



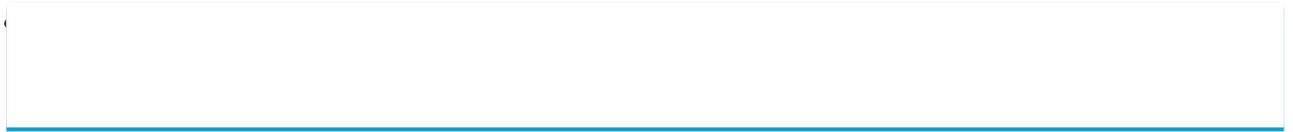
Toshiba TH Series Instruction Manual

Industrial robot

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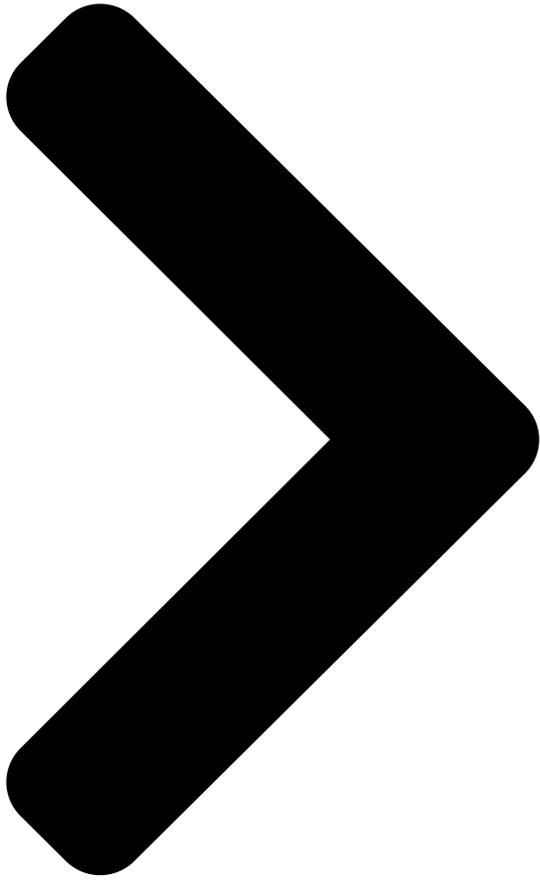
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TRANSPORTATION AND INSTALLATION MANUAL

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INDUSTRIAL ROBOT

Notice

January, 2009

TOSHIBA MACHINE CO., LTD.

NUMAZU, JAPAN

STE 73995□4

Industrial Robot

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Industrial robot (32 pages)

Summary of Contents for Toshiba TH Series

[Page 1](#) TRANSPORTATION AND INSTALLATION MANUAL Notice Make sure that this instruction manual is delivered to the final user of Toshiba Machine's industrial robot. Before operating the industrial robot, read through and completely understand this manual. After reading through this manual, keep it nearby for future reference.

[Page 2](#) TRANSPORTATION AND INSTALLATION MANUAL Copyright 2006 by Toshiba Machine Co., Ltd. All rights reserved. No part of this document may be reproduced in any form without obtaining prior written permission from Toshiba Machine Co., Ltd. The information contained in this manual is subject to change without prior notice to effect improvements.

[Page 3](#) TRANSPORTATION AND INSTALLATION MANUAL Preface This manual describes how to unpack and install the industrial robot and controller. Specifically, it describes how to unpack the shipment containing the equipment, how to install the equipment, how to connect wiring and air piping, and how to attach tools. Be sure to look through this manual before unpacking the shipment.

[Page 4](#) TRANSPORTATION AND INSTALLATION MANUAL Precautions on Safety Important information on the robot and controller is noted in the instruction manual to prevent injury to the user and persons nearby, prevent damage to assets and to ensure correct use. Make sure that the following details (indications and symbols) are well understood before reading this manual.

[Page 5](#) Wiring the robot before installation could lead to electric shocks or injuries. • Always use the power voltage and power capacity designated by Toshiba Machine. Failure to do so could lead to device faults or fires. • Always use the designated power cable. Using a cable other than that designated could lead to fires or faults.

[Page 6](#) TRANSPORTATION AND INSTALLATION MANUAL CAUTION • NEVER lift the robot by the arm 2 cover or arm 2. Doing so will apply an excessive force on the robot's mechanism section and could lead to faults. • For the controller, secure the ample space for air vent. Heating of controller could lead to malfunction.

[Page 7: Table Of Contents](#)

TRANSPORTATION AND INSTALLATION MANUAL Table of Contents Page Section 1 TransportationUnpacking..... Transportation.....1.2.1 Mass and Dimensions1.2.2 Transporting the Robot.....1.2.3 Transporting the Controller..... Storage1.3.1 Storage Precautions for the Robot 1.3.2 Storage Precautions for the ControllerSection 2 Installation.....

[Page 8](#) TRANSPORTATION AND INSTALLATION MANUAL Page 3.1.5 Connecting the Hand Control Signal Cable3.1.6 Grounding the Robot 3.1.7 Inserting and Removing Cables3.1.8 Examples of Connector Terminal Arrangement..... Controller Connector Signals3.2.1 Connector Signal Connection Diagrams..... 3.2.2 Jumpers for Safety Related Signals

[Page 9: Transportation](#)

If any parts of the equipment are found damaged or any accessories are missing after the shipment containing the robot and controller have reached your office, DO NOT install and operate them. Otherwise, the equipment will malfunction. Contact Toshiba Machine immediately. • Dispose of the corrugated cardboards, polyethylene shipping bags and cushion material according to your standards.

[Page 10](#) TRANSPORTATION AND INSTALLATION MANUAL Fig. 1.1 Robot package (TH250A) Fig. 1.2 Robot package (TH350A) STE 73995 - 9 -...

[Page 11](#) TRANSPORTATION AND INSTALLATION MANUAL Fig. 1.3 Robot package (TH180) STE 73995 - 10 -...

[Page 12: Transportation](#)

TRANSPORTATION AND INSTALLATION MANUAL Transportation Move the robot and controller very carefully. Make sure that no excessive impact (9.8m/s or more) or vibration is exerted on the equipment. If the equipment is to be subject to vibration over a long period, be sure to tighten all the nuts and screws completely.

[Page 13](#) TRANSPORTATION AND INSTALLATION MANUAL CAUTION • When transporting or unpacking the robot and robot controller, take careful precautions not to get injured by the drop of them or not to damage the equipment. • When lifting the robot by workers, hold the locations (shaded areas) by hands as shown in Figs.

[Page 14](#) TRANSPORTATION AND INSTALLATION MANUAL Arm 2 cover Robot harness Arm 2 Base Tool shaft Arm 1 Fig. 1.4 Robot handling area (shaded area) (TH250A, TH350A) Arm 2 cover Robot harness Arm 2 Tool shaft Base Arm 1 Fig. 1.5 Robot handling area (shaded area)

(TH180) After the installation, remove the clamp used for transport.

[Page 15](#) TRANSPORTATION AND INSTALLATION MANUAL Robot harness Arm 2 cover Arm 2 Base Tool shaft Arm 1 Fig. 1.6 Robot handling area (shaded area) (TH350A-T) STE 73995 - 14 -...

[Page 16: 1.2.3 Transporting The Controller](#)

TRANSPORTATION AND INSTALLATION MANUAL 1.2.3 Transporting the Controller Disconnect all cables and teach pendant before transporting the controller. DANGER • When placing the controller on the floor, etc., make sure not to catch your hands or feet. Storage Avoid storing the robot and controller for long periods of time after unpacking them. If this is unavoidable, however, strictly observe the following precautions for storage.

[Page 17: Installation](#)

TRANSPORTATION AND INSTALLATION MANUAL Section 2 Installation Installation Environment Table 2.1 shows the environmental conditions for the location in which the TH series Robot and TS1000 controller are to be installed. Table 2.1 Environmental conditions for robot and controller Item...

[Page 18: Robot Installation](#)

Also, high temperatures can reduce the performance and lifespan of the battery. If using the robot under high temperatures, please consult with the Toshiba Machine sales office. Robot Installation Before installing the robot, you should plan a layout, fully considering the working envelope, coordinate system and space for maintenance.

[Page 19](#) TRANSPORTATION AND INSTALLATION MANUAL Hand I/O connector Hand air joint Details of hand set part Scale 1 : 2 Set hole Details of T-slot for mounting peripheral equipment Scale 1 : 2 Clean vacuum air joint for $\phi 4$ tube Hand I/O connector Motor power connector Axis 3 brake OFF switch Working envelope...

[Page 20](#) TRANSPORTATION AND INSTALLATION MANUAL 4x7 hole See Details of "A". Details of "A": T-slot for mounting equipment Hand I/O connector Hand air joint Tap for mounting equipment 2xM4 Both sides Clean vacuum air joint for $\phi 6$ tube Brake OFF switch Battery box Hand air joint for 4x $\phi 4$ tube...

[Page 21](#) TRANSPORTATION AND INSTALLATION MANUAL Fig. 2.4 External view of TH350A-T robot STE 73995 - 20 -...

[Page 22: Coordinate System](#)

TRANSPORTATION AND INSTALLATION MANUAL 2.2.3 Coordinate System The robot's joint angle origin (0° or 0 mm position) is factory-calibrated according to the base reference planes. The base coordinate system is determined according to this calibration. Figs. 2.5 to 2.8 show the base coordinate system and zero position of each axis joint angle.

[Page 23](#) TRANSPORTATION AND INSTALLATION MANUAL Reference plane Reference plane Axis 2 Axis 2 Axis 4 Axis 1 Axis 4 Axis 1 Axis 3 Origin of base coordinate system Fig. 2.6 TH350A base coordinate system and joint angle origin STE 73995 - 22 -...

[Page 24](#) TRANSPORTATION AND INSTALLATION MANUAL Reference plane Reference plane Axis 2 Axis 4 Axis 4 Axis 1 Axis 2 Axis 1 Axis 3 Origin of base coordinate system Fig. 2.7 TH180 base coordinate system and joint angle origin STE 73995 - 23 -...

[Page 25](#) TRANSPORTATION AND INSTALLATION MANUAL Reference plane Reference plane Axis 2 Axis 4 Axis 4 Axis 2 Axis 1 Axis 3 Origin of base coordinate system Fig. 2.8 TH350A-T base coordinate system and joint angle origin STE 73995 - 24 -...

[Page 26: 2.2.4 Installing The Robot](#)

TRANSPORTATION AND INSTALLATION MANUAL 2.2.4 Installing the Robot The robot is secured, using the set holes on the base. Use M8 hexagon socket head cap screws. The robot installation method is shown in Figs. 2.9 to 2. 11. Reference planes are provided on the base section and marked with "xxx".1 To align the robot position in the base coordinate system, or to replace the

robot, provide adequate reference planes.

[Page 27](#) TRANSPORTATION AND INSTALLATION MANUAL Reference plane Reference plane Reference plane Reference plane 4xφ9 hole 4xφ7 hole Fig. 2.9 Installing the TH250A and Fig. 2.10 Installing the TH180 robot TH350A robots STE 73995 - 26 -...

[Page 28](#) TRANSPORTATION AND INSTALLATION MANUAL Reference plane Reference plane 4xφ9 hole Fig. 2.11 Installing the TH350A-T robot STE 73995 - 27 -...

[Page 29: Installing The Controller](#)

TRANSPORTATION AND INSTALLATION MANUAL Installing the Controller 2.3.1 External Dimensions External view of the TS1000 controller is shown in Fig. 2.12. CAUTION Be sure to connect the power wire and ground wire of the controller (AC IN) in the following manner.

[Page 30: Rack Mounting Dimensions](#)

TRANSPORTATION AND INSTALLATION MANUAL 2.3.2 Rack Mounting Dimensions When mounting the TS1000 robot controller in a rack, set the side brackets using the screw holes provided on both ends of the front panel, and secure the controller to the rack. The side brackets [1] in Fig. 2.13 are optional. 30mm 70mm 150mm...

[Page 31: Precautions For Rack Mounting](#)

TRANSPORTATION AND INSTALLATION MANUAL 2.3.3 Precautions for Rack Mounting Pay attention to the following matters when rack-mounting the TS1000 robot controller. Use the screw holes provided on both ends of the front panel, and secure the controller. (Optional side brackets are required.) CAUTION •...

[Page 32](#) TRANSPORTATION AND INSTALLATION MANUAL Fig. 2.14 Removing upper cover When the controller is mounted on the rack, the weight of the controller should be supported with the legs of the controller. Screw holes for rack-mounting the controller are used for securing the controller panel, and the weight of the controller cannot be supported only with the screws.

[Page 33: Precautions For Direct Installation](#)

TRANSPORTATION AND INSTALLATION MANUAL 2.3.4 Precautions for Direct Installation When two (2) or more controllers are used, it is necessary to provide a clearance of 50 mm or more in the horizontal direction and a clearance of 100 mm or more in the upward direction between the controllers.

[Page 34: Precautions For Handling The Teach Pendant](#)

TRANSPORTATION AND INSTALLATION MANUAL Precautions for Handling the Teach Pendant Be careful of the following matters when handling the teach pendant. CAUTION • DO NOT drop the teach pendant or hit it against anything. • DO NOT pull the cable running from the teach pendant. •...

[Page 35: Safety Measures](#)

TRANSPORTATION AND INSTALLATION MANUAL Safety Measures When installing the robot, provide sufficient space to carry out the work safely. Clarify the hazard zone, and provide a safety fence so that other persons cannot enter the zone easily. The hazard zone is the zone near the robot's working space where a hazardous state could occur if a person enters.

[Page 36: Position Detector Backup Batteries](#)

TRANSPORTATION AND INSTALLATION MANUAL Position Detector Backup Batteries The robot has batteries to back up positional information on position detectors in its base. Unless the robot is used for a long period of time, the battery voltage will drop and the positional data of origin will be lost. Replace the batteries every year.

[Page 37](#) TRANSPORTATION AND INSTALLATION MANUAL Table 2.3 List of level 8 alarms Error code Descriptions 8-065 Axis1 Encoder abnormal 8-097 Axis2 Encoder abnormal 8-129 Axis3 Encoder abnormal 8-161 Axis4 Encoder abnormal 8-193 Axis5 Encoder abnormal 8-225 Axis6 Encoder abnormal STE 73995 -...

[Page 38: Using The Robot In Clean Room](#)

TRANSPORTATION AND INSTALLATION MANUAL Using the Robot in Clean Room The main robot is designed pursuant to the Clean Class 10. To be more specific, when this robot is operated in the clean bench (Clean Class 1 or less) installed in the downflow clean room, the number of 0.3 μm or more fine particles in 1 ft as measured on the surface of the axis 3 stroke lower limit position is 10 or less.

[Page 39: System Connections](#)

TRANSPORTATION AND INSTALLATION MANUAL Section 3 System Connections Cable Wiring This section describes the various types of cables and connectors and explains how these are to be connected. 3.1.1 Connector Arrangement on the Controller The cables connected to the TS1000 robot controller are shown in Fig. 3.1. [6] COM1: For serial communication with external equipment [7] HOST: For user serial communication...

[Page 40: Connecting The Power Cable](#)

TRANSPORTATION AND INSTALLATION MANUAL 3.1.2 Connecting the Power Cable "ACIN" ([1] of Fig. 3.1; plug connector attached) The power cable is used to supply the main AC power to the controller. Table 3.1 Power supply specifications Item Specifications Power supply Single phase, AC 190 ~ 250 V, 50/60 Hz \pm 1 Hz Power capacity TH250A (0.9 kVA)

[Page 41](#) TRANSPORTATION AND INSTALLATION MANUAL DANGER • Always use the designated wire. Failure to do so could lead to fires or faults. • When connecting the connector and wires, make sure not to mistake the terminal arrangement. • After making the connection, use a tester, etc., to confirm the connection. For the terminal arrangement, see Para.

[Page 42: Connecting The Motor Cable](#)

TRANSPORTATION AND INSTALLATION MANUAL 3.1.3 Connecting the Motor Cable "MOTOR" ([2] of Fig. 3.1) (Cable attached) The motor cable connects the controller and robot, supplies the power required to rotate the motor from the controller servo driver to each axis feed motor of the robot and turns on and off the brake for securing the motor axis.

[Page 43](#) TRANSPORTATION AND INSTALLATION MANUAL Fig. 3.4 Robot side connector arrangement (TH350A-T) STE 73995 - 42 -...

[Page 44: Connecting The Encoder Cable](#)

TRANSPORTATION AND INSTALLATION MANUAL 3.1.4 Connecting the Encoder Cable "ENC" ([3] of Fig. 3.1) (Cable attached) The encoder cable is a signal line used to transmit a signal from the rotation angle detecting encoder of each robot axis to the controller. The connector for connecting the encoder cable is ENC ([3] of Fig.

[Page 45: Inserting And Removing Cables](#)

TRANSPORTATION AND INSTALLATION MANUAL 3.1.7 Inserting and Removing Cables CAUTION • Before inserting or removing any controller cable, be sure to turn off the "POWER" switch. • When removing a cable, be sure to pull the plug and not the cord. Otherwise, you may damage the cable.

[Page 46](#) TRANSPORTATION AND INSTALLATION MANUAL Receptacle Plug Loosen Lock screw Tighten Fig. 3.6 Inserting and removing a square connector STE 73995 - 45 -...

[Page 47: Examples Of Connector Terminal Arrangement](#)

TRANSPORTATION AND INSTALLATION MANUAL 3.1.8 Examples of Connector Terminal Arrangement Power cable connector ACIN Connects to controller. DANGER Type: JL04V-2E18-10PE-B • Completely connect the Manufacturer: grounding cable. Japan Aviation Otherwise, an electric Electronics Industry shock or fire may be Single phase, AC 170~250 V, caused if a fault or 50/60 Hz electric leak has...

[Page 48](#) TRANSPORTATION AND INSTALLATION MANUAL Robot hand control signal cable connector HAND Connects to controller. Type: 10114-3000VE 14 13 12 11 10 9 8 Manufacturer: 3M Fig. 3.10 External view of robot hand control signal cable connector External input signal cable connector INPUT Connects to controller.

[Page 49: Controller Connector Signals](#)

TRANSPORTATION AND INSTALLATION MANUAL Controller Connector Signals 3.2.1 Connector Signal Connection Diagrams Diagrams showing which signals correspond to which terminals are shown in Section 2 of the Interface Manual. 3.2.2 Jumpers for Safety Related Signals The following system input signals are provided to serve for the safety purpose. System input signals INPUT-12 (STOP)

[Page 50](#) TRANSPORTATION AND INSTALLATION MANUAL CAUTION • Unless the signals of SVOFF and emergency stop contacts 1, 2 are jumpered, the controller servo power cannot be turned on. • Unless the CYCLE signal is jumpered, the controller enters the cycle operation mode.

[Page 51: Tool Interface](#)

TRANSPORTATION AND INSTALLATION MANUAL Section 4 Tool Interface Mounting Tool TH250A, TH350A, TH180 and TH350A-T The tool is mounted on the end of the tool shaft ($\phi 16$). The tool shaft has a dog for the stopper, and the section in front of the dog is used for mounting the tool. At this time, the dog should not be removed.

[Page 52](#) TRANSPORTATION AND INSTALLATION MANUAL +0.018 -0.012 Split clamp $\phi 12H7$ -0.042 depth 4 $\phi 60$ Tool 45° 4- $\phi 4.5$ hole P.C.D.50 (b) Dimensions of tool set flange (option) Fig. 4.1 Mounting TH250A, TH350A, TH350A-T and TH180 tools STE 73995 - 51 -...

[Page 53: Tool \(Hand\) Wiring And Piping](#)

TRANSPORTATION AND INSTALLATION MANUAL Tool (Hand) Wiring and Piping The robot is provided with wiring and air piping for the tool. These wiring and piping extend to the arm 2 from the base. Wiring for tool Base side Arm side DSUB 25-pin connector DSUB 25-pin connector (XM2A-1501 made by OMRON)

[Page 54](#) TRANSPORTATION AND INSTALLATION MANUAL Hand air joint 4xM5 Hand air tube 4x $\phi 4$ Hand air joint For 4x $\phi 4$ tube Fig. 4.3 Air piping for tool (TH250A, TH350A) Hand air joint 4xM5 Hand air tube 4x $\phi 4$ Hand air joint For 4x $\phi 4$ tube Fig.

[Page 55](#) TRANSPORTATION AND INSTALLATION MANUAL Hand air joint Hand air joint For 4x $\phi 4$ tube Hand air tube 4x $\phi 4$ Fig. 4.5 Air piping for tool (TH350A□T) STE 73995 - 54-...

[Page 56: 4.2.1 Controller's Tool Signals](#)

TRANSPORTATION AND INSTALLATION MANUAL 4.2.1 Controller's Tool Signals The controller is provided with tool signals (i.e., five (5) input signals for sensor, etc., four (4) control signals for solenoid valve, etc., DC 24V and DC 24 VGND signals), which can be connected also from the controller side. (A cable between the controller and cable is an option.) The relevant signals are described below.

[Page 57](#) TRANSPORTATION AND INSTALLATION MANUAL Output signal connector HAND Table 4.2 Output signals Signal name Signal No. Output circuit and example of connections DC relay drive Customer's side HO_1 Hand output 1 P24V HO_2 Hand output 2 HO_3 Hand output 3 HO_4 Hand output 4 DC relay...

[Page 58](#) TRANSPORTATION AND INSTALLATION MANUAL The figure below shows the DC relay circuit when the external power is used. DC relay drive Customer's side P24V DC relay Diode for preventing counter electromotive voltage Fig. 4.6 DC relay circuit diagram STE 73995 -...

[Page 59: Permissible Load Conditions And Program Setting](#)

TRANSPORTATION AND INSTALLATION MANUAL Permissible Load Conditions and Program Setting This paragraph describes the permissible load conditions of the robot and how to set up the program according to the load. 4.3.1 Permissible Load Conditions The robot load conditions are defined by the tool mass, moment of inertia and offset value of tool gravity center from the center of the tool shaft, as shown in Fig.

[Page 60](#) TRANSPORTATION AND INSTALLATION MANUAL Tool center of gravity Moment of inertia Tool Gravity center offset Fig. 4.7 Tool and robot body (Normal type) Tool center of gravity Moment of inertia Tool Gravity center offset Fig. 4.8 Tool and robot body (Ceiling type)

[Page 61: Load Conditions And Program Setting](#)

The TH series can automatically change the acceleration and servo gain according to the load conditions by using the PAYLOAD command in the program. The specific method for using this function is explained below.

[Page 62](#) TRANSPORTATION AND INSTALLATION MANUAL (Program example 2) Let's assume that the hand mass is 1 kg and gravity center offset is 30 mm, and that the mass is 3 kg and gravity center offset is 50 mm when the workpiece is grasped.

[Page 63](#) TRANSPORTATION AND INSTALLATION MANUAL Setting of PAYLOAD command In the default state, or when the PAYLOAD command is not used, the acceleration is set to 100 % and the servo gain is set to the value under the minimum load. (See Para.

[Page 64](#) TRANSPORTATION AND INSTALLATION MANUAL If the robot still vibrates or overshoots after setting the above conditions, contact Toshiba Machine. Advise us of the then load conditions and program also. STE 73995 – 63 –...

[Page 65: Setting Robot Acceleration And Maximum Speed For Load Conditions](#)

TRANSPORTATION AND INSTALLATION MANUAL 4.3.3 Setting Robot Acceleration and Maximum Speed for Load Conditions TH250A Acceleration of the robot is automatically changed according to the load conditions when the PAYLOAD command is used. The acceleration changes with the load mass, as shown in Fig. 4.9. The vertical line shows the acceleration.

[Page 66](#) TRANSPORTATION AND INSTALLATION MANUAL Load mass [kg] 0□1[kg] 1□2[kg] 2□3[kg] Gravity center offset [mm] (a) Axes 1 and 2 Load mass [kg] 0□1[kg] 1□2[kg] 2□3[kg] Gravity center offset [mm] (b) Axis 4 Load mass [kg] 0□1[kg] 1□2[kg] 2□3[kg] Gravity center offset [mm] (c) Axis 3 Fig.

[Page 67](#) TRANSPORTATION AND INSTALLATION MANUAL Load mass [kg] 0□1[kg] 1□2[kg] 2□3[kg] Gravity center offset [mm] (a) Axes 1, 2, 4 Load mass [kg] 0□1[kg] 1□2[kg] 2□3[kg] Gravity center offset [mm] (b) Axis 3 Fig. 4.12 Setting of maximum speed for gravity center offset (TH250A) STE 73995 –...

[Page 68](#) TRANSPORTATION AND INSTALLATION MANUAL TH350A Acceleration of the robot is automatically changed according to the load conditions when the PAYLOAD command is used. The acceleration changes with the load mass, as shown in Fig. 4.13. The vertical line shows the acceleration. If the load mass is 3 kg, for instance, the acceleration of axes 1, 2 and 4 is 70 %.

[Page 69](#) TRANSPORTATION AND INSTALLATION MANUAL Load mass [kg] 0□1[kg] 1□2[kg] 2□3[kg] Gravity center offset [mm] (a) Axes 1, 2, and 4 Load mass [kg] 0□1[kg] 1□2[kg] 2□3[kg] Gravity center offset [mm] (b) Axis 3 Fig. 4.14 Setting of acceleration for gravity center offset (TH350A) STE 73995 –...

[Page 70](#) TRANSPORTATION AND INSTALLATION MANUAL TH180 Acceleration of the robot is automatically changed according to the load conditions when the PAYLOAD command is used. The acceleration changes with the load mass, as shown in Fig. 4.15. The vertical line shows the acceleration. If the load mass is 2 kg, for instance, the acceleration of axes 1 and 2 is 79 %.

[Page 71](#) TRANSPORTATION AND INSTALLATION MANUAL Load mass [kg] 0□1[kg] 1□2[kg] Gravity center offset [mm] (a) Axes 1, 2, and 4 Load mass [kg] 0□1[kg] 1□2[kg] Gravity center offset [mm] (b) Axis 3 Fig. 4.16 Setting of acceleration for gravity center offset (TH180) STE 73995 –...

[Page 72](#) TRANSPORTATION AND INSTALLATION MANUAL TH350A-T Acceleration of the robot is automatically changed according to the load conditions when the PAYLOAD command is used. The acceleration changes with the load mass, as shown in Fig. 4.17. The vertical line shows the acceleration. If the load mass is 3 kg, for instance, the acceleration of axes 1, 2 and 4 is 70 %.

[Page 73](#) TRANSPORTATION AND INSTALLATION MANUAL Load mass [kg] 0□1[kg] 1□2[kg] 2□3[kg] Gravity center offset [mm] (a) Axes 1, 2, and 4 Load mass [kg] 0□1[kg] 1□2[kg] Gravity

center offset [mm] (b) Axis 3 Fig. 4.18 Setting of acceleration for gravity center offset (TH350A-T) STE 73995 -...

[Page 74: Specifications](#)

TRANSPORTATION AND INSTALLATION MANUAL Section 5 Specifications Specifications Table Item Specifications Structure Horizontal multi-joint type SCARA robot Model TH180 Applicable controller TS1000 Mass of actuator 9 kg No. of controlled axes Four (4) Arm length 180 mm (70 mm + 110 mm) Axis 1 100 (W) Axis 2...

[Page 75](#) TRANSPORTATION AND INSTALLATION MANUAL Position detection method Absolute When the mass of load exceeds 1 kg, or when the gravity center position of load is away from the axis 4 center position, both the speed and acceleration should be reduced, using the PAYLOAD command. Shuttle time for rough positioning in horizontal direction of 300 mm and vertical direction of 25 mm.

[Page 76](#) TRANSPORTATION AND INSTALLATION MANUAL Item Specifications Structure Horizontal multi-joint type SCARA robot Model TH250A TH350A Applicable controller TS1000 Mass of actuator 14 kg No. of controlled axes Four (4) Arm length 250 mm (125 mm + 350 mm (225 mm + 125 mm) 125 mm) Axis 1...

[Page 77](#) TRANSPORTATION AND INSTALLATION MANUAL Shuttle time for rough positioning in horizontal direction of 300 mm and vertical direction of 25 mm. CAUTION Put the Z-axis (axis 3) in the raised position as much as possible, when moving Axes 1, 2, and 4. Moving Axis 1, 2, or 4 when the Z-axis is in low positions can lead to premature damage to the ball screw spline (Z-axis shaft).

[Page 78: Appendix A Calculating Control Power Capacity](#)

Table 5.1 Motor power capacity Motor capacity (W) Power capacity (VA) Example: The servo motor capacity and servo driver power capacity of the TH series robots are as follows: Table 5.2 Servo driver power capacity Type of robot Axis 1...

[Page 79](#) (Power capacity of servo driver) = Servo rated output / 0.7 Example of calculating power capacity The power capacity of TH series robot is listed in the following table. Table 5.3 Power capacity of TH series robots Type of robot...

[Page 80](#) TRANSPORTATION AND INSTALLATION MANUAL APPROVED BY: CHECKED BY: PREPARED BY: STE 73995 - 79 - □...

This manual is also suitable for:

[Th250aTh350aTh180Th350a-t](#)