



**PRISMO®**  
**Specifications**  
Version: October 2015



We make it visible.

## ZEISS PRISMO ultra sensor and accuracy <sup>10)</sup>

ZEISS VAST gold<sup>1)</sup>



Active scanning and multi-point sensor.

Scanning measuring rate up to 200 points/s. Variable measuring force (50-1000 mN) for data acquisition.

ZEISS VAST gold: stylus: max. length = 800 mm, max. weight = 600 g incl. stylus adapter, min. stylus tip diameter = 0.3 mm. With navigator and performance technology to increase measuring performance.

				ZEISS PRISMO 5 + 7 X=700 and X=900		ZEISS PRISMO 10 X=1200		ZEISS PRISMO 10 X=1600
Length measurement error <sup>2)</sup> MPE complies with ISO 10360-2:2009	EO	in µm	at 20-22 °C	0.5+L/500	at 20-22 °C	1.2+L/500	at 20-22 °C	1.9+L/400
			-	-	at 20-22 °C	1.0+L/500 <sup>4)</sup>	at 20-22 °C	1.6+L/400 <sup>7)</sup>
	E150	in µm	at 20-22 °C	0.8+L/500	at 20-22 °C	1.6+L/500	at 20-22 °C	2.5+L/400
Repeatability range of EO MPL complies with ISO 10360-2:2009	R0	in µm		0.4		0.7		0.8
Scanning error MPE complies with ISO 10360-4:2000	THP	in µm		0.9		1.1		1.6
required measuring time MPT	τ	in s		40		40		45
Form measurement error <sup>5)</sup> MPE for roundness complies with ISO 12181 (VDI/VDE 2617 sheet 2.2)	RONt (MZCI)	in µm		0.5		0.7		0.9
Single stylus form probing error MPE complies with ISO 10360-5:2010	PFTU	in µm		0.5		0.8		1.1
Multi-stylus form probing error MPE complies with ISO 10360-5:2010	PFTM <sup>8)</sup>	in µm		1.9		2.2		2.3
Multi-stylus dimension probing error MPE complies with ISO 10360-5:2010	PSTM <sup>8)</sup>	in µm		0.6		0.9		1.1
Multi-stylus location probing error MPL complies with ISO 10360-5:2010	PLTM <sup>8)</sup>	in µm		1.2		1.5		1.7

## ZEISS PRISMO navigator sensor and accuracy

ZEISS VAST gold <sup>1)</sup>

ZEISS VAST XTR gold <sup>1)</sup>



Active scanning and multi-point sensor.

Scanning measuring rate up to 200 points/s. Variable measuring force (50-1000 mN) for data acquisition.

ZEISS VAST gold: stylus: max. length = 800 mm, max. weight = 600 g incl. stylus adapter, min. stylus tip diameter = 0.3 mm. With navigator and performance technology to increase measuring performance.

ZEISS VAST XTR gold: max. length = 350 mm, max. weight = 500 g incl. stylus adapter, min. stylus tip diameter = 0.5 mm.

With navigator and performance technology to increase measuring performance.

				ZEISS PRISMO 5 + 7 X=700 and X=900		ZEISS PRISMO 10 X=1200		ZEISS PRISMO 10 X=1600
Length measurement error <sup>2)</sup> MPE complies with ISO 10360-2:2009	EO/E150	in µm	at 19-21 °C	0.9+L/350 <sup>3)</sup>	at 18-22 °C	1.5+L/350	at 18-22 °C	2.0+L/300
			at 15-30 °C	1.2+L/250	at 18-28 °C	1.8+L/300 <sup>4)</sup>	at 18-28 °C	3.4+L/270 <sup>4)</sup>
Repeatability range of EO MPL complies with ISO 10360-2:2009	R0	in µm		0.8		1.1		1.5
Scanning error MPE complies with ISO 10360-4:2000	THP	in µm	at 19-21 °C	1.3 (ZEISS PRISMO 5) 1.7 (ZEISS PRISMO 7)	at 18-22 °C	1.7	at 18-22 °C	2.5
required measuring time MPT	τ	in s		40		40		40
Form measurement error <sup>5)</sup> MPE for roundness complies with ISO 12181:2011 (VDI/VDE 2617 sheet 2.2:2000)	RONt (MZCI)	in µm		1.0		1.3		1.9
Single stylus form probing error MPE complies with ISO 10360-5:2010	PFTU	in µm		1.0		1.3		1.9
Multi-stylus form probing error MPE complies with ISO 10360-5:2010	PFTM <sup>8)</sup>	in µm		2.1 (ZEISS PRISMO 5) 2.7 <sup>9)</sup> 2.4 (ZEISS PRISMO 7) 3.0 <sup>9)</sup>		2.7 3.3 <sup>9)</sup>		3 3.6 <sup>9)</sup>
Multi-stylus dimension probing error MPE complies with ISO 10360-5:2010	PSTM <sup>8)</sup>	in µm		1.0 (ZEISS PRISMO 5) 1.2 (ZEISS PRISMO 7)		1.4		1.6
Multi-stylus location probing error MPL complies with ISO 10360-5:2010	PLTM <sup>8)</sup>	in µm		1.6 (ZEISS PRISMO 5) 1.7 <sup>9)</sup> 1.8 (ZEISS PRISMO 7) 1.9 <sup>9)</sup>		2.0 2.1 <sup>9)</sup>		2.1 2.2 <sup>9)</sup>

1) 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 with PRISMO navigator; Ø 3 x 33 mm, Ø 5 x 50 mm and Ø 12 x 92 mm with PRISMO ultra).

2) Measuring length L in mm.

3) 1.2 + L/350 at 18-22°C.

4) ZEISS PRISMO navigator 10 (Y >2400) 18-24°C.

5) Roundness in scanning operations on a 50 mm ring gauge with v 5 mm/sec, filter 50 W/U.

6) In limited measuring range 800/1000/600

7) In limited measuring range 800/1200/600

8) Measuring location near the calibration position to document sensor properties.

9) Applies to ZEISS VAST XTR gold

10) Accuracy in conjunction with the ZEISS RSH and the corresponding reference sphere bending correction.

## ZEISS RDS Sensors and accuracy

### ZEISS RDS



Dynamic ZEISS RDS 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  $\pm 180^\circ$ , large measuring range, rotation increments of  $2.5^\circ$ , CAA correction for automatic calibration of all 20,736 angular positions for touch-trigger multi-point sensors.

with ZEISS VAST XXT <sup>1)</sup>



Scanning and multi-point sensor on ZEISS RDS articulating probe holder. Measuring speed up to 2.5 seconds per point; stylus length with TL1 module = 30 - 125 mm; max. extension = 100 mm; max. stylus weight = 10 g; min. stylus tip diameter = 0.3 mm.

				ZEISS PRISMO 5 + 7 X=700 and X=900		ZEISS PRISMO 10 X=1200		ZEISS PRISMO 10 X=1600
Length measurement error <sup>2)</sup> MPE complies with ISO 10360-2:2009	E0 / E40	in $\mu\text{m}$	at 18-22 °C	1.6 + L/350	at 18-22 °C	2.2 + L/300	at 18-22 °C	3.2 + L/250
			at 18-26 °C	2.1 + L/300	at 18-26 °C	2.9 + L/250 <sup>3)</sup>	at 18-26 °C	3.7 + L/200 <sup>3)</sup>
Scanning error MPE complies with ISO 10360-4:2000	THP	in $\mu\text{m}$	at 18-22 °C	2.5	at 18-22 °C	3.5	at 18-22 °C	4.0
required measuring time MPT	$\tau$	in s		50 <sup>10)</sup>		68		68
Single stylus form probing error MPE complies with ISO 10360-5:2010	PFTU	in $\mu\text{m}$		1.7		1.9		3.0

with ZEISS ViScan <sup>4) 5)</sup>



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

				ZEISS PRISMO 5 + 7 X=700 and X=900		ZEISS PRISMO 10 X=1200		ZEISS PRISMO 10 X=1600
Length measurement error <sup>2)</sup> MPE complies with ISO 10360-7: 2011	EB(XY)	in $\mu\text{m}$	at 18-22 °C	10 + L/350	at 18-22 °C	10 + L/300	at 18-22 °C	10 + L/250
Probing error of image processing system MPE complies with ISO 10360-7:2011	PFV2D	in $\mu\text{m}$		10		10		10

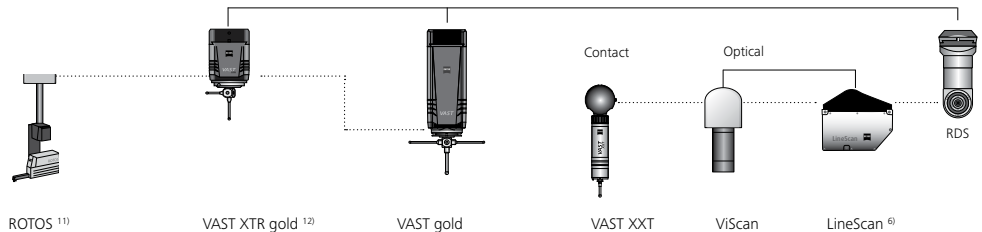
with ZEISS LineScan <sup>4) 6)</sup>



Optical laser triangulation scanner on ZEISS RDS. Maximum working distance: 73mm.  
Maximum transmission rate 250,000 points/s; 1000 profiles/s.

				ZEISS PRISMO 5 + 7 X=700 and X=900		ZEISS PRISMO 10 X=1200		ZEISS PRISMO 10 X=1600
Scanning error MPE complies with ISO 10360-8 (VDI/VDE 2617 sheet 6.2:2005) <sup>7)</sup>	PF (OT)	in $\mu\text{m}$	at 18-22 °C	50	at 18-22 °C	50	at 18-22 °C	50
Dispersion on sphere	(1 Sigma)	in $\mu\text{m}$		10		10		10

## Overview



	RODOS <sup>11)</sup>	VAST XTR gold <sup>12)</sup>	VAST gold	VAST XXT	ViScan	LineScan <sup>6)</sup>
Multi-point		■	■	■	■	
Min. probing force		50 mN	50 mN			
Measuring rate						
Passive Scanning				■		
Active Scanning		■	■			
Optical Scanning						■
Roughness measurement	■					
Rotatable / tiltable	■			■	■	■
Max. stylus length <sup>8)</sup>		350 mm	800 mm	250 mm <sup>9)</sup>		
Max. stylus weight (including adapter plate) <sup>8)</sup>		500 g	600 g	15 g <sup>9)</sup>		
Minimum stylus tip diameter <sup>8)</sup>		0,5 mm	0,3 mm	0,3 mm		

1) Specifications for ZEISS VAST XXT, TL1.

2) Measuring length L in mm.

3) ZEISS PRISMO navigator 10 (Y >2400) 18-24°C.

4) The use of optical probes only makes sense in conjunction with a contact probe, temperature range 18-22°C.

5) Measured with ZEISS ViScan 1x lens

6) Laser class 2M: the accessible laser beam lies in the visible spectral range that is safe for the eye at a short exposure time (up to 0.25 s) as long as the cross section is not reduced by optical instruments (e.g. magnifiers, lens elements, telescope).

7) Probing error on suitable sphere with matte surface

8) Depending on the application, limiting the parameters for a stylus configuration may be useful.

9) ZEISS VAST XXT: depending on model (TL1, TL2 or TL3).

10) 68 s for ZEISS PRISMO ultra

11) Only for PRISMO navigator Z < 1000; PRISMO ultra on request

12) Only for PRISMO navigator

## Dynamics

			ZEISS PRISMO 5+7 X=700 and X=900	ZEISS PRISMO 10 X=1200	ZEISS PRISMO 10 X=1600	ZEISS PRISMO ultra
Travel speeds	Motorized	in mm/s	0 to 70	0 to 70	0 to 70	0 to 70
	CNC	axis	max. 300	max. 300	max. 300	max. 300
		Vector	in mm/s	max. 520	max. 520	max. 520
	Scanning speed (with navigator)	in mm/s	max. 350	max. 350	max. 350	max. 350
Acceleration	axis	in m/s <sup>2</sup>	max. 1.2	max. 1.2	max. 0.8	max. 0.38
	Vector	in m/s <sup>2</sup>	max. 1.87	max. 1.87	max. 1.38	max. 0.67

## Technical features

Controller	Type	MCC 800
	Protection type	IP54
	Cooling system	Fan
Clamping device	Flatness in accordance with DIN 876	
Data technology	The ZEISS PRISMO line comes standard with a fully equipped workstation.	
Accessories (optional)	Increased permissible workpiece weight; leveling unit for uneven floors (only ZEISS PRISMO ultra), display for machine status, various controllers, multi-sensor rack, rotary table	
Scales	Glass ceramic. For Y >2400, steel scales (on ZEISS PRISMO navigator) and automatic temperature capture are used.	
Resolution	0.02 µm ZEISS PRISMO ultra, 0.2 µm ZEISS PRISMO navigator	




## Environmental conditions

Temperature conditions to guarantee specified accuracies	ZEISS PRISMO navigator					ZEISS PRISMO ultra	
	5+7	5+7	10 X=1200	10 X=1600	10 X=1200 and 1600		
Measuring reference temperature from		19-21°C	15-30°C	18-22°C	18-22°C	18-28°C <sup>1)</sup>	20-22°C
	per day	1.8 K/d	5 K/d	1.8 K/d	2 K/d	5 K/d	1 K/d
	per hour	0.8 K/h	2 K/h	0.8 K/h	1 K/h	2 K/h	0.5 K/h
	spatial	0.8 K/m	1 K/m	0.8 K/m	1 K/m	1 K/m	0.5 K/m
Floor vibrations	ZEISS PRISMO ultra is equipped with active vibration damping. ZEISS PRISMO navigator is equipped with a vibration damping system featuring elastomer/viscous supports. Limiting curves upon request; upon request, we will conduct a vibration analysis.						

## Requirements for operational readiness

Relative humidity	40 to 70% (non-condensing)
Ambient temperature	15°C to 35°C
Power rating	1/N/PE 100/110/115/120/125/230/240 V~ (±10%); 50-60 Hz (±3.5%). Max. power consumption 2500 VA Typical power consumption: 380 W
Compressed air supply	Supply pressure min. 6 bar, max. 8 bar, pre-cleaned. Consumption approx. 50 Nl/min. Air quality complies with ISO 8573 part 1: class 4 The use of the AirSaver included with delivery ensures that compressed air is not used during ZEISS PRISMO downtimes, thus enabling environmentally friendly operations.
Data technology	The ZEISS PRISMO line comes with a workstation or high-quality computer systems. The system can also be equipped with components for connection to your in-house network, if requested.

## Approvals

Regulations	ZEISS PRISMO complies with EC machine directive 2006/42/EC and EMC directive 2004/108/EEC.
	  
Disposal	ZEISS products and packaging returned to us are disposed of in accordance with applicable legal provisions.

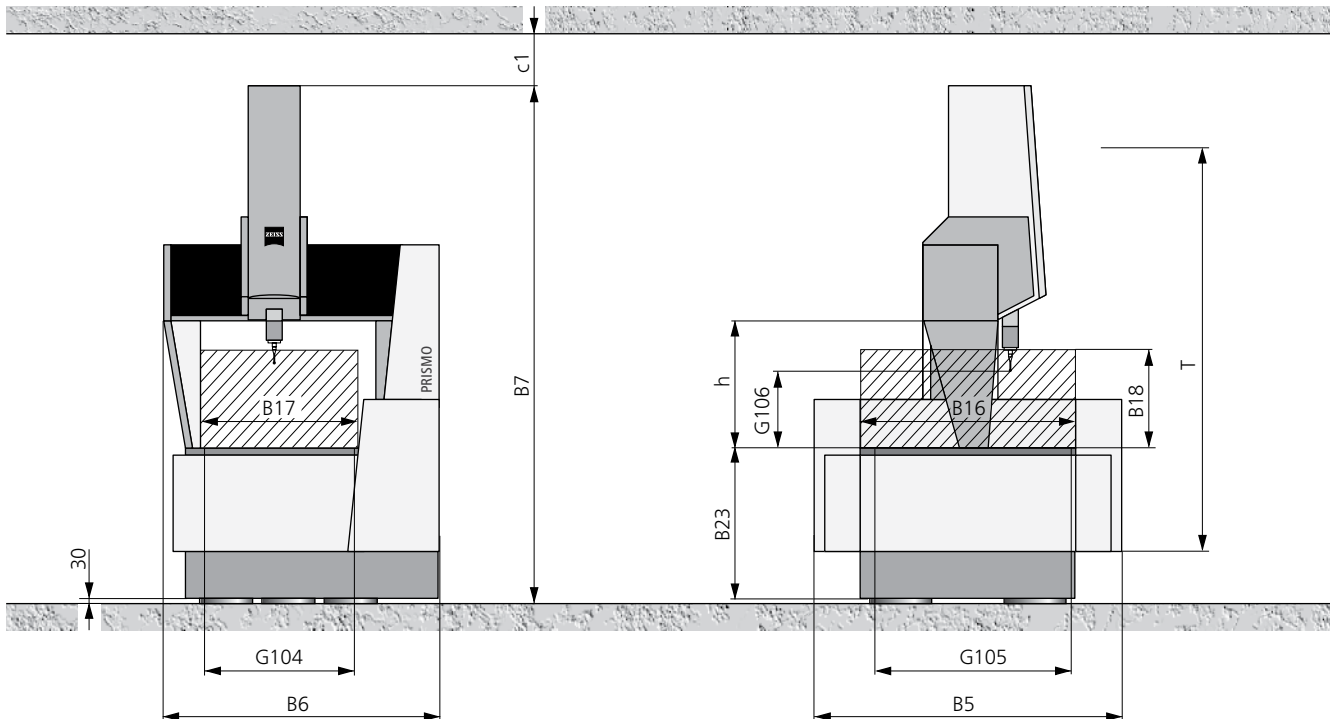
## Certification/accreditation

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

1) ZEISS PRISMO navigator 10 (Y >2400) 18-24°C with gradient: 1.8K/d, 0.8K/h, 0.8K/m.

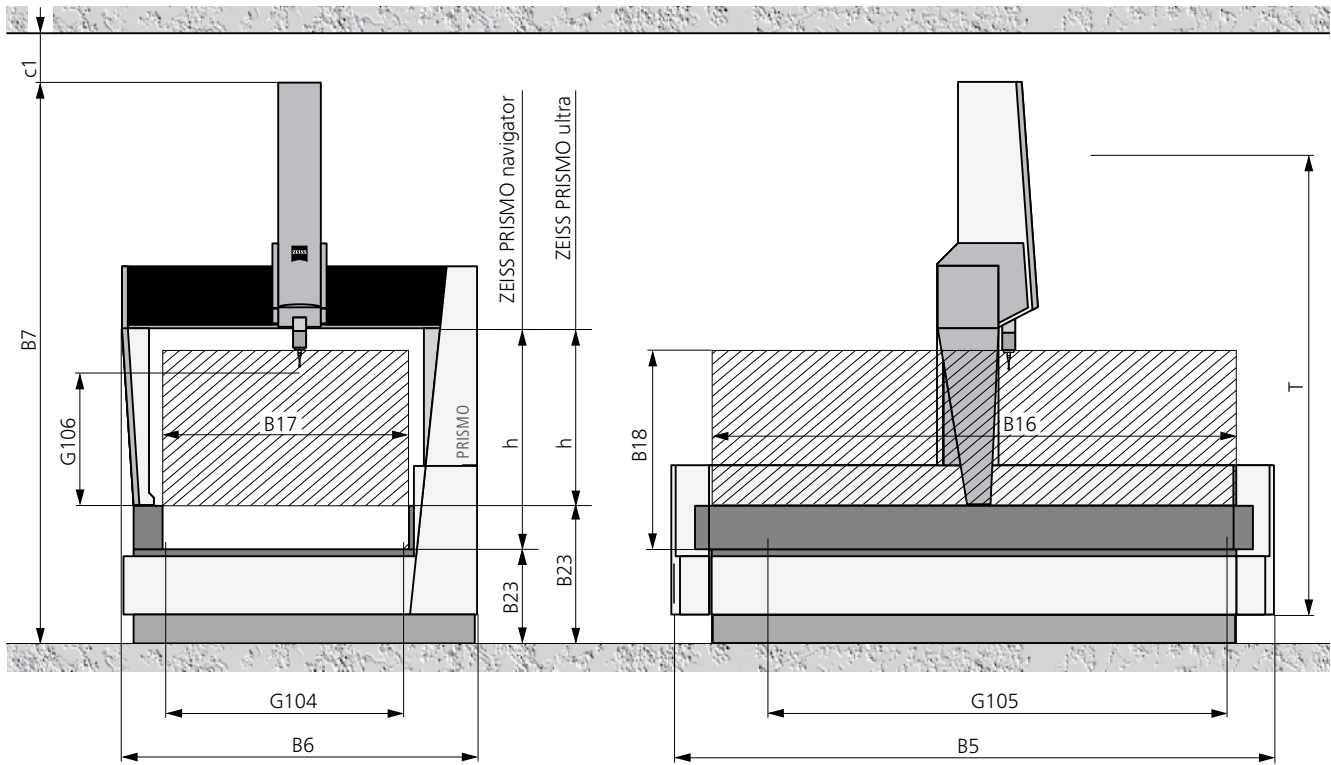
ZEISS PRISMO Sizes	Dimensions in mm													Weight in kg	
	Measuring range			Overall machine dimensions			Working range (Max. workpiece size)			Table height	Assembly space	Transport height	Measuring machine	Work-piece	
	X axis	Y axis	Z axis	Width	Length	Height	Width	Length	Height	Height	Height	Height	Height		
	G104	G105	G106 <sup>4)</sup>	B6	B5	B7	B17	B16	B18 <sup>3)</sup>	h	B23 <sup>1)</sup>	c1	T		
<b>ZEISS PRISMO ultra</b>															
7/10/5	700	1000	500	1557	2040	2906	896	1520	605	720	880	200	2310	3120	1000
9/13/7	900	1300	650	1733	2340	3060	1070	1820	705	820	880	200	2160	2950	1000
12/18/10	1200	1800	1000	2050	2940	3515	1416	2420	1079	1220	595	200	2410	6000	1500
12/24/10	1200	2400	1000	2050	3540	3515	1416	3220	1079	1220	595	200	2410	7250	2000
16/24/10	1600	2400	1000	2450	3540	3865	1700	3020	1147	1293	877	200	2800	13360	4000
16/30/10	1600	3000	1000	2450	4140	3865	1700	3620	1147	1293	877	200	2800	15750	4000
<b>ZEISS PRISMO navigator</b>															
7/9/5	700	900	500	1568	1750	2940	885	1220	585	710	860	200	1960	1700	1200
7/9/7	700	900	650	1568	1750	3040	885	1220	695	810	860	200	2110	1800	1200
9/12/7	900	1200	650	1743	2050	3040	1060	1520	695	810	860	200	2110	2300	1300
9/15/7	900	1500	650	1743	2350	3040	1060	1820	695	810	860	200	2160	2950	1500
9/18/7	900	1800	650	1743	2650	3040	1060	2120	695	810	860	200	2160	3460	1500
9/24/7	900	2400	650	1743	3250	3040	1060	2720	695	810	860	200	2160	4740	2000
12/18/10	1200	1800	1000	2060	2950	3550 <sup>2)</sup>	1406	2420	1069	1210	600 <sup>2)</sup>	200	2410	6100	2000
														6200 <sup>3)</sup>	5000 <sup>3)</sup>
12/24/10	1200	2400	1000	2060	3550	3780 <sup>3)</sup>	1406	3020	1069	1210	600 <sup>2)</sup>	200	2410	7350	2500
														7450 <sup>3)</sup>	5000 <sup>3)</sup>
12/30/10	1200	3000	1000	2060	4150	3600	1406	3620	1069	1210	650	200	2410	9600	3500
														9700 <sup>3)</sup>	5000 <sup>3)</sup>
12/42/10	1200	4200	1000	2060	5350	3600	1406	4820	1069	1210	650	200	2410	13000	3500
														13100 <sup>3)</sup>	5000 <sup>3)</sup>
16/24/10	1600	2400	1000	2460	3540	3900	1690	3020	1369	1515	650	200	2800	11000	3500
16/30/10	1600	3000	1000	2460	4150	3900	1690	3620	1369	1515	650	200	2800	13000	3500
														13100 <sup>1)</sup>	5000 <sup>1)</sup>
16/42/10	1600	4200	1000	2460	5350	3900	1690	4820	1369	1515	650	200	2800	17000	3500
														17100 <sup>1)</sup>	5000 <sup>1)</sup>

From 7/9/5 to 12/42/10



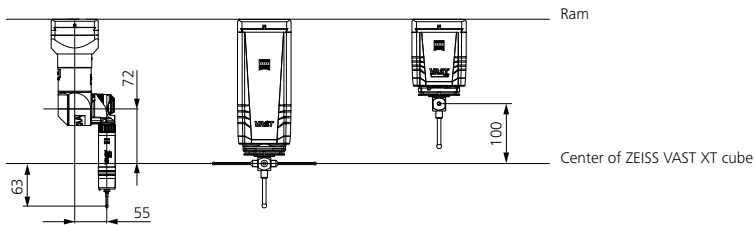
Note: the given dimensions and weights are approximate values. Subject to change. Dimensioning based on DIN 4000-167:2009.

- 1) Deviations from the given values can occur depending on the subsoil properties.
- 2) Optional table height 830 mm with base.
- 3) CMM with increased permissible workpiece weight option (NSP).
- 4) Data applies to ZEISS VAST gold with stylus length of 60 mm and tip diameter of 8 mm
- 5) Data applies to ZEISS VAST gold without adapter plate.



**Size comparison of the sensors**

ZEISS RDS Select Basis / ZEISS VAST gold      ZEISS VAST gold      ZEISS VAST XTR gold  
 ZEISS VAST XXT TL 1



Note: the given dimensions and weights are approximate values. Subject to change. Dimensioning based on DIN 4000-167:2009.

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