Instruction manual

Minisonic

Ultraflux
Ultrasonic flowmeters
A trademark of FAURE HERMAN

Introduction

Thank you for choosing the Minisonic: we hope you will appreciate all its metro-logical qualities and ease of use.

The purpose of this manual is to guide you as simply as possible towards using the instrument confidently to achieve results that match your expectations.

Specializing in ultrasonic flow meters since 1974, Ultraflux develops, manufactures and sells solutions based on the principle of differential ultrasonic transit times.

This method provides non-intrusive, constant and bi-directional flow measurements.

Ultraflux flow meters allow non-intrusive or intrusive, constant or occasional flow measurements on any type of homogeneous fluid (liquid or gas) and through any type of homogeneous material.

Always aiming to better serve its customers' needs while preserving the environment, Ultraflux has been committed for many years to a quality improvement and sustainable development policy.

Since it started in 1974, Ultraflux has developed and manufactured all its products in France, in order to ensure that its production processes are reliable and meet the standard required.

ISO Certifications

Ultraflux is certified ISO 9001 and ISO 14001.
You can download the certificates : ISO9001– ISO14001
http://www.ultraflux.net/downloads

Electrical Certifications

Minisonic complies with the Low Voltage Directive (DBT) according to EN 61010-1

ATEX Certifications

Some Ultraflux products are also certified for use in ATEX hazardous areas.

You can download the documents:
http://www.ultraflux.net/downloads

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Safety instructions

Usingthe device

The device, equipped with ultrasonic probes, enables the flow measurement of a fluid (gas or liquid) in a pipe. It is important to set up the device correctly so that the measurement results are correct.

It is recommended that Ultraflux qualified personnel be called in to ensure this. This is strongly recommended if your equipment is used to control a process, to intervene in a monitoring system, or in the case of other applications where incorrect flow measurement would entail risks.

During normal operation, the unit must not be heated up in a way that could cause burns. No special precautions need to be taken to allow it to cool down. If the temperature of the housing rises abnormally, it is essential to switch off the device and send it to Ultraflux for expert evaluation. In the event of fire inside the appliance, make sure to switch it off without opening or touching it, then call the competent services to secure the place.

The unit must not be used beyond the possibilities and specifications published in this manual. It must be stored in a dry place. It is advisable to wear PPE (Personal Protective Equipment) suitable for the environment of the installation site.

The modification or disassembly of the unit must only be carried out by Ultraflux personnel. Ultraflux declines all responsibility otherwise.

Connections as well as disconnections of the connectors must be carried out with the power off, insulated equipment.

Ultraflux declines all responsibility for any incidents that may occur as a result of failure to observe these instructions.

Equipments connected to the device

All equipment connected to the device must comply with the relevant safety standard and have SELV circuits. (double insulation between primary and secondary)

Caution: The supply voltage of the measuring probes is high (may exceed 200V).

Maintenance work on the device

Interventions related to the maintenance of the device must only be carried out by Ultraflux personnel and using only parts supplied by Ultraflux.

Temperature limits for Minisonic electronics

Use from -10°C to +40°C
Storage from -35°C to +60°C

General characteristics

Ultrasonic flow measurement by transit time measurement.
2 measuring cords (i.e. 4 probes)
Power supply: continuous 12-24Vdc or 110-220 Vac - Consumption: 7W typical, 15W peak.
Protection class: IP67 closed case

Dimensions / Weight

Width: 216mm / Height: 268mm / Depth (thickness): 90mm
Weight: 3.6 kg (with wall mounting plate)

Mechanics / Ergonomics

- Aluminum housing
- Wall mounting: special sheet metal rear panel + hole for locking screw accessible at the bottom of the product
- Monochrome graphic OLED display 128x64 pixels
- Lexan keyboard with: 7 keys (same keys as the Minisonic II Portable)
- Blue LED: ultrasonic operation
- RGB LED for diagnostics (operation to be described according to the errors to be reported to the user)

Cable glands

3x M20 type cable gland
Note: The M20 cable gland must be able to accommodate a reducer for the connection of two Pt100.
1x dedicated to the power supply
2x dedicated to In / Outputs and optional (module IN et module COM).
1x specifically assigned to the ethernet cable
2x M25 type double cable gland : dedicated to probes connection (1x double cable gland per cord)

Integrated wiring compartment / integrated connection

Basic functions
Power supply : 3,5mm 3 ways connector (base plate with pluggable screw terminal block)
USB : vertical USB type A socket
Ethernet : horizontal RJ45 socket
In/Output (4/20mA and 2 ways Digital output) :
Connectors with 3.5mm pitch (base plates with spring-cage (pluggable) terminal blocks)
Probe connection: on stepped connector (socket strips with pluggable screw terminal blocks)

Optional function / Modules
Module « IN » : 4/20mA Input or Double Pt100 (2 or 3 wires)
Module « COM » : RS485 or RS232 with automatic detection by the device
Connectors with 3.5mm pitch (base plates with spring-cage (pluggable) terminal blocks)

Electrical characteristics Inputs / Outputs

Digital output: Maximum output voltage of 500V between contact and its ground
Current 1 mA at a frequency of 10 kHz
Modules In:
Galvanic insulation between modules: 500V

CE marking

Ultraflux **Minisonic** flowmeters comply with CE certifications.

EN 55016-2-1	Conducted emissions measurements - criterion A
EN 55016-2-3	Radiated emissions measurements from 30MHz to 6GHz
EN 61000-4-6	Immunity to induced conducted disturbances - Criterion B
EN 61000-4-2	Immunity to electrostatic discharges - Criterion B
EN 61000-4-3	Immunity to radiated electromagnetic fields - Criterion A
EN 61000-4-4	Electrical Fast Transient / Burst Immunity - Criterion B
EN 610004-5	Surge immunity - Criterion B
IEC 60529	Degree of protection provided by the envelopes (IP)

Contact address

For anyrequestforinformation,donothesitate tocontact us::

Postal address
Bâtiment Texas
9Allée Rosa Luxemburg
ÉragnyParc – Parc desBellevues
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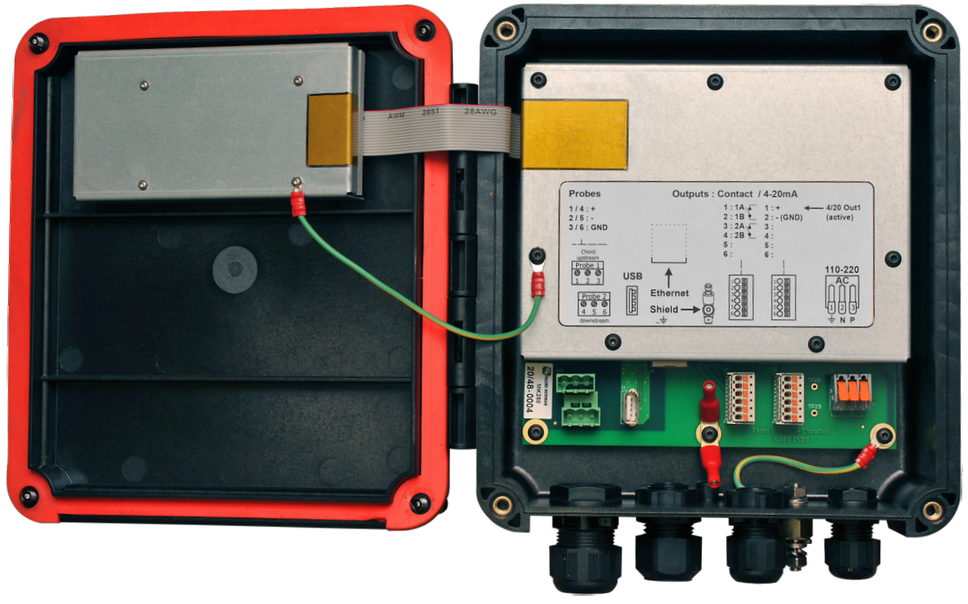
After-sales
sav@ultraflux.fr
+33(0)1 30 27 29 30
Emailaddresscontact@ultraflux.fr

Recycling the device

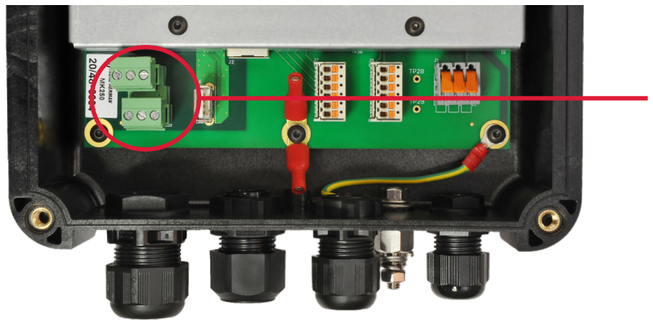
In accordance with decree no. 2005-829 of 20 July 2005 and decree no. 2009-1139 of 22 September 2009 concerning the obligations to collect, treat and dispose of electrical and electronic equipment, batteries and accumulators in France, Ultraflux delegates responsibility for the financial and logistical recovery to users who will manage their waste themselves. Separate collection and recycling of your waste at the moment of disposal will help preserve natural resources and guarantee recycling respectful of the environment and human health. For more information on the recycling centre nearest to your site, contact your City Hall or waste disposal department.

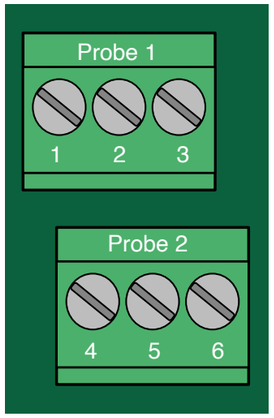
Wiring the Minisonic

Overview of the connections compartment



Probes connection





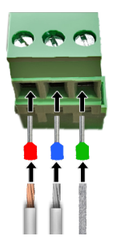
Chord 1 Probe 1 / Upstream probe		
PIN 1	PIN 2	PIN 3
Upstream probe +	Upstream probe -	Upstream probe ground
Probe 2 /Downstream probe		
PIN 4	PIN 5	PIN 6
Downstream probe +	Downstream probe -	Downstream probe ground

Note:

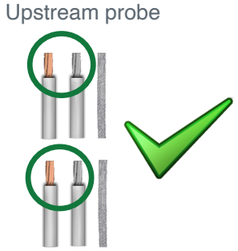
There is no + or - plug for connecting the sensors.
The choice of wire (silver or gold) for the upstream sensor must be the same for the downstream sensor

Example:

If the "gold" wire of the upstream sensor is connected to "upstream sensor +", then the "gold" wire of the downstream sensor must be connected to "downstream sensor +" Caution: The supply voltage of the measuring probes is high (may exceed 200V): Use electrical terminals

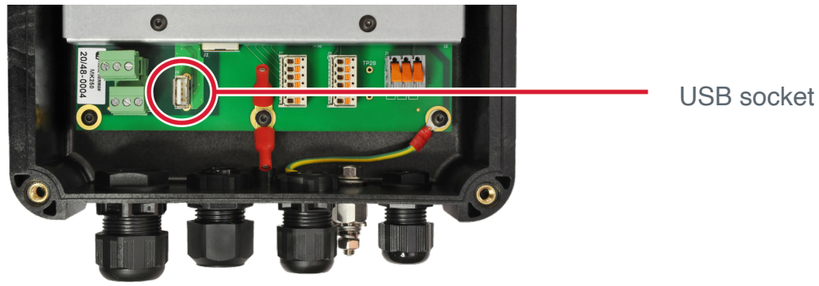


Fitting of electrical terminals recommended



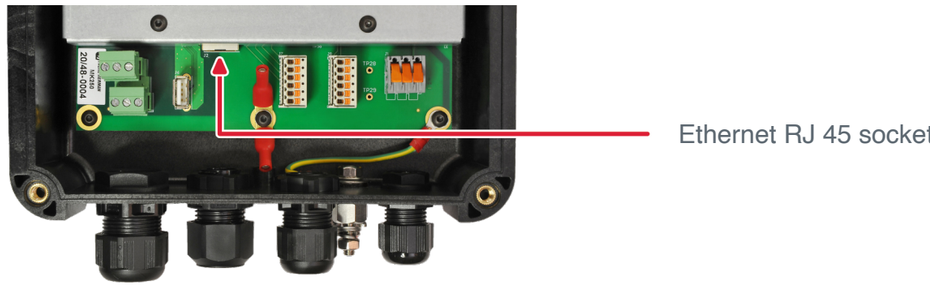
USB Connection

Vertical USB type A socket for software update and logger recovery

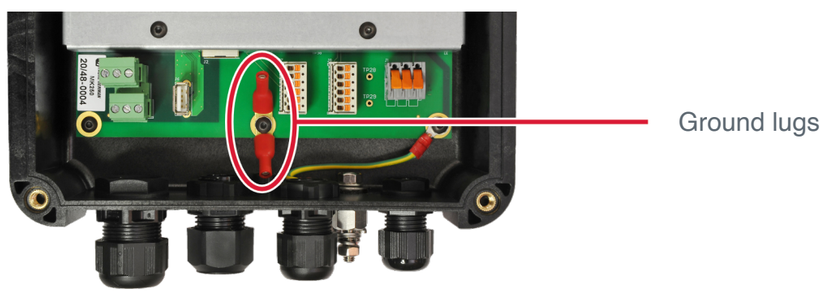


Ethernet connection

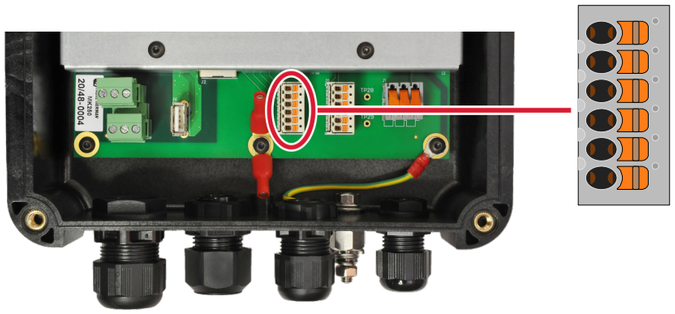
Horizontal RJ45 socket for Modbus TCP



Ground connection

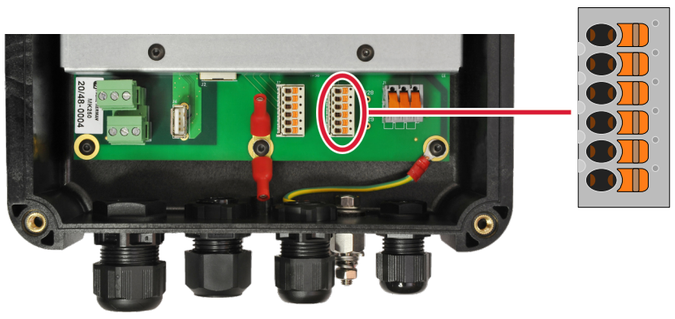


Contact output connection



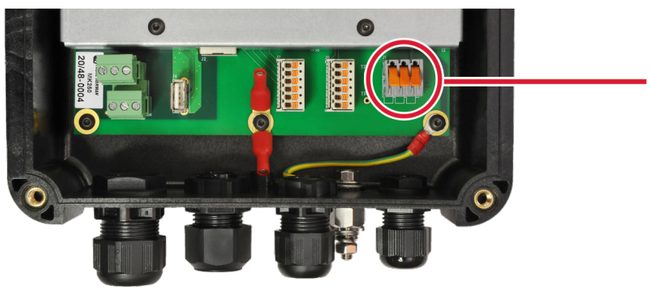
PIN	Function
1	Contact 1 - 1A
2	Contact 1 - 1B
3	Contact 2 - 2A
4	Contact 2 - 2B
5	/
6	/

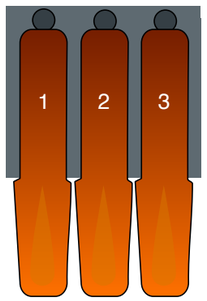
4-20 mA active analog output connection



PIN	Function
1	+
2	- (Masse)
3	
4	
5	
6	

Power supply connection AC 110 - 220 Vac





Power supply AC 110 - 220 Vac		
PIN 1	PIN 2	PIN 3
Ground	Neutral	Phase

Minisonic configuration

Description of navigation

The menus detailed in this manual correspond to the *Normal* mode of the setup level menu.

The Minisonic is equipped with a screen and a keypad for configuring it and viewing measurements directly.

Keypad

The keypad has seven keys which have different uses in different menus. However, navigation between the fields and menus is always based on the same principles:

MENU	Switches between the measurementviewing screens and the main configuration menu
↩	Takes you back to the previous screen.
∧ ∨ < >	Changes measuring screen, moves within the menus or changes parameter values.
OK	Goes into the menus in reverse video and is used to validate the parameters selected.

LED Display

Flash indicating the emission of ultrasonic waves

Flash indicating measurement status

If on at least one pipe all chords are working: green flash

If at least one chord does not work, or if there is an error on the input/output: orange flash.

If at least one line does not have a measurement: red flash

Types of screen

The Minisonic Fixed is based on several types of screens which are found throughout the navigation and work in the same way.

Screen for editing alphanumeric fields:

Figure 14 – Alphanumeric field edit screen

These screens are used to edit all the alphanumeric fields of the device, such as driving name, configuration names etc...

1 Fields currently being edited

Allows you to view the field being edited. You can select a character using the multi-directional keys and then select a character from the keypad to replace it.

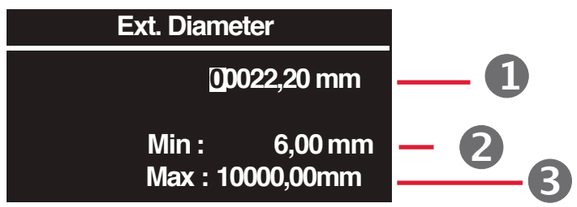
2 Alphanumeric keypad Allows you to select the characters to be placed in the field by pressing "OK".

3 "Delete" key : This key is used to delete the characters in the field being edited.

4 “CapsLock" key
Switches from the keyboard with upper case keys to the keyboard with lower case keys.

5 "OK" key
Allows you to validate the field and exit the screen.

Numeric field edit screen



Moving from digit to digit

Increases or decreases the value of the selected digit.

Validates the modification and returns to the previous level

This type of screen allows you to enter all the numerical parameters of the device.

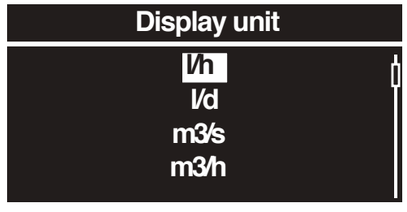
Currently edited field :

1 The number being edited appears in black on a white background. The value of the field is changed using the up and down keys. You can move from left to right using the direction keys to change the number being edited.

2 Minimum field value:
This number indicates the minimum value that can be set.

3 Maximum value of the field :
This number indicates the maximum value that can be set.

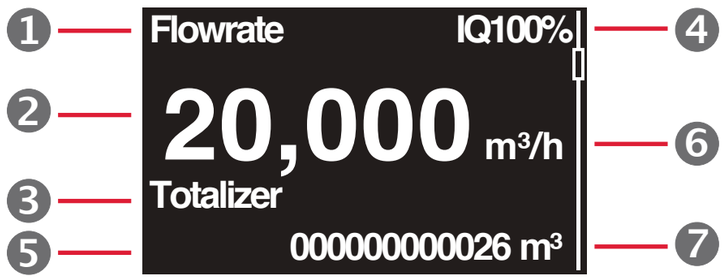
List selection screen



Choice among the proposed list

Validates the modification and returns to the previous level

Presentation of the measurement screens

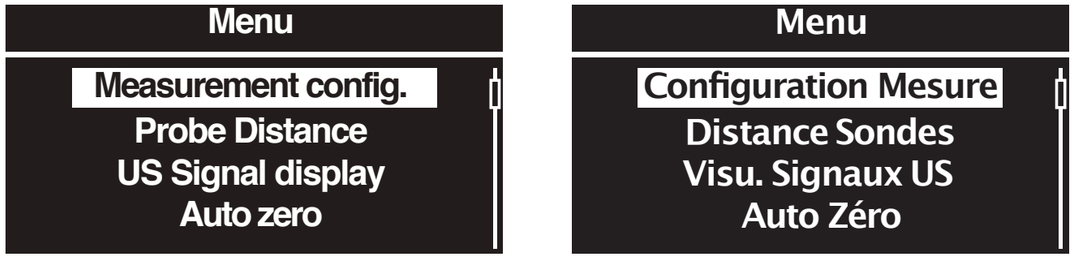


MENU — Access to menus

∧ ∨ — Visualisation of the various measurement screens

1. Denomination of the main measurement variable
   Example: Volume flow / Speed ...
2. Value of the main measurement variable
3. Designation of the secondary measurement variable
   Example: Totalizer / speed / velocity / velocity / gain ...
4. Quality index
   Indicates the percentage of successful ultrasonic shots among all the shots carried out by the Minisonic.
   This factor makes it possible to evaluate the difficulty of measurement, for example it is lower in the presence of loaded or aerated water. The higher the index, the simpler the measurement is for the device to carry out.
5. Value of the secondary measurement variable
6. Physical unit of the main measurement variable
7. Physical unit of the secondary measurement variable

Configuration menus



∧ ∨ — Choice of chapter

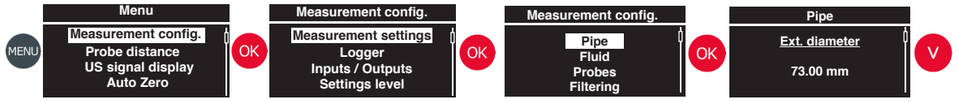
OK — Confirms the entry in the chapter in "inverse video" display.

Back to the previous chapter

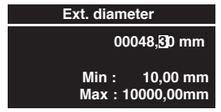
MENU — Back to the measurement screen

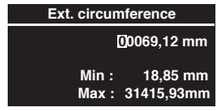
Measurement configuration	Configuration de l'ensemble de caractéristiques d'un point de mesure. Dans ce menu, vous allez paramétrer l'appareil pour qu'il soit opérationnel sur une application spécifique: Caractéristiques de la conduite / Caractéristiques du fluide / Caractéristiques des sondes utilisées.
Probe distance	Informs you of the distance to be set between the sensors according to the data set in "Measurement Configuration".
US signal display	Allows you to display the nature and quality of the measurement echo. It is a key factor in the analysis of the measurement conditions and can help you to identify any configuration error (diameter - thickness of the pipe ...).
Auto-Zero	Gives you the possibility to refine the response of your unit under the strict conditions of "Full pipe + Flow at standstill". This operation is essential to obtain optimal uncertainty
Advanced meas.	Gives you access to the details of numerous measures that can guide you in the search for increased performance
System Configuration	Setting the language information / Date Time / Custom features

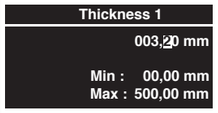
Measurement config. / Measurement settings / Pipe

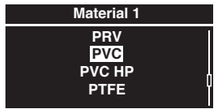


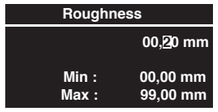
Ext. diameter	Adjustment of the outer diameter of the pipe.
Ext. circumference	The outer circumference can be adjusted if the diameter is not measured.
Thickness	Pipe thickness adjustment In case of mufti-layer piping: 3 thicknesses can be set in the EXPERT setting mode
Material	Choice of driving material from a list. In the case of multi-layer piping: possibility of setting 3 materials in EXPERT setting mode
Roughness	Specific roughness the inner wall of the pipe
Display unit	Choice of the volume flow unit Determines the physical unit associated with the volume flow display. Example: m3 /h - l/min...

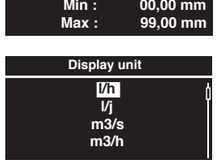




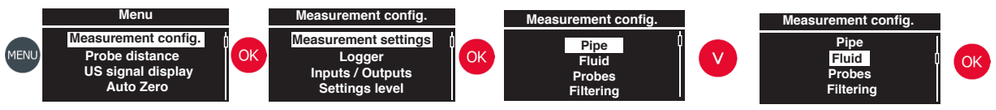






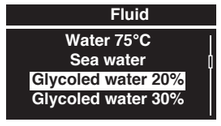


Measurement config. / Measurement settings / Fluid

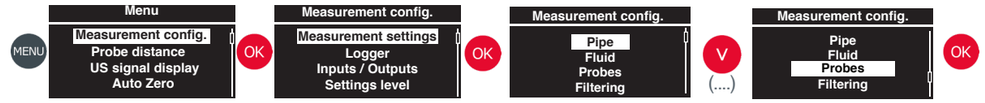


Setting the characteristics of the measured fluid

Fluid	Choice of the fluid to be measured from a list

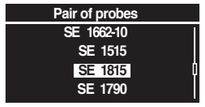


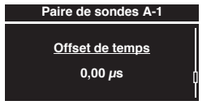
Measurement config. / Measurement settings / Probes



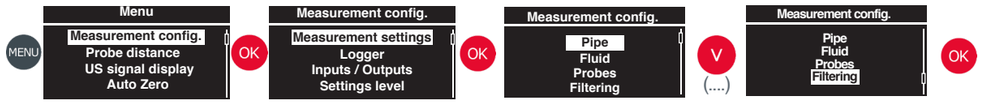
Paramétrage des sondes utilisées avec l'appareil

Sonde	Choice of probe model from a scrolling list
Trajet ultrason	Choice of probe mounting type
Delta T Zéro	Difference in transit time of the sound wave at zero flow. Value set automatically after "Auto Zero".
Mode de Gain	See appendix / Description of the gain adjustment on page 30
Offset de temps	



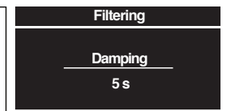


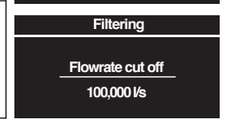
Measurement config. / Measurement settings / Filtering



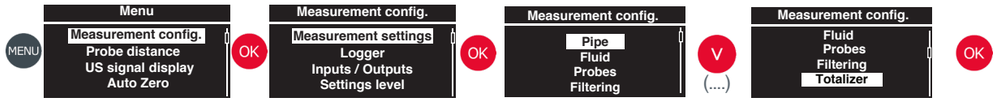
Measurement filtering settings

Damping	Damping time of the measurement. Setting to be made in the sub-menu for editing a numeric field (Unit in seconds)
Memory	Maintain measurement in case of signal loss. Setting to be made in the sub-menu for editing a numeric field (Unit in seconds)
Flowrate cut off	Flow threshold below which the measurement is forced to zero. (Display and outputs) Setting to be made in the editing sub-menu of a numeric field (Threshold value and unit).



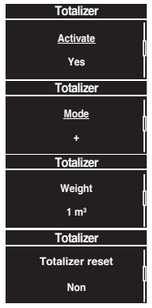


Measurement config. / Measurement settings / Totalizer

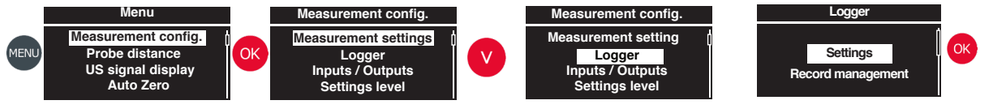


Paramétrage du totalisateur

Activate	Activate totalizer
Mode	Choose the operating mode : «direct + » « reverse - » « Net +/- »
Weight	Setting the totalizer increment weight
Totalizer reset	Resetting the totalizer

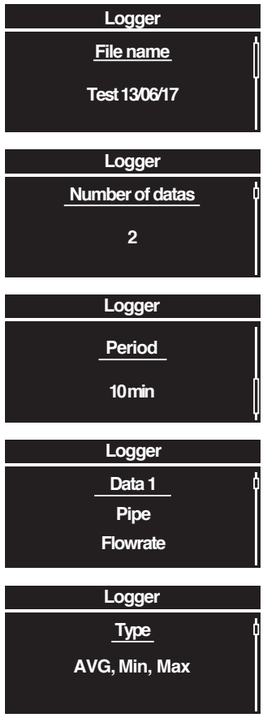


Measurement config. / Logger

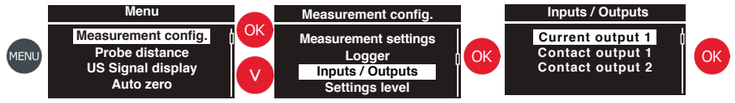


Configuration of the internal recorder

File name	Define the name of the recording file associated with the measurement point.
Number of data	Setting the number of variables to be recorded
Period	Choose a sampling period from a scrolling list
Data 1, 2, 3…	Define the nature of each variables Pipe: Physical quantities (Flow, Speed, Speed...) General: Device status, battery charge status
Type	Choose the type of value applied to all data • Average • Average + Min + Max • Average + Min + Max + Standard deviation

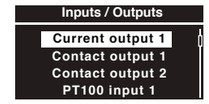


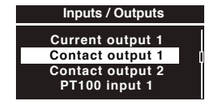
Measurement config. / Inputs - Outputs

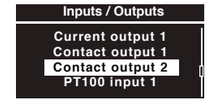


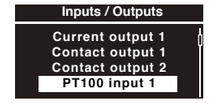
Setting Inputs / outputs

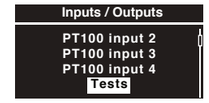
Current ouput 1	Adjustment of the characteristics of the 4-20 mA analogue output Activation / deactivation / • Determination of the variable to be assigned to this output • Adjustment of the flow rate corresponding to 4 mA • Adjustment of the flow rate corresponding to 20 mA • Unit of the instantaneous flow rate of this setting • Fill value in case of fault (in mA)
Contact output 1	Function selection: Counting / Alarm / Test On / Off Counting : Choice of flow variable (A / B / A+B pipe) Counting direction (Direct + / Reverse - / Net) Pulse length Pulse weight (value and unit) Alarm : Choice of the variable linked to the alarm
Contact output 2	Function selection: Counting / Alarm / Test On / Off Counting : Choice of flow variable (A / B / A+B pipe) Counting direction (Direct + / Reverse - / Net) Pulse length Pulse weight (value and unit) Alarm : Choice of the variable linked to the alarm
PT100 input (1-2-3-4)	Setting the characteristics of the Pt 100 input • Number of wires • Setting the temperature offset
Tests	Test mode of the analogue and contact outputs Caution: in test mode, the output values will be changed.



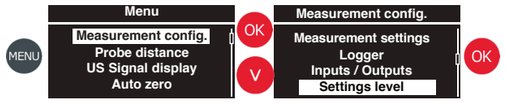






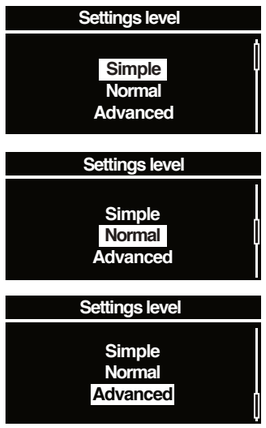


Measurement config. / Settings level



Settings level

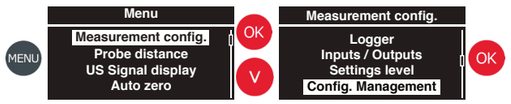
Simple	Contains the minimum parameters necessary to do flow measurement with the minimum of parameters to be set
Normal	Gives access to more features and settings to refine the measurement
Advanced	Contains all the parameters available in the unit.



The Minisonic has been designed to adapt to your level of knowledge of ultrasonic measurement.

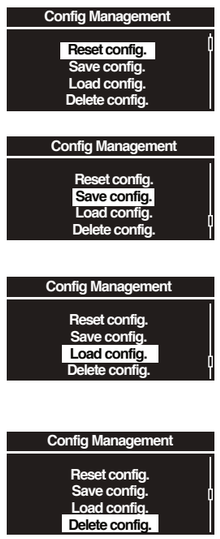
The menus detailed in this manual correspond to the Normal mode of the setting level menu.

Measurement config. / Config. Management



Configuration management

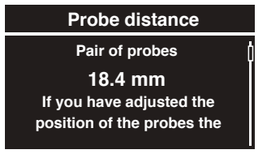
Reset config.	Deletes the data in the current configuration and returns to the default configuration. A warning message will pop-up on the screen to ask for reset confirmation
Save config.	Saves the current configuration Ask a name for this configuration so that you can use it again latter
Load config.	Uploads the parameter data of a saved configuration
Delete config.	Deletes selected or all configuration files



Measurement config. / Probe distance

Display of the probe spacing distance

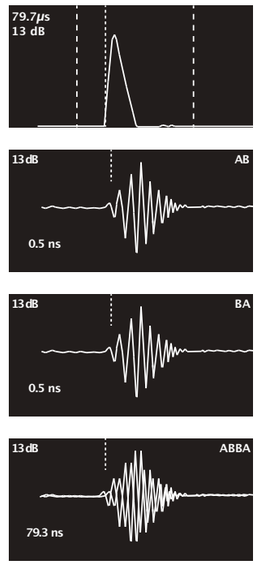
Probe distance	Displays the distance between the sensors. This distance is calculated by the device according to the configured parameters: • Diameter / thickness / pipe material • Type of fluid • Type of probes



Measurement config. / US signal display

Visualisation of measurement echoes

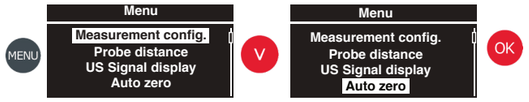
Large view	Wide visualisation of the quality of the measurement signal according to the programmed parameters and measurement conditions
Echo from A to B	Visualisation of the ultrasonic echo emitted from probe A and received on probe B
Echo from B to A	Visualisation of the ultrasonic echo emitted from probe B and received on probe A
Phase shift AB-BA	Visualisation of the 2 echoes and the difference in transit time of the ultrasonic wave between the AB and BA paths



< > Allows the viewing window to be moved for signal assessment

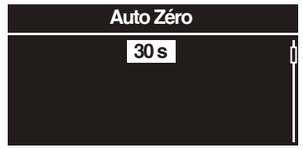
OK Allows the display to be centred on the measuring point.

Auto Zero



Minisonic zero flow adjustment

Auto Zero	Determines the duration of zero point adjustment.

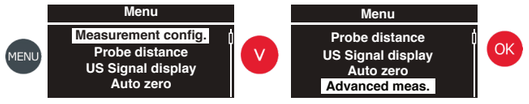


Caution, this operation can only be carried out under the strict conditions of:

- **Full pipework**
- **Zero flow**

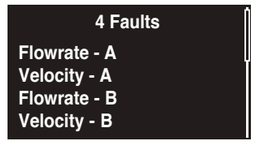
This operation is essential in order to obtain optimal accuracy. The actual stabilisation of the fluid vein at zero flow can take + or - time. This stabilisation depends on the diameter of the pipe and the type of shut-off devices. Make sure that the flow is actually mechanically shut off (valve....).

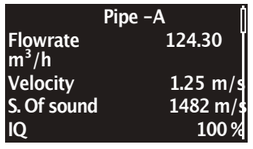
Advanced meas.

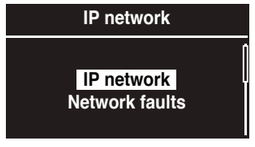


Visualisation of diagnostic variables and failures

Faults	Exhaustive list of faults found by the device.
Flowrates	Visualisation of advanced variables allowing adjustment, reliability or validation of measurement quality.
IP network	Network diagnotic



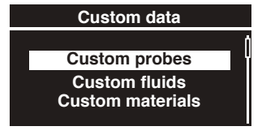


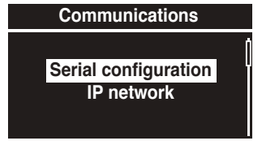


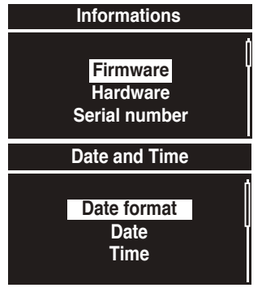
System configuration

Setting the device system data

Main	Definition of : • Display and programming language • Distance units mm or inches
Custom data	The Minisonic allows the customised setting of: • Probes • Fluids • Pipe materials
Communication	• Serial communication setting • IP Setting
Information	Display of: • Software version (Firmware) • Electronic board version (Hardware) • Serial number of the device
Date et heure	Adjustment and adjustment of: • Format DD/MM/YY ... • Date • Time







Implementation of a measuring point

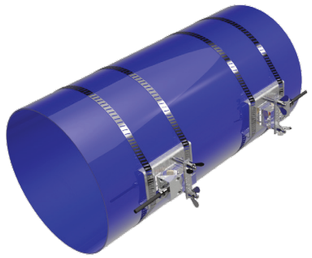
Setting up a measuring point

In addition to the flowmeter, a number of other elements are required to form a measuring point:

External sensors

A pair of potted cable probes with the required cable length

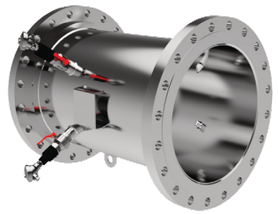
Suitable mounting brackets and fixing systems



Insertion probes

A pair of intrusive probes equipped with their mounting system (e.g. Valve / Boss...).

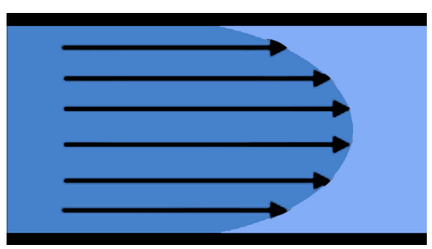
The required cable length between the sensors and the electronics.



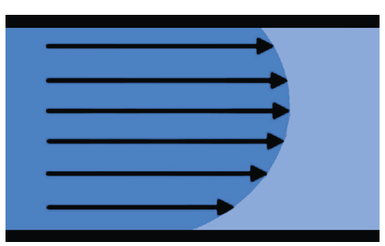
Choosing a location for the probes

The following paragraphs set out the main precautions to be taken when choosing a location for the probes.

To achieve the most accurate measurement possible, it is necessary to have what is called ‘a developed flow profile’. The aim is to obtain a hydraulic profile which is as predictable and symmetrical as possible.



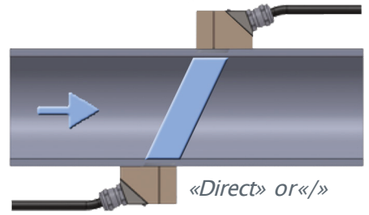
Symmetrical hydraulic profile



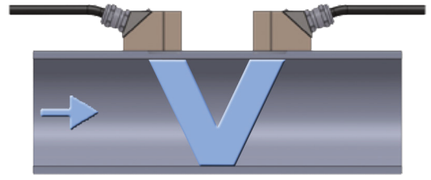
Asymmetrical hydraulic profile

Choosing the measurement mode

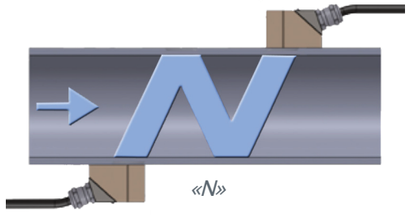
The external sensors can be installed in different ways, depending on the number of reflections of the ultrasonic wave on the pipe wall. There are four programmable types in the device:



«Direct» or«/»



«Reflex» or«V»



«N»

«W»

The preferred mounting method is the V-shaped mounting, which is suitable in most cases.

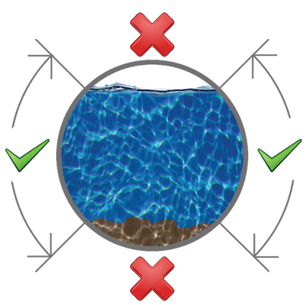
The longer the distance, the better the measuring principle is exploited. (significant difference in travel time upstream and downstream).

On the other hand, the ultrasonic echo will be all the weaker and more distorted as the number of reflections increases and will then be difficult to exploit. A compromise must therefore be found between precision and ease of transmitting and receiving ultrasound. This compromise depends on the application (fluid, wall quality, diameter, etc...).

In practice, multiple reflection modes are reserved for smooth pipes without fouling or corrosion.

Probe positioning

The measuring probes must be placed in such a way as to avoid areas at risk of air bubbles and sediment.

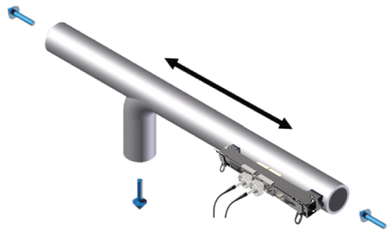


Respect for straight pipe lengths

We know the rules to be followed according to the layout of the pipes to obtain the ideal measuring conditions. The following paragraphs provide information on the general rules to be observed.

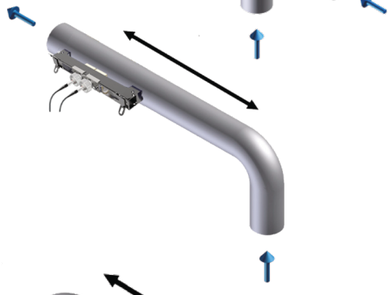
For liquids, the following instructions show the minimum distances (L) before and after a disturbance as a function of the inside diameter of the pipe (D) so that the errors induced by these disturbances remain below ± 1 %.

Measuring near an elbow



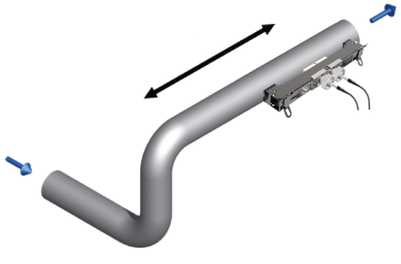
Reflex mode V : Distance > (3x) pipe diameter
Direct mode / : Distance > (5x) pipe diameter

Reflex mode V : Distance > (15x) pipe diameter
Direct mode / : Distance > (20x) pipe diameter



Reflex mode V : Distance > (15x) pipe diameter
Direct mode / : Distance > (20x) pipe diameter

Reflex mode V : Distance > (3x) pipe diameter
Direct mode / : Distance > (5x) pipe diameter



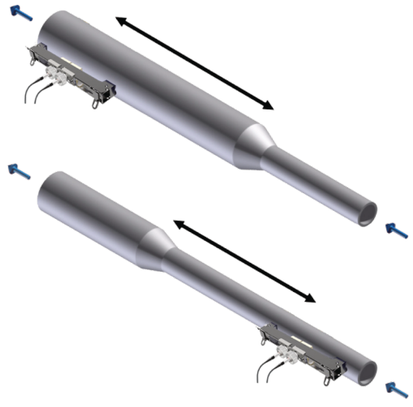
Reflex mode V : Distance > (15x) pipe diameter
Direct mode / : Distance > (20x) pipe diameter

Measuring close to a valve

Reflex mode V : Distance > (15x) pipe diameter
Direct mode / : Distance > (20x) pipe diameter

Reflex mode V : Distance > (5x) pipe diameter
Direct mode / : Distance > (8x) pipe diameter

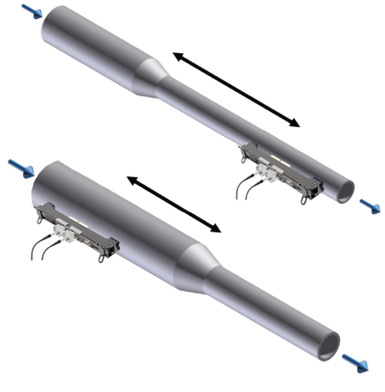
Measuring close to a divergent



Reflex mode V : Distance > (30x) pipe diameter
Direct mode / : Distance > (40x) pipe diameter

Reflex mode V : Distance > (3x) pipe diameter
Direct mode / : Distance > (5x) pipe diameter

Measuring close to a convergent



Reflex mode V : Distance > (10x) pipe diameter
Direct mode / : Distance > (15x) pipe diameter

Reflex mode V : Distance > (3x) pipe diameter
Direct mode / : Distance > (5x) pipe diameter

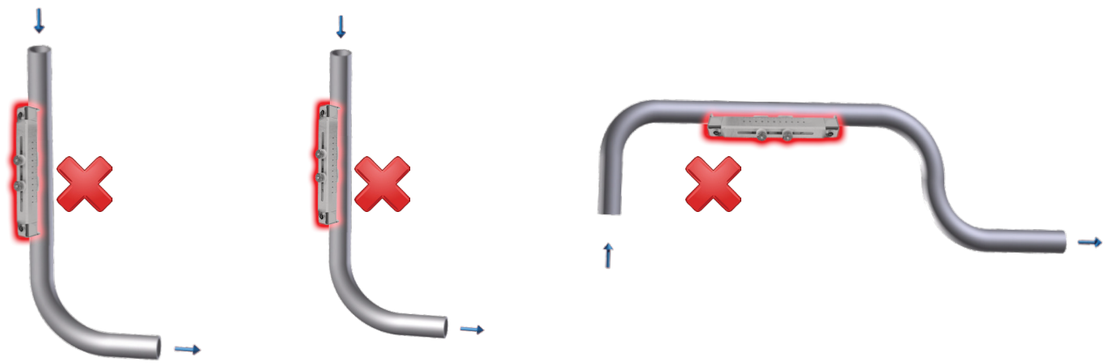
Comments :

The values indicated must be multiplied by 2.5 for gases.

Convergents with an overall angle of less than 16° are not taken into account and are considered as straight lengths (this is not the case for divergents).

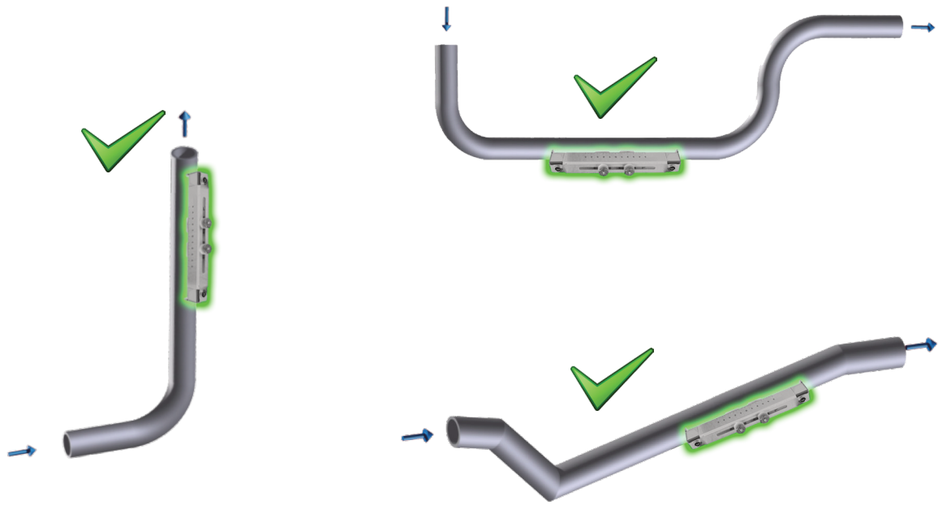
Locations not suitable:

Vertical pipe with downflow, especially in the case of free flow



Recommended locations:

Pipework with ascending flow.



Choice of probe type

The choice of the sensor pair depends on the pipe diameter.

The frequency of the probe has an important effect on the quality of the measurement.

The Minisonic can be used with many probes that are suitable for different pipe diameter ranges.

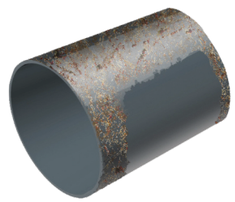
The following table defines the average operating ranges of the probes according to their frequencies:

Frequency	Pipe diameter
2 MHz	10 - 400 mm
1 MHz	40 - 2 500 mm
500 kHz	100 - 10 000 mm

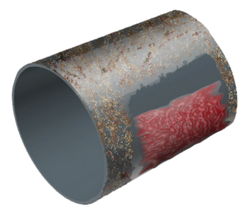
Note: The values given in the table correspond to the internal diameter of the pipe (or nominal).

Installation of the Clamp-on probes

Pipe preparation



After determining where the sensors are to be installed, clean the pipe surface by removing dirt, rust and any roughness (paintwork is not a problem if it is in good condition).

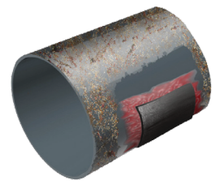


Grease the line with grease where the probes are located (Do not use silicone grease).

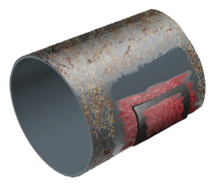
Installation of the elastomer strip

It can be used for any surface temperature between -30°C and +100°C.

Découper un morceau d'élastomère de la dimension de la sonde +5mm
Enlever le film protecteur



Cut a piece of elastomer the size of the probe +5mm.
Remove the protective film



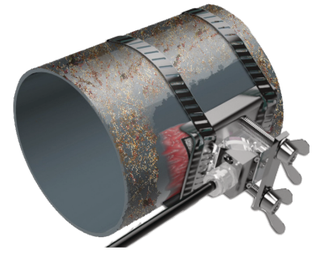
Apply grease to the outside of the elastomer strip.

Installation of one of the probes

Place the sensor and its holder and secure them by tightening the stainless steel clamps.

Place the clamping screws of the clamps preferably opposite the probes.

NB: The observation of the evolution of the gain (dB) measured by the flowmeter can allow to identify the degradation of the coupling and to foresee its replacement.



Application example

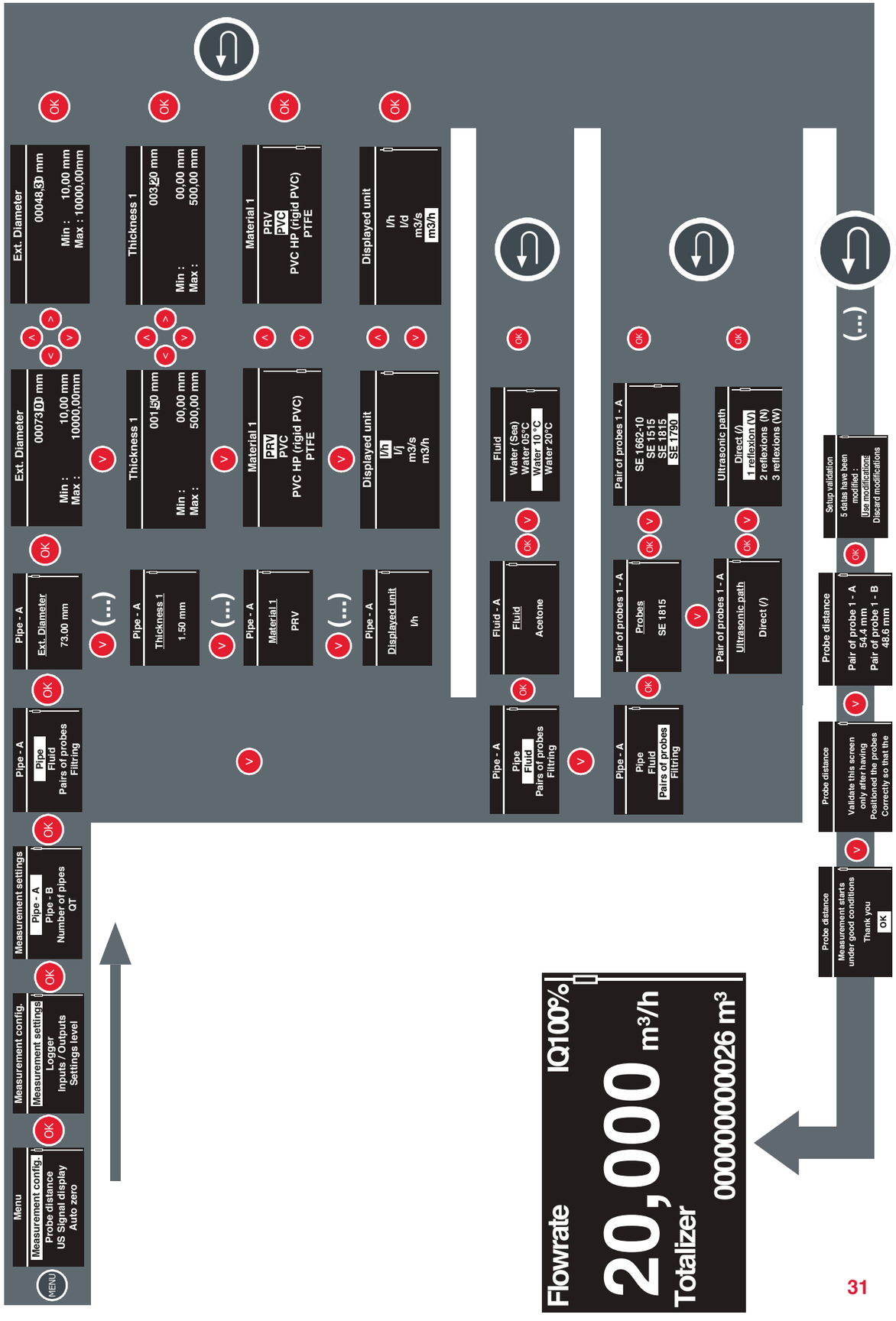
Flow measurement with an ultrasonic flowmeter requires the following information:

- Pipe characteristics (External diameter + Thickness + Material)
- Fluid characteristics
- Probes used (Model)

Application

- PVC pipe / Outer diameter 48.3mm / Thickness 3.2mm
- Fluid measured: Fresh water at 12°C.
- Probes used: SE 1790, V-mounting

Use the overview on the next page to configure the unit according to the data in the example.

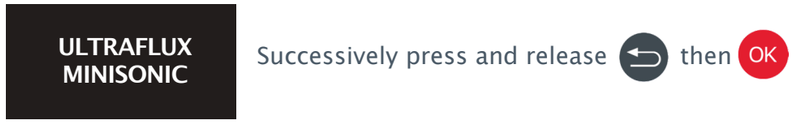


Software update procedure

In order to reach the specific area for system modification and software update you must:

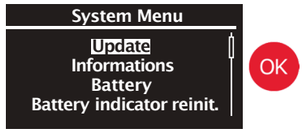
- Save the update file on the root of a USB key.
- If there are several update files, the unit will ask you to leave only one.
- Connect the USB key to the unit's USB port.
- Switch on the Minisonic with the USB cable and the key connected to the unit.

- ⚠ During the ignition phase which lasts 3 seconds



- A countdown timer appears in the upper right-hand corner for 5 seconds.
- Enter the password before the countdown reaches 0 : ROL (Right-OK-Left)

- ⚠ In case of an error in entering the code, the unit will start normally.
- Switch it off and restart the procedure
- In the "System Menu" press OK to start the loading procedure.



- Extract – about 30s
- Programming – Up to 4 minutes
- Switch off the unit and wait 1 minute;;;;;;
- Switch the unit back on
- ⚠ Attention, the device does not give any sign of life: this is normal.
- Wait about 5 minutes for the device to restart with the new version.

Software update procedure / FAQ

If the device restarts immediately, what happens?

- Either the device was already in the right version
- Or the update only concerned spelling corrections in one or more languages.

After 10 minutes without any sign of life, the device does not restart, what can I do? ?

The recovery procedure must be carried out

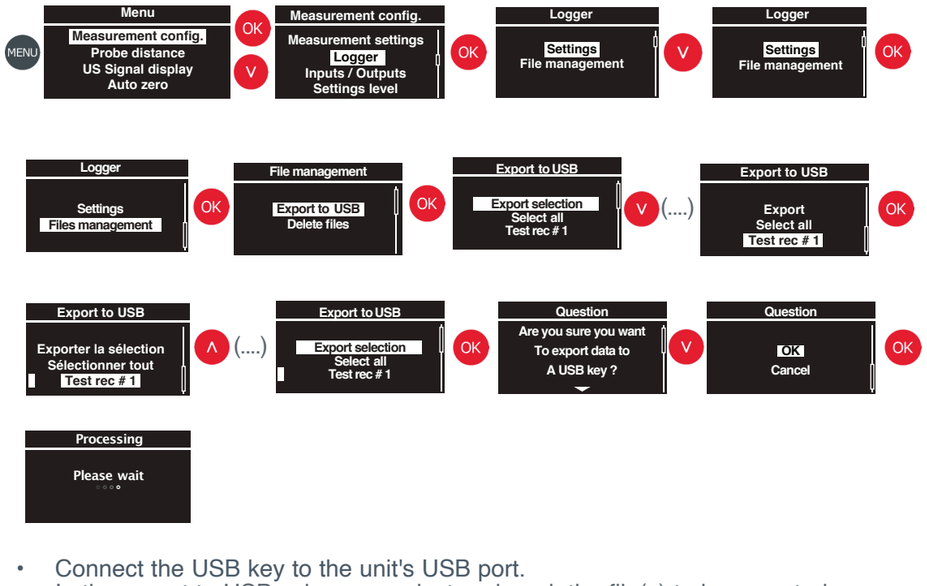
Switch off the unit and wait 2 seconds

- Switch the unit back on, the device does not give any sign of life: this is normal.
- Wait 5 minutes for the device to restart :Either with the new version or Or with the internal back-up version if the update has failed, in which case the complete update procedure must be started again

Logger / Retrieving recordings

The purpose of this procedure is to inform you:

- The path to the menu for retrieving the recording files
- The procedure for selecting the files to be recovered
- The effective recovery of the file(s) on the USB key
- Importing the registration file into Excel



- Connect the USB key to the unit's USB port.
- In the export to USB submenu, select and mark the file(s) to be exported.
- Export the selection.

When the export is complete, the structure appears as shown below:

USB key	Physical media: USB key
Ultraflux_Minisonic SN00017	File indicating the serial number of the device (e.g. SN00017)
Logger_Example 1	File indicating the name of the registration (e.g. Example 1)
Example 1_2017.11.22_23h38_config.txt	Text file containing the settings of the unit at the time of this recording.
Example 1_2017.11.22_23h38.ind001.log	Spreadsheet file containing logger record data

Measuring signal gain adjustment mode

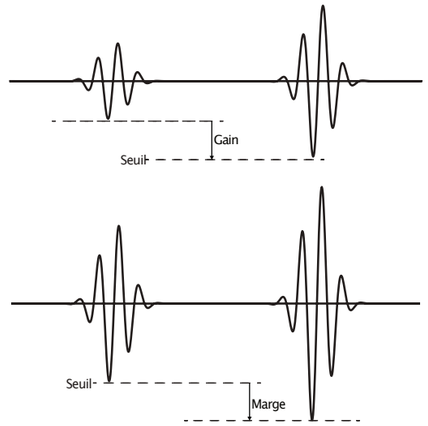
The information detailed in this chapter corresponds to the EXPERT mode of the menu setting level.

Foreword

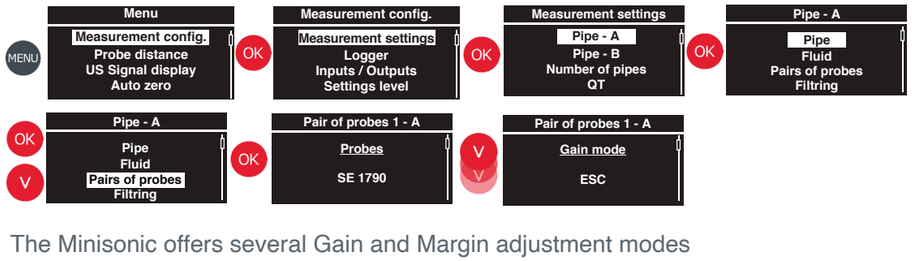
The Minisonic can work on the positive or negative polarity of the signal.

The Minisonic determines at each reception of the measurement signal, the Gain to be applied so that the peak of this signal reaches the detection threshold (example presented on a negative polarity).

To this Gain must be added an additional gain, called Margin, allowing the peak of the signal to be well above the threshold.



Path to gain type setting



The Minisonic offers several Gain and Margin adjustment modes

ESC then Auto

Switching from ESC mode (see below) to perform the first measurement and then permanently to Automatic mode (see below) for the rest. This mode is to be recommended for long term measurements on an installation without major changes in the application conditions.

ESC (Echo Shape Control)

This mode selects the best Gain to be applied to the signal and the most appropriate Margin.

This mode is to be recommended when using a portable flowmeter that performs point measurements on different applications.

This mode requires a few seconds of signal analysis before indicating the flow rate value.

In case of signal loss due to a disturbance in the measurement conditions (passing of bubbles...) the device starts a new ESC.

Automatic

In this mode, only the Gain is determined automatically, the Margin must be indicated manually. If the Margin is set too high, the flow rate measurement may be performed on a peak in the middle of the signal. However, the measurement is of better quality if it is carried out on the first alternation. This mode is to be recommended on an installation without strong modifications of the application conditions, for long term measurements.

Manual

The Gain and Margin values are determined by the user.

This mode is useful if signal disturbances make the gain too unstable for automatic search.

Ultraflux

Ultrasonic flowmeters

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