MITSUBISHI

MOTION CONTROLLER (SV13)

A30TU type Teaching unit
Operating Manual

type A171SCPU, A273UHCPU



REVISIONS

The manual number is given on the bottom left of the back cover.

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INTRODUCTION

Thank you for purchasing the Mitsubishi Motion Controller/Personal Machine Controller. This instruction manual describes the handling and precautions of this unit. Incorrect handling will lead to unforeseen events, so we ask that you please read this manual thoroughly and use the unit correctly.

Please make sure that this manual is delivered to the final user of the unit and that it is stored for future reference.

Precautions for Safety

Please read this instruction manual and enclosed documents before starting installation, operation, maintenance or inspections to ensure correct usage. Thoroughly understand the machine, safety information and precautions before starting operation.

The safety precautions are ranked as "Warning" and "Caution" in this instruction manual.



When a dangerous situation may occur if handling is mistaken leading to fatal or major injuries.



When a dangerous situation may occur if handling is mistaken leading to medium or minor injuries, or physical damage.

Note that some items described as cautions may lead to major results depending on the situation. In any case, important information that must be observed is described.

For Safe Operations

1. Prevention of electric shocks

<!> WARNING

- Never open the front case or terminal covers while the power is ON or the unit is running, as this may lead to electric shocks.
- Never run the unit with the front case or terminal cover removed. The high voltage terminal and charged sections will be exposed and may lead to electric shocks.
- Never open the front case or terminal cover at times other than wiring work or periodic inspections even if the power is OFF. The insides of the control unit and servo amplifier are charged and may lead to electric shocks.
- When performing wiring work or inspections, turn the power OFF, wait at least ten minutes, and then check the voltage with a tester, etc. Failing to do so may lead to electric shocks.
- Always ground the control unit, servo amplifier and servomotor with Class 3 grounding. Do not ground commonly with other devices.
- The wiring work and inspections must be done by a qualified technician.
- Wire the units after installing the control unit, servo amplifier and servomotor. Failing to do so may lead to electric shocks or damage.
- Never operate the switches with wet hands, as this may lead to electric shocks.
- Do not damage, apply excessive stress, place heavy things on or sandwich the cables, as this may lead to electric shocks.
- Do not touch the control unit, servo amplifier or servomotor terminal blocks while the power is ON, as this may lead to electric shocks.
- Do not touch the internal power supply, internal grounding or signal wires of the control unit and servo amplifier, as this may lead to electric shocks.

2. For fire prevention

CAUTION

- Install the control unit, servo amplifier, servomotor and regenerative resistor on inflammable material. Direct installation on flammable material or near flammable material may lead to fires.
- ⚠ If a fault occurs in the control unit or servo amplifier, shut the power OFF at the servo amplifier's power source. If a large current continues to flow, fires may occur.
- When using a regenerative resistor, shut the power OFF with an error signal. The regenerative resistor may abnormally overheat due to a fault in the regenerative transistor, etc., and may lead to fires.
- Always take heat measures such as flame proofing for the inside of the control panel where the servo amplifier or regenerative resistor is installed and for the wires used. Failing to do so may lead to fires.

3. For injury prevention

♠ CAUTION

- Do not apply a voltage other than that specified in the instruction manual on any terminal. Doing so may lead to destruction or damage.
- A Do not mistake the terminal connections, as this may lead to destruction or damage.
- △ Do not mistake the polarity (+/–), as this may lead to destruction or damage.
- The servo amplifier's heat radiating fins, regenerative resistor and servo amplifier, etc., will be hot while the power is ON and for a short time after the power is turned OFF. Do not touch these parts as doing so may lead to burns.
- Always turn the power OFF before touching the servomotor shaft or coupled machines, as these parts may lead to injuries.
- ⚠ Do not go near the machine during test operations or during operations such as teaching. Doing so may lead to injuries.

4. Various precautions

Strictly observe the following precautions.

Mistaken handling of the unit may lead to faults, injuries or electric shocks.

(1) System structure

⚠ CAUTION

- ⚠ Always install a leakage breaker on the control unit and servo amplifier power source.
- ⚠ If installation of a magnetic contactor for power shut off during an error, etc., is specified in the instruction manual for the servo amplifier, etc., always install the magnetic contactor.
- ⚠ Install an external emergency stop circuit so that the operation can be stopped immediately and the power shut off.
- ⚠ Use the control unit, servo amplifier, servomotor and regenerative resistor with the combinations listed in the instruction manual. Other combinations may lead to fires or faults.
- If safety standards (ex., robot safety rules, etc.,) apply to the system using the control unit, servo amplifier and servomotor, make sure that the safety standards are satisfied.
- ⚠ If the operation during a control unit or servo amplifier error and the safety direction operation of the control unit differ, construct a countermeasure circuit externally of the control unit and servo amplifier.
- ⚠ In systems where coasting of the servomotor will be a problem during emergency stop, servo OFF or when the power is shut OFF, use dynamic brakes.
- ⚠ Make sure that the system considers the coasting amount even when using dynamic brakes.
- ⚠ In systems where perpendicular shaft dropping may be a problem during emergency stop, servo OFF or when the power is shut OFF, use both dynamic brakes and magnetic brakes.
- The dynamic brakes must be used only during emergency stop and errors where servo OFF occurs. These brakes must not be used for normal braking.
- ↑ The brakes (magnetic brakes) assembled into the servomotor are for holding applications, and must not be used for normal braking.
- Construct the system so that there is a mechanical allowance allowing stopping even if the stroke end limit switch is passed through at the max. speed.

CAUTION

- Use wires and cables that have a wire diameter, heat resistance and bending resistance compatible with the system.
- ⚠ Use wires and cables within the length of the range described in the instruction manual.
- ↑ The ratings and characteristics of the system parts (other than control unit, servo amplifier, servomotor) must be compatible with the control unit, servo amplifier and servomotor.
- ⚠ Install a cover on the shaft so that the rotary parts of the servomotor are not touched during operation.
- There may be some cases where holding by the magnetic brakes is not possible due to the life or mechanical structure (when the ball screw and servomotor are connected with a timing belt, etc.). Install a stopping device to ensure safety on the machine side.

(2) Parameter settings and programming

<u>M</u> CAUTION

- ⚠ Set the parameter values to those that are compatible with the control unit, servo amplifier, servomotor and regenerative resistor model and the system application. The protective functions may not function if the settings are incorrect.
- The regenerative resistor model and capacity parameters must be set to values that conform to the operation mode, servo amplifier and servo power unit. The protective functions may not function if the settings are incorrect.
- \(\triangle \) Set the mechanical brake output and dynamic brake output validity parameters to values that are compatible with the system application. The protective functions may not function if the settings are incorrect.
- \(\triangle \) Set the stroke limit input validity parameter to a value that is compatible with the system application. The protective functions may not function if the setting is incorrect.
- \(\triangle \) Set the servomotor encoder type (increment, absolute position type, etc.) parameter to a value that is compatible with the system application. The protective functions may not function if the setting is incorrect.
- ⚠ Set the servomotor capacity and type (standard, low–inertia, flat, etc.) parameter to values that are compatible with the system application. The protective functions may not function if the settings are incorrect.
- ⚠ Set the servo amplifier capacity and type parameters to values that are compatible with the system application. The protective functions may not function if the settings are incorrect.
- \(\triangle\) Use the program commands for the program with the conditions specified in the instruction manual.
- ⚠ Set the sequence function program capacity setting, device capacity, latch validity range, I/O assignment setting, and validity of continuous operation during error detection to values that are compatible with the system application. The protective functions may not function if the settings are incorrect.
- ★ Some devices used in the program have fixed applications, so use these with the conditions specified in the instruction manual.
- The input devices and data registers assigned to the link will hold the data previous to when communication is terminated by an error, etc. Thus, an error correspondence interlock program specified in the instruction manual must be used.
- ⚠ Use the interlock program specified in the special function unit's instruction manual for the program corresponding to the special function unit.

(3) Transportation and installation

↑ CAUTION

- ⚠ Transport the product with the correct method according to the weight.
- ⚠ Use the servomotor suspension bolts only for the transportation of the servomotor. Do not transport the servomotor with machine installed on it.
- ⚠ Do not stack products past the limit.
- ⚠ When transporting the control unit or servo amplifier, never hold the connected wires or cables.
- ⚠ When transporting the servomotor, never hold the cables, shaft or detector.
- ⚠ When transporting the control unit or servo amplifier, never hold the front case as it may fall off.
- ⚠ When transporting, installing or removing the control unit or servo amplifier, never hold the edges.
- A Install the unit according to the instruction manual in a place where the weight can be withstood.
- ⚠ Do not get on or place heavy objects on the product.
- Always observe the installation direction.
- ⚠ Keep the designated clearance between the control unit or servo amplifier and control panel inner surface or the control unit and servo amplifier, control unit or servo amplifier and other devices.
- ⚠ Do not install or operate control units, servo amplifiers or servomotors that are damaged or that have missing parts.
- ⚠ Do not block the intake/outtake ports of the servomotor with cooling fan.
- ⚠ Do not allow conductive matter such as screw or cutting chips or combustible matter such as oil enter the control unit, servo amplifier or servomotor.
- The control unit, servo amplifier and servomotor are precision machines, so do not drop or apply strong impacts on them.
- \(\text{\text{Securely fix the control unit and servo amplifier to the machine according to the instruction manual.} \)

 If the fixing is insufficient, these may come off during operation.
- Always install the servomotor with reduction gears in the designated direction. Failing to do so may lead to oil leaks.
- !\! Store and use the unit in the following environmental conditions.

Environment	Conditions			
Environment	Control unit/servo amplifier	Servomotor		
Ambient temperature	0°C to +55°C (With no freezing)	0°C to +40°C (With no freezing)		
Ambient humidity	According to each instruction 80%RH or less manual. (With no dew condense			
Storage temperature	According to each instruction manual20°C to +65°C			
Atmosphere	Indoors (where not subject to direct sunlight). No corrosive gases, flammable gases, oil mist or dust must exist.			
Altitude 1000m or les		above sea level.		
Vibration	According to each instruction manual.			

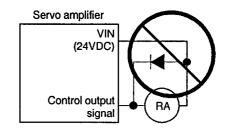
CAUTION

- Mhen coupling with the synchronization encoder or servomotor shaft end, do not apply impact such as by hitting with a hammer. Doing so may lead to detector damage.
- ⚠ Do not apply a load larger than the tolerable load onto the servomotor shaft. Doing so may lead to shaft breakage.
- ⚠ When not using the unit for a long time, disconnect the power line from the control unit or servo amplifier.
- A Place the control unit and servo amplifier in static electricity preventing vinyl bags and store.
- ⚠ When storing for a long time, contact the Service Center or Service Station.

(4) Wiring

/ CAUTION

- ⚠ Correctly and securely wire the wires. Reconfirm the connections for mistakes and the terminal screws for tightness after wiring. Failing to do so may lead to run away of the servomotor.
- ⚠ After wiring, install the protective covers such as the terminal covers to the original positions.
- ⚠ Do not install a phase advancing capacitor, surge absorber or radio noise filter (option FR–BIF) on the output side of the servo amplifier.
- Correctly connect the output side (terminals U, V, W). Incorrect connections will lead the servomotor to operate abnormally.
- ⚠ Do not connect a commercial power supply to the servomotor, as this may lead to trouble.
- ⚠ Do not mistake the direction of the surge absorbing diode installed on the DC relay for the control signal output of brake signals, etc. Incorrect installation may lead to signals not being output when trouble occurs or the protective functions not functioning.
- ⚠ Do not connect or disconnect the connection cables between each unit, the encoder cable or sequence expansion cable while the power is ON.



- △ Securely tighten the cable connector fixing screws and fixing mechanisms. Insufficient fixing may lead to the cables combing off during operation.
- \(\) Do not bundle the power line or cables.

(5) Trial operation and adjustment

↑ CAUTION

- ♠ Extreme adjustments and changes may lead to unstable operation, so never make them.

(6) Usage methods

↑ CAUTION

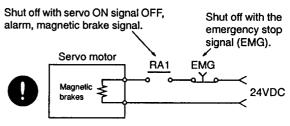
- ⚠ Immediately turn OFF the power if smoke, abnormal sounds or odors are emitted from the control unit, servo amplifier or servomotor.
- Always execute a test operation before starting actual operations after the program or parameters have been changed or after maintenance and inspection.
- ⚠ The units must be disassembled and repaired by a qualified technician.
- ⚠ Do not make any modifications to the unit.
- ★ Keep the effect or magnetic obstacles to a minimum by installing a noise filter or by using wire shields, etc. Magnetic obstacles may affect the electronic devices used near the control unit or servo amplifier.
- ⚠ Use the units with the following conditions.

Item	Conditions
Input power	According to the separate instruction manual.
Input frequency	According to the separate instruction manual.
Tolerable momentary power failure	According to the separate instruction manual.

(7) Remedies for errors

CAUTION

- ⚠ If an error occurs in the self diagnosis of the control unit or servo amplifier, confirm the check details according to the instruction manual, and restore the operation.
- ⚠ If a dangerous state is predicted in case of a power failure or product failure, use a servomotor with magnetic brakes or install a brake mechanism externally.
- ⚠ Use a double circuit construction so that the magnetic brake operation circuit can be operated by emergency stop signals set externally.
- ⚠ If an error occurs, remove the cause, secure the safety and then resume operation.
- The unit may suddenly resume operation after a power failure is restored, so do not go near the machine. (Design the machine so that personal safety can be ensured even if the machine restarts suddenly.)



(8) Maintenance, inspection and part replacement

⚠ CAUTION

- A Perform the daily and periodic inspections according to the instruction manual.
- A Perform maintenance and inspection after backing up the program and parameters for the control unit and servo amplifier.
- \triangle Do not place fingers or hands in the clearance when opening or closing any opening.
- ♠ Periodically replace consumable parts such as batteries according to the instruction manual.

CAUTION

- ⚠ Do not touch the lead sections such as ICs or the connector contacts.
- Do not place the control unit or servo amplifier on metal that may cause a power leakage or wood, plastic or vinyl that may cause static electricity buildup.
- ⚠ Do not perform a megger test (insulation resistance measurement) during inspection.
- ⚠ When replacing the control unit or servo amplifier, always set the new unit settings correctly.
- After maintenance and inspections are completed, confirm that the position detection of the absolute position detector function is correct.
- ⚠ Do not short circuit, charge, overheat, incinerate or disassemble the batteries.
- The electrolytic capacitor will generate gas during a fault, so do not place your face near the control unit or servo amplifier.
- The electrolytic capacitor and fan will deteriorate. Periodically change these to prevent secondary damage from faults. Replacements can be made by the Service Center or Service Station.

(9) Disposal

- ⚠ Dispose of this unit as general industrial waste.
- ⚠ Do not disassemble the control unit, servo amplifier or servomotor parts.
- ⚠ Dispose of the battery according to local laws and regulations.

(10) General cautions

CAUTION

- All drawings provided in the instruction manual show the state with the covers and safety partitions removed to explain detailed sections. When operating the product, always return the covers and partitions to the designated positions, and operate according to the instruction manual.
- Under no circumstances will Mitsubishi Electric be liable or responsible for any consequential damage that may arise as a result of the installation or use of this equipment. All examples and diagrams shown in this manual are intended only as an aid to understanding the text, not to guarantee operation. Mitsubishi Electric will accept no responsibility for actual use of the product based on these illustrative examples. Owing to the very great variety in possible applications of this equipment, you must satisfy yourself as to its suitability for your specific application.

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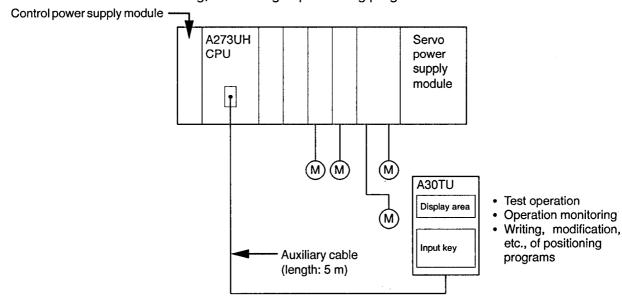
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		After Selecting Servo Instruction (Speed Control, Speed/Position Switching Control VF, VR, VVF, VVR)
		After Selecting Servo Instruction (Speed/Position Switching Control, Restart VPSTART)
		After Selecting Servo Instruction (Home Position Return Zero ZERO)
		After Selecting Servo Instruction (Simultaneous START START)
		After Selecting Servo Instruction (Position Follow-Up PFSTART)
		• After Selecting Servo Instruction (Repeat Same Control FOR-ON, FOR-OFF) 8-17
		After Selecting Servo Instruction (Repeat Same Control FOR-TIMES)
		• Setting Items 8-19
		Speed Type Selection Screen 8-20
	8.3	Deleting Programs 8-21
		• Deleting Programs 8-21
	8.4	Sort 8-22
		• Sorting Programs
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		• Copying Programs
	8.6	All-Clear 8-24
		• All-Clear 8-24
9.	ERR	OR MESSAGE LIST 9-1
AP	PEND	DIX APP-1
	- (NITLINE DRAWING

1. GENERAL DESCRIPTION

Mode Function Drawing No.

This manual covers the specifications, handling, and operation procedures for the A30TU teaching unit (hereafter referred to as "A30TU").

The A30TU teaching unit can be connected to the A273UHCPU/A171SCPU (OS name: SV13...real mode) motion controller to perform test operations, operation monitoring, and writing of positioning programs.



The configuration and main base unit name are different from those shown above when the A30TU is connected to an A171SCPU motion controller.

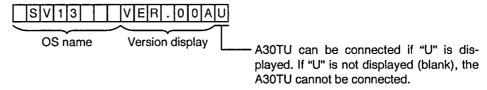
↑ CAUTION

- All settings and control procedures should be executed within the ranges specified in this manual.
- ↑ In order to prevent servo system CPU problems, an external safety circuit should be installed.
- As some of the components mounted on the PCBs (printed circuit boards) are susceptible to static electricity, either the work table or the worker should be grounded when handling the PCBs. The PCB conductive areas and electrical components should not be touched directly.

1.1 A273UHCPU & A171SCPU Compatibility with the A30TU

A273UHCPU and A171SCPU compatibility with the A30TU depends on the OS name and version.

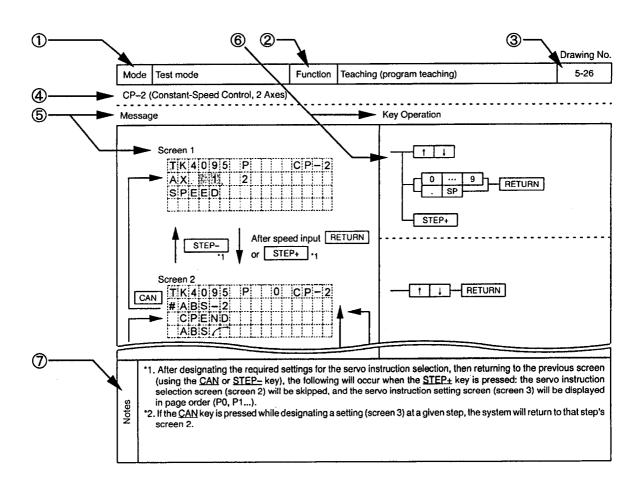
When used with the A273UHCPU, compatibility can be checked at the CPU's LED display. The version is displayed at power ON and when the LED display reset switch is pressed.

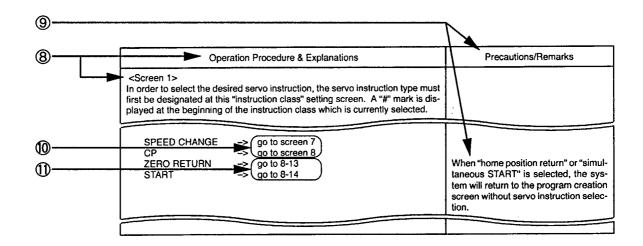


When used with the A171SCPU, compatibility can be checked at the IBM-PC (SW2SRX-GSV13PE).

* If the version is incompatible with the A30TU, install the A30TU compatible system data (SW2SRX-SV13V, SW2SRX-SV13K or SW0SRX-SV13M) from the system FD to the A273UHCPU or A171SCPU using the IBM-PC. Connection of the A30TU will then be possible.

The layout format used in this manual is explained below.





4

Mode Function 1-2.1

No.	Description
0	The selected mode (data, program, monitor, test) is indicated.
2	The function or item selected at the mode's initial screen is displayed.
3	 The number of the screen where the function or item is explained is displayed here. A "[○-○]" number is also displayed here as shown at item ①.
4	Item ② details are displayed here.
(5)	The screen content (message) for the function in question is displayed here.
6	Keys which are operative with the item screen are indicated, and the operation procedure is shown.
Ø	Notes related to the displayed screen are shown here.
8	Operation procedure details for the item ⑤ screen are displayed here.
9	Notes and supplementary information related to item are displayed here.
0	The screen number of the next operation is displayed here. (Operation within same function or item)
0	The item number (③) of the next operation is displayed here. (Operations with different item Nos.)

^{*} The numbers shown at the right in the table of contents are screen numbers. Searches for given items in the table of contents should be conducted using the item ③ entries on each page.

2. FUNCTION LIST

Drawing No.

Mode	Function	2-1

2.1 Function List

Mode		Item	Description	1	2
	Present value setting	Zero return	Home position returns occur in accordance with the home position return parameter data settings.	A	0
		Present value change	The feed present value is changed to the designated present value.		
	JOG operation		JOG operation is executed at the designated axis (override setting possible).		
əpo	Teaching Address teach		The present value is written to the designated program address. JOG operation is executed at the designated axis (override setting possible).		
Test mode		Program teach	Present values are written to addresses while the program is b ing created.		0
	Program operat	ion	Program operation is executed by designating the program number. Registered program numbers are executed in a continuous manner.		0
	PC test		Used to forcibly set PC devices: Y,M,D,W, etc.	lack	0
	Servo ON/OFF	All-axes servo ON/OFF	All-axes servo ON/OFF executed.	_	ō
		Designated axis servo ON/OFF	Servo ON/OFF switching occurs at the designated axis only.	A	0
	Address	•	The feed present value at 3 axes is monitored.	0	0
	Error		Error (minor, major, servo) monitoring of 3 axes.		0
ا يو ا	Axis monitor	· .	Data for one axis is monitored.		0
ĕ	Common monito	or	Data other than axis data is monitored.		
Monitor mode	Specified monitor	or	Monitoring is designated by designating a Y,M,D,W, etc. device number.		0
Ž	Torque trace		Effective torque and maximum torque are checked.	0	0
	Servo motor		Servo data is monitored.	0	0
	Scroll monitor		Effective program number and error number are monitored.	0	0
	System settings	3	System settings data are checked or initialized.	_	0
Data set	Axis data		Fixed parameters are checked or changed. Servo parameters are checked or changed. Home position return data is checked or changed. JOG data is checked or changed.	$\triangle \triangle \triangle \triangle$	0000
Dat	Parameter block	Κ	Each parameter block is checked or changed.	Δ	0
	Limit switch		Each limit switch is checked or initialized.	_	0
	All-Clear		All parameter data is cleared.	_	0
	Auxiliary functio	n	Backlight, buzzer ON/OFF switching, and language selection.	lack	0
	Readout		Program readouts are executed by designating the program number.		0
ا <u>۾</u> ا	Writing		Program writing/modification occurs after a program readout.		0
Program	Deletion		Deletion is possible in program number units.		
ਨੂੰ	Sort		Program area is sorted.		
	Сору		Copying is possible in program number units.		
	All-Clear		The program area is cleared.		

- ① Indicates whether or not operation can be performed at A30TU.
- ② Indicates whether or not operation can be performed at IBM-PC (SW2SRX-GSV13PE).
- \bigcirc Key operation is possible. \triangle Key inputs at this item are ignored when the enabled/disabled switch is set to "disabled".
- ▲ When the enabled/disabled switch is set to "disabled", key operation related to data checks are possible, but those related to data changes are ignored.
- Key operation is impossible.

 Execute the operation at IBM-PC (SW2SRX-GSV13PE).

2.2 Instruction Code List

	ositioning Control	Instruction Symbol	Processing Details	A30TU (SV13)	IBM-PC (SW2SRX- GSV13PE)	Remarks
	1 axis	ABS-1	Absolute 1-axis positioning	0	0	
	I AXIS	INC-1	Incremental 1-axis positioning	0	0	
trol	2 axes	ABS-2	Absolute 2-axis positioning	0	0	
con	L anoo	INC-2	Incremental 2-axis positioning	0	0	
Linerar control	3 axes	ABS-3	Absolute 3-axis positioning	0	0	
=	O axes	INC-3	Incremental 3-axis positioning	0	0	
	4 axes	ABS-4	Absolute 4-axis positioning	0	0	
	4 000	INC-4	Incremental 4-axis positioning	0	0	
	Auxiliary point	ABS	Absolute circular interpolation by auxilia- ry point designation	0	0	
	designation	INC	Incremental circular interpolation by auxiliary point designation	0	0	
		ABS 🔼	Absolute circular interpolation by radius designation; less than CW 180 °	0	0	
		ABS ()	Absolute circular interpolation by radius designation; more than CW 180 °	0	0	
<u>0</u>		ABS 🗸	Absolute circular interpolation by radius designation; less than CCW 180 °	0	0	
r cont	Radius designation	ABS 💟	Absolute circular interpolation by radius designation; more than CCW 180 °	0	0	
olation		INC 🔼	Incremental circular interpolation by radius designation; less than CW 180 °	0	0	
interp		INC 📿	Incremental circular interpolation by radius designation; more than CW 180 °	0	0	
Circular interpolation control		INC 🍑	Incremental circular interpolation by radius designation; less than CCW 180 °	0	0	
Ö		INC 💍	Incremental circular interpolation by radius designation; more than CCW 180 °	0	0	
		ABS 🕟	Absolute circular interpolation by center point designation; CW	0	0	
	Center point	ABS 🕚	Absolute circular interpolation by center point designation; CCW	0	0	
	designation	INC 🔒	Incremental circular interpolation by center point designation; CW	0	0	
		INC 🕚	Incremental circular interpolation by center point designation; CCW	0	0	
ج	1 axis	FEED-1	1-axis fixed-pitch feed START	0	0	
Fixed-pitch feed	2 axes	FEED-2	2-axis linear interpolation fixed-pitch feed START	0	0	
ΙΧ̈́	3 axes	FEED-3	3-axis linear interpolation fixed-pitch feed START	0	0	
		VSTART	Speed switching control START	0	0	
	Speed	VEND	Speed switching control END	0	0	
s	witching control	VABS	Absolute designation of speed switching point	0	0	
		VINC	Incremental designation of speed switching point	0	0	

Mode Function 2-	2.1 I
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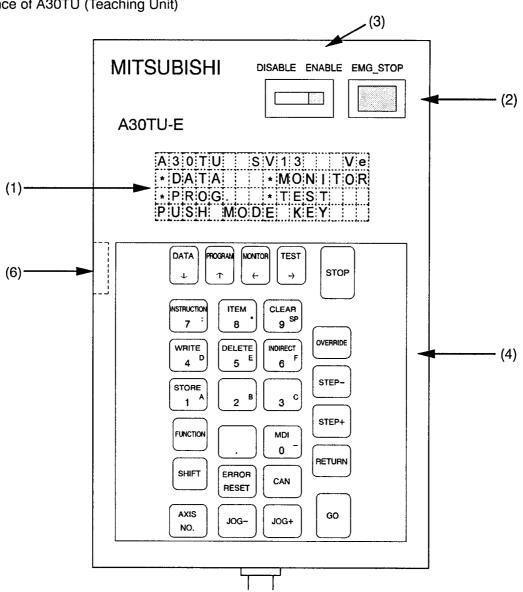
	ositioning Control	Symbol Details (A30TU (SV13)	IBM-PC (SW2SRX- GSV13PE)	Remarks
Speed	Forward	VF	Speed control, forward START	0	0	
	Reverse	VR	Speed control, reverse START	0	0	
Speed control II	Forward	VVF	Speed control, forward START II	0	0	
Spe	Reverse	VVR	Speed control, reverse START II	0	0	
& Introl	Forward	VPF	Speed & position control, forward START	0	0	
Speed & position control	Reverse	VPR	Speed & position control, reverse START	0	0	
Sposit	Restart	VPSTART	Speed & position control, restart	0	0	
	ition follow- p control	PFSTART	Position follow-up control	0	0	
		CPSTART1	1-axis constant speed control START	0	0	
		CPSTART2	2-axis constant speed control START	0	0	
	stant-speed control	CPSTART3	3-axis constant speed control START	0	0	
1		CPSTART4	4-axis constant speed control START	0	0	
		CPEND	Constant-speed control END	0	0	
	epetition of me control	FOR-TIMES				
	d with speed	FOR-ON	Designates start of repeat range	0	0	
	ching control constant-	FOR-OFF				
	eed control)	· · · · · · · · · · · · · · · · · · ·		0	0	
_	nultaneous START	START	Simultaneous START	0	0	
Z	ero return	ZERO	Zero return START	0	0	

 ^{○ ...} All test mode (teaching) and program mode operations, etc. are operative.
 △ ... Operative, but program content is not displayed in test mode and program operations (copy, all clear, sort).

3. GUIDE TO THE A30TU AND IT'S KEYS

Drawing No. Mode **Function** 3-1

Appearance of A30TU (Teaching Unit)



- (1) Display area
 - 4 lines x 16 characters liquid crystal display. Equipped with a backlight automatic OFF function and contrast adjusting dial.
- (2) Emergency stop key
 - Shuts OFF servo power, stopping all motion.
- (3) Enabled/Disabled switch
 - Enables and disables teaching box operation.
- (4) Control keys
 - These are the teaching box control keys.
- (5) Internal alarm
 - Buzzer sounds at key inputs and when an alarm occurs. The key input alarm can be switched OFF if desired.
- (6) Contrast adjusting dial
 - Adjusts the display screen contrast.

Mode	Function	3-2	
		3-2	

Control Key Explanations

Control Key Explanations										
Key	Explanation									
DISABLE ENABLE	Enables and disables teaching box operation. When set to "disabled", test mode and data change key operations will be disabled.									
EMG_STOP	Shuts OFF all power, causing an immediate stop on all axes. *1									
DATA ↓	The function stated on the upper half of the key is for the <u>data</u> setting mode, and becomes operative after the <u>FUNCTION</u> key has been pressed. The meaning of the symbol on the lower half of the key <u>↓</u> varies according to the operation being executed (override value change, or position alignment by numeric input, etc.).									
PROGRAM	The function stated on the upper half of the key is for the <u>program</u> mode, and becomes operative after the <u>FUNCTION</u> key has been pressed. The meaning of the symbol on the lower half of the key <u>1</u> varies according to the operation being executed (override value change, or position alignment by numeric input, etc.).									
MONTOR ←	The function stated on the upper half of the key is for the monitor mode, and becomes operative after the <u>FUNCTION</u> key has been pressed. The meaning of the symbol on the lower half of the key <u>varies</u> according to the operation being executed (position alignment by numeric input, or switch variable value change, etc.).									
TEST →	The function stated on the upper half of the key is for the <u>test</u> mode, and becomes operative after the <u>FUNCTION</u> key has been pressed. The meaning of the symbol on the lower half of the key → varies according to the operation being executed (position alignment by numeric input, or switch variable value change, etc.).									
STOP	Executes a START and STOP at program operations and when designating present value settings, etc.									
AXIS NO.	Designates the axis number. After pressing this key, a numeric value between 1 and 32 must be in (1 to $\underline{8}$ for A273UHCPU 8-axis specs.; 1 to $\underline{4}$ for A171SC									
CAN	Used to switch to a higher level screen. The "higher level" screen can be the previous screen or function/mode selection screen.									
ERROR RESET	Executes an error reset.									
FUNCTION	When an MDI, STORE, WRITE, DELETE, INDIRECT, INSTRUCTION, ITEM, or CLEAR key input is required, press the FUNCTION key, then press the appropriate key from 0 to 9. The FUNCTION key must also be pressed before pressing the DATA, PROGRAM, MONITOR, and TEST keys.									
SHIFT	The <u>SHIFT</u> key must be pressed in order to execute <u>-</u> , <u>A</u> , <u>B</u> , <u>C</u> , <u>D</u> , <u>E</u> , <u>F</u> ; <u>#</u> , <u>SP</u> inputs.									
	Insert/overwrite switching in the program mode is possible using the <u>FUNCTION</u> key plus <u>key</u> . The function indicated by the symbol on the lower half of the key is used to enter a decimal point in numeric data. When using the upper half of the key for speed type inputs, the <u>SHIFT</u> key must first be pressed.									
is in effect,	the teaching unit is disconnected from the RS-422 connector while a teaching unit emergency stop the emergency stop status will be cancelled. ency stop function that applies to the system as a whole is required, it must be provided separately.									

Mode	Function	3-2.1

Key	Explanation									
Jog+	JOG operation is executed in the address increase direction while this switch is pressed. Operation stops when the switch is released.									
JOG-	JOG operation is executed in the address decrease direction while this switch is pressed. Operation stops when the switch is released.									
OVERAIDE	Used to execute JOG speed changes during JOG operations. After pressing this key, use the ↓ , ↑ keys to select the desired value from the override table, then press the <u>RETURN</u> key.									
	OVERRIDE ↑ ↓ RETURN									
STEP+	Used during teaching operations for movement between points and monitor screen switching, etc.									
STEP-										
RETURN	Used as the "data set" key for function selections, override selections, teaching, program operations, and present value changes.									
GO	Used as the "execute" or "START" key.									
MDI 0 -	This key item is operative after pressing the <u>FUNCTION</u> key. This key item is operative after pressing the <u>SHIFT</u> key.									
CLEAR 9 SP	This key item is operative when neither the <u>FUNCTION</u> or <u>SHIFT</u> key is pressed.									
SHIFT key operation	When the <u>SHIFT</u> key is pressed, "S" is displayed at the top left of the screen. When the shift mode is canceled, the display returns to its original status. The shift mode is canceled when another key is pressed after pressing the SHIFT key.									
	SHIFT STORE SHIFT CLEAR 9 SP A SP A SP The shift mode is only valid for the key which is pressed immediately after pressing the SHIFT key. In cases where consecutive key inputs require the shift mode, the SHIFT key must be pressed before each key input.									
	SHIFT SHIFT SHIFT Shift mode is canceled.									
	TK4095E ABS-1 SHIFT SK4095E ABS-1 1-214748364.8u									

1			
	Mode	Function	3-2.2

Key	Explanation
FUNCTION key operation	When the <u>FUNCTION</u> key is pressed, "F" will be displayed at the top left of the screen. When the function mode is canceled, the screen returns to its original status.
	FUNCTION DATA LEY INDUT.
	FUNCTION MDI MDI key input.
	FUNCTION FUNCTION ——— Function mode is canceled.
	PK4095
A30TU Reset	When the CPU is reset by pressing the CPU RESET key, the A30TU is also reset, after which operation must be restarted from the initial display.

					Drawing No.							
Mode		Function			3-3							
	/hich are Always Valid											
When the system is operating, the disabled/enabled status of certain keys varies according to the operation in question. The keys shown below, however, are always valid. Used to cancel the current operation and return to a higher level screen. Although the "high-												
CAN		erally the previo	us screen, there	her level screen. Although are exceptions. This key	_							
Exampl	111010101		CAN	2 TEACH 6 SV 3 PROG. OPER	T E S T O . O N A T I O N T I N G							
ERROR RESET	Used for <u>error resets</u> .		,									
Exampl	e:		ERROR RESET	!EXECUTE ER	R. RES							
STOP	Used to stop servo op	eration.										
Exampl	e:		STOP	I DE STOP								
DATA	Used to switch from the When the current mode before proceeding to the This key input is ignored.	e is the test mod he data set mod	e, the test mode de.	cancel screen (5-2) will be	e displayed							
Exampl	e:		FUNCTION DATA	D DATA SETT 1 AX DATA 2 P. BLOCK 3 SUB FUNCT								
PROGRAM	2P. BLOCK 3SUB FUNCTION											
Exampl	e:		FUNCTION PROGRAM	P PROGRAM 1 READ / WR / D 2 SORT 3 COPY 4 A L L								

Drawing No.

Mode			Function	•					3-3.1
MONITO	be	sed to switch from the Then the current mode afore proceeding to the decuted.	e is the test i	mode,	the test mo	de cancel			
E	xample:				FUNCTION (MONT)		EED	P. V.	L u
TEST		sed to switch from th peration is being exe		ode to	the test m	ode. This	key input	t is ignore	ed when an
E	xample:					P C	CMD.		/LID MODE
DISABLE	ENABLE	The teaching box ke This disabled/enable and program modes key, etc.).	ed key statu	us doe	s not affect	monitor m	node oper		
EMG_ST	OP	Used to shut OFF the	he servo po	ower a	nd stop all	motion.			

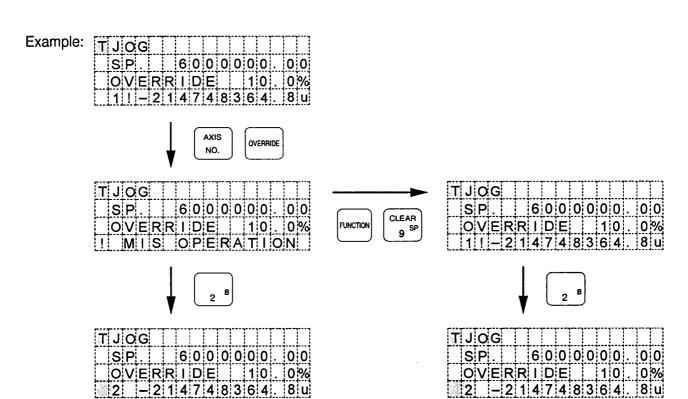
Mode	Function	3-4
		ł

Error Messages

An error message will be displayed at the bottom of the screen if an error occurs during system operation. If the buzzer setting is "ON", the buzzer will sound when the message is displayed.

After reading the error message, press the $\underline{\text{CLEAR}}$ key ($\underline{\text{FUNCTION}} + \underline{9}$) to delete the message from the screen. Although the message will be deleted, the error status must be reset by pressing $\underline{\text{ERROR RESET}}$ key.

If a key other than the <u>CLEAR</u> key is pressed while an error message is displayed, that key input will be valid.



Mode	Function	3-5

Display of Units

The units for address displays in each mode are displayed as follows.

Unit display examples

<µm: u>

T	J	0	G										
S									2				
О	V	Ε	R	R	ı	D							
							1	2	3	4	5	6	u

<nches: i>

T J												
SP						1	2	3		4	0	0
ΟV	ΕR	R	ı	D	Ε			1	0		0	%
11					1		2	3	4	5	6	

<Degrees: °>

T J		G											
SP							1	2	3		4	0	0
ΟV	Ε	R	R	ı	D	Ε			1	0		0	%
1						1		2	3	4	5	6	٥

<Pulses: P>

T	J	0	G											
S	Ρ								1	2	3	4	0	0
0	V	Ε	R	R	I	D	Ε			1	0		0	%
1								1	2	3	4	5	6	Р

4. STARTING THE SYSTEM

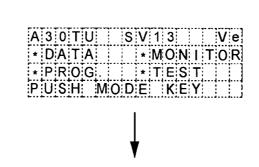
4.1 Selecting the Mode

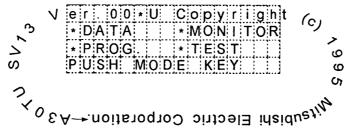
Drawing No.

Mode	Selecting The Mode	Function		4-1
			L	

Messages and Procedures at System Start

Message





The message at the top of the screen will continue to scroll from right to left until a mode key is pressed. Note: The OS version is displayed at the locations marked by an asterisk.

Operation Procedure & Explanations	Key Operation
Data set mode selection:	
DATA▶ Go to 7-1	DATA
Program mode selection:	PROGRAM
PROGRAM Go to 8-1	MONITOR
Monitor mode selection:	TEST
MONITOR Go to 6-2	
Test mode selection:	
Go to 5-1	The <u>FUNCTION</u> key must be pressed before pressing the mode key.
All key inputs except for the mode selection keys shown above, the <u>STOP</u> key, and the <u>ERROR RESET</u> key are ignored at this mode selection screen. If the A30TU has been installed at a system with an incompatible OS, the following will be displayed:	
CPUタイプ [*] カ [*] チカ [*] イマス (WRONG CPU TYPE)	

Mode Test mode	Function	Program operation		5-34
Program Operation Item Selection Screen) 			
Message			Key Operation	
T PROGRA 1SINGLE 2CONTIN 3RANDOM	1 RET	URN		
Operation Procedure	& Explana	tions	Precautions/Rema	rks
The program operation type is selected a			11000010/110/110	
The available types are as follows: indep	endent, con	tinuous, and random.		
Selecting "single operation":				
1 RETURN► Go to	5-35			
Selecting "continuous operation":				
2 RETURN► Go to	5-37			
Selecting "random operation":				
3 RETURN► Go to	5-39			
				·
When the No. of an item is keyed in	, that item N	lo. will be highlighted.		
Notes				

Mod	e Test mode	Function	Program operation (single	e operation)	5-35
Callir	ng the Designated Program				
Mess	age			Key Operation	
	T SINGLE PROG. NO		Cursor position	0 9	RETURN
	Operation Procedure	e & Explana	tions	Precautions/Rema	ırks
gran	keys 0 to 9 to designate the number on number range is 0 to 4095. Only the d. All other digits will be ignored.			In order to execute prograr a program must first be cre program mode.	n operation, eated in the
			t occurs, the displayed space to the left.	When this program call so played, the call program No at that time will be displaye fault.	o. registered
Ton	nake an input correction, press the Q	<u>:LEAR</u> key t	o delete the input field.		
Whe	en a program has been successfully execution START screen for that pro ▶ Go to 5-36	read out (by gram will be	pressing <u>RETURN</u> key), e displayed.	If no program exists, the err "IPROG. NOT FOUND" played.	ormessage will be dis-
Notes					

Mode	Test mode	Function	Program operation (single	e operation)	5-36
Progra	m Execution START Screen Oper	ation			
Messa	ge			Key Operation	
	T K 4 0 9 5 GO -> E CAN-> C	ANCEL		—GO	
	TK4095 EXECUTIN				
	Operation Procedur	e & Explana	tions	Precautions/Rema	ırks
of the	the <u>GO</u> key is pressed, "EXECUT designated program will begin. PLETED" is displayed when program returns to the program operation	ram execution	on is completed, and the		
Notes					

Mode	e Test mode	Function	Drogram aparation (april		Drawing No.
		Function	Program operation (contin	nuous operation)	5-37
	T/END Program No. Set				
Messa	age			Key Operation	
	T CONTINU REPEAT N START END		OPE 1 0 0 Cursor position	0 9 —(1 CLEAR	RETURN
	Operation Procedure	& Explana	tions	Precautions/Rema	arks
nate The r "0" is The 5 most		START and th endless of ange is 0 to for the repe program No ime an inpu	I END program numbers. operation occurring when 4095. eat count entry, and the 4	To execute continuous op programs must first be creprogram mode. The STAI No. and END program No. must be as follows: [START No.] <= [END No.	eated in the RT program relationship
the converse when the converse to the converse	4095 5 956 6 ake an input correction, press the Cursor position. In this screen is first displayed after secount will be displayed as "1", and bowill be displayed as the minimum number of the cursor will be positioned at the right that the RETURN key is pressed, the december of the RETURN key is pressed at the december of the RETURN key is pressed at the december of the RETURN key is pressed at the december of the RETURN key is pressed at the december of the RETURN key is pressed at the december of the december of the RETURN key is pressed at the december of the RETURN key is pressed at the december of the RETURN key is pressed at the december of the RETURN key is pressed at the december of the RETURN key is pressed at the december of the RETURN key is pressed at the december of the RETURN key is pressed at the december of the RETURN key is pressed at the december of the RETURN key is pressed at the december of the RETURN key is pressed at the december of the RETURN key is pressed at the december of the RETURN key is pressed at the december of the RETURN key is pressed at the december of the RETURN key is pressed at the december of the RETURN key is pressed at the december of the RETURN key is pressed at the december of the RETURN key is pressed at the december of the RETURN key is pressed, t	electing conth the STAR mbers possight-most dig cursor moves the 1 key e END No. I nated in the or message g program i	tinuous operation, the re- T and END program num- ible for continuous opera- git of the repeat count val- es to the lower input field, to move the cursor back field, a check will be con- e START No. to END No.		
Notes					

					Drawing No.
Mod	e Test mode	Function	Program operation (conti	nuous operation)	5-38
Exec	uting Continuous Operation				
Mess	age			Key Operation	
	TK 20 - K REPEAT NC GO ->EXE CAN->CAN T CONTINUC REPEAT EXECUTE END	US OP	1 0	—GO	
	Operation Proced	ure & Explana	ations	Precautions/Rem	arks
disp nate The play Whe the	en the <u>GQ</u> key is pressed, the "exelayed, and the designated program de count is reached. Program number being executed value. A running count occurs at this en the designated count is reached message "COMPLETED" will be only the continuous program operation of a continuous program operation.	n range will be will be indicate s line until the and continuous displayed. Who Program N	e repeated until the designed at the "EXECUTE" dis- END number is reached. us operation is completed, then this occurs, press the o. Set" screen (5-37).	Continuous operation without end if the repeat or nated as "0". In this case, to must be pressed to end the state of the s	ount is desig- he <u>STOP</u> key
Notes					

Mod	le Test mode	Function	Program operation (rando	om operation)	5-39
Rand	dom Operation Program No. Designa	ution			
Mes	sage			Key Operation	
	T RANDOM OF PROGRAM 1 PROGRAM 2 PROGRAM 3		Cursor position	0 9 F	RETURN
	Operation Procedure	e & Explana	tions	Precautions/Rema	ırks
Whe the will The tom Scre Ente to re duc The usin		designation of No.3 will put field. he RETURN is also possi No. range 1 xecution, an URN key is s, and if it co to digits ente	key is pressed at the botble using the 1, ↓ keys. to 30. d press the RETURN key pressed, a check is conan be executed.	In order to execute program the programs must first be the program mode. Random operation is possi 30 programs. Be sure to programs in an unbroken ginning from program 1. (space) status exists at so the program Nos., the subs gram Nos. will not be executed.	ble for up to register the series, be- If a CLEAR ome point in sequent pro-
the Prog 30 p field	nake an input correction, press the Coursor position. gram registration for the random oper program Nos. are registered, or when the creating a space. The "repeat count prement between input fields: Use the 1, 1 keys for 30 range. The display pressed at the program	ration is end the <u>CLEAR</u> input" screen or movement will scroll a in 1 position, ey is pressec	ed when the maximum of key is pressed at an input		
Notes					

							Drawing No.
Mode T	est mode	Fi	unction	Program operation ((randor	n operation)	5-40
Random (Operation Repeat (Count Designation	n	<u> </u>			
Message					1	Key Operation	
	PROG.	OM OPE NO. T NO.	1	Cursor position		0 9 - [I	RETURN
	Operat	ion Procedure &	Explana	tions		Precautions/Rem	arks
ignated a The repe peated w When the	at the above screer at count range is 0 rithout end.	n. to 65535. If "0" i	s design	ograms (30 or less) is a ated, operation will be a operation START sci	oe re-		
Notes							

					Drawing No.
Mode	Test mode	Function	Program operation (rande	om operation)	5-41
Randor	m Operation Execute				
Messag	ge			Key Operation	
	T PROG. NO. REPEAT NO. GO ->EXE CAN->CAN GO T RANDOM O REPEAT PROG. NO.	CUTE		—GO	
	Operation Procedu	re & Explana	tions	Precautions/Rem	arks
played count in The prodisplay When this octoor To encorrect at the Howev program.	the GO key is pressed, the "exect, and the designated program rangis reached." regram number being executed wy line. the designated count is reached, "curs, press the CAN key to change reen" (5-39). It a random program operation wham Nos. designated for the random "program No. registration" screen ver, the random operation will only m No. range which begins with progration will be executed up to	ge will be reprilified in discardadors in progress of program open (5-24). By be executed ogram 1 and the regram 1 and the re	eated until the designated at the "EXECUTE NO." D" will be displayed. When om operation program No. es, press the <u>STOP</u> key. eration must be registered ed through a consecutive is uninterrupted. In other	If a repeat count of "0" is operation will be repeated In this case, the STOP Is pressed to stop the operation will be executed from 1 to program 2. Program 1 10 Program 2 20 Program 2 20 Program 3 CLEAR Program 4 40 Program 5 45	without end. key must be tion. are designated arandom op-
Notes					

Mod	e Test mode	Function	Present value set		5-42
Item	Selection Screen Operation for Pres	ent Value S	et		
Mess	age			Key Operation	
	T P. VAL S 1 ZERO RE 2 P. VAL C	1 RETURN			
	Operation Procedure	& Explanal	tions	Precautions/Rema	rks
The lecte	present value setting type ("zero retu d at this screen.	ırn" or "pres	ent value change") is se-		
Sele	cting "zero return":				
[1 RETURN▶ Go to	5-43			
Sele	cting "present value change":				
[2 RETURN Go to	5-44			
					·
					į
— Т	When the number of an item is keye	d in that its	om No will be highlighted		
	when the humber of an item is keye	u in, that he	an No. will be nighlighted.		
Notes					
ž					

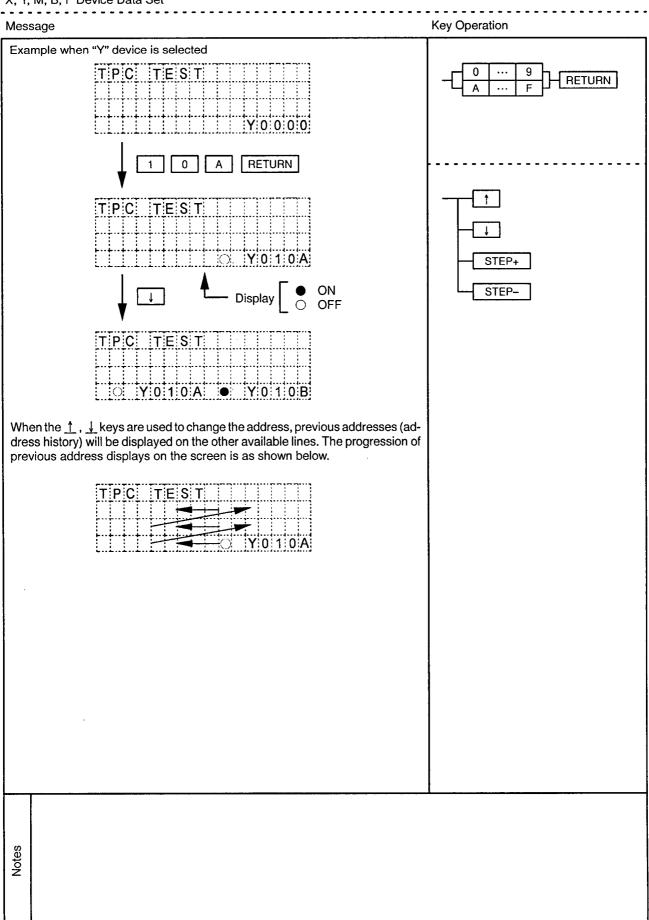
		Drawing No.
Mode Test mode	Function Present value set (zero r	return) 5-43
Home Position Return Screen		
Message	Key O _l	peration
T ZERO RETURN AX. 11 GO -> START	The axis No. is high-lighted when the servo ON status is established. When axis No. is a 2-digit value	AXIS NO. 1 RETURN 3 2 GO STOP
Operation Proced	lure & Explanations	Precautions/Remarks
Return operation instructions are also When "zero return" is designated at the screen, the axis number displayed here. Changing the axis: AXIS NO. After pressing the AXIS NO. key, design return is desired, then press the RETU. The range of axis Nos. which can be only type being used. For A273UHCPU (8-axis specs.) For A171SCPU START: GO Press the GO key to exect displayed axis No. "EXI	ne "item selection for present value set" re will be "1". JRN gnate the axis No. where a home position URN key. designated varies according to the CPU 1 to 8 axes 1 to 32 axes 1 to 4 axes ecute a home position return for the ECUTING" is displayed during the peration, and "COMPLETED" is dis-	If an axis No. outside the ranges shown at left is designated (by <u>RETURN</u> key),
STOP: STOP Press the STOP k operation which is	key to stop a home position return in progress.	
Notes		

						Drawing No
Mode	Test mode	Function	Present value se	t (presen	t value change)	5-44
Presen	t Value Change Screen					
Messa	ge			Key Op	eration	
	P. VAL CHAN AX. 11 -21474836 AX. 10	lighted vo ON lished u	exis No. is high- d when the ser- I status is estab- axis No. is git value		AXIS NO. 1 3 2 0 9 RETUR	RETURN
·	Operation F	Procedure & Explana	ations		Precautions/Rem	arks
When value The protioned Change After prochange The rative be For For Enterior Enterior be changed as the change of the change o	resent value which is to be "present value change" is set" screen, axis 1 data we resent value for the display beneath this value where ging the axis: AXIS NO. The pressing the AXIS NO. key be is desired, then press the result of axis Nos. which can be respectively and the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the red as the new (change) value of the red as the	s designated at the fill be displayed here red axis No. is indicate the new value is to RETURN A, designate the axis ne RETURN key. In to 8 axes In to 32 axes In to 4 axes In the RETURN key. In the RETURN key. In the designated value.	The present value ve, press the CLEAFly the 12 most rece	is posi- is value ne CPU will then key to nt digits	If an axis No. outside the rat left is designated (by Rithe error message "! M TION" will be displayed at the screen, and the axis N changed.	ETURN key) IIS OPERA the bottom o
Notes						

Mod	e Test mod	ie	Function	PC test		5-45
Oper	ation at Dev	ice Selection Screen for I	PC Test			
Mess	sage				Key Operation	
		T PC TEST 1 X 4 B 2 Y 5 F 3 M 6 D	7 W 8 T 9 C		1 RETURN 9	
		Operation Procedure	& Explanat	tions	Precautions/Rema	rks
Sele	ct the device	Y 2 RE M 3 RE B 4 RE F 5 RE D 6 RE W 7 RE T 8 RE	TURN TURN TURN TURN TURN TURN TURN		The device No. setting rang cording to the CPU type be a device No. outside the range is designated, the sage "! SETTING ERRO displayed at the bottom of and the device No. will cepted.	ing used. If applicable error mes- DR." will be the screen,
Notes						

.		F	DC toot	F 40
Mode	lest mode	Function	PC test	5-46
L		<u> </u>		L

X, Y, M, B, F Device Data Set

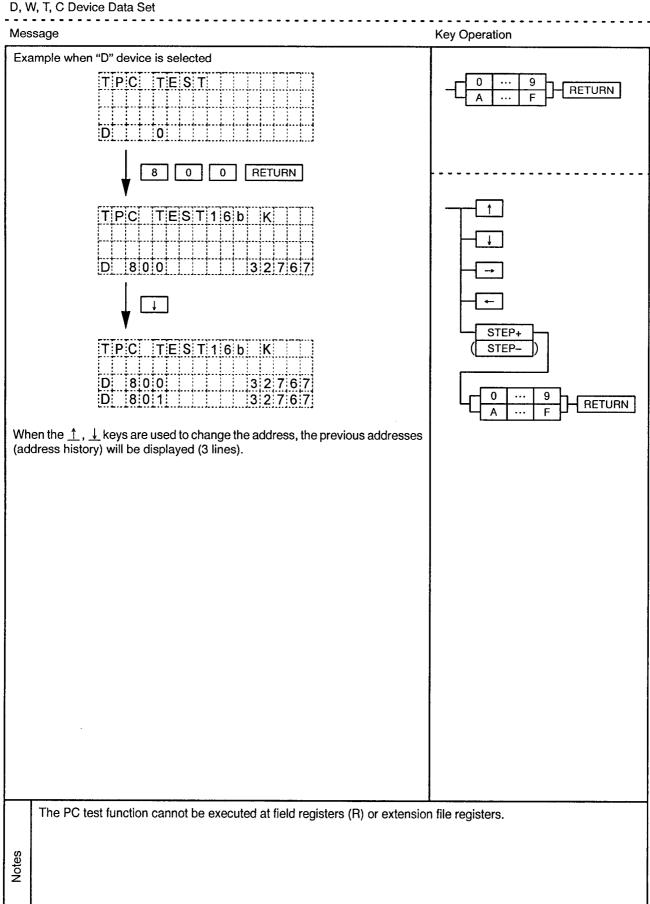


Mode	Test mode	Function	PC test	5-46.1
		L	L	

X, Y, M, B, F Device Data Set

Operation Procedure & Explanations	Precautions/Remarks
After selecting an X, Y, M, B, F device and entering its address, the displayed address can be switched ON and OFF.	
Entering the device address:	
0 9 RETURN	
A hexadecimal address is entered for X, Y, B devices, and a decimaladdress is entered for M, F devices.	
Displaying the previous device address:	
Press the 1 to display the previous device address. If positioned at the first address, the last address will be displayed.	
Displaying the next device address:	
Press the ↓ to display the next device address. If positioned at the last device address, the first device address will be displayed.	
Switching the device ON:	
STEP+ • will be displayed.	
Switching the device OFF:	
STEP- O will be displayed.	
ω	
Notes	

Mode	Test mode	Function	PC test	5-47
		L		i



Mode	Test mode	Function	PC test	5-47.1

D, W, T, C Device Data Set

After selecting a D, W, T, C device and entering its address, a setting value can be designated for the displayed address. Entering the device address: A hexadecimal address is entered for the W device, and a decimaladdress is entered for D, T, C devices. Displaying the previous device address: Press the 1 to display the previous device address. If positioned at the first address, the list address will be displayed. Displaying the next device address: Press the 1 to display the next device address. If positioned at the last device address, the first device address will be displayed. Displaying the next device address: Press the 1 to display the next device address will be displayed. 16/32-bit switching: Press the 1 to display the next device address will also be changed according to the 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed address display format. 16/32-bit switching willoccur at the top of the screen. The currently displayed address will also be changed address display format. When a decimal and hexadecimal format is selected. The is displayed. Enter the setting value: Press the 1 to displayed. Enter the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.									
Entering the device address: □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □		Operation Procedure & Explanations	Precautions/Remarks						
A hexadecimal address is entered for the W device, and a decimaladdress is entered for D, T, C devices. Displaying the previous device address: Press the 1 to display the previous device address. If positioned at the first address, the last address will be displayed. Displaying the next device address: Press the 1 to display the next device address will be displayed. Displaying the next device address, the first device address will be displayed. Press the 1 to display the next device address will be displayed. Press the 2 key to switch between a 16-bit and 32-bit address display format. 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed according to the 16/32-bit switching which occurs. Decimal/hexadecimal switching: Press the 2 key to switch between a decimal and hexadecimal address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal format is selected, "It is displayed at the top of the screen. When a hexadecimal format is selected, "It is displayed at the top of the screen. When a hexadecimal format is selected, "It is displayed at the top of the screen. When a hexadecimal format is selected, "It is displayed at the top of the screen. When a hexadecimal format is selected, "It is displayed at the top of the screen. When a hexadecimal format is selected, "It is displayed at the top of the screen. When a hexadecimal format is selected, "It is displayed at the top of the screen. When a hexadecimal format is selected, "It is displayed at the top of the screen. When a hexadecimal format is selected, "It is displayed at the top of the screen." When the STEP+ key is pressed, the cursor will appear at the bottom right of the screen for the setting value in put. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.									
A hexadecimal address is entered for the W device, and a decimaladdress is entered for D, T, C devices. Displaying the previous device address: Press the 1 to display the previous device address. If positioned at the first address, the last address will be displayed. Displaying the next device address: Press the 1 to display the next device address. If positioned at the last device address, the first device address will be displayed. 16/32-bit switching: Press the 2 key to switch between a 16-bit and 32-bit address display format. 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed according to the 16/32-bit switching which occurs. Decimal/hexadecimal switching: Press the 2 key to switch between a decimal and hexadecimal address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed. Enter the setting value: STEP+ (a) 9 RETURN When the STEP+ key is pressed, the cursor will appear at the bottom right of the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	Entering the	Entering the device address:							
entered for D, T, C devices. Displaying the previous device address: ☐ Press the _1 to display the previous device address. If positioned at the first address, the last address will be displayed. Displaying the next device address: ☐ Press the _1 to display the next device address. If positioned at the last device address, the first device address will be displayed. 16/32-bit switching: ☐ Press the _2 key to switch between a 16-bit and 32-bit address display format. 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed according to the 16/32-bit switching which occurs. Decimal/hexadecimal switching: ☐ Press the _2 key to switch between a decimal and hexadecimal address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed. Enter the setting value: ☐ STEP+ ☐ A F PRETURN When the STEP+ key is pressed, the cursor will appear at the bottom right of the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	0 A	9 F RETURN							
Press the 1 to display the previous device address. If positioned at the first address, the last address will be displayed. Displaying the next device address: Press the 1 to display the next device address. If positioned at the last device address, the first device address will be displayed. 16/32-bit switching: Press the 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed according to the 16/32-bit switching which occurs. Decimal/hexadecimal switching: Press the 16/32-bit switching which occurs. Press the 16/32-bit switching which occurs. Decimal/hexadecimal switching: Press the 16/32-bit switching which occurs. Press the 16/32-bit and 32-bit address will also be changed according to which in the special format is fixed. (16/32-bit and decimal/hexadecimal switching is ignored.) Moreover, only decimal format is fixed. (16/32-bit and decimal/hexadecimal switching is ignored.) Moreover, only decimal format is fixed. (16/32-bit and decimal/hexadecimal switching which occurs. Press the 16/32-bit and 32-bit address will also be changed according to which occurs. Press the 16/32-bit and 32-bit and 32-bit address will also be changed according to which									
tioned at the first address, the last address will be displayed. Displaying the next device address: Press the to display the next device address. If positioned at the last device address, the first device address will be displayed. 16/32-bit switching: Press the key to switch between a 16-bit and 32-bit address display format. 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed according to the 16/32-bit switching which occurs. Decimal/hexadecimal switching: Press the key to switch between a decimal and hexadecimal address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed. Enter the setting value: STEP+ To my Tand C devices, the 16-bit, decimal format is fixed. (16/32-bit and decimal/hexadecimal switching is ignored.) Moreover, only decimal inputs (0 to 9) are possible at these devices. For the T and C devices, the 16-bit, decimal format is fixed. (16/32-bit and decimal/hexadecimal switching is ignored.) Moreover, only decimal inputs (0 to 9) are possible at these devices. Enter the setting value: STEP+ STEP- Nem To my Tand C devices, the 16-bit, decimal format is fixed. (16/32-bit and decimal/hexadecimal inputs (0 to 9) are possible at these devices. When the STEP₂ key is pressed, the cursor will appear at the bottom right of the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	Displaying th	ne previous device address:							
Press the the last device address, the first device address will be displayed. 16/32-bit switching: Press the key to switch between a 16-bit and 32-bit address display format. 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed according to the 16/32-bit switching which occurs. Decimal/hexadecimal switching: Press the key to switch between a decimal and hexadecimal address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed. Enter the setting value: STEP+ A RETURN When the STEP+ key is pressed, the cursor will appear at the bottom right of the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	↑ ↑								
the last device address, the first device address will be displayed. 16/32-bit switching: Press the — key to switch between a 16-bit and 32-bit address display format. 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed according to the 16/32-bit switching which occurs. Decimal/hexadecimal switching: Press the — key to switch between a decimal and hexadecimal address display format. When a decimal format is selected, "t" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed. Enter the setting value: STEP+ O PRETURN When the STEP+ key is pressed, the cursor will appear at the bottom right of the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	Displaying th	ne next device address:							
Press the → key to switch between a 16-bit and 32-bit address display format. 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed according to the 16/32-bit switching which occurs. Decimal/hexadecimal switching: Press the → key to switch between a decimal and hexadecimal address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed. Enter the setting value: STEP+ key is pressed, the cursor will appear at the bottom right of the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	1	the last device address, the first device address will be dis-							
display format. 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed according to the 16/32-bit switching which occurs. Decimal/hexadecimal switching: Press the + key to switch between a decimal and hexadecimal address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed. Enter the setting value: STEP+	16/32-bit sw	itching:							
Decimal/hexadecimal switching: Press the — key to switch between a decimal and hexadecimal address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed. Enter the setting value: STEP+ STEP+ A F When the STEP+ key is pressed, the cursor will appear at the bottom right of the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	→	display format. 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed	decimal format is fixed. (16/32-bit and decimal/hexadecimal switching is ignored.) Moreover, only decimal inputs						
address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed. Enter the setting value: STEP+ STEP- A F When the STEP+ key is pressed, the cursor will appear at the bottom right of the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	Decimal/hex	adecimal switching:							
When the STEP+ key is pressed, the cursor will appear at the bottom right of the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	-	address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal for-							
When the STEP+ key is pressed, the cursor will appear at the bottom right of the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	Enter the se	tting value:							
the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	J	 							
Notes	the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the								
Notes									
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l Company of the Comp									

Mode	Test mode	Function	Servo ON		5-48
Servo (DN/OFF Function Selection Screen	n Operation			
Messa	је			Key Operation	
	T SERVO C 1ALL AX. 2EACH AX	ON / (OFF	1 RETURN	
	Operation Procedure	a P. Evolope	tiono.	Precautions/Rema	ul so
Select	the desired ON/OFF function as for		uon5	Frecautions/hema	rks
	es servo ON/OFF:	,o.,.			
I —		5-49			
Individ	ual axis servo ON/OFF:	70 40			
l _		5-50			
Notes					

	1	<u>1</u>		Drawing No
Mode	Test mode	Function	All-axes servo ON	5-49
All-Axe	s Servo ON/OFF Execute Scre	en		
Messag	де			Key Operation
	T ALL AX. ON ALL AX. SERV REQUEST (M200	O ON ACP. 9) ○-►	For A171SCPU and A273UHCPU (8-axis specs.) For A273UHCPU (32-axis specs.)	STEP+ STEP-
	Operation Proced	lure & Explana	tions	Precautions/Remarks
All-axe	es servo ON: STEP+ • is displayed at sets servo OFF: STEP- • is displayed at sets servo OFF:			The device No. display varies according to the CPU type being used.
Notes				

Mode Test mode	Function	Individual servo ON		5-50
Individual Servo ON/OFF E	xecute Screen			<u> </u>
Message			Key Operation	
For A273UHCPU	EACH AX ON 1 AX (M161 2 AX (M165 4 AX (M167 7 AX (X000 0 1 AX (X000 1 3 AX (X000 2	5) O	STEP+	_
(8-axis specs.)	4 A X . (X 0 0 3 5 A X . (X 0 0 4 6 A X . (X 0 0 5 7 A X . (X 0 0 6 8 A X . (X 0 0 7 E A C H A X . N O 1 A X . (M 2 4 1	F) 0 F) 0 F) 0 F) 0		
For A273UHCPU (32-axis specs.)	2 A X . (M2 4 3 3 A X . (M2 4 5 4 A X . (M2 4 7 2 9 A X . (M2 9 7 3 0 A X . (M2 9 9 3 1 A X . (M3 0 1 3 2 A X . (M3 0 3	5)		
·	ation Procedure & Explana	ations	Precautions/Rem	
Press the 1 Switching the servo ON a	key to move the "#" mark key to move the "#" mark t a given axis: the "#" mark to the axis whed ON, then press the S	k upward. here the servo is to be	The device No. display ving to the CPU type being	
	the "#" mark to the axis whed OFF, then press the <u>S</u>			
Notes	, a sa 17 - 17 - 17 - 17 - 17 - 17 - 17 - 17			

Drawing No.

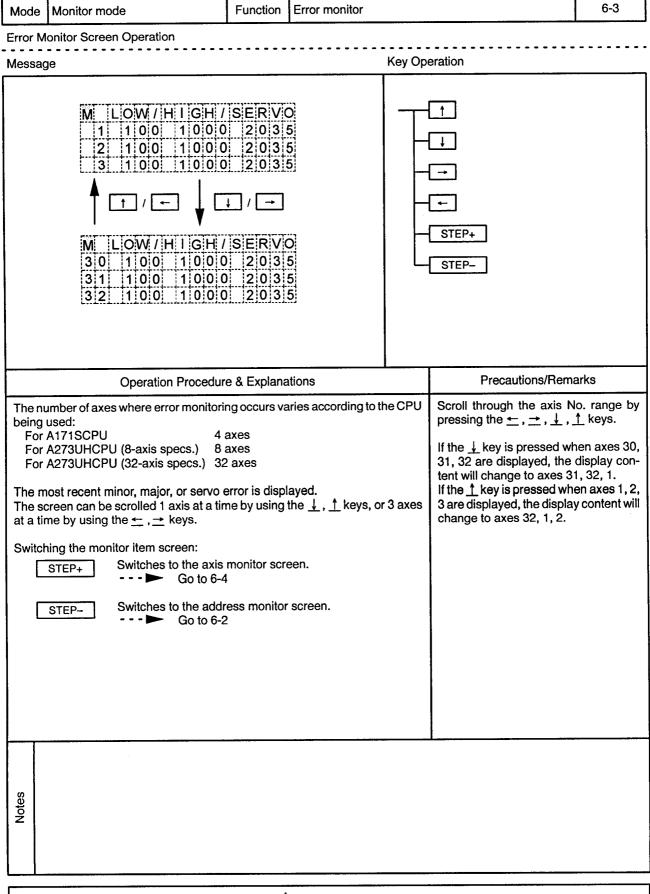
 Mode
 Monitor mode
 Function
 Monitor item selection
 6-1

Monitor Item Screen Switching

Precautions/Remarks Operation Procedure & Explanations The type of monitoring can be selected at the monitor item selection screen. Moreover, the STEP+ and STEP- keys can be used to switch from one monitor item screen to another. The screen switching progression in response to STEP+ and STEP- key operation is shown below. STEP-STEP+ The address monitor screen is the first Address monitor screen screen to be displayed when the monitor mode is accessed. STEP-STEP+ Scroll monitor screen (error) Error monitor screen STEP-STEP-STEP+ STEP+ Scroll monitor screen Axis monitor screen (program) STEP-STEP+ STEP+ STEP-Common monitor screen Servo monitor screen STEP+ STEP-STEP+ STEP-Specified monitor screen Torque trace screen STEP+ STEP-Notes

Drawing No.

		,		·····		Drawing No.
Mode	Monitor mode	Function	Address (feed pr	esent va	ulue) monitor	6-2
Addres	Address (Feed Present Value) Monitor Screen Operation					
Messa	ge			Key Op	peration	
	M FEED P. VA 1 -2147483 2 -2147483 3 -2147483 M FEED P. VA 3 0 -2147483 3 1 -2147483 3 2 -2147483 The axis No. is h status.	6 4 . 8 i 6 4 . 8 i			- ↑	
	Operation Procedure	e & Explana	tions		Precautions/Rema	arks
ing to For For The sc at a tir	umber of axes where feed present v the CPU being used: A171SCPU 4 a A273UHCPU (8-axis specs.) 8 a	alue monitor axes axes axes ne by using t monitor scre	ring occurs varies a he ↓, ↑ keys, or een.		Scroll through the axis N pressing the ←, →, ↑, If the ↓ key is pressed wh 31, 32 are displayed, the tent will change to axes 31 if the ↑ key is pressed whe 3 are displayed, the display change to axes 32, 1, 2.	o. range by ↓ keys. nen axes 30, display con- 1, 32, 1. en axes 1, 2,
Notes						



↑ CAUTION

⚠ If an error occurs, check the error contents and remedy the error as described in this manual. Some errors can result in unpredicted machine movements.

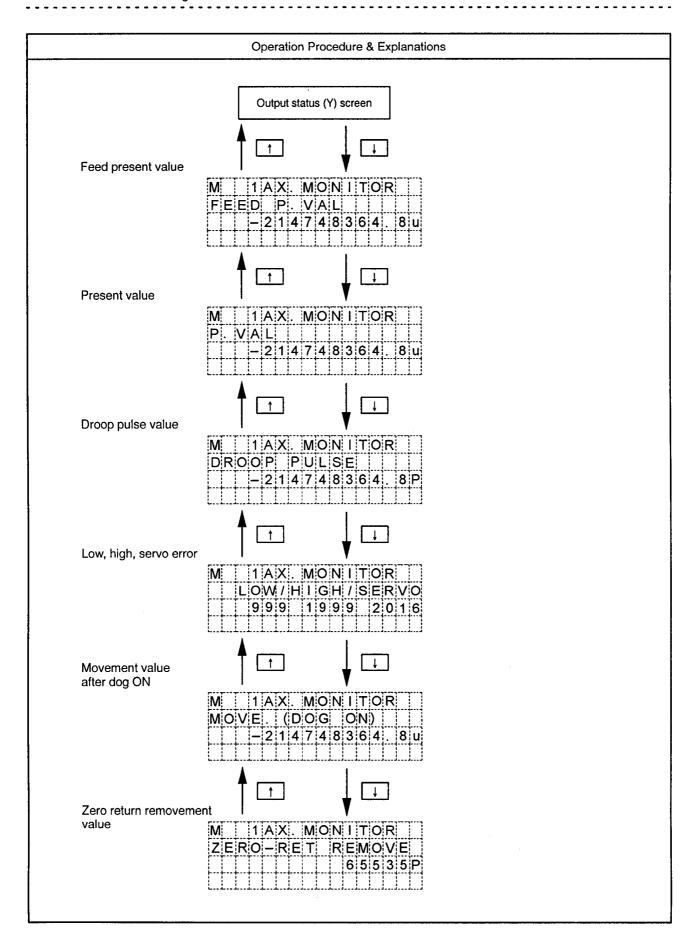
6.3	Axis Monitor					Drawing No.
Mod	de Monitor mode	Function	Axis monitor	- <u>-</u>		6-4
Axis	Monitor Screen Operation					
Mes	sage			Key Op	eration	
	M 3 2 A X . MON I FEED P. VAL - 2 1 4 7 4 8 3 M 3 2 A X . MON I P. VAL - 2 1 4 7 4 8 3	6 4 . 8 i			AXIS NO. 1 3 2 1 STEP+ STEP-	RETURN
	Operation Procedure	& Explana	tions	I	Precautions/Rema	ırks
F F		xes xes axes	-		The scrolling sequence items is shown below. Presto scroll downward, and the scroll upward. Feed present value Present value Droop pulse value Low, high, servo error Movement value after do Zero return removement Execution program No. M-code & torque restrict Movement value change Present value at STOP i Change value of present Speed change value JOG speed setting value Input status Output status External signal CHANGE torque limit control	es the ↓ key he ↑ key to he ↑
Notes						

Mode	Monitor mode	Function	Axis monitor	6-4.1
		İ	I	I

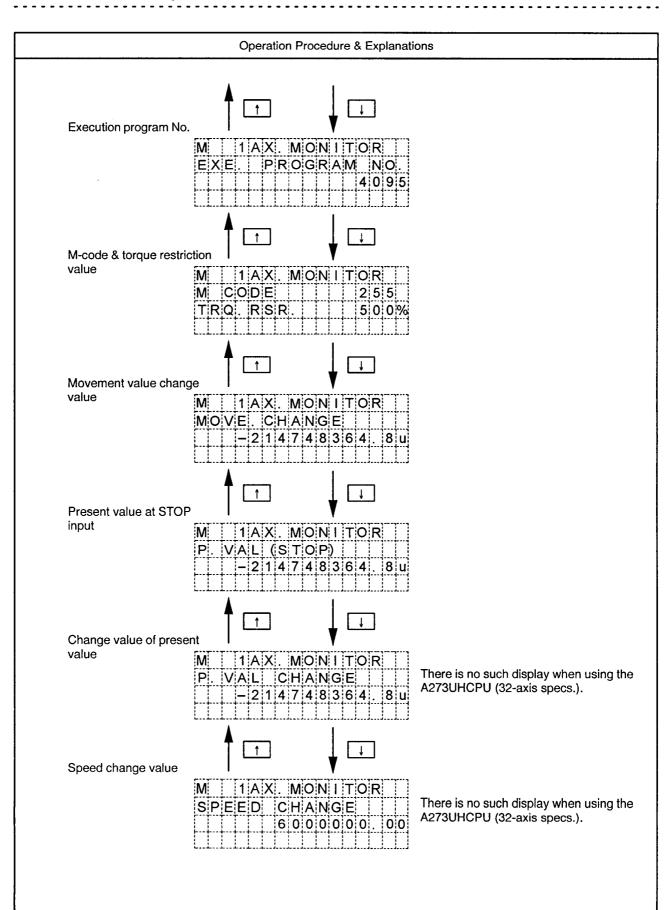
Axis Monitor Screen Operation

Operation Procedure & Explanations Precautions/Remarks If an axis No. outside the applicable Changing the monitored axis: range (monitoring impossible) is designated by a <u>RETURN</u> key input, the er-AXIS NO. RETURN ror message "! MIS OPERATION" will be displayed at the bottom of the screen, and the displayed axis No. will Press the AXIS NO. key, enter the axis No. where monitoring is desired, then not be changed. press the RETURN key. The monitor item will remain the same, but the monitored axis will be changed. Changing the monitor item: Press the STEP+ key to switch to the common monitor STEP+ screen. ---Go to 6-6 Press the STEP- key to switch to the error monitor STEPscreen. Go to 6-3

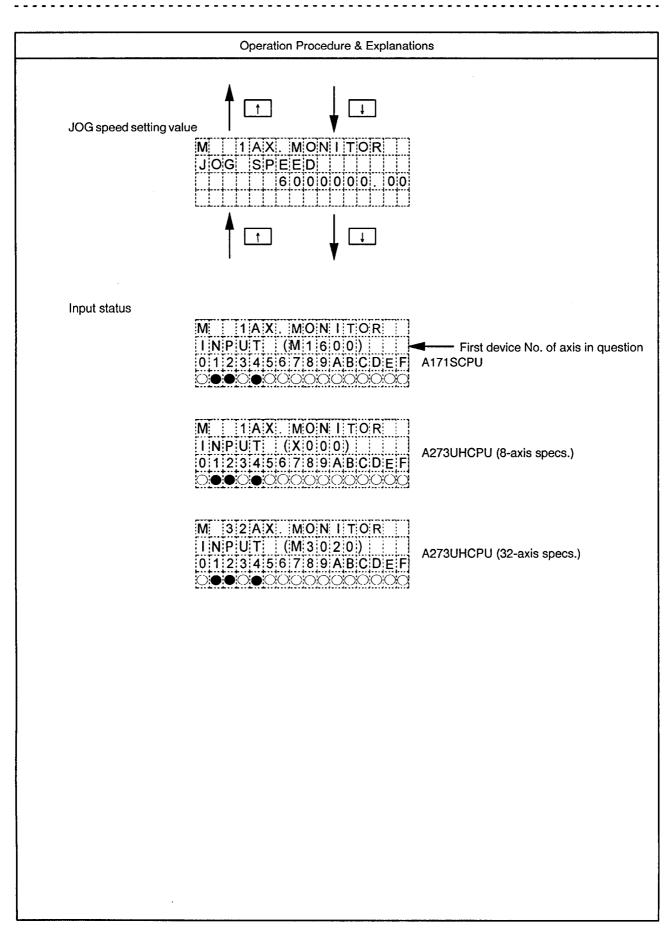
Mode Monitor mode Function Axis monitor 6-4.2	
---	--



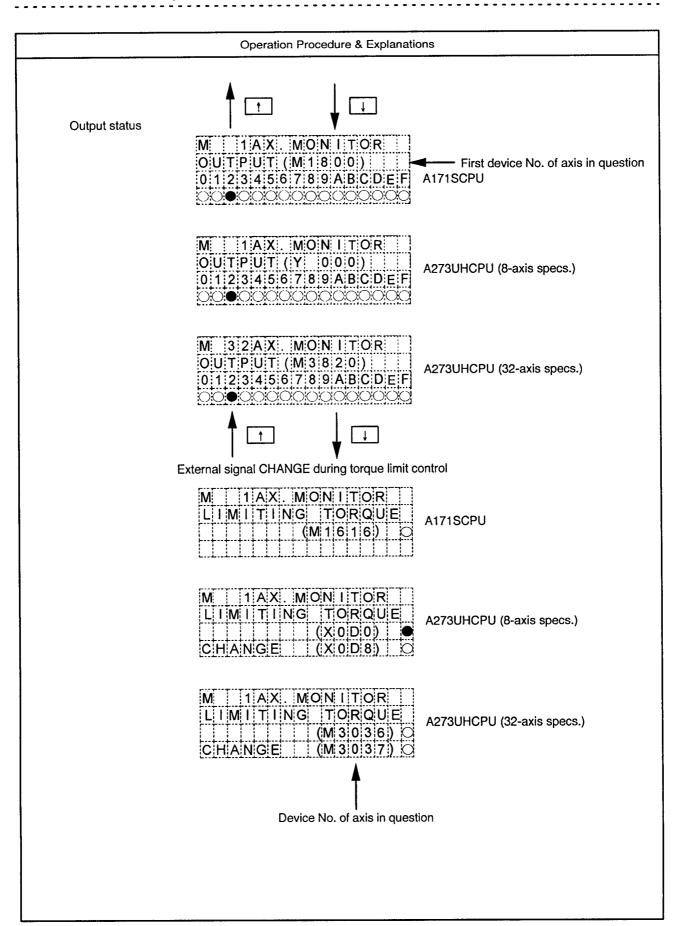
Mode Monitor mode Function Axis monitor	6-4.3
---	-------



Mode Monitor mode Function Axis monitor	6-4.4

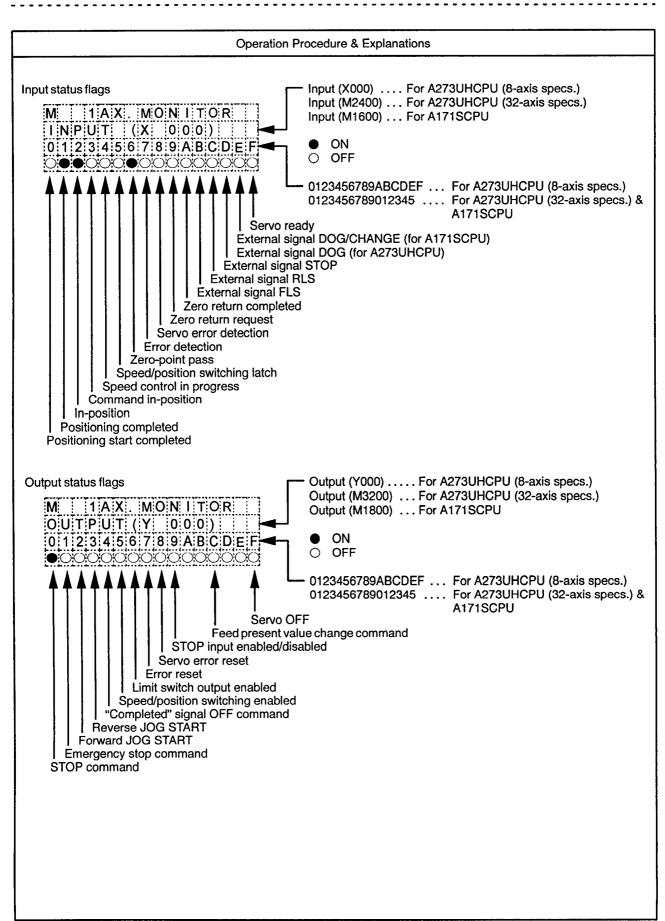


Mode	Monitor mode	Function	Axis monitor	6-4.5



Mode	Monitor mode	Function	Axis monitor	6-5
Mode	Monitor mode	Function	Axis monitor	6-5

Input Status & Output Status Flags



Notes

Mode	Monitor mode	Function	Common monitor	6-6.1
	<u> </u>			

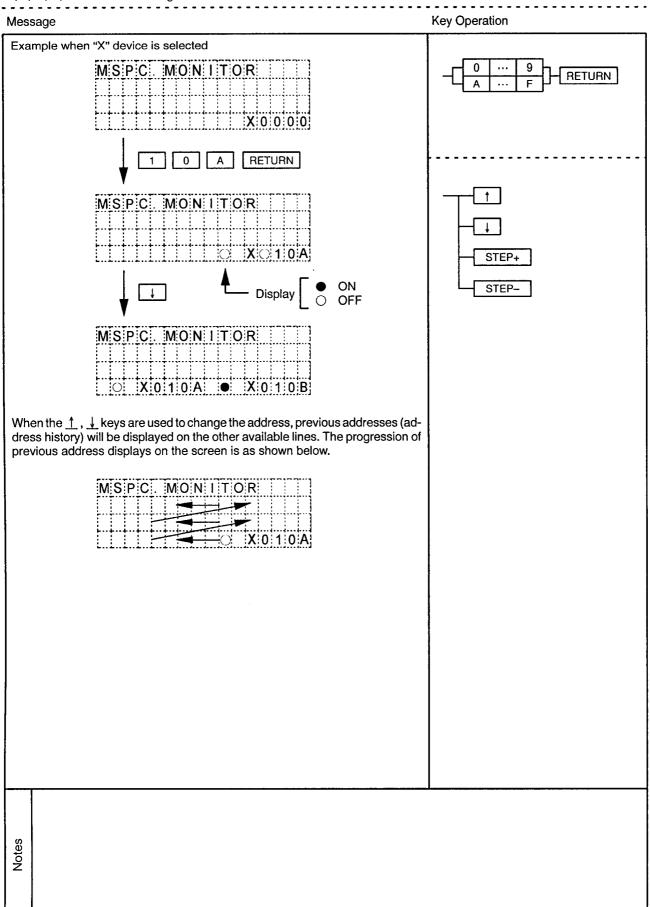
Common Monitor Screen Operation

	Operation Procedure & Explanations	Precautions/Remarks
Use the ↓, ↑ ke flag ON/OFF mor	A A273UHCPU (8-axis specs.) Bys to switch between the 2 common monitor screens. START itoring occurs at screen 1, and PC READY, all-axes servo ON all-axes servo ON request ON/OFF monitoring occurs at	The device No. display varies according to the CPU type being used.
START accept fla 1, and the START at screen 2. The PC READY,	l (32-axis specs.) eys to switch between the 3 common monitor screens. The ag ON/OFF statuses for axes 1 to 16 are monitored at screen accept flag ON/OFF statuses for axes 17 to 32 are monitored all-axes servo ON accept flag, and all-axes servo ON request a are monitored at screen 3.	
Changing the mo	onitor item:	
STEP+	Press the <u>STEP+</u> key to switch to the specified monitor screen. Go to 6-7	
STEP-	Press the <u>STEP</u> key to switch to the axis monitor screen. Go to 6-4	
:		
·		<u> </u>
Notes		

Mode	Monitor mode	Function	Specified monitor		6-7
Operat	tion at Specified Monitor Device S	election Scre	een		
Messa	ge			Key Operation	
	MSPC. MON 17 1 X 4 B 2 2 Y 5 F 3 M 6 D	OR 7 W 8 T 9 C		1 RETURN	
	Operation Procedu	e & Explana	ations	Precautions/Rema	ırks
E	Y 2 F Bit data M 3 F B 4 F F 5 F D 6 F W 7 F W 7 F	RETURN RETURN RETURN RETURN RETURN RETURN RETURN RETURN		The device No. setting rang cording to the CPU type be a device No. outside the range is designated, the sage "! SETTING ERR be displayed at the bott screen, and the device No accepted.	ing used. If applicable error mes- ROR " will tom of the
Notes					

Mode	Monitor mode	Function	Specified monitor	6-8

X, Y, M, B, F Device Monitoring



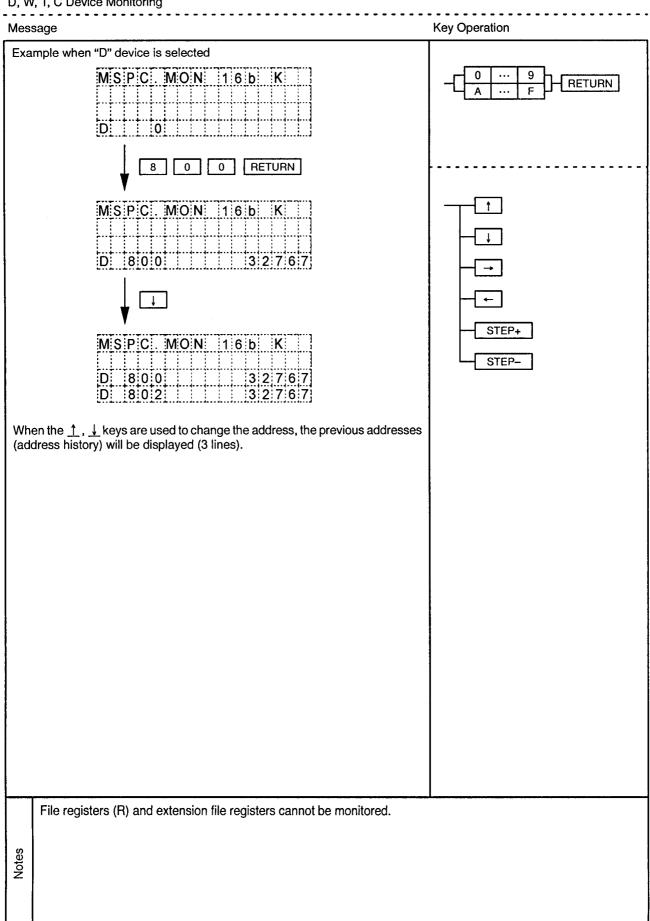
Mode M	Nonitor mode	Function	Specified monitor	6-8.1
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X, Y, M, B, F Device Monitoring

Operation Procedure & Explanations	Precautions/Remarks
After selecting an X, Y, M, B, F device and entering its address, the ON/OFF status of the address can be monitored.	
Entering the device address:	
0 9 A F RETURN	
A hexadecimal address is entered for X, Y, B devices, and a decimaladdress is entered for M, F devices.	
Monitoring the previous device address:	
Press the † to monitor the previous device address. If positioned at the first address, the last address (address of highest device No.) will be monitored.	
Monitoring the next device address:	
Press the \(\frac{1}{2}\) to monitor the next device address. If positioned at the last device address (address of highest device No.), the first device address will be monitored.	
Changing the monitor item:	
STEP+ Press the STEP+ key to switch to the torque trace screen. Go to 6-10	
STEP- Press the <u>STEP</u> - key to switch to the common monitor screen ■ Go to 6-6	
Notes	
2	

	and the second s				
Mode	Monitor mode	Function	Specified monitor	6-9	

D, W, T, C Device Monitoring



Mode	Monitor mode	Function	Specified monitor	6-9.1
			L '	

D, W, T, C Device Monitoring

Operation Procedure & Explanations	Precautions/Remarks
After selecting the device type (D, W, T, C) and entering the device address, the device data will be monitored.	
Entering the device address:	
O 9 RETURN	
A hexadecimal address is entered for W devices, and a decimal address is entered for D, T, C devices.	
Monitoring the previous device address:	
Press the <u>1</u> to monitor the previous device address. If positioned at the first address, the last address will be monitored.	
Monitoring the next device address:	
Press the <u>\(\price \)</u> to monitor the next device address. If positioned at the last device address, the first device address will be monitored.	
16/32-bit switching:	
Press the → key to switch between a 16-bit and 32-bit address display format. 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed according to the 16/32-bit switching which occurs.	For the T and C devices, the 16-bit, decimal format is fixed. (16/32-bit and decimal/hexadecimal switching is ignored.)
Decimal/hexadecimal switching:	
Press the ← key to switch between a decimal and hexadecimal address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed. Also used to switch between decimal and hexadecimal input for address content set values.	
Changing the monitor item:	
STEP+ Press the <u>STEP+</u> key to switch to the torque trace screen ► Go to 6-10	
STEP- Press the <u>STEP-</u> key to switch to the common monitor screen. Go to 6-6	
Notes	
ĬŽ	

	Torque trace	1				Drawing No.
Mode	Monitor mode	Function	Torque trace			6-10
Torqu	e Trace Screen Operation					
Mess	age		<u> </u>	Key Op	eration	
	M TRQ. TRC GO TRACING GO TRACING GO TRACING GO TRACING F. TRQ.	1 A X C E E N 3 5 S E 8 0 %	D		AXIS NO. 1 GO 3 2 STEP+ STEP-	RETURN
	Operation Broadur	o ⁹ Evolono	tions		Proceutions/Pom	orko
Pres desin The to the Fo		No. where the function is axes axes	ne torque trace funct		Precautions/Rem If an axis No. outside the ra at left is designated (by RE the error message "! SE ROR "will be displayed a of the screen, and the axis be changed.	anges shown ETURN key), ETTING ER- at the bottom
Notes						

Drawing No.

Mode	Monitor mode	Function	Torque trace	6-10.1

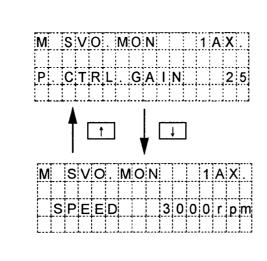
Torque Trace Screen Operation

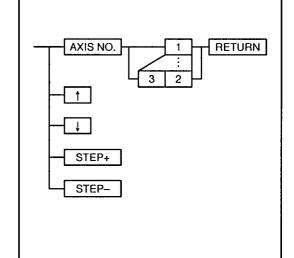
	Operation Procedure & Explanations	Precautions/Remarks
race START	& STOP:	
, لنتا ا	Press the <u>GO</u> key to start the trace function. "TRACING" will be displayed. Press the <u>GO</u> key again to stop the trace function. The trace results will then be displayed.	
Changing the	monitor item:	
STEP+	Press the <u>STEP+</u> key to switch to the servo monitor screen Go to 6-11	
STEP-	Press the <u>STEP</u> key to switch to the specified monitor screen. ■ Go to 6-7	
·		
S I		
Notes		

Mode	Monitor mode	Function	Servo monitor	6-11

Servo Monitor Screen Operation







Operation Procedure & Explanations

Precautions/Remarks

The scrolling sequence for servo data

monitor items is shown below. Use the

 \downarrow key to scroll downward, and the \uparrow

Servo monitoring is possible for up to 32 axes, with 3 screens for monitoring servo data, 2-port memory, and address designation. Six types of data can be monitored in servo data monitoring, and the $\underline{\downarrow}$, $\underline{\uparrow}$ keys are used to scroll among them.

The servo data monitor screen is the first screen to be displayed when the servo monitor function is selected.

Position control gain

key to scroll upward.

Motor speed

Motor current

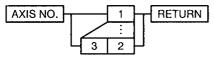
Regeneration level

Servo alarm

Error parameter No.

--- Go to 6-12

Changing the monitored axis:



Press the <u>AXIS NO.</u> key, enter the axis No. where monitoring is desired, then press the <u>RETURN</u> key. The monitor item will remain the same, but the monitored axis will be changed.

The range of axis Nos. which can be designated varies according to the CPU type being used.

For A273UHCPU (8-axis specs.) 11 For A273UHCPU (32-axis specs.) 11

1 to 8 axes

1 to 32 axes

For A171SCPU 1 to 4 axes

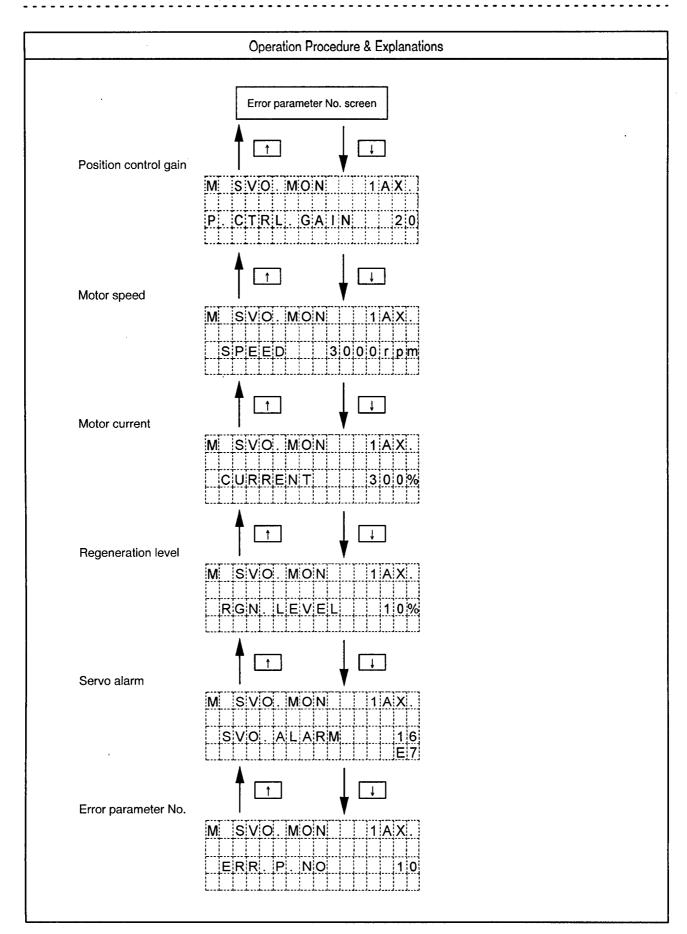
The servo data monitoring function takes 5 data readings, with the average value being displayed.

If an axis No. outside the range shown at left is designated (by <u>RETURN</u> key), the error message "! SETTING ERROR" will be displayed at the bottom of the screen, and the axis No. will not be changed.

Notes

Mode Monitor mode Fu	nction Servo monitor (servo data monitor)	6-12
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Servo Data Monitor Screen Scrolling



Function Scroll monitor (program) 6-13 Mode Monitor mode Scroll Monitor (Program) Screen Operation **Key Operation** Message Program No., SCR.MON. (PROG) servo instruction Axes used STEP+ STEP-SCR. MON. (PROG) 1 SCR. MON. (PROG) Precautions/Remarks Operation Procedure & Explanations If the ↓ key is pressed at the No.F dis-"No.1" is the first screen to be displayed when the scroll monitor function is seplay, No.1 will be displayed. If the 1 lected. Use the $\underline{\downarrow}$ key to switch to the next No., and the $\underline{\uparrow}$ key to switch to the key is pressed at the No.1 display, No.F previous No. will be displayed. As the execution program display begins from No.1, the execution programs are set from No.1 up when the number of execution programs is fewer than 15. JOG operation is designated at the scroll monitor. Notes

Drawing No.

I	Mode	Monitor mode	Function	Scroll monitor (program)	6-13.1
				, ,	

Scroll Monitor (Program) Screen Operation

	Operation Procedure & Explanations	Precautions/Remarks						
Changing the monitor item:								
STEP+	Press the <u>STEP+</u> key to switch to the scroll monitor (error) screen. Go to 6-14							
STEP-	Press the <u>STEP</u> key to switch to the servo monitor screen ► Go to 6-11							

6.9	Scroll Monitor (Error)				Drawing No.				
Mod	Monitor mode	Function	Scroll monitor (error)		6-14				
Scroll Monitor (Error) Screen Operation									
Mess	age			Key Operation					
	2 SVO. 20 20 3 HIGH 32 10 4 SVO. P 4 9 M SCR. MON 2 SVO. 2	0 0 0 3 5 0 0 0 1 1 1 1 1 1 1 2 0 2 0 2 0 3 2 1 0 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0 0 3 5 0 0 3 5 0 0 0 1	STEP+ STEP-					
	Operation Procedu	re & Explana	ations	Precautions/Ren	narks				
15 e and form Erro fund As t	scroll monitor (error) function displayerrors) in order, beginning from the error code. Information for the old nation for the most recent error is disputed in monitor Nos.1, 2, 3 are the first to tion is selected. Use the \$\frac{1}{2}\$, \$\frac{1}{2}\$ key he execution program display begingset from No.1 up when the number of	ays the following the followin	wing error information (for error type, error axis No., displayed at No.1, and inlo.F. ed when the scroll monitor other Nos. 1, the execution programs	Error types are abbreviat as follows: Low level error High level error Servo error	ed on-screen LOW HIGH SVO SVO.P e Nos.1, 2, 3 displayed. If				
Notes									

Drawing No.

Mode	Monitor mode	Function	Scroll monitor (error)	6-14.1

Scroll Monitor (Error) Screen Operation

	Operation Procedure & Explanations	Precautions/Remarks
Changing the mo	nitor item:	
STEP+	Press the STEP+ key to switch to the address monitor screen Go to 6-2	
STEP-	Press the STEP– key to switch to the scroll monitor (program) screen. ► Go to 6-13	
o de la companya de l		
-		

7. DATA SETTING MODE

Mode	Data setting mode	Function	Data setting item selectio	n	7-1
Setting	Item Selection Screen After Enter	ing Data Se	tting Mode		k
Messag	ge			Key Operation	
	D DATA SE 1AX. DATA 2P. BLOCK 3SUB. FUN	1 RE 2 3	TURN		
	Operation Procedure	e & Explana	tions	Precautions/Rema	arks
The da	ata setting item is selected at this s	creen.			
Selecti	ing "axis data setting":				
1 RETURN ▶ Go to 7-2					
Selecting "parameter block setting":					
	2 RETURN Go to				
Selecti	ing "auxiliary function setting":				
	3 RETURN▶ Go to	o 7-9		·	
Notes	/hen the number of an item is keye	ed in, that ite	em number will be highligh	ted.	

A CAUTION

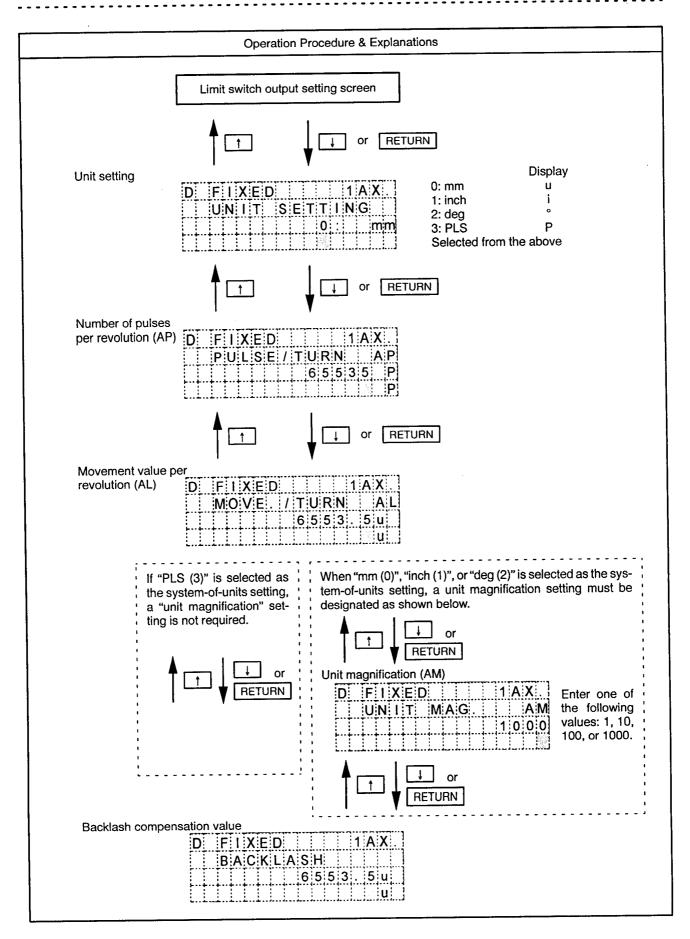
A Parameter settings which are appropriate for the system's application should be designated. Incorrect settings could disable the protective function.

Mode	Data setting mode	Function	Axis data setting	7-2.1
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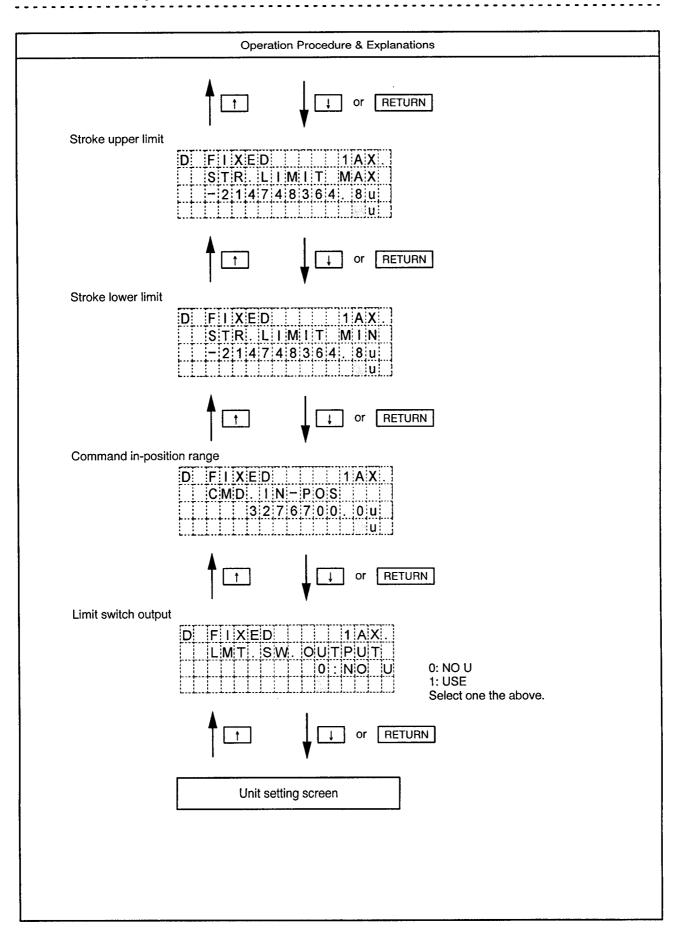
Axis No. & Item Selection Screen Operation (for Axis Data Setting)

Operation Procedure & Explanations	Precautions/Remarks
Selecting the axis data item:	
To select "fixed parameter setting":	
1 RETURN▶ Go to 7-3	
To select "servo parameter setting":	
2 RETURN For A273UH ADU, see 7-4	
For A273UH/A171S MR-H-B, see 7-4.3	
For A273UH/A171S MR-J-B, see 7-4.10	
To select "zero return data setting":	
3 RETURN ▶ Go to 7-5	
To select "JOG data setting":	
4 RETURN▶ Go to 7-6	
8	
Notes Cotes	

Mode Data setting mode Function Axis data setting (fixed parameter) 7-3



Mode	Data setting mode	Function	Axis data setting (fixed parameter)	7-3.1

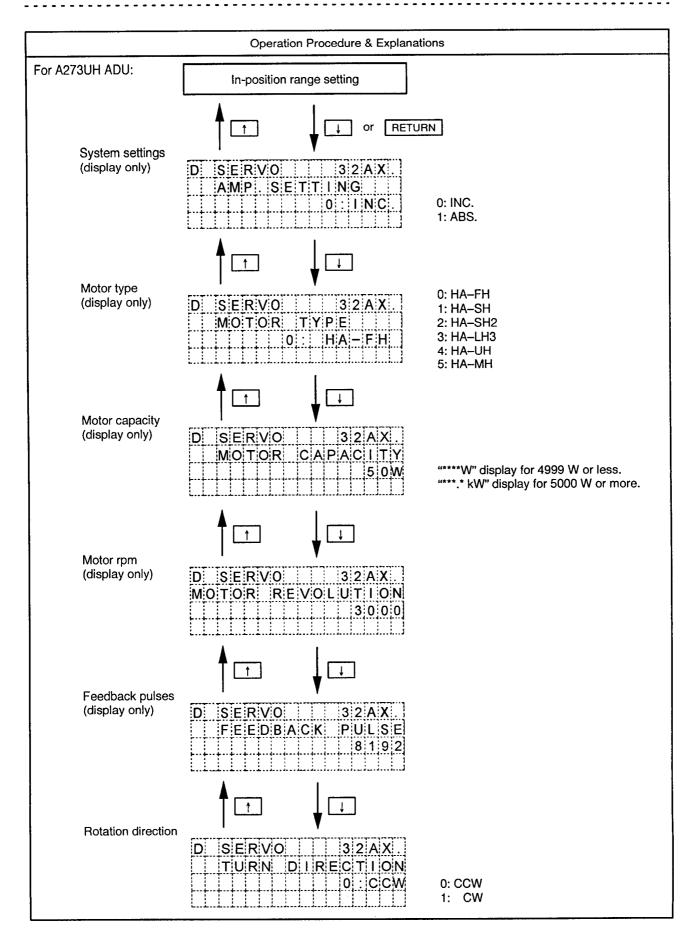


1					
	Mode	Data setting mode	Function	Axis data setting (fixed parameter)	7-3.2

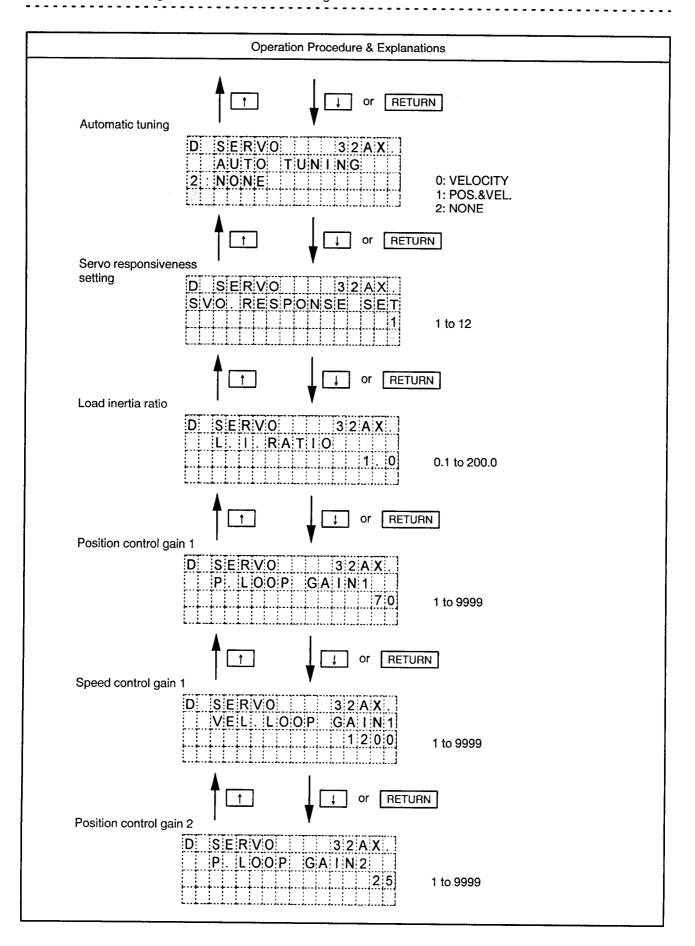
Fixed Parameter Data Input Ranges

System-of-units	mm	inch	бәр	PLS
Number of pulses per revolution (AP)		1 to 65535	5535	
Travel value per revolution (AL)	0.1 to 6553.5	0.00001 to 0.65535	0.00001 to 0.65535	1 to 65535
Unit magnification (AM)	1:×1	10: x 10 100: x 100	1000: x 1000	
Backlash compensation amount	0.0 to 6553.5	0.00000 to 0.65535	0.00000 to 0.65535	0 to 255
Stroke upper limit	-214748364.8 to 214748364.7	-21474.83648 to 21474.83647	0.00000 to 359.99999	-2147483648 to 2147483647
Stroke lower limit	-214748364.8 to 214748364.7	-21474.83648 to 21474.83647	0.00000 to 359.99999	-2147483648 to 2147483647
Command in-position range	0.1 to 214748364.7	0.00001 to 21474.83647	0.00001 to 359.99999	1 to 2147483647
Limit switch output		0: Unused	1: Used	

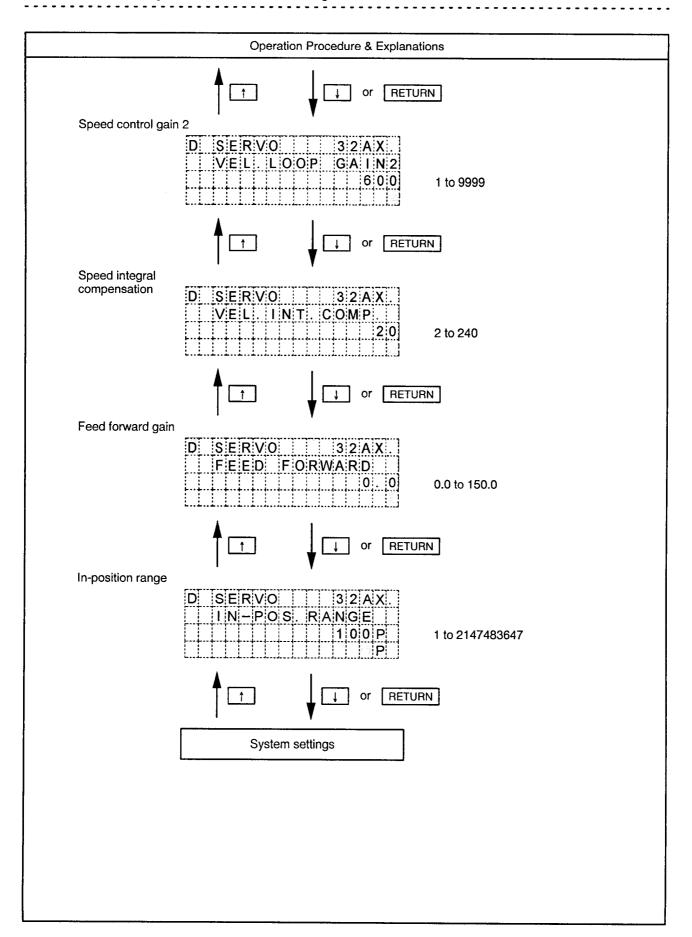
	T	· · · · · · · · · · · · · · · · · · ·		
Mode	Data setting mode	Function	Axis data setting (servo parameters) (for ADU)	7-4



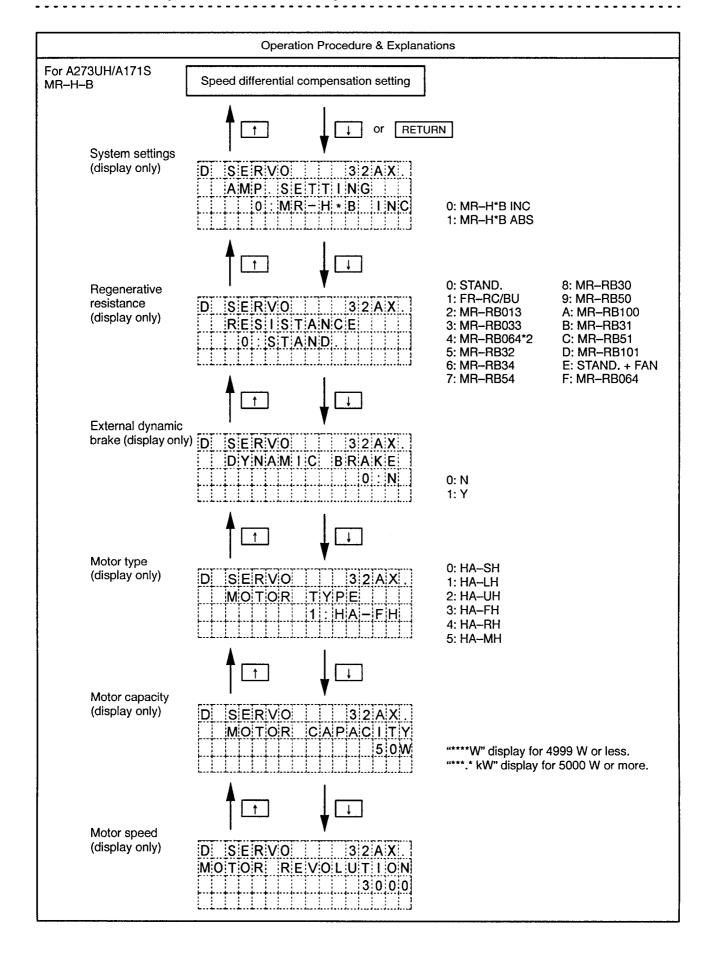
Mode Data setting mode Function Axis data setting (servo parameters) (for ADU) 7-4.1



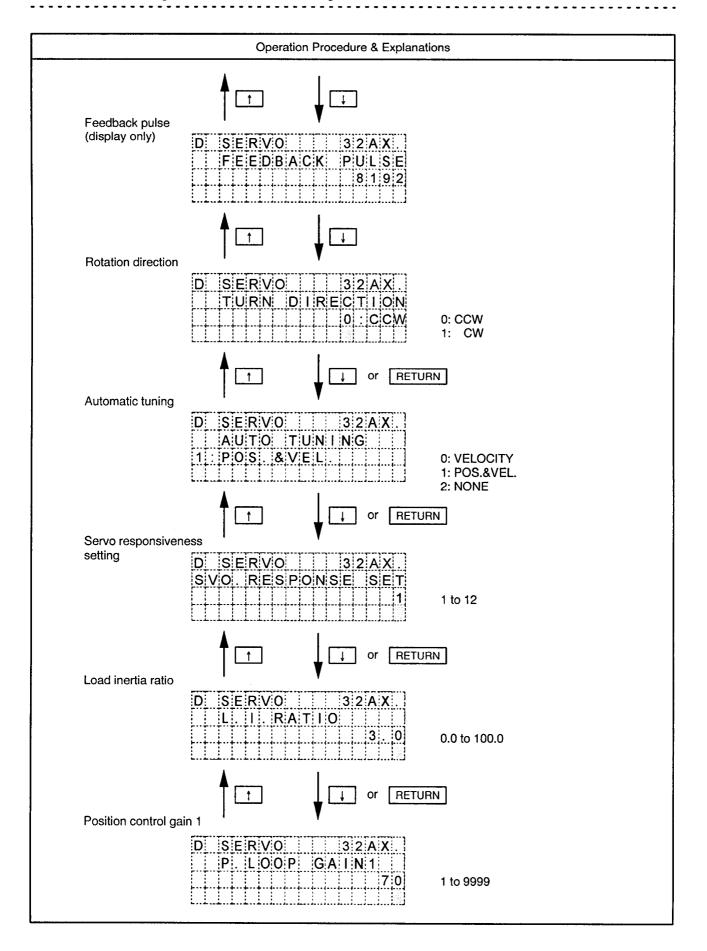
Mode	Data setting mode	Function	Axis data setting (servo parameters) (for ADU)	7-4.2
			3 (



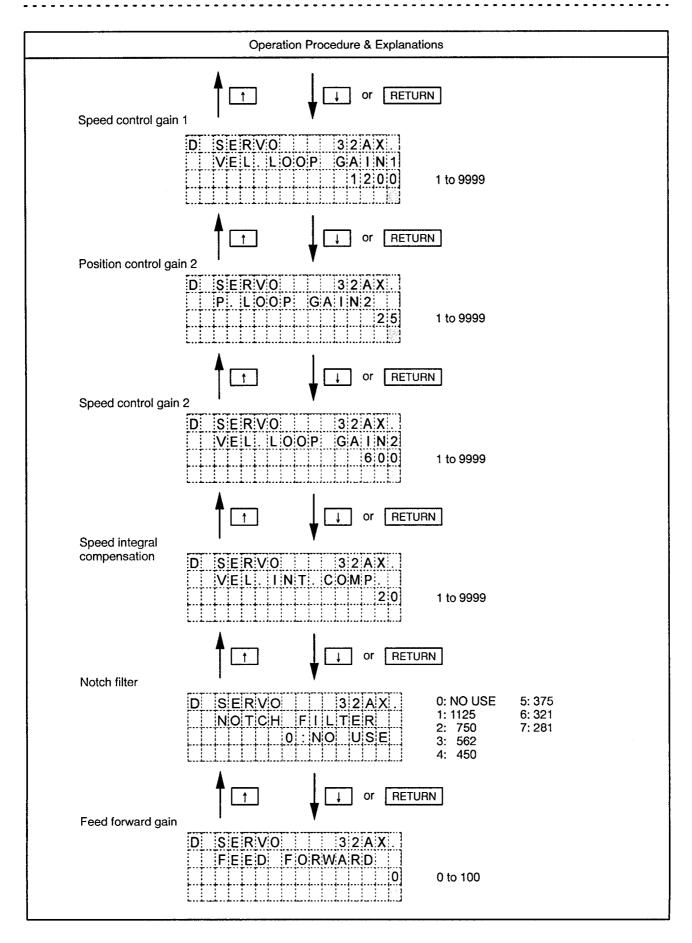
Mode	Data setting mode	Function	Axis data setting (servo parameters) (for MR–H)	7-4.3
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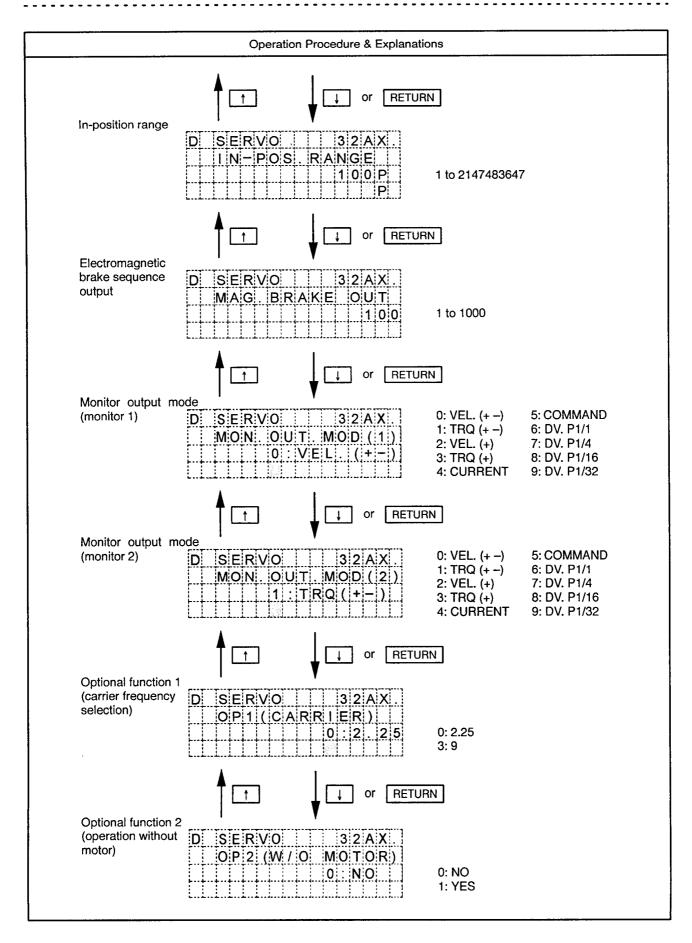
Mode Data setting mode Function Axis data setting (servo parameters) (for MR-H)	7-4.4
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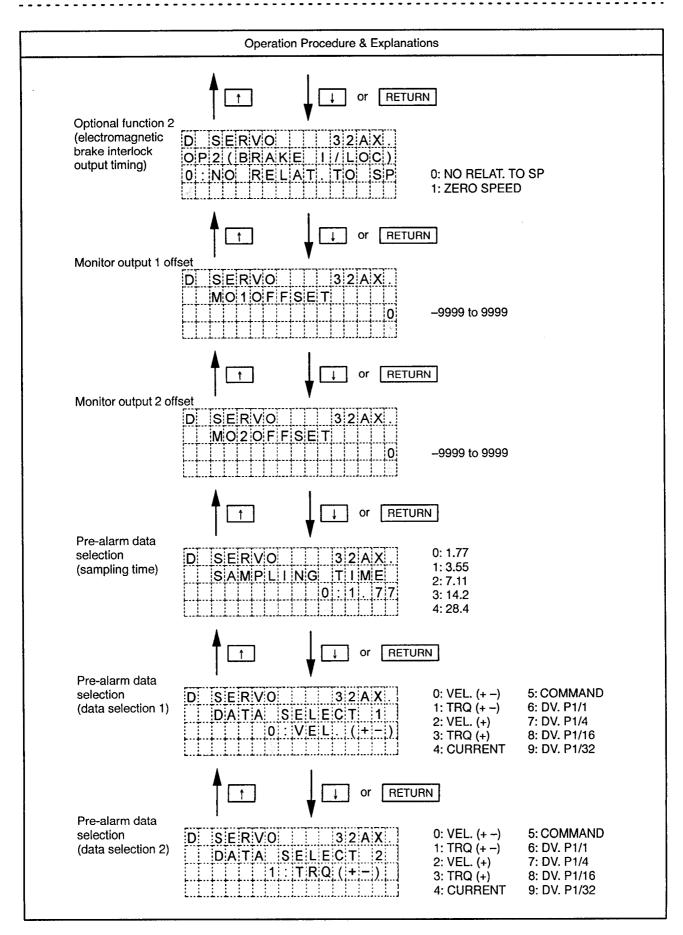
Mode	Data setting mode	Function	Axis data setting (servo parameters) (for MR-H)	7-4.5
		li .	J , , , , , , , , , , , , , , , , , , ,	



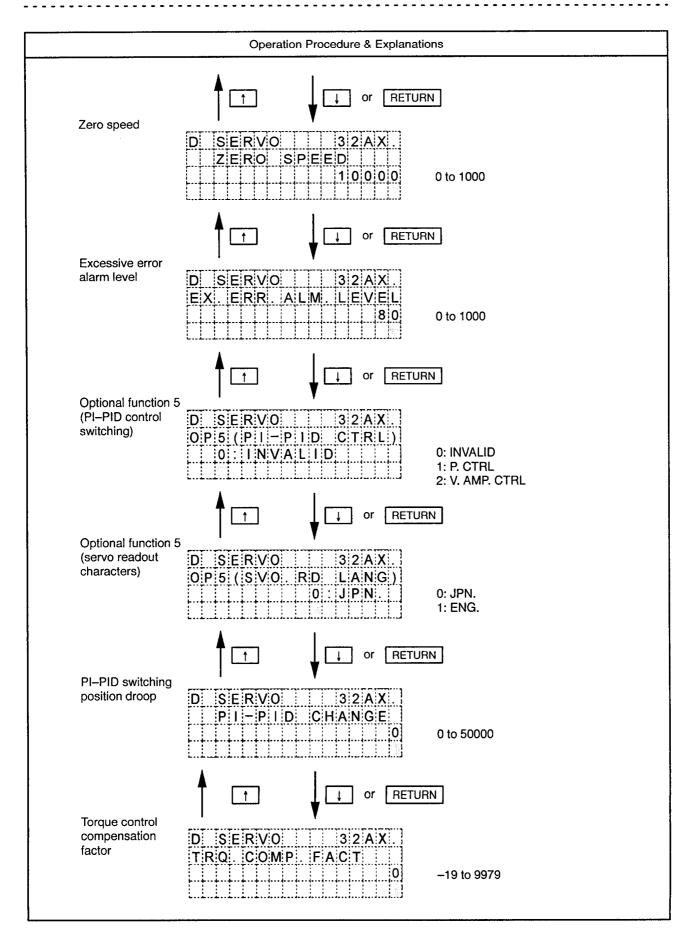
Mode	Data setting mode	Function	Axis data setting (servo parameters) (for MR–H)	7-4.6



Mode Data setting mode Function Axis data setting (servo parameters) (for MR-H) 7-4.7

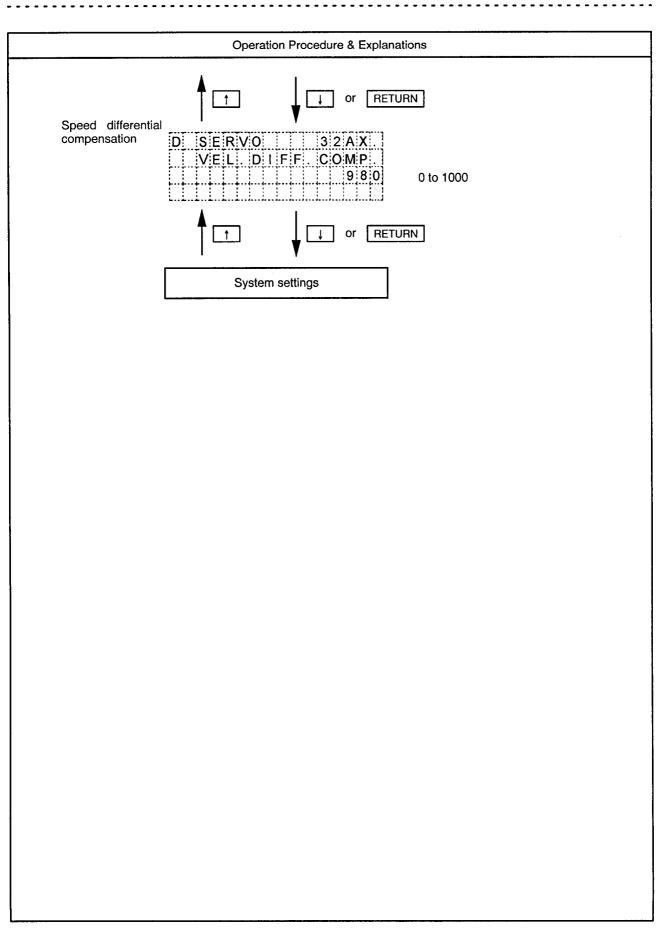


Mode	Data setting mode	Function	Axis data setting (servo parameters) (for MR-H)	7-4.8
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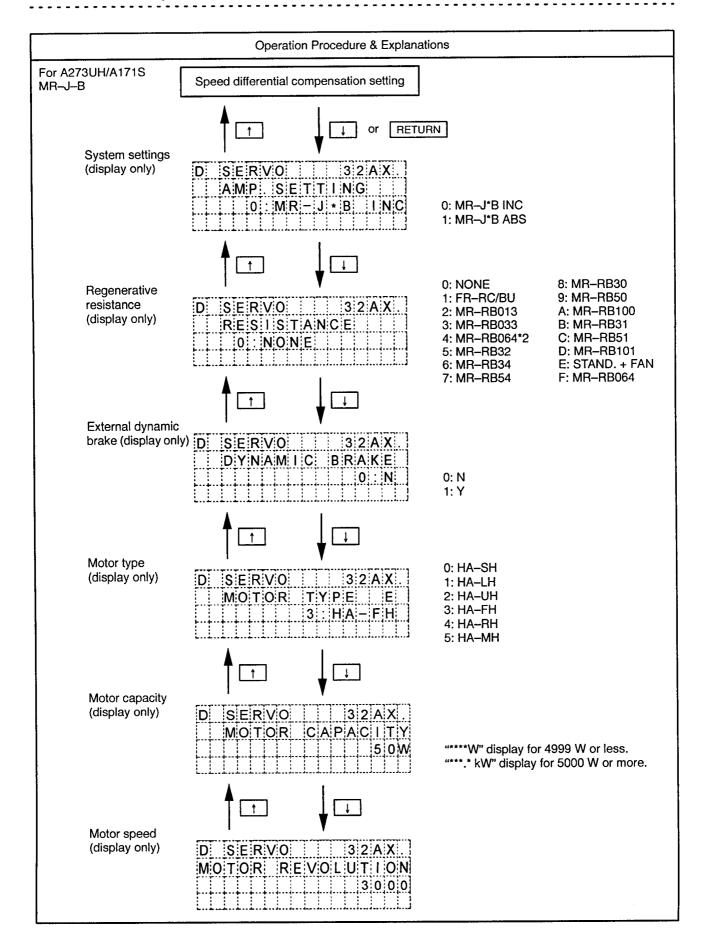


Drawing No.

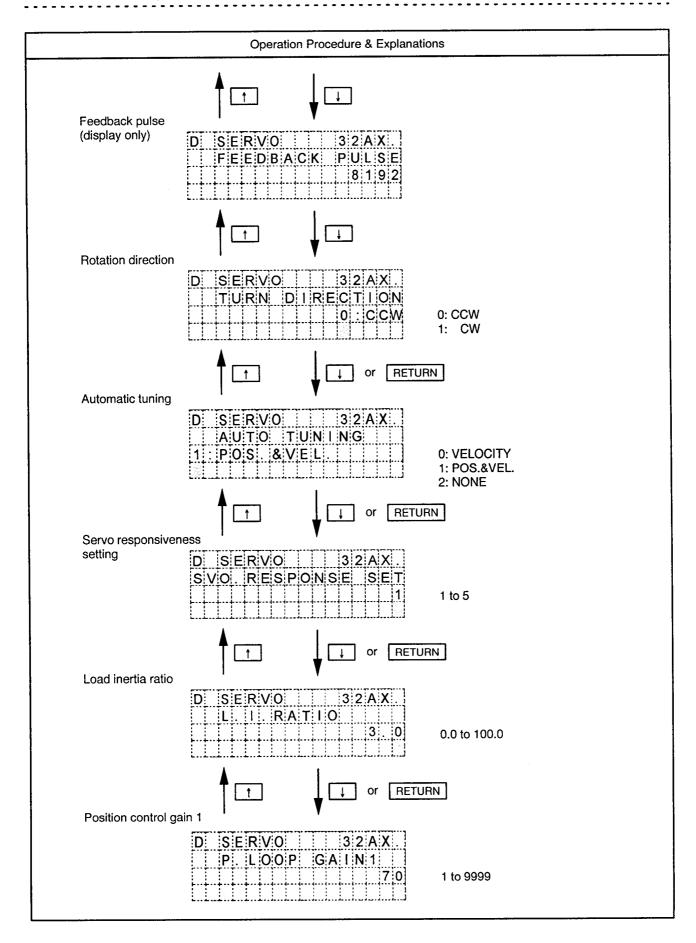
Mode	Data setting mode	Function	Axis data setting (servo parameters) (for MR-H)	7-4.9



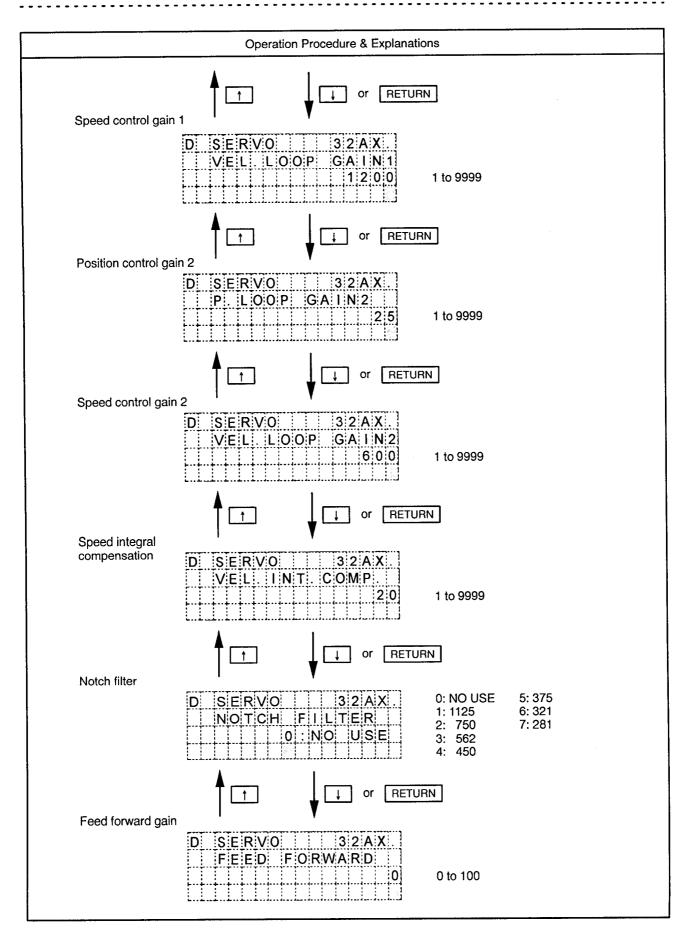
Mode	Data setting mode	Function	Axis data setting (servo parameters) (for MR–J)	7-4.10



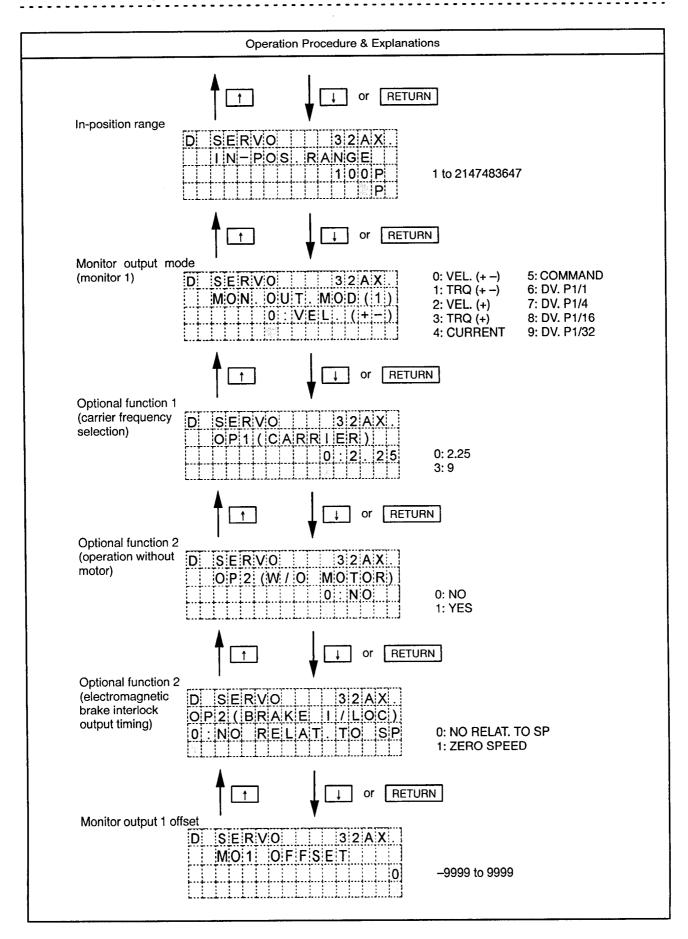
Mode Data setting mode Function Axis data setting (servo parameters) (for MR-J) 7-4.11



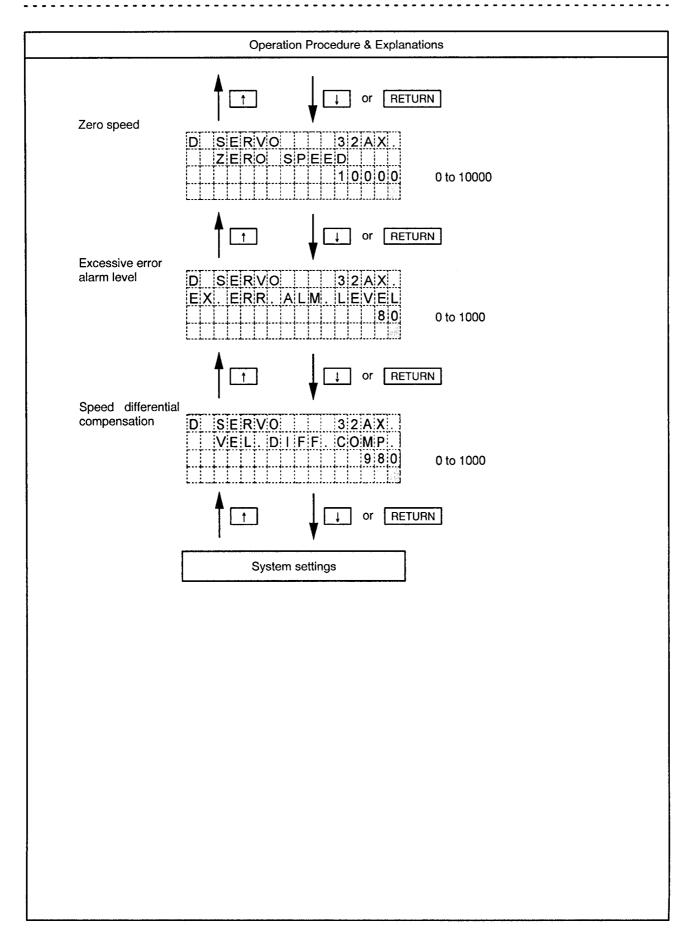
Mode Data setting mode Function Axis data setting (servo parameters) (for MR–J) 7-4.12



		T	T	
Mode Data se	ting mode	Function	Axis data setting (servo parameters) (for MR–J)	7-4.13

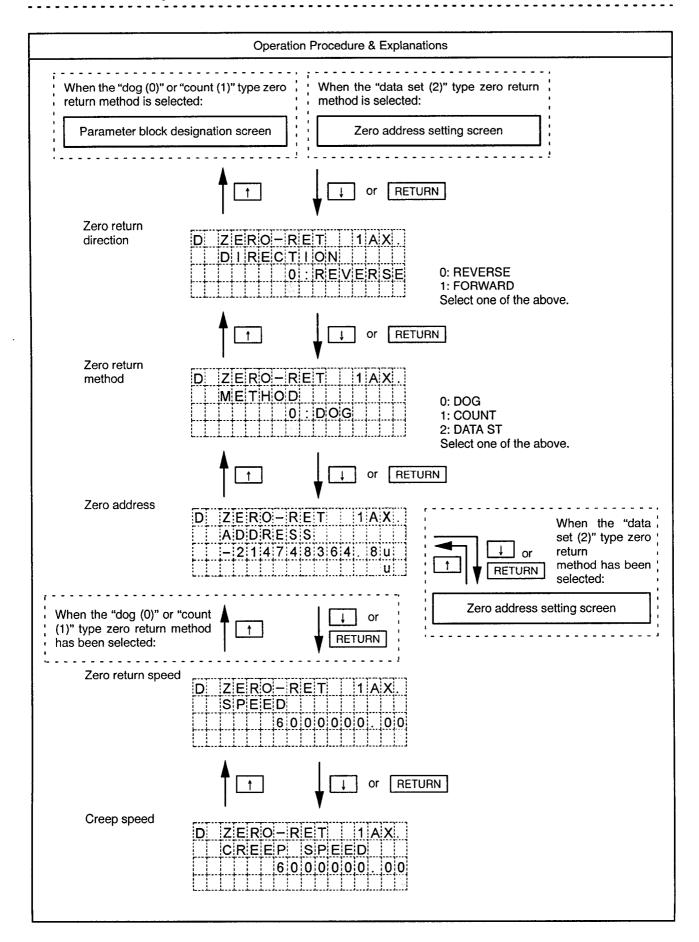


Mode Data setting mode Function Axis data setting (servo parameters) (for MR-J) 7-4



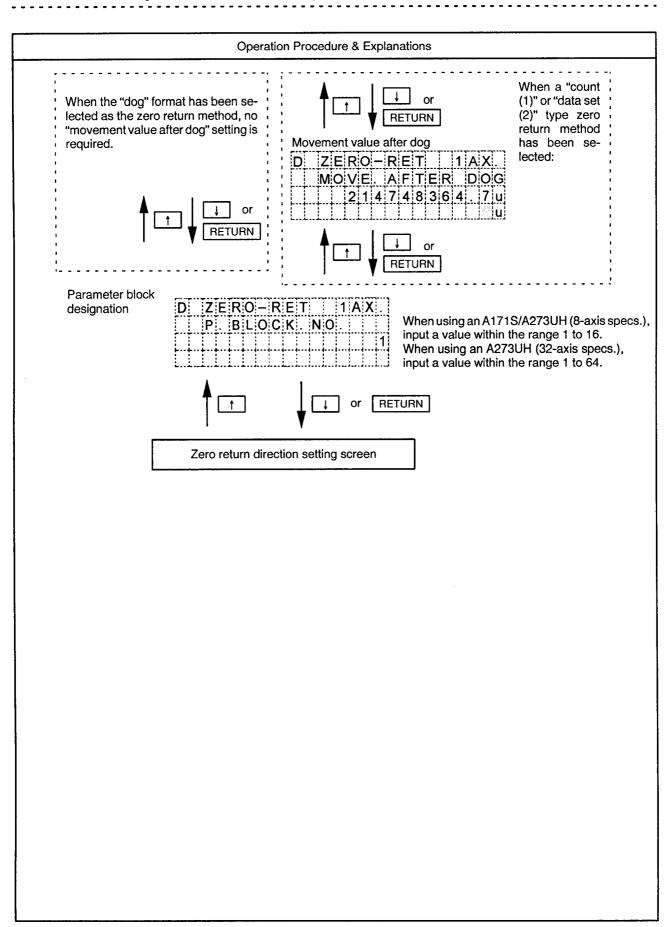
Mode	Data setting mode	Function	Axis data setting (zero return data)	7-5
	,			

Zero Return Data Setting Procedure & Screen Switching



Mode	Data setting mode	Function	Axis data setting (zero return data)	7-5.1

Zero Return Data Setting Procedure & Screen Switching



Drawing No.

ĺ	Mode	Data setting mode	Function	Axis data setting (zero return data)	7-5.2
L					

Zero Return Data Input Ranges

System-of-units	ш	inch	бәр	PLS
Zero address	-214748364.8 to 214748364.7	-21474.83648 to 21474.83647	-21474.83648 to 21474.83647	2147483648 to 2147483647
Zero return speed	0.01 to 6000000.00	0.001 to 600000.000	0.001 to 600000.000	1 to 1000000
Creep speed	0.01 to 6000000.00	0.001 to 600000.000	0.001 to 600000.000	1 to 1000000
Movement value after dog	0.0 to 214748364.7	0.00000 to 21474.83647	0.00000 to 21474.83647	0 to 2147483647
Parameter block designation		1 to 16 (A171S/A273UH 8-axis s 1 to 64 (A273UH 32-axis specs.)	1 to 16 (A171S/A273UH 8-axis specs.) 1 to 64 (A273UH 32-axis specs.)	

Mode D	Data setting mode	Function	Axis data setting (JOG operation data)	7-6
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JOG Operation Data Setting Procedure & Screen Switching

	Operation Procedure & Explai	nations
JOG speed limit va	alue D J O G 1 A X . J O G S P . R S R . 6 0 0 0 0 0 0 . 0 0	
Parameter block designation	D JOG 1AX. P. BLOCK. NO.	When using an A171S/A273UH (8-axis speinput a value within the range 1 to 16. When using an A273UH (32-axis specs.),
		input a value within the range 1 to 64.

Drawing No.

_					
	Mode	Data setting mode	Function	Axis data setting (JOG operation data)	7-6.1
					·

JOG Operation Data Input Ranges

System-of-units	шш	inch	бәр	PLS
JOG speed limit value	0.01 to 600000.00	0.001 to 600000.000	0.001 to 600000.000	1 to 1000000
Parameter block designation		1 to 16 (A171S/A273UH 8-axis s 1 to 64 (A273UH 32-axis specs.)	1 to 16 (A171S/A273UH 8-axis specs.) 1 to 64 (A273UH 32-axis specs.)	

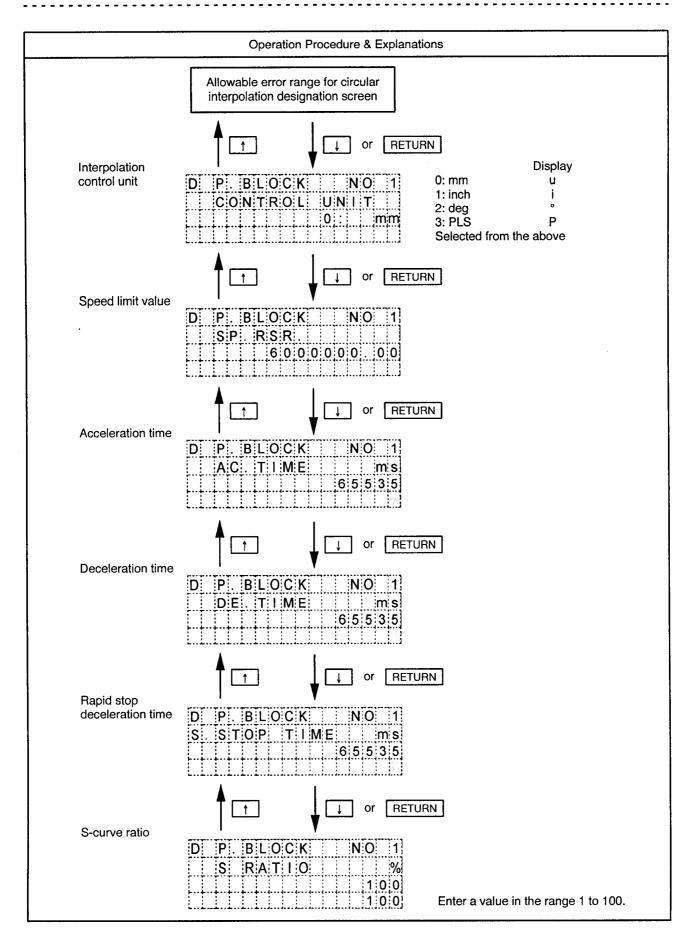
7.2 Setting the Parameter Block

Drawing No.

Mode	Data setting mode	Function	Parameter block		7-7
Parar	neter Block No. Designation Screen				
Mess	age			Key Operation	
	D P. BLOCK NO		1	0 9	RETURN
	Operation Procedure			Precautions/Rema	arks
nate After	o 16 (1 to 64 for A273UHCPU 32-axis d at this screen. designating the parameter block No. eter input screen for that block will be	by pressing	the <u>RETURN</u> key, the pa-		
	▶ Go to 7-8				
				,	
					:
ا س					
Notes					

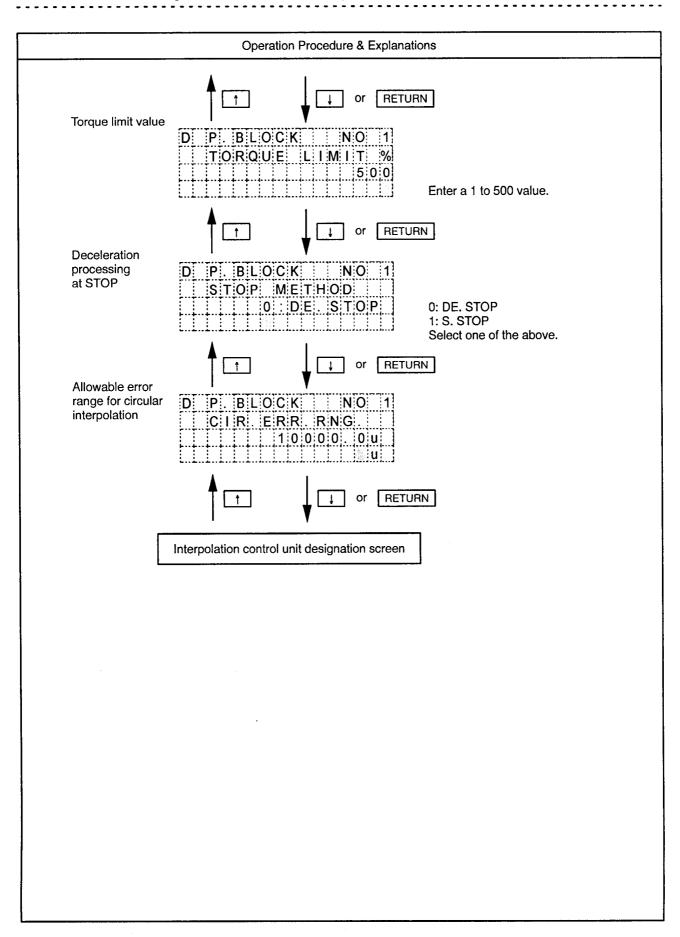
Mode	Data setting mode	Function	Parameter block	7-8

Parameter Block Data Setting Procedure & Screen Switching



Mode	Data setting mode	Function	Parameter block	7-8.1

Parameter Block Data Setting Procedure & Screen Switching



Mode	Data setting mode	Function	Parameter block	7-8.2

Parameter Block Data Input Ranges

System-of-unit	mm	inch	geb	PLS	
Speed limit value	0.01 to 6000000.00	0.001 to 600000.000	0.001 to 600000.000	1 to 1000000	
Acceleration time		1 to 65535	5535		
Deceleration time		1 to 65535	5535		
Rapid stop deceleration time		1 to 65535	5535		
Torque limit value		1 to 500	009		
Deceleration processing at STOP		0: DE. STOP	1: S. STOP		
Allowable error range for circular interpolation	0.0 to 10000.0	0.00000 to 1.00000	0.00000 to 1.00000	0 to 100000	-
S-curve ratio		0 to 100 %	% 00		

Mode	Data setting mode	Function	Auxiliary functions		7-9
Auxiliar	y Function Item Selection Screen				
Messag	ge			Key Operation	
	H SUB FUN 1 BACKLIG 2 A LARM 3 LAN SEL	HT		1 R	ETURN
	Operation Procedure	e & Explana	tions	Precautions/Rema	ırks
Select	ing "backlight:"				
_		7-10			
Select	ing "alarm":				
		o 7-11			
Select	ing "language":				
		o 7-12			
L	3 RETURN► Go to	07-12			
					:
 					
es					
Notes					
1 1					

Mode	Data setting mode	Function	Auxiliary functions (backli	ght)	7-10
	ht Setting Screen		<u> </u>		<u>. </u>
Messa(ge	-		Key Operation	
	H BACKLIG	H T O F F		— ← → RETURI	٧
	Operation Procedure	e & Explana	tions	Precautions/Rema	arks
A "#" n desire presse	nark is displayed at current setting. d setting, then press the RETURED, the system returns to the data s				
Notes					

					Drawing He.
Mode	Data setting mode	Function	Auxiliary functions (alarm)	7-11
Alarm S	Setting Screen				
Messag	ge			Key Operation	
	H ALARM #ON	OF F		RETURN	7
	Operation Procedure	e & Explana	tions	Precautions/Rema	arks
A "#" m desired presse	nark is displayed at current setting. d setting, then press the RETUR d, the system returns to the data s				
Notes					

Drawing No.

Mode	Data setting mode	Function	Auxiliary functions (langua	age)	7-12
		Tunction	Maximal y functions (langue	.90/	
 -	age Setting Screen				
Messa	A <u>c</u>	···		noy operation	
	T LAN. SEL #JAPANESE ENGLISH		DIN		RETURN
	Operation Procedure	e & Explana	tions	Precautions/Rema	arks
Г	↑ ↓ RETURN			- Indian de la companya de la compa	
desire When syste	mark is displayed at current setting. Id language, then press the RETUI The RETURN key is pressed, if the The returns to the data setting item sechanged, the mode selection scree	<u>RN</u> key. language se election scre	election is unchanged, the en. If the language selec-		
Notes					

<u> </u>		I -	5		Drawing No.		
Mod		Function	Function selection		8-1		
Selecting Program Mode Functions							
Message			Key Operation				
	P PROGRAM 1READ/WF 2SORT 3COPY 4	7 DEL		1 RE RE 3	TURN		
Operation Procedure & Explanations				Precautions/Remarks			
Program mode functions are selected at this screen.							
Sele	ecting "program readout":						
	1 RETURN▶ Go t						
Sele	ecting "sort":						
	2 RETURN▶ Go t		:				
Sele	ecting "copy":		:				
	3 RETURN▶ Go t		:				
Sele	Selecting "all-clear":						
	4 RETURN▶ Go t						
<u></u>							
	When the No. of an item is keyed in, that item No. is highlighted.						
s							
Notes							
1							

A CAUTION

- \triangle Instructions used in programs must conform to the conditions described in this manual.
- Device settings used in programs must be within the ranges given in this manual. Since some devices such as special devices have fixed applications, devices suitable for the intended application must be used.

b

Mode	Program mode	Function	9	8-2.1

Program Readout

Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Screen 1 is displayed when the program readout, write, or delete function is selected. The number of programs and steps being used are displayed, and the status in which program numbers can be input status is established.</screen>	
Number of programs used ——— Max. number of programs	
PROG. 1234/4096 STEP 12345/13312	
Number of steps used Max. number of steps	
Entering the program No.:	
0 ··· 9 RETURN	
Use the <u>0</u> to <u>9</u> keys to designate the number of the program which is to be read out or checked. The program No. range is 0 to 4095. Only the 4 most recent digits entered as the program No. will be valid. All other information digits will be ignored. To correct an entered value, press the <u>CLEAR</u> key to clear the input field. If the program readout occurs successfully when the <u>RETURN</u> key is pressed, the first part of that program content will be displayed.	Displayed digits move 1 space to the left each time another value is entered.
<screen 2=""></screen>	
Program write:	
WRITE The program write function is selected to edit the designated program. Go to 8-3	
If the program readout is unsuccessful, the following messages are display	ayed:
When the instruction code is incorrect (not an SV13 code): "I.COD ERROR"	
2	

١	Mode	Program mode	Function	Program readout	8-2.2
ı		<u> </u>			

Program Readout

<u></u>		Operation Procedure & Explanations	Precautions/Remarks						
Deleti	ng a prograr	n:							
	DELETE	Press the <u>DELETE</u> key to delete the designated program NO ► Go to 8-21							
Displa	aying the nex	kt step:							
	STEP+	Press the <u>STEP+</u> key to display the beginning of the next step.	The STEP+ and STEP- keys are only operative for speed switching control and constant-speed control.						
Displa	aying the pre	vious step:							
	Press the STEP- key to display the beginning of the previous step.								
Progra	am scrolling	:							
E	↑ Use t	he <u>↑</u> , <u>↓</u> keys to scroll in 1-line units.							
This s		ed to either cancel the operation or to create a program when ogram No. did not exist.							
Switc	hing to the ir	nstruction class setting screen:							
	INSTRUCTIO	N							
Switc	Switch to the servo instruction class setting screen in order to create a program. Go to 8-4								
			<u> </u>						
tes									
Notes									

8-3 **Function** Program write Mode | Program mode Creating a Program **Key Operation** Message I / insert mode * R / overwrite mode (default setting) RETURN Screen 1 ABS-1 PK4095R **CLEAR** GO 6000000.00 -214748364.8u STORE STEP+ STEP-The above screen is displayed when "program write" is selected after a successful program readout. INSTRUCTION ITEM FUNCTION + (insert) INDIRECT SHIFT + (Speed type) INDIRECT RETURN Screen 2 PINDIRECT INDIRECT Devices used by the system (for positioning, etc.) cannot be used for indirect designation purposes. The following devices are used exclusively for positioning: A273UHCPU (8-axis specs.) & A171SCPU D800 to D1023 Designation of an improper device can result in abnormal positioning, or an error. *1. The "insert" and "overwrite" modes are only operative during speed switching control or constant-speed control. *2. The "speed type" procedure can only be used with ABS-2, 3, 4 and INC-2, 3, 4. Notes

Mode P	rogram mode	Function	Program write		8-3.1		
Creating a Program							
	Operation Procedure	tions	Precautions/Rema	arks			
<screen Moving th</screen 	1> ne cursor to the position where a						
1	Use the ↑ , ↓ keys to cursor moves to positi						
Making th	ne correction:						
	9 RETURN						
	Although the new (correction) value is set when the <u>RETURN</u> key is pressed, it will not be registered at the program until the <u>STORE</u> and <u>GO</u> keys are pressed.						
Deleting	a line (step deletion):						
CL	EAR GO						
cursor po	e <u>CLEAR</u> and <u>GO</u> keys to delete sition. The next instruction will the used with VABS, VINC, VEND X, INC–XX, CPEND in constant						
Registeri	ng (storing) a program:						
ST	ORE GO						
ation is c	the required program modificati ompleted, press the <u>STORE</u> key data. When the <u>STORE</u> key is pr	y to register	the program number and				
	GO -> STORE CAN -> CANCEL						
program gram reg	After correcting or creating a program, a matching check is conducted for that program content. If the result is OK, the program will be registered. When program registration is completed, the program mode's "program readout" screen (8-2, screen 1) is displayed.						
				<u> </u>			
otes							

		r	T		Drawing No.			
Mode	Program mode	Function	Program write		8-3.2			
Creati	ng a Program							
	Operation Procedure	e & Explana	tions	Precautions/Rema	arks			
Displa	aying the next step:							
	STEP+ Press the <u>STEP+</u> ke next step.	The STEP+ and ST are only operative for spectontrol and constant-specton						
Displa	aying the previous step:			•				
	STEP- Press the <u>STEP-</u> key to display the beginning of the previous step.							
Switc	hing to the instruction class setting	screen:						
	NSTRUCTION							
inputs will be the er	Switch to the servo instruction class setting screen in order to execute program inputs. If the overwrite mode is in effect at this time, the entered servo instruction will be written over the displayed program step. If the insert mode is in effect, the entered instruction will be inserted in front of the displayed program step. Go to 8-4							
Switc	hing to the setting item screen:							
		ne item selection & input iem settings required for						
Switc	hing to the speed type screen:							
	SHIFT + .							
	The screen which allows selection of the speed type (resultant, reference axis, long axis) will be displayed. Go to 8-20							
Chan	ging input modes:							
[FUNCTION + .							
	Press the <u>FUNCTION</u> + , key to switch from the "overwrite" to the "insert" mode, and vice-versa.							
Notes								
ž								

Mode Program mode Function Program write 8-3.3
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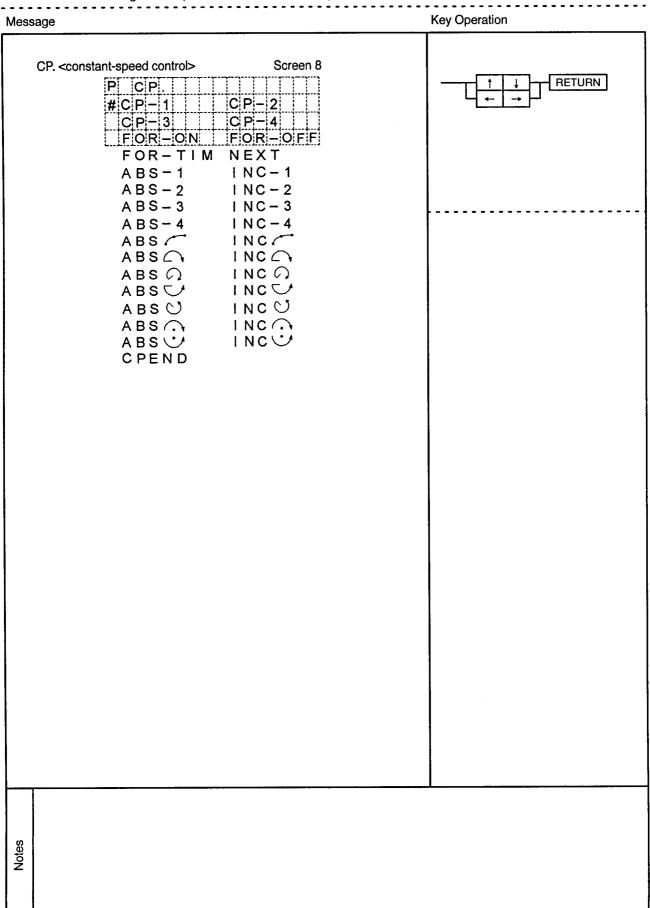
Creating a Program

Operation Procedure & Explanations	Precautions/Remarks								
<screen 2=""></screen>									
Screen 2 is displayed when the <u>INDIRECT</u> key is pressed.									
Selecting the setting device:									
Use the →, ← keys to move the "#" mark to either the "D" or "W" indirect designation device position.									
Entering the device No.:									
0 9 RETURN A F									
Enter a decimal value if the indirect designation device is a "D" device, and a hexadecimal value if it is a "W" device.									
Canceling the indirect designation:									
INDIRECT Press the <u>INDIRECT</u> key again at the indirect designation input screen to cancel the indirect designation.									
<u>&</u>									
Notes									

Мо	de	Program mode	Function	Prc gram write		8-4
Inst	ruct	ion Class Setting Screen (Servo Ir	struction Se	election)		
Mes	sag	ge			Key Operation	
		P COMMAND #POSITION CIRCLE FEED SPEED SPEED/PO SPEED CH CP POSITION ZERO RET START	ING SITIC ANGE FOLL		1 I RE	TURN
}		↓				
	Р	ositioning <for interpolation="" linear=""> P POSITIO # A B S - 1 A B S - 2 A B S - 3 A B S - 4</for>	NING	- 1 - 2 - 3	↑ ↓ RE	TURN .
	P	PCIRCLE ABSCA ABSCA ABSCA ABSCA ABSCA ABSCA ABSCA ABSCA ABSCA	# I N S 2		1 ↓ RE	FURN
Notes						

Mod	e Program mode	Function	Program write		8-4.1
Instru	ction Class Setting Screen (Servo Ir	struction Se	election)		
Mess	age			Key Operation	
·	Fixed-pitch feed PFEED #FEED-1 FEED-2 FEED-3	Scr	reen 4	↑	'URN
	ja i a dja si a dja a a a	Sci VR VVR	reen 5	↑ ↓ REI	URN
	Speed/position switching control P SPEED / P # V P F V P R V P S T A R T		reen 6	↑ ↓ RET	TÜRN
	Speed switching control P SPEED C # V S T A R T F O R - O N V A B S A B S - 1 A B S - 2 A B S - 3	HANGE VEND FOR-C NEXT VINC INC-1 INC-2	DFF F	↑ ↓ RET	[URN]
Notes					

					Drawing No
Mode	Program mode	Function	Program write		8-4.2
Instruct	ion Class Setting Screen	(Servo Instruction S	election)		
Messag	je			Key Operation	
	D. constant and contr		eroon 9		



	T		
Mode	Program mode	Function Program write	8-4.3
			L

Precautions/Remarks Operation Procedure & Explanations <Screen 1> In order to select a servo instruction, that servo instruction's class must first be designated at the instruction class setting screen. At this screen, the currently selected instruction class is indicated by a "#" mark. Use the 1 , 1 keys to scroll the screen, and press the RETURN key at the desired instruction class position. The system then proceeds to the servo instruction selection screen for that instruction class. POSITIONING → Go to screen 2 → Go to screen 3 CIRCLE FEED → Go to screen 4 → Go to screen 5 **SPEED** SPEED/POSITION → Go to screen 6 SPEED CHANGE → Go to screen 7 When zero return or simultaneous start → Go to screen 8 is selected, the system returns to the ZERO RETURN → Go to 8-14 program creation screen (there will be → Go to 8-15 START no servo instruction selection). POSITION FOLLOW → Go to 8-16 <Screen 2> This screen is displayed when "POSITIONING" is selected at screen 1. The currently selected servo instruction is indicated by a "#" mark. Use the \uparrow , \downarrow , $\stackrel{\longleftarrow}{}$, $\stackrel{\longrightarrow}{}$ keys to move the "#" mark to the desired servo instruction position, then press the RETURN key. The system then proceeds to the program creation screen for that servo instruction. The required settings should be designated at this screen. ABS-1 (absolute 1-axis positioning) → Go to 8-5 → Go to 8-6 ABS-2 (absolute 2-axis linear interpolation) → Go to 8-7 ABS-3 (absolute 3-axis linear interpolation) ABS-4 (absolute 4-axis linear interpolation) → Go to 8-8 → Go to 8-5 INC-1 (incremental 1-axis positioning) INC-2 (incremental 2-axis linear interpolation) → Go to 8-6 INC-3 (incremental 3-axis linear interpolation) → Go to 8-7 INC-4 (incremental 4-axis linear interpolation) → Go to 8-8 Notes

1			,		0.4.4
	Mode	Program mode	Function	Program write	8-4.4

	Operation Procedure & Explanations	Precautions/Remarks
This lecte mov pres	operation Procedure & Explanations reen 3> secreen is displayed when "CIRCLE" is selected at screen 1. The currently selected servo instruction is indicated by a "#" mark. Use the ↑, ↓, ←, → keys to be the "#" mark (screen will scroll) to the desired servo instruction position, then set the RETURN key. The system then proceeds to the program creation screen that servo instruction. The required settings should be designated at this screen. Absolute circular interpolation by auxiliary point designation ABS → Go to 8-9 Absolute circular interpolation by radius designation (less than CW 180°) ABS → Go to 8-11	rrecautions/nemarks
	Absolute circular interpolation by radius designation (CW 180 ° or more) ABS → Go to 8-11 Absolute circular interpolation by radius designation (less than CCW 180 °) ABS → Go to 8-11 Absolute circular interpolation by radius designation (CCW 180 ° or more) ABS → Go to 8-11 Absolute circular interpolation by center point designation (CW) ABS → Go to 8-10 Absolute circular interpolation by center point designation (CCW)	
	ABS → Go to 8-10 Incremental circular interpolation by auxiliary point designation INC → Go to 8-9 Incremental circular interpolation by radius designation (less than CW 180 °) INC → Go to 8-11 Incremental circular interpolation by radius designation (CW 180 ° or more) INC → Go to 8-11 Incremental circular interpolation by radius designation (less than CCW 180 °) INC → Go to 8-11 Incremental circular interpolation by radius designation (CCW 180 ° or more)	
	INC → Go to 8-11 Incremental circular interpolation by center point designation (CW) INC → Go to 8-10 Incremental circular interpolation by center point designation (CCW) INC → Go to 8-10	
Notes		
Notes		

				 	
Mode	Program mode	Function	Program write	İ	8-4.5

Operation Procedure & Explanations	Precautions/Remarks
<screen 4=""> This screen is displayed when "FEED" is selected at screen 1. The currently selected servo instruction is indicated by a "#" mark. Use the ↑, ↓, ←, → keys to move the "#" mark (screen will scroll) to the desired servo instruction position, then press the <u>RETURN</u> key. The system then proceeds to the program creation screen for that servo instruction. The required settings should be designated at this screen. 1-axis fixed-pitch feed start FEED-1 → Go to 8-5 2-axis linear interpolation fixed-pitch feed start FEED-2 → Go to 8-6</screen>	
3-axis linear interpolation fixed-pitch feed start FEED-3 → Go to 8-7 <screen 5=""> This screen is displayed when "SPEED" is selected at screen 1. The currently selected servo instruction is indicated by a "#" mark. Use the ↑, ↓ keys to</screen>	
move the "#" mark (screen will scroll) to the desired servo instruction position, then press the <u>RETURN</u> key. The system then proceeds to the program creation screen for that servo instruction. The required settings should be designated at this screen. VF (speed control forward start) → Go to 8-12	
VR (speed control reverse start) → Go to 8-12 VVF (speed control (II) forward start) → Go to 8-12 VVR (speed control (II) reverse start) → Go to 8-12 → Go to 8-12	
Notes	

1	Mode	Program mode	Function	Program write	8-4.6
			i		I .

Operation Procedure & Explanations		Precautions/Remarks
<screen 6=""> This screen is displayed when "SPEED/POSITION" is selected currently selected servo instruction is indicated by a "#" mark keys to move the "#" mark (screen will scroll) to the desired sposition, then press the <u>RETURN</u> key. The system then proc gram creation screen for that servo instruction. The required sed designated at this screen. VPF (speed/position switching control forward START) - VPR (speed/position switching control reverse START) - VPSTART (speed/position switching control restart)</screen>	x. Use the ↑, ↓ servo instruction ceeds to the pro- ettings should be → Go to 8-5	
<screen 7=""> This screen is displayed when "SPEED CHANGE" is selected currently selected servo instruction is indicated by a "#" ↑, ↓, , , , , keys to move the "#" mark (screen will scroll) to vo instruction position, then press the RETURN key. The syste to the program creation screen for that servo instruction. The is should be designated at this screen. If the overwrite mode is in effect at this time, the entered serv be written over the displayed program step. If the insert mode entered instruction will be inserted in front of the displayed program step. If the insert mode entered instruction will be inserted in front of the displayed program of the displayed program step. If the insert mode entered instruction will be inserted in front of the displayed program of the displayed</screen>	mark. Use the othe desired ser- em then proceeds required settings wo instruction will de is in effect, the	VSTART must be designated first, followed by ABS-1 to ABS-3, or INC-1 to INC-3. The screen 7 instructions will then be repeated until VEND is designated.

^{*1. •} The ABS-1 to ABS-3 or INC-1 to INC-3 instruction selections (following VSTART) will be processed as insert mode inputs even if the overwrite mode is in effect.

Other instruction selections (following ABS-1 to ABS-3 or INC-1 to INC-3) will be processed as insert mode inputs even if the overwrite mode is in effect.

	1		
Mode Program mode	Function	Program write	8-4.7

Operation Procedure & Explanations	Precautions/Remarks
Screen 8> This screen is displayed when "CP" is selected at screen 1. The currently selected servo instruction is indicated by a "#" mark. Use the ↑, ↓, ←, → keys to move the "#" mark (screen will scroll) to the desired servo instruction position, then press the <u>RETURN</u> key. The system then proceeds to the program creation screen (FORON, FOROFF, FOROTIM) for that servo instruction. The required settings should be designated at this screen. If the overwrite mode is in effect at this time, the entered servo instruction will be written over the displayed program step. If the insert mode is in effect, the entered instruction will be inserted in front of the displayed program step.	*2
CP-1 (1-axis constant-speed control START) CP-2 (2-axis constant-speed control START) CP-3 (3-axis constant-speed control START) CP-4 (4-axis constant-speed control START) CPEND (constant-speed control END) FOR-ON (repeat range beginning designation) → Go to 8-17 FOR-OFF (repeat range beginning designation) → Go to 8-17 FOR-TIM (repeat range beginning designation) → Go to 8-18 NEXT (repeat range end designation) ABS-1 (absolute 1-axis positioning) → Go to 8-5 ABS-2 (absolute 2-axis linear interpolation) → Go to 8-6 ABS-3 (absolute 3-axis linear interpolation) (less than CW 180 °) → Go to 8-7 ABS-4 (absolute 4-axis linear interpolation) (CW 180 ° or more) → Go to 8-8 ABS (Absolute circular interpolation by auxiliary point designation) (less than CCW 180 °) → Go to 8-9	Selection must begin with CP-2 or CP-3. The screen 8 instructions will then be repeated until VCPEND is designated.
ABS	

^{*2.} Other instruction selections (following CP-2 or CP-3) will be processed as insert mode inputs even if the overwrite mode is in effect.

- 1					
	Mode	Program mode	Function	Program write	8-4.8

Operation Procedure & Explanations	Precautions/Remarks
INC-3 (incremental 3-axis linear interpolation) (less than CCW 180 °) Go to 8-7 INC-4 (incremental 4-axis linear interpolation) (CCW 180 ° or more) Go to 8-8 INC	
Notes	

	Program mode		Program write		8-5
	lecting Servo Instruction (ABS-	1, INC-1, FE	ED-1, VPF, VPR)		
Message 	e			Key Operation	
	<pre><default> PK40951 AX. 1 SP. 1 1</default></pre>	0	S - 1 0 1 . 0 u	For details regarding key see page 8-3.	operation
	PK40951 AX. 32 SP. 32	0.	5 – 1 0 1 0 u		
8000					

Mode	Program mode	Function	Program write	8-6	l

After Selecting Servo Instruction (ABS-2, INC-2, FEED-2)

Message **Key Operation** - (Speed type)* <Default> P K 4 0 9 5 I (S Y) A B S - 2 A X . 1 , 2 . 0 . 0 1 S P . 0 . 0 1 u 2 0 . 0 1 u For details regarding key operation, see page 8-3. P K 4 0 9 5 I (S Y) A B S - 2 A X 3 1 3 2 0 0 0 1 3 1 0 0 0 1 u 3 2 0 0 1 u Meanings of "speed type" screen abbreviations are as follows: (SY) Resultant speed

(RE) Reference axis speed (LO) Long axis speed

Notes

Mode	Program mode	Function	Program write		8-7
After S	electing Servo Instruction (ABS-	-3, INC-3, FE	ED-3)		
Messa	ge	44		Key Operation	·
NIC33G	<default></default>	(RE) AB , 3 2 0 0	. 0 1 . 0 u . 0 u . 0 u . 1	For details regarding key see page 8-3.	y operation,
Notes					

Mode	Program mode	Function	Program write		8-8			
After Se	electing Servo Instruction (ABS	1, INC-4)						
Messag	Message Key Operation							
	<pre><default> P K 4 0 9 5 1 (A X</default></pre>	, 3, 0 0 0 0		For details regarding key see page 8-3.	operation,			
	PK 4 0 9 5 I (AX 2 9, 3 0 SP. 2 9 3 0 3 1 3 2	0	S - 4 2 . 0 1 . 0 u . 0 u . 0 u . 0 u					
Notes								

Mod	de Program mode	Function	Program write		8-9
After	Selecting Servo Instruction (Circular	Interpolation	on by Auxiliary Point Desig	nation ABS , INC , INC)
Mes	sage	• • • • • •		Key Operation	
Mes	<pre></pre>	0 0	0 u 0 u 0 u 0 u 0 u	For details regarding key see page 8-3.	operation,
Notes					

Mode | Program mode Function Program write 8-10 After Selecting Servo Instruction (Circular Interpolation by Center Point Designation ABS , INC , ABS , INC , INC , ABS , INC Message **Key Operation** <Default> PK 4 0 9 5 1 ABS (1) For details regarding key operation, see page 8-3. 0. 0 u 0. 0 u 2 END 0. 0 u 0. 0 u 1 2

.

			Drawing No
	Program mode	Function Program write	8-11
After Se	electing Servo Instruction ((Circular Interpolation by Radius Designation ABS ABS INC A, INC A	, ABS♥, ABS♥, , INC♥, INC♥)
Messag	e	Key Operation	
Messag 	P.K. 4 0 9 5 A.X 1. S.P R.A.D END 1 2	For details regar	ding key operation,
Notes			

Mode	Program mode	Function	Program write		8-12
After	Selecting Servo Instruction (Speed	Control, Spe	eed/Position Switching Cor	ntrol VF, VR, VVF, VVR)	
Messa	age			Key Operation	
	<default> P K 4 0 9 5 I A X . 1 S P</default>	V 0	F	For details regarding key see page 8-3.	operation,
Notes					,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

Mode	Program mode	Function	Program write		8-13
After S	electing Servo Instruction (Speed/I	Position Swi	itching Control, Restart VP	PSTART)	
Messag	ge			Key Operation	
Messag	PK40951 AX. 1		P S	For details regarding key see page 8-3.	operation,
Notes					

					Drawing No.
<u> </u>	de Program mode	L	Program write		8-14
After	Selecting Servo Instruction (Home F	Position Retu	ırn Zero ZERO)		
Mess	sage			Key Operation	
	PK40951 AX. 1	ZE	RO	For details regarding key see page 8-3.	operation,
Notes					
				•	

		I	I_	Drawing No.
Mode	Program mode	Function	Program write	8-15
After	Selecting Servo Instruction (Simulta	neous STAF	RT START)	
Messa	age		Key Operation	
Messa	PK40951	ST	ART For details regardi see page 8-3.	ng key operation,
Notes				

Mod	de Program mode	Function	Program write		8-16
After	Selecting Servo Instruction (Position	Follow-Up	PFSTART)		
Mes	sage			Key Operation	
	<default> P K 4 0 9 5 I A X 1 S P</default>	0.	STR 011 0	For details regarding key see page 8-3. Address inputs are only po- direct designation. Numerical value inputs (0 valid.	ssible by in-
	Screen 2				
des The	STOR P INDIREC	T S P C W sing, etc.) ca	5.0.0 annot be used for indirect oning: D800 to D1023 D0 to D799		
Notes					

Mod	e Program mode	Function	Program write	, , , , , , , , , , , , , , , , , , ,	8-17
After	Selecting Servo Instruction (Repeat	rol FOR-ON, FO	R-OFF)		
Mess	age			Key Operation	
	Screen 1 P F O R - O N # X		RETURN		
	RETU	JRN			
devi-	PK4095RP FORON R-ON repeat operation is ended where switches ON. R-OFF repeat operation is ended where switches OFF. exadecimal number input is required ecimal number input is required at Market switches of the switches	the trigger at X, Y, B de	at the corresponding er at the correspondevices.	For details regarding key open page 8-3.	eration, see
Notes	A return to screen 1 is impossible a or FOR–OFF must be selected aga	fter screen 2 in in the rep	2 is displayed. If a devolace mode.	vice change is required at this tim	e, FOR–ON

Mod	e Program mode	Function	Program write		Brawing No.
Щ.	Selecting Servo Instruction (Repeat	<u> </u>	<u> </u>		0 10
Mess				Key Operation	
TVIC55	ago			Ney Operation	
	Screen 1 P F O R - T I M E	S W H		<u> </u>	RETURN
	RETU	JRN			
	Screen 2 P K 4 0 9 5 R P F O R - T I M E	S	- 2	For details regarding key ope page 8-3.	eration, see
	-TIMES repeat operation is ended wached.	hen the desi	gnated repeat count		
mal v If "H' decir If "D" value If "W	is reached. If "K" is selected at screen 1, the count value is entered directly as a decimal value. If "H" is selected at screen 1, the count value is entered directly as a hexadecimal value. If "D" is selected at screen 1, the "D" device address is entered as a decimal value. If "W" is selected at screen 1, the "W" device address is entered as a hexadecimal value.				
Notes	A return to screen 1 is impossible aft must be selected again in the replac	er screen 2 i	s displayed. If a device	e change is required at this time, F	OR-TIMES

					Drawing No.
Mode	Program mode	Function	Program write		8-19
Setting	j Items				
Messa	ge			Key Operation	
	Screen 1 P SETT # • DWE L TRQ. UNIT OAC. OS.ST • STOP OSPEE	OP. B OS. R ODE. OP OP. T OC. E	DDE LK. RQ.		RETURN
	\	RETURN			
	S.STC P.TRC STOP C.E.R SP.	500 E 500 600000 6553 6553 P 6553 0:DE.S 10000	2 5 5 0 0 % 1 6 n c h . 0 0 5 m s 5 m s 5 m s 7 O P P L S	For details regarding key open page 8-3.	eration, see
The s	et value range for positionir	ng data is indicated	in 8-19.2.		
Notes	The ON/OFF indication is di	splayed only at sele	ectable positioning da	ta items.	

Mode	Program mode	Function	Program write	8-19.1

Setting Items

	Operation Procedure & Explanations Precautions/Remarks						
<screen 1=""> Selecting the positioning data:</screen>							
↑ ↓ ← → RETURN							
to be set at	Use the ↑, ↓, ←, → keys to move the "#" mark to the positioning data item to be set at the program. The item is switched ON and OFF by pressing the <u>RETURN</u> key. Note that setting errors may be caused with some instructions.						
Registering	the positioning data:						
GO	The system returns to the program creation screen when the <u>GO</u> key is pressed. Positioning data is entered at the bottom line of the program creation screen.						
Notes							
1							

_					
	Mode	Program mode	Function	Program write	8-19.2

Setting Items

	Default	mm	inch	degree	PULSE		
DWELL (dwell time)	0 (ms)	0 to 5000 (ms)					
M CODE (M-code)	0		0 to 255				
TRQ. (torque limit value)	According to parame- ter block 1	1 to 500 (%)					
P.B. (parameter block)	1		1 to 16 (A171S/A273UH 8-axis specs.) 1 to 64 (A273UH 32-axis specs.)				
UNIT (control units)	3	0	1	2	3		
S.R. (speed limit)	200.000 (PLS/sec)	0.01 to 6000000.00 (mm/min)	0.001 to 600000.000 (inch/min)	0.001 to 600000.000 (degree/min)	1 to 1000000 (PLS/sec)		
AC. (acceleration time)	1000 (ms)		1 to 655	35 (ms)			
DE. (deceleration time)	1000 (ms)		1 to 655	35 (ms)			
S.STOP (rapid stop deceleration time)	1000 (ms)	1 to 65535 (ms)					
P.TRQ. (parameter torque limit value)	300 (%)	1 to 500 (%)					
STOP (deceleration time at STOP input)	0	0: DE. STOP 1: S. STOP					
C.E.R. (allowable error range or circular interpolation)	100 (PLS)	0.0 to 10000.0	0.00000 to 1.00000	0.00000 to 1.00000	0 to 100000		
SPEED (speed command (constant-speed))	-	0.01 to 6000000.00 (mm/min)	0.001 to 600000.000 (inch/min)	0.001 to 600000.000 (degree/min)	1 to 1000000 (PLS/sec)		
S RATE (S-curve ratio)	0	0 to 100 (%)					

Mode	Program mode	Function	Program write	8-20		
On addition Only the Only						

Speed Type Selection Screen

Operation Procedure & Explanations	Precautions/Remarks
P SPEED CLAS #SYNTHETIC AX. SP LONG AX. SP RETURN To screen 1 at page 8-3 Selecting the speed type: TETURN Use the 1, keys to move the "#" mark to the desired speed type position, then press the RETURN key. The system then proceeds to screen 1 at page 8-3.	Precautions/Remarks RETURN RETURN
Notes	

Mode	Program mode	Function	Program delete		8-21	
Deleting Programs						
Messa	ge			Key Operation		
	P DEL. K4 GO -> DE CAN-> CA	—— GO				
	Operation Procedure	e & Explana	tions	Precautions/Remarks		
Delete						
1 <u> </u>	Press the <u>GO</u> key to delete to the function selection sc	the designareen.	ated program and return			
Notes						

Mode	Program mode	Function	Sort		8-22			
Sorting	Programs							
Messa	Message Key Operation							
	P SORT GO -> SC CAN-> CA	——GO						
	Operation Procedure	e & Explana	tions	Precautions/Rema	arks			
	Press the GO key to executompleted, the system returnal message is displayed during the EXECUTING.	ite program : rns to the fu	sorting. When sorting is nction selection screen.					
Notes								

Mode	Program mode	Function	Сору		8-23
Copyin	g Programs				
Messa	ge			Key Operation	
	P C O P Y 4 0 9 5 GO> C C C A N> C A	—————————————————————————————————————	RETURN		
	Operation Procedure	& Explana	tions	Precautions/Rema	ırks
Enterin Use ke then p	Use the ← , → keys to copy destination program No.: O ··· 9 RETURN BY O to 9 to enter the copy source ress the RETURN key. O Press the GO key to exect function selection screen is No. already exists, the mess played, and the next screen pressed at this time, the old ignated copy data (overwrite)	am No. inputate copying. displayed. Its age "PROGen is displadata will repu	estination program Nos., When completed, the f a designated program G.ALR.STORED" is disyyed. If the GQ key is		
The fo	GO -> REWRITE CAN -> CANCEL Illowing message is displayed durin "! EXECUTING"	ng a copy op	peration:		
Notes					

Mode	Program mode	Function	All-Clear	_	8-24			
All-Cle	All-Clear							
Messa	ge	Key Operation						
	P ALL CLE GO -> AL CAN-> CA	GO						
	Operation Procedure	e & Explana	tions	Precautions/Rema	rks			
-								
Notes								

9. ERROR MESSAGE LIST

Drawing No.

Mode	Function	9-1

When an error occurs, one of the error messages shown in this section is displayed at the bottom line of the screen. While an error message is displayed, processing is stopped and display content changes will be impossible.

Press the <u>CLEAR</u> key to clear the error message and resume processing.

Error messages are cleared by key inputs, and those key inputs are processed normally.

-		 	T	
	Mode	Function		9-1.1

"! MIS OPERATION"

Causes:

- Displayed in response to a key input which is prohibited at the current screen.
- Displayed in response to a key input which is prohibited at the current status.
- Displayed during numeric inputs when a key for screen movement is pressed without first pressing the <u>RETURN</u> key.
- * This error takes precedence over other errors.

Countermeasure: Press the correct keys.

2) "! SETTING ERROR"

Causes:

- Displayed in the following cases when inputting data (axis No., program No., setting data, program parameters, etc.):
 - 1. When the data entered (by pressing <u>RETURN</u> key) is outside the applicable range.
 - 2. When a negative value (minus key) is entered at a positive value input item.
 - 3. When the decimal point key is used at an integer input item.
 - 4. An inconsistency exists at system settings between the AMP slot setting and SB/SD servo settings.
 - 5. When the following statuses occur while registering programs in the program mode:
 - A. The same axis number is designated.
 - B. No simultaneous START program number is designated.
 - C. Abnormal FOR to NEXT relationship.
 - D. When an ABS-1 to ABS-4, INC-1 to INC-4, VABS, or VINC is missing at a speed change.
 - E. Constant-speed control does not end at CPEND.
 - F. Speed change does not end at VEND.
 - 6. When a key for screen movement is pressed at program mode constantspeed control or speed switching control after designating the same axis No. twice.
 - 7. When an improper instruction is selected at the 2nd or later step of constant-speed control or speed switching control in the program mode.
 - 8. When improper positioning data is selected for a given instruction in the program mode.
 - 9. When an indirect designation data change is attempted in direct numeric input under the address teaching function.
 - 10. When a key for screen movement or screen switching, etc., is pressed without entering the required data when using the program teaching function
 - 11. When a key for screen movement is pressed with the same axis number designated twice at the program teaching function.
 - 12. When the START program number is larger than the END program number for a "continuous" program operation.
 - 13. When no program number has been designated at a "random" program operation.
- * Note: When this error occurs, a setting cannot be designated for the data item in question.

Countermeasure: Enter a correct value.

9

			_
Mode	Function	9-1.2	

3) "! IN TEST MODE"

Cause:

- Displayed when a setting data (auxiliary data: backlight, buzzer ON/OFF, language selection) update is made in the test mode.
- * Note: Data will not be updated if this error occurs.

Countermeasure: Execute the update after canceling the test mode.

4) "! NO SERVO SYSTEM"

Cause:

- Displayed when any of the following operations are executed at an axis where no servo amplifier is installed.
 - 1. Axis monitoring
 - 2. Torque trace
 - 3. Servo monitoring
 - 4. Servo monitoring (2-port memory)
 - 5. JOG operation
 - 6. Home position return
 - 7. Present value setting
- * Note: The operation in question will not be executed if this error occurs.

Countermeasure: Designate another axis.

5) "! CAN'T TRACE"

Cause:

- Displayed when a torque trace operation is already in progress when a torque trace start is attempted, making the trace request impossible.
- * Note: The torque trace function will not be executed if this error occurs.

Countermeasure: Stop the trace operation which is in progress, then start the desired trace operation.

6) "! STARTING ERROR"

Causes:

- Displayed when switching to the test mode is impossible even after the prescribed period has elapsed. (See note 1)
- Displayed when the test mode cannot be canceled even after the prescribed period has elapsed. (See note 2)
- Displayed when a program operation start is attempted while operation is in progress. (See note 3)
- Displayed when address (designated by address teaching) writing is attempted while operation is in progress. (See note 4)
- Displayed when program (designated by program teaching) writing is attempted while operation is in progress. (See note 5)
- * Notes: 1. The test mode cannot be established when this error occurs.
 - 2. The test mode cannot be canceled when this error occurs.
 - 3. Program start is impossible when this error occurs.
 - 4. Address writing is impossible when this error occurs.
 - 5. Program writing is impossible when this error occurs.

Countermeasure: Stop the operation in progress, then try again.

7) "! TIME CHECK OVER"

Cause:

- Displayed when any of the following SCPU operations are not completed within the prescribed period:
 - 1. Bit device update
 - 2. Word device update
 - 3. Word device monitoring

Countermeasure: Look for malfunction at the SCPU.

8) "! DEVICE ERROR"

Cause:

- Displayed when a request to the SCPU ends in an error.
 - 1. Bit device update
 - 2. Word device update
 - 3. Word device monitoring

Countermeasure:

Check the device types and device addresses. If they are correct, there may be an SCPU malfunction.

9) "! WRITE ERROR"

Cause:

- Displayed when a ROM writing error occurred.
 - 1. When a data update is attempted at data setting.
 - 2. When address writing is attempted when using the address teaching function.
 - 3. When program registration is attempted when using the program teaching function.
 - 4. When a program change is attempted in the program mode.
- * Note: Data being registered at the ROM cannot be guaranteed when this error occurs.

Countermeasure: Replace the ROM.

10) "! ERROR DETECTED"

Cause:

- Displayed if an error is detected when a "continuous" or "random" program operation is started.
- * Note: Program operation is immediately stopped when this error occurs.

Countermeasure:

Check the program and error content, eliminate the error cause, execute an error reset, then re-start the program.

11) "M.OVER-CAN'T WR"

Causes:

- Displayed at program registration in the "program teaching" or "program" mode when the number of instruction words which have been created exceed the available program space.
- Displayed at the program copy operation (in program mode) when the number of instruction words to be copied exceed the available program space.
- * Note: This error also occurs at the program sort function, but only when the space required for the above operations cannot be secured.

 Program registration will be impossible if this error occurs.

Countermeasure:

Delete unnecessary programs, execute the sort function, then repeat the registration operation.

de Function 9-	4.4	1	
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12) "M.OVER-NEED SORT"

Causes:

- Displayed at program registration in the "program teaching" or "program" mode
 when the number of instruction words which have been created exceed the
 available program space.
- Displayed at a program copy operation (in program mode) when the number of instruction words to be copied exceed the available program space.

* Note: This error also occurs when using the program sort function, but only when the space required for the above operations cannot be secured. Program registration will be impossible if this error occurs.

Countermeasure: Execute the program sort function, then repeat the registration operation.

13) "! STEP NO. OVER"

Causes:

- Displayed during program creation in the "program teaching" or "program" mode when the number of instruction steps for constant-speed control or speed switching control exceeds 256.
- Displayed at program registration in the "program teaching" or "program" mode when the number of created instruction words for constant-speed control or speed switching control exceeds 768.
- * Note: Program registration is impossible when this error occurs.

Countermeasure: Shorten the program.

14) "! KEY INVALID"

Cause:

- Displayed when key operation for a data change, a program change or program operation is attempted with the enabled/disabled switch set to disabled.
- * Note: The above operations are impossible when this error occurs.

Countermeasure:

Set the enable/disabled switch to "enabled", then repeat the desired key operation.

15) "TST.MOD.OFF ERR"

Cause:

- Displayed when the test mode is canceled during a "continuous" or "random" program operation.
- * Note: Program operation is immediately stopped when this error occurs.

Countermeasure: Switch the test mode ON and start the program again.

16) "I.COD ERROR"

Cause:

- Displayed if an incorrect program code is read when modifying a program in the program mode.
 - 1. When the program number is entered.
 - 2. When the next step is read out in response to a STEP+ key input.
 - 3. When the next step is read out after canceling a step.

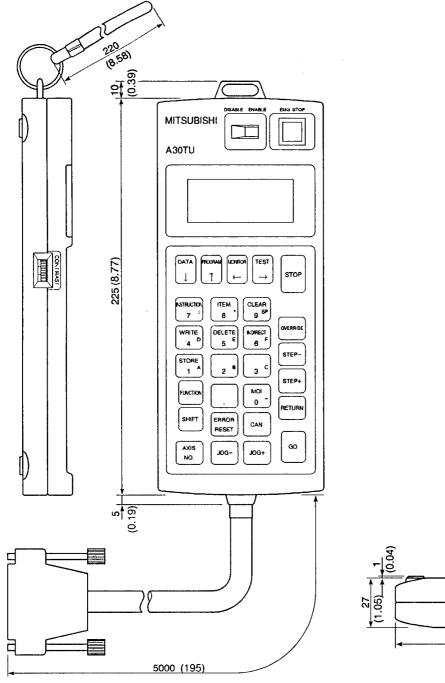
* Note: When an error occurs at status 2 or 3 above, all subsequent steps are abandoned. (If not registered, however, the program (ROM content) will not be changed.)

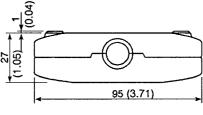
Countermeasure: Re-create the program.

APPENDIX. OUTLINE DRAWING

Drawing No.

_			····
	Mode	Function	APP-1





mm: inch

			Drawing
Mode	Test Mode	Function	5-1
Proced	lures at Initial Test Mode Screen		
Messa	ge	Key Operation	
	T TEST M PC CMD I GO -> T OTHER->		GO DATA PROGRAM MONITOR CAN
	Operation Procedu	re & Explanations	Precautions/Remarks
Switch Switch Switch No sc	ng the test mode: GO Go to 5-3 Ining to data set mode: DATA Go to 7-1 Ining to program mode: PROGRAM Go to 8-1 Ining to monitor mode: MONITOR Go to 6-2 ITEST This section for the control of the cont		Even if test mode operation is des nated by pressing the GQ key, the tomode will not be established at A273UHCPU/A171SCPU if axis ration in response to a programma controller command is in progress this case, a "! STARTING ERROR" ror will occur. The term "cancel" means switching another mode.
Notes	Start commands from the program	nmable controller are	e invalid when in the test mode.

Drawing No. Mode Test Mode Function Cancel 5-2 Procedures at Test Mode Cancel Screen Message **Key Operation** GO T TEST MODE PC COMMAND VALID CAN-> CANCEL Operation Procedure & Explanations Precautions/Remarks The test mode cancel screen will be displayed in test mode operation when another mode key is pressed, or when the CAN key is pressed at the test item selection screen (5-3). A test mode cancel confirmation procedure is then required as shown below. To cancel the test mode: GO If another mode key was pressed immediately prior to the test mode cancel screen being displayed, the initial screen for that mode will be displayed when the GO key is pressed. To continue the test mode: CAN The test mode will not be canceled, and the test mode's item selection screen (5-3) will be displayed.

Notes

Drawing No.

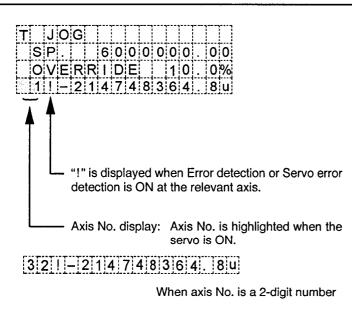
Mode	Test Mode	Function	Test Item Selection		5-3
Test Ite	em Selection Screen (Displayed Af	ter Entering	Test Mode)		lJ
Messa	ge			Key Operation	
	T 1 J O G 2 T E A C H 3 P R O G . O 4 P . V A L	PERAT	O N I O N	1 RE RE 6	FURN
	Operation Procedure	e & Explana	tions	Precautions/Rema	arks
The te	st item is selected at this screen.				
Select	ing JOG operation:				
	1 RETURN► Go to	5-4			
Select	ing teaching:				
	2 RETURN► Go to	5-5			
Select	ing program operation:				
	3 RETURN► Go to	5-34			
Select	ing present value setting:				
	4 RETURN► Go to	o 5-42			
Select	ing PC test:				
	5 RETURN► Go to	5-45			
Select	ing servo ON:				
	6 RETURN► Go to	5-48			
\	When the key which designates the	desired iter	n number is pressed, that	item number will be highligh	ited.
tes					
Notes					

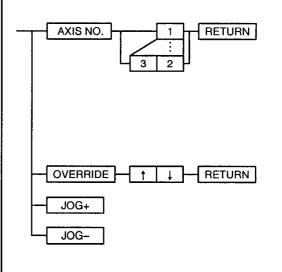
Mode Test Mode Function JOG Operation 5-4

Screen Procedures When JOG Operation is Selected

Message

Key Operation





Operation Procedure & Explanations

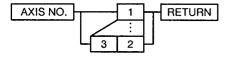
Precautions/Remarks

The data settings and procedures required for JOG operation are executed at this screen. The JOG speed is displayed as a "[JOG speed limit value] × [override]" value. The initial override display value is 10.0 %.

The selected axis number and the feed present value are displayed at the bottom line of the screen.

When the JOG screen is first displayed after being selected at the test item screen, a 1-axis JOG operation will be indicated.

Changing the axis:



Select axis No.1 to 32 immediately after pressing the AXIS NO, key. When an axis change is made, the new axis number is indicated at the bottom of the screen. The axis number input range varies according to the CPU type being used.

A273UHCPU (8-axis specs.) Axes 1 to 8 A273UHCPU (32-axis specs.) Axes 1 to 32 A171SCPU Axes 1 to 4

JOG operation is possible during an axis number change.

Although JOG operation can be started by pressing AXIS NO. JOG+ , the AXIS NO. key ON status will be canceled at that time.

When the JOG+ or JOG- key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! SETTING ER-ROR" will be displayed.

The <u>JOG+</u> and <u>JOG-</u> keys are always operative while in the JOG test mode.

Notes

	Mode	Test Mode	Function	JOG Operation	5-4.1
•					

Screen Procedures When JOG Operation is Selected

Operation Procedure & Explanations	Precautions/Remarks
Changing the override:	If the 1 key is pressed when the over-
OVERRIDE	ride is 100.0 %, the override will become 0.1 %. If the \downarrow key is pressed when the override is 0.1 %, the override
When the <u>OVERRIDE</u> key is pressed, the cursor will be displayed at the over-ride value.	will become 100.0 %.
10.	If the <u>CAN</u> key is pressed during an
At this time, the \uparrow , \downarrow keys can be used to display the override table values in order. Press the \uparrow key to increase the value, and the \downarrow key to decrease the value. The override table contains the values shown below, enabling selection of	override change, the change will be aborted, and the original value will be adopted.
0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 %	
0.8 % 8.0 % 80.0 % After selecting the desired override value, press the <u>RETURN</u> key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] JOG operation is possible during an override change. JOG operation is possible with the following key operations, but the override setting procedure will be canceled: OVERRIDE JOG+ or OVERRIDE ↑ ↓ JOG+	
JOG operation:	
While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the displayed speed. JOG operation stops when this key is released.	
JOG- While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the displayed speed. JOG operation stops when this key is released.	
Notes	·
Z	

Drawing No.

Mode	Test Mode	Function	Teaching		5-5
Procedu	ures at Teaching Item Selection So	reen			
Messag	е			Key Operation	
	T TEACHIN 1 ADDRESS 2 PROGRAM	TEAC	H H	1 RETURN	
	Operation Procedure	& Explanat	ions	Precautions/Rema	rke
The tea	aching type (address teaching or p			i rodauliona/Holfid	
Selection 1	ng "address teaching": RETURN► Go to				
Notes					

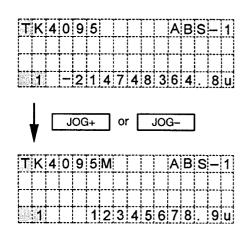
	T	·			Drawing No.
Mode	Test Mode	Function	Function Teaching (address teaching)		
Calling	a Designated Program			• • • • • • • • • • • • • • • • • • • •	
Messag	je		Key Operation		
	T TEACH I	0	Cursor position	0 9 —(CLEAR	RETURN
	Operation Procedure	e & Explana	tions	Precautions/Rema	arks
ber. Th The eff	ogram to be accessed is designated the program number range is 0 to 4 fective input digits will be the most g 4 digits will be invalid. Each to digit me 14 0 9 9 4 0 9 5 6 6	In order to execute the adfunction, a program must ated in the program mode When this screen is access teaching item selection screacessed due to the CAN pressed during an addresseration, the call program not tered at that time will be on the default.	first be cre- sed from the een (5-5), or key being s teach op- umber regis-		
Press the CLEAR key to correct an input. The input field will be cleared. If a program has been read out successfully (when RETURN key is pressed), that program's servo instructions and axis feed present values, etc., will be displayed. Go to 5-7 Go to 5-7			On returning to this scree address writing by the teation, a search will be conducted all subsequent program in steps where teaching is puthe number of the first prosuch a step is found will be lifted a program number where impossible (INC, VF, etc. nated, the message "! (P.VAL" will be displayed on line.	aching func- cted through numbers for ossible, and gram where e displayed. e teaching is .) is desig- CAN'T SET	
Notes					

Mode	Test Mode	Function	Teaching (address teaching)	5-7
		<u> </u>		1

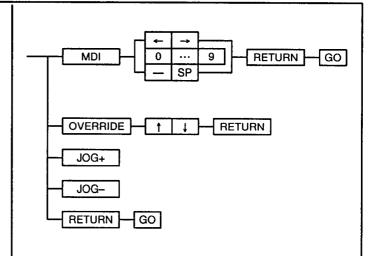
Absolute 1-Axis Positioning

Message

Key Operation



The axis number for which the JOG designation has been made is highlighted.

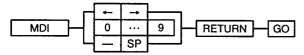


Operation Procedure & Explanations

Precautions/Remarks

When the program's servo instruction designates an absolute 1-axis operation, this is indicated by the display "ABS-1". The program content for the axis numbers designated for the program is displayed on the lower lines.

Numeric input:



When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value.

"E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress.

At this time, use the $\underline{\leftarrow}$, $\underline{\rightarrow}$ keys to move the cursor to the numeric value which is to be changed, then enter the desired value.

To change the numeric value's sign, press the <u>key</u> at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The <u>SP</u> key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged).

When the numeric input is completed, press the <u>RETURN</u> key. An address writing confirmation screen like that shown below will then be displayed.

GO -> WRITE CAN -> CANCEL

Because the absolute 1-axis positioning operation occurs at 1 axis only, there is no axis change procedure.

	Mode	Test Mode	Function	Teaching (address teaching)	5-7.1	
•						

Absolute 1-Axis Positioning

Operation Procedure & Explanations	Precautions/Remarks
Press the GO key at this time to write the changed numeric value.	
If the value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	
Changing the override:	
OVERRIDE	
When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The change procedure is identical to that in the test mode JOG operation, except that the system will return to the absolute 1 axis teaching screen when the RETURN key is pressed.	
When the JOG screen format is displayed, the cursor will be displayed at the override position.	
10.0 % Cursor position	
At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ key to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %.	If the 1 key is pressed when the override is 100.0 %, the override will become 0.1 %. If the 1 key is pressed when the override is 0.1 %, the override will become 100.0 %.
0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	If the <u>CAN</u> key is pressed during an override change, the change will be aborted, and the original value will be
After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	adopted.
Notes	

Mode	Test Mode	Function	Teaching (address teaching)	5-7.2

Absolute 1-Axis Positioning

		Operation Procedure & Explanations	Precautions/Remarks			
JOG	operation:					
	JOG+	While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will			
	JOG-	While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	be displayed.			
play	of the feed p	tion occurs, the displayed numeric value will change to a dis- resent values for the interpolating axes. This change is indi- nich is displayed to the right of the program No. (top of screen).				
Writin	ng the addre	SS:				
	RETURN	GO				
Press progr playe	ram. The foll	RN key to write the currently displayed numeric value to the owing address writing confirmation screen will then be dis-	·			
		GO -> WRITE CAN -> CANCEL				
Notes						

					Drawing No.
Mode	Test mode	Function	Teaching (address teachi	ng)	5-8
Absolu	te 2-Axis Linear Interpolation	1			
Messa	ge		Key Operation		
The a	T K 4 0 9 5	6 4 . 8 u 6 4 . 8 u 6 5 . 3 u	OVERRIDE - JOG-	RETURN RETURN RETURN RETURN RETURN RETURN	IRN — GO
	Operation Pro	cedure & Explana	tions	Precautions/Re	emarks
The a AXIS pressi the ax When	the program's servo instruction indicated by display of "ABS lesignated for the program is ging the axis: AXIS NO. The program is a sum of the program is a sum of the RETURN key. The axis number range designated a JOG axis number is changed in the program is a sum of the program is a sum of the program is number range designated a sum of the program is number is changed in the program is a sum of the program	is designated is mber where a JOG kis number which by the program.	content for the axis num- lower lines. changed by pressing the operation is to occur, then is entered must be within		
Notes					

Mode	Test Mode	Function	Teaching (address teaching)	5-8.1
`			· · · · · · · · · · · · · · · · · · ·	

Absolute 2-Axis Linear Interpolation

Operation Procedure & Explanations Precautions/Remarks When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen). "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the \leftarrow , \rightarrow , \uparrow , \downarrow keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the <u>-</u> key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key. An address writing confirmation screen like that shown below will then be displayed. GO -> WRITE CAN -> CANCEL Press the GO key to write the changed numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6). Changing the override: OVERRIDE -RETURN 1 | | F When the **OVERRIDE** key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom of the screen. The change procedure is identical to that in test mode JOG operation, except that the system will return to the absolute 2-axis teaching screen when the **RETURN** key is pressed. When the JOG screen format is displayed, the cursor will be displayed at the override position. - Cursor position At this time, the \uparrow , \downarrow keys can be used to display the override table values in order. Press the \uparrow to increase the value, and the \downarrow key to decrease the value.

Mode	Test Mode	Function	Teaching (address teaching)	5-8.2
			· · · · · · · · · · · · · · · · · · ·	

Absolute 2-Axis Linear Interpolation

	Operation Pr	Precautions/Remarks		
0.1 % to 100.0 %. 0.1 % 0.2 % 0.4 % 0.8 % After selecting the The JOG speed v	1.0 % 2.0 % 4.0 % 8.0 % e desired overrigilithen be dete	10.0 % 20.0 % 40.0 % 80.0 % de value, press t ermined as follow nit value] × [ove	rs: rride]	If the ↑ key is pressed when the over ride is 100.0 %, the override will be come 0.1 %. If the ↓ key is presse when the override is 0.1 %, the overrid will become 100.0 %. If the <u>CAN</u> key is pressed during a override change, the change will b aborted, and the original value will b adopted.
JOG operation: JOG+	designated as calculated spreleased.	kis in the addres eed. JOG opera	a operation will occur at the sincrease direction, at the tion stops when this key is a operation will occur at the	
JOG	designated a	kis in the address	s decrease direction, at the tion stops when this key is	
play of the feed p	resent values fo	or the interpolation	ric value will change to a dis- ng axes. This change is indi- e program No. (top of screen).	
Writing the addre	ss: 			
RETURN	GO			
			played numeric value to the tion screen will then be dis-	
	GO -> WRI CAN -> CAN			
next step where to	ue is written wit eaching is possi	hout error, a sea ble, and that ste	arch will be conducted for the p will be displayed. If no such seed to the program readout	

	T	T	I I		Drawing No.
Mode	Test mode	Function	Teaching (address teachi	ng)	5-9
Absolut	te 3-Axis Linear Interpolation			· · · · · · · · · · · · · · · · · · ·	
Messag	ge		Key Operation		
The ax	T K 4 0 9 5 ABS 1 - 2 1 4 7 4 8 3 6 4 2 - 2 1 4 7 4 8 3 6 4 3 - 2 1 4 7 4 8 3 6 4 JOG+ or JOG- T K 4 0 9 5 M ABS 1 1 1 1 1 8 3 4 9 6 3 1 2 3 9 8 4 7 1 6 5 3 1 1 2 3 4 5 6 7 8 dis number for which the JOG designade is highlighted.	8 u 8 u 8 u 1 u 3 u 9 u	MDI — OVERRIDE — JOG+ JOG-	1 RETURN 3 2 RETURN 1 HRETURN RETURN 1 HRETURN	IN GO
	Operation Procedure	e & Explana	tions	Precautions/Ren	narks
When the program's servo instruction designates an absolute 3-axis operation, this is indicated by display of "ABS-3". The program content for the axis numbers designated for the program is displayed on the lower lines. Changing the axis: AXIS NO. The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.					
Nume	ric input: MDI 0 9 - SP	RETURN }	-GO		
Notes					

Mode Test Mode Fun	ınction	Teaching (address teaching)	5-9.1
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Absolute 3-Axis Linear Interpolation

Operation Procedure & Explanations Precautions/Remarks When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen). "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the $\stackrel{\longleftarrow}{-}$, $\stackrel{\longrightarrow}{-}$, $\stackrel{1}{-}$ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the <u>-</u> key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key. An address writing confirmation screen like that shown below will then be displayed. GO -> WRITE CAN -> CANCEL Press the GO key to write the changed numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6). Changing the override: OVERRIDE -RETURN ↓ l When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom The change procedure is identical to that in test mode JOG operation, except that the system will return to the absolute 3-axis teaching screen when the RETURN key is pressed. Notes

ModeTest ModeFunctionTeaching (address teaching)5-9.2	:
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Absolute 3-Axis Linear Interpolation

Operation Procedure & Explanations	Precautions/Remarks
When the JOG screen format is displayed, the cursor will be displayed at the override position.	
10. 0 % Cursor position	
At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override]	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.
The system will then return to the original display screen.	
JOG operation:	
While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	
While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	
When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	
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Notes	

Drawing No.

ModeTest ModeFunctionTeaching (address teaching)5-9.3	Mode	Test Mode	Function	Teaching (address teaching)	5-9.3
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Absolute 3-Axis Linear Interpolation

Operation Procedure & Explanations	Precautions/Remarks
Writing the address:	
RETURN GO	
Press the <u>RETURN</u> key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed.	
GO -> WRITE CAN -> CANCEL	
Press the <u>GO</u> key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	
Notes	

				Drawing No.
Mode Test mode	Function	Teaching (address teachi	ng)	5-10
Absolute 4-Axis Linear Interpolation				
Message		Key Operation		
1 - 2 1 4 7 4 8 3 6 4 2 - 2 1 4 7 4 8 3 6 4 1 1 - 2 1 4 7 4 8 3 6 4 Axis No. display: Axis No. v designat lighted.	vhere JOG is ed is high-	AXIS NO. MDI OVERRIDE JOG- RETURN GI	1 RETURN 3 2 RETURN 1 RETURN 1 RETURN	IN GO
Operation Proced	lure & Explana	ations	Precautions/Ren	narks
When the program's servo instruction of this is indicated by display of "ABS-4", bers designated for the program is displayed the control of the program is displayed to the program is displayed to the program is displayed to the program is displayed to the axis. The axis where a JOG operation is displayed to the axis number pressing the RETURN key. The axis of the axis number range designated by is changed, that axis number will be holder to the program is displayed to the	The program played on the JRN designated is the where a JOG number which the program.	content for the axis num- lower lines. changed by pressing the apperation is to occur, then is entered must be within	If an axis number outsidesignated by the prograted, the error message ERROR" will be displayed tom line of the screen number will not be changed.	ram is desig- e "! SETTING ed at the bot- and the axis
Notes				

Mode Test Mode	Function	Teaching (address teaching)	5-10.1
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Absolute 4-Axis Linear Interpolation

Precautions/Remarks Operation Procedure & Explanations When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen). "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the \leftarrow , \rightarrow , \uparrow , \downarrow keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the _ key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key. An address writing confirmation screen like that shown below will then be displayed. GO -> WRITE CAN -> CANCEL Press the GO key to write the changed numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6). Changing the override: OVERRIDE -1 | J | RETURN When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom of the screen. The change procedure is identical to that in test mode JOG operation, except that the system will return to the absolute 4-axis teaching screen when the RETURN key is pressed. Notes

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Mode Test Mo	de	Function	Teaching (address teaching)	5-10.2

Absolute 4-Axis Linear Interpolation

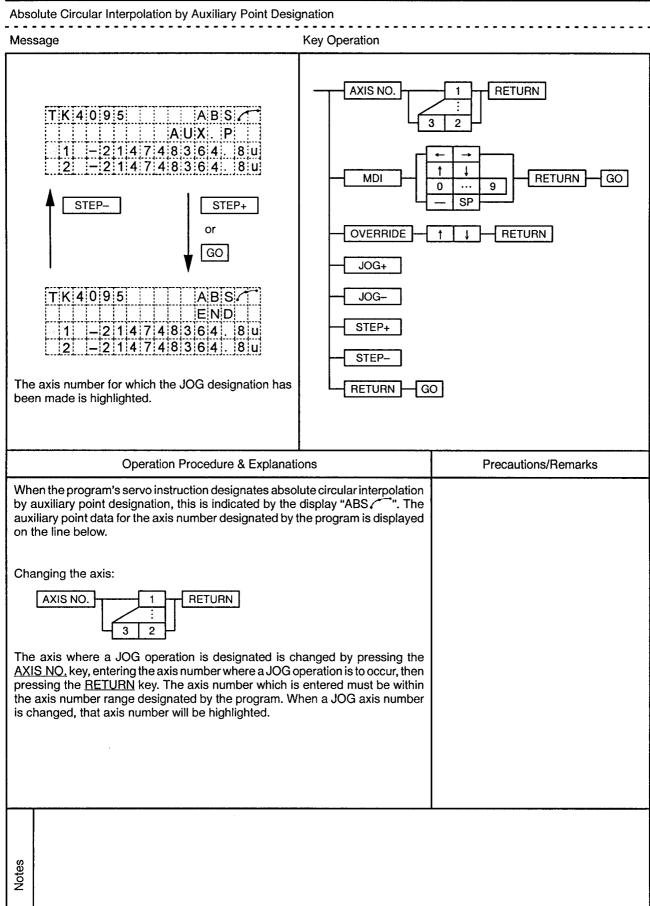
Operation Procedure & Explanations	Precautions/Remarks
When the JOG screen format is displayed, the cursor will be displayed at the override position.	
10.0 % Cursor position	
At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %.	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override
0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	will become 100.0 %. If the <u>CAN</u> key is pressed during an override change, the change will be aborted, and the original value will be
After selecting the desired override value, press the <u>RETURN</u> key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	adopted.
JOG operation:	
While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	
While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	
When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpalating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	
Notes	

Drawing No.

	Mode	Test Mode	Function	Teaching (address teaching)	5-10.3
Absolute 4-Axis Linear Interpolation					

Operation Procedure & Explanations	Precautions/Remarks
Writing the address:	
RETURN GO	
Press the <u>RETURN</u> key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed.	
GO -> WRITE CAN -> CANCEL	
Press the <u>GQ</u> key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	
Screen scrolling:	
For 4-axis interpolation, the data for all axes cannot be displayed on a single screen. In such cases, use the 1, 1 line.	
, , ,	
Notes	
2	

Mode	Test mode	Function	Teaching (address teaching)	5-11



Mode	Test Mode	Function	Teaching (address teaching)	5-11.1
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Absolute Circular Interpolation by Auxiliary Point Designation

Operation Procedure & Explanations	Precautions/Remarks
Numeric input:	
MDI RETURN GO	
0 9	
When the MDI key is pressed, the numeric input mode will be established and he cursor will appear at the right end of the axis value (top of screen).	
E" is displayed to the right of the program No. (top of screen) in order to indicate	
hat numeric data editing is in progress. At this time, use the \leftarrow , \rightarrow , \uparrow , \downarrow keys to move the cursor to the numeric value	
which is to be changed, then enter the desired value.	
To change the numeric value's sign, press the <u>_</u> key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted),	
and a positive value will be changed to a negative value (minus symbol will be	
displayed in front of the value). The <u>SP</u> key can also be used in the same manner to change a negative value to a positive value (a positive value will remain	
ınchanged).	
When the numeric input is completed, press the <u>RETURN</u> key. An address writing confirmation screen like that shown below will then be dis-	
played.	
GO -> WRITE	
CAN -> CANCEL	
Press the GO key to write the changed numeric value.	
f the numeric value is written without error, the system will proceed to the end- point designation screen (if the current screen is the auxiliary point designation	
screen) where the same procedure is possible. If the GO key is pressed at the	
end-point designation screen, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist	
n that program, the system will proceed to the program readout screen (5-6).	
Changing the override:	
OVERRIDE - 1 L RETURN	
When the OVERRIDE key is pressed, the screen will change to the JOG screen	
display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom	
of the screen.	
Notes	
2	

Mode Test Mode Function Teaching (address teaching)	5-11.2
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Absolute Circular Interpolation by Auxiliary Point Designation

	Operation Pro	cedure & Explanations		Precautions/Remarks
The override char tion, except that th key is pressed.				
When the JOG so override position.		isplayed, the cursor will be d	displayed at the	
	10.0 %	— Cursor position		
order. Press the 1 The override table 0.1 % to 100.0 %. 0.1 % 0.2 % 0.4 % 0.8 % After selecting the The JOG speed v [JOG speed] =	_, ↓ keys can be to increase the e contains the vector 1.0 % 10.0 2.0 % 20.0 4.0 % 40.0 8.0 % 80.0 e desired overrid vill then be deter [JOG speed limi	e used to display the override value, and the ↓ key to decral values shown below, enabling the shown below with t	ease the value. ng selection of	If the ↑ key is pressed when the override is 100.0 %, the override will be come 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the <u>CAN</u> key is pressed during ar override change, the change will be aborted, and the original value will be adopted.
JOG operation:				
JOG+	designated ax	s pressed, JOG operation wi s in the address increase dir ed. JOG operation stops wh	rection, at the	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satis fied, the message "! CAN'T START" will be displayed.
JOG-	designated ax	s pressed, JOG operation wi s in the address decrease di ed. JOG operation stops wh	rection, at the	oo diopiayou.
play of the feed p	resent values fo	displayed numeric value will or the interpolating axes. This to the right of the program No.	change is indi-	
Notes				

Drawing No.

Mod	e Test Mode	Function	Teaching (address teaching)	5-11.3

Absolute Circular Interpolation by Auxiliary Point Designation

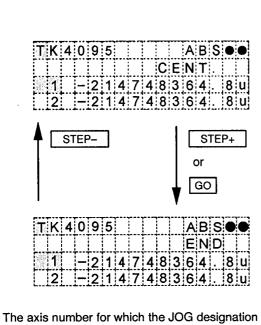
Changing the setting screen: STEP+ Press the STEP+ key at the auxiliary point designation screen to switch to the end-point designation screen. STEP- Press the STEP- key at the end-point designation screen to return to the auxiliary point designation screen. Writing the address: RETURN GO		Operation Procedure & Explanations	Precautions/Remarks
screen to switch to the end-point designation screen. Press the STEP- key at the end-point designation screen to return to the auxiliary point designation screen. Writing the address: RETURN GO Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO -> WRITE CAN -> CANCEL Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout	Changing the set	ing screen:	
to return to the auxiliary point designation screen. Writing the address: RETURN GO Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO -> WRITE CAN -> CANCEL Press the GQ key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout	STEP+	Press the <u>STEP+</u> key at the auxiliary point designation screen to switch to the end-point designation screen.	
Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO -> WRITE CAN -> CANCEL Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout	STEP-		
Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO -> WRITE CAN -> CANCEL Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout	Writing the addre	ss:	
Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout	RETURN	GO	
Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout		owing address writing confirmation screen is then displayed.	
If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout			
	If the numeric val	ue is written without error, a search will be conducted for the eaching is possible, and that step will be displayed. If no such	
			,
•			
Notes	tes		
2	2		

Mode	Test mode	Function	Teaching (address teaching)	5-12	
 Absolute Circular Interpolation by Center Point Designation					

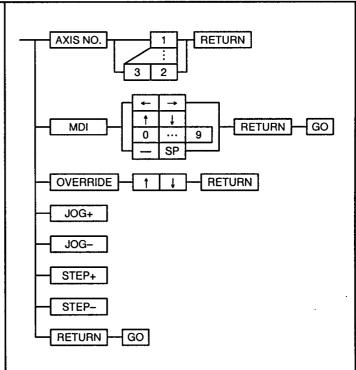
Absolute Circular Interpolation by Center Point Designation



Key Operation



The axis number for which the JOG designation has been made is highlighted.

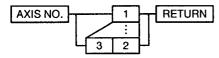


Operation Procedure & Explanations

Precautions/Remarks

When the program's servo instruction designates absolute circular interpolation by center point designation, this is indicated by display of "ABS ." The center point data for the axis number designated by the program is displayed on the line below.

Changing the axis:



The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.

The indication for circular interpolation by absolute center point designation is shown as "ABS●●" above, but the actual on-screen display appears in the following 2 ways: "ABS ,", "ABS .".

Notes

Mode	Test Mode	Function	Teaching (address teaching)	5-12.1	
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Absolute Circular Interpolation by Center Point Designation

	Operation Procedure & Explanations	Precautions/Remarks
Numeric input:		
MDI -	← → ↑ ↓ 0 ··· 9 — SP	
the cursor will app E" is displayed to that numeric data At this time, use the which is to be cha To change the numand a negative value wand a positive value displayed in front cher to change a neunchanged).	is pressed, the numeric input mode will be established and ear at the right end of the axis value (top of screen). The right of the program No. (top of screen) in order to indicate editing is in progress.	
	GO -> WRITE CAN -> CANCEL to write the changed numeric value.	
point designation s screen) where the end-point designa where teaching is p	e is written without error, the system will proceed to the end- creen (if the current screen is the center point designation same procedure is possible. If the <u>GO</u> key is pressed at the tion screen, a search will be conducted for the next step cossible, and that step will be displayed. If no such steps exist e system will proceed to the program readout screen (5-6).	
Changing the ove	ride: The structure of the screen will change to the JOG screen will change to the screen will be screen will change to the screen will be screen will	
display format, wit	the speed and override displayed at the 2nd and 3rd lines. esignated for the JOG operation is displayed at the bottom	

Mode	Test Mode	Function	Teaching (address teaching)	5-12.2

Absolute Circular Interpolation by Center Point Designation

Once the December 2.7 to the	
Operation Procedure & Explanations	Precautions/Remarks
The override change procedure is identical to that at the test mode JOG operation, except that the system will return to the original screen when the <u>RETURN</u> key is pressed.	
When the JOG screen format is displayed, the cursor will be displayed at the override position.	
10.0 % Cursor position	
At this time, the \uparrow , \downarrow keys can be used to display the override table values in order. Press the \uparrow to increase the value, and the \downarrow key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 %	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %.
0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	If the <u>CAN</u> key is pressed during an override change, the change will be aborted, and the original value will be
After selecting the desired override value, press the <u>RETURN</u> key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	adopted.
JOG operation:	
While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will
JOG- While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	be displayed.
When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolaing axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	
Notes	
2	

Drawing No.

Mode Test Mode Function Teaching (address teaching)	5-12.3
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Absolute Circular Interpolation by Center Point Designation

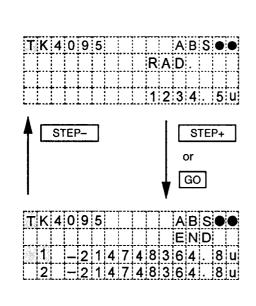
Operation Procedure & E	xplanations	Precautions/Remarks
Changing the setting screen:		
	the center point designation designation designation screen.	
STEP- Press the <u>STEP-</u> key at the to return to the center point	end-point designation screen t designation screen.	
Writing the address:		
RETURN GO		
Press the <u>RETURN</u> key to write the currently program. The following address writing confirm		
GO -> WRITE CAN -> CANCEL		
Press the <u>GO</u> key to write the numeric value. If the numeric value is written without error, a next step where teaching is possible, and that steps exist in that program, the system will p screen (5-6).	step will be displayed. If no such	
		-
Notes		

Mode Test mode	Function	Teaching (address teaching)	5-13
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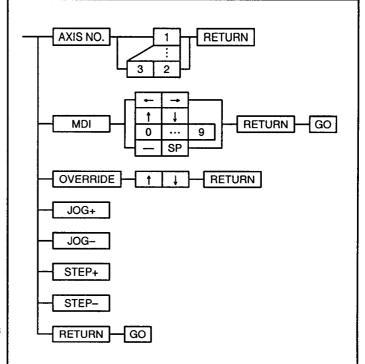
Circular Interpolation by Radius Designation



Key Operation



The axis number for which the JOG designation has been made is highlighted.

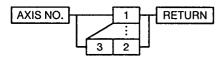


Operation Procedure & Explanations

Precautions/Remarks

When the program's servo instruction designates absolute circular interpolation by radius designation, this is indicated by the display "ABS•." The radius data designated by the program is displayed on the line below, and cannot be changed.

Changing the axis:



The axis where a JOG operation is designated is changed by pressing the <u>AXIS NO</u>, key, entering the axis number where a JOG operation is to occur, then pressing the <u>RETURN</u> key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.

The indication for circular interpolation by radius designation is shown as "ABS●●" above, but the actual on-screen display appears in the following 4 ways: "ABS ◯ ", "ABS ◯ ", "ABS ◯ ".

Notes

Mode Test Mode Function Teaching (address teaching) 5-13.1
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Circular Interpolation by Radius Designation

Operation Procedure & Explanations Precautions/Remarks Numeric input: MDI RETURN SP When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen). "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the \leftarrow , \rightarrow , \uparrow , \downarrow keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the <u>-</u> key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key. An address writing confirmation screen like that shown below will then be displayed. GO -> WRITE CAN -> CANCEL Press the GO key to write the changed numeric value. If the numeric value is written without error, the system will proceed to the endpoint designation screen (if the current screen is the center point designation screen) where the same procedure is possible. If the GO key is pressed at the end-point designation screen, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6). Changing the override: OVERRIDE RETURN When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom of the screen. Notes

- 1					Γ'
	Mode	Test Mode	Function	Teaching (address teaching)	5-13.2

Circular Interpolation by Radius Designation

Operation Procedure & Explanations	Precautions/Remarks
The override change procedure is identical to that in test mode JOG operation, except that the system will return to the original screen when the <u>RETURN</u> key is pressed.	
When the JOG screen format is displayed, the cursor will be displayed at the override position.	
10. 0 % Cursor position	
At this time, the \uparrow , \downarrow keys can be used to display the override table values in order. Press the \uparrow to increase the value, and the \downarrow key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %.	If the 1 key is pressed when the override is 100.0 %, the override will become 0.1 %. If the 1 key is pressed when the override is 0.1 %, the override
0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 %	will become 100.0 %. If the <u>CAN</u> key is pressed during an override change, the change will be
0.8 % 8.0 % 80.0 % After selecting the desired override value, press the <u>RETURN</u> key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	aborted, and the original value will be adopted.
JOG operation:	
JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will
While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	be displayed.
When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	
Notes	

Drawing No.

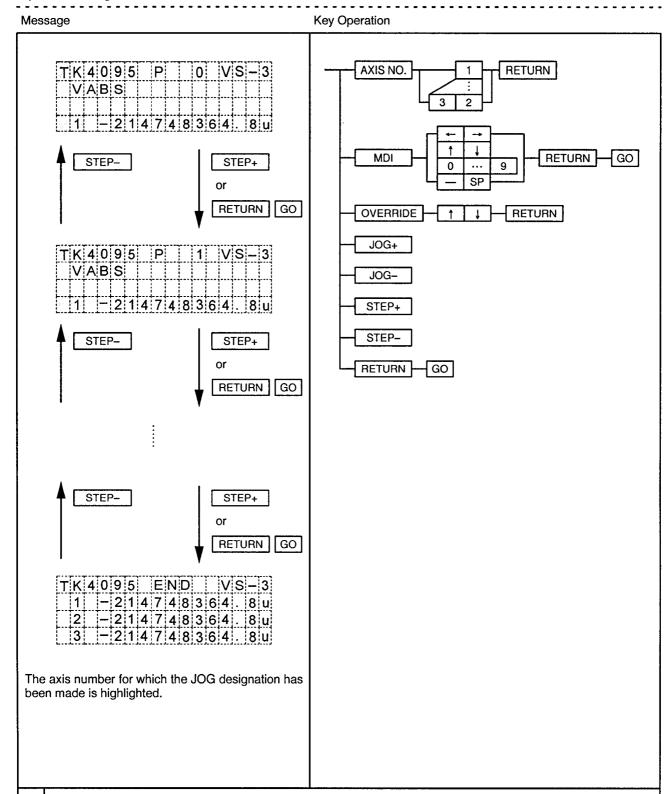
Mode	Test Mode	Function	Teaching (address teaching)	5-13.3

Circular Interpolation by Radius Designation

Operation Procedure & Explanations	Precautions/Remarks
Changing the setting screen:	
STEP+ Press the <u>STEP+</u> key to switch to the next step screen.	
STEP- Press the <u>STEP-</u> key to return to the previous step screen.	
Writing the address:	
RETURN GO	
Press the <u>RETURN</u> key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed.	
GO -> WRITE CAN -> CANCEL	
Press the <u>GO</u> key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	
Notes	
z	

Mode Test mode Function Teaching (address teaching) 5-14		Function	Teaching (address teaching)	
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Speed Switching Control



The first item to be displayed is the first ABS related instruction which appears in the program. Point numbers are assigned in sequence to program steps with addresses, beginning from point "0" (at initial step). Although INC related instructions can be displayed using the <u>STEP+</u> and <u>STEP-</u> keys, the teaching function cannot be used with respect to these instructions.

Precautions/Remarks

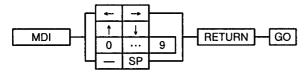
Mode	Test Mode	Function	Teaching (address teaching)	5-14.1

Speed Switching Control

Operation Procedure & Explanations Changing the axis: AXIS NO. 1 RETURN

The axis where a JOG operation is designated is changed by pressing the <u>AXIS NO.</u> key, entering the axis number where a JOG operation is to occur, then pressing the <u>RETURN</u> key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.

Numeric input:



When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen).

"E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress.

At this time, use the \leftarrow , \rightarrow , \uparrow , \downarrow keys to move the cursor to the numeric value which is to be changed, then enter the desired value.

To change the numeric value's sign, press the $\underline{\ }$ key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The \underline{SP} key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged).

When the numeric input is completed, press the <u>RETURN</u> key. An address writing confirmation screen like that shown below will then be displayed.

GO -> WRITE CAN -> CANCEL

Press the GO key to write the changed numeric value.

If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).

Notes

	Mode	Test Mode	Function	Teaching (address teaching)	5-14.2
•		2 " 1 "			

Speed Switching Control

Operation Procedure & Explanations	Precautions/Remarks
Changing the override:	
OVERRIDE	
When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom of the screen.	
The override change procedure is identical to that in test mode JOG operation, except that the system will return to the original screen when the <u>RETURN</u> key is pressed.	
When the JOG screen format is displayed, the cursor will be displayed at the override position.	
10. 0 % Cursor position	
At this time, the \uparrow , \downarrow keys can be used to display the override table values in order. Press the \uparrow to increase the value, and the \downarrow key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %.	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override
0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	will become 100.0 %. If the <u>CAN</u> key is pressed during an override change, the change will be aborted, and the original value will be
After selecting the desired override value, press the <u>RETURN</u> key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	adopted.
Notes	

М	lode	Test Mode	Function	Teaching (address teaching)	5-14.3

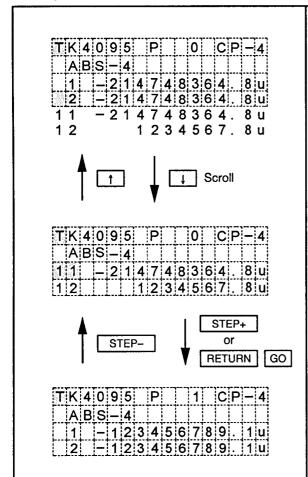
Speed Switching Control

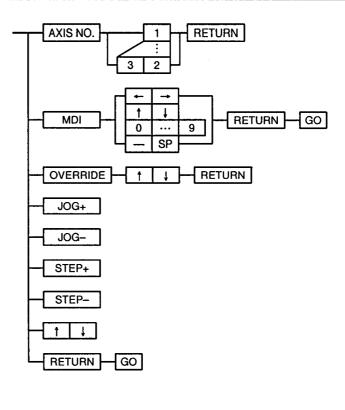
	Operation Procedure & Explanations	Precautions/Remarks
JOG operation:		
JOG+	While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will
JOG-	While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	be displayed.
play of the feed	ation occurs, the displayed numeric value will change to a dispresent values for the interpolating axes. This change is individual in the program No. (top of screen).	
Changing the se	tting screen:	
STEP+	Press the <u>STEP+</u> key to switch to the next step screen.	
STEP-	Press the <u>STEP</u> key to return to the previous step screen.	
Writing the addre	ess:	
RETURN	-GO	
Press the GO ke If the numeric vanext step where	RN key to write the currently displayed numeric value to the lowing address writing confirmation screen is then displayed. GO -> WRITE CAN -> CANCEL by to write the numeric value. Itue is written without error, a search will be conducted for the leaching is possible, and that step will be displayed. If no such lat program, the system will proceed to the program readout	
Notes		

Mode Test mode	Function	Teaching (address teaching)	5-15
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Message

Key Operation





The axis number for which the JOG designation has been made is highlighted.

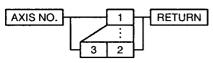
The first item to be displayed is the first ABS related instruction which appears in the program. Point numbers are assigned in sequence to program steps with addresses, beginning from point "0" (at the initial step). Although INC related instructions can be displayed using the <u>STEP+</u> and <u>STEP+</u> keys, the teaching function cannot be used with respect to these instructions.

Mode	Test mode	Function	Teaching (address teaching)	5-15.1
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Operation Procedure & Explanations

Precautions/Remarks

Changing the axis:

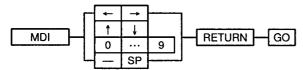


The axis where a JOG operation is designated is changed by pressing the <u>AXIS NO</u>, key, entering the axis number where a JOG operation is to occur, then pressing the <u>RETURN</u> key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.

If an axis number outside the range designated by the program is designated, the error message "! SETTING ERROR" will be displayed and the axis number will not be changed.

Numeric input:

Notes



When the <u>MDI</u> key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen).

"E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress.

At this time, use the \leftarrow , \rightarrow , \uparrow , \downarrow keys to move the cursor to the numeric value which is to be changed, then enter the desired value.

To change the numeric value's sign, press the <u>key</u> at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The <u>SP</u> key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged).

When the numeric input is completed, press the <u>RETURN</u> key. An address writing confirmation screen like that shown below will then be displayed.

GO -> WRITE CAN-> CANCEL

Press the GO key to write the changed numeric value.

If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).

-					
ı	Mode	Test mode	Function	Teaching (address teaching)	5-15.2
-					

Operation Procedure & Explanations	Precautions/Remarks
Changing the override:	
OVERRIDE ↑ ↓ RETURN	
When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom of the screen.	
The override change procedure is identical to that in test mode JOG operation, except that the system will return to the original screen when the <u>RETURN</u> key is pressed.	
When the JOG screen format is displayed, the cursor will be displayed at the override position.	
10. 0 % Cursor position	
At this time, the \uparrow , \downarrow keys can be used to display the override table values in order. Press the \uparrow to increase the value, and the \downarrow key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %.	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override
0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	will become 100.0 %. If the <u>CAN</u> key is pressed during an override change, the change will be aborted, and the original value will be
After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	aborted, and the original value will be adopted.
Notes	

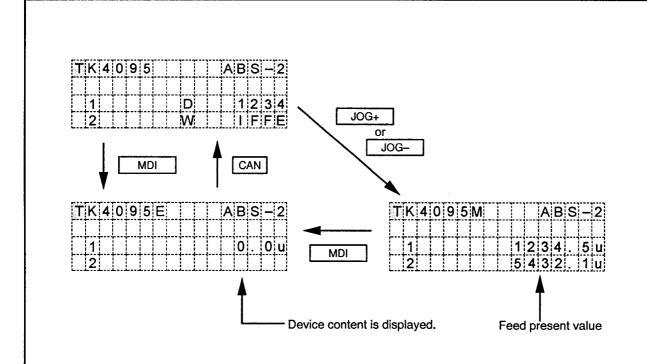
Mode	Test mode	Function	Teaching (address teaching)	5-15.3
111000	Took mode	1 411041011	roading (address toading)	0 .0.0

		Operation Procedure & Explanations	Precautions/Remarks			
JOG	operation:					
	JOG+	While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG</u> — key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.			
	JOG	While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	be displayed.			
play	of the feed pr	tion occurs, the displayed numeric value will change to a dis- resent values for the interpolating axes. This change is indi- nich is displayed to the right of the program No. (top of screen).				
Chan	nging the sett	ing screen:				
[STEP+	Press the STEP+ key to switch to the next step screen.				
	STEP-	Press the <u>STEP</u> key to return to the previous step screen.				
Scree	en Scrolling:					
	1 4	The address displays, etc., for 3 or 4 axes cannot be displayed on a single screen. Use the \uparrow , \downarrow keys for screen scrolling.	The ↑, ↓ keys are disabled when the displayed data is for 2 axes or less. If these keys are pressed at this time, the error message "! MIS OPERATION"			
Writin	ng the addres	3S:	will be displayed at the bottom of the screen.			
	RETURN	GO				
		RN key to write the currently displayed numeric value to the bwing address writing confirmation screen is then displayed.				
		GO -> WRITE CAN -> CANCEL				
If the next steps	Press the <u>GO</u> key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).					
	Intermediate ting screen	points can be switched, and address teaching can be executed STEP+ or STEP-, and writing addresses RETURN				
2						

ode Test mode Funct	on Teaching (address teaching)	5-16
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Indirect Address Designation

Message



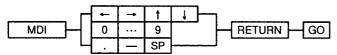
Operation Procedure & Explanations

Precautions/Remarks

At address teaching operations using an indirect address designation format, a designated address is set at the relevant device.

The numeric value designated at the device will remain valid until the CPU is reset or another value is designated.

Numeric input:



When the <u>MDI</u> key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen). When the numeric input is completed, press the <u>RETURN</u> key. An address writing confirmation screen like that shown below will then be displayed.

The device content will be displayed when the <u>MDI</u> is pressed.

GO -> WRITE CAN -> CANCEL

Press the <u>GO</u> key to set the entered numeric value at the relevant device. The system will then return to the device display program.

Notes

Mode	Test mode	Function	Teaching (address teaching)	5-16.1
		L	<u> </u>	L

Indirect Address Designation

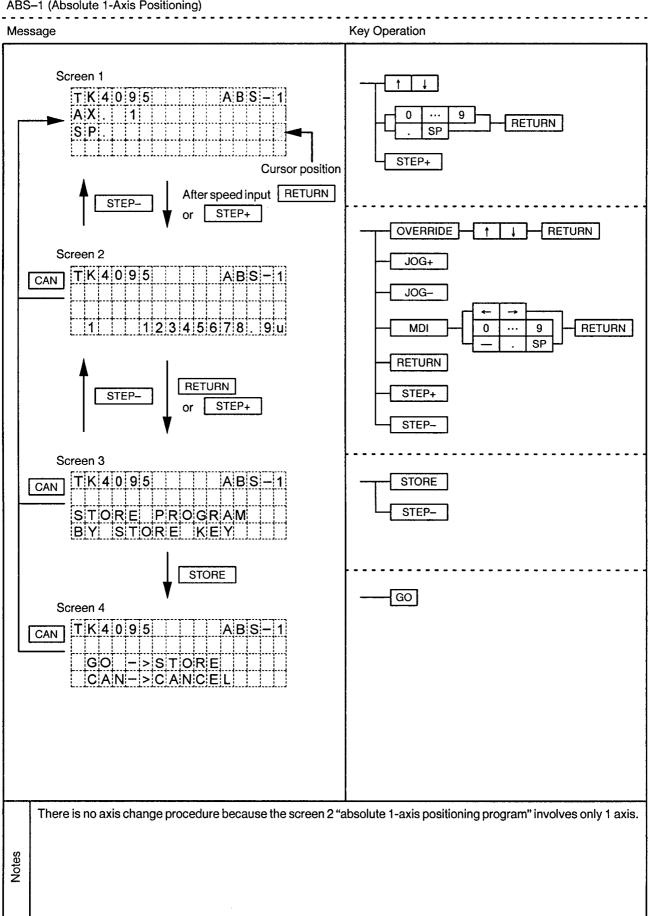
····	Operation Procedure & Explanations	Precautions/Remarks
JOG operation:		
JOG+	While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	
JOG-	While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	
play of the feed p	ation occurs, the displayed numeric value will change to a dispresent values for the interpolating axes. This change is indihich is displayed to the right of the program No. (top of screen).	
Writing to the dev	rice: -GO RN key to set the currently displayed numeric value at the de-	When the direct address designation format is being used, the numeric value displayed when the <u>RETURN</u> , <u>GO</u> keys are pressed is written directly to the program.
vice. The followin	g device writing confirmation screen is then displayed. GO -> WRITE CAN -> CANCEL to set the displayed numeric value at the relevant device. The rns to the device display program.	When the indirect address designation format is being used, the numeric value displayed when the <u>RETURN</u> , <u>GO</u> keys are pressed is written to the relevant device.
		Indirect address designation is not possible with the program teach function. This should be done using the address teaching function after creating a program (by program writing).
S		<u> </u>
Notes		

Mode | Test mode Function Teaching (program teaching) 5-17 Registering a Program No. Message **Key Operation** PROGRAM TEACH 9 RETURN CLEAR P:R:0:G: . N:0: Cursor position Operation Procedure & Explanations Precautions/Remarks The program to be registered is designated by using the Q to 9 keys to enter its number. The program number range is 0 to 4095. The effective input digits will be the most recent 4 digits entered. Any input exceeding 4 digits will be invalid. Each time a digit is entered, the previous digit moves one space to the left. 0 9 5 6 To correct an input, press the CLEAR key to delete the input field. The program number designated for registration will be checked to determine if it can be registered. If the number is OK, the system will proceed to the servo instruction definition screen. - - - ▶ Go to 5-18 If the designated program number already exists, the next screen will be displayed together with the message "PROG. ALR. STORED". To replace the existing program number with the newly designated one, press the GO key. GO -> REWRITE CAN -> CANCEL If the <u>CAN</u> key is pressed during the program teaching function in order to return to the servo instruction selection screen, and if the program which was being created has been completed, a confirmation message will be displayed asking if the created program should be discarded. Notes

Drawing No.

					Drawing No.
Мо	de Test mode	Function	Teaching (program teachi	ng)	5-18
Sen	o Instruction Definition				
Mes	sage	• • • • • • • • •		Key Operation	
	T K 4 0 9 5 # A B S - 1 A B S - 2 A B S - 3 Display	scrolling is poss	sible.	↑ RETUR	N
	Operation Proce	dure & Explana	tions	Precautions/Rema	arks
inst nate Wh inst	ignate the servo instruction for the ructions can be viewed by scrolling depending by pressing the RETURN key en scrolling, a "#" mark is displayer ruction. Ilist of servo instructions is show ABS-1 ABS-2 ABS-3 ABS-4 ABS ABS ABS ABS C ABS C ABS CP-1 CP-2 CP-3 CP-4 VS-1 VS-2 VS-3	ng. The desired at that instruction do to the left of the	servo instruction is desig- on's position.		
Notes					

				Drawing No.		
Mode	Test mode	Function	Teaching (program teaching)	5-19		
ABS-1	ABS-1 (Absolute 1-Axis Positioning)					
Message			Key Operation			



Mode	Test mode	Function	Teaching (program teaching)	5-19.1

ABS-1 (Absolute 1-Axis Positioning)

Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item: Use these keys to switch between the setting items ("axis" and "speed").</screen>	
Axis No. & speed inputs: O 9 RETURN With the cursor located at the desired position, enter the numeric value directly then press the RETURN key to register the setting.	Switching to screen 2 is only possible afterboth the "axis number" and "speed" inputs have been registered.
Switching screens: After confirming the axis number and speed settings, the STEP+ key can be pressed to proceed to screen 2.	When the <u>STEP+</u> key is operative, a return to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP-</u> key.
<screen 2=""> Changing the override: OVERRIDE</screen>	
When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The override change procedure is identical to that in test mode JOG operation except that the system will return to the program teaching screen when the <u>RETURN</u> key is pressed.	,
When the JOG screen format is displayed, the cursor will be displayed at the override position.	
10.	
At this time, the \uparrow , \downarrow keys can be used to display the override table values in order. Press the \uparrow to increase the value, and the \downarrow key to decrease the value. The override table contains the values shown below, enabling selection 0.1 % to 100.0 %.	ride is 100.0 %, the override will be-
0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	If the <u>CAN</u> key is pressed during an override change, the change will be aborted, and the original value will be adopted.
Notes	

Mode	Test mode	Function	Teaching (program teaching)	5-19.2
WICGE	rest mode	1 disclion	reaching (program teaching)	3-19.2

ABS-1 (Absolute 1-Axis Positioning)

	Operation Procedure & Explanations	Precautions/Remarks
spe [J	r selecting the desired override value, press the <u>RETURN</u> key. The JOG ed will then be determined as follows: OG speed] = [JOG speed limit value] \times [override] system will then return to the original display screen.	
JO	operation:	
	JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.
	JOG– While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	
play	en JOG operation occurs, the displayed numeric value will change to a dis- of the feed present values for the interpolating axes. This change is indi- d by an "M" which is displayed to the right of the program No. (top of screen).	
Nur	neric input:	
	MDI O ··· 9 RETURN — SP	
the "E" that At the is to A no and disp ner unc	en the MDI key is pressed, the numeric input mode will be established and cursor will appear at the right end of the numeric value field. Is displayed to the right of the program No. (top of screen) in order to indicate numeric data editing is in progress. It is time, use the —, — keys to move the cursor to the numeric value which be changed, then enter the desired value. The hange the numeric value's sign, press the — key at the numeric input field. It is equal to a positive value (minus symbol is deleted), a positive value will be changed to a negative value (minus symbol will be layed in front of the value). The SP key can also be used in the same mando change a negative value to a positive value (a positive value will remain hanged). En the numeric input is completed, press the RETURN key.	
Notes		

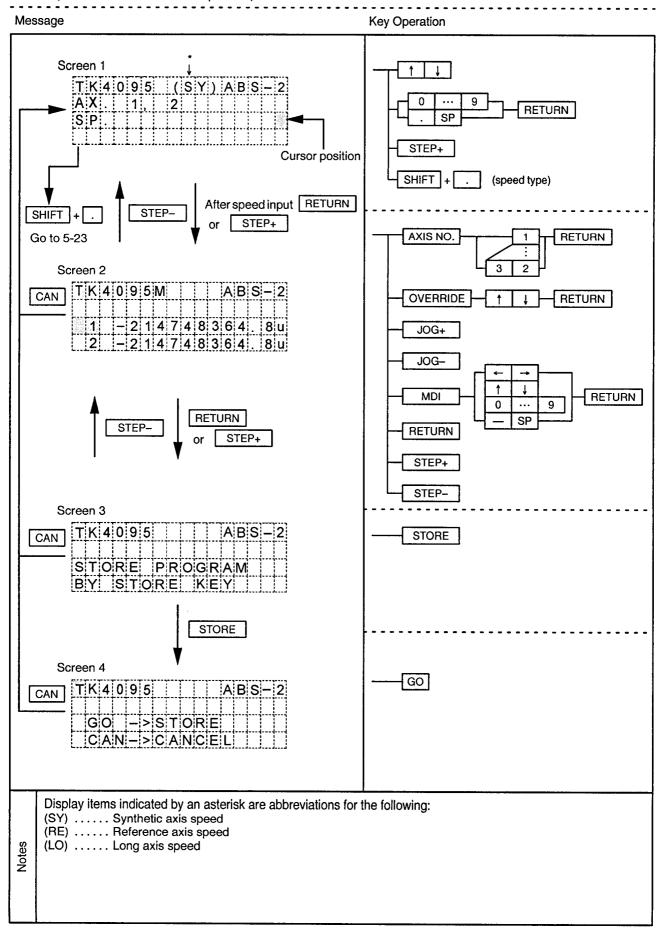
Mode	Test mode	Function	Teaching (program teaching)	5-19.3

ABS-1 (Absolute 1-Axis Positioning)

	Operation Procedure & Explanations	Precautions/Remarks
Writing the addre	ess:	
RETURN	The currently displayed numeric value is written to the program.	
Switching screen	is:	
STEP+	Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input screens.	
<screen 3="" and="" s<="" td=""><td>creen 4></td><td></td></screen>	creen 4>	
STORE	-GO	
be displayed for p	address writing has been executed at screen 2, screen 3 will brogram registration. To switch from screen 3 to screen 4, press At screen 4, press the GO key to execute program writing.	
Switching screen	s:	
STEP-	To switch from screen 3 to screen 2, press the <u>STEP</u> key.	
		
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Mode	Test mode	Function	Teaching (program teaching)	5-20

ABS-2 (Absolute 2-Axis Linear Interpolation)



Mode	Test mode	Function	Teaching (program teaching)	5-20.1

Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item: Use these keys to switch between the setting items ("axis" and "speed").</screen>	
Axis No. & speed inputs: 0 9 RETURN With the cursor located at the desired position, enter the numeric value directly, then press the RETURN key to register the setting. Each time the RETURN key is pressed, the input item will change as follows: Axis 1 → Axis 2 → Speed.	Switching to screen 2 is only possible afterboth the "axis number" and "speed" inputs have been registered.
Selecting and setting the speed type: SHIFT + The speed type is selected and designated. Switching screens: STEP+ After confirming that all axis number and speed settings have been registered, the STEP+ key can be pressed to proceed to screen 2.	For details regarding the display screen and operation procedure after keying in SHIFT + . , see 5-23. When the STEP+ key is operative, a return to screen 1 can be executed by pressing the CAN or STEP- key.
Changing the axis: AXIS NO. The axis where a JOG operation is designated is changed by pressing the AXIS NO, key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program.	
When a JOG axis number is changed, that axis number will be highlighted. Changing the override: OVERRIDE THE RETURN When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed.	
When the reference axis has been designated at screen 1, the message on the line beneath the speed display, and a reference axis input status with the speed display.	

Mode Test mode	Function	Teaching (program teaching)	5-20.2
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Operation Procedure & Explanations	Precautions/Remarks
	rrecautions/nemarks
When the JOG screen format is displayed, the cursor will be displayed at the override position.	
10. 🖸 %	
Cursor position	
At this time, the \uparrow , \downarrow keys can be used to display the override table values in order. Press the \uparrow to increase the value, and the \downarrow key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %.	If the 1 key is pressed when the override is 100.0 %, the override will become 0.1 %. If the 1 key is pressed when the override is 0.1 %, the override
0.1 % 1.0 % 10.0 % 100.0 %	will become 100.0 %.
0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	If the <u>CAN</u> key is pressed during an override change, the change will be aborted, and the original value will be
After selecting the desired override value, press the <u>RETURN</u> key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	adopted.
JOG operation:	
While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.
While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	be displayed.
When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	
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	Mode	Test mode	Function	Teaching (program teaching)	5-20.3

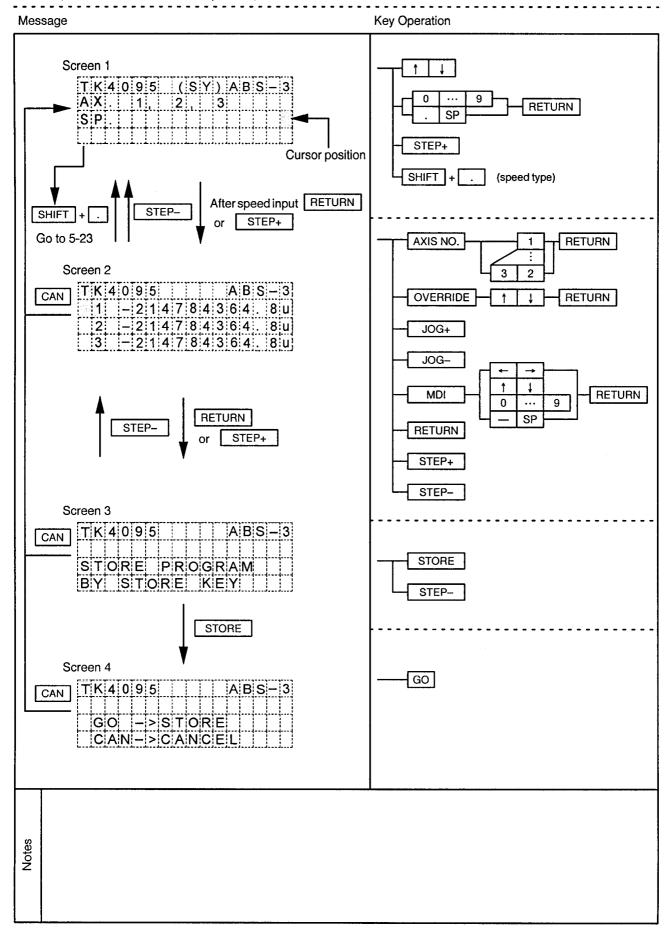
Operation Procedure & Explanations	Precautions/Remarks
umeric input:	
MDI	
When the MDI key is pressed, the numeric input mode will be established and he cursor will appear at the right end of the numeric value field. E" is displayed to the right of the program No. (top of screen) in order to indicate hat numeric data editing is in progress. At this time, use the — , — , 1 , ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the _ key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key.	
Writing the address:	
The currently displayed numeric value is written to the program.	
Switching screens:	
STEP+ Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input screens.	
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	Mode	Test mode	Function	Teaching (program teaching)	5-20.4

Operation Procedure & Explanations	Precautions/Remarks								
<screen 3="" 4="" and="" screen=""> Program Store: STORE GO</screen>									
When error-free address writing has been executed at screen 2, screen 3 will be displayed for program registration. To switch from screen 3 to screen 4, press the <u>GO</u> key to execute program writing.									
Switching screens:									
STEP- To switch from screen 3 to screen 2, press the <u>STEP-</u> key.									
Notes									
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Mode	Test mode	Function	Teaching (program teaching)	5-21
			3 (1 - 3	



Mode Test mode Function Teaching (program teaching) 5-21.1		Mode Te	est mode	Function	Teaching (program teaching)	5-21.1
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Operation Precedure 9 Evalenations	Precautions/Remarks
Operation Procedure & Explanations	Precautions/Hemarks
<screen 1=""> Selecting the setting item:</screen>	
Use these keys to switch between the setting items	
("axis" and "speed").	
Axis No. & speed inputs:	
	Switching to screen 2 is only possible afterboth the "axis number" and "speed"
. SP RETURN	inputs have been registered.
With the cursor located at the desired position, enter the numeric value directly,	
then press the <u>RETURN</u> key to register the setting. Each time the <u>RETURN</u> key is pressed, the input item will change as follows:	
Axis 1 \rightarrow Axis 2 \rightarrow Axis 3 \rightarrow Speed.	
Selecting and setting the speed type:	
SHIFT + . The speed type is selected and designated.	For details regarding the display screen and operation procedure after keying in
Switching screens:	SHIFT + . , See 5-23.
STEP+ After confirming that all axis number and speed settings	When the <u>STEP+</u> key is operative, a re-
have been registered, the <u>STEP+</u> key can be pressed to proceed to screen 2.	turn to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP</u> key.
F	, 5 ,
<screen 2=""></screen>	
Changing the axis:	·
AXIS NO. 1 RETURN	
$\begin{bmatrix} \frac{\cdot}{3} & \frac{\cdot}{2} \end{bmatrix}$	
The axis where a JOG operation is designated is changed by pressing the	
AXIS NO. key, entering the axis number where a JOG operation is to occur, then	
pressing the <u>RETURN</u> key. The axis number which is entered must be within the axis number range designated by the program.	
When a JOG axis number is changed, that axis number will be highlighted.	
Changing the override:	
OVERRIDE ↑ ↓ RETURN	·
When the <u>OVERRIDE</u> key is pressed, the screen will change to the	
JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines.	
The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the	
RETURN key is pressed.	,
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Mode Test mode Function Teaching (program teaching) 5-21.2	Mode Test mode	Function	Teaching (program teaching)	5-21.2
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When the J/GS screen format is displayed, the cursor will be displayed at the override position. At this time, the 1, ½ keys can be used to display the override table values in order. Press the 1 to increase the value, and the ½ key to decrease the value. In the cursor will be offered. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 10.1 % 10.0 % 10.0 % 10.0 % 10.0 % 0.2 % 2.0 % 20.0 % 0.4 % 40.0 % 0.4 % 40.0 % 0.4 % 40.0 % 0.4 % 50.0 % 80.0			Operation Procedure & Explanations	Precautions/Remarks
At this time, the 1. 1. keys can be used to display the override table values in order. Press the 1. to increase the value, and the 1. key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 1.0 % 1.0 % 10.0 % 10.0 % 10.0 % 10.0 % 0.8 % 8.0 % 80.0 % 100.0 % 0.8 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen. JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. When IDG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	14/1:	Ab c 100		1 reading the filars
At this time, the 1, 1 keys can be used to display the override table values in order. Press the 1 to increase the value, and the 1 key to decrease the value. The override table contains the values shown below, enabling selection of 0.1% to 10.0%. 0.1% to 10.0% 1			reen format is displayed, the cursor will be displayed at the	
At this time, the 1, keys can be used to display the override table values in order. Press the 1 to increase the value, and the 1 key to decrease the value. The override table contains the values shown below, enabling selection of 0.1% to 10.0 %. 1.1% 1.0% 1.0.0% 10.0.0% 1.2% 2.0% 20.0% 20.0% 1.4% 4.0% 40.0% 1.5% 50.0% 80.0% After selecting the desired override value, press the BETURN key. The JOG speed limit value) × (override). The system will then return to the original display screen. JOG operation: JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed, JOG operation stops when this key is released. JOG- While this key is pressed, JOG operation will occur at the designated axis in the address locates direction, at the calculated speed, JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).		•	10. 🖸 %	
order. Press the 1 to increase the value, and the 1 key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % It 10.0 % 10.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %			Cursor position	
0.1 % 1.0 % 10.0 % 10.0 % 10.0 % 10.0 % 10.0 % 10.0 % 10.0 % 2.0 % 20.0 % 40.0 % 40.0 % 8.0 % 80.0 % 80.0 % 80.0 % 80.0 % 80.0 % 80.0 % 80.0 % 80.0 % 80.0 % 10.0 G speed will then be determined as follows: [JOG speed] = [JOG speed] imit value] × [toverride] The system will then return to the original display screen. JOG operation: JOG+ While this key is pressed, JOG operation will occur at the calculated speed. JOG operation stops when this key is released. JOG- While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation cocurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	orde The	er. Press the <u>1</u> override tabl	to increase the value, and the $\frac{1}{2}$ key to decrease the value. e contains the values shown below, enabling selection of	ride is 100.0 %, the override will become 0.1 %. If the \downarrow key is pressed when the override is 0.1 %, the override
0.4 % 4.0 % 40.0 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen. JOG operation: JOG+				will become 100.0 %.
After selecting the desired override value, press the BETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen. JOG operation: While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	1			
After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen. JOG operation: While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).				
While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	The [J	JOG speed w OG speed] =	vill then be determined as follows: [JOG speed limit value] × [override]	
designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	JOG	Goperation:		
While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).		JOG+	designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is	pressed, the START conditions will be checked. If the conditions are not satis- fied, the message "! CAN'T START" will
play of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).		JOG-	designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is	be displayed.
Notes .	play	of the feed p	resent values for the interpolating axes. This change is indi-	
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	lote.			

Mode	Test mode	Function	Teaching (program teaching)	5-21.3
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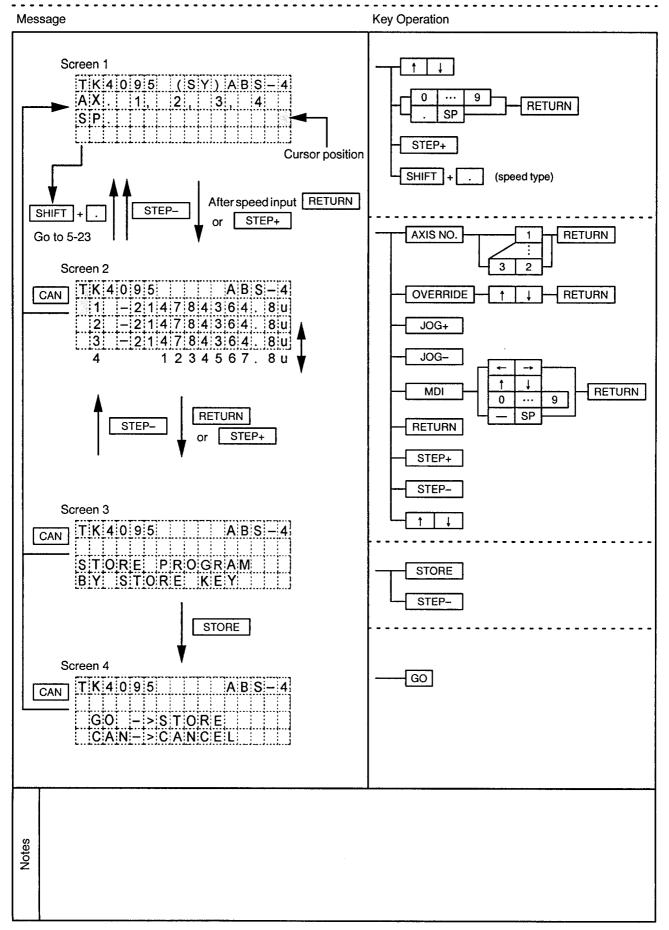
	Operation Procedure & Explanations	Precautions/Remarks
Numeric input:		
MDI —	← → ↑ ↓ 0 ··· 9 — SP	
the cursor will ap 'E" is displayed to that numeric data At this time, use the which is to be change the nu A negative value and a positive value are to change a nunchanged).	y is pressed, the numeric input mode will be established and bear at the right end of the numeric value field. The right of the program No. (top of screen) in order to indicate rediting is in progress. The \leftarrow , \rightarrow , \downarrow keys to move the cursor to the numeric value ranged, then enter the desired value. The numeric value's sign, press the \rightarrow key at the numeric input field. Will be changed to a positive value (minus symbol is deleted), we will be changed to a negative value (minus symbol will be of the value). The \rightarrow key can also be used in the same manegative value to a positive value (a positive value will remain to input is completed, press the \rightarrow RETURN key.	
Writing the addre	ss:	
RETURN	The currently displayed numeric value is written to the program.	
STEP+ STEP-	Use the STEP+ and STEP- keys to switch between input screens.	
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Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-21.4

Operation Procedure & Explanations	Precautions/Remarks
<screen 3="" 4="" and="" screen=""> Program Store:</screen>	
STORE GO	
When error-free address writing has been executed at screen 2, screen 3 will be displayed for program registration. To switch from screen 3 to screen 4, press the <u>STORE</u> key. At screen 4, press the <u>GO</u> key to execute program writing.	
Switching screens:	
STEP— To switch from screen 3 to screen 2, press the <u>STEP</u> – key.	
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Mode	Test mode	Function	Teaching (program teaching)	5-22



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	Mode	Test mode	Function	Teaching (program teaching)	5-22.1

Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item: Use these keys to switch between the setting items ("axis" and "speed").</screen>	
Axis No. & speed inputs: 0 9 RETURN With the cursor located at the desired position, enter the numeric value directly, then press the RETURN key to register the setting. Each time the RETURN key is pressed, the input item will change as follows: Axis 1 → Axis 2 → Axis 3 → Axis 4 → Speed.	Switching to screen 2 is only possible afterboth the "axis number" and "speed" inputs have been registered.
Selecting and setting the speed type: SHIFT + . The speed type is selected and designated. Switching screens: After confirming that all axis number and speed settings have been registered, the STEP+ key can be pressed to proceed to screen 2.	For details regarding the display screen and operation procedure after keying in SHIFT +, See 5-24. When the STEP+ key is operative, a return to screen 1 can be executed by pressing the CAN or STEP- key.
Screen scrolling For 4 axes interpolation, the data for all axes cannot be displayed on a single screen. In such cases, use the	
Changing the override: OVERRIDE T RETURN When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd	
and 3rd lines. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed.	
Notes	

Mode	Test mode	Function	Teaching (program teaching)	5-22.2

Operation Procedure & Explanations	Precautions/Remarks
When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.0 % Cursor position	
At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the <u>CAN</u> key is pressed during an override change, the change will be aborted, and the original value will be adopted.
JOG operation: While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG</u> — key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.
While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	
Notes	

Mode	Test mode	Function	Teaching (program teaching)	5-22.3
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	Operation Procedure & Explanations	Precautions/Remarks
umeric input:		
MDI	↑ ↓ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑	
e cursor will app is displayed to at numeric data this time, use the hich is to be cha o change the nur negative value value value and a positive value splayed in front of er to change a ne nchanged).	r is pressed, the numeric input mode will be established and ear at the right end of the numeric value field. The right of the program No. (top of screen) in order to indicate editing is in progress. e ← , → , ↑ , ↓ keys to move the cursor to the numeric value nged, then enter the desired value. neric value's sign, press the _ key at the numeric input field. Fill be changed to a positive value (minus symbol is deleted), will be changed to a negative value (minus symbol will be fithe value). The SP key can also be used in the same managative value to a positive value (a positive value will remain tinput is completed, press the RETURN key.	
riting the addres	s:	
RETURN	The currently displayed numeric value is written to the program.	
STEP+ STEP-	Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input screens.	

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-22.4
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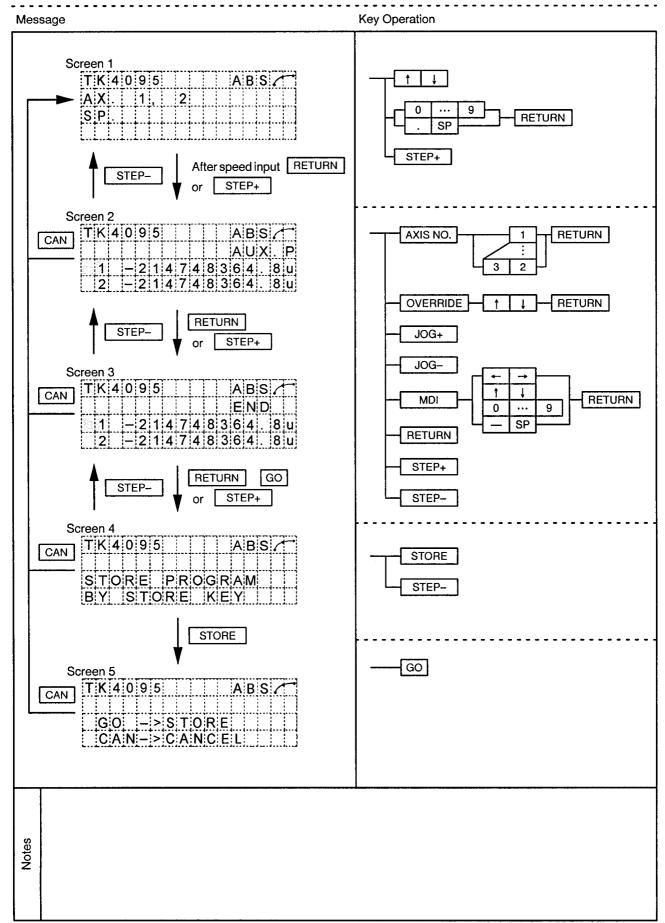
Screen 3 and Screen 4> Program Store: STORE GO When error-free address writing has been executed at screen 2, screen 3 will be displayed for program registration. To switch from screen 3 to screen 4, press the STORE key. At screen 4, press the GO key to execute program writing. Switching screens: STEP— To switch from screen 3 to screen 2, press the STEP—key.
Program Store: STORE GO When error-free address writing has been executed at screen 2, screen 3 will be displayed for program registration. To switch from screen 3 to screen 4, press the STORE key. At screen 4, press the GO key to execute program writing. Switching screens:
When error-free address writing has been executed at screen 2, screen 3 will be displayed for program registration. To switch from screen 3 to screen 4, press the <u>STORE</u> key. At screen 4, press the <u>GO</u> key to execute program writing. Switching screens:
be displayed for program registration. To switch from screen 3 to screen 4, press the <u>STORE</u> key. At screen 4, press the <u>GO</u> key to execute program writing. Switching screens:
STEP- To switch from screen 3 to screen 2, press the STEP-key.
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Mode Test mode Function Teaching (program teaching) 5-23		1	7	T	T
	Mode	Test mode	Function	Teaching (program teaching)	

Speed Type Selection Screen

Operation Procedure & Explanations	Precautions/Remarks
T SPEED CLAS. SYNTHET I C AX. SP #LONG AX. SP REFERENCE AX. SP RETURN Refer to pages 5-20, 5-21, 5-22 screen 2 Selecting the speed type:	- RETURN
Use the ↑, ↓ keys to move the "#" mark to the desired speed type position, then press the <u>RETURN</u> key to register the selection and proceed to page 5-20, 5-21, 5-22 screen 2.	
Notes	

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Mode	Test mode	Function	Teaching (program teaching)	5-24



Mode	Test mode	Function	Teaching (program teaching)	5-24.1

Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item:</screen>	
Use these keys to switch between the setting items ("axis" and "speed").	
Axis No. & speed inputs:	Switching to screen 2 is only possible afterboththe "axis number" and "speed"
O 9 RETURN	inputs have been registered.
With the cursor located at the desired position, enter the numeric value directly, then press the <u>RETURN</u> key to register the setting. Each time the <u>RETURN</u> key is pressed, the input item will change as follows: Axis $1 \rightarrow \text{Axis } 2 \rightarrow \text{Speed}$.	
Switching screens:	
STEP+ After confirming that all axis number and speed settings have been registered, the <u>STEP+</u> key can be pressed to proceed to screen 2.	When the <u>STEP+</u> key is operative, a return to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP-</u> key.
<screen 2,="" 3="" screen=""> Changing the axis:</screen>	
AXIS NO. 1 RETURN	
The axis where a JOG operation is designated is changed by pressing the <u>AXIS NO</u> , key, entering the axis number where a JOG operation is to occur, then pressing the <u>RETURN</u> key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.	
Changing the override:	
OVERRIDE	
When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines.	
The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the <u>RETURN</u> key is pressed.	
Notes	
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Mode	Test mode	Function	Teaching (program teaching)	5-24.2
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	On austina Dunardi una 8 Fruntanationa	Dunantina /Damada
	Operation Procedure & Explanations	Precautions/Remarks
When the JOG soverride position	creen format is displayed, the cursor will be displayed at the	
	10. 🖸 %	
	Cursor position	
order. Press the The override take 0.1 % to 100.0 %		If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %.
0.1 % 0.2 %	1.0 % 10.0 % 100.0 % 2.0 % 20.0 %	Will Become 100.0 70.
0.2 %	4.0 % 40.0 %	If the <u>CAN</u> key is pressed during an
0.8 %	8.0 % 80.0 %	override change, the change will be aborted, and the original value will be
The JOG speed [JOG speed] =	e desired override value, press the <u>RETURN</u> key. will then be determined as follows: [JOG speed limit value] × [override] hen return to the original display screen.	adopted.
JOG operation:	·	
JOG+	While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.
JOG-	While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	be displayed.
play of the feed	ation occurs, the displayed numeric value will change to a dispresent values for the interpolating axes. This change is individual in the program No. (top of screen).	
Notes	•	

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Mode	Test mode	Function	Teaching (program teaching)	5-24.3

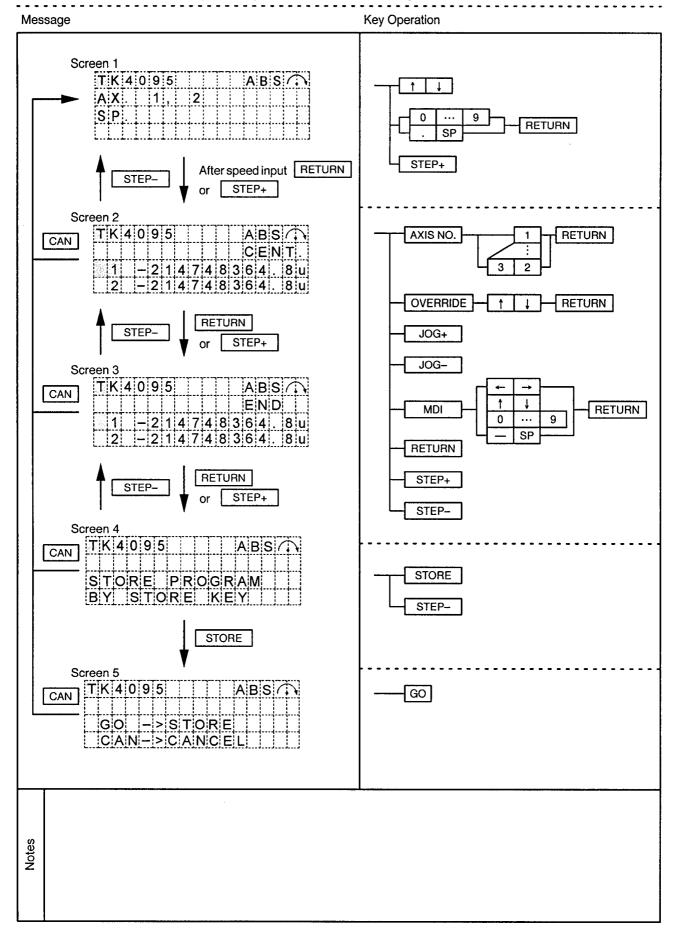
Operation Procedure & Explanations	Precautions/Remarks
Numeric input:	
MDI	
When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the ← , → , ↑ , ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the = key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key.	
Writing the address:	
RETURN The currently displayed numeric value is written to the program.	
Switching screens:	
STEP+ Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input screens.	
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Notes	

Mode Te	est mode	Function	Teaching (program teaching)	5-24.4
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Operation Procedure & Explanations	Precautions/Remarks
<screen 4="" 5="" and="" screen=""></screen>	
Program Store:	
STORE GO	
When error-free address writing has been executed at screen 2, screen 3 will be displayed for program registration. To switch from screen 3 to screen 4, press the <u>STORE</u> key. At screen 4, press the <u>GO</u> key to execute program writing.	
Switching screens:	
STEP— To switch from screen 3 to screen 2, press the <u>STEP</u> – key.	
Notes	

Mode	Test mode	Function	Teaching (program teaching)	5-25
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ABS , ABS (Circular Interpolation by Absolute Center Point Designation)



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Mode	Test mode	Function	Teaching (program teaching)	5-25.1

Operation Procedure & Explanations	Precautions/Remarks
Screen 1> Selecting the setting item: Use these keys to switch between the setting items	
("axis" and "speed").	
Axis No. & speed inputs:	Switching to screen 2 is only possible after both the "axis number" and
. SP RETURN	"speed" inputs have been registered.
With the cursor located at the desired position, enter the numeric value directly, then press the <u>RETURN</u> key to register the setting. Each time the <u>RETURN</u> key is pressed, the input item will change as follows: Axis $1 \rightarrow Axis 2 \rightarrow Speed$.	
Switching screens:	
STEP+ After confirming that all axis number and speed settings have been registered, the <u>STEP+</u> key can be pressed to proceed to screen 2.	When the <u>STEP+</u> key is operative, a return to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP-</u> key.
<screen 2,="" 3="" screen=""> Changing the axis:</screen>	
AXIS NO. 1 RETURN 3 2	:
The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.	
Changing the override:	
OVERRIDE	
When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines.	
The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed.	
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Mode	Test mode	Function	Teaching (program teaching)	5-25.2

	Operation Pr	ocedure & Explanations	Precautions/Remarks
When the JOG override position	١.	displayed, the cursor will be displayed at the	
·	10.🖸 %	Cursor position	
	L	Cursor position	
order. Press the The override ta 0.1 % to 100.0 9 0.1 % 0.2 % 0.4 %	↑, ↓ keys can be to increase the ble contains the %. 1.0 % 10. 2.0 % 20. 4.0 % 40.	the used to display the override table values in a value, and the \(\frac{1}{2}\) key to decrease the value. values shown below, enabling selection of 0 \% 100.0 \% 0 \% 0 \%	If the <u>↑</u> key is pressed when the ove ride is 100.0 %, the override will be come 0.1 %. If the <u>↓</u> key is presse when the override is 0.1 %, the overrid will become 100.0 %. If the <u>CAN</u> key is pressed during a override change, the change will be
0.8 %	8.0 % 80.	0 %	aborted, and the original value will be
The JOG speed [JOG speed]	will then be dete = [JOG speed tim	de value, press the <u>RETURN</u> key. rmined as follows: it value] × [override] original display screen.	adopted.
JOG operation:			
JOG+	designated ax	is pressed, JOG operation will occur at the kis in the address increase direction, at the eed. JOG operation stops when this key is	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satis fied, the message "! CAN'T START" will be displayed.
JOG-	designated ax	is pressed, JOG operation will occur at the is in the address decrease direction, at the eed. JOG operation stops when this key is	be displayed.
play of the feed	present values for	displayed numeric value will change to a dis- or the interpolating axes. This change is indi- to the right of the program No. (top of screen).	
Notes			

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	Test mode	Function	Teaching (program teaching)	5-25.3	l

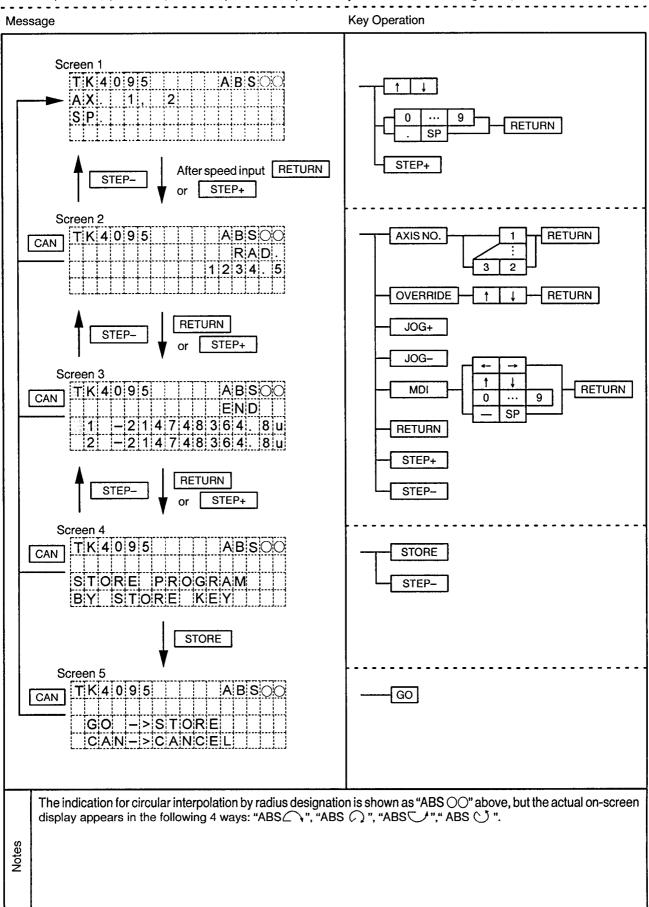
Operation Procedure & Explanations	Precautions/Remarks
Numeric input:	
MDI	
When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. 'E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the —, →, ↑, ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the _ key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key.	
Writing the address:	
RETURN The currently displayed numeric value is written to the program.	
Switching screens:	
STEP+ Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input screens.	
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Mode	Test mode	Function	Teaching (program teaching)	5-25.4

Operation Procedure & Explanations	Precautions/Remarks
<screen 4="" 5="" and="" screen=""> Program Store:</screen>	
STORE GO	
When error-free address writing has been executed at screen 3, screen 4 will be displayed for program registration. To switch from screen 4 to screen 5, press the <u>STORE</u> key. At screen 5, press the <u>GO</u> key to execute program writing.	
Switching screens:	
STEP— To switch from screen 4 to screen 3, press the <u>STEP</u> – key.	
Notes	

Mode	Test mode	Function	Teaching (program teaching)	5-26	l

ABS (, ABS), ABS (, ABS () (Circular Interpolation by Absolute Radius Designation)



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Mode	Test mode	Function	Teaching (program teaching)	5-26.1	

ABS C, ABS C, ABS C, ABS C (Circular Interpolation by Absolute Radius Designation)

Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item:</screen>	
Use these keys to switch between the setting items ("axis" and "speed").	
Axis No. & speed inputs:	Switching to screen 2 is only possible after both the "axis number" and
O 9 RETURN	"speed" inputs have been registered.
With the cursor located at the desired position, enter the numeric value directly, then press the <u>RETURN</u> key to register the setting. Each time the <u>RETURN</u> key is pressed, the input item will change as follows: Axis $1 \rightarrow \text{Axis } 2 \rightarrow \text{Speed}$.	
Switching screens:	
After confirming that all axis number and speed settings have been registered, the <u>STEP+</u> key can be pressed to proceed to screen 2.	When the <u>STEP+</u> key is operative, a return to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP-</u> key.
<screen 2,="" 3="" screen=""> Changing the axis:</screen>	
AXIS NO. 1 RETURN	
The axis where a JOG operation is designated is changed by pressing the <u>AXIS NQ</u> , key, entering the axis number where a JOG operation is to occur, then pressing the <u>RETURN</u> key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.	
Changing the override:	
OVERRIDE ↑ ↓ RETURN	
When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines.	
The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the <u>RETURN</u> key is pressed.	
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Mode	Test mode	Function	Teaching (program teaching)	5-26.2

ABS , ABS , ABS , ABS (Circular Interpolation by Absolute Radius Designation)

	Operation	n Procedure	& Explanations	Precautions/Remarks
When the JOG soverride position		t is displaye	d, the cursor will be displayed	at the
•	_	₫ %		
		Curs	sor position	
order. Press the The override tal 0.1 % to 100.0 %	to increase to the contains of	the value, the values	to display the override table valuand the \(\frac{1}{2}\) key to decrease the shown below, enabling selections	alue. I ride is 100.0 %, the override will be
0.1 % 0.2 %	1.0 % 2.0 %	10.0 % 20.0 %	100.0 %	
0.4 % 0.8 %	4.0 %	40.0 % 80.0 %		If the <u>CAN</u> key is pressed during an override change, the change will be
The JOG speed [JOG speed] =	ne desired ove will then be d [JOG speed	determined : I limit value]		aborted, and the original value will be adopted.
JOG operation:				
JOG+	designate	d axis in the	sed, JOG operation will occur at e address increase direction, at G operation stops when this ke	the pressed, the START conditions will be
JOG-	designate	d axis in the	sed, JOG operation will occur at address decrease direction, at G operation stops when this ke	the the
play of the feed	present value	es for the in	ed numeric value will change to terpolating axes. This change is ght of the program No. (top of sc	s indi-
Notes				
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Mod	Test mode	Function	Teaching (program teaching)	5-26.3

ABS 🔼, ABS 🔾, ABS 🖰, ABS 🖰 (Circular Interpolation by Absolute Radius Designation)

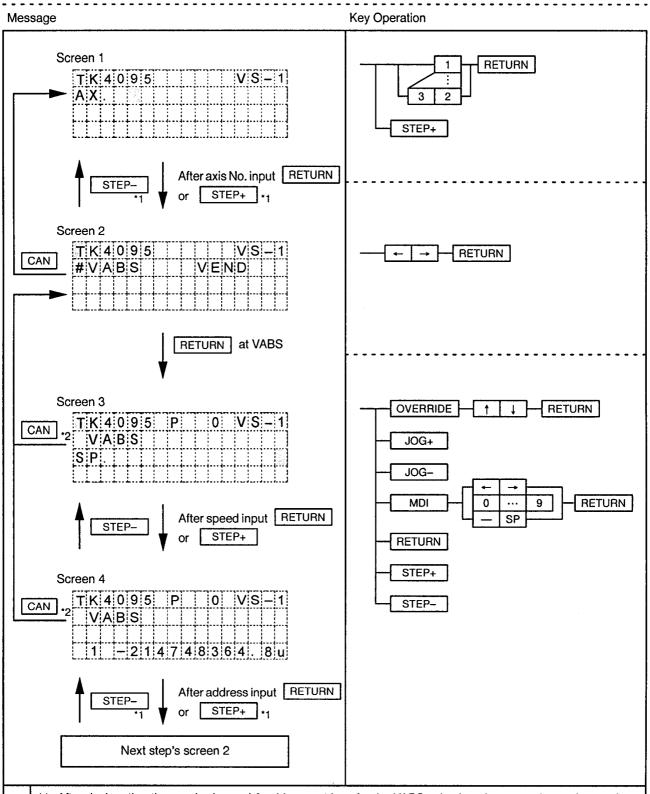
Operation Procedure & Explanations	Precautions/Remarks
Numeric input:	
MDI ← → ↑ ↑ ↓ RETURN	
When the MDI key is pressed, the numeric input mode will be established and he cursor will appear at the right end of the numeric value field. E' is displayed to the right of the program No. (top of screen) in order to indicate hat numeric data editing is in progress. At this time, use the —, →, , , , , keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the _ key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key.	
Writing the address:	
RETURN The currently displayed numeric value is written to the program.	
Switching screens:	
STEP+ Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input screens.	
STEP-	
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Notes	

Mode Test mode	Function	Teaching (program teaching)	5-26.4

Operation Procedure & Explanations	Precautions/Remarks
<screen 4="" 5="" and="" screen=""> Program Store:</screen>	
STORE GO	
When error-free address writing has been executed at screen 3, screen 4 will be displayed for program registration. To switch from screen 4 to screen 5, press the <u>STORE</u> key. At screen 5, press the <u>GQ</u> key to execute program writing.	
Switching screens:	
STEP— To switch from screen 4 to screen 3, press the <u>STEP</u> – key.	
Notes	

Mode	Test mode	Function	Teaching (program teaching)	5-27
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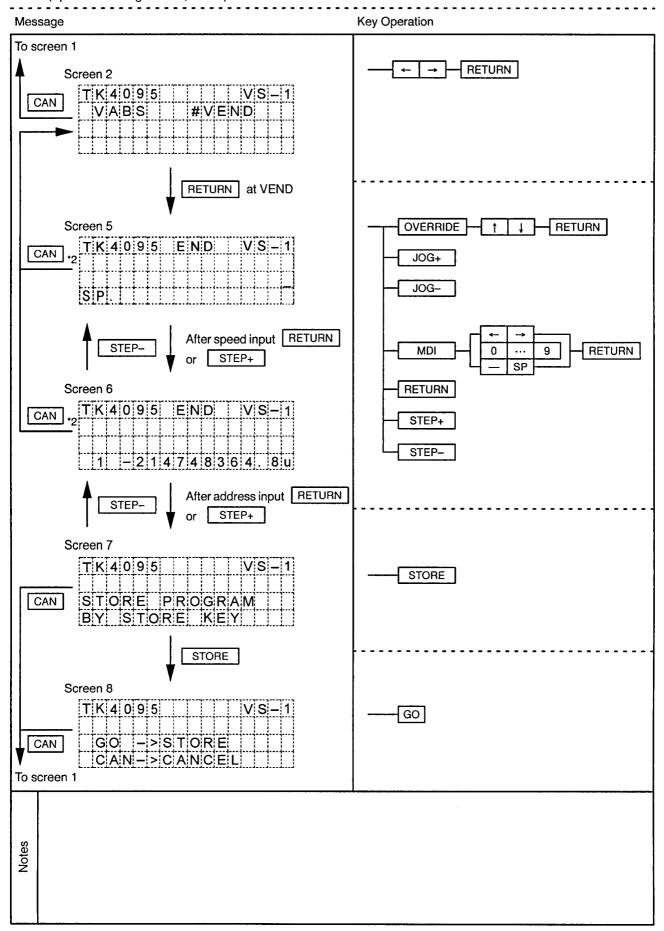
Notes



- *1. After designating the required speed & address settings for the VABS selection, then returning to the previous screen (using the <u>CAN</u> or <u>STEP</u>— key), the following will occur when the <u>STEP</u>+ key is pressed: the servo instruction selection screen (screen 2) will be skipped, and the speed & address setting screens (screen 3, screen 4) will be displayed in page order (P0, P1...).
- *2. If the <u>CAN</u> key is pressed while designating a speed or address setting (screen 3, screen 4) at a given step, the system will return to that step's screen 2.

Mode	Test mode	Function	Teaching (program teaching)	5-27.1	
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VS-1 (Speed Switching Control, 1 Axis)



Mode	Test mode	Function	Teaching (program teaching)	5-27.2
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Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Axis No. Input:</screen>	
1 RETURN	
3 2	
With the cursor located at the desired position, enter the numeric value directly, then press the <u>RETURN</u> key to register the setting.	As this speed change is for 1-axis linear control, only 1 axis can be designated.
Switching screens: After confirming that axis number setting has been registered, the <u>STEP+</u> key can be pressed to proceed to	When the <u>STEP+</u> key is operative, a re-
screen 2.	turn to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP</u> key.
<screen 2=""></screen>	
← → RETURN	
Designate whether the speed switching point setting (VABS) is to be continued or ended (VEND). A "#" mark indicates the currently selected servo instruction.	
Screen 3 is displayed when VABS is selected, and screen 5 is displayed when VEND is selected.	
<screen 3,="" 4,="" 5,="" 6="" screen=""> Changing the override value:</screen>	
OVERRIDE	
When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd	
and 3rd lines. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the	
RETURN key is pressed.	
Notes	
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Mode Test mode Function Teaching (program teaching) 5-27.3	Mode Te	lest mode	Function	Teaching (program teaching)	5-27.3
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Operation Procedure & Explanations	Precautions/Remarks
When the JOG screen format is displayed, the cursor will be displayed a override position.	t the
10.10 %	
Cursor position	
At this time, the ↑, ↓ keys can be used to display the override table value order. Press the ↑ to increase the value, and the ↓ key to decrease the value override table contains the values shown below, enabling selection 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 %	alue. I ride is 100.0 %, the override will be-
0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	If the <u>CAN</u> key is pressed during an override change, the change will be
After selecting the desired override value, press the <u>RETURN</u> key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	aborted, and the original value will be adopted.
JOG operation:	
While this key is pressed, JOG operation will occur at to designated axis in the address increase direction, at to calculated speed. JOG operation stops when this key released.	he pressed, the START conditions will be
While this key is pressed, JOG operation will occur at t designated axis in the address decrease direction, at t calculated speed. JOG operation stops when this key released.	he ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '
When JOG operation occurs, the displayed numeric value will change to a play of the feed present values for the interpolating axes. This change is cated by an "M" which is displayed to the right of the program No. (top of screen	indi-
Notes	

flode Test mode Functi	Teaching (program teaching)	5-27.4
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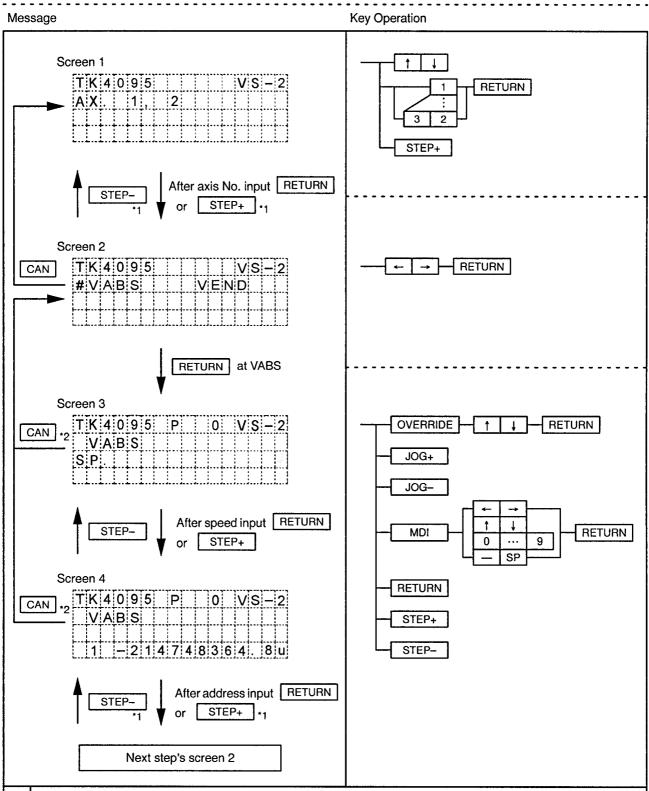
Operation Procedure & Explanations	Precautions/Remarks
Numeric input:	
MDI 0 9 RETURN	
When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the, keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key.	
Writing the address:	
RETURN The speed and address values for the currently displayed point are written to the program.	
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	Mode	Test mode	Function	Teaching (program teaching)	5-27.5

Operation Procedure & Explanations	Precautions/Remarks
Switching screens:	. rosasionoriomanio
STEP+ Use the STEP+ and STEP- keys to switch between input screens. When a speed switching point input has been completed, the system will proceed to the next point without going to screen 2 first.	
<screen 7,="" 8="" screen=""> Program Store:</screen>	
STORE GO	
When error-free end-address writing has been executed at screen 4, screen 5 will be displayed for program registration. To switch from screen 5 to screen 6, press the <u>STORE</u> key. At screen 6, press the <u>GO</u> key to execute program writing.	
Switching screens:	
STEP- To switch from screen 5 to screen 4, press the STEP-key.	
Notes	
 	

Mode	Test mode	Function	Teaching (program teaching)	5-28
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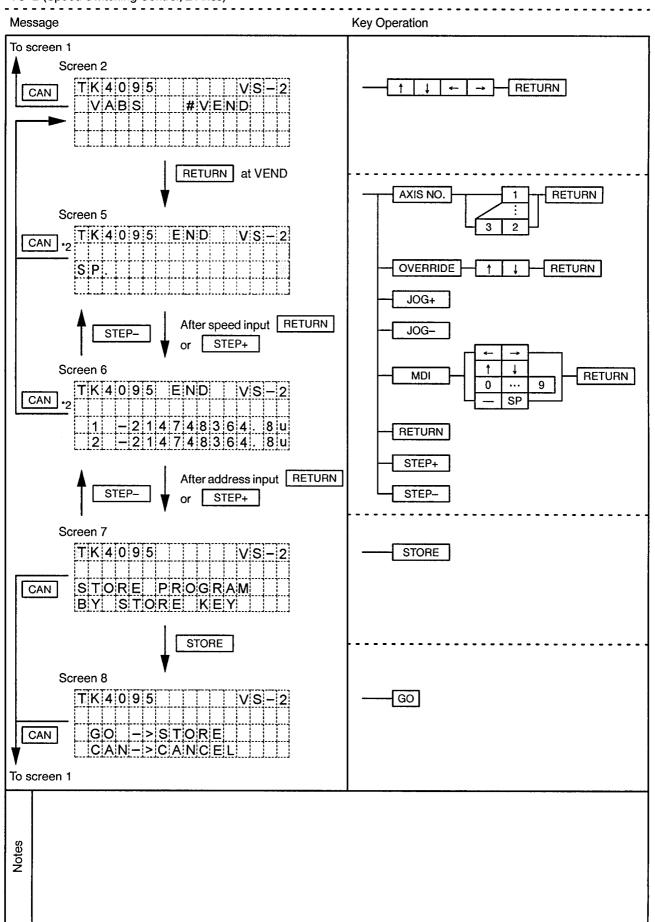
Notes



- *1. After designating the required speed & address settings for the VABS selection, then returning to the previous screen (using the <u>CAN</u> or <u>STEP</u>— key), the following will occur when the <u>STEP</u>+ key is pressed: the servo instruction selection screen (screen 2) will be skipped, and the speed & address setting screens (screen 3, screen 4) will be displayed in page order (P0, P1...).
- *2. If the <u>CAN</u> key is pressed while designating a speed or address setting (screen 3, screen 4) at a given step, the system will return to that step's screen 2.

Mode Test mode F	Function	Teaching (program teaching)	5-28.1

VS-2 (Speed Switching Control, 2 Axes)



	Mode	Test mode	Function	Teaching (program teaching)	5-28.2
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Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item:</screen>	
Use these keys to switch between the setting items ("axis" and "speed").	Use the <u>↑</u> , <u>↓</u> keys to move between the "AX. <u>, </u> ".
Axis No. Input:	
1 RETURN 3 2	
With the cursor located at the desired position, enter the numeric value directly, then press the <u>RETURN</u> key to register the setting.	The speed switching control axis is the first axis which is designated.
Switching screens: After confirming that the axis number setting has been registered, the <u>STEP+</u> key can be pressed to proceed to screen 2.	When the <u>STEP+</u> key is operative, a return to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP-</u> key.
<screen 2=""></screen>	
← → RETURN	
Designate whether the speed switching point setting (VABS) is to be continued or ended (VEND). A "#" mark indicates the currently selected servo instruction. Screen 3 is displayed when VABS is selected, and screen 4 is displayed when VEND is selected.	
<screen 3,="" 4,="" 5,="" 6="" screen=""> Changing the override value:</screen>	
OVERRIDE ↑ ↓ RETURN	
When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines.	
The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed.	
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Mode Test mode	Function	Teaching (program teaching)	5-28.3
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	Opera	tion Procedure	e & Explanations		Precautions/Remarks
When the JOG		nat is displaye	ed, the cursor will be displ	ayed at the	
		10.0 %			
		TCı	rsor position		
order. Press the The override to 0.1 % to 100.0 0.1 %	eto increadable contain %. 1.0 %	ase the value, ns the values 10.0 %	to display the override tab and the ↓ key to decreas shown below, enabling s 100.0 %	e the value.	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %.
0.2 % 0.4 %	2.0 % 4.0 %	20.0 % 40.0 %			If the CAN key is pressed during an
0.8 %	8.0 %	80.0 %			override change, the change will be
The JOG speed [JOG speed]	d will then b = [JOG spe I then return	e determined ed limit value	e, press the <u>RETURN</u> key as follows: × [override] ıl display screen.		aborted, and the original value will be adopted.
JOG operation					
JOG+	designa calculat release	ated axis in the ted speed. JO d.	sed, JOG operation will oc e address increase directi G operation stops when t	on, at the his key is	When the <u>JOG+</u> or <u>JOG</u> — key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.
JOG-	designa	ated axis in the ted speed. JO	sed, JOG operation will oc address decrease directi G operation stops when t	on, at the	
play of the feed	l present va	lues for the in	ed numeric value will char terpolating axes. This cha ght of the program No. (top	nge is indi-	
Notes					
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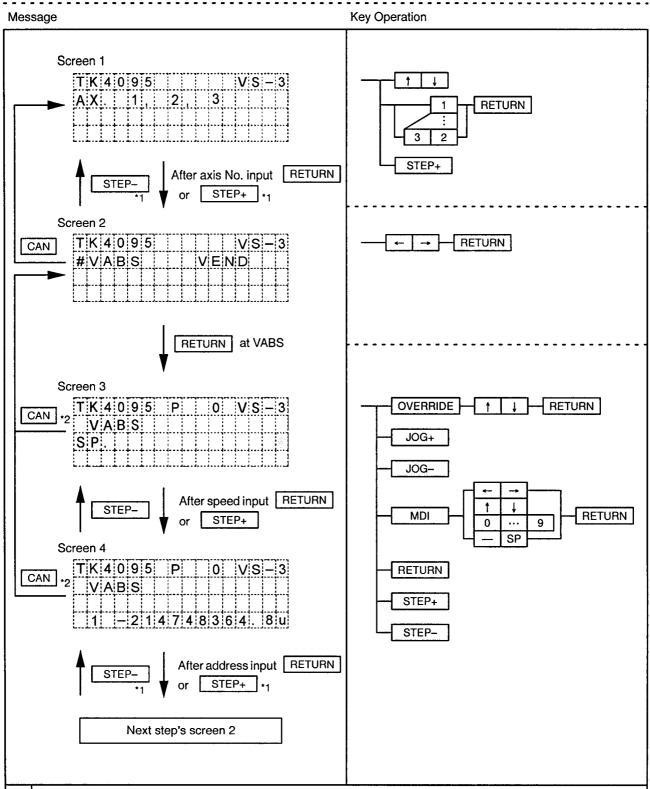
Mode	Test mode	Function	Teaching (program teaching)	5-28.4
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Operation Procedure & Explanations	Precautions/Remarks
Numeric input:	
MDI	
When the MDI key is pressed, the numeric input mode will be established and he cursor will appear at the right end of the numeric value field. E" is displayed to the right of the program No. (top of screen) in order to indicate hat numeric data editing is in progress. At this time, use the — , — , 1 keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key.	
Vriting the address:	
The speed and address values for the currently displayed point are written to the program.	
Changing the axis: AXIS NO. 1 RETURN	
The axis where a JOG operation is designated is changed by pressing the AXIS NO, key, entering the axis number where a JOG operation is to occur, then pressing the <u>RETURN</u> key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.	Operative only at screen 6
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	· ————————————————————————————————————
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Mode Test mode Fu	ınction	Teaching (program teaching)	5-28.5
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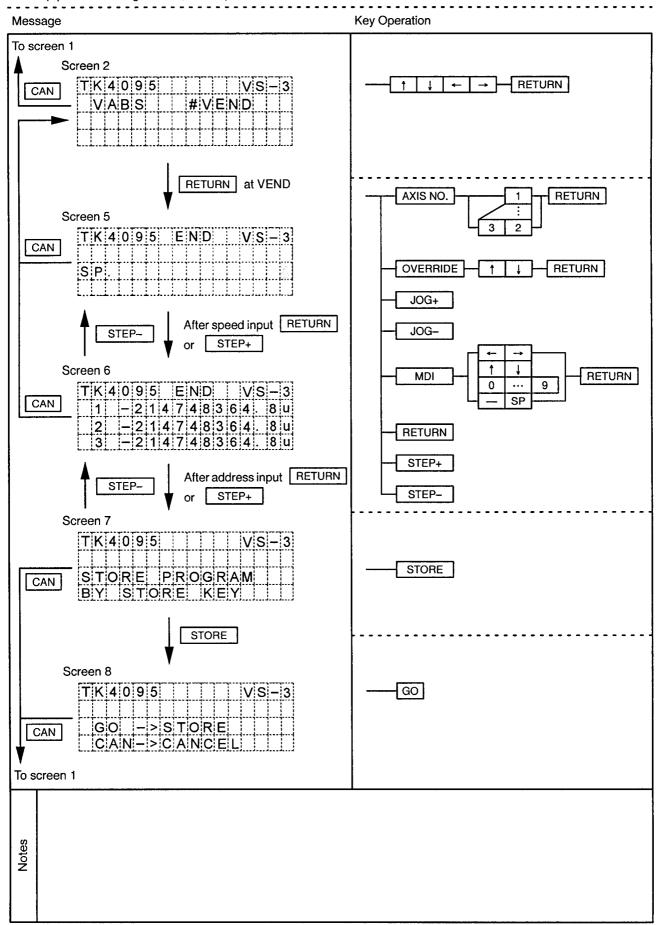
Operation Procedure & Explanations	Precautions/Remarks
witching screens:	
STEP+ Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input	
STEP- Screens. When a speed switching point input has been completed,	
the system will proceed to the next point without going to	
screen 2 first (remaining at screen 3).	
Screen 7, Screen 8>	
Program Store:	
STORE GO	
When error-free end-address writing has been executed at screen 4, screen 5	
will be displayed for program registration. To switch from screen 5 to screen 6, bress the STORE key. At screen 6, press the GO key to execute program writ-	
ng.	
Switching screens:	
STEP- To switch from screen 7 to screen 6, press the <u>STEP-</u> key.	

Mode Te	est mode	Function	Teaching (program teaching)	5-29
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- *1. After designating the required speed & address settings for the VABS selection, then returning to the previous screen (using the <u>CAN</u> or <u>STEP</u> key), the following will occur when the <u>STEP</u> key is pressed: the servo instruction selection screen (screen 2) will be skipped, and the speed & address setting screens (screen 3, screen 4) will be displayed in page order (P0, P1...).
- *2. If the <u>CAN</u> key is pressed while designating a speed or address setting (screen 3, screen 4) at a given step, the system will return to that step's screen 2.

	T T	1		1
Mode	Test mode	Function	Teaching (program teaching)	5-29.1



Mode Test mode Function Teaching (program teaching) 5-29,2					W	
3,1,3,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1	Į	Mode	Test mode	Function	Teaching (program teaching)	5-29.2

	T
Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item:</screen>	
Use these keys to switch between the setting items ("axis" and "speed").	Use the <u>↑</u> , <u>↓</u> keys to move between the "AX,,"
Axis No. input:	
1 RETURN 3 2	
With the cursor located at the desired position, enter the numeric value directly, then press the $\underline{\sf RETURN}$ key to register the setting.	The speed switching control axis is the first axis which is designated.
Switching screens: After confirming that the axis number setting has been registered, the <u>STEP+</u> key can be pressed to proceed to screen 2.	When the <u>STEP+</u> key is operative, a return to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP-</u> key.
<screen 2=""></screen>	
← → RETURN	
Designate whether the speed switching point setting (VABS) is to be continued or ended (VEND). A "#" mark indicates the currently selected servo instruction. Screen 3 is displayed when VABS is selected, and screen 4 is displayed when VEND is selected.	
<screen 3,="" 4,="" 5,="" 6="" screen=""> Changing the override value:</screen>	
OVERRIDE ↑ ↓ RETURN	
When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines.	
The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the <u>RETURN</u> key is pressed.	
80	
Notes	

Mode Test mode	Function	Teaching (program teaching)	5-29.3
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		Opera	tion Procedur	e & Explanations		Precautions/Remarks
	the JOG s de position.		nat is displaye	ed, the cursor will be display	ed at the	
	•		10.0 %			
			L Сі	ursor position		
order. The o	Press the	to increate to the total to the contain	ase the value,	to display the override table and the ↓ key to decrease shown below, enabling se	the value.	If the <u>↑</u> key is pressed when the override is 100.0 %, the override will become 0.1 %. If the <u>↓</u> key is pressed when the override is 0.1 %, the override will become 100.0 %.
C).1 %	1.0 %	10.0 %	100.0 %		Will become 100.0 70.
		2.0 %	20.0 %			If the <u>CAN</u> key is pressed during an
).4 %).8 %	4.0 % 8.0 %	40.0 % 80.0 %		:	override change, the change will be aborted, and the original value will be adopted.
The Je	OG speed G speed] =	will then b JOG spe	e determined eed limit value	e, press the <u>RETURN</u> key. as follows:] × [override] al display screen.		udopiou.
JOG o	operation:					
	JOG+	designa	ated axis in the ted speed. JC	sed, JOG operation will occu e address increase direction G operation stops when thi	n, at the	When the <u>JOG+</u> or <u>JOG</u> - key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.
	JOG-	designa	ated axis in the ted speed. JC	sed, JOG operation will occu a address decrease direction G operation stops when thi	n, at the	be displayed.
play o	f the feed p	resent va	lues for the in	ed numeric value will chang terpolating axes. This chang ight of the program No. (top c	ge is indi-	•
Notes						

Mada	Test mode	Eupotion	Teaching (program teaching)	5-29.4
MOGE	lest mode	1 unction	reaching (program teaching)	3-23.4

Operation Procedure & Explanations	Precautions/Remarks
Numeric input:	
MDI	
When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the —, —, , , , , keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the _ key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be lisplayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key.	
Vriting the address:	
RETURN The speed and address values for the currently displayed point are written to the program.	
Changing the axis: AXIS NO. 1 RETURN 3 2	
The axis where a JOG operation is designated is changed by pressing the AXIS NO, key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.	Operative only at screen 6
Notes	
4	

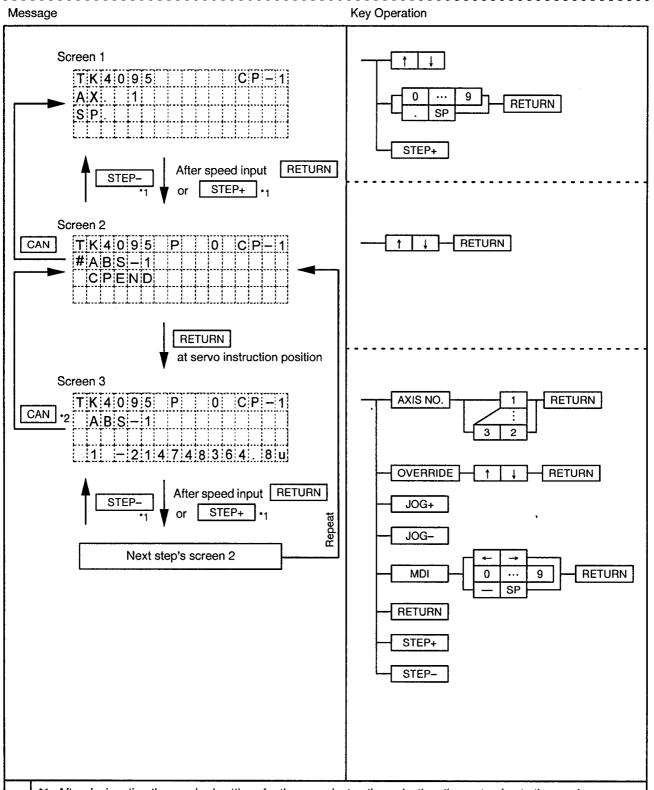
Mode Test mode Function Teaching (program teaching) 5-29	9.5
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Operation Procedure & Explanations	Precautions/Remarks
Switching screens:	
STEP+ Use the STEP+ and STEP- keys to switch between input screens. When a speed switching point input has been completed, the system will proceed to the next point without going to screen 2 first (remaining at screen 3).	
<screen 7,="" 8="" screen=""> Program Store</screen>	
STORE GO	
When error-free end-address writing has been executed at screen 6, screen 7 will be displayed for program registration. To switch from screen 7 to screen 8, press the <u>STORE</u> key. At screen 8, press the <u>GO</u> key to execute program writing.	
Switching screens:	
STEP— To switch from screen 7 to screen 6, press the STEP—key.	
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Notes	

Mode Test mode Function Teaching (program teaching) 5-3	Mode
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CP-1 (Constant-Speed Control, 1 Axis)

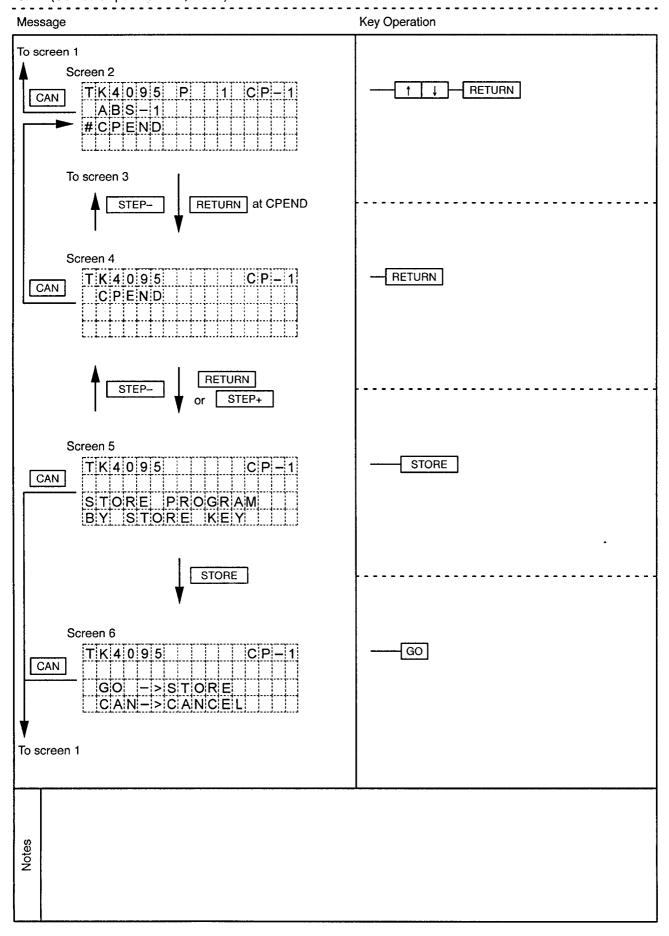
Notes



- *1. After designating the required settings for the servo instruction selection, then returning to the previous screen (using the <u>CAN</u> or <u>STEP</u>— key), the following will occur when the <u>STEP</u>+ key is pressed: the servo instruction selection screen (screen 2) will be skipped, and the servo instruction setting screen (screen 3) will be displayed in page order (P0, P1...).
- *2. If the <u>CAN</u> key is pressed while designating a setting (screen 3) at a given step, the system will return to that step's screen 2.

	ľ			
Mode	Test mode	Function	Teaching (program teaching)	5-30.1

CP-1 (Constant-Speed Control, 1 Axis)



Mode	Test mode	Function	Teaching (program teaching)	5-30.2
				I

Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item:</screen>	
Use these keys to switch between the setting items ("axis" and "speed").	Use the <u>↑</u> , <u>↓</u> keys to move between the "AX" and "SP" items.
Axis No. & speed inputs: O 9 RETURN	Switching to screen 2 is only possible after both the "axis number" and "speed" inputs have been registered.
With the cursor located at the desired position, enter the numeric value directly then press the <u>RETURN</u> key to register the setting. Each time the <u>RETURN</u> key is pressed, the input item will change as follows: Axis 1 → Speed.	
Switching screens:	
After confirming that all axis number and speed settings have been registered, the <u>STEP+</u> key can be pressed to proceed to screen 2.	When the <u>STEP+</u> key is enabled, a return to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP-</u> key.
<screen 2=""></screen>	
↑ ↓ RETURN	
Select a servo instruction which designates positioning control to a pass point. When constant-speed control is completed, CPEND is selected.	
ABS-1 1-axis linear interpolation control CPEND Constant-speed control END	
Notes	

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1	Mode	Test mode	Function	Teaching (program teaching)	5-30.3

Operation Procedure & Explanations	Precautions/Remarks
<screen 3=""> Changing the axis:</screen>	
AXIS NO. 1 RETURN	
The axis where a JOG operation is designated is changed by praction AXIS NO. key, entering the axis number where a JOG operation is to pressing the RETURN key. The axis number which is entered must the axis number range designated by the program. When a JOG axis number is changed, that axis number will be high	occur, then the beautiful to the within
Changing the override value:	
OVERRIDE ↑ ↓ RETURN	
When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed and 3rd lines. The override change procedure is identical to that in test mode JOG except that the system will return to the program teaching screen <u>RETURN</u> key is pressed.	at the 2nd operation,
When the JOG screen format is displayed, the cursor will be displayed override position.	ayed at the
10.0 % Cursor position	
At this time, the \uparrow , \downarrow keys can be used to display the override table order. Press the \uparrow to increase the value, and the \downarrow key to decrease The override table contains the values shown below, enabling so 0.1 % to 100.0 %.	e the value. ride is 100.0 %, the override will be- election of come 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override
0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 80.0 %	will become 100.0 %. If the <u>CAN</u> key is pressed during an override change, the change will be aborted, and the original value will be adopted.
After selecting the desired override value, press the <u>RETURN</u> key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	adopted.
Notes	

de Test mode Function	n Teaching (program teaching)	5-30.4
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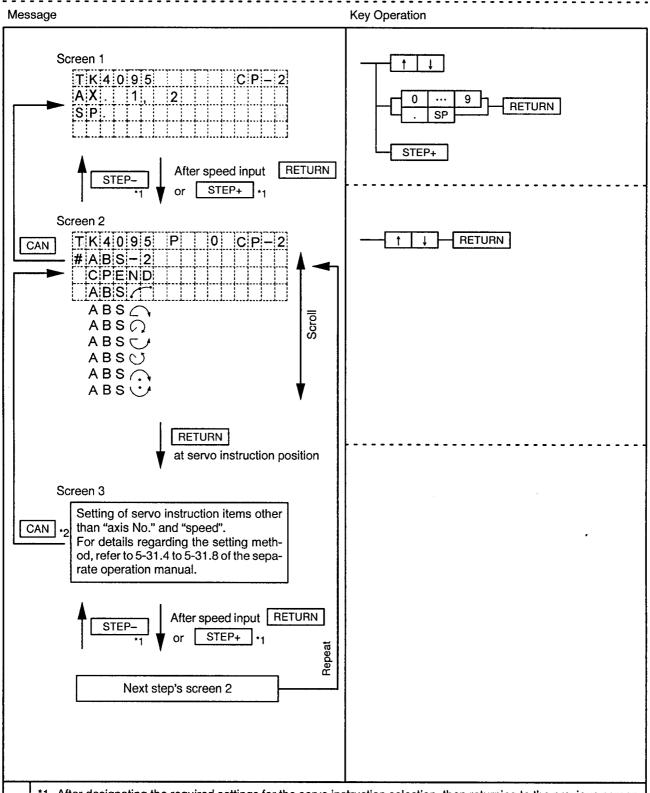
	Operation Procedure & Explanations	Precautions/Remarks
JOG operation:		
JOG+	While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG</u> key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.
JOG-	While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	be displayed.
play of the feed p	ation occurs, the displayed numeric value will change to a dispresent values for the interpolating axes. This change is individual in the program No. (top of screen).	
Numeric input:		
MDI -	0 9 RETURN	
the cursor will ap "E" is displayed to that numeric data At this time, use to is to be changed To change the nu A negative value and a positive value displayed in front ner to change a r unchanged).	ey is pressed, the numeric input mode will be established and pear at the right end of the numeric value field. In the right of the program No. (top of screen) in order to indicate a editing is in progress. The —, — keys to move the cursor to the numeric value which then enter the desired value. Immeric value's sign, press the — key at the numeric input field. Will be changed to a positive value (minus symbol is deleted), lue will be changed to a negative value (minus symbol will be of the value). The SP key can also be used in the same mannegative value to a positive value (a positive value will remain ic input is completed, press the RETURN key.	·
Notes		I

Mode Test mode	Function	Teaching (program teaching)	5-30.5
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	Operation Procedure & Explanations	Precautions/Remarks
Writing the addre		
RETURN	The servo instruction setting value for the currently displayed point is written to the program.	
Switching screen STEP+ STEP- STEP- <screen 4=""> RETURN <screen 5,="" program="" screen="" store:<="" td=""><td>Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input screens. When a pass point servo instruction input has been completed, the system will proceed to the next point without going to screen 2 first (remaining at screen 3). The CPEND input is executed.</td><td></td></screen></screen>	Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input screens. When a pass point servo instruction input has been completed, the system will proceed to the next point without going to screen 2 first (remaining at screen 3). The CPEND input is executed.	
STORE	-GO	
pleted at screen 4	-	•
Notes		

 Mode
 Test mode
 Function
 Teaching (program teaching)
 5-31

CP-2 (Constant-Speed Control, 2 Axes)



*1. After designating the required settings for the servo instruction selection, then returning to the previous screen (using the <u>CAN</u> or <u>STEP</u>— key), the following will occur when the <u>STEP</u>+ key is pressed: the servo instruction selection screen (screen 2) will be skipped, and the servo instruction setting screen (screen 3) will be displayed in page order (P0, P1...).

*2. If the <u>CAN</u> key is pressed while designating a setting (screen 3) at a given step, the system will return to that step's screen 2.

Notes

	The state of the s		T	Drawing No
Mode Tes	st mode	Function	Teaching (program teaching)	5-31.1
CP-2 (Con:	stant-Speed Control, 2 Axes)			
Message			Key Operation	
To screen 1	creen 2			
CAN		C P - 2	T T RETURN	
	STEP- RETURN	at CPEN	D	
CAN	TK4095 CPEND	CP-2	RETURN	
	STEP- RETURN or STE	<u></u>		
CAN	STORE PROGRA	C P - 2	STORE	
	STORE]		
CAN	GO ->STORE CAN->CANCEL	C P – 2	GO	
To screen 1	· · · · · · · · · · · · · · · · · · ·			
Notes				

Mode	Test mode	Function	Teaching (program teaching)	5-31.2

Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item:</screen>	
Use these keys to switch between the setting items ("axis" and "speed").	Use the \uparrow , \downarrow keys to move betweer the "AX , _" and "SP" items.
Axis No. & speed inputs:	Switching to screen 2 is only possible
0 9 RETURN	after both the "axis number" and "speed" inputs have been registered.
With the cursor located at the desired position, enter the numeric value directly, then press the <u>RETURN</u> key to register the setting. Each time the <u>RETURN</u> key is pressed, the input item will change as follows: Axis $1 \rightarrow \text{Axis } 2 \rightarrow \text{Speed}$.	
Switching screens:	
STEP+ After confirming that all axis number and speed settings have been registered, the <u>STEP+</u> key can be pressed to proceed to screen 2.	When the <u>STEP+</u> key is enabled, a return to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP-</u> key.
<screen 2=""></screen>	
↑ ↓ RETURN	
Select a servo instruction which designates positioning control to a pass point. When constant-speed control is completed, CPEND is selected.	
ABS-2 2-axis linear interpolation control → 5-31.4 CPEND Constant-speed control END	
ABS ← Circular interpolation by auxiliary point designation → 5-31.4 ABS ← Circular interpolation by radius designation → 5-31.5	
ABS ☐ Circular interpolation by radius designation → 5-31.5 ABS ☐ Circular interpolation by radius designation → 5-31.5 → 5-31.5	
ABS ○ Circular interpolation by radius designation → 5-31.5	
ABS	
Notes	
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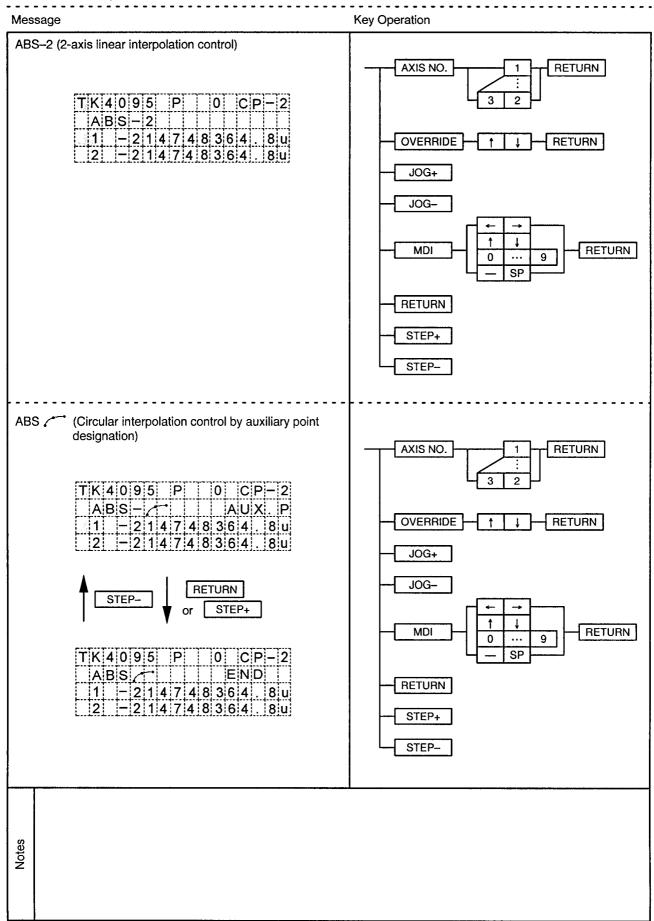
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-31.3

Operation Procedure & Explanations	Precautions/Remarks
<screen 4=""></screen>	
RETURN The CPEND input is executed.	
<screen 5,="" 6="" screen=""></screen>	
Program Store:	
STORE GO.	
When CPEND is selected at screen 2, and the CPEND setting has been completed at screen 4, screen 5 will be displayed for program registration. To switch from screen 5 to screen 6, press the <u>STORE</u> key. At screen 6, press the <u>GO</u> key to execute program writing.	
Switching screens:	
STEP— To switch from screen 5 to screen 4, press the <u>STEP</u> -key.	
Notes	

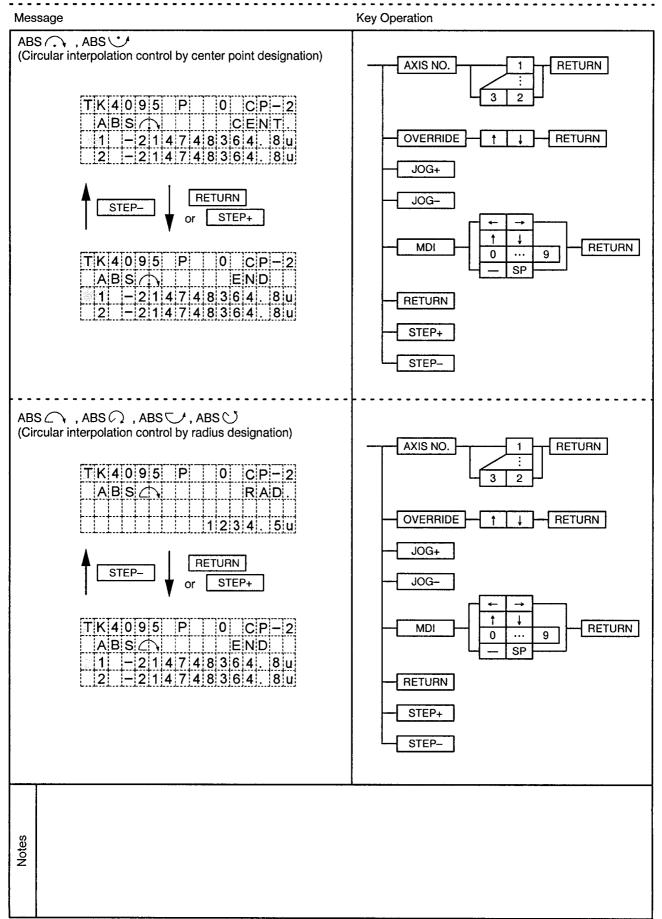
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1	I	l –	[
Mode	lest mode	Function	Teaching (program teaching)	5-31.4
			, , ,	

CP-2 (Constant-Speed Control, 2 Axes) Screen 3



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Mode	Test mode	Function	Teaching (program teaching)	5-31.5	

CP-2 (Constant-Speed Control, 2 Axes) Screen 3



Mode	Test mode	Function	Teaching (program teaching)	5-31.6
				4

CP-2 (Constant-Speed Control, 2 Axes) Screen 3

Operation Procedure & Explanations Precautions/Remarks Changing the axis: AXIS NO. RETURN The axis where a JOG operation is designated is changed by pressing the AXIS NO, key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted. Changing the override value: OVERRIDE - 1 ↓ RETURN When the **OVERRIDE** key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed. When the JOG screen format is displayed, the cursor will be displayed at the override position. - Cursor position At this time, the \uparrow , \downarrow keys can be used to display the override table values in If the _1_ key is pressed when the override is 100.0 %, the override will beorder. Press the \uparrow to increase the value, and the \downarrow key to decrease the value. The override table contains the values shown below, enabling selection of come 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override 0.1 % to 100.0 %. will become 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % If the CAN key is pressed during an 4.0 % 0.4 % 40.0 % override change, the change will be 80.0 % 0.8 % 8.0 % aborted, and the original value will be adopted. After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen. Notes

Mode	Test mode	Function	Teaching (program teaching)	5-31.7
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CP-2 (Constant-Speed Control, 2 Axes) Screen 3

	Operation Procedure & Explanations	Precautions/Remarks
JOG operation:		
JOG+	While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satisfied, the displayed "! CAN'T START" will
JOG-	While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	be displayed.
play of the feed	ation occurs, the displayed numeric value will change to a dispresent values for the interpolating axes. This change is indivinish is displayed to the right of the program No. (top of screen).	
Numeric input:		
MDI -	← → ↑ ↓ 0 ··· 9 — SP	
the cursor will ap "E" is displayed to that numeric dat At this time, use t which is to be ch To change the no A negative value and a positive va displayed in from ner to change a unchanged).	ey is pressed, the numeric input mode will be established and opear at the right end of the numeric value field. In the right of the program No. (top of screen) in order to indicate a editing is in progress. The	
Notes		I

Drawing No.

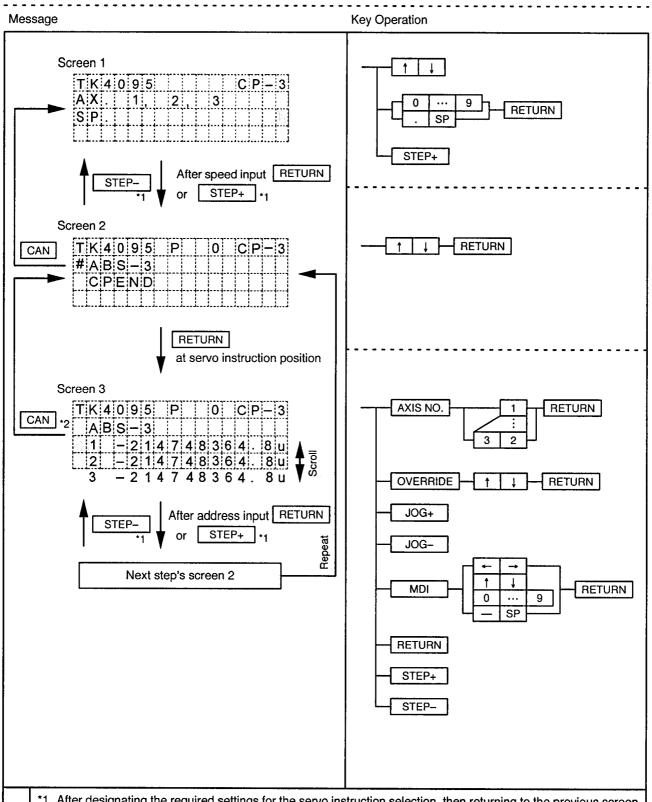
Mode Test mode	Function	Teaching (program teaching)	5-31.8
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CP-2 (Constant-Speed Control, 2 Axes) Screen 3

	Operation Procedure & Explanations	Precautions/Remarks
Writing the addre	ess:	
RETURN	The servo instruction setting value for the currently displayed point is written to the program.	
Switching screen	s:	
SWITCHING SCREEN STEP+ STEP-	Use the STEP+ and STEP- keys to switch between input screens. When a pass point servo instruction input has been completed, the system will proceed to the next point without going to screen 2 first (remaining at screen 3).	
Notes		

Mode Test mode	nction Teaching (program teach	ing) 5-32
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Notes



- *1. After designating the required settings for the servo instruction selection, then returning to the previous screen (using the <u>CAN</u> or <u>STEP</u> key), the following will occur when the <u>STEP</u> key is pressed: the servo instruction selection screen (screen 2) will be skipped, and the servo instruction setting screen (screen 3) will be displayed in page order (P0, P1...).
- *2. If the <u>CAN</u> key is pressed while designating a setting (screen 3) at a given step, the system will return to that step's screen 2.

Drawing No.

				Drawing N
Mode Test mode	Function	Teaching	(program teaching)	5-32.1
CP-3 (Constant-Speed Control, 3 Axes)			•••••	
Message			Key Operation	
To screen 1 Screen 2 TK4095 P 1 ABS-3	C P - 3		— ↑ ↓ RETURN	
To screen 3	at CPEN	ID		
Screen 4 T K 4 0 9 5 C P E N D	C P - 3		RETURN	
STEP- RETUR	RN TEP+			
Screen 5 T K 4 0 9 5 CAN S T O R E P R G O R A B Y S T O R E K E			STORE.	
STORE				
Screen 6 CAN GO ->STORE CAN->CANCE	C P - 3		——GO	
To screen 1				
Notes				

Wide rest mode reading (program teaching) 3-32.2	Mode	Test mode	Function	Teaching (program teaching)	5-32.2
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Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item:</screen>	
Use these keys to switch between the setting items ("axis" and "speed").	Use the ↑, ↓ keys to move between the "AX,," and "SP" items.
Axis No. & speed inputs:	Switching to screen 2 is only possible
0 9 — . SP RETURN	after both the "axis number" and "speed" inputs have been registered.
With the cursor located at the desired position, enter the numeric value directly, then press the <u>RETURN</u> key to register the setting. Each time the <u>RETURN</u> key is pressed, the input item will change as follows: Axis $1 \rightarrow Axis 2 \rightarrow Axis 3 \rightarrow Speed.$	
Switching screens:	
After confirming that all axis number and speed settings have been registered, the <u>STEP+</u> key can be pressed to proceed to screen 2.	When the <u>STEP+</u> key is enabled, a return to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP-</u> key.
<screen 2=""></screen>	
↑ ↓ RETURN	
Select a servo instruction which designates positioning control to a pass point. When constant-speed control is completed, CPEND is selected.	
ABS-3 3-axis linear interpolation control CPEND Constant-speed control END	
	,
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Notes	

Mode Test mode Function Teaching (program teaching) 5-32.3	Mode	Test mode	Function	I	5-32.3
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	Opera	tion Procedure	e & Explanations	Precautions/Remarks
<screen 3=""> Changing the</screen>	axis:			
AXIS NO.		RETURN	1	
AXIS NO. key, pressing the Ethe axis numb	entering the <u>RETURN</u> key er range des	axis number way. The axis nur signated by the	signated is changed by pressing where a JOG operation is to occur, the series which is entered must be with program. It is a number will be highlighted	en hin
Changing the	override valu	ıe:		
OVERRIE)E 1	↓ RETUF	RN	
JOG screen d and 3rd lines. The override of	isplay forma hange proce e system wi	t, with the spe dure is identic	e screen will change to the ed and override displayed at the 2 al to that in test mode JOG operation of the program teaching screen when the s	on,
When the JOC override positi		mat is displaye	ed, the cursor will be displayed at	the
overnae poeta	011.	10.0 %	rsor position	
order. Press th	ie <u>↑</u> to incre table contaii	s can be used ase the value,	to display the override table values and the ↓ key to decrease the values shown below, enabling selection	ue. ride is 100.0 %, the override will be- of come 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override
0.1 % 0.2 % 0.4 % 0.8 %	1.0 % 2.0 % 4.0 % 8.0 %	10.0 % 20.0 % 40.0 % 80.0 %	100.0 %	will become 100.0 %. If the <u>CAN</u> key is pressed during an override change, the change will be aborted, and the original value will be adopted.
The JOG speed [JOG speed	ed will then b [] = [JOG spe	e determined eed limit value		adopted.

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Notes				

Mode Test mode Function Teaching (program teaching) 5-32.	Mode Test mode Function Teaching (program teaching)
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	Operation Procedure & Explanations	Precautions/Remarks			
JOG operation					
JOG+	While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satisfied, the med sage "! CAN'T START" will be discontinuous.			
While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs the displayed numeric value will change to a displayed.					
play of the feed	ation occurs, the displayed numeric value will change to a dispresent values for the interpolating axes. This change is indivhich is displayed to the right of the program No. (top of screen).				
Numeric input:					
MDI -	← → ↑ ↓ 0 ··· 9 — SP				
the cursor will ay "E" is displayed to that numeric dath At this time, use to which is to be change the no A negative value and a positive value displayed in from ner to change a unchanged).	ey is pressed, the numeric input mode will be established and opear at the right end of the numeric value field. to the right of the program No. (top of screen) in order to indicate a editing is in progress. the				
Notes					

Drawing No.

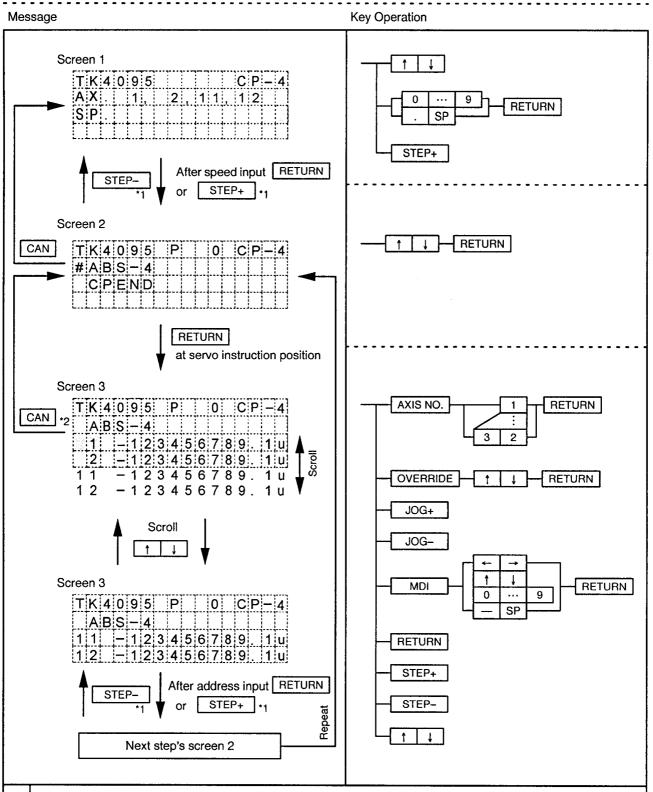
Mode Test mode Function Teaching (program teaching	5-32.5
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	Operation Procedure & Explanations	Precautions/Remarks
Writing the addre	ss:	
RETURN	The servo instruction setting value for the currently displayed point is written to the program.	
Switching screen	s:	
STEP+	Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input screens. When a pass point servo instruction input has been completed, the system will proceed to the next point without going to screen 2 first (remaining at screen 3).	
<screen 4=""></screen>		
RETURN	The CPEND input is executed.	
<screen 5,="" program="" screen="" store:<="" td=""><td>en 6></td><td></td></screen>	en 6>	
STORE	-GO	
pleted at screen 4	selected at screen 2, and the CPEND setting has been com- l, screen 5 will be displayed for program registration. To switch screen 6, press the <u>STORE</u> key. At screen 6, press the <u>GO</u> key am writing.	
Switching screen	s:	:
STEP-	To switch from screen 5 to screen 4, press the <u>STEP</u> key.	
	-	
		- 11 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1
Se l		
Notes		

Mode Test mode Function Teaching (program teaching)	5-33

CP-4 (Constant-Speed Control, 4 Axes)

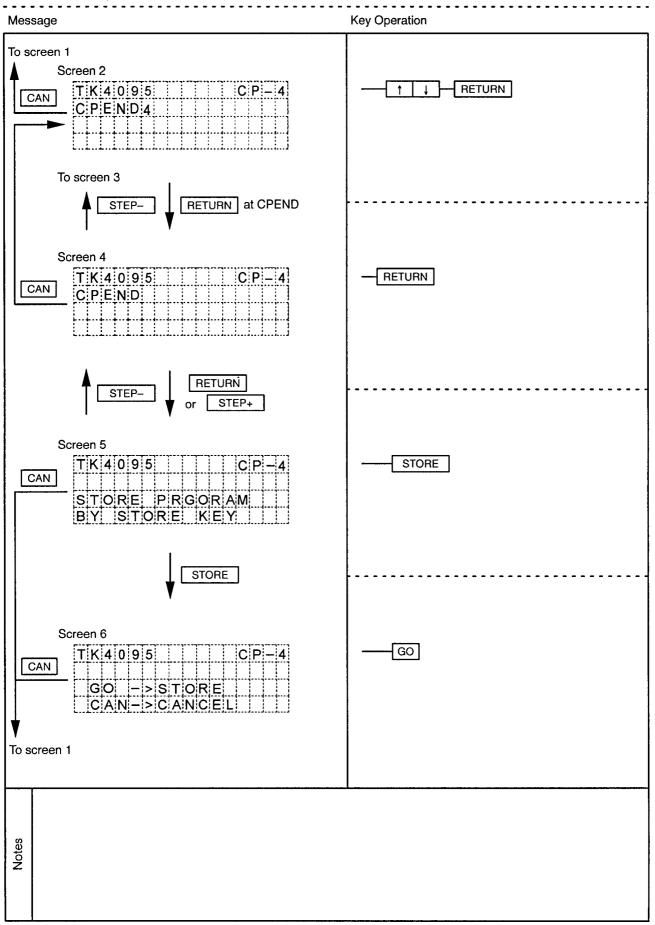
Notes



*1. After designating the required settings for the servo instruction selection, then returning to the previous screen (using the <u>CAN</u> or <u>STEP</u>– key), the following will occur when the <u>STEP</u>+ key is pressed: the servo instruction selection screen (screen 2) will be skipped, and the servo instruction setting screen (screen 3) will be displayed in page order (P0, P1...).

*2. If the <u>CAN</u> key is pressed while designating a setting (screen 3) at a given step, the system will return to that step's screen 2.

Mode	Test mode	Function	Teaching (program teaching)	5-33.1



		** ** * * * * * * * * * * * * * * * * *			
ı	Mode	Test mode	Function	Teaching (program teaching)	5-33.2

Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item:</screen>	
Use these keys to switch between the setting items ("axis" and "speed").	Use the ↑, ↓ keys to move between the "AX,,, and "SP" items.
Axis No. & speed inputs:	
0 9 SP RETURN	Switching to screen 2 is only possible after both the "axis number" and "speed" inputs have been registered.
With the cursor located at the desired position, enter the numeric value direct then press the <u>RETURN</u> key to register the setting. Each time the <u>RETURN</u> is pressed, the input item will change as follows: Axis $1 \rightarrow \text{Axis } 2 \rightarrow \text{Axis } 3 \rightarrow \text{Axis } 4 \rightarrow \text{Speed}$.	itly,
Switching screens:	
After confirming that all axis number and speed settings have been registered, the <u>STEP+</u> key can be pressed to proceed to screen 2.	
<screen 2=""></screen>	
↑ ↓ — RETURN	
Select a servo instruction which designates positioning control to a pass power when constant-speed control is completed, CPEND is selected.	int.
ABS-4 4-axis linear interpolation control CPEND Constant-speed control END	
5. E.	
Notes	
Z	

Mode Test mode Function Teaching (program teaching) 5-33.3	Mode Test mode	Function	Teaching (program teaching)	5-33.3
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	Operation	on Procedure	e & Explanations	Precautions/Remarks
<screen 3=""> Changing the axis</screen>	3:			
AXIS NO.	3 2	RETURN		
AXIS NO. key, ento pressing the RET the axis number r	ering the a <u>URN</u> key. ange desig	xis number w The axis num gnated by the	ignated is changed by pressing the here a JOG operation is to occur, the aber which is entered must be withing program. at axis number will be highlighted.	n
Screen Scrolling:				
† ↓	For 3 and be displa ↑, ↓ ke	When data for fewer than 2 axes is displayed, the ↑, ↓ keys are disabled, and the error message "! MIS OPERATION" will be displayed at the bottom		
Changing the over	rride value	: :		line of the screen if they are pressed.
OVERRIDE	<u></u>	RETUR	N	
JOG screen displ and 3rd lines. The override char	ay format, nge proced ystem will	with the spec	e screen will change to the ed and override displayed at the 2nd all to that in test mode JOG operation program teaching screen when the	,
When the JOG so override position.	reen form	at is displaye	ed, the cursor will be displayed at the	e
Override position.	1	0.0 %		
			rsor position	A
order. Press the 1 The override table 0.1 % to 100.0 %.	to increas le contains	se the value, a	to display the override table values i and the 上 key to decrease the value shown below, enabling selection of	. ride is 100.0 %, the override will be-
0.2 % 0.4 %	1.0 % 2.0 % 4.0 % 8.0 %	10.0 % 20.0 % 40.0 % 80.0 %	100.0 %	If the <u>CAN</u> key is pressed during an override change, the change will be aborted, and the original value will be adopted.
After selecting the The JOG speed v [JOG speed] = The system will the	vill then be [JOG spee	determined a ed limit value]	X [override]	adopted.

Mode	Test mode	Function	Teaching (program teaching)	5-33.4

		Operation Procedure & Explanations	Precautions/Remarks
JOG	operation		
	JOG+	While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. While this key is pressed, JOG operation will occur at the	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satis fied, the message "! CAN'T START" will be displayed.
1	JOG-	designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	
play	of the feed p	tion occurs, the displayed numeric value will change to a dis- resent values for the interpolating axes. This change is indi- nich is displayed to the right of the program No. (top of screen).	
Num	eric input:		
1	MDI	↑ ↓ RETURN 0 9 — SP	
the c "E" is that At th whice To cl A ne and disp ner t unch	cursor will app s displayed to numeric data is time, use th th is to be cha hange the nu gative value val a positive val layed in front to change a n nanged).	y is pressed, the numeric input mode will be established and pear at the right end of the numeric value field. The right of the program No. (top of screen) in order to indicate editing is in progress. $e \leftarrow , \rightarrow , \uparrow$, \downarrow keys to move the cursor to the numeric value anged, then enter the desired value. The meric value's sign, press the \pm key at the numeric input field. Will be changed to a positive value (minus symbol is deleted), we will be changed to a negative value (minus symbol will be of the value). The \underline{SP} key can also be used in the same manegative value to a positive value (a positive value will remain c input is completed, press the \underline{RETURN} key.	
<u></u>			
Notes			

	Mode	Test mode	Function	Teaching (program teaching)	5-33.5
1	mode	lest mode	Function	reaching (program teaching)	5-33.5

	Operation Procedure & Explanations	Precautions/Remarks
Writing the addre	SS:	
RETURN	The servo instruction setting value for the currently displayed point is written to the program.	
Switching screen	s:	
STEP+	Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input screens. When a pass point servo instruction input has been completed, the system will proceed to the next point without going to screen 2 first (remaining at screen 3).	
<screen 4=""></screen>	The CPEND input is executed.	
<screen 5,="" scree<br="">Program Store:</screen>	en 6>	
STORE	-GO	
pleted at screen 4	selected at screen 2, and the CPEND setting has been com- i, screen 5 will be displayed for program registration. To switch screen 6, press the <u>STORE</u> key. At screen 6, press the <u>GO</u> key am writing.	
Switching screen	s:	
STEP-	To switch from screen 5 to screen 4, press the <u>STEP</u> key.	
8		
Notes		
1 1		

			Drawing
Mode	Test Mode	Function	5-1
Proced	lures at Initial Test Mode Screen		
Messa	ge		Key Operation
	T TEST M PC CMD I GO -> T OTHER->		GO DATA PROGRAM MONITOR CAN
	Operation Procedu	re & Explanations	Precautions/Remarks
Switch Switch Switch No sc	ng the test mode: GO Go to 5-3 Ining to data set mode: DATA Go to 7-1 Ining to program mode: PROGRAM Go to 8-1 Ining to monitor mode: MONITOR Go to 6-2 ITEST This section for the control of the cont		Even if test mode operation is des nated by pressing the GQ key, the tomode will not be established at A273UHCPU/A171SCPU if axis ration in response to a programma controller command is in progress this case, a "! STARTING ERROR" ror will occur. The term "cancel" means switching another mode.
Notes	Start commands from the program	nmable controller are	e invalid when in the test mode.

Drawing No. Mode Test Mode Function Cancel 5-2 Procedures at Test Mode Cancel Screen Message **Key Operation** GO T TEST MODE PC COMMAND VALID CAN-> CANCEL Operation Procedure & Explanations Precautions/Remarks The test mode cancel screen will be displayed in test mode operation when another mode key is pressed, or when the CAN key is pressed at the test item selection screen (5-3). A test mode cancel confirmation procedure is then required as shown below. To cancel the test mode: GO If another mode key was pressed immediately prior to the test mode cancel screen being displayed, the initial screen for that mode will be displayed when the GO key is pressed. To continue the test mode: CAN The test mode will not be canceled, and the test mode's item selection screen (5-3) will be displayed.

Notes

Drawing No.

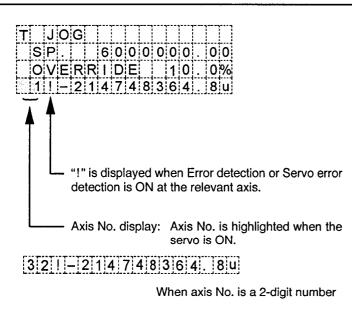
Mode	Test Mode	Function	Test Item Selection		5-3
Test Ite	em Selection Screen (Displayed Af	ter Entering	Test Mode)		lJ
Messa	ge			Key Operation	
	T 1 J O G 2 T E A C H 3 P R O G . O 4 P . V A L	PERAT	O N I O N	1 RE RE 6	FURN
	Operation Procedure	e & Explana	tions	Precautions/Rema	arks
The te	st item is selected at this screen.				
Select	ing JOG operation:				
	1 RETURN► Go to	5-4			
Select	ing teaching:				
	2 RETURN► Go to	5-5			
Select	ing program operation:				
	3 RETURN► Go to	5-34			
Select	ing present value setting:				
	4 RETURN► Go to	o 5-42			
Select	ing PC test:				
	5 RETURN► Go to	5-45			
Select	ing servo ON:				
	6 RETURN► Go to	5-48			
\	When the key which designates the	desired iter	n number is pressed, that	item number will be highligh	ited.
tes					
Notes					

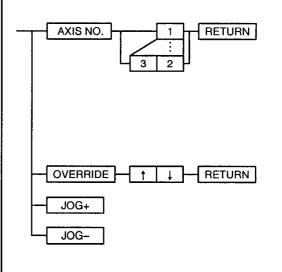
Mode Test Mode Function JOG Operation 5-4

Screen Procedures When JOG Operation is Selected

Message

Key Operation





Operation Procedure & Explanations

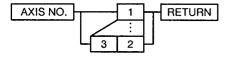
Precautions/Remarks

The data settings and procedures required for JOG operation are executed at this screen. The JOG speed is displayed as a "[JOG speed limit value] × [override]" value. The initial override display value is 10.0 %.

The selected axis number and the feed present value are displayed at the bottom line of the screen.

When the JOG screen is first displayed after being selected at the test item screen, a 1-axis JOG operation will be indicated.

Changing the axis:



Select axis No.1 to 32 immediately after pressing the AXIS NO, key. When an axis change is made, the new axis number is indicated at the bottom of the screen. The axis number input range varies according to the CPU type being used.

A273UHCPU (8-axis specs.) Axes 1 to 8 A273UHCPU (32-axis specs.) Axes 1 to 32 A171SCPU Axes 1 to 4

JOG operation is possible during an axis number change.

Although JOG operation can be started by pressing AXIS NO. JOG+ , the AXIS NO. key ON status will be canceled at that time.

When the JOG+ or JOG- key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! SETTING ER-ROR" will be displayed.

The <u>JOG+</u> and <u>JOG-</u> keys are always operative while in the JOG test mode.

Notes

М	lode	Test Mode	Function	JOG Operation	5-4.1	
-						

Screen Procedures When JOG Operation is Selected

	Operation Procedure & Explanations	Precautions/Remarks	
Changing the over	rride:		If the 1 key is pressed when the over-
OVERRIDE	↑ ↓ RETURN	ride is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override	
When the <u>OVERR</u> ride value.	IIDE key is pressed, the cursor will be o	will become 100.0 %.	
	10. 0 % Cursor position		If the <u>CAN</u> key is pressed during an
order. Press the _1 value.	, ↓ keys can be used to display the ov key to increase the value, and the ↓	override change, the change will be aborted, and the original value will be adopted.	
0.1 % to 100.0 %.	e contains the values shown below, e	enabling selection of	
0.2 % 0.4 %	1.0 % 10.0 % 100.0 % 2.0 % 20.0 % 4.0 % 40.0 % 8.0 % 80.0 %		
speed will then be [JOG speed] = JOG operation is JOG operation is setting procedure	e desired override value, press the RE determined as follows: [JOG speed limit value] × [override] possible during an override change. possible with the following key operation will be canceled: OG+ OVERRIDE	·	
JOG operation:			
JOG+	While this key is pressed, JOG operat designated axis in the address increadisplayed speed. JOG operation stop released.	se direction, at the	
JOG-	While this key is pressed, JOG operat designated axis in the address decreadisplayed speed. JOG operation stop released.	se direction, at the	
		<u> </u>	
88			
Notes			

Drawing No.

Mode	Test Mode	Function	Teaching		5-5
Procedu	ures at Teaching Item Selection So	reen			
Messag	е			Key Operation	
	T TEACHIN 1 ADDRESS 2 PROGRAM	TEAC	H H	1 RETURN	
	Operation Procedure	& Explanat	ions	Precautions/Rema	rke
The tea	aching type (address teaching or p			i rodauliona/Holfid	
Selection 1	ng "address teaching": RETURN► Go to				
Notes					

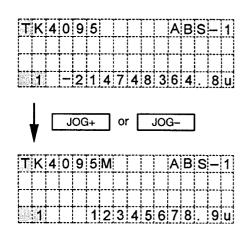
	T	·			Drawing No.	
Mode	Test Mode	Function Teaching (address teaching)			5-6	
Calling a Designated Program						
Messag	je	Key Operation				
	T TEACH I	0	Cursor position	0 9 —(CLEAR	RETURN	
	Operation Procedure	e & Explana	tions	Precautions/Rema	arks	
ber. Th The eff	ogram to be accessed is designated the program number range is 0 to 4 fective input digits will be the most g 4 digits will be invalid. Each to digit me 1	In order to execute the adfunction, a program must ated in the program mode When this screen is access teaching item selection screacessed due to the CAN pressed during an addresseration, the call program not tered at that time will be on the default.	first be cre- sed from the een (5-5), or key being s teach op- umber regis-			
If a pro	the CLEAR key to correct an input ogram has been read out successfunctions and axis. Go to 5-7 Go to 5-7	ully (when <u>B</u>	RETURN key is pressed),	On returning to this scree address writing by the teation, a search will be conducted all subsequent program in steps where teaching is puthe number of the first prosuch a step is found will be lifted a program number where impossible (INC, VF, etc. nated, the message "! (P.VAL" will be displayed on line.	aching func- cted through numbers for ossible, and gram where e displayed. e teaching is .) is desig- CAN'T SET	
Notes						

Mode	Test Mode	Function	Teaching (address teaching)	5-7
		<u> </u>		1

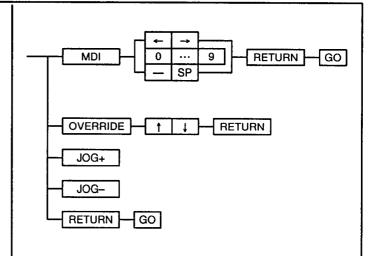
Absolute 1-Axis Positioning

Message

Key Operation



The axis number for which the JOG designation has been made is highlighted.

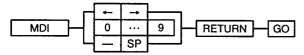


Operation Procedure & Explanations

Precautions/Remarks

When the program's servo instruction designates an absolute 1-axis operation, this is indicated by the display "ABS-1". The program content for the axis numbers designated for the program is displayed on the lower lines.

Numeric input:



When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value.

"E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress.

At this time, use the $\underline{\leftarrow}$, $\underline{\rightarrow}$ keys to move the cursor to the numeric value which is to be changed, then enter the desired value.

To change the numeric value's sign, press the <u>key</u> at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The <u>SP</u> key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged).

When the numeric input is completed, press the <u>RETURN</u> key. An address writing confirmation screen like that shown below will then be displayed.

GO -> WRITE CAN -> CANCEL

Because the absolute 1-axis positioning operation occurs at 1 axis only, there is no axis change procedure.

	Mode	Test Mode	Function	Teaching (address teaching)	5-7.1	
•						

Absolute 1-Axis Positioning

Operation Procedure & Explanations	Precautions/Remarks
Press the GO key at this time to write the changed numeric value.	
If the value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	
Changing the override:	
OVERRIDE	
When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The change procedure is identical to that in the test mode JOG operation, except that the system will return to the absolute 1 axis teaching screen when the RETURN key is pressed.	
When the JOG screen format is displayed, the cursor will be displayed at the override position.	
10.0 % Cursor position	
At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ key to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %.	If the 1 key is pressed when the override is 100.0 %, the override will become 0.1 %. If the 1 key is pressed when the override is 0.1 %, the override will become 100.0 %.
0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	If the <u>CAN</u> key is pressed during an override change, the change will be aborted, and the original value will be
After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	adopted.
Notes	

Mode	Test Mode	Function	Teaching (address teaching)	5-7.2

Absolute 1-Axis Positioning

		Operation Procedure & Explanations	Precautions/Remarks
JOG	operation:		
	JOG+	While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will
	JOG-	While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	be displayed.
play	of the feed p	tion occurs, the displayed numeric value will change to a dis- resent values for the interpolating axes. This change is indi- nich is displayed to the right of the program No. (top of screen).	
Writin	ng the addre	ss:	
	RETURN	GO	
Press progr playe	ram. The foll	RN key to write the currently displayed numeric value to the lowing address writing confirmation screen will then be dis-	·
		GO -> WRITE CAN -> CANCEL	
If the next steps	numeric val step where to	y to write the numeric value. ue is written without error, a search will be conducted for the eaching is possible, and that step will be displayed. If no such it program, the system will proceed to the program readout	
Notes			

					Drawing No.
Mode	Test mode	Function	Teaching (address teachi	ng)	5-8
Absolu	te 2-Axis Linear Interpolation	1			
Messa	ge		Key Operation		
The a	T K 4 0 9 5	6 4 . 8 u 6 4 . 8 u 6 5 . 3 u	OVERRIDE - JOG-	RETURN RETURN RETURN RETURN RETURN	RN — GO
	Operation Pro	cedure & Explana	tions	Precautions/Re	marks
When the program's servo instruction designates an absolute 2-axis operation, this is indicated by display of "ABS-2". The program content for the axis numbers designated for the program is displayed on the lower lines. Changing the axis: AXIS NO. The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number is highlighted. Numeric input:					
Notes					

ſ	Mode Test Mode	Function	Teaching (address teaching)	5-8.1
•				

Absolute 2-Axis Linear Interpolation

Operation Procedure & Explanations Precautions/Remarks When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen). "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the \leftarrow , \rightarrow , \uparrow , \downarrow keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the <u>-</u> key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key. An address writing confirmation screen like that shown below will then be displayed. GO -> WRITE CAN -> CANCEL Press the GO key to write the changed numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6). Changing the override: OVERRIDE -RETURN 1 | | F When the **OVERRIDE** key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom of the screen. The change procedure is identical to that in test mode JOG operation, except that the system will return to the absolute 2-axis teaching screen when the **RETURN** key is pressed. When the JOG screen format is displayed, the cursor will be displayed at the override position. - Cursor position At this time, the \uparrow , \downarrow keys can be used to display the override table values in order. Press the \uparrow to increase the value, and the \downarrow key to decrease the value.

Mode	Test Mode	Function	Teaching (address teaching)	5-8.2
			· · · · · · · · · · · · · · · · · · ·	

Absolute 2-Axis Linear Interpolation

	Operation	ocedure & Expla	anations	Precautions/Remarks
0.1 % to 100.0 %. 0.1 % 0.2 % 0.4 % 0.8 % After selecting the The JOG speed v	1.0 % 2.0 % 4.0 % 8.0 % e desired overrigilithen be dete	10.0 % 20.0 % 40.0 % 80.0 % de value, press t ermined as follow nit value] × [ove	rs: rride]	If the ↑ key is pressed when the over ride is 100.0 %, the override will be come 0.1 %. If the ↓ key is presse when the override is 0.1 %, the overrid will become 100.0 %. If the <u>CAN</u> key is pressed during a override change, the change will b aborted, and the original value will b adopted.
JOG operation: JOG+	designated as calculated spreleased.	kis in the addres eed. JOG opera	a operation will occur at the sincrease direction, at the tion stops when this key is a operation will occur at the	
JOG	designated a	kis in the address	s decrease direction, at the tion stops when this key is	
play of the feed p	resent values fo	or the interpolation	ric value will change to a dis- ng axes. This change is indi- e program No. (top of screen).	
Writing the addre	ss: 			
RETURN	GO			
			played numeric value to the tion screen will then be dis-	
	GO -> WRI CAN -> CAN			
next step where to	ue is written wit eaching is possi	hout error, a sea ble, and that ste	arch will be conducted for the p will be displayed. If no such seed to the program readout	

	T	T	I I		Drawing No.		
Mode	Test mode	Function	Teaching (address teachi	ng)	5-9		
Absolut	te 3-Axis Linear Interpolation			· · · · · · · · · · · · · · · · · · ·			
Messag	ge		Key Operation				
The ax	T K 4 0 9 5 ABS 1 - 2 1 4 7 4 8 3 6 4 2 - 2 1 4 7 4 8 3 6 4 3 - 2 1 4 7 4 8 3 6 4 JOG+ or JOG- T K 4 0 9 5 M ABS 1 1 1 1 1 8 3 4 9 6 3 1 2 3 9 8 4 7 1 6 5 3 1 1 2 3 4 5 6 7 8 dis number for which the JOG designade is highlighted.	MDI — OVERRIDE — JOG+ JOG-	1 RETURN 3 2 RETURN 1 HRETURN RETURN 1 HRETURN	IN GO			
	Operation Procedure	e & Explana	tions	Precautions/Ren	narks		
this is bers d Chang The at AXIS I pressite ax	When the program's servo instruction designates an absolute 3-axis operation, this is indicated by display of "ABS-3". The program content for the axis numbers designated for the program is displayed on the lower lines. Changing the axis: AXIS NO. The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.						
Nume	Numeric input: MDI T T T T T T T T T T T T T						
Notes							

Mode Test Mode Fun	ınction	Teaching (address teaching)	5-9.1
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Absolute 3-Axis Linear Interpolation

Operation Procedure & Explanations Precautions/Remarks When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen). "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the $\stackrel{\longleftarrow}{-}$, $\stackrel{\longrightarrow}{-}$, $\stackrel{1}{-}$ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the <u>-</u> key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key. An address writing confirmation screen like that shown below will then be displayed. GO -> WRITE CAN -> CANCEL Press the GO key to write the changed numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6). Changing the override: OVERRIDE -RETURN ↓ l When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom The change procedure is identical to that in test mode JOG operation, except that the system will return to the absolute 3-axis teaching screen when the RETURN key is pressed. Notes

Mode Test Mode Function Teaching (address teaching) 5-9.2	Mode	Test Mode	Function	Teaching (address teaching)	5-9.2
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Absolute 3-Axis Linear Interpolation

	Operation Procedure & Explanations	Precautions/Remarks
When the JOG override position	screen format is displayed, the cursor will be displayed at the n.	
	10.0 %	
	Cursor position	
order. Press the The override to 0.1 % to 100.0		If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %.
0.1 % 0.2 %	1.0 % 10.0 % 100.0 % 2.0 % 20.0 %	Will become 100.0 %.
0.2 % 0.4 % 0.8 %	4.0 % 40.0 % 8.0 % 80.0 %	If the <u>CAN</u> key is pressed during an override change, the change will be aborted, and the original value will be
The JOG speed [JOG speed]	he desired override value, press the <u>RETURN</u> key. I will then be determined as follows: = [JOG speed limit value] × [override] then return to the original display screen.	adopted.
JOG operation:		
JOG+	While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	
JOG-	While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	
play of the feed	ration occurs, the displayed numeric value will change to a dispresent values for the interpolating axes. This change is indiwhich is displayed to the right of the program No. (top of screen).	
Notes		

Drawing No.

	Mode	Test Mode	Function	Teaching (address teaching)	5-9.3
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Absolute 3-Axis Linear Interpolation

Operation Procedure & Explanations	Precautions/Remarks
Writing the address:	
RETURN GO	
Press the <u>RETURN</u> key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed.	
GO -> WRITE CAN -> CANCEL	
Press the <u>GO</u> key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	
Notes	

				Drawing No.
Mode Test mode	Function	Teaching (address teachi	ng)	5-10
Absolute 4-Axis Linear Interpolation				
Message		Key Operation		
1 - 2 1 4 7 4 8 3 6 4 2 - 2 1 4 7 4 8 3 6 4 1 1 - 2 1 4 7 4 8 3 6 4 Axis No. display: Axis No. v designat lighted.	vhere JOG is ed is high-	AXIS NO. MDI OVERRIDE JOG- RETURN GI	1 RETURN 3 2 RETURN 1 RETURN 1 RETURN	IN GO
Operation Proced	Precautions/Ren	narks		
When the program's servo instruction of this is indicated by display of "ABS-4", bers designated for the program is displayed the control of the program is displayed to the program is displayed to the program is displayed to the program is displayed to the axis. The axis where a JOG operation is on the axis number the axis number pressing the RETURN key. The axis of the axis number range designated by is changed, that axis number will be holder to the program is displayed	The program played on the JRN designated is the where a JOG number which the program.	content for the axis num- lower lines. changed by pressing the apperation is to occur, then is entered must be within	If an axis number outsidesignated by the prograted, the error message ERROR" will be displayed tom line of the screen number will not be changed.	ram is desig- e "! SETTING ed at the bot- and the axis
Notes				

Mode Test Mode	Function	Teaching (address teaching)	5-10.1
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Absolute 4-Axis Linear Interpolation

Precautions/Remarks Operation Procedure & Explanations When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen). "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the \leftarrow , \rightarrow , \uparrow , \downarrow keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the _ key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key. An address writing confirmation screen like that shown below will then be displayed. GO -> WRITE CAN -> CANCEL Press the GO key to write the changed numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6). Changing the override: OVERRIDE -1 | J | RETURN When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom of the screen. The change procedure is identical to that in test mode JOG operation, except that the system will return to the absolute 4-axis teaching screen when the RETURN key is pressed. Notes

ode Test Mode	Function	Teaching (address teaching)	5-10.2
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Absolute 4-Axis Linear Interpolation

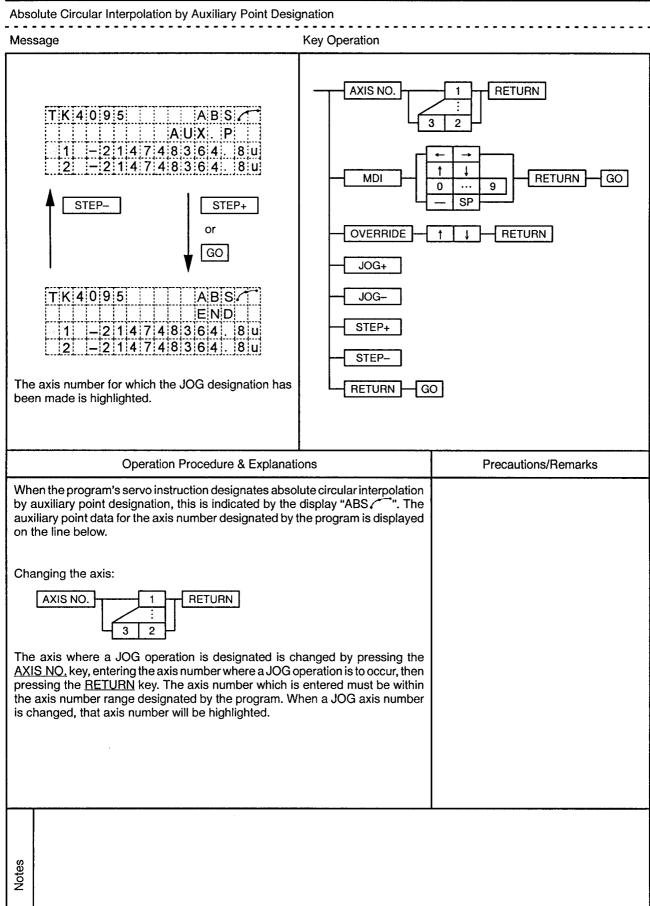
Operation Procedure & Explanations	Precautions/Remarks
When the JOG screen format is displayed, the cursor will be displayed at the	
override position.	
Cursor position At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %.	If the ↑ key is pressed when the over- ride is 100.0 %, the override will be- come 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override
0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	will become 100.0 %. If the <u>CAN</u> key is pressed during an override change, the change will be aborted, and the original value will be adopted.
JOG operation: JOG+ While this key is pressed, JOG operation will occur at the	
designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	
JOG- While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	
When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpalating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	
Notes	

Drawing No.

Mode	Test Mode	Function	Teaching (address teaching)	5-10.3
Absolute 4-Axis Linear Interpolation				

Operation Procedure & Explanations	Precautions/Remarks
Writing the address:	
RETURN GO	
Press the <u>RETURN</u> key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed.	
GO -> WRITE CAN -> CANCEL	
Press the <u>GQ</u> key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	
Screen scrolling:	
For 4-axis interpolation, the data for all axes cannot be displayed on a single screen. In such cases, use the 1, 1 keys to scroll the axis number, etc., 1 line.	
Notes	

Mode	Test mode	Function	Teaching (address teaching)	5-11



Mode	Test Mode	Function	Teaching (address teaching)	5-11.1
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Absolute Circular Interpolation by Auxiliary Point Designation

Operation Procedure & Explanations	Precautions/Remarks
Numeric input:	
<u> </u>	
MDI 1 1 RETURN GO	
0 9 (TILL STATE)	
When the MDI key is pressed, the numeric input mode will be established and he cursor will appear at the right end of the axis value (top of screen).	
E" is displayed to the right of the program No. (top of screen) in order to indicate	
that numeric data editing is in progress. At this time, use the \leftarrow , \rightarrow , \uparrow , \downarrow keys to move the cursor to the numeric value	
which is to be changed, then enter the desired value.	
To change the numeric value's sign, press the <u></u> key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted),	
and a positive value will be changed to a negative value (minus symbol will be	
displayed in front of the value). The <u>SP</u> key can also be used in the same manner to change a negative value to a positive value (a positive value will remain	
unchanged).	
When the numeric input is completed, press the <u>RETURN</u> key. An address writing confirmation screen like that shown below will then be dis-	
played.	
GO -> WRITE	
CAN -> CANCEL	
Press the GO key to write the changed numeric value.	
f the numeric value is written without error, the system will proceed to the end- point designation screen (if the current screen is the auxiliary point designation	
screen) where the same procedure is possible. If the GO key is pressed at the	
end-point designation screen, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist	
n that program, the system will proceed to the program readout screen (5-6).	
Changing the override:	
OVERRIDE 1 ↓ RETURN	
When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen	
display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom	
of the screen.	
8	
Notes	

Mode Test Mode Function Teaching (address teaching)	5-11.2
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Absolute Circular Interpolation by Auxiliary Point Designation

	Operation Pro	ocedure & Explanation	s	Precautions/Remarks
		identical to that at the urn to the original scre	test mode JOG opera- en when the <u>RETURN</u>	
When the JOG so override position.			rill be displayed at the	
	10.0 %	Cursor position		
order. Press the 1 The override table 0.1 % to 100.0 %. 0.1 % 0.2 % 0.4 % 0.8 % After selecting the The JOG speed v [JOG speed] =	_, ↓ keys can b _ to increase the e contains the 1.0 % 10. 2.0 % 20. 4.0 % 40. 8.0 % 80. e desired overric vill then be dete [JOG speed lim	e used to display the ovalue, and the ↓ key values shown below,		If the ↑ key is pressed when the override is 100.0 %, the override will be come 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the <u>CAN</u> key is pressed during ar override change, the change will be aborted, and the original value will be adopted.
JOG operation:				
JOG+	designated ax	is pressed, JOG opera is in the address incre eed. JOG operation st	ase direction, at the	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satis fied, the message "! CAN'T START" will be displayed.
JOG-	designated ax	is pressed, JOG opera is in the address decre eed. JOG operation st	ease direction, at the	во спортаува.
play of the feed p	resent values fo	r the interpolating axe	ue will change to a dis- s. This change is indi- am No. (top of screen).	
Notes				

Drawing No.

Mod	e Test Mode	Function	Teaching (address teaching)	5-11.3

Absolute Circular Interpolation by Auxiliary Point Designation

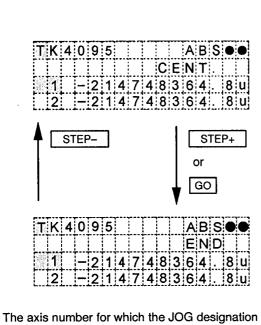
Changing the setting screen: STEP+ Press the SIEP± key at the auxiliary point designation screen to switch to the end-point designation screen. STEP- Press the SIEP=key at the end-point designation screen to return to the auxiliary point designation screen. Writing the address: RETURN GO Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO -> WRITE CAN -> CANCEL Press the GQ key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).		Operation Procedure & Explanations	Precautions/Remarks
screen to switch to the end-point designation screen. Press the STEP- key at the end-point designation screen to return to the auxiliary point designation screen. Writing the address: RETURN GO Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO -> WRITE CAN -> CANCEL Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout	Changing the set	ting screen:	
to return to the auxiliary point designation screen. Writing the address: RETURN GO Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO -> WRITE CAN -> CANCEL Press the GQ key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout	STEP+	Press the <u>STEP+</u> key at the auxiliary point designation screen to switch to the end-point designation screen.	
Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO -> WRITE CAN -> CANCEL Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout	STEP-		
Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO -> WRITE CAN -> CANCEL Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout	Writing the addre	ss:	
Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout	RETURN	GO	
Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout		owing address writing confirmation screen is then displayed.	
If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout			
	If the numeric val next step where t	ue is written without error, a search will be conducted for the eaching is possible, and that step will be displayed. If no such	
			,
Notes	tes		
2	2		

Mode	Test mode	Function	Teaching (address teaching)	5-12
 healut	e Circular Interpolation by Center	nation		

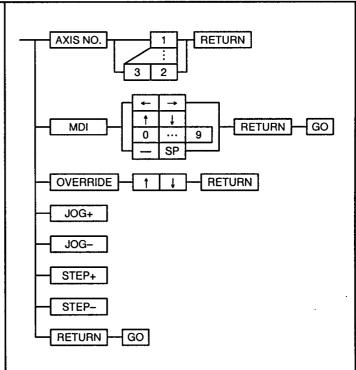
Absolute Circular Interpolation by Center Point Designation



Key Operation



The axis number for which the JOG designation has been made is highlighted.

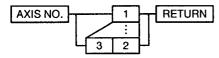


Operation Procedure & Explanations

Precautions/Remarks

When the program's servo instruction designates absolute circular interpolation by center point designation, this is indicated by display of "ABS ." The center point data for the axis number designated by the program is displayed on the line below.

Changing the axis:



The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.

The indication for circular interpolation by absolute center point designation is shown as "ABS●●" above, but the actual on-screen display appears in the following 2 ways: "ABS ,", "ABS .".

Notes

Mode	Test Mode	Function	Teaching (address teaching)	5-12.1	
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Absolute Circular Interpolation by Center Point Designation

	Operation Procedure & Explanations	Precautions/Remarks
Numeric input:		
MDI	← → ↑ ↓ 0 ··· 9 — SP	
the cursor will ap 'E" is displayed to that numeric data At this time, use the which is to be ch To change the nu A negative value and a positive va displayed in front ner to change a r unchanged). When the numeric	y is pressed, the numeric input mode will be established and pear at the right end of the axis value (top of screen). In the right of the program No. (top of screen) in order to indicate a editing is in progress. In e ← , → , ↑ , ↓ keys to move the cursor to the numeric value ranged, then enter the desired value. In eric value's sign, press the – key at the numeric input field. In will be changed to a positive value (minus symbol is deleted), we will be changed to a negative value (minus symbol will be of the value). The SP key can also be used in the same manageative value to a positive value (a positive value will remain a cinput is completed, press the RETURN key. An address writereren like that shown below will then be displayed.	
	GO -> WRITE CAN -> CANCEL	
If the numeric va point designation screen) where the end-point design where teaching is	we is written without error, the system will proceed to the end- screen (if the current screen is the center point designation e same procedure is possible. If the <u>GO</u> key is pressed at the ation screen, a search will be conducted for the next step possible, and that step will be displayed. If no such steps exist he system will proceed to the program readout screen (5-6).	
display format, w	,	
of the screen.		

Mode	Test Mode	Function	Teaching (address teaching)	5-12.2

Absolute Circular Interpolation by Center Point Designation

Occurring Breach 2.5 1 11	
Operation Procedure & Explanations	Precautions/Remarks
The override change procedure is identical to that at the test mode JOG operation, except that the system will return to the original screen when the <u>RETURN</u> key is pressed.	
When the JOG screen format is displayed, the cursor will be displayed at the override position.	
10. 0 % Cursor position	
At this time, the \uparrow , \downarrow keys can be used to display the override table values in order. Press the \uparrow to increase the value, and the \downarrow key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 %	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %.
0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	If the <u>CAN</u> key is pressed during an override change, the change will be aborted, and the original value will be
After selecting the desired override value, press the <u>RETURN</u> key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	adopted.
JOG operation:	
JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will
While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	be displayed.
When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolaing axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	
Notes	
Z	

Drawing No.

Mode Test Mode Function Teaching (address teaching)	5-12.3
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Absolute Circular Interpolation by Center Point Designation

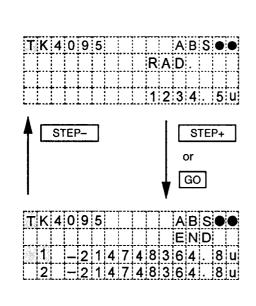
Operation Procedure & E	xplanations	Precautions/Remarks
Changing the setting screen:		
	the center point designation designation designation screen.	
STEP- Press the <u>STEP-</u> key at the to return to the center point	end-point designation screen t designation screen.	
Writing the address:		
RETURN GO		
Press the <u>RETURN</u> key to write the currently program. The following address writing confirm		
GO -> WRITE CAN -> CANCEL		
Press the <u>GO</u> key to write the numeric value. If the numeric value is written without error, a next step where teaching is possible, and that steps exist in that program, the system will p screen (5-6).	step will be displayed. If no such	
		-
Notes		

Mode Test mode	Function	Teaching (address teaching)	5-13
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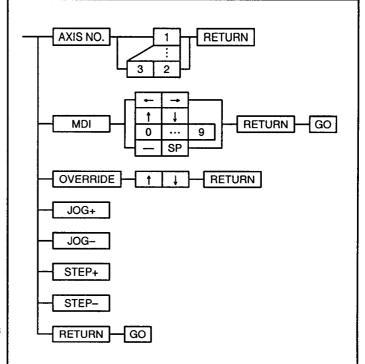
Circular Interpolation by Radius Designation



Key Operation



The axis number for which the JOG designation has been made is highlighted.

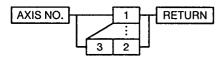


Operation Procedure & Explanations

Precautions/Remarks

When the program's servo instruction designates absolute circular interpolation by radius designation, this is indicated by the display "ABS•." The radius data designated by the program is displayed on the line below, and cannot be changed.

Changing the axis:



The axis where a JOG operation is designated is changed by pressing the <u>AXIS NO</u>, key, entering the axis number where a JOG operation is to occur, then pressing the <u>RETURN</u> key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.

The indication for circular interpolation by radius designation is shown as "ABS●●" above, but the actual on-screen display appears in the following 4 ways: "ABS ◯ ", "ABS ◯ ", "ABS ◯ ".

Notes

Mode Test Mode Function Teaching (address teaching) 5-13.1
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Circular Interpolation by Radius Designation

Operation Procedure & Explanations Precautions/Remarks Numeric input: MDI RETURN SP When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen). "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the \leftarrow , \rightarrow , \uparrow , \downarrow keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the <u>-</u> key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key. An address writing confirmation screen like that shown below will then be displayed. GO -> WRITE CAN -> CANCEL Press the GO key to write the changed numeric value. If the numeric value is written without error, the system will proceed to the endpoint designation screen (if the current screen is the center point designation screen) where the same procedure is possible. If the GO key is pressed at the end-point designation screen, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6). Changing the override: OVERRIDE RETURN When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom of the screen. Notes

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	Mode	Test Mode	Function	Teaching (address teaching)	5-13.2

Circular Interpolation by Radius Designation

Operation Procedure & Explanations	Precautions/Remarks		
The override change procedure is identical to that in test mode JOG operation, except that the system will return to the original screen when the <u>RETURN</u> key is pressed.			
When the JOG screen format is displayed, the cursor will be displayed at the override position.			
10. 0 % Cursor position			
At this time, the \uparrow , \downarrow keys can be used to display the override table values in order. Press the \uparrow to increase the value, and the \downarrow key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %.	If the ↑ key is pressed when the over ride is 100.0 %, the override will be come 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override		
0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 %	will become 100.0 %. If the <u>CAN</u> key is pressed during an override change, the change will be		
0.8 % 8.0 % 80.0 % After selecting the desired override value, press the <u>RETURN</u> key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	aborted, and the original value will be adopted.		
JOG operation:			
JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will		
While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	be displayed.		
When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).			
Notes			

Drawing No.

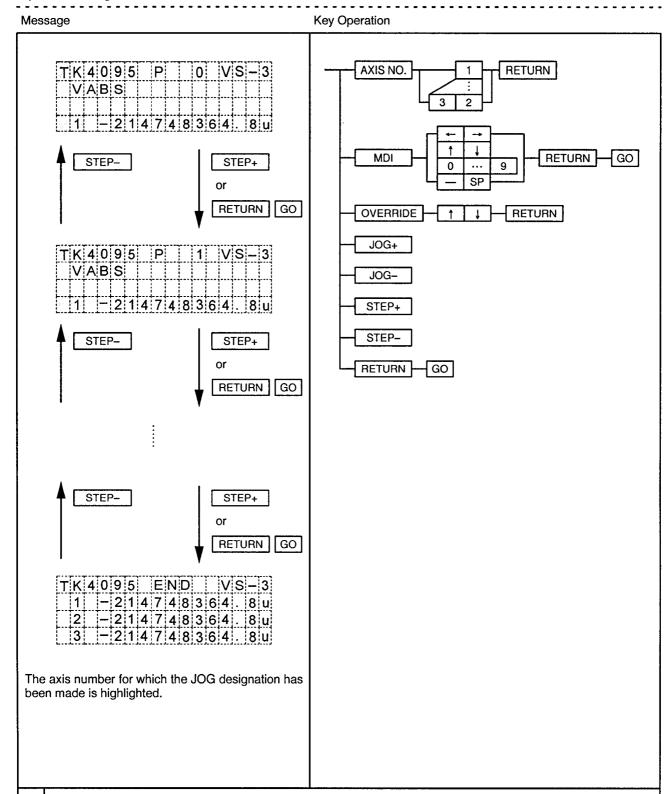
Mode	Test Mode	Function	Teaching (address teaching)	5-13.3

Circular Interpolation by Radius Designation

Operation Procedure & Explanations	Precautions/Remarks
Changing the setting screen:	
STEP+ Press the <u>STEP+</u> key to switch to the next step screen.	
STEP- Press the <u>STEP-</u> key to return to the previous step screen.	
Writing the address:	
RETURN GO	
Press the <u>RETURN</u> key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed.	
GO -> WRITE CAN -> CANCEL	
Press the <u>GO</u> key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	
Notes	
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Mode Test mode Function Teaching (address teaching) 5-14		Function	Teaching (address teaching)	
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Speed Switching Control



The first item to be displayed is the first ABS related instruction which appears in the program. Point numbers are assigned in sequence to program steps with addresses, beginning from point "0" (at initial step). Although INC related instructions can be displayed using the <u>STEP+</u> and <u>STEP-</u> keys, the teaching function cannot be used with respect to these instructions.

Precautions/Remarks

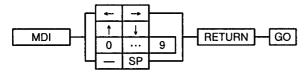
Mode	Test Mode	Function	Teaching (address teaching)	5-14.1

Speed Switching Control

Operation Procedure & Explanations Changing the axis: AXIS NO. 1 RETURN

The axis where a JOG operation is designated is changed by pressing the <u>AXIS NO.</u> key, entering the axis number where a JOG operation is to occur, then pressing the <u>RETURN</u> key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.

Numeric input:



When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen).

"E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress.

At this time, use the \leftarrow , \rightarrow , \uparrow , \downarrow keys to move the cursor to the numeric value which is to be changed, then enter the desired value.

To change the numeric value's sign, press the $\underline{\ }$ key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The \underline{SP} key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged).

When the numeric input is completed, press the <u>RETURN</u> key. An address writing confirmation screen like that shown below will then be displayed.

GO -> WRITE CAN -> CANCEL

Press the GO key to write the changed numeric value.

If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).

Notes

Mode	Test Mode	Function	Teaching (address teaching)	5-14.2
Speed 9	Switching Control			

Speed Switching Control

Operation Procedure & Explanations	Precautions/Remarks
Changing the override:	
OVERRIDE ↑ ↓ RETURN	
When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom of the screen.	
The override change procedure is identical to that in test mode JOG operation, except that the system will return to the original screen when the <u>RETURN</u> key is pressed.	
When the JOG screen format is displayed, the cursor will be displayed at the override position.	
10. 0 % Cursor position	
At this time, the \uparrow , \downarrow keys can be used to display the override table values in order. Press the \uparrow to increase the value, and the \downarrow key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %.	If the ↑ key is pressed when the over- ride is 100.0 %, the override will be- come 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override
0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	If the <u>CAN</u> key is pressed during an override change, the change will be aborted and the original value will be
	override change, the change will be aborted, and the original value will be adopted.
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Notes	

Mode	Test Mode	Function	Teaching (address teaching)	5-14.3
Wode	Test Mode	1 dilotion	reaching (address teaching)	3-14.0

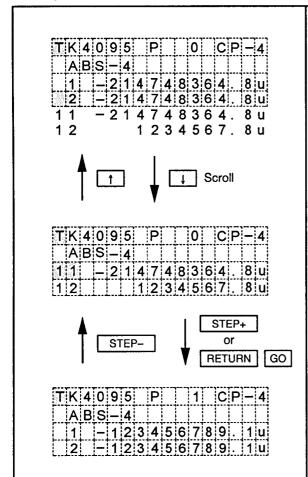
Speed Switching Control

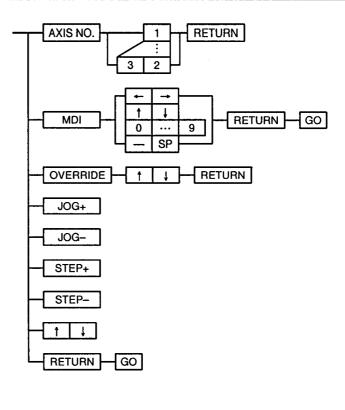
designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is checked. If the conditions are not sat		Operation Procedure & Explanations	Precautions/Remarks
designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. JOG— While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen). Changing the setting screen: STEP+ Press the STEP± key to switch to the next step screen. Writing the address: RETURN GO Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO > WRITE CAN > CANCEL Press the GQ key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	JOG operation:		
While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen). Changing the setting screen: STEP+ Press the STEP+ key to switch to the next step screen. STEP- Press the STEP- key to return to the previous step screen. Writing the address: RETURN — GO Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO -> WRITE CAN -> CANCEL Press the GQ key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	JOG+	designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will
play of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen). Changing the setting screen: STEP+ Press the STEP+ key to switch to the next step screen. STEP- Press the STEP- key to return to the previous step screen. Writing the address: RETURN GO Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO -> WRITE CAN -> CANCEL Press the QO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	JOG-	designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is	be displayed.
Press the STEP+ key to switch to the next step screen. STEP- Press the STEP- key to return to the previous step screen. Writing the address: RETURN GO Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO ->WRITE CAN -> CANCEL Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	play of the feed p	resent values for the interpolating axes. This change is indi-	
Writing the address: RETURN GO Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO -> WRITE CAN -> CANCEL Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	Changing the set	ting screen:	
Writing the address: RETURN — GO Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO -> WRITE CAN -> CANCEL Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	STEP+	Press the <u>STEP+</u> key to switch to the next step screen.	
Press the <u>RETURN</u> key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO -> WRITE CAN -> CANCEL Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	STEP-	Press the <u>STEP</u> key to return to the previous step screen.	
Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO -> WRITE CAN -> CANCEL Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	Writing the addre	SS:	
program. The following address writing confirmation screen is then displayed. GO -> WRITE CAN -> CANCEL Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	RETURN	-GO	
Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).			
If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).			
Notes	If the numeric val next step where to steps exist in tha	ue is written without error, a search will be conducted for the eaching is possible, and that step will be displayed. If no such	
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Mode Test mode	Function	Teaching (address teaching)	5-15
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Message

Key Operation





The axis number for which the JOG designation has been made is highlighted.

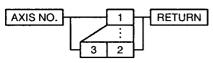
The first item to be displayed is the first ABS related instruction which appears in the program. Point numbers are assigned in sequence to program steps with addresses, beginning from point "0" (at the initial step). Although INC related instructions can be displayed using the <u>STEP+</u> and <u>STEP+</u> keys, the teaching function cannot be used with respect to these instructions.

Mode	Test mode	Function	Teaching (address teaching)	5-15.1
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Operation Procedure & Explanations

Precautions/Remarks

Changing the axis:

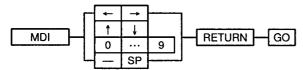


The axis where a JOG operation is designated is changed by pressing the <u>AXIS NO</u>, key, entering the axis number where a JOG operation is to occur, then pressing the <u>RETURN</u> key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.

If an axis number outside the range designated by the program is designated, the error message "! SETTING ERROR" will be displayed and the axis number will not be changed.

Numeric input:

Notes



When the <u>MDI</u> key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen).

"E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress.

At this time, use the \leftarrow , \rightarrow , \uparrow , \downarrow keys to move the cursor to the numeric value which is to be changed, then enter the desired value.

To change the numeric value's sign, press the <u>key</u> at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The <u>SP</u> key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged).

When the numeric input is completed, press the <u>RETURN</u> key. An address writing confirmation screen like that shown below will then be displayed.

GO -> WRITE CAN-> CANCEL

Press the GO key to write the changed numeric value.

If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).

-					
ı	Mode	Test mode	Function	Teaching (address teaching)	5-15.2
-					

Operation Procedure & Explanations	Precautions/Remarks
Changing the override:	
OVERRIDE ↑ ↓ RETURN	
When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom of the screen.	
The override change procedure is identical to that in test mode JOG operation, except that the system will return to the original screen when the <u>RETURN</u> key is pressed.	
When the JOG screen format is displayed, the cursor will be displayed at the override position.	
10. 0 % Cursor position	
At this time, the \uparrow , \downarrow keys can be used to display the override table values in order. Press the \uparrow to increase the value, and the \downarrow key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %.	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override
0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	will become 100.0 %. If the <u>CAN</u> key is pressed during an override change, the change will be aborted, and the original value will be
After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	aborted, and the original value will be adopted.
Notes	

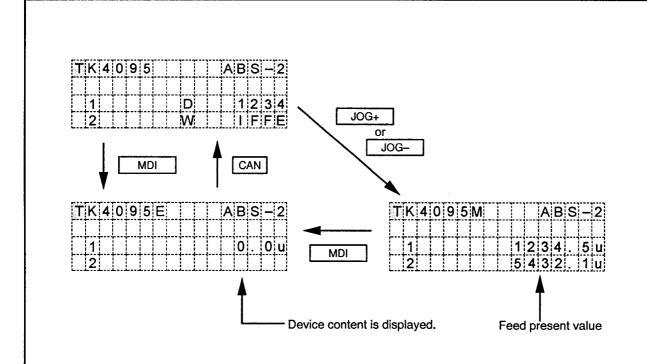
Mode	Test mode	Function	Teaching (address teaching)	5-15.3
111000	Took mode	1 411041011	roading (address toading)	0 .0.0

		Operation Procedure & Explanations	Precautions/Remarks
JOG	operation:		
	JOG+	While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG</u> — key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.
	JOG	While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	be displayed.
play	of the feed pr	tion occurs, the displayed numeric value will change to a dis- resent values for the interpolating axes. This change is indi- nich is displayed to the right of the program No. (top of screen).	
Chan	nging the sett	ing screen:	
[STEP+	Press the STEP+ key to switch to the next step screen.	
	STEP-	Press the <u>STEP</u> key to return to the previous step screen.	
Scree	en Scrolling:		
	1 4	The address displays, etc., for 3 or 4 axes cannot be displayed on a single screen. Use the \uparrow , \downarrow keys for screen scrolling.	The ↑, ↓ keys are disabled when the displayed data is for 2 axes or less. If these keys are pressed at this time, the error message "! MIS OPERATION"
Writin	ng the addres	3S:	will be displayed at the bottom of the screen.
	RETURN	GO	
		RN key to write the currently displayed numeric value to the bwing address writing confirmation screen is then displayed.	
		GO -> WRITE CAN -> CANCEL	
If the next steps	numeric vali step where te	to write the numeric value. ue is written without error, a search will be conducted for the eaching is possible, and that step will be displayed. If no such t program, the system will proceed to the program readout	
	Intermediate ting screen	points can be switched, and address teaching can be executed STEP+ or STEP-, and writing addresses RETURN	
2			

ode Test mode Funct	on Teaching (address teaching)	5-16
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Indirect Address Designation

Message



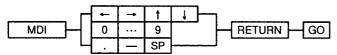
Operation Procedure & Explanations

Precautions/Remarks

At address teaching operations using an indirect address designation format, a designated address is set at the relevant device.

The numeric value designated at the device will remain valid until the CPU is reset or another value is designated.

Numeric input:



When the <u>MDI</u> key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen). When the numeric input is completed, press the <u>RETURN</u> key. An address writing confirmation screen like that shown below will then be displayed.

The device content will be displayed when the <u>MDI</u> is pressed.

GO -> WRITE CAN -> CANCEL

Press the <u>GO</u> key to set the entered numeric value at the relevant device. The system will then return to the device display program.

Notes

N	lode	Test mode	Function	Teaching (address teaching)	5-16.1
			l		<u> </u>

Indirect Address Designation

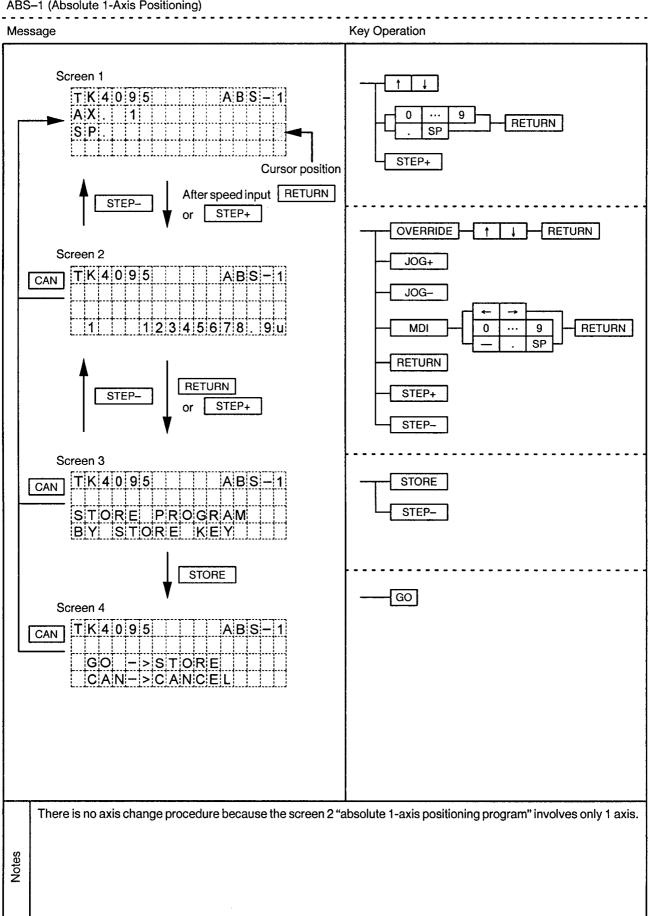
• · • · · · · · · · · · · · · · · · · ·	Operation Procedure & Explanations	Precautions/Remarks
JOG operation:		
JOG+	While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	
JOG-	While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	
play of the feed p	ation occurs, the displayed numeric value will change to a dispresent values for the interpolating axes. This change is indihich is displayed to the right of the program No. (top of screen).	
Writing to the dev	rice: -GO RN key to set the currently displayed numeric value at the de-	When the direct address designation format is being used, the numeric value displayed when the RETURN, GC keys are pressed is written directly to the program. When the indirect address designation format is being used, the numeric value displayed when the RETURN, GC keys are pressed is written to the relevant device.
vice. The followin	g device writing confirmation screen is then displayed. GO -> WRITE CAN -> CANCEL to set the displayed numeric value at the relevant device. The rns to the device display program.	
		Indirect address designation is not possible with the program teach function. This should be done using the address teaching function after creating a program (by program writing).
S		
Notes		

Mode | Test mode Function Teaching (program teaching) 5-17 Registering a Program No. Message **Key Operation** PROGRAM TEACH 9 RETURN CLEAR P:R:0:G: . N:0: Cursor position Operation Procedure & Explanations Precautions/Remarks The program to be registered is designated by using the Q to 9 keys to enter its number. The program number range is 0 to 4095. The effective input digits will be the most recent 4 digits entered. Any input exceeding 4 digits will be invalid. Each time a digit is entered, the previous digit moves one space to the left. 0 9 5 6 To correct an input, press the CLEAR key to delete the input field. The program number designated for registration will be checked to determine if it can be registered. If the number is OK, the system will proceed to the servo instruction definition screen. - - - ▶ Go to 5-18 If the designated program number already exists, the next screen will be displayed together with the message "PROG. ALR. STORED". To replace the existing program number with the newly designated one, press the GO key. GO -> REWRITE CAN -> CANCEL If the <u>CAN</u> key is pressed during the program teaching function in order to return to the servo instruction selection screen, and if the program which was being created has been completed, a confirmation message will be displayed asking if the created program should be discarded. Notes

Drawing No.

					Drawing No.
Мо	de Test mode	Function	Teaching (program teachi	ng)	5-18
Sen	Servo Instruction Definition				
Mes	Message Key Operation				
	T K 4 0 9 5 # A B S - 1 A B S - 2 A B S - 3 Display	scrolling is poss	sible.	↑ RETUR	N
	Operation Proce	edure & Explana	tions	Precautions/Rema	arks
inst nate Wh inst	ignate the servo instruction for fructions can be viewed by scrollied by pressing the RETURN keyen scrolling, a "#" mark is displayer uction. list of servo instructions is show ABS-1 ABS-2 ABS-3 ABS-4 ABS ABS ABS ABS C A	ng. The desired at that instruction to the left of the	servo instruction is desig- on's position.		
Notes					

				Drawing No.
Mode	Test mode	Function	Teaching (program teaching)	5-19
ABS-1 (Absolute 1-Axis Positioning)				
Message			Key Operation	



Mode	Test mode	Function	Teaching (program teaching)	5-19.1

ABS-1 (Absolute 1-Axis Positioning)

Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item: Use these keys to switch between the setting items ("axis" and "speed").</screen>	
Axis No. & speed inputs: O 9 RETURN With the cursor located at the desired position, enter the numeric value directly then press the RETURN key to register the setting.	Switching to screen 2 is only possible afterboth the "axis number" and "speed" inputs have been registered.
Switching screens: After confirming the axis number and speed settings, the STEP+ key can be pressed to proceed to screen 2.	When the <u>STEP+</u> key is operative, a return to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP-</u> key.
<screen 2=""> Changing the override: OVERRIDE</screen>	
When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The override change procedure is identical to that in test mode JOG operation except that the system will return to the program teaching screen when the <u>RETURN</u> key is pressed.	,
When the JOG screen format is displayed, the cursor will be displayed at the override position.	
10.	
At this time, the \uparrow , \downarrow keys can be used to display the override table values in order. Press the \uparrow to increase the value, and the \downarrow key to decrease the value. The override table contains the values shown below, enabling selection 0.1 % to 100.0 %.	ride is 100.0 %, the override will be-
0.1 % 1.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	If the <u>CAN</u> key is pressed during an override change, the change will be aborted, and the original value will be adopted.
Notes	

Mode Test mode Function Teaching (program teaching)	5-19.2
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ABS-1 (Absolute 1-Axis Positioning)

	Operation Procedure & Explanations	Precautions/Remarks
speed will ther [JOG speed	the desired override value, press the <u>RETURN</u> key. The JOG be determined as follows: = [JOG speed limit value] × [override] then return to the original display screen.	
JOG operation	•	
JOG+	While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG</u> - key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will
JOG-	While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	be displayed.
play of the fee	eration occurs, the displayed numeric value will change to a disdipresent values for the interpolating axes. This change is individual to the right of the program No. (top of screen).	
Numeric input:		
MDI	← → 0 ··· 9 RETURN — SP	
the cursor will "E" is displayed that numeric d At this time, us is to be change To change the A negative valuand a positive displayed in froner to change unchanged).	key is pressed, the numeric input mode will be established and appear at the right end of the numeric value field. It to the right of the program No. (top of screen) in order to indicate atta editing is in progress. e the ←, → keys to move the cursor to the numeric value which ed, then enter the desired value. numeric value's sign, press the – key at the numeric input field. We will be changed to a positive value (minus symbol is deleted), value will be changed to a negative value (minus symbol will be ont of the value). The SP key can also be used in the same manana negative value to a positive value (a positive value will remain eric input is completed, press the RETURN key.	
Notes		

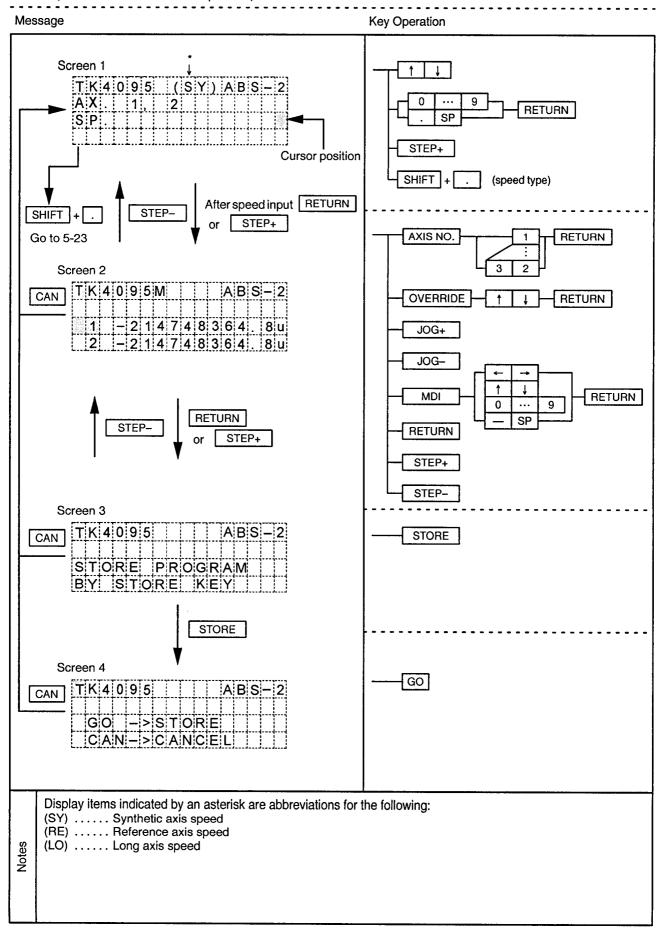
Mode	Test mode	Function	Teaching (program teaching)	5-19.3

ABS-1 (Absolute 1-Axis Positioning)

	Operation Procedure & Explanations	Precautions/Remarks
Writing the addre	ess:	
RETURN	The currently displayed numeric value is written to the program.	
Switching screen	is:	
STEP+	Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input screens.	
<screen 3="" and="" s<="" td=""><td>creen 4></td><td></td></screen>	creen 4>	
STORE	-GO	
be displayed for p	address writing has been executed at screen 2, screen 3 will brogram registration. To switch from screen 3 to screen 4, press At screen 4, press the GO key to execute program writing.	
Switching screen	s:	
STEP-	To switch from screen 3 to screen 2, press the <u>STEP</u> key.	
		
Notes		
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Mode	Test mode	Function	Teaching (program teaching)	5-20

ABS-2 (Absolute 2-Axis Linear Interpolation)



Mode	Test mode	Function	Teaching (program teaching)	5-20.1

Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item: Use these keys to switch between the setting items ("axis" and "speed").</screen>	
Axis No. & speed inputs: 0 9 RETURN With the cursor located at the desired position, enter the numeric value directly, then press the RETURN key to register the setting. Each time the RETURN key is pressed, the input item will change as follows: Axis 1 → Axis 2 → Speed.	Switching to screen 2 is only possible afterboth the "axis number" and "speed" inputs have been registered.
Selecting and setting the speed type: SHIFT + The speed type is selected and designated. Switching screens: STEP+ After confirming that all axis number and speed settings have been registered, the STEP+ key can be pressed to proceed to screen 2.	For details regarding the display screen and operation procedure after keying in SHIFT + . , see 5-23. When the STEP+ key is operative, a return to screen 1 can be executed by pressing the CAN or STEP- key.
Changing the axis: AXIS NO. The axis where a JOG operation is designated is changed by pressing the AXIS NO, key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program.	
When a JOG axis number is changed, that axis number will be highlighted. Changing the override: OVERRIDE THE RETURN When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed.	
When the reference axis has been designated at screen 1, the message on the line beneath the speed display, and a reference axis input status with the speed display.	

Mode Test mode	Function	Teaching (program teaching)	5-20.2
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Operation Procedure & Explanations	Precautions/Remarks						
	rrecautions/nemarks						
When the JOG screen format is displayed, the cursor will be displayed at the override position.							
10. 🖸 %							
Cursor position	.						
At this time, the \uparrow , \downarrow keys can be used to display the override table values in order. Press the \uparrow to increase the value, and the \downarrow key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %.	If the 1 key is pressed when the override is 100.0 %, the override will become 0.1 %. If the 1 key is pressed when the override is 0.1 %, the override						
0.1 % 1.0 % 10.0 % 100.0 %	will become 100.0 %.						
0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	If the <u>CAN</u> key is pressed during an override change, the change will be aborted, and the original value will be						
After selecting the desired override value, press the <u>RETURN</u> key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	adopted.						
JOG operation:							
While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.						
While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	be displayed.						
When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indi-						
Notes							

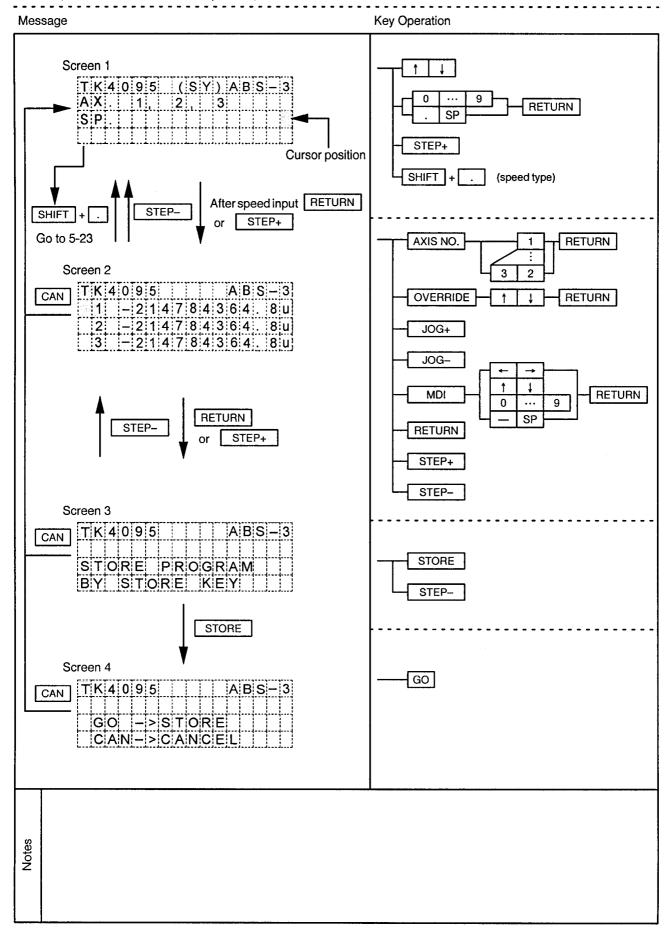
ı					
	Mode	Test mode	Function	Teaching (program teaching)	5-20.3

Operation Procedure & Explanations	Precautions/Remarks
umeric input:	
MDI	
When the MDI key is pressed, the numeric input mode will be established and he cursor will appear at the right end of the numeric value field. E" is displayed to the right of the program No. (top of screen) in order to indicate hat numeric data editing is in progress. At this time, use the — , — , 1 , ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the _ key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key.	
Writing the address:	
The currently displayed numeric value is written to the program.	
Switching screens:	
STEP+ Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input screens.	
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	Mode	Test mode	Function	Teaching (program teaching)	5-20.4

Operation Procedure & Explanations	Precautions/Remarks
<screen 3="" 4="" and="" screen=""> Program Store: STORE GO</screen>	
When error-free address writing has been executed at screen 2, screen 3 will be displayed for program registration. To switch from screen 3 to screen 4, press the <u>STORE</u> key. At screen 4, press the <u>GO</u> key to execute program writing.	
Switching screens:	
STEP- To switch from screen 3 to screen 2, press the <u>STEP-</u> key.	
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Mode	Test mode	Function	Teaching (program teaching)	5-21
			3 (1 - 3	



Mode Test mode Function Teaching (program teaching) 5-21.1		Mode Te	est mode	Function	Teaching (program teaching)	5-21.1
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Operation Precedure 9 Evalenations	Precautions/Remarks
Operation Procedure & Explanations	Precautions/Hemarks
<screen 1=""> Selecting the setting item:</screen>	
Use these keys to switch between the setting items	
("axis" and "speed").	
Axis No. & speed inputs:	
	Switching to screen 2 is only possible afterboth the "axis number" and "speed"
. SP RETURN	inputs have been registered.
With the cursor located at the desired position, enter the numeric value directly,	
then press the <u>RETURN</u> key to register the setting. Each time the <u>RETURN</u> key is pressed, the input item will change as follows:	
Axis 1 \rightarrow Axis 2 \rightarrow Axis 3 \rightarrow Speed.	
Selecting and setting the speed type:	
SHIFT + . The speed type is selected and designated.	For details regarding the display screen and operation procedure after keying in
Switching screens:	SHIFT + . , See 5-23.
STEP+ After confirming that all axis number and speed settings	When the <u>STEP+</u> key is operative, a re-
have been registered, the <u>STEP+</u> key can be pressed to proceed to screen 2.	turn to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP</u> key.
F	, 5 ,
<screen 2=""></screen>	
Changing the axis:	
AXIS NO. 1 RETURN	
$\begin{bmatrix} \frac{\cdot}{3} & \frac{\cdot}{2} \end{bmatrix}$	
The axis where a JOG operation is designated is changed by pressing the	
AXIS NO. key, entering the axis number where a JOG operation is to occur, then	
pressing the <u>RETURN</u> key. The axis number which is entered must be within the axis number range designated by the program.	
When a JOG axis number is changed, that axis number will be highlighted.	
Changing the override:	
OVERRIDE ↑ ↓ RETURN	·
When the <u>OVERRIDE</u> key is pressed, the screen will change to the	
JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines.	
The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the	
RETURN key is pressed.	,
Notes	
1	

Mode Test mode Function Teaching (program teaching) 5-21.2	Mode Test mode	Function	Teaching (program teaching)	5-21.2
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When the J/GS screen format is displayed, the cursor will be displayed at the override position. At this time, the 1, ½ keys can be used to display the override table values in order. Press the 1 to increase the value, and the ½ key to decrease the value. In the cursor will be offered. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 10.1 % 10.0 % 10.0 % 10.0 % 10.0 % 0.2 % 2.0 % 20.0 % 0.4 % 40.0 % 0.4 % 40.0 % 0.4 % 40.0 % 0.4 % 50.0 % 80.0			Operation Procedure & Explanations	Precautions/Remarks
At this time, the 1. 1. keys can be used to display the override table values in order. Press the 1. to increase the value, and the 1. key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 1.0 % 1.0 % 10.0 % 10.0 % 10.0 % 10.0 % 0.8 % 8.0 % 80.0 % 100.0 % 0.8 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen. JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. When IDG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	14/1:	Ab c 100		1 reading the filates
At this time, the 1, 1 keys can be used to display the override table values in order. Press the 1 to increase the value, and the 1 key to decrease the value. The override table contains the values shown below, enabling selection of 0.1% to 10.0%. 0.1% to 10.0% 1			reen format is displayed, the cursor will be displayed at the	
At this time, the 1, keys can be used to display the override table values in order. Press the 1 to increase the value, and the 1 key to decrease the value. The override table contains the values shown below, enabling selection of 0.1% to 10.0 %. 1.1% 1.0% 1.0.0% 10.0.0% 2.2% 2.0% 20.0% 2.4% 4.0% 40.0% 2.8% 8.0.0% 80.0% After selecting the desired override value, press the BETURN key. The JOG speed limit value) × (override). The system will then return to the original display screen. JOG operation: JOG- While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed, JOG operation stops when this key is released. JOG- While this key is pressed, JOG operation will occur at the designated axis in the address lorease direction, at the calculated speed, JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).		•	10. 🖸 %	
order. Press the 1 to increase the value, and the 1 key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % If 10.0 % 10.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %			Cursor position	
0.1 % 1.0 % 10.0 % 10.0 % 10.0 % 10.0 % 10.0 % 10.0 % 10.0 % 2.0 % 20.0 % 40.0 % 40.0 % 8.0 % 80.0 % 80.0 % 80.0 % 80.0 % 80.0 % 80.0 % 80.0 % 80.0 % 80.0 % 10.0 G speed will then be determined as follows: [JOG speed] = [JJOG speed] imit value] × [toverride] The system will then return to the original display screen. JOG operation: JOG+ While this key is pressed, JOG operation will occur at the calculated speed. JOG operation stops when this key is released. JOG- While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation cocurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	orde The	er. Press the <u>1</u> override tabl	to increase the value, and the $\frac{1}{2}$ key to decrease the value. e contains the values shown below, enabling selection of	ride is 100.0 %, the override will become 0.1 %. If the \downarrow key is pressed when the override is 0.1 %, the override
0.4 % 4.0 % 40.0 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen. JOG operation: JOG+				will become 100.0 %.
After selecting the desired override value, press the BETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen. JOG operation: While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	1			
After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen. JOG operation: While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).				
While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	The [J	JOG speed w OG speed] =	vill then be determined as follows: [JOG speed limit value] × [override]	
designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	JOG	Goperation:		
While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).		JOG+	designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is	pressed, the START conditions will be checked. If the conditions are not satis- fied, the message "! CAN'T START" will
play of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).		JOG-	designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is	be displayed.
Notes .	play	of the feed p	resent values for the interpolating axes. This change is indi-	
Notes				
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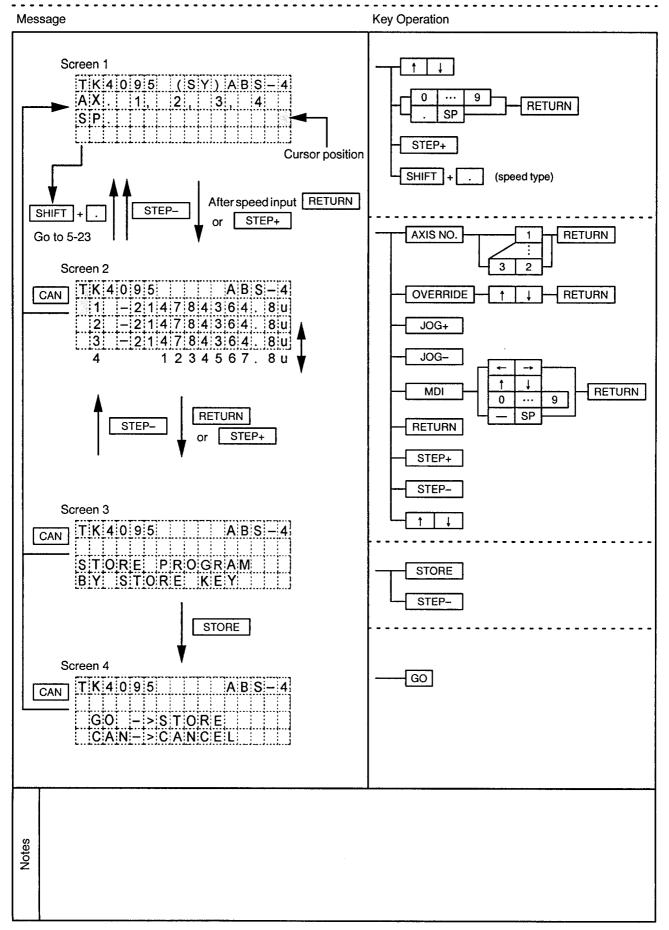
Mode	Test mode	Function	Teaching (program teaching)	5-21.3
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	Operation Procedure & Explanations	Precautions/Remarks
Numeric input:		
MDI —	← → ↑ ↓ 0 ··· 9 — SP	
the cursor will ap 'E" is displayed to that numeric data At this time, use the which is to be change the nu A negative value and a positive value are to change a nunchanged).	y is pressed, the numeric input mode will be established and bear at the right end of the numeric value field. The right of the program No. (top of screen) in order to indicate rediting is in progress. The \leftarrow , \rightarrow , \downarrow keys to move the cursor to the numeric value ranged, then enter the desired value. The remaining respective value's sign, press the \rightarrow key at the numeric input field. Will be changed to a positive value (minus symbol is deleted), we will be changed to a negative value (minus symbol will be of the value). The \rightarrow key can also be used in the same manegative value to a positive value (a positive value will remain to input is completed, press the \rightarrow RETURN key.	
Writing the addre	ss:	
RETURN	The currently displayed numeric value is written to the program.	
STEP+ STEP-	Use the STEP+ and STEP- keys to switch between input screens.	
Notes	· .	

Mode	Test mode	Function	Teaching (program teaching)	5-21.4

Operation Procedure & Explanations Screen 3 and Screen 4> Program Store: STORE GO When error-free address writing has been executed at screen 2, screen 3 will be displayed for program registration. To switch from screen 3 to screen 4, press the STORE key. At screen 4, press the GO key to execute program writing. Switching screens: STEP— To switch from screen 3 to screen 2, press the STEP—key.		
Program Store: STORE—GO When error-free address writing has been executed at screen 2, screen 3 will be displayed for program registration. To switch from screen 3 to screen 4, press the STORE key. At screen 4, press the GO key to execute program writing. Switching screens: STEP— To switch from screen 3 to screen 2, press the STEP—key.	Operation Procedure & Explanations	Precautions/Remarks
When error-free address writing has been executed at screen 2, screen 3 will be displayed for program registration. To switch from screen 3 to screen 4, press the STORE key. At screen 4, press the SQ key to execute program writing. Switching screens: STEP— To switch from screen 3 to screen 2, press the STEP—key.		
be displayed for program registration. To switch from screen 3 to screen 4, press the STORE key. At screen 4, press the GQ key to execute program writing. Switching screens: STEP— To switch from screen 3 to screen 2, press the STEP—key.	STORE GO	
To switch from screen 3 to screen 2, press the STEP-key.	be displayed for program registration. To switch from screen 3 to screen 4, press	
	Switching screens:	
Notes () () () () () () () () () (STEP— To switch from screen 3 to screen 2, press the <u>STEP</u> –key.	
Notes		
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Mode	Test mode	Function	Teaching (program teaching)	5-22



Mode	Test mode	Function	Teaching (program teaching)	5-22.1

Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item: Use these keys to switch between the setting items ("axis" and "speed").</screen>	
Axis No. & speed inputs: 0 9 RETURN With the cursor located at the desired position, enter the numeric value directly, then press the RETURN key to register the setting. Each time the RETURN key is pressed, the input item will change as follows: Axis 1 → Axis 2 → Axis 3 → Axis 4 → Speed.	Switching to screen 2 is only possible afterboth the "axis number" and "speed" inputs have been registered.
Selecting and setting the speed type: SHIFT + . The speed type is selected and designated. Switching screens: After confirming that all axis number and speed settings have been registered, the STEP+ key can be pressed to proceed to screen 2.	For details regarding the display screen and operation procedure after keying in SHIFT +, See 5-24. When the STEP+ key is operative, a return to screen 1 can be executed by pressing the CAN or STEP- key.
Screen scrolling For 4 axes interpolation, the data for all axes cannot be displayed on a single screen. In such cases, use the	
Changing the override: OVERRIDE RETURN When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd	
and 3rd lines. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed.	
Notes	

Mod	de Test mode	Function	Teaching (program teaching)	5-22.2

If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the <u>CAN</u> key is pressed during an override change, the change will be
ride is 100.0 %, the override will become 0.1 %. If the key is pressed when the override is 0.1 %, the override will become 100.0 %. If the <u>CAN</u> key is pressed during an override change, the change will be
aborted, and the original value will be adopted.
When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.

Mode	Test mode	Function	Teaching (program teaching)	5-22.3
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	Operation Procedure & Explanations	Precautions/Remarks
umeric input:		
MDI	↑ ↓	
e cursor will app is displayed to at numeric data this time, use the hich is to be cha o change the nur negative value value value and a positive value splayed in front of er to change a ne nchanged).	r is pressed, the numeric input mode will be established and ear at the right end of the numeric value field. The right of the program No. (top of screen) in order to indicate editing is in progress. e ← , → , ↑ , ↓ keys to move the cursor to the numeric value nged, then enter the desired value. neric value's sign, press the _ key at the numeric input field. Fill be changed to a positive value (minus symbol is deleted), will be changed to a negative value (minus symbol will be fithe value). The SP key can also be used in the same managative value to a positive value (a positive value will remain tinput is completed, press the RETURN key.	
riting the addres	s:	
RETURN	The currently displayed numeric value is written to the program.	
STEP+ STEP-	Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input screens.	

Mode	Test mode	Function	Teaching (program teaching)	5-22.4
1				

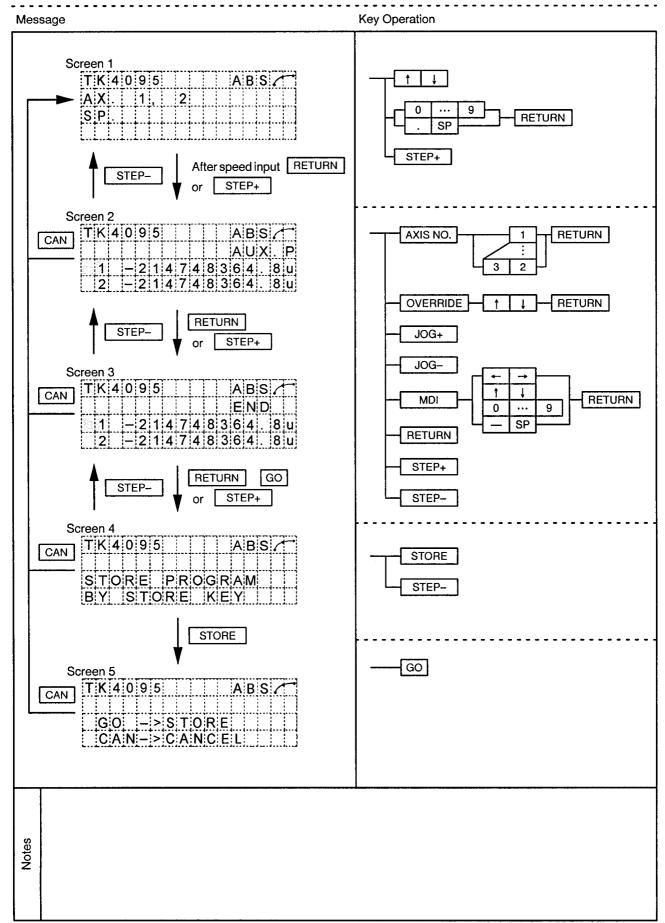
Operation Procedure & Explanations Precautions/Remarks	
<screen 3="" 4="" and="" screen=""></screen>	
Program Store:	:
STORE GO	
When error-free address writing has been executed at screen 2, screen 3 will be displayed for program registration. To switch from screen 3 to screen 4, press the <u>STORE</u> key. At screen 4, press the <u>GO</u> key to execute program writing.	
Switching screens:	
STEP- To switch from screen 3 to screen 2, press the <u>STEP-</u> key.	
Notes	

Mode Test mode Function Teaching (program teaching) 5-23		1	7	T	T
	Mode	Test mode	Function	Teaching (program teaching)	

Speed Type Selection Screen

Operation Procedure & Explanations	Precautions/Remarks
T SPEED CLAS. SYNTHET I C AX. SP #LONG AX. SP REFERENCE AX. SP RETURN Refer to pages 5-20, 5-21, 5-22 screen 2 Selecting the speed type:	- RETURN
Use the 1 , ↓ keys to move the "#" mark to the desired speed type position, then press the <u>RETURN</u> key to register the selection and proceed to page 5-20, 5-21, 5-22 screen 2.	
Notes	

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Mode	Test mode	Function	Teaching (program teaching)	5-24



Mode	Test mode	Function	Teaching (program teaching)	5-24.1

Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item:</screen>	
Use these keys to switch between the setting items ("axis" and "speed").	
Axis No. & speed inputs:	Switching to screen 2 is only possible afterboththe "axis number" and "speed"
O 9 RETURN	inputs have been registered.
With the cursor located at the desired position, enter the numeric value directly, then press the <u>RETURN</u> key to register the setting. Each time the <u>RETURN</u> key is pressed, the input item will change as follows: Axis $1 \rightarrow \text{Axis } 2 \rightarrow \text{Speed}$.	
Switching screens:	
STEP+ After confirming that all axis number and speed settings have been registered, the <u>STEP+</u> key can be pressed to proceed to screen 2.	When the <u>STEP+</u> key is operative, a return to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP-</u> key.
<screen 2,="" 3="" screen=""> Changing the axis:</screen>	
AXIS NO. 1 RETURN	
The axis where a JOG operation is designated is changed by pressing the <u>AXIS NO</u> , key, entering the axis number where a JOG operation is to occur, then pressing the <u>RETURN</u> key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.	
Changing the override:	
OVERRIDE	
When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines.	
The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the <u>RETURN</u> key is pressed.	
Notes	
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Mode	Test mode	Function	Teaching (program teaching)	5-24.2
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	On austica Durandi una 8 Frustandi ana	Dunantina /Damada
	Operation Procedure & Explanations	Precautions/Remarks
When the JOG soverride position	creen format is displayed, the cursor will be displayed at the	
	10. 🖸 %	
	Cursor position	
order. Press the The override take 0.1 % to 100.0 %		If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %.
0.1 % 0.2 %	1.0 % 10.0 % 100.0 % 2.0 % 20.0 %	Will Become 100.0 70.
0.2 %	4.0 % 40.0 %	If the <u>CAN</u> key is pressed during an
0.8 %	8.0 % 80.0 %	override change, the change will be aborted, and the original value will be
The JOG speed [JOG speed] =	e desired override value, press the <u>RETURN</u> key. will then be determined as follows: [JOG speed limit value] × [override] hen return to the original display screen.	adopted.
JOG operation:	·	
JOG+	While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.
JOG-	While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	be displayed.
play of the feed	ation occurs, the displayed numeric value will change to a dispresent values for the interpolating axes. This change is individual in the program No. (top of screen).	
Notes	•	

Mode	Test mode	Function	Teaching (program teaching)	5-24.3	

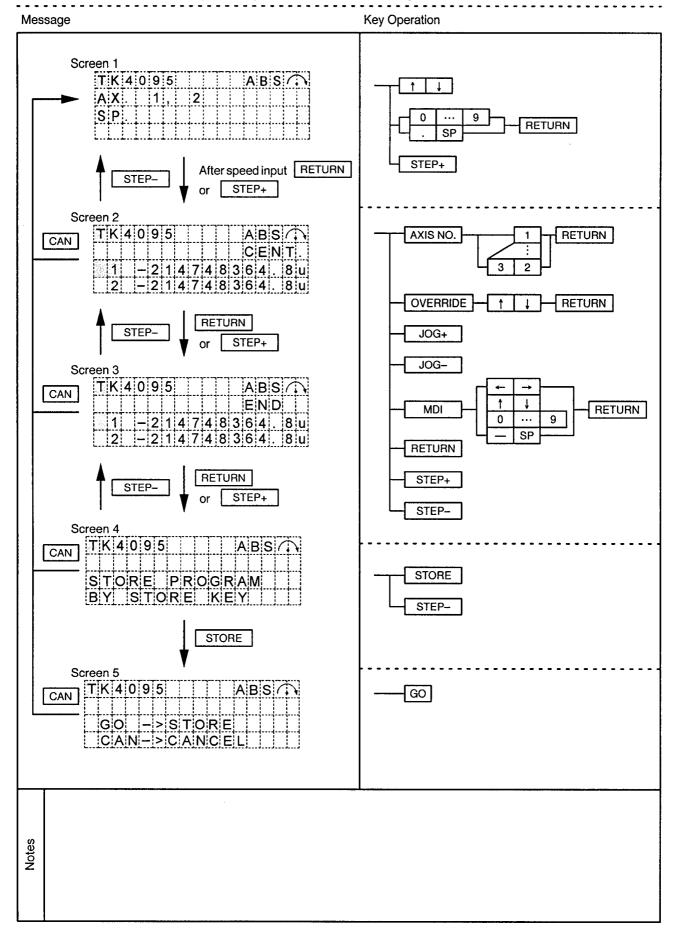
Operation Procedure & Explanations	Precautions/Remarks
Numeric input:	
MDI	
When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the ← , → , ↑ , ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the = key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key.	
Writing the address:	
RETURN The currently displayed numeric value is written to the program.	
Switching screens:	
STEP+ Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input screens.	
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Notes	

Mode Te	est mode	Function	Teaching (program teaching)	5-24.4
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Operation Procedure & Explanations	Precautions/Remarks
<screen 4="" 5="" and="" screen=""></screen>	
Program Store:	
STORE GO	
When error-free address writing has been executed at screen 2, screen 3 will be displayed for program registration. To switch from screen 3 to screen 4, press the <u>STORE</u> key. At screen 4, press the <u>GO</u> key to execute program writing.	
Switching screens:	
STEP— To switch from screen 3 to screen 2, press the <u>STEP</u> – key.	
Notes	

Mode	Test mode	Function	Teaching (program teaching)	5-25
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ABS , ABS (Circular Interpolation by Absolute Center Point Designation)



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Mode	Test mode	Function	Teaching (program teaching)	5-25.1

Operation Procedure & Explanations	Precautions/Remarks
Screen 1> Selecting the setting item: Use these keys to switch between the setting items	
("axis" and "speed").	
Axis No. & speed inputs:	Switching to screen 2 is only possible after both the "axis number" and
. SP RETURN	"speed" inputs have been registered.
With the cursor located at the desired position, enter the numeric value directly, then press the <u>RETURN</u> key to register the setting. Each time the <u>RETURN</u> key is pressed, the input item will change as follows: Axis $1 \rightarrow Axis 2 \rightarrow Speed$.	
Switching screens:	
STEP+ After confirming that all axis number and speed settings have been registered, the <u>STEP+</u> key can be pressed to proceed to screen 2.	When the <u>STEP+</u> key is operative, a return to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP-</u> key.
<screen 2,="" 3="" screen=""> Changing the axis:</screen>	
AXIS NO. 1 RETURN 3 2	:
The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.	
Changing the override:	
OVERRIDE ↑ ↓ RETURN	
When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines.	
The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed.	
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Notes	

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Mode	Test mode	Function	Teaching (program teaching)	5-25.2

	Operation Pr	ocedure & Explanations	Precautions/Remarks
When the JOG override position	١.	displayed, the cursor will be displayed at the	
·	10.🖸 %	Cursor position	
	L	Cursor position	
order. Press the The override ta 0.1 % to 100.0 9 0.1 % 0.2 % 0.4 %	↑, ↓ keys can be to increase the ble contains the %. 1.0 % 10. 2.0 % 20. 4.0 % 40.	the used to display the override table values in a value, and the \(\frac{1}{2}\) key to decrease the value. values shown below, enabling selection of 0 \% 100.0 \% 0 \% 0 \%	If the <u>↑</u> key is pressed when the ove ride is 100.0 %, the override will be come 0.1 %. If the <u>↓</u> key is presse when the override is 0.1 %, the overrid will become 100.0 %. If the <u>CAN</u> key is pressed during a override change, the change will be
0.8 %	8.0 % 80.	0 %	aborted, and the original value will be
The JOG speed [JOG speed]	will then be dete = [JOG speed tim	de value, press the <u>RETURN</u> key. rmined as follows: it value] × [override] original display screen.	adopted.
JOG operation:			
JOG+	designated ax	is pressed, JOG operation will occur at the kis in the address increase direction, at the eed. JOG operation stops when this key is	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satis fied, the message "! CAN'T START" will be displayed.
JOG-	designated ax	is pressed, JOG operation will occur at the is in the address decrease direction, at the eed. JOG operation stops when this key is	be displayed.
play of the feed	present values for	displayed numeric value will change to a dis- or the interpolating axes. This change is indi- to the right of the program No. (top of screen).	
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	Test mode	Function	Teaching (program teaching)	5-25.3	l

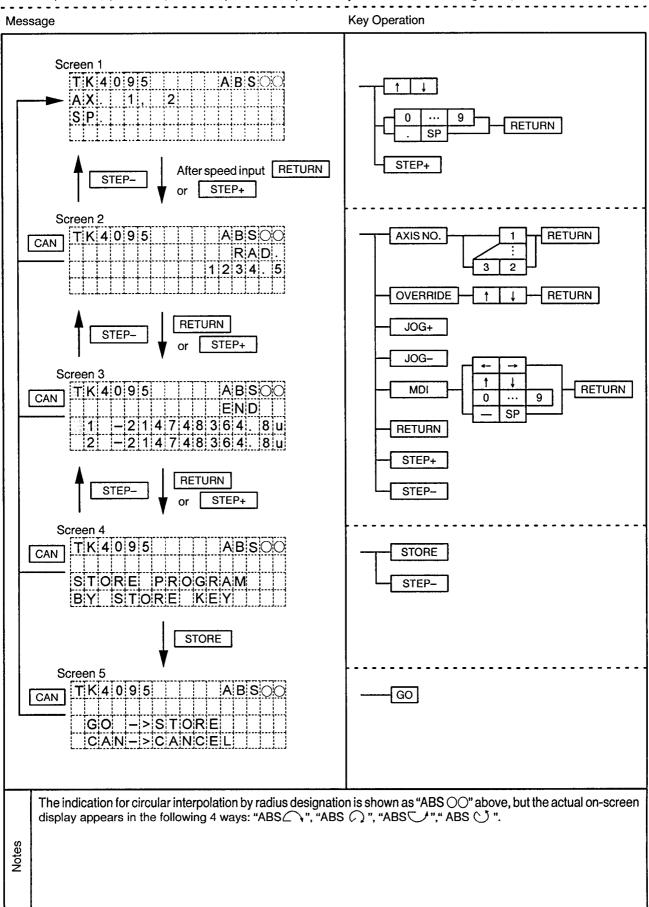
Operation Procedure & Explanations	Precautions/Remarks
Numeric input:	
MDI	
When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. 'E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the —, →, ↑, ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the _ key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key.	
Writing the address:	
RETURN The currently displayed numeric value is written to the program.	
Switching screens:	
STEP+ Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input screens.	
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Mode	Test mode	Function	Teaching (program teaching)	5-25.4

Operation Procedure & Explanations	Precautions/Remarks
<screen 4="" 5="" and="" screen=""> Program Store:</screen>	
STORE GO	
When error-free address writing has been executed at screen 3, screen 4 will be displayed for program registration. To switch from screen 4 to screen 5, press the <u>STORE</u> key. At screen 5, press the <u>GO</u> key to execute program writing.	
Switching screens:	
STEP— To switch from screen 4 to screen 3, press the <u>STEP</u> – key.	
Notes	

Mode	Test mode	Function	Teaching (program teaching)	5-26	l

ABS (, ABS), ABS (, ABS () (Circular Interpolation by Absolute Radius Designation)



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Mode	Test mode	Function	Teaching (program teaching)	5-26.1	

ABS C, ABS C, ABS C, ABS C (Circular Interpolation by Absolute Radius Designation)

Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item:</screen>	
Use these keys to switch between the setting items ("axis" and "speed").	
Axis No. & speed inputs:	Switching to screen 2 is only possible after both the "axis number" and
O 9 RETURN	"speed" inputs have been registered.
With the cursor located at the desired position, enter the numeric value directly, then press the <u>RETURN</u> key to register the setting. Each time the <u>RETURN</u> key is pressed, the input item will change as follows: Axis $1 \rightarrow \text{Axis } 2 \rightarrow \text{Speed}$.	
Switching screens:	
After confirming that all axis number and speed settings have been registered, the <u>STEP+</u> key can be pressed to proceed to screen 2.	When the <u>STEP+</u> key is operative, a return to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP-</u> key.
<screen 2,="" 3="" screen=""> Changing the axis:</screen>	
AXIS NO. 1 RETURN	
The axis where a JOG operation is designated is changed by pressing the <u>AXIS NQ</u> , key, entering the axis number where a JOG operation is to occur, then pressing the <u>RETURN</u> key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.	
Changing the override:	
OVERRIDE ↑ ↓ RETURN	
When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines.	
The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the <u>RETURN</u> key is pressed.	
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Mode	Test mode	Function	Teaching (program teaching)	5-26.2

ABS , ABS , ABS , ABS (Circular Interpolation by Absolute Radius Designation)

	Operation	n Procedure	& Explanations	Precautions/Remarks
When the JOG soverride position		t is displaye	d, the cursor will be displayed	at the
•	_	₫ %		
		Curs	sor position	
order. Press the The override tal 0.1 % to 100.0 %	to increase to the contains of	the value, the values	to display the override table valuand the \(\frac{1}{2}\) key to decrease the shown below, enabling selections	alue. I ride is 100.0 %, the override will be
0.1 % 0.2 %	1.0 % 2.0 %	10.0 % 20.0 %	100.0 %	
0.4 % 0.8 %	4.0 %	40.0 % 80.0 %		If the <u>CAN</u> key is pressed during an override change, the change will be
The JOG speed [JOG speed] =	ne desired ove will then be d [JOG speed	determined : I limit value]		aborted, and the original value will be adopted.
JOG operation:				
While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. When the JOG+ or JOG pressed, the START conditions are fied, the message "! CAN'TS"				the pressed, the START conditions will be
JOG-	designate	d axis in the	sed, JOG operation will occur at address decrease direction, at G operation stops when this ke	the the
play of the feed	present value	es for the in	ed numeric value will change to terpolating axes. This change is ght of the program No. (top of sc	s indi-
Notes				
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Mod	Test mode	Function	Teaching (program teaching)	5-26.3

ABS 🔼, ABS 🔾, ABS 🖰, ABS 🖰 (Circular Interpolation by Absolute Radius Designation)

Operation Procedure & Explanations	Precautions/Remarks
Numeric input:	
MDI ← → ↑ ↑ ↓ RETURN	
When the MDI key is pressed, the numeric input mode will be established and he cursor will appear at the right end of the numeric value field. E' is displayed to the right of the program No. (top of screen) in order to indicate hat numeric data editing is in progress. At this time, use the —, →, , , , , keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the _ key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key.	
Writing the address:	
RETURN The currently displayed numeric value is written to the program.	
Switching screens:	
STEP+ Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input screens.	
STEP-	
σ	
Notes	

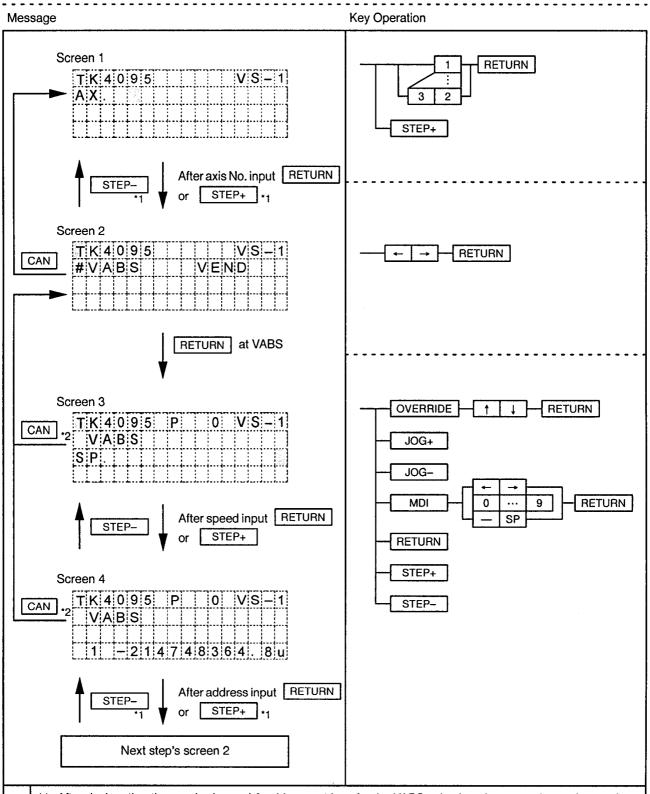
Mode Test mode	Function	Teaching (program teaching)	5-26.4

Operation Procedure & Explanations	Precautions/Remarks
<screen 4="" 5="" and="" screen=""> Program Store:</screen>	
STORE GO	
When error-free address writing has been executed at screen 3, screen 4 will be displayed for program registration. To switch from screen 4 to screen 5, press the <u>STORE</u> key. At screen 5, press the <u>GQ</u> key to execute program writing.	
Switching screens:	
STEP— To switch from screen 4 to screen 3, press the <u>STEP</u> – key.	
Notes	

Mode	Test mode	Function	Teaching (program teaching)	5-27
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VS-1 (Speed Switching Control, 1 Axis)

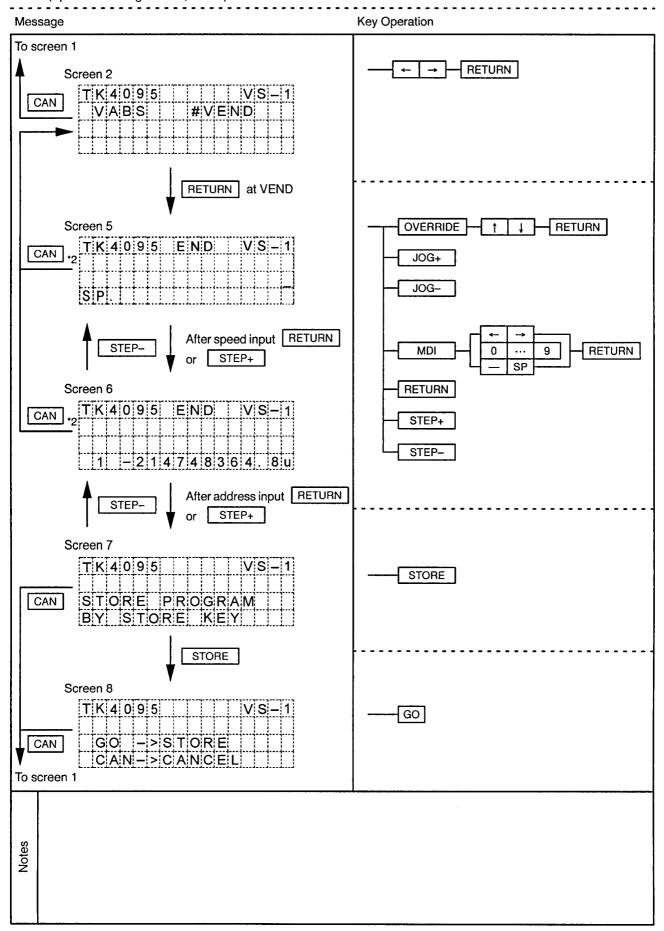
Notes



- *1. After designating the required speed & address settings for the VABS selection, then returning to the previous screen (using the <u>CAN</u> or <u>STEP</u>— key), the following will occur when the <u>STEP</u>+ key is pressed: the servo instruction selection screen (screen 2) will be skipped, and the speed & address setting screens (screen 3, screen 4) will be displayed in page order (P0, P1...).
- *2. If the <u>CAN</u> key is pressed while designating a speed or address setting (screen 3, screen 4) at a given step, the system will return to that step's screen 2.

Mode	Test mode	Function	Teaching (program teaching)	5-27.1	
10.000	1001111040		Traditing (program todoming)	•	

VS-1 (Speed Switching Control, 1 Axis)



Mode	Test mode	Function	Teaching (program teaching)	5-27.2
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VS-1 (Speed Switching Control, 1 Axis)

Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Axis No. Input:</screen>	
1 RETURN	
3 2	
With the cursor located at the desired position, enter the numeric value directly, then press the <u>RETURN</u> key to register the setting.	As this speed change is for 1-axis linear control, only 1 axis can be designated.
Switching screens: After confirming that axis number setting has been registered, the STEP+ key can be pressed to proceed to	Miles the CTCD, begin an easting a se
STEP+ tered, the <u>STEP+</u> key can be pressed to proceed to screen 2.	When the <u>STEP+</u> key is operative, a return to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP-</u> key.
<screen 2=""></screen>	
← → RETURN	
Designate whether the speed switching point setting (VABS) is to be continued or ended (VEND). A "#" mark indicates the currently selected servo instruction.	
Screen 3 is displayed when VABS is selected, and screen 5 is displayed when VEND is selected.	
<screen 3,="" 4,="" 5,="" 6="" screen=""> Changing the override value:</screen>	
OVERRIDE	
When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd	
and 3rd lines. The override change procedure is identical to that in test mode JOG operation,	
except that the system will return to the program teaching screen when the $\underline{\sf RETURN}$ key is pressed.	·
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Mode Test mode Function Teaching (program teaching) 5-27.3	Mode Te	lest mode	Function	Teaching (program teaching)	5-27.3
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Operation Procedure & Explanations	Precautions/Remarks
When the JOG screen format is displayed, the cursor will be displayed a override position.	t the
10.10 %	
Cursor position	
At this time, the ↑, ↓ keys can be used to display the override table value order. Press the ↑ to increase the value, and the ↓ key to decrease the value override table contains the values shown below, enabling selection 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 %	alue. I ride is 100.0 %, the override will be-
0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	If the <u>CAN</u> key is pressed during an override change, the change will be
After selecting the desired override value, press the <u>RETURN</u> key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	aborted, and the original value will be adopted.
JOG operation:	
While this key is pressed, JOG operation will occur at to designated axis in the address increase direction, at to calculated speed. JOG operation stops when this key released.	he pressed, the START conditions will be
While this key is pressed, JOG operation will occur at t designated axis in the address decrease direction, at t calculated speed. JOG operation stops when this key released.	he ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '
When JOG operation occurs, the displayed numeric value will change to a play of the feed present values for the interpolating axes. This change is cated by an "M" which is displayed to the right of the program No. (top of screen	indi-
Notes	

flode Test mode Functi	Teaching (program teaching)	5-27.4
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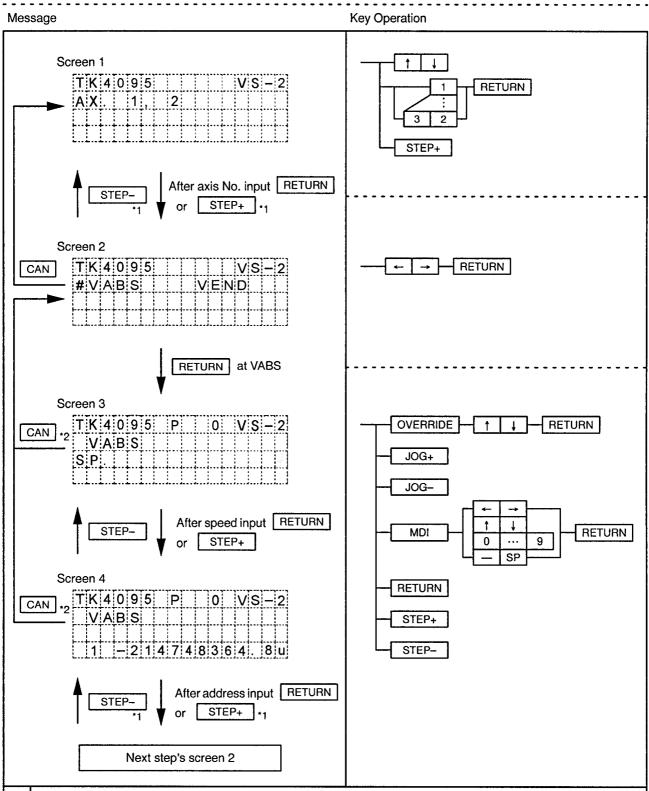
Operation Procedure & Explanations	Precautions/Remarks
Numeric input:	
MDI 0 9 RETURN	
When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the, keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key.	
Writing the address:	
RETURN The speed and address values for the currently displayed point are written to the program.	
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	Mode	Test mode	Function	Teaching (program teaching)	5-27.5

Operation Procedure & Explanations	Precautions/Remarks
Switching screens:	. rosasionoriomanio
STEP+ Use the STEP+ and STEP- keys to switch between input screens. When a speed switching point input has been completed, the system will proceed to the next point without going to screen 2 first.	
<screen 7,="" 8="" screen=""> Program Store:</screen>	
STORE GO	
When error-free end-address writing has been executed at screen 4, screen 5 will be displayed for program registration. To switch from screen 5 to screen 6, press the <u>STORE</u> key. At screen 6, press the <u>GO</u> key to execute program writing.	
Switching screens:	
STEP- To switch from screen 5 to screen 4, press the STEP-key.	
Notes	
 	

Mode	Test mode	Function	Teaching (program teaching)	5-28
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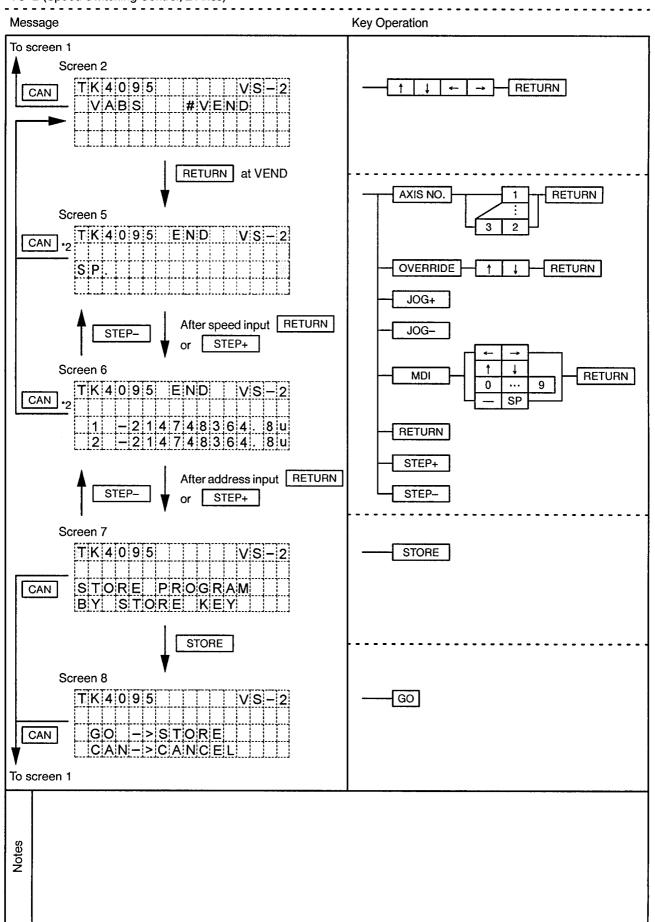
Notes



- *1. After designating the required speed & address settings for the VABS selection, then returning to the previous screen (using the <u>CAN</u> or <u>STEP</u>— key), the following will occur when the <u>STEP</u>+ key is pressed: the servo instruction selection screen (screen 2) will be skipped, and the speed & address setting screens (screen 3, screen 4) will be displayed in page order (P0, P1...).
- *2. If the <u>CAN</u> key is pressed while designating a speed or address setting (screen 3, screen 4) at a given step, the system will return to that step's screen 2.

Mode Test mode F	Function	Teaching (program teaching)	5-28.1

VS-2 (Speed Switching Control, 2 Axes)



	Mode	Test mode	Function	Teaching (program teaching)	5-28.2
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Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item:</screen>	
Use these keys to switch between the setting items ("axis" and "speed").	Use the <u>↑</u> , <u>↓</u> keys to move between the "AX. <u>, </u> ".
Axis No. Input:	
1 RETURN 3 2	
With the cursor located at the desired position, enter the numeric value directly, then press the <u>RETURN</u> key to register the setting.	The speed switching control axis is the first axis which is designated.
Switching screens: After confirming that the axis number setting has been registered, the <u>STEP+</u> key can be pressed to proceed to screen 2.	When the <u>STEP+</u> key is operative, a return to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP-</u> key.
<screen 2=""></screen>	
← → RETURN	
Designate whether the speed switching point setting (VABS) is to be continued or ended (VEND). A "#" mark indicates the currently selected servo instruction. Screen 3 is displayed when VABS is selected, and screen 4 is displayed when VEND is selected.	
<screen 3,="" 4,="" 5,="" 6="" screen=""> Changing the override value:</screen>	
OVERRIDE ↑ ↓ RETURN	
When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines.	
The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed.	
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Mode Test mode	Function	Teaching (program teaching)	5-28.3
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	Opera	tion Procedure	e & Explanations		Precautions/Remarks
When the JOG		nat is displaye	ed, the cursor will be displ	ayed at the	
		10.0 %			
		Т _{Сі}	rsor position		
order. Press the The override to 0.1 % to 100.0 0.1 %	eto increadable contain %. 1.0 %	ase the value, ns the values 10.0 %	to display the override tab and the ↓ key to decreas shown below, enabling s 100.0 %	e the value.	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %.
0.2 % 0.4 %	2.0 % 4.0 %	20.0 % 40.0 %			If the CAN key is pressed during an
0.4 %	8.0 %	80.0 %			override change, the change will be
After selecting The JOG speed [JOG speed] The system will JOG operation	d will then b = [JOG spe I then return	aborted, and the original value will be adopted.			
JOG operation					
JOG+	designa calculat release	ated axis in the ted speed. JO d.	sed, JOG operation will oc e address increase directi G operation stops when t	on, at the his key is	When the <u>JOG+</u> or <u>JOG</u> — key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.
JOG-	designa	ated axis in the ted speed. JO	sed, JOG operation will oc address decrease directi G operation stops when t	on, at the	
play of the feed	l present va	lues for the in	ed numeric value will char terpolating axes. This cha ght of the program No. (top	nge is indi-	
Notes					
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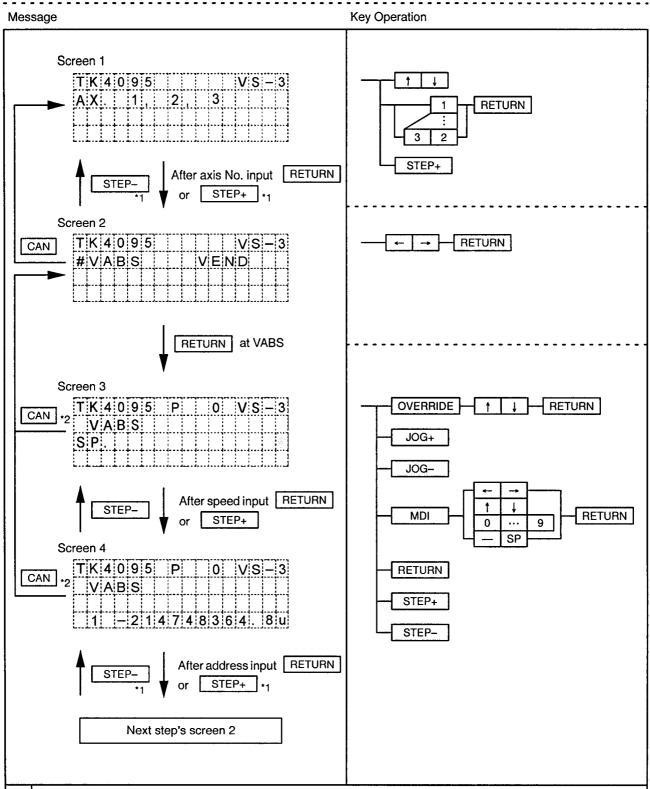
Mode	Test mode	Function	Teaching (program teaching)	5-28.4
				1

Operation Procedure & Explanations	Precautions/Remarks
Numeric input:	
MDI	
When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the — , — , 1 keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key.	
Vriting the address:	
The speed and address values for the currently displayed point are written to the program.	
Changing the axis: AXIS NO. 1 RETURN	
The axis where a JOG operation is designated is changed by pressing the AXIS NO, key, entering the axis number where a JOG operation is to occur, then pressing the <u>RETURN</u> key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.	Operative only at screen 6
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Mode Test mode Fu	ınction	Teaching (program teaching)	5-28.5
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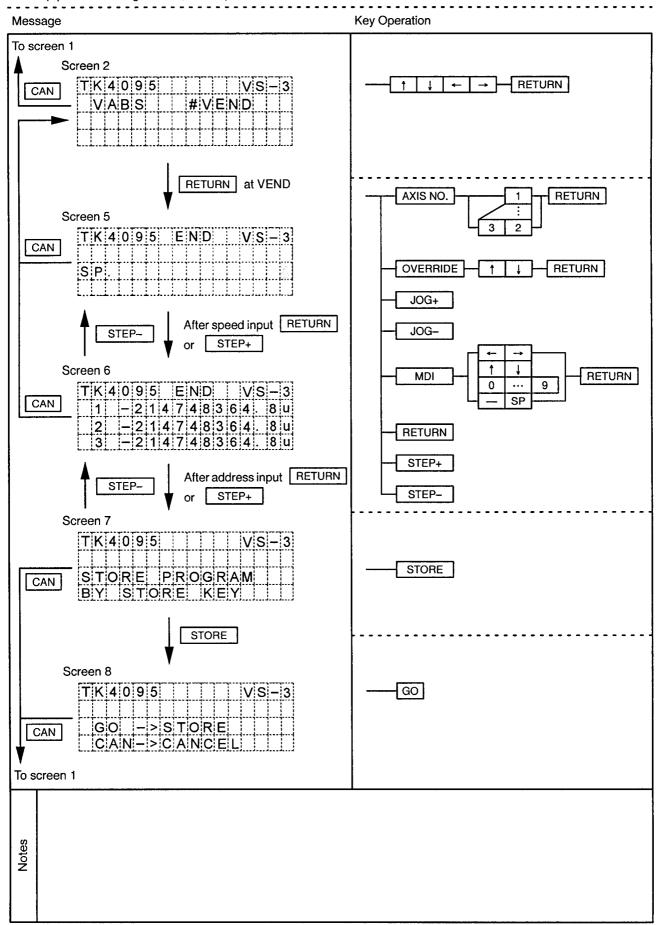
Operation Procedure & Explanations	Precautions/Remarks
witching screens:	
STEP+ Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input	
STEP- Screens. When a speed switching point input has been completed,	
the system will proceed to the next point without going to	
screen 2 first (remaining at screen 3).	
Screen 7, Screen 8>	
Program Store:	
STORE GO	
When error-free end-address writing has been executed at screen 4, screen 5	
will be displayed for program registration. To switch from screen 5 to screen 6, bress the STORE key. At screen 6, press the GO key to execute program writ-	
ng.	
Switching screens:	
STEP- To switch from screen 7 to screen 6, press the <u>STEP-</u> key.	

Mode Te	est mode	Function	Teaching (program teaching)	5-29
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- *1. After designating the required speed & address settings for the VABS selection, then returning to the previous screen (using the <u>CAN</u> or <u>STEP</u> key), the following will occur when the <u>STEP</u> key is pressed: the servo instruction selection screen (screen 2) will be skipped, and the speed & address setting screens (screen 3, screen 4) will be displayed in page order (P0, P1...).
- *2. If the <u>CAN</u> key is pressed while designating a speed or address setting (screen 3, screen 4) at a given step, the system will return to that step's screen 2.

	T T	1		1
Mode	Test mode	Function	Teaching (program teaching)	5-29.1



Mode Test mode Function Teaching (program teaching) 5-29,2					W	
3,1,3,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1	Į	Mode	Test mode	Function	Teaching (program teaching)	5-29.2

	T
Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item:</screen>	
Use these keys to switch between the setting items ("axis" and "speed").	Use the <u>↑</u> , <u>↓</u> keys to move between the "AX,,"
Axis No. input:	
1 RETURN 3 2	
With the cursor located at the desired position, enter the numeric value directly, then press the $\underline{\sf RETURN}$ key to register the setting.	The speed switching control axis is the first axis which is designated.
Switching screens: After confirming that the axis number setting has been registered, the <u>STEP+</u> key can be pressed to proceed to screen 2.	When the <u>STEP+</u> key is operative, a return to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP-</u> key.
<screen 2=""></screen>	
← → RETURN	
Designate whether the speed switching point setting (VABS) is to be continued or ended (VEND). A "#" mark indicates the currently selected servo instruction. Screen 3 is displayed when VABS is selected, and screen 4 is displayed when VEND is selected.	
<screen 3,="" 4,="" 5,="" 6="" screen=""> Changing the override value:</screen>	
OVERRIDE ↑ ↓ RETURN	
When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines.	
The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the <u>RETURN</u> key is pressed.	
80	
Notes	

Mode Test mode	Function	Teaching (program teaching)	5-29.3
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		Opera	tion Procedur	e & Explanations		Precautions/Remarks
	the JOG s de position.		nat is displaye	ed, the cursor will be display	ed at the	
	•		10.0 %			
			L Сі	ursor position		
order. The o	Press the	to increate to the total to the contain	ase the value,	to display the override table and the ↓ key to decrease shown below, enabling se	the value.	If the <u>↑</u> key is pressed when the override is 100.0 %, the override will become 0.1 %. If the <u>↓</u> key is pressed when the override is 0.1 %, the override will become 100.0 %.
C).1 %	1.0 %	10.0 %	100.0 %		Will become 100.0 70.
		2.0 %	20.0 %			If the <u>CAN</u> key is pressed during an
).4 %).8 %	4.0 % 8.0 %	40.0 % 80.0 %		:	override change, the change will be aborted, and the original value will be adopted.
The Je	OG speed G speed] =	will then b JOG spe	e determined eed limit value	e, press the <u>RETURN</u> key. as follows:] × [override] al display screen.		udopiou.
JOG o	operation:					
	JOG+	designa	ated axis in the ted speed. JC	sed, JOG operation will occu e address increase direction G operation stops when thi	n, at the	When the <u>JOG+</u> or <u>JOG</u> - key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.
	JOG-	designa	ated axis in the ted speed. JC	sed, JOG operation will occu a address decrease direction G operation stops when thi	n, at the	be displayed.
play o	f the feed p	resent va	lues for the in	ed numeric value will chang terpolating axes. This chang ight of the program No. (top c	ge is indi-	•
Notes						

Mada	Test mode	Eupotion	Teaching (program teaching)	5-29.4
MOGE	lest mode	i unction	reaching (program teaching)	3-23.4

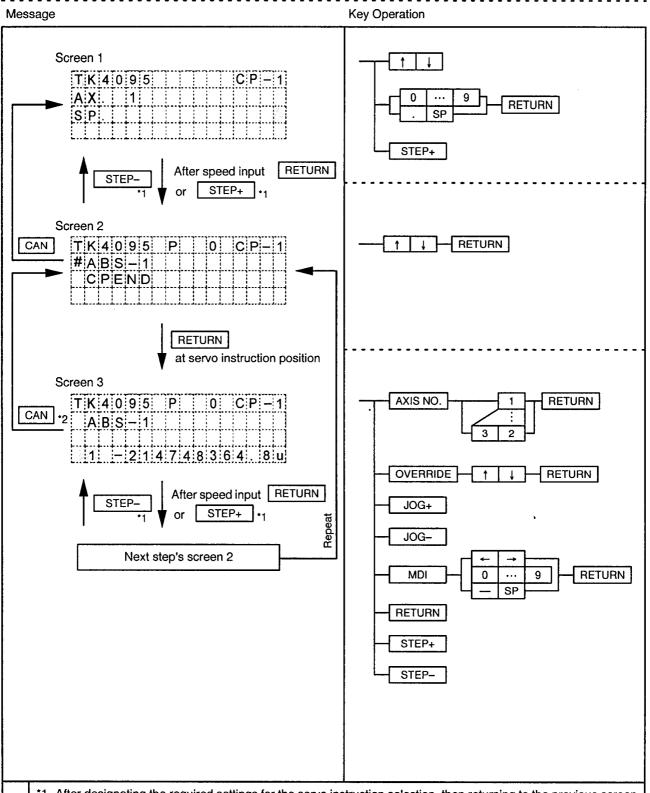
Operation Procedure & Explanations	Precautions/Remarks
Numeric input:	
MDI	
When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the —, —, , , , , keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the _ key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be lisplayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key.	
Vriting the address:	
RETURN The speed and address values for the currently displayed point are written to the program.	
Changing the axis: AXIS NO. 1 RETURN 3 2	
The axis where a JOG operation is designated is changed by pressing the AXIS NO, key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.	Operative only at screen 6
Notes	
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Mode Test mode Function Teaching (program teaching) 5-29	9.5
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Operation Procedure & Explanations	Precautions/Remarks
Switching screens:	
STEP+ Use the STEP+ and STEP- keys to switch between input screens. When a speed switching point input has been completed, the system will proceed to the next point without going to screen 2 first (remaining at screen 3).	
<screen 7,="" 8="" screen=""> Program Store</screen>	
STORE GO	
When error-free end-address writing has been executed at screen 6, screen 7 will be displayed for program registration. To switch from screen 7 to screen 8, press the <u>STORE</u> key. At screen 8, press the <u>GO</u> key to execute program writing.	
Switching screens:	
STEP— To switch from screen 7 to screen 6, press the STEP—key.	
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Notes	

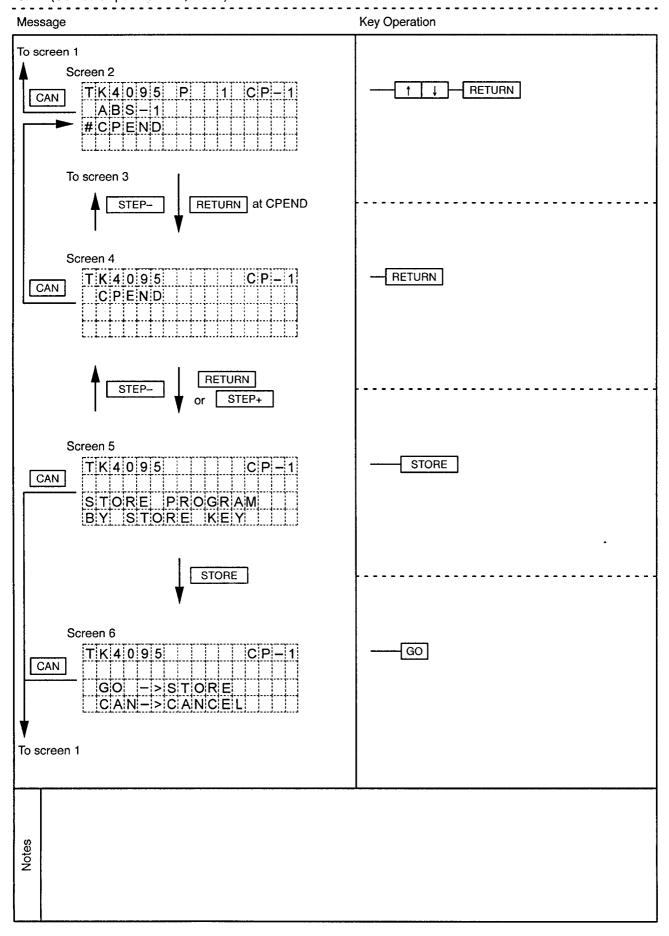
Mode Test mode Function Teaching (program teaching) 5-3	Mode	de Test mode	Function		5-30
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Notes



- *1. After designating the required settings for the servo instruction selection, then returning to the previous screen (using the <u>CAN</u> or <u>STEP</u>— key), the following will occur when the <u>STEP</u>+ key is pressed: the servo instruction selection screen (screen 2) will be skipped, and the servo instruction setting screen (screen 3) will be displayed in page order (P0, P1...).
- *2. If the <u>CAN</u> key is pressed while designating a setting (screen 3) at a given step, the system will return to that step's screen 2.

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Mode	Test mode	Function	Teaching (program teaching)	5-30.1



Mode	Test mode	Function	Teaching (program teaching)	5-30.2
				I

Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item:</screen>	
Use these keys to switch between the setting items ("axis" and "speed").	Use the <u>↑</u> , <u>↓</u> keys to move between the "AX" and "SP" items.
Axis No. & speed inputs: O 9 RETURN	Switching to screen 2 is only possible after both the "axis number" and "speed" inputs have been registered.
With the cursor located at the desired position, enter the numeric value directly then press the <u>RETURN</u> key to register the setting. Each time the <u>RETURN</u> key is pressed, the input item will change as follows: Axis 1 → Speed.	
Switching screens:	
After confirming that all axis number and speed settings have been registered, the <u>STEP+</u> key can be pressed to proceed to screen 2.	When the <u>STEP+</u> key is enabled, a return to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP-</u> key.
<screen 2=""></screen>	
↑ ↓ RETURN	
Select a servo instruction which designates positioning control to a pass point. When constant-speed control is completed, CPEND is selected.	
ABS-1 1-axis linear interpolation control CPEND Constant-speed control END	
Notes	

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1	Mode	Test mode	Function	Teaching (program teaching)	5-30.3

Operation Procedure & Explanations	Precautions/Remarks
<screen 3=""> Changing the axis:</screen>	
AXIS NO. 1 RETURN	
The axis where a JOG operation is designated is changed by praction AXIS NO. key, entering the axis number where a JOG operation is to pressing the RETURN key. The axis number which is entered must the axis number range designated by the program. When a JOG axis number is changed, that axis number will be high	occur, then the beautiful to the within
Changing the override value:	
OVERRIDE ↑ ↓ RETURN	
When the <u>OVERRIDE</u> key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed and 3rd lines. The override change procedure is identical to that in test mode JOG except that the system will return to the program teaching screen <u>RETURN</u> key is pressed.	at the 2nd operation,
When the JOG screen format is displayed, the cursor will be displayed override position.	ayed at the
10.0 % Cursor position	
At this time, the \uparrow , \downarrow keys can be used to display the override table order. Press the \uparrow to increase the value, and the \downarrow key to decrease The override table contains the values shown below, enabling so 0.1 % to 100.0 %.	e the value. ride is 100.0 %, the override will be- election of come 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override
0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 80.0 %	will become 100.0 %. If the <u>CAN</u> key is pressed during an override change, the change will be aborted, and the original value will be adopted.
After selecting the desired override value, press the <u>RETURN</u> key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	adopted.
Notes	

de Test mode Function	n Teaching (program teaching)	5-30.4
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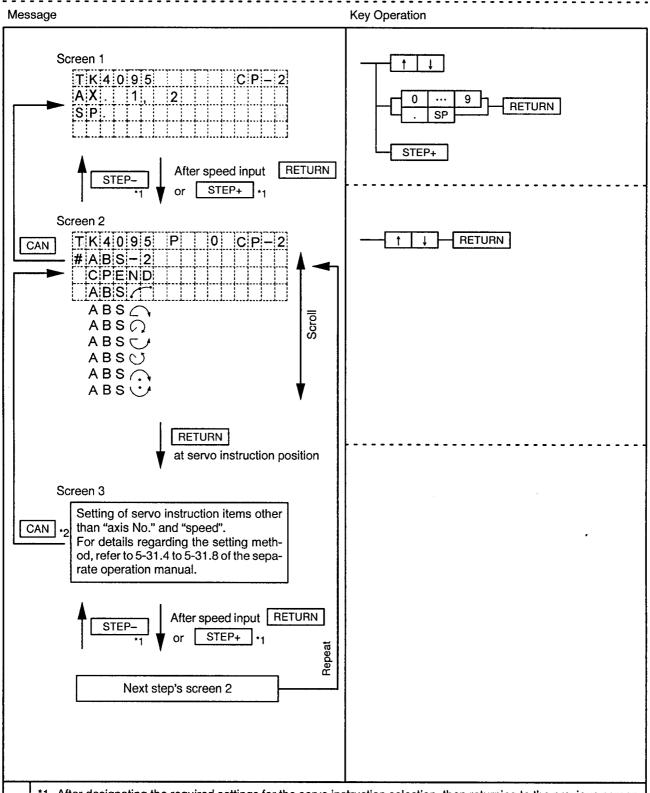
	Operation Procedure & Explanations	Precautions/Remarks
JOG operation:		
JOG+	While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG</u> key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.
JOG-	While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	be displayed.
play of the feed p	ation occurs, the displayed numeric value will change to a dispresent values for the interpolating axes. This change is individual in the right of the program No. (top of screen).	
Numeric input:		
MDI -	0 9 RETURN	
the cursor will ap "E" is displayed to that numeric data At this time, use to is to be changed To change the nu A negative value and a positive value displayed in front ner to change a r unchanged).	ey is pressed, the numeric input mode will be established and pear at the right end of the numeric value field. In the right of the program No. (top of screen) in order to indicate a editing is in progress. The, keys to move the cursor to the numeric value which then enter the desired value. Immeric value's sign, press the key at the numeric input field. Will be changed to a positive value (minus symbol is deleted), lue will be changed to a negative value (minus symbol will be of the value). The SP key can also be used in the same mannegative value to a positive value (a positive value will remain ic input is completed, press the RETURN key.	·
Notes		I

Mode Test mode	Function	Teaching (program teaching)	5-30.5
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	Operation Procedure & Explanations	Precautions/Remarks
Writing the addre		
RETURN	The servo instruction setting value for the currently displayed point is written to the program.	
Switching screen STEP+ STEP- STEP- <screen 4=""> RETURN <screen 5,="" program="" screen="" store:<="" td=""><td>Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input screens. When a pass point servo instruction input has been completed, the system will proceed to the next point without going to screen 2 first (remaining at screen 3). The CPEND input is executed.</td><td></td></screen></screen>	Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input screens. When a pass point servo instruction input has been completed, the system will proceed to the next point without going to screen 2 first (remaining at screen 3). The CPEND input is executed.	
STORE	-GO	
pleted at screen 4	-	•
Notes		

 Mode
 Test mode
 Function
 Teaching (program teaching)
 5-31

CP-2 (Constant-Speed Control, 2 Axes)



*1. After designating the required settings for the servo instruction selection, then returning to the previous screen (using the <u>CAN</u> or <u>STEP</u>— key), the following will occur when the <u>STEP</u>+ key is pressed: the servo instruction selection screen (screen 2) will be skipped, and the servo instruction setting screen (screen 3) will be displayed in page order (P0, P1...).

*2. If the <u>CAN</u> key is pressed while designating a setting (screen 3) at a given step, the system will return to that step's screen 2.

Notes

	The state of the s		T	Drawing No
Mode Tes	st mode	Function	Teaching (program teaching)	5-31.1
CP-2 (Con:	stant-Speed Control, 2 Axes)			
Message			Key Operation	
To screen 1	creen 2			
CAN		C P - 2	T T RETURN	
	STEP- RETURN	at CPEN	D	
CAN	TK4095 CPEND	CP-2	RETURN	
	STEP- RETURN or STE	<u></u>		
CAN	STORE PROGRA	C P - 2	STORE	
	STORE]		
CAN	GO ->STORE CAN->CANCEL	C P – 2	GO	
To screen 1	· · · · · · · · · · · · · · · · · · ·			
Notes				

Mode	Test mode	Function	Teaching (program teaching)	5-31.2

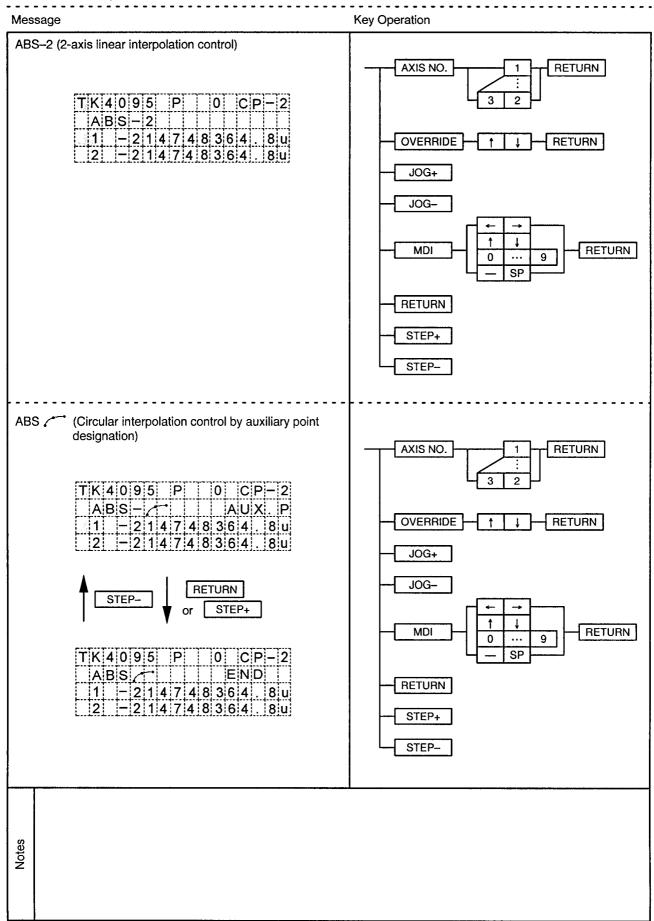
Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item:</screen>	
Use these keys to switch between the setting items ("axis" and "speed").	Use the \uparrow , \downarrow keys to move betweer the "AX , _" and "SP" items.
Axis No. & speed inputs:	Switching to screen 2 is only possible
0 9 RETURN	after both the "axis number" and "speed" inputs have been registered.
With the cursor located at the desired position, enter the numeric value directly, then press the <u>RETURN</u> key to register the setting. Each time the <u>RETURN</u> key is pressed, the input item will change as follows: Axis $1 \rightarrow \text{Axis } 2 \rightarrow \text{Speed}$.	
Switching screens:	
STEP+ After confirming that all axis number and speed settings have been registered, the <u>STEP+</u> key can be pressed to proceed to screen 2.	When the <u>STEP+</u> key is enabled, a return to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP-</u> key.
<screen 2=""></screen>	
↑ ↓ RETURN	
Select a servo instruction which designates positioning control to a pass point. When constant-speed control is completed, CPEND is selected.	
ABS-2 2-axis linear interpolation control → 5-31.4 CPEND Constant-speed control END	
ABS ← Circular interpolation by auxiliary point designation → 5-31.4 ABS ← Circular interpolation by radius designation → 5-31.5	
ABS ☐ Circular interpolation by radius designation → 5-31.5 ABS ☐ Circular interpolation by radius designation → 5-31.5 → 5-31.5	
ABS ○ Circular interpolation by radius designation → 5-31.5	
ABS	
Notes	
ž	

Mode	Test mode	Function	Teaching (program teaching)	5-31.3

Operation Procedure & Explanations	Precautions/Remarks
<screen 4=""></screen>	
RETURN The CPEND input is executed.	
<screen 5,="" 6="" screen=""></screen>	
Program Store:	
STORE GO.	
When CPEND is selected at screen 2, and the CPEND setting has been completed at screen 4, screen 5 will be displayed for program registration. To switch from screen 5 to screen 6, press the <u>STORE</u> key. At screen 6, press the <u>GO</u> key to execute program writing.	
Switching screens:	
STEP— To switch from screen 5 to screen 4, press the <u>STEP</u> -key.	
Notes	

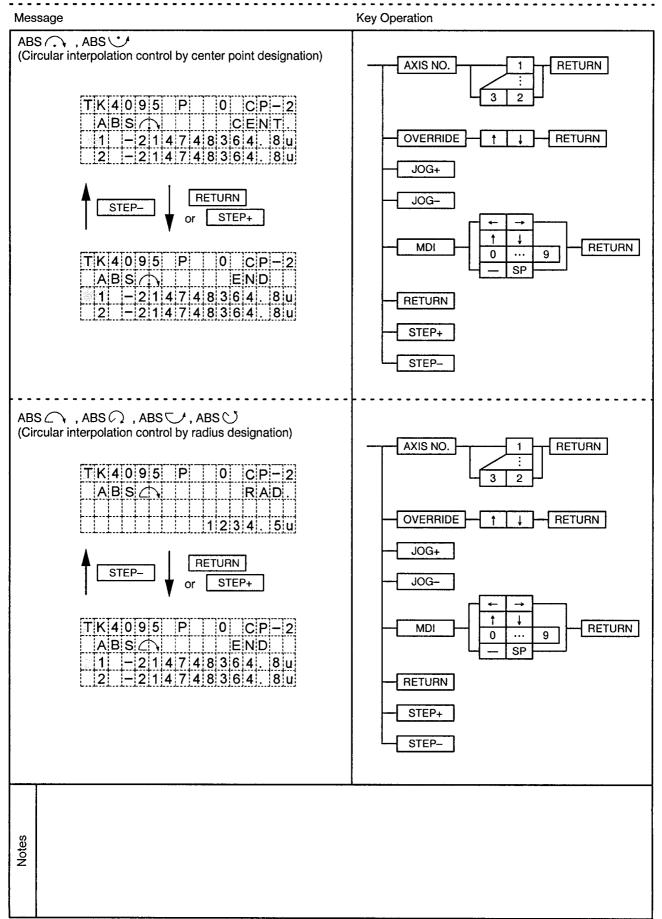
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1	I	l –	[
Mode	lest mode	Function	Teaching (program teaching)	5-31.4
			, , ,	

CP-2 (Constant-Speed Control, 2 Axes) Screen 3



				_	
Mode	Test mode	Function	Teaching (program teaching)	5-31.5	

CP-2 (Constant-Speed Control, 2 Axes) Screen 3



Mode	Test mode	Function	Teaching (program teaching)	5-31.6
				4

CP-2 (Constant-Speed Control, 2 Axes) Screen 3

Operation Procedure & Explanations Precautions/Remarks Changing the axis: AXIS NO. RETURN The axis where a JOG operation is designated is changed by pressing the AXIS NO, key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted. Changing the override value: OVERRIDE - 1 ↓ RETURN When the **OVERRIDE** key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed. When the JOG screen format is displayed, the cursor will be displayed at the override position. - Cursor position At this time, the \uparrow , \downarrow keys can be used to display the override table values in If the _1_ key is pressed when the override is 100.0 %, the override will beorder. Press the \uparrow to increase the value, and the \downarrow key to decrease the value. The override table contains the values shown below, enabling selection of come 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override 0.1 % to 100.0 %. will become 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % If the CAN key is pressed during an 4.0 % 0.4 % 40.0 % override change, the change will be 80.0 % 0.8 % 8.0 % aborted, and the original value will be adopted. After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen. Notes

Mode	Test mode	Function	Teaching (program teaching)	5-31.7
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CP-2 (Constant-Speed Control, 2 Axes) Screen 3

	Operation Procedure & Explanations	Precautions/Remarks
JOG operation:		
JOG+	While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satisfied, the displayed "! CAN'T START" will
JOG-	While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	be displayed.
play of the feed	ation occurs, the displayed numeric value will change to a dispresent values for the interpolating axes. This change is indivinish is displayed to the right of the program No. (top of screen).	
Numeric input:		
MDI -	← → ↑ ↓ 0 ··· 9 — SP	
the cursor will ap "E" is displayed to that numeric dat At this time, use t which is to be ch To change the no A negative value and a positive va displayed in from ner to change a unchanged).	ey is pressed, the numeric input mode will be established and opear at the right end of the numeric value field. In the right of the program No. (top of screen) in order to indicate a editing is in progress. The	
Notes		I

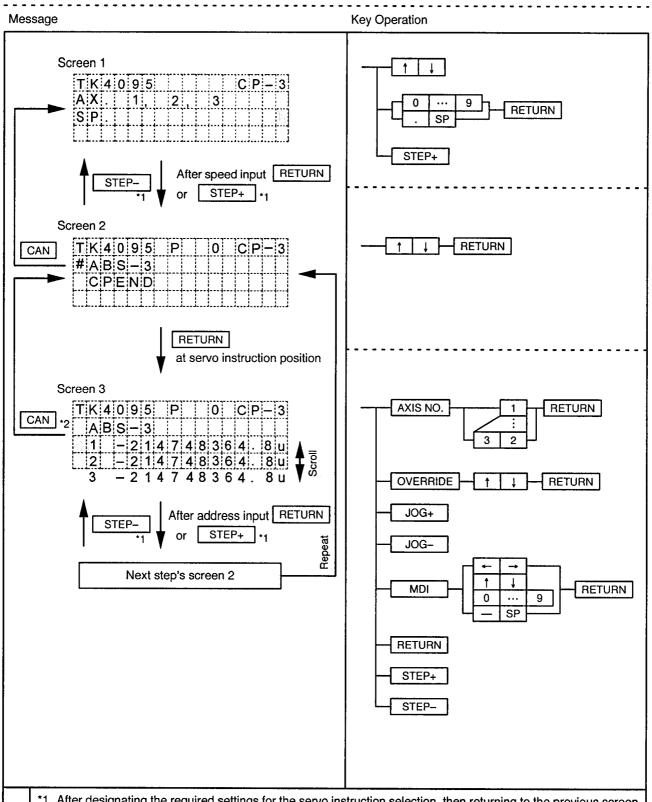
Mode Test mode	Function	Teaching (program teaching)	5-31.8
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CP-2 (Constant-Speed Control, 2 Axes) Screen 3

	Operation Procedure & Explanations	Precautions/Remarks
Writing the addre	ess:	
RETURN	The servo instruction setting value for the currently displayed point is written to the program.	
Switching screen	s:	
SWITCHING SCREEN STEP+ STEP-	Use the STEP+ and STEP- keys to switch between input screens. When a pass point servo instruction input has been completed, the system will proceed to the next point without going to screen 2 first (remaining at screen 3).	
Notes		

Mode Test mode	unction Teaching (program teaching	g) 5-32
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Notes



- *1. After designating the required settings for the servo instruction selection, then returning to the previous screen (using the <u>CAN</u> or <u>STEP</u> key), the following will occur when the <u>STEP</u> key is pressed: the servo instruction selection screen (screen 2) will be skipped, and the servo instruction setting screen (screen 3) will be displayed in page order (P0, P1...).
- *2. If the <u>CAN</u> key is pressed while designating a setting (screen 3) at a given step, the system will return to that step's screen 2.

Mode Test mode	1		
	Function	Teaching (program teaching)	5-32.1
P-3 (Constant-Speed Control, 3 Axes))		
Message		Key Operation	
O screen 1 Screen 2 TK 4 0 9 5 P 1 ABS - 3 # CPEND	CP-3	— ↑ ↓ RETURN	
To screen 3	RN at CPEN	D	
Screen 4 T K 4 0 9 5 CAN C P E N D	C P-3	RETURN	
STEP- RETU	JRN STEP+		
Screen 5 T K 4 0 9 5		STORE	
STOR	E		
Screen 6 CAN T K 4 0 9 5 GO ->STORE CAN->CANCE	CP-3	——GO	
o screen 1			

wide rest mode reading (program teaching) 3-32.2	Mode	Test mode	Function	Teaching (program teaching)	5-32.2
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Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item:</screen>	
Use these keys to switch between the setting items ("axis" and "speed").	Use the ↑, ↓ keys to move between the "AX,," and "SP" items.
Axis No. & speed inputs:	Switching to screen 2 is only possible
0 9 — . SP RETURN	after both the "axis number" and "speed" inputs have been registered.
With the cursor located at the desired position, enter the numeric value directly, then press the <u>RETURN</u> key to register the setting. Each time the <u>RETURN</u> key is pressed, the input item will change as follows: Axis $1 \rightarrow Axis 2 \rightarrow Axis 3 \rightarrow Speed.$	
Switching screens:	
After confirming that all axis number and speed settings have been registered, the <u>STEP+</u> key can be pressed to proceed to screen 2.	When the <u>STEP+</u> key is enabled, a return to screen 1 can be executed by pressing the <u>CAN</u> or <u>STEP-</u> key.
<screen 2=""></screen>	
↑ ↓ RETURN	
Select a servo instruction which designates positioning control to a pass point. When constant-speed control is completed, CPEND is selected.	
ABS-3 3-axis linear interpolation control CPEND Constant-speed control END	
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Notes	

Mode Test mode Function Teaching (program teaching) 5-32.3	Mode	e Test mode	Function		5-32.3
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	Opera	ition Procedur	e & Explanations	Precautions/Remarks
<screen 3=""> Changing the</screen>	avie.			
AXIS NO		RETURI	٧	
AXIS NO. key pressing the I the axis numb	, entering the <u>RETURN</u> key er range des	axis number v The axis nui signated by the	signated is changed by pressi where a JOG operation is to occumber which is entered must be exprogram. nat axis number will be highligh	ır, then within
Changing the	override val	ne:		
OVERRIE	DE 1	↓ RETU	RN	
JOG screen of and 3rd lines. The override of	lisplay forma change proce e system wi	t, with the spe edure is identic	e screen will change to the ed and override displayed at that to that in test mode JOG ope program teaching screen where	ration,
When the JOO		at the		
,		10.0 %	ursor position	
order. Press th	ne <u>†</u> to incre table contai	s can be used ase the value,	to display the override table va and the ↓ key to decrease the shown below, enabling selec	value. ride is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override
0.1 % 0.2 % 0.4 % 0.8 %	1.0 % 2.0 % 4.0 % 8.0 %	10.0 % 20.0 % 40.0 % 80.0 %	100.0 %	will become 100.0 %. If the <u>CAN</u> key is pressed during an override change, the change will be aborted, and the original value will be adopted.
The JOG spec	ed will then b i] = [JOG sp	e determined eed limit value	e, press the <u>RETURN</u> key. as follows:] × [override] al display screen.	асорюс.
		-	. ,	
			77. 77. 74.77. 2	
Notes				
1				

Mode Test mode Function Teaching (program teaching) 5-32.	Mode Test mode Function Teaching (prog
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	Operation Procedure & Explanations	Precautions/Remarks
JOG operation		
JOG+	While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be discussed.
JOG-	While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	be displayed.
play of the feed	ation occurs, the displayed numeric value will change to a dispresent values for the interpolating axes. This change is indivhich is displayed to the right of the program No. (top of screen).	
Numeric input:		
MDI -	← → ↑ ↓ 0 ··· 9 — SP	
the cursor will ay "E" is displayed to that numeric dath At this time, use to which is to be change the no A negative value and a positive value displayed in from ner to change a unchanged).	ey is pressed, the numeric input mode will be established and opear at the right end of the numeric value field. to the right of the program No. (top of screen) in order to indicate a editing is in progress. the	
Notes		

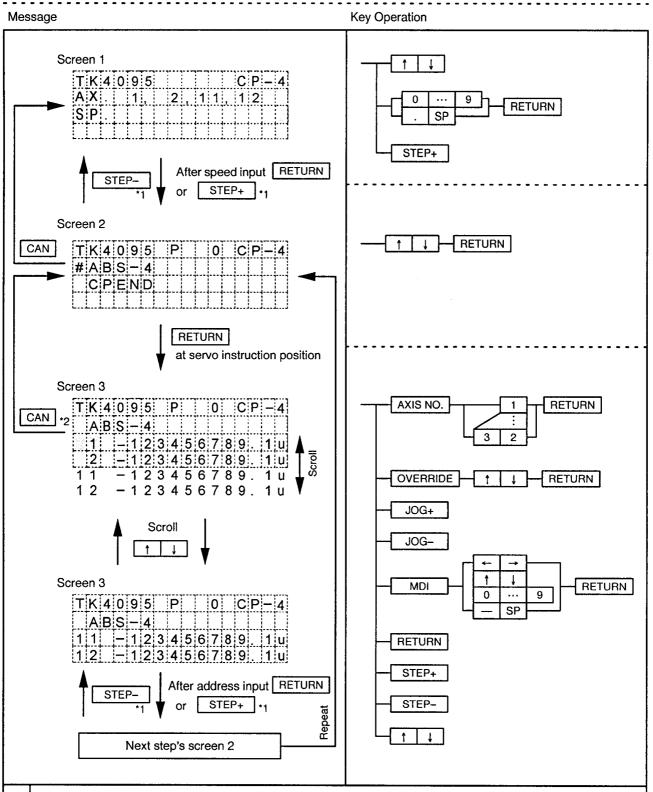
	Mode	Test mode	Function	Teaching (program teaching)	5-32.5
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	Operation Procedure & Explanations	Precautions/Remarks
Writing the addre	ess:	
RETURN	The servo instruction setting value for the currently displayed point is written to the program.	
Switching screen	s:	
STEP+	Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input screens. When a pass point servo instruction input has been completed, the system will proceed to the next point without going to screen 2 first (remaining at screen 3).	
<screen 4=""></screen>		
RETURN	The CPEND input is executed.	
<screen 5,="" program="" screen="" store:<="" td=""><td>en 6></td><td></td></screen>	en 6>	
STORE	-GO	
pleted at screen 4	selected at screen 2, and the CPEND setting has been com- t, screen 5 will be displayed for program registration. To switch screen 6, press the <u>STORE</u> key. At screen 6, press the <u>GO</u> key am writing.	
Switching screer	os:	:
STEP-	To switch from screen 5 to screen 4, press the <u>STEP</u> key.	
Notes		
Ž		

Mode Test mode Function Teaching (program teaching)	5-33

CP-4 (Constant-Speed Control, 4 Axes)

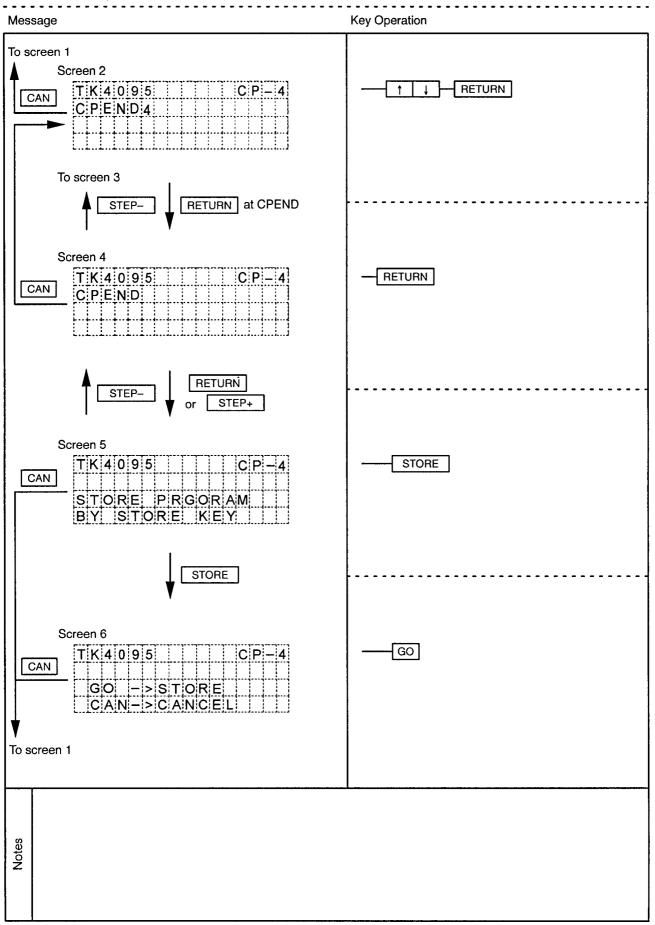
Notes



*1. After designating the required settings for the servo instruction selection, then returning to the previous screen (using the <u>CAN</u> or <u>STEP</u>– key), the following will occur when the <u>STEP</u>+ key is pressed: the servo instruction selection screen (screen 2) will be skipped, and the servo instruction setting screen (screen 3) will be displayed in page order (P0, P1...).

*2. If the <u>CAN</u> key is pressed while designating a setting (screen 3) at a given step, the system will return to that step's screen 2.

Mode	Test mode	Function	Teaching (program teaching)	5-33.1



		** ** * * * * * * * * * * * * * * * * *			
ı	Mode	Test mode	Function	Teaching (program teaching)	5-33.2

Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting the setting item:</screen>	
Use these keys to switch between the setting items ("axis" and "speed").	Use the ↑, ↓ keys to move between the "AX,,, and "SP" items.
Axis No. & speed inputs:	
0 9 SP RETURN	Switching to screen 2 is only possible after both the "axis number" and "speed" inputs have been registered.
With the cursor located at the desired position, enter the numeric value direct then press the <u>RETURN</u> key to register the setting. Each time the <u>RETURN</u> is pressed, the input item will change as follows: Axis $1 \rightarrow \text{Axis } 2 \rightarrow \text{Axis } 3 \rightarrow \text{Axis } 4 \rightarrow \text{Speed}$.	itly,
Switching screens:	
After confirming that all axis number and speed settings have been registered, the <u>STEP+</u> key can be pressed to proceed to screen 2.	
<screen 2=""></screen>	
↑ ↓ — RETURN	
Select a servo instruction which designates positioning control to a pass power when constant-speed control is completed, CPEND is selected.	int.
ABS-4 4-axis linear interpolation control CPEND Constant-speed control END	
5. E.	
Notes	
Z	

Mode Test mode Function Teaching (program teaching) 5-33.3	Mode Test mode	Function	Teaching (program teaching)	5-33.3
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	Operation	on Procedure	e & Explanations	Precautions/Remarks
<screen 3=""> Changing the axis</screen>	3:			
AXIS NO.	3 2	RETURN		
AXIS NO. key, ento pressing the RET the axis number r	ering the a <u>URN</u> key. ange desig	xis number w The axis num gnated by the	ignated is changed by pressing the here a JOG operation is to occur, the aber which is entered must be withing program. at axis number will be highlighted.	n
Screen Scrolling:				
† ↓	be displa	ayed on a sing	uctions, the data for all axes cannot gle screen. In such cases, use the he axis number, etc., 1 line.	When data for fewer than 2 axes is displayed, the ↑, ↓ keys are disabled, and the error message "! MIS OPERATION" will be displayed at the bottom
Changing the over	rride value	: :		line of the screen if they are pressed.
OVERRIDE	<u></u>	RETUR	N	
When the OVERF JOG screen displ and 3rd lines. The override char except that the si RETURN key is p	ay format, nge proced ystem will	, 		
When the JOG so override position.	reen form	at is displaye	ed, the cursor will be displayed at the	e
Override position.	1	0.0 %		
			rsor position	A
order. Press the 1 The override table 0.1 % to 100.0 %.	to increas le contains	se the value, a	to display the override table values i and the 上 key to decrease the value shown below, enabling selection of	. ride is 100.0 %, the override will be-
0.2 % 0.4 %	1.0 % 2.0 % 4.0 % 8.0 %	10.0 % 20.0 % 40.0 % 80.0 %	100.0 %	If the <u>CAN</u> key is pressed during an override change, the change will be aborted, and the original value will be adopted.
After selecting the The JOG speed v [JOG speed] = The system will the	vill then be [JOG spee	determined a ed limit value]	X [override]	adopted.

Mode	Test mode	Function	Teaching (program teaching)	5-33.4

		Operation Procedure & Explanations	Precautions/Remarks
JOG	operation		
	JOG+	While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. While this key is pressed, JOG operation will occur at the	When the <u>JOG+</u> or <u>JOG-</u> key is pressed, the START conditions will be checked. If the conditions are not satis fied, the message "! CAN'T START" will be displayed.
1	JOG-	designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	
play	of the feed p	tion occurs, the displayed numeric value will change to a dis- resent values for the interpolating axes. This change is indi- nich is displayed to the right of the program No. (top of screen).	
Num	eric input:		
1	MDI	↑ ↓ RETURN 0 9 — SP	
the c "E" is that At th whice To cl A ne and disp ner t unch	cursor will apped to numeric data is time, use the his to be chatange the nuagative value valued in front to change a nuanged).	y is pressed, the numeric input mode will be established and pear at the right end of the numeric value field. The right of the program No. (top of screen) in order to indicate editing is in progress. $e \leftarrow , \rightarrow , \uparrow$, \downarrow keys to move the cursor to the numeric value anged, then enter the desired value. The meric value's sign, press the \pm key at the numeric input field. Will be changed to a positive value (minus symbol is deleted), we will be changed to a negative value (minus symbol will be of the value). The \underline{SP} key can also be used in the same manegative value to a positive value (a positive value will remain c input is completed, press the \underline{RETURN} key.	
<u></u>			
Notes			

	Mode	Test mode	Function	Teaching (program teaching)	5-33.5
1	Mode	Test mode	Function	reaching (program teaching)	5-33.5

	Operation Procedure & Explanations	Precautions/Remarks
Writing the addre	SS:	
RETURN	The servo instruction setting value for the currently displayed point is written to the program.	
Switching screen	s:	
STEP+	Use the <u>STEP+</u> and <u>STEP-</u> keys to switch between input screens. When a pass point servo instruction input has been completed, the system will proceed to the next point without going to screen 2 first (remaining at screen 3).	
<screen 4=""></screen>	The CPEND input is executed.	
<screen 5,="" scree<br="">Program Store:</screen>	en 6>	
STORE	-GO	
pleted at screen 4	selected at screen 2, and the CPEND setting has been com- i, screen 5 will be displayed for program registration. To switch screen 6, press the <u>STORE</u> key. At screen 6, press the <u>GO</u> key am writing.	
Switching screen	s:	
STEP-	To switch from screen 5 to screen 4, press the <u>STEP</u> key.	
8		
Notes		
1 1		

Mode Test mode	Function	Program operation		5-34		
Program Operation Item Selection Screen) 					
Message	Message					
T PROGRA 1SINGLE 2CONTIN 3RANDOM	UOUS		1 RET	URN		
Operation Procedure	& Explana	tions	Precautions/Rema	rks		
The program operation type is selected a			11000010/110/110			
The available types are as follows: indep	endent, con	tinuous, and random.				
Selecting "single operation":						
1 RETURN► Go to	5-35					
Selecting "continuous operation":						
2 RETURN► Go to	5-37					
Selecting "random operation":						
3 RETURN▶ Go to	5-39					
				·		
When the No. of an item is keyed in	, that item N	lo. will be highlighted.				
Notes						

Mod	e Test mode	Function	Program operation (single	e operation)	5-35
Callir	ng the Designated Program				
Mess	age			Key Operation	
	T SINGLE PROG. NO		Cursor position	0 9	RETURN
	Operation Procedure	e & Explana	tions	Precautions/Rema	ırks
gran	keys 0 to 9 to designate the number on number range is 0 to 4095. Only the d. All other digits will be ignored.			In order to execute prograr a program must first be cre program mode.	n operation, eated in the
			t occurs, the displayed space to the left.	When this program call so played, the call program No at that time will be displaye fault.	o. registered
Ton	nake an input correction, press the Q	<u>:LEAR</u> key t	o delete the input field.		
Whe	en a program has been successfully execution START screen for that pro ▶ Go to 5-36	read out (by gram will be	pressing <u>RETURN</u> key), e displayed.	If no program exists, the err "IPROG. NOT FOUND" played.	ormessage will be dis-
Notes					

Mode	Test mode	Function	Program operation (single	e operation)	5-36
Progra	m Execution START Screen Oper	ation			
Messa	ge			Key Operation	
	T K 4 0 9 5 GO -> E CAN-> C	ANCEL		—GO	
	TK4095 EXECUTIN				
	Operation Procedur	e & Explana	tions	Precautions/Rema	ırks
of the	the <u>GO</u> key is pressed, "EXECUT designated program will begin. PLETED" is displayed when program returns to the program operation	ram execution	on is completed, and the		
Notes					

Mode	Toot made	Function	Dragram aparation (april		Drawing No.				
	Mode Test mode Function Program operation (continuous operation				5-37				
	START/END Program No. Set								
Messa	age			Key Operation					
	T CONTINU REPEAT N START END		OPE 1 0 0 Cursor position	0 9 —(1 CLEAR	RETURN				
	Operation Procedure	& Explana	tions	Precautions/Rema	arks				
nate The r "0" is The 5 most	ler to execute continuous operation, the operation repeat count, and the epeat count range is 0 to 65535, wi designated. The program number romost recently input digits are valid recently input digits are valid for the nored.	To execute continuous op programs must first be creprogram mode. The STAI No. and END program No. must be as follows: [START No.] <= [END No.	eated in the RT program relationship						
To make an input correction, press the <u>CLEAR</u> key to delete the input field at the cursor position. When this screen is first displayed after selecting continuous operation, the repeat count will be displayed as "1", and both the START and END program numbers will be displayed as the minimum numbers possible for continuous operation. The cursor will be positioned at the right-most digit of the repeat count value. When the <u>RETURN</u> key is pressed, the cursor moves to the lower input field. To re-designate an existing setting, press the <u>heart was the cursor back to the upper field.</u> When the <u>RETURN</u> key is pressed at the END No. field, a check will be conducted to verify that the programs designated in the START No. to END No. range exist. If a missing program No. is found, the error message "! PROG. NOT FOUND" will be displayed together with the missing program number. If all programs are ready, the continuous operation execute START screen (5-38) will be displayed.									
Notes									

					Drawing No.
Mod	e Test mode	Function	Program operation (conti	nuous operation)	5-38
Exec	uting Continuous Operation				
Mess	age			Key Operation	
	TK 20 - K REPEAT NC GO ->EXE CAN->CAN T CONTINUC REPEAT EXECUTE END	US OP	1 0	—GO	
	Operation Proced	ure & Explana	ations	Precautions/Rem	arks
disp nate The play Whe the	en the <u>GQ</u> key is pressed, the "exelayed, and the designated program de count is reached. Program number being executed value. A running count occurs at this en the designated count is reached message "COMPLETED" will be only the continuous program operation of a continuous program operation.	n range will be will be indicate s line until the and continuous displayed. Who Program N	e repeated until the designed at the "EXECUTE" dis- END number is reached. us operation is completed, then this occurs, press the o. Set" screen (5-37).	Continuous operation without end if the repeat or nated as "0". In this case, to must be pressed to end the state of the s	ount is desig- he <u>STOP</u> key
Notes					

Mod	le Test mode	Function	Program operation (rando	om operation)	5-39
Rand	dom Operation Program No. Designa	ution			
Mes	sage			Key Operation	
	T RANDOM OF PROGRAM 1 PROGRAM 2 PROGRAM 3		Cursor position	0 9 F	RETURN
	Operation Procedure	e & Explana	tions	Precautions/Rema	ırks
Whe the will The tom Scre Ente to re duc The usin	dom operation can be executed for the "random operation program No.1 to program be positioned at the program No.1 in input area is scrolled upward when the line program No. input field. Scrolling olling is possible within the program No. in their order of expister each No. Each time the RET ted to determine if that program exist range for program numbers is 0 to 4 g keys 0 to 9. Only the 4 most recent is will be ignored. Each digits: 40999 40956666	In order to execute program the programs must first be the program mode. Random operation is possi 30 programs. Be sure to programs in an unbroken ginning from program 1. (space) status exists at so the program Nos., the subs gram Nos. will not be executed.	ble for up to register the series, be- If a CLEAR ome point in sequent pro-		
the Prog 30 p field	nake an input correction, press the Coursor position. gram registration for the random open program Nos. are registered, or when the creating a space. The "repeat count prement between input fields: Use the 1, 1 keys for 30 range. The display pressed at the program program 30. If the 1 keys or will move to program so the count program of the				
Notes					

							Drawing No.
Mode T	est mode	Fi	unction	Program operation ((randor	n operation)	5-40
Random (Operation Repeat (Count Designation	n	<u> </u>			
Message					1	Key Operation	
	PROG.	OM OPE NO. T NO.	1	Cursor position		0 9 - [I	RETURN
	Operat	ion Procedure &	Explana	tions		Precautions/Rem	arks
ignated a The repe peated w When the	at the above screer at count range is 0 rithout end.	n. to 65535. If "0" i	s design	ograms (30 or less) is a ated, operation will be a operation START sci	e re-		
Notes							

					Drawing No.
Mod	le Test mode	Function	Program operation (rando	om operation)	5-41
Rand	dom Operation Execute				
Mes	sage			Key Operation	
	T PROG. NO. REPEAT NO. GO -> EXEC CAN-> CANC T RANDOM OF REPEAT 1 PROG. NO.	UTE EL		—GO	
	Operation Procedure	e & Explana	itions	Precautions/Ren	narks
play cou The disp Whe this set To e Pro- at th How pro-	en the <u>GO</u> key is pressed, the "executed, and the designated program rangent is reached. program number being executed will alay line. en the designated count is reached, "Coccurs, press the <u>CAN</u> key to change screen" (5-39). end a random program operation which gram Nos. designated for the random ne "program No. registration" screen evever, the random operation will only gram No. range which begins with prods, operation will be executed up to the screen where the program No.	I be indicate COMPLETEI to the "rando le in progres program ope (5-24). The be executed by the executed program 1 and 1	eated until the designated ed at the "EXECUTE NO." D" will be displayed. When om operation program No. es, press the <u>STOP</u> key. eration must be registered ed through a consecutive is uninterrupted. In other	If a repeat count of "0" is operation will be repeated in this case, the STOP pressed to stop the operation will be executed 1 to program 2. Program 1 10 Program 2 20 Program 3 CLEAR Program 4 40 Program 5 45 :	d without end. key must be ation. s. are desig- ie random op- from program
Notes					

Mod	e Test mode	Function	Present value set		5-42
Item	Selection Screen Operation for Pres	et			
Mess	age			Key Operation	
	T P. VAL S 1 ZERO RE 2 P. VAL C	1 RETURN			
			!		
	Operation Procedure	& Explanal	tions	Precautions/Rema	rks
The lecte	present value setting type ("zero retu d at this screen.	ırn" or "pres	ent value change") is se-		
Sele	cting "zero return":				
[1 RETURN▶ Go to	5-43			
Sele	cting "present value change":				
[2 RETURN Go to	5-44			
					·
					į
— Т	When the number of an item is keye	d in that its	om No will be highlighted		
	when the humber of an item is keye	u in, that he	an No. will be nighlighted.		
Notes					
ž					

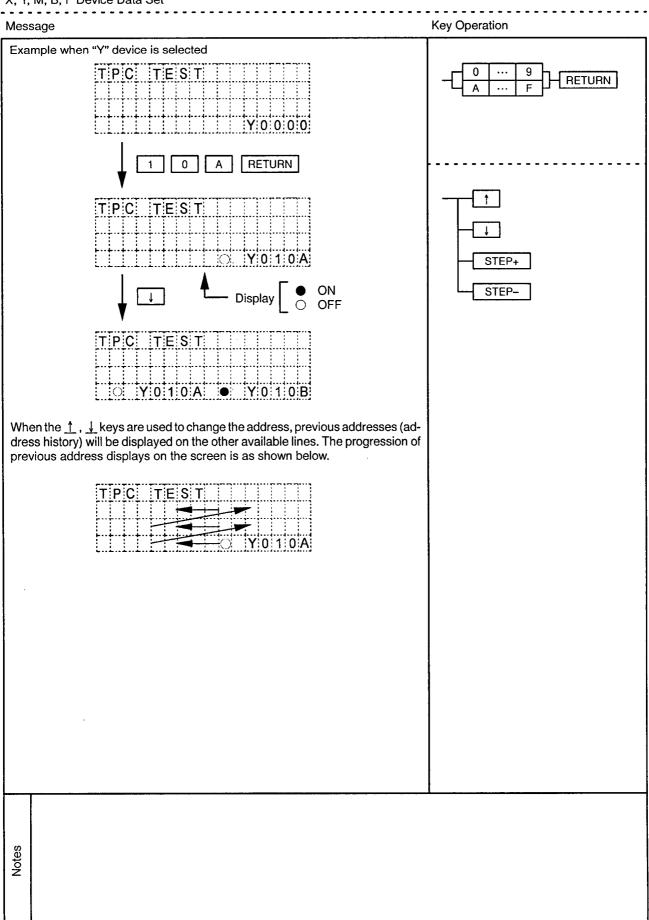
		Drawing No.
Mode Test mode	Function Present value set (zero r	return) 5-43
Home Position Return Screen		
Message	Key O _l	peration
T ZERO RETURN AX. 11 GO -> START	The axis No. is high-lighted when the servo ON status is established. When axis No. is a 2-digit value	AXIS NO. 1 RETURN 3 2 GO STOP
Operation Proced	lure & Explanations	Precautions/Remarks
The axis where a home position return Return operation instructions are also When "zero return" is designated at the screen, the axis number displayed her Changing the axis: AXIS NO. After pressing the AXIS NO. key, design return is desired, then press the RETUTHE range of axis Nos. which can be only type being used. For A273UHCPU (8-axis specs.) For A273UHCPU (32-axis specs.) For A171SCPU START: GO Press the GO key to exect displayed axis No. "EXI home position return opplayed when the operation."	If an axis No. outside the ranges shown at left is designated (by <u>RETURN</u> key),	
STOP: STOP Press the STOP k operation which is	key to stop a home position return in progress.	
Notes		

						Drawing No
Mode	Test mode	Function	Present value se	t (presen	t value change)	5-44
Presen	t Value Change Screen					
Messa	ge			Key Op	eration	
	P. VAL CHAN AX. 11 -21474836 AX. 10	lighted vo ON lished u	exis No. is high- d when the ser- I status is estab- axis No. is git value		AXIS NO. 1 3 2 0 9 RETUR	RETURN
·	Operation F	Procedure & Explana	ations		Precautions/Rem	arks
When value The protioned Change After prochange The rative be For For Enterior Enterior be changed as the change of the change o	resent value which is to be "present value change" is set" screen, axis 1 data we resent value for the display beneath this value where ging the axis: AXIS NO. The pressing the AXIS NO. key be is desired, then press the result of axis Nos. which can be respectively and the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the input field, then enter the red as the new (change) value of the red as the new (change) value of the red as the new (change) value of the red as the new (change) value of the red as the new (change) value of the red as the new (change) value of the red as the new (change) value of the red as the new (change) value of the red as the new (change) value of the red as the new (change) value of the red as the red as the red as the red as the red as the new (change) value of the red as the	s designated at the fill be displayed here red axis No. is indicate the new value is to RETURN A, designate the axis ne RETURN key. In to 8 axes In to 32 axes In to 4 axes In the RETURN key. In the RETURN key. In the designated value.	The present value ve, press the CLEAFly the 12 most rece	is posi- is value ne CPU will then key to nt digits	If an axis No. outside the rat left is designated (by Rithe error message "! M TION" will be displayed at the screen, and the axis N changed.	ETURN key) IIS OPERA the bottom o
Notes						

Mod	e Test mod	ie	Function	PC test		5-45
Oper	ation at Dev	ice Selection Screen for I	PC Test			
Mess	sage				Key Operation	
		T PC TEST 1 X 4 B 2 Y 5 F 3 M 6 D	7 W 8 T 9 C		1 RETURN 9	
		Operation Procedure	& Explanat	tions	Precautions/Rema	rks
Sele	ct the device	Y 2 RE M 3 RE B 4 RE F 5 RE D 6 RE W 7 RE T 8 RE	TURN TURN TURN TURN TURN TURN TURN		The device No. setting rang cording to the CPU type be a device No. outside the range is designated, the sage "! SETTING ERRO displayed at the bottom of and the device No. will cepted.	ing used. If applicable error mes- DR." will be the screen,
Notes						

.		F	DC toot	F 40
Mode	lest mode	Function	PC test	5-46
L		<u> </u>		L

X, Y, M, B, F Device Data Set

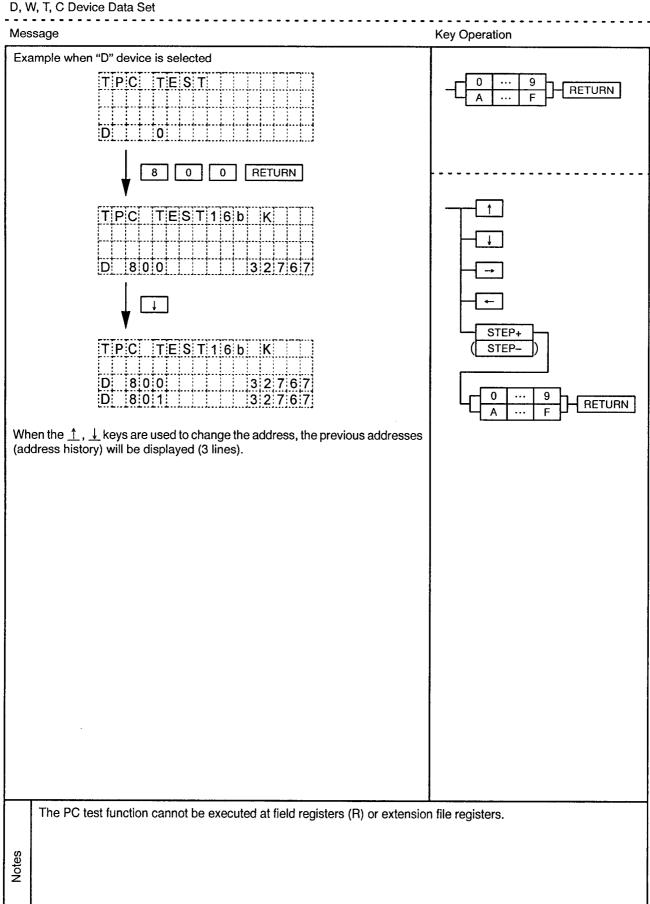


Mode	Test mode	Function	PC test	5-46.1
		L	L	

X, Y, M, B, F Device Data Set

Operation Procedure & Explanations	Precautions/Remarks
After selecting an X, Y, M, B, F device and entering its address, the displayed address can be switched ON and OFF.	
Entering the device address:	
0 9 RETURN	
A hexadecimal address is entered for X, Y, B devices, and a decimaladdress is entered for M, F devices.	
Displaying the previous device address:	
Press the 1 to display the previous device address. If positioned at the first address, the last address will be displayed.	
Displaying the next device address:	
Press the ↓ to display the next device address. If positioned at the last device address, the first device address will be displayed.	
Switching the device ON:	
STEP+ • will be displayed.	
Switching the device OFF:	
STEP- O will be displayed.	
ω	
Notes	

Mode	Test mode	Function	PC test	5-47
		L		i



Mode	Test mode	Function	PC test	5-47.1

D, W, T, C Device Data Set

After selecting a D, W, T, C device and entering its address, a setting value can be designated for the displayed address. Entering the device address: A hexadecimal address is entered for the W device, and a decimaladdress is entered for D, T, C devices. Displaying the previous device address: Press the 1 to display the previous device address. If positioned at the first address, the list address will be displayed. Displaying the next device address: Press the 1 to display the next device address. If positioned at the last device address, the first device address will be displayed. Displaying the next device address: Press the 1 to display the next device address will be displayed. 16/32-bit switching: Press the 1 to display the next device address will also be changed according to the 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed address display format. 16/32-bit switching willoccur at the top of the screen. The currently displayed address will also be changed address display format. When a decimal and hexadecimal address display format. When a decimal and hexadecimal address display format. When a decimal and hexadecimal address display format. When a decimal and hexadecimal format is selected. The is displayed. Enter the setting value: Press the 1 to displayed. Enter the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.			
Entering the device address: □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □		Operation Procedure & Explanations	Precautions/Remarks
A hexadecimal address is entered for the W device, and a decimaladdress is entered for D, T, C devices. Displaying the previous device address: Press the 1 to display the previous device address. If positioned at the first address, the last address will be displayed. Displaying the next device address: Press the 1 to display the next device address will be displayed. Displaying the next device address, the first device address will be displayed. Press the 1 to display the next device address will be displayed. Press the 2 key to switch between a 16-bit and 32-bit address display format. 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed according to the 16/32-bit switching which occurs. Decimal/hexadecimal switching: Press the 2 key to switch between a decimal and hexadecimal address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal format is selected, "It is displayed at the top of the screen. When a hexadecimal format is selected, "It is displayed at the top of the screen. When a hexadecimal format is selected, "It is displayed at the top of the screen. When a hexadecimal format is selected, "It is displayed at the top of the screen. When a hexadecimal format is selected, "It is displayed at the top of the screen. When a hexadecimal format is selected, "It is displayed at the top of the screen. When a hexadecimal format is selected, "It is displayed at the top of the screen. When a hexadecimal format is selected, "It is displayed at the top of the screen. When a hexadecimal format is selected, "It is displayed at the top of the screen." When the STEP+ key is pressed, the cursor will appear at the bottom right of the screen for the setting value in put. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.			
A hexadecimal address is entered for the W device, and a decimaladdress is entered for D, T, C devices. Displaying the previous device address: Press the 1 to display the previous device address. If positioned at the first address, the last address will be displayed. Displaying the next device address: Press the 1 to display the next device address. If positioned at the last device address, the first device address will be displayed. 16/32-bit switching: Press the 2 key to switch between a 16-bit and 32-bit address display format. 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed according to the 16/32-bit switching which occurs. Decimal/hexadecimal switching: Press the 2 key to switch between a decimal and hexadecimal address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed. Enter the setting value: STEP+ (a) 9 RETURN When the STEP+ key is pressed, the cursor will appear at the bottom right of the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	Entering the	device address:	
entered for D, T, C devices. Displaying the previous device address: ☐ Press the _1 to display the previous device address. If positioned at the first address, the last address will be displayed. Displaying the next device address: ☐ Press the _1 to display the next device address. If positioned at the last device address, the first device address will be displayed. 16/32-bit switching: ☐ Press the _2 key to switch between a 16-bit and 32-bit address display format. 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed according to the 16/32-bit switching which occurs. Decimal/hexadecimal switching: ☐ Press the _2 key to switch between a decimal and hexadecimal address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed. Enter the setting value: ☐ STEP+ ☐ A F PRETURN When the STEP+ key is pressed, the cursor will appear at the bottom right of the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	0 A	9 RETURN	
Press the 1 to display the previous device address. If positioned at the first address, the last address will be displayed. Displaying the next device address: Press the 1 to display the next device address. If positioned at the last device address, the first device address will be displayed. 16/32-bit switching: Press the 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed according to the 16/32-bit switching which occurs. Decimal/hexadecimal switching: Press the 16/32-bit switching which occurs. Press the 16/32-bit switching which occurs. Decimal/hexadecimal switching: Press the 16/32-bit switching which occurs. Press the 16/32-bit and 32-bit address will also be changed according to which in the special format is fixed. (16/32-bit and decimal/hexadecimal switching is ignored.) Moreover, only decimal format is fixed. (16/32-bit and decimal/hexadecimal switching is ignored.) Moreover, only decimal format is fixed. (16/32-bit and decimal/hexadecimal switching which occurs. Press the 16/32-bit and 32-bit address will also be changed according to which occurs. Press the 16/32-bit and 32-bit and 32-bit address will also be changed according to which			
tioned at the first address, the last address will be displayed. Displaying the next device address: Press the to display the next device address. If positioned at the last device address, the first device address will be displayed. 16/32-bit switching: Press the key to switch between a 16-bit and 32-bit address display format. 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed according to the 16/32-bit switching which occurs. Decimal/hexadecimal switching: Press the key to switch between a decimal and hexadecimal address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed. Enter the setting value: STEP+ To my Tand C devices, the 16-bit, decimal format is fixed. (16/32-bit and decimal/hexadecimal switching is ignored.) Moreover, only decimal inputs (0 to 9) are possible at these devices. For the T and C devices, the 16-bit, decimal format is fixed. (16/32-bit and decimal/hexadecimal switching is ignored.) Moreover, only decimal inputs (0 to 9) are possible at these devices. Enter the setting value: STEP+ STEP- Nem To my Tand C devices, the 16-bit, decimal format is fixed. (16/32-bit and decimal/hexadecimal inputs (0 to 9) are possible at these devices. When the STEP₂ key is pressed, the cursor will appear at the bottom right of the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	Displaying th	ne previous device address:	
Press the the last device address, the first device address will be displayed. 16/32-bit switching: Press the key to switch between a 16-bit and 32-bit address display format. 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed according to the 16/32-bit switching which occurs. Decimal/hexadecimal switching: Press the key to switch between a decimal and hexadecimal address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed. Enter the setting value: STEP+ A RETURN When the STEP+ key is pressed, the cursor will appear at the bottom right of the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	↑ ↑		
the last device address, the first device address will be displayed. 16/32-bit switching: Press the — key to switch between a 16-bit and 32-bit address display format. 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed according to the 16/32-bit switching which occurs. Decimal/hexadecimal switching: Press the — key to switch between a decimal and hexadecimal address display format. When a decimal format is selected, "t" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed. Enter the setting value: STEP+ O PRETURN When the STEP+ key is pressed, the cursor will appear at the bottom right of the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	Displaying th	ne next device address:	
Press the → key to switch between a 16-bit and 32-bit address display format. 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed according to the 16/32-bit switching which occurs. Decimal/hexadecimal switching: Press the → key to switch between a decimal and hexadecimal address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed. Enter the setting value: STEP+ 0 9 RETURN STEP- A F RETURN When the STEP+ key is pressed, the cursor will appear at the bottom right of the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	1	the last device address, the first device address will be dis-	
display format. 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed according to the 16/32-bit switching which occurs. Decimal/hexadecimal switching: Press the + key to switch between a decimal and hexadecimal address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed. Enter the setting value: STEP+	16/32-bit sw	itching:	
Decimal/hexadecimal switching: Press the — key to switch between a decimal and hexadecimal address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed. Enter the setting value: STEP+ STEP+ A F When the STEP+ key is pressed, the cursor will appear at the bottom right of the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	→	display format. 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed	decimal format is fixed. (16/32-bit and decimal/hexadecimal switching is ignored.) Moreover, only decimal inputs
address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed. Enter the setting value: STEP+ STEP- A F When the STEP+ key is pressed, the cursor will appear at the bottom right of the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	Decimal/hex	adecimal switching:	
When the STEP+ key is pressed, the cursor will appear at the bottom right of the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	-	address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal for-	
When the STEP+ key is pressed, the cursor will appear at the bottom right of the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	Enter the se	tting value:	
the screen for the setting value input. Enter the desired setting value in accordance with the selected mode (decimal/hexadecimal) and bit length (16/32), the press the RETURN key.	<u> </u>	 	
Notes	the screen for dance with the	or the setting value input. Enter the desired setting value in accor- ne selected mode (decimal/hexadecimal) and bit length (16/32), the	
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l Control of the Cont			

Mode	Test mode	Function	Servo ON		5-48			
Servo (Servo ON/OFF Function Selection Screen Operation							
Messa	Message Key Operation							
	T SERVO C 1ALL AX. 2EACH AX	ON / (OFF	1 RETURN				
	Operation Procedure	a P. Evolope	tiono.	Precautions/Rema	ul so			
Select	the desired ON/OFF function as for	Frecautions/hema	rks					
	es servo ON/OFF:	,o.,.						
I —		5-49						
Individ	ual axis servo ON/OFF:	70 40						
l _		5-50						
Notes								

	1	<u>1</u>		Drawing No
Mode	Test mode	Function	All-axes servo ON	5-49
All-Axe	s Servo ON/OFF Execute Scre	en		
Messag	де			Key Operation
	T ALL AX. ON ALL AX. SERV REQUEST (M200	O ON ACP. 9) ○-►	For A171SCPU and A273UHCPU (8-axis specs.) For A273UHCPU (32-axis specs.)	STEP+ STEP-
	Operation Proced	lure & Explana	tions	Precautions/Remarks
All-axe	es servo ON: STEP+ • is displayed at sets servo OFF: STEP- • is displayed at sets servo OFF:			The device No. display varies according to the CPU type being used.
Notes				

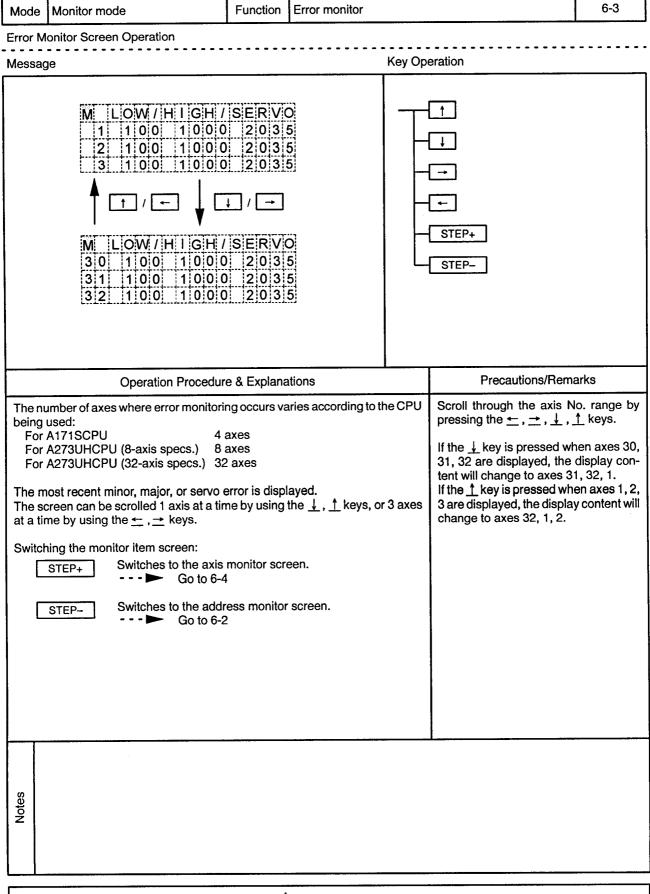
Mode Test mode	Function	Individual servo ON		5-50
Individual Servo ON/OFF E	xecute Screen			<u> </u>
Message			Key Operation	
For A273UHCPU	EACH AX ON 1 AX (M161 2 AX (M163 3 AX (M165 4 AX (M167 EACH AX NO 1 AX (X000 2 AX (X001 3 AX (X001	5) O	STEP+	_
(8-axis specs.)	4 A X . (X 0 0 3 5 A X . (X 0 0 4 6 A X . (X 0 0 5 7 A X . (X 0 0 6 8 A X . (X 0 0 7 E A C H A X . N O 1 A X . (M 2 4 1	F) 0 F) 0 F) 0 F) 0		
For A273UHCPU (32-axis specs.)	2 A X . (M2 4 3 3 A X . (M2 4 5 4 A X . (M2 4 7 2 9 A X . (M2 9 7 3 0 A X . (M2 9 9 3 1 A X . (M3 0 1 3 2 A X . (M3 0 3	5)		
·	ation Procedure & Explana	ations	Precautions/Rem	
Press the 1 Switching the servo ON a STEP+ Move	key to move the "#" mark key to move the "#" mark t a given axis: the "#" mark to the axis whed ON, then press the S	k upward. here the servo is to be	The device No. display ving to the CPU type being	
	the "#" mark to the axis whed OFF, then press the <u>S</u>			
Notes	, a , a , a , a , a , a , a , a , a , a			

Drawing No.

 Mode
 Monitor mode
 Function
 Monitor item selection
 6-1

Monitor Item Screen Switching

Precautions/Remarks Operation Procedure & Explanations The type of monitoring can be selected at the monitor item selection screen. Moreover, the STEP+ and STEP- keys can be used to switch from one monitor item screen to another. The screen switching progression in response to STEP+ and STEP- key operation is shown below. STEP-STEP+ The address monitor screen is the first Address monitor screen screen to be displayed when the monitor mode is accessed. STEP-STEP+ Scroll monitor screen (error) Error monitor screen STEP-STEP-STEP+ STEP+ Scroll monitor screen Axis monitor screen (program) STEP-STEP+ STEP+ STEP-Common monitor screen Servo monitor screen STEP+ STEP-STEP+ STEP-Specified monitor screen Torque trace screen STEP+ STEP-Notes



↑ CAUTION

⚠ If an error occurs, check the error contents and remedy the error as described in this manual. Some errors can result in unpredicted machine movements.

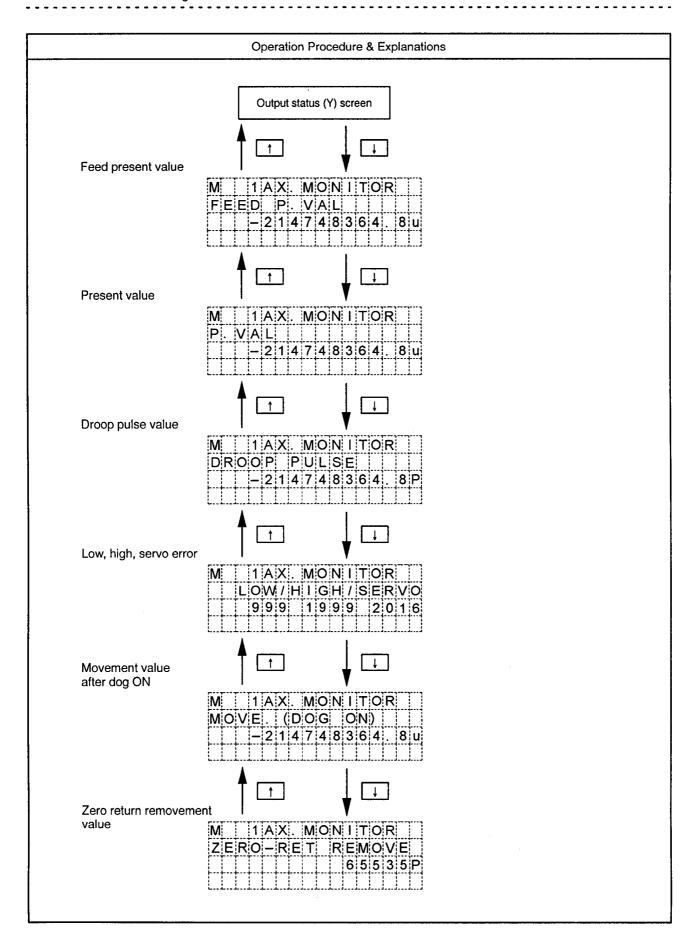
6.3	Axis Monitor					Drawing No.
Mod	de Monitor mode	Function	Axis monitor	- <u>-</u>		6-4
Axis	Monitor Screen Operation					
Mes	sage			Key Op	eration	
	M 3 2 A X . MON I FEED P. VAL - 2 1 4 7 4 8 3 M 3 2 A X . MON I P. VAL - 2 1 4 7 4 8 3	6 4 . 8 i			AXIS NO. 1 3 2 1 STEP+ STEP-	RETURN
	Operation Procedure	& Explana	tions	I	Precautions/Rema	ırks
F F		xes xes axes	-		The scrolling sequence items is shown below. Presto scroll downward, and the scroll upward. Feed present value Present value Droop pulse value Low, high, servo error Movement value after do Zero return removement Execution program No. M-code & torque restrict Movement value change Present value at STOP i Change value of present Speed change value JOG speed setting value Input status Output status External signal CHANGE torque limit control	es the ↓ key he ↑ key to he ↑
Notes						

Mode	Monitor mode	Function	Axis monitor	6-4.1
		İ	I	I

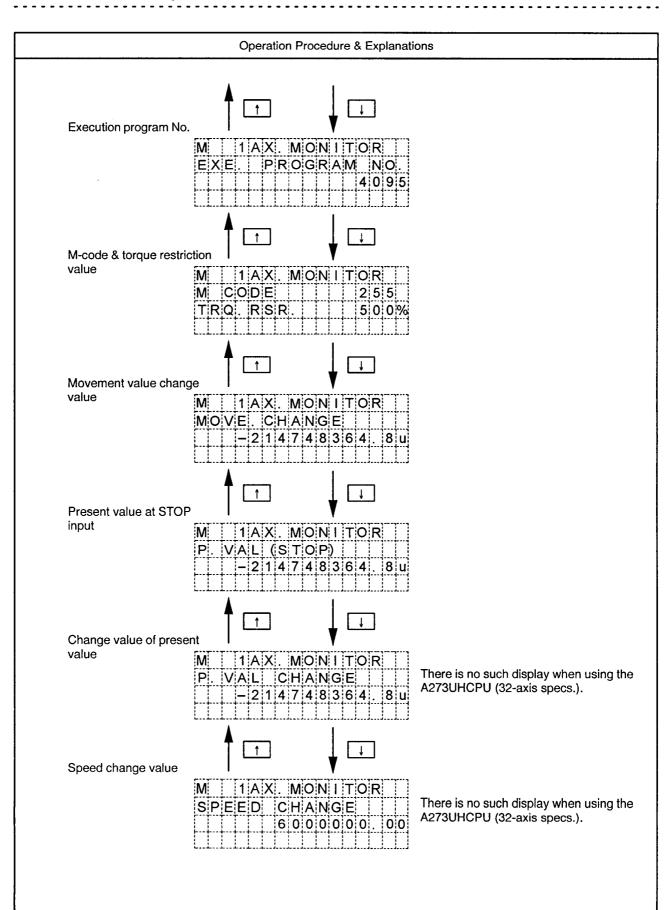
Axis Monitor Screen Operation

Operation Procedure & Explanations Precautions/Remarks If an axis No. outside the applicable Changing the monitored axis: range (monitoring impossible) is designated by a <u>RETURN</u> key input, the er-AXIS NO. RETURN ror message "! MIS OPERATION" will be displayed at the bottom of the screen, and the displayed axis No. will Press the AXIS NO. key, enter the axis No. where monitoring is desired, then not be changed. press the RETURN key. The monitor item will remain the same, but the monitored axis will be changed. Changing the monitor item: Press the STEP+ key to switch to the common monitor STEP+ screen. ---Go to 6-6 Press the STEP- key to switch to the error monitor STEPscreen. Go to 6-3

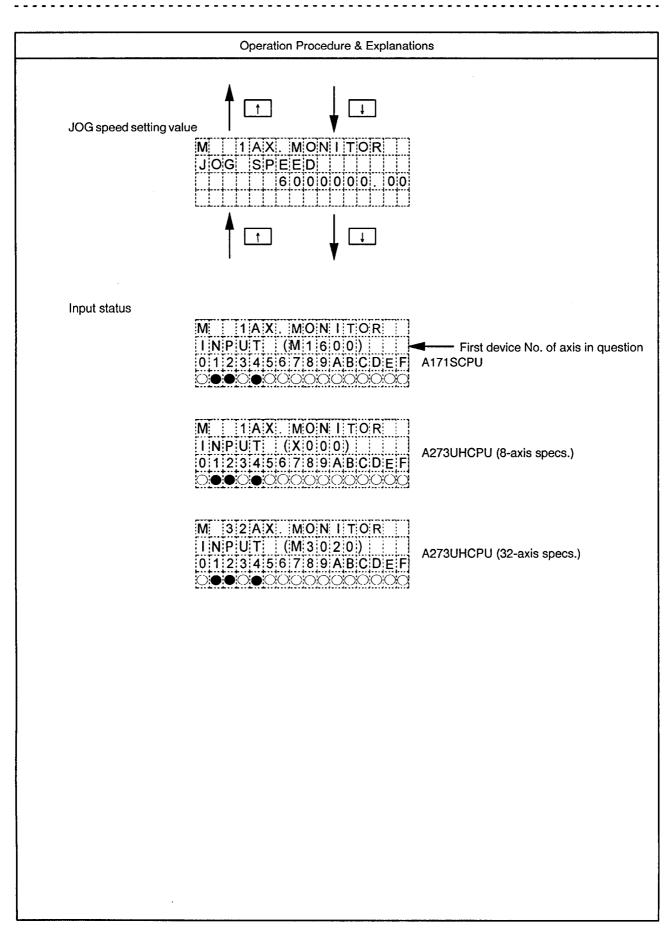
Mode Monitor mode Function Axis monitor 6-4.2	
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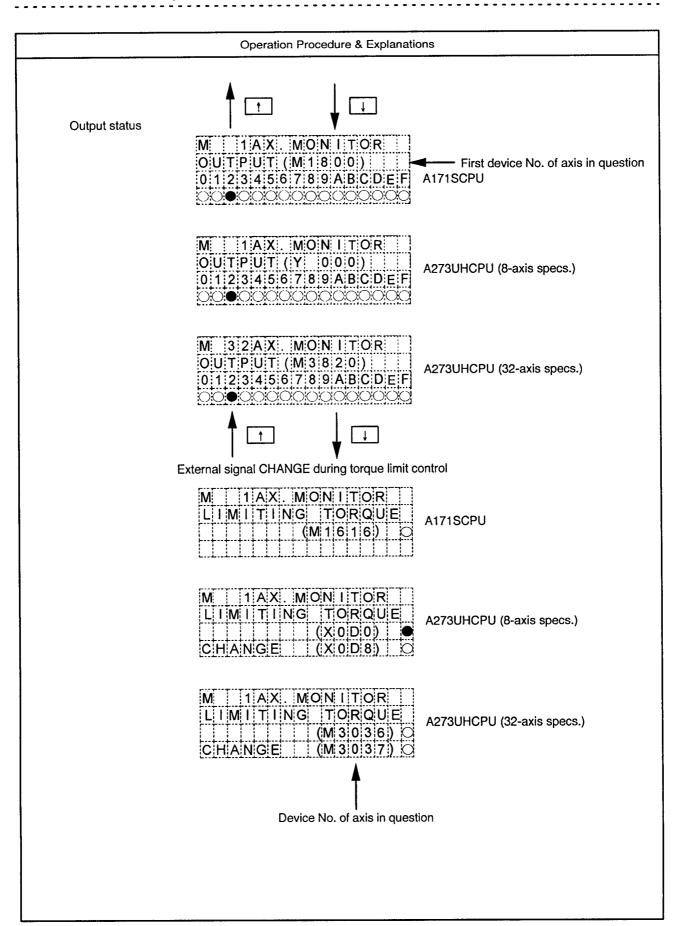
Mode Monitor mode Function Axis monitor	6-4.3
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Mode Monitor mode Function Axis monitor	6-4.4

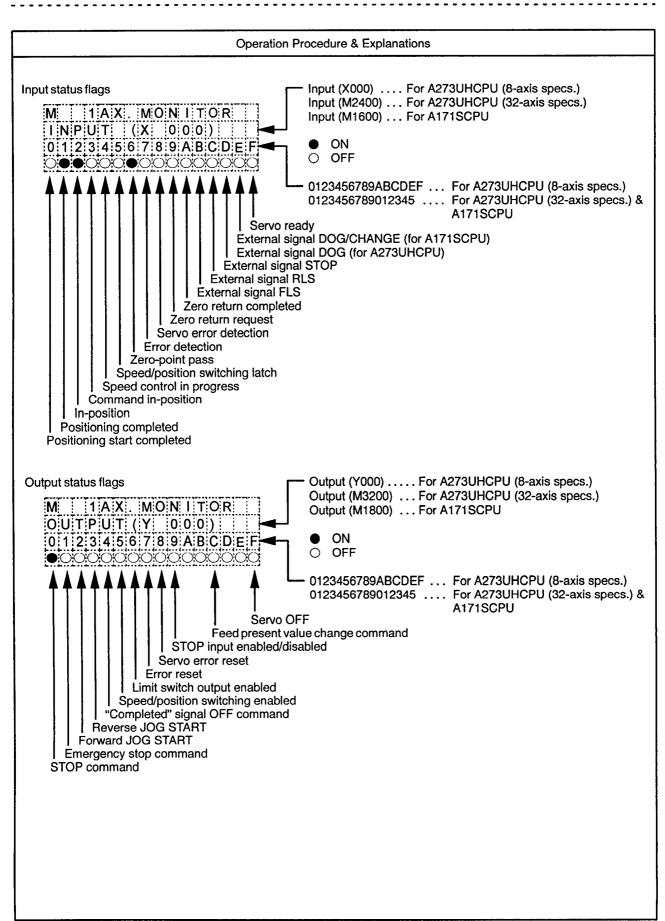


Mode	Monitor mode	Function	Axis monitor	6-4.5



Mode	Monitor mode	Function	Axis monitor	6-5
Mode	Monitor mode	Function	Axis monitor	6-5

Input Status & Output Status Flags



Notes

Mode	Monitor mode	Function	Common monitor	6-6.1
	<u> </u>			

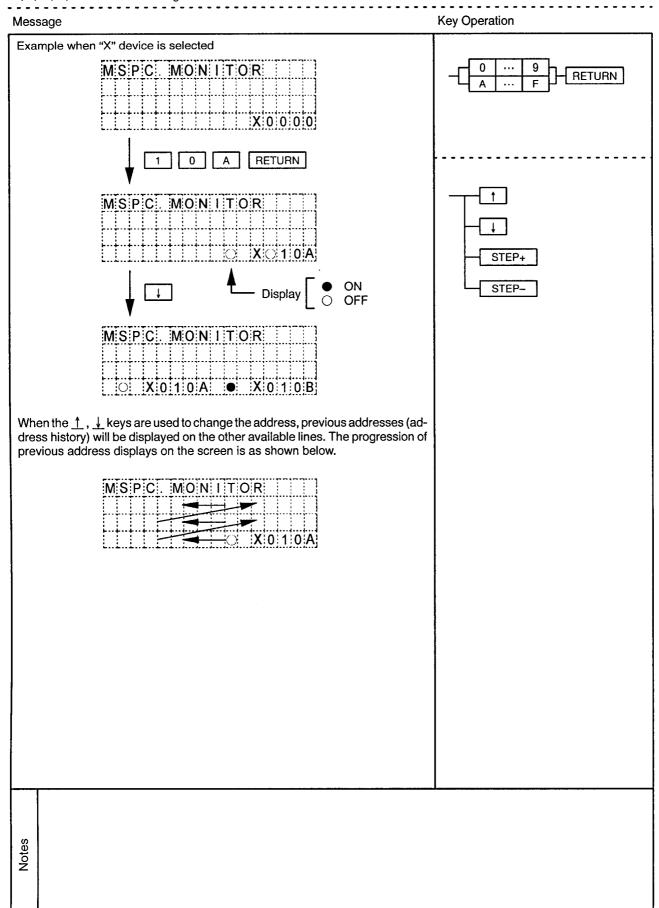
Common Monitor Screen Operation

	Operation Procedure & Explanations	Precautions/Remarks
Use the ↓, ↑ ke flag ON/OFF mor	A A273UHCPU (8-axis specs.) Bys to switch between the 2 common monitor screens. START itoring occurs at screen 1, and PC READY, all-axes servo ON all-axes servo ON request ON/OFF monitoring occurs at	The device No. display varies according to the CPU type being used.
START accept fla 1, and the START at screen 2. The PC READY,	(32-axis specs.) eys to switch between the 3 common monitor screens. The ag ON/OFF statuses for axes 1 to 16 are monitored at screen accept flag ON/OFF statuses for axes 17 to 32 are monitored all-axes servo ON accept flag, and all-axes servo ON request are monitored at screen 3.	
Changing the mo	onitor item:	
STEP+	Press the <u>STEP+</u> key to switch to the specified monitor screen. Go to 6-7	
STEP-	Press the <u>STEP</u> key to switch to the axis monitor screen. Go to 6-4	
:		
·		<u> </u>
Notes		

Mode	Monitor mode	Function	Specified monitor			6-7
Operati	ion at Specified Monitor Device S	election Scr	een			
Messag	ge			Key C	Operation	· · · · · ·
	MSPC MONI 1 X 4 B 2 Y 5 F 3 M 6 D	TOR 7 W 8 T 9 C			1 RETURN : 9	
	Operation Procedu	re & Explana	itions		Precautions/Rema	rks
В	Y 2 [1] Bit data	RETURN RETURN RETURN RETURN RETURN RETURN RETURN RETURN RETURN			The device No. setting rang cording to the CPU type be a device No. outside the range is designated, the sage "! SETTING ERR be displayed at the bott screen, and the device No accepted.	ing used. If applicable error mes- OR " will tom of the
Notes						

Mode	Monitor mode	Function	Specified monitor	6-8

X, Y, M, B, F Device Monitoring



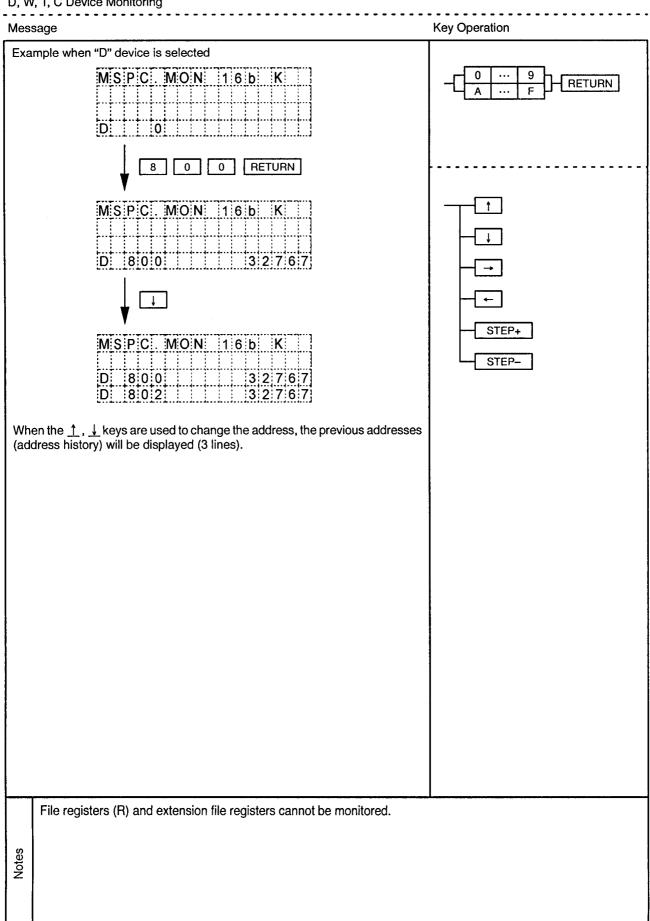
Mode M	Nonitor mode	Function	Specified monitor	6-8.1
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X, Y, M, B, F Device Monitoring

Operation Procedure & Explanations	Precautions/Remarks					
After selecting an X, Y, M, B, F device and entering its address, the ON/OFF status of the address can be monitored.						
Entering the device address:						
0 9 A F RETURN						
A hexadecimal address is entered for X, Y, B devices, and a decimaladdress is entered for M, F devices.						
Monitoring the previous device address:						
Press the † to monitor the previous device address. If positioned at the first address, the last address (address of highest device No.) will be monitored.						
Monitoring the next device address:						
Press the \(\frac{1}{2}\) to monitor the next device address. If positioned at the last device address (address of highest device No.), the first device address will be monitored.						
Changing the monitor item:						
STEP+ Press the STEP+ key to switch to the torque trace screen. Go to 6-10						
STEP- Press the <u>STEP-</u> key to switch to the common monitor screen ■ Go to 6-6						
Notes						
2						

	and the second s				
Mode	Monitor mode	Function	Specified monitor	6-9	

D, W, T, C Device Monitoring



Mode	Monitor mode		Specified monitor	6-9.1
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D, W, T, C Device Monitoring

Operation Procedure & Explanations	Precautions/Remarks
After selecting the device type (D, W, T, C) and entering the device address, the device data will be monitored.	
Entering the device address:	
O 9 RETURN	
A hexadecimal address is entered for W devices, and a decimal address is entered for D, T, C devices.	
Monitoring the previous device address:	
Press the <u>1</u> to monitor the previous device address. If positioned at the first address, the last address will be monitored.	
Monitoring the next device address:	
Press the <u>\(\price \)</u> to monitor the next device address. If positioned at the last device address, the first device address will be monitored.	
16/32-bit switching:	
Press the → key to switch between a 16-bit and 32-bit address display format. 16/32-bit switching will occur at the top of the screen. The currently displayed address will also be changed according to the 16/32-bit switching which occurs.	For the T and C devices, the 16-bit, decimal format is fixed. (16/32-bit and decimal/hexadecimal switching is ignored.)
Decimal/hexadecimal switching:	
Press the <u>key</u> to switch between a decimal and hexadecimal address display format. When a decimal format is selected, "K" is displayed at the top of the screen. When a hexadecimal format is selected, "H" is displayed. Also used to switch between decimal and hexadecimal input for address content set values.	
Changing the monitor item:	
STEP+ Press the <u>STEP+</u> key to switch to the torque trace screen ► Go to 6-10	
STEP- Press the <u>STEP-</u> key to switch to the common monitor screen. Go to 6-6	
Notes	
ĬŽ	

	Torque trace	1				Drawing No.
Mode	Monitor mode	Function	Torque trace			6-10
Torqu	e Trace Screen Operation					
Mess	age		<u> </u>	Key Op	eration	
	M TRQ. TRC GO TRACING GO TRACING GO TRACING GO TRACING F. TRQ.	1 A X C E E N 3 5 S E 8 0 %	D		AXIS NO. 1 GO 3 2 STEP+ STEP-	RETURN
	Operation Broadur	o ⁹ Evolono	tions		Proceutions/Pom	orko
Pres desin The to the Fo		No. where the function is axes axes	ne torque trace funct		Precautions/Rem If an axis No. outside the ra at left is designated (by RE the error message "! SE ROR "will be displayed a of the screen, and the axis be changed.	anges shown ETURN key), ETTING ER- at the bottom
Notes						

Drawing No.

Mode	Monitor mode	Function	Torque trace	6-10.1

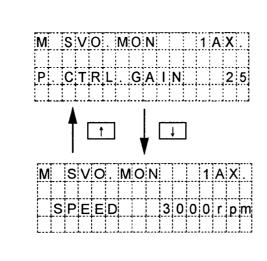
Torque Trace Screen Operation

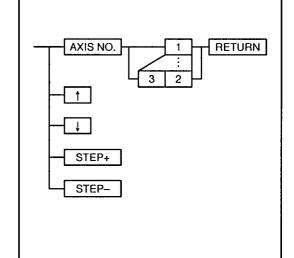
	Operation Procedure & Explanations	Precautions/Remarks
race START	& STOP:	
, لنتا ا	Press the <u>GO</u> key to start the trace function. "TRACING" will be displayed. Press the <u>GO</u> key again to stop the trace function. The trace results will then be displayed.	
Changing the	monitor item:	
STEP+	Press the <u>STEP+</u> key to switch to the servo monitor screen Go to 6-11	
STEP-	Press the <u>STEP</u> key to switch to the specified monitor screen. ■ Go to 6-7	
·		
S I		
Notes		

Mode	Monitor mode	Function	Servo monitor	6-11

Servo Monitor Screen Operation







Operation Procedure & Explanations

Precautions/Remarks

The scrolling sequence for servo data

monitor items is shown below. Use the

 \downarrow key to scroll downward, and the \uparrow

Servo monitoring is possible for up to 32 axes, with 3 screens for monitoring servo data, 2-port memory, and address designation. Six types of data can be monitored in servo data monitoring, and the $\underline{\downarrow}$, $\underline{\uparrow}$ keys are used to scroll among them.

The servo data monitor screen is the first screen to be displayed when the servo monitor function is selected.

Position control gain

key to scroll upward.

Motor speed

Motor current

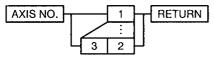
Regeneration level

Servo alarm

Error parameter No.

--- Go to 6-12

Changing the monitored axis:



Press the <u>AXIS NO.</u> key, enter the axis No. where monitoring is desired, then press the <u>RETURN</u> key. The monitor item will remain the same, but the monitored axis will be changed.

The range of axis Nos. which can be designated varies according to the CPU type being used.

For A273UHCPU (8-axis specs.) 11 For A273UHCPU (32-axis specs.) 11

1 to 8 axes

1 to 32 axes

For A171SCPU 1 to 4 axes

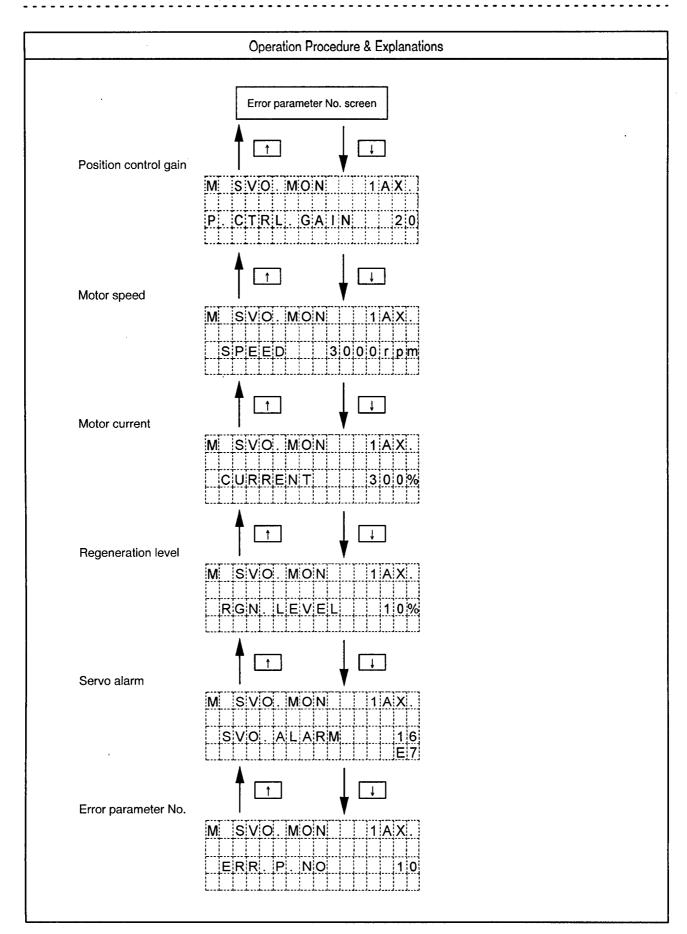
The servo data monitoring function takes 5 data readings, with the average value being displayed.

If an axis No. outside the range shown at left is designated (by <u>RETURN</u> key), the error message "! SETTING ERROR" will be displayed at the bottom of the screen, and the axis No. will not be changed.

Notes

Mode Monitor mode Fu	nction Servo monitor (servo data monitor)	6-12
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Servo Data Monitor Screen Scrolling



Drawing No. **Function** Scroll monitor (program) 6-13 Mode Monitor mode Scroll Monitor (Program) Screen Operation **Key Operation** Message Program No., SCR.MON. (PROG) servo instruction Axes used STEP+ STEP-SCR. MON. (PROG) 1 SCR. MON. (PROG) Precautions/Remarks Operation Procedure & Explanations If the ↓ key is pressed at the No.F dis-"No.1" is the first screen to be displayed when the scroll monitor function is seplay, No.1 will be displayed. If the 1 lected. Use the $\underline{\downarrow}$ key to switch to the next No., and the $\underline{\uparrow}$ key to switch to the key is pressed at the No.1 display, No.F previous No. will be displayed. As the execution program display begins from No.1, the execution programs are set from No.1 up when the number of execution programs is fewer than 15. JOG operation is designated at the scroll monitor. Notes

Drawing No.

_					
ſ	Mode	Monitor mode	Function	Scroll monitor (program)	6-13.1
-1					

Scroll Monitor (Program) Screen Operation

	Operation Procedure & Explanations	Precautions/Remarks
hanging the mo	nitor item:	
STEP+	Press the <u>STEP+</u> key to switch to the scroll monitor (error) screen. Go to 6-14	
STEP-	Press the <u>STEP</u> key to switch to the servo monitor screen Go to 6-11	
SOC		

6.9	Scroll Monitor (Error)				Drawing No.
Mode	Monitor mode	Function	Scroll monitor (error)		6-14
Scroll	Monitor (Error) Screen Operation				
Mess	age			Key Operation	
	2 SVO. P 2 0 2 0 3 4 SVO. P 4 9	(ERR 1 1 1 2 0 2 0 3 2 1 0 4 9	0 0 3 5 0 0 0 0 3 5 0 0 0 1	STEP+ STEP-	
ļ	Operation Procedu	re & Explana	ations	Precautions/Rem	narks
15 e and form Erro func As t	scroll monitor (error) function display rrors) in order, beginning from the deterror code. Information for the old ation for the most recent error is display to the interest of the execution program display beging set from No.1 up when the number of	oldest error: est error is of splayed at N be displayed s to scroll to as from No.1	error type, error axis No., displayed at No.1, and in-lo.F. ed when the scroll monitor other Nos. I, the execution programs	High level error Servo error	LOW HIGH SVO SVO.P e Nos.1, 2, 3 displayed. If
Notes					

Drawing No.

Mode	Monitor mode	Function	Scroll monitor (error)	6-14.1

Scroll Monitor (Error) Screen Operation

	Operation Procedure & Explanations	Precautions/Remarks
Changing the mo	nitor item:	
STEP+	Press the STEP+ key to switch to the address monitor screen Go to 6-2	
STEP-	Press the STEP– key to switch to the scroll monitor (program) screen. ► Go to 6-13	
o de la companya de l		
-		

7. DATA SETTING MODE

Mode	Data setting mode	Function	Data setting item selectio	n	7-1
Setting	Item Selection Screen After Enter	ing Data Se	tting Mode		k
Messag	ge			Key Operation	
	D DATA SE 1AX. DATA 2P. BLOCK 3SUB. FUN	1 RE 2 3	TURN		
	Operation Procedure	e & Explana	tions	Precautions/Rema	arks
The da	ata setting item is selected at this s	creen.			
Selecti	ing "axis data setting":				
	1 RETURN Go to	7-2			
Selecti	ing "parameter block setting":				
	2 RETURN Go to	7-7			
Selecti	ing "auxiliary function setting":				
3 RETURN► Go to 7-9				·	
Notes	/hen the number of an item is keye	ed in, that ite	em number will be highligh	ted.	

⚠ CAUTION

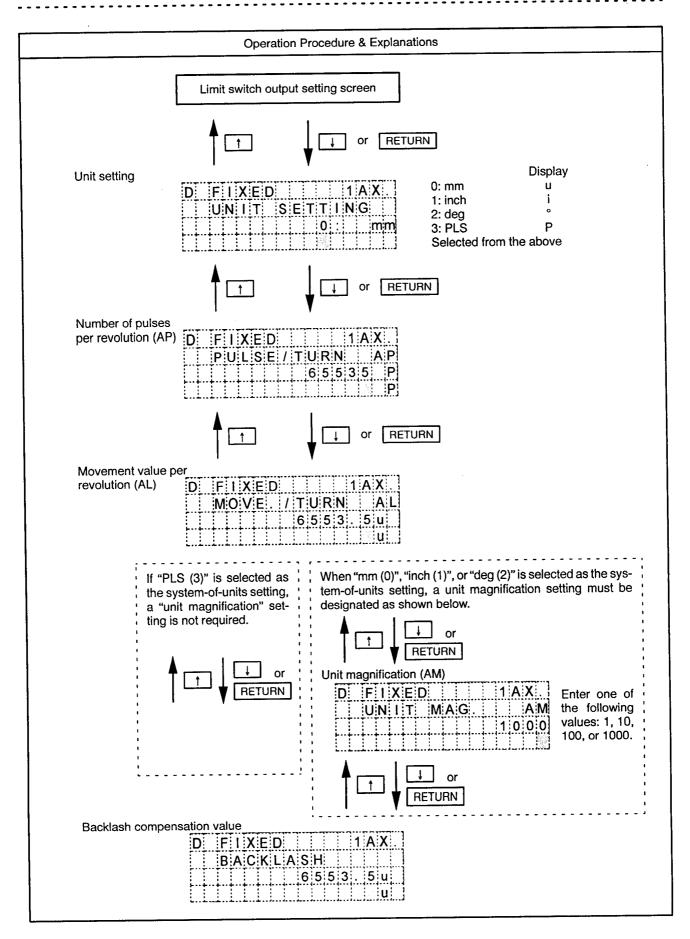
A Parameter settings which are appropriate for the system's application should be designated. Incorrect settings could disable the protective function.

Mode	Data setting mode	Function	Axis data setting	7-2.1
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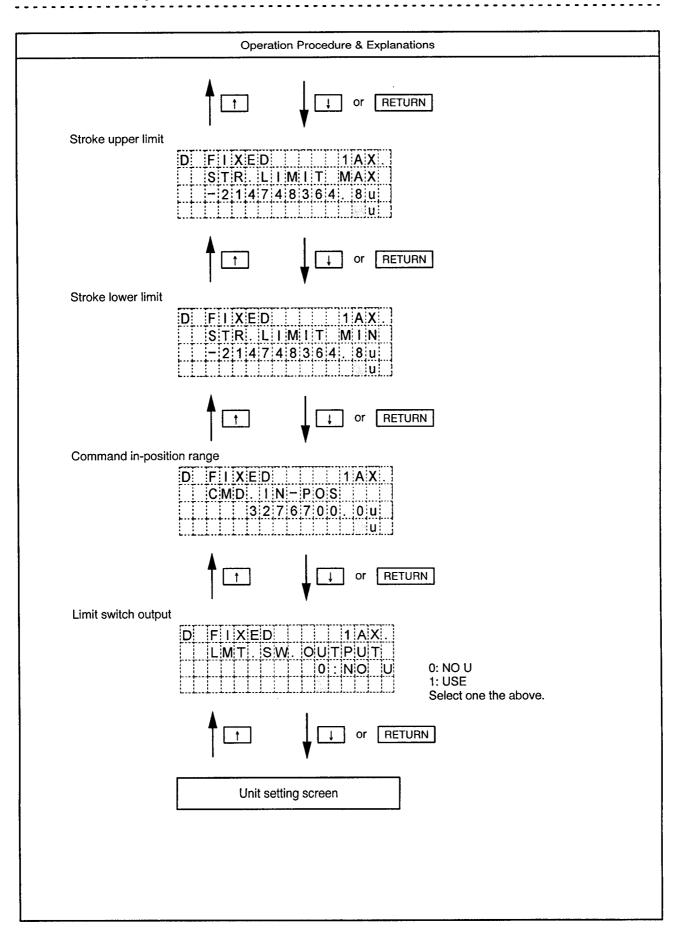
Axis No. & Item Selection Screen Operation (for Axis Data Setting)

Operation Procedure & Explanations	Precautions/Remarks
Selecting the axis data item:	
To select "fixed parameter setting":	
1 RETURN▶ Go to 7-3	
To select "servo parameter setting":	
2 RETURN For A273UH ADU, see 7-4	
For A273UH/A171S MR-H-B, see 7-4.3	
For A273UH/A171S MR-J-B, see 7-4.10	
To select "zero return data setting":	
3 RETURN ▶ Go to 7-5	
To select "JOG data setting":	
4 RETURN▶ Go to 7-6	
8	
Notes Cotes	

Mode Data setting mode Function Axis data setting (fixed parameter) 7-3



Mode	Data setting mode	Function	Axis data setting (fixed parameter)	7-3.1

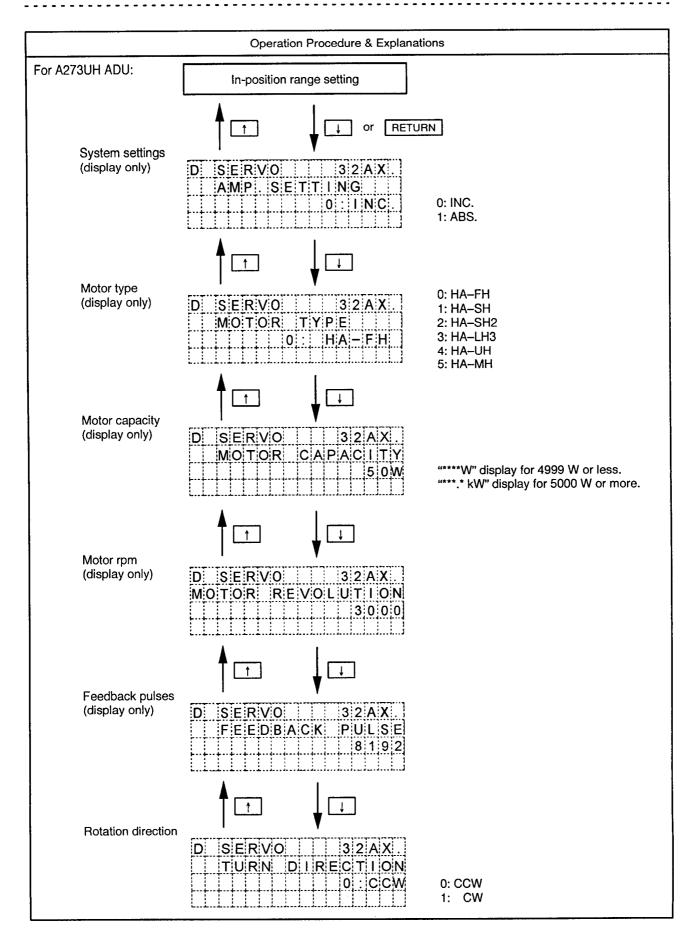


1					
	Mode	Data setting mode	Function	Axis data setting (fixed parameter)	7-3.2

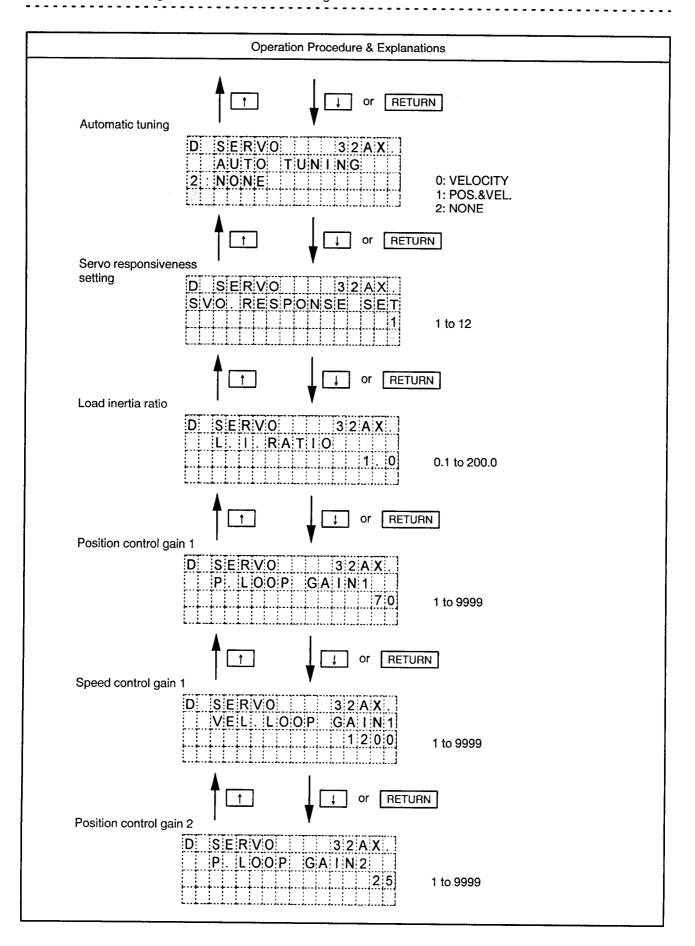
Fixed Parameter Data Input Ranges

System-of-units	шш	inch	бәр	PLS
Number of pulses per revolution (AP)		1 to 65535	535	
Travel value per revolution (AL)	0.1 to 6553.5	0.00001 to 0.65535	0.00001 to 0.65535	1 to 65535
Unit magnification (AM)	1:×1 10	10: x 10 100: x 100	1000: x 1000	
Backlash compensation amount	0.0 to 6553.5	0.00000 to 0.65535	0.00000 to 0.65535	0 to 255
Stroke upper limit	-214748364.8 to 214748364.7	-21474.83648 to 21474.83647	0.00000 to 359.99999	-2147483648 to 2147483647
Stroke lower limit	-214748364.8 to 214748364.7	-21474.83648 to 21474.83647	0.00000 to 359.99999	-2147483648 to 2147483647
Command in-position range	0.1 to 214748364.7	0.00001 to 21474.83647	0.00001 to 359.99999	1 to 2147483647
Limit switch output		0: Unused	1: Used	

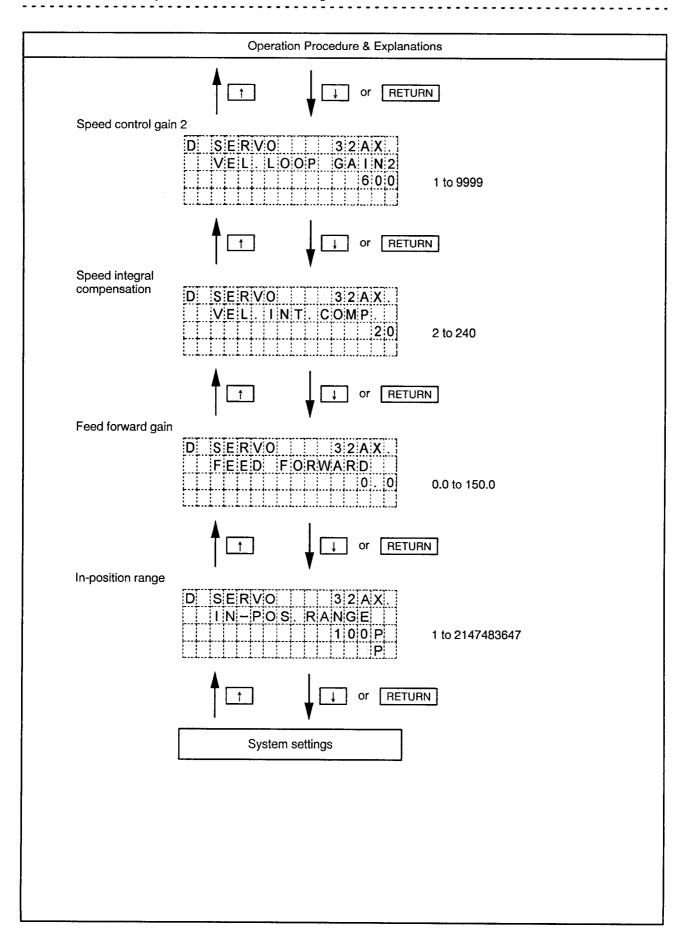
	T	· · · · · · · · · · · · · · · · · · ·		
Mode	Data setting mode	Function	Axis data setting (servo parameters) (for ADU)	7-4



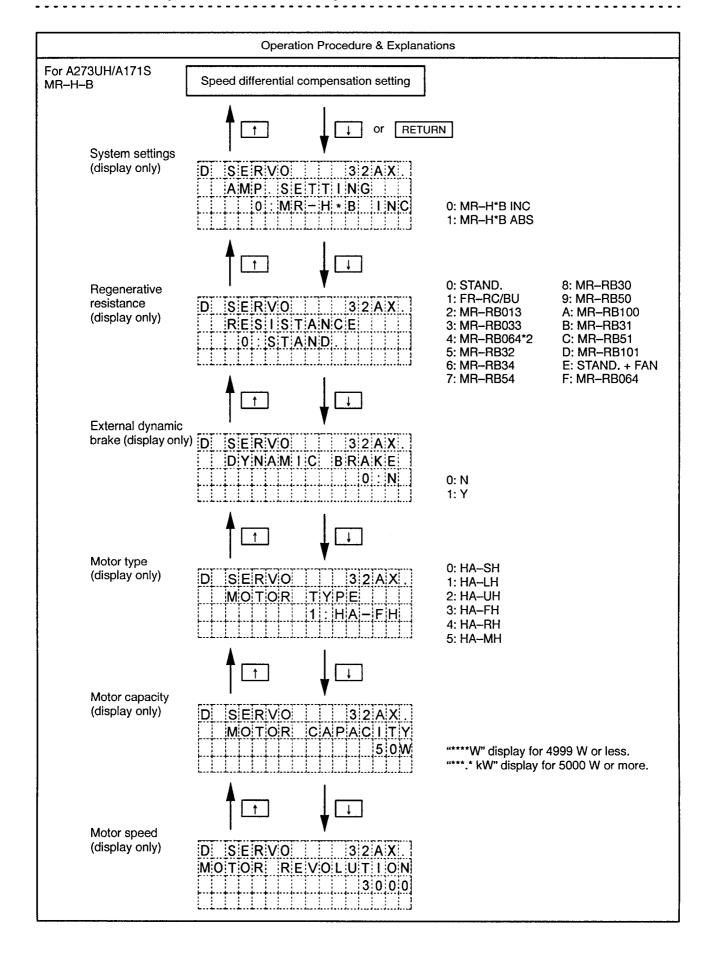
Mode Data setting mode Function Axis data setting (servo parameters) (for ADU) 7-4.1



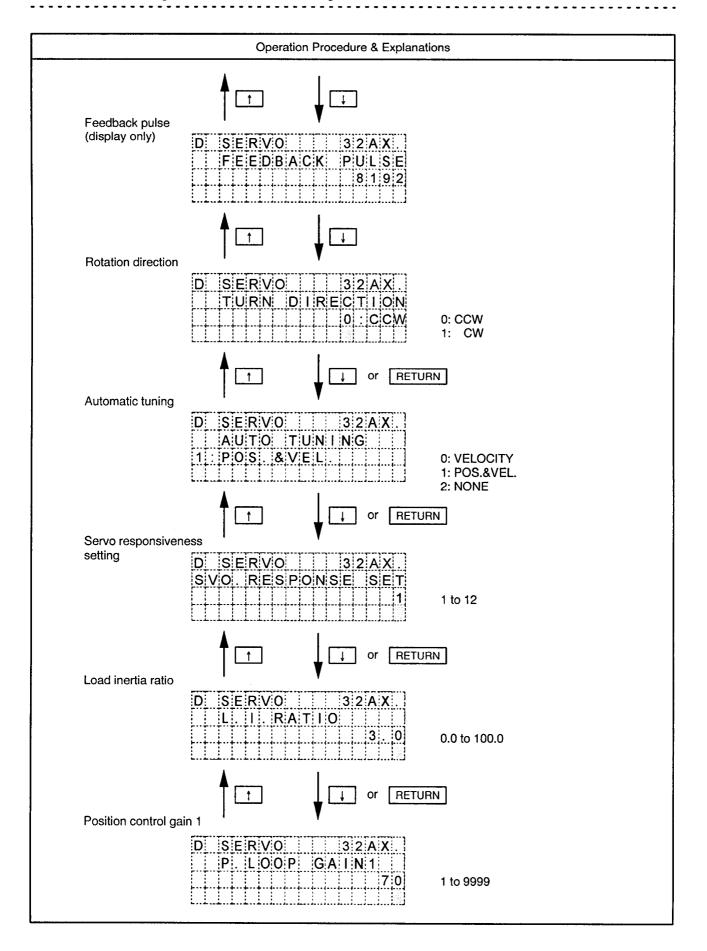
Mode	Data setting mode	Function	Axis data setting (servo parameters) (for ADU)	7-4.2
	J		in the same seeming (see to parameters) (io. 1, 20)	, ,,_



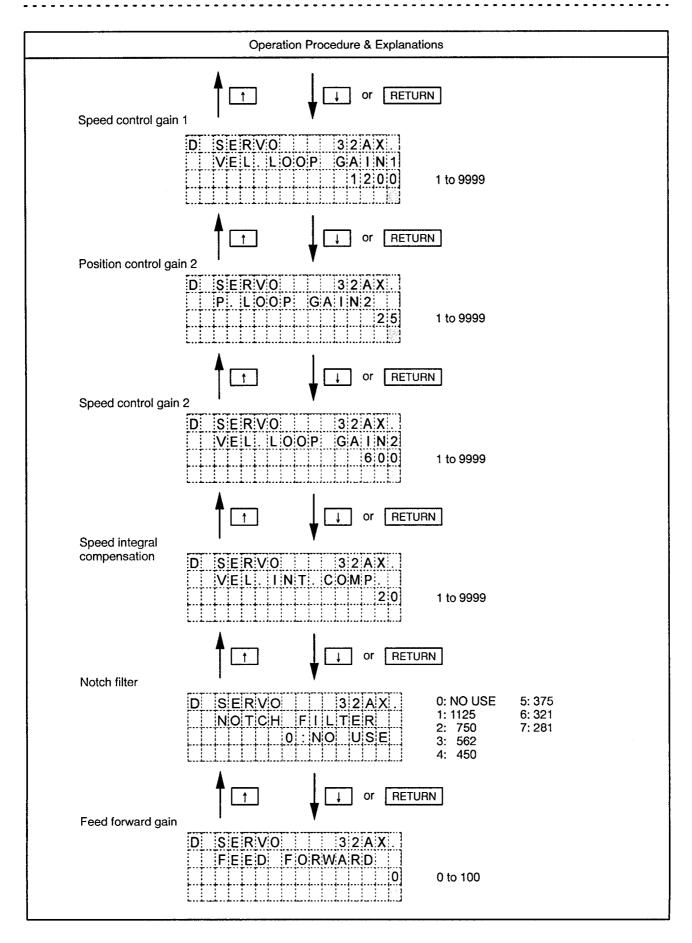
Mode	Data setting mode	Function	Axis data setting (servo parameters) (for MR–H)	7-4.3
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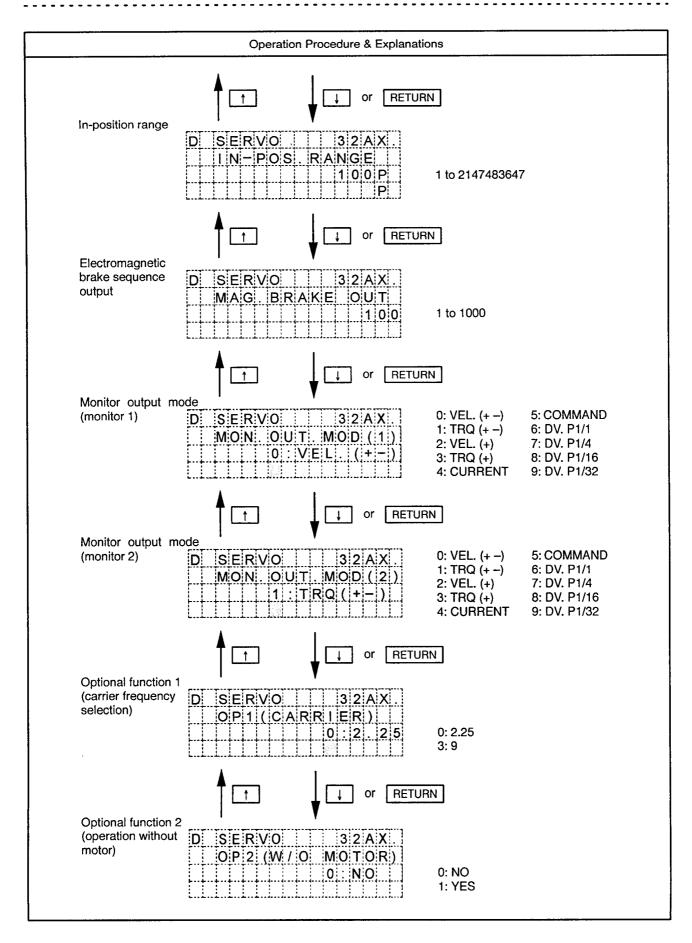
Mode Data setting mode Function Axis data setting (servo parameters) (for MR-H)	7-4.4
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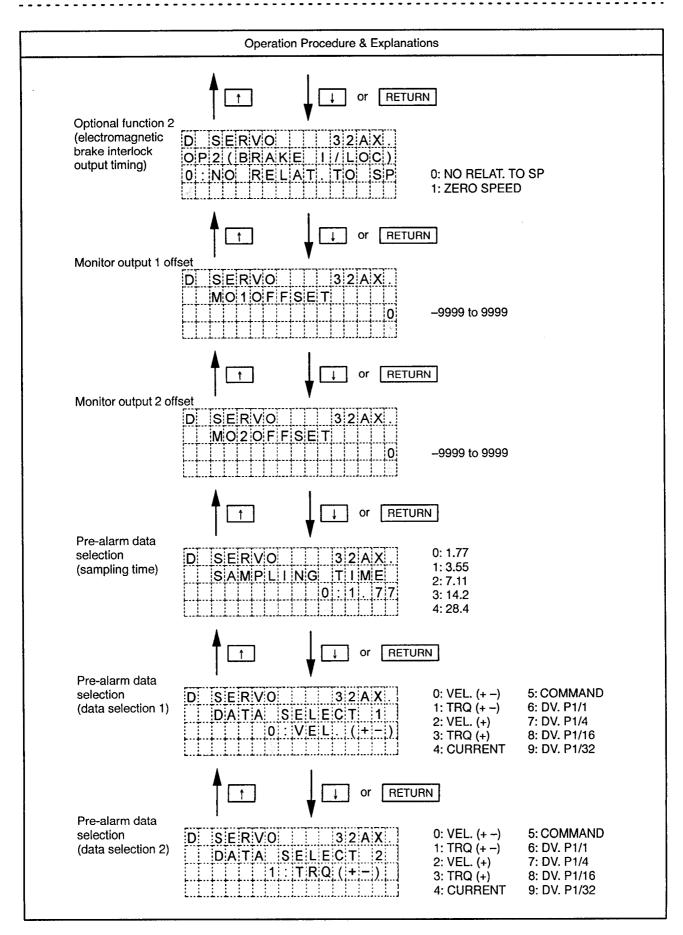
Mode	Data setting mode	Function	Axis data setting (servo parameters) (for MR-H)	7-4.5
		li .	J , , , , , , , , , , , , , , , , , , ,	



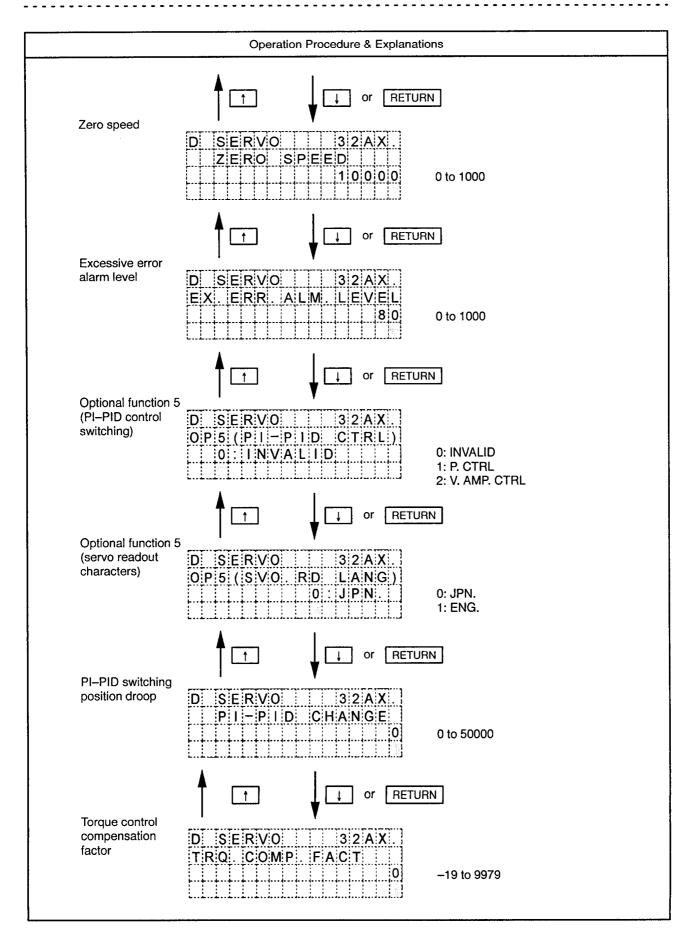
Mode	Data setting mode	Function	Axis data setting (servo parameters) (for MR–H)	7-4.6



Mode Data setting mode Function Axis data setting (servo parameters) (for MR-H) 7-4.7

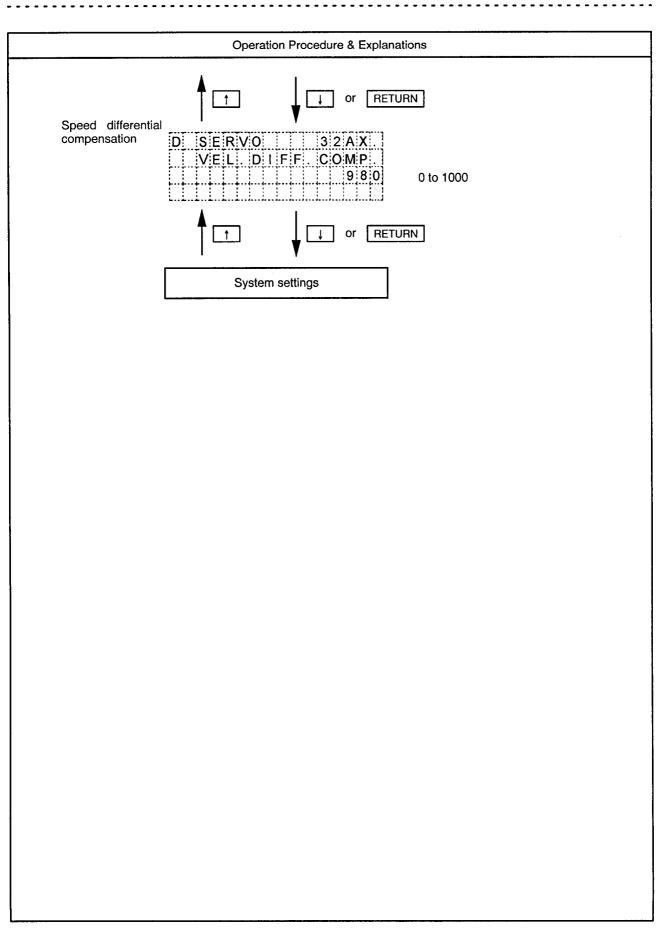


Mode	Data setting mode	Function	Axis data setting (servo parameters) (for MR-H)	7-4.8
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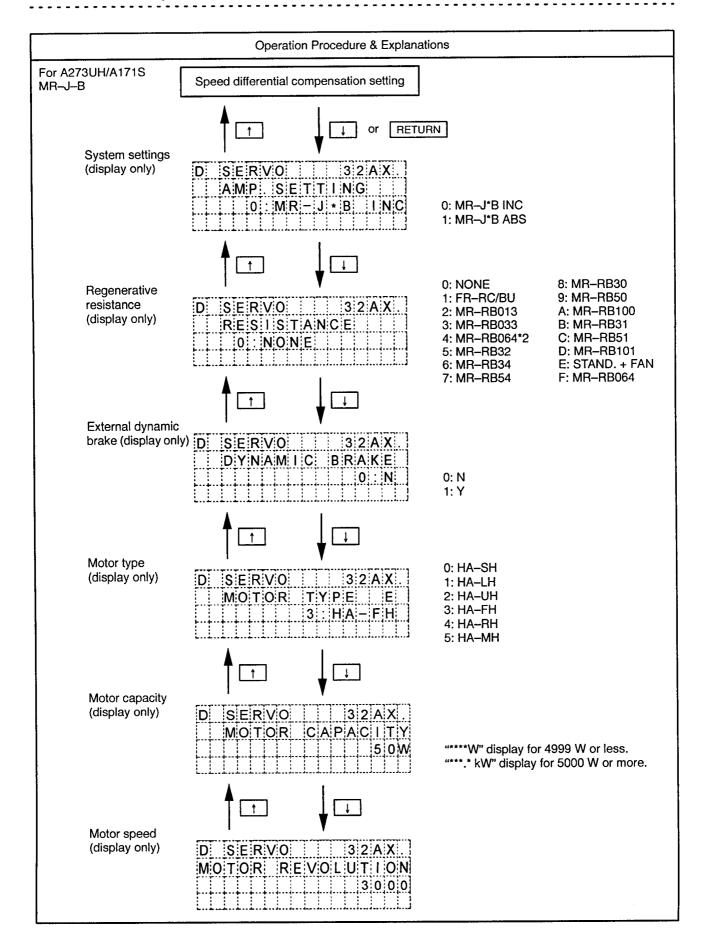


Drawing No.

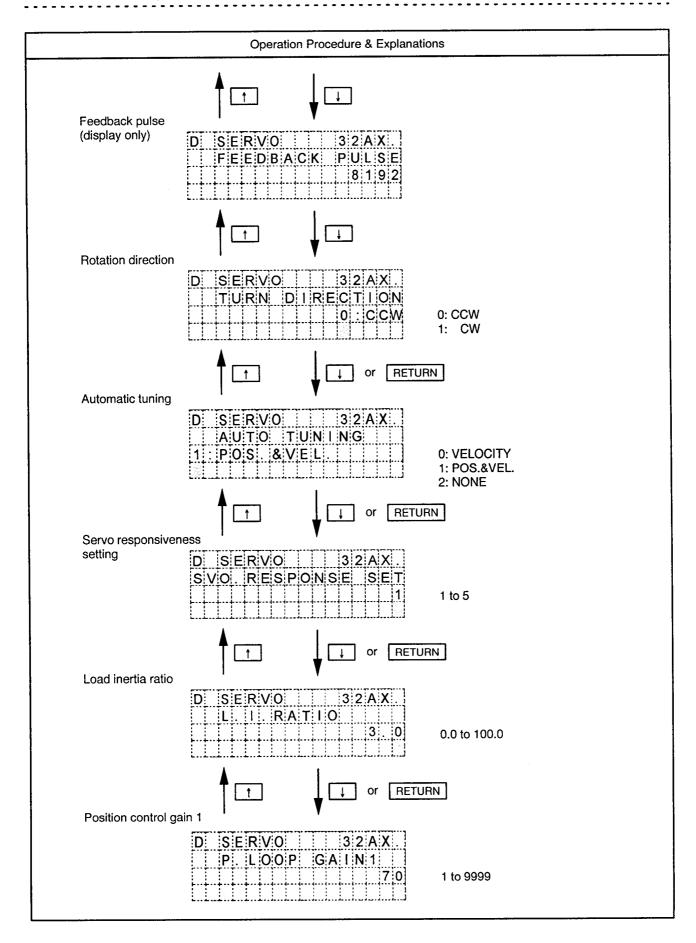
Mode	Data setting mode	Function	Axis data setting (servo parameters) (for MR-H)	7-4.9



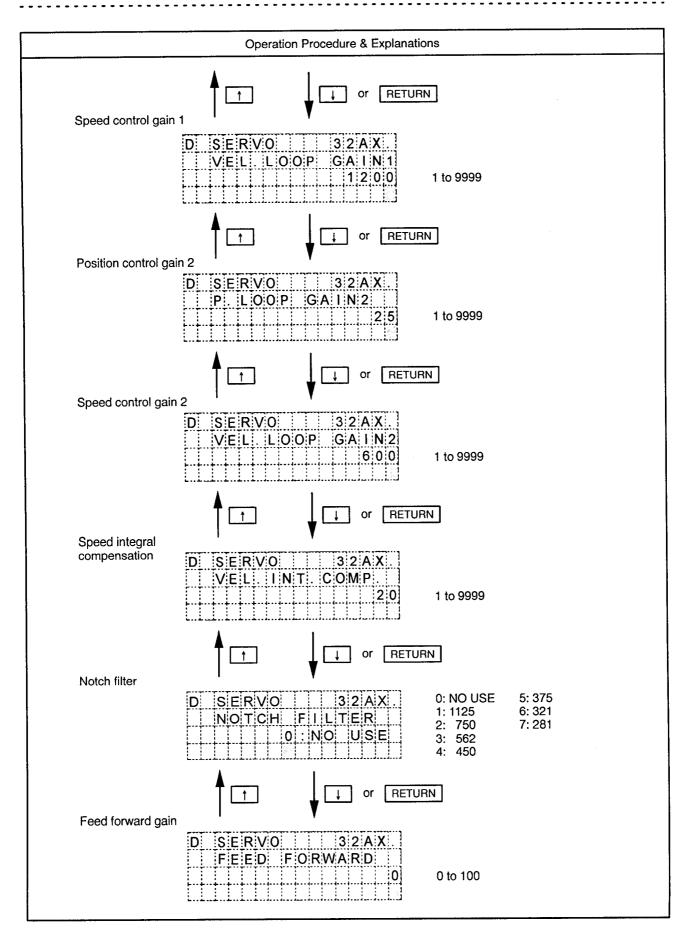
Mode	Data setting mode	Function	Axis data setting (servo parameters) (for MR–J)	7-4.10



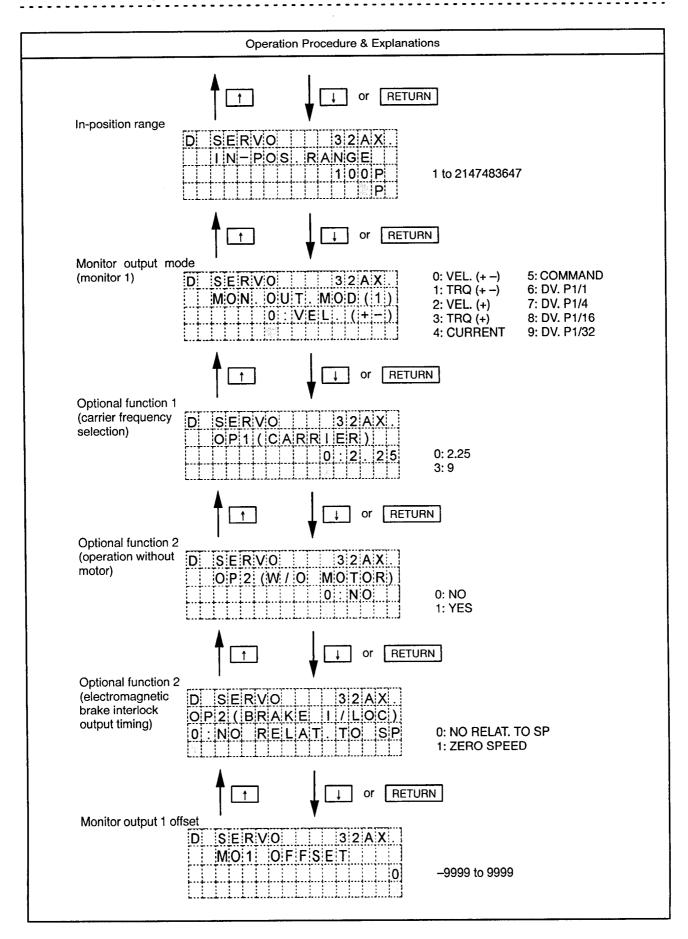
Mode Data setting mode Function Axis data setting (servo parameters) (for MR-J) 7-4.11



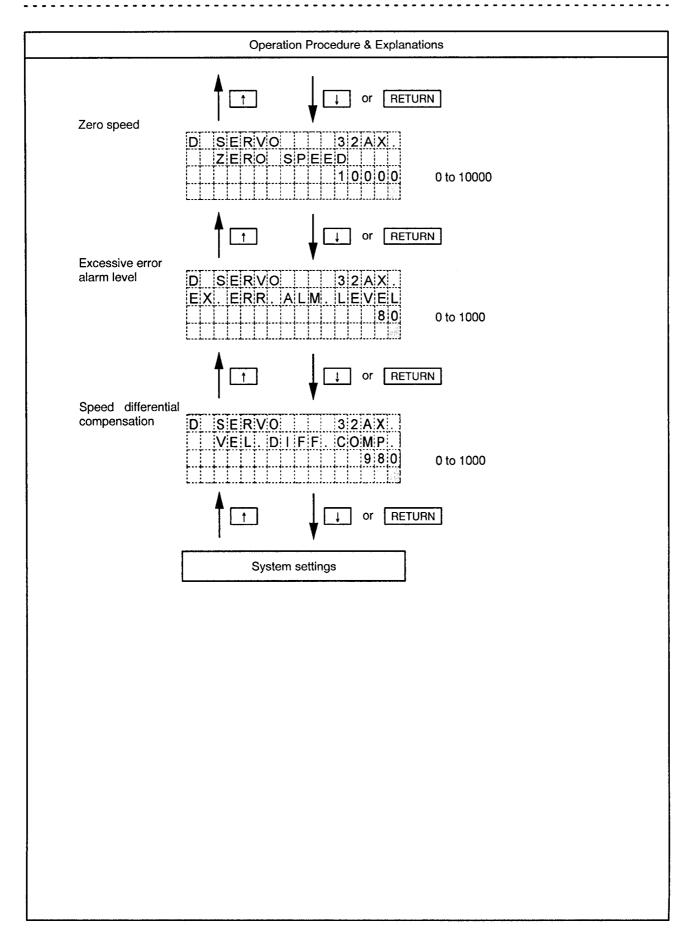
Mode Data setting mode Function Axis data setting (servo parameters) (for MR–J) 7-4.12



		T	T	
Mode Data se	ting mode	Function	Axis data setting (servo parameters) (for MR–J)	7-4.13

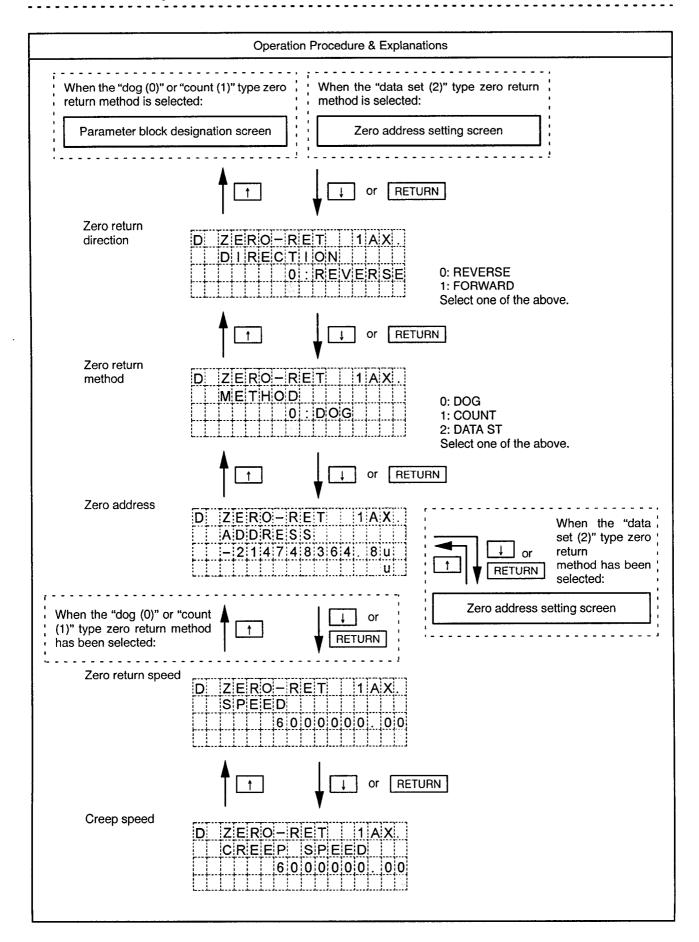


Mode Data setting mode Function Axis data setting (servo parameters) (for MR-J) 7-4



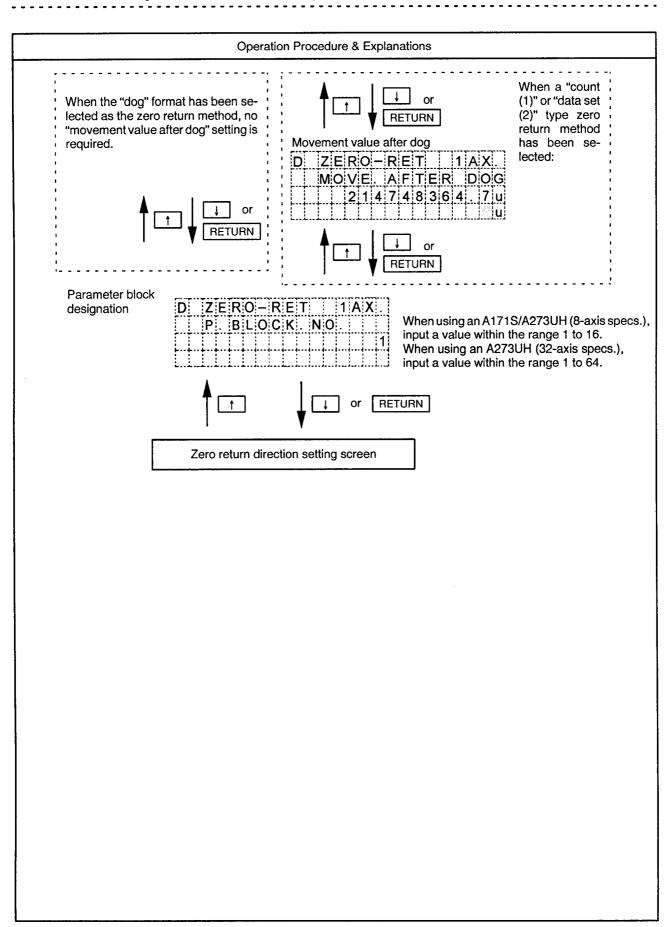
Mode	Data setting mode	Function	Axis data setting (zero return data)	7-5
	,			

Zero Return Data Setting Procedure & Screen Switching



Mode	Data setting mode	Function	Axis data setting (zero return data)	7-5.1

Zero Return Data Setting Procedure & Screen Switching



ĺ	Mode	Data setting mode	Function	Axis data setting (zero return data)	7-5.2
L					

Zero Return Data Input Ranges

System-of-units	ш	inch	бәр	PLS
Zero address	-214748364.8 to 214748364.7	-21474.83648 to 21474.83647	-21474.83648 to 21474.83647	2147483648 to 2147483647
Zero return speed	0.01 to 6000000.00	0.001 to 600000.000	0.001 to 600000.000	1 to 1000000
Creep speed	0.01 to 6000000.00	0.001 to 600000.000	0.001 to 600000.000	1 to 1000000
Movement value after dog	0.0 to 214748364.7	0.00000 to 21474.83647	0.00000 to 21474.83647	0 to 2147483647
Parameter block designation		1 to 16 (A171S/A273UH 8-axis s 1 to 64 (A273UH 32-axis specs.)	1 to 16 (A171S/A273UH 8-axis specs.) 1 to 64 (A273UH 32-axis specs.)	

Mode D	Data setting mode	Function	Axis data setting (JOG operation data)	7-6
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JOG Operation Data Setting Procedure & Screen Switching

	Operation Procedure & Explai	nations
JOG speed limit va	alue D J O G 1 A X . J O G S P . R S R . 6 0 0 0 0 0 0 . 0 0	
Parameter block designation	D JOG 1AX. P. BLOCK. NO.	When using an A171S/A273UH (8-axis speinput a value within the range 1 to 16. When using an A273UH (32-axis specs.),
		input a value within the range 1 to 64.

_					
	Mode	Data setting mode	Function	Axis data setting (JOG operation data)	7-6.1
					·

JOG Operation Data Input Ranges

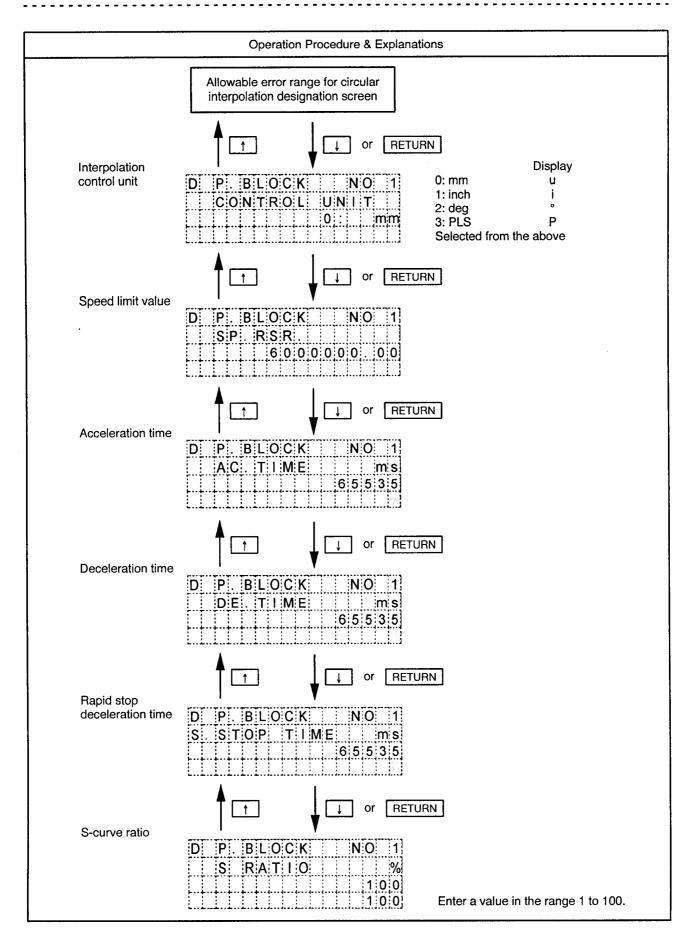
System-of-units	шш	inch	бәр	PLS
JOG speed limit value	0.01 to 600000.00	0.001 to 600000.000	0.001 to 600000.000	1 to 1000000
Parameter block designation		1 to 16 (A171S/A273UH 8-axis s 1 to 64 (A273UH 32-axis specs.)	1 to 16 (A171S/A273UH 8-axis specs.) 1 to 64 (A273UH 32-axis specs.)	

7.2 Setting the Parameter Block

Mode	Data setting mode	Function	Parameter block		7-7
Parar	neter Block No. Designation Screen				
Mess	age			Key Operation	
	D P. BLOCK NO		1	0 9	RETURN
	Operation Procedure			Precautions/Rema	arks
nate After	o 16 (1 to 64 for A273UHCPU 32-axis d at this screen. designating the parameter block No. eter input screen for that block will be	by pressing	the <u>RETURN</u> key, the pa-		
	▶ Go to 7-8				
				,	
					:
ا س					
Notes					

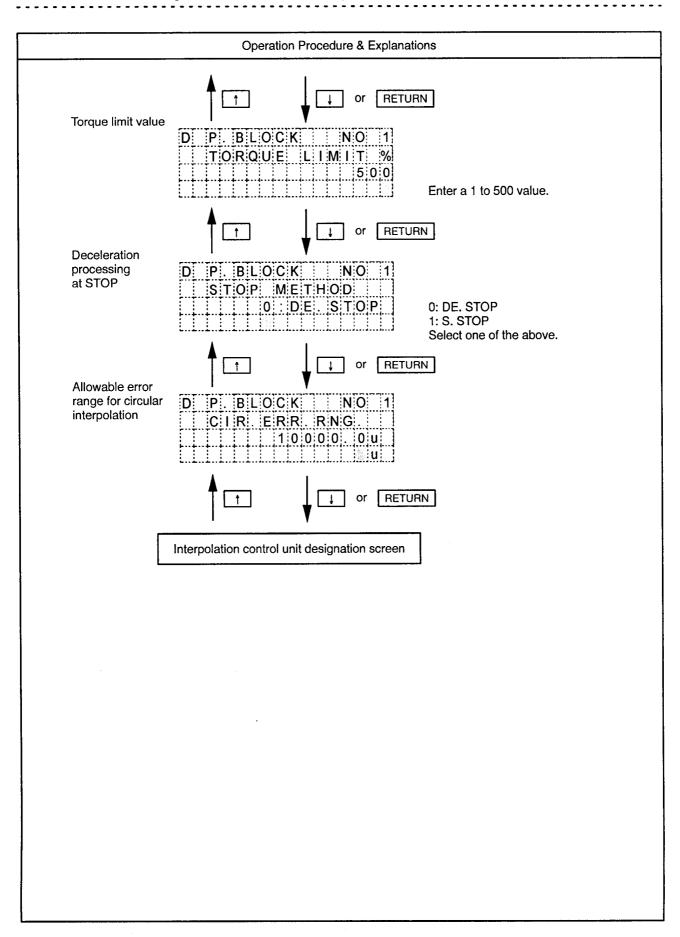
Mode	Data setting mode	Function	Parameter block	7-8

Parameter Block Data Setting Procedure & Screen Switching



Mode	Data setting mode	Function	Parameter block	7-8.1

Parameter Block Data Setting Procedure & Screen Switching



Mode	Data setting mode	Function	Parameter block	7-8.2

Parameter Block Data Input Ranges

System-of-unit	mm	inch	geb	PLS	
Speed limit value	0.01 to 6000000.00	0.001 to 600000.000	0.001 to 600000.000	1 to 1000000	
Acceleration time		1 to 65535	5535		
Deceleration time		1 to 65535	5535		
Rapid stop deceleration time		1 to 65535	5535		
Torque limit value		1 to 500	009		
Deceleration processing at STOP		0: DE. STOP	1: S. STOP		
Allowable error range for circular interpolation	0.0 to 10000.0	0.00000 to 1.00000	0.00000 to 1.00000	0 to 100000	-
S-curve ratio		0 to 100 %	% 00		

Mode	Data setting mode	Function	Auxiliary functions		7-9
Auxiliar	y Function Item Selection Screen				
Messag	ge			Key Operation	
	H SUB FUN 1 BACKLIG 2 A LARM 3 LAN SEL	1 R	ETURN		
	Operation Procedure	e & Explana	tions	Precautions/Rema	ırks
Select	ing "backlight:"				
_		7-10			
Select	ing "alarm":				
		o 7-11			
Select	ing "language":				
		o 7-12			
L	3 RETURN► Go to	07-12			
					:
 					
es					
Notes					
1 1					

Mode	Data setting mode	Function	Auxiliary functions (backli	ght)	7-10			
	klight Setting Screen							
Messa(Key Operation						
	H BACKLIG	H T O F F		— ← → RETURI	٧			
	Operation Procedure	e & Explana	tions	Precautions/Rema	arks			
Operation Procedure & Explanations A "#" mark is displayed at current setting. Use the →, ← keys to designate the desired setting, then press the RETURN key. When the RETURN key is pressed, the system returns to the data setting item selection screen.								
Notes								

					Drawing He.
Mode	Data setting mode	Function	Auxiliary functions (alarm)	7-11
Alarm S	Setting Screen				
Messag	ge	Key Operation			
	H ALARM #ON	OF F		RETURN	7
	Operation Procedure	e & Explana	tions	Precautions/Rema	arks
A "#" m desired presse	nark is displayed at current setting. d setting, then press the RETUR d, the system returns to the data s				
Notes					

Mode	Data setting mode	Function	Auxiliary functions (langua	age)	7-12
Langua	age Setting Screen				
Messa	ge		Key Operation		
	T LAN.SEL #JAPANESE ENGLISH		D N	<u>↑ ↓ — </u> F	RETURN
	Operation Procedure	e & Explana	ations	Precautions/Rema	arks
	↑ ↓ ↓ RETURN				
desire When syster	mark is displayed at current setting. Ed language, then press the RETUI The RETURN key is pressed, if the m returns to the data setting item se changed, the mode selection scree	<u>3N</u> key. language se election scre	election is unchanged, the een. If the language selec-		
Notes				1	

		I -	5		Drawing No.
Mod		Function	Function selection		8-1
	cting Program Mode Functions				
Mess	sage			Key Operation	
	P PROGRAM 1READ/WF 2SORT 3COPY 4	1 RE RE 3	TURN		
	Operation Procedure	e & Explana	tions	Precautions/Rema	arks
Prog	gram mode functions are selected at	this screen.			
Sele	ecting "program readout":				
	1 RETURN▶ Go t	o 8-2			
Sele	ecting "sort":				
	2 RETURN▶ Go t	o 8-22			:
Sele	ecting "copy":				:
	3 RETURN▶ Go t	o 8-23			:
Sele	ecting "all-clear":				
	4 RETURN▶ Go t	o 8-24			
					1
	When the No. of an item is keyed in	n, that item f	No. is highlighted.		
S _S					
Notes					
1					

A CAUTION

- \triangle Instructions used in programs must conform to the conditions described in this manual.
- Device settings used in programs must be within the ranges given in this manual. Since some devices such as special devices have fixed applications, devices suitable for the intended application must be used.

Mode	Program mode	Function	9	8-2.1

Program Readout

Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Screen 1 is displayed when the program readout, write, or delete function is selected. The number of programs and steps being used are displayed, and the status in which program numbers can be input status is established.</screen>	
Number of programs used ——— Max. number of programs	
PROG. 1234/4096 STEP 12345/13312	
Number of steps used Max. number of steps	
Entering the program No.:	
0 ··· 9 RETURN	
Use the <u>0</u> to <u>9</u> keys to designate the number of the program which is to be read out or checked. The program No. range is 0 to 4095. Only the 4 most recent digits entered as the program No. will be valid. All other information digits will be ignored. To correct an entered value, press the <u>CLEAR</u> key to clear the input field. If the program readout occurs successfully when the <u>RETURN</u> key is pressed, the first part of that program content will be displayed.	Displayed digits move 1 space to the left each time another value is entered.
<screen 2=""></screen>	
Program write:	
WRITE The program write function is selected to edit the designated program. Go to 8-3	
If the program readout is unsuccessful, the following messages are display	ayed:
When the instruction code is incorrect (not an SV13 code): "I.COD ERROR"	
2	

١	Mode	Program mode	Function	Program readout	8-2.2
ı		<u> </u>			

Program Readout

<u></u>		Operation Procedure & Explanations	Precautions/Remarks
Deleti	ng a prograr	n:	
	DELETE	Press the <u>DELETE</u> key to delete the designated program NO ► Go to 8-21	
Displa	aying the nex	kt step:	
	STEP+	Press the <u>STEP+</u> key to display the beginning of the next step.	The STEP+ and STEP- keys are only operative for speed switching control and constant-speed control.
Displa	aying the pre	vious step:	
	STEP-	Press the <u>STEP</u> key to display the beginning of the previous step.	
Progra	am scrolling	:	
E	↑ Use t	he <u>↑</u> , <u>↓</u> keys to scroll in 1-line units.	
This s		ed to either cancel the operation or to create a program when ogram No. did not exist.	
Switc	hing to the ir	nstruction class setting screen:	
	INSTRUCTIO	N	
Switc	th to the serve	o instruction class setting screen in order to create a program. 3-4	
			<u> </u>
tes			
Notes			

8-3 **Function** Program write Mode | Program mode Creating a Program **Key Operation** Message I / insert mode * R / overwrite mode (default setting) RETURN Screen 1 ABS-1 PK4095R **CLEAR** GO 6000000.00 -214748364.8u STORE STEP+ STEP-The above screen is displayed when "program write" is selected after a successful program readout. INSTRUCTION ITEM FUNCTION + (insert) INDIRECT SHIFT + (Speed type) INDIRECT RETURN Screen 2 PINDIRECT INDIRECT Devices used by the system (for positioning, etc.) cannot be used for indirect designation purposes. The following devices are used exclusively for positioning: A273UHCPU (8-axis specs.) & A171SCPU D800 to D1023 Designation of an improper device can result in abnormal positioning, or an error. *1. The "insert" and "overwrite" modes are only operative during speed switching control or constant-speed control. *2. The "speed type" procedure can only be used with ABS-2, 3, 4 and INC-2, 3, 4. Notes

Mode P	rogram mode	Function	Program write		8-3.1		
Creating a							
	Operation Procedure	& Explana	tions	Precautions/Rema	arks		
<screen Moving th</screen 	1> ne cursor to the position where a	a correction	is desired:				
1	Use the ↑ , ↓ keys to cursor moves to positi		line units. Note that the not over, axis Nos.				
Making th	ne correction:						
	9 RETURN						
	the new (correction) value is se be registered at the program						
Deleting	a line (step deletion):						
CL	EAR GO						
cursor po	e <u>CLEAR</u> and <u>GO</u> keys to delete sition. The next instruction will the used with VABS, VINC, VEND X, INC–XX, CPEND in constant	nen be displ in speed sv	ayed. This procedure can vitching control, and with				
Registeri	ng (storing) a program:						
ST	ORE GO						
ation is c	the required program modificati ompleted, press the <u>STORE</u> key data. When the <u>STORE</u> key is pr	y to register	the program number and				
	GO -> STORE CAN -> CANCEL						
program gram reg	recting or creating a program, a content. If the result is OK, the pistration is completed, the progreen 1) is displayed.						
					,		
				<u> </u>			
otes							

		r	T		Drawing No.
Mode	Program mode	Function	Program write 8-3.2		
Creati	ng a Program				
	Operation Procedure	e & Explana	tions	Precautions/Rema	arks
Displa	aying the next step:				
	STEP+ Press the <u>STEP+</u> ke next step.	y to display	the beginning of the	The STEP+ and ST are only operative for spectontrol and constant-specton	
Displa	aying the previous step:			•	
	STEP- Press the <u>STEP-</u> ke previous step.	y to display	the beginning of the		
Switc	hing to the instruction class setting	screen:			
	NSTRUCTION				
inputs will be the er	th to the servo instruction class setting. If the overwrite mode is in effect at the written over the displayed programmered instruction will be inserted in Go to 8-4	this time, the m step. If the	entered servo instruction e insert mode is in effect,		
Switc	hing to the setting item screen:				
		signate the it in question.	ne item selection & input iem settings required for		
Switc	hing to the speed type screen:				
	SHIFT + .				
	creen which allows selection of the axis) will be displayed. Go to 8-20	speed type	(resultant, reference axis,		
Chan	ging input modes:				
[FUNCTION + .				
	the <u>FUNCTION</u> + _ key to switch fro	om the "oven	write" to the "insert" mode,		
Notes					
ĬŽ					

Mode Program mode Function Program write 8-3.3
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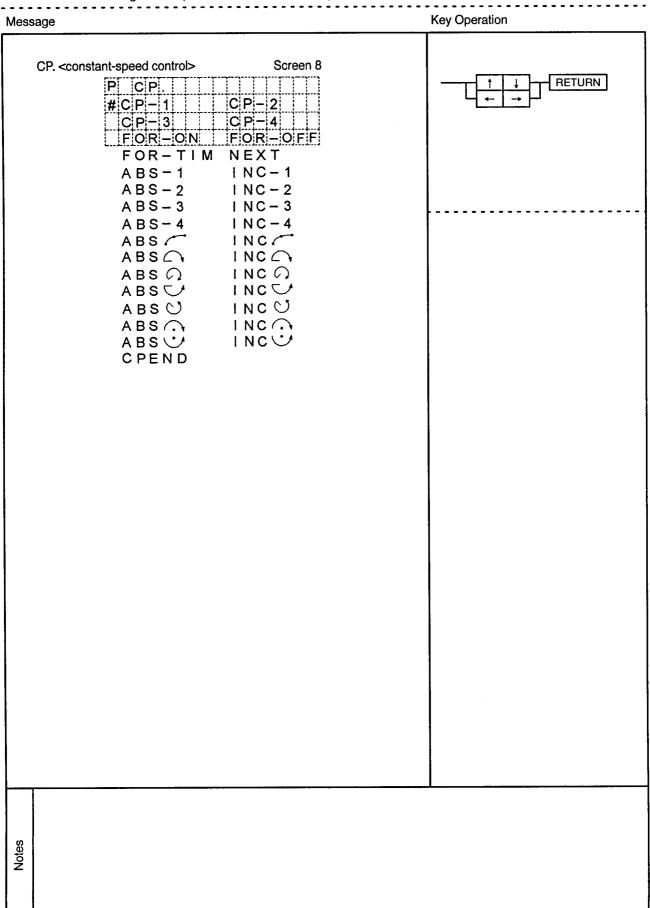
Creating a Program

Operation Procedure & Explanations	Precautions/Remarks
<screen 2=""></screen>	
Screen 2 is displayed when the <u>INDIRECT</u> key is pressed.	
Selecting the setting device:	
Use the →, ← keys to move the "#" mark to either the "D" or "W" indirect designation device position.	
Entering the device No.:	
0 9 RETURN A F	
Enter a decimal value if the indirect designation device is a "D" device, and a hexadecimal value if it is a "W" device.	
Canceling the indirect designation:	
INDIRECT Press the <u>INDIRECT</u> key again at the indirect designation input screen to cancel the indirect designation.	
<u>&</u>	
Notes	

Мо	de	Program mode	Function	Prc gram write		8-4				
Inst	ruct	ion Class Setting Screen (Servo Ir	struction Se	election)						
Mes	Message Key Operation									
		P COMMAND #POSITION CIRCLE FEED SPEED SPEED/PO SPEED CH CP POSITION ZERO RET START	ING SITIC ANGE FOLL		1 I RE	TURN				
}		↓								
	Р	ositioning <for interpolation="" linear=""> P POSITIO # A B S - 1 A B S - 2 A B S - 3 A B S - 4</for>	NING	- 1 - 2 - 3	↑ ↓ RE	TURN .				
	P	PCIRCLE ABSCA ABSCA ABSCA ABSCA ABSCA ABSCA ABSCA ABSCA ABSCA	# I N S 2		1 I RE	FURN				
Notes										

Mod	e Program mode	Function	Program write		8-4.1
Instru	ction Class Setting Screen (Servo Ir	struction Se	election)		
Mess	age			Key Operation	
·	Fixed-pitch feed PFEED #FEED-1 FEED-2 FEED-3	Scr	reen 4	↑	'URN
	ja i a spari a spara spara spara spara spara spara spara spara spara spara spara spara spara spara spara spara	Sci VR VVR	reen 5	↑ ↓ REI	URN
	Speed/position switching control P SPEED / P # V P F V P R V P S T A R T		reen 6	↑ ↓ RET	TÜRN
	Speed switching control P SPEED C # V S T A R T F O R - O N V A B S A B S - 1 A B S - 2 A B S - 3	HANGE VEND FOR-C NEXT VINC INC-1 INC-2	DFF F	↑ ↓ RET	[URN]
Notes					

					Drawing No
Mode	Program mode	Function	Program write		8-4.2
Instruct	ion Class Setting Screen	(Servo Instruction S	election)		
Messag	je			Key Operation	
	D. constant and contr		eroon 9		



	T		
Mode	Program mode	Function Program write	8-4.3
			L

Precautions/Remarks Operation Procedure & Explanations <Screen 1> In order to select a servo instruction, that servo instruction's class must first be designated at the instruction class setting screen. At this screen, the currently selected instruction class is indicated by a "#" mark. Use the 1 , 1 keys to scroll the screen, and press the RETURN key at the desired instruction class position. The system then proceeds to the servo instruction selection screen for that instruction class. POSITIONING → Go to screen 2 → Go to screen 3 CIRCLE FEED → Go to screen 4 → Go to screen 5 **SPEED** SPEED/POSITION → Go to screen 6 SPEED CHANGE → Go to screen 7 When zero return or simultaneous start → Go to screen 8 is selected, the system returns to the ZERO RETURN → Go to 8-14 program creation screen (there will be → Go to 8-15 START no servo instruction selection). POSITION FOLLOW → Go to 8-16 <Screen 2> This screen is displayed when "POSITIONING" is selected at screen 1. The currently selected servo instruction is indicated by a "#" mark. Use the \uparrow , \downarrow , $\stackrel{\longleftarrow}{}$, $\stackrel{\longrightarrow}{}$ keys to move the "#" mark to the desired servo instruction position, then press the RETURN key. The system then proceeds to the program creation screen for that servo instruction. The required settings should be designated at this screen. ABS-1 (absolute 1-axis positioning) → Go to 8-5 → Go to 8-6 ABS-2 (absolute 2-axis linear interpolation) → Go to 8-7 ABS-3 (absolute 3-axis linear interpolation) ABS-4 (absolute 4-axis linear interpolation) → Go to 8-8 → Go to 8-5 INC-1 (incremental 1-axis positioning) INC-2 (incremental 2-axis linear interpolation) → Go to 8-6 INC-3 (incremental 3-axis linear interpolation) → Go to 8-7 INC-4 (incremental 4-axis linear interpolation) → Go to 8-8 Notes

1			,		0.4.4
	Mode	Program mode	Function	Program write	8-4.4

	Operation Procedure & Explanations	Precautions/Remarks
This lecter moves pression to	operation Procedure & Explanations reen 3> secreen is displayed when "CIRCLE" is selected at screen 1. The currently selected servo instruction is indicated by a "#" mark. Use the ↑, ↓, ←, → keys to be the "#" mark (screen will scroll) to the desired servo instruction position, then set the RETURN key. The system then proceeds to the program creation screen that servo instruction. The required settings should be designated at this screen. Absolute circular interpolation by auxiliary point designation ABS → Go to 8-9 Absolute circular interpolation by radius designation (less than CW 180°) ABS → Go to 8-11	rrecautions/nemarks
	Absolute circular interpolation by radius designation (CW 180 ° or more) ABS → Go to 8-11 Absolute circular interpolation by radius designation (less than CCW 180 °) ABS → Go to 8-11 Absolute circular interpolation by radius designation (CCW 180 ° or more) ABS → Go to 8-11 Absolute circular interpolation by center point designation (CW) ABS → Go to 8-10 Absolute circular interpolation by center point designation (CCW)	
	ABS → Go to 8-10 Incremental circular interpolation by auxiliary point designation INC → Go to 8-9 Incremental circular interpolation by radius designation (less than CW 180 °) INC → Go to 8-11 Incremental circular interpolation by radius designation (CW 180 ° or more) INC → Go to 8-11 Incremental circular interpolation by radius designation (less than CCW 180 °) INC → Go to 8-11 Incremental circular interpolation by radius designation (CCW 180 ° or more)	
	INC → Go to 8-11 Incremental circular interpolation by center point designation (CW) INC → Go to 8-10 Incremental circular interpolation by center point designation (CCW) INC → Go to 8-10	
Notes		
Notes		

				 	
Mode	Program mode	Function	Program write	İ	8-4.5

Operation Procedure & Explanations	Precautions/Remarks
<screen 4=""> This screen is displayed when "FEED" is selected at screen 1. The currently selected servo instruction is indicated by a "#" mark. Use the ↑, ↓, ←, → keys to move the "#" mark (screen will scroll) to the desired servo instruction position, then press the <u>RETURN</u> key. The system then proceeds to the program creation screen for that servo instruction. The required settings should be designated at this screen. 1-axis fixed-pitch feed start FEED-1 → Go to 8-5 2-axis linear interpolation fixed-pitch feed start FEED-2 → Go to 8-6</screen>	
3-axis linear interpolation fixed-pitch feed start FEED-3 → Go to 8-7 <screen 5=""> This screen is displayed when "SPEED" is selected at screen 1. The currently selected servo instruction is indicated by a "#" mark. Use the ↑, ↓ keys to</screen>	
move the "#" mark (screen will scroll) to the desired servo instruction position, then press the <u>RETURN</u> key. The system then proceeds to the program creation screen for that servo instruction. The required settings should be designated at this screen. VF (speed control forward start) → Go to 8-12	
VR (speed control reverse start) → Go to 8-12 VVF (speed control (II) forward start) → Go to 8-12 VVR (speed control (II) reverse start) → Go to 8-12 → Go to 8-12	
Notes	

1	Mode	Program mode	Function	Program write	8-4.6
			i		I .

Operation Procedure & Explanations		Precautions/Remarks
<screen 6=""> This screen is displayed when "SPEED/POSITION" is selected currently selected servo instruction is indicated by a "#" mark keys to move the "#" mark (screen will scroll) to the desired sposition, then press the <u>RETURN</u> key. The system then proc gram creation screen for that servo instruction. The required sed designated at this screen. VPF (speed/position switching control forward START) - VPR (speed/position switching control reverse START) - VPSTART (speed/position switching control restart)</screen>	x. Use the ↑, ↓ servo instruction ceeds to the pro- ettings should be → Go to 8-5	
<screen 7=""> This screen is displayed when "SPEED CHANGE" is selected currently selected servo instruction is indicated by a "#" ↑, ↓, , , , , keys to move the "#" mark (screen will scroll) to vo instruction position, then press the RETURN key. The syste to the program creation screen for that servo instruction. The is should be designated at this screen. If the overwrite mode is in effect at this time, the entered serv be written over the displayed program step. If the insert mode entered instruction will be inserted in front of the displayed program step. If the insert mode entered instruction will be inserted in front of the displayed program of the displayed program step. If the insert mode entered instruction will be inserted in front of the displayed program of the displayed</screen>	mark. Use the othe desired ser- em then proceeds required settings wo instruction will de is in effect, the	VSTART must be designated first, followed by ABS-1 to ABS-3, or INC-1 to INC-3. The screen 7 instructions will then be repeated until VEND is designated.

^{*1. •} The ABS-1 to ABS-3 or INC-1 to INC-3 instruction selections (following VSTART) will be processed as insert mode inputs even if the overwrite mode is in effect.

Other instruction selections (following ABS-1 to ABS-3 or INC-1 to INC-3) will be processed as insert mode inputs even if the overwrite mode is in effect.

	1		
Mode Program mode	Function	Program write	8-4.7

Operation Procedure & Explanations	Precautions/Remarks
Screen 8> This screen is displayed when "CP" is selected at screen 1. The currently selected servo instruction is indicated by a "#" mark. Use the ↑, ↓, ←, → keys to move the "#" mark (screen will scroll) to the desired servo instruction position, then press the <u>RETURN</u> key. The system then proceeds to the program creation screen (FORON, FOROFF, FOROTIM) for that servo instruction. The required settings should be designated at this screen. If the overwrite mode is in effect at this time, the entered servo instruction will be written over the displayed program step. If the insert mode is in effect, the entered instruction will be inserted in front of the displayed program step.	*2
CP-1 (1-axis constant-speed control START) CP-2 (2-axis constant-speed control START) CP-3 (3-axis constant-speed control START) CP-4 (4-axis constant-speed control START) CPEND (constant-speed control END) FOR-ON (repeat range beginning designation) → Go to 8-17 FOR-OFF (repeat range beginning designation) → Go to 8-17 FOR-TIM (repeat range beginning designation) → Go to 8-18 NEXT (repeat range end designation) ABS-1 (absolute 1-axis positioning) → Go to 8-5 ABS-2 (absolute 2-axis linear interpolation) → Go to 8-6 ABS-3 (absolute 3-axis linear interpolation) (less than CW 180 °) → Go to 8-7 ABS-4 (absolute 4-axis linear interpolation) (CW 180 ° or more) → Go to 8-8 ABS (Absolute circular interpolation by auxiliary point designation) (less than CCW 180 °) → Go to 8-9	Selection must begin with CP-2 or CP-3. The screen 8 instructions will then be repeated until VCPEND is designated.
ABS	

^{*2.} Other instruction selections (following CP-2 or CP-3) will be processed as insert mode inputs even if the overwrite mode is in effect.

- 1					
	Mode	Program mode	Function	Program write	8-4.8

Operation Procedure & Explanations	Precautions/Remarks
INC-3 (incremental 3-axis linear interpolation) (less than CCW 180 °) Go to 8-7 INC-4 (incremental 4-axis linear interpolation) (CCW 180 ° or more) Go to 8-8 INC (Incremental circular interpolation by auxiliary point designation) (CCW) Go to 8-9 INC (Incremental circular interpolation by radius designation) (CCW) Go to 8-11 INC (Incremental circular interpolation by radius designation) Go to 8-11 INC (Incremental circular interpolation by radius designation) Go to 8-11 INC (Incremental circular interpolation by radius designation) Go to 8-11 INC (Incremental circular interpolation by center point designation) Go to 8-10 INC (Incremental circular interpolation by center point designation) Go to 8-10	Precautions/ nemarks
Notes	

	Program mode		Program write		8-5
	electing Servo Instruction (ABS-	1, INC-1, FE	ED-1, VPF, VPR)		
Messag	e			Key Operation	
	<pre><default> P K 4 0 9 5 I A X .</default></pre>	0	S - 1 . 0 1 . 0 u	For details regarding key see page 8-3.	operation
	PK40951 AX. 32 SP. 32	0.	S – 1 0 1 0 u		
Notes					

Mode	Program mode	Function	Program write	8-6	l

After Selecting Servo Instruction (ABS-2, INC-2, FEED-2)

Message **Key Operation** (Speed type)* <Default> P K 4 0 9 5 I (S Y) A B S - 2 A X . 1 , 2 . 0 . 0 1 S P . 0 . 0 1 u 2 0 . 0 1 u For details regarding key operation, see page 8-3. P K 4 0 9 5 I (S Y) A B S - 2 A X 3 1 3 2 0 0 0 1 3 1 0 0 0 1 u 3 2 0 0 1 u Meanings of "speed type" screen abbreviations are as follows: (SY) Resultant speed

(RE) Reference axis speed (LO) Long axis speed

Notes

Mode	Program mode	Function	Program write		8-7
After S	Selecting Servo Instruction (Al	BS-3, INC-3, FE	ED-3)		
Messa	age			Key Operation	·
	<pre><default> P K 4 0 9 5 I A X .</default></pre>	(RE) AB 31,32 0	0 1 0 u 0 u 0 u 1	For details regarding key see page 8-3.	y operation,

Mode	Program mode	Function	Program write		8-8
After S	electing Servo Instruction (ABS	I, INC-4)			
Messa	ge			Key Operation	
	<default></default>	3 , 0 0 0 0		For details regarding key see page 8-3.	operation,
	PK 4 0 9 5 1 (AX 2 9, 3 0 SP 2 2 9 3 0 3 1 3 2	LO) AB: 31,3: 0.	S – 4]		
Notes					

Mod	de Program mode	Function	Program write		8-9		
After	After Selecting Servo Instruction (Circular Interpolation by Auxiliary Point Designation ABS , INC ,)						
Mes	sage	• • • • • •		Key Operation			
Mes	<pre></pre>	0 0	S	For details regarding key see page 8-3.	operation,		
Notes							

Mode | Program mode Function Program write 8-10 After Selecting Servo Instruction (Circular Interpolation by Center Point Designation ABS , INC , ABS , INC , INC , ABS , INC Message **Key Operation** <Default> PK 4 0 9 5 1 ABS (1) For details regarding key operation, see page 8-3. 0. 0 u 0.0u 2 END 0. 0 u 0. 0 u 1 2

.

Mode Pro			I I
	gram mode	Function Program write	8-11
After Selecti	ng Servo Instruction (Circ	ular Interpolation by Radius Designation A IN	$BS \cite{\mathcal{O}}$, $ABS \cite{\mathcal{O}}$, $ABS \cite{\mathcal{O}}$, $INC \cite{\mathcal{O}}$, $INC \cite{\mathcal{O}}$, $INC \cite{\mathcal{O}}$)
Message		ŀ	Key Operation
	<pre><default> P K 4 0 9 5 I A X</default></pre>	ABS 🔼	For details regarding key operation, see page 8-3.
Notes			

Mode	Program mode	Function	Program write		8-12
After	Selecting Servo Instruction (Speed	Control, Spe	eed/Position Switching Cor	ntrol VF, VR, VVF, VVR)	
Messa	age			Key Operation	
	<default> P K 4 0 9 5 I A X . 1 S P</default>	V 0	F	For details regarding key see page 8-3.	operation,
Notes					,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

Mode	Program mode	Function	Program write		8-13
After S	electing Servo Instruction (Speed/I	Position Swi	itching Control, Restart VP	PSTART)	
Messag	ge			Key Operation	
Messag	PK40951 AX. 1		P S	For details regarding key see page 8-3.	operation,
Notes					

					Drawing No.
<u> </u>	de Program mode	L	Program write		8-14
After	Selecting Servo Instruction (Home F	Position Retu	ırn Zero ZERO)		
Mess	sage			Key Operation	
	PK40951 AX. 1	ZE	RO	For details regarding key see page 8-3.	operation,
Notes					
				•	

		I	I_	Drawing No.
Mode	Program mode	Function	Program write	8-15
After	Selecting Servo Instruction (Simulta	neous STAF	RT START)	
Messa	age		Key Operation	
Messa	PK40951	ST	ART For details regardi see page 8-3.	ng key operation,
Notes				

Mod	de Program mode	Function	Program write		8-16
After	Selecting Servo Instruction (Position	Follow-Up	PFSTART)		
Mes	sage			Key Operation	
	<default> P K 4 0 9 5 I A X 1 S P</default>	0.	STR 011 0	For details regarding key see page 8-3. Address inputs are only po- direct designation. Numerical value inputs (0 valid.	ssible by in-
	Screen 2				
des The	P INDIREC	T S P C W sing, etc.) ca	5.0.0 annot be used for indirect oning: D800 to D1023 D0 to D799		
Notes					

Mod	e Program mode	Function	Program write	, , , , , , , , , , , , , , , , , , ,	8-17
After	Selecting Servo Instruction (Repeat	Same Cont	rol FOR-ON, FO	R-OFF)	
Mess	age			Key Operation	
	Screen 1 P F O R - O N # X	Y L F			RETURN
	RETU	JRN			
devi-	PK4095RP FORON R-ON repeat operation is ended where switches ON. R-OFF repeat operation is ended where switches OFF. exadecimal number input is required ecimal number input is required at Market switches of the switches	the trigger at X, Y, B de	at the corresponding er at the correspondevices.	For details regarding key open page 8-3.	eration, see
Notes	A return to screen 1 is impossible a or FOR–OFF must be selected aga	fter screen 2 in in the rep	2 is displayed. If a devolace mode.	vice change is required at this tim	e, FOR–ON

Mod	e Program mode	Function	Program write		Brawing No.
Щ.	Selecting Servo Instruction (Repeat	<u> </u>	<u> </u>		0 10
Mess				Key Operation	
10000	ago			Ney Operation	
	Screen 1 P F O R - T I M E	S W H		<u> </u>	RETURN
	RETU	JRN			
	Screen 2 P K 4 0 9 5 R P F O R - T I M E	S	- 2 1	For details regarding key ope page 8-3.	eration, see
	-TIMES repeat operation is ended wached.	hen the desi	gnated repeat count		
mal v If "H' decir If "D" value If "W	is selected at screen 1, the count varalue. is selected at screen 1, the count vanal value. is selected at screen 1, the "D" devices. is selected at screen 1, the "W" devinal value.	lue is entere e address is e	d directly as a hexa-		
Notes	A return to screen 1 is impossible aft must be selected again in the replac	er screen 2 i	s displayed. If a device	e change is required at this time, F	OR-TIMES

					Drawing No.
Mode	Program mode	Function	Program write		8-19
Setting	j Items				
Messa	ge			Key Operation	
	Screen 1 P SETT # • DWE L TRQ. UNIT OAC. OS.ST • STOP OSPEE	OP. B OS. R ODE. OP OP. T OC. E	DDE LK. RQ.		RETURN
	\	RETURN			
	S.STC P.TRC STOP C.E.R SP.	500 E 500 600000 6553 6553 P 6553 0:DE.S 10000	2 5 5 0 0 % 1 6 n c h . 0 0 5 m s 5 m s 5 m s 7 O P P L S	For details regarding key open page 8-3.	eration, see
The s	et value range for positionir	ng data is indicated	in 8-19.2.		
Notes	The ON/OFF indication is di	splayed only at sele	ectable positioning da	ta items.	

Mode	Program mode	Function	Program write	8-19.1

Setting Items

	Operation Procedure & Explanations	Precautions/Remarks
<screen 1=""> Selecting th</screen>	e positioning data:	
1 .	← → RETURN	
to be set at	↓ , ← , → keys to move the "#" mark to the positioning data item the program. The item is switched ON and OFF by pressing the y. Note that setting errors may be caused with some instructions.	
Registering	the positioning data:	
GO	The system returns to the program creation screen when the <u>GO</u> key is pressed. Positioning data is entered at the bottom line of the program creation screen.	
Notes		
1		

_					
	Mode	Program mode	Function	Program write	8-19.2

Setting Items

	Default	mm	inch	degree	PULSE			
DWELL (dwell time)	0 (ms)		0 to 5000 (ms)					
M CODE (M-code)	0		0 to	255	* ************************************			
TRQ. (torque limit value)	According to parame- ter block 1		1 to 50	00 (%)				
P.B. (parameter block)	1		1 to 16 (A171S/A27 1 to 64 (A273UH 32	3UH 8-axis specs.) 2-axis specs.)				
UNIT (control units)	3	0	1	2	3			
S.R. (speed limit)	200.000 (PLS/sec)	0.01 to 6000000.00 (mm/min)	0.001 to 600000.000 (inch/min)	0.001 to 600000.000 (degree/min)	1 to 1000000 (PLS/sec)			
AC. (acceleration time)	1000 (ms)		1 to 65535 (ms)					
DE. (deceleration time)	1000 (ms)		1 to 655	35 (ms)				
S.STOP (rapid stop deceleration time)	1000 (ms)		1 to 655	35 (ms)				
P.TRQ. (parameter torque limit value)	300 (%)		1 to 50	00 (%)				
STOP (deceleration time at STOP input)	0		0: DE. 1: S. S					
C.E.R. (allowable error range or circular interpolation)	100 (PLS)	0.0 to 10000.0	0.00000 to 1.00000	0.00000 to 1.00000	0 to 100000			
SPEED (speed command (constant-speed))	-	0.01 to 6000000.00 (mm/min)	0.001 to 600000.000 (inch/min)	0.001 to 600000.000 (degree/min)	1 to 1000000 (PLS/sec)			
S RATE (S-curve ratio)	0	0 to 100 (%)						

Mode	Program mode	Function	Program write	8-20	
0 1					

Speed Type Selection Screen

Operation Procedure & Explanations	Precautions/Remarks
P SPEED CLAS #SYNTHETIC AX. SP LONG AX. SP RETURN To screen 1 at page 8-3 Selecting the speed type: RETURN Use the 1, keys to move the "#" mark to the desired speed type position, then press the RETURN key. The system then proceeds to screen 1 at page 8-3.	Precautions/Remarks RETURN RETURN
Notes	

Mode	Program mode	Function	Program delete		8-21
Deletin	g Programs				
Messa	ge	Key Operation			
	P DEL. K4 GO -> DE CAN-> CA	—— GO			
	Operation Procedure	e & Explana	tions	Precautions/Rema	ırks
Delete		-			
1 <u> </u>	Press the GO key to delete to the function selection sc	the designate reen.	ated program and return		
Notes					

Mode	Program mode	Function	Sort		8-22			
Sorting	orting Programs							
Messa	essage Key Operation							
	P SORT GO -> SC CAN-> CA	——GO						
	Operation Procedure	e & Explana	tions	Precautions/Rema	arks			
	Press the GO key to executompleted, the system returnal message is displayed during the EXECUTING.	ite program : rns to the fu	sorting. When sorting is nction selection screen.					
Notes								

Mode	Program mode	Function	Сору		8-23
Copyin	g Programs				
Message Key Operation					
	P C O P Y 4 0 9 5 G O - > C O		9 4	—————————————————————————————————————	RETURN
	Operation Procedure	& Explana	tions	Precautions/Rema	ırks
Enterir Use kethen pr	Use the ←, → keys to copy destination program No.: Description: Descr	am No. input and copy d and copy d displayed. It sage "PROG en is displa data will rep	estination program Nos., When completed, the f a designated program G.ALR.STORED" is disjuded. If the GQ key is		
The fo	llowing message is displayed durin	ng a copy op	peration:		
Notes					

Mode	Program mode	Function	All-Clear	_	8-24			
All-Cle								
Messa	ge			Key Operation				
	P ALL CLE GO -> AL CAN-> CA	L CLI	EAR	GO				
	Operation Procedure	e & Explana	tions	Precautions/Rema	rks			
-		e an all–clea to the functi	r operation. When com- on selection screen.					
Notes								

9. ERROR MESSAGE LIST

Drawing No.

Mode	Function	9-1

When an error occurs, one of the error messages shown in this section is displayed at the bottom line of the screen. While an error message is displayed, processing is stopped and display content changes will be impossible.

Press the <u>CLEAR</u> key to clear the error message and resume processing.

Error messages are cleared by key inputs, and those key inputs are processed normally.

-		 	T	
	Mode	Function		9-1.1

"! MIS OPERATION"

Causes:

- Displayed in response to a key input which is prohibited at the current screen.
- Displayed in response to a key input which is prohibited at the current status.
- Displayed during numeric inputs when a key for screen movement is pressed without first pressing the <u>RETURN</u> key.
- * This error takes precedence over other errors.

Countermeasure: Press the correct keys.

2) "! SETTING ERROR"

Causes:

- Displayed in the following cases when inputting data (axis No., program No., setting data, program parameters, etc.):
 - 1. When the data entered (by pressing <u>RETURN</u> key) is outside the applicable range.
 - 2. When a negative value (minus key) is entered at a positive value input item.
 - 3. When the decimal point key is used at an integer input item.
 - 4. An inconsistency exists at system settings between the AMP slot setting and SB/SD servo settings.
 - 5. When the following statuses occur while registering programs in the program mode:
 - A. The same axis number is designated.
 - B. No simultaneous START program number is designated.
 - C. Abnormal FOR to NEXT relationship.
 - D. When an ABS-1 to ABS-4, INC-1 to INC-4, VABS, or VINC is missing at a speed change.
 - E. Constant-speed control does not end at CPEND.
 - F. Speed change does not end at VEND.
 - 6. When a key for screen movement is pressed at program mode constantspeed control or speed switching control after designating the same axis No. twice.
 - 7. When an improper instruction is selected at the 2nd or later step of constant-speed control or speed switching control in the program mode.
 - 8. When improper positioning data is selected for a given instruction in the program mode.
 - 9. When an indirect designation data change is attempted in direct numeric input under the address teaching function.
 - 10. When a key for screen movement or screen switching, etc., is pressed without entering the required data when using the program teaching function
 - 11. When a key for screen movement is pressed with the same axis number designated twice at the program teaching function.
 - 12. When the START program number is larger than the END program number for a "continuous" program operation.
 - 13. When no program number has been designated at a "random" program operation.
- * Note: When this error occurs, a setting cannot be designated for the data item in question.

Countermeasure: Enter a correct value.

9

			_
Mode	Function	9-1.2	

3) "! IN TEST MODE"

Cause:

- Displayed when a setting data (auxiliary data: backlight, buzzer ON/OFF, language selection) update is made in the test mode.
- * Note: Data will not be updated if this error occurs.

Countermeasure: Execute the update after canceling the test mode.

4) "! NO SERVO SYSTEM"

Cause:

- Displayed when any of the following operations are executed at an axis where no servo amplifier is installed.
 - 1. Axis monitoring
 - 2. Torque trace
 - 3. Servo monitoring
 - 4. Servo monitoring (2-port memory)
 - 5. JOG operation
 - 6. Home position return
 - 7. Present value setting
- * Note: The operation in question will not be executed if this error occurs.

Countermeasure: Designate another axis.

5) "! CAN'T TRACE"

Cause:

- Displayed when a torque trace operation is already in progress when a torque trace start is attempted, making the trace request impossible.
- * Note: The torque trace function will not be executed if this error occurs.

Countermeasure: Stop the trace operation which is in progress, then start the desired trace operation.

6) "! STARTING ERROR"

Causes:

- Displayed when switching to the test mode is impossible even after the prescribed period has elapsed. (See note 1)
- Displayed when the test mode cannot be canceled even after the prescribed period has elapsed. (See note 2)
- Displayed when a program operation start is attempted while operation is in progress. (See note 3)
- Displayed when address (designated by address teaching) writing is attempted while operation is in progress. (See note 4)
- Displayed when program (designated by program teaching) writing is attempted while operation is in progress. (See note 5)
- * Notes: 1. The test mode cannot be established when this error occurs.
 - 2. The test mode cannot be canceled when this error occurs.
 - 3. Program start is impossible when this error occurs.
 - 4. Address writing is impossible when this error occurs.
 - 5. Program writing is impossible when this error occurs.

Countermeasure: Stop the operation in progress, then try again.

7) "! TIME CHECK OVER"

Cause:

- Displayed when any of the following SCPU operations are not completed within the prescribed period:
 - 1. Bit device update
 - 2. Word device update
 - 3. Word device monitoring

Countermeasure: Look for malfunction at the SCPU.

8) "! DEVICE ERROR"

Cause:

- Displayed when a request to the SCPU ends in an error.
 - 1. Bit device update
 - 2. Word device update
 - 3. Word device monitoring

Countermeasure:

Check the device types and device addresses. If they are correct, there may be an SCPU malfunction.

9) "! WRITE ERROR"

Cause:

- Displayed when a ROM writing error occurred.
 - 1. When a data update is attempted at data setting.
 - 2. When address writing is attempted when using the address teaching function.
 - 3. When program registration is attempted when using the program teaching function.
 - 4. When a program change is attempted in the program mode.
- * Note: Data being registered at the ROM cannot be guaranteed when this error occurs.

Countermeasure: Replace the ROM.

10) "! ERROR DETECTED"

Cause:

- Displayed if an error is detected when a "continuous" or "random" program operation is started.
- * Note: Program operation is immediately stopped when this error occurs.

Countermeasure:

Check the program and error content, eliminate the error cause, execute an error reset, then re-start the program.

11) "M.OVER-CAN'T WR"

Causes:

- Displayed at program registration in the "program teaching" or "program" mode when the number of instruction words which have been created exceed the available program space.
- Displayed at the program copy operation (in program mode) when the number of instruction words to be copied exceed the available program space.
- * Note: This error also occurs at the program sort function, but only when the space required for the above operations cannot be secured.

 Program registration will be impossible if this error occurs.

Countermeasure:

Delete unnecessary programs, execute the sort function, then repeat the registration operation.

Мо	de	Function	9-1.4

12) "M.OVER-NEED SORT"

Causes:

- Displayed at program registration in the "program teaching" or "program" mode
 when the number of instruction words which have been created exceed the
 available program space.
- Displayed at a program copy operation (in program mode) when the number of instruction words to be copied exceed the available program space.

* Note: This error also occurs when using the program sort function, but only when the space required for the above operations cannot be secured. Program registration will be impossible if this error occurs.

Countermeasure: Execute the program sort function, then repeat the registration operation.

13) "! STEP NO. OVER"

Causes:

- Displayed during program creation in the "program teaching" or "program" mode when the number of instruction steps for constant-speed control or speed switching control exceeds 256.
- Displayed at program registration in the "program teaching" or "program" mode when the number of created instruction words for constant-speed control or speed switching control exceeds 768.
- * Note: Program registration is impossible when this error occurs.

Countermeasure: Shorten the program.

14) "! KEY INVALID"

Cause:

- Displayed when key operation for a data change, a program change or program operation is attempted with the enabled/disabled switch set to disabled.
- * Note: The above operations are impossible when this error occurs.

Countermeasure:

Set the enable/disabled switch to "enabled", then repeat the desired key operation.

15) "TST.MOD.OFF ERR"

Cause:

- Displayed when the test mode is canceled during a "continuous" or "random" program operation.
- * Note: Program operation is immediately stopped when this error occurs.

Countermeasure: Switch the test mode ON and start the program again.

16) "I.COD ERROR"

Cause:

- Displayed if an incorrect program code is read when modifying a program in the program mode.
 - 1. When the program number is entered.
 - 2. When the next step is read out in response to a STEP+ key input.
 - 3. When the next step is read out after canceling a step.

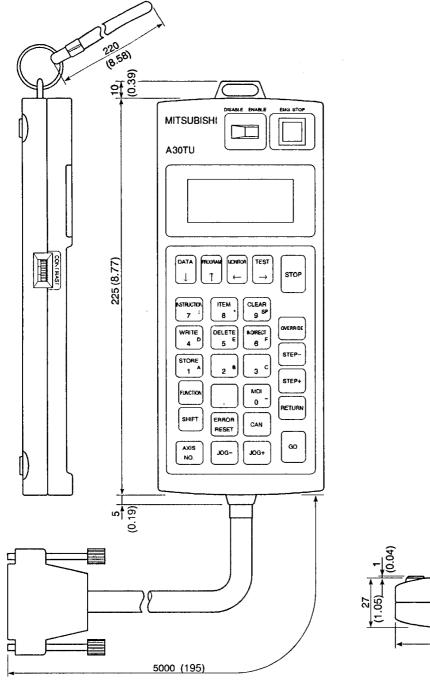
* Note: When an error occurs at status 2 or 3 above, all subsequent steps are abandoned. (If not registered, however, the program (ROM content) will not be changed.)

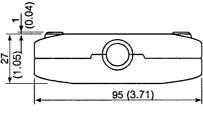
Countermeasure: Re-create the program.

APPENDIX. OUTLINE DRAWING

Drawing No.

Mode	Function	APP-1





mm:inch