

# BRS.50

## Basic Reference Standard for Ultra Sonic Flow Meters

### BRS.50 Basic Reference Standard

The BRS-50 Basic Reference Standard permits 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.)

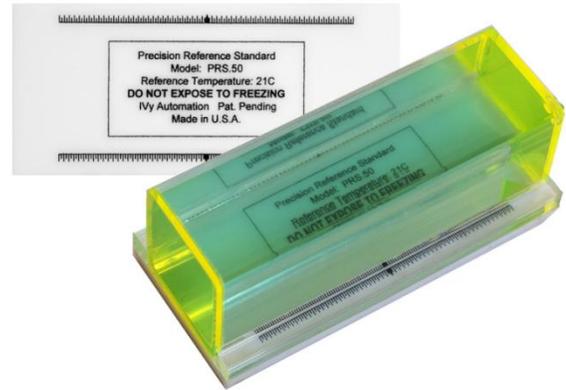
2/ The dimensions and construction details of the piping system in which the process is flowing are known values. (Pipe ID, Pipe wall thickness, Pipe material etc.)

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 connecting cable continuity. Unfortunately, there is not a way to confirm the correct operation of the transducers.

The BRS.50 resolves that issue!



BRS.50

Simply setup the Flow Metering System as if making a measurement. Enter the BRS.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 BRS.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 BRS.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 BRS.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:

\*OD: 51.5 mm

\*Wall thickness: 3.0 mm Nominal

## Fill Specifications

Material: Sanitized, anti-microbial, Water-based, Ultra Sonic Medium

Total Halogens: < 20.0 PPM

Total Sulfur: < 0.0 PPM

\*Speed of Sound @ 25°C: 1490 m/sec

## 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 may change product characteristics
5. The BRS scale is in 2 mm increments

## BRS.50 Setup and Use:

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

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

#11: Pipe Wall OD: 45.4 mm (nominal)

#12- Pipe Wall Thickness: 3.0 mm (nominal)

#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: ~1490 m/sec

#22-Process Fluid Viscosity: 1.0 cP

#23-Transducer : TS-1 or TM-1

#24-Transducer Mounting Method: V,Z,N,W

#25 Distance between transducers: *Calculated & Displayed by the transmitter or handheld in millimeters*

C) Put ultrasonic couplant 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 (Menu Item #25) calculated by the handheld. The scale's center marks should be used as reference points.

F) Confirm the system's overall operation by reviewing the TOM/TOS ratio, the Signal Strengths and the Quality all in Menu Item #90 (Reading respectively ~100.0%, ~860/860, 97-98) in the Alia handheld.

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.BRS/PRS.50 "Using a Reference Standard 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: 206.395.FLOW (3569)