

LEITZ SIRIO LINE

VERSION 2017-6



TECHNICAL DATA

Description	High-speed measuring machines for quality control in the shop floor. With integrated continuous rotary table and automatic styli changer. New: SENMATION SX Technology - intelligent sensor automation with optical sensor (optional).
Applications	Fast inspection of powertrain components in the production line, without air conditioning. Especially suitable for process control in series production.
Design	Integrated continuous rotary table with horizontal spindle. Machine base in "Closed Frame" design with PrimeTHERM technology (SIRIO SX / BX).
Guide ways	SIRIO SX / BX: Pre-loaded air bearings in all axes. SIRIO Xi: Re-circulating precision ball guides in all axes (rotary table with air bearings).
Drives	High-performance DC motors with electronic drive monitoring. Power transmission by re-circulating ball screw drives.
Length measuring system	SIRIO SX / BX: High resolution scales; glass ceramic (X axis) and steel (Y and Z axis) . SIRIO Xi: Steel scales, high resolution, in all axes.
Resolution	5 nm (0.005 µm)
Temperature compensation	Correction of temperature-related geometric errors in real time by FE models, based on integrated temperature sensors. Workpiece temperature measured with CNC-controlled sensor.
Damping system	Active pneumatic vibration damping (SIRIO SX / BX) or passive vibration damping (SIRIO Xi)



Precitec S 3, optional

PROBE HEADS AND SUPPLY SPECIFICATIONS

Leitz Probe Heads				
	LSP-S8	LSP-S10	HP-S-X1	Precitec S 3
SIRIO Xi		●		
SIRIO SX	●			
SIRIO BX			●	○
Measuring method	3D-Self-Centring Scanning, Variable High Speed Scanning (VHSS), Tag-Scan, Scan Catch, Four Axis Scan			
Max. data rate	1000 points/s	1000 points/s	1000 points/s	1000 points/s
Probing force	0.6 N	0.6 N	0.1 - 0.6 N	
Max. stylus length	400 mm	250 mm	150 mm, cranked: 50 mm	
Max. stylus weight	500 g	500 g	25 g	
Min. tip diameter	0.8 mm	0.8 mm	0.3 mm	

● standard ○ optional, SENMATION SX required

Optical Point Sensor		Precitec S 3
Measuring methods		Chromatic confocal
Measuring angle to surface		± 30°
Working distances / measuring range		22.5 mm / 3 mm
Resolution in Z direction		< 0.15 µm
Spot diameter		12 µm
Applications		Turbine blades and all kinds of surfaces

Safety

Collision protection	For the complete machine (probehead, styli), in set up mode.
Safety devices	Laser scanner to safeguard the work area.
Safety standards	CE-conform with machine directive (2006/42/EG), EMC directive (2014/30/EU).

Supply Specifications						
	Voltage	Protection	Power req.	Consump.	Rat. current	Main fuse
B5	230 V, ±10%; 50-60 Hz; P, N, PE	IP 54	1.4 KVA	0.6 KVA	6 A	16 A
B5 - USA, Japan	115 V, ±10%; 50-60 Hz; P, N, PE	IP 54	1.4 KVA	0.6 KVA	12 A	16 A

Air Supply		
	Leitz SIRIO SX / BX	Leitz SIRIO Xi
Pressure	≥ 0.55 MPa (5.5 bar)	≥ 0.5 MPa (5 bar)
Consumption	ca. 149 NI/min	ca. 58 NI/min
Quality	According to ISO 8573-1: 2010 [4:4:4]	According to ISO 8573-1: 2010 [4:4:4]

Options	• Additional styli change magazine • Manual and automated part loading systems • Fixtures • Panel holder (SIRIO Xi)	• Optical sensor Precitec S 3 (SIRIO BX) • System integration • Automatic workpiece temperature sensor • Part programming and start up support
----------------	--	---

SPECIFICATIONS LEITZ SIRIO SX / XI

Max. permissible error MPE [μm] acc. to		Temperature range	SIRIO SX 6.8.9	SIRIO SX 6.8.15	SIRIO Xi 6.8.8
ISO 10360-2 (2010)					
Volumetric length measuring error ^{(1),(2)}	E ₀	18-22 °C	1.5 + L / 400	1.9 + L / 350	1.8 + L / 300
		15-40 °C	2.0 + L / 200		2.2 + L / 200
Repeatability range ⁽²⁾	R ₀		0.8	0.9	1.5
ISO 10360-3 (2000)					
Four-axis error, radial	FR		4.1	4.1	4.1
Four-axis error, tangential	FT		5.2	5.2	5.2
Four-axis error, axial	FA		4.0	4.0	4.0
ISO 10360-4 (2000)					
Single stylus Form error, scanning ⁽³⁾	THP		1.9 / 45s	2.3 / 45s	1.9 / 39s
ISO 10360-5 (2011)					
Single stylus Form error ⁽²⁾	PFTU		1.7	1.9	1.9
ISO 12181 (2011)					
Form measurement error ⁽⁵⁾	RONt		1.2	1.2	1.5
Permitted Environmental Conditions					
Temp. gradients hour / day / meter			18-22 °C: 1 / 2 / 2 K; 15-40 °C: 3 / 6 / 2 K		
Relative air humidity			30-80%, non-condensing		
Throughput					
Max. probing frequency (points/min)			40	40	60
Max. travel speed (mm/s)			900	900	800
Max. acceleration (mm/s²)			2800	2500	3500

⁽¹⁾ E_0 is valid⁽²⁾ E_0 , R_0 and PFTU are valid⁽³⁾ THP is valid⁽⁴⁾ PFTM, PSTM and PLTM are valid⁽⁵⁾ RONT (MZCI) is validfor a length gauge with a calibrated coefficient of expansion (CTE) between $10 \times 10^{-6}/\text{K}$ and $13 \times 10^{-6}/\text{K}$.for a Leitz stylus $\varnothing 5 \times 50$ mm, without extension; anywhere in the measuring volume.for a Leitz stylus $\varnothing 5 \times 50$ mm.for 5 Leitz styli $\varnothing 5 \times 50$ mm. To be tested near the reference sphere. For sensor change $1 \mu\text{m}$ has to be added.for a Leitz stylus $\varnothing 5 \times 50$ mm, filter 50 UPR, with precision calibration. Verification with QUINDOS only.Form error (roundness) at a $\varnothing 50$ mm ring gauge, in scanning mode, acc. to EN ISO 12 181 (VDI/VDE 2617, part 2.2).

Specifications for acceptance test with ball plates on request.

Specifications are valid with original Leitz accessories only.

SPECIFICATIONS LEITZ SIRIO BX

Max. permissible error MPE [µm] acc. to		Temperature range	SIRIO BX 6.8.9	SIRIO BX 6.8.15
ISO 10360-2 (2010)				
Volumetric length measuring error ^{(1),(2)}	E ₀	18-22 °C	1.8 + L / 300	1.9 + L / 300
		15-40 °C	2.1 + L / 200	
Repeatability range ⁽²⁾	R ₀		0.8	0.9
ISO 10360-3 (2000)				
Four-axis error, radial	FR		4.1	4.1
Four-axis error, tangential	FT		5.2	5.2
Four-axis error, axial	FA		4.0	4.0
ISO 10360-4 (2000)				
Single stylus Form error, scanning ⁽³⁾	THP		1.9 / 45s	2.3 / 45s
ISO 10360-5 (2011)				
Single stylus Form error ⁽²⁾	PFTU		1.7	1.9
ISO 12181 (2011)				
Form measurement error ⁽⁵⁾	RONt		1.2	1.2
Specification for optical sensor Precitec S 3				
ISO 10360-8 (2013)				
Form error	P _{Form. Sphere 1x25:Tr}		2.7	3.1
Size error	P _{Size. Sphere 1x25:Tr}		5.8	6.2
ISO 10360-9 (2013)				
Multi probing system Form error	P _{Form. Sphere 2x25:MPS}		8.2	8.5
Multi probing system Size error	P _{Size. Sphere 2x25:MPS}		4.5	4.8
Multi probing system Location error	L _{Dia. 2x25:MPS}		8.0	8.4
Permitted Environmental Conditions				
Temp. gradients hour / day / meter			18-22 °C: 1 / 2 / 2 K; 15-40 °C: 3 / 6 / 2 K	
Relative air humidity			30-80%, non-condensing	
Throughput				
Max. probing frequency (points/min)			40	40
Max. travel speed (mm/s)			900	900
Max. acceleration (mm/s²)			2800	2500

⁽¹⁾ E₀ is valid⁽²⁾ E₀, R₀ and PFTU are valid⁽³⁾ THP is valid⁽⁴⁾ PFTM, PSTM and PLTM are valid⁽⁵⁾ RONt (MZCI) is validfor a length gauge with a calibrated coefficient of expansion (CTE) between 10 x 10⁻⁶/K and 13 x 10⁻⁶/K.

for a Leitz stylus ø 5 x 50 mm, without extension; anywhere in the measuring volume.

for a Leitz stylus ø 5 x 50 mm.

for 5 Leitz styli ø 5 x 30 mm. To be tested near the reference sphere. For sensor change 1 µm has to be added.

for a Leitz stylus ø 5 x 50 mm, filter 50 UPR, with precision calibration. Verification with QUINDOS only.

Form error (roundness) at a ø 50 mm ring gauge, in scanning mode, acc. to EN ISO 12 181 (VDI/VDE 2617, part 2.2).

Specifications for acceptance test with ball plates on request.

Specifications are valid with original Leitz accessories only.

CMM CAPABILITY CHARTS AND ISO 10360

CMM Capability Charts - Distances and Diameters

	Distance or diameter [mm]					
	50	100	200	400	600	1000
Tolerance [mm]	± 0.010	0.9 + L / 400	0.8 + L / 500	0.6 + L / 500	0.5 + L / 800	0.4 + L / 1000
	± 0.015	1.3 + L / 300	1.2 + L / 350	0.9 + L / 350	0.7 + L / 500	0.6 + L / 700
	± 0.020	1.8 + L / 250	1.6 + L / 250	1.3 + L / 300	0.9 + L / 350	0.6 + L / 700
	± 0.030	2.8 + L / 200	2.6 + L / 250	2.2 + L / 250	1.7 + L / 300	1.0 + L / 500
	± 0.050	4.7 + L / 150	4.3 + L / 150	4.0 + L / 200	3.0 + L / 200	1.7 + L / 300
	± 0.070	6.7 + L / 200	6.7 + L / 350	6.3 + L / 300	5.4 + L / 250	4.5 + L / 400

Example: A diameter of 100 mm has a tolerance of ± 0.020 mm.

For the inspection of this feature a CMM with a length measuring error $E_0 = 1.6 + L / 250$ [µm] is required.

CMM Capability Charts - Form Tolerances

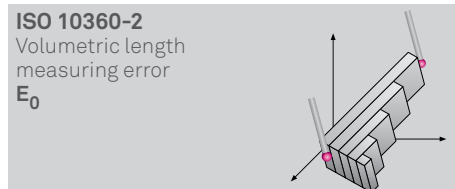
Tolerance	0.005 mm	0.007 mm	0.010 mm	0.015 mm	0.020 mm	0.030 mm	0.050 mm
PFTU [µm]	0.5	0.7	1.0	1.5	2.0	3.0	
THP [µm]				1.5	2.0	3.0	5.0

Example: For inspection of a roundness tolerance of 0.020 mm a CMM with a single stylus form error of PFTU = 2.0 µm respectively with a single stylus form error, scanning THP = 2.0 µm is required.

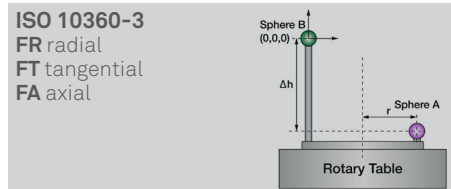
Note: PFTU and THP are specified for small areas only (up to 30 mm).

CMM capability charts are applicable only, if the feature can be measured with a stylus for which the accuracy of the CMM is specified.

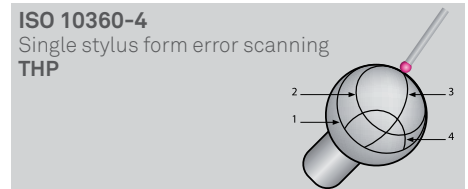
ISO 10360



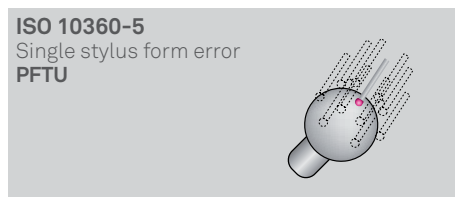
5 gauges have to be measured 3 times with one probing each end, in 7 different directions. All measuring results must be within » E_0 «.



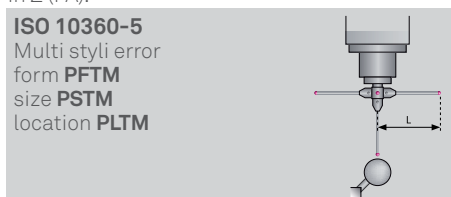
Spheres A and B are measured in 29 defined angular positions. Evaluated are the max. range of the centre points in X (FR), in Y (FT) and in Z (FA).



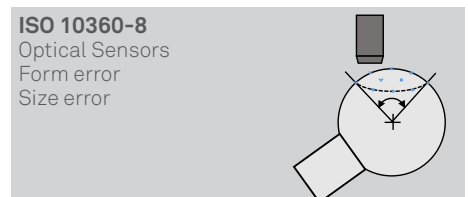
A precision sphere has to be scanned with 4 defined lines. THP is the range of all radii. $THP = R_{max} - R_{min}$ = sphere form, scanning.



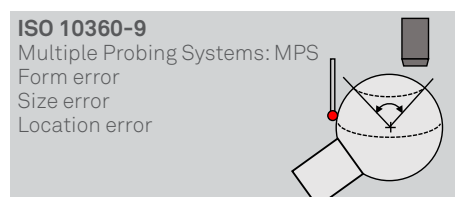
A precision sphere has to be measured with 25 probings. PFTU is the range of all radii. $PFTU = R_{max} - R_{min}$ = sphere form.



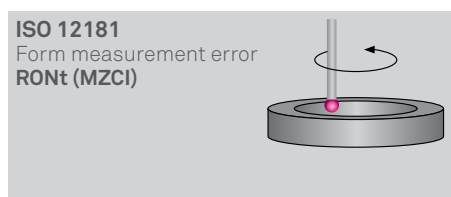
A sphere is measured with 5 styli (fixed PH) or with 1 stylus in 5 orientations (articulating PH) with 5 x 25 probings. Form, size and location error over 125 points.



A sphere is measured with 25 optical probings. $P_{Form, Sphere.1x25:tr}$ is the range of all radii = $R_{max} - R_{min}$ (sphere form) $P_{Size, Sphere.1x25:tr}$ is the diameter deviation $D_{meas} - D_{cal}$.



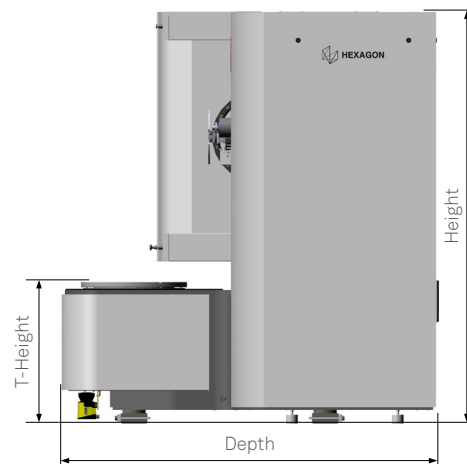
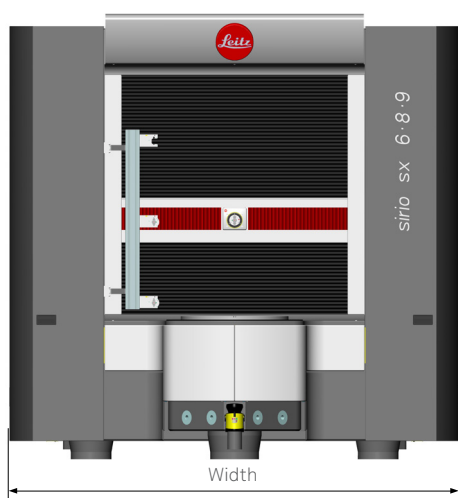
A sphere is measured with contact and non contact sensor, with 25 probings each. Form and size error over all 50 points. Location error $L_{Dia.2x25:MPS}$ = space distance between both centre points.



A ring gauge, ø 50 mm, is scanned with high point density. The range of radial distances is then evaluated on a calculated Tschebyscheff-circle.

MEASURING RANGES AND DIMENSIONS

Leitz SIRIO	SX6.8.9 / Xi6.8.8 / SX/BX 6.8.15	BX 6.8.9
Table diameter (mm)	600	400
Hole pattern	M8, 50 mm pattern	M8, 50 mm pattern
Permitted workpiece weight (kg)	550	250
Max. speed (rpm)	8	12
Mass moment of inertia (kgm ²)	20	15



Model	Measuring range [mm]	Width [mm]	Depth [mm]	Height [mm]	T-Height [mm]	Weight [kg]
SIRIO SX / BX 6.8.9	600 x 750 x 900	2509	2645	2482	800	5.950
SIRIO SX / BX 6.8.15	600 x 750 x 1500	2509	2645	3082	800	6.270
SIRIO Xi 6.8.8	600 x 800 x 800	3016	2138	2334	800	4.600



HEXAGON

MANUFACTURING INTELLIGENCE

Hexagon Manufacturing Intelligence helps industrial manufacturers develop the disruptive technologies of today and the life-changing products of tomorrow. As a leading metrology and manufacturing solution specialist, our expertise in sensing, thinking and acting – the collection, analysis and active use of measurement data – gives our customers the confidence to increase production speed and accelerate productivity while enhancing product quality.

Through a network of local service centres, production facilities and commercial operations across five continents, we are shaping smart change in manufacturing to build a world where quality drives productivity. For more information, visit HexagonMI.com.

Hexagon Manufacturing Intelligence is part of Hexagon (Nasdaq Stockholm: HEXA B; hexagon.com), a leading global provider of information technologies that drive quality and productivity across geospatial and industrial enterprise applications.



COORDINATE MEASURING MACHINES



3D LASER SCANNING



SENSORS



PORTABLE MEASURING ARMS



SERVICES



LASER TRACKERS & STATIONS



MULTISENSOR & OPTICAL SYSTEMS



WHITE LIGHT SCANNERS



METROLOGY SOFTWARE SOLUTIONS



CAD / CAM



STATISTICAL PROCESS CONTROL



AUTOMATED APPLICATIONS



MICROMETERS, CALIPERS AND GAUGES



DESIGN AND COSTING SOFTWARE



Full Bright®

福宮通商股份有限公司

總公司: 新北市 235 中和區連城路 258 號 3F-3
(遠東世紀廣場 I 棟)

Tel: 02-82271200 Fax: 02-82271266

Http:// www.fullbright.com.tw

E-mail : sales@fullbright.com.tw

台北 Tel: 02 - 82271227 Fax: 02 - 82271191

台中 Tel: 04 - 24736300 Fax: 04 - 24734733

高雄 Tel: 07 - 3430270 Fax: 07 - 3430296

昆山 Tel: 512 - 57751291 Fax: 512 - 57751293

東莞 Tel: 769 - 85847220 Fax: 769 - 85847229

www.fullbright.com.tw