



TEC-SPEC

FLO-SONIC P

Ultrasonic portable flowmeter
An advanced portable
flowmeter suitable for pipes
from 10 to 3300 mm diameter

Date: 06-04-2004

Rev.: 01

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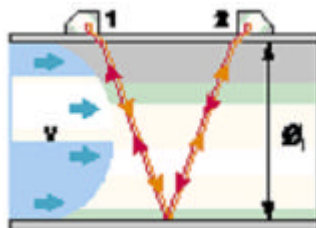
- Non-Invasive External probes clamped on the pipe
- Easy and quick installation
- User friendly operation, set up by keypad or software
- Automatic control of ultrasonic signal using the ESC mode (Echo Shape Control)
- Automatic zero flow adjustment with “anti air bubble” signal processing
- Robust, watertight (IP67) control unit enclosure
- Very light weight: less than 1 Kg
- Battery life : Up to 40 hours continuous operation
- Very high accuracy and sensitivity : 0.001 m/sec up to ... 99m/sec
- Probes available from -100°C to $+200^{\circ}\text{C}$ (pipe temperature)

Principle *

The FLO-SONIC calculates the (v) speed and the (Q) flow of the fluid by the measurement of the (Δt) difference of the transit times of ultrasonic waves ($t_{21}-t_{12}$):

$$Q = f(\varnothing \cdot t_1 \cdot t_2 \cdot t_1)$$
$$\Delta t = t_{21} - t_{12} = K \cdot v$$

with K : proportion coefficient



* The fluid should allow for the propagation of ultrasounds

Typical applications *

- Flows in all water applications: Network (potable water, raw water, sewage) – Pumping – Metering.
- Flow of various oil products – Refined – crude oil – Multiproducts pipelines.
- Petrochemical and food industries Process – Metering, control.
- Climate and hydraulic engineering – Network balancing – Performance

* With exception for two phase or high viscosity liquids

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SYSTEM DESCRIPTION

FLOW-SONIC uses the very latest electronic technology combined with highly efficient digital signal processing (D.S.P.), technique which maximize the system performance giving the user significant benefits. FLOW-SONIC gives outstanding measurement capability including the ability to adapt its operation suit the most challenging site conditions. The system consists of a hand held control unit and two probes with support and cables.

SPECIFICATION

- 2 lines LCD display – 16 characters – programmable backlight.
- Ergonomic keypad and menu configuration – access code if needed.
- Analog output (x2), relays (x2) and (or 485).
- High resolution time measurement < 0.1 ns.
- Dynamic Gain up to 89 dB.
- Echo analyzer with automatic control (ESC mode)
- Multiparameter : Flow, speed, gain, signal quality radio, ...

ELECTRICAL SPECIFICATION

- A CE product
- Internal battery 12 V – NiMH non pollutant
- Charger 90 V – 260 V AC – 12 to 14 h charging. External supply option.
- Isolated output current 4-20 mA- 250 Ohm
- Static relay 100 V – 100 mA (x2)

KIT DESCRIPTION

FLO-SONIC kit includes :

- 1 carrying bag for FLO-SONIC including pocket for cable (l=2.5 m, for pipes of approx ID 800mm)
- 1 charger, 1 PC cable and software LS_600W (disk or CD)
Extra : Probes and attaching system stored in separate carrying or case with a coupling agent

Optional accessories include :

- Extra cable length for probes (l = 5 m)
- External data logger with software
- Oscilloscope interface (echo analysis)

ESC MODE AND AUTOMATIC ZERO FLOW

To achieve accurate flow readings, proper probes selection and installation are required. The E.S.C mode acts as an 'Auto focus' for the ultrasonic signals in order to optimize the acoustic signal. Zero offset adjustment at no flow conditions is not necessary, nevertheless auto zero function can still be used.

PERFORMANCE

- Typical accuracy following dry calibration : 0.5 % (DN \geq 100 mm), linearity on test loop : 0.1 %, repeatability 0.05 %
- Practical accuracy with common liquids (water, ...) :
DN \leq 100 mm : +/- 2 % if $v > 0.3$ m/s if not +/- 5 mm/s
DN > 100 mm : +/- 1 % if $v > 0.3$ m/s if not +/- 2 mm/s
- Built in correction for multiproduct or for laminar/turbulent transitions flow.
- Bi-directional measurement
- Volume metering. Choice of units from 0.001 to 100 m³
- Choice of probes installation : / . V. N and W mode

MECHANICAL SPECIFICATION

- ABS enclosure with carrying pocket.
Dimensions : 220 x 115 x 64 mm. Converter weight : 850 g
- IP 67 protection against dust and immersion
- Use temperature: - 10°C to + 50°C

PROBES AND SUPPORTS

Flow-Tronic offers a large range of conventional technology and microstructure technology probes with supports, designed for easy and secure installation.

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