

MID-WEST® INSTRUMENT	STANDARD OPERATING PROCEDURE	ISSUE DATE: 4-16-09	REV: O.R.	PROCEDURE No. 116-DRAFT
SUBJECT: DOWNSCALE Accuracy Check for Model 116 Liquid Level Gauge				

Reference – The following procedure is based on the principles and recommendations of ASME B40.100.

Equipment – The instrument used to check the accuracy of a model 116 should have an error tolerance at least 4 times smaller than the error tolerance of the model 116. For example: +/- 1%, 0-100" H₂O model 116 has an error tolerance of +/- 1" H₂O. The instrument used to check this model 116 should have an error tolerance of not more than +/- 0.25" H₂O.

An instrument such as the Meriam model 200-GI0030 (0-30 PSI (0-832" H₂O)) or equivalent is suitable for checking the entire range of Mid-West Instrument model 116's used for cryogenic level measurement.

Environment - Accuracy checks should be performed in a controlled environment at a temperature of 73 °F +/- 2 °F (23 °C +/- 1 °C).

Procedure –

- Vent the high and low side of the model 116 to atmosphere creating zero ΔP on the model 116.
- Connect a pressure source and test instrument to the high side of the model 116 with an atmospheric reference pressure on the low side. **CAUTION: The fluid in the pressure source must be compatible with the process fluid.**
- Cycle the model 116 one time by applying full scale pressure to the high side of the model 116 then vent the pressure to zero.
- Verify that the pointer is on zero. If not, zero the pointer using the micro adjust feature per the IOM.
- Apply full scale pressure to the test instrument. Lightly tap the model 116 bezel then record the reading of the model 116 and the test instrument.
- Decrease the pressure in the test instrument to a major pressure graduation between 70% and 80% of full scale. *(i.e. for a 0-150" H₂O range decrease the pressure to 110" H₂O not 112.5" H₂O)* Lightly tap the model 116 bezel then record the reading of the model 116 and the test instrument.
- Decrease the pressure in the test instrument to a major pressure graduation between 45% and 55% of full scale. Lightly tap the model 116 bezel then record the reading of the model 116 and the test instrument.
- Decrease the pressure in the test instrument to a major pressure graduation between 20% and 30% of full scale. Lightly tap the model 116 bezel then record the reading of the model 116 and the test instrument.
- Decrease the pressure in the test instrument to zero. Lightly tap the model 116 bezel then record the reading of the model 116 and the test instrument.

Note- For gauges with non-linear level dials, contact Mid-West Instrument for test procedures and test points.

Accuracy Calculation – The accuracy of the model 116 can be calculated as follows:

$$\frac{(\text{Test Instrument Reading} - \text{model 116 reading})}{\text{Model 116 full scale range}} \times 100 = \% \text{ Accuracy}$$

Example:

$$\frac{(110 - 109)}{150} \times 100 = 0.667\%$$

- The model 116 gauge has an accuracy of +/- 1% of full scale.
- The model 116 with single switch has an accuracy of +/- 2% of full scale

Contact Mid-West Instrument should the readings fall outside the permissible error tolerance.