/cm^3) density accuracy]
Code	**Thermal insulation**
Z	No thermal insulation (For CDM thermally insulating jacket, order part number INSJKTCDM100)
Code	**Conduit connections**
Z	Standard 1/2-inch NPT fittings (no adapters)
B	M20 stainless steel adapters included
Code	**Factory options**
Z	Standard product
X	ETO product
Code	**Special tests and certificates(8)**
Material Quality Examination Tests and Certificates (select any from this group)	
MC	Material Inspection Certificate 3.1 (Supplier Lot Traceability per EN 10204)
NC	NACE Certificate 2.1 (MR0175 and MR0103)
Pressure Testing (select any from this group)	
HT	Hydrostatic Test Certificate 3.1
Radiographic Examination (select only one from this group)	
RT	X-Ray Package 3.1 (Radiographic Examination Certificate with digital image; Weld map; Radiographic Inspection NDE Qualification)
Dye Penetrant Examination (select only one from this group)	
D1	Dye Penetrant Test Package 3.1 (Sensor only; Liquid Dye Penetration NDE Qualification)
D2	Dye Penetrant Test Package 3.1 (Case only; Liquid Dye Penetration NDE Qualification)
Weld Examination	
WP	Weld Procedure Package (Weld Map, Weld Procedure Specification, Weld Procedure Qualification Record, Welder Performance Qualification)
Positive Material Testing (select only one from this group)	
PM	Positive Material Test Certificate 3.1 (without carbon content)
PC	Positive Material Test Certificate 3.1 (including carbon content)
Sensor Completion Options (select any from this group)	
WG	Witness General
SP	Special Packaging
Instrument Tagging	
TG	Instrument Tagging – customer information required (max. 24 characters)

(1) Requires Factory option X.
(2) Available only with process connection codes 329, 330 & A18.
(3) Requires remote-mount Model 2700 transmitter with mounting option H - 4 wire connection option (power and communications).
(4) With Transmitter Output Options code A, all signal outputs on the integrally mounted transmitter are disabled, except for the Modbus/RS-485 communications which is used for communication to the Model 2700 transmitter.
(5) Available only with approvals codes Z, B & E.
(6) Not available with Transmitter Output Option code B.
(7) When Transmitter output options code is B, C or D, the chosen Application configuration low & high limits are also programmed as the Channel A mA output 4 mA and 20 mA.
(8) Multiple test or certificate options may be selected.

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