

## Product Data Sheet

PS-00363, Rev. E  
October 2007

# Micro Motion® R-Series Coriolis Flow Meters

Micro Motion® R-Series Coriolis meters are simple and reliable, and feature a compact form factor that is easy to install and maintain. Versatile R-Series meters are used in a wide range of industries to obtain the fundamental benefits of Coriolis flow measurement.



### Simple to install and easy to use Coriolis flow measurement

- Measure flow in either mass or volume units for any application
- Install easily anywhere with compact design that is immune to flow profile effects
- Keep process loops easy to clean and maintain with self-draining design

### Broad range of application coverage

- 316L stainless steel construction for compatibility with most fluids

### Superior reliability

- No moving parts to wear or replace minimizes maintenance for long-term reliability

ELITE® Peak performance Coriolis meter

F-Series High performance compact drainable Coriolis meter

H-Series Hygienic compact drainable Coriolis meter

T-Series Straight tube full-bore Coriolis meter

R-Series General purpose flow-only Coriolis meter

LF-Series Extreme low-flow Coriolis meter



# Micro Motion R-Series Coriolis Flow Meters

---

Micro Motion Coriolis meters meet a vast range of application needs, ranging from extreme low-flow up to high-flow, high-capacity lines. Cryogenic, hygienic, high-temperature, and high-pressure— Micro Motion meters can handle them all. Micro Motion meters are available with a variety of wetted parts to ensure the best material compatibility.

**Coriolis meters.** Coriolis meters offer dramatic benefits over traditional volumetric measurement technologies. Coriolis meters:

- Deliver accurate and repeatable process data over a wide range of flow rates and process conditions.
- Provide direct inline measurement of mass flow and density, and also measure volume flow and temperature—all from a single device.
- Have no moving parts, so maintenance costs are minimal.
- Have no requirements for flow conditioning or straight pipe runs, so installation is simplified and less expensive.
- Provide advanced diagnostic tools for both the meter and the process.

**R-Series Coriolis flow meters.** Micro Motion R-Series Coriolis meters are designed to handle most common mass and volume flow measurement applications. The compact case of the R-Series meter allows it to fit almost anywhere, and integral electronics make installation and setup easy.

R-Series meters support a number of digital communication protocols, such as HART®, Modbus®, FOUNDATION fieldbus™, and PROFIBUS-PA.

---

## Contents

|                                      |   |  |    |
|--------------------------------------|---|--|----|
| Liquid flow performance . . . . .    | 3 | Hazardous area classifications . . . . . | 9  |
| Gas flow performance . . . . .       | 5 | Materials of construction . . . . .      | 13 |
| Temperature specifications . . . . . | 7 | Weight . . . . .                         | 13 |
| Pressure ratings . . . . .           | 9 | Dimensions . . . . .                     | 14 |
| Vibration limits . . . . .           | 8 | Fitting options . . . . .                | 17 |
| Environmental effects . . . . .      | 8 | Ordering information . . . . .           | 20 |

# Liquid flow performance

|   |                                  | <b>Mass</b>  |        | <b>Volume<sup>(1)</sup></b> |        |
|---|----------------------------------|--|--------|-----------------------------|--------|
|   |                                  | lb/min   | kg/h   | gal/min                     | l/h    |
| <b>Maximum flow rate</b>                  | R025S, R025P                     | 100  | 2720   | 12                          | 2720   |
|   | R050S                            | 300  | 8160   | 36                          | 8160   |
|   | R100S                            | 1200   | 32,650 | 144                         | 32,650 |
|   | R200S                            | 3200   | 87,100 | 384                         | 87,100 |
| <b>Mass flow accuracy<sup>(2)</sup></b>   | Transmitter with MVD™ technology | ±0.5% of rate <sup>(3)</sup>                                   |        |                             |        |
|   | IFT9703 transmitter              | ±0.5% of rate ±[(zero stability / flow rate) × 100]% of rate   |        |                             |        |
| <b>Volume flow accuracy</b>               | Transmitter with MVD technology  | ±0.5% of rate <sup>(3)</sup>                                   |        |                             |        |
|   | IFT9703 transmitter              | ±0.5% of rate ±[(zero stability / flow rate) × 100]% of rate   |        |                             |        |
| <b>Mass and volume flow repeatability</b> | Transmitter with MVD technology  | ±0.25% of rate <sup>(3)</sup>                                  |        |                             |        |
|   | IFT9703 transmitter              | ±0.25% of rate ±[½(zero stability / flow rate) × 100]% of rate |        |                             |        |
|   |                                  | lb/min   | kg/h   | gal/min                     | l/h    |
| <b>Zero stability</b>                     | R025, R025P                      | 0.01   | 0.27   | 0.0012                      | 0.27   |
|   | R050S                            | 0.03   | 0.82   | 0.0036                      | 0.82   |
|   | R100S                            | 0.12   | 3.27   | 0.0144                      | 3.27   |
|   | R200S                            | 0.32   | 8.71   | 0.0384                      | 8.71   |

(1) Volumetric measurement is based on a process-fluid density of 1 g/cm<sup>3</sup>. For fluids with density other than 1 g/cm<sup>3</sup>, the volume flow rate equals the maximum mass flow rate divided by the fluid's density.

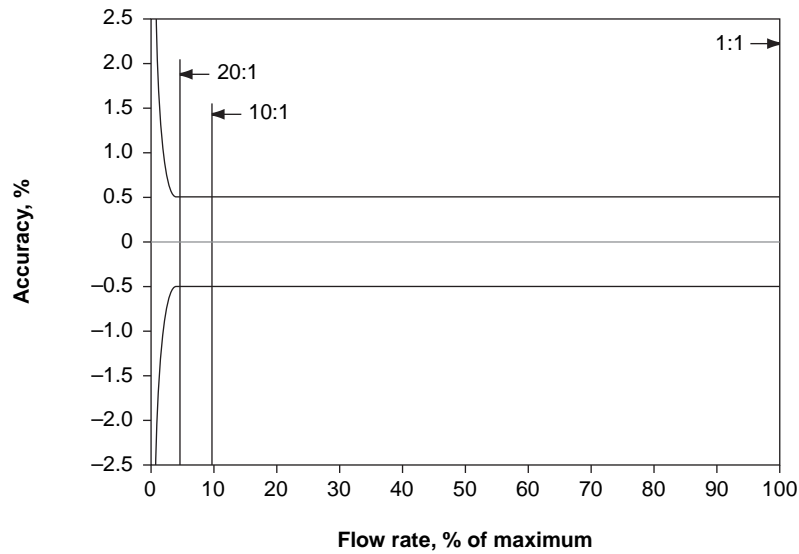
(2) Stated flow accuracy includes the combined effects of repeatability, linearity, and hysteresis. All specifications for liquids are based on reference conditions of water at 68 to 77 °F (20 to 25 °C) and 15 to 30 psig (1 to 2 bar), unless otherwise noted.

(3) When flow rate < (zero stability / 0.005), then accuracy = ±[½(zero stability / flow rate) × 100]% of rate and repeatability = ±[½(zero stability / flow rate) × 100]% of rate.

# Liquid flow performance *continued*

## Typical accuracy, turndown, and pressure drop with transmitter with MVD technology

Pressure drop is dependent on process conditions. To determine accuracy, turndown, and pressure drop with your process variables, use Micro Motion's product selector, available at [www.micromotion.com](http://www.micromotion.com).



| <i><b>Turndown from maximum flow rate</b></i> | <i><b>20:1</b></i> | <i><b>10:1</b></i> | <i><b>1:1</b></i> |
|---|--------------------|--------------------|-------------------|
| Accuracy, ± %                                 | 0.50               | 0.50               | 0.50              |
| Pressure drop                                 |                    |                    |                   |
| <i>psi</i>                                    | 0.1                | 0.813              | 54                |
| <i>bar</i>                                    | 0.007              | 0.05               | 3.4               |

# Gas flow performance

When selecting sensors for gas applications, measurement accuracy is a function of fluid mass flow rate independent of operating temperature, pressure, or composition. However, pressure drop through the sensor is dependent upon operating temperature, pressure, and fluid composition. Therefore, when selecting a sensor for any particular gas application, it is highly recommended that each sensor be sized using Micro Motion's product selector, available at [www.micromotion.com](http://www.micromotion.com).

|   |              | Mass   |      | Volume <sup>(1)</sup> |       |
|---|--------------|--------|------|-----------------------|-------|
|   |              | lb/min | kg/h | SCFM                  | Nm³/h |
| Typical flow rates that produce approximately 10 psid (0.68 bar) pressure drop on <i>air</i> at 68 °F (20 °C) and 100 psi (6.8 bar) |              |        |      |                       |       |
|   | R025S, R025P | 4      | 120  | 60                    | 90    |
|   | R050S        | 13     | 360  | 175                   | 275   |
|   | R100S        | 50     | 1400 | 700                   | 1050  |
|   | R200S        | 140    | 3800 | 2000                  | 3000  |

**Typical flow rates that produce approximately 50 psid (3.4 bar) pressure drop on *natural gas* (MW 16.675) at 68 °F (20 °C) and 500 psi (34 bar)**

|              |     |        |        |        |
|--------------|-----|--------|--------|--------|
| R025S, R025P | 16  | 450    | 380    | 600    |
| R050S        | 50  | 1350   | 1150   | 1820   |
| R100S        | 190 | 5200   | 4400   | 6900   |
| R200S        | 520 | 14,500 | 12,300 | 19,500 |

|  |                                 |  |  |
|--|---------------------------------|--|--|
| <b>Mass flow accuracy<sup>(2)</sup></b>      | Transmitter with MVD technology | ±0.75% of rate <sup>(3)</sup>                                |  |
|  | IFT9703 transmitter             | ±1.0% of rate ±[(zero stability / flow rate) × 100]% of rate |  |
| <b>Mass flow repeatability<sup>(2)</sup></b> | Transmitter with MVD technology | ±0.5% of rate <sup>(3)</sup>                                 |  |
|  | IFT9703 transmitter             | ±0.5% of rate ±[(zero stability / flow rate) × 100]% of rate |  |

|                       |              | lb/min | kg/h |
|-----------------------|--------------|--------|------|
|                       |              |        |      |
| <b>Zero stability</b> | R025S, R025P | 0.01   | 0.27 |
|                       | R050S        | 0.03   | 0.82 |
|                       | R100S        | 0.12   | 3.27 |
|                       | R200S        | 0.32   | 8.71 |

(1) Standard (SCFM) reference conditions are 14.7 psia and 68 °F. Normal (Nm<sup>3</sup>/hr) reference conditions are 1.013 bar and 0 °C.

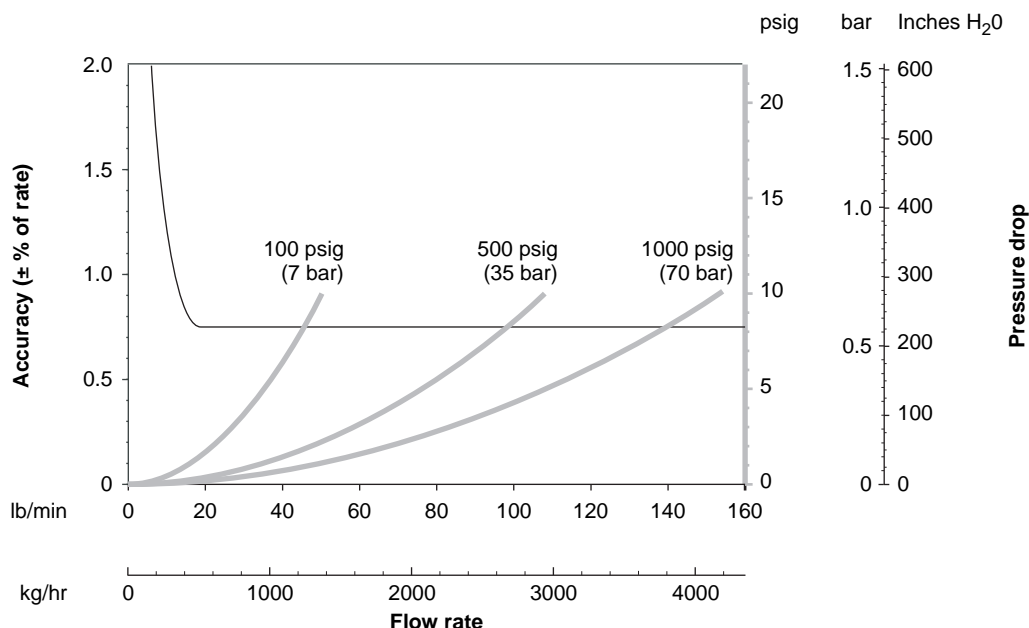
(2) Stated flow accuracy includes the combined effects of repeatability, linearity, and hysteresis.

(3) When flow rate < (zero stability / 0.0075), then accuracy = ±[(zero stability / flow rate) × 100]% of rate and repeatability = ±[(zero stability / flow rate) × 100]% of rate.

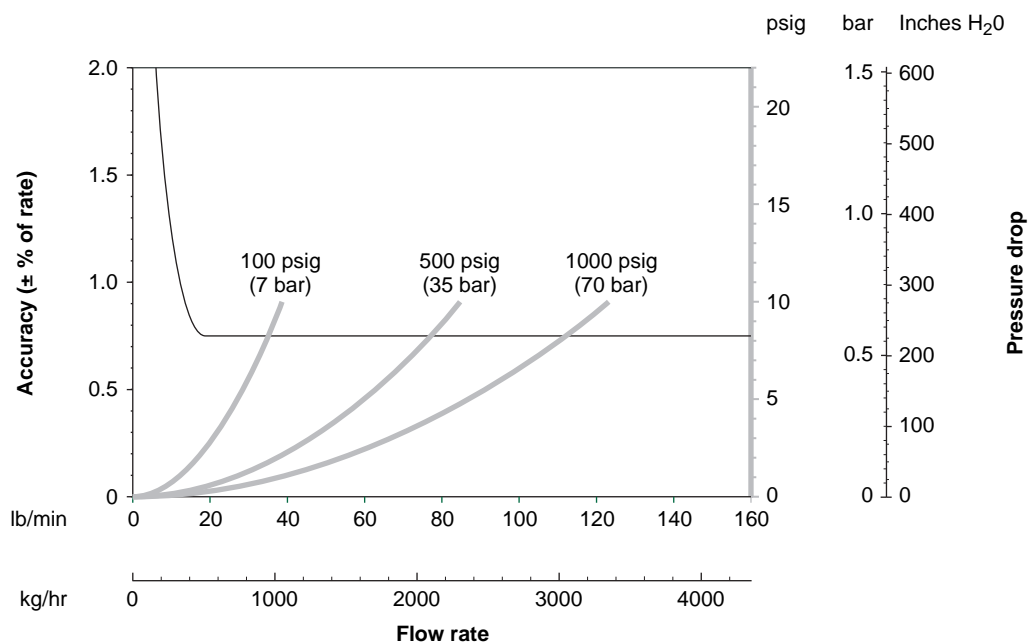
# Gas flow performance *continued*

## Typical accuracy and pressure drop with R100S with MVD technology

Air at 68 °F (20 °C), static pressures as indicated on graph



Natural gas (MW 16.675) at 68 °F (20 °C), static pressures as indicated on graph



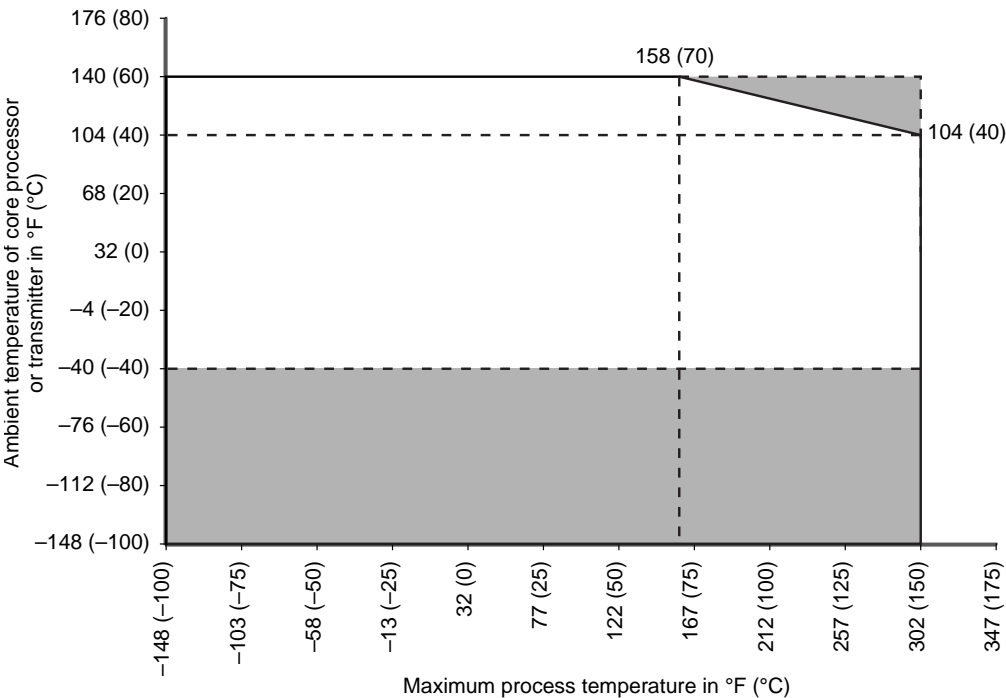
## Standard or normal volumetric capability

Standard and normal volumes are “quasi mass” flow units for any fixed composition fluid. Standard and normal volumes do not vary with operating pressure, temperature, or density. With knowledge of density at standard or normal conditions (available from reference sources), a Micro Motion meter can be configured to output in standard or normal volume units without the need for pressure, temperature, or density compensation. Contact your local sales representative for more information.

# Temperature specifications

|               |            |  |
|---------------|------------|--|
| Accuracy      | All models | $\pm 1\text{ }^{\circ}\text{C} \pm 0.5\%$ of reading in $^{\circ}\text{C}$ |
| Repeatability | All models | $\pm 0.2\text{ }^{\circ}\text{C}$  |

**Temperature limits<sup>(1)</sup>**
All models with all electronics options (except the IFT9703 transmitter)<sup>(2)</sup>



When ambient temperature is below  $-40\text{ }^{\circ}\text{F}$  ( $-40\text{ }^{\circ}\text{C}$ ), a core processor must be heated to bring its local ambient temperature to between  $-40\text{ }^{\circ}\text{F}$  ( $-40\text{ }^{\circ}\text{C}$ ) and  $+140\text{ }^{\circ}\text{F}$  ( $+60\text{ }^{\circ}\text{C}$ ). Long-term storage of electronics at ambient temperatures below  $-40\text{ }^{\circ}\text{F}$  ( $-40\text{ }^{\circ}\text{C}$ ) is not recommended.

|  |   |
|--|---|
| Sensors with integral IFT9703 transmitter <sup>(3)</sup> | Ambient temperature:<br>$+131\text{ }^{\circ}\text{F}$ ( $+55\text{ }^{\circ}\text{C}$ ) maximum<br><br>Process temperature:<br>$+257\text{ }^{\circ}\text{F}$ ( $+125\text{ }^{\circ}\text{C}$ ) maximum |
|--|---|

(1) Temperature limits may be further restricted by hazardous area approvals. See pages 9–12.  
 (2) The temperature extender option allows the sensor case to be insulated without covering the transmitter, core processor, or junction box, but does not affect temperature ratings.  
 (3) Refer to the IFT9703 Product Data Sheet for more information about its temperature limits.

# Environmental effects

## Process temperature effect

Process temperature effect is defined as:

- For mass flow measurement, the worst-case zero offset due to process fluid temperature change away from the zeroing temperature.
- For density measurement, the maximum measurement offset due to process fluid temperature change away from the density calibration temperature.

### Process temperature effect

|      | % of maximum flow rate per °C | density accuracy per °C <sup>(1)</sup> |                   |
|------|-------------------------------|--|-------------------|
|      |                               | g/cm <sup>3</sup>                      | kg/m <sup>3</sup> |
| R025 | ±0.00175                      | ±0.0001                                | ±0.1              |
| R050 | ±0.00175                      | ±0.0001                                | ±0.1              |
| R100 | ±0.00175                      | ±0.0001                                | ±0.1              |
| R200 | ±0.00175                      | ±0.0001                                | ±0.1              |

## Pressure effect

Pressure effect is defined as the change in sensor flow and density sensitivity due to process pressure change away from the calibration pressure<sup>(2)</sup>. Pressure effect can be corrected.

### Pressure effect on mass flow accuracy

|      | % of rate per psi | % of rate per bar |
|------|-------------------|-------------------|
| R025 | None              | None              |
| R050 | None              | None              |
| R100 | None              | None              |
| R200 | –0.001            | –0.015            |

### Pressure effect on density accuracy

|      | g/cm <sup>3</sup> per psi | kg/m <sup>3</sup> per bar |
|------|---------------------------|---------------------------|
| R025 | None                      | None                      |
| R050 | None                      | None                      |
| R100 | None                      | None                      |
| R200 | –0.00003                  | –0.43                     |

(1) For –100 °C and above.

(2) To determine factory calibration pressure, refer to the calibration document shipped with your sensor. If the data is unavailable, use 20 psi (1.4 bar).

# Vibration limits

Meets IEC 68.2.6, endurance sweep, 5 to 2000 Hz, 50 sweep cycles at 1.0 g



# Pressure ratings

|                                       |  | psi  | bar |
|---------------------------------------|--|--|-----|
| <b>Flow tube rating<sup>(1)</sup></b> | R025P  | 2300   | 158 |
|                                       | R025S  | 1450   | 100 |
|                                       | R050S  | 1500   | 103 |
|                                       | R100S  | 1450   | 100 |
|                                       | R200S  | 1600   | 110 |
| <b>PED compliance</b>                 | Sensors comply with council directive 97/23/EC of 29 May 1997 on Pressure Equipment. |  |     |
| <b>Housing rating</b>                 | All models   | Housing is not rated for pressure containment. |     |

(1) Over the entire temperature range, according to ASME B31.3.

# Hazardous area classifications

## UL

|   |  |
|---|--|
| Sensor with integrally mounted<br>Model IFT9703 transmitter | Ambient temperature: -4 to +104 °F (-20 to +40 °C)<br>Class I, Div. 2, Groups A, B, C, and D<br>Class II, Div. 2, Groups F and G |
|---|--|

## CSA and CSA-US

|  |  |
|--|--|
| Sensor with integrally mounted<br>Model IFT9703 transmitter                          | Ambient temperature: +140 °F max. (+60 °C max.)<br>Class I, Div. 2, Groups A, B, C, and D<br>Class II, Div. 2, Groups F and G  |
| Sensor with integrally mounted<br>Model 1700/2700 transmitter or with core processor | Ambient temperature: -40 to +140 °F (-40 to +60 °C)<br>Class I, Div. 1, Groups C and D<br>Class I, Div. 2, Groups A, B, C, and D<br>Class II, Div. 1, Groups E, F, and G |

## NEPSI and IECEx<sup>(1)</sup>

|  |                 |
|--|-----------------|
| Sensor with integrally mounted<br>Model 1700/2700 transmitter or with core processor | Ex ib IIC T1-T5 |
|--|-----------------|

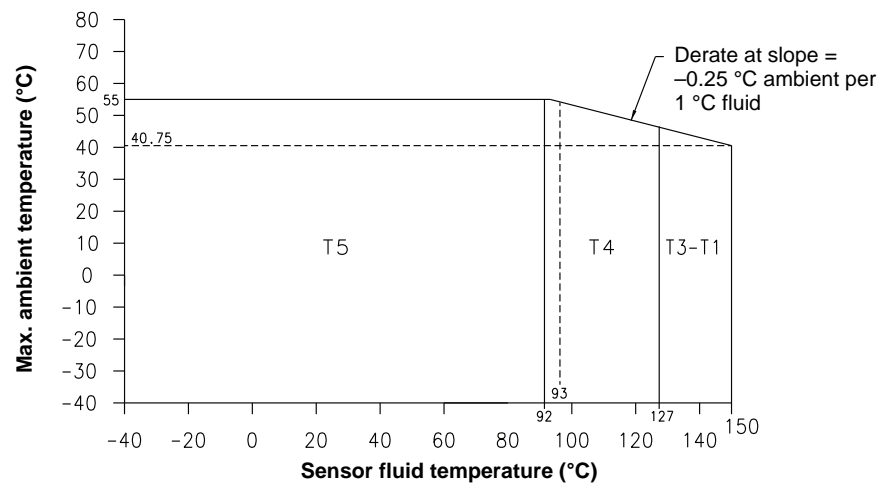
(1) For NEPSI and IECEx approvals, refer to the ATEX temperature graphs on the following pages for ambient and process temperature limits.

# Hazardous area classifications *continued*

ATEX<sup>(1)</sup>

Models R025 and R050 (C.I.C. A2) with core processor or Model 1700/2700 transmitter

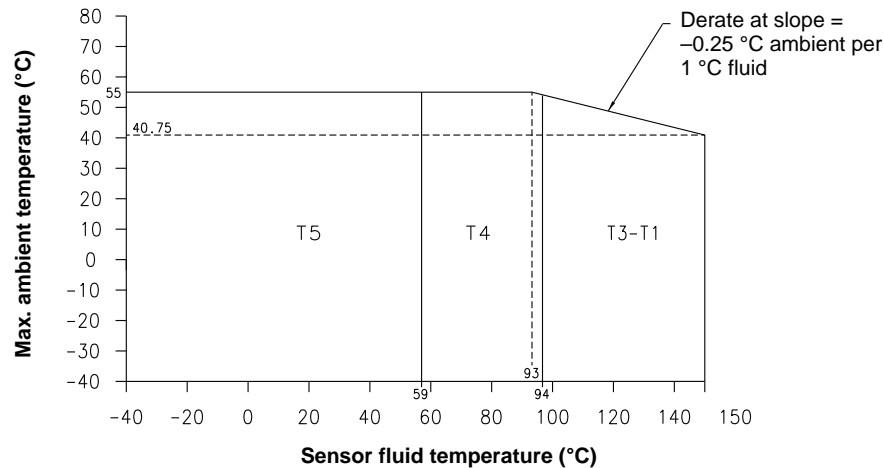
CE 0575 Ex  
II 2 G EEx ib IIC T1...T5  
II 2 D IP65 T °C



The maximum surface temperature for dust is as follows: T5:T 95°C, T4:T 130°C, T3 to T1:T 153°C.

Model R100 (C.I.C. A2) with core processor or Model 1700/2700 transmitter

CE 0575 Ex  
II 2 G EEx ib IIC T1...T5  
II 2 D IP65 T °C



The maximum surface temperature for dust is as follows: T5:T 95°C, T4:T 130°C, T3 to T1:T 186°C.

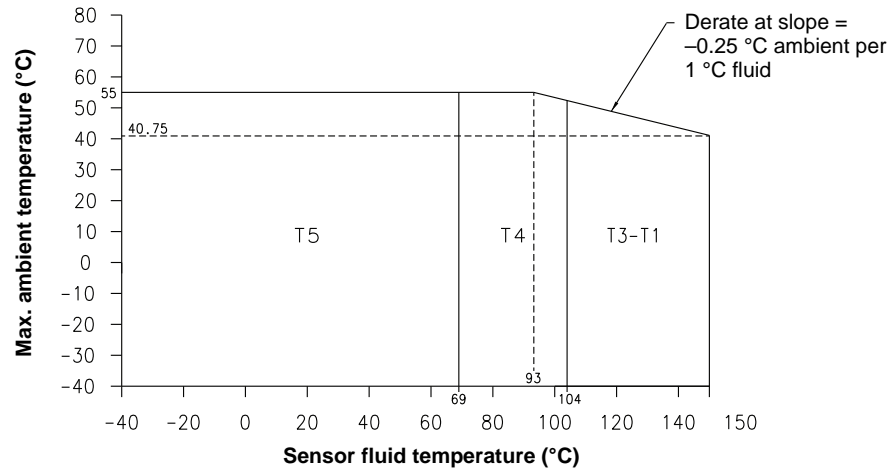
(1) ATEX “T” rating depends on the maximum temperature shown in the graphs above.

# Hazardous area classifications *continued*

## ATEX<sup>(1)</sup>

Model R200 (C.I.C. A1) with core processor or Model 1700/2700 transmitter

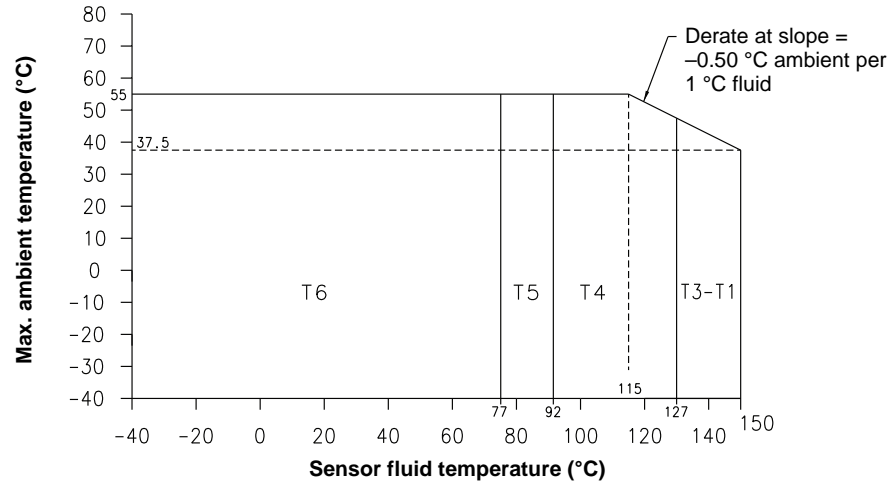
CE 0575 Ex  
II 2 G EEx ib IIC T1...T5  
II 2 D IP65 T °C



The maximum surface temperature for dust is as follows: T5:T 95°C, T4:T 130°C, T3 to T1:T 176°C.

Models R025 and R050 (C.I.C. A2) with IFT9703 transmitter

CE 0575 Ex  
II 2 G EEx ib IIC T1...T6



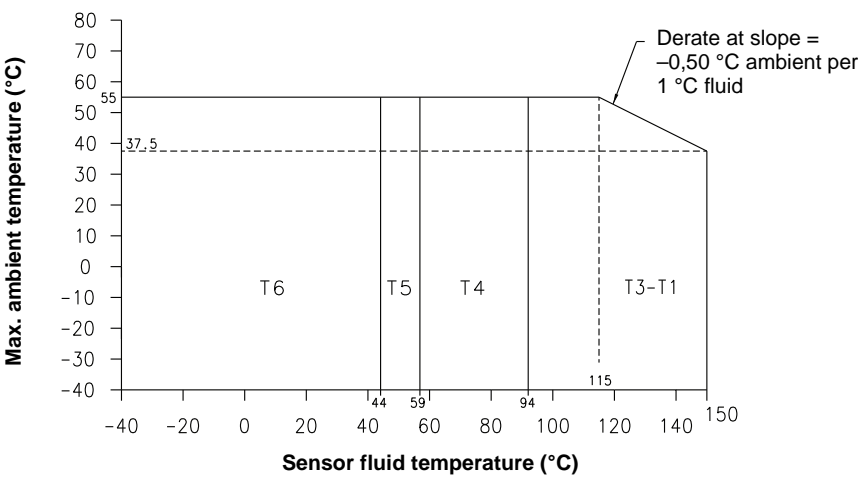
(1) ATEX "T" rating depends on the maximum temperature shown in the graphs above.

# Hazardous area classifications *continued*

ATEX<sup>(1)</sup>

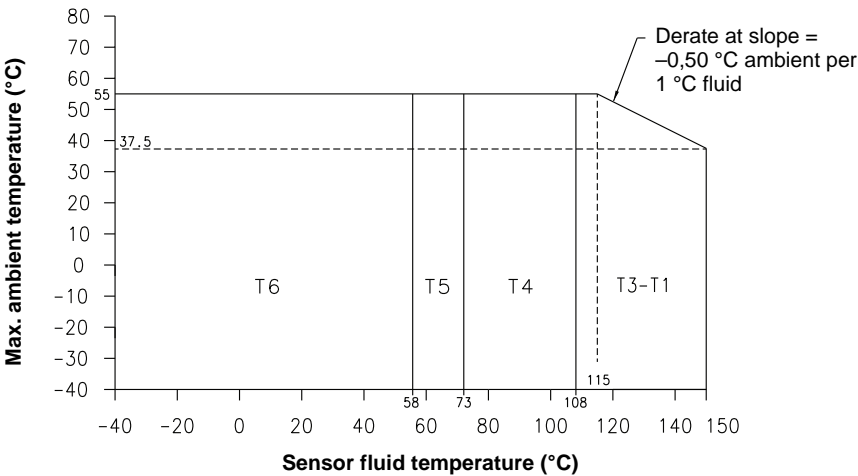
Model R100 (C.I.C. A2) with IFT9703 transmitter

CE 0575 Ex  
II 2 G EEx ib IIC T1...T6



Model R200 (C.I.C. A1) with IFT9703 transmitter

CE 0575 Ex  
II 2 G EEx ib IIC T1...T6



(1) ATEX "T" rating depends on the maximum temperature shown in the graphs above.

# Materials of construction

|                                   |                                |   |
|-----------------------------------|--------------------------------|---|
| <b>Wetted parts<sup>(1)</sup></b> | All models                     | 316L stainless steel  |
| <b>Housing</b>                    | Sensor                         | 304L stainless steel  |
|                                   | Core processor                 | CF-3M stainless steel or polyurethane-painted aluminum;<br>NEMA 4X (IP65) |
|                                   | Integrally mounted transmitter | Polyurethane-painted aluminum; NEMA 4X (IP65)                             |

(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 meter. Please refer to the Micro Motion corrosion guide for material compatibility information.

## Weight

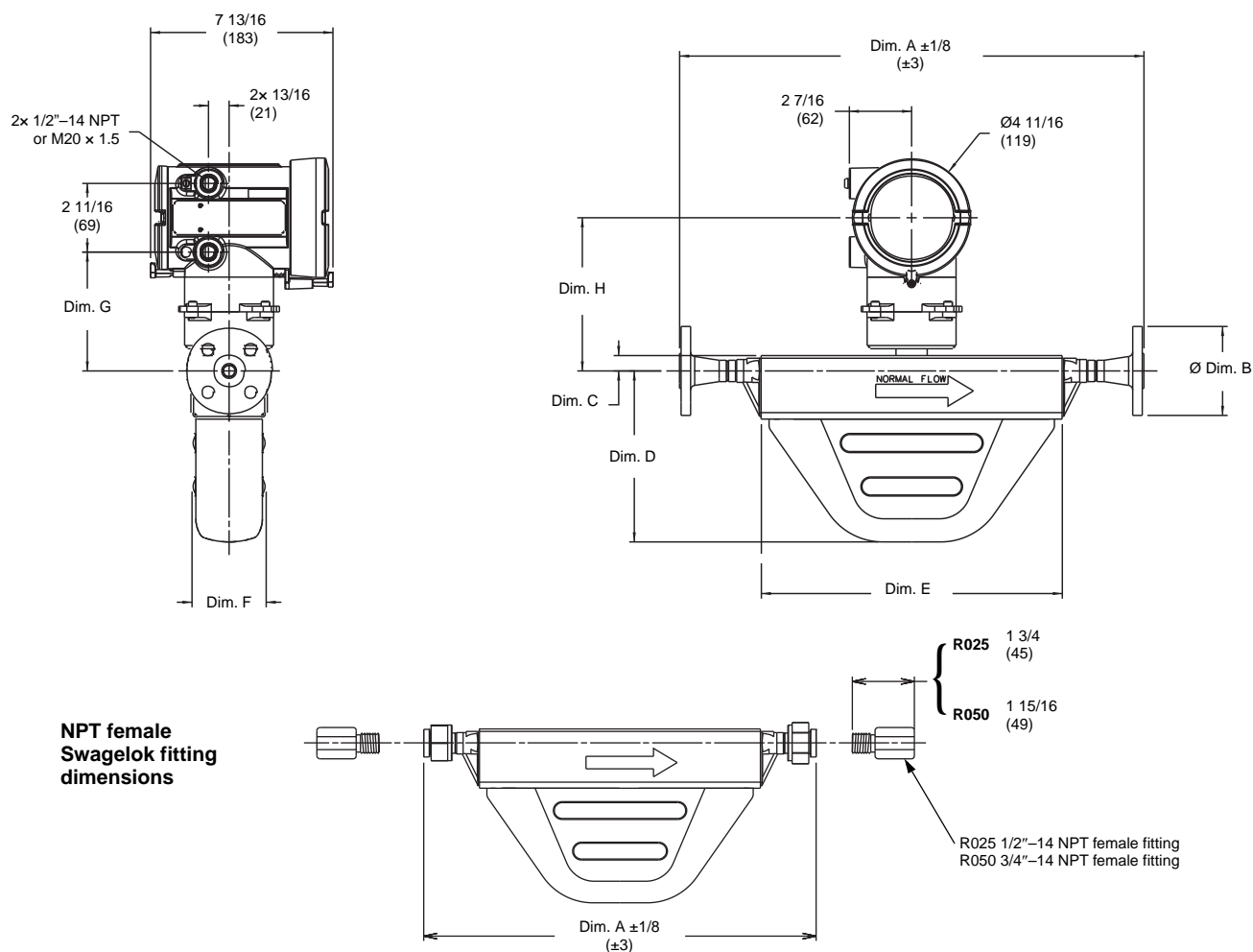
Weights provided are the weight of the meter with ANSI CL150 weld neck raised face flanges.

|  |      | <b>lb</b> | <b>kg</b> |
|--|------|-----------|-----------|
| Sensor with integrally mounted IFT9703 transmitter         | R025 | 16        | 8         |
|  | R050 | 17        | 8         |
|  | R100 | 27        | 12        |
|  | R200 | 49        | 22        |
| Sensor with integrally mounted Model 1700/2700 transmitter | R025 | 17        | 8         |
|  | R050 | 18        | 9         |
|  | R100 | 27        | 13        |
|  | R200 | 49        | 23        |
| Sensor with core processor                                 | R025 | 11        | 5         |
|  | R050 | 12        | 6         |
|  | R100 | 22        | 10        |
|  | R200 | 43        | 20        |
| Sensor with extended core processor                        | R025 | 12        | 6         |
|  | R050 | 13        | 6         |
|  | R100 | 23        | 11        |
|  | R200 | 44        | 20        |

# Dimensions

## Sensor with integrally mounted Model 1700 transmitter

Dimensions in *inches*  
(*mm*)



|       |            | Dimensions <sup>(1)</sup> |               |                  |                 |                 |                  |                 |
|-------|------------|---------------------------|---------------|------------------|-----------------|-----------------|------------------|-----------------|
| Model |            | RD <sup>(2)</sup>         | C             | D                | E               | F               | G                | H               |
| R025  | in<br>(mm) | 0.210<br>(5)              | 5/8<br>(15)   | 5 1/8<br>(130)   | 9 3/4<br>(247)  | 2 13/16<br>(72) | 4 11/16<br>(119) | 6<br>(153)      |
| R050  | in<br>(mm) | 0.345<br>(9)              | 5/8<br>(15)   | 6 3/4<br>(171)   | 11 7/8<br>(301) | 2 15/16<br>(74) | 4 11/16<br>(119) | 6<br>(153)      |
| R100  | in<br>(mm) | 0.647<br>(16)             | 7/8<br>(22)   | 9 1/8<br>(232)   | 14 7/8<br>(378) | 4 1/8<br>(104)  | 4 15/16<br>(126) | 6 1/4<br>(159)  |
| R200  | in<br>(mm) | 1.058<br>(29)             | 1 3/4<br>(44) | 12 9/16<br>(319) | 17 7/8<br>(454) | 5 5/8<br>(144)  | 5 13/16<br>(148) | 7 3/16<br>(182) |

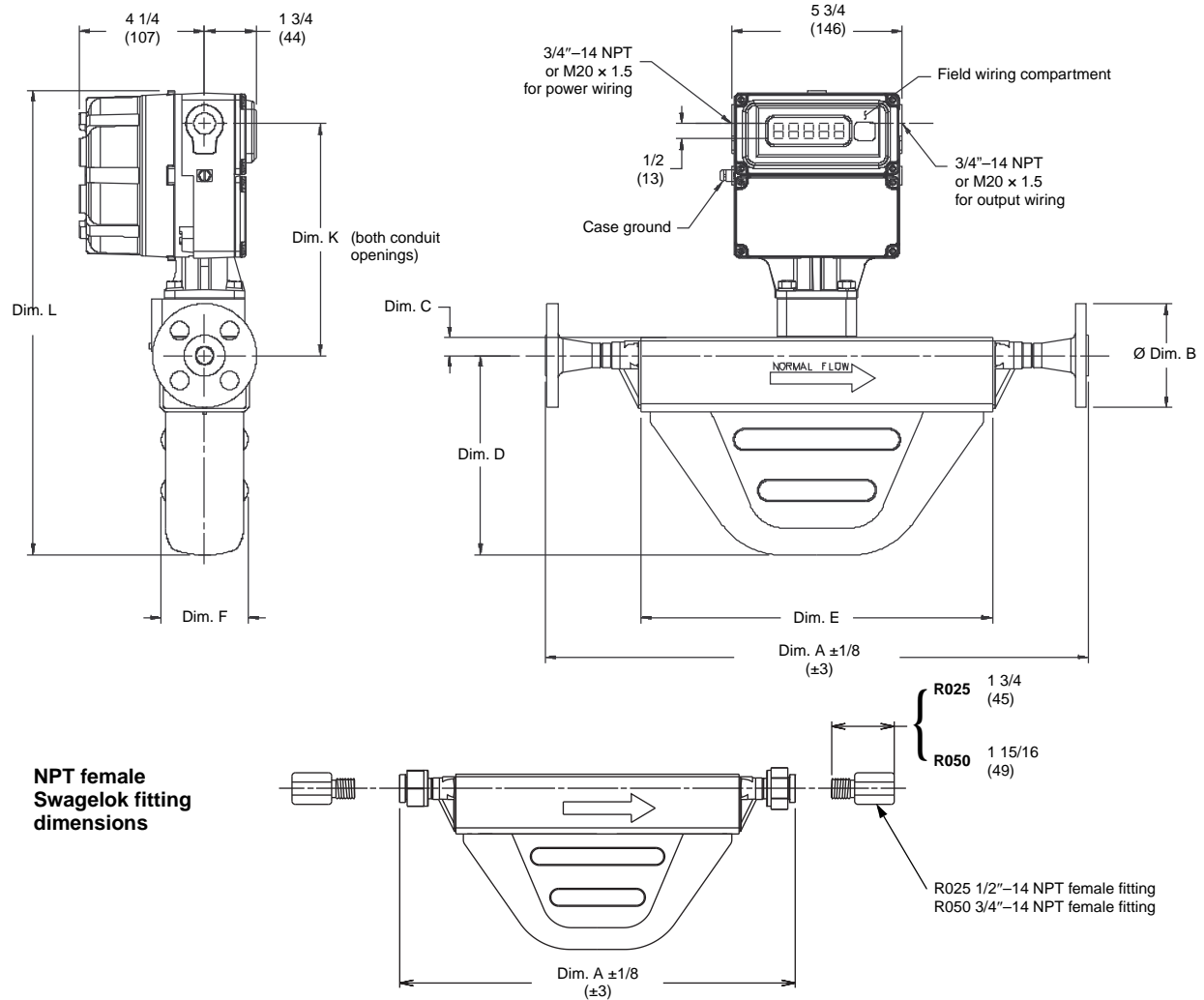
(1) For dimensions A and B, see fittings tables on pages 17–19.

(2) Minimum flow path restriction diameter.

## Dimensions *continued*

### Sensor with integrally mounted IFT9703 transmitter

Dimensions in *inches*  
(mm)



|       |            | Dimensions <sup>(1)</sup> |               |                  |                 |                 |                  |                   |
|-------|------------|---------------------------|---------------|------------------|-----------------|-----------------|------------------|-------------------|
| Model |            | RD <sup>(2)</sup>         | C             | D                | E               | F               | K                | L                 |
| R025  | in<br>(mm) | 0.210<br>(5)              | 5/8<br>(15)   | 5 1/8<br>(130)   | 9 3/4<br>(247)  | 2 13/16<br>(72) | 7 13/16<br>(199) | 14 1/16<br>(358)  |
| R050  | in<br>(mm) | 0.345<br>(9)              | 5/8<br>(15)   | 6 3/4<br>(171)   | 11 7/8<br>(301) | 2 15/16<br>(74) | 7 13/16<br>(199) | 15 11/16<br>(398) |
| R100  | in<br>(mm) | 0.647<br>(16)             | 7/8<br>(22)   | 9 1/8<br>(232)   | 14 7/8<br>(378) | 4 1/8<br>(104)  | 8 1/16<br>(205)  | 18 5/16<br>(466)  |
| R200  | in<br>(mm) | 1.058<br>(29)             | 1 3/4<br>(44) | 12 9/16<br>(319) | 17 7/8<br>(454) | 5 5/8<br>(144)  | 8 15/16<br>(228) | 22 5/8<br>(575)   |

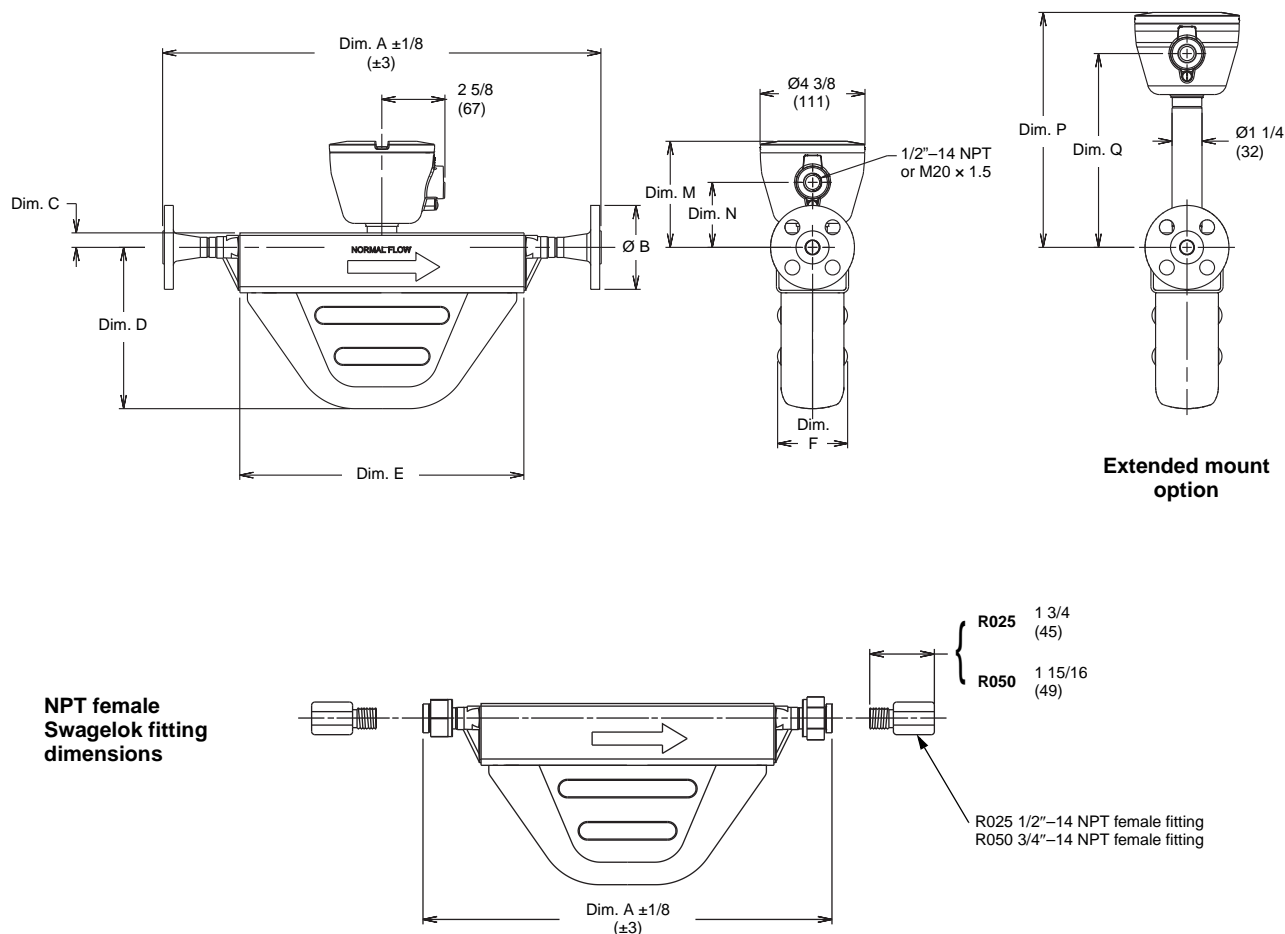
(1) For dimensions A and B, see fittings tables on pages 17–19.

(2) Minimum flow path restriction diameter.

# Dimensions *continued*

## Sensor with core processor

Dimensions in *inches*  
(*mm*)



|       |            | Dimensions <sup>(1)</sup> |               |                  |                 |                 |                  |                 |                   |                 |
|-------|------------|---------------------------|---------------|------------------|-----------------|-----------------|------------------|-----------------|-------------------|-----------------|
| Model |            | RD <sup>(2)</sup>         | C             | D                | E               | F               | M                | N               | P                 | Q               |
| R025  | in<br>(mm) | 0.210<br>(5)              | 5/8<br>(15)   | 5 1/8<br>(130)   | 9 3/4<br>(247)  | 2 13/16<br>(72) | 4 7/16<br>(112)  | 2 11/16<br>(69) | 9 13/16<br>(249)  | 8 1/16<br>(205) |
| R050  | in<br>(mm) | 0.345<br>(9)              | 5/8<br>(15)   | 6 3/4<br>(171)   | 11 7/8<br>(301) | 2 15/16<br>(74) | 4 7/16<br>(112)  | 2 11/16<br>(69) | 9 13/16<br>(249)  | 8 1/16<br>(205) |
| R100  | in<br>(mm) | 0.647<br>(16)             | 7/8<br>(22)   | 9 1/8<br>(232)   | 14 7/8<br>(378) | 4 1/8<br>(104)  | 4 11/16<br>(119) | 2 15/16<br>(75) | 10 1/16<br>(255)  | 8 5/16<br>(212) |
| R200  | in<br>(mm) | 1.058<br>(29)             | 1 3/4<br>(44) | 12 9/16<br>(319) | 17 7/8<br>(454) | 5 5/8<br>(144)  | 5 9/16<br>(141)  | 3 7/8<br>(98)   | 10 15/16<br>(278) | 9 1/4<br>(234)  |

(1) For dimensions A and B, see fittings tables on pages 17–19.

(2) Minimum flow path restriction diameter.



# Fitting options

|   | Fitting code | Dim. A face-to-face<br>inches (mm) | Dim. B outside diam.<br>inches (mm) |
|---|--------------|------------------------------------|-------------------------------------|
| <b>R025S fitting options<sup>(1)</sup></b>            |              |                                    |                                     |
| 1/2-inch ANSI CL150 weld neck raised face flange      | 113          | 16 (406)                           | 3 1/2 (89)                          |
| 1/2-inch ANSI CL300 weld neck raised face flange      | 114          | 16 3/8 (416)                       | 3 3/4 (95)                          |
| 1/2-inch ANSI CL600 weld neck raised face flange      | 115          | 16 7/8 (429)                       | 3 3/4 (95)                          |
| 1/2-inch NPT female Swagelok size 8 VCO fitting       | 319          | 14 (356) <sup>(2)</sup>            | not applicable                      |
| 1/2-inch sanitary fitting (Tri-Clamp® compatible)     | 121          | 14 (356)                           | 1 (25)                              |
| DN15 PN40 weld neck; DIN 2635 type C face             | 116          | 15 1/4 (387)                       | 3 3/4 (95)                          |
| DN15 PN40 weld neck flange; EN 1092-1 Form B1         | 176          | 15 1/4 (387)                       | 3 3/4 (95)                          |
| DN15 PN40 weld neck flange; EN 1092-1 Form D          | 310          | 15 1/4 (387)                       | 3 3/4 (95)                          |
| DN25 PN40 weld neck flange; EN 1092-1 Form B1         | 172          | 15 3/8 (400)                       | 4 1/2 (115)                         |
| DN25 PN40 weld neck flange; EN 1092-1 Form D          | 183          | 15 3/8 (400)                       | 4 1/2 (115)                         |
| DN15 PN100/160 weld neck flange; DIN 2638 type E face | 120          | 15 13/16 (401)                     | 4 1/8 (105)                         |
| DN15 PN100/160 weld neck flange; EN 1092-1 Form B2    | 170          | 15 13/16 (401)                     | 4 1/8 (105)                         |
| DN15 PN100 weld neck flange; EN 1092-1 Form D         | 178          | 15 13/16 (401)                     | 4 1/8 (105)                         |
| 15mm DIN 11851 hygienic coupling                      | 222          | 13 15/16 (353)                     | Rd 34 × 1/8                         |
| JIS 15mm 10K/20K weld neck raised face flange         | 122          | 15 7/16 (393)                      | 3 3/4 (95)                          |
| JIS 15mm 40K weld neck raised face flange             | 221          | 16 1/2 (420)                       | 4 1/2 (115)                         |
| <b>R025P fitting options<sup>(1)</sup></b>            |              |                                    |                                     |
| 15mm DIN PN100/160 weld neck, DIN 2638, type E face   | 120          | 15 13/16 (401)                     | 4 1/8 (105)                         |
| DN15 PN100/160 weld neck flange; EN 1092-1 Form B2    | 170          | 15 13/16 (401)                     | 4 1/8 (105)                         |
| DN15 PN100 weld neck flange; EN 1092-1 Form D         | 178          | 15 13/16 (401)                     | 4 1/8 (105)                         |
| DN25 PN100 weld neck flange; EN 1092-1 Form B2        | 180          | 16 13/16 (427)                     | 5 7/8 (150)                         |
| 1/2-inch NPT female Swagelok size 8 VCO fitting       | 319          | 14 (356) <sup>(2)</sup>            | not applicable                      |

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

(2) Dimension specified in table does NOT include fitting length. For installation, modify Dim. A value to include fitting. See pages 14–16.

## Fitting options *continued*

|   | Fitting code | Dim. A face-to-face<br>inches (mm) | Dim B. outside diam.<br>inches (mm) |
|---|--------------|------------------------------------|-------------------------------------|
| <b>R050S fitting options<sup>(1)</sup></b>            |              |                                    |                                     |
| 1/2-inch ANSI CL150 weld neck raised face flange      | 113          | 18 1/8 (460)                       | 3 1/2 (89)                          |
| 1/2-inch ANSI CL300 weld neck raised face flange      | 114          | 18 1/2 (469)                       | 3 3/4 (95)                          |
| 1/2-inch ANSI CL600 weld neck raised face flange      | 115          | 19 (482)                           | 3 3/4 (95)                          |
| 3/4-inch NPT female Swagelok size 12 VCO fitting      | 239          | 16 3/8 (415) <sup>(2)</sup>        | not applicable                      |
| 3/4-inch sanitary fitting (Tri-Clamp compatible)      | 322          | 15 7/8 (403)                       | 1 (25)                              |
| DN15 PN40 weld neck flange; DIN 2635 type C face      | 116          | 17 3/8 (441)                       | 3 3/4 (95)                          |
| DN15 PN40 weld neck flange; EN 1092-1 Form B1         | 176          | 17 3/8 (441)                       | 3 3/4 (95)                          |
| DN15 PN40 weld neck flange; EN 1092-1 Form D          | 310          | 17 3/8 (441)                       | 3 3/4 (95)                          |
| DN15 PN100/160 weld neck flange; DIN 2638 type E face | 120          | 17 7/8 (455)                       | 4 1/8 (105)                         |
| DN15 PN100/160 weld neck flange; EN 1092-1 Form B2    | 170          | 17 7/8 (455)                       | 4 1/8 (105)                         |
| DN15 PN100 weld neck flange; EN 1092-1 Form D         | 178          | 17 7/8 (455)                       | 4 1/8 (105)                         |
| DN25 PN40 weld neck flange; DIN 2635 type C face      | 131          | 17 1/2 (444)                       | 4 1/2 (115)                         |
| DN25 PN40 weld neck flange; EN 1092-1 Form B1         | 172          | 17 1/2 (444)                       | 4 1/2 (115)                         |
| DN25 PN40 weld neck flange; EN 1092-1 Form D          | 183          | 17 1/2 (444)                       | 4 1/2 (115)                         |
| 15mm DIN 11851 hygienic coupling                      | 222          | 16 (407)                           | Rd 34 × 1/8                         |
| JIS 15mm 10K/20K weld neck raised face flange         | 122          | 17 9/16 (446)                      | 3 3/4 (95)                          |
| JIS 15mm 40K weld neck raised face flange             | 221          | 18 5/8 (473)                       | 4 1/2 (115)                         |
| <b>R100S fitting options<sup>(1)</sup></b>            |              |                                    |                                     |
| 1-inch ANSI CL150 weld neck raised face flange        | 128          | 22 11/16 (576)                     | 4 1/4 (108)                         |
| 1-inch ANSI CL300 weld neck raised face flange        | 129          | 23 3/16 (588)                      | 4 7/8 (124)                         |
| 1-inch ANSI CL600 weld neck raised face flange        | 130          | 23 11/16 (601)                     | 4 7/8 (124)                         |
| 1-inch sanitary fitting (Tri-Clamp compatible)        | 138          | 21 1/4 (540)                       | 2 (50)                              |
| DN25 PN40 weld neck flange; DIN 2635 type C face      | 131          | 21 7/16 (544)                      | 4 1/2 (115)                         |
| DN25 PN100/160 weld neck flange; DIN 2638 type E face | 137          | 22 13/16 (580)                     | 5 1/2 (140)                         |
| 25mm DIN 11851 hygienic coupling                      | 230          | 20 9/16 (522)                      | Rd 52 × 1/6                         |
| DN25 PN40 weld neck flange; EN 1092-1 Form B1         | 179          | 21 7/16 (545)                      | 4 1/2 (115)                         |
| DN25 PN40 weld neck flange; EN 1092-1 Form D          | 311          | 21 7/16 (545)                      | 4 1/2 (115)                         |
| DN25 PN100 weld neck flange; EN 1092-1 Form B2        | 180          | 22 7/8 (581)                       | 5 1/2 (140)                         |
| DN25 PN100 weld neck flange; EN 1092-1 Form D         | 181          | 22 7/8 (581)                       | 5 1/2 (140)                         |
| JIS 25mm 10K/20K weld neck raised face flange         | 139          | 21 11/16 (550)                     | 4 15/16 (125)                       |
| JIS 25mm 40K weld neck raised face flange             | 229          | 22 15/16 (582)                     | 5 1/8 (130)                         |

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

(2) Dimension specified in table does NOT include fitting length. For installation, modify Dim. A value to include fitting. See pages 14–16.

## Fitting options *continued*

|  | Fitting code | Dim. A face-to-face<br>inches (mm) | Dim B. outside diam.<br>inches (mm) |
|--|--------------|------------------------------------|-------------------------------------|
| <b>R200S fitting options<sup>(1)</sup></b>         |              |                                    |                                     |
| 1 1/2-inch ANSI CL150 weld neck raised face flange | 341          | 24 3/4 (629)                       | 5 (127)                             |
| 1 1/2-inch ANSI CL300 weld neck raised face flange | 342          | 25 1/4 (642)                       | 6 1/8 (155)                         |
| 1 1/2-inch ANSI CL600 weld neck raised face flange | 343          | 25 3/4 (654)                       | 6 1/8 (155)                         |
| 2-inch ANSI CL150 weld neck raised face flange     | 418          | 24 7/8 (632)                       | 6 (152)                             |
| 2-inch ANSI CL300 weld neck raised face flange     | 419          | 25 3/8 (645)                       | 6 1/2 (165)                         |
| 2-inch ANSI CL600 weld neck raised face flange     | 420          | 26 1/8 (664)                       | 6 1/2 (165)                         |
| 1 1/2-inch sanitary fitting (Tri-Clamp compatible) | 351          | 23 1/4 (591)                       | 2 (50)                              |
| 2-inch sanitary fitting (Tri-Clamp compatible)     | 352          | 22 7/8 (581)                       | 2 1/2 (64)                          |
| DN40 PN40 weld neck flange; DIN 2635 type C face   | 381          | 23 9/16 (598)                      | 5 15/16 (150)                       |
| DN50 PN40 weld neck flange; DIN 2635 type C face   | 382          | 23 5/8 (600)                       | 6 1/2 (165)                         |
| DN50 PN100 weld neck flange; DIN 2637 type E face  | 378          | 25 1/4 (641)                       | 7 11/16 (195)                       |
| DN40 PN40 weld neck flange; EN 1092-1 Form B1      | 368          | 23 1/4 (594)                       | 5 15/16 (150)                       |
| DN40 PN40 weld neck flange; EN 1092-1 Form D       | 312          | 23 1/4 (594)                       | 5 15/16 (150)                       |
| DN40 PN100 weld neck flange; EN 1092-1 Form B2     | 363          | 24 3/4 (628)                       | 6 11/16 (170)                       |
| DN40 PN100 weld neck flange; EN 1092-1 Form D      | 366          | 24 3/4 (628)                       | 6 11/16 (170)                       |
| DN50 PN40 weld neck flange; EN 1092-1 Form B1      | 369          | 23 5/8 (600)                       | 6 1/2 (165)                         |
| DN50 PN40 weld neck flange; EN 1092-1 Form D       | 316          | 23 5/8 (600)                       | 6 1/2 (165)                         |
| DN50 PN100 weld neck flange; EN 1092-1 Form B2     | 365          | 25 1/4 (641)                       | 7 11/16 (195)                       |
| DN50 PN100 weld neck flange; EN 1092-1 Form D      | 367          | 25 1/4 (641)                       | 7 11/16 (195)                       |
| 40mm DIN 11851 hygienic coupling                   | 353          | 23 3/16 (589)                      | Rd 65 × 1/6                         |
| 50mm DIN 11851 hygienic coupling                   | 354          | 23 1/4 (591)                       | Rd 78 × 1/6                         |
| JIS 40mm 10K weld neck raised face flange          | 385          | 23 7/16 (595)                      | 5 1/2 (140)                         |
| JIS 40mm 20K weld neck raised face flange          | 387          | 23 7/16 (595)                      | 5 1/2 (140)                         |
| JIS 50mm 10K weld neck raised face flange          | 386          | 23 7/16 (595)                      | 6 1/8 (155)                         |
| JIS 50mm 20K weld neck raised face flange          | 388          | 23 5/8 (600)                       | 6 1/8 (155)                         |
| JIS 50mm 40K weld neck raised face flange          | 389          | 25 7/16 (646)                      | 6 1/2 (165)                         |

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

# Ordering information

| Model                  | Product description   |
|------------------------|---|
|                        | <b>Standard sensor models</b>   |
| R025S                  | R-Series sensor; 1/4-inch (6 mm); 316L stainless steel  |
| R050S                  | R-Series sensor; 1/2-inch (12 mm); 316L stainless steel   |
| R100S                  | R-Series sensor; 1-inch (25 mm); 316L stainless steel   |
| R200S                  | R-Series sensor; 2-inch (50 mm); 316L stainless steel   |
|                        | <b>High-pressure models</b>   |
| R025P                  | R-Series sensor; 1/4-inch (6 mm); 316L stainless steel; 2300 psi (158 bar) tube rating  |
| <b>Code</b>            | <b>Process connection</b>   |
| ###                    | See fittings option tables on pages 17–19   |
| <b>Code</b>            | <b>Case options</b>   |
| N                      | Standard case   |
| <b>Code</b>            | <b>Electronics interface</b>  |
| Q                      | 4-wire polyurethane-painted aluminum integral core processor for remotely mounted transmitter with MVD technology                     |
| A                      | 4-wire stainless steel integral core processor for remotely mounted transmitter with MVD technology                                   |
| V                      | 4-wire polyurethane-painted aluminum integral core processor with extended mount for remotely mounted transmitter with MVD technology |
| B                      | 4-wire stainless steel integral core processor with extended mount for remotely mounted transmitter with MVD technology               |
| C                      | Integrally mounted Model 1700 (all output options) or Model 2700 (FOUNDATION fieldbus or PROFIBUS-PA) transmitter                     |
| W <sup>(1)</sup>       | Polyurethane-painted aluminum integral core processor for MVD™ Direct Connect™ installations  |
| D <sup>(1)</sup>       | Stainless steel integral core processor for MVD Direct Connect installations  |
| Y <sup>(1)</sup>       | Polyurethane-painted aluminum integral core processor with extended mount for MVD Direct Connect installations                        |
| E <sup>(1)</sup>       | Stainless steel integral core processor with extended mount for MVD Direct Connect installations                                      |
| I                      | Integrally mounted IFT9703 transmitter  |
| <b>Code</b>            | <b>Conduit connections</b>  |
|                        | <b>Electronics interface codes Q, A, V, B, W, D, Y, and E</b>   |
| B                      | 1/2-inch NPT — no gland   |
| E                      | M20 — no gland  |
| F                      | Brass/nickel cable gland (cable diameter 0.335 to 0.394 inches [8.5 to 10 mm])  |
| G                      | Stainless steel cable gland (cable diameter 0.335 to 0.394 inches [8.5 to 10 mm])   |
|                        | <b>Electronics interface codes C or I (integrally mounted 1700/2700 or IFT9703, no conduit connections)</b>                           |
| A                      | No gland  |
| Continued on next page |   |

(1) When electronics interface W, D, Y, or E is ordered with approval code C, A, or Z, an MVD Direct Connect I.S. barrier is supplied. No barrier is supplied when ordered with approval code M or N.

## Ordering information *continued*

| Code   | Approvals <sup>(1)</sup>                             |
|--|--|
| M  | Micro Motion standard (no approval)                  |
| N  | Micro Motion standard / PED compliant (no approval)  |
| U <sup>(2)</sup>   | UL   |
| C  | CSA (Canada only)                                    |
| A  | CSA C-US (U.S.A. and Canada)                         |
| Z  | ATEX — Equipment category 2 (Zone 1) / PED compliant |
| I  | IECEx Zone 1   |
| P <sup>(3)</sup>   | NEPSI  |
| Code   | Language   |
| A  | Danish installation manual                           |
| C  | Czech installation manual                            |
| D  | Dutch installation manual                            |
| E  | English installation manual                          |
| F  | French installation manual                           |
| G  | German installation manual                           |
| H  | Finnish installation manual                          |
| I  | Italian installation manual                          |
| J  | Japanese installation manual                         |
| M  | Chinese installation manual                          |
| N  | Norwegian installation manual                        |
| O  | Polish installation manual                           |
| P  | Portuguese installation manual                       |
| S  | Spanish installation manual                          |
| W  | Swedish installation manual                          |
| B  | Hungarian CE requirements and English manual         |
| K  | Slovak CE requirements and English manual            |
| T  | Estonian CE requirements and English manual          |
| U  | Greek CE requirements and English manual             |
| L  | Latvian CE requirements and English manual           |
| V  | Lithuanian CE requirements and English manual        |
| Y  | Slovenian CE requirements and English manual         |
| Code   | Future option 1                                      |
| Z  | Reserved for future use                              |
| Code   | Future option 2                                      |
| Z  | Reserved for future use                              |
| Code   | Future option 3                                      |
| Z  | Reserved for future use                              |
| Code   | Factory options                                      |
| Z  | Standard product                                     |
| X  | ETO product  |
| <b>Typical model number: R025S 113 N C A C E Z Z Z Z</b> |  |

(1) When electronics interface W, D, Y, or E is ordered with approval code C, A, or Z, an MVD Direct Connect I.S. barrier is supplied. No barrier is supplied when ordered with approval code M or N.

(2) Available only with electronics interface code I.

(3) Available only with language code M (Chinese).





# 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 500,000 meters installed worldwide and 30 years of flow and density measurement experience.

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

© 2007 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 5366 2622  
Argentina T: 54 11 4837 7000  
Brazil T: 55 15 3238 3677  
Venezuela T: 58 26 1731 3394

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

Central & Eastern Europe T: +41 41 7686 111  
Dubai T: 971-4 8835235  
France T: 0800 917 901  
Germany T: 0800 182 5347  
Italy T: 8008 77334  
The Netherlands T: (31) 318 495 555  
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 3895 4788  
India T: (91) 22 5662 0566  
Japan T: (81) 3 5769 6803  
Korea T: (82) 2 3438 4600  
Singapore T: (65) 6 777 8211

