

Step 1: Preparation of the pipe

- Avoid installation of sensors in the vicinity of deformations and pipe defects, near welding seams or where deposits could be building up.
- Clean pipe at the measuring point. Remove loose paint and rust with a wire brush or file.

Step 2: Sensor installation

1. Reflection Mode (V-Mode)

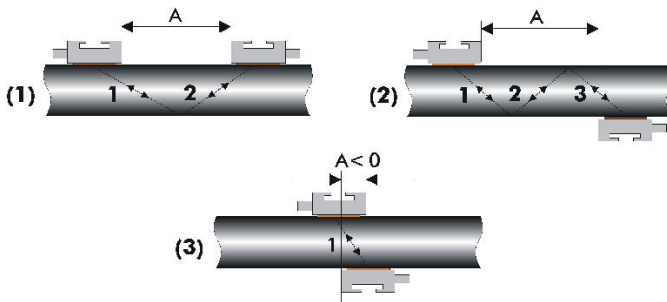
The signal passes twice through the medium. It is the most convenient mounting method as the transducer separation distance can be measured very easily and the sensors can be accurately aligned. Used whenever possible. Sketch 1.

2. Diagonal Mode (Z-Mode)

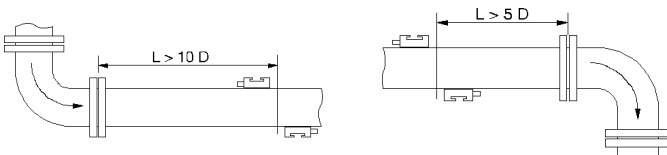
The signals travel only once through the pipe. Used for larger pipes where greater signal attenuation might occur. Sketch 3.

3. Several Passes Mode (N-Mode or W-Mode)

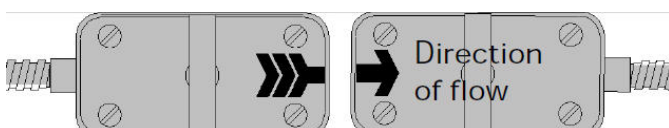
The signals travel 3 (sketch 2) or 4 times through the medium. Used for very small pipes.



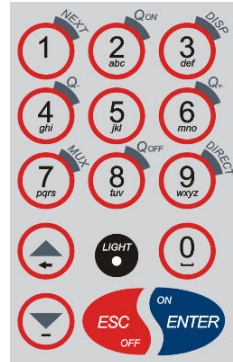
- Install the sensors according to one of the modes illustrated above. Do not forget the coupling paste.
- Select a measuring point with a sufficient straight pipe to obtain accurate measurements. Generally a 10 times pipe diameter straight run length on the inlet of the measuring point and a 5 times pipe diameter on the outlet as illustrated below.



- For a horizontal pipe: Mount the sensors on the side of the pipe. For a vertical pipe: Mount the sensors on a location where the liquid flows upwards.
- Always mount the sensors in the direction of the flow as illustrated below:



Step 3: Keyboard Familiarisation



- Show **NEXT** (1) available item
- **Q_{ON}** (2) = Start totaliser function
- Show next **DISP**lay (3)
- **Q_{OFF}** (8) = Stop totaliser function
- **DIRECT** (9) access to trend plot
- Move menu / selection item **UP**
- Move menu / selection item **DOWN**
- **ESC**ape entry without saving / Switch device **OFF** (press > 2 sec.)
- **ENTER** selection with saving / Switch device **ON** (press > 2 sec.)

Step 4: Quick Setup Wizard

After the installation of the sensors and switching-on of the instrument, you can enter the most important parameters into the Quick Setup Wizard to prepare the flowmeter within a few minutes for measurement.

Display screen	Operation
<p>MAIN MENU</p> <p>Quick start System Installation Diagnostics Output Datalogger Input Serial Comm</p>	<p>The main menu is displayed after first power on and the boot-up sequence.</p> <p>Use <UP> and <DOWN> cursor keys to select Quick start. Confirm by pressing <ENTER>.</p>
<p>QUICK START MENU</p> <p>Setup Wizard Single Stored Setup Start Measurement</p>	<p>Use cursor keys to select Setup Wizard. Confirm by pressing <ENTER>.</p>
<p>Units</p> <p>m³/h m³/m m³/s</p>	<p>Select units of measurement using cursor keys and pressing <ENTER>.</p>
<p>PIPE MATERIAL</p> <p>Stainless Steel Stainless Steel Stainless Steel</p>	<p>Choose pipe material using cursor keys and pressing <ENTER>.</p>
<p>OUTSIDE DIAMETER</p> <p>76.1 mm</p>	<p>Enter outside pipe diameter using alphanumeric keys and confirm by pressing <ENTER>.</p> <p>Use key <UP> as character backspace clear to correct for data entry errors.</p>

Explanation of the instrument's setup continues on the left hand side of the following page.

WALL THICKNESS 3.4 mm	Enter pipe wall thickness using alphanumerical keys and confirm by pressing <ENTER> . Use key <UP> as character backspace clear to correct for data entry errors.
FLUID Water Water Water	Select fluid using cursor keys. Confirm by pressing <ENTER> .
TEMPERATURE 20.0 C	Enter process temperature using alphanumerical keys and confirm by pressing <ENTER> . Use key <UP> as character backspace clear to correct for data entry errors.
LINER MATERIAL Rubber Rubber Rubber	Select pipe lining material using cursor keys. Confirm by pressing <ENTER> .
PASSES Auto 1 2	Select transducer configuration (number of passes) using cursor keys. Auto Automatically 1 1 pass, diagonal mode 2 2 passes, reflection mode 3 3 passes, diagonal mode 4 4 passes, reflection mode 5 5 passes, diagonal mode 6 6 passes, reflection mode ..etc. Confirm by pressing <ENTER> .
QUICK START MENU Setup Wizard Single Stored Setup Start Measurement	Use cursor keys to select Start Measurement . Confirm by pressing <ENTER> .
CHNL1 SENSOR Spacing 110.5 mm Reflection 6 Mode Signal 26 dB 	Sensor placement screen: Mount transducers with suggested spacing and use lower bar for fine adjustment of position (central position is desired). Observe signal strength. Confirm by pressing <ENTER> to obtain measurements.
FLOW RATE 25.678 m3/h 11/11/07 10:56:00	Success!

Step 5: Measurements

1. Main process value (PV) display

The measurements are started either through the Quick Setup Wizard or the menu structure by selecting Start Measurement. Once all parameters are programmed, any subsequent power-on sequences will bring up the main PV display immediately.

Display screen	Operation
FLOW RATE 25.678 m3/h 11/11/07 10:56:00	The main process value can be changed by accessing the menu structure. Press <ESC> at any time to access the main menu. Change to the Diagnostic display by pressing <DISP> .

2. Diagnostic displays

You can look at the diagnostic displays by pressing 3 / DISP.

Display screen	Operation
DIAGNOSTIC 1 55.2 Gain 20.5 Signal -10.0 Noise 11/11/07 10:56:00	Line 1 shows the amplifier gain. Line 2 displays the signal strength. Line 3 indicates the noise. Change to more diagnostic displays by pressing <NEXT> .

3. Totalisers

The totaliser displays will only be shown when the totalisers are activated.

Display screen	Operation
TOTALISER -1 - 0.0 m3 0.0 + - 0.0 - 11/11/07 10:56:00	The flow totaliser can be started by pressing <Q_{ON}> . Pressing <Q₊> shows the total accumulated flow in positive flow direction. Pressing <Q₋> shows the total accumulated flow in negative flow direction. The totalisers can be stopped by activating <Q_{OFF}> . Change to other displays by pressing <DISP> .

If a screen appears as illustrated above, your measurement was successful.

