

### 1

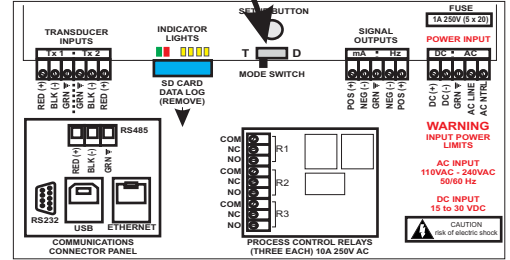
#### Select Doppler or Transit Time Mode

Note that the meter is factory set for Transit-Time operation.



FRONT COVER PLATE REMOVED

#### MODE SELECT SWITCH



CIRCUIT BOARD LAYOUT

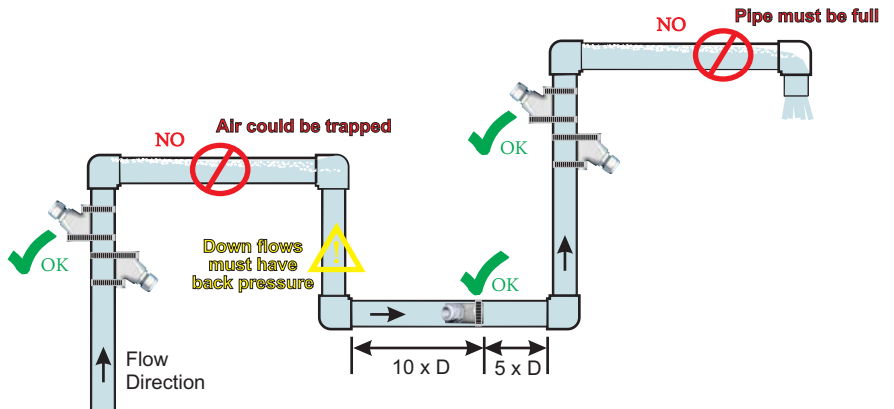
### 2

#### Select the Transducer Mounting Location

The flowmeter's sound wave beam only measures fluid that actually passes through the beam, therefore, the fluid velocity must be consistent across the entire pipe diameter to ensure high accuracy. Flow disturbances such as pumps, elbows, tees, and valves in the flow stream can cause swirl patterns and vortices that will affect the measurement. Install the transducers on a straight run of pipe **as far as possible** from any disturbances. The distance required for accuracy will depend on the type of disturbance.

Type of Disturbance	Straight Lengths of Pipe Required	
	Upstream from Transducers	Downstream from Transducers
Flange	5 x Nominal Pipe Size	5 x Nominal Pipe Size
Reducer	7 x Nominal Pipe Size	5 x Nominal Pipe Size
90° Elbow	10 x Nominal Pipe Size	5 x Nominal Pipe Size
Two 90° Elbows - 1 Direction	15 x Nominal Pipe Size	5 x Nominal Pipe Size
Two 90° Elbows - 2 Directions	20 x Nominal Pipe Size	5 x Nominal Pipe Size
Gate valve	25 x Nominal Pipe Size	5 x Nominal Pipe Size
Pump	25 x Nominal Pipe Size	5 x Nominal Pipe Size

MINIMUM STRAIGHT PIPE LENGTHS

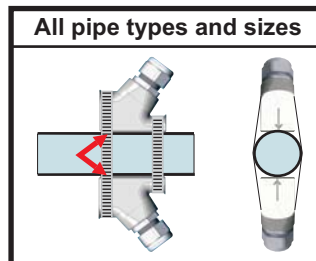


PIPE SYSTEM CONSIDERATIONS

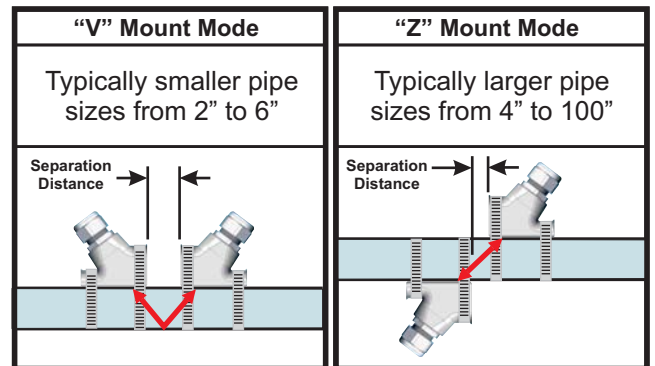
### 3

#### Determine the Transducer Mounting Mode

When operated in the **Doppler** mode, the transducers are always mounted directly opposite each other, 180 degrees around the pipe. When operated in the **Transit-Time** mode, the front faces of the transducers must face each other and be positioned the correct distance apart. In V-mode, the transducers are on the same side of the pipe. In Z-mode, the transducers are on the opposite side of the pipe, 180 degrees apart.



DOPPLER

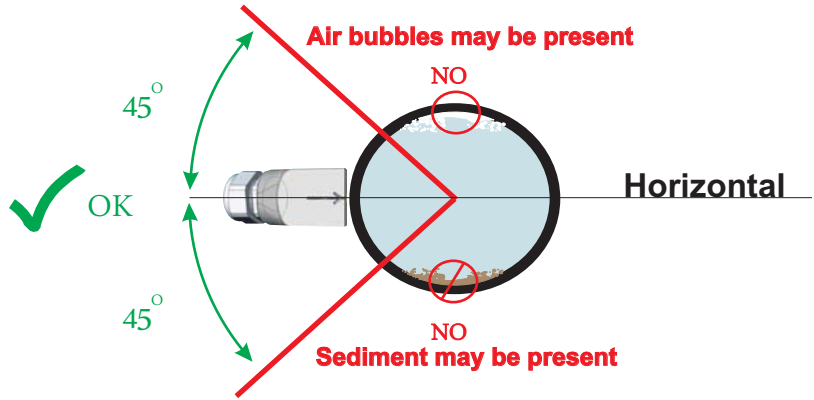


TRANSIT TIME

### 3

#### Determine the 1st Transducer Location

The mounting surface must be clean, smooth and free of surface imperfections. Remove all insulation material, loose paint, etc. Clean the pipe thoroughly. Use sandpaper if necessary to remove surface imperfections. Be sure to locate the transducers on the side of horizontal runs of pipe. Do not mount the transducers over weld seams. Place a mark where the first transducer will be located.



TRANSDUCER MOUNTING LOCATION

### 4

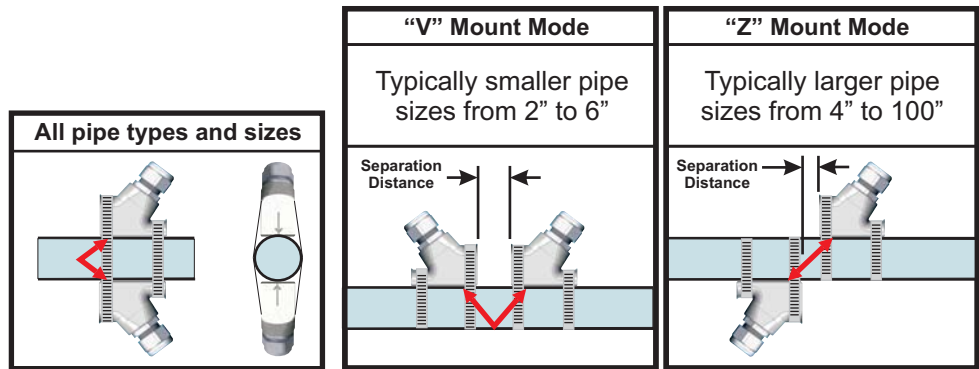
#### Determine the 2nd Transducer Location

When operated in the **Doppler** mode, the transducers are always mounted directly opposite each other, 180 degrees around the pipe.

When operated in the **Transit-Time** mode, the factory configured separation distance and mounting mode is printed on the serial label. The currently active separation distance is also displayed on the run mode screen, the fault indicator screen, and when activating a new configuration.

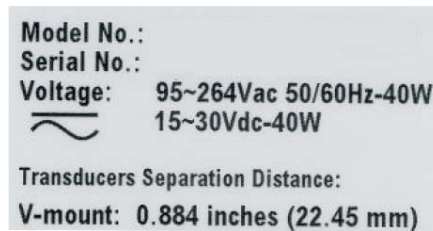
If the meter has not been factory configured, or if a new configuration is required, the pipe OD, pipe wall thickness, pipe type, fluid type and mounting mode configuration data must be input before proceeding.

Once activated, the new separation distance will be displayed.

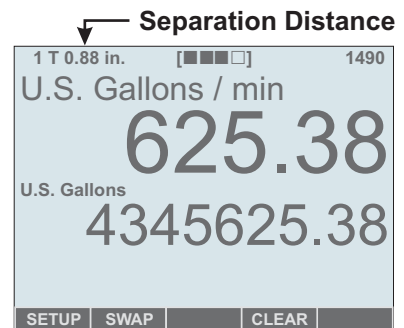


DOPPLER

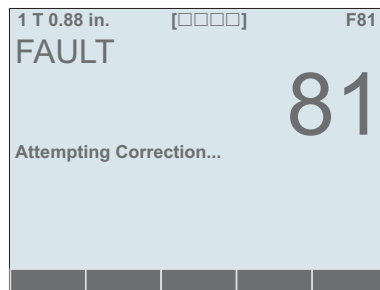
TRANSIT TIME



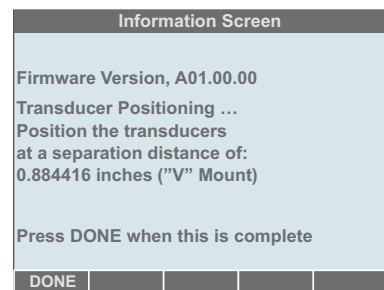
SERIAL LABEL



RUN MODE SCREEN



FAULT INDICATOR SCREEN



NEW CONFIGURATION ACTIVATION SCREEN

# 5

## Install the Transducers

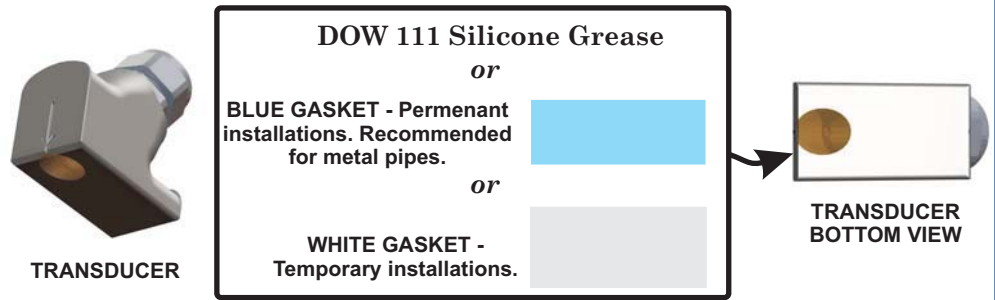
An acoustic coupling material must be placed between the transducer and the pipe surface at the point where the sound waves enter the pipe.

Draw a centerline on the pipe parallel to the pipe center. Place the first transducer onto the pipe. Locate the front arrow exactly over the first separation distance mark (A). Place the transducer straight and parallel to the centerline.

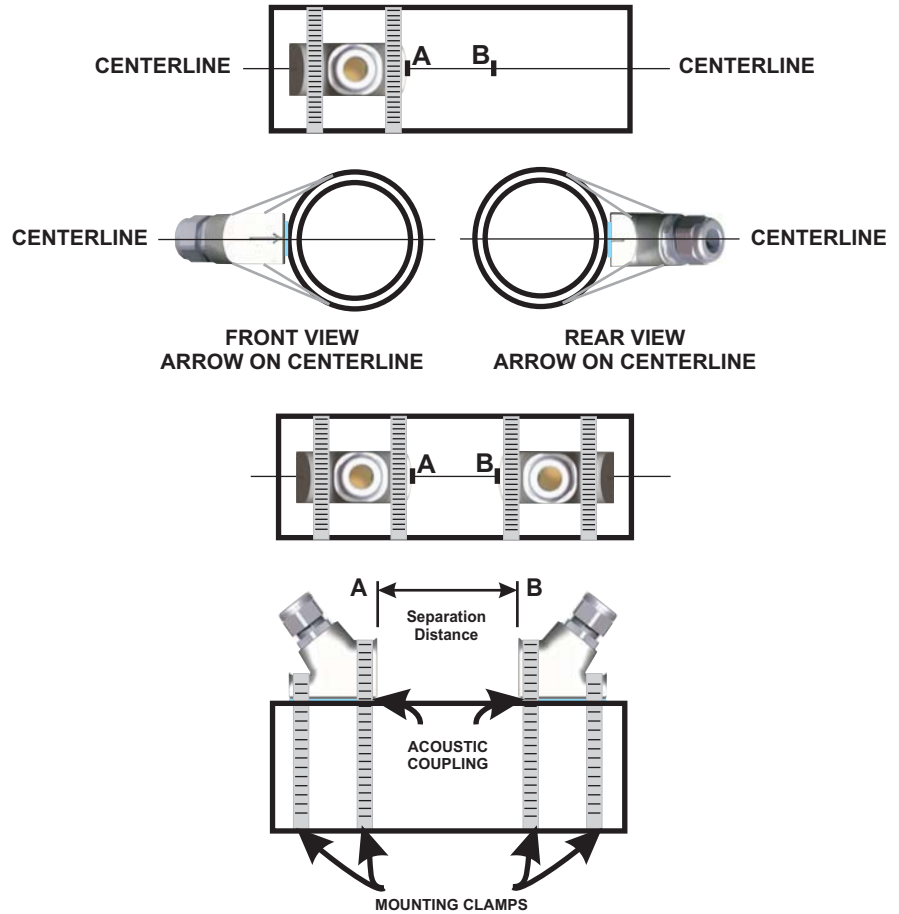
Secure the first transducer to the pipe using the pipe clamps. The arrows on the front and rear of the transducers must point toward the centerline.

Locate the second transducer separation mark (B). Place the second transducer so that the front arrow is located exactly over the mark (B). Place the transducer straight and parallel to the centerline. Be sure that both transducers are facing each other and parallel to the pipe centerline.

Check that the separation distance is correct. Tighten the clamps equally.



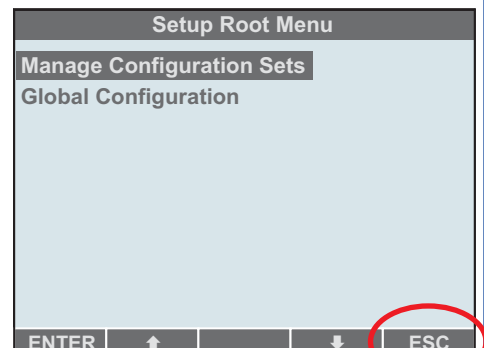
### ACOUSTIC COUPLING MATERIAL INSTALLATION



# 6

## Restart the Meter

Press the **SETUP** button. The meter will enter the **SETUP ROOT MENU**. Creation and modification of the five available Configuration Sets and the Global Configuration settings can be made from this menu. If no changes are to be made, press **ESC**. The meter will re-start.



## Setup Root Menu

### Manage Configuration Sets

- ↳ Create a New Configuration Set
- ↳ Delete a Saved Configuration Set
- ↳ Activate a Configuration Set
- ↳ Open a Saved Configuration Set
  - ↳ Configuration Set #1
  - ↳ Configuration Set #2
  - ↳ Configuration Set #3
  - ↳ Configuration Set #4
  - ↳ Configuration Set #5

### ↳ Transducer Setup

- ↳ Measurement Units
  - ↳ English (U.S. units)
  - ↳ Metric (SI units)
- ↳ Transducer
  - ↳ Model Number
  - ↳ **Mount Method**
  - ↳ Cable Length (Feet)
- ↳ Pipe
  - ↳ **Outside Diameter**
  - ↳ **Wall Thickness**
  - ↳ **Pipe Material**
  - ↳ Speed of Sound in Custom material
- ↳ Liner
  - ↳ Liner Wall Thickness
  - ↳ Speed of Sound in Liner material
- ↳ Fluid
  - ↳ **Fluid Type**
  - ↳ Speed of Sound in Custom Fluid

### ↳ Metering Setup

- ↳ Flow Rate
  - ↳ Volume Units
  - ↳ Custom Unit Volume per U.S. Gallon
  - ↳ Time Units
  - ↳ Digits After Decimal Point
- ↳ Totalizer
  - ↳ Volume Units
  - ↳ Custom Unit Volume per U.S. Gallon
  - ↳ Digits After Decimal Point
  - ↳ Total Display Function
- ↳ Display
  - ↳ Display Language
  - ↳ Flow Rate Averaging
  - ↳ Display Update
  - ↳ Low Flow Cutoff
  - ↳ High Flow Cutoff
  - ↳ Scaling Offset
- ↳ Signal Output
  - ↳ Analog Output
  - ↳ Pulse Output
- ↳ Data Logging
  - ↳ Log Interval
  - ↳ Log Rate Setpoint
  - ↳ Log Totalizer Setpoint

### ↳ Process Control Setup

- ↳ Relay Channel #1
  - ↳ Assign Relay
    - ↳ Monitor Flow Rate
    - ↳ Monitor Flow Total
    - ↳ Disabled
  - ↳ Flow Rate Alarm Settings
    - ↳ High Trigger
    - ↳ High Release
    - ↳ Low Trigger
    - ↳ Low Release
    - ↳ Alarm Delay Time
  - ↳ Batch Dispense Settings
    - ↳ Default Batch Amount
    - ↳ Batch Start Mode
      - ↳ Manual Batch Start
      - ↳ Auto (Proportional)
    - ↳ Relay Timer
- ↳ Relay Channel #2
  - ↳ Assign Relay
    - ↳ Monitor Flow Rate
    - ↳ Monitor Flow Total
    - ↳ Disabled
  - ↳ Flow Rate Alarm Settings
    - ↳ High Trigger
    - ↳ High Release
    - ↳ Low Trigger
    - ↳ Low Release
    - ↳ Alarm Delay Time
  - ↳ Batch Dispense Settings
    - ↳ Default Batch Amount
    - ↳ Batch Start Mode
      - ↳ Manual Batch Start
      - ↳ Auto (Proportional)
    - ↳ Relay Timer
- ↳ Relay Channel #3
  - ↳ Assign Relay
    - ↳ Monitor Flow Rate
    - ↳ Monitor Flow Total
    - ↳ Disabled
  - ↳ Flow Rate Alarm Settings
    - ↳ High Trigger
    - ↳ High Release
    - ↳ Low Trigger
    - ↳ Low Release
    - ↳ Alarm Delay Time
  - ↳ Batch Dispense Settings
    - ↳ Default Batch Amount
    - ↳ Batch Start Mode
      - ↳ Manual Batch Start
      - ↳ Auto (Proportional)
    - ↳ Relay Timer

### Global Configuration

- ↳ Communications Settings
- ↳ Master Password
- ↳ Date and Time
- ↳ Save Changes