

## PRS.50

### Precision Reference Standard for Portable Ultra Sonic Flow Meters

#### PRS.50 Precision Reference Standard

The PRS-50 Precision Reference Standard permits the visual verification of ultra sonic flow meter transducer operation. In order to understand this product one must understand a little about the application of time of flight (TOF) ultra sonic flow meters. A TOF flow meter permits a user to measure the process flow of any pipe, knowing two things:

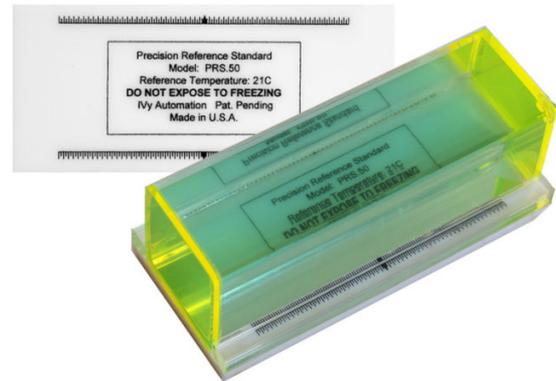
1/ The pipe is full of a homogeneous, particulate-free, liquid with known process characteristics. (i.e. process fluid, Viscosity, Speed of Sound, etc.)

2/ The dimensions and construction details of the piping system in which the process is flowing are known values. (Pipe ID, Pipe wall thickness, Pipe material etc.)

To make the measurement, these known parameters are entered into the ultra sonic meter handheld, the transducers are connected and properly mounted to the pipe and then the operator reads the result.

However, what if after setup, the meter is not reading anything or the results shown are questionable? For example the TOM/TOS ratio does not read within 2% of 100.0% or the Signal Strengths are vastly different or the signal quality is under 50%. The simple answer is to start troubleshooting. Most Ultra Sonic meters made today provide enough feedback data (microprocessor sub-routines in the handheld) to confirm the correct overall operation of the system's electronics and a quick check with a standard multi-meter will confirm connection cable continuity. Unfortunately, there is not a way to confirm the correct operation of the transducers.

The PRS.50 resolves that issue!



PRS.50

Simply setup the Flow Metering System as if making a measurement. Enter the PRS.50 parameters (*asterisked in the specifications*) into the flow meter's handheld electronics (*Menu Items #12 -25*). Then mount the transducers on the sides of the PRS.50 with the proper distance between the transducer faces as determined by the Handheld (MENU Item #25) and the bounce pattern you have selected (V, W, Z, N). The transducer spacing is accurately measured using the scale printed on the PRS.50. The user can then confirm the system's operation by checking feedback parameters displayed in the handheld such as the TOM/TOS ratio. The TOM/TOS ratio (Menu item #90 or #91) will be very close to 100.0%. A small 'adjustment' of one of the transducers may be necessary to achieve 100.0%. The signal strengths should be ~860 each and the signal quality (Q) should be 97-98%.

#### SUMMARY:

The PRS.50 simulates a perfect pipe installation allowing visual confirmation of the transducers' operation.

### Case Specifications

Material: Acrylic  
 ASTM Grade: PMMA0130V4  
 Refractive Index: 1.49  
 Color: Clear  
 Specific Gravity: 1.19  
 \*Speed of Sound @21°C: 2260M/sec  
 Toxicity: None  
 Odor: None  
 Taste: None  
 Test Method: ASTM-D-788-93,D-696, D792

### Case Dimensions:

\*ID: 45.3644mm (+/- 0.254mm)  
 \*Wall thickness: 3.048 mm Nominal

### Fill Specifications

Material: Proprietary, Non-Toxic, Water-based,  
 Ultra Sonic Medium  
 Total Halogens: < 10.0 PPM  
 Total Sulfur: < 5.0 PPM  
 \*Speed of Sound @ 21°C: 1550 m/sec  
 Test Methods: ASTMD808, D129, D512, D1179

### Precautions

1. Do not freeze
2. Temp Range: 10 °C < PRS.50 < 30°C
3. Do not drop.
4. Exposure to nuclear radiation or excessive sunlight will change product characteristics

### PRS.50 Setup and Use:

A) Set the Units of Measurement to Metric (Menu Item 30)

B) Enter the PRS.50 values asterisked above or as listed below, into the respective MENU locations:

#12: Pipe Wall Thickness: 3.048mm	#13-Pipe Wall ID: 45.3644
#14: Pipe Mat'l: Other	#15-SoS of Pipe: 2260m/sec
#16 to #19: N/A	#20-Process Mat'l: Other
#21-SoS of Process Fluid: 1550m/sec	#22-Process Fluid Viscosity: 50cP
#23-Transducer : TS-1 or TM-1	#24-Transducer Mounting Method: V,Z,N,W
#25 Distance between transducer faces: +/-XXmm	

C) Put ultrasonic grease on the transducers.

D) Place the transducers on the pipe per the method specified. (Opposite sides-Z & N or same side-N & W)

E) Using the scale, visually align the faces of the transducers to coincide with the offset value calculated by the handheld. The scale's center marks may be used as reference points.

F) Confirm the system operation in the Alia handheld via the TOM/TOS ratio (MENU Items 90 or 91) the Signal Strengths and the Quality. (Should be 100.0%)

G) The flow rate will always be zero. If the handheld shows flow then re-zero as per the manual.

NOTE: Refer to IVy TechNote 2010.05.PRS.50 "Using the PRS.50 and Interpreting the Results"

### Applications:

- ✓ Visual confirmation & verification of transducer and system operation
- ✓ Investigate the effect of pipe & process parameter changes
- ✓ Training of new personnel
- ✓ Customer presentations

For Questions or Concerns contact Alia or IVy at: 763.245.6079