

# MINISONIC® 600 - 2000 - SPEED - G

## A range of ultrasonic flowmeters

Single or dual chord and dual pipe versions



**MINISONIC® 600**  
**MINISONIC® 2000**  
**MINISONIC® G**  
**MINISONIC® SPEED**

Pipe sizes from DN 4 to DN 600 mm (liquids)

Pipe sizes up to 3300 mm (liquids)

Gas volume metering, DN size depending on pressure

Open channel velocity measurement

- ✓ Non-Invasive (clamp-on) probes (except G version) or intrusive (wetted) probes or spools
- ✓ Water resistant to IP 67
- ✓ On site "dry" calibration possible
- ✓ Automatic echo adjustment with ESC mode (Echo Shape Control)

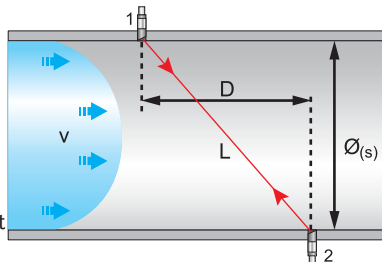
- ✓ Low cost simple installation
- ✓ Virtually no maintenance required
- ✓ High accuracy with no time drift
- ✓ Security of totalizations-Security locked of the converter cabinet with seals

### Principle

The MINISONIC calculates the speed (v), the flow (Q) and the volume (Vol) of a fluid by measuring the ( $\Delta t$ ) difference of transit time of ultrasonic wave ( $t_{21} - t_{12}$ )

$$\Delta t = t_{21} - t_{12}$$
$$Q = \frac{\pi \phi(s)^2}{4} \times \frac{L^2}{2D} \times \frac{\Delta t}{t_{21} t_{12}} \times \frac{1}{Kh}$$
$$Vol = Q \times t$$

C : speed of sound in the fluid  
Kh : hydraulic coefficient



### Typical applications \*

- Water flow of all types of water : Network (potable water, waste water) – Pumping - Metering.
  - Flow of various oil products – Refined – Crude oil– Multiproduct pipelines.
  - Petrochemical and food industries process.
  - Replacement of outdated equipment - retrofitting.
- \* With exception for two phase or high viscosity liquids

**Ultraflux**

Ultrasonic Measurements



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## DESCRIPTION

Its new electronics allows MINISONIC to suit all cases, and this, thanks to an enhanced emission power, a greater received gain, to a better noise rejection (+20 to 30 dB at final) and a new digital signal and measurement processor.

A single chord metering unit consists of one convertor, two probes with supports and cable.

A dual chord version (two speed measurements on the same pipe) is adaptable to hydraulic disturbances.

A dual pipe unit allows the flow measurement on two different pipes.

## RESOURCES

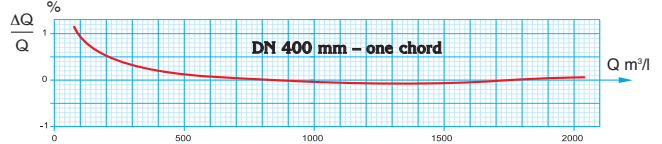
- 2 lines LCD display - 16 characters - Programmable backlight.
- Ergonomic keypad and menu driven configuration - access code if needed.
- Dynamic gain up to 89 dB.
- High resolution time measurement < 0.1 ns
- Echo analyser with zero flow automatic control (ESC mode): automatic mode when commissioning
- Multiparameter : Flow, speed, gain, signal quality ratio
- Windows software PC LS\_600 W for extended calibration, expertise and data saving.

## ESC MODE AND AUTOMATIC ZERO FLOW

The best accuracy would be achieved by a proper selection of probes together with a strict installation.

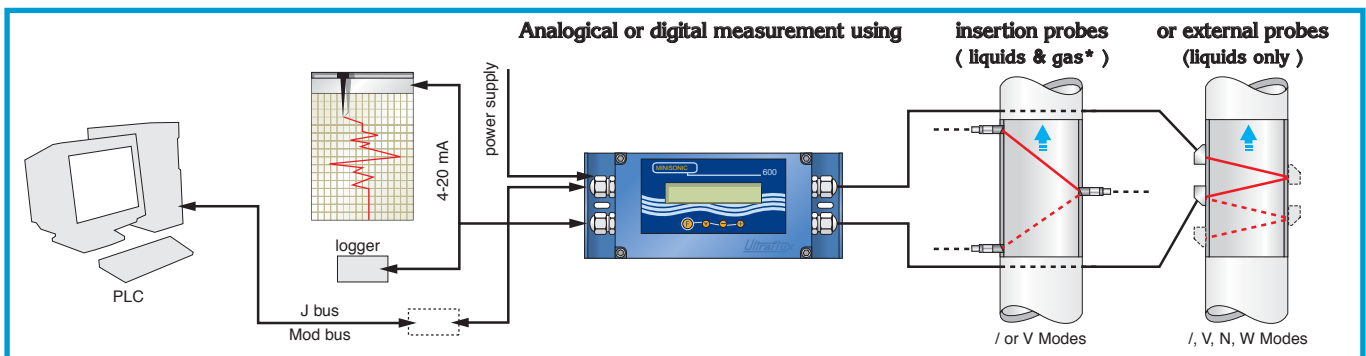
Good hydraulic conditions must be obtained : upstream straight length >20D minimum.

The ESC mode which acts as an 'Auto focus' for the ultrasonic signals in order to optimise the global acoustic adjustment to ensure proper results.



## PERFORMANCES

- Single chord system
  - Typical accuracy following dry calibration : 0.5 % (DN > 100 mm). Calibration curve can also be linearized
  - Practical uncertainty with common liquids (water,...) :
    - DN ≤ 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
- Repeatability on test loop : 0.05%
- Bi-directional measurement +/- 15 m/s
- Volume metering. Choice of unit from 1 cl to 100 m<sup>3</sup>
- Built-in correction for multiproduct or for laminar/turbulent transitions flow.



\* limited depending on site conditions

## ELECTRICAL CHARACTERISTICS

- A CE product
- Power supply : 9 to 36 VDC (option : 48 V) or 7 to 25 VAC - extra : external transformer 110 V or 230 VAC or internal supply 110V/220V/24V
- Isolated output current 4-20 mA (x2) - 1500 Ohm depending on supply current - active output wiring available.
- Static relay (x2) 100 V/100 mA/10 VA max
- RS 232 or 485 output, 9600 Bauds maximum or JBus/ModBus protocol

## MECHANICAL CHARACTERISTICS

- Aluminium cabinet – epoxy coated.
- IP 67 protection – Ambient T° = - 25 + 50 °C
- Size - Weight :
  - Industrial type : 237 x 108 x 79 mm - 1.5 Kg (Wall or pipe mounting)
  - Ex proof type (IxHxP) : 244 x 130 x 232 mm - 6.6 Kg
- Large range of probes IP 55 to IP 68, insertion or external - Industrial support.

### Certifications

MINISONIC EXD : CE0081 II 2 G EEx d IIC T6

Probes CE0081 II 2 G EEx m II T6

EEx me II T6

EEx md IIC T6

Probes CE0081 II 1 G EEx ia IIB T3 to T6

Ultrasafe Barrier : CE0081 II (1) G [EEx ia] IIB

