SCARA ROBOT

Shibaura Machine

SCARA ROBOT
THL SERIES

THL300
THL400

THL500
THL600
THL700

THL800
THL900
THL1000

Controller
TSL3000
TSL3000E

⚠ **Safety warnings**

● Before using, read through and completely understand the appropriate instruction manuals.
● The contents of this catalog may be subject to change without prior notice.

SHIBAURA MACHINE CO., LTD.

TM ROBOTICS [AMERICAS] INC.
755 Greenleaf Avenue, EIK Grove Village, IL 60007, U.S.A.
TEL:[1]-847-709-7308   Mail:info@tmrobotics.com

TM ROBOTICS [EUROPE] LTD.
Unit 2, Bridge Gate Centre, Martinfield,
Welwyn Garden City, Herts, AL7 1JG UK
TEL:[44]- (0)1707-290370   Mail:sales@tmrobotics.co.uk

SHIBAURA MACHINE CO., LTD.

www.shibaura-machine.co.jp

Distributor

Achieving Reliable Quality and Superior Performance

SCARA ROBOT
THL Series

Low cost

Impressive performance at affordable prices.

Light-weight

Maximum weight reduction of about 60% has been achieved in comparison with our current. Models Capable of reducing environmental impact.
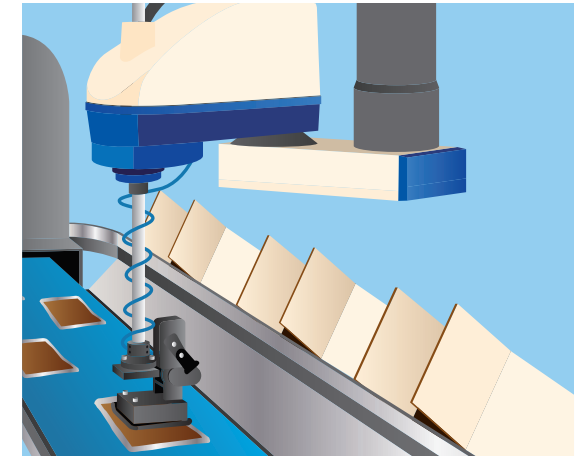
Energy-efficient

Maximum power consumption reduction of about 70% has been achieved in comparison with our current models. Low-power consumption robots ideal for energy conservation era.

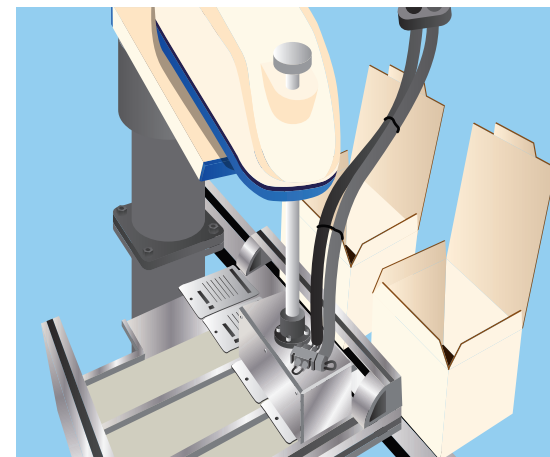## Examples of Application and Adoption
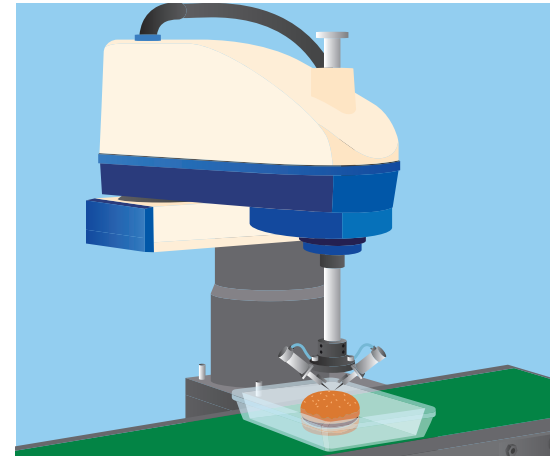
Food Manufacturing
Used for food manufacturing lines to prepare and transport food.

Food
Used for food boxing lines to automatically box ready-packed food being transported on the belt conveyor into boxes.

Pharmaceutical and Medical
Used for boxing lines of pharmaceutical and medical products to automatically box finished products being transported on the belt conveyor into boxes.
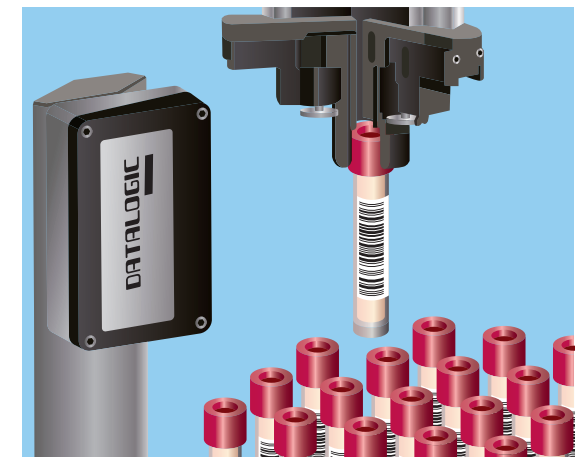
Medical Examination
Used to automate the processing of a large quantity of specimen samples at medical institutions. Test tubes picked up by the SCARA robot are read by a barcode reader, allowing uniform work and secure repeatability.
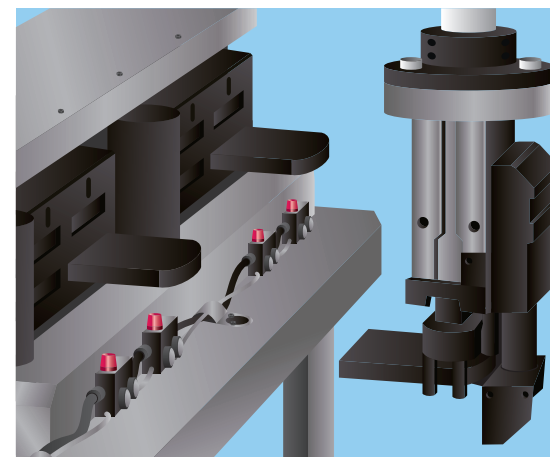
Assembling and Inspection
Used to assemble and inspect electronic devices. The SCARA robot has been adopted for manufacturing of precision machines.
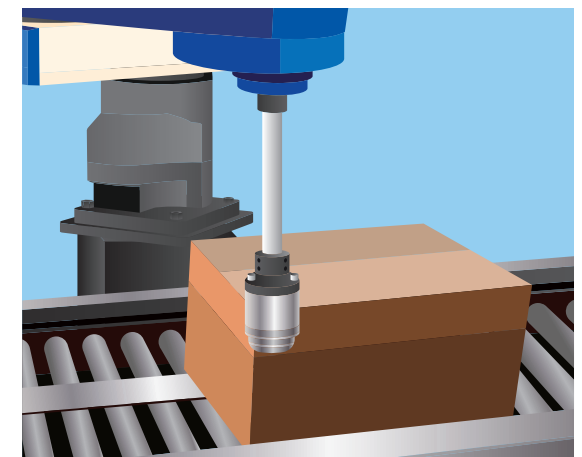
Cutting
Used as a cutting device. Cardboard boxes being transported by the conveyor are cut by the cutter attached to the SCARA robot.

Diverse Lineup to Meet Your Application Needs

THL300
p.08

THL400
p.09

THL500
p.10

THL600
p.11

THL700
p.12

THL800
p.13

THL900
p.14

THL1000
p.15

Order model code

THL400-Z-C-E-S

Arm length

Z-axis long stroke

Special design

Optional specifications

CE Specifications

With cap : C	Simple Cleanroom : CS
With protective bellows : B	Dust-proof : IP6X
Ceiling-mount type : T	Low height : LH

Model	THL500	THL600	THL700
Type	Horizontal multi-joint	Horizontal multi-joint	Horizontal multi-joint
No. of controlled axes	4	4	4
Arm length	500mm（200mm+300mm）	600mm（300mm+300mm）	700mm（400mm+300mm）
Working envelope Axis 1	±125°	±125°	±125°
Axis 2	±145°	±145°	±145°
Axis 3 (Z axis)	0～150mm	0～150mm	0～150mm
Axis 4 (Z-axis rotation)	±360°	±360°	±360°
Maximum speed*1 Axis 1	450°/s	450°/s	450°/s
Axis 2	450°/s	450°/s	450°/s
Axis 3 (Z axis)	2000mm/s	2000mm/s	2000mm/s
Axis 4 (Z-axis rotation)	1700°/s	1700°/s	1700°/s
Composite	6.3m/s	7.1m/s	7.9m/s
Standard cycle time (with 2 kg load)*2	0.45s	0.45s	0.50s
Maximum payload mass	10 kg (rated: 2 kg)	10kg (rated: 2 kg)	10kg (rated: 2 kg)
Allowable moment of inertia	0.2kg·㎡	0.2kg·㎡	0.2kg·㎡
Positioning repeatability*3 X-Y	±0.01mm	±0.01mm	±0.01mm
Z (Axis 3)	±0.015mm	±0.015mm	±0.015mm
Axisθ (Z-axis rotation)	±0.007°	±0.007°	±0.007°
Hand wiring	8 inputs / 8 outputs	8 inputs / 8 outputs	8 inputs / 8 outputs
Hand pneumatic joints*4	φ6 x 3 pcs.	φ6 x 3 pcs.	φ6 x 3 pcs.
Position detection	Absolute	Absolute	Absolute
Robot controller cable	3.5m	3.5m	3.5m
Power capacity	1.4kVA	1.4kVA	1.4kVA
Mass	22kg	23kg	24kg

Model	THL800	THL900	THL1000
Type	Horizontal multi-joint	Horizontal multi-joint	Horizontal multi-joint
No. of controlled axes	4	4	4
Arm length	800mm（350mm+450mm）	900mm（450mm+450mm）	1000mm（550mm+450mm）
Working envelope Axis 1	±125°	±125°	±125°
Axis 2	±145°	±145°	±145°
Axis 3 (Z axis)	0～300mm	0～300mm	0～300mm
Axis 4 (Z-axis rotation)	±360°	±360°	±360°
Maximum speed*1 Axis 1	187.5°/s	187.5°/s	187.5°/s
Axis 2	217.5°/s	217.5°/s	217.5°/s
Axis 3 (Z axis)	2000mm/s	2000mm/s	2000mm/s
Axis 4 (Z-axis rotation)	1700°/s	1700°/s	1700°/s
Composite	4.3m/s	4.6m/s	5.0m/s
Standard cycle time (with 2 kg load)*2	0.47s	0.48s	0.48s
Maximum payload mass	10kg (rated: 2 kg)	10kg (rated: 2 kg)	10kg (rated: 2 kg)
Allowable moment of inertia	0.2kg·㎡	0.2kg·㎡	0.2kg·㎡
Positioning repeatability*3 X-Y	±0.02mm	±0.02mm	±0.02mm
Z (Axis 3)	±0.015mm	±0.015mm	±0.015mm
Axisθ (Z-axis rotation)	±0.007°	±0.007°	±0.007°
Hand wiring	8 inputs / 8 outputs	8 inputs / 8 outputs	8 inputs / 8 outputs
Hand pneumatic joints*4	φ6 x 3 pcs.	φ6 x 3 pcs.	φ6 x 3 pcs.
Position detection	Absolute	Absolute	Absolute
Robot controller cable	3.5m	3.5m	3.5m
Power capacity	1.4kVA	1.4kVA	1.4kVA
Mass	33kg	35kg	37kg

Model	THL300	THL400
Type	Horizontal multi-joint	Horizontal multi-joint
No. of controlled axes	4	4
Arm length	300mm（125mm+175mm）	400mm（225mm+175mm）
Working envelope Axis 1	±125°	±125°
Axis 2	±145°	±145°
Axis 3 (Z axis)	0～160mm	0～160mm
Axis 4 (Z-axis rotation)	±360°	±360°
Maximum speed*1 Axis 1	660°/s	660°/s
Axis 2	660°/s	660°/s
Axis 3 (Z axis)	1120mm/s	1120mm/s
Axis 4 (Z-axis rotation)	1500°/s	1500°/s
Composite	5.1m/s	6.3m/s
Standard cycle time (with 2 kg load)*2	0.48s	0.47s
Maximum payload mass	5kg (rated: 2 kg)	5kg (rated: 2 kg)
Allowable moment of inertia	0.05kg·㎡	0.05kg·㎡
Positioning repeatability*3 X-Y	±0.01mm	±0.01mm
Z (Axis 3)	±0.015mm	±0.015mm
Axisθ (Z-axis rotation)	±0.007°	±0.007°
Hand wiring	8 inputs / 8 outputs	8 inputs / 8 outputs
Hand pneumatic joints*4	φ4 x 3 pcs.	φ4 x 3 pcs.
Position detection	Absolute	Absolute
Robot controller cable	3.5m	3.5m
Power capacity	0.7kVA	0.7 k VA
Mass	12kg	13kg

*1: Acceleration/deceleration rates may be limited according to the motion pattern, load mass and amount of offset.
*2: Horizontal 300 mm, vertical 25 mm, round-trip with coarse positioning. Continuous operation is not possible beyond the effective load ratio.
*3: Positioning repeatable accuracy in one-direction movement, when the environmental temperature and robot temperature are constant. Not absolute positioning accuracy.
　　Positioning repeatability for X-Y and C are for when Z-axis is at the upper-most position. Trajectory accuracy is not ensured.
*4: Pneumatic joints for hand are provided on the base. Pipes are to be provided by the customers.

Controllers

Controller
TSL3000

Controller
TSL3000E

Teach Pendant
(Optional)

TP1000

TP3000

Controller Specifications

Model	TSL3000
No. of Controlled Axes	4
Motion Mode	PTP (point-to-point), CP (continuous path; Linear, Circular), Short-Cut, Arch Motion
Storage capacity	Total: Approx. 6,400 points + 12,800 steps 1 program: Approx. 2,000 points + 3,000 steps
No. of registrable Programs	Max. 256 (247 User files, 9 System files)
Teaching Unit (Optional)	Teach Pendant TP1000, TP3000 Programming by PC Software TSAssist and TSPC
External input/output signals	8 inputs and 8 outputs
Hand control signal	8 inputs and 8 outputs
External operation signals — Input	Program selection, start, stop, program reset, etc.
External operation signals — Output	Servo ON, operation ready, fault, cycle stop, etc.
Communication port	RS232C 1 port (HOST or TCPRG) RS232C 1 port (General-purpose "COM1") RS4285 1 port (for I/O expansion) RS422 1 port (for TP1000) Ethernet
Other functions	Torque control, Interruptive functions, self-diagnosis, I/O control and communications during motion, Coordinate calculations, Built-in PLC, etc.
Power supply	Single-phase, 190 to 240V AC, 50/60 Hz
Outer dimensions and mass [*1]	150(W)×266(H)×304(D) mm, 7(kg)
PC Software (Optional)	TSAssist: Robot Programming assist tool High-performance 3D simulation, program editor, teaching function, etc., TSPC TC-WORX: PLC programming
Optional specifications [*2]	I/O signal polarity ("N-type" or "P-type"), I/O extension, Field network (PROFIBUS, DeviceNet, CC-Link, EtherNet/IP, EtherCAT, PROFINET)

Optional Controller Specifications

Model	TSL3000E
Storage capacity	Total: Approx. 12, 800 points + 25,600 steps 1 program: Approx. 2,000 points + 3,000 steps
Outer dimensions and mass [*1]	320(W)×266(H)×304(D) mm, 13 (kg)
Optional specifications for TSL3000E	High-speed input signal, conveyor synchronization, CE compliance

*1: Height values include rubber feet. Space clearance is required for cable routing etc. Please contact us about the full details of dimensions.
*2: 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 and EtherNet/IP are registered trademarks of ODVA. Profibus and PROFINET are registered trademark of PROFIBUS User Organization. EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

External view

TSL3000

(250)   304   *(110)   150

Standard bend radius (160)

Robot Connector Dimensions

82

116.6   56

Unit is mm.

255

11

| Top View | Right Side View | Front View | Rear View |

Unit is mm.

*When a cable is attached for ethernet or optional additional I/O unit.

Control system options
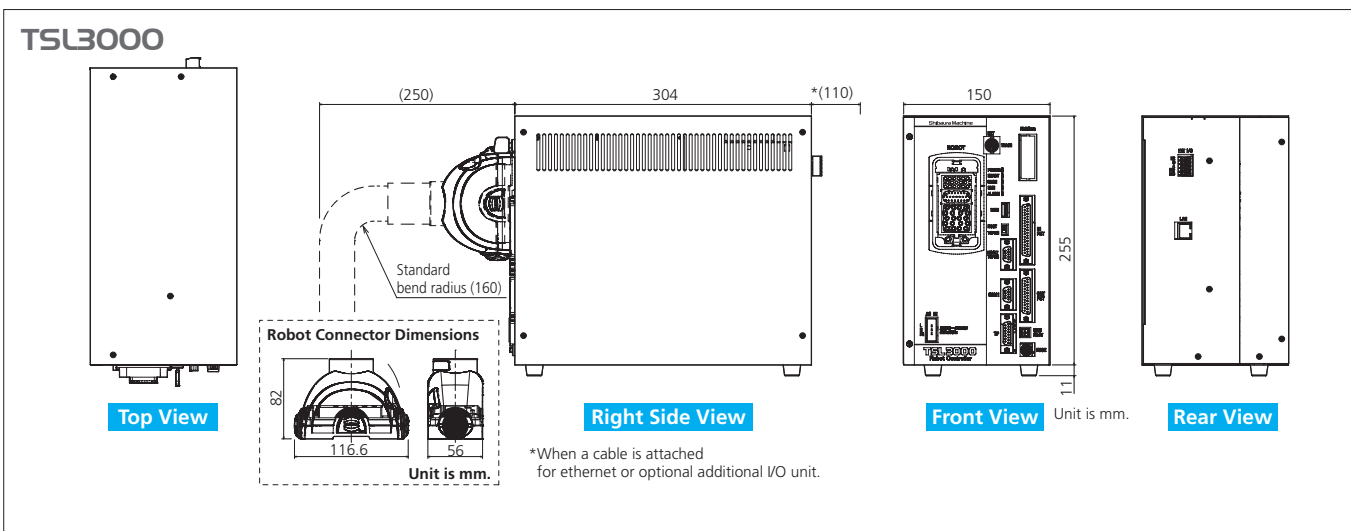
High-performance Teach Pendant TP3000 (Optional)

New sensation!
Equipped with graphic operation keys!
The teach pendant TP3000 is easy to see and operate!

● Adoption of an easy-to-view vivid color screen

Compared to our conventional teaching pendant TP1000, the TP3000 has significantly improved expression capability with the adoption of an LCD color screen.

● Equipped with graphic operation keys

The keyboard display changes dynamically according to the operation. Required keys can be displayed whenever they are necessary.

● Equipped with language association function

Language input candidates are displayed according to character input.Compared to the conventional teaching pendant TP1000, the TP3000 makes it easier to input commands more quickly.

● Outline function

The main program, subprograms and labels in the SCOL program can be displayed hierarchically so that the program structure can be viewed quickly.
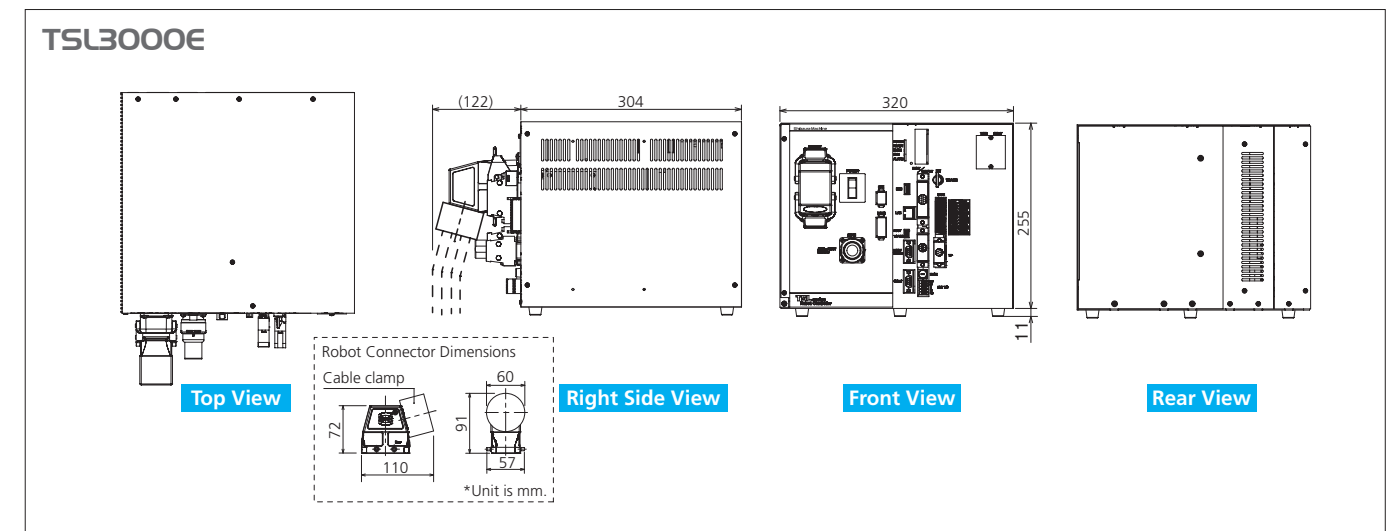
● Support for IP65
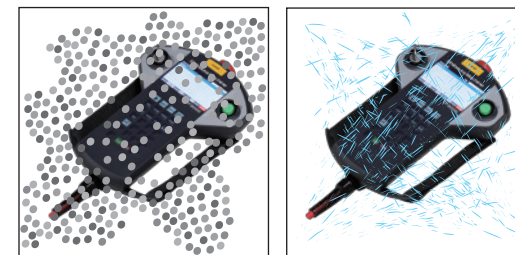
*The images shown are illustration only
Note: The controller's main body and the parts around the connector do not support the IP.

What is IP65?

IP□□—(Second characteristic numeral)
(First characteristic numeral)

IP (International Protection) rating classifies and rates the degree of protection provided against the ingress of solid foreign objects (including particles and dust) and water in mechanical casings and with electrical enclosures.
The first characteristic numeral indicates the level of protection that the enclosure provides against the ingress of solid foreign objects (including particles and dust). "6"means "totally dust tight" so that "the enclosure provides against the ingress of solid particles and dust".
The second characteristic numeral indicates the level of protection that the enclosure provides against the ingress of water. "5" means "protection against water jets" so that "water directly projected by a nozzle against the enclosure from any direction shall have no harmful effects".

Note: Be sure to turn off the main power before attaching or detaching the cable.

External view

TSL3000E

(122)   304   320

Robot Connector Dimensions
Cable clamp

72   110   91   57   60

*Unit is mm.

255

11

| Top View | Right Side View | Front View | Rear View |

SCARA ROBOT THL300

Model		THL300
Type		Horizontal multi-joint
No. of controlled axes		4
Arm length		300mm (125mm+175mm)
Working envelope	Axis 1	±125°
	Axis 2	±145°
	Axis 3 (Z axis)	0～160mm
	Axis 4 (Z-axis rotation)	±360°
Maximum speed*[1]	Axis 1	660°/s
	Axis 2	660°/s
	Axis 3 (Z axis)	1120mm/s
	Axis 4 (Z-axis rotation)	1500°/s
	Composite	5.1m/s
Standard cycle time (with 2 kg load)*[2]		0.48s
Maximum payload mass		5kg (rated: 2kg)
Allowable moment of inertia		0.05kg·㎡
Positioning repeatability*[3]	X-Y	±0.01mm
	Z (Axis 3)	±0.015mm
	Axis θ (Z-axis rotation)	±0.007°
Hand wiring		8 inputs / 8 outputs
Hand pneumatic joints*[4]		φ4 x 3 pcs.
Position detection		Absolute
Robot controller cable		3.5m
Power capacity		0.7kVA
Mass		12kg

■For *1 to *4, please see page 5.

External view

Operation Range

Z view

Hand Installation Area Detail

*The air tubes are packed, which need to be installed by the user.

SCARA ROBOT THL400

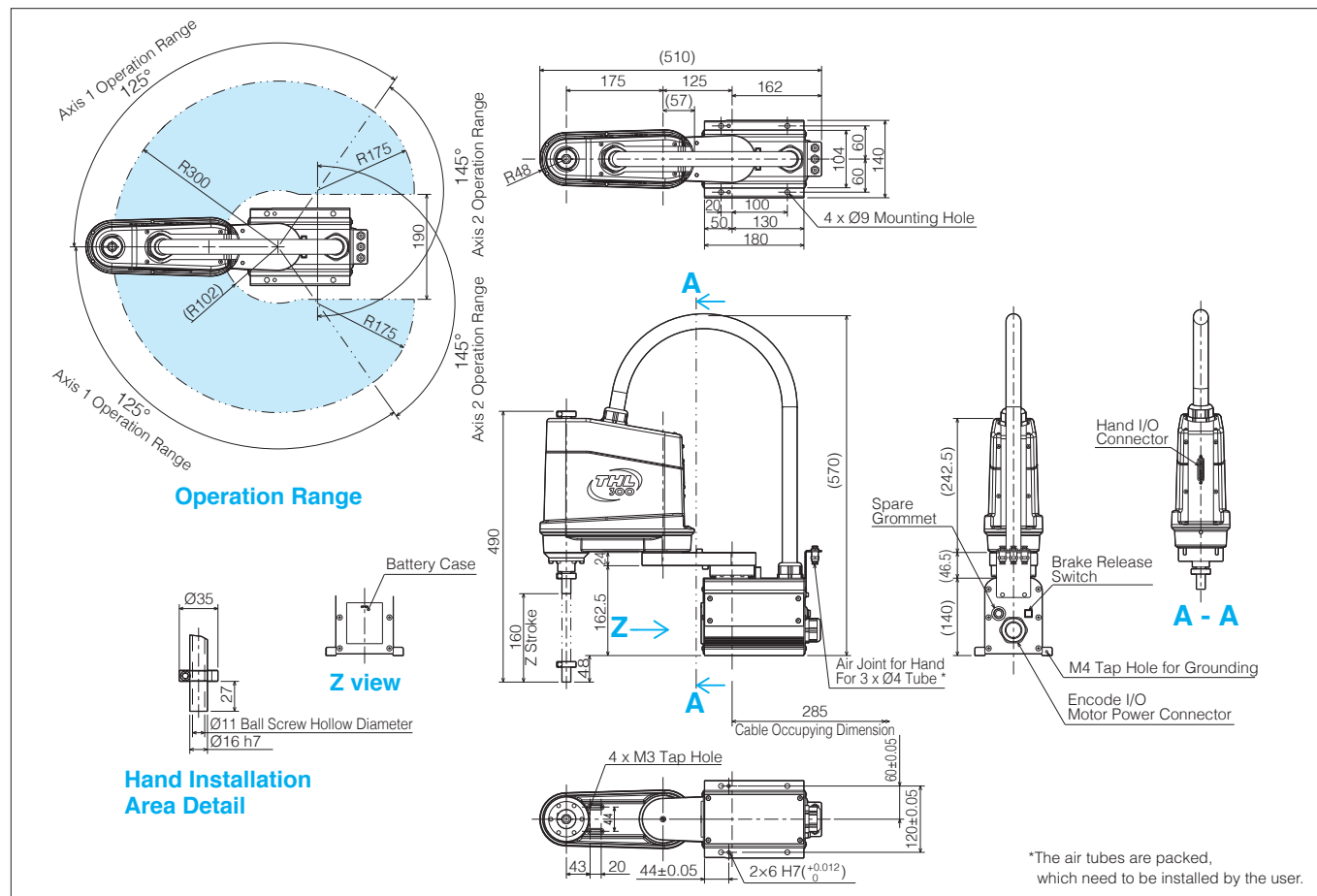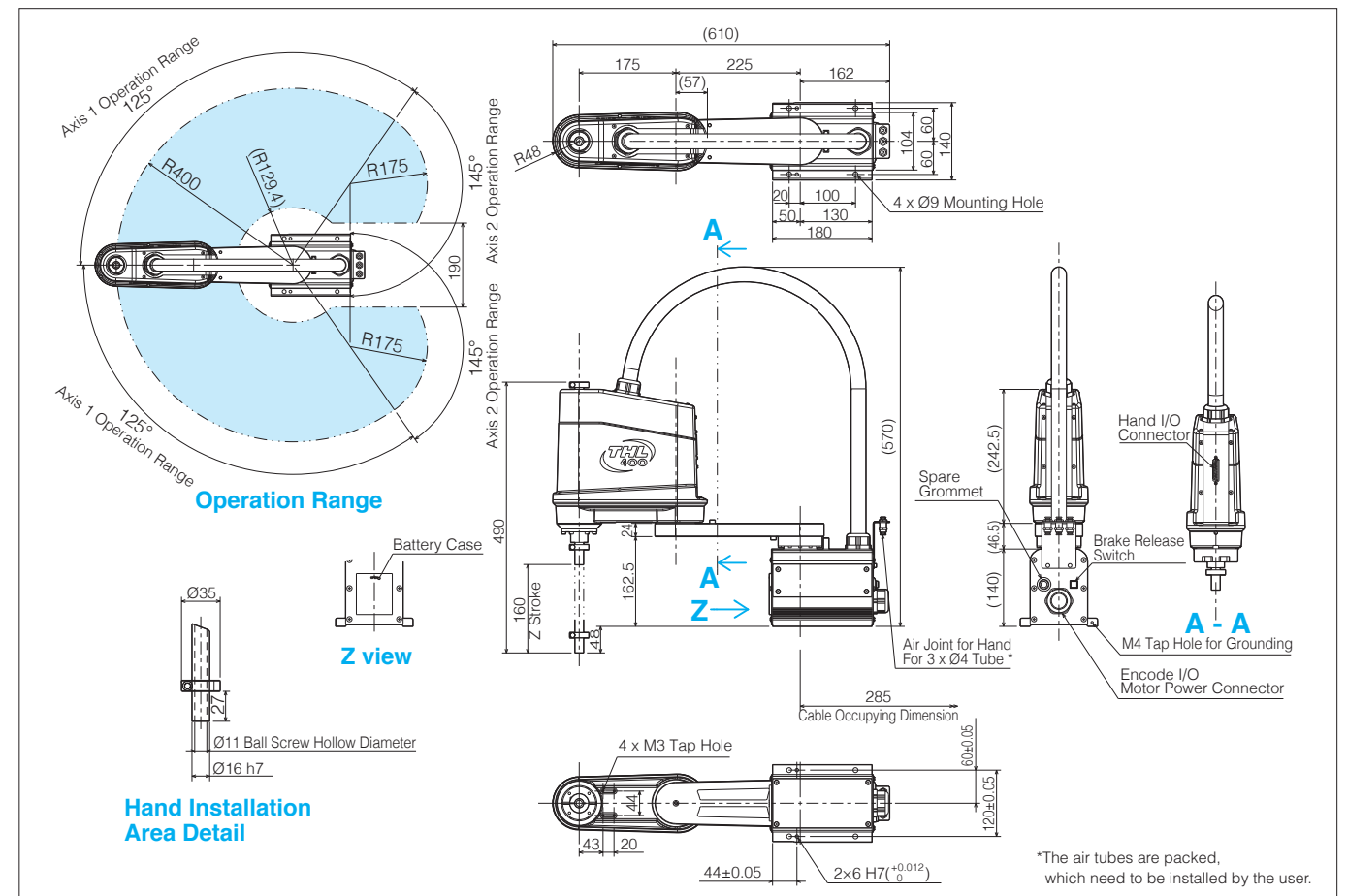| Model		THL400
Type		Horizontal multi-joint
No. of controlled axes		4
Arm length		400mm (225mm+175mm)
Working envelope	Axis 1	±125°
	Axis 2	±145°
	Axis 3 (Z axis)	0～160mm
	Axis 4 (Z-axis rotation)	±360°
Maximum speed*[1]	Axis 1	660°/s
	Axis 2	660°/s
	Axis 3 (Z axis)	1120mm/s
	Axis 4 (Z-axis rotation)	1500°/s
	Composite	6.3m/s
Standard cycle time (with 2 kg load)*[2]		0.47s
Maximum payload mass		5kg (rated: 2kg)
Allowable moment of inertia		0.05kg·㎡
Positioning repeatability*[3]	X-Y	±0.01mm
	Z (Axis 3)	±0.015mm
	Axis θ (Z-axis rotation)	±0.007°
Hand wiring		8 inputs / 8 outputs
Hand pneumatic joints*[4]		φ4 x 3 pcs.
Position detection		Absolute
Robot controller cable		3.5m
Power capacity		0.7kVA
Mass		13kg

■For *1 to *4, please see page 5.

External view

Operation Range

Z view

Hand Installation Area Detail

*The air tubes are packed, which need to be installed by the user.

SCARA ROBOT THL500

Model	THL500	
Type	Horizontal multi-joint	
No. of controlled axes	4	
Arm length	500mm (200mm+300mm)	
Working envelope	Axis 1	±125°
	Axis 2	±145°
	Axis 3 (Z axis)	0〜150mm
	Axis 4 (Z-axis rotation)	±360°
Maximum speed*1	Axis 1	450°/s
	Axis 2	450°/s
	Axis 3 (Z axis)	2000mm/s
	Axis 4 (Z-axis rotation)	1700°/s
	Composite	6.3m/s
Standard cycle time (with 2 kg load)*2	0.45s	
Maximum payload mass	10kg (rated: 2kg)	
Allowable moment of inertia	0.2kg·㎡	
Positioning repeatability*3	X-Y	±0.01mm
	Z (Axis 3)	±0.015mm
	Axis θ (Z-axis rotation)	±0.007°
Hand wiring	8 inputs / 8 outputs	
Hand pneumatic joints*4	φ6 x 3 pcs.	
Position detection	Absolute	
Robot controller cable	3.5m	
Power capacity	1.4kVA	
Mass	22kg	

■For *1 to *4, please see page 5.

External view

Operation Range

Z view

Hand Installation Area Detail

*The air tubes are packed, which need to be installed by the user.

SCARA ROBOT THL600

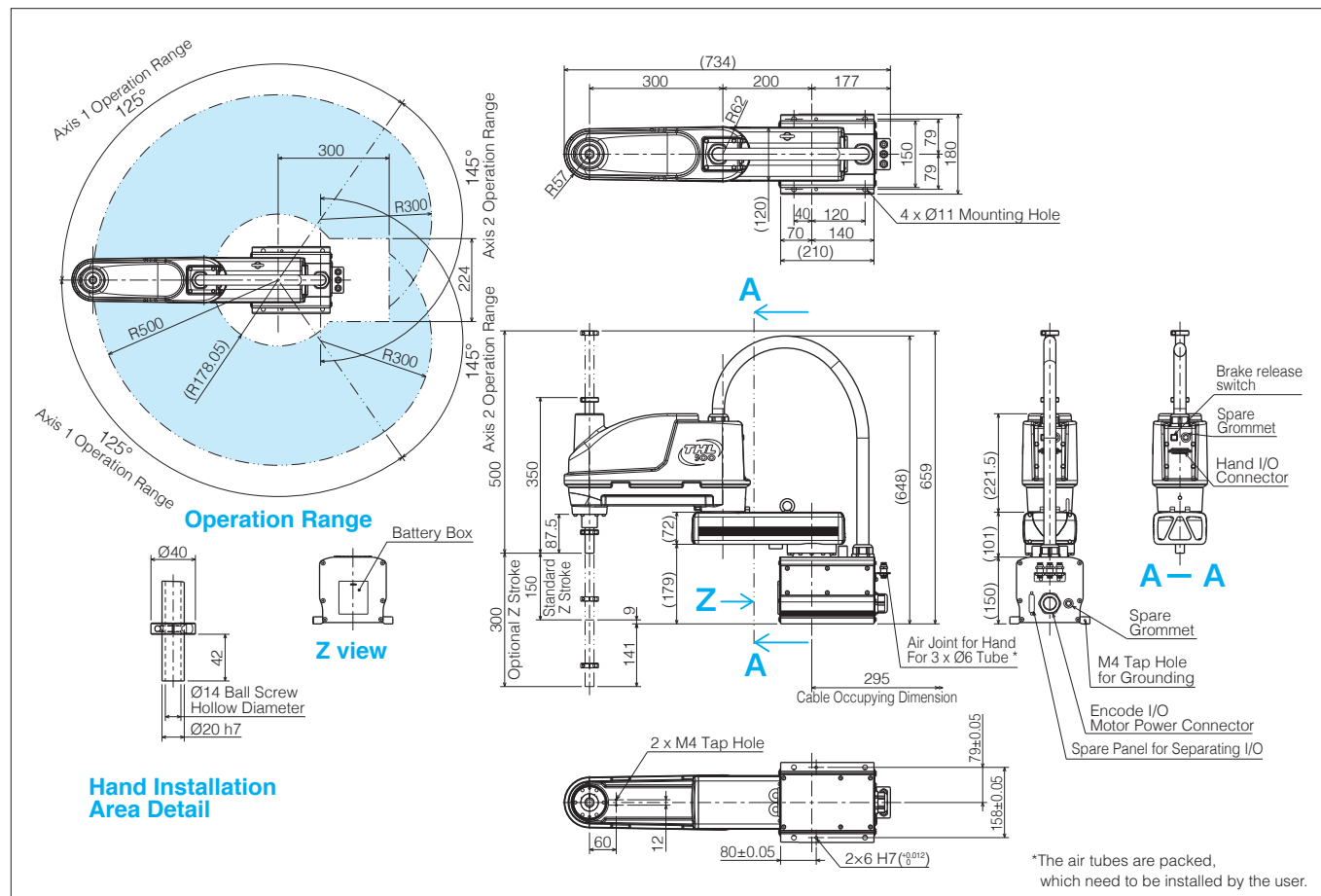| Model	THL600	
Type	Horizontal multi-joint	
No. of controlled axes	4	
Arm length	600mm (300mm+300mm)	
Working envelope	Axis 1	±125°
	Axis 2	±145°
	Axis 3 (Z axis)	0〜150mm
	Axis 4 (Z-axis rotation)	±360°
Maximum speed*1	Axis 1	450°/s
	Axis 2	450°/s
	Axis 3 (Z axis)	2000mm/s
	Axis 4 (Z-axis rotation)	1700°/s
	Composite	7.1m/s
Standard cycle time (with 2 kg load)*2	0.45s	
Maximum payload mass	10kg (rated: 2kg)	
Allowable moment of inertia	0.2kg·㎡	
Positioning repeatability*3	X-Y	±0.01mm
	Z (Axis 3)	±0.015mm
	Axis θ (Z-axis rotation)	±0.007°
Hand wiring	8 inputs / 8 outputs	
Hand pneumatic joints*4	φ6 x 3 pcs.	
Position detection	Absolute	
Robot controller cable	3.5m	
Power capacity	1.4kVA	
Mass	23kg	

■For *1 to *4, please see page 5.

External view

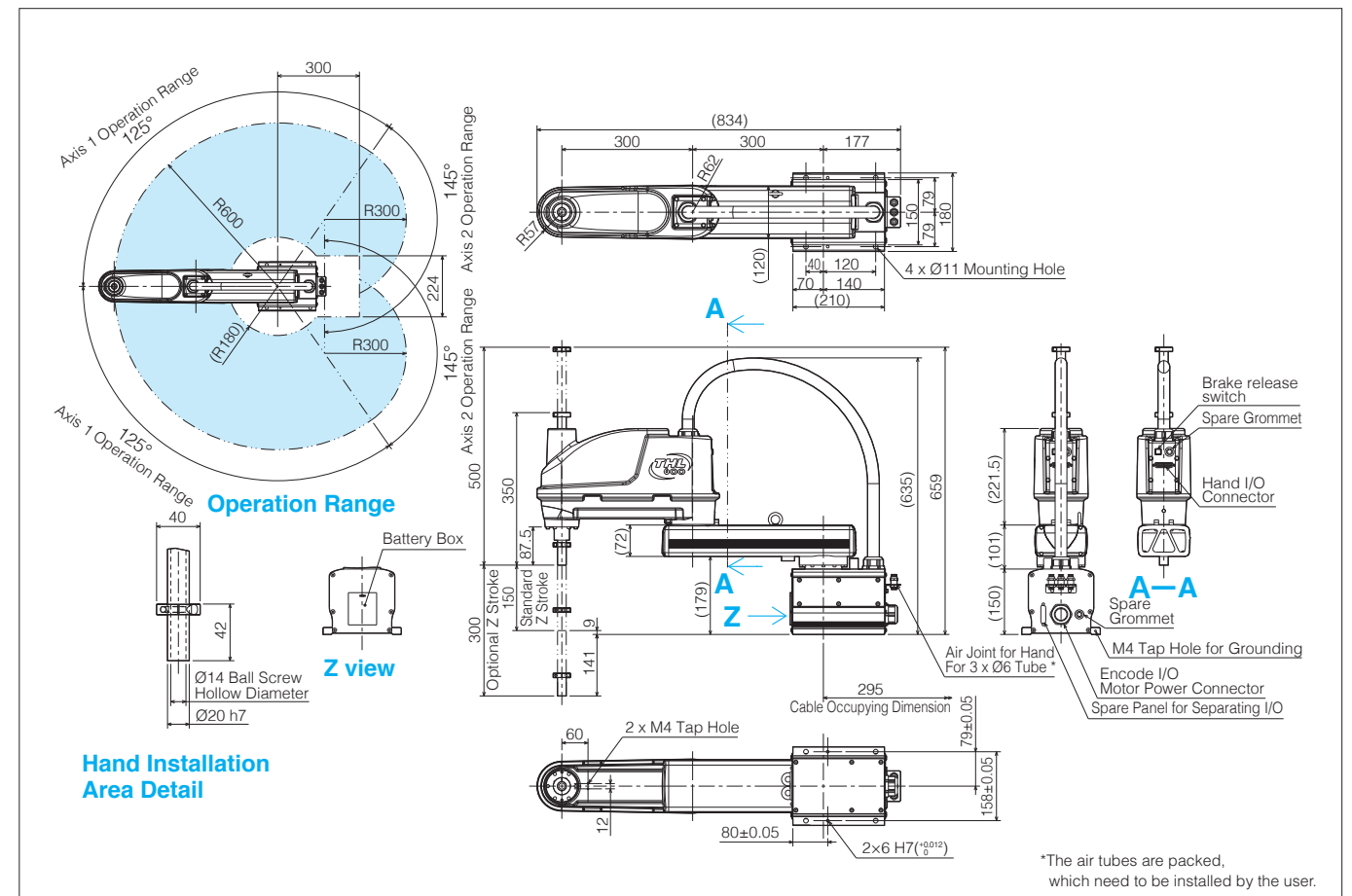

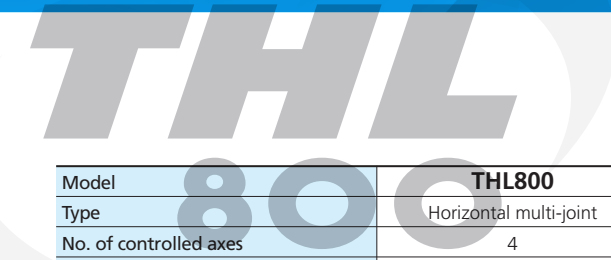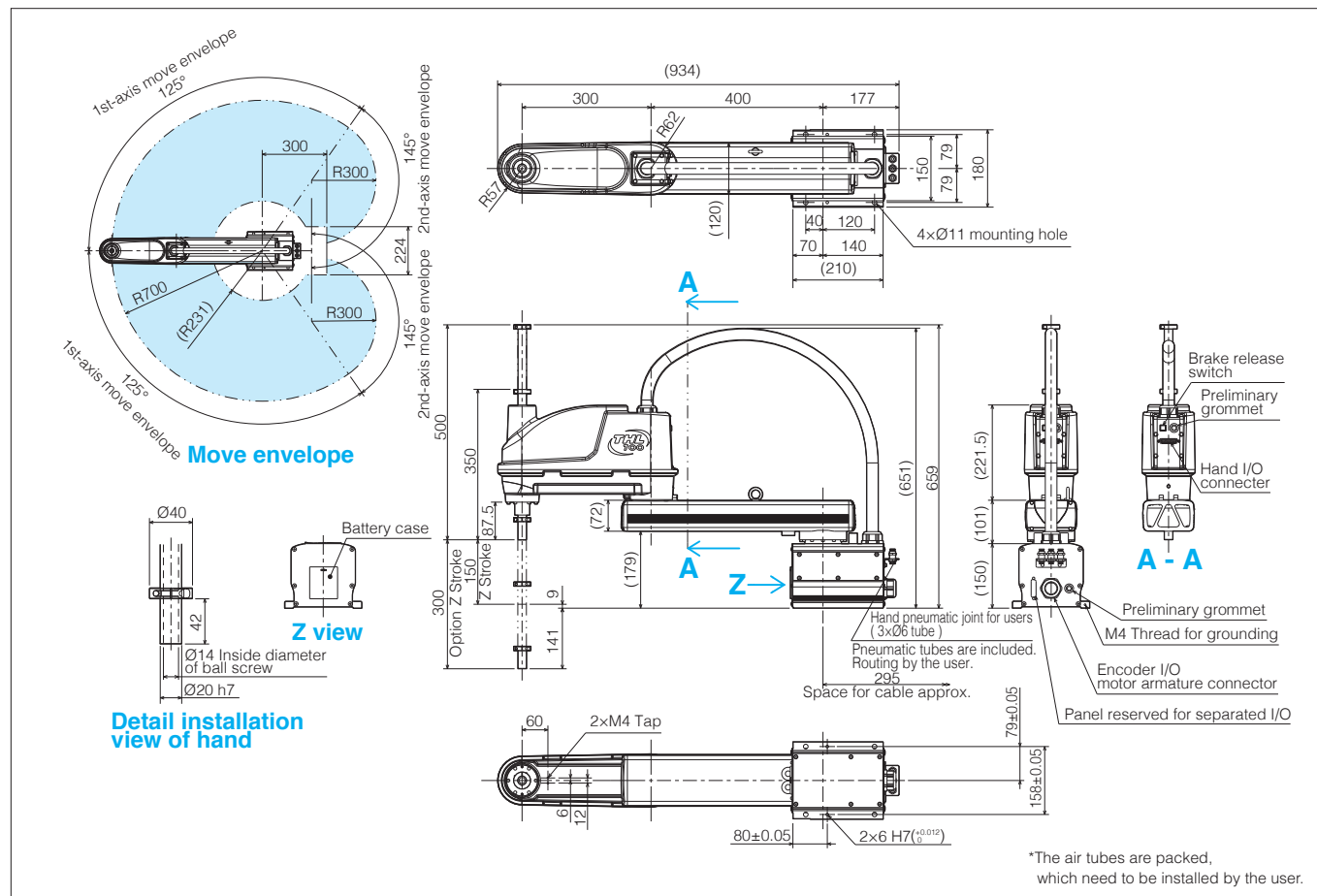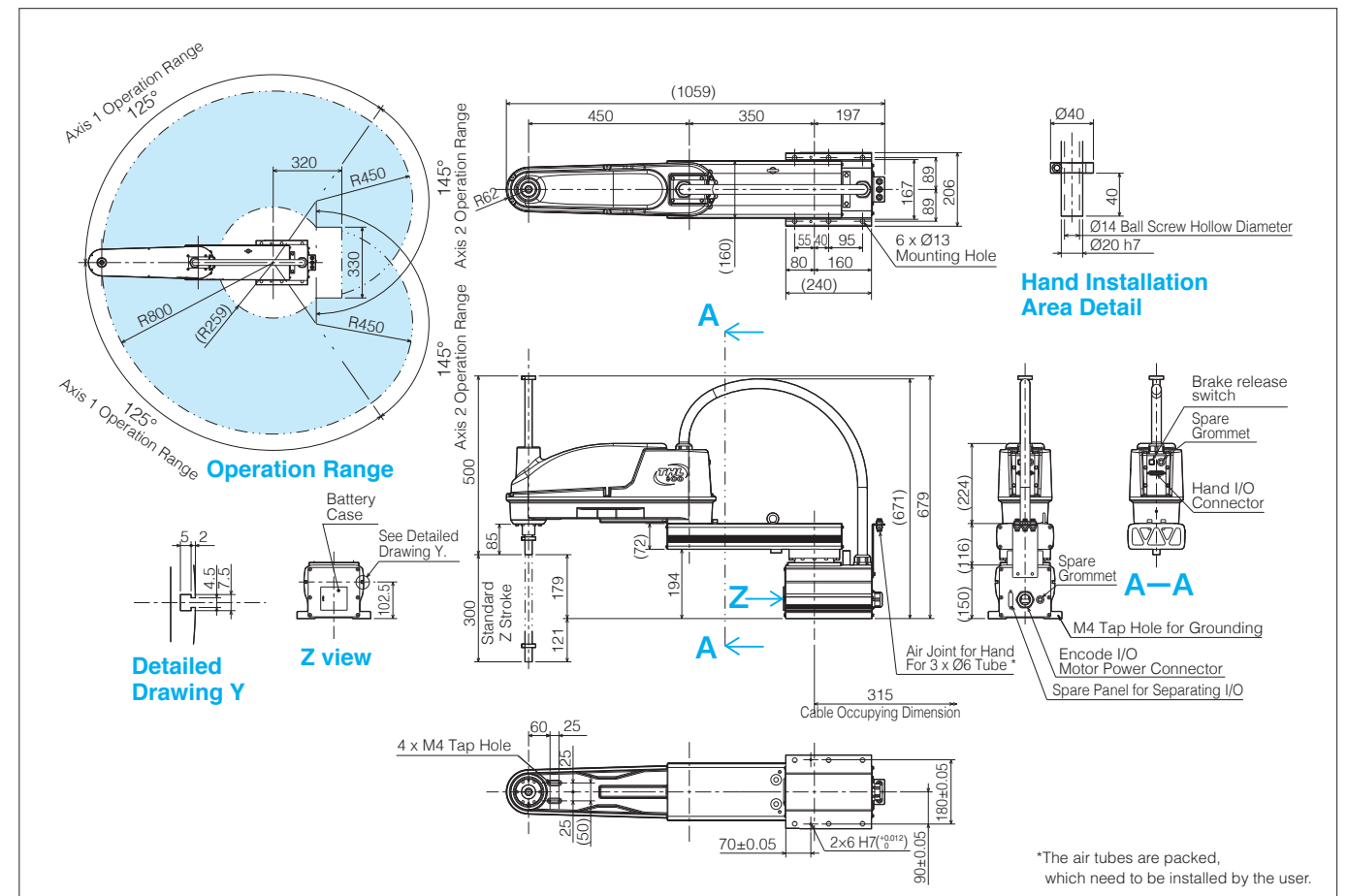**Operation Range**

Z view

Hand Installation Area Detail

*The air tubes are packed, which need to be installed by the user.

SCARA ROBOT THL700

Model		THL700
Type		Horizontal multi-joint
No. of controlled axes		4
Arm length		700mm (400mm+300mm)
Working envelope	Axis 1	±125°
	Axis 2	±145°
	Axis 3 (Z axis)	0〜150mm
	Axis 4 (Z-axis rotation)	±360°
Maximum speed*¹	Axis 1	450°/s
	Axis 2	450°/s
	Axis 3 (Z axis)	2000mm/s
	Axis 4 (Z-axis rotation)	1700°/s
	Composite	7.9m/s
Standard cycle time (with 2 kg load)*²		0.50s
Maximum payload mass		10kg (rated: 2kg)
Allowable moment of inertia		0.2kg·㎡
Positioning repeatability*³	X-Y	±0.01mm
	Z (Axis 3)	±0.015mm
	Axis θ (Z-axis rotation)	±0.007°
Hand wiring		8 inputs / 8 outputs
Hand pneumatic joints*⁴		φ 6 x 3 pcs.
Position detection		Absolute
Robot controller cable		3.5m
Power capacity		1.4kVA
Mass		24kg

■For *1 to *4, please see page 5.

External view

Move envelope

Z view

Detail installation view of hand

A - A

A

Z

Brake release switch
Preliminary grommet
Hand I/O connecter
Preliminary grommet
M4 Thread for grounding
Encoder I/O motor armature connector
Panel reserved for separated I/O

Hand pneumatic joint for users (3×Ø6 tube)
Pneumatic tubes are included.
Routing by the user.
Space for cable approx.

2×M4 Tap

*The air tubes are packed, which need to be installed by the user.

SCARA ROBOT THL800

Model		THL800
Type		Horizontal multi-joint
No. of controlled axes		4
Arm length		800mm (350mm+450mm)
Working envelope	Axis 1	±125°
	Axis 2	±145°
	Axis 3 (Z axis)	0〜300mm
	Axis 4 (Z-axis rotation)	±360°
Maximum speed*¹	Axis 1	187.5°/s
	Axis 2	217.5°/s
	Axis 3 (Z axis)	2000mm/s
	Axis 4 (Z-axis rotation)	1700°/s
	Composite	4.3m/s
Standard cycle time (with 2 kg load)*²		0.47s
Maximum payload mass		10kg (rated: 2kg)
Allowable moment of inertia		0.2kg·㎡
Positioning repeatability*³	X-Y	±0.02mm
	Z (Axis 3)	±0.015mm
	Axis θ (Z-axis rotation)	±0.007°
Hand wiring		8 inputs / 8 outputs
Hand pneumatic joints*⁴		φ 6 x 3 pcs.
Position detection		Absolute
Robot controller cable		3.5m
Power capacity		1.4kVA
Mass		33kg

■For *1 to *4, please see page 5.

External view

Operation Range

Detailed Drawing Y

Z view

Hand Installation Area Detail

Ø14 Ball Screw Hollow Diameter
Ø20 h7
6 x Ø13 Mounting Hole

A—A

A

Z

A

Brake release switch
Spare Grommet
Hand I/O Connector
Spare Grommet
M4 Tap Hole for Grounding
Encode I/O Motor Power Connector
Spare Panel for Separating I/O
Air Joint for Hand For 3 x Ø6 Tube
Cable Occupying Dimension

Battery Case
See Detailed Drawing Y.

4 x M4 Tap Hole

2×6 H7

*The air tubes are packed, which need to be installed by the user.

SCARA ROBOT THL900

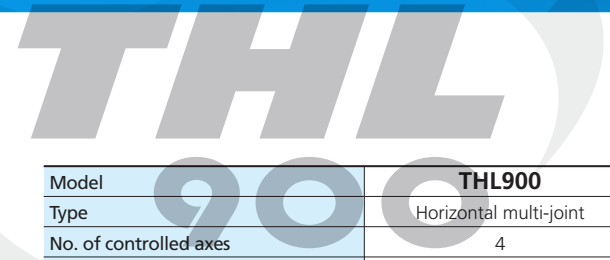| Model		THL900
Type		Horizontal multi-joint
No. of controlled axes		4
Arm length		900mm (450mm+450mm)
Working envelope	Axis 1	±125°
	Axis 2	±145°
	Axis 3 (Z axis)	0～300mm
	Axis 4 (Z-axis rotation)	±360°
Maximum speed*1	Axis 1	187.5°/s
	Axis 2	217.5°/s
	Axis 3 (Z axis)	2000mm/s
	Axis 4 (Z-axis rotation)	1700°/s
	Composite	4.6m/s
Standard cycle time (with 2 kg load)*2		0.48s
Maximum payload mass		10kg (rated: 2kg)
Allowable moment of inertia		0.2kg·㎡
Positioning repeatability*3	X-Y	±0.02mm
	Z (Axis 3)	±0.015mm
	Axis θ (Z-axis rotation)	±0.007°
Hand wiring		8 inputs / 8 outputs
Hand pneumatic joints*4		φ6 x 3 pcs.
Position detection		Absolute
Robot controller cable		3.5m
Power capacity		1.4kVA
Mass		35kg

■For *1 to *4, please see page 5.

External view

Operation Range

Detailed Drawing Y

Z view

Hand Installation Area Detail

Ø14 Ball Screw Hollow Diameter Ø20 h7

Brake release switch
Spare Grommet
Hand I/O Connector
Spare Grommet
M4 Tap Hole for Grounding
Air Joint for Hand For 3 x Ø6 Tube *
Encode I/O Motor Power Connector
Spare Panel for Separating I/O

A—A

*The air tubes are packed, which need to be installed by the user.

SCARA ROBOT THL1000

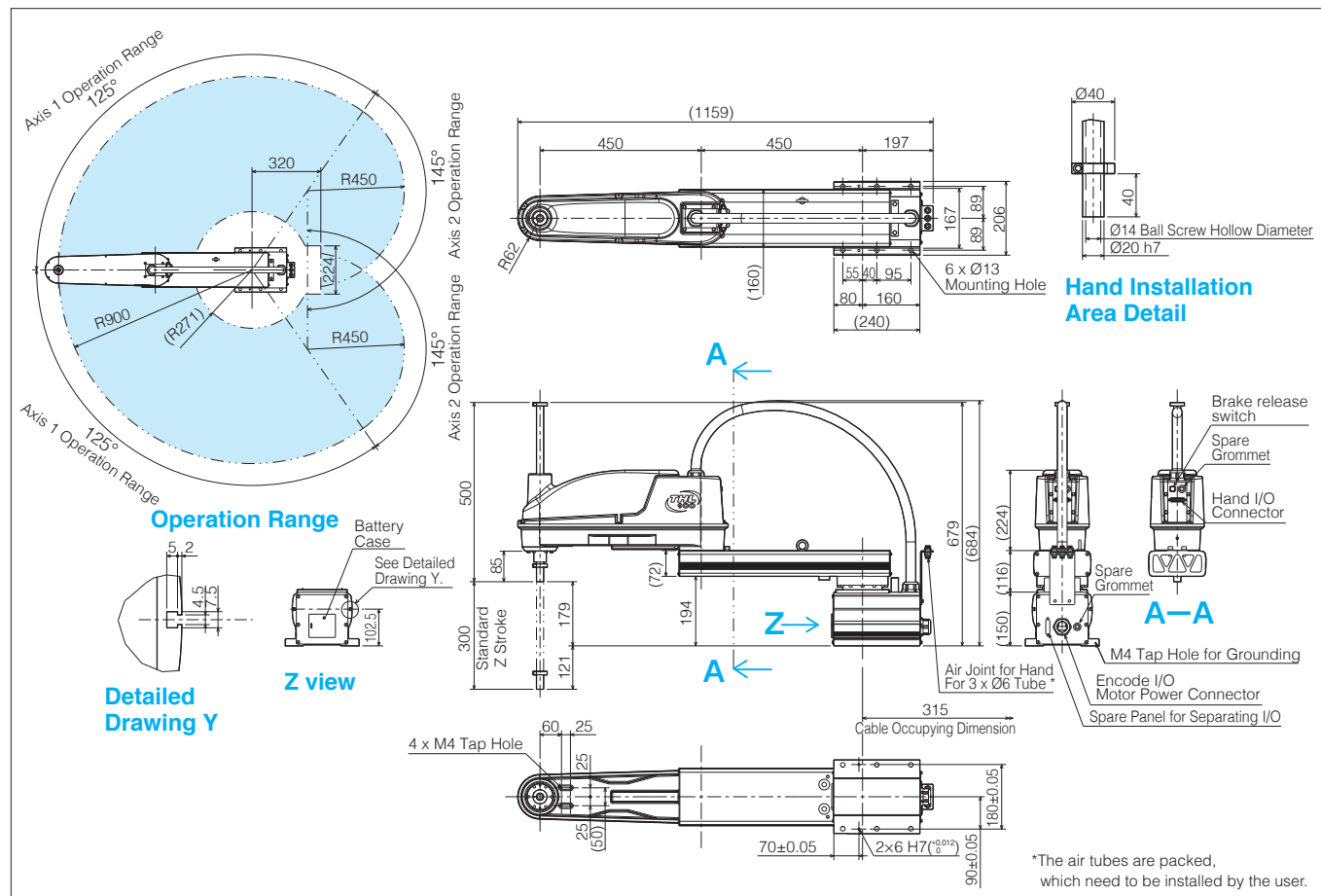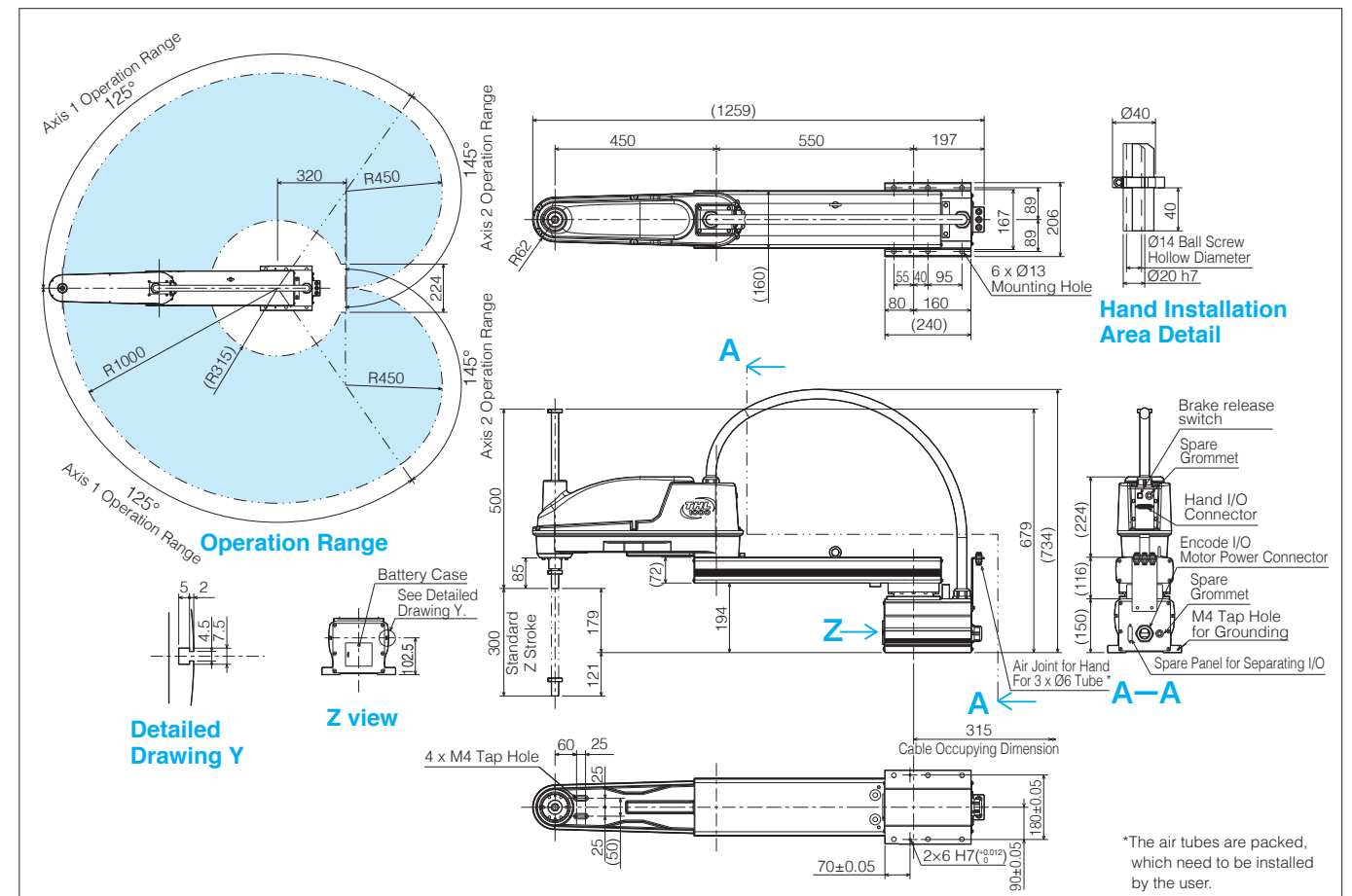| Model		THL1000
Type		Horizontal multi-joint
No. of controlled axes		4
Arm length		1000mm (550mm+450mm)
Working envelope	Axis 1	±125°
	Axis 2	±145°
	Axis 3 (Z axis)	0～300mm
	Axis 4 (Z-axis rotation)	±360°
Maximum speed*1	Axis 1	187.5°/s
	Axis 2	217.5°/s
	Axis 3 (Z axis)	2000mm/s
	Axis 4 (Z-axis rotation)	1700°/s
	Composite	5.0m/s
Standard cycle time (with 2 kg load)*2		0.48s
Maximum payload mass		10kg (rated: 2kg)
Allowable moment of inertia		0.2kg·㎡
Positioning repeatability*3	X-Y	±0.02mm
	Z (Axis 3)	±0.015mm
	Axis θ (Z-axis rotation)	±0.007°
Hand wiring		8 inputs / 8 outputs
Hand pneumatic joints*4		φ6 x 3 pcs.
Position detection		Absolute
Robot controller cable		3.5m
Power capacity		1.4kVA
Mass		37kg

■For *1 to *4, please see page 5.

External view

Operation Range

Detailed Drawing Y

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A—A

*The air tubes are packed, which need to be installed by the user.

Options

These functional optional specifications are designed with consideration for applications, environment, and system-layout requirements.

Z-Axis Long Stroke (-Z)

Applicable Models: THL500, THL600, THL700

The Z-axis stroke range is extended.
Useful in an application with large up-down movements and handling of long workpieces.

(Note: If a stroke length other than 300mm is required, please contact us.)

Protective Belliows for Z-Axis (-B)

Applicable Models: all models of the THL Series

Protection of the Z-axis shaft lower side in an environment where liquid or chips may scatter.

(Note: The cycle time and Z-axis stroke differ from the standard specifications. Please contact us for details.)

Z-Axis Cap (-C)

Applicable Models: all models of the THL Series

Protection of the Z-axis shaft upper side in an environment where liquid or chips may scatter. It also prevents intrusion and jamming by cables and other peripheral items.

Ceiling-mount type (-T)

Applicable Models: THL400, THL500, THL600, THL700, THL800, THL900, THL1000

To enable more freedom in system layout and effective use of space, the robot is suspended from the upper side of the working area.

(Note: The working envelopes differ from the standard-type robots. Please contact us for details.)

Optional Cables Length

In all models of the THL Series SCARA robots, the length of the cable between a SCARA robot and its controller can be extended to a maximum of 15m.

Dust-proof (-IP6X)

Applicable models: THL500, THL600, THL700

Dust-proof structure with protection rating IP6X.

(Note: The number of hand signals and pneumatic pipes differ from the standard design. Please contact us for details.)

Support of Safety Category 3

Applicable Models: all models of the THL Series

By adding necessary safety design, conformance to the safety category 3, which is required in the ANSI and CE marking, is achieved.

(Note: this is possible with TSL3000E controller.)

Tool Flange for End Effectors Mounting

Applicable Models: all models of the THL Series

Tool flange for securing the robot's hand is available.

*The photo right shows the tool flange for the THL500 ~ THL1000 SCARA robots. The shape of the tool flange for the THL300 and THL400 SCARA robots is different from the photo right.

Additional Axis

Applicable Models: all models of the THL Series

Additional axis can be added and controlled, for such purpose as mounting a robot on a traverse axis.

Simple Cleanroom specification (-SC)

Applicable Models: all models of the THL Series

Cleanroom design equivalent of ISO clean Class 5.
Effective for dust-averse applications such as semiconductor and electronics manufacturing.

Low Height Design (-LH)

Applicable Models: THL1000

Total height is lower than standard design by alternative wire harness design. It allows for installation in tight space.
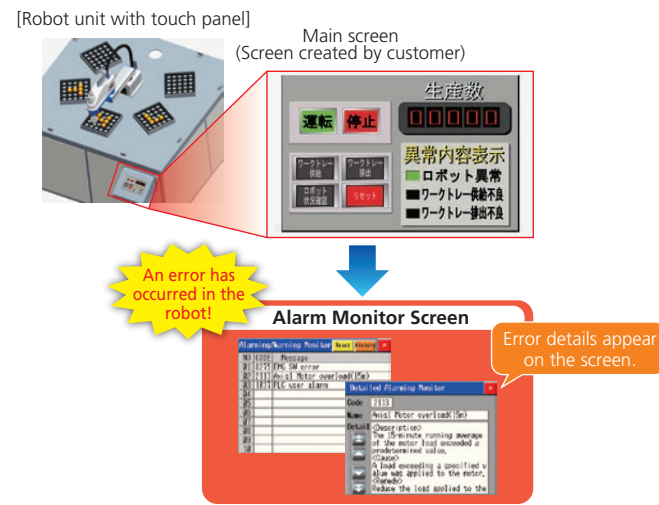
Options Overview Table

Please contact us for the latest optional designs supported.

Option / Model Name	Z-Axis Long Stroke (-Z)	Protective Belliows for Z-Axis (-B)	Z-Axis Cap (-C)	Ceiling-mount type (-T)	Cable Extension (Max.)	Safety Category 3	Dust-proof (-IP6X)	Dust and Splash-proof (-IP)	Tool Flange for End Effectors Mounting	Additional Axis	Simple Cleanroom (-SC)	Low Height (-LH)
THL300	△	○	○	×	15m	○	△	×	○	○	○	×
THL400	△	○	○	○	15m	○	△	×	○	○	○	×
THL500	○(300mm)	○	○	○	15m	○	○	×	○	○	○	×
THL600	○(300mm)	○	○	○	15m	○	○	×	○	○	○	×
THL700	○(300mm)	○	○	○	15m	○	○	×	○	○	○	×
THL800	△	○	○	○	15m	○	△	×	○	○	○	△
THL900	△	○	○	○	15m	○	△	×	○	○	○	△
THL1000	△	○	○	○	15m	○	△	×	○	○	○	○

○: Applicable   △: Please contact us   ×: Not applicable   TH-A Series is recommended for dust and splash proof (IP) design.

Functions and Applications

Support for Connection Device Samples

Shibaura Machine   **Pro-face** for the best interface

[Robot unit with touch panel]

Main screen (Screen created by customer)

生産数

運転 停止 □□□□□

異常内容表示
■ ロボット異常
■ ワークトレー供給不良
■ ワークトレー排出不良

An error has occurred in the robot!

Alarm Monitor Screen
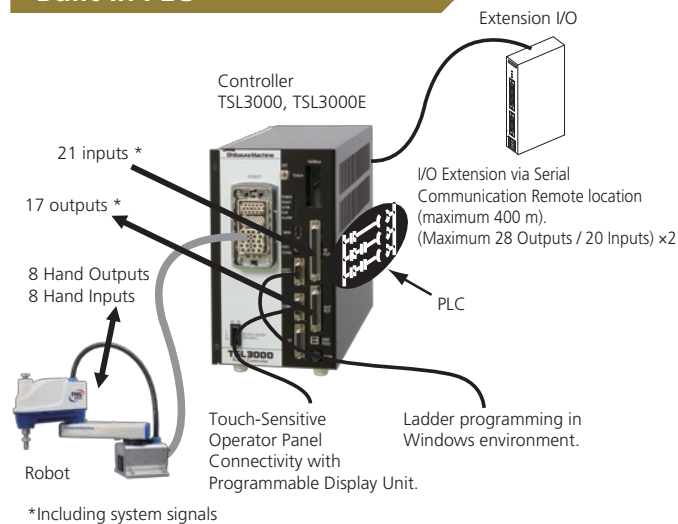
Error details appear on the screen.

Connection Device Samples is a collaborative system between Shibaura Machine Co., Ltd. and Digital Electronics Corporation. It enables users to check the status of the robot on the touch panel display device.

[Features and advantages]

• When an error occurs in the robot, the error information or details can be checked on the Alarm Monitor Screen (see the left figure).

• Additionally, various other screens for functions including Robot I/O Monitor, Current Position Monitor, I/O Time Chart and Connected Device Data Transfer are provided.

• The above robot screens can be downloaded from the website of Digital Electronics Corporation free of charge. There is no need to create these screens and they can be used immediately after product purchase.
http://www.proface.co.jp/otasuke/sample/download/common/connection_robot_con_ts_j.html

• The status of the robot can be checked even by people who cannot operate the teach pendant.

• Because the information about both the robot and the system is displayed on the same display device, troubleshooting is much easier.

*For product information about the touch panel that is compatible with this system, please contact Digital Electronics Corporation.
http://www.pro-face.com/otasuke/sample/detail/common/connection_robot_con_ts_e.html

Built-In PLC

Extension I/O

Controller TSL3000, TSL3000E

21 inputs *

17 outputs *

I/O Extension via Serial Communication Remote location (maximum 400 m). (Maximum 28 Outputs / 20 Inputs) ×2

8 Hand Outputs
8 Hand Inputs

PLC

Robot

Touch-Sensitive Operator Panel Connectivity with Programmable Display Unit.

Ladder programming in Windows environment.
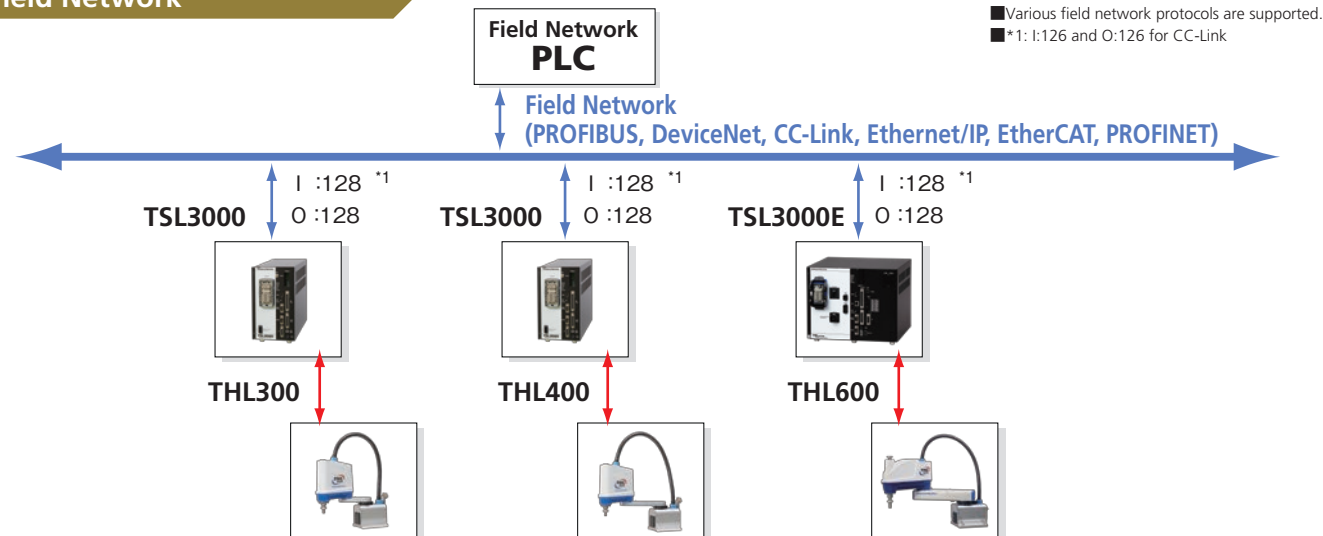
*Including system signals

The TSL3000 controller has a built-in PLC (TCmini). Input and output signals can be handled by ladder-style programming logic, independent from robot motion.

[Features and advantages]

• TCmini controls input/output signals of standard I/O, extension I/O and touch-sensitive panel by ladder program and exchanges data with robot program.

• Thus, flexible system design and control of peripheral equipment is possible without the added cost of an outside host PLC.

• Creation, monitoring and debugging of ladder-logic programming with powerful programming support software TC-WORX (optional).

• The scan time is 5ms per 1 K-Word. Connection is possible with various programmable controllers and display units etc.

Field Network

Field Network **PLC**

■ Various field network protocols are supported.
■ *1: I:126 and O:126 for CC-Link

Field Network
(PROFIBUS, DeviceNet, CC-Link, Ethernet/IP, EtherCAT, PROFINET)

I :128 *1   O :128   I :128 *1   O :128   I :128 *1   O :128

TSL3000   TSL3000   TSL3000E

THL300   THL400   THL600

PC Software for Programming Support

The following PC software tools are provided to shorten the time and increase the efficiency of system designing and installation work.

Robot Programming Assist Tool

TSAssist
Robot Programming Assist Tool

POWERFUL ASSISTANCE TO ALL PHASES OF AUTOMATION FACILITIES, FROM PLANNING, INSTALLATION TO ENHANCEMENT

1.High Performance 3D Simulation

Accurate simulation with interference check, locus display, timer (cycle time measurement), placing simple workpieces and model shapes, loading 3D CAD data, saving 3D simulation to a video file, and multi-angle view.

These functions enable highly-accurate and a high-quality estimation of robot-automation processes. From simple outline simulation to "get the picture" to accurate simulation closer to actual machine implementation, TSAssist powerfully assists all phases of robot-automation system life cycle, from initial "sketch," planning, proposal, designing and installation, to improvement and re-purposing of existing facilities.

3D STEP file

CAD converter

Import
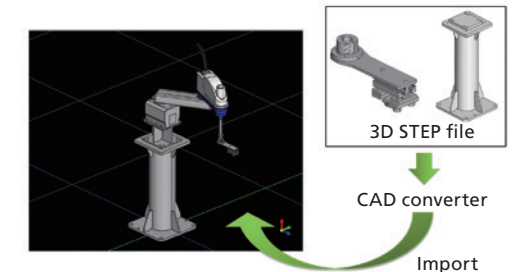
2.Highly Functional Program Editor
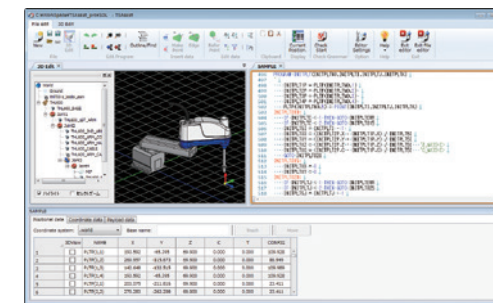
Robot language input support (keyword suggestions), Outline display, Split display.

Point data (taught position information) editor with, sort, search, filter functions.
And in 3D Editor Mode, robot can be guided by mouse dragging and by clicking on object model surface. No complex position calculation is necessary.
With these functions, programming can be done efficiently and with minimum mistakes.

3.Easy Operation

Easy-to-understand, intuitive screen design, ribbon interface, window-dock function for customize-able operator panels.

Beginners will find it easy to understand and can quickly learn robot programming skills. For experienced robot users, TSAssist helps making robot programs efficiently by customization.
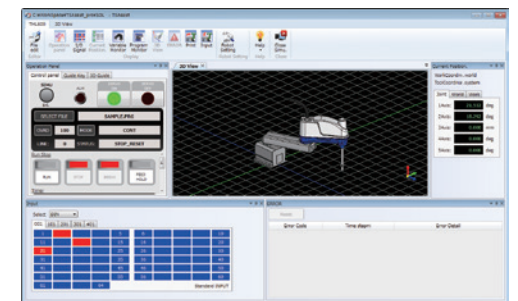
● **TC-WORX:** For programming the built-in PLC

1. Ladder-style logic programming for the built-in PLC.

2. In addition to program creation, on-line monitoring of ladder program and I/O status help reduce development and debugging time.

3. Extensive functions such as address map display, comment display and search functions are provided.