CALIBRATION CERTIFICATE

General Information

Product	HandySCAN BLACK™|Elite	**Condition**	As found / As left
Manufactured by	Creaform Inc.		
HandySCAN 3D S/N	9271228	**Certificate number**	03-26006-5331
Calibration plate S/N	9351224	**Calibration date**	2026-01-07
		Ambient temperature	Min 20.0 ° C ; Max 20.0 ° C
Customer	V3D Technologies Inc 6 Indell Lane Brampton, Canada, L6T 3Y3	**Calibration center**	Creaform - Head Office Lab 4700, rue de la Pascaline Lévis, Québec, G6W 0L9, Canada

Certificate #4274.01

Acceptance Test Procedure

The performance testing procedures[1] used for this calibration are based on the VDI/VDE 2634 Part 3 standard.

5 ballbars of 3 different lengths are used to perform this procedure (see *Equipments* for details). The 10 spheres of the 5 ballbars are measured in different locations and orientations[2] throughout the system working volume of 0.58 m x 0.58 m x 0.74 m. The top hemisphere of the measured data is used for sphere fitting. Deviations of the test parameters between measured and nominal values are reported (see *Calibration Results* for details). The acceptance limits are defined as a constant value for the probing size error test and as a variable value for the sphere spacing error test dependent on the length of the artefact (0.0200 mm + 0.0400 mm/m).

Note 1 : Refer to procedure ATP927-01 for more details.
Note 2 : For more details concerning positions and orientations, refer to the drawings in the following pages of this certificate.

Calibration Results

Test	*Specification*	*Limits +/-*	*Result*	*Status*
Probing Size Error (Max. dev.)	Accuracy	0.0250	0.0145	**Passed**
Sphere Spacing Error (Max. dev.)	Volumetric Accuracy (0.650 m)	0.0459	0.0278	**Passed**
	Volumetric Accuracy (0.520 m)	0.0408	0.0208	**Passed**
	Volumetric Accuracy (0.395 m)	0.0357	0.0056	**Passed**

Equipments

Apparatus	*Type*	*Serial number*	*Certificate number*	*Calibration date*
Ballbar #1	Ballbar 650 mm	BB650_005	63330	2024-04-11
Ballbar #2	Ballbar 520 mm	BB520_009	63328	2024-04-11
Ballbar #3	Ballbar 520 mm	BB520_010	63329	2024-04-11
Ballbar #4	Ballbar 395 mm	BB395_009	63326	2024-04-11
Ballbar #5	Ballbar 395 mm	BB395_010	63327	2024-04-11
Comet System	Thermometer	SC1-HSB03	E25-SC1-HSB03	2025-04-02

These calibration results are traceable to the International System of Units (SI) through Euramet laboratories for Europe (LNE, NPL, PTB, etc.), the NIST or NRC for North America, ISO/IEC 17025 accredited calibration laboratories or National Metrology Institutes that are signatories to the International CIPM MRA (Mutual Recognition Arrangement). The scope of accreditation for ISO/IEC 17025 :2017 is granted by A2LA, a signatory of ILAC MRA (Mutual Recognition Arrangement).

This certificate shall not be reproduced, except in full, without written authorisation from Creaform Inc.
This certificate invalidates all other certificates generated before : 2026-01-07, 17:51
The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95%.

Digitally approved by :

Patrick Savard
Calibration and tests specialist

Unless otherwise stated, mm is the unit.

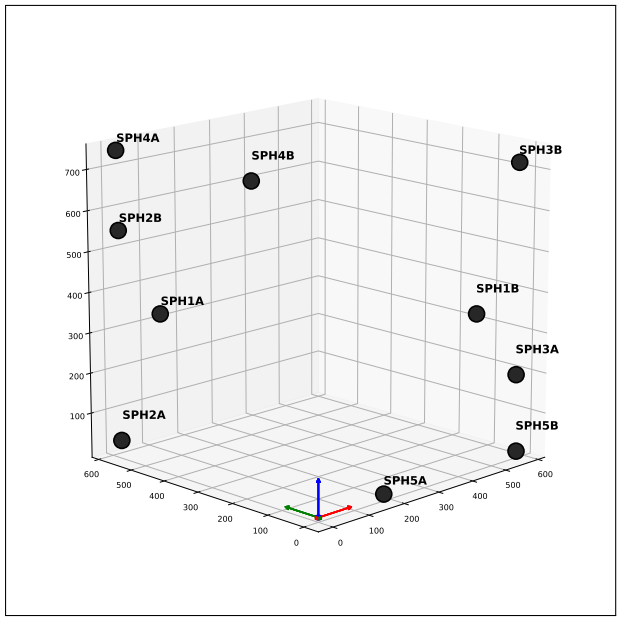
Probing Size Error

Summary

Specification	Limits +/-	Status	Max. Deviation (Result)
Accuracy	0.0250	**Passed**	0.0145

Uncertainty ($k = 2$) : 0.0040
Statements of compliance, where applicable, are based on test results falling within specification limits with no reduction by the uncertainty of the measurement.

Positions in volume



Isometric view

Unless otherwise stated, mm is the unit.

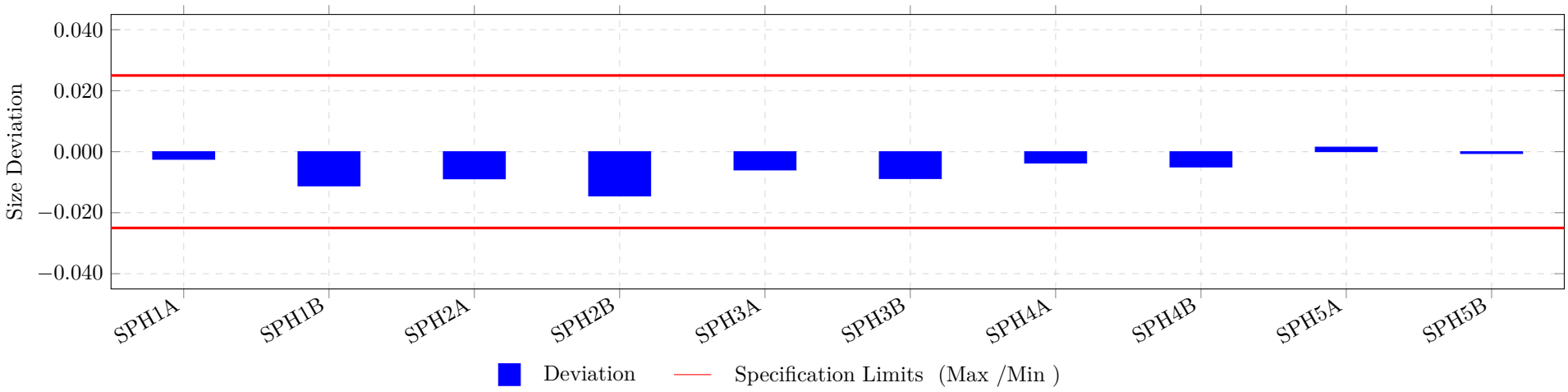
Probing Size Error

Detailed Results

Position	Size Deviation	Diameter (Nominal)	Diameter (Measured)	Form (Range of deviation)[3]	Form (Sigma)[3]
SPH1A	**-0.0025**	38.1016	38.0990	0.0380	0.0052
SPH1B	**-0.0112**	38.1005	38.0893	0.0323	0.0042
SPH2A	**-0.0089**	38.0993	38.0905	0.0408	0.0059
SPH2B	**-0.0145**	38.1012	38.0866	0.0392	0.0063
SPH3A	**-0.0060**	38.0992	38.0932	0.0322	0.0037
SPH3B	**-0.0088**	38.1009	38.0921	0.0353	0.0043
SPH4A	**-0.0037**	38.1006	38.0969	0.0401	0.0062
SPH4B	**-0.0050**	38.0994	38.0944	0.0390	0.0060
SPH5A	**0.0015**	38.1009	38.1024	0.0350	0.0039
SPH5B	**-0.0006**	38.0999	38.0993	0.0328	0.0037

Average Deviation	-0.0060	
Max. dev. (Result)	**0.0145**	**Passed**
Limits +/-	0.0250	

Graph



Note 3 : Not included in the scope of accreditation to ISO/IEC 17025 :2017

Unless otherwise stated, mm is the unit.

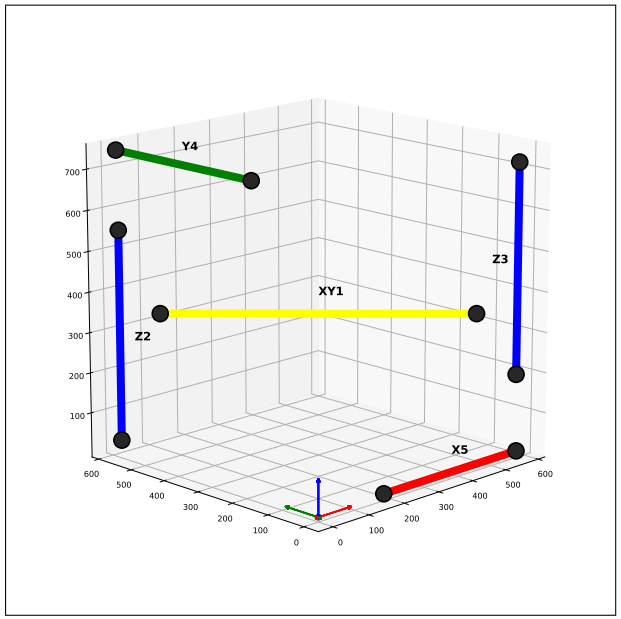
Sphere Spacing Error

Summary

Specification	Limits +/-	Status	Max. Deviation (Result)
Volumetric Accuracy (0.650 m)	0.0459	**Passed**	0.0278
Volumetric Accuracy (0.520 m)	0.0408	**Passed**	0.0208
Volumetric Accuracy (0.395 m)	0.0357	**Passed**	0.0056

Uncertainty ($k = 2$) : 0.0120
Statements of compliance, where applicable, are based on test results falling within specification limits with no reduction by the uncertainty of the measurement.

Positions in volume



Isometric view

Sphere Spacing Error

Detailed Results

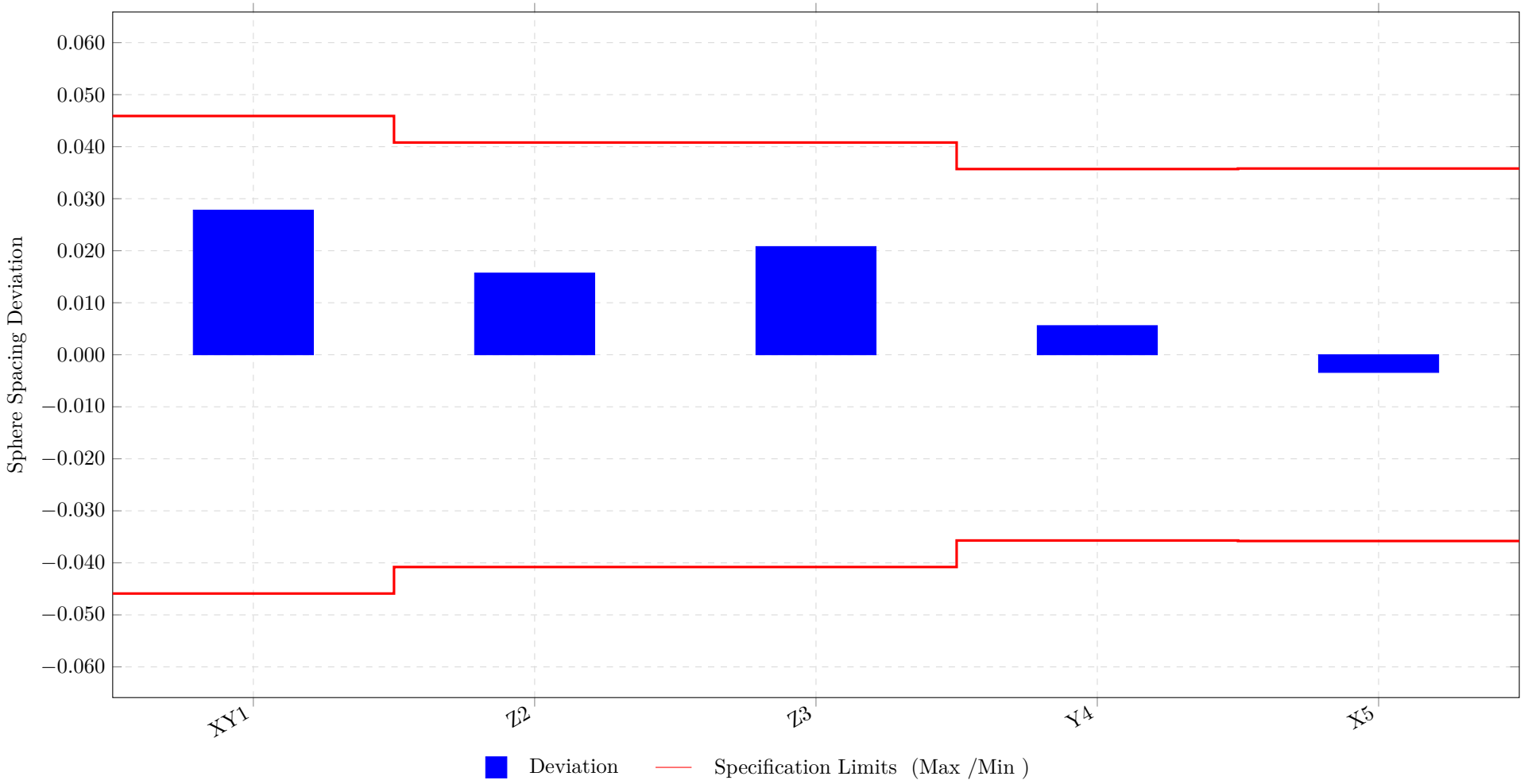
Position	X_a	Y_a	Z_a	X_b	Y_b	Z_b
XY1	9.9698	460.5533	379.3537	460.3797	-4.6898	368.0331
Z2	6.1084	583.5375	1.4255	17.7395	586.2661	521.9297
Z3	578.9393	2.5763	222.4302	589.9663	-0.0541	742.9703
Y4	21.1024	588.4265	748.4678	14.4531	194.7727	748.6080
X5	184.6952	-0.2910	-2.9267	578.4279	0.8588	1.3884

Position	Limits +/-	Sphere Spacing Deviation	Sphere Spacing (Nominal)	Sphere Spacing (Measured)	Length Measurement Deviation (Method C)[3]
XY1	0.0459	**0.0278**	647.6207	647.6484	0.0249
Z2	0.0408	**0.0157**	520.6255	520.6413	0.0020
Z3	0.0408	**0.0208**	520.6428	520.6636	0.0068
Y4	0.0357	**0.0056**	393.7043	393.7099	0.0077
X5	0.0358	**-0.0034**	393.7615	393.7581	-0.0070
	Average Deviation	0.0133			
	Max. dev. L=0.650 m (Result)	**0.0278**	**Passed**		
	Max. dev. L=0.520 m (Result)	**0.0208**	**Passed**		
	Max. dev. L=0.395 m (Result)	**0.0056**	**Passed**		

Note 3 : Not included in the scope of accreditation to ISO/IEC 17025 :2017

Sphere Spacing Error

Graph



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