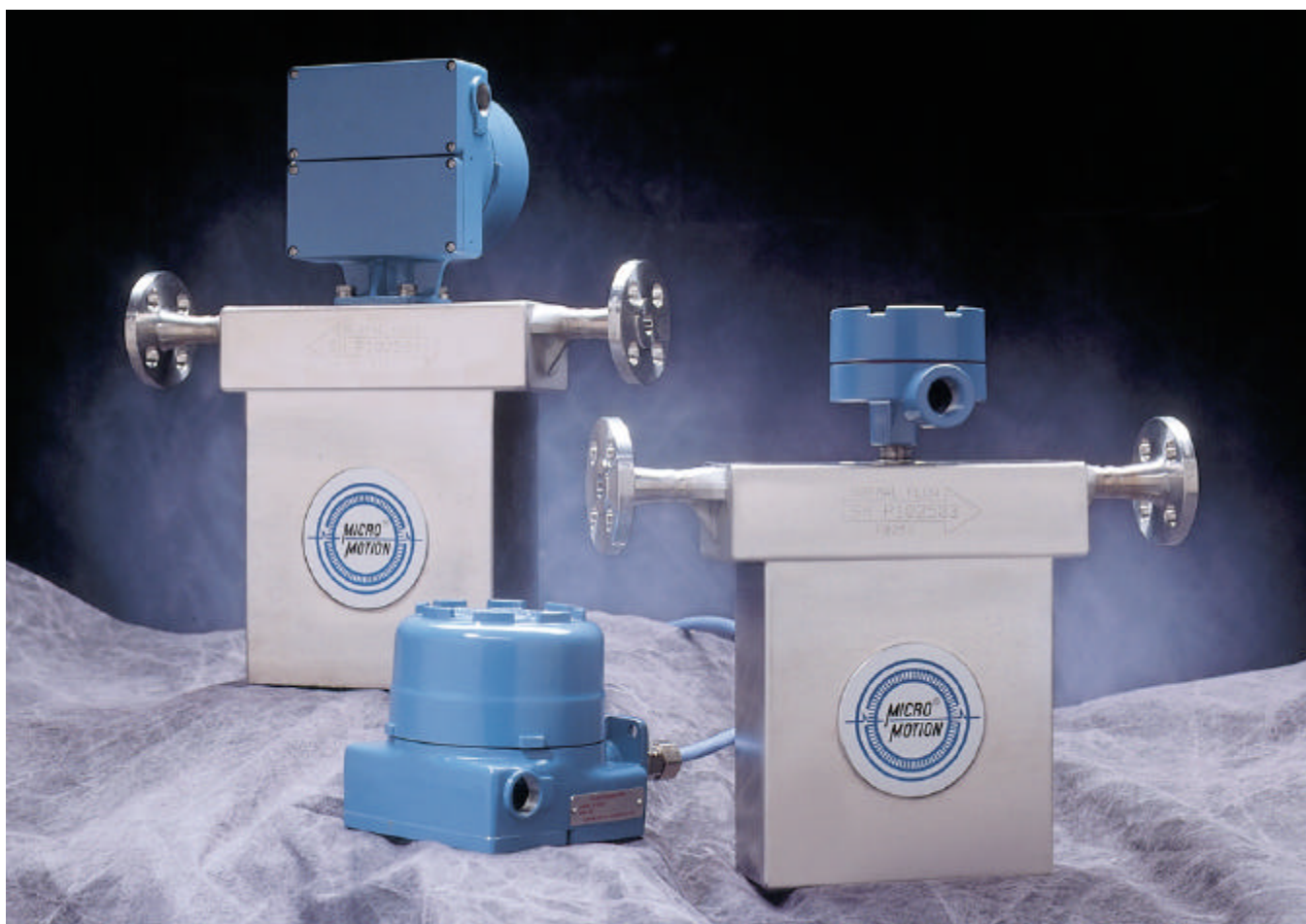


Micro Motion IFT9701 Mass and Volume Flow Transmitter



Micro Motion IFT9701 transmitter

The IFT9701 microprocessor-based transmitter works with Micro Motion® sensors to provide affordable, precise mass and volumetric flow measurement in a wide variety of fluid applications.

The IFT9701 simultaneously transmits the flow rate signal by means of an internally powered (active) milliamp output and an externally powered (passive) pulse output. The IFT9701 is capable of digital communication using HART® protocol and the Bell 202 serial standard. For configuration in the field, use Micro Motion ProLink® software, Fisher-Rosemount™ AMS software, or a Rosemount® Model 275 HART Communicator.

To simplify and reduce the cost of flowmeter installation, the IFT9701 is available integrally mounted to any Micro Motion F-Series sensor. With optional remote-mount hardware, the IFT9701 can be installed up to 300 meters from Micro Motion F-Series sensors, ELITE® sensors, standard or high-pressure Model D sensors, or Model DL sanitary sensors.

The IFT9701 is housed in a IP65 weathertight enclosure, and is available with an optional local display.

Additional options are available with transmitters that are similar to the IFT9701. The Model 5300 transmitter features FOUNDATION™ fieldbus output, and Micro Motion R-Series meters, which feature the integrally mounted IFT9703 transmitter, are our latest general purpose flowmeters.



The IFT9701 transmitter supports PlantWeb® field-based architecture, a scalable way to use open and interoperable devices and systems to build process solutions of the future.

IFT9701 performance specifications

Sensor model		Flow accuracy ⁽¹⁾
ELITE [®] ⁽²⁾	liquid gas	$\pm 0,10\% \pm [(\text{zero stability/flow rate}) \times 100]\%$ of rate $\pm 0,50\% \pm [(\text{zero stability/flow rate}) \times 100]\%$ of rate
F-Series	liquid gas	$\pm 0,20\% \pm [(\text{zero stability/flow rate}) \times 100]\%$ of rate $\pm 0,70\% \pm [(\text{zero stability/flow rate}) \times 100]\%$ of rate
D (except DH38 and D600) and DL ⁽³⁾	liquid gas	$\pm 0,15\% \pm [(\text{zero stability/flow rate}) \times 100]\%$ of rate $\pm 0,65\% \pm [(\text{zero stability/flow rate}) \times 100]\%$ of rate
DH38	liquid gas	$\pm 0,15\% \pm [(\text{zero stability/flow rate}) \times 100]\%$ of rate $\pm 0,50\% \pm [(\text{zero stability/flow rate}) \times 100]\%$ of rate

Sensor model		Flow repeatability ⁽¹⁾
ELITE	liquid gas	$\pm 0,05\% \pm [\frac{1}{2}(\text{zero stability/flow rate}) \times 100]\%$ of rate $\pm 0,25\% \pm [(\text{zero stability/flow rate}) \times 100]\%$ of rate
F-Series	liquid gas	$\pm 0,10\% \pm [\frac{1}{2}(\text{zero stability/flow rate}) \times 100]\%$ of rate $\pm 0,35\% \pm [(\text{zero stability/flow rate}) \times 100]\%$ of rate
D (except DH38 and D600) and DL ⁽³⁾	liquid gas	$\pm 0,05\% \pm [\frac{1}{2}(\text{zero stability/flow rate}) \times 100]\%$ of rate $\pm 0,30\% \pm [(\text{zero stability/flow rate}) \times 100]\%$ of rate
DH38	liquid gas	$\pm 0,05\% \pm [\frac{1}{2}(\text{zero stability/flow rate}) \times 100]\%$ of rate $\pm 0,25\% \pm [\frac{1}{2}(\text{zero stability/flow rate}) \times 100]\%$ of rate

Sensor model		Density accuracy kg/m ³	Density repeatability kg/m ³
ELITE (except high-pressure CMF010P)	liquid gas	$\pm 2,0$ $\pm 20,0$	$\pm 1,0$ $\pm 10,0$
ELITE high-pressure CMF010P	liquid gas	$\pm 8,0$ $\pm 80,0$	$\pm 4,0$ $\pm 40,0$
F-Series	liquid only	$\pm 2,0$	$\pm 1,0$
D (except D600) and DL ⁽³⁾ DH100, DH150, DH300	liquid only	$\pm 2,0$	$\pm 1,0$
DH25, DH38	liquid only	$\pm 4,0$	$\pm 2,0$

Sensor model		Temperature accuracy	Temperature repeatability
All models		$\pm 1^\circ\text{C} \pm 0,5\%$ of reading in $^\circ\text{C}$	$\pm 0,2^\circ\text{C}$

⁽¹⁾ Accuracy includes the combined effects of repeatability, linearity, and hysteresis. All specifications are based on reference conditions of water at 20 to 25°C, and 1 to 2 bar unless otherwise noted. For values of zero stability, refer to product specifications for each sensor.

⁽²⁾ For ELITE sensors with the IFT9701 transmitter, specified accuracy applies to nominal flow range only.

⁽³⁾ The IFT9701 cannot be used with Model D600 or DT-series sensors.

IFT9701 functional specifications

Output signals

Analog

One 4-20mA output can represent the same mass or volume flow rate variable as the pulse output. Internally powered (active), galvanically isolated to ± 500 VDC from ground, 600 ohm load limit.

Out-of-range capability: 3,8 to 20,5 mA.

Milliamp (mA) output rangeability:

Maximum span determined by sensor specifications
Range limit determined by sensor maximum rate
Minimum recommended span (% of nominal flow range):

ELITE® sensors	2,5%
F-Series sensors	10%
D and DL sensors	10%

Pulse

One pulse output can represent the same mass or volume flow rate variable as the analog output. Externally powered (passive), requires pull-up resistor to 5-30 VDC power supply. Minimum resistance: 500 ohms at 5V, 3 kohm at 30V. Galvanically isolated to ± 500 VDC. Signal can be scaled up to 7200 Hz. Out-of-range capability to 7200 Hz. Voltage in on state is less than 1 V. Below 1 Hz, pulse width will be 500 ms; at all pulse frequencies between 1 Hz and 7200 Hz, pulse width is half the pulse period.

Digital

Bell 202 signal is superimposed on 4-20 mA variable, available for host system interface. Frequency 1,2 and 2,2kHz, amplitude 0,5 V peak-to-peak, baud rate 1200 baud. Requires 250 to 600 ohms load resistance.

Low-flow cutoff

Flow rate below cutoff causes outputs to default to the level that indicates zero flow.

Slug-flow inhibit

When transmitter senses density outside user-selected limits, outputs default to the level that indicates zero flow.

Damping

Wide range of programmed filter time constants for damping on flow.

Fault indication

User-selected downscale (2 mA, 0 Hz) or upscale (22mA, 7200 Hz) indicates a fault condition.

Output testing

Current source

Transmitter can produce a user-specified current between 2 and 22 mA.

Frequency source

Transmitter can produce a user-specified frequency between 0,01 and 1200 Hz.

Local display (optional)

5-digit, alphanumeric, liquid crystal display (LCD) installed on the field-wiring compartment cover. The LCD shows flow rate, and indicates slug flow, flowmeter zeroing in progress, and electronic faults.

Power supply options

85 to 250 VAC

45 to 65 Hz, 9 watts maximum power dissipation;
20 volt-amperes maximum apparent line power.
Fused at 250 V/0,4 A IEC delayed, nonreplaceable.
Meets low-voltage directive 73/23/EEC.

20 to 30 VDC

6 watts typical, 14 watts maximum. Fused at 60 V/1,8 A Trip. Minimum startup voltage is 16 V at transmitter terminals. Maximum total resistance for wiring is 13 ohm. At startup, transmitter power source must provide a minimum of 0,7 amp of short-term current.

Ambient temperature limits

Operating

Transmitters integrally mounted to sensor
At their upper limits, process fluid temperature and ambient temperature restrict each other. The graphs provided on the next page define the maximum recommended process fluid temperature based on maximum expected ambient temperature.

Transmitters remotely mounted from sensor
Without local display -30 to 55°C
With optional display 0 to 55°C

Note: Optional local display may become difficult to read below -10°C.

Storage

-40 to 85°C

Process temperature limits

Transmitters integrally mounted to sensor
-40 to 125°C

At their upper limits, process fluid temperature and ambient temperature restrict each other. The graphs provided on the next page define the maximum recommended process fluid temperature based on maximum expected ambient temperature.

Transmitters remotely mounted from sensor
Refer to sensor specifications

Density limits for volume flow

200 to 2000 kg/m³

Humidity limits

5 to 95% non-condensing

Vibration limits

Meets IEC 68.2.6, 2 g, endurance sweep, 10 to 2000 Hz, 50 sweep cycles

Environmental effects

Transmitters meet the requirements of the EMC directive 89/336/EEC per EN 50081-2 (January 1992) and EN 50082-2 (March 1995) when operated at nominal rated flow measurement range. For specific EMC effects within the EC, the Technical EMC file may be reviewed at Micro Motion Veenendaal.

All IFT9701 transmitters meet the requirements of SAMA PMC 33.1 (October 1978), Class 2, A, B, C (1% span) at nominal flow rate. All IFT9701 transmitters meet the recommendations of ANSI/IEEE C62.41 (1991) for surge and EFT.

To meet the above specifications, the transmitter must be installed with an approved Micro Motion sensor, and the sensor cable must be doubly shielded with full-contact glands, or installed in continuous, fully bonded metallic conduit. The transmitter and sensor must be directly connected to a low-impedance (less than 1 ohm) earth ground. Transmitter outputs must be standard twisted-pair, shielded instrument wire

Ambient temperature effect on milliamp output

±0,005% of flow rate per °C deviation from output trim temperature

Hazardous area classifications

UL and CSA

Class I, Div. 2, Groups A, B, C, and D
Class II, Div 2, Groups F and G

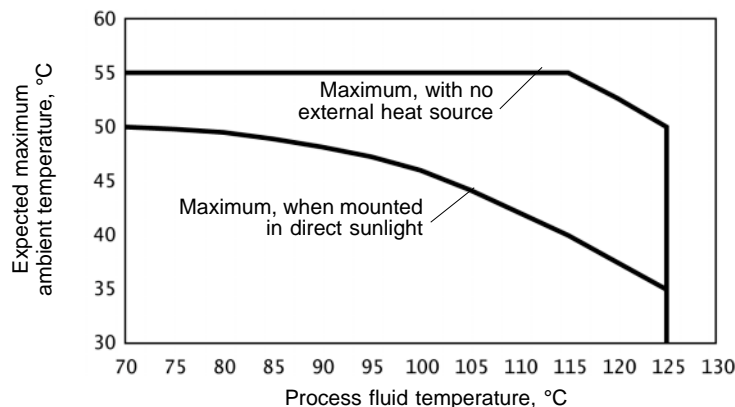
UL Division 2 nonincendive parameters

Active (4-20mA) output		Passive (pulse) output	
V _{oc}	20 V	V _{max}	30 V
I _{sc}	5 mA	I _{max}	128 mA
C _a	0,75 µF	C _i	0
L _a	100 mH	L _i	0

CENELEC

When ordered for installation in Zone 1 (hazardous) area, EEx de [ib] IIC T6. Otherwise, EEx [ib] IIC.

Process fluid vs. ambient temperature for transmitter integrally mounted to sensor



IFT9701 physical specifications

Housing

IP65 epoxy polyester painted cast aluminum.

Two M20 or 3/4-14 NPT female conduit ports for power and output signal wiring. Remotely mounted transmitter has one additional 3/4-14 NPT female conduit for sensor cable.

Electrical connections

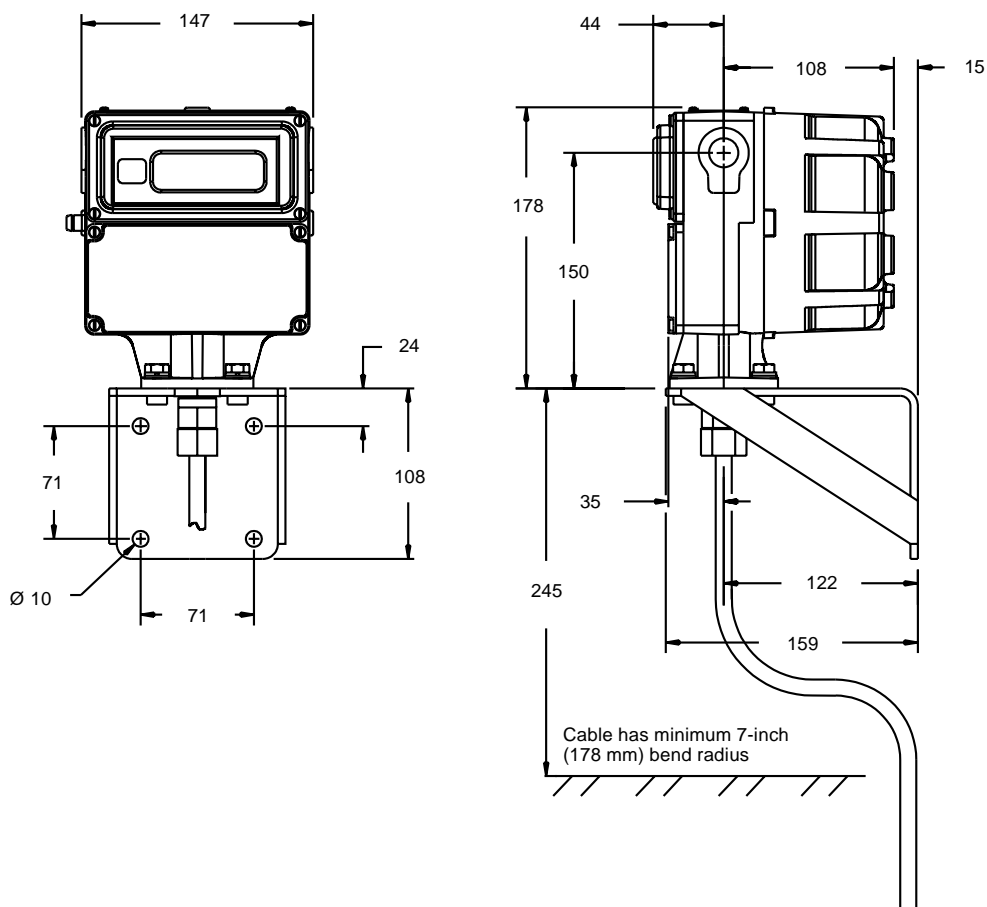
Fixed screw terminals for all wiring connections. Screw terminal on housing for chassis ground.

Weight

5,7 kg

Remotely mounted transmitter*

Dimensions in mm



*For integrally mounted sensor and transmitter, refer to sensor product specifications.

IFT9701 model number matrix

Code	Model number
IFT9701	IFT9701 flow transmitter
Code	Mounting options
I	Integral mount
R ¹	Remote mount, 5 m copper-shielded sensor cable, insulated with Teflon® coating
Code	Power-supply options
6	85 to 250 VAC
3	20 to 30 VDC
Code	Display options
N	No display
D ²	Local display
Code	Conduit ports
1	20 mm (M20) conduit ports, no cable glands
2	20 mm (M20) conduit ports, with two nickel-plated brass cable glands approved for EExe (increased safety) installations
3	¾-inch NPT conduit ports, no cable glands
Code	Approvals
M	Micro Motion standard (no approvals)
U ³	UL
B	CENELEC Safe Area — not available with mount code I; with mount code R, L, J, S or A, the sensor must have approval code Z
Z	CENELEC Zone 1 — not available with display code D
Example*	IFT9701 I 6 N 1 Z

*Example: IFT9701 I 6 N 1 Z = Model IFT9701 transmitter, integral mount, configured for 85-250 VAC power supply; no display; 20 mm (M20) conduit openings, no glands; CENELEC Zone 1 compliant.

⁽¹⁾ When transmitter is ordered in any remote mount configuration, and approval B or Z, sensor must be ordered with approval code Z.

⁽²⁾ Not available on CENELEC Zone 1 version (approval code Z).

⁽³⁾ Available with conduit port code 3 only.

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