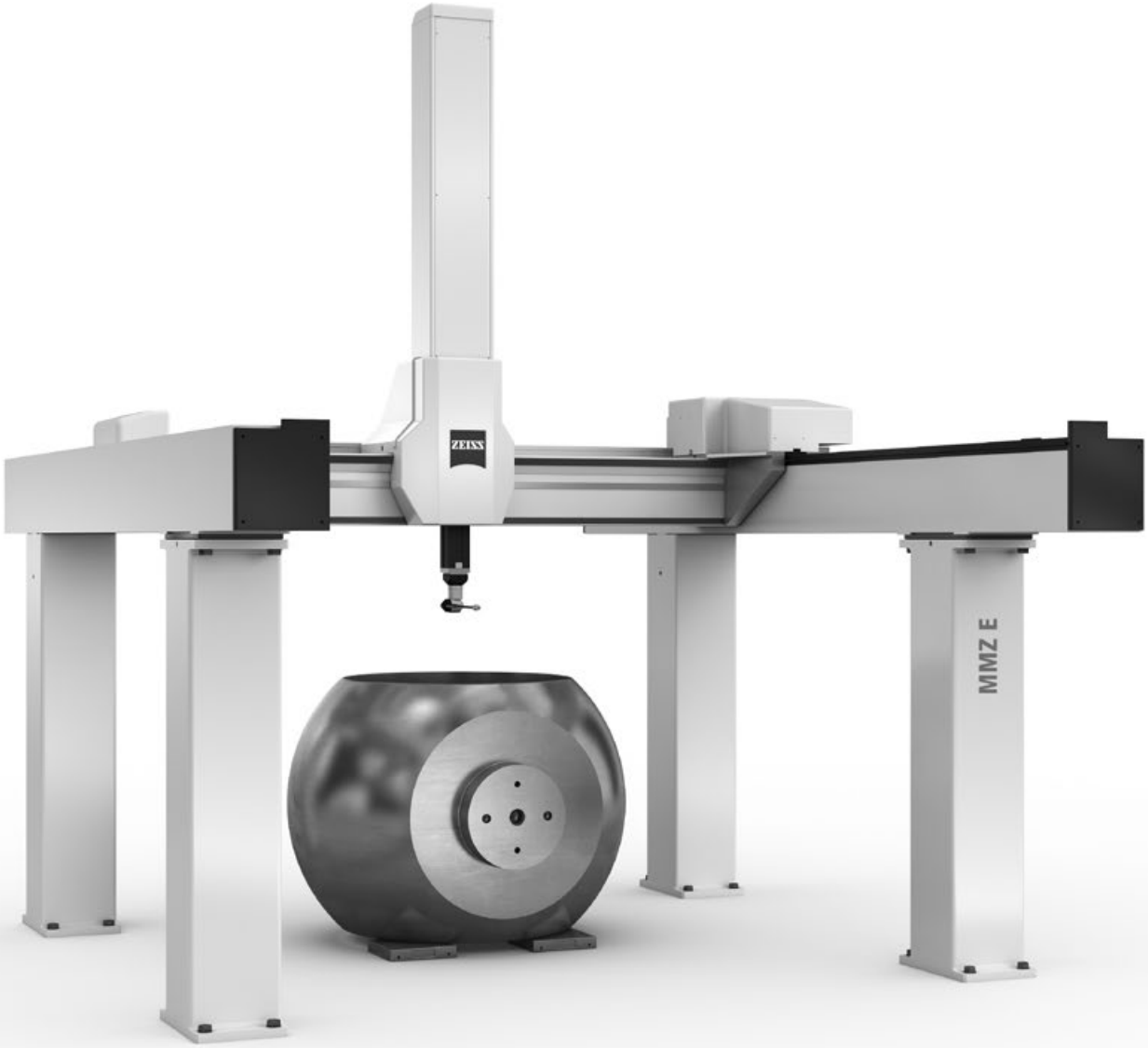
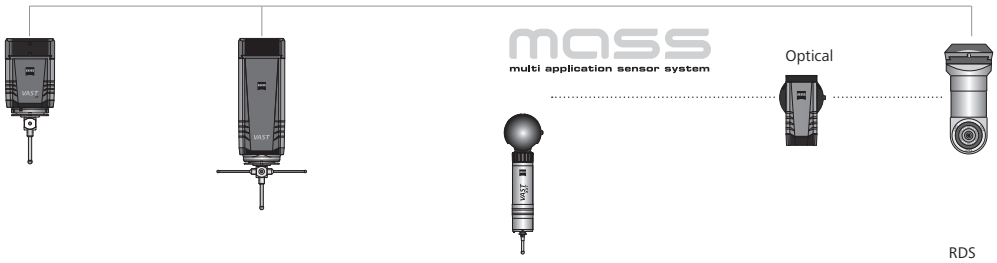


ZEISS MMZ E
Specifications
Version: November 2017

System description

Type according to ISO 10360-1:2000	Gantry CMM			
Guideways	X axis	Precision-manufactured, anodized extruded profile made of light metal		
	Y axis	On stabilized, welded steel supports		
	Z axis	Extruded component made of silicon carbide (active) or precision-manufactured, anodized extruded component made of light metal (compact)		
Drive type	X axis	Friction drive		
	Y axis	Rack and pinion system		
	Z axis	Friction drive		
Guideway system	Air bearings in X and Z axes, air bearings and linear guideway in Y axis			
Drive system	DC motor in all moving axes			
Temperature compensation	Temperature compensation of workpiece and scales. Optional for ZEISS MMZ E compact			
Measuring system	Free-float steel scale in steel tape scale in aluminum cassette in all axes, resolution 0.2 µm. 2 scales and reader heads in Y axis for ZEISS MMZ E active. 1 scale and reading head in Y axis of ZEISS MMZ E compact.			
Travel speed	Motorized	Axes	in mm/s	0 to 100
	CNC	X axis	in mm/s	max. 350 (in conjunction with safety technology)
		Y axis		
		Z axis		
		Vector	in mm/s	max. 610
Acceleration		Axes	in mm/s^2	400
		Vector	in mm/s^2	700
Scanning speed			in mm/s	max. 200

Sensor overview



	VAST XT gold	VAST gold	VAST XXT	LineScan
Multi-point	■	■	■	
Passive scanning			■	
Active scanning	■	■		
Optical scanning				■
Rotary table/ tiltable			■	■
Max. stylus length [1)]	500 mm	800 mm	250 mm	
Max. stylus weight [1)]	500 g	600 g	15 g	
VAST navigator	optional	optional		

1) Depending on the application, it may be advisable to limit the parameters for a stylus system.

Sensors and accuracy of ZEISS MMZ E active

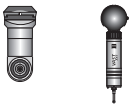
The CMM specifications are only valid when using original accessories by ZEISS. The specified parameters are observed in the application of the internal test instructions for acceptance testing and in the use of the released standards in accordance with the ISO 10360 series.

ZEISS RDS
Renishaw TP6

ZEISS RDS / Renishaw TP6:
Acceptance test with stylus length of 40 mm and tip diameter of 8 mm

			20/yy/10	20/yy/15	25/yy/15	25/yy/18
Length measurement error [1] MPE complies with ISO 10360-2:2001	E [2]	in µm	4.8 + L/230	5.3 + L/200	5.7 + L/200	6.8 + L/180
Probing error MPE complies with ISO 10360-2:2001	P [2]	in µm	5.0	5.5	5.5	6.0

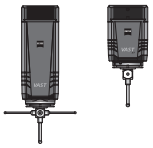
ZEISS RDS
ZEISS VAST XXT



ZEISS VAST XXT:
Acceptance test with a stylus length of 50 mm, tip diameter of 8 mm
Scanning measuring rate up to 500 points/s.

			20/yy/10	20/yy/15	25/yy/15	25/yy/18
Length measurement error [1] MPE complies with ISO 10360-2:2001	E [2]	in µm	3.8 + L/230	4.3 + L/200	4.7 + L/200	5.8 + L/180
Probing error MPE complies with ISO 10360-2:2001	P [2]	in µm	3.5	4.0	4.0	4.5
Scanning error MPE complies with ISO 10360-4:2000	THP[2]	in µm	4.5	5.0	5.0	6.0
Required measuring time MPT	τ	in s	70	70	70	70

ZEISS VAST gold
ZEISS VAST XT gold



ZEISS VAST gold:
Acceptance test with a stylus length of 75 mm, tip diameter of 12 mm
Scanning measuring rate up to 500 points/s.

			20/yy/10	20/yy/15	25/yy/15	25/yy/18
Length measurement error [1] MPE complies with ISO 10360-2:2001	E [2]	in µm	3.3 + L/230	3.8 + L/200	4.2 + L/200	5.3 + L/180
Probing error MPE complies with ISO 10360-2:2001	P [2]	in µm	3.0	3.5	3.5	4.0
Scanning error MPE complies with ISO 10360-4:2000	THP[2]	in µm	3.5	4.0	4.0	5.0
Required measuring time MPT	τ	in s	70	70	70	70

ZEISS LineScan [3] [4]

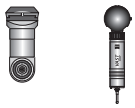
Optical laser triangulation scanner on ZEISS RDS-D.

The achievable accuracy is consistent with the values of the MMZ E compact, and are subsequently in Chapter sensors and precision Carl Zeiss MMZ E compact listed (page 3):

1) Measuring length L in mm.
2) In compliance with the specified ambient conditions.
3) The use of optical probes requires calibration with a contact probe (e.g. ZEISS VAST XXT).
4) Laser class 2M: The accessible laser beam is 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).

Sensors and accuracy of ZEISS MMZ E compact

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 RDS **Renishaw TP6** 	ZEISS RDS / Renishaw TP6: Acceptance test with stylus length of 40 mm and tip diameter of 8 mm					
			20/yy/10	20/yy/15	25/yy/15	25/yy/18
Length measurement error [1] MPE complies with ISO 10360-2:2001	E [2]	in µm	5.0 + L/170	6.0 + L/125	7.5 + L/110	9.0 + L/100
Probing error MPE complies with ISO 10360-2:2001	P [2]	in µm	6.0	7.0	7.5	9.0
ZEISS RDS **ZEISS VAST XXT** 	ZEISS VAST XXT: Acceptance test with a stylus length of 50 mm, tip diameter of 8 mm					
			20/yy/10	20/yy/15	25/yy/15	25/yy/18
Length measurement error [1] MPE complies with ISO 10360-2:2001	E [2]	in µm	4.0 + L/170	5.0 + L/150	6.0 + L/150	7.0 + L/125
Probing error MPE complies with ISO 10360-2:2001	P [2]	in µm	4.0	4.5	5.0	5.5
Scanning error MPE complies with ISO 10360-4:2000	THP[2]	in µm	5.5	6.0	6.0	7.0
Required measuring time MPT	τ	in s	70	70	70	70
ZEISS LineScan [3] [4] 	Optical laser triangulation scanner on ZEISS RDS-C.					
			20/yy/10	20/yy/15	25/yy/15	25/yy/18
25 mm working range 63 mm working distance						
Probing error [5] MPE complies with ISO 10360-8	PF (OT)	in µm	12	12	12	12
Dispersion on sphere	1 Sigma	in µm	4	4	4	4
50 mm working range 94 mm working distance						
Probing error [5] MPE complies with ISO 10360-8	PF (OT)	in µm	20	20	20	20
Dispersion on sphere	1 Sigma	in µm	5	5	5	5
100 mm working range 220 mm working distance						
Probing error [5] MPE complies with ISO 10360-8	PF (OT)	in µm	50	50	50	50
Dispersion on sphere	1 Sigma	in µm	12	12	12	12

1) Measuring length L in mm.
2) In compliance with the specified ambient conditions.
3) The use of optical probes requires calibration with a contact probe (e.g. ZEISS VAST XXT).
4) Laser class 2M: The accessible laser beam is 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 tolerance in the center of the measuring range on a suitable sphere (30 mm diameter) with matte surface. According to ISO 10360-8 PF(OT) indicates D.95 %,Tr,Opt. The information on the working distance refers to the center of the measuring range.

ZEISS MMZ E type comparison

	ZEISS MMZ E active	ZEISS MMZ E compact
Ram	Silicone carbide	Light metal
Sensors	ZEISS RDS-D-CAA, ZEISS VAST gold, ZEISS VAST XT gold, LineScan 2-25, 2-50, 2-100	ZEISS RDS-C-CAA, ZEISS VAST XXT, LineScan 2-25, 2-50, 2-100
Navigator	Optional only	No
mass	Yes	No
Controller	ZEISS C99 in TCC control cabinet	ZEISS C99 in TCC control cabinet
Temperature compensation	Standard	Optional
Dual scale	in Y axis	Not available
Rotary tables	Optional	Not available

Probes

Manual probe	Not available
Articulating sensor holder	ZEISS MMZ E compact: ZEISS RDS-C-CAA ZEISS MMZ E active: ZEISS RDS-D-CAA
Contact sensors	Renishaw TP6
Active and passive scanning sensors	ZEISS VAST gold and ZEISS VAST XT gold, VAST XXT, only for ZEISS MMZ E active
Stylus changer	Available

Environmental conditions

Temperature conditions to guarantee specified accuracies		
Measuring reference temperature	18 °C - 22 °C	
Temperature gradient	per day	2.0 K/d
	per hour	1.0 K/h
	spatial	0.5 K/m
Relative humidity	40 % - 70% (without condensation)	
Permissible vibrations	<2 mm/s^2 from 1 to 10 Hz	
	15 mm/s^2 from 10 to 20 Hz	
	50 mm/s^2 from 20 to 100 Hz	

Requirements for operational readiness

Relative humidity	Max. 70 % (without condensation)
Consumption of compressed air	Max. 150 Nl/min
Provision of compressed air	6-10 bar (87-145 psi) supply pressure. Pre-cleaned air as per ISO 8573 Part1: Class 4
Electrical power rating	1/N/PE 100/110/115/120/125/230/240 VAC ~ (± 10 %); 50-60 Hz (± 3.5 %) Power consumption: with TCC control cabinet: max. 1600 VA Typical power consumption: 500W

Approvals

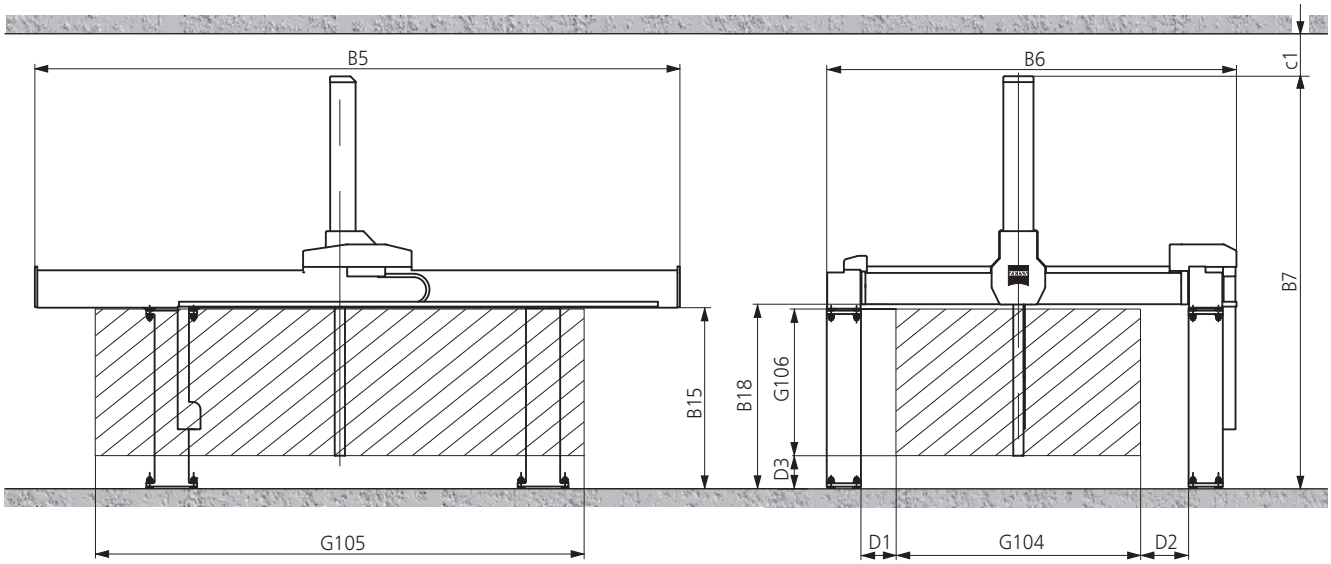
Regulations	ZEISS MMZ E complies with EC machine directive 2006/42/EC and EMC directive 2014/30/EU. CE
Disposal	ZEISS products and packaging returned to us are disposed of in accordance with applicable legal provisions.

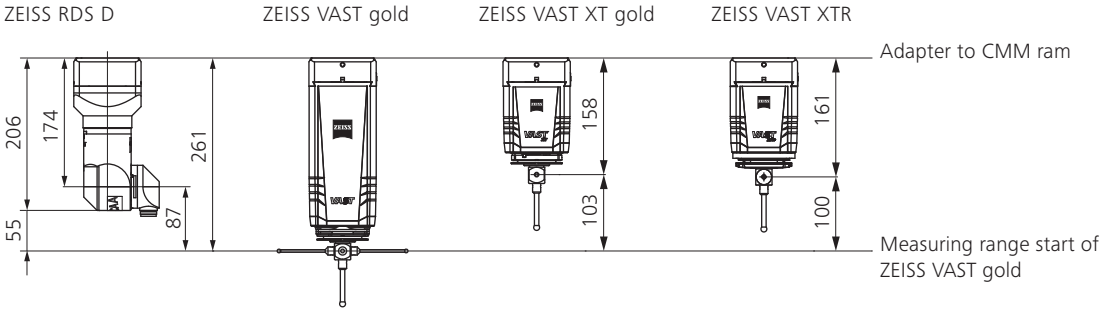
Certification/accreditation

Quality management system	ISO 9001:2008 VDA 6, Parts 4, 2. Version 2005
Environmental management system	ISO 14001:2004
Occupational health & safety management systems	BS OHSAS 18001:2007
Accredited	ISO/IEC 17025:2005

ZEISS MMZ E sizes	Dimensions in mm												Weight in kg	Number of columns
	Measuring range			Total machine dimensions			Working range					Assembly space	Measuring machine	
	X axis	Y axis	Z axis	Width	Length	Height	Height	Height	Height	Width	Width	Height		
	G104	G105	G106	B6	B5	B7	B15	B18	D3	D1	D2	c1		
20/30/10	2000	3000	1000	3690	4600	3720	1852	1887	837	360	490	≥200	3600	2 + 2
20/40/10	2000	4000	1000	3690	5600	3720	1852	1887	837	360	490	≥200	4100	2 + 2
20/30/15	2000	3000	1500	3690	4600	4220	1852	1887	337	360	490	≥200	3600	2 + 2
20/40/15	2000	4000	1500	3690	5600	4220	1852	1887	337	360	490	≥200	4100	2 + 2
20/50/15	2000	5000	1500	3690	6600	4220	1852	1887	337	360	490	≥200	4600	2 + 2
25/40/15	2500	4000	1500	4190	5600	4220	1852	1887	337	360	490	≥200	4200	2 + 2
25/50/15	2500	5000	1500	4190	6600	4220	1852	1887	337	360	490	≥200	4700	2 + 2
25/60/15	2500	6000	1500	4190	7600	4220	1852	1887	337	360	490	≥200	5200	3 + 3
25/40/18	2500	4000	1800	4190	5600	4820	2152	2187	337	360	490	≥200	4300	2 + 2
25/50/18	2500	5000	1800	4190	6600	4820	2152	2187	337	360	490	≥200	4800	2 + 2
25/60/18	2500	6000	1800	4190	7600	4820	2152	2187	337	360	490	≥200	5300	3 + 3

The max. parts weight depends on the foundation





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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