Ultrasonic Flow meter quick start guide
Model: FT221

We also have an installation demo video on Youtube, scan the QR,
Search 'FlowT FT221 Ultrasonic Flow Meter Overview & Demo', or use this link: https://youtu.be/hI84zgTN7J0

SCAN ME

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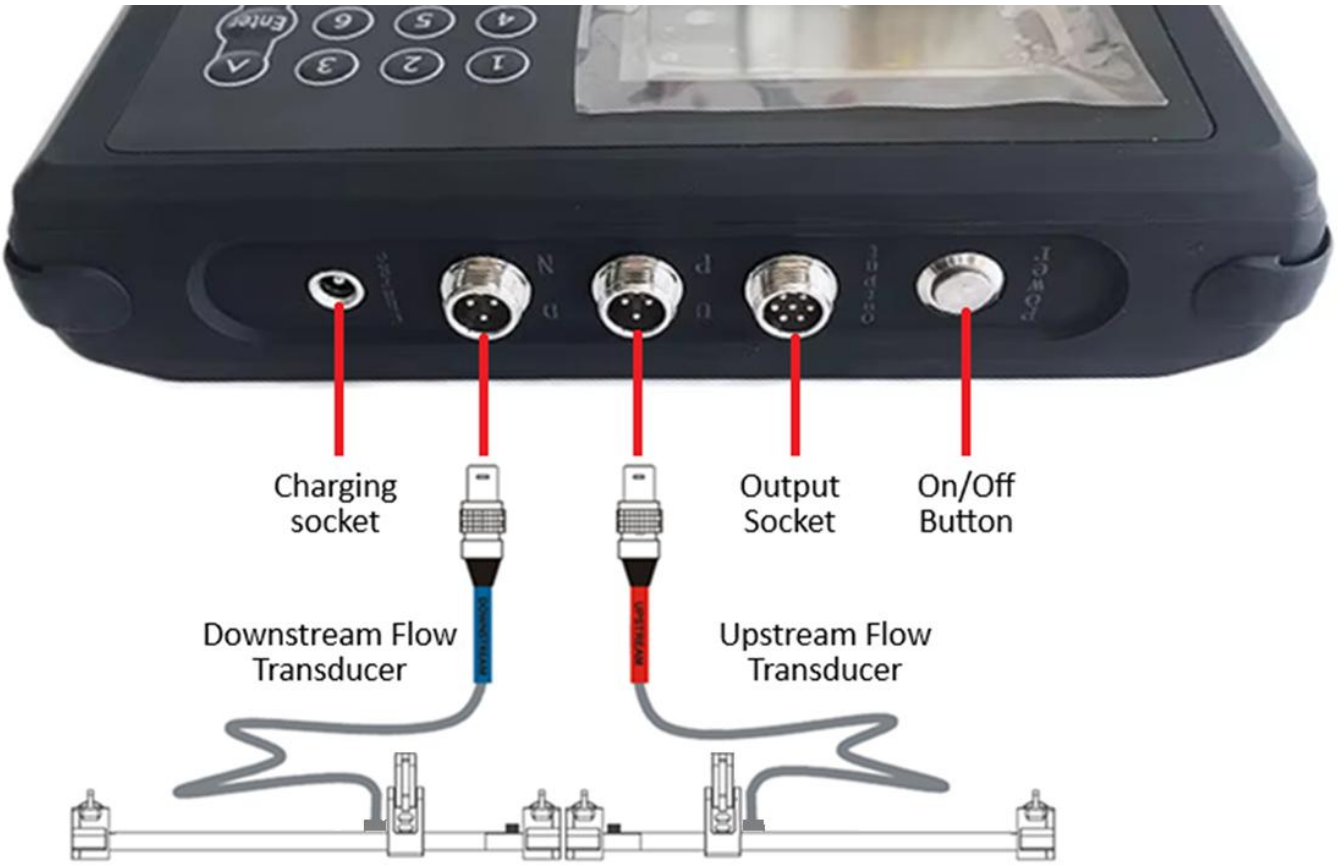
Introduction:

Please note that this guide will go through basic functions of the flow meter only, for advance functions please see the full manual.

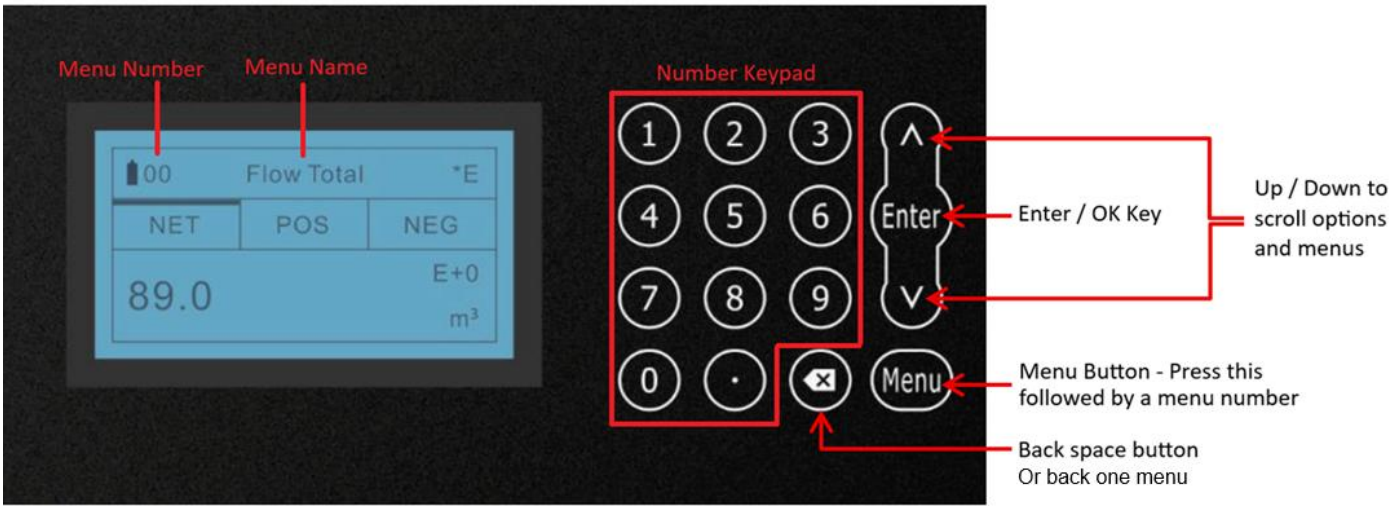
Connection ports and on/off button is on the top of the flow meter, as shown in the diagram below:



Press in the on/off button at the top of the meter, then you can proceed with using the flow meter.
If it does not turn on it may need to be charged before use.

Interface and keypad

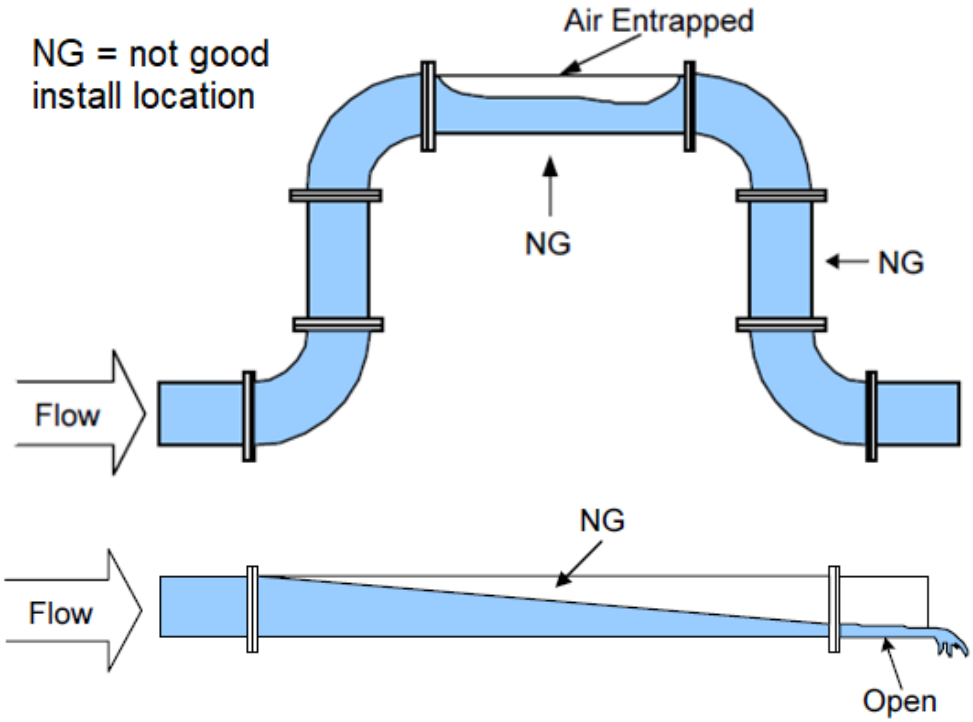
The full keypad is pictured below, this will describe basic functionality of the keypad



0 – 9 and '.' numeric keys input numbers and decimal, used during configuration and setup.
is delete / backspace and used to exit menu structures
and scrolls up and down menu numbers
To enter a specifc menu: press the Menu button, then input a two-digit Menu number. for example, by pressing these buttons: Menu + 1 + 0 will enter menu 10
Enter is enter/confirm

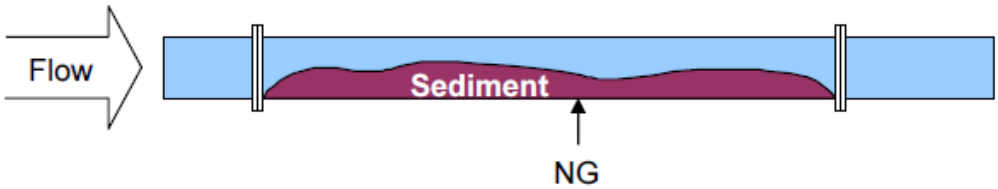
Select installation location

Measurements cannot be made accurately if pipe is not filled, install transducers in a position that is filled with fluid, even after flow has stopped. Some below examples show areas that would be unsuitable for installation.



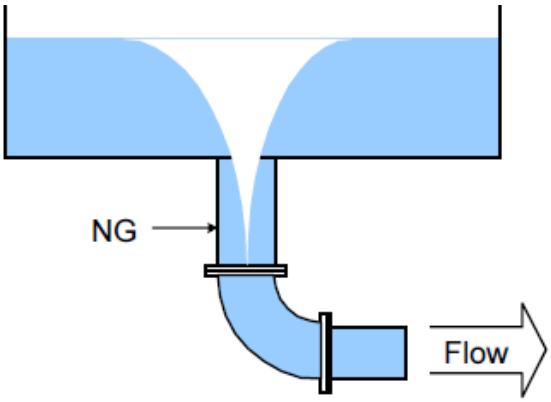
Sediment

Sediment accumulation at the transducer position may cause measurement errors.
Countermeasures include installation of closing flange, etc.



Entrained air

Measurement may not be possible if there is entrained air at the transducer position.



Vertical pipes

If installing on vertical pipes, it should not be used where flow direction is downward, as the pipe may not be completely full, it would work best on a vertical pipe where the flow direction is from bottom to top.

Minimum straight pipe requirements

When selecting a measurement site, it is important to select an area where the fluid flow profile is fully developed to provide an accurate measurement. Use the following guidelines to select a proper installation site

a) Choose a section of pipe that is **always full of liquid**, such as a vertical pipe with flow in the upward direction, or a full horizontal pipe.

b) Ensure **enough straight pipe length** before and after the transducers so that the flow is non turbulent inside the pipe, the **images on the right indicate these requirements**

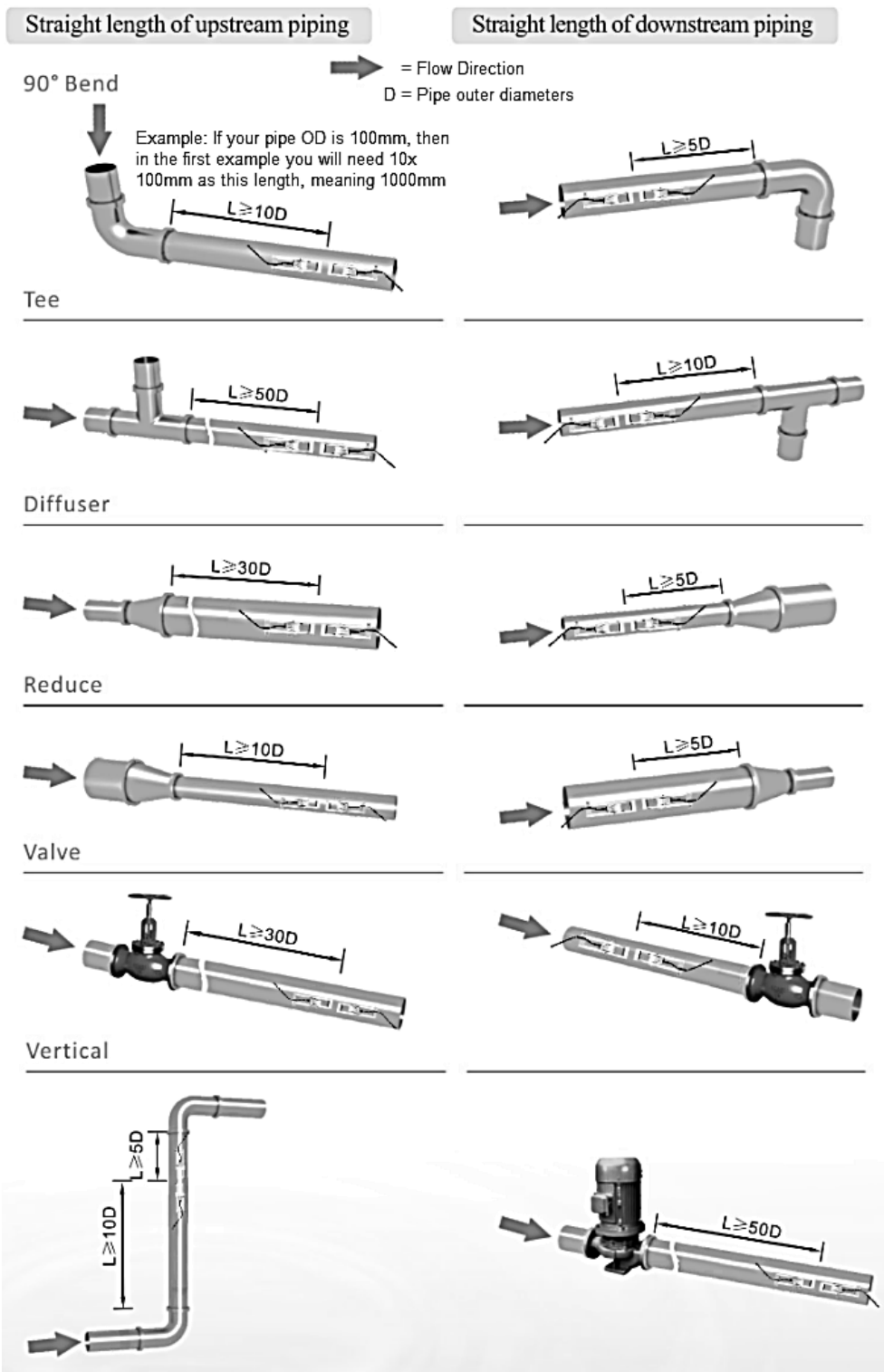
c) Transducers are best **mounted on the 3 or 9 o'clock position** of the pipe section (at the side of the pipe) this is to avoid sediment at the bottom of a pipe or air bubbles at the top

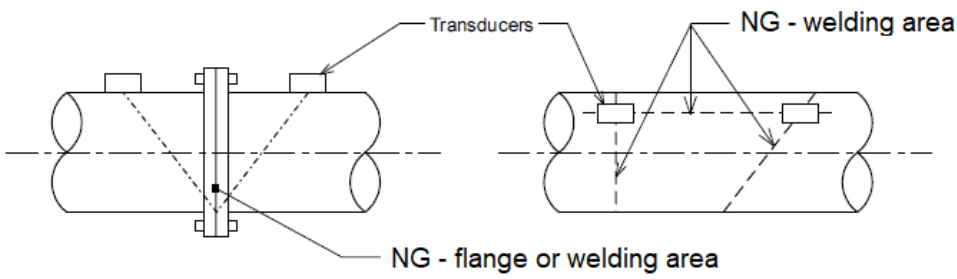
d) Ensure that the **pipe surface temperature** at the measuring point is within the transducer temperature limits

e) Consider the **condition of the pipe** inside and out. Select a section free of excessive corrosion or scaling

f) Consider the possibility of **sediment at the bottom of the pipe and the presence of an air pocket at the top of the pipe.** In addition, **avoid flanges** and welding areas and **select a smooth portion of the pipe** to install the transducers.

g) Ensure **pipe and liquid are compatible** or suitable to measured ultrasonically and install **away from sources of interference or vibrations.**





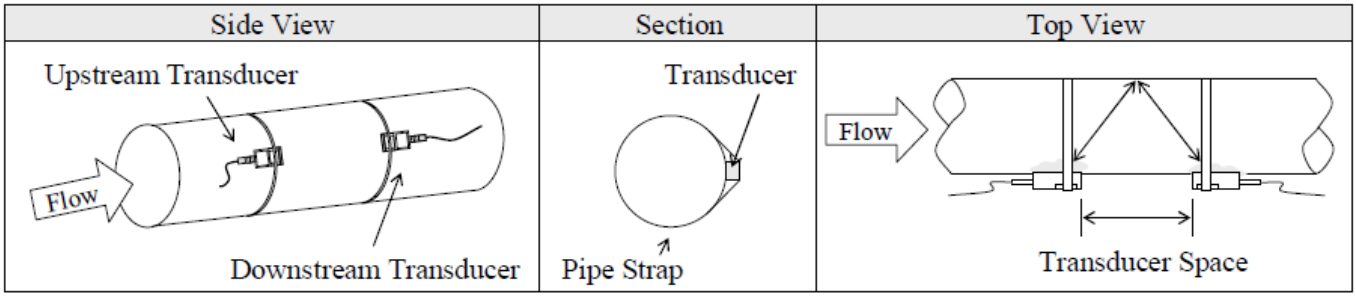
Transducer mounting methods

Three transducer mounting methods are available, **V method, Z method** and **N method.**

V method

The V method is considered the standard method. It usually gives a more accurate reading and is used on pipe diameters ranging from 25mm to 400mm. It is also the most convenient to use and setup. (although sometimes for small pipes less than ~50mm N method may be required) Most of the time you can use just one frame.

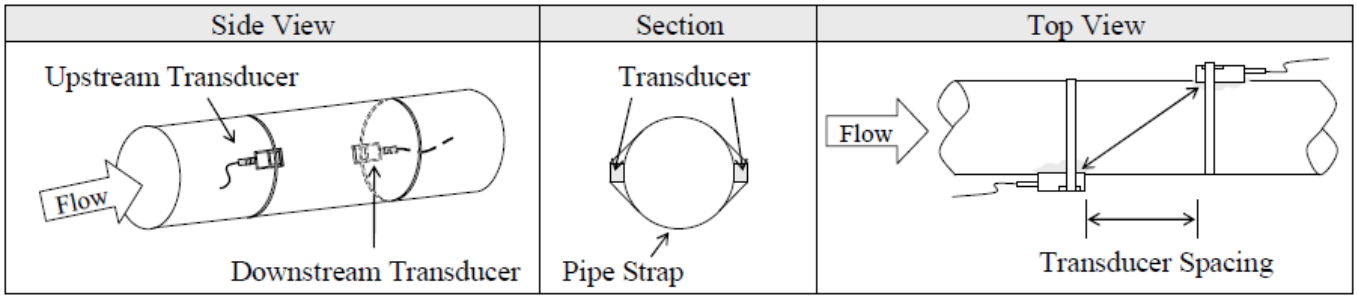
V method – best suits 50mm to 400mm pipes (sometimes works as low as 25mm)



Z Method

The signal transmitted in a Z method installation has less attenuation than a signal transmitted with the V method, therefore is good to use when the pipes are large, there are some suspended solid in the fluid, or the scaling and liner are too thick. This is because the Z method utilizes a directly transmitted (rather than reflected) signal which transverses the liquid only once. While the Z method can measure on pipe diameters over 100mm, it is recommended to use this method for pipe diameters over 300mm. Both frames are needed on opposite sides.

Z method – can be used on pipes over 100mm

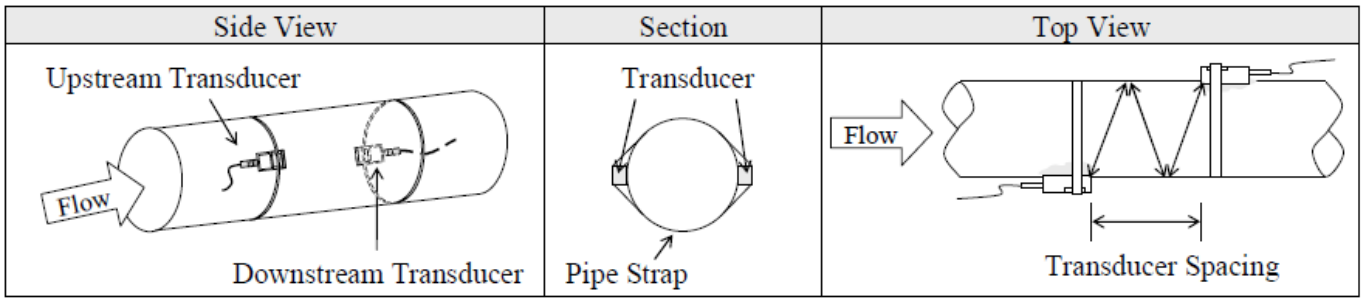


N Method (uncommonly used)

With the N method, the sound waves traverse the fluid three times and bounce twice off the pipe walls. It is suitable for small pipe diameter measurement. The measurement accuracy can be improved by extending the transit distance with the N method which this helps to achieve on small pipes. Both frames are needed on opposite sides.

Though the frames may not fit well on very small pipe! If you cannot fit the frames, then you could instead attach the sensors to pipe with hose strap/clamps or cable ties can work well.

N method – while uncommon – it can be used on small pipes usually under 50mm



Overview list of menus

Below is a list of all the menu codes for quick reference, proceed to the next chapter for configuring the meter.

Red menus are key menus of importance; others are probably not used much or for specialised functions

Menu types	Menu code	Description
Indication and status menus	00	Flow totaliser
	01	Flow rate
	02	Heat (only for energy meter models)
	03	Cool (only for energy meter models)
	04	Measurement status
Installation settings	10	Pipe section settings
	11	Liner Settings
	12	Fluid settings
	13	Transducer settings
	14	Installation spacing
Calibration settings / in depth config	20	Damping
	21	Low flow cut off
	22	Zero-point settings
	23	Totaliser
	24	Temperature
	25	Power cut compensation
	26	K factor
	27	Correction
	28	SQA
Input/output settings	30	Serial port settings
	32	Current settings
	37	SD card settings (optional)
Flow unit options	40	Metric/British unit
	41	Flow unit
	42	Energy unit
	43	Temperature unit
System settings	50	Serial number
	51	Time and date
	52	Key tone
	53	Languages
	54	System lock
	55	System reset
Others	60	Date totaliser
	61	Running time
	62	Current calibration
	63	RTD calibration

Parameters setting, configuring the meter for your pipe

This guide will only tell you about the most basic menu's and relevant for our standard set – for a full description about each menu's function please see the full manual

Now that you have decided on a suitable installation location, and by now you should select the best mounting method for your pipe, we will need to program the pipes parameters into the flow meter, follow the below steps

Pipe settings

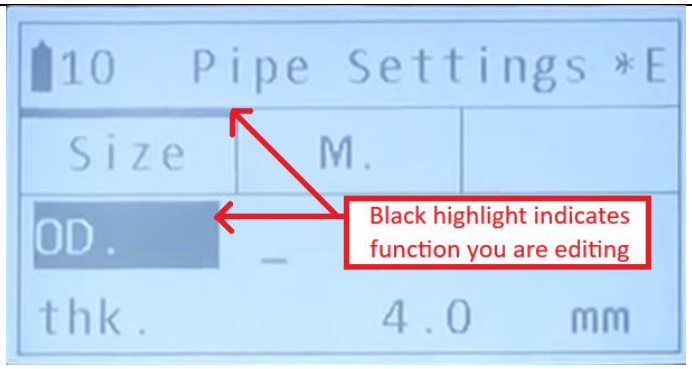
Hint: ∧ and ∨ scrolls up and down menus and functions, or you can manually type a menu number.

Menu 10 – Pipe settings

Scroll through the menus with ∧ and ∨ to reach menu 10, OR:

Press Menu 1 0 to enter menu 10

Press Enter to enter this 'size menu'

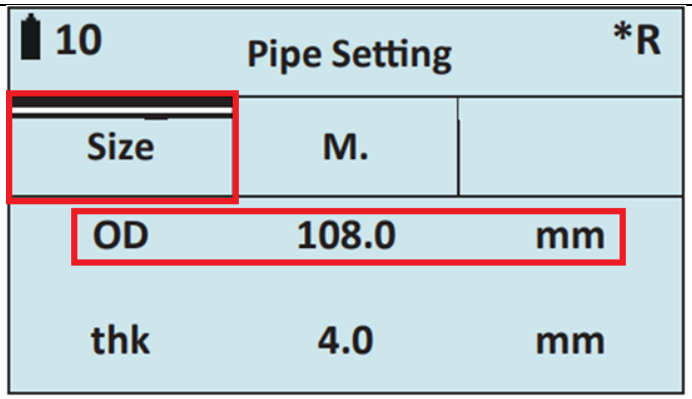


Set the pipe outer diameter (OD)

Ensure you are highlighted on the OD setting and adjust it as required

EG: If your pipe is 108mm OD then do the following: Enter first, then type the diamter '108', then enter again to confirm

Enter 1 0 8 Enter



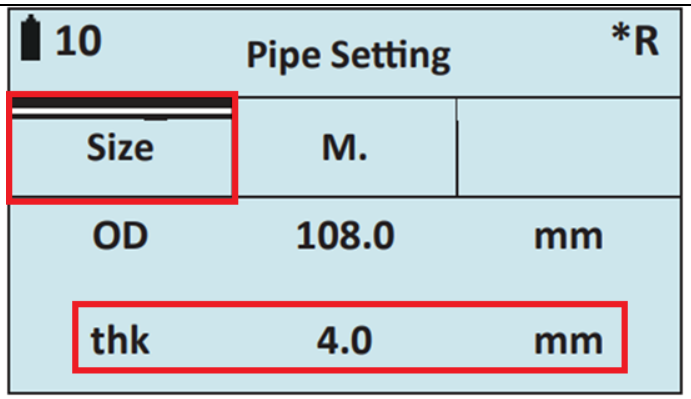
Set the pipe thickness (thk)

Press the down arrow ∨ to move to thickness setting then adjust it as required

EG: If your pipe is 4mm thick then do the following: Enter first, then type the thickness '4', then enter again to confirm

Enter 4 Enter

If you do not know the thickness of the pipe, you can consider purchasing an ultrasonic thickness tester, we also sell this tool



Press ⌫ back to top, then ∨ to switch menu

Now highlighted is the 'M.' menu (Pipe Material)

Press Enter to go into this menu

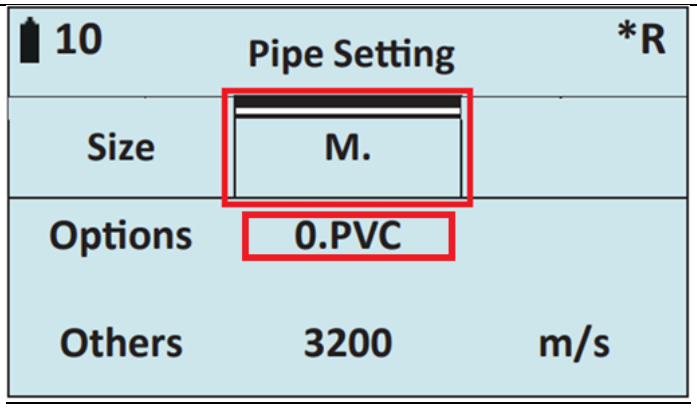
Press Enter then scroll the list with ∧ + ∨

Then Enter to confirm selection

Selectable materials include:

0.PVC	5.Copper (Copper)
1.CS (Carbon Steel)	6. Alu (Aluminum)
2.SSP (Stainless Steel)	7. ACP (Asbestos Cement)
3.CIP (Cast Iron)	8. FPG (Fiberglass)
4.DIP (Ductile Iron)	9. Others

If your pipe material is not one of those listed, select other and manually enter the material sound velocity in m/s



Press ⌫ back to top, then ∨ to switch menu

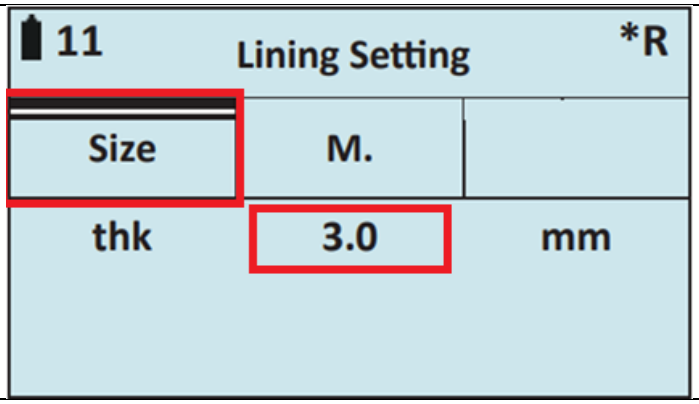
Now adjust menu 11 – Lining thickness

Press Enter to go into this menu

Enter the thickness of the pipe liner

EG: If you have no liner, enter it as 0mm

Enter 0 Enter



Press ⌫ back to top, then ∨ to switch menu

Now adjust menu 11 – Lining Material

Press Enter to go into this menu

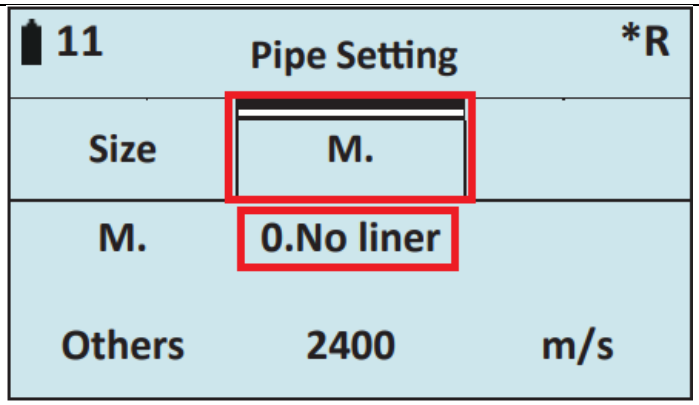
Press Enter then scroll the list with ∧ + ∨

Then Enter to confirm selection

Selectable materials include:

0. No liner	6. PS Polystyrene
1. Tar Epoxy	7. Polyester
2. Rubber	8. PE Polyethylene
3. Mortar	9. Ebonite
4. PP Polypropylene	10. Teflon
5. Polystryol	11. Others

If your liner material is not one of those listed, select others and manually enter the material sound velocity in m/s



Press ⌫ back to top, then ∨ to switch menu

Now adjust menu 12 – Fluid Setting

Press Enter to go into this menu

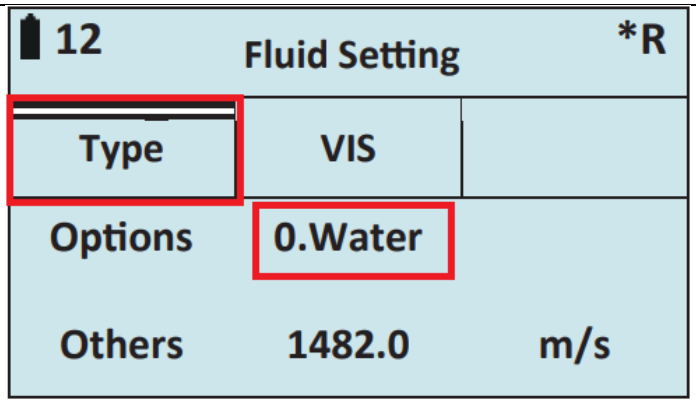
Press Enter then scroll the list with ∧ + ∨

Then Enter to confirm selection

<u>Selectable fluids include:</u>

0. Water
1. Water 125°C
2. Seawater
3. Kerosene
4. Gasoline
5. Fuel Oil
6. Crude Oil
7. Diesel Oil
8. Castor Oil
9. Peanut Oil
10. Alcohol
11. Propane (-45°C)
12. Butane (0°C)
13. Gas #93 -USA spec 93
14. Others

If your fluid is not one of those listed, select others and manually enter the liquid sound velocity in m/s

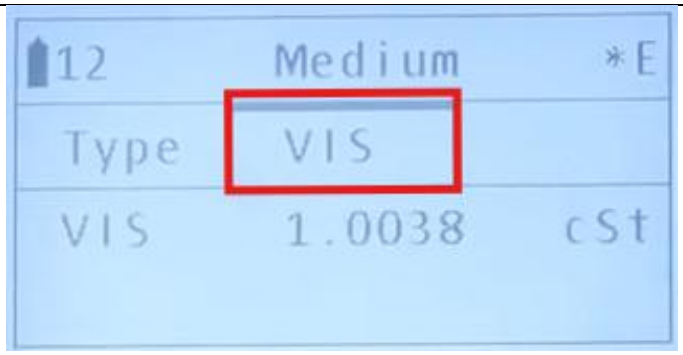


Press ⌫ back to top, then ∨ to switch menu

Setting of VIS (setting for viscosity)

Normally you can disregard this menu.

Unless you have selected 'others' in the previous menu, then you can enter the viscosity of the liquid manually to help measurement accuracy



Now adjust menu 13 – Transducer Setting

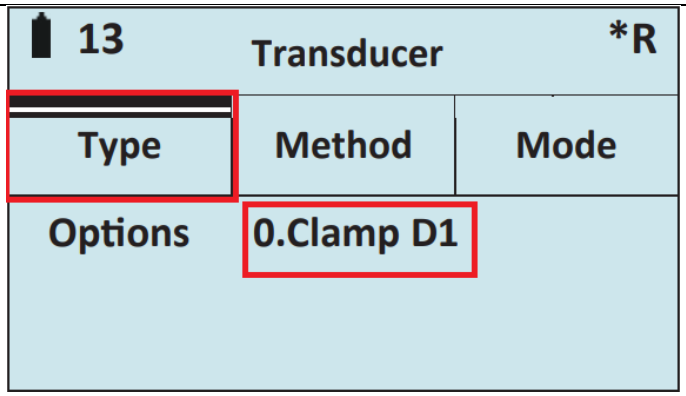
Press Enter to go into this menu

Press Enter then scroll the list with ∧ + ∨

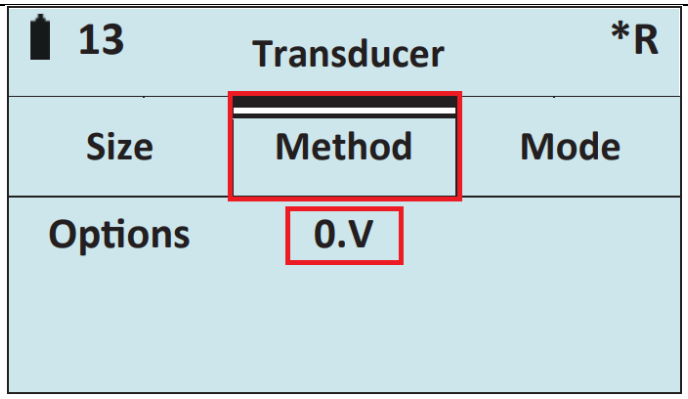
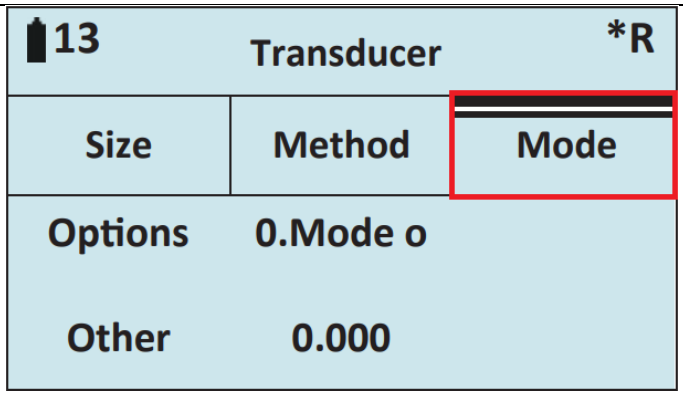
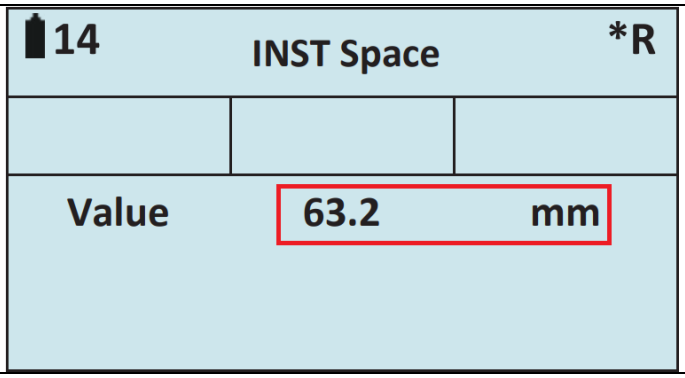
Then Enter to confirm selection

0. Clamped D1 – These are our standard type sensors
2.Clamped D1U – Special order high temp sensors

You may also have D2 or D2U (high temp) these are for specially ordered small pipe sensors



Press ⌫ back to top, then ∨ to switch menu

Now adjust transducer mounting method Press Enter to go into this menu Press Enter then scroll the list with ∧ + ∨ Then Enter to confirm selection See page 7 (Transducer mounting methods) for more info on selecting the best mounting method, three mounting methods are available: • **0.V** -Most common • **1.Z** -Best suits larger pipes >100mm and can be used if the signal is poor with V method. • **2.N** -Best suits small pipes <50mm (uncommon)	
Press ⌫ back to top, then ∨ to switch menu	
Mode menu is defined by the manufacturer. Please do not change any settings in this menu, leave it as the factory configured it. **Continue to scroll past this menu with** ∨	
Menu 14 – Installation spacing Spacing of transducers is calculated by the flowmeter according to pipe parameters you set. Install the transducer according to the displayed transducer mounting spacing and the selected mounting method, so in this shown example you need to space them 63.2mm apart	

Now the parameters are configured, you can move on to the next steps of pipe preparation

Pipe preparation

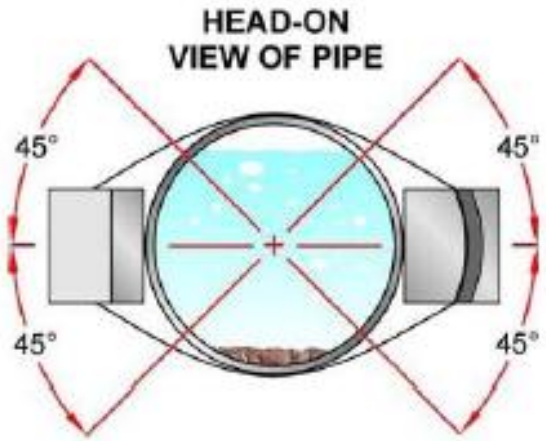
This carries on from page 5 and 6 of selecting an installation location, so by now you should have already selected the ideal location to install the flow meter transducers.

Consider the possibility of:

- Sediment at the bottom of the pipe
- Air/bubbles at the top of the pipe

Because of this it is best to install the transducers on the side of the pipe usually within 45° of a horizontal pipe, as shown.

In addition, avoid flanges and welded areas of pipe, select a smooth portion of the pipe to install the transducers.



To recap:

- Meters parameters have been programmed
- You know the required transducers spacing is as per menu 14
- A suitable location for the installation was selected with enough distance upstream and downstream away from bends, pumps, valves etc…

Now prepare the pipe for mounting the transducers:

Depending on your accuracy and reliability requirements you could try to get away with not sanding down the pipework, but the recommendation is to do this for the best installation possible. It can really depend from pipe to pipe, some it might work better than others. It's always better to have bare metal for optimal performance.

Using a polisher or sandpaper make the mounting position clean of all rust, mud, scale, painting etc.

- Ensure the polished area is larger than transducer surface area.
- Polish one mounting area first, measure out the required spacing as per menu 14, then you can polish the other area accordingly.
- A clean, polished mounting surface is very important for good signal. Clean away any paint, rust, sticky oil, adhesives, etc…

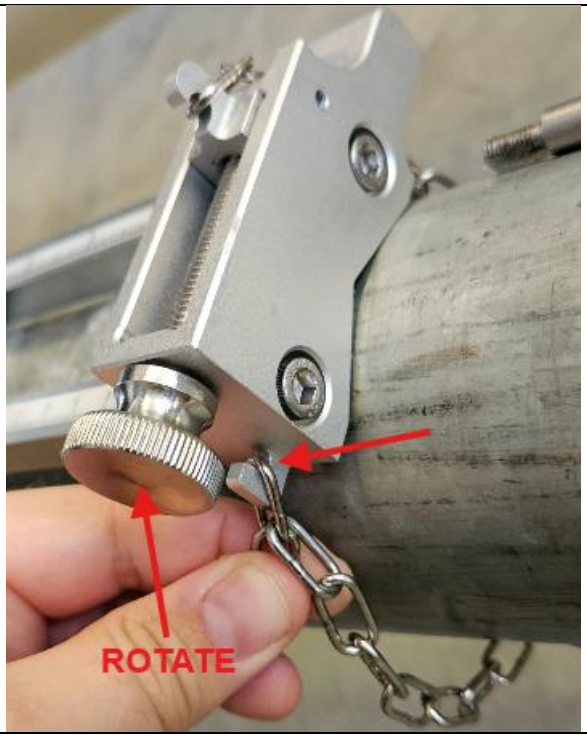
Transducer installation and fixing

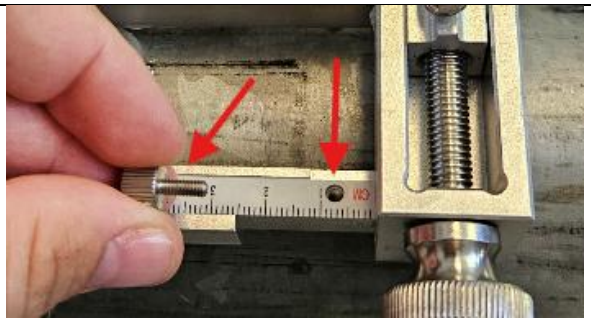
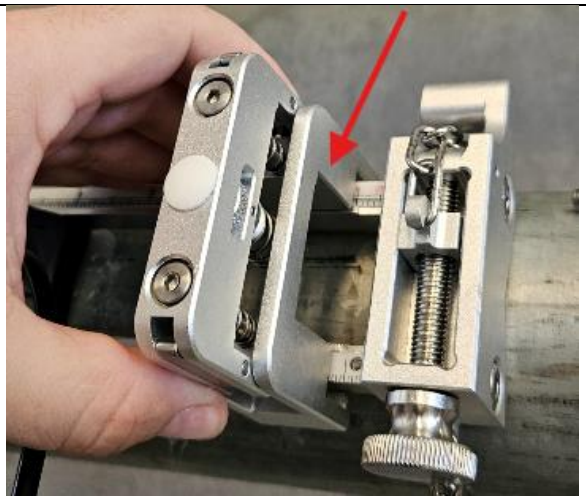
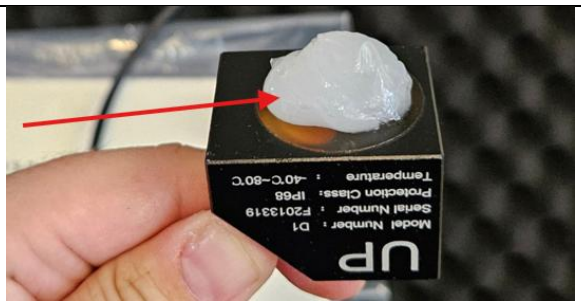
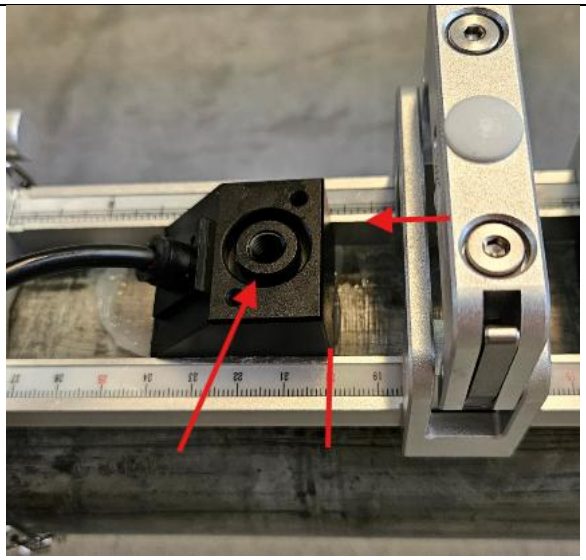
Now the transducers can be installed onto the pipe, our standard model frames are magnetic to assist with mounting on magnetic pies, though it's suggested to use the chains for proper strong mounting of the frames.

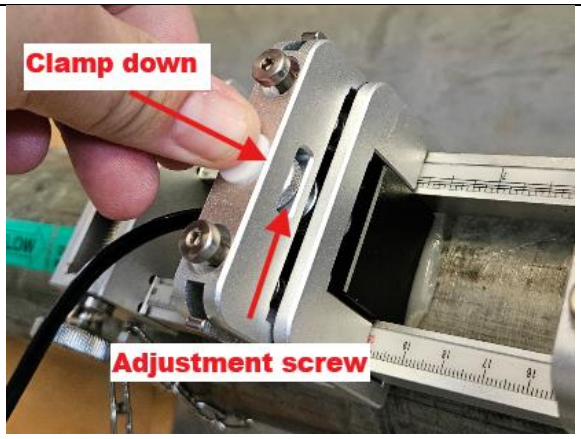
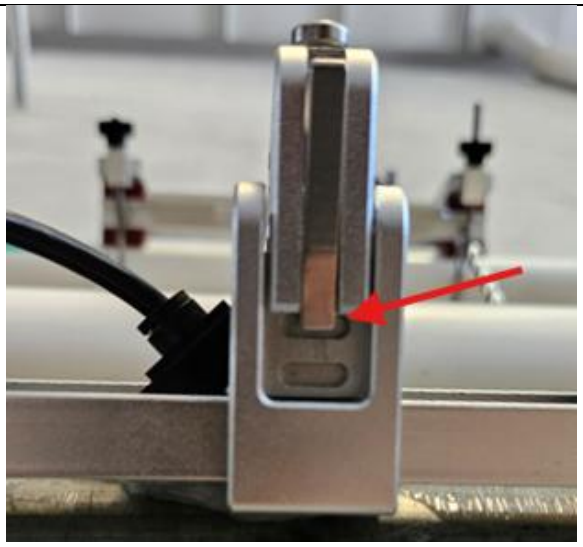
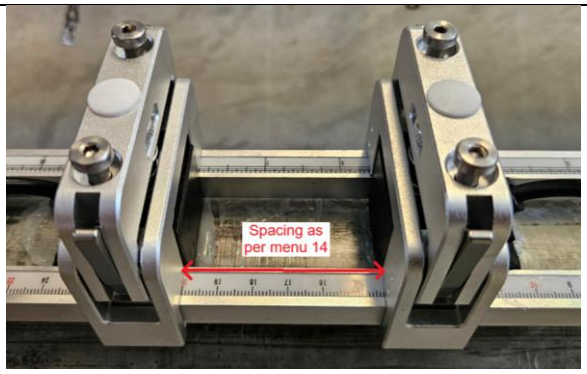
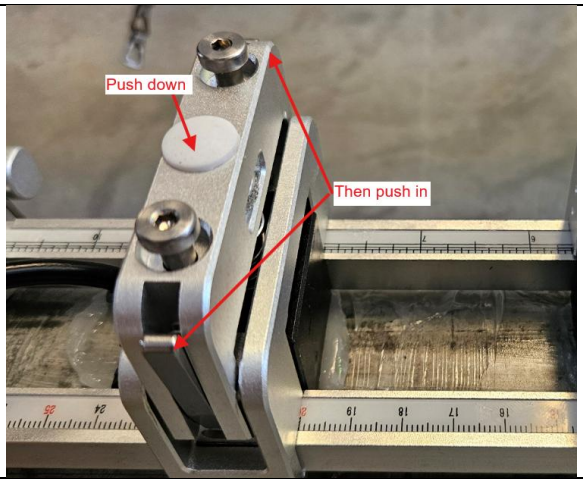
The mounting conditions and positioning directly influences the flow value accuracy and system long-term operation reliability so it is important to mount the transducers correctly and accurately spaced.

Orienting the transducers and mounting frames:

Depending on the required spacing on menu 14, you can decide to use 1 or 2 frames, for most small to medium pipes you use just one frame but on larger spacing applications you may need two frames and measure the gap with included tape measure. This will demonstrate setting both sensors in one frame and with the 'V' mounting method, though the same premise applies to using two mounting frames and other mounting methods like 'Z'

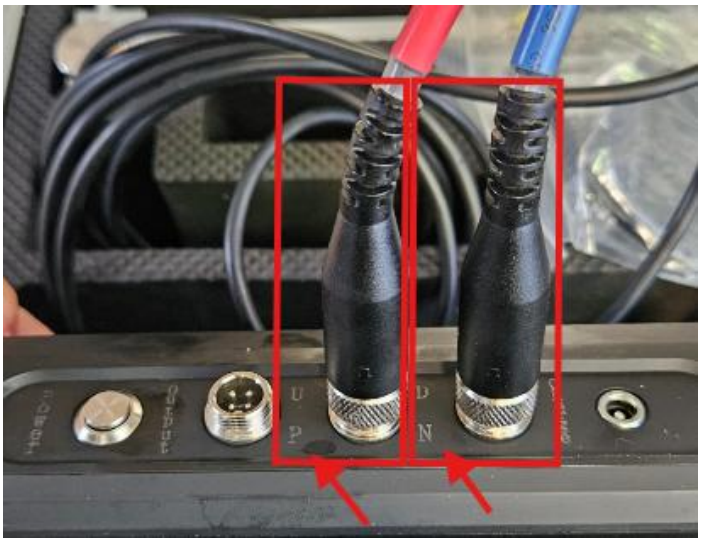
Take the frame and place it on the pipe Take one of the mounting chains and link it around the mounting hook shown, then route the chain around the back of the pipe	
Choose a chain link so that the chain is reasonably tight wrapped around the back of the pipe and then hook it onto the mounting hook shown Then rotate the tensioning knob until the chain is tight Repeat these steps for the other side of the frame too	

Add the sensor clamps onto the frame Remove this retention screw from the frame	
Insert the sensor clamps onto the rain in the area of this retention screw and then slide it along the rail. Add both sensor clamps onto the frame Then re-install the retention screw	
Take note of the markings on the sensors. On each sensor there is a marking for UP and DN, these indicate which sensor is for upstream and downstream	
Apply a blob of compound on the sensor surface of both transducers. It should be enough to cover the brown oval noting it will be pushed out a bit when mounted up to the pipe Silicone-based grease can used as a couplant, select a grease that is rated not to “flow” at the temperature that the pipe may reach.	
Make sure you have determined the flow direction and place the upstream transducer into the frame It’s suggested to place at an easy to measure from position, EG and 20cm mark. Then slide the sensor clamp over the sensor	

Push down the sensor clamp to apply some spring pressure onto the sensor to ensure it's snug against the pipework There is some fine adjustment with this screw if needed	
When you push it down, it will catch in these notches	
When all mounted up double check the spacing matches menu 14, and it should look something like this	
After testing, to remove the frames: Press down to relieve the tension off the side arms, and then push in the side arms at the top If you have put more tension with the adjustment screw you may need to loosen it off. Then disassemble in reverse and put away in the case	

Connecting the transducer cables

Now connect the transducer cables as shown below – ensure you have upstream and downstream in the correct position



Now the meter should begin measuring flow, there are a few values you should check to ensure proper installation

Checking signal strength

Check Signal strength (Menu 04) Press Menu + 0 + 4 + Enter This displays upstream/downstream signal intensity and quality. Signal intensity is expressed by digits from 00.0 to 99.9. • indicates no signals are received • 99.9 indicates the maximum signal intensity Higher number = more stable measurement. **All 3 signal values should be >75** to ensure normal operation of the flowmeter. Ensure all the previous setup steps have been carried out and ensure enough couplant has been applied. Adjust the transducer position during the installation to obtain the maximum signal strength. If the signal strength detected is too low, the transducer installation position and the transducer mounting spacing should be re-adjusted and the pipe should be re-inspected. If necessary, re-consider the mounting method or you can also check the troubleshooting steps outlined in the troubleshooting section.	04 Status *R Signal Sound Time UP DN Q 80.0 80.1 85
Continue to scroll past this menu with V	

Now you will see the Sound menu

Measured Velocity:

This 'Vel.' display shows the sound velocity measured by the flowmeter.

Under normal conditions, it should be close to the sound velocity of your selected liquid, If the difference is too big, you should check the installation settings and whether it is properly installed or not.

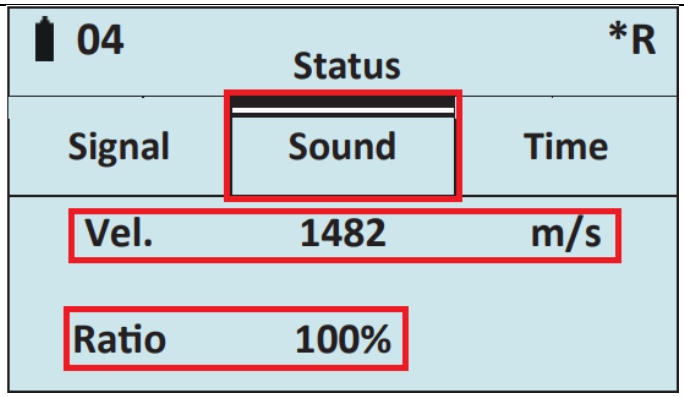
Measured Ratio:

Please check the ratio shown.

The **normal transit time ratio should be 100±3** if the installation and parameters and been completed correctly. (so 97% to 103%)

If these measurements are out of range, check:

- If the parameters are entered correctly (pipe outside diameter, wall thickness, pipe material..)
- If the transducer mounting spacing is in accordance with the display in Window M14
- If the transducers are mounted correctly
- Check the pipe is well prepared and consider there may possibly be too thick scale inside the pipe, or pipe distorted in shape, etc.
- You can also check the troubleshooting steps outlined in the troubleshooting section



Continue to scroll past this menu with

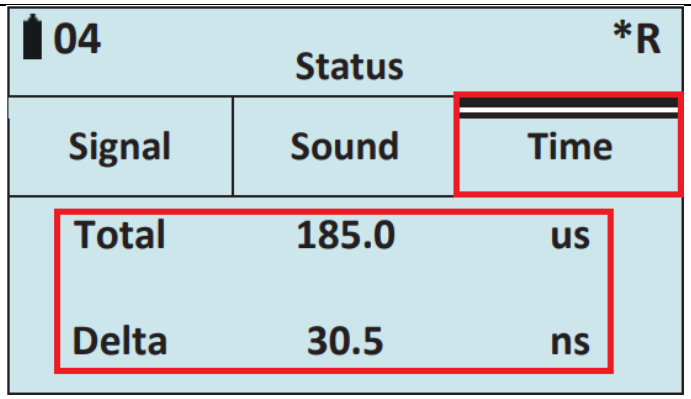
Transmission Time:

Display the average transmission time of ultrasound measured (Unit: us) and upstream/downstream transmission time difference (Unit: ns).

These readings are the main basis for the flowmeter to calculate the flow velocity,you can use these figures to determine if the measurement is stable

Under normal conditions, the fluctuation ratio of the transmission time difference should be less than 20%, if it exceeds 20%, measurements will be unstable.

In that case check whether the transducers are installed is proper position or not and whether parameter settings are correct.



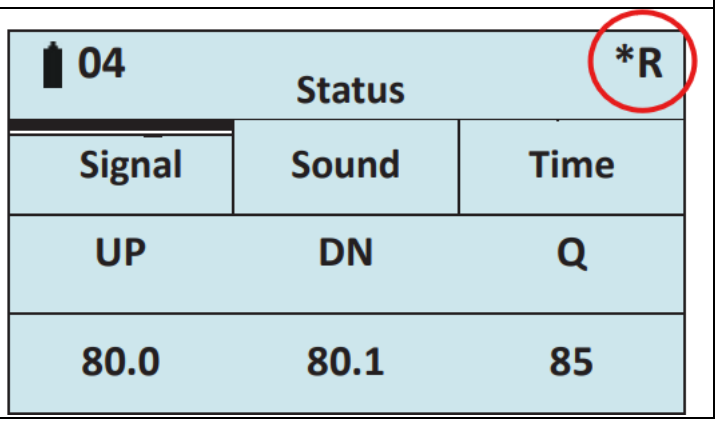
EG: In this case it is showing 185, if you saw it jump down to 140 then that is more than a 20% shift and would indicate a problem.

Status indicator

Also for quick status indication, you can check that status indicator in the top right corner.

- "*R" indicates the flowmeter is running normally
- "D" indicates gain adjustment, it is normal most of the time, if is adjusting gain for a long time it may indicate a problem with the installation.
- "E" indicates no signal

See troubleshooting if there is a problem.



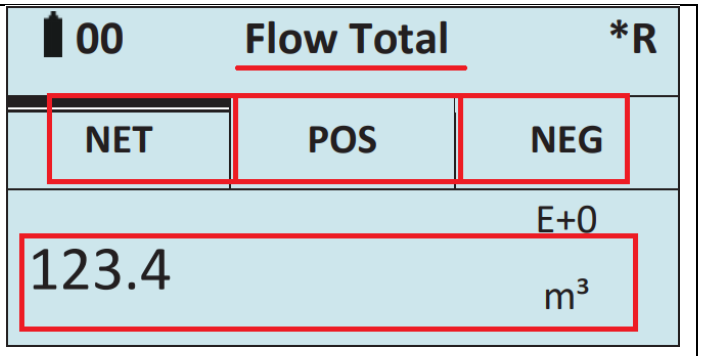
View the flow rate measurement

Now you have determined the meter is performing normally, signal and ratios are good, so you can measure flow.

Menu 00 - View the totaliser

Totaliser is total amount of liquid flow since last reset
There is:
NET Totaliser – NET flow (POS take away NEG)
POS totaliser – total flow in the forward direction
NEG totaliser – total flow in the backwards direction

/ switch between totalisers

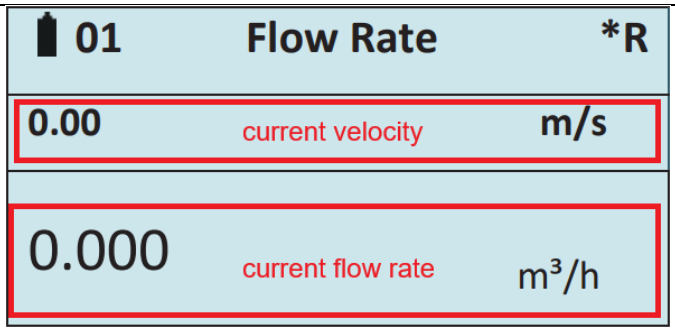


Menu 01 - View the flow rate measurement

This menu is used to display
Transient velocity (current velocity) & totaliser
Transient flow (current flow)

The upper display will auto switch between displays

Enter toggles auto switching display



Menu 41 - Changing the flow units

Here you can change both the flow rate unit and totaliser units

Press Enter to go into this menu

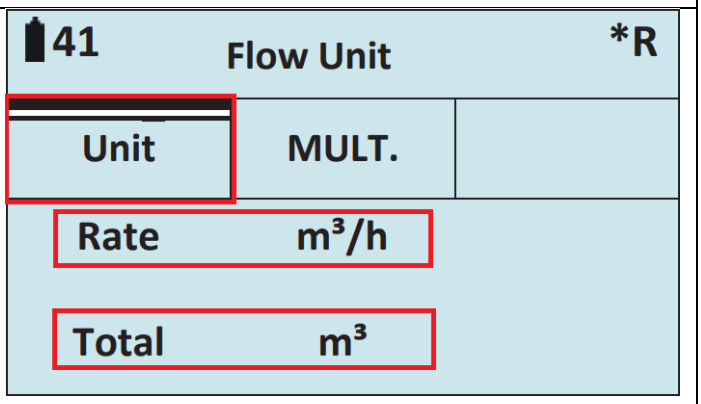
Press Enter then scroll the list with +

Then Enter to confirm selection

0.**m3** - Cubic Meters
1.**L** - Liters
2.**GAL** - USA Gallons
3.**Ig** - Imperial Gallons
4.**mg** - Million Gallons
5.**cf** - Cubic Feet
6.**Ub** - USA Barrels
7.**Ib** - Imp. Barrels
8.**Ob** - Oil Barrels

Each of these also have a /Day/Hour/Min/Sec choice

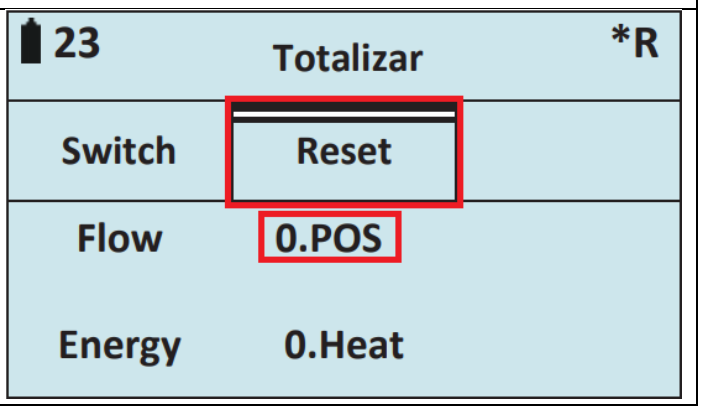
Press the down arrow to move to TOTAL setting and you can choose this unit as required also.



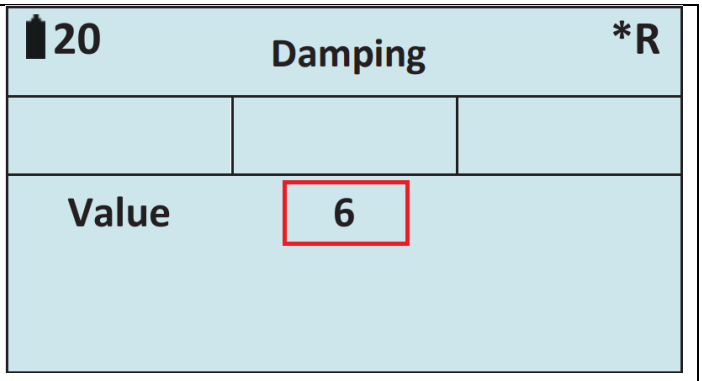
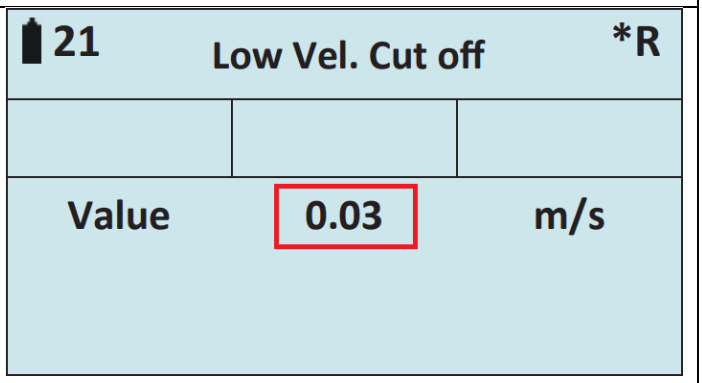
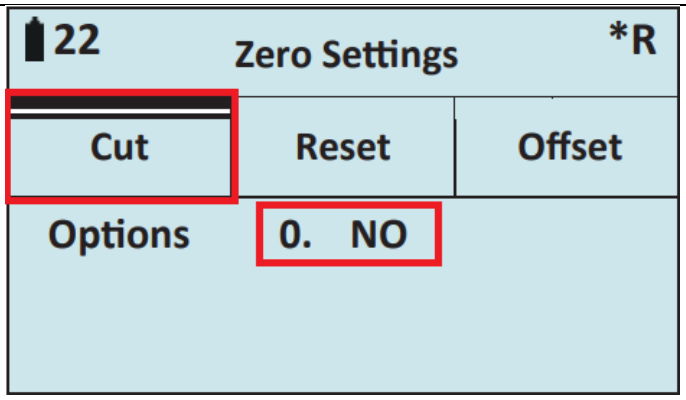
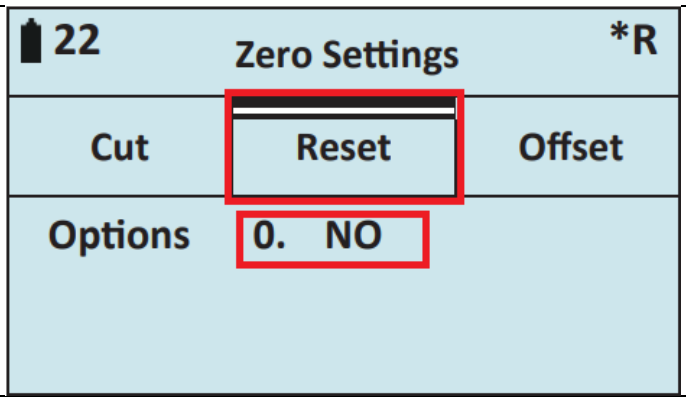
Menu 23 - Reset the totaliser

If you want to reset your totaliser, use Menu 23, select the flow totalizer you need to reset. After resetting that totaliser will be zero on menu 00

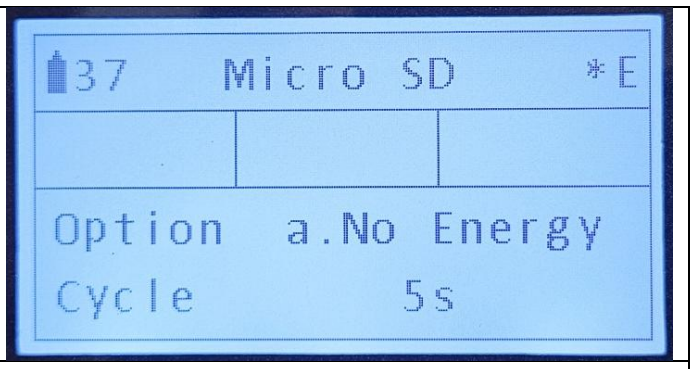
0. POS Total
1. NEG Total
2. NET Total
0. Clear all



Some other key menus you may want to adjust

Menu 20 - Damping Typically, we recommend setting this between 3~10. Damping is used for smoothing the displayed data. No damping will respond quicker to flow changes, but measurements can spike and jump around a bit more than perhaps desired. Damping range can be set from 0~999 sec. 0 = no damping 999 = maximum damping	
Menu 21 - Low Vel. Cut off Typically, we recommend setting this at 0.03 Ultrasonic flow meters can sometimes pick up some small nuisance reading on empty or non-flowing pipes, Even if it measured just 0.01ms velocity, gradually over time that measured flow will add up. Low Flow Cut off is used to make the system disregard these low flow values to avoid nuisance readings near zero flow to avoid invalidating the totaliser. EG: If the cutoff value is set as 0.03, any velocity measured at this value or lower will measure as 0.	
Menu 22 - Zero Point Settings - CUT If you are getting some small flow displayed once configured and setup on a pipe with no flow (static), then you can use this function to zero out or 'tare' the flow value. Think of it like a weight scale – they can need to be zeroed occasionally for best accuracy; by using this function you can improve measurement accuracy. Static zero-point settings must be carried out after the transducers are installed and the fluid inside the pipe is completely static (0 flow)	
Menu 22 - Zero Point Settings – RESET Select "Yes" to reset zero point to factory value. After if flow measurement is no zero on a static pipe, please use the above mentioned cut function. **Note:** We suggest not to use the offset function – you can basically manually offset the measured value with this function, but it makes room for induced errors.	

Data logging

Menu 37 - Micro SD / logging setting The flow meter while turned on with the SD card installed is continuously data logging. You can just choose how often it will log a data point.	

Option: a. No energy - is the default and only selectable option for our standard model. No need to change it.

Cycle: is the data collection interval, this determines how often the unit will take a log, any interval setting from 1-99999 second is acceptable. EG: set to 5 seconds and it will create a record every 5 seconds.

Data content: date and time, flow rate, flow velocity, positive totalizer, negative totalizer, net totalizer

File type: Text file (.TXT).
Number of files: 512 max
The file saved each time should be 120 bytes.
If interval is set at 5 seconds, the file saved in 24 hours is: 120*3600/5*24 = 2073600byte~2.1Mbyte;
Therefore: 1GB SD card could save data for 1024/2.1= 487.6 days.
Therefore: 32GB SD card could save data for 487.6*32= 15,603 days = ~42 years

When SD card is full, new data would automacally overwrite the earliest files

⚠	Be aware when the capacity of the SD card is full, new data will overwrite old data automatically Though the files are small so it would take a while to fill the SD card.
⚠	If you want to remove the SD card, please turn off the flow meter first. DO NOT remove the SD card while the flow meter is turned on. If removed while the SD card is processing data it may be corrupted or damaged.

To retrieve logged data

Ensure the flow meter is turned off, remove the SD card from the flow meter (inside the bottom right cover)	
You will need a computer with a 'Micro SD' card slot Or source an adaptor to plug it into your computer via USB, you can source one locally or online. The SD card is included with the meter, but a USB adaptor/reader is not included.	

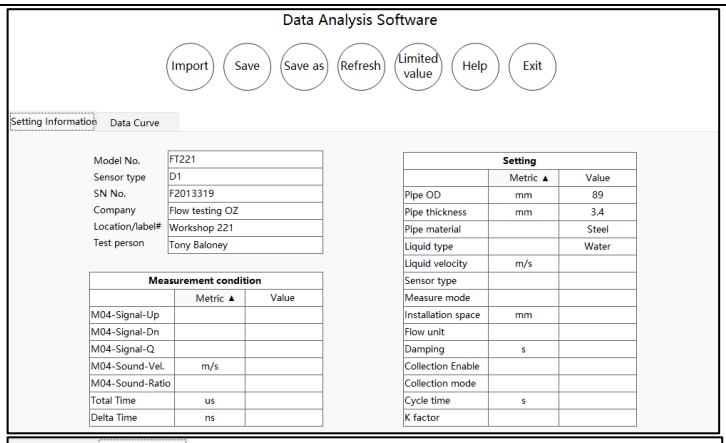
Raw data storage format is .txt, each log would look something like this just in continuous lines.
a=2025-11-17,10:30:31
b=+1.660672E+02 l/m
c=+5.215540E-01 m/s
d=+3.962903E+02 l
e=+3.962903E+02 l
f=+0.000000E+00 l

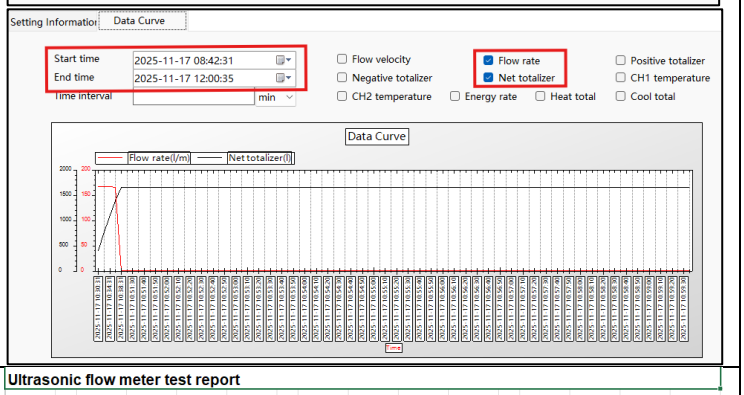
Use the data analysis software to view results and generate reports. This software can open and interpret the data, and output in a more usable excel format

64 bit windows download link:
https://www.zedflo.com.au/wp-content/uploads/2025/11/Flow-meter-data-analysis-software.zip
(contact us for a 32bit version if required – only windows software is available)
Download the files > unzip the folder > run 'Data_analysis_software_setup.exe', and follow the installation wizard

The software easy and self-explanatory, but here is an outline of the steps to make a basic report:

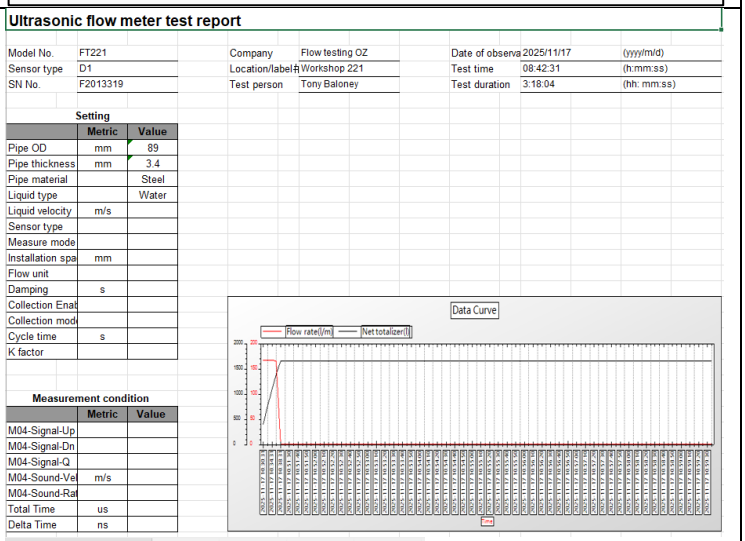
1- Take SD card and plug it into PC
2- If there are multiple files, arrange them by modified date and find the file you want to open, we suggest copying to your PC.
3- Open data analysis software
4- Press Import
5- Select the .txt data file
6- On the 'setting Information' tab, you can enter information about the test
7- Then press on the 'data curve' tab, here you can choose what to include on the report, like:
    a. the date/time range
    b. what to include, eg. flow rate and totaliser.
8- Press 'Save as' and choose where to save your report
9- Done – now you can open your report in excel





In one tab you will have an overview with any information you entered and graph

In another tab the flow results with the fields you choose to include.



A	B	C	D	E
Time	Flow rate		Net totalizer	
2025-11-17 10:30:31	166.0672	l/m	396.2903	l
2025-11-17 10:32:31	165.7947	l/m	727.6111	l
2025-11-17 10:34:31	165.8363	l/m	1059.414	l
2025-11-17 10:36:31	165.6075	l/m	1390.696	l
2025-11-17 10:38:31	0	l/m	1643.521	l

Basic Troubleshooting

If you are having problems acquiring or maintaining strong signal over 75

- Pipe parameters entered must be accurate; otherwise, the flowmeter will not work properly.
- During the installation, apply enough coupling compounds to the transducer to ensure adequate contact with the pipe wall.
- Make sure you have achieved the minimum straight pipe requirements as shown on page 6
- Check to be sure the mounting spacing is accordance with the display in Menu 14 and the transducers are mounted in line with each other along the pipe's centreline
- Remember that the transducers are best installed not at the top or bottom of the pipe, install them on the side, as shown on page 13 – pipe preparation
- While checking the signal strength and Q value, if required you can move the transducers slowly around the mounting site until the strongest signal and maximum Q value can be obtained.
- Ensure the pipe surface is sanded/polished and free from dirt where the transducers are mounted.
- Keep the flowmeter away from electromagnetic interference areas to ensure its proper operation. Heavy vibrations on a pipe can also cause issues.
- Ascertain there is not too much air or solids in the fluid
- Ensure the flow velocity is not higher than what this spec meter can measure (max 12ms velocity)
- If there is still none or poor signal detected, the measurement site must be changed.

If the signal strength is always displayed as 0.00 there is no signal detected.

- Check that the parameters have been entered accurately.
- Check to be sure the transducer mounting method has been selected properly
- Check the pipe is not worn-out, rust or pitting may make ultrasonic measurement problematic
- Check the liner is well bonded to the pipe and not too thick if applicable
- Make sure there is indeed fluid in the pipe
- Make sure the cables are connected correctly, and to the correct upstream/downstream ports
- Make sure the transducers are correctly mating to the pipe surface and all in the correct orientation.

If signal strength value Q displayed in M04 is less than 75, following methods are recommended:

- Relocate a better location noting the recommendations on page 5 and 6.
- Try to polish the outer surface of the pipe and use enough coupling compound to increase the signal
- The transducers spacing should be the same as the 'menu 14' value, you can try to adjust the position slightly to increase signal.
- If you have the unit on charge, please try without the charger inserted, sometimes chargers or other nearby electronics can cause some electronic interference.
- You can also try another mounting method instead, V mounting method is most common to use, however it requires the signal to "bounce" off the pipe and therefor can degrade the signal or if the pipe is pitted slightly the signal may bounce unreliably. If you instead use Z method for example the transducers are mounted on opposite sides of the pipe and therefore no "bouncing" is required and should provide a stronger signal when setup correctly.

You may need to reference the full manual for further installation instructions.

Frequently asked Questions and Answers

Question: New pipe, high quality material, and all installation requirements met: why still no signal detected?

Answer: Check pipe parameter settings, installation method and wiring connections. Confirm if the coupling compound is applied adequately, the pipe is full of liquid, transducer spacing agrees with the screen readings and the transducers are installed in the right direction.

Question: Old pipe with heavy scale inside, no signal or poor signal detected: how can it be resolved?

Answer: Check if the pipe is full of fluid. Try the Z method for transducer installation (If the pipe is too close to a wall, or it is necessary to install the transducers on a vertical or inclined pipe with flow upwards instead of on a horizontal pipe). Carefully select a good pipe section and fully clean it, apply a wide band of coupling compound on each transducer face (bottom) and install the transducer properly. Slowly and slightly move each transducer with respect to each other around the installation point until the maximum signal is detected. Be careful that the new installation location is free of scale inside the pipe and that the pipe is concentric (not distorted) so that the sound waves do not bounce outside of the proposed area.
For pipe with thick scale inside or outside, try to clean the scale off, if it is accessible from the inside. (Note: Sometimes this method might not work, and sound wave transmission is not possible because of a layer of scale between the transducers and pipe inside wall).

Question: Why is the flow rate still displayed as near zero (or known to be very inaccurate) while there is fluid obviously inside the pipe and flowing

Answer: Check to see if "Set Zero" was carried out with fluid flowing inside the pipe (refer to menu 22, described on page 20 of this guide)

If an incorrect “Set Zero” has been carried out, do it again correctly or recover the factory default

Question: The pipe is not full of liquid or there is no flow in the pipe, but it still displays unstable or wrong?

Answer: Pipe must be full of liquid to measure properly with an ultrasonic flow meter.

Question: The pipe is full and flowing, but only at a very low speed, why is the flow meter is displaying 0 flow?

Answer: Menu 21 is Low Flow cut-off Value. If the flow rate falls below the low flow cut-off value, the flow indication is deemed to be ZERO. This can prevent nuisance readings causing the totaliser to accumulate the flow when the actual flow is “0” after a pump was shut down for example.
Generally, 0.03m/s is recommended to enter as the flow cut-off point, the low flow cut-off value has no relation to the measurement results once the velocity is higher than the flow cut-off value.

Question: Why is the flow reading on the display not the same as a trusted known flow rate?

Answer: If you have a known flow rate on a pipe and this flow meter is not reading as expected then the flow meter may need to be “tared” or “zeroed”. Just like scales for example, the zero point sometimes needs a ‘reset’. Refer to menu 22, described on page 20 of this guide, the zero may have accidently been set to an incorrect point, in which case you can re-set the zero point to the factory point.
Alternatively, if you install the flow meter on a full pipe with no flow you can use menu 22 to set a new zero point.

If the zero point is fine, your flow meter may need re-calibration, it is recommended to have the flow meter calibrated regularly to maintain best accuracy.

Question: Date and time are incorrect

Answer: Menu 51 is used to set date and time, though note that the format for date is YYYY-MM-DD (USA format)