

Calibration Procedure

PosiTector SST Soluble Salt Tester

Table of Contents

1	Introduction and UUC Performance Requirements	2
	Table 1-1	2
2	Measurement Standards and Support Equipment Performance Requirements.....	2
	Table 2-1 UUC Accuracy Requirements and Description	2
	Table 2-2 Minimum Use Specification	2
	Table 2-3 Actual Equipment Specification	3
	Table 2-4 Calibration Environmental and Warm-up Requirements	3
3	Preliminary Operations	3
4	Calibration Process.....	4
5	Performance Requirements	5
	Table 5-1 Performance Requirements and Calibration Data	5
	for PosiTector SST.....	5

1 Introduction and UUC Performance Requirements

1.1 This procedure describes the calibration of DeFelsko Corporation PosiTector SST probe and gage.

Table 1-1

Models	Measurement Range
PosiTector SST	0.0 – 1500 $\mu\text{S/cm}$
	0.0 – 50.0 $^{\circ}\text{C}$

1.2 The unit being calibrated will be referred to as the UUC (unit-under-calibration).

2 Measurement Standards and Support Equipment Performance Requirements

2.1 The UUC accuracy requirements are based upon the published UUC performance specifications.

2.2 The test uncertainty ratio applied in this Calibration Procedure is 4:1 unless otherwise stated. The 0.0 – 200 $\mu\text{S/cm}$ range has a 2.5:1 test uncertainty ratio.

2.3 The Minimum-Use-Specifications are the minimum test equipment specifications required to meet all the UUC accuracy requirements and the test uncertainty ratio applied.

Table 2-1 UUC Accuracy Requirements and Description

UUC Parameter	Performance Specifications		Test Method
Conductivity	0.0 – 200 $\mu\text{S/cm}$	$\pm 2 \mu\text{S/cm}$	Compare to Standard
	>200 – 600 $\mu\text{S/cm}$	$\pm 10 \mu\text{S/cm}$	
	>600 – 1500 $\mu\text{S/cm}$	$\pm 20 \mu\text{S/cm}$	
Solution Temperature	0.0 – 50.0 $^{\circ}\text{C}$	$\pm 0.5^{\circ}\text{C}$	Digital Thermometer

Table 2-2 Minimum Use Specification

Parameter	Range	Accuracy
Conductivity	0.0 – 200 $\mu\text{S/cm}$	$\pm 0.5 \mu\text{S/cm}$
Conductivity	>200 – 600 $\mu\text{S/cm}$	$\pm 2.5 \mu\text{S/cm}$
Conductivity	>600 – 1500 $\mu\text{S/cm}$	$\pm 5.0 \mu\text{S/cm}$
Solution Temperature	0.0 – 50.0 $^{\circ}\text{C}$	$\pm 0.125^{\circ}\text{C}$

Table 2-3 Actual Equipment Specification

Parameter	Range	Accuracy	Manufacturer/Model #’s Applicable
Conductivity	84 μ S/cm	\pm 0.8 μ S/cm	Hanna Instruments HI6033
Conductivity	500 μ S/cm	\pm 2.0 μ S/cm	Ricca Chemical 2241
Conductivity	1413 μ S/cm	\pm 5.0 μ S/cm	Hanna Instruments HI7031
Solution Temperature	Room Temperature	\pm 0.05°C	Control Company 6412

Caution: The instructions in this Calibration Procedure relate specifically to the equipment and conditions listed in Section 2. If other equipment is substituted, the information and instructions must be interpreted accordingly.

Table 2-4 Calibration Environmental and Warm-up Requirements

Measurement Standards & Support Equipment Environmental Requirements:	Temperature: 23 \pm 2° C. Relative Humidity: 40 - 60%
Measurement Standards & Support Equipment Warm-up and Stabilization Requirements:	Not Required

3 Preliminary Operations

Note: Review the entire document before starting the calibration process.

3.1 Visual Inspection

3.1.1 Visually inspect the UUC for, but not limited to:

- Dirty or contaminated test cell
- Probe damage

3.1.2 Damage or excess wear shall be repaired prior to beginning the calibration process.

3.1 For product returned for service, ensure the gage has been updated with the most recent firmware.

3.2 Gage Reset

3.2.1 When the unit is powered down, simultaneously hold the “+” and middle buttons until the reset symbol (2 arrows) appears.

3.3 On the Gage body menu navigate to the “Setup” menu, select “Hi Res” then select “Exit”

4 Calibration Process

Note: Do not place any objects in the sensor cell. Do not blow into the sensor cell. Do not touch the tip of the conductivity standard or deionized water spouts with exposed skin. Make sure the conductivity standards and probe have had a chance to reach room temperature. To reduce temperature effects, touch the probe as little as possible.

4.1 Review the Performance Requirements Table 5-1.

Note: Whenever the test requirement is not met, verify the results of each test and take corrective action before proceeding.

4.2 Conductivity

4.2.1 Place the UUC such that the probe is over a container that can collect the liquids that will spill.

4.2.2 Fill the probe test cell to overflowing with the 84 $\mu\text{S}/\text{cm}$ conductivity standard and empty it out. Do not take a reading.

4.2.3 Repeat step 4.2.2 a second time.

4.2.4 Fill the probe test cell a third time and verify there are no air bubbles in the test cell.

4.2.5 Record the γ reading, in $\mu\text{S}/\text{cm}$, as displayed on the UUC.

4.2.6 Repeat steps 4.2.2 - 4.2.5 using the 500 $\mu\text{S}/\text{cm}$ standard solution and again with the 1413 $\mu\text{S}/\text{cm}$ solution.

4.2.7 Record the conductivity value and lot numbers from the certificates of analysis for the conductivity solutions.

4.2.8 Rinse the test cell with deionized water.

4.3 Solution Temperature

4.4 Place at least the entire white plastic tip of the UUC probe in an insulated chamber containing the reference temperature probe.

4.5 After at least 30 minutes record the UUC and reference probe readings.

5 Performance Requirements

Table 5-1 Performance Requirements and Calibration Data
for PosiTector SST

Parameter	Reference Value	Min ¹	UUC Reading	Max ²	Lot Number
Conductivity					
Conductivity					
Conductivity					
Solution Temperature					N/A

- 1) 84.0 $\mu\text{S}/\text{cm}$ min= reference value - 2.0 $\mu\text{S}/\text{cm}$
 500 $\mu\text{S}/\text{cm}$ min = reference value - 10 $\mu\text{S}/\text{cm}$
 1413 $\mu\text{S}/\text{cm}$ min = reference value - 20 $\mu\text{S}/\text{cm}$
 Temperature = reference value - 0.5°C

- 2) 84.0 $\mu\text{S}/\text{cm}$ min= reference value + 2.0 $\mu\text{S}/\text{cm}$
 500 $\mu\text{S}/\text{cm}$ min = reference value + 10 $\mu\text{S}/\text{cm}$
 1413 $\mu\text{S}/\text{cm}$ min = reference value + 20 $\mu\text{S}/\text{cm}$
 Temperature = reference value + 0.5°C

Note: Do not write in this procedure.

Management Procedure Change Notice

Procedure Number: MP 2557
Revision Level: B
Date of Change: March 13, 2018
Title: Calibration Procedure, PosiTector SST Soluble Salt Tester

Reason for Change: <ul style="list-style-type: none">• Increased measurement range of SST
Description of Change: <ul style="list-style-type: none">• Change 0.0-199.9 range to 0.0 - 200• Changed 200 – 500 range to >200 to 600• Added range from 600 – 1500us/cm• Updated tables 1-1, 2-1, 2-2, 2-3 and 5-1

I confirm I have read and understand the procedure and the change described above.

Printed Name	Signature	Date

Management Form 0010.02-05/1998