



# 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 : m<sup>3</sup>/h, m<sup>3</sup>/min, m<sup>3</sup>/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<sup>3</sup>, 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

Temperature : Galvanically isolated from main electronics  
PT 100, four-wire circuit, measuring range - 50 ... 400 °C  
Current : 0 ... 20 mA; R<sub>i</sub> = 50 Ω  
Voltage : 0 ... 1 V; R<sub>i</sub> = 1 MΩ

### Process outputs

Current : Galvanically isolated from main electronics  
0/4 ... 20 mA; passive (U<sub>ext</sub> < 24 V) or active (R<sub>ext</sub> < 500 Ω)  
Voltage : 0 ... 1 V or 0 ... 10 V, R<sub>i</sub> = 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

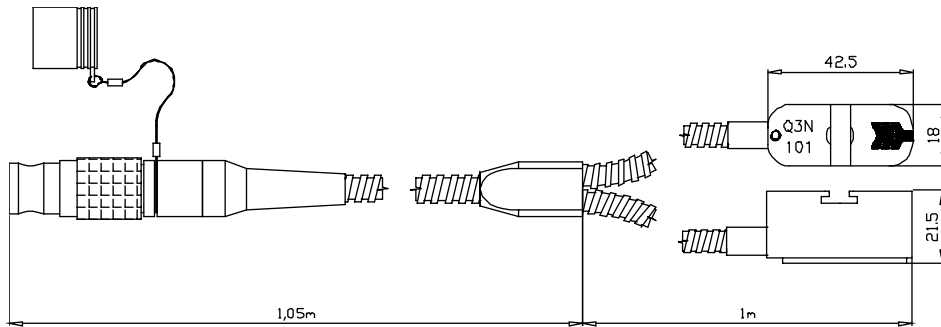
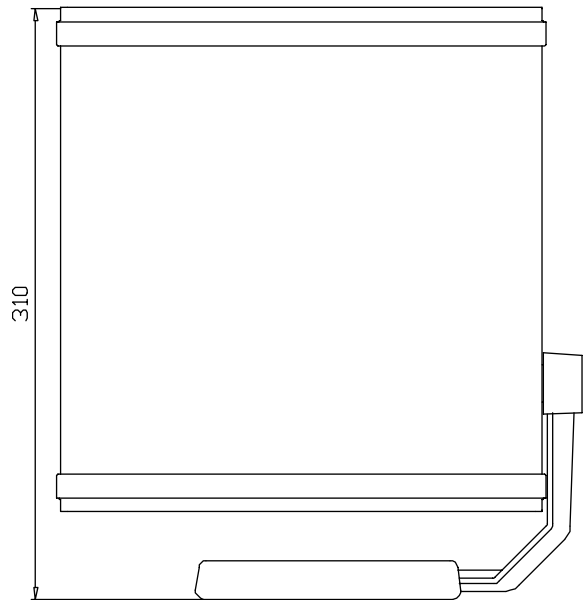
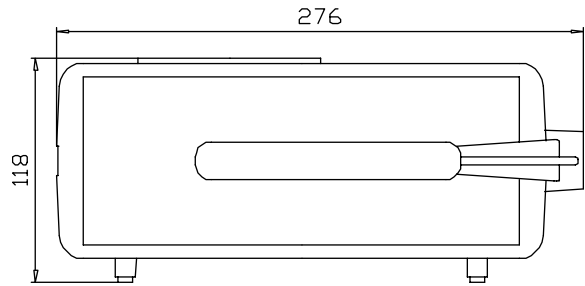
Measuring range : 1.0 ... 200 mm  
Resolution : 0.01 mm  
Linearity : 0.1 mm  
Temperature range : Standard version -20 ... 60 °C  
High temperature version 0 ... 200 °C, for short periods up to 540 °C

## Accessories

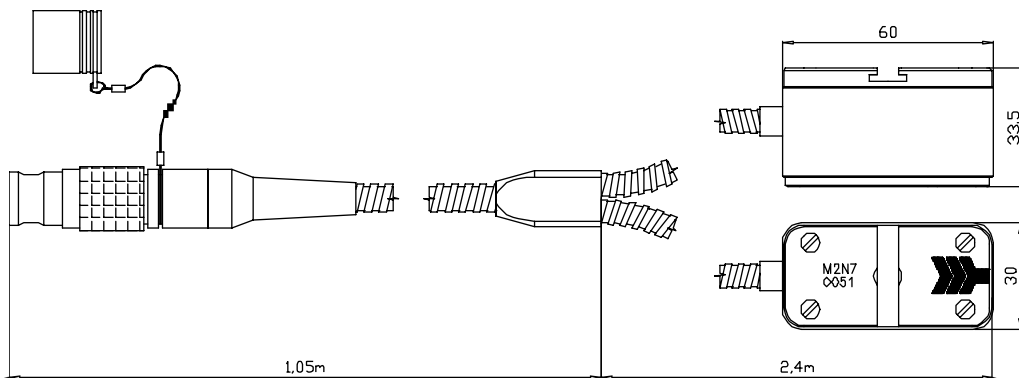
- External power supply 230 V, 50Hz/12 V, 1.2 A; IP 30
- Car power adapter 12 V, 2 A
- Leather carrying case 330 x 340 x 220 mm
- Cable extension 3 m, 5 m, 10 m or 20 m
- Sensor positioning rail for sensors type Q3, stainless steel V2A
- External printer, ink jet 192 dpi

## External dimensions

Portable flow transmitter  
EESIFLO 6000 Series



Clamp-on sensors type Q3N-7-P002



Clamp-on sensors type M2N-7-P003

# EESIFLO EASZ TG 11

## Standard Industrial Thickness Gauge



### Description:

The EES TG 11 is an easy to use standard industrial type ultrasonic thickness gauge. It uses the transit time ultrasonic wave propagation principle to measure the thickness of materials of several types including metals, plastics or any sonically conductive materials. The probe acts as a sender and receiver of a 5 MHz ultrasonic signal and an internal counter calculates the time taken for the signals sending and receiving through the solid being measured. The EES TG 11 can be set at different acoustic velocities depending on the material being measured. The instruction book includes a table of acoustic velocities for some of the commonly used materials. In the absence of the acoustic velocity of the material being measured, it is still possible to measure materials of this kind if a representative sample is available of a known thickness.

### Features:

- High measuring range 1.0mm...300.0mm
- Built in calibration test block
- Small and light weight
- Metric & imperial version available.
- Easy operation

### Typical Applications:

- Access wall thickness of material due to corrosion.
- Wall thickness measurements of hard materials, piping and hull plates.
- General inspection of metals including steel, cast iron, aluminium, copper, brass, titanium sheet metal, tanks, ships and piping systems
- Inspection of glass, ceramics and hard plastics

### Technical Specifications:

Range: 1.0mm...300mm  
Resolution: 0.1mm  
Display: 4 digit LCD  
Accuracy:  $\pm 0.1$ mm (up to 60mm)  
 $\pm 0.3\%$  (above 60mm)

Battery: Two AA sized cells. Up to 20hours operation.  
Dimensions: 65 W x 125 H x 30 D mm  
Operating temperature: 0...50 °C  
Calibration block:  $\pm 0.2$ mm Steel  
Auto Power Off: within 3 minutes.

Certificate SG06/00724

The management system of

## Eesiflo International Pte Ltd

60 Kaki Bukit Place, #02-02  
#02-12 & #02-19 Eunos Techpark  
Singapore 415979

has been assessed and certified as meeting the requirements of

### ISO 9001:2000

For the following activities

**Supply, Design Management and Manufacturing of Fluid Measuring  
Instruments and Apparatus.**

Further clarifications regarding the scope of this certificate and the applicability of  
ISO 9001:2000 requirements may be obtained by consulting the organisation

This certificate is valid from 16 July 2008 until 15 July 2011 and  
remains valid subject to satisfactory surveillance audits.

Re certification audit due before 26 May 2011

Issue 3. Certified since 13 February 2006

Authorised by



SGS United Kingdom Ltd - Systems & Services Certification  
Rossmore Business Park - Ellesmere Port - Cheshire - CH65 3EN - UK  
t +44 (0)151 350-6666 f +44 (0)151 350-6600 www.sgs.com

