

Contour and Surface Roughness Measuring Systems FORMTRACER Avant Series Specifications Sheet



FTA-**C3000/4000 Series (Contour Instruments) Specifications

Order No.		FTA-S4C3000	FTA-H4C3000	FTA-W4C3000	FTA-L4C3000	FTA-S8C3000	FTA-H8C3000	FTA-W8C3000	FTA-L8C3000	
		FTA-S4C4000	FTA-H4C4000	FTA-W4C4000	FTA-L4C4000	FTA-S8C4000	FTA-H8C4000	FTA-W8C4000	FTA-L8C4000	
Z1 axis (detector unit)	Measuring range	60 mm (± 30 mm in horizontal orientation)								
	Scale unit	Arc scale								
	Resolution	C3000: 0.04 μ m C4000: 0.02 μ m								
Straightness (when the X axis is horizontal)		0.8 μ m / 100 mm				2 μ m / 200 mm				
Accuracy (20°C)	C3000	X axis	$\pm (0.8+0.01L) \mu$ m L = Measuring length (mm) Wide range: 1.8 μ m / 100 mm Narrow range: 1.05 μ m / 25 mm				$\pm (0.8+0.015L) \mu$ m L = Measuring length (mm) Wide range: 3.8 μ m / 200 mm Narrow range: 1.2 μ m / 25 mm			
		Z1 axis (detector unit)	$\pm (1.2+ 2H / 100) \mu$ m H = Measurement height from the horizontal position (mm)							
	C4000	X axis	$\pm (0.8+0.01L) \mu$ m L = Measuring length (mm) Wide range: 1.8 μ m / 100 mm Narrow range: 1.05 μ m / 25 mm				$\pm (0.8+0.015L) \mu$ m L = Measuring length (mm) Wide range: 3.8 μ m / 200 mm Narrow range: 1.2 μ m / 25 mm			
		Z1 axis (detector unit)	$\pm (0.8+ 2H / 100) \mu$ m H = Measurement height from the horizontal position (mm)							
Stylus up/down motion		Arc movement								
Measuring direction		Both pulling and pushing directions								
Measuring face direction		Downward or upward								
Measuring force	C3000	30 mN								
	C4000	10, 20, 30, 40, 50 mN (direction switch from FORMTRACEPAK)								
Stylus traceable range (when using standard accessory stylus)	C3000	One-sided cut stylus SPH-71: Ascent 77° Descent 83° (according to surface texture)								
	C4000	One-sided cut stylus SPH-71: Ascent 77° Descent 83° (according to surface texture) Double-sided cone stylus SPHW-56: Ascent 74° Descent 72° (according to surface texture)								
Stroke limit function		Range: -29 mm - +29 mm Positioning accuracy range: ± 1 mm								
X axis (drive unit) measuring range		100 mm				200 mm				
Scale unit	X axis	Ultra-high precision linear encoders								
	Z2 axis (column)	ABS linear encoder								
Resolution	X axis	0.05 μ m								
	Z2 axis (column)	1 μ m								
X axis inclination angle		$\pm 45^\circ$								
Z2 axis (column) travel range		300 mm	500 mm	700 mm	300 mm	500 mm	700 mm			
Drive speed	X axis	Software: 0 - 80 mm/s Remote box operation: 0 - 40 mm/s								
	Z2 axis (column)	Software: 0 - 30 mm/s Remote box operation: 0 - 30 mm/s								
Measuring speed		0.02, 0.05, 0.1, 0.2, 0.5, 1.0, 2.0, 5.0, 10, 20, 30 mm/s*								
Detector replacement		Hot swap feature allows for replacement without turning the controller power off (initialization of contour detector required) Employs tool-less replacement mechanism (using thumb-turn knob)								
Base size (WxD)		600x450 mm		1000x450 mm		600x450 mm		1000x450 mm		
Base material		Granite								
External dimensions (mm)	Main unit	W	759	759	1159	1159	769	769	1169	1169
		D	482	482	482	492	482	482	482	492
		H	966	1166	1176	1430	966	1166	1176	1430
	Controller	W221xD472xH346								
Remote box	W248xD62xH102									
Mass (kg)	Main unit	140	150	220	270	140	150	220	270	
	Controller	14								
	Remote box	0.9								
Accuracy guaranteed temperature range		19 - 21°C								
Accuracy guaranteed temperature change over time (max)		2.0°C / 8 h								
Operating temperature range		5 - 40°C (within $\pm 1^\circ$ C temperature fluctuation on calibration and measurement)								
Operating humidity range		20 - 80%RH (with no condensation)								
Storage temperature range		-10 - 50°C								
Storage humidity range		5 - 90%RH (with no condensation)								
Communication interface		USB								
Power supply		100 - 120 V, 200 - 240 V $\pm 10\%$, 50/60 Hz								
Power consumption		400 W								

* Recommended that measurements be conducted at measurement speeds no faster than 5 mm/s.
(If the measurement speed is too fast, coupled with high surface roughness, this may cause the stylus to chip or compromise measurement accuracy.)

FTA-***S3000 Series (Surface Roughness Testers) Specifications

Order No.		FTA-S4S3000	FTA-H4S3000	FTA-W4S3000	FTA-L4S3000	FTA-S8S3000	FTA-H8S3000	FTA-W8S3000	FTA-L8S3000	
Z1 axis (detector unit)	Measuring range	800 μm / 80 μm / 8 μm								
	Scale unit	Differential inductance								
	Resolution	0.01 μm (800 μm), 0.001 μm (80 μm), 0.0001 μm (8 μm)								
Straightness (when the X axis is horizontal) Evaluation parameter: Pt		(0.05+0.001L) μm L = Drive length (mm)				(0.1+0.002L) μm L = Drive length (mm)				
Stylus up/down motion		Arc movement								
Measuring direction		Retracting direction								
Measuring face direction		Downward direction								
Measuring force		0.75 mN								
Stylus tip		60°, R2 μm, Diamond								
X axis (drive unit) measuring range		100 mm				200 mm				
Scale unit	X axis	Ultra-high precision linear encoders								
	Z2 axis (column)	ABS linear encoder								
Resolution	X axis	0.05 μm								
	Z2 axis (column)	1 μm								
X axis inclination angle		±45° (applies only to models with X-axis inclination unit)								
Z2 axis (column) travel range		300 mm	500 mm	700 mm	300 mm	500 mm	700 mm			
Drive speed	X axis	Software: 0 - 80 mm/s Remote box operation: 0 - 40 mm/s								
	Z2 axis (column)	Software: 0 - 30 mm/s Remote box operation: 0 - 30 mm/s								
Measuring speed		0.02, 0.05, 0.1, 0.2, 0.5, 1.0, 2.0, 5.0, 10, 20, 30 mm/s*								
Detector replacement		Hot swap feature allows for replacement without turning the controller power off (initialization of contour detector required) Employs tool-less replacement mechanism (using thumb-turn knob)								
Base size (W×D)		600×450 mm		1000×450 mm		600×450 mm		1000×450 mm		
Base material		Granite								
External dimensions (mm)	Main unit	W	759	759	1159	1159	769	769	1169	1169
		D	482	482	482	492	482	482	482	492
		H	966	1166	1176	1430	966	1166	1176	1430
	Controller	W221×D472×H346								
	Remote box	W248×D62×H102								
Mass (kg)	Main unit	140	150	220	270	140	150	220	270	
	Controller	14								
	Remote box	0.9								
Accuracy guaranteed temperature range		19 - 21°C								
Accuracy guaranteed temperature change over time (max)		2.0°C / 8 h								
Operating temperature range		5 - 40°C (within ±1°C temperature fluctuation on calibration and measurement)								
Operating humidity range		20 - 80%RH (with no condensation)								
Storage temperature range		-10 - 50°C								
Storage humidity range		5 - 90%RH (with no condensation)								
Communication interface		USB								
Power supply		100 - 120 V, 200 - 240 V ±10%, 50/60 Hz								
Power consumption		400 W								

* Recommended that measurements be conducted at measurement speeds no faster than 5 mm/s.

(If the measurement speed is too fast, coupled with high surface roughness, this may cause the stylus to chip or compromise measurement accuracy.)

FTA-**D3000/4000 Series (Contour and Surface Roughness Measuring Systems) Specifications

Surface roughness measurement

Order No.		FTA-S4D3000	FTA-H4D3000	FTA-W4D3000	FTA-L4D3000	FTA-S8D3000	FTA-H8D3000	FTA-W8D3000	FTA-L8D3000
		FTA-S4D4000	FTA-H4D4000	FTA-W4D4000	FTA-L4D4000	FTA-S8D4000	FTA-H8D4000	FTA-W8D4000	FTA-L8D4000
Z1 axis (detector unit)	Measuring range	800 μm / 80 μm / 8 μm							
	Scale unit	Differential inductance							
	Resolution	0.01 μm (800 μm), 0.001 μm (80 μm), 0.0001 μm (8 μm)							
Straightness (when the X axis is horizontal) Evaluation parameter: Pt		(0.05+0.001L) μm L = Measuring length (mm)				(0.1+0.002L) μm L = Measuring length (mm)			
Stylus up/down motion		Arc movement							
Measuring direction		Retracting direction							
Measuring face direction		Downward direction							
Measuring force		0.75 mN							
Stylus tip		60°, R2 μm, Diamond							

Contour measurement

Order No.		FTA-S4D3000	FTA-H4D3000	FTA-W4D3000	FTA-L4D3000	FTA-S8D3000	FTA-H8D3000	FTA-W8D3000	FTA-L8D3000
		FTA-S4D4000	FTA-H4D4000	FTA-W4D4000	FTA-L4D4000	FTA-S8D4000	FTA-H8D4000	FTA-W8D4000	FTA-L8D4000
Z1 axis (detector unit)	Measuring range	60 mm (±30 mm in horizontal orientation)							
	Scale unit	Arc scale							
	Resolution	C3000: 0.04 μm C4000: 0.02 μm							
Straightness (when the X axis is horizontal)		0.8 μm / 100 mm				2 μm / 200 mm			
Accuracy (20°C)	D3000	X axis	± (0.8+0.01L) μm L = Measuring length (mm) Wide range: 1.8 μm / 100 mm Narrow range: 1.05 μm / 25 mm			± (0.8+0.015L) μm L = Measuring length (mm) Wide range: 3.8 μm / 200 mm Narrow range: 1.2 μm / 25 mm			
		Z1 axis (detector unit)	± (1.2+ 2H / 100) μm H = Measurement height from the horizontal position (mm)						
	D4000	X axis	± (0.8+0.01L) μm L = Measuring length (mm) Wide range: 1.8 μm / 100 mm Narrow range: 1.05 μm / 25 mm			± (0.8+0.015L) μm L = Measuring length (mm) Wide range: 3.8 μm / 200 mm Narrow range: 1.2 μm / 25 mm			
		Z1 axis (detector unit)	± (0.8+ 2H / 100) μm H = Measurement height from the horizontal position (mm)						
Stylus up/down motion		Arc movement							
Measuring direction		Both pulling and pushing directions							
Measuring face direction		Downward or upward							
Measuring force	D3000	30 mN							
	D4000	10, 20, 30, 40, 50 mN (direction switch from FORMTRACEPAK)							
Stylus traceable range (when using standard accessory stylus)	D3000	One-sided cut stylus SPH-71: Ascent 77° Descent 83° (according to surface texture)							
	D4000	One-sided cut stylus SPH-71: Ascent 77° Descent 83° (according to surface texture) Double-sided cone stylus SPHW-56: Ascent 74° Descent 72° (according to surface texture)							
Stroke limit function		Range: -29 mm - +29 mm Positioning accuracy range: ±1 mm							

FTA-**D3000/4000 Series (Contour and Surface Roughness Measuring Systems)

Common specifications

Order No.		FTA-S4D3000	FTA-H4D3000	FTA-W4D3000	FTA-L4D3000	FTA-S8D3000	FTA-H8D3000	FTA-W8D3000	FTA-L8D3000	
		FTA-S4D4000	FTA-H4D4000	FTA-W4D4000	FTA-L4D4000	FTA-S8D4000	FTA-H8D4000	FTA-W8D4000	FTA-L8D4000	
X axis (drive unit) measuring range		100 mm				200 mm				
Scale unit	X axis	Ultra-high precision linear encoders								
	ZZ axis (column)	ABS linear encoder								
Resolution	X axis	0.05 μm								
	ZZ axis (column)	1 μm								
X axis inclination angle		$\pm 45^\circ$								
ZZ axis (column) travel range		300 mm	500 mm	700 mm	300 mm	500 mm	700 mm			
Drive speed	X axis	Software: 0 - 80 mm/s Remote box operation: 0 - 40 mm/s								
	ZZ axis (column)	Software: 0 - 30 mm/s Remote box operation: 0 - 30 mm/s								
Measuring speed		0.02, 0.05, 0.1, 0.2, 0.5, 1.0, 2.0, 5.0, 10, 20, 30 mm/s*								
Detector replacement		Hot swap feature allows for replacement without turning the controller power off (initialization of contour detector required) Employs tool-less replacement mechanism (using thumb-turn knob)								
Base size (WxD)		600x450 mm	1000x450 mm	600x450 mm	1000x450 mm					
Base material		Granite								
External dimensions (mm)	Main unit	W	759	759	1159	1159	769	769	1169	1169
		D	482	482	482	492	482	482	482	492
		H	966	1166	1176	1430	966	1166	1176	1430
	Controller	W221xD472xH346								
	Remote box	W248xD62xH102								
Mass (kg)	Main unit	140	150	220	270	140	150	220	270	
	Controller	14								
	Remote box	0.9								
Accuracy guaranteed temperature range		19 - 21°C								
Accuracy guaranteed temperature change over time (max)		2.0°C / 8 h								
Operating temperature range		5 - 40°C (within $\pm 1^\circ\text{C}$ temperature fluctuation on calibration and measurement)								
Operating humidity range		20 - 80%RH (with no condensation)								
Storage temperature range		-10 - 50°C								
Storage humidity range		5 - 90%RH (with no condensation)								
Communication interface		USB								
Power supply		100 - 120 V, 200 - 240 V $\pm 10\%$, 50/60 Hz								
Power consumption		400 W								

* Recommended that measurements be conducted at measurement speeds no faster than 5 mm/s.

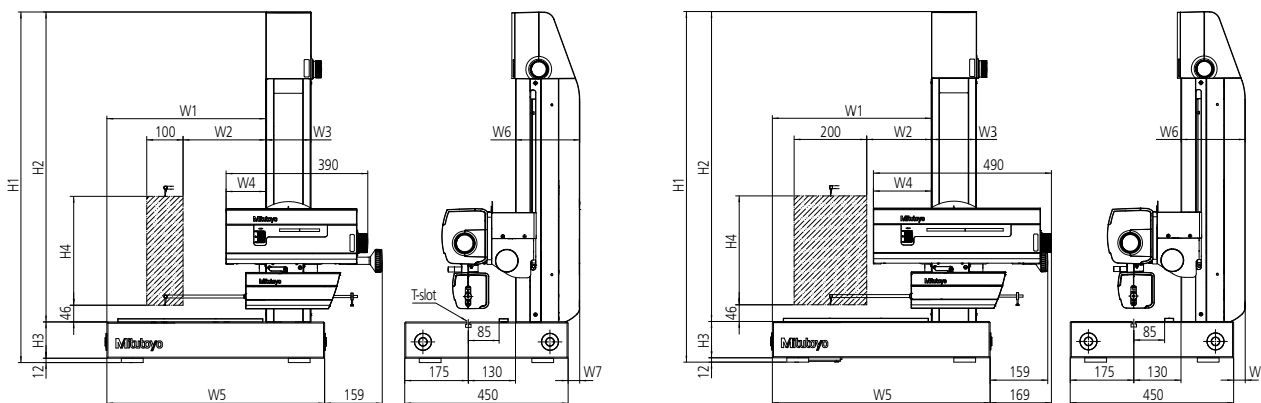
(If the measurement speed is too fast, coupled with surface property, this may cause the stylus to chip or compromise measurement accuracy.)

Dimensions

unit: mm

FTA-S4 / H4 / W4 / L4C3000 Series, FTA-S4/ H4 / W4 / L4C4000 Series

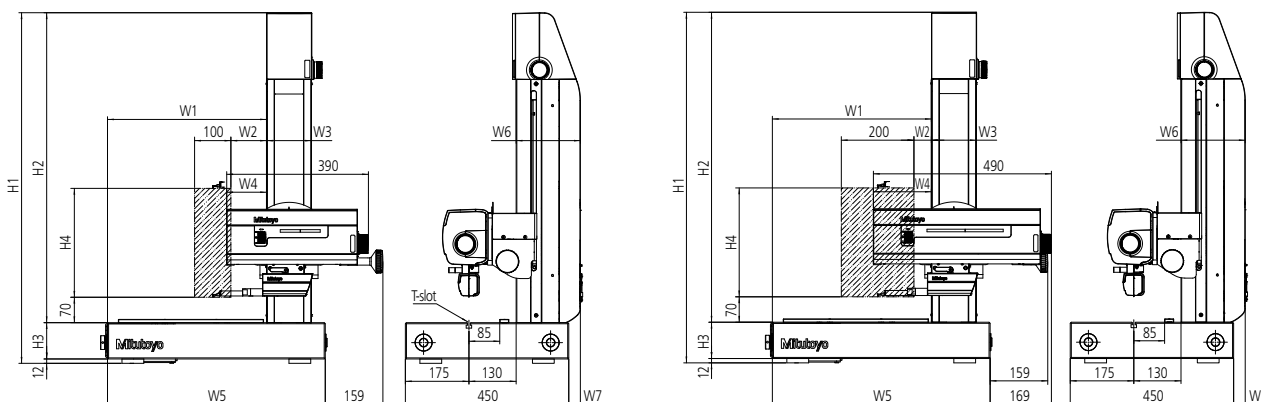
FTA-S8 / H8 / W8 / L8C3000 Series, FTA-S8 / H8 / W8 / L8C4000 Series



X axis (drive unit) measuring range	Order No.		W1 (mm)	W2 (mm)	W3 (mm)	W4 (mm)	W5 (mm)	W6 (mm)	W7 (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)
	3000 Series	4000 Series											
100 mm	FTA-S4C3000	FTA-S4C4000	438	228	124	110	600	177	32	966	854	100	300
	FTA-H4C3000	FTA-H4C4000	438	228	124	110	600	177	32	1166	1054	100	500
	FTA-W4C3000	FTA-W4C4000	838	228	124	110	1000	177	32	1176	1054	110	500
	FTA-L4C3000	FTA-L4C4000	825	215	150	97	1000	187	42	1430	1308	110	700
200 mm	FTA-S8C3000	FTA-S8C4000	438	228	124	110	600	177	32	966	854	100	300
	FTA-H8C3000	FTA-H8C4000	438	228	124	110	600	177	32	1166	1054	100	500
	FTA-W8C3000	FTA-W8C4000	838	228	124	110	1000	177	32	1176	1054	110	500
	FTA-L8C3000	FTA-L8C4000	825	215	150	97	1000	187	42	1430	1308	110	700

FTA-S4 / H4 / W4 / L4S3000 Series

FTA-S8 / H8 / W8 / L8S3000 Series



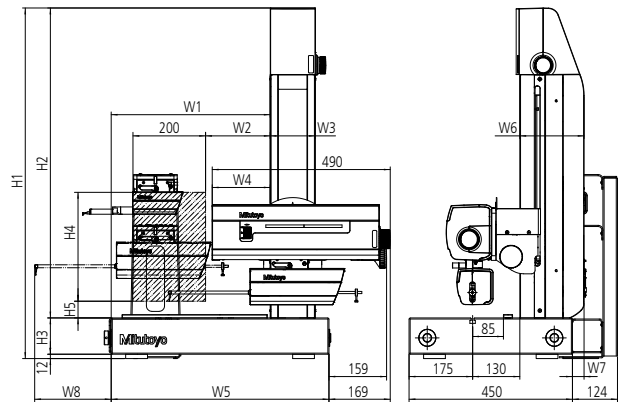
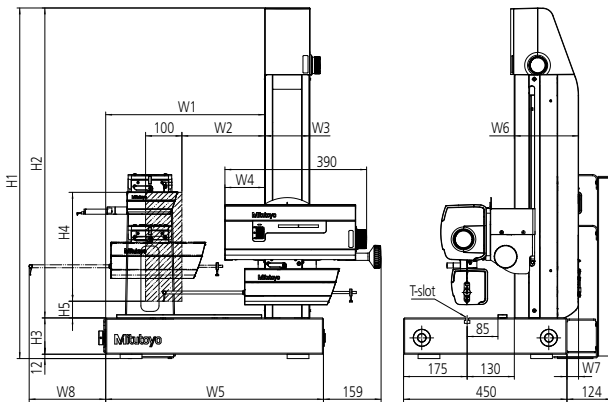
X axis (drive unit) measuring range	Order No.	W1 (mm)	W2 (mm)	W3 (mm)	W4 (mm)	W5 (mm)	W6 (mm)	W7 (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)
100 mm	FTA-S4S3000	438	98	124	110	600	177	32	966	854	100	300
	FTA-H4S3000	438	98	124	110	600	177	32	1166	1054	100	500
	FTA-W4S3000	838	98	124	110	1000	177	32	1176	1054	110	500
	FTA-L4S3000	825	85	150	97	1000	187	42	1430	1308	110	700
200 mm	FTA-S8S3000	438	48	124	160	600	177	32	966	854	100	300
	FTA-H8S3000	438	48	124	160	600	177	32	1166	1054	100	500
	FTA-W8S3000	838	48	124	160	1000	177	32	1176	1054	110	500
	FTA-L8S3000	825	35	150	147	1000	187	42	1430	1308	110	700

Dimensions

unit: mm

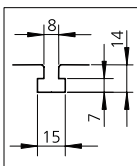
**FTA-S4 / H4 / W4 / L4D3000 Series,
FTA-S4 / H4 / W4 / L4D4000 Series**

**FTA-S8 / H8 / W8 / L8D3000 Series,
FTA-S8 / H8 / W8 / L8D4000 Series**



X axis (drive unit) measuring range	Order No.		W1 (mm)	W2 (mm)	W3 (mm)	W4 (mm)	W5 (mm)	W6 (mm)	W7 (mm)	W8 (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)
	3000 Series	4000 Series													
100 mm	FTA-S4D3000	FTA-S4D4000	438	228 (98)	124	110	600	177	32	211	966	854	100	300	46 (70)
	FTA-H4D3000	FTA-H4D4000	438	228 (98)	124	110	600	177	32	211	1166	1054	100	500	46 (70)
	FTA-W4D3000	FTA-W4D4000	838	228 (98)	124	110	1000	177	32	210	1176	1054	110	500	46 (70)
	FTA-L4D3000	FTA-L4D4000	825	215 (85)	150	97	1000	187	42	210	1430	1308	110	700	46 (70)
200 mm	FTA-S8D3000	FTA-S8D4000	438	228 (98)	124	110	600	177	32	211	966	854	100	300	46 (70)
	FTA-H8D3000	FTA-H8D4000	438	228 (98)	124	110	600	177	32	211	1166	1054	100	500	46 (70)
	FTA-W8D3000	FTA-W8D4000	838	228 (98)	124	110	1000	177	32	210	1176	1054	110	500	46 (70)
	FTA-L8D3000	FTA-L8D4000	825	215 (85)	150	97	1000	187	42	210	1430	1308	110	700	46 (70)

Note: Dimensions when surface roughness detector is installed indicated in parentheses

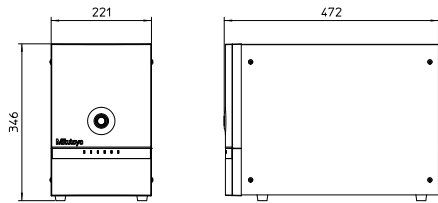


T-slot dimensions
(Common to all models)

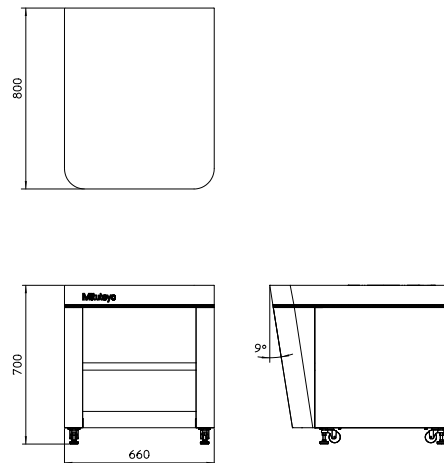
Dimensions

unit: mm

Controller (Common to all models: standard accessories)



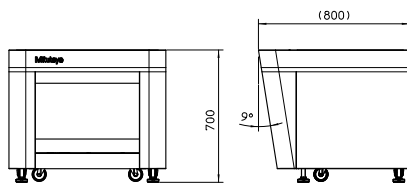
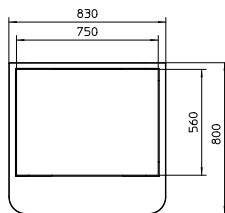
Side table (option)



Vibration isolators (for standard base: option)

Supported models (standard base)

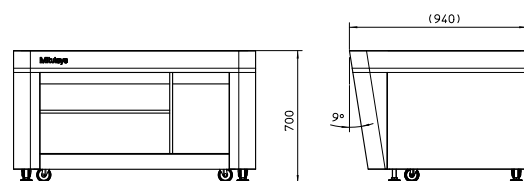
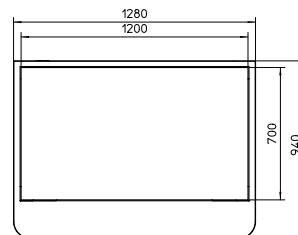
FTA-S4 / H4 / S8 / H8S3000
FTA-S4 / H4 / S8 / H8C3000
FTA-S4 / H4 / S8 / H8C4000
FTA-S4 / H4 / S8 / H8D3000
FTA-S4 / H4 / S8 / H8D4000



Vibration isolators (wide base: option)

Supported models (wide base)

FTA-W4 / L4 / W8 / L8S3000
FTA-W4 / L4 / W8 / L8C3000
FTA-W4 / L4 / W8 / L8C4000
FTA-W4 / L4 / W8 / L8D3000
FTA-W4 / L4 / W8 / L8D4000



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Vision Measuring Systems

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Optical Measuring

Sensor Systems

Test Equipment and Seismometers

Digital Scale and DRO Systems

Small Tool Instruments and Data Management