





## CONTROLLER SPECIFICATIONS





Model	TS1000	TS2000	TS2100	TS2000L
Number of controlled axis	Maximum 4-axis simultaneous control		Maximum 5-axis simultaneous control	
Operation mode	PTP, CP(linear, circular), Short-cut, Arch motion			
Position detecting system	Absolute encoders			
Storage capacity	Total : Approx.6400 points+12800 steps (512k bytes) 1 program : Approx.2000 points+3000 steps			
Number of registrable programs	Max.256 (247 user files + 9 system files)			
Programming language	SCOL (proprietary, similar to BASIC)			
Teaching unit	Teach pendant TP1000...Cable length 5m (programs can be written on PC)			
External input/output signals(general)	Input:16/Output:16 (8/8 can be switchable with system)		Input:31+7/Output:22+10 (7/10 can be switchable with system)	
Hand control signals	5 inputs/4 outputs			
External operation signals(exclusive)	Input:Cycle operation mode, start, stop, program reset, etc. Output:Servo-ON, operation ready, malfunction, cycle operation ON, etc.			
Serial communication port	RS-232C:2 ports			
Power supply and capacity	Single-phase AC170V~250V 50/60Hz 1.1kVA	Single-phase AC190V~250V 50/60Hz 2.3kVA	Three-phase AC190V~250V 50/60Hz 3.5~4.4kVA	Three-phase AC190V~250V 50/60Hz 8kVA
Outer dimensions and mass	170W×290H×280D (mm) ,10kg	290W×230H×280D (mm) ,12kg	420W×230H×300D (mm) ,16kg	700W×1265H×570D (mm) ,90kg
Other functions	Torque control, Interruption, robot motion ON signal, communication processing, coordinate calculation, built-in PLC, self-diagnosis, etc.			
Software for programming support(option)	TSPC...Program editor, teaching, remote operation, etc. TCPRGOS...Built-in PLC programming, etc. (for Windows2000, WindowsXP)			
Option	Synchronization with conveyor, I/O extension, data latch function, Ethernet, CC-Link, Devicenet, Profibus, CE compliance, etc. (Synchronization with conveyor and Ethernet are not available on TS1000)			

•Windows is a registered trademark of Microsoft Corporation in the U.S.A. •Ethernet is a registered trademark of Xerox Corp. in the U.S.A.  
 •CC-link is a registered trademark of CC-link Partner Association. •DeviceNet is a registered trademark of ODVA.  
 •Profibus is a registered trademark of Profibus User Organization.

## LCD ROBOT

<b>Small-size glass substrate handling robot</b> <b>TCR5L-3S:Single arm</b> <b>TCR5L-4W:Double arm</b>  Substrate size:370mm5470mm	<b>Middle-size glass substrate handling robot</b> <b>TCR10L-3S:Single arm</b> <b>TCR10L-4W:Double arm</b>  Substrate size:730mm5920mm	<b>Middle-size glass substrate handling robot</b> <b>TCR12C-3SZ:Single arm</b> <b>TCR12C-4WZ:Double arm</b>  Substrate size:620mm51,080mm	<b>Large-size glass substrate handling robot</b> <b>TCR20V-3S:Single arm</b> <b>TCR20V-4W:Double arm</b>  Substrate size:1,250mm51,100mm
--	---	--	--

## SEMICONDUCTOR ROBOT

<b>Large-size glass substrate handling robot</b> <b>TCR20V2-3SZ:Single arm</b> <b>TCR20V2-4WZ:Double arm</b>  Substrate size:1,200mm51,300mm	<b>Wafer handling robot</b> <b>SR-404HC/SR-624HC</b>  Max.payload mass:20/35kg	<b>Foup handling robot</b> <b>SR-L9GL3-CR-DN</b>  Max.payload mass:15kg	<b>8inch wafer cassette handling robot</b> <b>SR-354VH-CR</b>  Max.payload mass:10kg
---	--	--	--

**TOSHIBA MACHINE CO.,LTD.** HEAD OFFICE  
 Control Systems Sales Department, Control Systems Division  
 2068-3, Ooka, Numazu-shi, Shizuoka-ken 410-8510, Japan  
 TEL:[81]-(0)55-926-5032 FAX:[81]-(0)55-925-6527

**TOSHIBA MACHINE CO.,AMERICA.**  
 755 Greenleaf Avenue, EIK Grove Village, IL 60007, U.S.A.  
 TEL:[1]-847-593-1616 FAX:[1]-847-593-0897

**TM ROBOTICS(EUROPE) LTD.**  
 Unit 15, The Weltech Centre,  
 Ridgeway Welwyn Garden City, Herts AL7 2AA  
 TEL:[44]-(0)1707-871535 FAX:[44]-(0)1707-393959

URL:<http://www.toshiba-machine.co.jp/seiji/prod/sr>  
[http://www.toshiba-machine.com/robotics/SR\\_homepagef.htm](http://www.toshiba-machine.com/robotics/SR_homepagef.htm)  
<http://www.tmrobotics.co.uk>



Before operating the industrial robot, read through and completely understand the instruction manuals.

■The contents included in this catalog are subject to change without prior notice to reflect improvements.

# TOSHIBA MACHINE

# SYSTEM ROBOTS

## TH/SR Series



# Toshiba Machine's System Robots TH/SR Series

## COMPACT SCARA ROBOT

**TH180**



Arm length ● 180mm  
Z-axis stroke ● 120mm  
Max. payload mass ● 2kg

**TH250A**



Arm length ● 250mm  
Z-axis stroke ● 120mm  
Max. payload mass ● 3kg

**TH350A**



Arm length ● 350mm  
Z-axis stroke ● 120mm  
Max. payload mass ● 3kg

## CONTROLLER

**TS1000**



Outer Dimensions ● 170W×290H×290D (mm)  
Mass ● 10kg  
Cable ● 3m

## HIGH SPEED, HIGH ACCURACY SCARA ROBOT

**TH450**



Arm length ● 450mm  
Z-axis stroke ● 150(300) mm  
Max. payload mass ● 5kg

**TH550**



Arm length ● 550mm  
Z-axis stroke ● 150(300) mm  
Max. payload mass ● 5kg

**TS2000**



Outer Dimensions ● 290W×230H×280D (mm)  
Mass ● 12kg  
Cable ● 5m

**TH650A**



Arm length ● 650mm  
Z-axis stroke ● 200(400) mm  
Max. payload mass ● 10kg

**TH850A**



Arm length ● 850mm  
Z-axis stroke ● 200(400) mm  
Max. payload mass ● 20kg

**TH1050A**



Arm length ● 1050mm  
Z-axis stroke ● 200(400) mm  
Max. payload mass ● 20kg

**TS2100**



Outer Dimensions ● 420W×230H×300D (mm)  
Mass ● 16kg  
Cable ● 5m

## LARGE SIZE SCARA ROBOT

**SR-15004HZ**



Arm length ● 1500(1950) mm  
Z-axis stroke ● 600(1200) mm  
Max. payload mass ● 70(40) kg

**TS2000L**



Outer Dimensions ● 700W×1265H×570D (mm)  
Mass ● 90kg  
Cable ● 5m

## TEACH PENDANT

**TP1000**



Outer Dimensions ● 133W×255H×58D (mm)  
Mass ● 600g  
Cable ● 5m

# Ample lineup to meet users requirements

## ROBOT SPECIFICATIONS

Model	COMPACT SCARA ROBOT			HIGH SPEED, HIGH ACCURACY SCARA ROBOT		
	TH180	TH250A	TH350A	TH450	TH550	
Arm length (1st arm+2nd arm)	180mm (70+110)	250mm (125+125)	350mm (225+125)	450mm (200+250)	550mm (300+250)	
Working envelope	Axis 1	±120°	±115°	±120°	±120°	
	Axis 2	±140°	±140°	±145°	±145°	
	Axis 3 (Z-axis)	120mm	120mm	120mm	150mm/300mm	150mm/300mm
	Axis 4 (Z-axis rotation)	±360°	±360°	±360°	±360°	±360°
Maximum speed	Axis 1	533°/s	540°/s	337.5°/s	600°/s	375°/s
	Axis 2	480°/s	540°/s	540°/s	600°/s	600°/s
	Axis 3 (Z-axis)	1013mm/s	1120mm/s	1120mm/s	2000mm/s	2000mm/s
	Axis 4 (Z-axis rotation)	1186°/s	1143°/s	1143°/s	2000°/s	2000°/s
	Composite	2.6m/s	3.53m/s	3.24m/s	7.33m/s	6.21m/s
Standard cycle time	0.35s (With 1kg payload) *1	0.41s (With 1kg payload) *2	0.41s (With 1kg payload) *2	0.33s (With 2kg payload) *2	0.33s (With 2kg payload) *2	
Maximum payload mass	2kg	3kg	3kg	5kg	5kg	
Allowable moment of inertia at end	0.01kg·m <sup>2</sup> *3	0.017kg·m <sup>2</sup> *3	0.017kg·m <sup>2</sup> *3	0.05kg·m <sup>2</sup> *3	0.05kg·m <sup>2</sup> *3	
Positioning repeatability	X·Y (Plane)	±0.01mm	±0.01mm	±0.01mm	±0.015mm	±0.015mm
	Z (Vertical)	±0.01mm	±0.01mm	±0.01mm	±0.01mm	±0.01mm
	Axis 4 (Z-axis rotation)	±0.005°	±0.005°	±0.005°	±0.005°	±0.005°
Input/output signals for hand-Air piping for hand	5 inputs/4 outputs·φ4×4pcs					
Robot-controller cable length	3m (Option 5m)	3m (Option 5m)	3m (Option 5m)	5m (Option max.25m)	5m (Option max.25m)	
Mass	9kg	14kg	14kg	27kg	29kg	
Controller	TS1000	TS1000	TS1000	TS2000	TS2000	

Model	HIGH SPEED, HIGH ACCURACY SCARA ROBOT			LARGE SIZE SCARA ROBOT	
	TH650A	TH850A	TH1050A	SR-1504HZ	
Arm length (1st arm+2nd arm)	650mm (300+350)	850mm (350+500)	1050mm (550+500)	1500mm~1950mm (1500=850+650)	
Working envelope	Axis 1	±160°	±160°	±110°	
	Axis 2	±143°	±145°	±150°	
	Axis 3 (Z-axis)	200mm/400mm	200mm/400mm	200mm/400mm	600mm/1200mm
	Axis 4 (Z-axis rotation)	±360°	±360°	±360°	±360°
Maximum speed	Axis 1	340°/s	300°/s	300°/s	130°/s
	Axis 2	600°/s	420°/s	420°/s	160°/s
	Axis 3 (Z-axis)	2050mm/s	2050mm/s	2050mm/s	1000mm/s
	Axis 4 (Z-axis rotation)	1700°/s	1200°/s	1200°/s	300°/s
	Composite	7.52m/s	8.13m/s	9.15m/s	5.22m/s
Standard cycle time	0.31s (With 2kg payload) *2	0.39s (With 2kg payload) *2	0.39s (With 2kg payload) *2	—	
Maximum payload mass	10kg	20kg	20kg	70kg (Arm length 1950mm=40kg)	
Allowable moment of inertia at end	0.1kg·m <sup>2</sup> *3	0.2kg·m <sup>2</sup> *3	0.2kg·m <sup>2</sup> *3	3.5kg·m <sup>2</sup> *3	
Positioning repeatability	X·Y (Plane)	±0.01mm	±0.01mm	±0.01mm	±0.2mm
	Z (Vertical)	±0.01mm	±0.01mm	±0.01mm	±0.2mm
	Axis 4 (Z-axis rotation)	±0.004°	±0.004°	±0.004°	±0.05°
Input/output signals for hand-Air piping for hand	5 inputs/4 outputs·φ6×4pcs			5 inputs/4 outputs·φ12×2pcs	
Robot-controller cable length	5m (Option max.25m)	5m (Option max.25m)	5m (Option max.25m)	5m (Option max.25m)	
Mass	55kg	76kg	80kg	550kg	
Controller	TS2100	TS2100	TS2100	TS2000L	

## OPTIONS

- Z-axis long stroke ..... TH450/TH550:300mm  
TH650/TH850/TH1050:400mm
- Protective Bellows for Z-axis .. TH450~TH1050
- Cover for Z-axis ..... TH650/TH850/TH1050
- Optional cable lengths ..... Robot-Controller maximum 25 meters (TH450~TH1050)  
Teach pendant maximum 15 meters
- Tool flange for end-effector attachment .. TH180/TH250A/TH350A/TH450/TH550
- Additional 5th axis ..... Traverse axis, wrist axis, etc. (TH450~TH1050)
- Ceiling mount ..... TH350A/TH450/TH550

## CLEAN ROOM (OPTION)

- ... TH180-CR / TH250A-CR / TH350A-CR
- Class (0.1μm)
- Applicable only around the hand area, in the downward airflow of speed 0.4m/s or larger and the robot air-purged at 60 l/min.
- No logotype on the arm cover.

## ALLOWABLE MOMENT OF INERTIA

\*3: The acceleration/deceleration rates may be limited depending on motion patterns, load mass and offset amount.

## MOTION PATTERN FOR STANDARD CYCLE TIME

\*1: 100mm for horizontal direction, 25mm for vertical direction, round-trip.  
\*2: 300mm for horizontal direction, 25mm for vertical direction, round-trip.