



ZEISS METROTOM

Specifications

Version: November 2019



System description

Operating mode	Stop and go mode, VAST scan mode, measurement in the image
Measuring principle	Measurement of the attenuation of the X-ray radiation due to the component geometry and the density of the material used. The volume data is calculated using the Feldkamp reconstruction algorithm.
Sensor technology	Flat-panel detector
Software	Operating software: ZEISS METROTOM OS
Applications	Dimensional measurements and material analysis

Radiation generation and sensor technology

ZEISS METROTOM		800/130 kV		800/225 kV	800/225 kV HR	1500/225 kV
Micro-focus tube	Max. tube voltage	in kV	130	225	225	225
	Max. tube current	in μ A	300	3000	3000	3000
	Max. target performance	in W	39	500	500	500
	Min. focal spot size	in mm	0.005	0.007	0.007	0.007
Flat-panel detector	Number of pixels ¹⁾		1536 x 1920	1024 x 1024	1536 x 1920	3072 x 3072
	Pixel size	in μ m	127 x 127	200 x 200	127 x 127	139 x 139

Resolution (ISO 15708) ²⁾

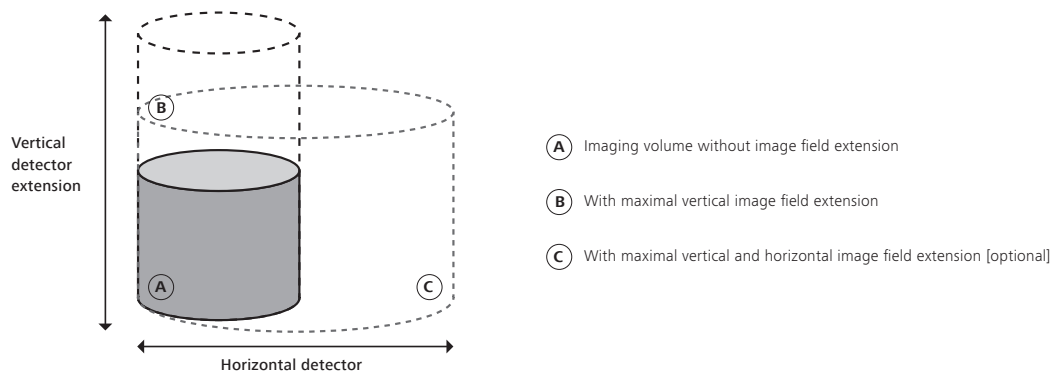
		800/130 kV		800/225 kV	800/225 kV HR	1500/225 kV
Maximum spatial resolution at 10 % modulation transfer	in μ m		3.5 (143 lp/mm ³⁾)	6.0 (83 lp/mm ³⁾)	4.0 (125 lp/mm ³⁾)	4.0 (125 lp/mm ³⁾)

Accuracy (MPE complies with VDI/VDE 2630 sheet 1.3) ⁴⁾

		800/130 kV		800/225 kV	800/225 kV HR	1500/225 kV	
Stop and go mode	Sphere center point error	SD (TS)	in μ m	2.9+L/100	4.0+L/100	4.0+L/100	4.5+L/50
	Probing error	PS (TS)	in μ m	3	3	3	3
		PF (TS)	in μ m	4	4	4	4
	Length measurement error ⁶⁾	E (TS)	in μ m	6.9+L/100	8+L/100	8+L/100	9+L/50
VAST scan mode ⁵⁾	Sphere center point error	SD (TS)	in μ m	2.9+L/100	4.0+L/100	4.0+L/100	4.5+L/50
	Probing error	PS (TS)	in μ m	3	4	4	4
		PF (TS)	in μ m	4	4	4	4,5
	Length measurement error ⁶⁾	E (TS)	in μ m	6.9+L/100	9+L/100	9 +L/100	10.5+L/50

Measuring range

		800/130 kV		800/225 kV	800/225 kV HR	1500/225 kV		
A) in the image without image field extension		Portrait (Standard)	Landscape		Portrait	Landscape (Standard)		
	Max. Diameter	in mm	150	170	170	150	170	330
	Max. Height	in mm	170	115	150	170	115	270
B) with max. vertical image field extension	Max. Diameter	in mm	150	170	170	150	170	330
	Max. Height	in mm	360	360	405	400	385	870
C) with max. vertical and horizontal image field extension [optional]	Max. Diameter	in mm	275	300	300	275	300	615
	Max. Height	in mm	360	360	390	380	360	800



1) Max. 3% bleed on each detector margin

2) Factory inspection prior to delivery

3) lp/mm = line pairs per millimeter

4) Accuracy specification is valid for measurement in the image without image field extension.

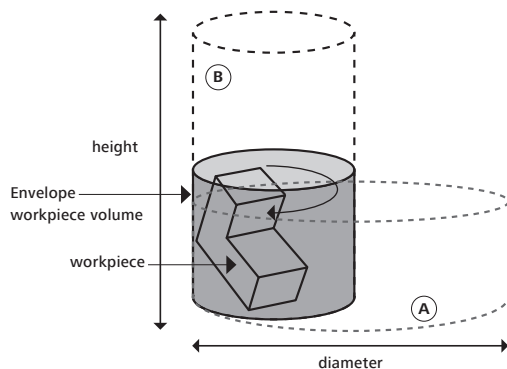
5) Accuracy specification is valid for VAST scan mode for number of projections \geq of number of projections recommended by METROTOM OS

6) Measuring length L in mm.

Travel path		800/130 kV	800/225 kV // 800/225 kV HR	1500/225 kV
X axis	in mm	700	700	1150
Y axis	in mm	270	270	300
Z axis	in mm	270	270	600

Workpiece size ¹⁾

		800/130 kV	800/225 kV // 800/225 kV HR	1500/225 kV
Max. workpiece weight	in kg	5	5	50
Maximum fittable workpieces sizes with limitation of travel and measuring range				
A) optimized for max. diameter	Diameter in mm	400	600	770
	Height in mm	255	550	1350
B) optimized for max. height	Diameter in mm	300	550	615
	Height in mm	620	800	1500



- (A) Max. fittable workpiece size optimized for maximum diameter (with limitation of travel and measuring range)
- (B) Max. fittable workpiece size optimized for maximum height (with limitation of travel and measuring range)

Technical features

	800/130 kV	800/225 kV // 800/225 kV HR	1500/225 kV
Positioning system	Design: welded steel design with 3 linear axes	Design: welded steel design with 3 linear axes	Design: welded steel design with 3 linear axes
Length measuring system	Electro-optical reflected light system, photoelectric, resolution 0.2 µm	Electro-optical reflected light system, photoelectric, resolution 0.2 µm	Electro-optical reflected light system, photoelectric, resolution 0.1 µm
Protective enclosure	The ZEISS METROTOM 800 system fulfills the conditions of §21 of the Strahlenschutzverordnung (StrlSchV). It thus meets the technical requirements for a fully protected device.	The ZEISS METROTOM 800 system fulfills the conditions of §21 of the Strahlenschutzverordnung (StrlSchV). It thus meets the technical requirements for a fully protected device.	The ZEISS METROTOM 1500 system fulfills the conditions of §21 of the Strahlenschutzverordnung (StrlSchV). It thus meets the technical requirements for a fully protected device.
Clamping device	Changer pallet on rotary table with 170 mm diameter	Changer pallet on rotary table with 170 mm diameter	Changer pallet on rotary table with 300 mm diameter

Environmental requirements ²⁾

		800/130 kV	800/225 kV // 800/225 kV HR	1500/225 kV
Relative humidity		40 % to 70 %	40 % to 70 %	40 % to 70 %
Measuring reference temperature		+18°C to +22°C	+18°C to +22°C	+18°C to +22°C
	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

Requirements for operational readiness

		800/130 kV	800/225 kV // 800/225 kV HR	1500/225 kV
Relative humidity		40 % to 70 %	40 % to 70 %	40 % to 70 %
Ambient temperature		+15°C to +35°C	+15°C to +35°C	+15°C to +35°C
Power rating		Power supply: 100/110/120/125/230/240 V ~ (+-10%) Type of current: 1/N/PE Frequency: 50 - 60 Hz (+-3,5%) Max. power consumption: 2,5 kVA Typ. energy demand: 1kWh (typically energy demand depends on installed hardware) Heat emission for typ. energy demand: 1 kW Fuse: C25A	Power supply: 400/230 V ~ (+-10%) Type of current: 3/N/PE Frequency: 50 - 60 Hz (+-3,5%) Max. power consumption: 6.2 kVA Typ. energy demand: 1,5-2,5 kWh (typically energy demand depends on installed hardware) Heat emission for typ. energy demand: 2,5 kW Fuse: C25A	Power supply: 400/230 V ~ (+-10%) Type of current: 3/N/PE Frequency: 50 - 60 Hz (+-3,5%) Max. power consumption: 6.2 kVA Typ. energy demand: 1,5-2,5 kWh (typically energy demand depends on installed hardware) Heat emission for typ. energy demand: 2,5 kW Fuse: C32A

1) The theoretical max. workpiece size is given. Given values describe the envelop cylinder when part is rotated. Sample holders are not yet considered and might reduce the given values.

2) Necessary to achieve the specified accuracy.

3) Max. acceptable mass moment of inertia $J = 0,6 \text{ kgm}^2$ and max. acceptable breakdown torque 10 Nm.

Approvals

Regulations

ZEISS METROTOM 800 and ZEISS METROTOM 1500 comply with EC machine directive 2006/42/EC and EMC directive 2014/30/EU. IEC/EN 61010-2-091, CFR 1020.40
ZEISS METROTOM 800/130kV also complies to cCSAus-authorization



Disposal

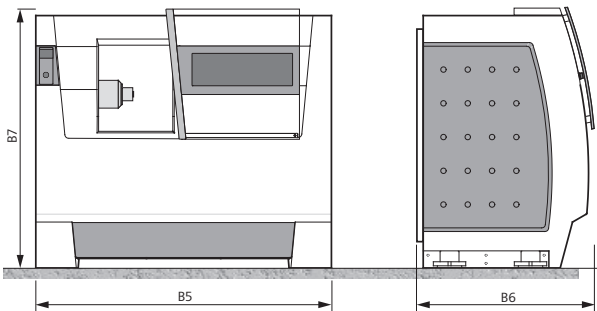
ZEISS products and packaging returned to us are disposed of in accordance with applicable legal provisions.

Certifications/accreditations

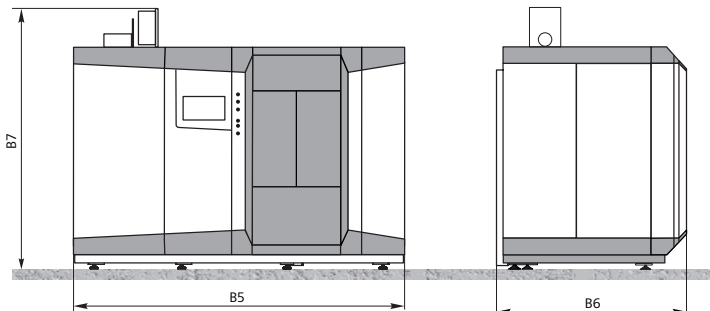
Quality management system	ISO 9001:2015, VDA 6, Parts 4, 3. Version 2017
Environmental management system	ISO 14001:2015
Occupational health & safety management systems	BS OHSAS 18001:2007
Accredited	ISO / IEC 17025:2005

ZEISS METROTOM sizes	Dimensions in mm			Weight in kg
	Overall machine dimensions			
	Width	Length	Height	
	B6	B5	B7	
800/130 kV	1310	2190	1960	5700
800/225 kV // 800/225 kV HR	1900	3330	2420	5200
1500/225 kV	1809	3700	2441	6600

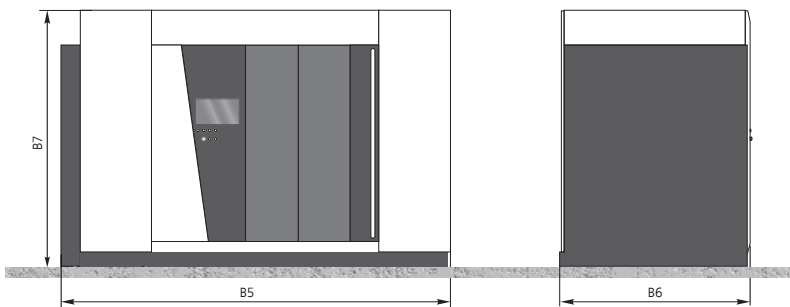
ZEISS METROTOM 800/130 kV



ZEISS METROTOM 800/225 kV // 800/225 kV HR



ZEISS METROTOM 1500/225 kV



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.

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