Clamp-on Ultrasonic Flowmeter

EESIFLO 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 EESIFLO 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 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 stocking 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	:	< 10 % of volume

Flow transmitter

Enclosure	:	Wall mounted housing
Degree of protection	:	IP 65 according EN 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

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

Quantity and units of measurement
Volumetric flow rate : 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 Ω)
Voltage : 0 ... 1 V or 0 ... 10 V, R_i = 500 Ω
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

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

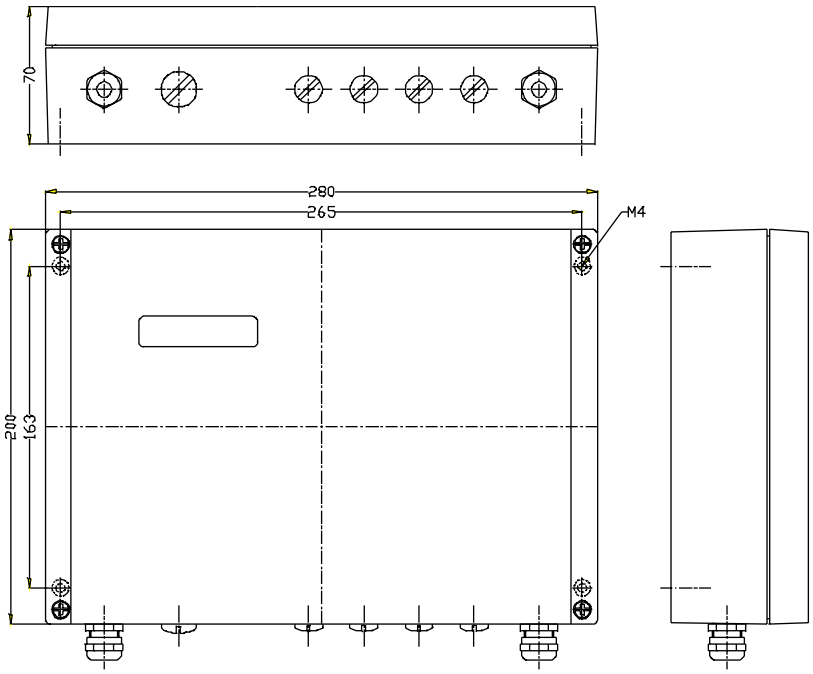
Type Q3N, Q3E
Rated (possible) diameter range : (10) 25 ... 400 (1000) mm
Dimensions : 43 x 18 x 22 mm
Material : Stainless steel
Temperature range : *Type Q3N:*
-30 ... 130 °C (-22 ... 266 °F)
Type Q3E:
-30 ... 200 °C (-22 ... 392 °F), for short periods up to 300 °C (572 °F)
Degree of protection : IP 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 = 200 m). Complete hazardous area system solutions on request.

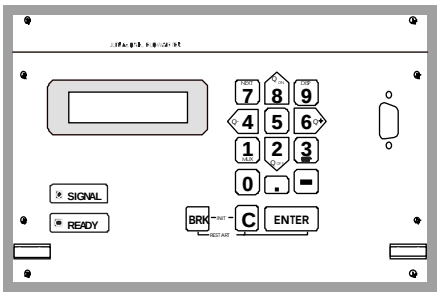
Accessories

- Cable extension 10 m, 20 m, 50 m, special
- Sensor positioning rail for sensors type Q3, stainless steel V2A

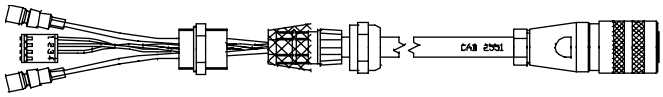
External dimensions



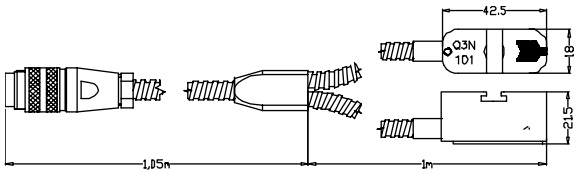
Flow transmitter
EESIFLO 7000 Series



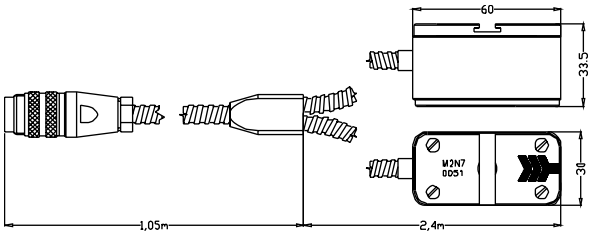
Front panel EESIFLO 7000 Series



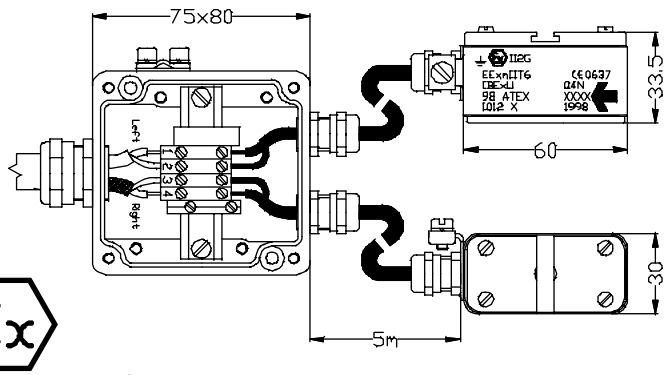
Connection cable



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



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



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