ZEISS O-INSPECT
Specifications
Status: November 2019

System description

Type according to ISO 10360-1:2000	O-INSPECT 3/2/2: Column CMM, O-INSPECT 5/4/3 and 8/6/3: Fixed bridge CMM					
Operating mode	motorized / CNC					
Sensor mounts	Fixed installation					
Sensors	ZEISS VAST XXT (contact)/ ZEISS Discovery.V12 (optical)					
				3/2/2	**5/4/3**	**8/6/3**
Travel speed	Motorized	in mm/s	Axes	0 to 100	0 to 100	0 to 100
	CNC	in mm/s	X, Y, Z axes	300/300/100	300/300/100	300/150/100
		in mm/s	Vector	435	435	350
Acceleration		in mm/s²	X, Y, Z axes	500/500/500	500/500/500	500/200/500
		in mm/s²	Vector	866	866	735

Sensors and accuracy

The CMM specifications are only valid when using original accessories by ZEISS. The specified parameters are observed in the application of the internal test instructions for acceptance testing and in the use of the released standards in accordance with the ISO 10360 series.

ZEISS VAST XXT [1]

Scanning and single-point sensor. Measuring speed up to max. 2.5 seconds per point and up to 500 points/s by scanning. Max. stylus speed = 5 mm/s.
VAST XXT TL1: Axial stylus length 30-125 mm; radial stylus length up to 40 mm (star stylus); stylus tip diameter of 0.1 to 8 mm, maximum stylus weight = 10 g;
VAST XXT TL3: Axial stylus length 30-150 mm; radial stylus length up to 65 mm (star stylus); stylus tip diameter of 0.3 to 8 mm, maximum stylus weight = 15 g;

				3/2/2	**5/4/3**	**8/6/3**
Length measurement error [2] MPE complies with ISO 10360-2:2009	E0 X/Y/Z (1D)	in µm	18 °C - 22 °C	1.6 + L/200	1.6 + L/250	1.9 + L/150
	E0 XY (2D)	in µm	18 °C - 22 °C	1.9 + L/150	1.7 + L/250	2.0 + L/150
	E0 (3D)	in µm	18 °C - 22 °C	2.4 + L/150	1.9 + L/250	2.2 + L/150
	TVA 1 [7]	in µm	18 °C - 26 °C	2.7 + L/150	2.2 + L/100	2.5 + L/100
	TVA 2 [7]	in µm	18 °C - 30 °C	2.9 + L/150	2.4 + L/80	2.7 + L/80
Repeatability range MPL complies with ISO 10360-2:2009	R0	in µm		1.2	1.2	1.2
Scanning error MPE complies with ISO 10360-4:2000	THP	in µm	18 °C - 22 °C	2.7	2.7	3.8
Required measuring time MPT	τ	in s	18 °C - 22 °C	55	55	68
Form measurement error [6] MPE for roundness complies with ISO 12181 (VDI/VDE 2617, sheet 2.2)	RONt (MZCI)	in µm	18 °C - 22 °C	2.4	2.4	2.4
Single stylus form probing error MPE complies with ISO 10360-5:2010	PFTU	in µm	18 °C - 22 °C	2.4	1.9	2.2
Multi-stylus form probing error MPE complies with ISO 10360-5:2010	PFTM [3]	in µm	18 °C - 22 °C	4.8	4.8	4.8
Multi-stylus dimension probing error MPE complies with ISO 10360-5:2010	PSTM [3]	in µm	18 °C - 22 °C	1.2	1.2	1.2
Multi-stylus location probing error MPL complies with ISO 10360-5:2010	PLTM [3]	in µm	18 °C - 22 °C	3.8	3.8	3.8

ZEISS Discovery.V12 [4]

Optical 2D camera sensor with image processing functionality and autofocus, 12x zoom, 10 fixed zoom levels, CMOS measuring camera chip, measuring speed up to 30 frames/s, max. probing speed 10 mm/s (Z axis), working distance 87 mm, laser pointer. Illumination: outside 8-segment ring light (blue and red), inside ring light (blue and red), coaxial light (blue and red), transmitted light.

				3/2/2	**5/4/3**	**8/6/3**
Length measurement error [2] MPE complies with ISO 10360-7:2011	EU X/Y (1D) [5]	in µm	18 °C - 22 °C	1.6 + L/200	1.6 + L/250	1.9 + L/150
	EU XY (2D) [5]	in µm	18 °C - 22 °C	1.9 + L/150	1.7 + L/250	2.0 + L/150
Repeatability range (of EU - MPL complies with ISO 10360-7:2011	RU XY [5]	in µm	18 °C - 22 °C	1.2	1.2	1.2
Repeatability range (of EUZ L = 0 mm - MPL complies with ISO 10360-7:2011	RUZ [5]	in µm	18 °C - 22 °C	1.9	1.9	1.9
Probing error MPE complies with ISO 10360-7:2011	PF2D [5]	in µm	18 °C - 22 °C	1.9	1.7	2.0
Probing error of the image processing system MPE complies with ISO 10360-7:2011	PFV2D [5]	in µm	18 °C - 22 °C	1.2	1.2	1.2

1) ZEISS VAST XXT: acceptance test with TL3 module; stylus length of 70 mm and stylus tip diameter of 8 mm.
2) Measuring length L in mm with acceptance testing plate from ZEISS.
3) Measuring location near the calibration position to document sensor properties.
4) Laser class 1: EN (IEC) 60825-1:2002
5) 6.3x magnification
6) Filter used: 50 W/U; scanning speed for roundness: 5 mm/s, value valid XY direction
7) All accuracy specifications of the sensors can be increased by + 0.3 µm for TVA 1 and + 0.5 µm for TVA 2.

Optical white light distance sensor [1] for ZEISS O-INSPECT 3/2/2, 5/4/3, 8/6/3

ZEISS DotScan **Measuring range 1 mm** [1] 	White light distance sensor, Scanning measuring rate up to 1000 points/s, Working distance 10,5 mm [2], resolution 28 nm, measurable surface inclination to beaming direction 90° ±30° [1], measuring spot diameter 8 µm			
Unidirectional length measurement error MPE complies with ISO 10360-8:2013	E[Uni:Tr:ODS] in sensor direction	in µm	18 °C - 22 °C	1.9 + L/150
Dimension probing error MPE complies with ISO 10360-8:2013	P[Size.Sph.1x25:Tr:ODS] in sensor direction	in µm	18 °C - 22 °C	5
ZEISS DotScan **Measuring range 3 mm** [1] 	White light distance sensor, Scanning measuring rate up to 1000 points/s, Working distance 21,5 mm [2], resolution 36 nm, measurable surface inclination to beaming direction 90° ±24° [1], measuring spot diameter 9 µm			
Unidirectional length measurement error MPE complies with ISO 10360-8:2013	E[Uni:Tr:ODS] in sensor direction	in µm	18 °C - 22 °C	2.2 + L/150
Dimension probing error MPE complies with ISO 10360-8:2013	P[Size.Sph.1x25:Tr:ODS] in sensor direction	in µm	18 °C - 22 °C	5
ZEISS DotScan **Measuring range 10 mm** [1] 	White light distance sensor, Scanning measuring rate up to 1000 points/s, Working distance 55 [2] mm, resolution 60 nm, measurable surface inclination to beaming direction 90° ±17° [1], measuring spot diameter 16 µm			
Unidirectional length measurement error MPE complies with ISO 10360-8:2013	E[Uni:Tr:ODS] in sensor direction	in µm	18 °C - 22 °C	3.2 + L/150
Dimension probing error MPE complies with ISO 10360-8:2013	P[Size.Sph.1x25:Tr:ODS] in sensor direction	in µm	18 °C - 22 °C	5

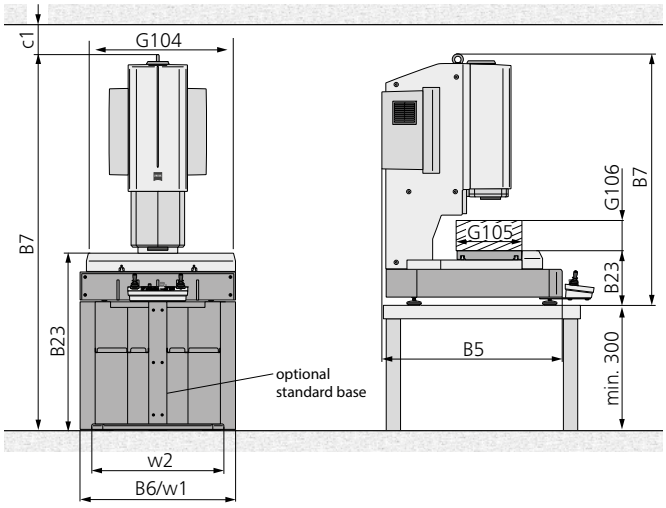
Rotary table [3] for ZEISS O-INSPECT 5/4/3 and 8/6/3

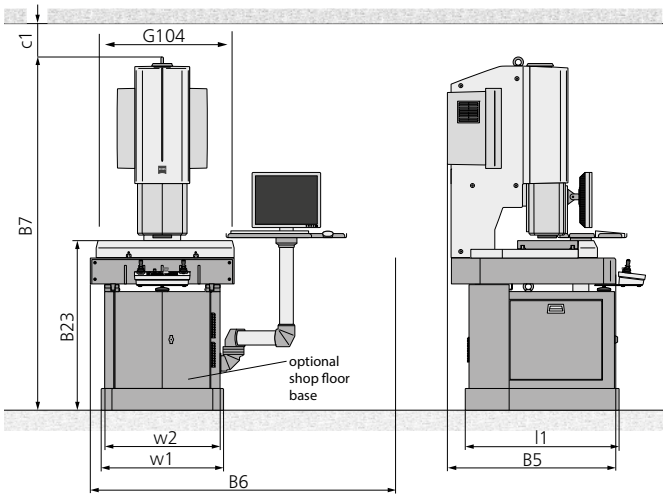
Dimensions and weight					
Masse		in kg		6.3	
Measuring system	Resolution	in “		0,07	
Working range	B12 With a vertical RT axis	in mm in mm		165	
Hight	h2 With a horizontal RT axis	in mm in mm		135	
Centre height with horizontal RT axis		in mm		100	
Max. workpiece diameter		in mm		150	
Dynamics					
Max. angular velocity		in °/s		50	
Rotation speed		in min^{-1}		8.3	
Load/moment					
Moment of tilt		in Nm in Nm	horizontal vertical	max. 2 centric	
Max. centering capacity [4]		in kg	vertical	9	
Max. mass moment of inertia		in kgm^2		0.1	
Tilt rigidity		in Nm/“		1	
Available drive torque	M	in Nm		3	
Max. external torque acting on the rotary axis		in Nm		3	
Max. distance of the load	to the jaw chuck	in mm		100	by approx. 1.5 kg
Accuracy [5]					
Angular position repeatability		in “	18 °C - 22 °C	±0.75	
Axial runout MPE complies with ISO 10360-3:2000	FA	in µm	18 °C - 22 °C	6	
Radial runout MPE complies with ISO 10360-3:2000	FR	in µm	18 °C - 22 °C	6	
Wobble MPE complies with ISO 10360-3:2000	FT	in µm	18 °C - 22 °C	6	

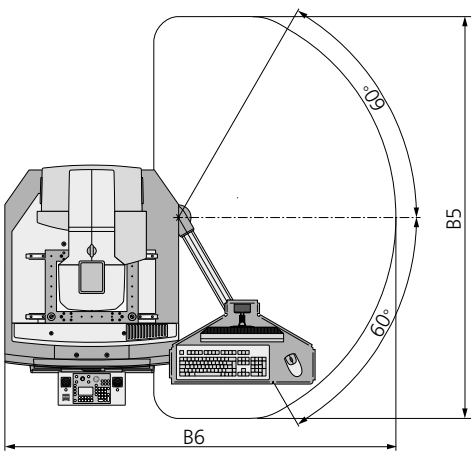
1) Depending on the reflection behavior of the surface.
2) To middle of measuring range.
3) Optionally available.
4) Max. centric load capacity refers to the weight of the workpiece and any additional clamping devices required.
5) The rotary table specifications only apply when using original ZEISS 3D Alpha-Check for RT-RB-10-n, Δ h = 25 mm, r = 25 mm. A standard according to the specifications of ISO 10360-3:2000 is not possible due to its design.

ZEISS O-INSPECT 3/2/2	Dimensions in mm												
	Measuring range			Stylus data geometry						Overall machine dimensions			Working range (Max. workpiece size)
	X axis	Y axis	Z axis	ZEISS VAST XXT		ZEISS Discovery.V12		White light distance sensor		Width	Length	Height	Width
	G104	G105	G106	X	Y	X	Y	X	Y	B6	B5	B7	B17
Basic model	300	200	200	0	0	74.0	0	176	0	865[1]	1000 [2]	1405	∞
With standard base	300	200	200	0	0	74.0	0	176	0	865[1]	1000 [2]	2080	∞
With shopfloor base	300	200	200	0	0	74.0	0	176	0	approx. 1935	1960 [2]	2115	∞

	Dimensions in mm					Weight in kg	
	Footprint			Table height	Assembly clearance	Max. workpiece	Measuring machine
	Width		Length				
	w1	w2 [3]	l1	B23	c1		
Basic model	865	765	1000	305	≥200	20	325
with standard base	865	740	1021	980	≥200	20	440
With shopfloor base	732	-	920	1015	≥200	20	490







Note: the given dimensions and weights are approximate values. Subject to change. Actual appearance of specific sizes may vary from illustration.
Dimensioning based on DIN 4000-167:2009.

1) plus 2 x 500 mm assembly clearance.
2) plus 240 mm for control panel storage and 500 mm assembly clearance.
3) With disassembly of the cover parts during installation.

ZEISS O-INSPECT 5/4/3 Dimensions in mm

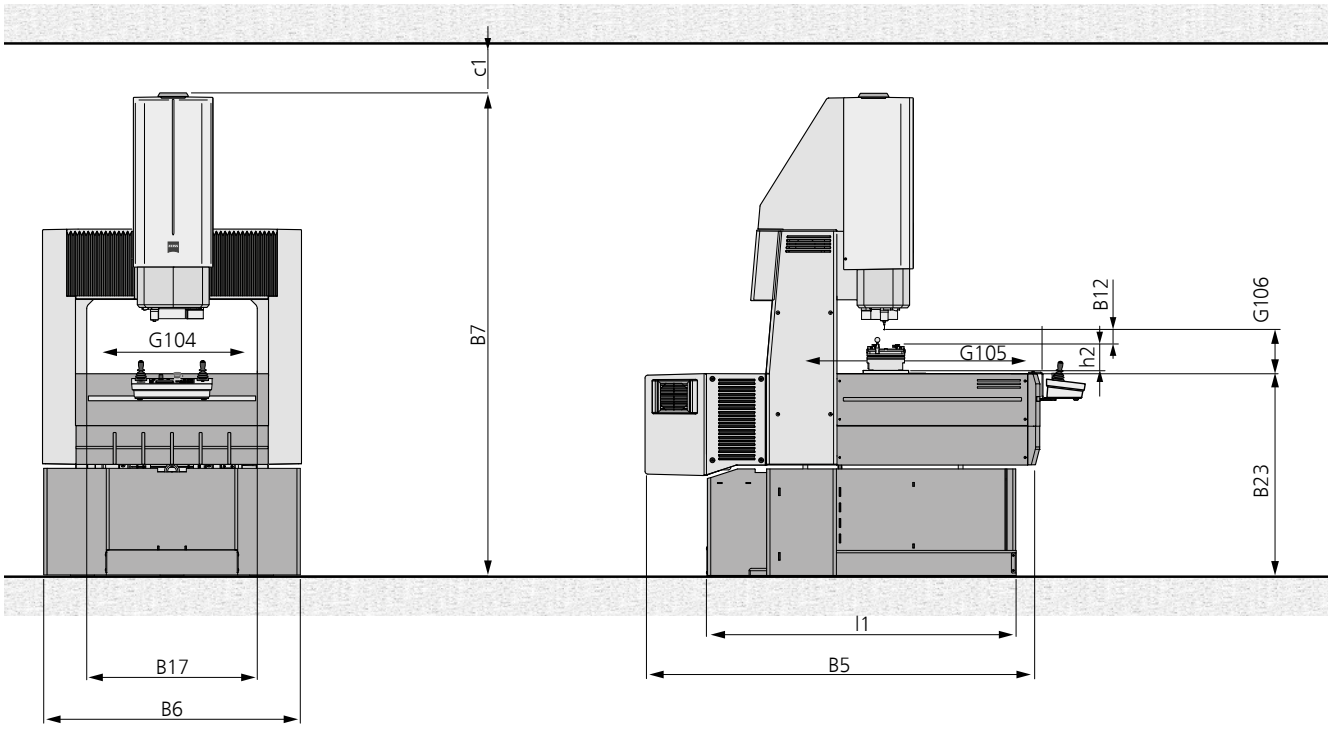
Measuring range			Stylus data geometry						Overall machine dimensions			Working range (Max. workpiece size)
X axis	Y axis	Z axis	ZEISS VAST XXT		ZEISS Discovery.V12		White light distance sensor		Width	Length	Height	Width
G104	G105	G106	X	Y	X	Y	X	Y	B6	B5	B7	B17
500	400	300	0	0	74.0	0	176	0	1090[1)]	1653[2)]	2030	700

Dimensions in mm				Weight in kg		
Footprint		Table height	Assembly clearance	Max. workpiece	Measuring machine	Base
Width	Length					
B6	l1	B23	c1			
1090	1295	850	≥200	25	600	150

ZEISS O-INSPECT 8/6/3 Dimensions in mm

Measuring range			Stylus data geometry						Overall machine dimensions			Working range (Max. workpiece size)
X axis	Y axis	Z axis	ZEISS VAST XXT		ZEISS Discovery.V12		White light distance sensor		Width	Length	Height	Width
G104	G105	G106	X	Y	X	Y	X	Y	B6	B5	B7	B17
800	600	300	0	0	74.0	0	176	0	1440[1)]	2144[2)]	2030	1060

Dimensions in mm				Weight in kg		
Footprint		Table height	Assembly clearance	Max. workpiece	Measuring machine	Base
Width	Length					
B6	l1	B23	c1			
1440	1591	850	≥200	100	1000	200



Note: the given dimensions and weights are approximate values. Subject to change. Actual appearance of specific sizes may vary from illustration.
Dimensioning based on DIN 4000-167:2009.

1) plus 2 x 500 mm assembly clearance.
2) plus 200 mm for control panel storage and 500 mm assembly clearance.

Requirements for operational readiness

Relative humidity	40 % - 70% (without condensation)			
Environmental temperature	17°C - 35°C			
Electrical power rating		**3/2/2**	**5/4/3**	**8/6/3**
		1/N/PE 100 - 240V~(+10%); 50-60 Hz max. power consumption 600 VA Typical power consumption (thermal load): 170 W Amount of heat generated max. 2160 kJ/h	1/N/PE 100 - 240V~(+10%); 50-60 Hz max. power consumption 600 VA Typical power consumption (thermal load): 170 W Amount of heat generated max. 2160 kJ/h	1/N/PE 100 - 240V~(+10%); 50-60 Hz max. power consumption 600 VA Typical power consumption (thermal load): 170 W Amount of heat generated max. 2160 kJ/h

Environmental requirements

		3/2/2	**5/4/3**	**8/6/3**
Permissible humidity (without condensation)		40 % - 70 %	40 % - 70 %	40 % - 70 %
Environmental temperature		18 °C - 22 °C	18 °C - 22 °C	18 °C - 22 °C
Temperature fluctuations	per day	2.0 K/d	2.0 K/d	2.0 K/d
	per hour	1.0 K/h	1.0 K/h	1.0 K/h
	spatial	1.0 K/m	1.0 K/m	1.0 K/m
Floor vibrations	ZEISS O-INSPECT is equipped with an integrated vibration damping system and is therefore highly resistant to vibrations.			

Technical features

		3/2/2	**5/4/3**	**8/6/3**
Length measurement system		Optical scales; reflected light system, photoelectric, resolution 0.08 µm	Optical scales; reflected light system, photoelectric, resolution 0.08 µm	Optical scales; reflected light system, photoelectric, resolution 0.08 µm
Controller	Type	based on ZEISS C99L	based on ZEISS C99L	based on ZEISS C99L
	Protection type	IP53	IP53	IP53
Data technology		Delivered with a fully equipped workstation.	Delivered with a fully equipped workstation.	Delivered with a fully equipped workstation.
Accessories (optional)		Star stylus kit, part clamping set, pallet frame, optical confocal white light distance sensor, workpiece temperature sensor, measuring lab illumination, standard base, ShopFloor base	Star stylus kit, part clamping set, pallet frame, rotary table, optical confocal white light distance sensor, workpiece temperature sensor, measuring lab illumination	Star stylus kit, part clamping set, pallet frame, rotary table, optical confocal white light distance sensor, workpiece temperature sensor, measuring lab illumination

Approvals

Regulations	ZEISS O-INSPECT complies with EC machinery directive 2006/42/EC, the EMC directive 2014/30/EU and the RoHS directive 2011/65/EU.
Disposal	ZEISS products and packaging returned to us are disposed of in accordance with applicable legal provisions.

Certifications/accreditations

Quality management system	ISO 9001:2015; VDA 6, Parts 4, 3. Issue 2017
Environmental management system	ISO 14001:2015
Occupational health & safety management systems	BS OHSAS 18001:2007
Accredited	ISO/IEC 17025:2005

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