JANOME DESKTOP ROBOT

JR2000N Series

Operation Manual

Maintenance

(For Maintenance Operators)

Maintenance operators are persons who have received maintenance training at Janome or at a representative branch. People responsible for maintenance work should complete this training.

Thank you for purchasing this Janome Robot.

- **Before using your robot, read this manual thoroughly and always make sure you use the robot correctly. In particular, be sure to thoroughly read "For Your Safety" as it contains important safety information.**

- **After reading this manual, store in a safe place that can be easily accessed at any time by the operator.**

- **This manual is written according to IEC 62079.**

JANOME

PREFACE

The Janome Desktop Robot JR2000N Series are new low-cost, high-performance robots. With these robots we succeeded in reducing the price while maintaining functionality. The combined use of stepping motors and specialized micro step driving circuits saves both energy and installation space. There are several manuals pertaining to these robots.

Setup	Explains how to set up the robot. ■ Make sure you read this manual ■ NOTE: This manual is designed for people who have received safety and installation training regarding the robot.
Maintenance	Explains maintenance procedures for the robot. ■ Make sure you read this manual ■ NOTE: This manual is designed for people who have received safety and maintenance training regarding the robot.
Basic Instructions	Provides part names, data configurations, and the basic knowledge necessary to operate the robot.
Quick Start	Explains the actual operation of the robot by creating and running simple programs.
Teaching Pendant Operation	Explains how to operate the robot via the teaching pendant.
PC Operation	Explains how to use the PC software, JR C-Points.
Functions I	Explains point teaching.
Functions II	Explains commands, variables, and functions.
Functions III	Explains functions such as Run Mode parameters and sequencer programs.
Functions IV	Explains functions in Customizing Mode.
External Control I (I/O-SYS)	Explains I/O-SYS communication control.
External Control II (COM Communication)	Explains COM1 – COM3 communication control.
Camera/Sensor	Explains the functions of the attachable camera and Z position sensor.
Specifications	Outlines general specifications such as the robot's operating range, weight, etc.
Application Specifications	Explains the specialized functions of the various application specifications.

Note: Product specifications are regularly updated; therefore the content of this manual may differ from the robot in your possession. Additionally, the menu items displayed on the TP and PC may vary from those listed in this manual.

The descriptions within this manual are based on standard specifications. The menu item names etc. may vary depending on the model type.

Attention

To make full use of the machine's functions and capabilities, make sure that you use the robot according to the correct handling/operation procedures that are written in this manual. Do not handle or operate the robot in ways not covered in this manual.

Attention

If you turn OFF the power after making changes to robot's settings or data without saving, these changes are lost and the robot will revert to its original settings. Make sure that you save any changes to data and/or settings.

Warning

Make sure that the **machine is grounded and do not use the machine if it is not grounded**. Make sure that the **ground resistance of the robot power supply is 100Ω or less**.
Using the machine without sufficient grounding can cause electric shock, fire, accidental operation and machine breakdown.

Warning

Make sure that the machine power supply is OFF before connecting the power cord.
Failure to do so could cause electric shock and/or injury.

Note: The operation methods described in this manual are indicated as follows:

TP Operation via the teaching pendant

PC Operation via PC (JR C-Points)

RESPONSE TO EC/EU DIRECTIVES

This robot is a semi-finished product, and includes a declaration to the EC/EU directives.
Janome implements its conformity testing through a third certification authority for each of the EMC, LVD, MD directives.
The applicable requirements of the MD and EMC Directives vary depending on the machine settings and systems. We conduct general confirmation tests through a model setup. Conduct your own final confirmation tests and risk assessments of your machine and its setup and make sure that it conforms to the MD and EMC Directives.

CONTENTS

FOR YOUR SAFETY

The safety notes outlined below are provided in order to ensure safe and correct usage of the product in addition to preventing injury to the operator, other people and damage to property as well.

・・・・・Be sure to follow the safety guidelines detailed here・・・・・

Symbols are also listed alongside the safety note explanations. Refer to the list below for an explanation of these symbols.

Symbols that indicate the level of danger and/or damage.
The level of danger or damage that could occur as a result of ignoring these safety guidelines and misusing the robot are classified by the following symbols.

Danger	This symbol indicates an imminent risk of serious injury or death.
Warning	This symbol indicates a risk of serious injury or death.
Caution	This symbol indicates the possibility of serious injury or damage to property.

The following symbols list the nature of the danger and any necessary safety methods to be taken.

	Indicates caution must be taken
	Take Caution (General Precaution)
	Indicates a forbidden action
	Never do this (General Prohibition)
	Do not disassemble, modify or repair.
	Do not touch (Contact Prohibition)
	Indicates a required action
	Be sure to follow instructions (General Requirement)
	Be sure to unplug the power cord
	Make sure the machine is grounded

FOR YOUR SAFETY

Danger	
	**Do not use where flammable or corrosive gas is present.** Leaked gas accumulating around the unit can cause fire or an explosion.

Warning	
	**Make sure that you securely install the unit in a place that can withstand both the mass of the machine and the usage conditions.** In addition, **for units with a cooling fan on the back, allow for 30cm or more clearance between the back of the unit and the wall.** If installation is inadequate, the unit may drop or fall over causing injury and/or unit breakdown.
	**Make sure to power the unit within its rated current range.** Failure to do so may cause electric shock, fire, or unit malfunction.
	**Plug the power cord into the power outlet firmly.** Failure to do so may cause the plug to heat up and may result in fire.
	**Be sure to use the unit within its indicated voltage range.** Failure to do so may cause fire or unit malfunction.
	**When inspecting or lubricating the unit, unplug the power cord from the power outlet, then remove the cord from the main unit and make sure there is no electrical current.** Also, **do not touch any of the power inlet pins within 5 seconds of removing the power cord.** Failure to follow these steps causes electric shock or injury.

FOR YOUR SAFETY

Warning	
	Always **make sure the unit is grounded to avoid possible electrical shocks. Do not use when the unit is not grounded.** Improper grounding may cause electric shock or fire.
	**Wipe the power plug with a clean, dry cloth periodically to eliminate dust.** Dust accumulation may deteriorate the electrical insulation and cause fire.
	**Be sure to unplug the power cord from the power outlet when the unit is not in use for long periods of time.** Dust accumulation may cause fire.
	**Be sure to turn OFF the unit before inserting or removing cords and cables such as the teaching pendant cable.** Failure to do so may result in electric shock, fire, data loss, or unit malfunction.
	**Do not attempt to disassemble or modify the unit.** Disassembly or modification may cause electric shocks or unit malfunction.
	**Do not allow water or oil to come in contact with the unit, control box or the power cord.** Contact with water or oil may cause electric shock, fire, or unit malfunction. IP Protection Rating: IP30 (CE specifications : IP40)
	**If anything unusual occurs, such as a burning smell or unusual sound, stop operation and unplug the power cord immediately. Contact the dealer from whom you purchased the robot or the office listed on the last page of this manual.** Continuing to use the robot without addressing the problem may cause electric shock, fire, or unit breakdown.

FOR YOUR SAFETY

Caution	
	**Do not drop or jar the unit during transport and/or installation.** This could cause injuries or damage the unit.
	**Before performing any operation, ensure there is no imminent danger to any of the operators**. Failure to do so may result in injury.
	**Use the unit in an environment between 0 and 40°C, with a humidity level of 20 – 90%, and without condensation.** Use outside of these conditions may result in unit malfunction or breakdown. IP Protection Rating: IP30 (CE specifications: IP40)
	**Use the unit in an environment where no electrical noise is present.** Failure to do so may result in unit malfunction or breakdown.
	**For models with I/O-S circuits, when installing the unit, take safety measures such as setting up area sensors and an enclosure.** If there are no safety measures in place and someone enters the area of operation when the robot is running, they may be injured.
	**Keep the emergency stop switch within reach of the operator when running or operating the robot.** If the robot is operated when the emergency switch is not within reach, it may not be possible to stop the robot immediately and safely. This is potentially dangerous.
	**Make sure that you regularly perform a function check for the emergency stop switch. Also, for models with I/O-S circuits, regularly perform an I/O-S circuit function check.** If you perform work without making a circuit check, you or the operator will not be able to immediately and safely stop the robot in an emergency. This is potentially dangerous.

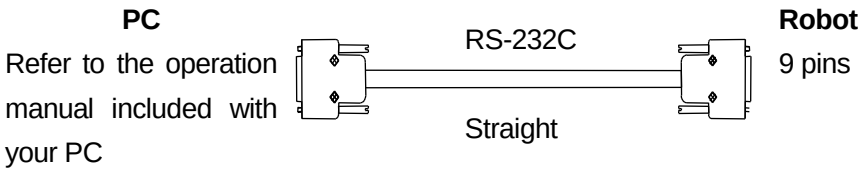
FOR YOUR SAFETY

Caution	
	**When attaching tools make sure they are securely fitted before running the robot.** Failure to do so causes injury or breakdown.
	**When using the machine for extended periods of time, check and make sure none of the main unit's mounting screws are loose, and perform a routine inspection every 3 months.** Failure to do so causes injury or breakdown.
	**Be sure to check the connections of the cords and cables to the main unit.** Improper wiring may result in unit malfunction or breakdown.
	**Be sure to secure the movable parts of the unit before transportation.** Failure to do so may result in injury or breakdown.
	**When lifting and transporting the robot, do so with 2 or more people.** Failure to do so causes injury or breakdown.
	**Use the unit in an environment that is not exposed to direct sunlight.** Direct sunlight may cause unit malfunction or breakdown.
	Individual Configuration Information varies for each individual unit even if they are the same model. **Do not use backup data with a different robot. The robot cannot function normally with backup data from a different robot.**

1. CONNECTING TO A PC

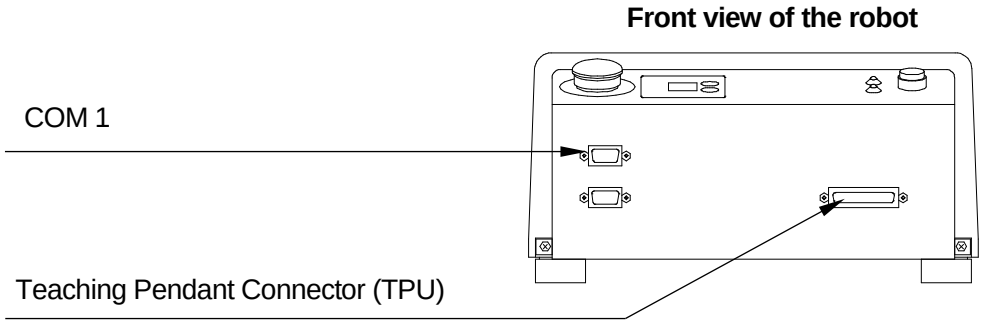
To back up the robot's C&T data and to upgrade the robot's system software, make sure the robot and PC are able to interface and connect the robot to the PC.
To connect, an RS-232C Straight Cable is required as shown below.

Note: The wiring diagram for the interfacing cable for COM connections (RS-232C) is on the next page.



Attention Make sure the power to both the robot and the PC are OFF before attaching or removing the cable. Failure to do so can cause malfunction.

Insert one of the two ends of the above RS-232C cable into the COM 1 connector on the robot and other into the COM port on the PC (serial connector/RS-232C).



NOTE
If you are using JR C-Points (optional) to operate the robot from the PC, remove the teaching pendant. (If you are using a teaching pendant with an enable switch or emergency stop switch, connect a grip switch (optional) to the teaching pendant connector.

■ Interfacing cable wiring diagram (for COM: RS-232C)

The connector on the robot's side is a 9 pin, D-SUB connector.

For the COM (RS-232C port) use a straight cable. Reverse type or cross type cables cannot be used.

■ 9 pin D-SUB connector on the host (PC) side

COM1 (RS232C port)

	Robot			Host (PC)	
Pin No.	Terminal	Function		Pin No.	Terminal	Function
3	R x D	Receive data	←	3	T x D	Transmit data
2	T x D	Transmit data	→	2	R x D	Receive data
8	RTS	Request to send	→	8	CTS	Clear to send
7	CTS	Clear to send	←	7	RTS	Request to send
5	GND	Ground	—	5	GND	Ground
Connector: D-SUB, 9 pins				Connector: D-SUB, 9 pins		

■ 25 pin D-SUB connector on the host (PC) side

COM1 (RS232C port)

	Robot			Host (PC)	
Pin No.	Terminal	Function		Pin No.	Terminal	Function
3	R x D	Receive data	←	2	R x D	Transmit data
2	T x D	Transmit data	→	3	CTS	Receive data
8	RTS	Request to send	→	5	RTS	Clear to send
7	CTS	Clear to send	←	4	GND	Request to send
5	GND	Ground	—	7	T x D	Ground
Connector: D-SUB, 9 pins				Connector: D-SUB, 25 pins		

Use cables which are suitable for any of the PCs you are using.

Normally a D-SUB, 9 pin is connected to the serial port mark "|O|O|" on the back of the PC.

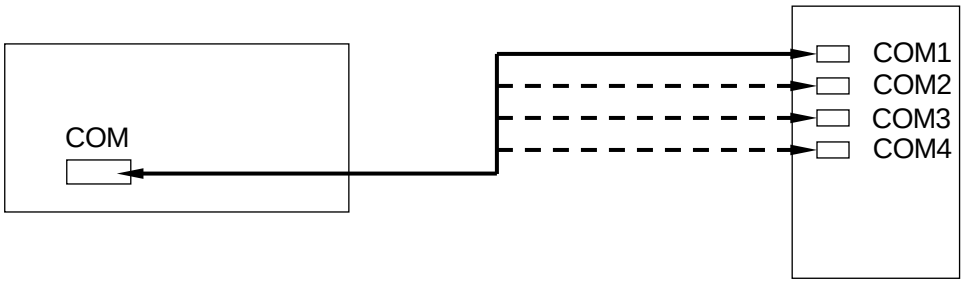
■ COM Settings

To get the robot and PC to interface, select the COM port on the PC side, and make sure that the parameters on both the robot side and PC side match.
(You can't confirm or set the robot communication parameters from the PC).
For further information refer to the next page and install and startup JR C-Points Limited Edition (included on the Operational Manual CD)

PC

PC [Robot] → [COM Status]

Startup JR C-Points Limited Edition and after selecting [Robot] from the menu bar, select [Port Settings] from the pull down menu.
Confirmation and settings made here are settings for the PC.
The "Port" setting is the COM port number on the PC side used to connect to the robot. Select the COM port number on the PC side.



Robot

TP MODE [Administration]
[Administration Settings Mode]
[COM Setting]
[COM 1 Communication Setting]

Push the MODE key and switch to Administration. Follow the procedure above and select [COM 1 Communication Setting]. Confirm/set each communication parameter so they match up with the settings on the PC side.

In the JR C-Points Limited Edition menu bar select [Robot] and from the pull down menu bar click [System Information]. If the information is displayed, the connection is complete.

NOTE
The JR C-Points PC software (optional) can do this same operation.

■ JR C-Points Limited Edition requirements

To operate JR C-Points Limited Edition (included in the operation manual CD), the following are necessary:

Computer	A PC capable of running Windows® 2000/XP
Memory capacity	32MB or more
OS	Microsoft Windows®2000/XP
Hard disk capacity	20 MB or more free disk space after installing Windows® 2000/XP
COM Port (serial port)	One free COM port for connecting to the robot Connect the COM 1 port on the robot side to the PC COM port using an RS-232C straight cable.

The required memory capacity and hard disk capacity can vary depending on the PC's system requirements.

Also, be careful when using the PC because if there is not enough free hard disk space, it can result in insufficient memory during operation or other such problems.

■ How to install JR C-Points Limited Edition (included on the operation manual CD)

1. Startup Windows® and confirm it is operating properly. Also, close down any other open applications.
2. Insert the operation manual CD into the CD-ROM drive. In the [JCP*E***L] folder (* = specifications, *** = version number) double click [¥SETUP.EXE]. The installer will startup.
3. Follow the instructions on the screen and proceed with the installation.

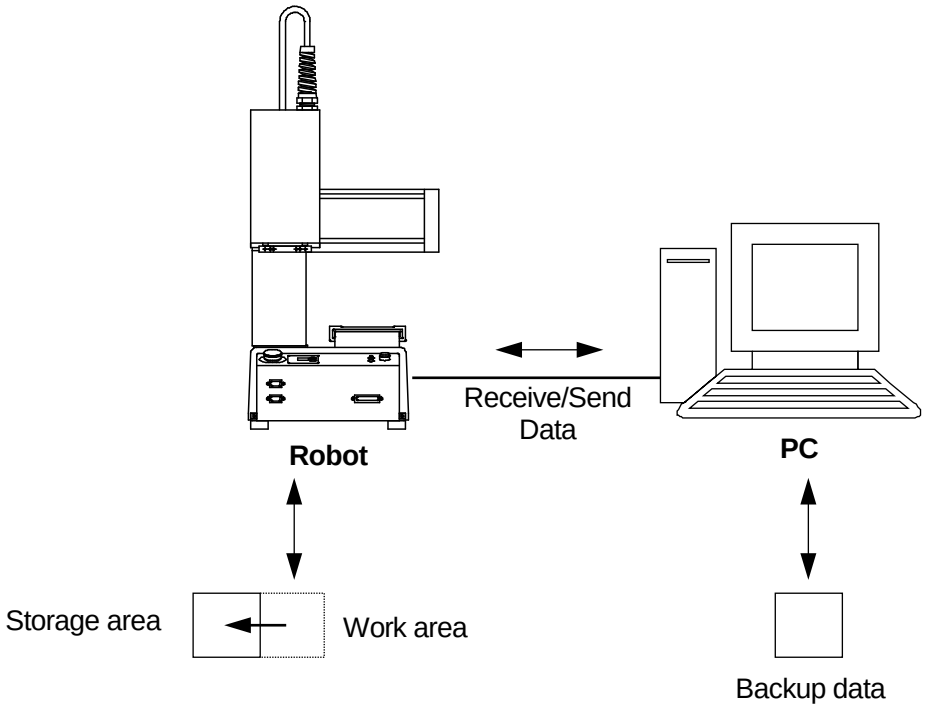
NOTE

If the installer is started up when the software is already installed, it will begin the uninstallation process. To uninstall JR C-Points Limited Edition follow the same procedure as above to startup the uninstaller.

2. BACKING UP C & T DATA

Always remember to back up data in case of contingencies.
To create backup data, startup JR C-Points Limited Edition on the PC and receive data from the robot, then save the received data as a file.
The data sent and received between the robot and the PC is teaching data and customizing data, sent as one unit (C & T data).

NOTE
To create backup data, the robot and PC must be connected. Refer to the section “1. Connecting to the PC” and make sure the robot and PC are able to interface.



The robot has a data storage area and a work area. When you start the robot, the C & T data in the storage area is copied to the work area. The copied data is used to operate the robot, and teaching. The data in the work area is deleted when the power to the robot is turned OFF.
When receiving data from the robot, (the PC) receives work area data. After sending data from the PC to the robot, the sent data is automatically written to the storage area via the work area.

NOTE
If you are using JR C-Points software (optional), you can also back up the data by selecting [Receive C&T Data] from the [Robot] pull-down menu.

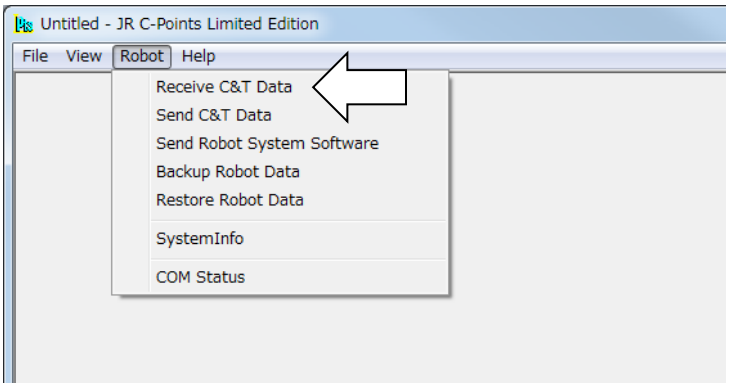
Have the robot doing one of the following:

Switch Run Mode: Waiting for run start (Wait Start Point)

External Run Mode: Waiting for run start (Wait Start Point)

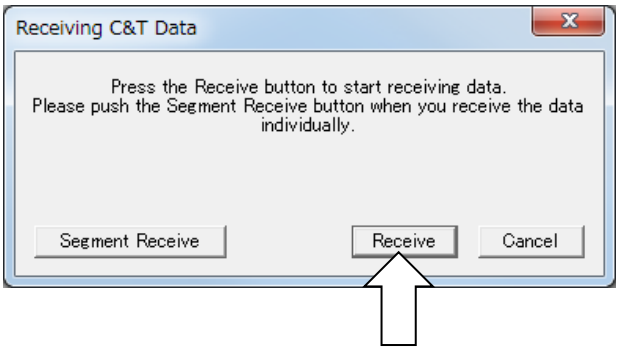
Teaching Mode: Point value setting screen

Startup JR C-Points Limited Edition, and from the [Robot] pull down menu select [Receive C & T Data].



To create a backup file, click the [Receive] button. The C&T data transfer begins.

Once the transfer of C&T data is complete, [The C&T Data was Received Successfully] message appears on the screen.
Note that the C & T data is not displayed on the screen.



Save the file by selecting [Save as] from the [File] pull down menu.

If you send a backup file to the robot using [Send C&T Data], the robot will revert back to the received data.

Click [Segment Receive] to select and receive a specific program or customizing data etc. For example, when the backup file is open, select just one program with [Segment Receive] and only that received program is updated.

With [Segment Receive], you can update the robot's C & T data for only a specific program, etc.

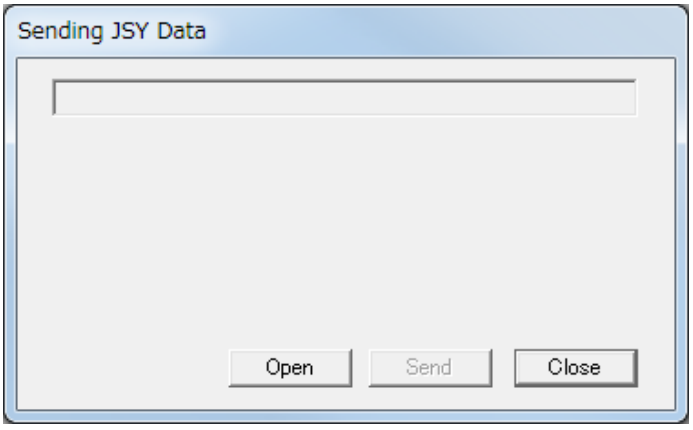
3. DOWNLOADING THE ROBOT SYSTEM SOFTWARE

This robot is controlled by built-in robot system software. To update the robot system software, follow the instructions below. (The robot system software version number can be confirmed through the version information display (11. Checking Version Information)).

The robot system software is included on the operation manual CD-ROM under the following file name:

JRN_+++_****.jsy ("+++" varies according to specifications. "****" indicates the version number.)

1. Turn OFF the robot and remove the panel cover on the left side of the robot to slide the special mode switch to ON.
2. Turn ON the robot again, and startup JR C-Points Limited Edition on the PC.
3. In the menu bar select [Robot] and then click [Send Robot System Software] from the pull down menu. The dialog below is displayed:



4. Click [Open], select the robot system software to download and click [Send].
5. After transmission, turn OFF the robot and slide the special mode switch back to OFF, then reattach the panel cover to the side of the robot.

NOTE

- To perform this operation, the robot and PC must be connected. Refer to "1. Connecting to the PC" and make sure the robot and PC can interface.
- If you are using JR C-Points software (optional), the robot system software can also be upgraded by selecting [Send Robot System Software] from the [Robot] pull-down menu.
  Additionally, JSYROADE (in the operational manual CD) can do this same operation.

4. PERIODICAL INSPECTION

Below is a table of inspections for the robot. Add any inspections of surrounding devices, jigs etc, based on your own judgment.

NOTE

Periodical inspections should be performed within the allocated number of months elapsed or hours of use; whichever comes first.

			Period of Inspection		
Inspection Item	Inspection Method	Power Supply Status During Inspection	Daily (Before Operation/Run)	Every 3 Months / Every 750 Hours	Every 6 Months / Every 1500 Hours
Any damage to cables; not loose or disconnected.	Visual check	OFF	O		
Teaching pendant display and PC communication.	Visual check	ON	O		
Emergency stop switch	Push the emergency switch	ON	O		
I/O-S circuit function	Test operation of safety device connected to I/O-S (If using a light curtain, test by obstructing the light etc.)	ON	O		
Rotation of cooling fan	Visual check	ON	O		
Abnormal vibration, sound, and odor	Visual, auditory and olfactory check	ON	O		
Screws of the jig mounting parts	Check the tightening torque using a torque wrench.	OFF		O	
Lubrication	Grease the parts	OFF			O

Caution

Perform daily and periodic inspections and check to make sure there are no abnormalities with the unit or the surrounding devices. Additionally, keep records of the inspections and store them for 3 years or more so that the details can be referred to during the .next inspection.

5. PERODICAL INSPECTION SHEET

Copy this page and use it to write in the dates the inspections were performed. Additionally, store these records for at least three years.

Routine inspections should be performed within the allocated months or hours of use; whichever comes first.

			Period of Inspection		
Item of Inspection	Method	Power Status During Inspection	Daily (Before Operation/Run)	Every 3 Months Every 750 Hours	Every 6 Months Every 1500 Hours
Damage to cables; not loose or disconnected.	Visual check	OFF			
Teaching pendant display and PC communication.	Visual check	ON			
Emergency stop switch	Push the emergency switch	ON			
I/O-S circuit function	Test operation of safety device connected to I/O-S (If using a light curtain, test by obstructing the light etc.)	ON			
Rotation of cooling fan	Visual check	ON			
Abnormal vibration, sound, and odor	Visual, auditory and olfactory check	ON			
Screws of the jig mounting parts	Check the tightening torque using a torque wrench.	OFF			
Lubrication	Grease the parts	OFF			

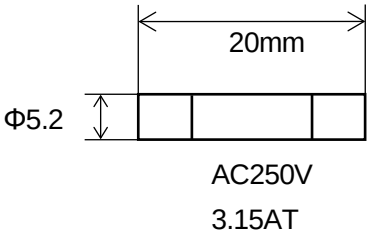
6. EXCHANGING FUSES (JR2300N – JR2600N)

Warning

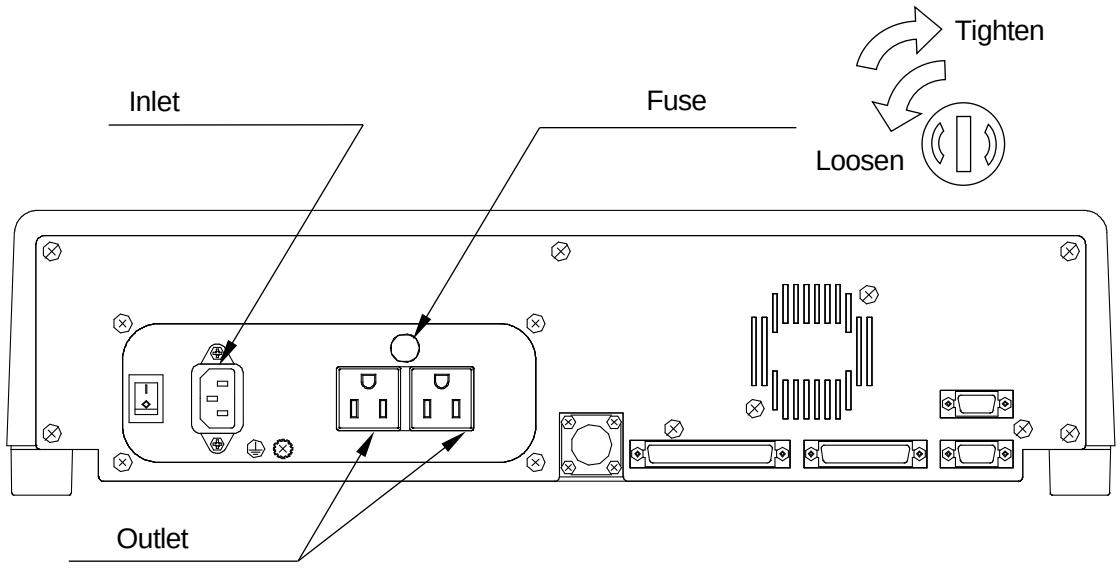
When replacing a fuse, **unplug the power cord from the wall outlet, remove it from the main unit and make sure there is no electricity flowing to the robot.** Also, do not touch any of the power inlet pins within 5 seconds of removing the power cord.
Failure to do so may cause electric shock or injury.

On the back of the main units of the JR2300 – JR2600N models are two outlets (service power) with a total connective capacity of 3A. If a current higher than 3A is connected, the fuse will blow and power can no longer be supplied from the outlets. (There are no outlets on the JR2200N)
In the case above, make sure the device connected to the outlet is using a current within 3A and replace the blown fuse.

Use a fuse with the same specifications as the diagram to the right.
Product number: 000143992 (SOC Co. LTD., ET3.15A equivalent)



Turn the power to the robot OFF, and remove the cord from both the power outlet and from the robot.
Use a flathead screwdriver to turn the fuse cover counterclockwise. Remove the fuse holder.
Take out the fuse from the fuse holder and replace it with a new fuse.
Put the fuse holder with the new fuse in it back into the robot, and turn it clockwise to secure it.



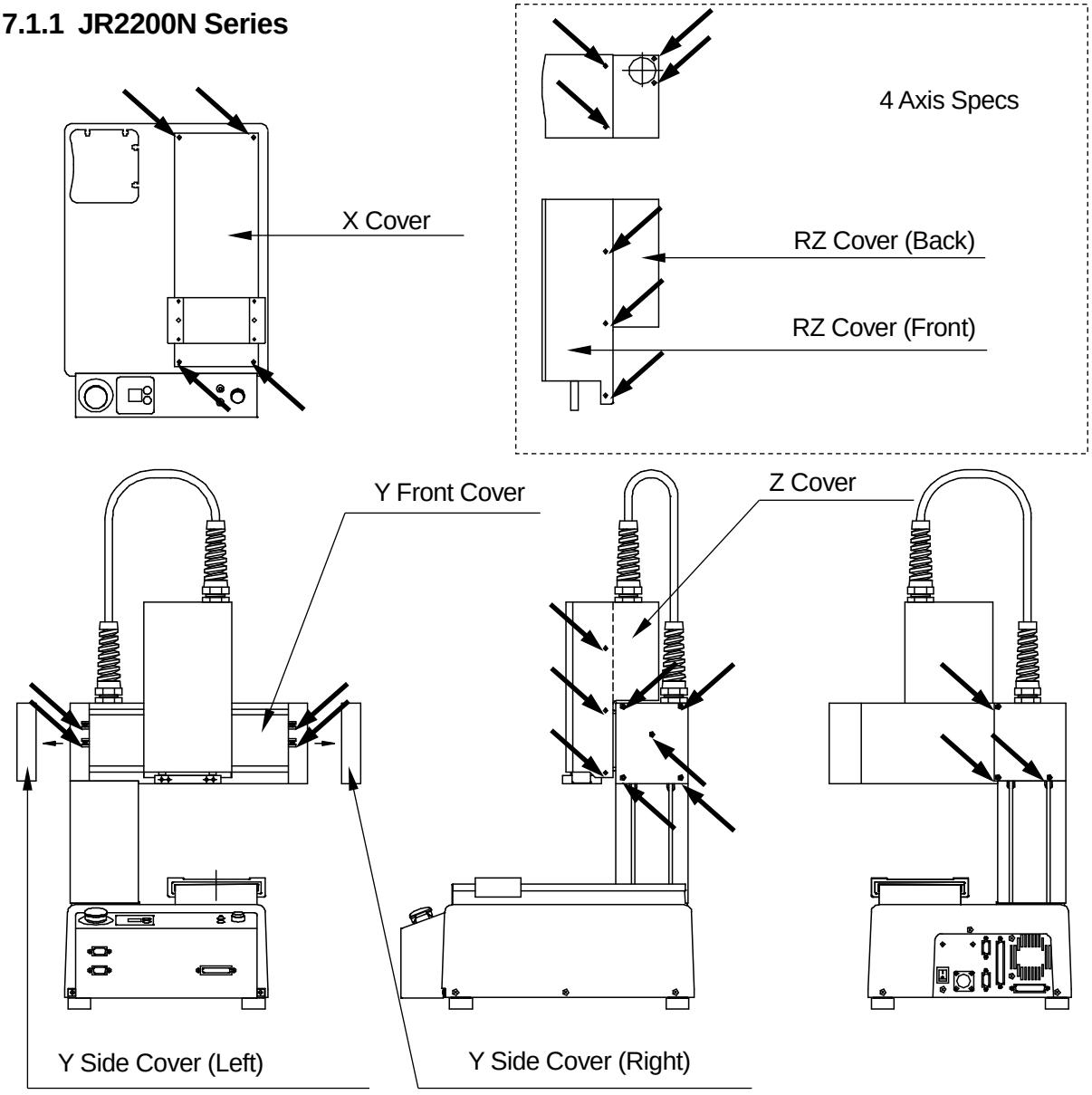
7. LUBRICATION

7.1 Screws You Need to Remove for Lubrication (the thick arrows)

Caution

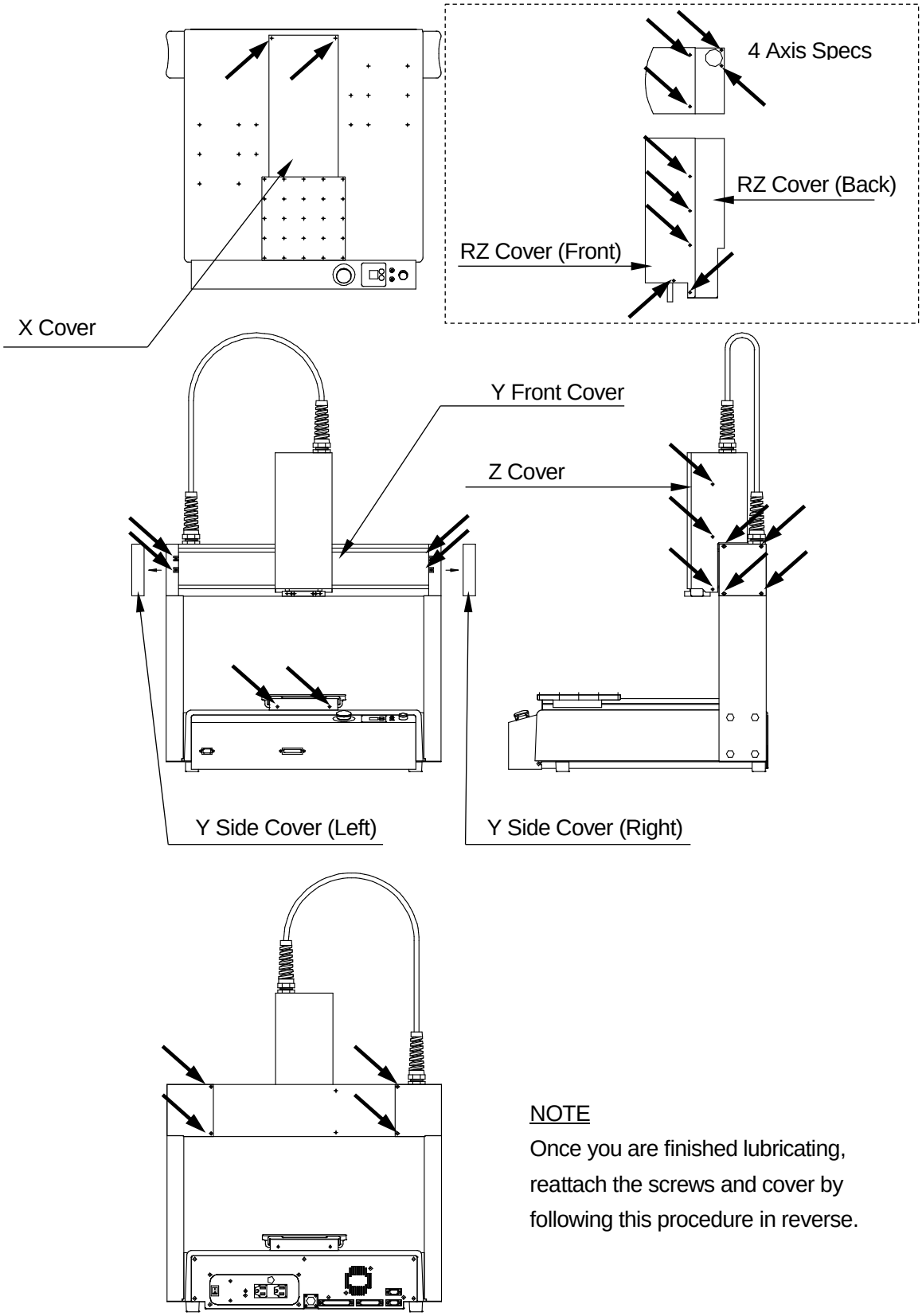
When removing covers and screws, unplug the power cord from the wall outlet, remove it from the main unit and make sure there is no electricity flowing to the robot. Also, do not touch any of the power inlet pins within 5 seconds of removing the power cord. Failure to do so may cause electric shock or injury.

7.1.1 JR2200N Series



NOTE: Once you are finished lubricating, reattach the screws and cover by following this procedure in reverse.

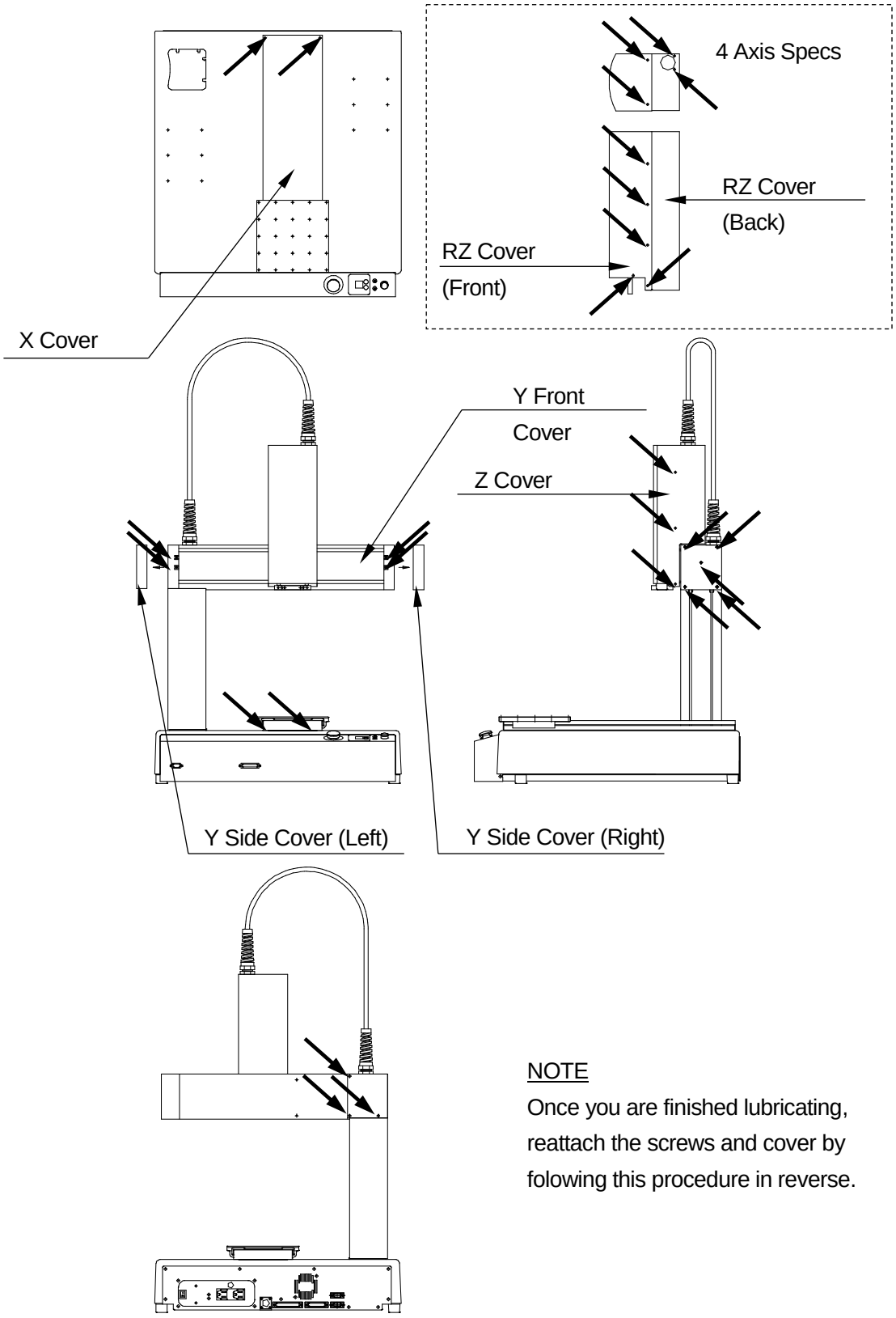
7.1.2 JR2300N Series



NOTE

Once you are finished lubricating, reattach the screws and cover by following this procedure in reverse.

7.1.3 JR2400N – JR2600N Series



NOTE

Once you are finished lubricating, reattach the screws and cover by folowing this procedure in reverse.

7.2 Lubrication

Attention

For smooth operation and long-term use of the robot, **grease the robot once every six months or so.**
Grease the robot more frequently if running it continuously for long periods, such as 24 hour runs, or repeating short stroke movements.

Attention

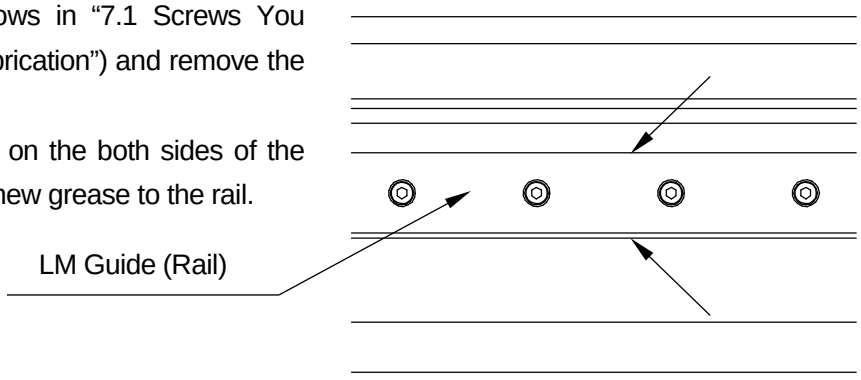
If the Z-axis is continuously moved in a short pitch, the internal parts cannot be automatically greased from the internal grease pot and may cause only that certain part of the ball screw to wear out. To ensure grease is spread over the whole ball screw, **move the Z-axis in a full stroke motion (From Z=0 to the maximum stroke**) about once a week.

Attention

Use grease recommended by Janome. Using any other grease may cause unit breakdown.
Recommended grease: Shell Alvania Grease S2 equivalent, manufactured by Showa Shell Sekiyu K.K. (Puffing agent: Lithium soap group)
EPNOC Grease AP(N)-1 equivalent, manufactured by NIPPON OIL CORPORATION (Puffing agent: Lithium soap group)

■ X-Axis LM Guide

1. Remove the four screws securing the X cover (indicated by black arrows in "7.1 Screws You Need to Remove for Lubrication") and remove the cover.
2. Wipe off the old grease on the both sides of the LM guide rail and apply new grease to the rail.



■ Y-Axis LM Guide

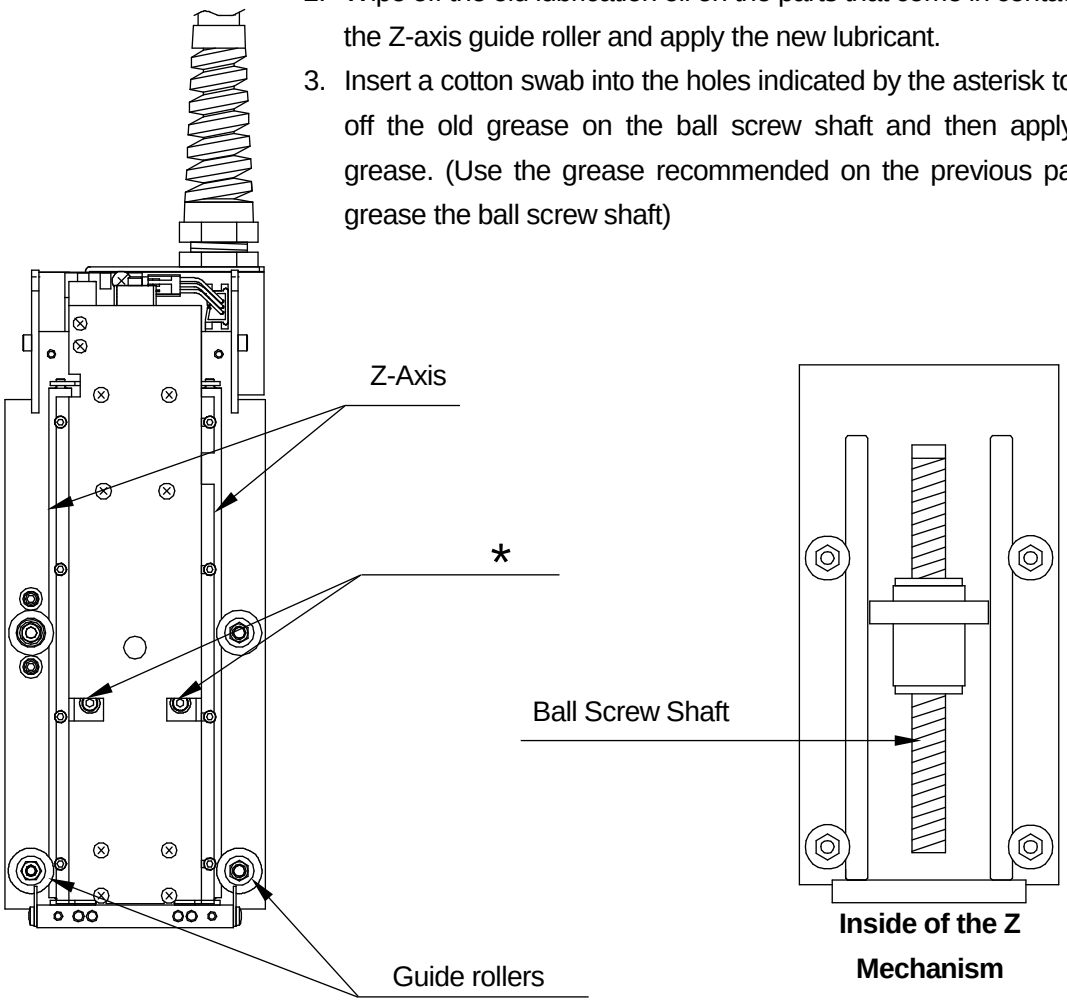
1. Remove the thirteen screws securing the left and right Y side covers (indicated by black arrows in the "7.1 Screws You Need to Remove for Lubrication") and remove the left and right Y side covers.
2. Remove the four screws securing the Y front cover (indicated by black arrows in the "7.1 Screws You Need to Remove for Lubrication") and remove the Y front cover.
3. Wipe off the old grease on both sides of the LM guide rail and apply new grease to the rail.

■ Z Mechanism (3-Axis Model)

Attention

Use the Z-axis lubrication oil, lubrication oil bottle (Part No. 963418100). Use of any other lubricant may cause unit breakdown. Additionally, do not mix different types of lubrication oils into the bottle.
Do not apply too much oil to the Z-axis. Otherwise, the oil may drip.

1. Remove the six screws securing the Z cover (indicated by black arrows in the “7.1 Screws You Need to Remove for Lubrication”) and remove the Z cover.
2. Wipe off the old lubrication oil on the parts that come in contact with the Z-axis guide roller and apply the new lubricant.
3. Insert a cotton swab into the holes indicated by the asterisk to wipe off the old grease on the ball screw shaft and then apply new grease. (Use the grease recommended on the previous page to grease the ball screw shaft)

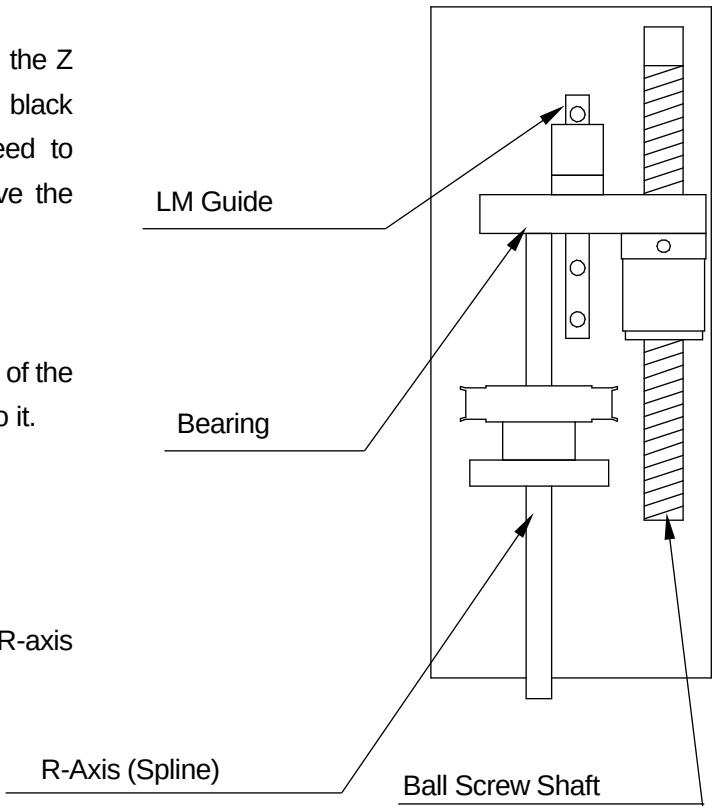


■ Z Mechanism (4-Axis Model)

1. Remove the eight securing fastening the Z front and rear covers (indicated by black arrows in the “7.1 Screws You Need to Remove for Lubrication”) and remove the covers.

2. Wipe off the old grease on both sides of the LM guide rail and apply new grease to it.

3. Wipe off the old grease on the R-axis (spline) and apply new grease to it.



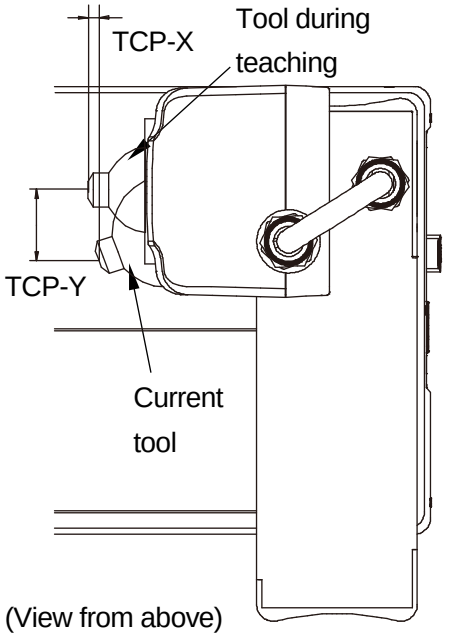
4. Grease the bearing on the upper part of the R-axis and wipe off the old grease that is pushed out.

5. Wipe off the old grease on the ball screw shaft and apply new grease to it.

8. TOOL REPLACEMENT SETTINGS

8.1 3-Axes: Tool Data

When you change tools, the tool center point will be out of alignment due to the angle of attachment and other factors. If you run the robot without realigning the tool, the point coordinates will also be out of alignment by this same amount.
When changing tools, enter the values below into [Tool Data].



NOTE
For 4 axis specification models, refer to “Settings Needed for Teaching” in the operation manual *Setup*, and reenter the tool data.

The following settings are in [Tool Data]:

- Tool Weight
- TCP-X (X-direction distance from the registered tool center point to the current tool center point.)
- TCP-Y (Y-direction distance from the registered tool center point to the current tool center point.)
- TCP-ΔZ (Z-direction distance from the registered tool center point to the current tool center point.)
- Copying to All Programs (the entered tool data is copied to all programs.)

NOTE
The tool weight for the JR2200N is fixed at 3.5kg. This cannot be changed. If the tool weight is heavier than the settings, it is possible a positioning error will occur.

TP MENU [Program Data Settings] [Tool Data]

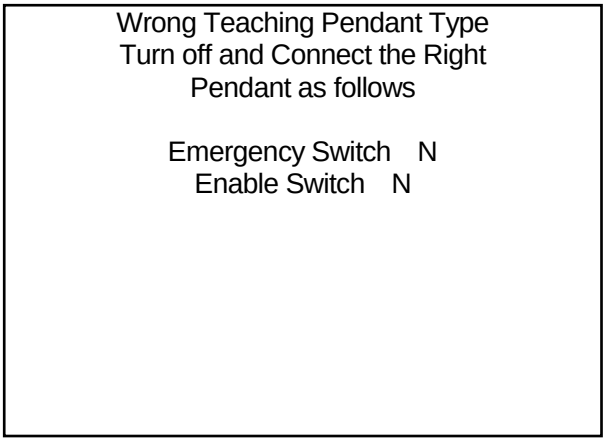
PC [Program] → [Program Data] → [Tool Data]

9. TROUBLESHOOTING

9.1 Teaching Pendant Message at Power ON

Do not plug or remove the teaching pendant while the power is ON. Doing so can damage the device and/or cause a malfunction. Additionally, only connect teaching pendants with options/without options to the compatible robot. Connecting an incompatible teaching pendant can cause robot breakdown.

If the screen below is displayed when the power is turned ON, make sure the connected teaching pendant and its specifications (whether or not it has an emergency switch and/or enable switch) are compatible with your robot. If you are using the appropriate teaching pendant and this screen is still displayed, the teaching pendant is likely to be faulty.
Contact Janome (listed on the back page of this manual) or your local dealer.



NOTE: These are example teaching pendant specifications

NOTE: Even if “Hit Any Key” is displayed, do not press any of the keys.

9.2 Self-Diagnostic

When an error occurs during a run or during teaching, the error number and error message are displayed on the teaching pendant LCD. If an error occurs during a run, the robot stops running. Fix the problem according to the error message.

Error has occurred Error No.092 X Sensor/Motor Error Turn off the power switch if error occurs repeatedly contact your dealer with error number.	Error has occurred Error No.096 Y Driver 0-Phase Error Turn off the power switch if error occurs repeatedly contact your dealer with error number.

NOTE

If the robot does not display this message but also does not move (the robot is stuck on the "Welcome" message, or does not respond to the operator) turn the robot OFF and then turn it back ON again.
If this continues, turn the power OFF and confirm whether or not the main unit, control box, and teaching pendant (or grip switch) are connected correctly. If all connections are normal and this problem persists, contact Janome Sewing Machine (the phone number listed on the back page of this manual) or your dealer.

If the teaching pendant was not connected, turn the robot OFF and attach the teaching pendant. When you turn the power back ON, the error message is displayed on the teaching pendant LCD (once an error message is displayed, the error information is automatically deleted. For this reason, **an error will not appear on the teaching pendant if it is connected after the message has been displayed on the PC**).
For further details regarding error content and how to handle them, refer to "12. Error Message List" at the end of this manual.

9.3 Fault Diagnostic

With this robot, when you are in Administration Mode, the Administration Mode menu is equipped with a Diagnostic Mode. By selecting Diagnostic Mode, the robot performs hardware fault diagnoses including those for the keys, LCD, Switches, external I/O, servo motor, and print circuit boards.
In the following instances, first of all check the items in the table below and execute Diagnostic Mode:

- The robot is not moving
- The robot is not operating even when the sysIn1 signal (I/O-SYS) is ON

	Cause	Treatment
1	The unit's power cord is not firmly connected.	Firmly connect the power cord.
2	The unit's power switch is OFF.	Turn the power switch ON.
3	The mode selection switch is not turned to the correct mode for the purpose intended: • Teaching Mode • Run Mode • Administration	Turn the mode selection switch to the correct mode for the purpose intended: TEACH: Teaching Mode RUN: Run Mode ADMIN: Administration Mode
4	Tried to do a run, but there was nothing connected to the teaching pendant connector.	If not using the teaching pendant, connect the included short connector.
5	The emergency stop switch is pressed in.	Turn the emergency stop switch clockwise to release.
6	Teaching has not been performed correctly.	Follow the procedures and redo the teaching.
7	The program number is not set correctly.	Set a program number of a registered program.
8	The servodriver is generating an error.	Turn the power to the robot OFF, and after 5 seconds turn the power back ON. Even after repeating this if the error continues, contact Janome or your dealer as per the information below.
9	The self-diagnostic message displays an error	Fix by following the instructions of the message.

If the robot still doesn't move after confirming the above items and executing the Diagnostic Mode, contact Janome Sewing Machine (the phone number listed on the back page of this manual) or your dealer.

If you think something is faulty with the unit, perform a diagnostic for every section.

Caution Only maintenance operators should perform the following checks.

"Diagnostic" contains the following items:

No.	Item	No.	Item
1	Key of Teaching Pendant	8	ZR Axis Motor
2	Teaching Pendant	9	Position of Sensor
3	Switches	10	External I/O
4	LED Buzzer	11	Emergency
5	State of Sensor	12	COM1 Communication
6	Z-Phase of Motor Driver	13	COM2 Communication
7	XY Axis Motor	14	COM3 Communication

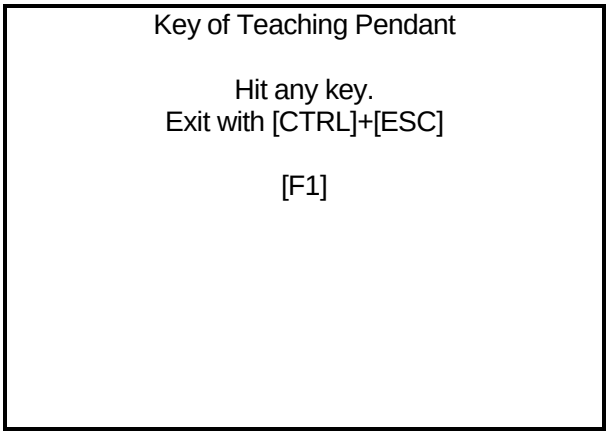
Press the MODE key and select [Administration] from the Mode selection menu to start up the Administration Mode. Select [Diagnostic Mode] from the Administration Mode menu to enter the Diagnostic Mode. Select an item that you wish to check and make sure that it is functioning properly.

Caution **In the Diagnostic Mode, the move area limit is disabled.** Therefore, if you are running diagnostics on something related to the drive, such as "Motors" etc., first remove the tools, etc. Failure to do so may damage the tools. Also, make sure not to move the robot arm beyond its maximum operating range.

Caution After performing diagnostics, be sure to turn the power OFF once. The robot may not be able to perform a run or job accurately if you run the robot as is after diagnostics.

9.3.1 Teaching Pendant Keys

Press a key on the teaching pendant and check that the same key is displayed on the teaching pendant LCD.



NOTE

Press the CTRL key and the ESC key to return to the diagnostics menu.

Press the SHIFT key and the ESC key to return to the Administration Mode menu.

9.3.2 Teaching Pendant

Check the enable switch (optional), buzzer, LED, and LCD functions. Select an item that you wish to check. Press the [ESC] key to return to the Diagnostic Mode menu.

1. Enable Switch (Optional)
   When the enable switch is pressed, [ON] is displayed. When it is released, [OFF] will be displayed.

2. Buzzer
   Press the [ENTR] key. The teaching pendant shows it is [ON] and the buzzer sounds. Press the [ENTR] key again. The teaching pendant shows it is [OFF] and the buzzer stops.

Teaching Pendant	
Enable Switch	OFF
Buzzer	**OFF**
LED1	ON
LED2	OFF
LED3	OFF
LED4	OFF
LED5	OFF
Back Light	ON
Screen	ON
Changing Display	
Brightness Adjustment	Standard

Teaching Pendant Diagnosis Screen

3. LED1 – LED5
   Pressing the [ENTR] key switches each LED indicator [ON] and [OFF].

NOTE

This is a test for the teaching pendant LED lighting. For example, the robot will not switch to Teaching Mode if the LED [TEACH] is turned ON during a diagnostic check.

4. Back Light
   Pressing the [ENTR] key switches the backlight of the teaching pendant LCD [ON] and [OFF].

5. Screen
   Pressing the [ENTR] key turns the teaching pendant LCD ON and OFF. When the screen is OFF, everything shown on the teaching pendant LCD disappears.

6. Changing Display
   Each time the [ENTR] key is pressed, the teaching pendant LCD display changes in the following order: checkered pattern → highlighted checkered pattern → blank → white → teaching pendant diagnostic screen

7. Contrast
   Each time the [ENTR] key is pressed, the teaching pendant LCD brightness and screen display changes in the following order: Standard → High → Low → Standard

NOTE

The emergency stop switch diagnostic can be done in the “Emergency” diagnostic.

9.3.3 Switch

Press or turn each switch and check the switch status on the LCD. Press the ESC key to return to the Diagnostic Mode menu.

Switch	
Start Switch	**OFF**
Increment Number	OFF
Decrement Number	OFF
Special Mode Switch	ON
Spare Switch	ON

1. Start Switch
   When the start switch is pressed, [ON] is displayed.

2. Increment Number
   When the program number increment switch is pressed, [ON] is displayed.

3. Decrement Number
   When the program number decrement switch is pressed, [ON] is displayed.

4. Special Mode Switch
   The current position of the special mode switch (ON or OFF) is displayed.

5. Spare Switch
   The current position of the special mode switch (ON or OFF) is displayed.

NOTE

The current positions of the I/O-SYS internal/external power selector switch and the I/O-1 internal/external power selector switch will not be displayed.

9.3.4 LED Buzzer

Each time the ENTR key is pressed on one of the items in this diagnostic, it changes ON/OFF.

For “Number Display”, the diagnostic status switches in order from “00” → “11” →... “99” → “St” each time the “+” program increment switch key is pressed.

Switch the LED to ON and the respective LED lights up, switch it to OFF and it goes out. Switch “Buzzer” to ON and the buzzer sounds. Switch it to OFF and the buzzer stops.

LED Buzzer	
Number Display	33
Green LED	ON
Red LED	ON
Buzzer (Control Box)	OFF

Press the ESC key to return to the Diagnostic Mode menu.

9.3.5 Mechanical Initialization Sensor

Select [State of Sensor] in Diagnostic Mode and each axis can be moved manually.

Move each axis manually and check that the sensor status (ON or OFF) is properly displayed on the screen.

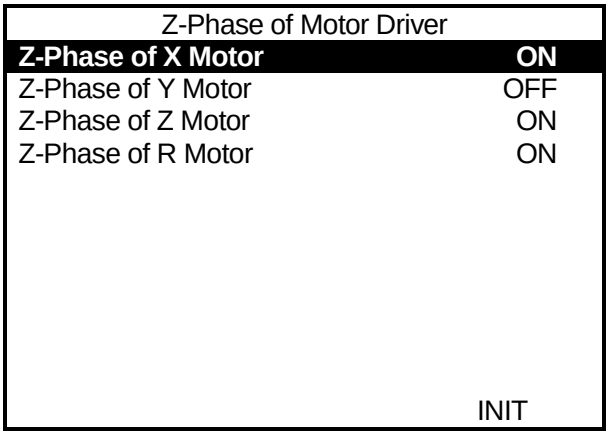
The indicator will show [ON] if the axis goes further than the initialization position in a negative direction.

Press the ESC key to return to the Diagnostic Mode menu.

State of Sensor	
X Axis Sensor	**ON**
Y Axis Sensor	ON
Z Axis Sensor	OFF
R Axis Sensor	ON

9.3.6 Z-Phase of Motor Driver Diagnosis

This performs a diagnostic for each axis motor.



1. Press the [F4] (INIT) key to start mechanical initialization. The Z-Phases of the motors for all the axes turn ON*.
2. Push the [↑X] key once and the Z-phase of the X motor turns OFF.
3. Push the [↑X] key nine more times and the Z-phase of the X motor turns ON. If the Z-phase of X motor turns ON for every 10 times the [↑X] key is pushed, it is working correctly.

Do the same for the Z-phase of Y motor and the Z-phase of Z motor; push the [→Y] key and [↑Z] key ten times each; if they switch ON, they are working correctly.
Press the [ESC] key to return to the Diagnostic Mode menu.

Caution

Always pay special attention to the robot's movement in the Diagnostic Mode.

9.3.7 XY Axis Motor Diagnosis

Check the X-axis and Y-axis motor drives on this screen.

You can set the output pulses, output pulse rate, axis hold (excitation), and half power ON/OFF settings on this screen.

The [Number of Output Pulse] and [Rate of Output Pulse] settings are common to both the X and Y-axis motors. The default settings for [Number of Output Pulse] and [Rate of Output Pulse] are 10000 (equal to a full 1 rotation of the motor) and 1000.

Use the JOG keys (such as the ↑X key, etc.) to drive the motor. Pressing a JOG key rotates the axis motor the number of registered pulses.

XY Axis Motor	
Number of Output Pulse	**10000**
Rate of Output Pulse	1000
X Axis Hold	ON
X Axis Half	OFF
Y Axis Hold	ON
Y Axis Half	OFF
X Axis Encoder	10000
Y Axis Encoder	10000
	INIT

JR2000NE Series Example

10,000 output pulses moves the X- and Y-Axes approximately 50mm.

If you are using the JR2000NE Series, items [X Axis Encoder] and [Y Axis Encoder] are displayed on the XY Axis Motor diagnostic screen. Before making a JOG movement for either one, if the value of [X Axis / Y Axis Encoder] + [Number of Output Pulse] is within a plus or minus range of 40, they are functioning correctly.

Press the F4 key to perform mechanical initialization (to initialize each of the X, Y, Z, and R axes).
Press the ESC key to return to the Diagnostic Mode menu.

⚠ Caution

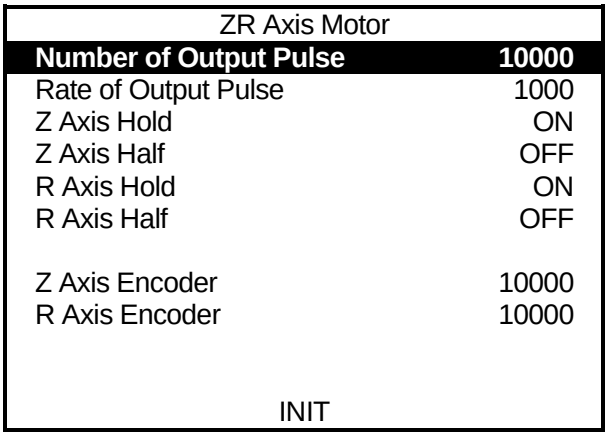
Always pay special attention to the robot's movement in the Diagnostic Mode.

9.3.8 ZR Axis Motor

This checks the motor drives for the Z-axis and R-axis.

You can set the number of output pulses, output pulse rate, axis hold (excitation) and half power ON/OFF settings on this screen.

The [Number of Output Pulse] and [Rate of Output Pulse] settings are common to both the Z and R-axes motors. The default settings for [Number of Output Pulse] and [Rate of Output Pulse] are 10,000 (equal to a full 1 rotation of the motor) and 1,000. Use the JOG keys (such as the [↓Z] key) to drive the motor.



JR2000NE Series Example

Pressing any JOG key once rotates each axis motor by the [Number of Output Pulse]. 10,000 output pulses moves the Z-axis about 25mm and R-axis about 90deg.

If you are using the JR2000NE Series, the [Z Axis Encoder] and [R Axis Encoder] items are displayed on the ZR Axis Motor diagnostic screen. They are functioning properly if the values on the screen fall within plus or minus 40 range of the [Number of Output Pulse] value.

Press the [F4] key to perform the mechanical initialization (to move all the X, Y, Z, and R axes to their initial positions).

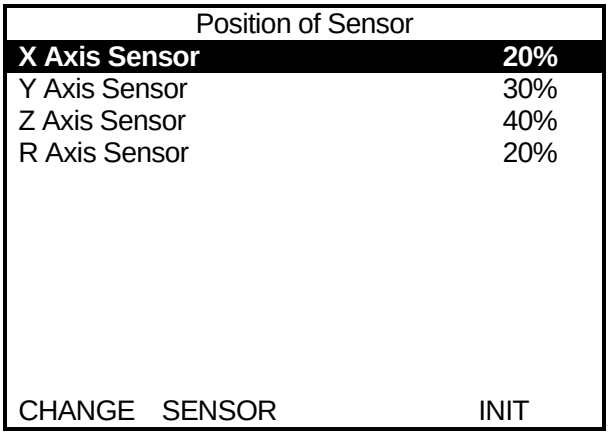
Press the [ESC] key to return to the Diagnostic Mode menu.

Caution

Always pay special attention to the robot's movement in the Diagnostic Mode.

9.3.9 Position of Sensor

First, press the F4 (INIT) key according to the instructions on the LCD. Mechanical initialization starts.



This diagnostic checks the sensor position at initialization and the phase amounts in between the motor Z-phases.

They are functioning correctly if they are within the ranges below. If they are outside of the range, the sensor position needs adjusting. Contact the dealer from whom you purchased the robot.

X-axis: ±25%
Y-axis: ±25%
Z-axis: ±25%
R-axis: ±25%

Press the F0 (CHANGE) key to change [%] indicator to [OK] or [Fault]. (If within 25% it is [OK])
Press the F1 (SENSOR) key to change the screen display to the current sensor status display (indicator will change to [ON] and [OFF]).
Press the F4 (INIT) key to perform the mechanical initialization again and refresh the display.

Caution

Always pay special attention to the robot's movement in the Diagnostic Mode.

To re-check, press the F4 key and perform the mechanical initialization.
Press the ESC key to return to the Diagnostic Mode menu.

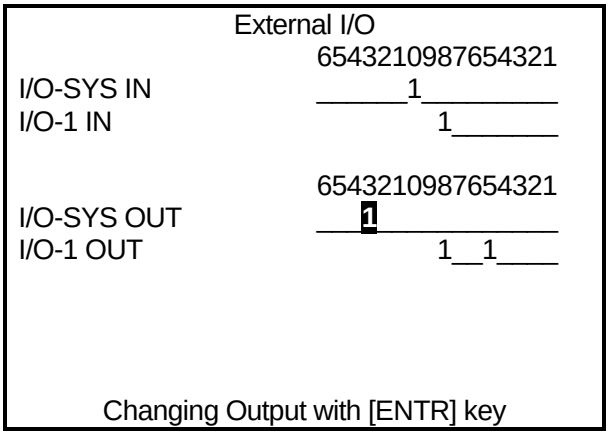
9.3.10 External I/O

This diagnostic displays the I/O-SYS, I/O-1 input/output statuses on the LCD.

Connect an external I/O test device (something that can check the input switch and output status) to the external I/O connection port, and push the [ENTR] key.

The I/O-1 status is displayed. (ON: 1, OFF: _)

If the input status is output correctly, the external I/O is working properly.

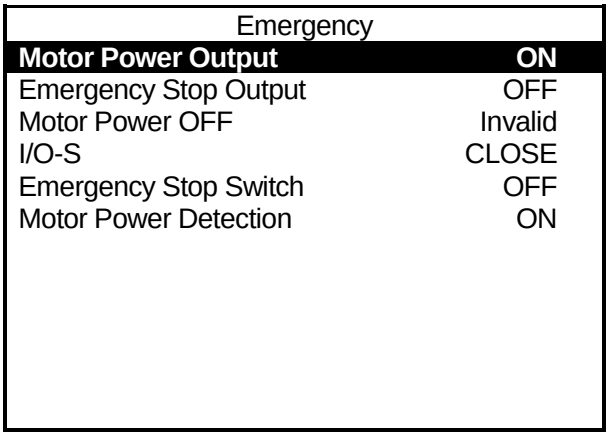


Press the [ESC] key to return to the Diagnostic Mode menu.

9.3.11 Safety Circuit

This checks that safety circuits such as the emergency stop and I/O-S are functioning properly.

There are six signals used here, categorized into the three groups indicated below.

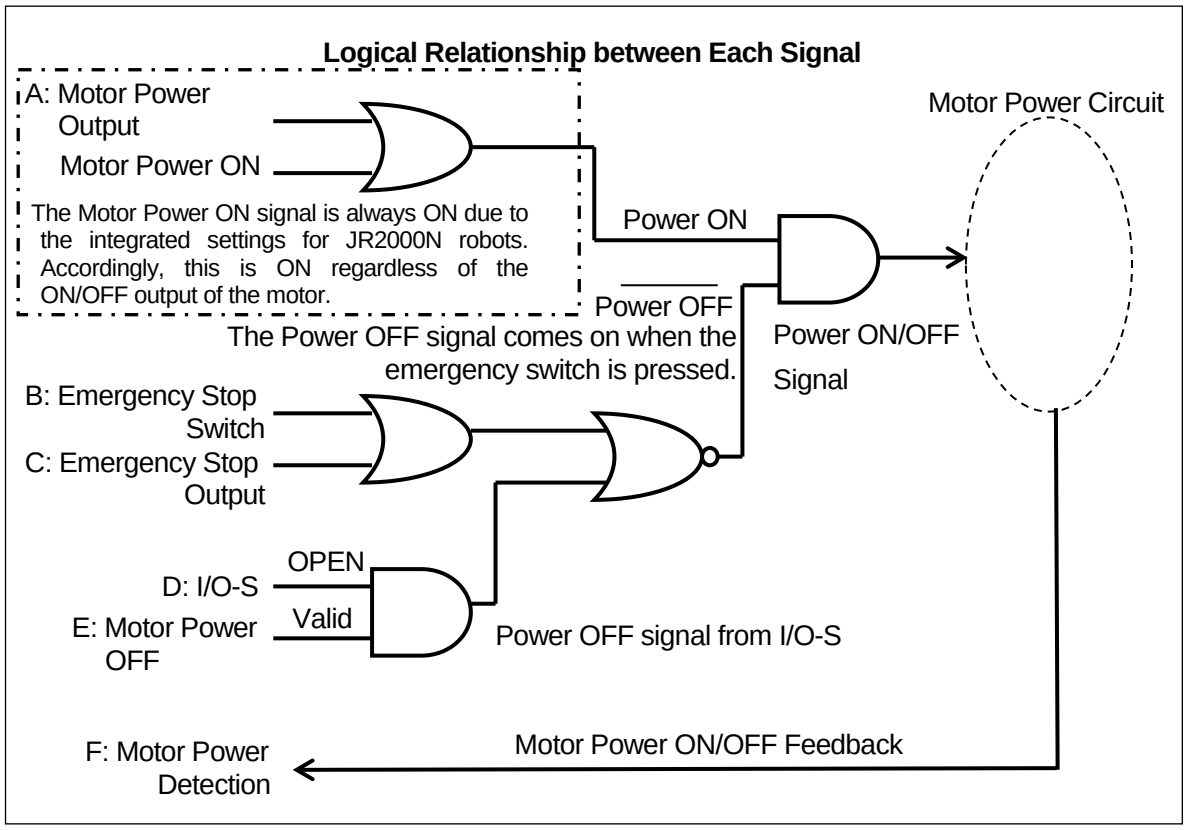


1. Motor Power ON Command
   A: Motor Power Output ON

2. Motor Power OFF Command
   B: Emergency Stop Switch
   C: Emergency Stop Output
   D: I/O-S (OPEN/CLOSE)
   E: Motor Power OFF (Valid/Invalid)

3. Motor Power Feedback Signal
   F: Motor Power Detection

The following diagram shows the logical relationship between each signal:



After diagnosis, the results are split into “Input Signal” and “Emergency Stop Sequencer”. Be sure to check these.

1. Input Signal

   Check that the B: [Emergency Stop Switch] and D: [I/O-S] signals are input normally.

Emergency Stop Switch		I/O-S	
Status	Display	Status	Display
When the switch is pressed	ON	When the connector is short-circuited	CLOSE
When the switch is not pressed	OFF	When the connector is not short-circuited	OPEN

2. Emergency Stop Sequence

   To confirm if the emergency stop sequence is operating normally, check whether the motor power indicator (F) is ON or OFF for the A – E input signals. The chart (at the top of the page) indicates the logical relationship between the A - E input signals and the motor power indicator (F).

   [Motor Power Output], [Emergency Stop Output], [Motor Power OFF] are switched ON/OFF (or Valid/Invalid) by pushing the ENTR key.

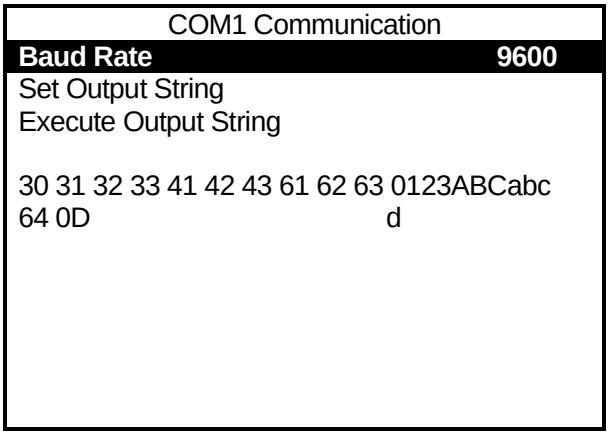
As shown in the “Logical Relationship” chart on the previous page, regardless motor power output ON/OFF (A), the signal is always ON if the motor power is ON. Accordingly, if it is functioning normally, the motor power (F) ON/OFF indicator does not change even if the motor power output (A) ON/OFF changes.

Input	A: Motor Power Output	OFF	OFF	OFF	OFF	OFF
	B: Emergency Stop Output	OFF	ON	OFF	OFF	OFF
	C: Motor Power OFF	Valid	Valid	Valid	Valid	Invalid
	D: I/O-S	CLOSE	CLOSE	CLOSE	OPEN	OPEN
	E: Emergency Stop Switch	OFF	OFF	ON	OFF	OFF
Output	F: Motor Power Detection	**ON**	**OFF**	**OFF**	**OFF**	**ON**

9.3.12 COM1 – 3 Communication

Select “Set Output String” and a screen for inputting the character string is displayed. Set the output character string here, and select “Execute Output String” and the registered character string is outputted from the COM port.

Data sections 00H – 1FH and 7FH – FFH are displayed in HEX only. ASCII text appears as a blank space.



The baud rate exchanges are as follows:

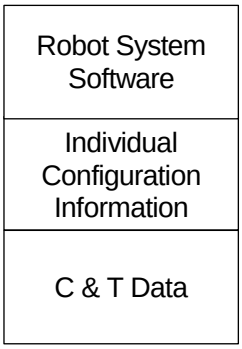
COM1	9600/19200/38400/57600/115200
COM2	9600/19200/38400/57600/115200
COM3	9600/19200

NOTE

The baud rate exchanges here are a test. These automatically reset to their original values after the diagnosis.

10. THINGS TO TRY BEFORE YOU MAKE REPAIRS

The figure on the right shows in simplified terms how the memory domain of the robot is divided up.



Data Area

If there is something wrong with the robot's operation even after restarting it, download the "robot system software" and "model setting file" to the robot.
When you download these two data, you can restore all data, other than the individual configuration information and C&T data, to its original state at the time of shipping.

Download these two data to the robot and recheck the operational status of the robot once before performing repair work.

1. Download the Robot System Software

Refer to "3. Downloading the Robot System Software".

2. Download the Individual Configuration Information

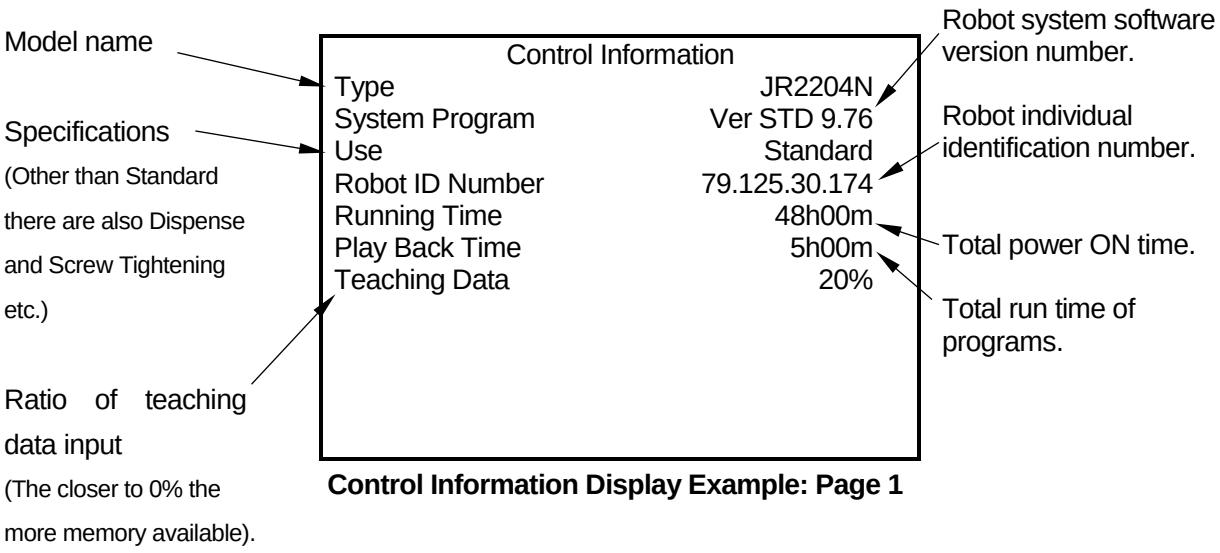
Refer to "3. Backing up Individual Configuration Information" in the operational manual *Setup* and open the file "PSKBKUPE.EXE". Select [Send Data] from the [Communication Settings] menu.

NOTE

- Only download individual configuration information when there is a malfunction.
- Do not turn OFF the power to the PC or robot when downloading.

11. CHECKING VERSION INFORMATION

Use this when you want to confirm version information. Checking this information can be helpful when there is trouble with the robot.



Control Information Display Example: Page 1

Item Selection

TP MODE [Administration]
[Version Information]

PC [Robot] → [Administration Settings] → [Control Information]

There are multiple pages within the version information screen.

CURSOR↓ / CURSOR→ Use these keys to display the next page.

CURSOR↑ / CURSOR← Use these keys to display the previous page.

12. ERROR MESSAGE LIST

When an error occurs, the program number display on the front of the operation panel will alternately show the [Er] sign and the error number (excluding error numbers 100 and above).

TP The error number and the error content appear on the teaching pendant LCD. If the teaching pendant is not connected, turn OFF the power once and connect the teaching pendant. When you turn ON the power again, the error and error number appear on the teaching pendant LCD.

Once an error message is displayed, the error information is automatically deleted. For this reason, after the error is displayed on the teaching pendant, even if you select [System Errors] or [Run Errors] on your PC, “There are no errors” appears.

PC When connected to a PC, select [System Errors] or [Run Errors] from the [Robot] pull-down menu in JR C-Points. Every error of the connected robot is loaded and displayed.

If the PC is not connected, turn OFF the robot’s power once (if the PC is running, also turn OFF the PC’s power) and after connecting the PC, startup both the robot and the PC and load the error information.

Once an error message is displayed, the error information is automatically deleted. For this reason, an error will not be displayed on the teaching pendant if it is connected after the message has been displayed on the PC.

Error No.	Message	Countermeasure
001	Program is Empty.	Enter the number of a registered program.
006	Point Type Error	Point type error in which a PTP point is succeeded by a CP passing point. Check the point type and reenter.
007	Position is out of range	The point position itself is out of range or the axes have gone out of range at the CP arc point, etc. Out of range means that the tool tip is unable to move in the range designated by the robot’s soft limit. Check and reenter the teaching position. Also, check the move area limit and TCP (tool center point) in the tool data and reenter.

Error No.	Message	Countermeasure
008	Error on Point Job	Any point job errors that are not as defined as errors 009 to 013, 016, and 042 to 053 are all 008 errors. -There is no *ld* and *ldi* for *anb* and *orb* in the condition operation command. -When *then/else/timeUp* in a nest reaches 30 or more. -*Then/else/endIf* appear even though *if* doesn't exist -*timeUp/endWait* appears even though *waitCondTime* and *waitCond* don't exist. Check the point job contents and reenter.
009	then/else for if doesn't exist	If in the point job command: -There is no *then/else* for *if* -If there is something other than a condition operation command written before *then/else* and after *if* etc. Check the point job command and reenter.
010	endIf for if doesn't exist	Check the point job command and reenter.
011	endWait for waitCond doesn't exist	Check the point job command and reenter.
012	Label for *jump* doesn't exist	Check the point job command and reenter.
013	Point for goPoint doesn't exist	The pallet loop jump point number of the point job command *goPoint*, *goRPoint* is larger than the program's biggest point number, or it is a negative number. Check the point job command and reenter it.
016	Error on pallet Routine data	The pallet number designated by a point job command doesn't exist. Check the pallet for point job command and/or the additional function pallet and reenter it.
022	CP Speed Over	Reduce the CP line speed.
029	Saving Data Error	- If the TP is not connected and you are in Run Mode, the error number is displayed by LED and the robot cannot proceed. - If the TP is not connected and you are not in Run Mode, the robot initializes the work data (data in the RAM) and starts up. You cannot modify the saved data at this time. - If the TP is connected, the error message is displayed, confirm whether or not to delete all data [Y/N], and the robot will then initialize with the saved data included.
030	Flash ROM Erase Error	When saving C&T data, after all the data is deleted then you can save anew. If the data is not deleted, this error occurs. Printed circuit board A is most likely damaged and needs replacing. Please contact the dealer from whom you purchased the robot.
031	Flash ROM Write Error	This is a writing error which occurs when saving the C&T data, meaning that printed circuit board A needs replacing. Please contact the dealer from whom you purchased the robot.
035	Teaching data SUM error	When the robot's power is turned ON, the stored C&T data is read out. If the data sum is incorrect, this error occurs. Delete the C&T data. If the power is turned OFF in the middle of saving the C&T data, this error occurs.

Error No.	Message	Countermeasure
037	Motor Power Supply Error	This error occurs when there is no power supplied to the motor. Check the motor power. Damage to the power supply connector → Check the connection etc. Damage to the power supply itself → Replace the power supply unit.
042	Job for callJob doesn't exist	Check the point job command and reenter.
043	callJob Nesting Error	This error occurs when the number of *callJob*, *callBase* in a nest reaches 30 or more in a point command sequence. Check the point job commands and reenter.
044	Program for callProg doesn't exist	Check the point job command and reenter it.
045	callProg Nesting Error	This error occurs when the number of *callProg*, *callPoints* commands in a nest reaches 30 or more. Check the point job commands and reenter.
046	for, do Nesting Error	This error occurs when the number of *for*, *do* reaches 30 or more. Check the point job commands and reenter.
047	Points for callPoints doesn't exist	Check the point job commands and reenter
048	for-next, do-loop Error	This error occurs when *next* for *for* and *loop* for *do* do not exist; or, when *for* and *next* do not exist but *next* or *loop* appear. Check the point job command and reenter it.
049	Creating Local Variable Error	This error occurs when you try to generate a local variable with the *declare* command, and the identifier is wrong or the variable domain cannot be acquired. Check the point job commands and reenter.
050	Evaluate Expression Error	This error occurs if an error such as the following is detected by the sensor (judgment). There are no variables or functions in the expression; The identifier of the variable/function is wrong, or the definition for the variable/function is missing. The use of parentheses is incorrect Use of the operator is incorrect (+-*/etc.) There is a mistake in the calling up of functions, or the form or number of arguments (including sequence elements). Check the point job command and reenter.
051	I/O Alias Error	This error occurs if there is no I/O alias specified. It is likely that the identifier is wrong or there is no definition. Check the point job commands and reenter.
052	COM Alias Error	This error is occurs if there is no COM alias specified. It is likely that the identifier is wrong or the definition is missing. Check the point job commands and reenter.

Error No.	Message	Countermeasure
053	Parameter value is out of range	This error occurs when the formula judgment value exceeds the range. Check the point job commands and reenter.
056	Measurement of Needle Error	This error occurs when the measurement of Needle Adjuster 2 (optional) could not be taken correctly at the measuring point.
082	Emergency Stop	This error occurs when the emergency stop button is pressed or the I/O-S emergency stop function (CE model only) is activated. Release the emergency stop switch then send the start signal to perform the mechanical initialization.
083	Stop with Over Load (This error message appears only if you are using the JR2000NE Series.)	This error occurs if a position error is detected. In the Teaching Mode Two seconds after the error message [Stop with Over Load] is displayed, the robot restarts operation again. If this error occurs during the test run, press the start switch or a teaching pendant key. In the Run Mode Press the start switch or a teaching pendant key. The robot will stand by for restarting. In the Ext. Run Mode If [I/O-A] is selected: The robot will stand to restart when the sysIn11 (Error Reset) signal is turned on. Note that the default sysIn11 function is set to [Last Work]. If you wish to use the signal as an error reset signal, select [I/O-SYS Function Assignment], and then set the sysIn11 function to [Error Reset]. If [I/O-B] is selected: The robot will stand by to restart when the sysIn13 (Error Reset) signal is turned on.
085	Incorrect Use	This error occurs if the respective application specifications of system programs and C&T data are different. For example, if you write a “Standard” system program to a robot that has a “Dispensing” program registered, an error occurs when the power is turned ON. Either delete the C&T data or make a system program that is appropriate for the work you want to perform. If the teaching pendant is connected, “OK to delete all teaching pendant data?” appears and if you select [YES], the C&T data is deleted.
086	Incorrect Data Version	This error occurs when the data version number of the system program is smaller than the data version number of the teaching data. This means that the new teaching data registered in the unit is not compatible with the system program. Either delete all the teaching data or upgrade the system program. If the teaching pendant is connected, a message stating “OK to Delete All Teaching Data?” is displayed. Selecting [YES] deletes the C&T data.

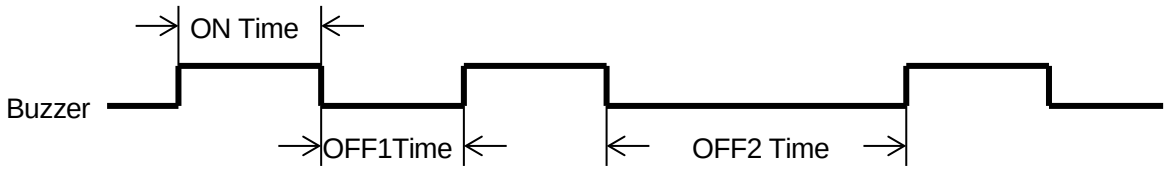
Error No.	Message	Countermeasure
087	Incorrect Data Sub Version	This error occurs when the system program data subversion number is different from the teaching data subversion number. This means that there is new teaching data registered in the main unit that the system program cannot run. Delete all teaching data or update the system program to a newer version. If the teaching pendant is connected, “OK to Delete All Teaching Data?” will appear and if you select [YES], the C&T data is deleted.
088	Z Motor/Encoder Error (JR2000NE Series only)	If the Z motor is running, this is an encoder error. If the Z motor is not running, this is a motor error. Confirm operation in Diagnostic Mode. (Mechanical initialization error)
089	Z Sensor/Motor Error	This error occurs if the sensor does not open or close after running the motor according to the preset pulse output during mechanical initialization. If the Z motor is running, this is a sensor error. If the Z motor is not running, this is a motor error. (Mechanical initialization error)
090	Z Driver 0-Phase Error	This error occurs when the driver Z-Phase signal is not output or is constantly output after running the motor according to the preset pulse output during mechanical initialization. (Mechanical initialization error)
092	X Sensor/Motor Error	This error occurs if the X sensor does not open or close after rotating the X motor according to the preset pulse output at mechanical initialization. If the X motor is rotating, the error has been caused by a sensor malfunction. If the X motor is not rotating, it has been caused by a motor malfunction. (Mechanical initialization error)
093	X Driver 0-Phase Error	This error occurs when the driver Z-phase signal is not output or if it is constantly output after running motor according to the preset pulse output during mechanical initialization. (Mechanical initialization error)
094	Y Motor/Encoder Error (JR2000NE Series Only)	If the Y motor is running, this is an encode error. If the Y motor is not running, this is a motor error. Confirm operation in Diagnostic Mode. (Mechanical initialization error)
095	Y Sensor/Motor Error	This error occurs if the sensor does not open or close after running the motor according to the preset pulse output during mechanical initialization. If the Y motor is running, this is a sensor error. If the Y motor is not running, this is a motor error. (Mechanical initialization error)

Error No.	Message	Countermeasure
096	Y Driver 0-Phase Error	This error occurs when the driver Z-phase signal is not output or if it is constantly output after running the Y motor according to the preset pulse output during mechanical initialization. (Mechanical initialization error)
097	R Motor/Encoder Error (JR2000NE Series Only)	If the R motor is running, this is an encoder error. If the R motor is not running, this is a motor error. Confirm operation in Diagnostic Mode. (Mechanical initialization error)
098	R Sensor/Motor Error	This error occurs if the sensor does not open or close after running the R motor according to the preset pulse output during mechanical initialization. If the R motor is running, this is a sensor error. If the R motor is not running, this is a motor error. (Mechanical initialization error)
099	R Driver 0-Phase Error	This error occurs when the driver Z-phase signal is not output or if it constantly output after running the R motor according to the preset pulse output during mechanical initialization. (Mechanical initialization error)
100	Logical Error XXXXXX	This error number is not displayed in the program number display, but will be on the teaching pendant LCD or PC. Turn the power OFF and ON again. If the error persists, please contact the dealer from whom you purchased the robot and tell them about the “XXXXXX” display information.
101	Trap Error	When a trap error occurs, it is not shown on the display. A short buzzer sounds twice and when the power is turned ON the error and error number are displayed on the teaching pendant LCD. This is likely a printed circuit board A malfunction, so it is necessary to replace the printed circuit board A. Please contact the dealer from whom you purchased the robot for assistance.

■ Power-On Errors

The errors below are not displayed on the screen. Identify the error type from the following buzzer sounds:

Buzzer	Contents
One long beep	This indicates a write mode program error. When switching to Write Mode and turning the power ON, this error occurs when there is no write mode program or when it is corrupted (judged using SUM check). Printed circuit board A needs replacing. Please contact the dealer from whom you purchased the robot for assistance.
Two long beeps	This indicates a system program error. This error occurs when there is no system program or it is corrupted (determined using SUM check). The system program may be restored by switching to Write Mode and re-downloading the system program. Please contact the dealer from whom you purchased the robot for assistance.
Two short beeps	This indicates a trap error. It is a likely a malfunction with printed circuit board A. Printed circuit board A needs replacing. Please contact the dealer from whom you purchased the robot for assistance.
A two second beep	This indicates a flash ROM write error. This error occurs when writing is not executed properly in the Write Mode program. Printed circuit board A needs replacing. Please contact the dealer from whom you purchased the robot for assistance.



	ON Time	OFF1 Time	OFF2 Time
Long	0.6[sec]	0.6[sec]	1.2[sec]
Short	0.2 [sec]	0.2[sec]	1.2[sec]

Example: One long beep

ON	OFF	ON	OFF	ON	OFF	...
0.6	1.2	0.6	1.2	0.6	1.2	[sec]

Example: Two long beeps

ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	...
0.6	0.6	0.6	1.2	0.6	0.6	0.6	1.2	0.6	0.6	[sec]

Example: Two short Beeps

ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	...
0.2	0.2	0.2	1.2	0.2	0.2	0.2	1.2	0.2	0.2	[sec]

13. DISPOSAL

When disposing of the robot, contact a specialist collection service and dispose of the robot in accordance with national and local regulations.

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Machine specifications may be modified without prior notice to improve quality.

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