

Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89

Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81

Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Ноябрьск (3496)41-32-12
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47

Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Саранск (8342)22-96-24
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35

Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

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Video Measurement System, Multisensor

► High-Speed, Non-Contact 3-Axis Coordinate Measurement
► Superior Stability and Accuracy from Granite Base and Gantry
► Multisensor: Video, Touch, and Laser Sensors
► High-Accuracy Air or Mechanical Bearings

VSA463
Video Measurement System
305 mm x 305 mm x 200 mm Range
Shown with Coaxial Light and Touch Probe

VSA713
Video Measurement System
711 mm x 610 mm x 200 mm Range
Shown with Adjustable Quadrant Light

Features

- XYZ Measuring Range Options:
 - 305 mm x 305 mm x 200 mm (Linear Motor)
 - 305 mm x 460 mm x 200 mm (Linear or Servo Motor)
 - 610 mm x 711 mm x 200 mm (Linear or Servo Motor)
 - 760 mm x 965 mm x 200 mm (Linear Motor)
 - 915 mm x 1270 mm x 200 mm (Linear Motor)
- All Systems Offer CNC and Manual Operation
- High-Resolution Video Sensors for High-Contrast Imaging
- Laser and Tactile Probes for Multisensor Metrology
- Multiple LED Options to Highlight Surface and Edge Features
- Stable Granite Base Ensures High Accuracy and Repeatability
- Floor-Standing, Ergonomic Workstation for Simple and Convenient Operation
- Advanced, Feature-Rich M3 MetLogix[®] Metrology Control Software

This video outlines the features, options, and accessories for our line of VideoMic[®] video measurement systems.

Build Your Coordinate Measuring Machine

- Select a Base System (Required, See *Base Systems* tab for Details)
- Select Video System Options (Required, See *Video Configurations* tab for Details)
 - Camera, Zoom Lens, Lighting, and Software
- Select Additional Sensors and Accessories (Optional, See *Accessories* tab for Details)
 - Touch Probes, Laser Sensors, Glass Platen, Software, and CPU Upgrades

Thorlabs' VideoMic[®] video measuring systems provide high-speed, non-contact 3-axis coordinate measurement with industry-leading accuracy. These multisensor measuring machines can easily verify critical dimensions on first articles, production samples, or entire runs. Automated inspection protocols utilize the system's large field of view and high-resolution sensors to easily inspect large volumes of parts sequentially or simultaneously. With tolerance reports and export utilities, thresholds can be set to enable timely corrections to a production

process or, when necessary, interruption of production to minimize scrap. With over 1000 systems installed worldwide, each system has a long lifetime, is completely modular, and can easily scale with the demands of any quality assurance or production facility.

Seven base systems are available, each utilizing a granite, split-axis base and gantry; see the *Base Systems* tab for details. Item numbers beginning with VSA utilize balanced linear motors with air bearings to position each axis of travel, while item numbers beginning with VSM utilize servo-driven ground-ball-screws to position each axis of travel. Each of the three motor axes and associated encoders are bonded directly onto the granite to create a system that is extremely accurate, stable, and resistant to environmental factors.

Once a base system is selected, Thorlabs offers a wide selection of CCD cameras, zoom lenses, and lights to customize the video system to the demands of the application. For further details, see the *Video Configurations* tab above. A number of optional accessories are also available to increase the versatility and functionality of the system. These include Renishaw^{®b} tactile probes; laser sensors; a hinged, pneumatic glass platen; a touch screen monitor; statistical process control software; and import/export utilities. See the *Accessories* tab for additional details about these options.

Base Systems

Our Video CMM System come in five base sizes. All are available with air bearings and linear motors as a standard, except for the VSM463 and VSM713, which include ball-bearings and a servo motor. The most popular option is highlighted in green below.

VideoMic[®] Video Inspection Systems Specifications

Base System Item # ^a	VSA303	VSA463	VSM463	VSA713	VSM713
XYZ Control					
Stage Bearings	Air	Air	Mechanical	Air	Mechanical
Stage Motors	Linear	Linear	Servo	Linear	Servo
Measurement (Travel) Range	X-Y 305 mm x 305 mm (12" x 12")	Z 460 mm x 305 mm (18" x 12")	X-Y 711 mm x 610 mm (28" x 24")	Z 200 mm (8")	
Accuracy^b	X-Y (E2) (1.5 + 5L/1000) μm	Z (E1) (1.5 + 5L/1000) μm	(2.5 + 5L/1000) μm	(1.5 + 5L/1000) μm	(2.5 + 5L/1000) μm
Velocity	X-Y ≤760 mm/s	Z 150 mm/s			
Repeatability	Z ±3 μm (±0.00012") at High Magnification				
Granite	Flatness ≤0.005 mm (Over Any 700 mm Area)	Roughness Ra0.4 (Equivalent to RMS16)	Waviness ≤0.001 mm / 100 mm x 100 mm		
Unit Dimensions					
Footprint	Width 870 mm (34")	Depth 1020 mm (40")		Width 1270 mm (50")	Depth 1630 mm (64")
Total Height	1730 mm (68")	1730 mm (68")		1730 mm (68")	
Approximate System Weight (Crated / Uncrated)	885 kg (1950 lb) 590 kg (1300 lb)	1043 kg (2300 lbs) / 726 kg (1600 lbs)		1630 kg (3600 lbs) / 1225 kg (2700 lbs)	
Approximate Footprint Overhang^c	Control Station up to 635 mm (25")	Printer Tray up to 280 mm (11")			
Top Clearance	Allow for Approximately 1220 mm (48") for Servicing				
Rear Clearance	Allow for Approximately 610 mm (24") for Servicing				
Typical Unit Dimensions					
General					
Operating Temperature	Range 20 ± 0.5 °C (67° - 69 °F)				
	Rate 0.25 °C/hr (0.5 °F/hr)				
Relative Humidity (Non-Condensing)	30% - 80%				
Line Voltage	115 / 230 VAC, 50 / 60 Hz, Single Phase, 1.0 kW				
Air Supply (Air Bearings Only)	Velocity 85 L/m (3 CFM) Dry Air			85 L/m (3 CFM) Dry Air	
	Pressure 7 - 8.25 Bar (100 - 120 PSI)			7 - 8.25 Bar (100 - 120 PSI)	

a. The control station includes the monitor, keyboard, mouse, and control pad; it is mounted at the front of the unit. The printer tray is an optional accessory that is mounted at the rear of the unit.

CCD Cameras

Specifications for our 1.3 MP and 5 MP camera can be found below, with plots to the right showing each camera's sensitivity to wavelengths in the visible spectra. The most popular option is highlighted in green.

1.3 MP Camera Response with Included IR Filter

Camera Specifications		
Resolution	1.3 MP	5 MP
Sensor Type	Interline SXGA Progressive Color CCD: ICX424AQ	Interline QSXGA Progressive Color CCD: ICX625AQ
Pixels (H x V)	1348 x 976	2536 x 2068
Active Pixels (H x V)	1280 x 966	2448 x 2058
Imaging Area (H x V)	4.8 mm x 3.6 mm	8.4 mm x 7.1 mm
Pixel Size	3.75 μm x 3.75 μm	3.45 μm x 3.45 μm
Optical Format	1/3"	2/3"
Frame Rate	40 fps	15 fps
Filter	IR Cut-On Filter	
Video Output Format	Digital 8, 10, or 12 bit Raw Data or RGB 8 bit	

[Click to Enlarge](#)

Transmission does not include an auxiliary lens or extension tube. An AR coating minimizes reflections in the visible spectra (about 400 - 700 nm).

Zoom Lenses

A zoom lens system consists of three modules: the zoom lens, an auxiliary lens, and an extension tube. Each module can be viewed in the first three columns of the below tables. Specifications of the entire three part system, including system magnification and field of view, can be found by reading horizontally across from your selection. Note that field of view is dependant on the camera format being used.

Zoom Lenses with Coaxial Light Input

Specifications for a 12X and 6.5X system with a side-mounted coaxial light input will be the same as those in the below tables, however the transmission may drop slightly due to the additional beamsplitter the light must pass through. Additionally, the 0.25X, 0.5X, and 0.75X auxiliary lenses are not compatible with this zoom lens version. The internal coaxial light will illuminate a circular area of 14 mm and 11 mm in diameter for the 12X and 6.5X zoom lenses, respectively. Any field of view (FOV) larger than these values will have darkened corners.

12X Zoom Lens System Specifications

Zoom Lens	Auxiliary Lens Options	Extension Tube Options	System Optical Magnification	Field of View ^a (m) (High - Low)	Matching Pixel Size ^b (μm) (Low - High)	Working Distance (mm)	Resolving Limit (μm) (Low - High)	Depth of Field (Low - High)
12X	0.25X ^c	0.5X	0.07 - 0.87	1/3": 85.71 - 6.89	2.33 - 5.8	341	66.66 - 13.34	20.00 - 0.80
				2/3": 72.00 - 9.35 ^d				
		0.67X	0.10 - 1.17	1/3": 61.73 - 5.10	3.33 - 7.80			
				2/3": 75.88 - 6.28				
		1.00X	0.15 - 1.75	1/3": 41.38 - 3.42	5.00 - 11.67			
				2/3": 57.89 - 4.72				
	1.33X	0.19 - 2.33	1/3": 31.57 - 2.57	6.33 - 15.54				
			2/3": 37.94 - 3.14					
	2.0X	0.29 - 3.50	1/3": 20.69 - 1.71	9.67 - 23.34				
			2/3": 22.99 - 1.90					
	3.3X	0.48 - 5.78	1/3": 12.54 - 1.04	16.59 - 40.53				

0.50X^c	0.5X	0.14 - 1.75	1/3": 42.85 - 3.42	2.59 - 5.82	165	37.04 - 6.66	6.17 - 0.19
	0.67X	0.19 - 2.35	2/3": 36.0 - 4.68 ^d 1/3": 30.87 - 2.55	3.60 - 7.68			
	1.00X	0.29 - 3.50	2/3": 37.94 - 3.14 1/3": 20.69 - 1.71	5.38 - 11.45			
	1.33X	0.39 - 4.66	2/3": 18.96 - 1.57 1/3": 10.34 - 0.85	7.22 - 15.51			
	2.0X	0.58 - 7.00	2/3": 18.97 - 1.57 1/3": 10.34 - 0.86	10.74 - 22.89			
	3.3X	0.96 - 11.55	2/3": 11.50 - 0.95 1/3": 6.27 - 0.52	16.64 - 50.60			
0.75X^c	0.5X	0.22 - 2.62	1/3": 27.27 - 2.29	2.61 - 5.81	108	23.80 - 4.44	2.55 - 0.09
	0.67X	0.29 - 3.52	2/3": 24.3 - 3.12 ^d 1/3": 20.58 - 1.70	3.45 - 7.73			
	1.00X	0.44 - 5.25	2/3": 25.30 - 2.09 1/3": 13.79 - 1.14	5.24 - 11.52			
	1.33X	0.58 - 6.98	2/3": 18.96- 1.57 1/3": 10.34 - 0.85	6.90 - 15.49			
	2.0X	0.87 - 10.50	2/3": 12.64 - 1.05 1/3": 6.89 - 0.57	10.35 - 23.05			
	3.3X	1.44 - 17.33	2/3": 7.67 - 0.63 1/3": 4.18 - 0.35	16.62 - 46.34			
None (1.0X)	0.5X	0.29 - 3.49	1/3": 20.69 - 1.72	2.68 - 5.82	86	18.52 - 3.34	1.39 - 0.05
	0.67X	0.39 - 4.69	2/3": 18.20 - 2.34 ^d 1/3": 15.44 - 1.28	3.42 - 7.74			
	1.00X	0.58 - 7.00	2/3": 18.79 - 1.57 1/3": 10.34 - 0.86	5.09 - 11.55			
	1.33X	0.77 - 9.31	2/3": 14.28 - 1.18 1/3": 7.79 - 0.64	7.13 - 5.54			
	2.0X	1.16 - 14.00	2/3": 9.49 - 0.78 1/3": 5.18 - 0.43	10.17 - 23.10			
	3.3X	1.91 - 23.10	2/3": 5.75 - 0.48 1/3": 3.13 - 0.26	16.60 - 40.54			
1.5X	0.5X	0.43 - 5.23	1/3": 13.95 - 1.14	2.65 - 5.85	50	12.34 - 2.24	0.64 - 0.02
	0.67X	0.58 - 7.04	2/3": 12.20 - 1.55 ^d	3.45 - 7.78			

				1/3": 10.29 - 0.85				
				2/3": 12.64 - 1.05				
	1.00X	0.87 - 10.50		1/3": 6.89 - 0.57		5.18 - 11.60		
				2/3": 9.48 - 0.78				
	1.33X	1.16 - 14.00		1/3": 5.17 - 0.44		7.15 - 15.68		
				2/3": 6.33 - 0.52				
	2.0X	1.74 - 21.00		1/3": 3.45 - 0.29		10.74 - 23.34		
				2/3": 3.83 - 0.323				
	3.3X	2.87 - 34.65		1/3": 2.09 - 0.17		16.62 - 40.77		
		0.5X	0.58 - 6.98	1/3": 10.34 - 0.85		2.61 - 5.79		
				2/3": 9.10 - 1.17 ^d				
	0.67X	0.78 - 9.38		1/3": 7.72 - 0.64		3.42 - 7.79		
				2/3": 9.49 - 0.78				
	1.00X	1.16 - 14.00		1/3": 5.18 - 0.43		5.09 - 11.62		
				2/3": 7.14 - 0.59				
	1.33X	1.54 - 18.60		1/3": 3.89 - 0.32		6.93 - 15.43		
				2/3": 4.75 - 0.40				
	2.0X	2.32 - 28.00		1/3": 2.59 - 0.22		10.17 - 23.24		
				2/3": 2.88 - 0.24				
	3.3X	3.83 - 46.20		1/3": 1.57 - 0.13		16.56 - 36.04		
	2.0X					37	9.00 - 1.66	0.35 - 0.01

- FOV values are measured diagonally where Horizontal FOV = Diagonal FOV x 0.8 and Vertical FOV = Diagonal FOV x 0.6. FOV values will change depending on the camera format chosen; values for 1/3" and 2/3" camera formats are provided.
- Matching pixel size (MPS) is that which will permit the minimum feature size to overlap two pixels, where $MPS = 1/2 \times (\text{Feature Size} \times \text{System Magnification})$
- These options are not compatible with a zoom lens that has a coaxial light input.
- Vignetting occurs at zoom settings less than 0.9X

6.5X Zoom Lens System Specifications

Zoom Lens	Auxiliary Lens Options	Extension Tube Options	System Optical Magnification	Field of View (mm) (High - Low)	Matching Pixel Size (µm) (Low - High)	Working Distance (mm)	Resolving Limit (µm) (Low - High)	Depth of Field (Low - High)
		0.5X	0.09 - 0.56	2/3": 91.40 - 19.52 1/3": 68.64 - 10.64	2.50 - 5.19			
		0.67X	0.12 - 0.75	2/3": 93.62 - 14.66 1/3": 51.12 - 8.04	3.33 - 6.95			
6.5X	0.25X	1.00X	0.18 - 1.13	2/3": 62.84 - 9.76 1/3": 34.52 - 9.76	5.00 - 10.46	300	55.56 - 18.52	13.89 - 1.54
		1.33X	0.23 - 1.51	2/3": 47.25 - 7.34 1/3": 25.80 - 4.0	6.65 - 13.91			
		2.0X	0.35 - 2.25	2/3": 31.42 -	15.29 - 28.93			

		4.88	
		1/3": 17.16 - 2.66	
		2/3": 19.04 - 2.96	
3.3X	0.58 - 3.71	1/3": 10.40 - 1.61	16.59 - 40.53
		2/3": 12.56 - 1.96	
5.0X	0.88 - 5.62	1/3": 6.88 - 1.08	24.45 - 52.04

0.50X	0.5X	0.18 - 1.13	2/3": 45.70 - 9.76 1/3": 34.32 - 5.32	2.73 - 5.38	175	30.30 - 9.52	4.13 - 0.41
	0.67X	0.23 - 1.50	2/3": 46.81 - 7.33 1/3": 25.56 - 4.00	3.48 - 7.14			
	1.00X	0.35 - 2.25	2/3": 31.43 - 4.89 1/3": 17.16 - 2.67	5.30 - 10.71			
	1.33X	0.47 - 3.03	2/3": 23.63 - 3.68 1/3": 12.90 - 2.01	7.05 - 14.24			
	2.0X	0.70 - 4.50	2/3": 15.71 - 2.44 1/3": 8.58 - 1.33	10.61 - 21.42			
	3.3X	1.16 - 7.43	2/3": 9.52 - 1.48 1/3": 5.20 - 0.81	15.44 - 39.08			
	5.0X	1.75 - 11.25	2/3": 6.29 - 0.98 1/3": 3.43 - 0.53	26.51 - 53.55			
0.75X	0.5X	0.26 - 1.69	2/3": 30.50 - 6.52 1/3": 22.86 - 3.56	2.55 - 5.32	113	19.62 - 6.28	1.73 - 0.18
	0.67X	0.35 - 2.25	2/3": 31.21 - 4.89 1/3": 17.04 - 2.67	3.43 - 7.08			
	1.00X	0.53 - 3.38	2/3": 20.95 - 3.26 1/3": 11.43 - 1.78	5.20 - 10.63			
	1.33X	0.70 - 4.54	2/3": 15.75 - 2.45 1/3": 8.59 - 1.34	6.92 - 14.13			
	2.0X	1.05 - 6.75	2/3": 10.48 - 1.63 1/3": 5.72 - 0.89	10.30 - 21.23			
	3.3X	1.73 - 11.14	2/3": 6.35 - 0.99 1/3": 3.46 - 0.54	15.36 - 33.31			
	5.0X	2.63 - 16.88	2/3": 4.19 - 0.65 1/3": 2.29 - 0.35	25.74 - 53.09			
None (1.0X)	0.5X	0.35 - 2.25	2/3": 22.90 - 4.89 1/3": 17.16 - 2.67	2.54 - 5.28	92	14.50 - 4.70	0.95 - 0.10

	0.67X	0.47 - 3.00	2/3": 23.40 - 3.65 1/3": 12.77 - 2.01	3.41 - 7.04			
	1.00X	0.70 - 4.50	2/3": 15.71 - 2.44 1/3": 8.58 - 1.33	5.08 - 10.55			
	1.33X	0.93 - 6.05	2/3": 11.81 - 1.83 1/3": 6.45 - 1.00	6.76 - 14.03			
	2.0X	1.40 - 9.00	2/3": 7.86 - 1.22 1/3": 4.29 - 0.67	10.15 - 21.11			
	3.3X	2.31 - 14.85	2/3": 4.76 - 0.74 1/3": 2.60 - 0.40	15.29 - 29.11			
	5.0X	3.50 - 22.50	2/3": 3.14 - 0.49 1/3": 1.72 - 0.27	25.38 - 52.76			
1.5X	0.5X	0.53 - 3.38	2/3": 15.00 - 3.26 1/3": 11.43 - 1.78	2.60 - 5.32	51	9.80 - 3.14	0.43 - 0.04
	0.67X	0.70 - 4.50	2/3": 15.60 - 2.44 1/3": 8.52 - 1.33	3.43 - 7.09			
	1.00X	1.05 - 6.75	2/3": 10.48 - 1.63 1/3": 5.72 - 0.89	5.15 - 10.63			
	1.33X	1.40 - 9.08	2/3": 7.88 - 1.22 1/3": 4.3 - 0.67	6.85 - 14.14			
	2.0X	2.10 - 13.50	2/3": 5.24 - 0.81 1/3": 2.86 - 0.44	10.29 - 21.26			
	3.3X	3.47 - 22.28	2/3": 3.18 - 0.49 1/3": 1.73 - 0.27	15.29 - 28.92			
	5.0X	5.25 - 33.75	2/3": 2.10 - 0.33 1/3": 1.14 - 0.18	25.73 - 53.16			
2.0X	0.5X	0.70 - 4.50	2/3": 11.40 - 2.44 1/3": 8.58 - 1.33	2.54 - 5.29	36	7.24 - 2.34	0.24 - 0.02
	0.67X	0.94 - 6.00	2/3": 11.70 - 1.83 1/3": 6.39 - 1.00	3.41 - 7.05			
	1.00X	1.40 - 9.00	2/3": 7.86 - 1.22 1/3": 4.29 - 0.67	5.08 - 10.58			
	1.33X	1.86 - 12.10	2/3": 5.91 - 0.92 1/3": 3.22 - 0.50	6.76 - 14.07			
	2.0X	2.80 - 18.00	2/3": 3.93 - 0.61 1/3": 2.15 - 0.33	10.15 - 21.15			

		3.3X	4.62 - 29.70	2/3": 2.38 - 0.37 1/3": 1.30 - 0.14	15.30 - 28.70			
		5.0X	7.00 - 45.00	2/3": 1.57 - 0.24 1/3": 0.86 - 0.13	25.38 - 52.88			

- a. FOV values are measured diagonally where Horizontal FOV = Diagonal FOV x 0.8 and Vertical FOV = Diagonal FOV x 0.6. FOV values will change depending on the camera format chosen; values for 1/3" and 2/3" camera formats are provided.
- b. Matching pixel size (MPS) is that which will permit the minimum feature size to overlap two pixels, where MPS = 1/2 x (Feature Size x System Magnification)
- c. These options are not compatible with a zoom lens that has a coaxial light input.
- d. Vignetting occurs at zoom settings less than 0.9X

Objectives

Item #	Wavelength Range	M ^a	WD	EFL	NA	EA	Typical Transmission	OFN	PFL	AR Coating Reflectance
LMUL-10X-UVB		10X	20.0 mm	20 mm	0.25	10.0 mm	Raw Data			
LMUL-20X-UVB	240 - 360 nm	20X	15.3 mm	10 mm	0.36	7.2 mm	Raw Data	24	95.0 mm	<1.5% per Surface (240 - 360 nm)
LMUL-50X-UVB		50X	12.0 mm	4 mm	0.42	3.4 mm	Raw Data			
TL1X-SAP ^b	420 - 700 nm	1X	8.0 mm	200 mm	0.03	23.4 mm	Raw Data	22	95.0 mm	R _{avg} < 0.5% per Surface @ 0° AOI (420 - 700 nm)
MY5X-802		5X	34.0 mm	40 mm	0.14	11.2 mm				
MY10X-803		10X	34.0 mm	20 mm	0.28	11.2 mm				
MY20X-804	436 - 656 nm	20X	20.0 mm	10 mm	0.42	8.4 mm		24	95 mm	Not Available
MY50X-805		50X	13.0 mm	4 mm	0.55	4.4 mm				

- a. When Used with a 200 mm Focal Length Tube Lens
- b. Specifications are for the objective with the included wave plate attached.

M = Magnification
WD = Working Distance
EFL = Effective Focal Length

PFL = Parfocal Length
NA = Numerical Aperture
OFN = Optical Field Number

Probe Body Options

Series	TP20	TP200	SP600
Sensor Type	Kinematic	Strain Gauge	Scanning
Application	Auto or Manual CMM, Suitable for Most Applications	Auto or Manual CMM with High Accuracy	High-Speed, Contact Form Scanning and Fast Point Measurement Applications
Renishaw Stylus Range	M2 Threaded	M2 Threaded	M3 Threaded
Module Changing Racks		Manual and Motorized	

Renishaw® Tactile Probes

Thorlabs' video systems are compatible with most Renishaw TP20 and TP200 series 3-axis, touch-trigger probes and SP600 series 3-axis scanning probes. These are sold as a kit that is preconfigured onto the video system. Each kit includes a probe body, probe module, and an optional manual or motorized module changing rack.

TP20 Series Probe Options and Specifications ^a												
Module	Sense Direction	Pre-Travel Variation	Unidirectional Repeatability	Trigger Force (N) (Stylus Length ^a)		Overtravel Force (N) (Stylus Length ^a)			Overtravel Displacement			Repeatability of Stylus Changing
				XY ^b	Z	XY	+Z	-Z	XY (deg.)	+Z (mm)	-Z (mm)	
Low Force (LF)		±0.60 µm	±0.35 µm	0.055	0.65	0.09	1.15	N/A	±14	3.1	N/A	
Standard Force (SF)		±0.80 µm	±0.35 µm	0.08	0.75	0.2 - 0.3	3.5	N/A	±14	4	N/A	
Medium Force (MF)	±X, ±Y, ±Z	±1.00 µm	±0.50 µm	0.10 (25 mm)	1.9 (25 mm)	0.2 - 0.4 (25 mm)	7 (25 mm)	N/A	±14	3.7	N/A	Motorized: ±0.50 µm Manual: ±1.0 µm
Extended Force (EF)		±2.00 µm	±0.65 µm	0.10 (50 mm)	3.2 (50 mm)	0.2 - 0.5 (50 mm)	10 (50 mm)	N/A	±14	2.4	N/A	
6 Way (6W)	±X, ±Y, ±Z	±1.50 µm	±1.00 µm	0.14	1.60	0.25	2.5	9	±14	4.5	1.5	

- a. For stylus lengths of 10 mm, unless stated otherwise, and velocities of 480 mm/min.
b. Low Force Direction

TP200 Series Probe Options and Specifications												
Module	Sense Direction	Unidirectional Repeatability		XY Form Measurement Deviation		XYZ Form Measurement Deviation		Trigger Force (N)		Overtravel Force ^a (N)		Repeatability of Stylus Changing
		Trigger 1	Trigger 2	Trigger 1	Trigger 2	Trigger 1	Trigger 2	XY ^b	Z	XY	Z	
Low Force (LF)										0.1 - 0.15	1.6	
Standard Force (SF)	±X, ±Y, ±Z	±0.40 µm	±0.50 µm	±0.80 µm	±0.90 µm	±1 µm	±1.4 µm	0.02	0.07	0.2 - 0.4	4.9	Motorized: ±0.50 µm Manual: ±1.0 µm
Extended Overtravel (EO)										0.2 - 0.4	4.9	

- a. At a displacement of 0.50 mm.
b. Low Force Direction

SP600 Series Scanning Probe Options and Specifications							
Module	Sense Direction	Measurement Range	Overtravel Range		Resolution	Spring Rate	Damping
SP600	±X, ±Y, ±Z	±1 mm ^a	X, Y and -Z Protected by Kinematic Joint.		0.1 µm - 1 µm	120 gmf/mm in X, Y, Z (Nominal)	20% in X,Y,Z (Typical)

- a. In All Axes and Orientations with a 50 mm long, 4.6 g Stylus.

Laser Sensors

The Conoscopic Holography Laser Sensor utilizes interchangeable objectives at the output port that determine the measuring range of the sensor. Two of the more popular objectives are specified below; other options are available if the application requires it. The Triangulation Displacement Sensor does not use an objective, and is selected based on its measurement range.

Triangulation Displacement Sensor Specifications		
Measuring Range	25 mm	50 mm

Triangulation Displacement Sensor Specifications

	Start (SMR)	25 mm	35 mm
Measuring Range Spread	Mid (MMR)	27.5 mm	60 mm
	End (EMR)	50 mm	85 mm
Linearity^b		≤ ±0.08%	≤ ±0.08%
Repeatability at Measuring Rate		1 µm	2 µm
Measuring Rate			2 kHz
	SMR	100 x 140 µm	90 x 120 µm
Spot Diameter (±10%)	MMR	120 x 130 µm	230 x 240 µm
	EMR	390 x 500 µm	630 x 820 µm
	Minimum	55 x 50 µm	70 x 65 µm
Laser Power			< 1 mW
Laser Color			Red (670 nm)
Laser Safety Class			Class 2 in Accordance with DIN EN 60825-1 : 2008-05

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