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Clamp On Ultrasonic Flowmeter 7000 Series

- Dual mode flowmeter mounted in IP 65 field enclosure
- Easy to install clamp-on sensors with no process interruption
- Non-invasive flow measurement of liquids , no pipeline disturbance, no pressure loss
- Suitable for all commonly used pipe materials with pipe diameters from 10 mm to 6.5 m (1/4" to 256")
- 1 or 2 flow channels

Description:

Our range of non-invasive flowmeters utilises ultrasonic technology for the accurate flow measurement of liquids in full pipes.
The field mounted flow transmitter can be configured via keypad without any additional programming devices and is available as single or dual channel unit.

The measurement of flow is based on the principle that sound waves are influenced by a flowing medium.

Measurements are made by penetrating the pipe with ultrasound and subsequently time differences, frequency variations and phase shifts of the ultrasonic signals are evaluated. This measuring technique has no effect on the flowing liquid. There is no pressure loss in the pipe and no wear on components of the measuring device.

The ultrasonic sensors are clamped onto the outside of the pipe, thus eliminating the need to dismantle the pipework and interrupt the process. The 7000 Series can be applied to any type of standard pipe carrying clean or dirty liquids.

Advantages

- Low installation effort and costs
- Measurement is independent of fluid conductivity and pressure
- No pressure loss , no possibility of leakage
- Retrospective installation for existing plants possible
- No cutting of pipes neces sary, no interruption of process , no plant shut down
- No additional fittings for maintenance required
- Hygienic measurement, no risk of contamination, suitable for ultra clean liquids
- No contact with medium, no risk of corrosion when used with aggressive media
- Cost advantages when used with large diameter pipes, high pressure systems, etc.
- Low stock costs, nearly all pipe sizes are covered with only 2 types of sensors

Specification

General

Measuring principle	Ultrasonic time difference correlation principle
Flow velocity range	0.01 ... 25 m/s
Resolution	0.025 cm/s
Repeatibility	0.15 % of measured value ± 0.015 m/s
Accuracy	Volume flow: ± 1 .. 3 % of measured value depending on application, ± 0.5 % of measured value with process calibration Flow velocity: ± 0.5 % of measured value
Turn down ratio	1/200
Gaseous and solid content of medium	

Flow transmitter

Enclosure	Wall mounted housing
Degree of protection	IP 65 according E N 60529
Operating temperature	10 ... 60 °C (14 ... 140 °F) :
Housing material	Aluminium, powder coated
Flow channels	1 or 2
Power supply	100 . 240 V AC / 9 .18 V DC / 18 . 36 V DC / 36 . 72 V DC
Display	2 x 16 digit LCD, dot matrix, backlit
Dimensions	H 200 x W 280 x D 70 mm
Weight	Approx. 2.8 kg
Power consumption	< 15 W
Signal damping	0 ... 60 s

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Flow transmitter (cont.)

Response time	1 s
Measuring cycle	100 ... 1000 Hz, single channel
Calculation functions	Average/difference/sum
Operating languages	Selectable between Danish, English, German, French, Dutch, Norwegian, Polish, Czech, Turkish, Spanish

Quantity and units of measurement

Volumetric flow rates	m^3/h, m^3/min, m^3/s, l/h, l/min, l/s USgph, bls/d (barrels per day),
Flow velocity	m/s, inch/s
Mass flow rate	g/s, t/h, kg/h, kg/min
Volume	m^3, l, gal (gallons)
Mass	g, kg, t

Communication

Serial interface	RS 485 optional
Process outputs	Galvanically isolated from main electronics
Current	0/4 ... 20 mA; passive (U_{ext} < 24 V) or active (R_{ext} < 500 O)
Voltage	0 ... 1 V or 0 ... 10 V, R_i = 500 O
Frequency	0 ... 1 kHz or 0 ... 10 kHz; (OC)
Digital (pulse, status)	Totaliser value 0.01 ... 1000 / unit; width 80 ... 1000 ms; (OC/ Reed) Reed = Reed - NO contact (300 V/ 0.5 A) OC = Open - Collector

Accessories

- Cable extension 10 m, 20 m, 50 m, special
- Sensor positioning rail for sensors type Q3, stainless steel V2A
- External printer, ink jet 192 dpi

Clamp-on sensors

Type M2N, M2E

Rated (possible) diameter range	(50) 100 ... 6500 mm
Dimensions	60 x 30 x 34 mm
Material	Stainless steel
Temperature range	*Type M2N:* -30 ... 130 °C (-22 ... 266 °F) *Type M2E:* -30 ... 200 °C (-22 ... 392 °F), for short periods up to 300 °C (572 °F)
Degree of protection	IP 65 acc. EN 60529, IP 68 optional

Type Q3N Q3E:

Rated (possible) diameter range	(10) 25 ... 400 (1000) mm
Dimensions	43 x 18 x 22 mm
Material	Stainless steel
Temperature range	*Type Q3N* -30 ... 130 °C (-22 ... 266 °F) *Type Q3E* -30 ... 200 °C (-22 ... 392 °F) for short periods up to 300 °C (572 °F)
Degree of protection	IP 65 acc. EN 60529 IP 68 optional

Type Q4N-Ex, M4N-Ex
(for use in hazardous areas Zone 1 and 2)

Rated (possible) diameter range	*Type Q4N-Ex* (10) 25 ... 400 (1000) mm *Type M4N-Ex* (50) 100 ... 3000 mm
Dimensions	60 x 30 x 34 mm
Material	Stainless steel
Temperature range	-20 °C ... 120 °C
Degree of protection	IP 65 acc. EN 60529 IP 68 optional
Protection concept	Encapsulation
Certification code	EEx m II T4 - T6.

The sensors are suitable for use in hazardous areas classified as Zone 1 and 2. The transmitter unit must be placed in the safe area (max. cable length=200mt) Complete hazardous area system solutions on request

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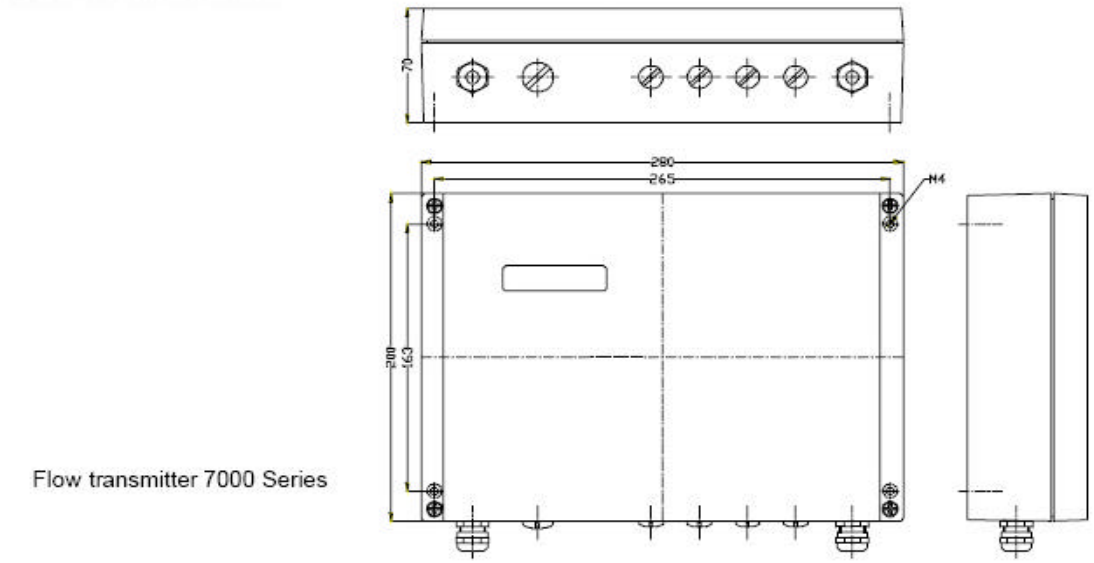
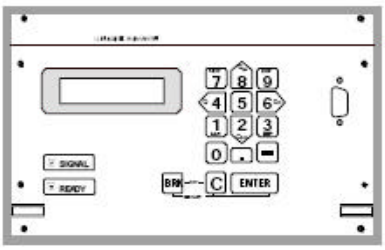
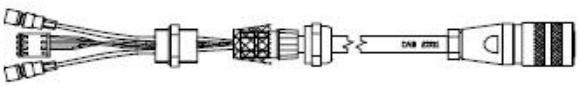
External Dimensions



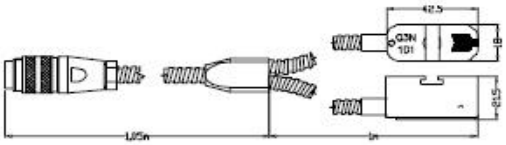
Flow transmitter 7000 Series



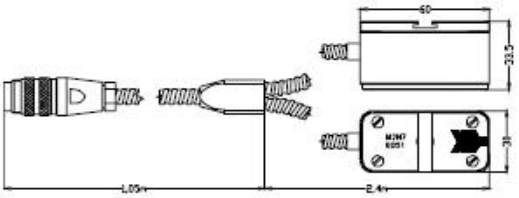
Front panel 7000 Series



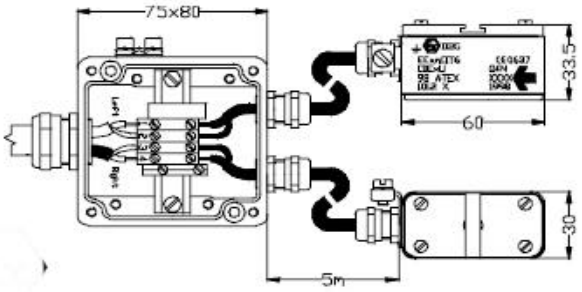
Connection cable



Clamp-on sensors type Q3N-7-F_ _ _



Clamp-on sensors type M2N-7-F_ _ _



Clamp-on sensors type M4N-Ex-7-F_ _ _

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Clamp On Ultrasonic Flowmeter 8000 Series

- Dual mode field Transmitter
- Easy to install clamp-on sensors with no process interruption
- Non-invasive flow measurement of liquids , no pipeline disturbance, no pressure loss
- Suitable for all commonly used pipe materials with pipe diameters from 10 mm to 6.5 m (1/4" to 256")
- 2 flow channels standard, IP 66 housing
- Certified for hazardous areas Zone 1 & 2

Description:

Our range of non-invasive flowmeters utilises ultrasonic technology for the accurate flow measurement of liquids in full pipes.

The field transmitter Eesiflo™ 8000 Series has been designed for permanent installations in potentially explosive atmospheres and for field applications with harsh environmental conditions. The opening of the enclosure is not required for instrument set-up and operation and without the necessity of a separate hand-held remote control or laptop computer.

The measurement of flow is based on the principle that sound waves are influenced by a flowing medium. Measurements are made by penetrating the pipe with ultrasound and subsequently time differences, frequency variations and phase shifts of the ultrasonic signals are evaluated. This measuring technique has no effect on the flowing liquid. There is no pressure loss in the pipe and no wear on components of the measuring device.

The ultrasonic sensors are clamped onto the outside of the pipe, thus eliminating the need to dismantle the pipework and interrupt the process. The 7800 Series can be applied to any type of standard pipe carrying clean or dirty liquids.

Advantages

- Low installation effort and costs
- Measurement is independent of fluid conductivity and pressure
- No pressure loss , no possibility of leakage
- Retrospective installation for existing plants possible
- No cutting of pipes necessary, no interruption of process , no plant shut down
- No additional fittings for maintenance required
- Hygienic measurement, no risk of contamination, suitable for ultra clean liquids
- No contact with medium, no risk of corrosion when used with aggressive media
- Cost advantages when used with large diameter pipes, high pressure systems, etc.
- Low stock costs, nearly all pipe sizes are covered with only 2 types of sensors

Transmitter and sensors can be located in hazardous areas Zone 1 and 2

Specification

General

Measuring principle	Ultrasonic time difference correlation principle and doppler
Flow velocity range	0.01 ... 25 m/s
Resolution	0.025 cm/s
Repeatibility	0.15 % of measured value ± 0.015 m/s
Accuracy	Volume flow: ± 1 .. 3 % of measured value depending on application, ± 0.5 % of measured value with process calibration Flow velocity: ± 0.5 % of measured value
Turn down ratio	1/200
Gaseous and solid content of medium	< 10 % of volume

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Flow transmitter (cont.)

Enclosure	Field transmitter housing
Degree of protection	IP 66 according EN 60529
Operating temperature	-10 … 55 °C (14 ... 131 °F)
Housing material	Aluminium, powder coated
Flow channels	2
Power supply	100 ... 240 V AC / 9 ...18 V DC / 18 … 36 V DC / 36 … 72 V DC
Display	2 x 16 digit LCD, dot matrix, backlit, 2 x status LED
Keyboard	5 keys, external access via magnet
Dimensions	W 140 x H 310 x D 260 mm (without cable glands and support)
Power consumption	< 15 W
Signal damping	0 ... 60 s, user configurable
Response time	1 s, 70 ms optional
Measuring cycle	100 ... 1000 Hz, single channel
Calculation functions	Average/difference/sum
Operating languages	Selectable between Danish, English, German, French, Dutch, Norwegian, Polish, Czech, Turkish, Spanish
Protection concep	Flameproof (d), intrinsic safety (i) Increased safety (e)
Certification code	EEx id II T6, EEx ie II T6
Certification	ATEX

Quantity and units of measurement

Volumetric flow rates	m_3/h, m_3/min, m_3/s, l/h, l/min, l/s USgph, (US gallons per hour), USgpm, USgps, bbl/d (barrels per day), bbl/min, bbl/s
Flow velocity	m/s, inch/s
Mass flow rate	g/s, t/h, kg/h, kg/min
Volume	m^3, l, gal (gallons)
Mass	g, kg, t

Software EesiData

Functionality	Downloading of measured values/parameter set, graphical presentation, list format, export to third party software, on-line transfer of measured data
Operating system	Windows 3.11, 95, 98, NT

Process outputs	Galvanically isolated from main electronics
Current	0/4 . 20 mA; passive (Uext < 24 V) or active (Rext < 500 O)
Voltage	0 ... 1 V or 0 ... 10 V, Ri = 500 O
Frequency	0 ... 1 kHz or 0 ... 10 kHz; (OC)
Digital (pulse, status)	Totaliser value 0.01-1000 / unit width 80 ... 1000 ms; (OC) OC = Open-Collector

Clamp-on sensors

Type Q4N-Ex, M4N-Ex
(for use in hazardous areas Zone 1 and 2)

Rated (possible) diameter range	*Type Q4N-Ex* (10) 25 ... 400 (1000) mm *Type M4N-Ex* (50) 100 ... 3000 mm
Dimensions	60 x 30 x 34 mm
Material	Stainless steel
Temperature range	-20 °C ... 120 °C
Degree of protection	IP 66 acc. EN 60529 IP 68 optional
Protection concept	Encapsulation
Certificate Number	IBExU 98 ATEX 1012 X

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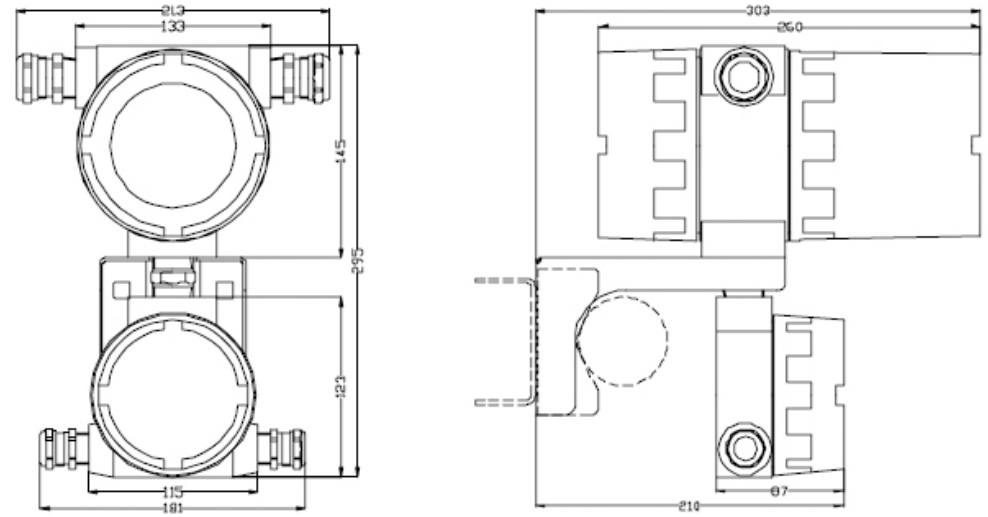
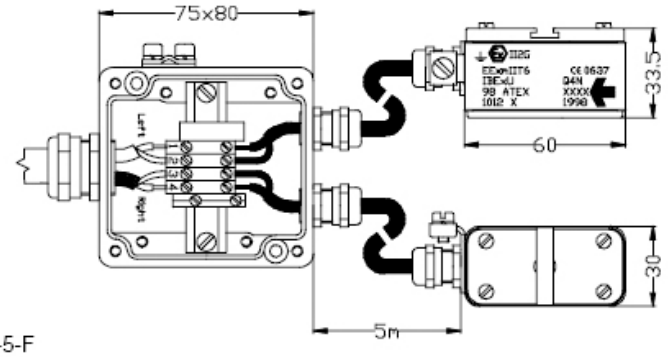
External Dimensions



Flow transmitter 8000 Series

Transducer selection



Clamp-on sensors type Q4N/M4N-Ex-5-F

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