



# Operating Instructions Digital Verticality Meter For use with USP Apparatus #1 & #2

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P/N VERTMET-MI  
Revision 2.1  
October 7, 2014

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## Table of Contents

1.0	General Information .....	4
1.1	Introduction.....	4
1.2	Product Specifications .....	4
2.0	Unpacking.....	4
3.0	Product Description.....	5
3.1	Diagram, Front of Digital Verticality Meter.....	5
3.2	Diagram, Back of Digital Verticality Meter .....	5
4.0	Operating Instructions .....	5
4.1	Measuring Paddle or Basket Shaft Verticality.....	5
4.2	Battery Life Indicator and Information .....	6
5.0	Key Functions .....	7
5.1	ON / OFF Key .....	7
5.2	ABS / ZERO Key .....	7
5.3	HOLD Key .....	7
6.0	Recalibration .....	7
7.0	Maintenance.....	9
8.0	Warranty .....	9
Figure 1	.....	6
Figure 2	.....	8
Figure 3	.....	8
Figure 4	.....	8
Figure 5	.....	9
Figure 6	.....	9



## Revision History

Rev.	Description	Revised By	Revised On	Approved By	Approved On
A	Initial Release	RGM	3/23/09	RGM	3/24/09
B	Updated Pictures	RGM	3/11/11	RGM	3/11/11
2.1	Formatting	DMC	10/7/14	RGM	10/7/14



## 1.0 General Information

### 1.1 Introduction

Thank you for purchasing the QLA Digital Verticality Meter. This meter is a unique measuring tool that provides an immediate digital reading of all angles in a 360 Degree range. The machined aluminum frame is rigid, light weight and includes a machined “V” groove that fits easily onto any paddle or basket shaft. This precision meter is excellent for verifying paddle or basket shaft perpendicularity in two directions 90 Degrees apart as described in the new FDA specifications outlining the use of an Enhanced Mechanical Calibration procedure as an alternate approach to current Apparatus Suitability procedure for Dissolution Apparatus 1 and 2 as described in the USP General Chapter <711> Dissolution.

The meter is maintenance free, easy to use and does not need to be returned to QLA for recalibration. By following the instructions in this manual, the user can test and recalibrate the meter in minutes, in the lab and without any special fixtures.

### 1.2 Product Specifications

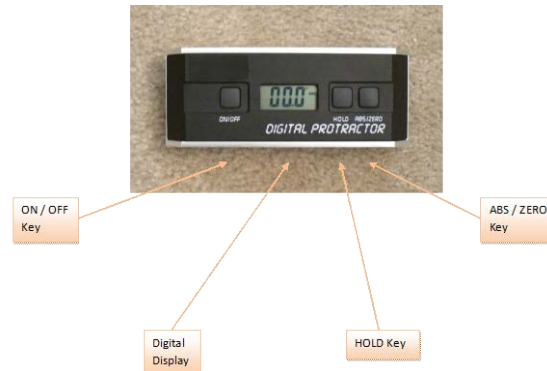
Parameter	Specification
Range	360 Degrees
Resolution	0.1 Degree
Accuracy	+/- 0.1 Degree
Temperature	-5 Degrees C to 50 Degrees C
Power	3V Lithium Cell
Battery Life	Approx. 500 Hours
Weight	10.2 oz.

## 2.0 Unpacking

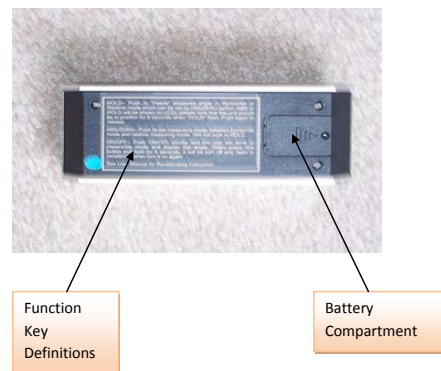
The Digital Verticality Meter is shipped in a foam padded storage case to minimize any damage that may occur during transport. Check the shipping container for any damage during transport. Unpack the meter carefully. After unpacking, check the meter for possible damage. Report any damage to the forwarding shipper immediately and inform QLA or your local representative.

### 3.0 Product Description

#### 3.1 Diagram, Front of Digital Verticality Meter



#### 3.2 Diagram, Back of Digital Verticality Meter



### 4.0 Operating Instructions

#### 4.1 Measuring Paddle or Basket Shaft Verticality

**Important: An Accuracy Test and/or Recalibration Of The Digital Verticality Meter Must Be Performed Before Use To Ensure Accurate Readings!** See Section 6 of this manual for accuracy test and recalibration instructions.

***Specification: Use an accurate leveling device to determine that the paddle or basket shafts are vertical in two directions 90 Degrees apart around the vertical axis while the drive unit is in the operating position. Repeat this procedure on all shaft locations.***

Turn the meter on and press the ABS / ZERO key until the “ABS” icon appears on the digital display.

Place the meter against the paddle or basket shaft as shown in Figure 1. The meter should be positioned with the “V” groove against the shaft. Keep the meter motionless for six seconds and then record the value shown on the digital display. This value is the angular difference from True Horizontal.

To calculate the shaft verticality, use the example below:

Subtract the value shown on the meter (In Degrees) from 90 Degrees. This new value is the shaft verticality.

*Example: If the value on the meter shows 89.7. Then 90 Degrees Minus 89.7 Degrees, Equals 0.3 Degrees Shaft Verticality.*

The acceptable shaft verticality value is 90.0 +/- 0.5 Degrees.

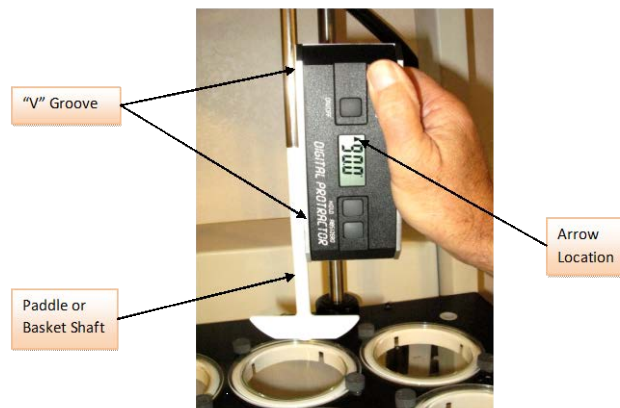


Figure 1

NOTE: An arrow located on the left side of the digital display as shown in Figure 1, will indicate which direction to move the dissolution tester to achieve true verticality. The adjustable feet located on the base of the dissolution tester can be raised or lowered to accomplish this.

#### 4.2 Battery Life Indicator and Information

The Digital Verticality Meter is powered by a 3 Volt Lithium Battery, type CR2032. A new battery should provide about 500 hours of use.

If the battery is low, the battery icon will be illuminated on the digital display. Replace with a new battery immediately.



## 5.0 Key Functions

### 5.1 ON / OFF Key

This key is used to turn the meter on or off and to enable the recalibration mode. See Section 6 of this manual for recalibration instructions.

### 5.2 ABS / ZERO Key

This key is used to switch the meter from “Absolute Reference Mode” to “Alternate Reference Mode. This meter should be used in the “Absolute Reference Mode” ONLY. After turning the meter on, make sure the “ABS” Icon appears in the digital display before use.

### 5.3 HOLD Key

This key is used to hold the value on the digital display while measuring an angle. Place the meter against the paddle or basket shaft as shown in Figure 1. Wait six seconds and then press the “HOLD” key. While still holding the meter in position, the “Hold” Icon located on the digital display will begin blinking for about six seconds and then become solid. Once the icon becomes solid, the meter can be removed from the shaft and the value shown on the display will remain. To disengage the hold function, press the HOLD key again.

## 6.0 Recalibration

### 6.1 Accuracy Check

Perform this three step test before using this meter. Also perform this test any time the meter has been dropped or is used in an environment that varies more than 5 Degrees C from the environment in which it was last recalibrated.

**STEP #1:** Turn the meter on and press the ABS / Zero key until the “ABS” Icon appears in the digital display.

**STEP #2:** Position the meter with the display facing you on a clean, flat horizontal surface as shown in Figure 2. (The test surface does not have to be perfectly level.) Wait ten seconds until the reading has completely settled and note the angle on the display.



Figure 2

Step #3: Rotate the meter end-to-end so the display is facing away from you as shown in Figure 3. Make sure to position the meter in exactly the same spot and wait ten seconds before noting the reading on the display.

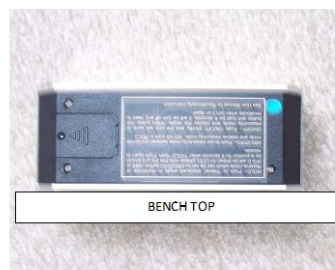


Figure 3

NOTE: If any two readings vary from one another by more than 0.1 degree, the meter MUST be recalibrated.

## 6.2 Recalibrating Instructions

Follow these five easy steps to recalibrate the meter thru out its entire 360 degree range by electronically calibrating two horizontal angles.

STEP #1: With the meter turned on, press and hold the ON / OFF key for six seconds or until the display goes blank.

STEP #2: Press the ON / OFF key again to enable the recalibration mode and position the meter on a flat surface with the lettering on the front, right side up as shown in Figure 4. The number -1- will appear on the display.



Figure 4



STEP #3: Press the ABS / ZERO key and the -1- will begin blinking for about four seconds and then change to -2- as shown in Figure 5.



Figure 5

STEP #4: Rotate the meter 180 degrees horizontally so it faces away from you with the lettering right side up as shown in Figure 6.

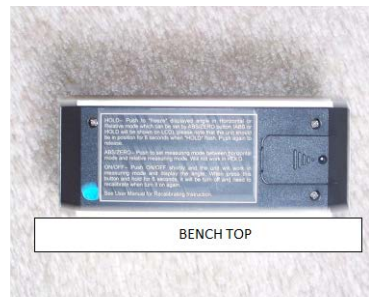


Figure 6

STEP #5: Press the ABS / ZERO key and the -2- will begin blinking for about four seconds and then display a reading. The recalibration is now complete.

## 7.0 Maintenance

The digital verticality meter is designed to be maintenance free and easily calibrated on site without any special fixtures.

## 8.0 Warranty

This Digital Verticality Meter is warranted to be free from defects in materials and workmanship under normal installation, use and service for a period of one (1) year from the date of purchase as shown on the purchase order receipt.

The obligation of QLA under this warranty shall be limited to repair or replacement (at our option) during the warranty period, provided the product is returned to QLA, transportation charges prepaid.



This warranty shall be invalid if the product is damaged as a result of defacement, misuse, accident, destruction or alteration of the serial numbers, repair alteration or maintenance by any person or party other than our own service facility or authorized QLA service technician.