

Product Data Sheet

PS-001334, Rev. E
April 2013

Micro Motion® Certified Marine Bunker Measurement Solution

The Micro Motion® Certified Marine Bunker Measurement Solution from Emerson Process Management combines the power of the Series 3000 platform, the specialized processing of the Marine Bunker Transfer Package, the accuracy of Coriolis meters, and field services to provide transparent, traceable measurement for marine bunker fuel transfer.

OIML/MID compliance is monitored and reported for each transfer. When the appropriate options are purchased, the bunker ticket can be used as a legal document.



Complete solution for custody transfer of marine heavy fuel oil

- Hardware and software components
- Installation and startup assistance
- Bunker transfer procedures
- System suitable for installation on terminal, barge, or vessel, for use by vendor, customer, or transportation agent

Certified accuracy and security

- Flow measurement meets OIML R117-1 and MID 2004/22/EC Annex MI-005 requirements
- Security capabilities meet Weights & Measures/custody transfer requirements
- Bunker ticket can be used as legal document

Powerful user interface and data management

- Monitoring features enable early detection of aeration, erratic flow, or other process problems
- Additional history, trending, and reporting functions available via ProLink® II



Certified Marine Bunker Measurement Solution

Designed for accuracy and usability. The Marine Bunker Transfer Package software, running on the Series 3000 transmitter, applies the accuracy and reliability of Coriolis measurement to bunker fuel transfers, and adds specialty features for the marine industry.

Bunker measurement is based on the mass total process variable, which is OIML/MID-approved for bunker transfer of marine fuels when the appropriate options are purchased and the defined Micro Motion bunkering procedures are followed. Due to its immunity to process variation, direct measurement of mass is more accurate than traditional volume measurement.

The Certified Marine Bunker Measurement Solution begins measurement when flow starts and ends measurement when flow stops. New measurement algorithms are optimized for marine bunker fuels. The effects of aeration (air or gas entrainment) are calculated continuously, allowing the operator to take corrective action if required. Automatic alarms are posted if aeration reaches preset limits. At the end of the transfer, the system assesses OIML/MID compliance and reports Pass or Fail.

The Certified Marine Bunker Measurement Solution is shipped with ticket-printing capability. If an MID

option is ordered (recommended), the ticket can be used as a legal document. Other options include a ProLink II interface that supports data collection, trend analysis, and reporting for individual bunkers, and the Smart Meter Verification application.

Built on the Series 3000 platform. The powerful Series 3000 platform provides local interface and display capabilities, plus Modbus communications for host or PLC access. Complete configuration, operation, and maintenance functions are available via either method. Security can be implemented via passwords and Weights & Measures hardware/software lockout.

The innovative Series 3000 interface provides complete access to configuration, operation, and maintenance functions via a large, easy-to-use display with big, tactile-feedback pushbuttons. A custom Marine Bunkering dashboard allows operators to manage bunker transfers and monitor fuel delivery, temperature, density, and OIML/MID compliance. At the end of the transfer, the operator can print tickets and/or profile reports. The five most recent transfers are available for review or for duplicate tickets.

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Applications

Marine Bunker Transfer Package

- Meets OIML R117-1 and MID 2004/22/EC Annex MI-005 requirements
- Custom display (Marine Bunkering dashboard) provides continuous monitoring of quantity transferred (mass total), mass flow rate, and selected variables. Additionally, the system monitors process aeration (air or gas entrainment) against OIML/MID limits. Using the default settings, a medium-aeration alarm is posted when aeration reaches 20% of the limit, and a high-aeration alarm is posted when aeration reaches 75% of the limit.
- Configurable alarms assist detection of process problems. An integrity breach alarm is available for installations that include an integrity detection loop.
- At end of bunker transfer, reports transfer data plus OIML/MID pass/fail.
- Configurable tickets for different levels of detail, such as inventories, gross volume and net volume totals, average temperature, average API density, etc.
- System can calculate and print “mass in air” data instead of “mass in vacuum.”
- Bi-directional measurement is available to support installations that will be both loading and unloading fuel (i.e., barges).
- Four system options:
 - Basic: Measure the bunker transfer and print bunker tickets (printing optional)
 - Basic/MID: Measure the bunker transfer and print MID-approved bunker tickets
 - Profile: Measure the bunker transfer and print profile reports and bunker tickets (ticket printing optional)
 - Profile/MID: Measure the bunker transfer and print profile reports and MID-approved bunker tickets
- Supported sensors:
 - ELITE® High Capacity Coriolis Meters (CMFHC3M) (approved for use with the Certified Marine Bunker Measurement Solution)
- Requirements:
 - Enhanced core processor
 - Weights & Measures application and hardware (automatically included with order)
 - Petroleum measurement application (automatically included with order)

Process monitor/totalizer

Process monitoring and totalizing for multiple variables, including mass total (OIML/MID approved for bunker transfer as applicable), mass flow rate, volume flow rate, density, and temperature. All variables are reported in the user's choice of unit. Unit options include all common units, plus the ability to define a special unit for mass or volume. Included automatically.

Weights & Measures

Included automatically with the Certified Marine Bunker Measurement Solution. Provides:

- Physical and software security and lockout capability
- MID 2004/22/EC compliance, based on OIML recommendation R117-1
- Security-breach alarm posting
- MID-approved mass totalizer
- Audit trail of configuration changes
- Custom formatting of receipt tickets

Petroleum measurement

Provides process variables such as temperature-corrected volume flow and batch-weighted average density, calculated using the American Petroleum Institute equations. Included automatically with the Certified Marine Bunker Measurement Solution.

Smart Meter Verification

Provides a quick, complete assessment of a Micro Motion Coriolis meter, determining whether the meter has been affected by erosion, corrosion, or other influences affecting meter calibration. No secondary references are required to perform this operation. Meter verification tests can be run manually or automatically, using the built-in scheduler function. The Continue Measurement option enables test execution without interrupting process measurement and reporting.⁽¹⁾

(1) Background meter verification (the Continue Measurement option) can be run while the transmitter is secured. For other meter verification options, the transmitter must be unsecured.

System performance

The Certified Marine Bunker Measurement Solution is engineered to deliver bunkers to 0.5% accuracy under the following conditions:

- A Basic/MID or Profile/MID system is purchased.
- The system is installed according to Micro Motion recommendations.
- Bunker Startup services are provided by a certified technician.
- Micro Motion bunker transfer procedures are followed.
- Flow rate does not exceed 900 mTon/hr.

Sample tickets

Micro Motion Inc, Business Unit of Emerson
[Header 1]
[Header 2]

[Transmitter Tag]

System ID: [HART ID]

BOL Number: [xx]

Reset Time
26-JAN-2012 17:14:49

Print Time
26-JAN-2012 17:17:46

Bunker Begin Time
26-JAN-2012 17:15:21

Bunker End Time
26-JAN-2012 18:17:17

Mass Total
6.2995 t

Mass Inventory
6034.5977 t

Bunker Begin Fwd Inv
6218.1221 t

Bunker End Fwd Inv
6224.4219 t

Bunker Begin Rev Inv
196.3344 t

Bunker End Rev Inv
196.3344 t

Overall Bunker: Pass

IMPORTANT: Attach this
ticket to BDN Report

[Footer]
Original

Basic or Profile system

Approved Measurement
Micro Motion Inc, Business Unit of Emerson
[Header 1]
[Header 2]

[Transmitter Tag]

System ID: [HART ID]

BOL Number: [xx]

Reset Time
10-JAN-2012 9:48:53

Print Time
10-JAN-2012 9:51:37

Bunker Begin Time
10-JAN-2012 9:51:14

Bunker End Time
10-JAN-2012 9:51:30

Mass Total
6.2995 t

Aeration Limit
71.42876%

Overall OIML R117-1 Accuracy: Pass
* Accuracy within 0.5%

MID Cert#: xxxx

Approved Measurement
IMPORTANT: Attach this
ticket to BDN Report

[Footer]
Original

Basic/MID or Profile/MID system

Marine Bunker Instruments

- MID-Approved Printer Option**
 - Supports MID-approved ticket printing for Basic/MID and Profile/MID systems.
 - Includes:
 - MID-approved ticket printer (Epson TM-T88V)⁽¹⁾
 - MID-approved RS-485 to RS-232 signal converter (KK Systems K2-ADE-TB).⁽¹⁾
- Non-MID-Approved Printer Option**
 - Supports standard ticket printing (not MID-approved) for Basic and Profile systems.
 - Includes:
 - Standard ticket printer (Epson TM-U295)⁽¹⁾
 - RS-485 to RS-232 signal converter (KK Systems K2-ADE-TB)⁽¹⁾
- Profile Printing Option**
 - Required for Profile and Profile/MID systems.
 - Enables use of RS-485 terminals for communication with both ticket printer and ProLink II. Transmitter automatically detects communication partner and switches as required.
 - Factory-assembled Printer Interface Component⁽¹⁾ includes:
 - NEMA-approved enclosure
 - Factory-mounted relay and terminal block
 - Factory-mounted relay power supply
- Pressure instrument**
 - Rosemount Model 3051S (sensor and transmitter). Included automatically with all orders.
- Temperature instrument**
 - Included automatically with all orders. Components:

- Transmitter		Rosemount Model 3144P
- RTD (sensor)	Approvals option = Z (ATEX)	Rosemount Model 0065
	Approvals option = U (FM)	Rosemount Model 0068
- Check valve**
 - 1-inch industry-standard component. Included automatically if Type option = V (Vessel).
- Level switch**
 - Rosemount Model 2120
 - If Orientation option = F (Flag), one level switch is included automatically with order.
 - If Orientation option code = T (Tubes down), two level switches are included automatically with order.

(1) *Must be installed in safe area.*

Micro Motion Bunker Services

Bunker survey⁽¹⁾

One-day site visit, plus preparation and documentation. Includes:

- Review of build drawings and current structure
- Assessment of installation options
- Assessment of OIML/MID readiness (if applicable)
- Development and delivery of installation recommendations and requirements

Bunker startup⁽²⁾

Site visit.

Basic systems and Profile systems

- Transmitter and application configuration
- System zero
- Print and communications test
- Monitoring of first bunker transfer
- Witness of first ticket printing (if applicable)

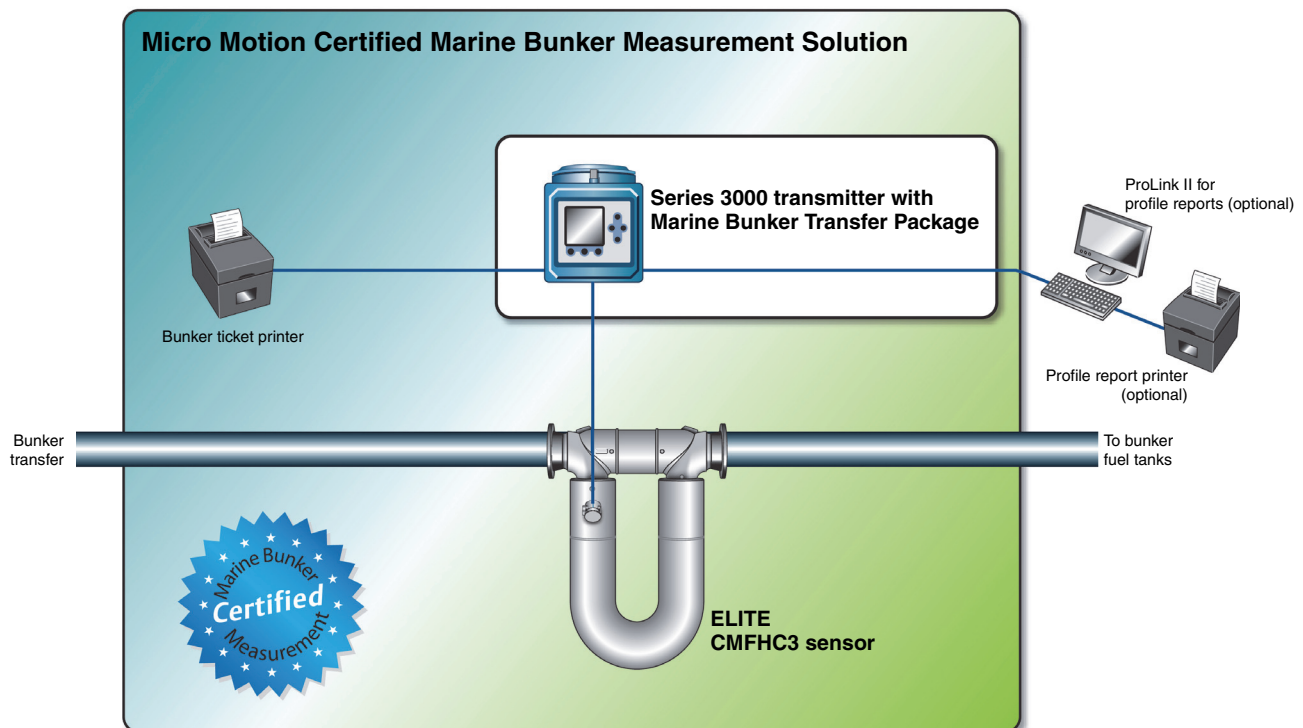
Basic/MID systems and Profile/MID systems

- Transmitter and application configuration
- System zero
- Print and communications test
- System verification according to Measuring Instrument Directive (MID) Module F, performed under Approved Supplier Certificate AS-008, and including:
 - Checking of measurement instruments
 - Monitoring of first bunker transfer
 - Witness of first ticket printing
 - Weights & Measures sealing, if system meets requirements
 - NMI Certificate of Conformity

(1) Must be ordered and completed before product order.

(2) Mechanical and electrical installation must be completed by customer before site visit.

Typical system



Housings

Transmitter

Rack-mount	19-inch (486.2 mm) rack-mount housing meets DIN standard 41494 and IEC 297-3 Front panel is rated IP40
Panel-mount	Front panel with bezel is rated NEMA 4X (IP65)
Field-mount	Compartment with threaded cover contains electronics Terminal compartment contains: <ul style="list-style-type: none">• Non-intrinsically safe compartment with input/output and power supply terminals• Intrinsically safe compartment with interface/display, sensor terminals (Model 3700 only), and optional input and output terminals Mounting bracket and interface/display rotate to allow mounting in four different orientations Rated NEMA 4X (IP67)

Sensor See the product data sheet for your sensor.

Marine Bunker Instruments See vendor documentation for individual components, or contact Micro Motion.

Interface/display

Transmitter

Display	Backlit LCD, 128 × 128 pixel, bit map Adjustable contrast Non-glare tempered glass lens Suitable for hazardous area installation
Keypad membrane switch	Large push buttons with tactile feedback Software-defined function keys Chemical-resistant polyester

Sensor N/A

Marine Bunker Instruments See vendor documentation for individual components, or contact Micro Motion.

Weight

Transmitter

Model 3500	Maximum 3.5 lb (1.6 kg), excluding prepared cables
Model 3700	19 lb (8.6 kg)

Sensor See the product data sheet for your sensor.

Marine Bunker Instruments See vendor documentation for individual components, or contact Micro Motion.

Cabling between transmitter and sensor

Requirements Requires standard 4-wire twisted-pair shielded signal cable between the sensor and the transmitter. Micro Motion recommends using Micro Motion 4-wire cable. For Lloyd's Register Type Approval, supplied ferrite bead must be installed on cable.

10 ft (3 m) of 4-wire cable is included with the transmitter. To obtain additional cable, include with purchase order.

Maximum cable lengths	Cable type	Wire gauge	Maximum length
	Micro Motion 4-wire	Not applicable	1000 feet (300 meters)
	User-supplied 4-wire		
	• Power wires (VDC)	22 AWG (0.35 mm ²)	300 feet (90 meters)
		20 AWG (0.5 mm ²)	500 feet (150 meters)
		18 AWG (0.8 mm ²)	1000 feet (300 meters)
	• Signal wires (RS-485)	22 AWG (0.35 mm ²) or larger	1000 feet (300 meters)

Power supply

Transmitter

AC power supply 85 to 265 VAC
50/60 Hz, 30 VA
0.33 A maximum at 85 VAC, 0.15 A maximum at 265 VAC
IEC 127-3/4 fuse, 0.63 A time-delay
Complies with European low-voltage directive 2006/95/EC per IEC 61010-1
Installation (Overvoltage) Category II, Pollution Degree 2

DC power supply 18 to 30 VDC
18 watts typical, 25 watts maximum
IEC 127-3/4 fuse, 1.6 A time-delay

Sensor N/A

Marine Bunker Instruments See vendor documentation for individual components, or contact Micro Motion.

Electrical connections

Transmitter

Input and output connections	Rack-mount	Type D connectors per DIN standard 41612 (IEC 603-2) Available as solder tails (standard) or screw terminals (optional) Screw terminals accept 24 AWG (0.25 mm ²) to 16 AWG (1.5 mm ²) wires
	Panel-mount	Screw terminals (standard) or I/O cable with remote DIN rail-mount screw terminals (optional) Remote terminals attach to any of four rail types. I/O cable is available in lengths of 2, 5, and 10 feet (0.6, 1.5, and 3 meters) Screw terminals accept 24 AWG (0.25 mm ²) to 16 AWG (1.5 mm ²) wires
	Field-mount⁽¹⁾	Two color-coded wiring compartments: <ul style="list-style-type: none"> • Compartment with intrinsically safe terminals has two 3/4-inch NPT or M20 × 1.5 conduit openings • Compartment with non-intrinsically safe terminals has three 3/4-inch NPT or M20 × 1.5 conduit openings Screw terminals accept 22 AWG (0.34 mm ²) to 16 AWG (1.5 mm ²) wires
Power connection	Rack-mount	Screw terminals are fixed to rack chassis Ground makes first and breaks last Screw terminals accept 18 AWG (0.75 mm ²) to 14 AWG (2.5 mm ²) wires
	Panel-mount	Screw terminals accept 18 AWG (0.75 mm ²) to 14 AWG (2.5 mm ²) wires
	Field-mount⁽¹⁾	Screw terminals accept 18 AWG (0.75 mm ²) to 12 AWG (4.0 mm ²) wires
Sensor	N/A	
Marine Bunker Instruments	See vendor documentation for individual components, or contact Micro Motion.	

(1) For Lloyd's Register Type Approval (field-mount only), supplied ferrite beads must be installed on I/O wiring and power wiring.

Input signals

Transmitter

Non-intrinsically safe input signals	One 2-wire frequency/pulse input	Frequency range	0–20,000 Hz
		Minimum pulse width	25 μ -sec
		Power	Sourcing or sinking
	Two discrete momentary inputs	Voltage	0–0.8 VDC low state 3–30 VDC high state
		Current	Nominal 5 mA pull-up
		Pulse width	0.15 sec minimum
Intrinsically safe input signals	One 4-wire Coriolis sensor signal input with ground	Voltage	0–0.8 VDC low state 3–30 VDC high state
		Dry contacts	

Sensor

N/A

Marine Bunker Instruments

See vendor documentation for individual components, or contact Micro Motion.

Output signals

Transmitter

Non-intrinsically safe output signals

Two active
4–20 mA outputs

- Isolated to ± 50 VDC from all other outputs and earth ground.
- Maximum load limit of 1000 ohms.
- Output is linear with process from 3.8 to 20.5 mA per NAMUR NE43 (February 2003).

Three discrete outputs

Configurable for the application

Polarity	Active high or active low, software selectable
Power	Internal pull-up to 24 V
Voltage	24 VDC nominal
Current	Sourcing at 5.6 mA when $V_{out} = 3$ VDC Sinking up to 500 mA at 30 VDC maximum

One 2-wire
frequency/pulse output

- Scalable to 10,000 Hz.
- Output is linear with flow rate to 12,500 Hz.

Pulse width	50% duty cycle above the crossover frequency ⁽¹⁾ Configurable between 0.543 ms and 277 ms
Polarity	Active high or active low, software selectable
Power	Active or passive, software selectable
Voltage	24 VDC nominal, active 30 VDC applied maximum, passive
Current	Sourcing at 10 mA at 3 VDC, active Sinking at 500 mA, active or passive

Fault actions

When a fault is detected, outputs go to configured states. User can select upscale, downscale, internal zero, or none. Milliamp outputs conform to NAMUR NE43 (February 2003).

Upscale	Milliamp	21 to 24 mA, user configurable
	Frequency	15,000 Hz
Downscale	Milliamp	1 to 3.6 mA, user configurable
	Frequency	0 Hz
Internal zero	Drives the mA and frequency outputs for process variables to zero values	
None	Ignores fault conditions	

Sensor

N/A

Marine Bunker Instruments

See vendor documentation for individual components, or contact Micro Motion.

(1) The crossover frequency depends on the configured value of the pulse width. At the minimum pulse width value of 0.543 ms, the crossover frequency is 922 Hz. At the maximum pulse width value of 277 ms, the crossover frequency is 1.8 Hz.

Digital communications

Transmitter

RS-485

One pair of terminals supports SP (service port) mode or RS-485 mode. On device power-up, the user has 10 seconds to connect in SP mode. After 10 seconds, the terminals switch to RS-485 mode. The communication parameters in SP mode are:

Protocol	Modbus RTU
Data rate	38,400 baud
Parity	No parity
Stop bit	One stop bit
Address	111

In RS-485 mode, the transmitter communicates via Modbus RTU protocol. The communication parameters are configurable with ProLink II software, Modbus, or the display. The shipped default parameters are:

Data rate	9600 baud
Parity	Odd
Stop bit	One stop bit

Printer port

The RS-485 port is also used for ticket printing. An internal setting enables automatic switching between printer and communications functions.

Requires RS-485 to RS-232 conversion (included with MID-Approved Printer Option and Non-MID-Approved Printer Option)

Bidirectional features:⁽¹⁾

- Epson TM-U295 printer (Basic and Profile systems): detects and reports “paper out” conditions.
- Epson TM-T88V printer (Basic/MID and Profile/MID systems): detects and reports “printer offline” and “paper out” conditions

Sensor

N/A

Marine Bunker Instruments

See vendor documentation for individual components, or contact Micro Motion.

(1) Requires a point-to-point connection. In multidrop configurations, bidirectional communications are not supported.

Environmental specifications

Transmitter

EMI effects	All Series 3000 devices meet EMC directive 2004/108/EC per EN 61326 Industrial, and all Series 3000 devices conform to NAMUR NE 21 (August 2007).		
Ambient temperature effect	On analog outputs		±0.005% of span per °C
Ambient temperature limits⁽¹⁾	Operating	-4 to +140 °F	-20 to +60 °C
	Storage	-40 to +158 °F	-40 to +70 °C
Temperature accuracy	±1.0 °C ±0.5% of reading in °C		
Temperature repeatability	±0.2 °C		
Humidity limits	5 to 95% relative humidity, non-condensing at 140 °F (60 °C)		
Vibration limits	Per IEC 68-2-6, endurance sweep, 5 to 2000 Hz, 50 sweep cycles at 1.0 g		

Sensor See the product data sheet for your sensor.

Marine Bunker Instruments See vendor documentation for individual components, or contact Micro Motion.

(1) If exposed to direct sunlight, the ambient temperature can be expected to rise by an additional 50 °F (10 °C).

Marine approvals



Transmitters	American Bureau of Shipping (ABS)	Lloyd's Register North America
Model 3500	Approved	
Model 3700	Approved	Approved ⁽¹⁾
Sensors		
ELITE CMFHC3M	Approved	Approved

(1) When Add-on Option LR is ordered (Lloyd's Register Type Approval), supplied ferrite beads must be installed on I/O wiring and power wiring.

Hazardous area classifications

CSA is a Canadian approvals agency that provides approvals accepted in both the U.S.A. (C-US) and Canada. ATEX is a European directive. FM is a U.S.A. approvals agency and is used for hazardous area approvals on the pressure, temperature, and level switch instruments included with Marine Bunker Instruments.

Transmitter

CSA	Model 3500	Class I, Div. 2, Groups A, B, C, and D when installed in a suitable enclosure Provides non-incendive sensor outputs for use in Class I, Div. 2, Groups A, B, C, and D, or intrinsically safe sensor outputs for use in Class I, Div. 1, Groups C and D; Class II, Div. 1, Groups E, F, and G
	Model 3700	Class I, Div. 2, Groups A, B, C, and D Provides non-incendive sensor outputs for use in Class I, Div. 2, Groups A, B, C, and D, or intrinsically safe sensor outputs for use in Class I, Div. 1, Groups C and D; Class II, Div. 1, Groups E, F, and G
	Model 3500	Safe area only. Can be connected to a sensor in ATEX Zone 1 area. CE 0575  II (2)G [Ex ib] IIB/IIC
	Model 3700	ATEX Zone 1 CE 0575  II 2G Ex de [ib] IIB/IIC T4 Gb
ATEX		
IECEX	Model 3700	Ex d e [ib] IIB/IIC T4 Gb
Sensor	See the product data sheet for your sensor.	
Marine Bunker Instruments	See vendor documentation for individual components, or contact Micro Motion.	

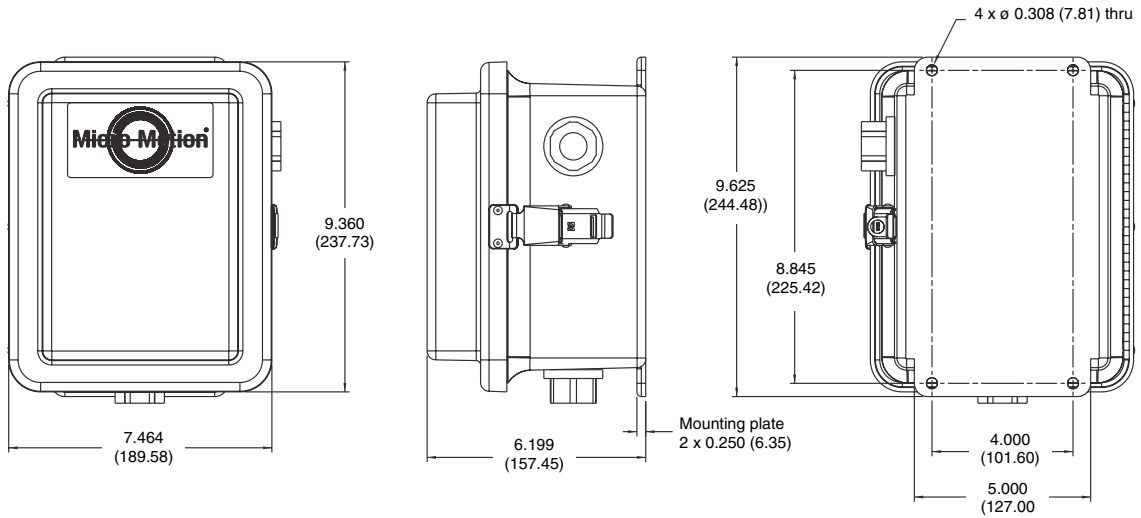
Dimensions

Sensor

See the product data sheet for your sensor.

Printer Interface Component

Dimensions in inches
(mm)

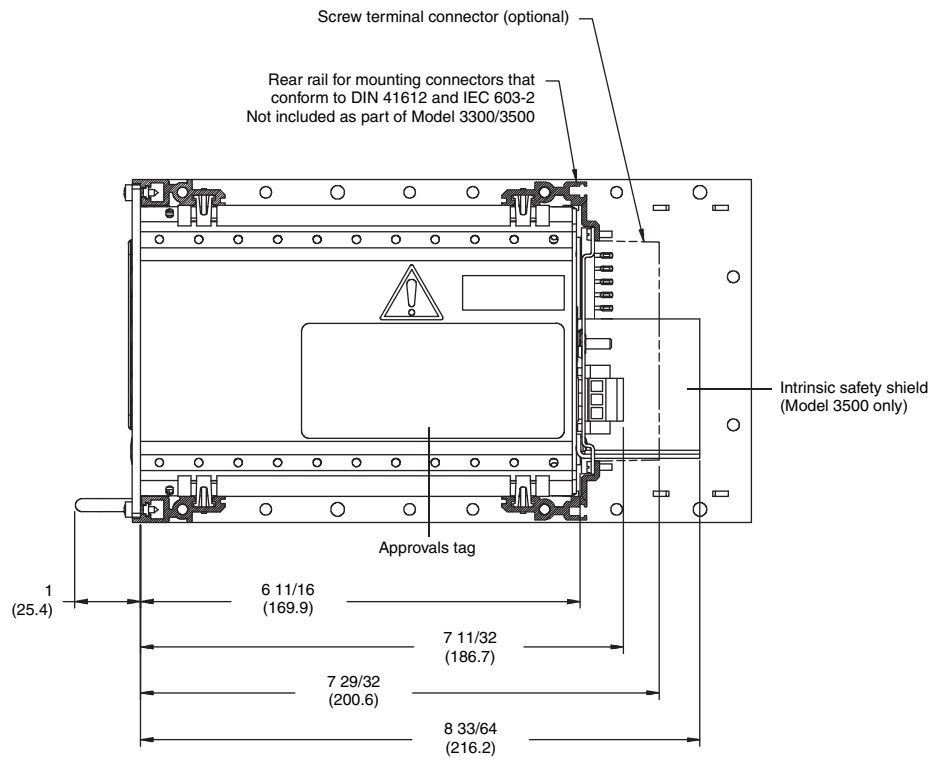
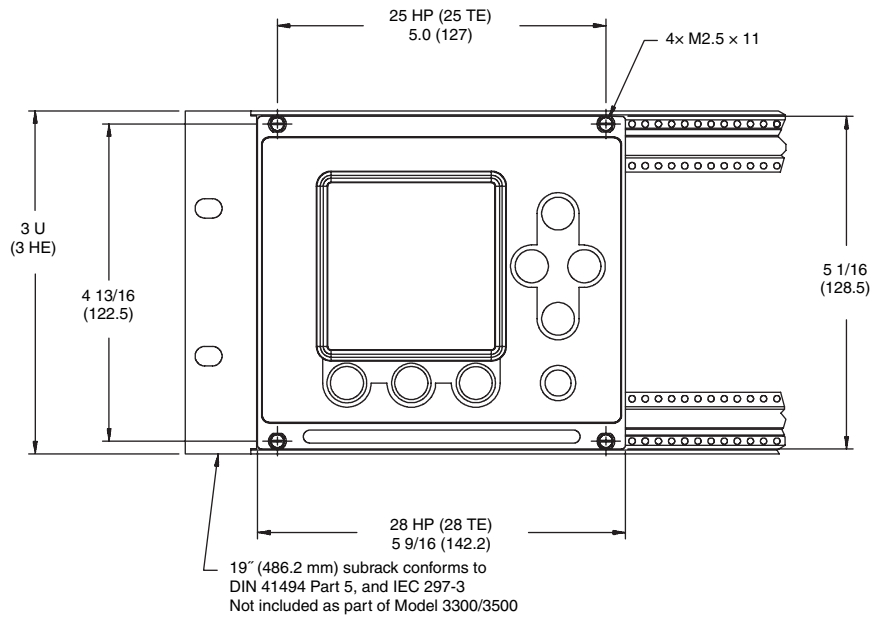


Transmitter

Rack-mount Model 3500

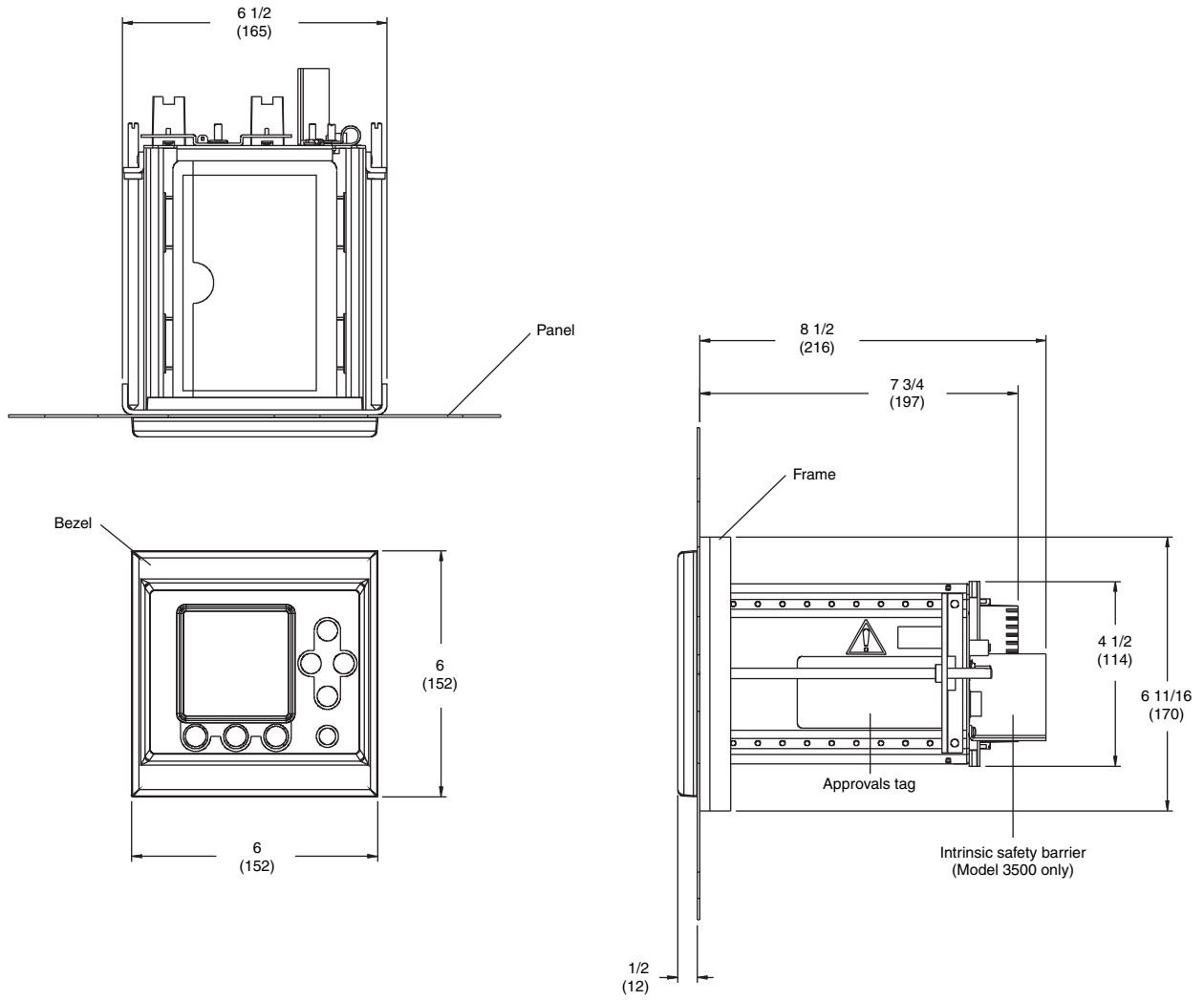
Dimensions in inches
(mm)

1 U = 1 HE = 1.750 inches (44.45 mm)
1 HP = 1 TE = 0.200 inches (5.08 mm)



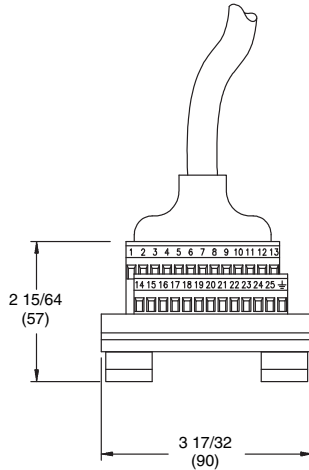
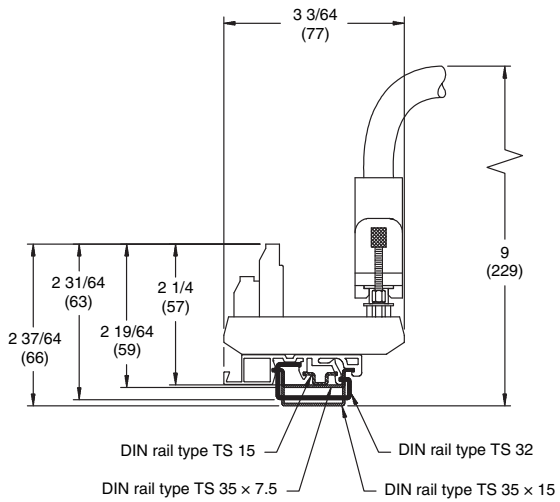
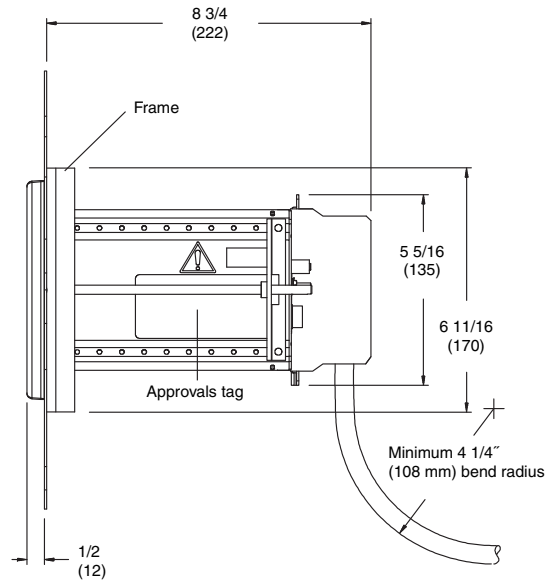
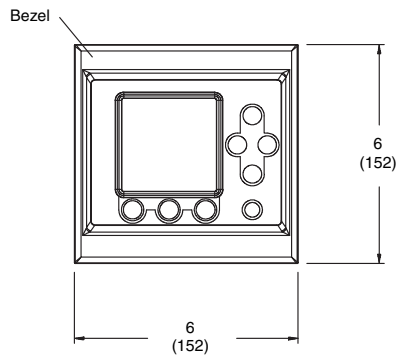
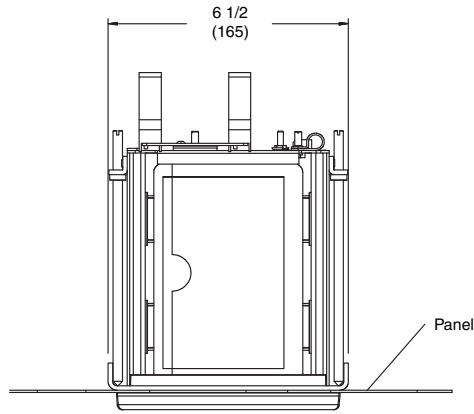
Panel-mount Model 3500 with screw-type connectors

Dimensions in inches
(mm)



Panel-mount Model 3500 with optional I/O cable

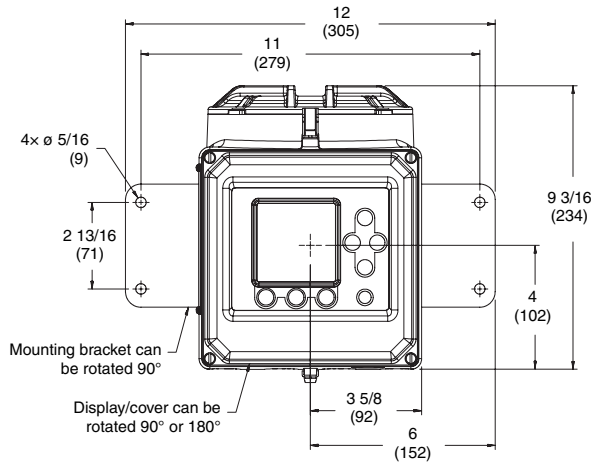
Dimensions in inches (mm)



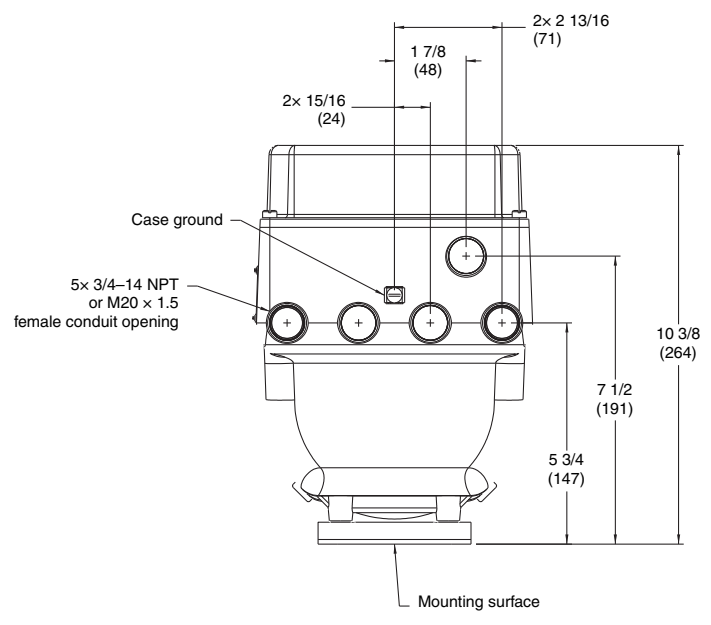
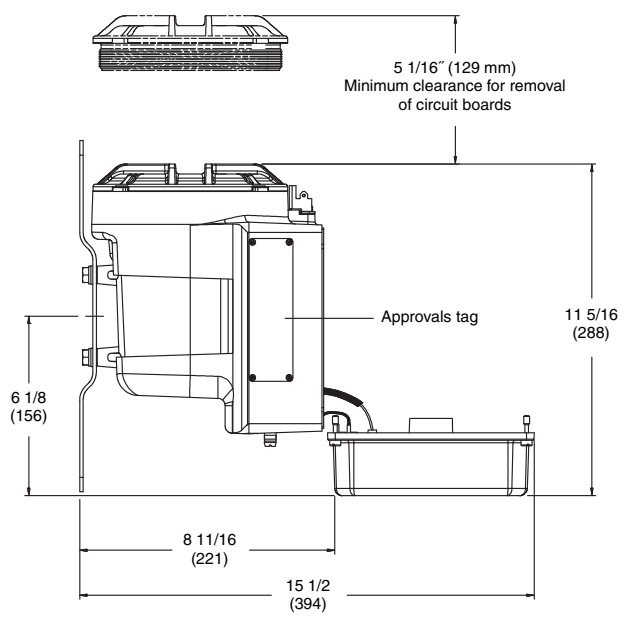
DIN-rail-mount screw terminals detail

Field-mount Model 3700

Dimensions in inches (mm)



4x M8 x 16 bolts are included for attaching the mounting bracket to the Model 3350 or 3700 transmitter



Conduit openings view

Ordering information

Refer to the table below for the Micro Motion components for your system. Ordering information for each component is provided on the following pages. Sample purchase orders are provided at the end of this section.

Basic system	<ul style="list-style-type: none">• Supported sensor• Model 3500 or Model 3700 transmitter with Marine Bunker Transfer Package• Marine Bunker Instruments:<ul style="list-style-type: none">- Non-MID-Approved Printer Option- Other components included automatically with order• ProLink II v2.94 or later (optional)• Micro Motion bunker services:<ul style="list-style-type: none">- Bunker survey⁽¹⁾- Bunker startup
Basic/MID system	<ul style="list-style-type: none">• Supported sensor with MID calibration option• Model 3500 or Model 3700 transmitter with Marine Bunker Transfer Package• Marine Bunker Instruments:<ul style="list-style-type: none">- MID-Approved Printer Option- Other components included automatically with order• ProLink II v2.94 or later (optional)• Micro Motion bunker services:<ul style="list-style-type: none">- MID-specific bunker survey⁽¹⁾- MID-specific bunker startup (include system check and Weights & Measures sealing)
Profile system	<ul style="list-style-type: none">• Supported sensor• Model 3500 or Model 3700 transmitter with Marine Bunker Transfer Package• Marine Bunker Instruments:<ul style="list-style-type: none">- Non-MID-Approved Printer Option- Profile Printing Option- Other components included automatically with order• ProLink II v2.94 or later• Micro Motion bunker services:<ul style="list-style-type: none">- Bunker survey⁽¹⁾- Bunker startup
Profile/MID system	<ul style="list-style-type: none">• Supported sensor with MID calibration option• Model 3500 or Model 3700 transmitter with Marine Bunker Transfer Package• Marine Bunker Instruments:<ul style="list-style-type: none">- MID-Approved Printer Option- Profile Printing Option- Other components included automatically with order• ProLink II v2.94 or later• Micro Motion bunker services:<ul style="list-style-type: none">- MID-specific bunker survey⁽¹⁾- MID-specific bunker startup (include system check and Weights & Measures sealing)

(1) *Must be ordered and completed before product order.*

Ordering information — Sensor

For detailed sensor information, see the sensor data sheet. Then use the order matrix below to order a sensor that is compatible with the Certified Marine Bunker Measurement Solution. If an option is unspecified here, you can select any of the options available from the sensor data sheet.

Model	Product description
CMFHC3M	High-capacity sensor, approved for use in the Certified Marine Bunker Measurement Solution ⁽¹⁾
Code	Process connections
...	
Code	Case options
...	
Code	Electronics interface
3	4-wire stainless steel integral enhanced core processor for remote-mount transmitters
5	4-wire stainless steel integral extended-mount enhanced core processor for remote-mount transmitters
Code	Conduit connections
...	
Code	Approvals
...	
Code	Language
...	
Code	Calibration options
Z	No calibration options
Code	Measurement application software
Z	No measurement application software
Code	Factory options
Z	No factory options
Code	MID calibration options
(blank)	No MID calibration
BB	MID calibration
Typical model number: CMFHC3M 801 N 3 E Z E Z Z BB	

(1) CMFHC3A is not available for the Certified Marine Bunker Measurement Solution.

Ordering information — Transmitter

Order a Model 3500 or Model 3700 transmitter using one of the following order matrices. Do not use the order matrix in the Series 3000 data sheet.

Model 3500

Model	Product description
3500	Micro Motion Coriolis multivariable transmitter; remote rack/panel-mount
Code	Mounting options
R	DIN rack
P	Panel-mount
Code	Power supply options
1	85 to 265 VAC
2	18 to 30 VDC (recommended for 24 VDC users)
Code	Remote core processor
A	None
Code	Additional hardware modules
3	Marine bunker hardware
Code	Sensor interface
5	4-wire interface to sensors with core processors
Code	Terminals
B	Screw terminals
C	Prepared cables; 2 foot (0.6 m) length (use with mounting code P only)
D	Prepared cables; 5 foot (1.5 m) length (use with mounting code P only)
E	Prepared cables; 10 foot (3 m) length (use with mounting code P only)
Code	Relays and housings
1	No relays and housing
Code	Approvals
M	Micro Motion standard (no approval)
C	CSA (Canada only)
A	CSA C-US (U.S.A. and Canada)
B	ATEX — Safe area with IS sensor outputs
P ⁽¹⁾	NEPSI — Safe area
Continued on next page	

(1) Available only with language option M (Chinese).

Model 3500 *continued*

Code	Language				
	Local display	Quick reference	CE requirements	Manual	Marine Bunker application manual
A	English	Danish	N/A	English	English
D	English	Dutch	N/A	English	English
E	English	English	N/A	English	English
F	French ⁽¹⁾	French	N/A	French	English
G	German ⁽¹⁾	German	N/A	German	English
H	English	Finnish	N/A	English	English
I	English	Italian	N/A	English	English
M	English	Chinese	N/A	Chinese	English
N	English	Norwegian	N/A	English	English
O	English	Polish	N/A	English	English
P	English	Portuguese	N/A	English	English
S	English	Spanish	N/A	Spanish	English
W	English	Swedish	N/A	English	English
B	English	N/A	Hungarian	English	English
C	English	N/A	Czech	English	English
K	English	N/A	Slovak	English	English
L	English	N/A	Latvian	English	English
T	English	N/A	Estonian	English	English
U	English	N/A	Greek	English	English
V	English	N/A	Lithuanian	English	English
Y	English	N/A	Slovenian	English	English
Code	Control application software				
F	Marine Bunker Transfer Package				
H	Marine Bunker Transfer Package with Smart Meter Verification				
Code	Measurement application software				
Z	No measurement application software				
Code	Specialty applications				
Z	No specialty applications				
X	ETO application				
Typical model number: 3500 R 1 A 3 5 B 1 U M E H Z Z					

(1) *Marine Bunker Transfer Package panels are in English.*

Model 3700

Model	Product description
3700	Micro Motion Coriolis multivariable transmitter and discrete controller; remote field-mount
Code	Mounting options
A	Field-mount
Code	Power supply options
1	85 to 265 VAC
2	18 to 30 VDC (recommended for 24 VDC users)
Code	Remote core processor
A	None
Code	Additional hardware modules
3	Marine bunker hardware
Code	Sensor interface
5	4-wire interface to sensors with core processors
Code	Conduit connections
A	M20 without glands
B	M20 with three increased safety glands
C	M20 with five increased safety glands
D	3/4-inch NPT without conduit seals
Code	Approvals
M	Micro Motion standard (no approval)
C	CSA (Canada only)
A	CSA C-US (U.S.A. and Canada)
Z	ATEX — Zone 1 Equipment Category 2
P ⁽¹⁾	NEPSI — Safe area
Continued on next page	

(1) Available only with language option M (Chinese).

Model 3700 *continued*

Code	Language				
	Local display	Quick reference	CE requirements	Manual	Marine Bunker application manual
A	English	Danish	N/A	English	English
D	English	Dutch	N/A	English	English
E	English	English	N/A	English	English
F	French ⁽¹⁾	French	N/A	French	English
G	German ⁽¹⁾	German	N/A	German	English
H	English	Finnish	N/A	English	English
I	English	Italian	N/A	English	English
M	English	Chinese	N/A	Chinese	English
N	English	Norwegian	N/A	English	English
O	English	Polish	N/A	English	English
P	English	Portuguese	N/A	English	English
S	English	Spanish	N/A	Spanish	English
W	English	Swedish	N/A	English	English
B	English	N/A	Hungarian	English	English
C	English	N/A	Czech	English	English
K	English	N/A	Slovak	English	English
L	English	N/A	Latvian	English	English
T	English	N/A	Estonian	English	English
U	English	N/A	Greek	English	English
V	English	N/A	Lithuanian	English	English
Y	English	N/A	Slovenian	English	English
Code	Control application software				
F	Marine Bunker Transfer Package				
H	Marine Bunker Transfer Package with Smart Meter Verification				
Code	Measurement application software				
Z	No measurement application software				
Code	Specialty applications				
Z	No specialty applications				
X	ETO application				
Code	Add-on option				
LR	Lloyd's Register Approval for marine application (includes required hardware)				
Typical model number: 3700 A 1 A 3 5 A M E H Z Z LR					

(1) Marine Bunker Transfer Package panels are in English.

Ordering information — Marine Bunker Instruments

Model	Product description
MBI	Marine Bunker Instruments
Code	Type
V	Vessel
B	Barge
Code	Orientation
T	Tubes down
F	Flag
Code	Pipe size (for Level Switch)
3	6–10" (150–250 mm) pipe size
4	> 10" (> 250 mm) pipe size
Code	Approvals
Z	ATEX (Europe)
U	FM (U.S.A.)
Code	Profile printing
Z	None
P	Profile Printing Option
Code	Printer
0	None
2	Non–MID-Approved Printer Option
4	MID-Approved Printer Option
Code	Future code
Z	None
Code	Future code
Z	None

Ordering information — ProLink II

See the product data sheet for ProLink II.

Ordering information — Micro Motion Bunker Services

Model	Description
MMIYMABBZZZZ	Bunker survey.
MMIYMABZBZZD	Bunker startup. Includes OIML/MID verification and Weights & Measures sealing.
MMIYMABZBZZW	Bunker startup. No OIML/MID verification or Weights & Measures sealing.

Sample purchase orders

Basic system with ticket printer

Line item	Model code or part number
1 Sensor	CMFHC3M 801 N 3 E Z E Z Z Z
2 Transmitter	3700 A 1 A 3 5 A Z E H Z Z
3 Marine Bunker Instruments	MBIVT3ZZ2ZZ
4 Bunker survey	MMIYMABBZZZZ
5 Bunker startup	MMIYMABZBZZW
6 Additional 4-wire cable (1000 ft [300 m])	CMVDSZZ01K

Basic/MID system with ticket printer

Line item	Model code or part number
1 Sensor	CMFHC3M 801 N 3 E Z E Z Z Z BB
2 Transmitter	3700 A 1 A 3 5 A Z E H Z Z
3 Marine Bunker Instruments	MBIVT3ZZ4ZZ
4 MID-specific bunker survey	MMIYMABBZZZZ
5 MID-specific bunker startup	MMIYMABZBZZD
6 Additional 4-wire cable (1000 ft [300 m])	CMVDSZZ01K

Profile system with ticket printer

Line item	Model code or part number
1 Sensor	CMFHC3M 801 N 3 E Z E Z Z Z
2 Transmitter	3700 A 1 A 3 5 A Z E H Z Z
3 Marine Bunker Instruments	MBIVT3ZP2ZZ
4 ProLink II	PLK0UEF
5 Bunker survey	MMIYMABBZZZZ
6 Bunker startup	MMIYMABZBZZW
7 Additional 4-wire cable (1000 ft [300 m])	CMVDSZZ01K

Profile/MID system with ticket printer and Lloyd's Register Approval

Line item	Model code or part number
1 Sensor	CMFHC3M 801 N 3 E Z E Z Z Z BB
2 Transmitter	3700 A 1 A 3 5 A Z E H Z Z LR
3 Marine Bunker Instruments	MBIVT3ZP4ZZ
4 ProLink II	PLK0UEF
5 MID-specific bunker survey	MMIYMABBZZZZ
6 MID-specific bunker startup	MMIYMABZBZZD
7 Additional 4-wire cable (1000 ft [300 m])	CMVDSZZ01K

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