

## ADVICE - PROBLEMS - SOLUTIONS

### Choice of suitable probes

Respect the site conditions is essential. All our probes have a recommended range but the practical limits result mainly from the pipe itself (corrosion, deposits ...).

**Selection criteria:** High frequency (HF) probes can be more accurate. Low frequency (LF) probes penetrate further but are noisier.

The size of a sensor limits its installation in a small pipe, above all in the V mode (contact).

→ Ask **ULTRAFLUX** for advice!

**One choice for two pipes**

### Choice of assembly mode

- **V mode:** recommended in more than 90 % of cases.

- **W mode:** used in exceptional cases and reserved for very small pipes.

- **\ mode:** used as final recourse or when recommended for large pipe (for instance: V mode + LF probes = no measurement → test in \ mode).

- **N mode:** reserved for fixed station applications.

**The position of the probes** is not critical (a deviation of a few mm is tolerable) but installation must be well done, with good coupling; it helps get good results and facilitates the expression of the ESC mode.

Despite compliance with a good procedure, the result is not satisfactory.

- Did you enter the right sizes?

→ Check and measure again.

- Do you have the right fluid? (Co, ΔC)

→ If the C value returned by **Minisonic P** differs a great deal from the entered Co value = rerun the procedure with Co = C.

**Advice:** a broad ΔC facilitates echo capture.

- The quality index I.Q. varies and is far from 100 %? Interference? Charged fluid?

- The gain value varies.

Presence of bubbles? Charged fluid?

→ Try with sensors in the direct mode.

- The gain value is very high (> 65 %) or the ESC mode (Echo search) starts too often.

→ try with gain in AUTO mode and a reasonable margin (5 to 10 dB). In this case, **Minisonic P** will allow higher amplification.

You have a measurement but it does not correspond to what you expect.

- Have you privileged straight lengths upstream and downstream of the sensors?

Statistically, the measurement is by default (a few %) when the straight length is short.

- Were you able to check the zero setting of **Minisonic P** and zero flow rate?

**Minisonic P** has an excellent theoretical zero setting (electronic autozero).

However, disparities at each probe location can cause a significant offset in case of measurement at a low scale (low dT).

→ do flow rate = zero (check) . Go to the Zero Settings menu and choose "Autozero" 1 and/or 2.

Exit (F) and wait until the signs (\*) have disappeared before reapplying the flow rate.

**Minisonic P** will have optimized the zero at this measurement point by taking in account its Δ to Then reapply Δ to = 0 if you have changed position.

**Another customary check on water flow rate:**

The relation between speed of sound / temperature is reliable (see the training manual) and may be used to check the proper control of pipe geometry.

If C is too low → inside diameter set too small, with obvious effect on flow rate display.

# Ultraflux MINISONIC P USER GUIDE

This simple and compact guide is intended for user in the field. In case of difficulty or in-depth questions, refer to the technical manual.

## ► Description of the MiniSonic P "Pack standard"

This pack includes:

- The **Minisonic** converter delivered with its protection and transport cover, a strap and a wallet for a cable or the accessories.
- The 2 **cables** connecting to the **probes**, 2.5 meter long, terminating in a Y (1 and 2).
- The **case** for connection to a **PC** or another peripheral - in two parts.
- The **charger/auxiliary** power supply module and its mains power cable.
- The PC windows **software** LS\_600W\*\* consisting of two diskettes or one CD-ROM.
- The **technical manual** supplied as hard copy or a CD - ROM
- a **pack** suitable for storing probes, brackets, accessories ( gel,.....) and the Minisonic P itself.

## ► Additional equipment necessary or recommended:

- **Probes** suitable for the measurement to be made depending on the diameter of the pipe and the fluid to be measured.

For the record:

DN 12 to 115 mm → SE\_1586 ;

DN 40 to 1000 mm → SE\_1515 ;

DN 100 to 10000 mm → SE\_1599 ;

Alternatives :

DN 40 to 1000 mm → SE\_1662

DN 100 to 2500 mm → SE\_1595

- **supports** or **strips** for assembly on the pipe (depending on nominal diameter)

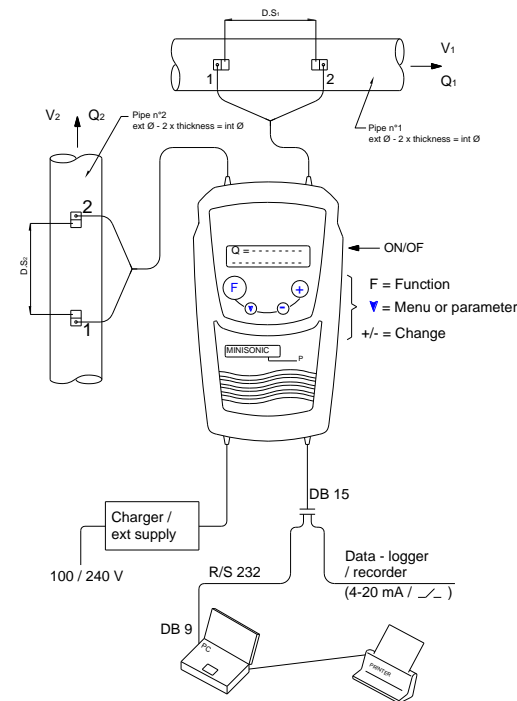
- **gel** for coupling the probes with the pipe = BT or HT (low / high temperature option)

- two extension cables 5 meters long if O.D. > 600 mm

- a tape measure and a thickness gauge if the pipes are not specified

- a peripheral for recording the measurements = data logger, PC with software...

## ► Ergonomics of MiniSonic - Connections (Simultaneous use for two pipes)



## MENUS - Organization and Parameters

### 1. Powering up

Display of welcome messages: (Init)

⇒ **Minisonic P** ⇒ software version + serial number

⇒ Name / Company

⇒ Measurement display ⇒ probe information / D.S.

⇒ Flow rate  $Q^* = \text{xxxx}$  / and Messages if any

**2. Measurements menu:** display of flow rate QT, Q1... + messages (search, echo, default...)

(✓) = Other information: Gain (mode) =  $\text{xxdB}$   
+ I.Q. (quality) =  $\text{xx} \%$  (channel 1)

⇒ Fluid velocity =  $\text{xx}$  + speed of sound =  $\text{xx}$  m/s

⇒ Measurements of times T et dT (pipes 1 and 2)

⇒ Totalizers  $t_1$  and  $t_2$  ⇒ date/time

⇒ Battery recharge condition (%)

⇒ Calculated KH 1 & 2 + Reynolds number

⇒ Programmed probes and requested interval  
D.S.1 and D.S.2

**3. Functions and parameter menus:** Access by

(F) "n" times or (F) then (+/-). Enter by (✓).

Exit from the Menus, automatic or timeout, or by (F) → Measurement function.

(F) = once → Access menu "**Calibration allowed**"

+ access code field if it has been activated ( $\neq 0$ )

(✓) Code change + menu language (+/-)

(F) = twice → "**Pipe settings**" (pipes 1 & 2):

(✓) Outside diameter / circumference (+/-)

(✓) Material (+/-) → list + Other

(✓) Thickness mm =  $\text{xxx.x}$  (+/-)

(✓) If other: CM =  $\text{xxxx}$  m/s (characteristic)

(F) = 3 times → "**Q settings**": (common data with similar products for pipes 1 & 2):

(✓) Choice of units ( $\text{m}^3/\text{h}$ )

(✓) Maximum flow rate (graphic display on P.C.)

(✓) Product = Water or Other (⇒ Characteristic):

(✓)  $C_0 = \text{xxxx}$  m/s / Delta C =  $\text{xxx}$  m/s

(✓) Hydraulic correction

(✓) K-Hydro = AUTO or Manual (= 1.xxx)

(✓) Fluid viscosity (Cstocke- $\text{mm}^2/\text{s}$ )

(✓) Pipe roughness (mm)

(✓) Turbulence / Laminar transition zone  
Reynolds critical (2800) range (LBR = 3)

(F) = 4 times → "**Probe (same Ref) / Echos settings**"  
amplification modes 1 and 2 :

(✓) Probe = Réf. SE\_  $\text{xxxx}$  (external probe) or  
SM (wet probe) or SP (special probe if any)

(✓) Probe assembly: \ = direct V = Reflex  
N = 3 crossings W = double Reflex

(✓) Gain management = ESC by default or Auto +  
Margin or Manual.

(✓) If SM = Length and Axial D 1&2 between probes

(F) = 5 times → "**General settings**" :

(✓) Display backlighting (ON/OFF/TEMP)

(✓) Measurement filtering =  $\text{xx}$  cycles

(✓) Memory if default =  $\text{xx}$  sec.

(✓) Assignment of totalizers 1 and 2 + units  
(+/- QT or Q1 or Q2)

(✓) Assignment of relays + adjustment of threshold  
and volume pulse duration

(✓) Totalizer reset to zero

(✓) Assignment and Adjustment of scale 4 - 20 mA  
of SA 1 and SA 2

(✓) R/S communication =  $N^\circ$ J Bus (1) – Bauds  
(9600)

(F) = 6 times → "**Autozero settings**" :

(✓) Status display (Delta To 1 & 2 =  $\text{xx}$  ns) or Reset  
(Delta To = 0) or Autozero, then launching  
of the function by (F)

(F) + 1 = (if authorized) → "**Factory settings**»:

(✓) S.E correction (Coefficient = 0,5 à 1,5)  
depending on application and pipe diam. range.

(F) + 1 = I/O Test with simulation on outputs SA 1  
and SA 2 (4-20 mA) and Relays 1 and 2 state.

### 4. Recommended method of use

- avoid the access code.

- before going to the site, fill in the main menus  
according to your criteria, choice, selection of probes.  
→ *see the recommended values below.*

- on site, enter the measurement points data  
(diameter...).

- install the probes as requested (D.S.).

- check ( read ) the measurement and values related to  
its quality.

- only carry out a zero (autozero) on pipe 1 or 2 if the  
"zero flow" conditions are verified, pipe after pipe.

## PRACTICAL USE

### 1. Recommended choice and values, before use on site:

⇒ Flow rate menus / General / Probes:

- the formula for the calculated flow rate must be done  
by PC and LS\_600W software. ( $QT = Q1 + / - Q2$ )

- the flow rate / volume units and the choice of probes,  
pipes and fluids are the responsibility of the user.

- prefer the automatic management modes =  
KH auto – ESC gain

- use the V mode ( Reflex ) as much as possible

- other values : Filtering = 5 to 10 ;

Memory = 10 to 30

N.JBus = 1 / 9600 Bauds

- if fluid = Water :  $1\ 300 < C < 1\ 600$  m/s  
viscosity = 1 cst ;

- if fluid = Other : carefully fill in  $C_0$  and do not enter  
too low Delta C ( 15 to 20 % of  $C_0$ ) and enter the  
viscosity ( centiStocke or  $\text{mm}^2/\text{s}$  )

*Be careful, the two fluids must be similar!*

- If "Factory" adjustment" appears, please consult us.

### 2. Choices related to measurement points: Parameter settings on site.

- definite as accurately as possible the pipes

⇒ Pipe parameter setting menu: Outside diameter ,  
thickness...

- confirm the fluid, the flow range and the unit.

⇒ Flow rate parameter settings menu.

- choose suitable probes ⇒ Probe menu/echo and  
the assembly mode( V, W...).

- read the required distance between probes = D.S.1  
and 2.

→ Display in measurement menu.

### 3. Install and connect the probes:

- prefer side access to the pipe: horizontal plane  
except for vertical pipe.

- clean the pipe and the locations chosen for the  
probes. There is no need to scrape of high-quality  
paint.

- spread a little coupling gel over these points (wetting).

- apply a dab of gel on each probe.  
- install the probes, if necessary with their bracket, trying  
not to move them outside of the pressure direction.  
- connect the probes to **Minisonic P**.

### 4. Read the measurements:

- leave the ESC mode engaged ("Echo search"  
message). This mode restarts automatically but it may  
be provoked by turning the **Minisonic P** Off and On.

- after a few seconds, the flow rates should be displayed  
→  $Q = \dots$  Read this flow rates and monitor it as  
necessary ...

- check the quality on the other indicated values:

\*Gain not too high and stable → good signal criteria.

\*I.Q. = High (100 %) → no rejects or few.

\*Speed of sound close to  $C_0$  → good control of the  
parameter settings.

\*Significant dT → zero setting barely critical,  
→ otherwise check  $Q_0$ .(Delta To 1 & 2).

### 5. Record the measurement if necessary:

- Our LS\_600W \* software allows you to use your PC as  
a data logger. To do so, use the connection cable  
supplied and refer to the NT 204 and NT214 manuals.

- An external data logger may be connected either to our  
4-20 mA outputs or to our relay outputs copying the  
volume incrementing.

Connections to 15 pin male DB =

4-20 mA (200  $\Omega$  max) = SA 1 ( 10 et 11 / SA ( 12 et 13 )  
Re 1 = pin 7 et 14 / Re 2 = pin 8 et 15

→ Set the parameters of the flow scale (4- 20 mA)  
or the totalizer unit.

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\* This software allows the adjustment of the period and  
the duration of the recordings. The software can call  
up your Excel spreadsheet and use a recording  
management macro.