

Portable Clamp-on Ultrasonic Flowmeter

EESIFLO 6000 Series

- Portable dual mode flowmeter
- 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 6 mm to 6.5 m (1/4" to 256")
- Integrated wall thickness measurement, 2 flow channels



Description

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

The portable device has been designed to meet the needs of the Service/Maintenance and Commissioning Engineer wishing to check the flow rate of liquids at different locations in the plant. The set-up of the unit is simple and user friendly in order to obtain the required flow information in minutes.

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.

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 6000 Series can be applied to any type of standard pipe carrying clean or dirty liquids.

Advantages

- Low installation effort and costs
- Dual measuring mode (transit-time and doppler)
- 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.

Specification

General

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

Flow transmitter

Enclosure	: Portable
Degree of protection	: IP 54 according EN 60529, IP 68 optional
Operating temperature	: -10 ... 60 °C (14 ... 140 °F)
Housing material	: Aluminium, powder coated
Flow channels	: 2
Power supply	: Internal rechargeable battery, 6 V/4 Ah, or external power supply 9 ... 15 V DC
Operating time	: > 14 h with fully charged battery
Display	: 2 x 16 digit LCD , dot matrix, backlit
Dimensions	: H 118 x W 276 x D 310 mm (with handle)
Weight	: 3.5 kg
Power consumption	: < 2.5 W in measurement mode
Signal damping	: 0 ... 60 s, configurable

Flow transmitter (cont.)

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

Quantity and units of measurement

Volumetric flow rate : m³/h, m³/min, m³/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 : m³, l, gal (gallons)
Mass : g, kg, t
Heat flow : W, kW, MW (only with heat
quantity measurement option)
Heat quantity : J, kJ, MJ (only with heat quantity
measurement option)

Internal data logger

Storage capacity : approx. 27,000 (optional
> 100,000) measuring values
Logging data : All measured and totalised
values, parameter sets

Communication

Serial interface : RS 232
Data : Instantaneous measured value,
parameter set and configuration,
logged data

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 systems : Windows™ 3.11, 95, 98, NT

Process inputs : Galvanically isolated from main
electronics
Temperature : PT 100, four-wire circuit,
measuring range - 50 ... 400 °C
Current : 0 ... 20 mA; R_i = 50 Ω
Voltage : 0 ... 1 V; R_i = 1 MΩ

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 : M2N-30 ... 130 °C (-22 ... 266 °F)
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 : Q3N-30 ... 130 °C (-22 ... 266 °F)
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

Special clamp-on sensors

Type S2N : For very small pipe
diameters 6 ... 40 (100) mm
Other types : On request

Wall thickness measurement

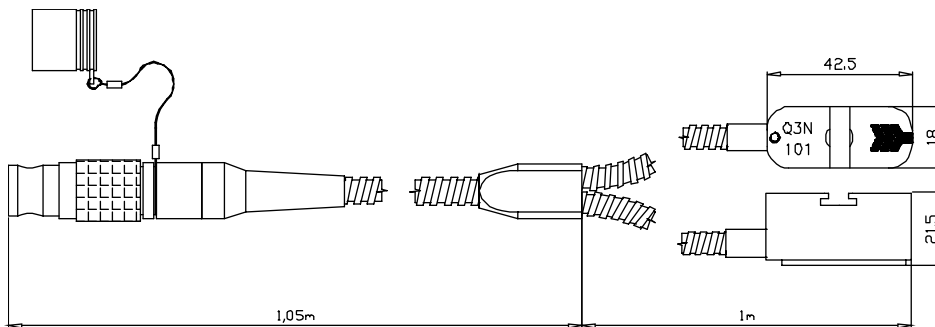
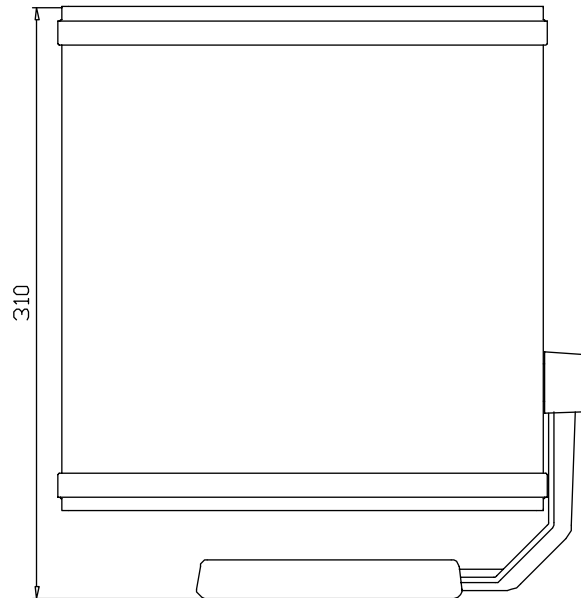
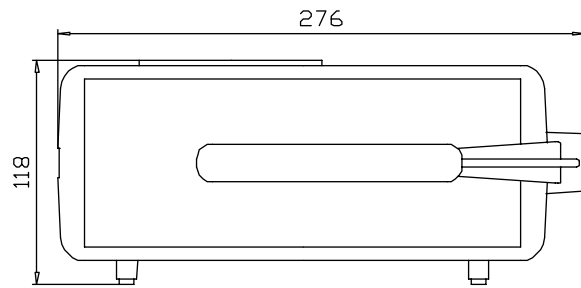
Measuring range : 1.0 ... 200 mm
Resolution : 0.01 mm
Linearity : 0.1 mm
Temperature range : Standard version -20 ... 60 °C
High temperature version
0 ... 200 °C, for short periods up
to 540 °C

Accessories

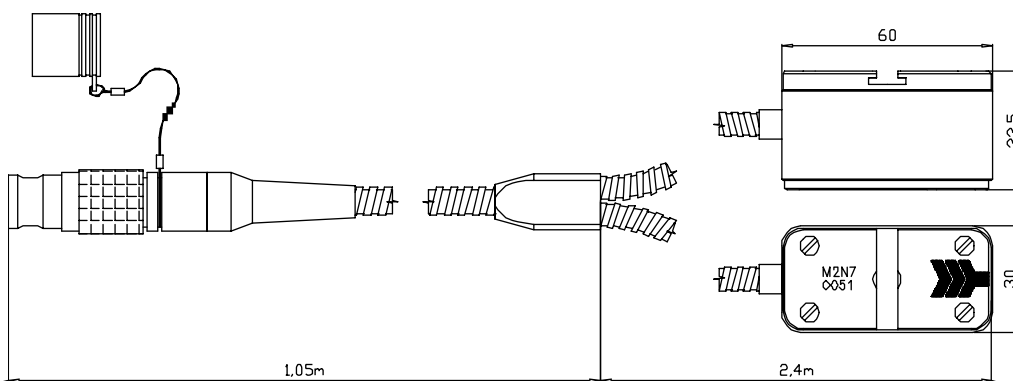
- External power supply 230 V, 50Hz/12 V, 1.2 A; IP 30
- Car power adapter 12 V, 2 A
- Leather carrying case 330 x 340 x 220 mm
- Cable extension 3 m, 5 m, 10 m or 20 m
- Sensor positioning rail for sensors type Q3, stainless
steel V2A
- External printer, ink jet 192 dpi

External dimensions

Portable flow transmitter
EESIFLO 6000 Series



Clamp-on sensors type Q3N-7-P002



Clamp-on sensors type M2N-7-P003