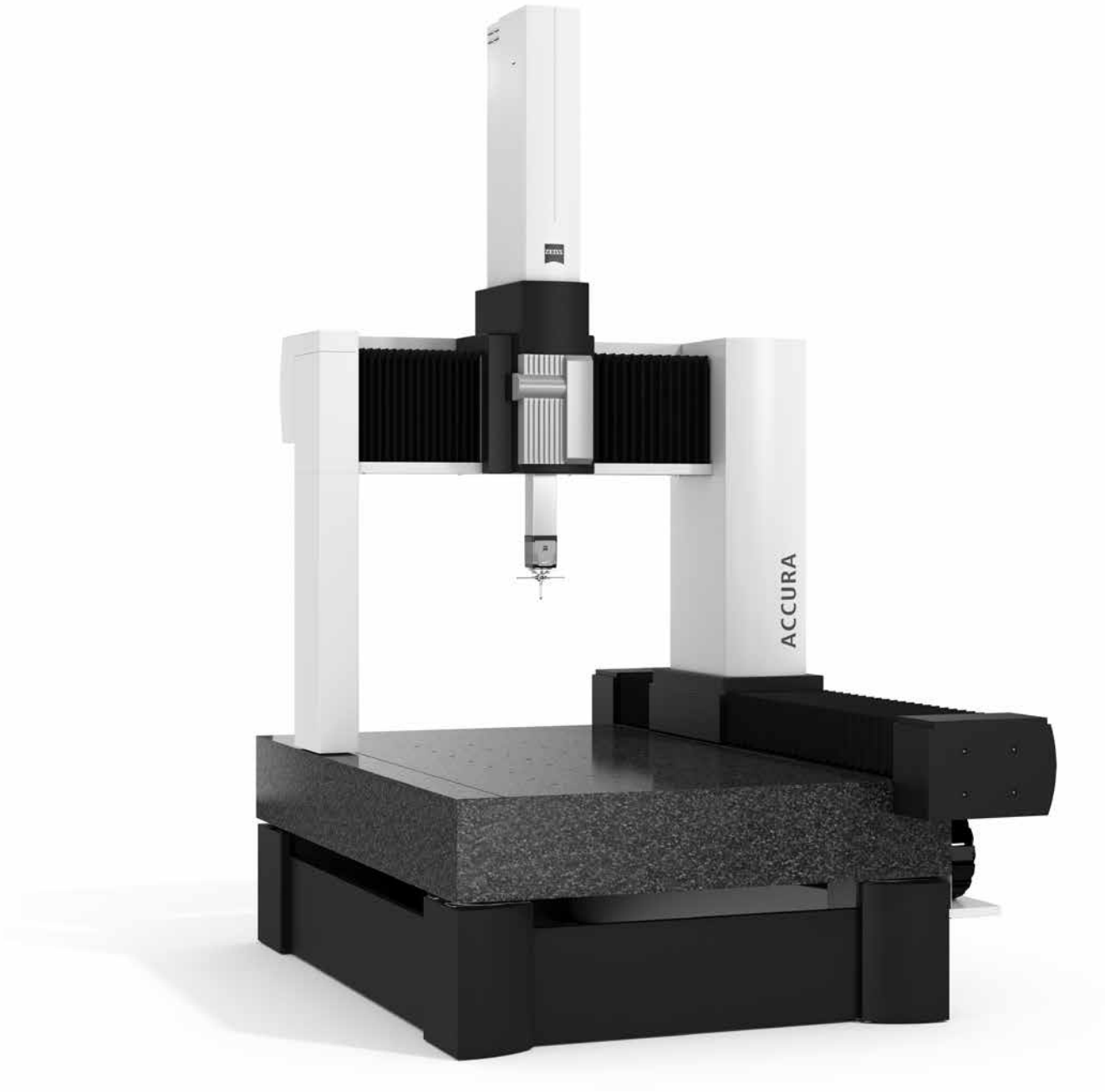


ZEISS ACCURA®

Specifications

ZEISS

Seeing beyond

Version: 2021-05

System description

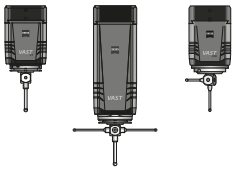
Type according to ISO 10360-1:2000	Moving bridge CMM		
Operating mode	motorized / CNC		
Sensor mounts	Fixed installation		
Software	ZEISS CALYPSO, ZEISS GEAR PRO, ZEISS HOLOS		
Travel speed	motorized	Axes	0 to 70 mm/s
	Low dynamic	Axes	X- and Z-axis max. 250 mm/s (in conjunction with safety technology), y-axis max.150 mm/s
		Vector	max. 385 mm/s
	High dynamic	Axes	x-, y- and z-axis max. 460 mm/s (in conjunction with safety technology)
		Vector	max. 800 mm/s
Acceleration		Vector	max. 2.3 m/s^2
Scanning speed [1]			max. 200 mm/s

Sensors and accuracy

The functionality of the device and its specifications are only achievable 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 XT gold [2]
ZEISS VAST gold [2]
ZEISS VAST XTR gold [2]

Active scanning and multipoint sensor.
Scanning measuring rate up to 500 points/s.
Variable measuring force (50-1000 mN) for data acquisition.



ZEISS VAST XT gold: stylus: max. length = 500 mm, max. weight = 500 g incl. stylus adapter, min. stylus tip diameter = 0.5 mm.
ZEISS VAST gold: stylus: max. length = 800 mm, max. weight = 600 g incl. stylus adapter, min. stylus tip diameter = 0.3 mm.
ZEISS VAST XTR gold: max. length (rigid) = 500 mm, max. length (during rotation) = 350 mm,
max. weight = 500 g, including stylus adapter, min. stylus tip diameter = 0.5 mm.

			9/16/8	12/18/10 to 12/24/10	16/24/15 to 16/42/15	20/24/10 to 20/42/10	20/24/15 to 20/42/15
Length measurement error [3] MPE complies with ISO 10360-2:2009	E0 / E150	in µm	1.2 + L/350	1.8 + L/350	3.2 + L/300	2.9 + L/300	3.6 + L/300
With HTG option 15 - 30°C	E0 / E150	in µm	1.9 + L/150	1.9 + L/150 [4]	-	-	-
Repeatability range of E0 MPL complies with ISO 10360-2:2009	R0	in µm	1.2	1.5	2.4	2.0	2.4
Scanning error MPE complies with ISO 10360-4:2000	THP	in µm	2.0	2.9	3.0	3.7	3.7
Required measuring time MPT	τ	in s	40	40	68	68	68
Form measurement error [7] MPE for roundness complies with ISO 12181 (VDI/VDE 2617 sheet 2.2)	RONt (MZCI)	in µm	1.4	1.7	2.7	3.0	3.5
Single stylus form probing error MPE complies with ISO 10360-5:2010	PFTU	in µm	1.2	1.7	3.2	2.9	3.6
Multi-stylus form probing error MPE complies with ISO 10360-5:2010	PFTM [4]	in µm	2.6 3.2 [6]	2.9 3.5 [6]	3.5	4.2	4.2
Multi-stylus dimension probing error MPE complies with ISO 10360-5:2010	PSTM [4]	in µm	1.4	1.6	1.8	1.9	1.9
Multi-stylus location probing error MPL complies with ISO 10360-5:2010	PLTM [4]	in µm	1.9 2.0 [6]	2.1 2.2 [6]	2.7	2.4 2.5 [6]	2.9 2.9 [6]

1) Applies to ZEISS ACCURA with an active probe and navigator function.
2) Acceptance test with stylus length of 60 mm and tip diameter of 8 mm. Also valid for other styli (Ø 3 x 33 mm, Ø 5 x 50 mm, Ø 8 x 114 mm and Ø 12 x 92 mm were tested).
3) Measuring length L in mm.
4) Measuring location near the calibration position to document sensor properties.
5) For 12/18/10 and 12/24/10
6) Applies to ZEISS VAST XTR gold
7) Roundness in Scanning Mode on a 50 mm ring gauge for Vscan = 5 mm/s, filter 50 UPR.

ZEISS RDS-D

Dynamic ZEISS RDS-D articulating unit for optical and contact sensors.
Lateral swivel axis provides more advantages over articulating joints with front-to-back and lateral tilt axis; front-to-back and lateral tilt range of ±180°, large measuring range, rotation increments of 2.5°, CAA correction for automatic qualification for measuring multi-point sensors of all 20,736 angular positions.

ZEISS VAST XXT [1]

Scanning and multi-point sensor on ZEISS RDS-D. Scanning measuring rate up to 500 points/s.
Stylus length with TL3 module = 30-150 mm; maximum sensor extension = 100 mm;
maximum stylus weight = 15 g; minimum stylus tip diameter = 0.3 mm.

			9/16/8	12/18/10 to 12/24/10	16/24/15 to 16/42/15	20/24/10 to 20/42/10	20/24/15 to 20/42/15
Length measurement error [2] MPE complies with ISO 10360-2:2009	E0 / E40 for TL3 E0 / E40 for TL4	in µm in µm	1.6 + L/350 2.8 + L/350	2.2 + L/300 3.4 + L/300	4.2 + L/250 6.1 + L/250	3,9 + L/200 5,7 + L/200	4.9 + L/200 6.7 + L/250
With HTG option 15-30°C	E0 / E40 for TL3	in µm	1.9 + L/150	2.2 + L/150 [3]	-	-	-
Repeatability range of E0 MPL complies with ISO 10360-2:2009	R0	in µm	1.6	2.2	4.9	5,2	5.5
Scanning error MPE complies with ISO 10360-4:2000	THP	in µm	2.5	3.3	3.5	4,7	4.7
Required measuring time MPT	τ	in s	50	68	68	68	68
Form measurement error MPE for roundness complies with ISO 12181 (VDI/VDE 2617 sheet 2.2)	RONt (MZCI) [4]	in µm	1.7	1.9	3.2	4,5	5.0
Single stylus form probing error MPE complies with ISO 10360-5:2010	PFTU	in µm	1.7	1.9	4.2	3,9	4.9

1) Acceptance test with TL3 module; stylus length of 50 mm and stylus tip diameter of 3 mm.
2) Measuring length L in mm. Measured with RDS angle position A=0° and B=0°
3) For 12/18/10 and 12/24/10.
4) Roundness in Scanning Mode on a 50 mm ring gauge for Vscan = 5 mm/s, filter 50 UPR.

ZEISS ViScan [2]

Optical 2D image sensor with autofocus on ZEISS RDS-D.
Working distance (depending on lens): 75 - 90 mm.

			9/16/8	12/18/10 to 12/24/10	16/24/15 to 16/42/15	20/24/10 to 20/42/10	20/24/15 to 20/42/15
Length measurement error [1] MPE complies with ISO 10360-7: 2011	EB(XY)	in µm	10 [3] + L/350	10 [3] + L/300	10 [3] + L/250	10 [3] + L/200	10 [3] + L/200
MPE probing error of the image editing system as per ISO 10360-7:2011	PFV2D	in µm	10 [3]	10 [3]	10 [3]	10 [3]	10 [3]

ZEISS LineScan [2] [4] [6]

Optical laser triangulation scanner on ZEISS RDS-D.

			9/16/8	12/18/10 to 12/24/10	16/24/15 to 16/42/15	20/24/10 to 20/42/10	20/24/15 to 20/42/15
8 mm Measuring range 32 mm Working distance							
Probing dispersion [5] MPE complies with ISO 10360-8:2013	PF (OT)	in µm	3.3	3.3	3.3	3.3	3.3
Dispersion on sphere	1 Sigma	in µm	0.9	0.9	0.9	0.9	0.9
25 mm Measuring range 63 mm Working distance							
Probing dispersion [5] MPE complies with ISO 10360-8:2013	PF (OT)	in µm	12	12	12	12	12
Dispersion on sphere	1 Sigma	in µm	4	4	4	4	4
50 mm Measuring range 94 mm Working distance							
Probing dispersion [5] MPE complies with ISO 10360-8:2013	PF (OT)	in µm	20	20	20	20	20
Dispersion on sphere	1 Sigma	in µm	5	5	5	5	5
100 mm Measuring range 220 mm Working distance							
Probing dispersion [5] MPE complies with ISO 10360-8:2013	PF (OT)	in µm	50	50	50	50	50
Dispersion on sphere	1 Sigma	in µm	12	12	12	12	12

1) Measuring length L in mm. Measured with RDS angle position A=0° and B=0°
2) The use of optical probes requires calibration with contact probe (e.g. ZEISS VAST XXT)
3) Measured with ZEISS ViScan 1x lens
4) Laser class 2M: the accessible laser beam lies in the visible spectral range that is safe for the eye at a short exposure time (0.25 s) as long as the cross section is not reduced by optical instruments (e.g. magnifiers, lens elements, telescope).
5) Probing dispersion in the center of the measuring range on suitable sphere (30 mm diameter) with matte surface. P[Form.Sph.D95%:Tr:ODS]. The information on the working distance is based on the center of the measuring range.
6) The use of ZEISS ROTOS and ZEISS LineScan on the same device is not possible.

ZEISS DotScan
Measuring range 1 mm [2]

Optical confocal white light distance sensor on RDS-D CAA,
Scanning measuring rate up to 1000 points/s,
Working distance 10,5 mm, resolution 28 nm,
measurable surface inclination to beaming direction 90° ±30° [1], measuring spot diameter 8 µm

				9/16/8	12/18/10 to 12/24/10	16/24/15 to 16/42/15	20/24/10 to 20/42/10	20/24/15 to 20/42/15
Unidirectional length measurement error MPE complies with ISO 10360-8:2013	E[Uni:Tr:ODS] in sensor direction	in µm	18 °C - 22 °C	1.6 + L/350	2.2 + L/300	–	–	–
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	5	–	–	–

ZEISS DotScan
Measuring range 3 mm [2]

Optical confocal white light distance sensor on RDS-D CAA,
Scanning measuring rate up to 1000 points/s,
Working distance 21,5 mm, resolution 36 nm,
measurable surface inclination to beaming direction 90° ±24° [1], measuring spot diameter 9 µm

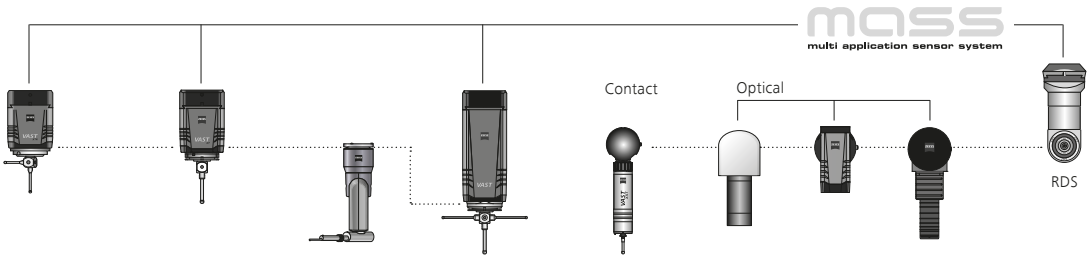
				9/16/8	12/18/10 to 12/24/10	16/24/15 to 16/42/15	20/24/10 to 20/42/10	20/24/15 to 20/42/15
Unidirectional length measurement error MPE complies with ISO 10360-8:2013	E[Uni:Tr:ODS] in sensor direction	in µm	18 °C - 22 °C	1.9 + L/350	2.5 + L/300	–	–	–
Dimension probing error MPE complies with ISO 10360-8:2013	P[Size.Sph.1x25:Tr:ODS] in sensor direction	in µm	18 °C - 22 °C	5	5	–	–	–

ZEISS DotScan
Measuring range 10 mm [2]

Optical confocal white light distance sensor on RDS-D CAA,
Scanning measuring rate up to 1000 points/s,
Working distance 55 mm, resolution 60 nm,
measurable surface inclination to beaming direction 90° ±17° [1], measuring spot diameter 16 µm

				9/16/8	12/18/10 to 12/24/10	16/24/15 to 16/42/15	20/24/10 to 20/42/10	20/24/15 to 20/42/15
Unidirectional length measurement error MPE complies with ISO 10360-8:2013	E[Uni:Tr:ODS] in sensor direction	in µm	18 °C - 22 °C	2.9 + L/350	3.5 + L/300	5.5 + L/250	6,2 + L/200	6,2 + L/200
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	5	14	14	14

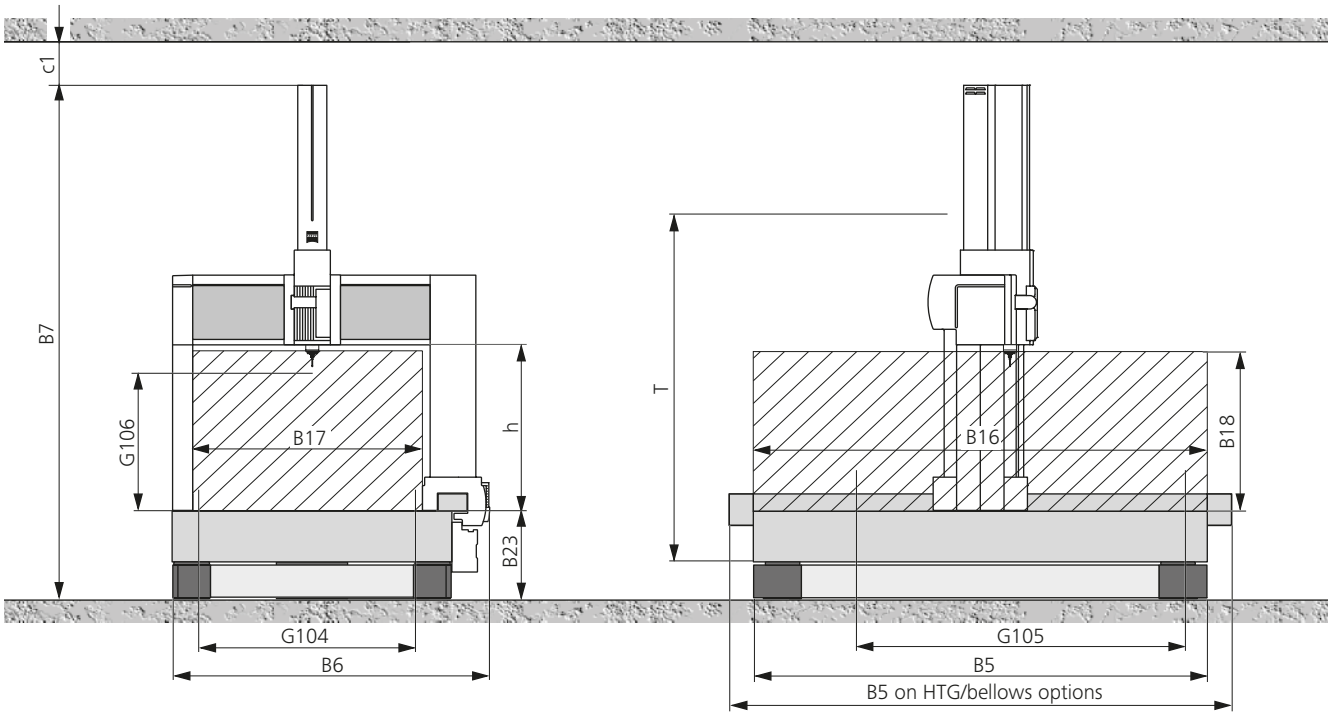
Sensor overview



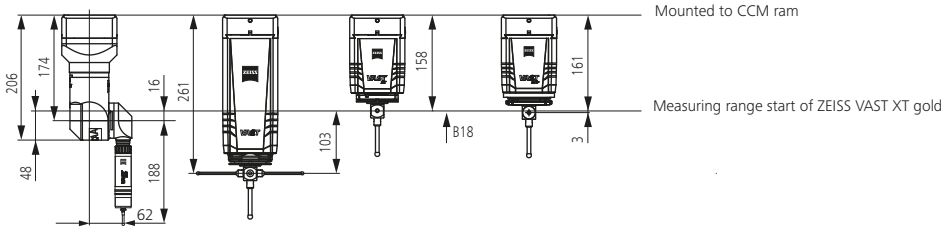
	VAST XTR gold	VAST XT gold	ROTOS [4]	VAST gold	VAST XXT	ViScan	LineScan	DotScan
Multi-point	■	■		■	■	■		
Passive Scanning					■			
Active Scanning	■	■		■				
Optical Scanning						■	■	■
Roughness measurement			■					
Rotatable / tiltable			■		■	■	■	■
Max. stylus length [3]	350/500 mm	500 mm		800 mm	250 mm			
Max. stylus weight [3]	500 g	500 g		600 g	15 g			
Navigator	■	■		■				

1) Depending on the reflection behavior of the surface.
2) The use of optical probes requires calibration with a contact probe (e.g. ZEISS VAST XXT).
3) Depending on the application, limiting the parameters for a stylus system may be useful.
4) Valid for the Z-axis ≤ 1000 mm

ZEISS ACCURA sizes	Dimensions in mm													Weight in kg	
	Measuring range			Overall CMM dimensions			Working range (Max. workpiece size)				Table height	As-sembly space	Trans-port height[5]	CMM	Max. workpiece
	X axis	Y axis	Z axis	Width	Length	Height	Width	Length	Height	Height	Height	Height	Height		
	G104	G105	G106	B6	B5	B7	B17	B16	B18	H	B23	c1	T		
9/16/8	900	1600	800 [1]	1867	2340 [6]	3296 [7]	1260	2340	864 [2]	950	752 [7]	≥200	1900	4100	1500
12/18/10	1200	1800	1000 [1]	2197	2540 [4] [6]	3550	1590	2540	1064 [2]	1151	604	≥200	2150	5900	2000
						3556 [7]									5000 [3]
12/24/10	1200	2400	1000 [1]	2197	3140 [4] [6]	3550	1590	3140	1064 [2]	1151	604	≥200	2200	8200	2500
						3556 [7]					610 [7]				5000 [3]
16/24/15	1600	2400	1500 [1]	2627	3140 [4] [6]	4556	1927	3140	1564 [2]	1651	610	≥200	2700	11000	4000
16/30/15	1600	3000	1500 [1]	2627	3740 [4] [6]	4566	1927	3740	1564 [2]	1651	620	≥200	2700	13200	4000
16/42/15	1600	4200	1500 [1]	2627	4940 [4] [6]	4616	1927	4940	1564 [2]	1651	670	≥200	2750	18500	4000
20/24/10	2000	2400	1000 [1]	3067	3140 [4] [6]	3610	2367	3140	1064 [2]	1151	660	≥200	2250	13000	5000
20/30/10	2000	3000	1000 [1]	3067	3740 [4] [6]	3620	2367	3740	1064 [2]	1151	670	≥200	2250	15400	5000
20/42/10	2000	4200	1000 [1]	3067	4940 [4] [6]	3620	2367	4940	1064 [2]	1151	670	≥200	2250	20000	6000
20/24/15	2000	2400	1500 [1]	3067	3140 [4] [6]	4556	2367	3140	1564 [2]	1651	610	≥200	2700	12700	5000
20/30/15	2000	3000	1500[1]	3067	3740 [4] [6]	4566	2367	3740	1564 [2]	1651	620	≥200	2700	15100	5000
20/42/15	2000	4200	1500[1]	3067	4940 [4] [6]	4616	2367	4940	1564 [2]	1651	670	≥200	2750	21500	7000



ZEISS RDS D ZEISS VAST gold ZEISS VAST XT gold ZEISS VAST XTR gold



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) Applies to ZEISS VAST XT gold. The measuring range (G106) and the maximum workpiece height (B18) are reduced when other probes such as ZEISS VAST gold and ZEISS RDS are used, see sketch.
2) Lower edge of ZEISS VAST XT gold cube
3) CMM with increased permissible workpiece weight option. Does not apply in conjunction with pneumatic vibration insulation.
4) Length of granite table approx. 130 mm including maintenance unit.
5) Transport height of the secured machine group from lower edge of granite table.
6) Increases by up to 500 mm on HTG/bellows option.
7) Valid for all CMMs with pneumatic vibration insulation option.

Technical features

Length measuring system	Glass ceramic length measuring system (with Y>2400 mm steel scales and automatic temperature compensation), 0.2 µm resolution	
Controller	Type	ZEISS C99
	Protection type	IP22 or IP54 as an option
	Cooling system	Fan, optional air conditioner
Accessories (optional)	Increased permissible workpiece weight; High-dynamic Package (standard on all ZEISS ACCURA with X = 2000 mm), various control panels, Multisensor Rack to store stylus systems, rotary tables	

Environmental requirements [1)]

Relative humidity		40 % - 70 % (without condensation)		
		9/16/8 to 12/24/10	**HTG option: 9/16/8 to 12/24/10**	**16/24/15 to 20/42/15**
Measuring reference temperature from		20°C - 26°C [2)]	15°C - 30°C	18 °C - 22° C
	per day	2.0 K/d	5.0 K/d	2.0 K/d
	per hour	1.0 K/h	2.0 K/h	1.0 K/h
	Spatial	1.0 K/m	1.0 K/m	1.0 K/m

Requirements for operational readiness

Relative humidity	Max. 70 % (without condensation)
Ambient temperature	10 °C - 35 °C

Conection data

Electrical	1/N/PE 100/110/115/120/125/230/240 V VAC ~ (±10 %); 50-60 Hz (±3.5 %), Power consumption with TCC cabinet: max. 1600 VA, Typical power consumption: 350 W, Power consumption with optional MCC 800 cabinet: max. 2500 VA. Typical power consumption: 380W Amount of heat generated: TCC controler box: 5760 kJ/h, MCC controler box: max 9000 kJ/h
Compressed air supply	Supply pressure min. 6 bar, max. 8 bar, pre-cleaned. Max. consumption: 50 Nl/min. The use of the AirSaver included with delivery ensures that compressed air is not used during ZEISS ACCURA downtimes, thus enabling environmentally friendly operations. Air quality complies with ISO 8573-1:2010 [6:4:4], Particle: class 6; Water/Oil: class 4 Particle, class 6: max. particle size 15 µm, max. dirt particle concetration ≤ 5mg/m³ Water, class 4: max. compressed air dew point +3°C Oil, class 4: max. oil concentration of 5 mg/m³ If the air supply does not comply with the above requirements, an additional air filter unit and, if necessary, a membrane dryer must be inserted in the compressed air line.

Approvals

Regulations	ZEISS ACCURA complies with EC machine 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. Version 2017
Environmental management system	ISO 14001:2015
Occupational health & safety management systems	BS OHSAS 18001:2007
Accredited	ISO/IEC 17025:2005

1) To ensure specified accuracies.
2) At a measuring lab temperature that has remained constant for 48 hours. For ZEISS ACCURA with a Y measuring range > 2400mm and for all ZEISS ACCURA with X measuring range of 1600 mm and 2000 mm a fixed reference measuring temperature of 20 °C ±2K applies.

Carl Zeiss
Industrielle Messtechnik GmbH
73446 Oberkochen / Germany
Sales: +49 7364 20-6336
Service: +49 7364 20-6337
Fax: +49 7364 20-3870
Email: info.metrology.de@zeiss.com
Internet: www.zeiss.de/imt

Carl Zeiss
Industrial Metrology, LLC
6250 Sycamore Lane North
Maple Grove, MN 55369/USA
Phone: +1 763 744-2400
Fax: +1 763 533-0219
Email: info.metrology.us@zeiss.com
Internet: www.zeiss.com/metrology

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