Technical Note – TN0101
SprayVIEW® System
Calibrations/Verifications Acceptance Criteria

In the SprayVIEW® Measurement system, there are five calibrations/verifications:

1. Load Cell Calibrations
2. Actuator Movement Verifications
3. Spray Pattern Verifications
4. Plume Geometry Verifications
5. Laser Verifications

This document provides the acceptance criteria for each calibrations/verifications in the Viota® software.

1. Load Cell Calibrations

   The load cell calibration is used by Viota® software to convert the electrical signal coming from the Vereo® actuator's load cell into force using the calibration masses (1 Kg and 3 Kg). The calibration process uses a three point algorithm to determine the force vs. voltage calibration that is used to convert the load cell's raw output voltage to force over the instrument's entire useful measurement range (nominally 0 to 12 Kg). To help ensure data integrity, the load cell calibration procedure also uses a hysteresis check based on the 1kg mass to verify that the load cell is functioning properly. The hysteresis test involves loading and unloading the load cell with 1 Kg and 3 Kg masses and ensuring that the output measurements agree to within 1%. Table 1 shows the acceptance criteria for the Load Cell Calibrations.

Table 1: Acceptance criteria for the Load Cell Calibrations

PARAMETERS	ACCEPTANCE CRITERIA
Pedestal Only	0.00 Kg ± 0.50 Kg
1 Kg Mass	1.00 Kg ± 0.50 Kg
3 Kg Mass	3.00 Kg ± 0.50 Kg
Slope	1.00 ± 0.05
Intercept	0.00 ± 0.50
MSE (Mean Squared Error)	Between 0.00 and 0.01
Hysteresis Percent Difference	≤ 1.00 %

2. Movement Verifications

The movement verification runs a series of movements verifying multiple distances at multiple velocities settings. The position error from each movement is measured in counts and shown in the actuator movement verification results table. The acceptance criteria for the max top and the max bottom are less than or equal to 100 counts. 100 counts are approximately 0.127mm.

3. Spray Pattern Verifications

There are two types of spray pattern verification tests: Circle and Ellipse. The image analysis includes both elliptical fit (primary measurements) and true shape analysis (secondary measurements). The related parameters with the acceptance criteria are listed in Table 2-5.

3.1 Circle Test

Table 2: Acceptance criteria for Circle Test Primary Measurements

PARAMETERS	ACCEPTANCE CRITERIA
Major Length (mm)	37.1 - 39.1
Minor Length (mm)	37.1 - 39.1
Ellipticity	1.00 - 1.05
Inclusion	0.00 - 0.05

Table 3: Acceptance criteria for Circle Test Secondary Measurements

PARAMETERS	ACCEPTANCE CRITERIA
D_{min} (mm)	36.1 - 40.1
D_{max} (mm)	36.1 - 40.1
Ovality	1.0 - 1.1
Perimeter (mm)	113.4 - 126.0
Area (mm^2)	1023.5 - 1263.0

3.2 Ellipse Test

Table 4: Acceptance criteria for Ellipse Test Primary Measurements

PARAMETERS	ACCEPTANCE CRITERIA
Major Length (mm)	43.5 - 45.5
Minor Length (mm)	24.4 - 26.4
Ellipticity	1.7 - 1.8
Inclusion	0.00 - 0.05
Inclination (degrees)	59.0 - 61.0

Table 5: Acceptance criteria for Ellipse Test Secondary Measurements

PARAMETERS	ACCEPTANCE CRITERIA
D_{min} (mm)	23.04 - 27.4
D_{max} (mm)	42.45 - 46.45
Ovality	1.65 - 1.85
Perimeter (mm)	105.2 - 118.0
Area (mm^2)	780.2 - 999.6

4 Plume Geometry Verifications

A triangle test is performed at plume geometry verifications with user's inputs on the triangle's origin, and the edges. The related parameters with the acceptance criteria are listed in table 6.

Table 6: Acceptance criteria for Triangle test

PARAMETERS	ACCEPTANCE CRITERIA
Arm 1 Angle (degrees)	20.0 - 25.0
Arm 2 Angle (degrees)	20.0 - 25.0
Plume Angle (degrees)	42.5 - 47.5
Plume Width (mm)	41.45 - 47.45
Plume Distance (mm)	50.6 - 56.6

5 Laser Verifications

The laser power is measured at 19 positions during the laser verifications. The acceptance criteria for the average laser power across all positions are greater than or equal to 18.00 mW, and the standard deviation less than or equal to 5.00.

Please refer to the 006621-DOC Proveris SprayVIEW® Measurement System 8.x User Manual Rev D for more details of the calibrations and verifications

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