

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Yaskawa / Motoman NXC100* at our website: *Click HERE*

Motoman NXC100 Controller

NXC100 Controller Manual

Part Number: 150975-1CD
Revison 2

MOTOMAN a YASKAWA company

Motoman, Incorporated
805 Liberty Lane
West Carrollton, OH 45449
TEL: (937) 847-6200
FAX: (937) 847-6277
24-Hour Service Hotline: (937) 847-3200

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

COMPLETE OUR ONLINE SURVEY

Motoman is committed to total customer satisfaction! Please give us your feedback on the technical manuals you received with your Motoman robotic solution.

To participate, go to the following website:

http://www.motoman.com/forms/techpubs.asp

The information contained within this document is the proprietary property of Motoman, Inc., and may not be copied, reproduced or transmitted to other parties without the expressed written authorization of Motoman, Inc.

©2007 by MOTOMAN
All Rights Reserved

Because we are constantly improving our products, we reserve the right to change specifications without notice. MOTOMAN is a registered trademark of YASKAWA Electric Manufacturing.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Chapter 1
Introduction

1.1 About This Document

This manual provides information for the NXC100 controller and contains the following sections:

SECTION 1 - INTRODUCTION
Provides general information about the structure of this manual, a list of reference documents, and customer service information.

SECTION 2 - SAFETY
This section provides information regarding the safe use and operation of Motoman products.

SECTION 3 - NXC100 INSTRUCTIONS
Provides detailed instructions for the NXC100 controller.

1.2 Reference to Other Documentation

For additional information refer to the following:

- Concurrent I/O Manual (P/N 149230-1)
- Operator's Manual for your application
- Vendor manuals for system components not manufactured by Motoman

1.3 Customer Service Information

If you are in need of technical assistance, contact the Motoman service staff at (937) 847-3200. Please have the following information ready before you call:

- Robot Type (HP3JC)
- Application Type (handling)
- Robot Serial Number (located on back side of robot arm)
- Robot Sales Order Number (located on back of controller)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Notes

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Chapter 2
Safety

2.1 Introduction

It is the purchaser's responsibility to ensure that all local, county, state, and national codes, regulations, rules, or laws relating to safety and safe operating conditions for each installation are met and followed.

We suggest that you obtain and review a copy of the ANSI/RIA National Safety Standard for Industrial Robots and Robot Systems. This information can be obtained from the Robotic Industries Association by requesting ANSI/RIA R15.06-1999. The address is as follows:

Robotic Industries Association
900 Victors Way
P.O. Box 3724
Ann Arbor, Michigan 48106
TEL: (734) 994-6088
FAX: (734) 994-3338
INTERNET: www.roboticsonline.com

Ultimately, the best safeguard is trained personnel. The user is responsible for providing personnel who are adequately trained to operate, program, and maintain the robot cell. **The robot must not be operated by personnel who have not been trained!**

We recommend that all personnel who intend to operate, program, repair, or use the robot system be trained in an approved Motoman training course and become familiar with the proper operation of the system.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

This safety section addresses the following:

- Standard Conventions (Section 2.2)
- General Safeguarding Tips (Section 2.3)
- Mechanical Safety Devices (Section 2.4)
- Installation Safety (Section 2.5)
- Programming, Operation, and Maintenance Safety (Section 2.6)

2.2 Standard Conventions

This manual includes the following alerts – in descending order of severity – that are essential to the safety of personnel and equipment. As you read this manual, pay close attention to these alerts to insure safety when installing, operating, programming, and maintaining this equipment.

DANGER!
Information appearing in a DANGER concerns the protection of personnel from the immediate and imminent hazards that, if not avoided, will result in immediate, serious personal injury or loss of life in addition to equipment damage.

WARNING!
Information appearing in a WARNING concerns the protection of personnel and equipment from potential hazards that can result in personal injury or loss of life in addition to equipment damage.

CAUTION!
Information appearing in a CAUTION concerns the protection of personnel and equipment, software, and data from hazards that can result in minor personal injury or equipment damage.

Note: Information appearing in a Note provides additional information which is helpful in understanding the item being explained.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2.3 General Safeguarding Tips

All operators, programmers, plant and tooling engineers, maintenance personnel, supervisors, and anyone working near the robot must become familiar with the operation of this equipment. All personnel involved with the operation of the equipment must understand potential dangers of operation. General safeguarding tips are as follows:

- Improper operation can result in personal injury and/or damage to the equipment. Only trained personnel familiar with the operation of this robot, the operator's manuals, the system equipment, and options and accessories should be permitted to operate this robot system.
- Do not enter the robot cell while it is in automatic operation. Programmers must have the teach pendant when they enter the robot cell.
- Improper connections can damage the robot. All connections must be made within the standard voltage and current ratings of the robot I/O (Inputs and Outputs).
- The robot must be placed in Emergency Stop (E-STOP) mode whenever it is not in use.
- In accordance with ANSI/RIA R15.06-1999, section 4.2.5, Sources of Energy, use lockout/tagout procedures during equipment maintenance. Refer also to Section 1910.147 (29CFR, Part 1910), Occupational Safety and Health Standards for General Industry (OSHA).

2.4 Mechanical Safety Devices

The safe operation of the robot, positioner, auxiliary equipment, and system is ultimately the user's responsibility. The conditions under which the equipment will be operated safely should be reviewed by the user. The user must be aware of the various national codes, ANSI/RIA R15.06-1999 safety standards, and other local codes that may pertain to the installation and use of industrial equipment. Additional safety measures for personnel and equipment may be required depending on system installation, operation, and/or location. The following safety equipment is provided as standard:

- Safety fences and barriers
- Light curtains and/or safety mats
- Door interlocks
- Emergency stop palm buttons located on operator station, robot controller, and programming pendant

Check all safety equipment frequently for proper operation. Repair or replace any non-functioning safety equipment immediately.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2.5 Installation Safety

Safe installation is essential for protection of people and equipment. The following suggestions are intended to supplement, but not replace, existing federal, local, and state laws and regulations. Additional safety measures for personnel and equipment may be required depending on system installation, operation, and/or location. Installation tips are as follows:

- Be sure that only qualified personnel familiar with national codes, local codes, and ANSI/RIA R15.06-1999 safety standards are permitted to install the equipment.
- Identify the work envelope of each robot with floor markings, signs, and barriers.
- Position all controllers outside the robot work envelope.
- Whenever possible, install safety fences to protect against unauthorized entry into the work envelope.
- Eliminate areas where personnel might get trapped between a moving robot and other equipment (pinch points).
- Provide sufficient room inside the workcell to permit safe teaching and maintenance procedures.

2.6 Programming, Operation, and Maintenance Safety

All operators, programmers, plant and tooling engineers, maintenance personnel, supervisors, and anyone working near the robot must become familiar with the operation of this equipment. Improper operation can result in personal injury and/or damage to the equipment. Only trained personnel familiar with the operation, manuals, electrical design, and equipment interconnections of this robot should be permitted to program, operate, and maintain the system. All personnel involved with the operation of the equipment must understand potential dangers of operation.

- Inspect the robot and work envelope to be sure no potentially hazardous conditions exist. Be sure the area is clean and free of water, oil, debris, etc.
- Be sure that all safeguards are in place. Check all safety equipment for proper operation. Repair or replace any non-functioning safety equipment immediately.
- Do not enter the robot cell while it is in automatic operation. Be sure that only the person holding the programming pendant enters the workcell.
- Check the E-STOP button on the programming pendant for proper operation before programming. The robot must be placed in Emergency Stop (E-STOP) mode whenever it is not in use.
- Back up all programs and jobs onto suitable media before program changes are made. To avoid loss of information, programs, or jobs, a backup must always be made before any service procedures are done and before any changes are made to options, accessories, or equipment.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

- Any modifications to PART 1, System Section, of the robot controller concurrent I/O program can cause severe personal injury or death, as well as damage to the robot! Do not make any modifications to PART 1, System Section. Making any changes without the written permission of Motoman will VOID YOUR WARRANTY!
- Some operations require standard passwords and some require special passwords. Special passwords are for Motoman use only. YOUR WARRANTY WILL BE VOID if you use these special passwords.
- The robot controller allows modifications of PART 2, User Section, of the concurrent I/O program and modifications to controller parameters for maximum robot performance. Great care must be taken when making these modifications. All modifications made to the controller will change the way the robot operates and can cause severe personal injury or death, as well as damage the robot and other parts of the system. Double-check all modifications under every mode of robot operation to ensure that you have not created hazards or dangerous situations.
- Check and test any new or modified program at low speed for at least one full cycle.
- This equipment has multiple sources of electrical supply. Electrical interconnections are made between the controller and other equipment. Disconnect and lockout/tagout all electrical circuits before making any modifications or connections.
- Do not perform any maintenance procedures before reading and understanding the proper procedures in the appropriate manual.
- Use proper replacement parts.
- Improper connections can damage the robot. All connections must be made within the standard voltage and current ratings of the robot I/O (Inputs and Outputs).

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Notes

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

NXC100
INSTRUCTIONS

TYPE: ERCR-NS00-A200

Upon receipt of the product and prior to initial operation, read these instructions thoroughly, and retain for future reference.

MOTOMAN INSTRUCTIONS

MOTOMAN-□□□ INSTRUCTIONS
NXC100 INSTRUCTIONS
NX100 OPERATOR'S MANUAL

The NX100 operator's manual above corresponds to specific usage.
Be sure to use the appropriate manual.



YASKAWA

MANUAL NO.
HW0482738 ①

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

MANDATORY

- This instruction manual explains the robot system for NXC100. Read this manual carefully and be sure to understand its contents before handling the NXC100.
- General items related to safety are listed in Section 1: Safety of this instruction manual: NXC100 INSTRUCTIONS. To ensure correct and safe operation, carefully read the NXC100 instructions before operating the robot system.

CAUTION

- Some drawings in this manual are shown with the protective covers or shields removed for clarity. Be sure all covers and shields are replaced before operating this product.
- The drawings and photos in this manual are representative examples and differences may exist between them and the delivered product.
- YASKAWA may modify this model without notice when necessary due to product improvements, modifications, or changes in specifications. If such modification is made, the manual number will also be revised.
- If your copy of the manual is damaged or lost, contact a YASKAWA representative to order a new copy. The representatives are listed on the back cover. Be sure to tell the representative the manual number listed on the front cover.
- YASKAWA is not responsible for incidents arising from unauthorized modification of its products. Unauthorized modification voids your product's warranty.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Notes for Safe Operation

Read this manual and other required documents carefully before installation, operation, maintenance, or inspection of the NXC100.
In this manual, the Notes for Safe Operation are classified as “WARNING,” “CAUTION,” “MANDATORY,” or “PROHIBITED.”

 WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to personnel.
 CAUTION	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury to personnel and damage to equipment. It may also be used to alert against unsafe practices.
 MANDATORY	Always be sure to follow explicitly the items listed under this heading.
 PROHIBITED	Must never be performed.

Even items described as “CAUTION” may result in a serious accident in some situations.
At any rate, be sure to follow these important items.



To ensure safe and efficient operation at all times, be sure to follow all instructions, even if not designated as “CAUTION” and “WARNING.”

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

WARNING

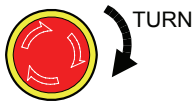
- Before operating the manipulator, check that servo power is turned OFF when the emergency stop buttons on the front face of the NXC100 and on the right side of the programming pendant are pressed.
  When the servo power is turned OFF, the SERVO ON LED on the programming pendant is turned OFF.

  Injury or damage to machinery may result if the emergency stop circuit cannot stop the manipulator during an emergency. The manipulator should not be used if the emergency stop buttons do not function.

Emergency Stop Button 

- Once the emergency stop button is released, clear the cell of all items which could interfere with the operation of the manipulator.
  Then turn the servo power ON.

  Injury may result from unintentional or unexpected manipulator motion.

Release of Emergency Stop 

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

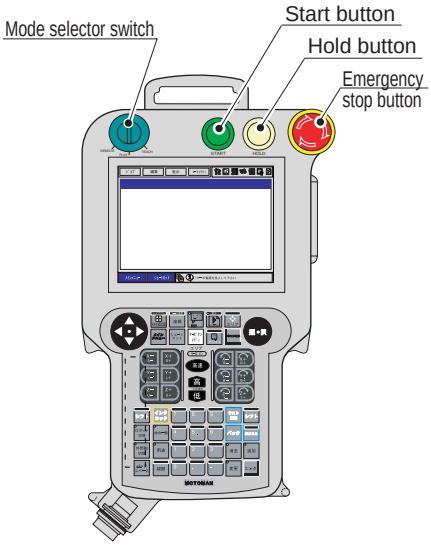
WARNING

- Observe the following precautions when performing teaching operations:
  -Always follow the predetermined operating procedure.
  -Ensure that you have a safe place to retreat in case of emergency.

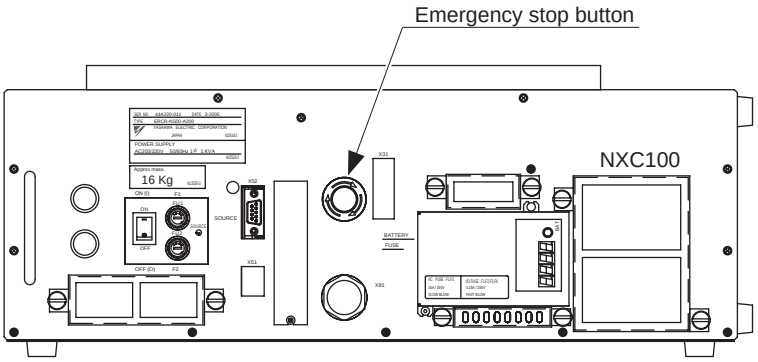
  Improper operation or unintended manipulator motion may result in injury.

- Confirm that no persons are present in the P-point maximum envelope of the manipulator and that you are in a safe location before:
  -Turing ON the robot system power.
  -Moving the manipulator with the programming pendant.
  -Running the system in the check mode.
  -Performing automatic operations.

  Injury may result if anyone enters the P-point maximum envelope of the manipulator during operation. Always press an emergency stop button immediately if there is a problem. The emergency stop button is located on the right side of the programming pendant and on the front face of the NXC100.



Programming pendant



NXC100

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

CAUTION

- Perform the following inspection procedures prior to conducting manipulator teaching. If problems are found, repair them immediately, and be sure that all other necessary processing has been performed.
  -Check for problems in movement of the manipulator and servo track.
  -Check for damage to insulation and sheathing of external wires.
- Read and understand the Explanation of Warning Labels before operating the robot system.
- For safety, operate under the proper lighting.

Definition of Terms Used Often in This Manual

In this manual, the equipment is designated as follows:

Equipment	Manual Designation
Manipulator	Manipulator
NXC100 Controller (ERCR-NS00-A200)	NXC100
Manipulator, servo track, controller altogether	Robot system

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Explanation of Warning Labels

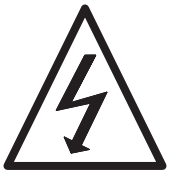
The following warning labels are attached to the NXC100.

Always follow the warnings on the labels.

WARNING

- Always follow the instructions in the warning labels.

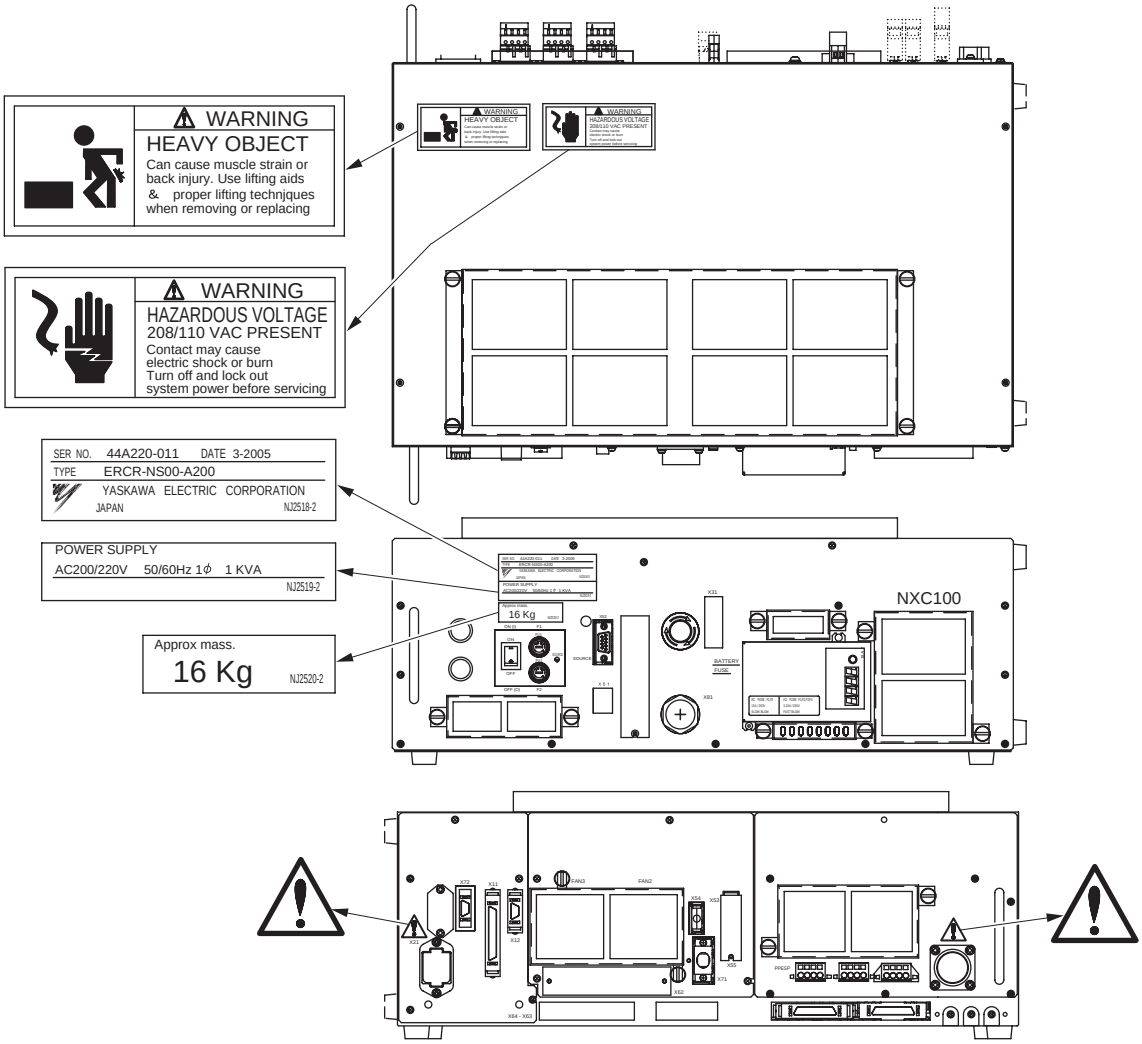
  Failure to observe this may result in injury or damage to machinery.



This warning label indicates the connector which includes “HAZARDOUS VOLTAGE.”
220 VAC / 200 VAC
Contact may cause electric shock or burn.
Turn OFF and lock out the system power before connecting or disconnecting.

Location of Warning Labels and Name Plate

The following warning labels are attached to the NXC100.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1 Safety

1.1 For Your Safety 2-1
1.2 Special Training 2-3
1.3 Motoman Manual List 2-3
1.4 Personnel Safety 2-4
1.5 Motoman Safety 2-6
1.5.1 Installation and Wiring Safety 2-6
1.5.2 Work Area Safety 2-9
1.5.3 Operation Safety 2-10
1.6 Notes for Moving and Transferring the MOTOMAN 2-12
1.7 Notes on MOTOMAN Disposal 2-12

2 Product Confirmation

3 Transporting

3.1 Transporting Method 4-1

4 Installation

4.1 NXC100 Basic Specifications 5-1
4.2 Programming Pendant Specifications 5-3
4.3 Dimensions 5-4
4.4 LED Indicator, Operation Switch, etc. 5-5

5 Explanation

5.1 NXC100 Connector Names 5-1
5.2 Pin Assignments 5-2
5.3 Circuit Diagram for I/O Signals 5-9
5.4 Interlock Circuit 5-13
5.5 Expansion of I/O Capacity 5-14

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

6 Maintenance and Inspection

6.1 Inspection Schedule 6-1
6.2 Inspection Items 6-2

7 Recommended Spare Parts

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1 Safety

1.1 For Your Safety

Robots generally have requirements which are different from other manufacturing equipment, such as larger working areas, high-speed operation, rapid arm movements, etc., which can pose safety hazards.
Read and understand the instruction manuals and related documents, and observe all precautions in order to avoid the risk of injury to personnel and damage to equipment.
It is the user’s responsibility to ensure that all local, state, and national codes, regulations rules, or laws relating to safety and safe operating conditions are met and followed.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

MANDATORY

- Teaching maintenance of the robot must conform to:

  -Industrial Safety and Health Law
  -Enforcement Order of Industrial Safety and Health Law
  -Ordinance of Industrial Safety and Health Law

  Other related laws are:

  -Occupational Safety and Health Act in USA
  -Factory Act (Gewerbeordnung) in Germany
  -Health and Safety at Work, etc. Act in UK
  -EC Directive 89/392 Machinery and 91/368 EEC

- Prepare

  -SAFETY WORK REGULATIONS

  based on concrete policies for safety management complying with related laws.

- Observe the

  -MANIPULATING INDUSTRIAL ROBOTS-SAFETY (ISO 10218)

  for safe operation of the robot. (Japan Only) (JIS B 8433)

- Reinforce the

  -SAFETY MANAGEMENT SYSTEM

  by designating authorized workers and safety managers, as well as giving continuing safety education.

- Teaching and maintaining the robot are specified as "Hazardous Operations" in the Industrial Safety and Health Law

  (Japan only).
  Workers employed in these above operations are requested to attend special training offered by YASKAWA.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1.2 Special Training

MANDATORY

- Persons who teach or inspect the manipulator must undergo required training before using the manipulator.
- For more information on training, inquire at the nearest YASKAWA branch office.

  The telephone numbers are listed on the back cover of this manual.

1.3 Motoman Manual List

MANDATORY

- It is important to have and be familiar with all manuals concerning the MOTOMAN.

  You should have the four manuals listed below:

  -MOTOMAN-□□□ INSTRUCTIONS
  -NXC100 INSTRUCTIONS
  -NX100 OPERATOR'S MANUAL

  Confirm that you have all these manuals on hand.
  If any manuals are missing, contact your salesman from YASKAWA's local branch office.
  The relevant telephone numbers are listed on the back cover.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1.4 Personnel Safety

The entire manipulator P-point maximum envelope is potentially dangerous.
All personnel working with the MOTOMAN (safety administration, installation, operation, and maintenance personnel) must always be prepared and "Safety First" minded, to ensure the safety of all personnel.

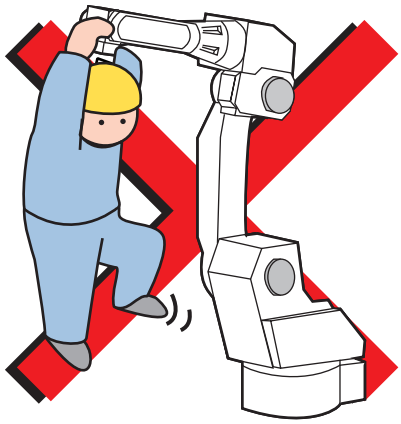
CAUTION
• Avoid any dangerous actions in the area where the MOTOMAN is installed. There is a danger of injury if there is contact with the manipulator or peripheral equipment.
• Please take strict safety precautions by placing signs such as "Flammable", "High Voltage", "Waiting", and "Off-limits to Unauthorized Personnel" in necessary areas in the factory. Failure to observe these cautions may result in fire, electric shock, or injury due to contact with the manipulator and other equipment.
• Strictly observe the following items: -Always wear approved work clothes (no loose-fitting clothes). -Do not wear gloves when operating the MOTOMAN. -Do not allow underwear, shirts, or neckties to hang out from the work clothes. -Do not wear large jewelry, such as earrings, rings, or pendants. Always wear protective safety equipment such as helmets, safety shoes (with slip-proof soles), face shields, safety glasses, and gloves as necessary. Improper clothing may result in injury.
• Unauthorized persons should not approach the manipulator or associated peripheral equipment. Failure to observe this caution may result in injury due to contact with NXC100, controller, the workpiece, the positioner, etc.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

CAUTION

- Never forcibly move the manipulator axes.

  Failure to observe this caution may result in injury or equipment damage.



- Avoid inadvertently pushing buttons.

  Failure to observe this caution may result in injury or damage by unexpected movement of the manipulator.

- Never allow unauthorized personnel to touch the NXC100 during operation.

  Failure to observe this caution may result in injury or damage resulting from unexpected movement of the manipulator.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1.5 Motoman Safety

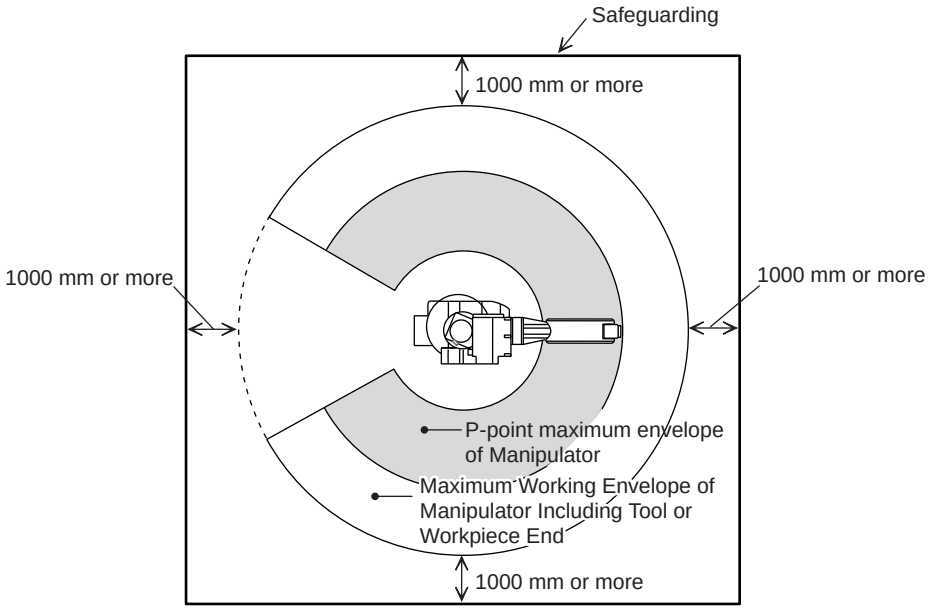
1.5.1 Installation and Wiring Safety

Refer to the MOTOMAN-□□□ Instructions manual and NXC100 Instructions for details on installation and wiring.
In planning installation, adapt an easy to observe arrangement to ensure safety. Take safety into consideration when planning the installation. Observe the following when installing the manipulator:

WARNING

- Select an area such as that described below to install the manipulator: Confirm that the area is large enough so that the fully extended manipulator arm with tool will not reach a side wall, safeguarding, or the controller.

  Failure to observe this caution may result in injury or damage resulting from unexpected movement of the manipulator.



- Perform grounding in accordance with all applicable electrical codes.

  Failure to observe this caution may result in fire or electric shock.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

CAUTION

- Operation of the crane, sling, or forklift should only be performed by authorized personnel.

  Failure to observe this precaution may result in injury or equipment damage.

MOTOMAN should be lifted with a crane using wire rope threaded through the shipping bolts and positioners and the body should be lifted in an upright posture as described in the manipulator instruction manual.

Failure to observe these precautions may cause the manipulator to turn downward, potentially causing injury or damage to equipment.

- If storing the manipulator temporarily before installation, be sure to place it on a stable and flat surface and take precautions to prevent unauthorized personnel from touching it.

  Failure to observe this precaution may result in injury of damage to equipment.

CAUTION

- Be sure there is sufficient room for maintenance on the manipulator, NXC100, and other peripheral equipment.

  Failure to observe this precaution could result in injury during maintenance.

- The manipulator is controlled by the NXC100 or the controller for positioner.

  To ensure safety, be sure to operate the controller from a location where the manipulator is easily visible.

  Operation by unauthorized personnel may result in injury or equipment damage.

- Install the NXC100 outside the safeguarding of the manipulator's safety enclosure.

  Failure to observe this precaution may result in injury or damage to equipment resulting from contact with the manipulator.

- Install the manipulator using bolts of the size and type specified for each MOTOMAN in the MOTOMAN INSTRUCTION MANUAL.

  Failure to observe this caution may result in injury or damage to equipment.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

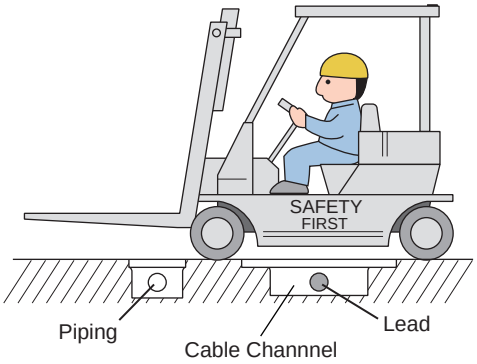
CAUTION

- Be familiar with the connection diagram before wiring the NXC100, and perform the wiring in accordance with the connection diagram.

  There is a danger of equipment damage or injury due to miswiring and unexpected movement of the equipment.

- Take precautions when wiring and piping between the NXC100, manipulator, and peripheral equipment. Run the piping, wiring, or cables through a pit or use a protective cover, so that they are not stepped on by personnel or run over by the forklift.

  Operators and other personnel may stumble on exposed wiring or piping. Cable damage can cause unexpected manipulator motion resulting in injury or property damage.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1.5.2 Work Area Safety

Carelessness contributes to serious accidents in the work area. To ensure safety, enforce the following precautions:

WARNING

- Install a safeguarding around the manipulator to prevent any accidental contact with the manipulator while the power is on.
  Post a warning sign stating "Off-limits During Operation" at the entrance of the enclosure. The gate of the safeguarding must be equipped with a safety interlock. Be sure the interlock operates correctly before use.

  Failure to observe this caution may result in a serious accident due to contact with the manipulator.

CAUTION

- Store tools and similar equipment in proper locations outside of the enclosure.

  Tools and loose equipment should not be left on the floor around the manipulator, NX100, or welding fixture, etc., as injury or damage to equipment can occur if the manipulator comes in contact with objects or equipment left in the work area.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1.5.3 Operation Safety

WARNING
• Never exceed the rated capacity of the manipulator (capacity can be found in the specifications section of the manipulator manual.). Failure to observe this caution may result in injury or damage to equipment.
• Teach jobs from outside the manipulator's work area whenever possible.
• Observe the following precautions when performing teaching operations within the P-point maximum envelope of the manipulator: - Always view the manipulator from the front. - Always follow the predetermined operating procedure. - Always have an escape plan in mind in case the manipulator comes toward you unexpectedly. - Ensure that you have a place to retreat to in case of emergency. Improper or unintentional manipulator operation can result in injury.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

WARNING

- Before operating the manipulator, check that the SERVO ON lamp on the programming pendant goes out when the emergency stop button on the right of the front door of the NXC100 and the programming pendant are pressed. And confirm that the servo lamp is turned off.

  Injury or damage to machinery may result if the manipulator cannot be stopped in case of an emergency.

- Always press Teach Lock before starting to teach.

  Failure to observe this precaution may result in injury due to unauthorized personnel operating the manipulator from the playback panel.

CAUTION

- Perform the following inspection procedures prior to teaching the manipulator. If problems are found, correct them immediately, and be sure that all other necessary tasks have been performed.

  -Check for problems in manipulator movement.
  -Check for damage to the insulation and sheathing of external wires.

- Always return the programming pendant to its hook on the NX100 cabinet after use.

  If the programming pendant is inadvertently left on the manipulator, a fixture, or on the floor, the manipulator or a tool could collide with it during manipulator movement, possibly causing injury or equipment damage.

MANDATORY

- Persons operating or inspecting the manipulator should be trained as required by applicable laws and company policies.

  (Refer to the 1.2 Special Training)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1.6 Notes for Moving and Transferring the MOTOMAN

When moving or transferring the Motoman, observe the following safety precautions:

CAUTION
• Attach the instructions to the controller cabinet so that all users have access to necessary manuals. See Section 1.3 for a complete list of manuals. If any manuals are missing, contact your Yaskawa representative.
• If the warning labels on the manipulator and NXC100 are illegible, clean the labels so that they can be read clearly. Note that some local laws may prohibit equipment operation if safety labels are not in place. Contact your YASKAWA representative if you require new warning labels.
• When the MOTOMAN is transferred, it is recommended to check with Yaskawa Engineering Co. which is listed on back cover of this manual. Incorrect installation or wiring may result in personal injury and property damage.

PROHIBITED
• Never modify the manipulator or NXC100. Failure to observe this precaution could result in injury or damage resulting from fire, power failure, or operation error.

1.7 Notes on MOTOMAN Disposal

CAUTION
• When disposing of the MOTOMAN, follow the applicable national/local laws and regulations.
• Anchor the manipulator well, even when temporarily storing it before disposal. Failure to observe this precaution may result in injury due to the manipulator falling down.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2 Product Confirmation

CAUTION

- Confirm the contents of the delivery that there is no damage or lack of parts caused by transporting.

  Failure to observe this instruction may affect the manipulator performance or the manipulator may not perform as expected.

- Confirm that the serial numbers (S/N) of the manipulator and the NXC100 (the first 6 digits and last 2 digits) are same.

  * Serial numbers of the nameplate on th manipulator and the NXC100 match as below.

  E.g. S/N of Manipulator
  S2K783 - 1 - 01
  First 6 digits Last 2 digits

  S/N of the NXC100
  S2K783 - 3A - 01
  First 6 digits Last 2 digits

- Perform transporting and installing of the NXC100 with 2 personnel or more.

  Approx. mass
  NXC100 controller (ERCR-NS00-A200) : 16kgf

- Avoid jarring, dropping, or hitting the robot system.

  Injury and damage to the robot system may result.

- Avoid excessive vibration or impacting the NXC100 during handling.

  Failure to observe this caution may adversely affect the performance of the NXC100.

MANDATORY

- Install the robot system in the host system with LockOut/TagOut provisions. That is, each installation requires a device to shut OFF the power to the manipulator, servo track, and NXC100. The device to shut OFF the power should locate outside the enclosure where the manipulator and servo track are installed and has a LockOut/Tagout capability.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

3 Transporting

CAUTION
• Perform transporting and installing of the NXC100 with 2 personnel or more. Approx. mass NXC100 controller (ERCR-NS00-A200) : 16 kg Failure to observe this caution may result in injury or damage to the machinery.

3.1 Transporting Method

Approximate mass of the NXC100 is 16 kg.
Perform the installation of the NXC100 with 2 personnel or more.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4 Installation

4.1 NXC100 Basic Specifications

Table. 1 NXC100 Specifications

Item		Specifications
Applications		Material handling (The NXC100 cannot be used for arc welding.)
Basic Specifications		
Input Power Supply		Single-phase 200/220 VAC (50/60Hz) Power fluctuation +/- 10 % Frequency fluctuation +/- 2 Hz
Grounding		Ground resistance 100 Ω or less
Environmental Conditions	Operating/ Storage Temperature	0 °C ~ +40 °C / -10 °C ~ +60 °C
	Operating/ Storage Humidity	90 %RH max. (non-condensing)
	Vibration Resistance/ Shock Resistance	1 G / 5 G
	Altitude	1000 m or below
	Ambient	Free from explosive, inflammable, and corrosive gas Free from dirt or dust Pollution degree 1 (IEC664-1)
Structure		Self-stand, Vertically or horizontally mounted type, Forced cooling (Air inlet from the front and top panels and air outlet from the rear panel)
Approx. Mass		16 kg
Case Surface		Painting (Munsell notation 5Y 7/1)
Control Section		
Main Memory		128 Mbyte
Flash Disk		Compact flash memory card 64 Mbyte
Extended PCI Slot		1 slot (DC5V 1A or less)
Communication		RS232C (One channel) 10Base-T/ 100Base-TX (One channel) (Communication function is set optionally.)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com
HW0482738

Table. 1 NXC100 Specifications

Item			Specifications
Input / Output Signals			
	Input	Photo-insulation external input for Host 24 VDC, 5 mA max.	12 inputs (concurrent D-IN)
		Robot Interlock signal Double contact inputs	Safety Plug (SAFE) Forced Release Input (FORCE) Full Speed Test (FST) Slow Speed Mode Selection (SS-P) External Servo ON (EXSVON) External Hold (EXHOLD) External Emergency Stop (EXESP) External Enable Switch (EXDSW) Servo On Enable (ONEN)
		CPU reset for Host Contact input	1 input
	Output	Photo-insulation out-put for Host 24 VDC, 40 mA max.	14 outputs (Concurrent D-OUT)
		Robot Interlock signal Double contact inputs	PP Emergency Stop (PPESP) Panel Emergency Stop (PBESP)
Number of Controlled Axes			6 axes One external axis (200 W max.) can be added optionally. The external axis is limited in simultaneous opera-tion with the manipulator.
Manipulators Applicable to NXC100			HP3, HP3L, HP5
Motors Applicable to NXC100			ΣII, ΣIII series AC servo motors manufactured by YASKAWA ELECTRIC CORPORATION (200 VAC spec.)
Display			Pilot lamp for power supply input (White) 7-Segment LED, 4 digits (Green) CPU backup battery condition indicator (Red)
Power Supply			
	Control Power		+5 V, +24 V supplied by built-in switching regulator
	Current Protection		Double phase protected by fuses

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com
HW0482738

4.2 Programming Pendant Specifications

Table. 2 Programming Pendant Specifications

Item		Specifications
Basic Specifications		
	Material	Reinforced plastic (with strap)
	External Dimensions	Width: 200 x Height: 300 x Depth: 60 [mm]
	Approx. Mass	1.3 kg
Display		
	Display	6.5 inch TFT-color LCD
	Number of Indication Dots	640 x 480
Operational Panel		
	Key Switch	54 key switches, arrow key x 1 piece
	Touch Panel	Touch screen display
	Servo On Ready	Illuminated push button switch
	Emergency Stop	Red mushroom type Push Lock / Turn Reset
	Mode Selector	Switch among three modes: TEACH, PLAY, REMOTE 3-position select switch
	Enable Switch	3-position switch, compliant with EN
Others		Hand strap is delivered with the programming pendant.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4.3 Dimensions

The figure " Fig. 1 Parts Names of NXC100 " shows the locations of parts on the NXC100 panel.
The outside dimension of the NXC100 is; Width: 485 x Height: 183 x Depth: 300 [mm].

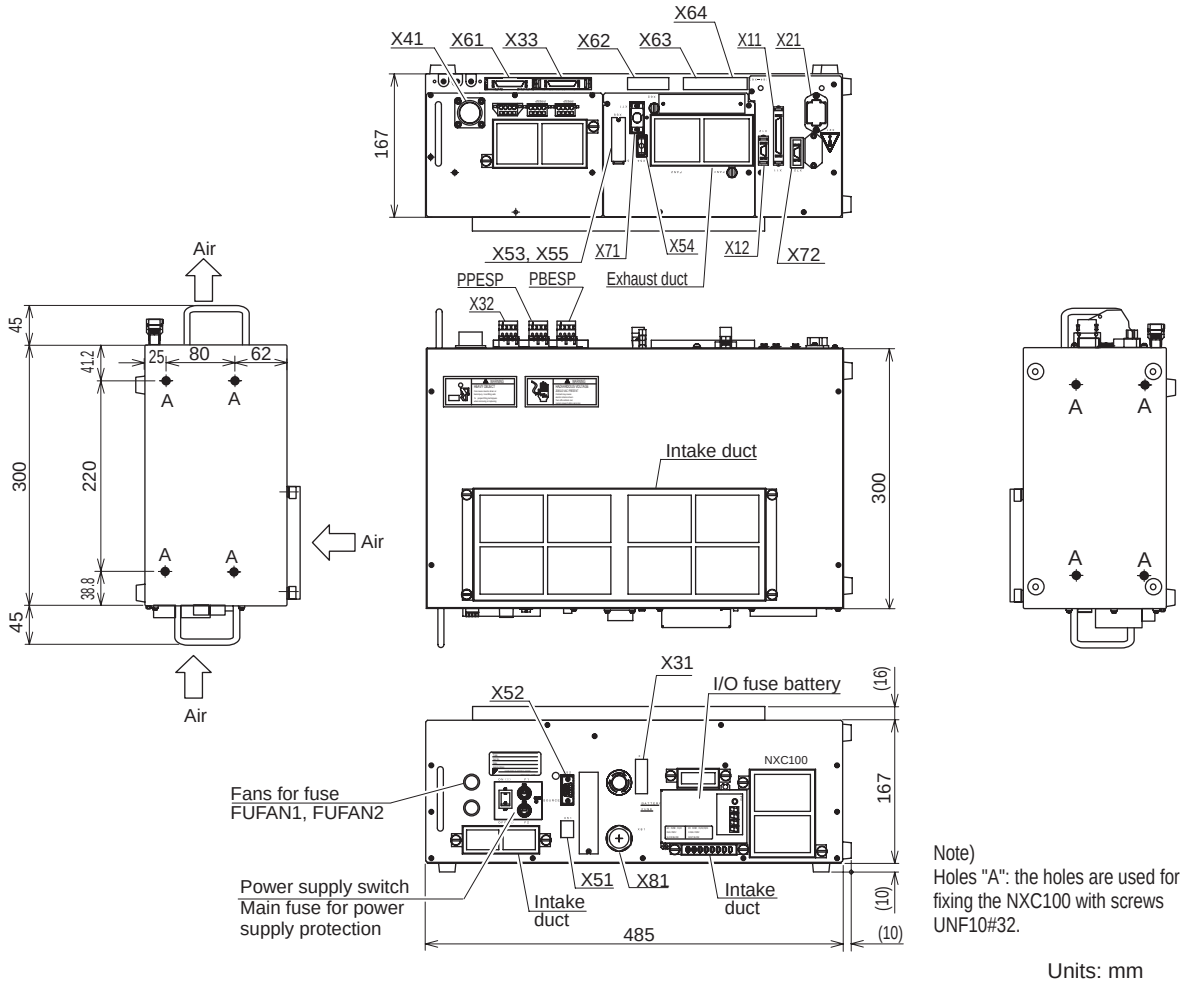


Fig. 1 Parts Names of NXC100

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4.4 LED Indicator, Operation Switch, etc.

1. 7-segment LED Indicator
   Indicates the NXC100's internal status in 4 digits.
   Mainly used to indicate an error code.

	0	1	2	3	4	5	6	7	8	9
Display										
	A	B	C	D	E	F				
Display										

2. Power Switch
   Turns ON/OFF the input power supply.

3. Fuse
   Device code F1, F2, F1 to F4
   Main fuse for power supply protection
   Location: 2 places on the NXC100 front face
   Parts No. 314010, 250 V, 10 A, 6 mm diameter x 32 mm in length,
   Time Lag type
   Manufactured by Littelfuse Inc.

   F1, F2: Fuse for Robot IO protection
   F3, F4: Fuse for Host IO protection
   Location: Inside the Fuse box
   Parts No. 2173.15, 250 V, 3.15 A, 5 mm diameter x 20 mm in length,
   Fast-Acting type,
   Manufactured by Littelfuse Inc.

   Fuse for Brake Protection
   Location: NXC100 rear face
   Parts No. SMP50, 5 A, Time Lag type
   Manufactured by Daito Communication Apparatus Co., Ltd

   Fuse for Fan (FUFAN1, FUFAN2)
   Location: NXC100 front face
   Parts No. 213001, 1 A, 5 mm diameter x 20 mm in length, Time Lag type
   Manufactured by Littelfuse Inc.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4. LED Indicator
   Device code: SOURCE
   LED Indicator (SOURCE) indicates the ON/OFF condition of the NXC100 power supply.
   Device code: BAT
   LED indicator (BAT) indicates with detecting the decline of the CPU memory backup battery voltage.

5. Battery
   Battery is for CPU memory backup.
   Location: Inside the Fuse box
   LITHIUM battery, ER6VC3, 3.6 V, 2000 mAh
   Manufactured by Toshiba Battery Co., Ltd

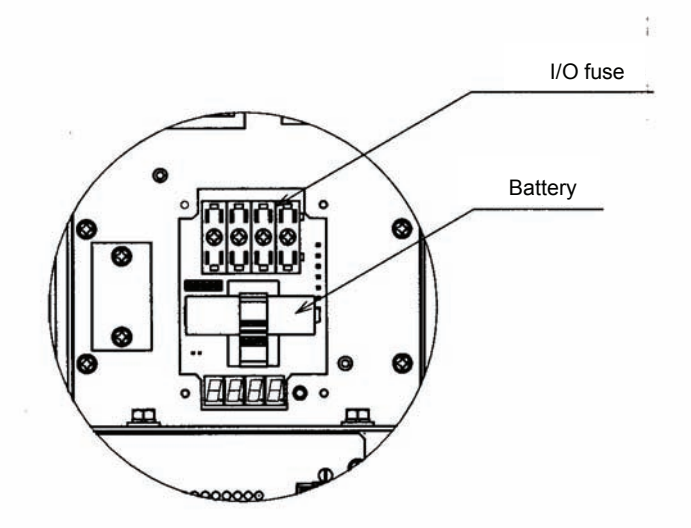


Fig. 2 Diagram of Battery Cover Inside

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5 Explanation

5.1 NXC100 Connector Names

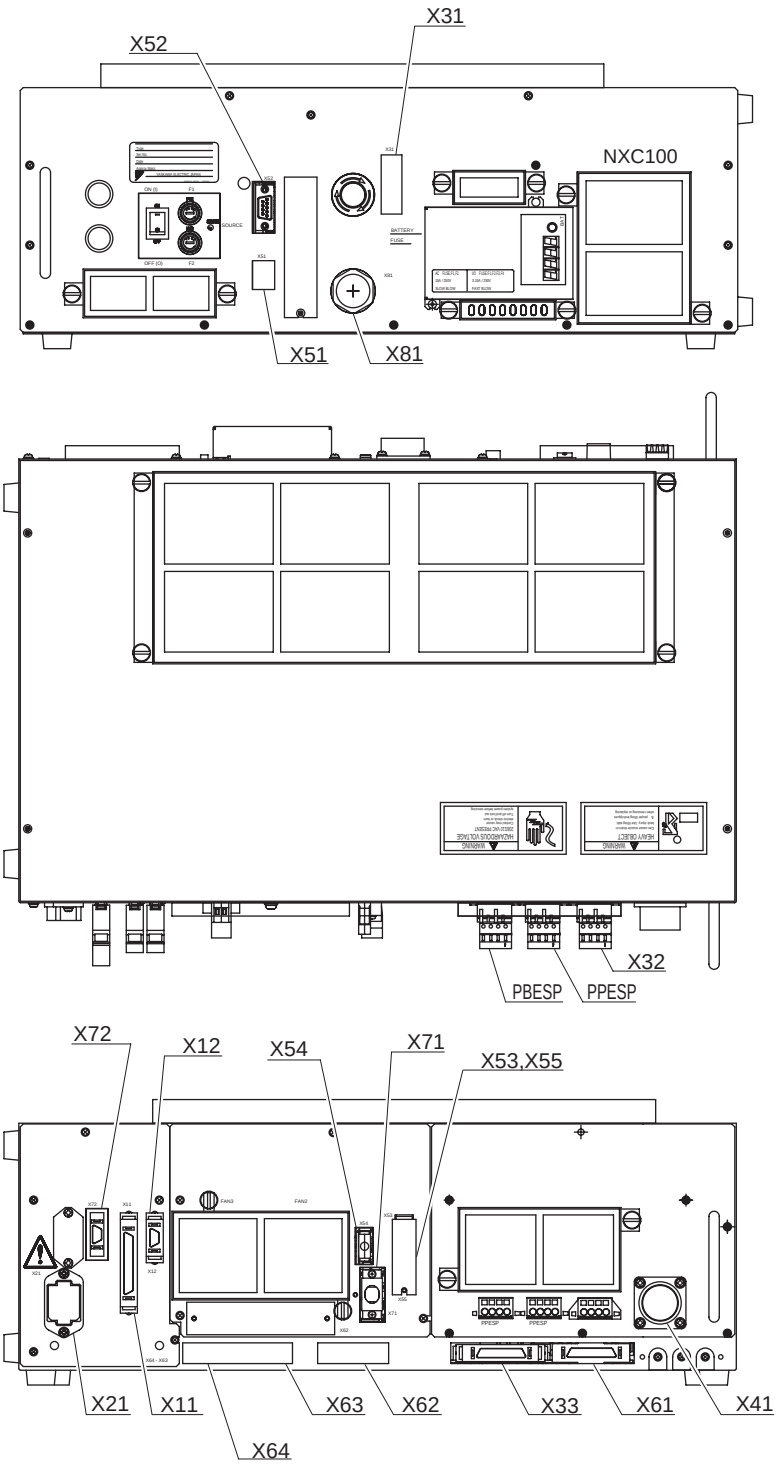


Fig. 3 NXC100 Connectors

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5.2 Pin Assignments

WARNING

- Do not remove/insert connectors when operating the equipment or turning ON the power supply.

  Failure to observe this instruction may result in electric shock, damage on the operation circuit, or the manipulator may become uncontrollable.

The followings show the connector pin assignments between the NXC100 and the host system.

Controller Front Panel

(1) X51 ETHERNET For maintenance PC connection
NXC100 Side Connector: RJ45 (Socket)
Cable Side Connector: RJ45 (Plug)

Pin No.	Signal Name	Contents
1	TX+	Data
2	TX-	Data
3	RX+	Data
4	N.C.	Connection Disabled
5	N.C.	Connection Disabled
6	RX-	Data
7	N.C.	Connection Disabled
8	N.C.	Connection Disabled

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

(2) X52 RS232C For host communication and maintenance PC connection
NXC100 Side Connector: DSUB 9 Pin (Pin)
Cable Side Connector: DSUB 9 Pin (Socket)

Pin No.	Signal Name	Contents
1	DCD	Connection Disabled
2	RXD	Data Receiving
3	TXD	Data Transmission
4	DTR	Connection Disabled
5	GND	Signal Ground
6	DSR	Connection Disabled
7	RTS	Request Transmission
8	CTS	Clear to Send
9	RI	Connection Disabled

Screw type fastening; applicable screw size: M2.6

Controller Rear Panel

(3) X41 INPUT AC For AC power supply input
NXC100 Side Connector: CE05-2A18-10PD-B (DDK)
Cable Side Connector: CE05-6A18-10SD-B-BSS

Pin No.	Signal Name	Contents
A	R	AC Input
B	T	AC Input
C	N.C.	Connection Disabled
D	PE	Protective Grounding

NOTE Customer must properly ground the PE line in the host system. The ground resistance must be 100 Ω or less.

(4) X33 DI/O For general-purpose digital I/O signal
NXC100 Side Connector: 10268-52A2JL (3M)
Cable Side Connector: 10168-6000EL (3M)
Cable Side Shell: 10368-3280-000-0 (3M)

Pin No.	Concurrent Assignment	Signal Name	Pin No.	Concurrent Assignment	Signal Name
1		+24VU	35		024VU
2	20010	EXTERNAL START A	36	20010	EXTERNAL START B
3	20011	MASTER JOB CALL A	37	20011	MASTER JOB CALL B

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Pin No.	Concurrent Assignment	Signal Name	Pin No.	Concurrent Assignment	Signal Name
4	20012	ALARM/ERROR RESET A	38	20012	ALARM/ERROR RESET B
5	20013	SELECT PLAY MODE A	39	20013	SERECT PLAY MODE B
6	20014	SELECT TEACH MODE A	40	20014	SELECT TEACH MODE B
7	20015	IN01A	41	20015	IN01B
8	20016	IN02A	42	20016	IN02B
9	20017	IN03A	43	20017	IN03B
10	20020	IN04A	44	20020	IN04B
11	20021	IN05A	45	20021	IN05B
12	20022	IN06A	46	20022	IN06B
13	20023	IN07A	47	20023	IN07B
14		+24VU	48		024VU
15		DOPCOM0	49		DONCOM0
16	30010	OPERATING	50	30011	SERVO ON
17	30012	TOP MASTER JOB	51	30013	ALARM/ERROR OCURRENCE
18		+24VU	52	30014	BATTERY ALARM
19		DOPCOM1	53		024VU
20	30015	REMOTE MODE SELECTING	54		DONCOM1
21	30017	TEACH MODE SELECTING	55	30016	PLAY MODE SELECTING
22	30021	OUT02	56	30020	OUT01
23		+24VU	57		024VU
24		DOPCOM2	58		DONCOM2
25	30022	OUT03	59	30023	OUT04
26	30024	OUT05	60	30025	OUT06
27		+24V2	61		G2
28		+24V2	62		G2
29		+24V2	63		G2
30		+24V2	64		G2
31		EX+24IN	65		EX024IN
32		EX+24IN	66		EX024IN
33		EX+24IN	67		EX024IN
34		EX+24IN	68		EX024IN

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

NOTE

- The signal names in the table are common in the general-purpose and handling application.
- The concurrent assignment Nos.: 20024 to 20037 and 30026 to 30037 are not available.
- If I/O board is additionally installed, the concurrent assignment Nos.: 20040 or more and

DIN

Item	Specification
Circuit Architecture	Input circuit based on AC input type photo-coupler isolation
Input Points	12
Input Voltage	24 V +/-20 %
Input Current	5 mA (max)
Common	DI0 - DI11 Common

DOUT

Item	Specification
Circuit Architecture	Open collector transistor output
Output Points	14
Output Voltage	24 V +/-20 %
Output Current	DO0 to DO13: 50 mA per contact Current source output
24 V Common	DO0 - DO4: 5 Points Common DO5 - DO9: 5 Points Common DO10 - DO13: 4 Points Common

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

(5) X61 SAFETY For interlock I/O signal
NXC100 Side Connector: 10250-52A2JL (3M)
Cable Side Connector: 10150-6000EL (3M)
Cable Side Shell: 10350-3280-000-0 (3M)

Pin No.	Signal Name	Pin No.	Signal Name	Function	Logic *1		Signal Direction	
					1	0	Host	NXC 100
1	SAFE1+	26	SAFE1-	The signal turns OFF the servo power if the door on the safe-guarding is opened. Connect the interlock signal of the safety plug or etc. which is installed in the door on the safeguarding. If the inter lock signal is input, the servo power will be turned OFF, and it becomes unable to be turned ON. In the teach mode, however, the signal is disabled.	Normal (Safeguard-ing closed)	Emergency Stop (Safeguard-ing open)	→	
2	SAFE2+	27	SAFE2-					
3	FORCE1+	28	FORCE1-	The signal is used for input of the switch which is installed in exter-nal operation device to turn OFF all the safety functions except hotline. [CAUTION] ① Use the "FORCE (forced release)" input signal with the signal circuit open. ② If the "FORCE" input signal is used by necessity, be sure to use a switch with a key for safety and the key has to be managed by a system administrator. ③ Handle the NXC100 with care for safety because the enable switch becomes disable while the "FORCE" signal is input.	Enable (Switch closed)	Normal (Switch open)	→	
4	FORCE2+	29	FORCE2-					
5	Not Used	30	Not Used	-	--	--	→	
6	Not Used	31	Not Used	-	--	--	--	
7	Not Used	32	Not Used					
8	FST1+	33	FST1-	The signal is used for input of the switch which is installed in exter-nal operation device to release the safety speed limit at test run in the teach mode.	Max. speed (Switch closed)	Safety speed select (Switch open)	→	
9	FST2+	34	FST2-					
10	SSP+	35	SSP-	The signal is used for input of the switch which is installed in exter-nal operation device to switch the safety speed between the safety speed1 (16%) and safety speed2 (2%).	Safety speed1 (16%) (Switch closed)	Safety speed2 (2%) (Switch open)	→	
11	EXSVON+	36	EXSVON-	The signal is used for input of the switch which is installed in exter-nal operation device to turn ON the servo power.	Servo ON (Switch closed)	Servo OFF (Switch open)	→	
12	EXHOLD+	37	EXHOLD-	The signal is used for input of the temporary stop switch which is installed in external operation device.	Hold (Switch closed)	Normal (Switch open)	→	

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5.2 Pin Assignments

Pin No.	Signal Name	Pin No.	Signal Name	Function	Logic *1		Signal Direction	
					1	0	Host	NXC 100
13	EXESP1+	38	EXESP1-	The signal is used for input of the emergency stop button which is installed in external operation device.	Normal (Switch closed)	Emergency stop (Switch open)	→	
14	EXESP2+	39	EXESP2-					
15	EXDSW11+	40	EXDSW11-	The signal is used for input of the enable switch which is operated by the second person when teaching is performed by two people.	Servo ON (Teach mode) (Switch closed)	Servo OFF (Teach mode) (Switch open)	→	
16	EXDSW12+	41	EXDSW12-					
17	RSV1+	42	RSV1-	Reserved input	--	--		
18	RSV2+	43	RSV2-	Reserved input	--	--		
19	CHKOUT+	44	CHKOUT-	Reserved for future use	--	--	←	
20	Not Used	--	--	--	--	--	--	
21	Not Used	--	--		--	--		
--	--	45	Not Used		--	--	--	
--	--	46	Not Used		--	--		
22	ONEN1+	47	ONEN1-	The signal is used for input of enable signal from external operation device.			→	
23	ONEN2+	48	ONEN2-					
24	(NC)	49	(NC)	Not connected	--	--		
25	(NC)	50	(NC)	Not connected	--	--		

1 1: Photo isolator ON, 0: Photo isolator OFF

(6) X32 RESET For RESET I/O signal

NXC100 Side Connector: 231-604/019-000 (WAGO)

Cable Side Connector: 231-104/026-000 (WAGO), delivered with the NXC100

Pin No.	Signal Name	Contents
1	R-IN	Reset input *1
2	R-IN com	Reset input common *1
3	R-OUT	Connection disabled (Outputs the RESET signal to the second controller.)
4	R-OUT com	Connection disabled (Outputs the RESET common signal to the second controller.)

1 Short-circuit between the pin No.1 and pin No.2 when the RESET input signal is not used.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

(7) PRESP Contact Point of Programming Pendant Emergency Stop Button

The signal outputs status of the emergency stop button on programming pendant.

NXC100 Side Connector: 721-604/019-000 (WAGO)

Cable Side Connector: 721-104/026-000 (WAGO), delivered with the NXC100

Pin No.	Signal Name	Contents
1	PRESP11	PP Emergency Stop 1
2	PRESP12	
3	PRESP21	PP Emergency Stop 2
4	PRESP22	

(8) PBESP Contact Point of Panel Emergency Stop Button

The signal outputs the status of the emergency stop button on the NXC100 panel.

NXC100 Side Connector: 721-604/019-000 (WAGO)

Cable Side Connector: 721-104/026-000 (WAGO), delivered with the NXC100

Pin No.	Signal Name	Contents
1	PBESP11	PB Emergency Stop 1
2	PBESP12	
3	PBESP21	PB Emergency Stop 2
4	PBESP22	

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5.3 Circuit Diagram for I/O Signals

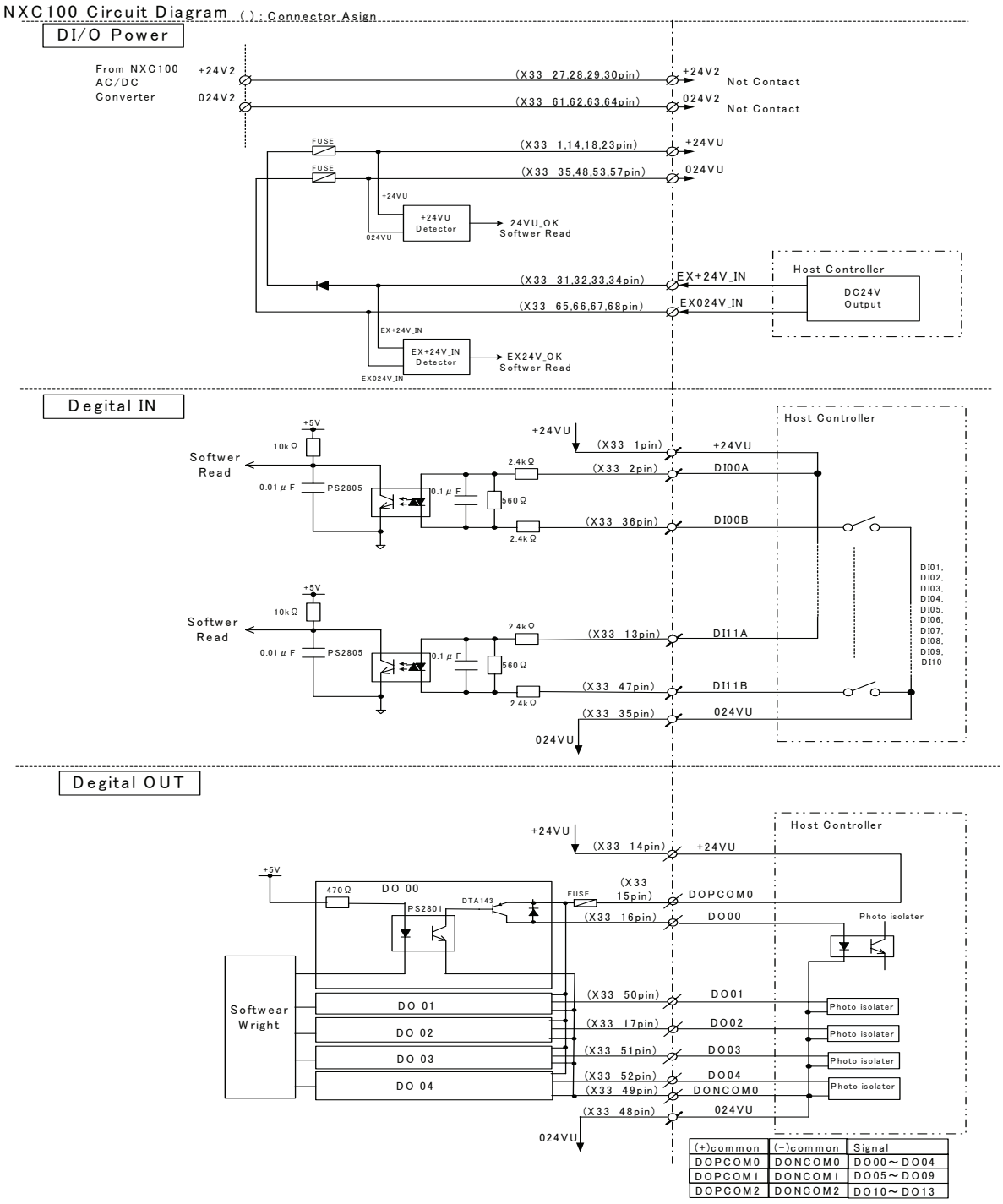
(1) X33 DI/O For general-purpose digital I/O signal

When the 24 VDC output of the NXC100 is used;

- Connect +24V2 to EX+24VIN.
- Connect 024V2 to EX024VIN.

When the 24 VDC input from the host controller is used;

- Connect 24 VDC to EX+24VIN.
- Connect 24 VDC to EX024VIN.



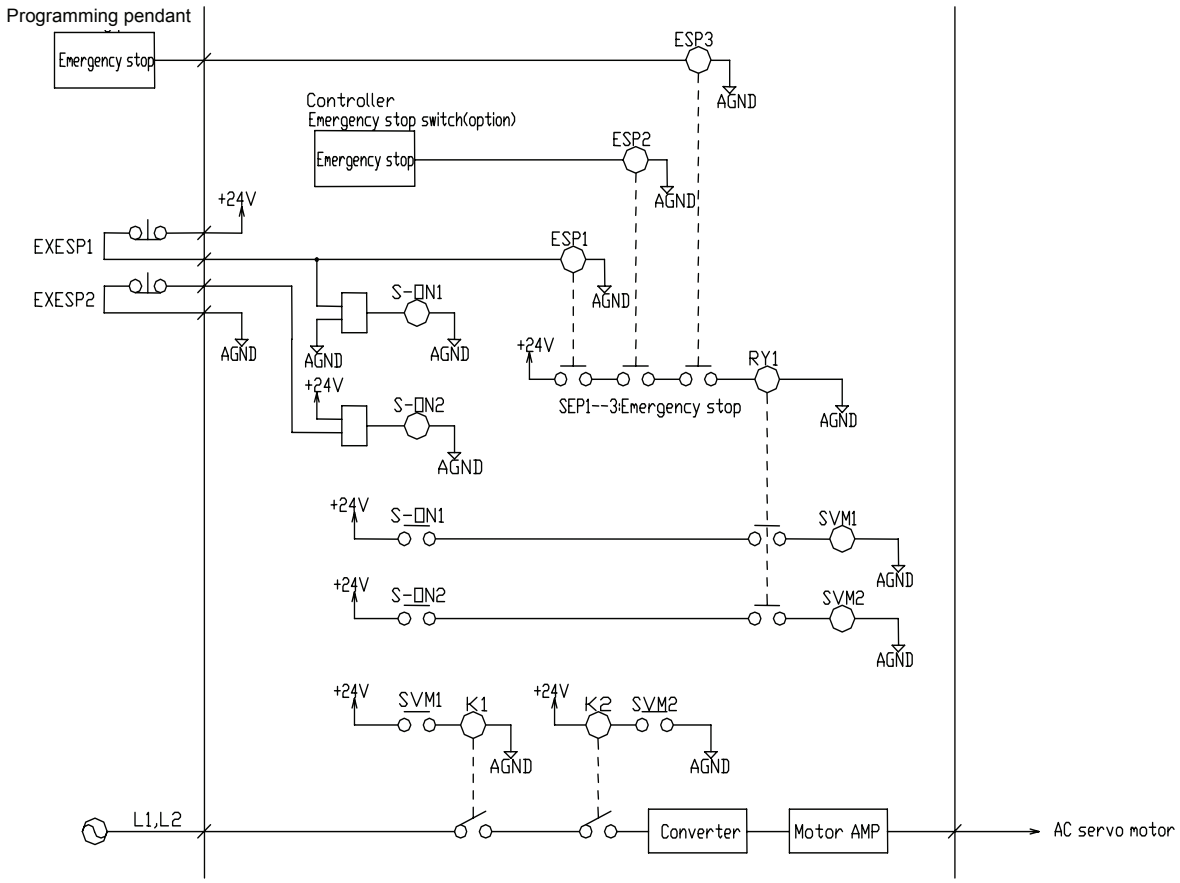
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

(2) X61 SAFETY For SAFETY I/O signal

a) Signal: EXESP;

The signal is used for hotline signal of emergency stop button.

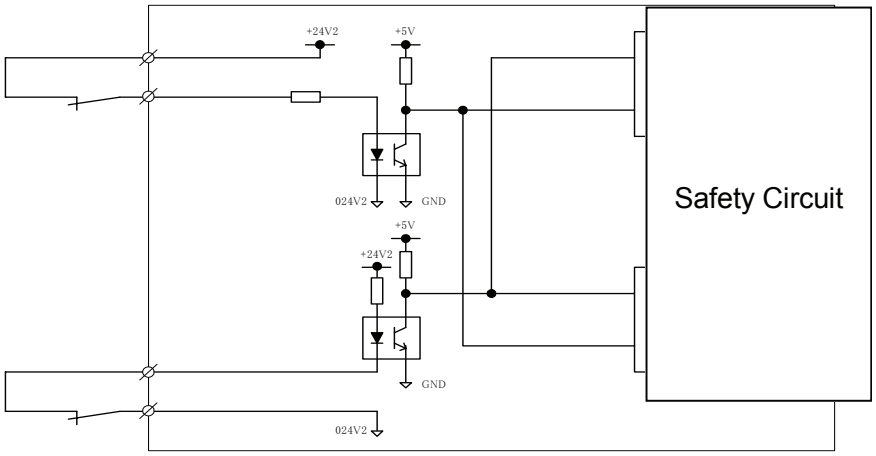
For safety reasons, use the switch with direct contact opening mechanism.



b) Signals: SAFE, FORCE, HSW, FST, EXDSW, ONEN

The signals are used for hotline signals for safety.

For safety reasons, use the switch with direct contact opening mechanism.



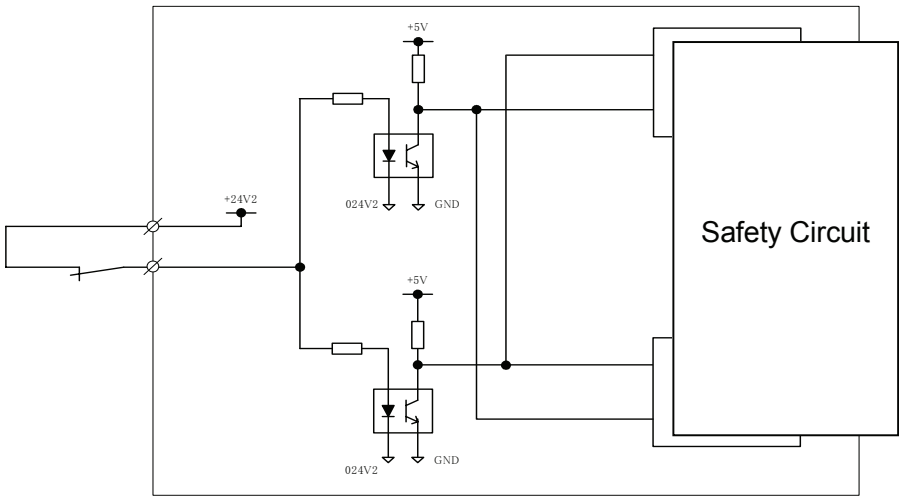
Input Circuit Block Diagram

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

C) Signals: EXSVON, EXHOLD

The signals are used for mode setting signals.

Input a contact signal.



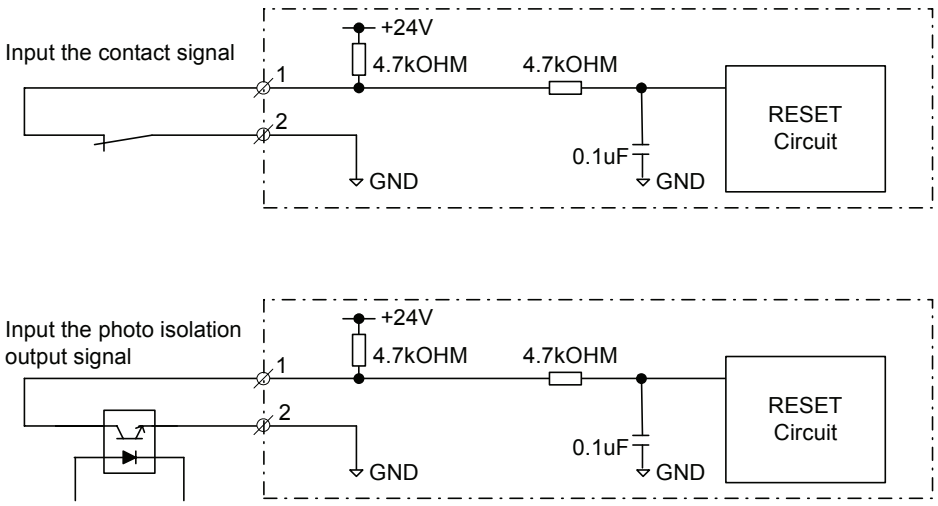
I/O Circuit Block Diagram

(3) X32 RESET For RESET I/O signals

The signal is used for the NXC100 reset signal.

Input a contact signal or photo isolation output signal.

Short-circuit between the pin No.1 and pin No.2 when the RESET input signal is not used.

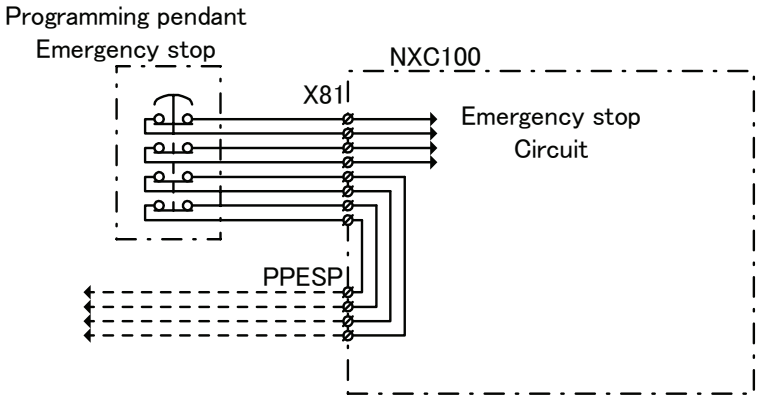


I/O Circuit Block Diagram

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

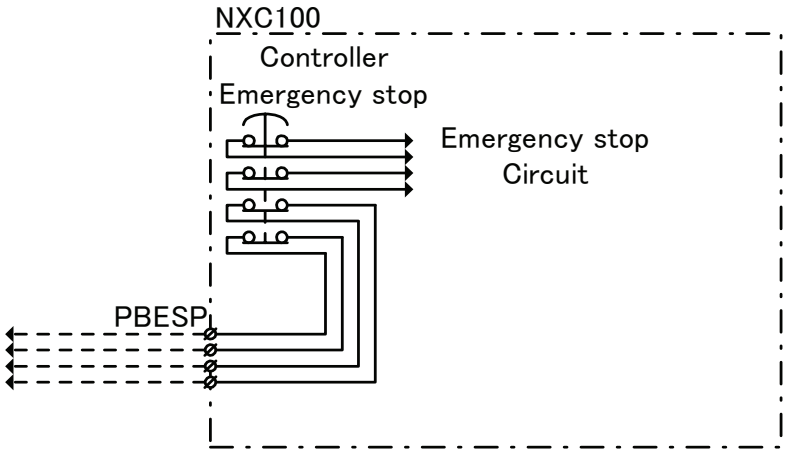
(4) PPESP

PPESP is the signal which indicates the state of the emergency stop button on the programming pendant.



(5) PBESP

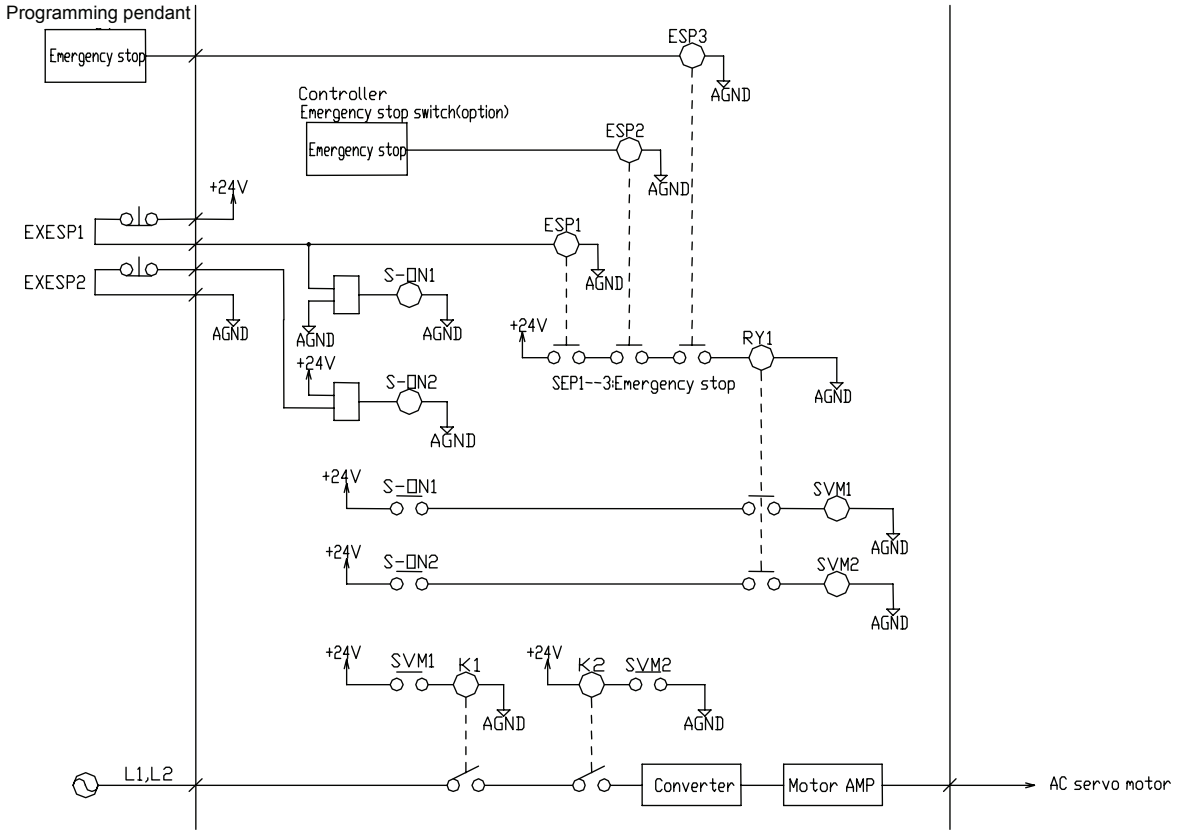
PBESP is the signal which indicates the state of the emergency stop button on the NXC100 panel.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5.4 Interlock Circuit

The NXC100 has "Interlock signals" connected to the conntector X61 on the NXC100.
The NXC100 has interlock circuit: "EXESP" for the hardware configuration. Together with "ALARM" circuit, this interlock circuit gives feedback on the operating status to the user software. When this interlock is activated, the servo motors for all axes decelerate to a stop and then the serv power is turned OFF (Servo OFF Status).



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5.5 Expansion of I/O Capacity

When the I/O capacity is expanded, the I/O signals are assigned as follows.
For expanding the I/O capacity, one board such as XOI01 board, XFB01 board, etc. can be used.

The board for I/O expansion is installed in the expansion I/O box (optional).

Concurrent Assignment	Signal Name (genelral-purpose)	Signal Name (handling)	Concurrent Assignment	Signal Name (genelral-purpose)	Signal Name (handling)
20040	IN09	IN09	30040	OUT09	OUT09
20041	IN10	IN10	30041	OUT10	OUT10
20042	IN11	IN11	30042	OUT11	OUT11
20043	IN12	IN12	30043	OUT12	OUT12
20044	IN13	IN13	30044	OUT13	OUT13
20045	IN14	IN14	30045	OUT14	OUT14
20046	IN15	IN15	30046	OUT15	OUT15
20047	IN16	IN16	30047	OUT16	OUT16
20050	IN17	IN17	30050	OUT17	OUT17
20051	IN18	IN18	30051	OUT18	OUT18
20052	IN19	IN19	30052	OUT19	OUT19
20053	IN20	IN20	30053	OUT20	OUT20
20054	IN21	IN21	30054	OUT21	OUT21
20055	IN22	IN22	30055	OUT22	OUT22
20056	IN23	IN23	30056	OUT23	OUT23
20057	IN24	IN24	30057	OUT24	OUT24
20060	IN25	IN25	30060	OUT25	OUT25
20061	IN26	IN26	30061	OUT26	OUT26
20062	IN27	IN27	30062	OUT27	OUT27
20063	IN28	IN28	30063	OUT28	OUT28
20064	IN29	IN29	30064	OUT29	OUT29
20065	IN30	IN30	30065	OUT30	OUT30
20066	IN31	Shock Sensor(NC)	30066	OUT31	OUT31
20067	IN32	Low Air Pressre	30067	OUT32	OUT32
20070	IN33	Sensor Input 1	30070	OUT33	Hand Valve 1-1
20071	IN34	Sensor Input 2	30071	OUT34	Hand Valve 1-2
20072	IN35	Sensor Input 3	30072	OUT35	Hand Valve 2-1
20073	IN36	Sensor Input 4	30073	OUT36	Hand Valve 2-2
20074	IN37	Sensor Input 5	30074	OUT37	Hand Valve 3-1
20075	IN38	Sensor Input 6	30075	OUT38	Hand Valve 3-2
20076	IN39	Sensor Input 7	30076	OUT39	Hand Valve 4-1
20077	IN40	Sensor Input 8	30077	OUT40	Hand Valve 4-2
20080	IN41	IN41	30080	OUT41	OUT41
20081	IN42	IN42	30081	OUT42	OUT42
⋮	⋮		⋮	⋮	

NOTE The signal names in the table are those of the general-purpose applications.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

6 Maintenance and Inspection

WARNING

- Before conducting maintenance, inspection or wiring, turn OFF all supplied power (including the compressed air) to the robotic system, lock the switch in the “OFF” position and put up a warning sign, such as “DO NOT TURN ON THE POWER.”
- The robotic system does not have the switches to turn OFF the power. Turn OFF the switch in the host system to which the robotic system is connected.

  Failure to observe this instruction may result in electric shock or injury.

CAUTION

- Maintenance and inspections must be performed by specified personnel.

  Failure to observe this instruction may result in electric shock or injury.

6.1 Inspection Schedule

Proper inspections are essential not only to assure that the mechanism will be able to function for a long period, but also to prevent malfunctions and assure safe operation.
The inspection intervals should be based on the power supply ON time.
Inspection intervals are displayed in three levels: weekly inspection, every 6-month inspection and after 5-year inspection (overhaul) by taking it as a standard that the NXC100 is used for 6,000 hours per year.
Weekly inspection and every 6-month inspection are essential mainly to assure safe operation and assure that the mechanism is able to function for a long period. These inspections can be conducted at the customer’s facilities (on-site inspections).
Conduct these on-site periodical inspections according to the inspection schedule in " 6.2 Inspection Items ".
In addition, YASKAWA recommends the complete check (including the items which cannot be done on-site) at YASKAWA as a preventive maintenance after 5 years (30,000 hours). In this case, for the best adjustment, YASKAWA recommends to check manipulator and the NXC100 as a set.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

6.2 Inspection Items

The inspection items are classified into three types of operations: the operation which can be performed by personnel authorized by the user, the operation which can be performed by personnel being trained and the operation which is performed by YASKAWA. Only specified personnel are to do the inspection work.

Table. 3 Inspection Items

Items*4		Schedule			Inspection Method	Operation	Inspection		
		Weekly	Every 3,000H 6 months	Every 30,000H After 5 years			Specified Person	Licensee	YASKAWA or Service Company
①	Cable	○	○		Visual	Check for damage and deterioration. Fix or replace as necessary.	○	○	
②	NXC100 exterior	○	○		Visual	Check for damage and outside cracks of each part.	○	○	
③	Air filter	○	○		Visual	Clean the air filter if dust is present. Check for damage. Fix or replace as necessary.	○	○	
④	Cable connection		○		Visual	Check for loose connections. Tighten loose screws as necessary.	○	○	
⑤	Cover screw		○		Wrench, Philips screwdriver	Check for loose screws. Tighten loose screws as necessary.	○	○	
⑥	Emergency stop button	○	○		Function check		○	○	
⑦	Safety interlock	○	○		Function check		○	○	

NOTE Perform inspections of the items 1 to 5 with the equipment fully de-energized.
Perform inspections of the items 6 and 7 with the equipment energized.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

7 Recommended Spare Parts

CAUTION

- Be sure to use Yaskawa's recommended parts for replacement.

  Product performance cannot be guaranteed when using spare parts from any company other than Yaskawa.

It is recommended that the following parts and components be kept in stock as spare parts for the NXC100. The spare parts list is shown in " Table. 4 Spare Parts for the NXC100 ".

The spare parts are ranked as follows:
[Ranks of Recommended Parts]

- Rank "A": Expendable and frequently replaced parts
- Rank "B": Parts for which replacement may be necessary as a result of frequent operation
- Rank "C": Drive unit

Table. 4 Spare Parts for the NXC100

Rank	Parts No.	Name	Type	Manufacturer	Qty	Qty per Unit	Remarks
C	1	Fan	HB0470220	Minebea Co., Ltd.	1	3	Fan type: 2406KL-05W-B59-L00 (Minebea)
C	2	Fan	HB0470221	Royal Electric Co., Ltd.	1	2	Fan type: S40E7R (Royal)
C	3	Fan		Minebea Co., Ltd.	3	1	Fan type: 4710PS-22T-B30-B00 (Minebea)
A	4	Fuse	SMP50, 5A	Daito Communication Apparatus Co., Ltd.	2	1	For brake unit
A	5	Fuse	2173.15	Littelfuse, Inc.	4	1	250 V 3.15 A For I/O
A	6	Fuse	314010	Littelfuse, Inc.	2	1	250 V 10 A For power supply
A	7	Fuse	213001	Littelfuse, Inc.	2	1	250 V 1 A For fan
A	8	Battery	ER6VC3N	Toshiba Battery Co., Ltd.	1	1	

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table. 4 Spare Parts for the NXC100

Rank	Parts No.	Name	Type	Manufacturer	Qty	Qty per Unit	Remarks
A	9	Air filter		Japan Vilene Company, Ltd.	7	7	Type: PS/150 (Japan Vilene) 340 mm × 130 mm × t8 mm 90 mm × 33 mm × t8 mm 40 mm × 23 mm × t8 mm 65 mm × 13 mm × t8 mm 77 mm × 103 mm × t8 mm 112 mm × 57 mm × t8 mm 120 mm × 60 mm × t8 mm One air filter for each size

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

NXC100
INSTRUCTIONS

HEAD OFFICE
2-1 Kurosaki-Shiroishi, Yahatanishi-ku, Kitakyusyu-shi, 806-0004, Japan
Phone 81-93-645-7745 Fax 81-93-645-7746

MOTOMAN INC. HEADQUARTERS
805 Liberty Lane West Carrollton, OH 45449, U.S.A.
Phone 1-937-847-6200 Fax 1-937-847-6277

YASKAWA MOTOMAN CANADA LTD.
3530 Laird Road, Unit 3, Mississauga, Ontario, L5L 5Z7, Canada
Phone 1-905-569-6686 Fax 1-905-813-5911

MOTOMAN ROBOTICS EUROPE AB
Franska Vagen 1039854, Kalmar, Sweden
Phone 46-480-417800 Fax 46-480-417999

MOTOMAN ROBOTEC GmbH
Kammerfeld strasse 1, DE-85391 Allershausen, Germany
Phone 49-8166-90100 Fax 49-8166-90103

YASKAWA ELECTRIC KOREA CORPORATION
1F Samyang Bldg. 89-1, Shinchun-dong, Donk-Ku, Daegu, Korea
Phone 82-53-745-7844 Fax 82-2-784-8495

YASKAWA ELECTRIC (SINGAPORE) PTE. LTD.
151 Lorong Chuan, #04-01, New Tech Park, Singapore 556741, Singapore
Phone 65-6282-3003 Fax 65-6289-3003

YASKAWA ELECTRIC (MALAYSIA) SDN. BHD.
No.71, Jalan Bandar Rawang 2, 48000 Rawang, Selangor D.E., Malaysia
Phone 60-3-6092-1377 Fax 60-3-6092-6377

YASKAWA ELECTRIC TAIWAN CORPORATION
9F, 16 Nanking E. Rd., Sec. 3, Taipei, Taiwan
Phone 886-2-2502-5003 Fax 886-2-2505-1280

SHOUGANG MOTOMAN ROBOT CO., LTD.
7,Yongchang-North Road, Beijing Economic & Technological Development Area, Beijing 100076, China
Phone 86-10-6788-0541 Fax 86-10-6788-2878

YASKAWA ELECTRIC CORPORATION

YASKAWA

Specifications are subject to change without notice
for ongoing product modifications and improvements.

© Printed in Japan August 2006 05-07

MANUAL NO.
HW0482738 ① 48/48

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP