

The Quality Sourcebook's CMM Guide features information on more than 30 CMM manufacturers' and distributors' products. Our guide provides the critical specifications of each company's CMM to help you narrow your choices. To avoid duplicating manufacturer and distributor entries, repeated product specifications appear only in the manufacturer's listing. Distributor listings indicate which manufacturers each distributes for and show product specifications from manufacturers not otherwise listed.

Our guide includes a number of video- and laser-based products in addition to traditional CMMs. As new technologies arise, look for more of these nontraditional CMMs. Laser- and vision-based machines are performing CMM functions in places that CMMs can't reach and on very large objects, such as aircraft wings. Although these CMMs function differently from traditional CMMs, for this buyers guide, the manufacturers have done their best to translate their specifications into traditional CMM specifications.

New technologies are also improving the performance and versatility of traditional CMMs. Advances in temperature compensation techniques are allowing CMM manufacturers to move their products to the shop floor and still maintain a high degree of accuracy. Advances in and standardization of software protocols, such as DMIS, are allowing CMMs to communicate directly with CAD systems for reverse engineering, design verification, CMM offline programming, and real-time part-to-CAD measurement.

This buyers guide reflects some of these new technologies, but to stay informed of the latest in metrology tools, look for technology articles in *Quality Digest*.

CMM Directory

CMM Manufacturer Matrix 34
This matrix of CMM manufacturers and distributors features the company name and product names, machine type, range, resolution, linear accuracy, temperature range, volumetric accuracy, repeatability, throughput, guide method, probe type, control method and temperature compensation. Except where otherwise indicated, units of measure for a particular specification are as shown at the top of each column.

CMM Manufacturer Directory 42
This directory of CMM manufacturers includes the company name, address, phone and fax numbers, Web address, and a brief description of the company's products and services. (Please note that not all companies provided us with descriptions.)

As with all *Quality Digest* guides, the CMM Guide is in no way meant to endorse or exclude a particular organization. Rather, it's meant to be used as the starting point in the data-gathering process. Readers are encouraged to contact the companies directly for more information and to ask for—and check—references. Please be sure to mention you saw their listings in *Quality Digest's* 2000 Quality Sourcebook!

We appreciate any feedback you have on our CMM Guide. If you have any suggestions for how we can improve this guide for next year, e-mail them to sourcebook@qualitydigest.com.

Glossary

Linear accuracy—accuracy of the instrument when measuring along a single axis. This data is often integrated with the volumetric accuracy.

Range—the x, y or z distance the CMM can travel while measuring a part. For articulating arms, laser trackers and other nontraditional CMMs, this dimension may be represented as a sphere.

Resolution—the smallest distance that can be measured by the instrument.

T Comp.—many instruments provide a means for temperature compensation. Temperature data can be manually input, read from a sensor mounted on the part being measured, read from sensors mounted on the instrument itself or any combination of these.

Throughput—describes how many points per minute an instrument can measure. This number tends to be much higher for noncontact measurement systems than for contact measurement systems.

VDI, B89 or ISO—accuracy standards to which the instrument conforms.

Volumetric accuracy—accuracy of the instrument when measuring along all axes simultaneously.

Coordinate Measuring Machines Sourcebook Guide

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2000 CMM Buyers Guide

Company/Product

A.A. Jansson Inc. Ph. 248-674-4811 Fax 248-674-1234 The Inspector 10150 The Inspector 12150 The Inspector 15150 The Inspector 18150 The Inspector 20150 The Inspector 25150 The Inspector 30150	Also distributes International Metrology Systems, Laser Design, Quality Control Solutions and used CMMs																
	Horiz. Arm	Call	60	40	400	•	2,000	2,000		3X=5,000					Mechanical		
	Horiz. Arm	Call	48	60	400		2,000	2,000		3X=5,000				•	Mechanical		
	Horiz. Arm	Call	60	60	400	•	2,000	2,000		3X=5,000				•	Mechanical		
	Horiz. Arm	Call	60	72	400		2,000	2,000		3X=5,000				•	Mechanical		
	Horiz. Arm	Call	60	80	400	•	2,000	2,000		3X=5,000				•	Mechanical		
	Horiz. Arm	Call	60	100	400	•	2,000	2,000		3X=5,000				•	Mechanical		
	Horiz. Arm	Call	60	120	400	•	2,000	2,000		3X=5,000				•	Mechanical		
	Acu-Gage Systems																
	Ph. 603-622-2481 Fax 603-626-1277	Bridge-Vert.	8	8	4-6	20		200	200	200	65-85		100	Cross Roller			
High Precision Line—8	Fixed Bridge	12	12	4-8	20		200	200	200	65-85		100	Cross Roller				
LMD 48	Gantry	48	48	4-12	80		1,000	1,000	200	65-85		400					
LMD 72	Gantry	48	72	4-12	80		1,000	1,000	200	65-85		400					
LMD 96	Gantry	48	96	4-12	80		1,000	1,000	200	65-85		400					
American SIP Corp. Ph. 914-592-8006 Fax 914-592-2383	30M																
	Orion 5	Fixed Bridge	16	10	12	4	•	20 + L/1.2		68 ± 4	3X=32 + L/0.8	8	6,000	Hydrostatic	•		
	Orion 6	Fixed Bridge	28	28	22	4	•	20 + L/1.2		60-86	3X=32 + L/0.8	8	6,000	Hydrostatic	•		
	Sirius 7	Fixed Bridge	47	28	22	4	•	20 + L/1.2		60-86	3X=32 + L/0.8	8	6,000	Hydrostatic	•		
	Sirius 7	Fixed Bridge	39	34	32	4	•	56 + L/0.6		60-86	3X=68 + L/0.4	6,000	6,000	Hydrostatic	•		
	Sirius 8	Fixed Bridge	39	60	32	4	•	56 + L/0.6		60-86	3X=68 + L/0.4	6,000	6,000	Hydrostatic	•		
Bobier Tool Supply Inc. Ph. 810-732-4030 Fax 810-732-3909	PAG																
	Meas. Robot	36	24	24	1	•	4 + L/6			65-95	4X=6 + L/6	2	60	Air	•		
	Horiz. Arm	no limit	157	157		•	50 + L/100			60-80	80 + L/100	400	60	Mechanical	•		
	TRIMEK																
Brown & Sharpe Ph. 401-886-2000 Fax 401-886-2727	Beta SP	Gantry	101-203	60-101	40-60	40	•				68 ± 1.8	3X=280 + 80L—800 + 200L		Air	•		
	Beta SPM	Gantry	101-132	60-81	40-60	40	•				68 ± 1.8	3X=280 + 80L—640 + 150L			•		
	Bravo	Horiz. Arm	73-332	26-118	38-130	40	•				68 ± 9	3X=600 + 150L—2,000 + 450L			•		
	Chameleon	Bridge-Vert.	30-35	26-59	20-34	10	•	200	200	200	64-72	3X=3,500	110	45-60	Air	•	
	CYGNUS X	Fixed Bridge	40-55	32-48	24-40	4	•	48 + L/0.4			3X=72 + L/0.3	50		Air	•		
	Delta SP	Gantry	132-254	81-101	60-73	40	•				68 ± 1.8	3X=200 + 60L—360 + 100L			Air	•	
	FDG 1000	Bridge-Vert.	27-28	19-26	12-18		•				3X=200	140	60	Air	•		
	FDG 2000	Bridge-Vert.	40-56	26-34	18-26		•				3X=200	140	60	Air	•		
	Gage 2000	Bridge-Vert.	18	20	16		•	200	200	200	68 ± 1.8	3X=400	160		Air	•	
	Gage 2000A	Artic. Arm	48-144 Dia. Sphere				•	1,000-4,700								Hard Ball	
	Gage 2000H	Bridge-Vert.	30	20	30		•				59-104	3X=980			Air	•	
	Ghibli Series	Bridge-Vert.	80-104	60	54		•				3X=300	40	60	Air	•		
	Ghibli Record Series	Bridge-Vert.	79-102	47	37		•				68 ± 3.6	3X=240					

2000 GMM Buyers Guide									
Line Type			Range			Position (µin)			
						Accord.		To	
(inches)			(inches)			(µin)		(µin)	
(inches)			(inches)			(µin)		(µin)	
(inches)			(inches)			(µin)		(µin)	
Range			Linear Accuracy			Volumetric Accuracy			
						3-axis=3X (µin)			
Method			Stability (µin)			Input (µin/min)			
Probe Type			Control			T Comp.			

Company/Product	Mac	X-axis	Y-axis	Z-axis	Resc	Temp	Rep	Throat	Guida	Anal	Switch	Con	Wrist	Mac
Mac	X-axis	Y-axis	Z-axis	Resc	Temp	Rep	Throat	Guida	Anal	Switch	Con	Wrist	Mac	

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2000 GMM Buyers Guide

Company/Product

Machine Type	Range			Resolution (µin)	Linear Accuracy				Temp. Range (°F)	Volumetric Accuracy	Repeatability (µin)	Throughput (points/min)	Guide Method	Probe Type					Control		T Comp.
	X-axis (inches)	Y-axis (inches)	Z-axis (inches)		Accord. To	X-axis (µin)	Y-axis (µin)	Z-axis (µin)						Analog	Switching	Laser	Contact	Vision System	Manual	D.C.C.	
Equalizer					VDI/VD																
Talon ELM-282818	24-240	24-84	24-96	20	•	560 + L/15	200	200	68±1.8	3X=1,000 + L/06	200	60	Mechanical		•	•	•		•	•	Machine Sensor
Talon ELM-282824	28	28	18	20	•	200	200	200	68±4	3X=400	100	60	Air	•	•	•	•		•	•	Part Sensor
Talon ELM-284024	28	28	24	20	•	200	200	200	68±4	3X=400	100	60	Air	•	•	•	•		•	•	
Talon ELM-404824	40	48	24	20	•	300	300	300	68±4	3X=400	100	60	Air	•	•	•	•		•	•	
Talon ELM-408040	40	80	40	20	•	300	300	200	68±4	3X=500	100	60	Air	•	•	•	•		•	•	
Talon ELM-484824	48	48	24	20	•	300	300	200	68±4	3X=500	100	60	Air	•	•	•	•		•	•	
Talon ELM-486024	48	60	24	20	•	300	300	250	68±4	3X=700	100	60	Air	•	•	•	•		•	•	
Talon ELM-489640	48	96	40	20	•	300	600	250	68±4	3X=750	100	60	Air	•	•	•	•		•	•	
Talon ELM-606040	60	60	40	20	•	300	500	250	68±4	3X=700	100	60	Air	•	•	•	•		•	•	
Talon ELM-6010040	60	100	40	20	•	400	700	250	68±4	3X=750	100	60	Air	•	•	•	•		•	•	
Titan LCMV	24-720	24-96	24-108	40	•	500	500	500	68±1.8		100		Mechanical	•	•	•	•	•	•	•	
FARO Technologies Inc. Ph. 800-736-0234 Fax 407-333-4181																					
FaroArm Gold Series				100	•	1,000-6,600			32-113			5,400			•	•	•		•	•	
FaroArm Sterling Series				100	•	2,000-9,300			32-113			5,400			•	•	•		•	•	
Giddings & Lewis—Sheffield Measurement Ph. 937-254-5377 Fax 937-254-5054																					
Cordax 1808M-DCC	39	25	20	4	•	200	160	140	59-104	3X=430	120	60	Porous Media Air	•	•	•	•	•	•	•	
Cordax 1808MH-DCC	59	25	20	4	•	350	220	200	59-104	3X=560	120	60	Porous Media Air	•	•	•	•	•	•	•	
Cordax 1808MM-DCC	79	25	20	4	•	430	220	200	59-104	3X=560	120	60	Porous Media Air	•	•	•	•	•	•	•	
Cordax Apollo RS-150	48	80	40	4	•	200	280	160	59-104	3X=590	160	80	Porous Media Air	•	•	•	•	•	•	•	
Cordax Apollo RS-170	60	69	48	4	•	220	240	200	59-104	3X=590	160	60	Porous Media Air	•	•	•	•	•	•	•	
Cordax Apollo RS-220	48	120	40	4	•	200	350	200	59-104	3X=630	160	60	Porous Media Air	•	•	•	•	•	•	•	
Cordax Apollo RS-280	60	109	48	4	•	220	310	200	59-104	3X=670	160	60	Porous Media Air	•	•	•	•	•	•	•	
Cordax Apollo RS-50	48	40	30	4	•	160	120	120	59-104	3X=560	120	80	Porous Media Air	•	•	•	•	•	•	•	
Cordax Apollo RS-70	48	40	40	4	•	200	160	160	59-104	3X=590	120	80	Porous Media Air	•	•	•	•	•	•	•	
Cordax Atlas	98	276	60	20	•	800	1,920	600	59-104	3X=3,680	160	40	Porous Media Air	•	•	•	•	•	•	•	
Cordax Discovery D-8	20	24	16	40	•	200	200	180	40-104	3X=510	100	60	Recirc. Ball	•	•	•	•	•	•	•	
Cordax Discovery D-12	20	36	16	40	•	280	280	180	40-104	3X=510	100	60	Recirc. Ball	•	•	•	•	•	•	•	
Cordax Discovery D-28	30	40	24	40	•	240	300	200	40-104	3X=510	100	60	Recirc. Ball	•	•	•	•	•	•	•	
Cordax Horizon H30.15.9	120	60	36	4	•	470	290	220	59-104	4X=800	120	80	Porous Media Air	•	•	•	•	•	•	•	
Cordax RS-25	30	30	27	4	•	170	170	160	59-104	3X=430	120	80	Porous Media Air	•	•	•	•	•	•	•	
Cordax RS-35	30	42	27	4	•	170	210	160	59-104	3X=430	120	80	Porous Media Air	•	•	•	•	•	•	•	
Cordax RS-5	18	18	15	4	•	130	130	120	59-104	3X=400	100	80	Porous Media Air	•	•	•	•	•	•	•	
Cordax RS-670	80	140	60	4	•	310	450	300	59-104	3X=780	200	40	Porous Media Air	•	•	•	•	•	•	•	
GSI Lumonics Inc. Ph. 805-578-5000 Fax 805-578-5249																					
View Voyager V6 x 12	12	6	6	0.1µm	•	(4.0+L/100)µm	±7.5µm	±7.5µm	63-73				Cross roller			•	•	•	•	•	•
View Voyager V12 x 12	12	12	6	3µm	•	(0.5+L/140)µm	±5µm	±5µm	63-73				Linear recirculating			•	•	•	•	•	•
View Voyager V18 x 18	18	18	6	3µm	•	(1.0+L/500)µm	±5µm	±5µm	63-73				Linear recirculating			•	•	•	•	•	•
View Voyager V18 x 24	18	24	6	3µm	•	(1.0+L/500)µm	±5µm	±5µm	63-73				Linear recirculating			•	•	•	•	•	•

2000 CMM Buyers Guide		Machine Type		Range		Resolution (µin)		Linear Accuracy			Temp. Range (°F)	Volumetric Accuracy	Repeatability (µin)	Throughput (points/min)	Guide Method	Probe Type						Control	T Comp.	
								Accord. To	X-axis (µin)	Y-axis (µin)						Z-axis (µin)	Analog	Switching	Laser	Contact	Vision System			Manual
Machine Type		Range		Resolution (µin)		Linear Accuracy					Temp. Range (°F)	Volumetric Accuracy	Repeatability (µin)	Throughput (points/min)	Guide Method							Analog	Switching	
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											Temp. Range (°F)	Volumetric Accuracy	Repeatability (µin)	Throughput (points/min)	Guide Method							Analog	Switching	

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K Metrology Systems Inc.
Ph. 810-220-4360 Fax 810-220-4300

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Company/Product

Machine Type	Range			Resolution (µin)	Linear Accuracy				Temp. Range (°F)	Volumetric Accuracy	Repeatability (µin)	Throughput (points/min)	Guide Method	Probe Type					Control			T' Comp.
	X-axis (inches)	Y-axis (inches)	Z-axis (inches)		VDI/VDA To	X-axis (µin)	Y-axis (µin)	Z-axis (µin)						Analog	Switching	Laser	Contact	Vision System	Manual	D.C.C.	Manual Input	
Bridge and Laser	39	39	32	20mm	•	•	•	(1.9 or 0.9 + L/200)µm	61-79	3X=(2.3 or 1.2 + L/200)µm	<1µm		Air or Mech.		•				•		•	•
Meas. Robot																						
Metric/Vision 1008																						
Metric/Vision 1008																						
Mitutoyo/MTI Corp.																						
Ph. 630-820-9666 Fax 630-978-6475																						
Bright Apex 504	20	16	16	20µm	ISO			(2.9 + 4L/1,000)µm	61-79	3X=(2.9 + 4L/1,000)µm	60		Air	•		•	•	•	•	•	•	•
Bright Apex 707	28	28	24	20µm	ISO			(2.9 + 4L/1,000)µm	61-79	3X=(2.9 + 4L/1,000)µm	60		Air	•		•	•	•	•	•	•	•
Bright Apex 710	28	40	24	20µm	ISO			(2.9 + 4L/1,000)µm	61-79	3X=(2.9 + 4L/1,000)µm	60		Air	•		•	•	•	•	•	•	•
Bright Apex 910	36	40	24	20µm	ISO			(3.9 + 4L/1,000)µm	61-79	3X=(3.9 + 4L/1,000)µm	60		Air	•		•	•	•	•	•	•	•
Bright Apex 916	36	64	24	20µm	ISO			(3.9 + 4L/1,000)µm	61-79	3X=(3.9 + 4L/1,000)µm	60		Air	•		•	•	•	•	•	•	•
Bright Apex 1212	48	48	40	20µm	ISO			(4.9 + 5L/1,000)µm	61-79	3X=(4.9 + 5L/1,000)µm	60		Air	•		•	•	•	•	•	•	•
Bright Apex 1220	48	80	40	20µm	ISO			(4.9 + 5L/1,000)µm	61-79	3X=(4.9 + 5L/1,000)µm	60		Air	•		•	•	•	•	•	•	•
Bright Apex 1230	48	120	40	20µm	ISO			(4.9 + 5L/1,000)µm	61-79	3X=(4.9 + 5L/1,000)µm	60		Air	•		•	•	•	•	•	•	•
BRTM 507	20	28	16	20µm	•			(3 + 4L/1,000)µm	66-70	3X=(4 + 5L/1,000)µm	60		Air	•		•	•	•	•	•	•	•
BRTM 707	28	28	24	20µm	•			(4 + 4L/1,000)µm	66-70	3X=(5 + 5L/1,000)µm	60		Air	•		•	•	•	•	•	•	•
BRTM 710	28	40	24	20µm	•			(4 + 4L/1,000)µm	66-70	3X=(5 + 5L/1,000)µm	60		Air	•		•	•	•	•	•	•	•
BRT Strato 707	28	28	24	8µm	ISO			(1.4 + 3L/1,000)µm	64-72	3X=(1.4 + 3L/1,000)µm	60		Air	•		•	•	•	•	•	•	•
BRT Strato 710	28	40	24	8µm	ISO			(1.4 + 3L/1,000)µm	64-72	3X=(1.4 + 3L/1,000)µm	60		Air	•		•	•	•	•	•	•	•
BRT Strato 910	36	40	24	8µm	ISO			(1.7 + 3L/1,000)µm	64-72	3X=(1.7 + 3L/1,000)µm	60		Air	•		•	•	•	•	•	•	•
BRT Strato 916	36	64	24	8µm	ISO			(1.7 + 3L/1,000)µm	64-72	3X=(1.7 + 3L/1,000)µm	60		Air	•		•	•	•	•	•	•	•
LEGEX 707	28	28	24	0.1µm	ISO			(0.48 + L/1,000)µm	64-72	3X=(0.48 + L/1,000)µm	40		Air	•		•	•	•	•	•	•	•
LEGEX 910	36	40	24	0.1µm	ISO			(0.48 + L/1,000)µm	64-72	3X=(0.48 + L/1,000)µm	40		Air	•		•	•	•	•	•	•	•
MACH 403-04	18	12	12	4µm	ISO			(3.5 + 4.0L/1,000)µm	59-77	3X=(3.5 + 4.0L/1,000)µm	80		Air	•		•	•	•	•	•	•	•
MACH 806-10	40	32	24	4µm	ISO			(3.5 + 4.0L/1,000)µm	59-77	3X=(3.5 + 4.0L/1,000)µm	80		Air	•		•	•	•	•	•	•	•
Mycrona Inc.																						
Ph. 734-453-5880 Fax 734-453-4076																						
Magnus MB Multi-Sensor	80	40	33	20	•			3.0 + L/300	±3.5	3X=4.8 + L/200	60+		Air	•		•	•	•	•	•	•	•
Magnus Multi-Sensor Two	24	24	16	4	•			0.9 + L/500	±1.5	3X=1.3 + L/400	8		Air	•		•	•	•	•	•	•	•
Primus Multi-Sensor	12	6	6	20	•			2.4 + L/250	±3	3X=3.0 + L/200	60+		Needle Bearings	•		•	•	•	•	•	•	•
Signum Multi-Sensor 300	12	12	6	4	•			1.5 + L/300	±3	3X=2.2 + L/250	20		Needle Bearings	•		•	•	•	•	•	•	•
Signum Multi-Sensor 400	16	16	12	4	•			1.5 + L/300	±3	3X=2.2 + L/250	20		Needle Bearings	•		•	•	•	•	•	•	•
Nikon Inc.																						
Ph. 516-547-8524 Fax 516-547-0306																						
Veritas VM-150	6-12	6-8	6	20				3 + L/50µm	50-95		2µm		Ball Bearing	•								
Operations Technology Inc. (OPTEK)																						
Ph. 800-606-7835 Fax 908-362-5966																						
OPTEK G-Series	48-60	36-48	4-6	20-40				400 400 400	70 ± 5		400		Linear Bearings	•								
OPTEK Innvision	50	36		10-40				800 800 400	70 ± 5		200		Air	•								
OPTEK Innvision X-Ray	18-37	12-26		10-40				400 400 400	70 ± 5		200		Linear Bearings	•								

Note 1: MetricVision 1008 linear accuracy= range: 2.5 ppm; elevation and azimuth: 2.1 ppm. Repeatability= 3 sigma ±65µm @ 10m

2000 GMM Buyers Guide

Company/Product		Machine	X-axis	Y-axis	Z-axis	Resolution	VDI/B89	X-axis	Y-axis	Z-axis	Temp.	4-axis=4X (µin) 6-axis=6X (µin)	Repeatability	Throughput (points/min)	Guide	Analog	Switch	Laser	Contact	Vision	Manual	D.C.C.	Manual	Part
OPTeK V-Series OPTeK VideoMic 1273V OPTeK VideoMic 463V, 462V, 613V, 612V OPTeK VideoMic 713V, 712V, 863V, 862V	Fixed Bridge	Fixed Bridge	12-34	12-26	0-6	10-40		200	200	200	70 ± 5		200	12,000	Linear Bearings									
	Fixed Bridge	Fixed Bridge	50	36	0-6	10-40		200	200	100	70 ± 5		200	12,000	Air									
	Cantilever	Cantilever	18-24	12-18	0-6	5-40		120	120	80	70 ± 5		200	12,000	Linear Bearings									
	Cantilever	Cantilever	28-34	24-26	0-6	5-40		160	160	100	70 ± 5		200	12,000	Linear Bearings									
Optical Gaging Products Inc. Ph. 716-544-0400 Fax 716-544-0131																								
Avant Apex Avant AT5 Avant Zip SmartScope MVP SmartScope ZIP	Cantilever	Cantilever	8	8	4	0.1µm					66-70	x/y=(1.5+L/500)µm z=(1.5+L/500)µm	1,500		Mechanical									
	Cantilever	Cantilever	24	24	8	0.1µm					65-75	x/y=(2+3L/1000)µm z=(2.5+5L/1000)µm	2,000		Air									
	Cantilever	Cantilever	12	12	8	0.25µm					65-75	x/y=(2+L/150)µm z=(2.5+5L/1000)µm	2,000		Mechanical									
	Cantilever	Cantilever	18	18	6	0.5µm					65-75	x/y=(3.5+L/125)µm z=(7+5L/100)µm	1,000		Mechanical									
	Cantilever	Cantilever	10	6	6	0.25µm					65-75	x/y=(2+4L/1000)µm z=(2.5+5L/1000)µm	2,000		Mechanical									
Romer Inc. Ph. 313-563-5933 Fax 313-563-8405																								
1000 Series SMX Corp. Ph. 610-444-2300 Fax 610-444-2323	Port. Artic. Arm	Port. Artic. Arm	5'-12 Dia. Sphere			1000-6000																		
	Port. Tracking Laser	Port. Tracking Laser	Unlimited			80					40-110		200											
TechTran Development Corp. Ph. 201-816-8185 Fax 201-567-7470																								
NexGen WENZEL America Ltd. Ph. 914-347-7822 Fax 914-347-7881	Bridge-Vert.	Bridge-Vert.	20-60	80-200	20-50	100					50-80		200	120	Mech. & Air									
	Horiz. Rail	Horiz. Rail	157-236	62	70	20					64-72	3X=200 + L/0.15	70	50	Air									
	Bridge-Vert.	Bridge-Vert.	25-120	29-160	19-80	20					68±2	3X=100 + L/0.25	40	240	Air									
	Bridge-Vert.	Bridge-Vert.	25-120	29-160	19-80	20					68±2	3X=80 + L/0.45	28	8,000	Air									
	Bridge-Vert.	Bridge-Vert.	98-118	157-236	66-78	20					64-72	3X=168 + L/0.25	74	50	Air									
	Dual Horiz. Arm	Dual Horiz. Arm	216-472	118	70-98	20					60-75	3X=1200 + L/0.04	400	70	Linear									
	Horiz. Rail	Horiz. Rail	157-236	40-63	48-83	20					60-75	3X=800 + L/0.05	300	70	Linear									
	Horiz. Arm	Horiz. Arm	80-180	40-64	48-96	20					68±4	3X=750 + L/0.03	350	120	Roller Bearing									
	Dual Horiz. Arm	Dual Horiz. Arm	180-480	88-120	72-96	20					68±4	3X=1,570 + L/0.02	600	50	Roller Bearing									
Carl Zeiss IMT Corp. Ph. 612-533-9990 Fax 612-533-0219																								
CARMET Contura ECLIPSE ECLIPSE 550 Prismo-VAST SCANMAX SMC SMM UPMC 850 CARAT Vista	Horiz. Arm	Horiz. Arm	79-197	47-107	59-83	40					62-75	3X=0.894 + L/50			Air									
	Fixed Bridge	Fixed Bridge	28	39	24	20					63-95	3X=0.000106 + L/300,000			Bearings									
	Bridge-Vert.	Bridge-Vert.	28-40	28-84	20-24	20					64-79	3X=138 + L/0.25	80		Air									
	Bridge-Vert.	Bridge-Vert.	20	22	24	20					65-78	3X=219 + L/250µm	80		Air									
	Bridge-Vert.	Bridge-Vert.	28-63	35-118	20-39	20					64-82	3X=0.055 + L/350			Air									
	Artic. Arm	Artic. Arm	34	16	16-19	20					60-95	3X=0.00019 + L/50,000			Bearings									
	Horiz. Arm	Horiz. Arm	71-165	39-53	59-94	40					68±5.4	3X=1,181 + L/0.1												
	Horiz. Arm	Horiz. Arm	39-472	39-63	47-94	40					68±7.2													
	Bridge-Vert.	Bridge-Vert.	22-45	20-59	18-39	8					68±3.6	3X=31 + L/0.6			Air									
	Bridge-Vert.	Bridge-Vert.	16	20	14						63-95	3X=144 + L/0.25	80		Air									

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