MITSUBISHI

MOTION CONTROLLER

Operating Manual

type SW2SRX-GSV13PE



REVISIONS

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

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

\$	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.
Ś	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.
٩	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

- A 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.
- A 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.
- A 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

- 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.
- A 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

- 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.
- ▲ 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.
- ▲ Use wires and cables that have a wire diameter, heat resistance and bending resistance compatible with the system.

- \triangle 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.
- A 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

- A 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.
- A 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.
- A 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.
- A 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.
- ▲ 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.
- A 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.
- A 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.
- △ 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

	 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 produ	cts past the limit.				
	cables.	the control unit or servo amplifie	er, never hold the connected wires or	r		
\triangle	When transporting	the servomotor, never hold the ca	ables, shaft or detector.			
	When transporting fall off.	the control unit or servo amplifie	r, never hold the front case as it may	1		
	When transporting, edges.	installing or removing the control	unit or servo amplifier, never hold the	;		
⚠	Install the unit acc withstood.	cording to the instruction manual	in a place where the weight can be	;		
\triangle	Do not get on or pl	ace heavy objects on the product.				
\wedge	Always observe the	e installation direction.				
	Keep the designate inner surface or the devices.	ed clearance between the control u e control unit and servo amplifier, c	nit or servo amplifier and control panel control unit or servo amplifier and other	l r		
⚠	Do not install or op that have missing	erate control units, servo amplifie parts.	rs or servomotors that are damaged or	r		
\triangle	Do not block the in	take/outtake ports of the servomo	tor with cooling fan.			
⚠	Do not allow condu as oil enter the cor	ictive matter such as screw or cut htrol unit, servo amplifier or servo	tting chips or combustible matter such motor.	۱		
⚠	The control unit, se apply strong impac	ervo amplifier and servomotor are ts on them.	precision machines, so do not drop or	r		
⚠	Securely fix the commanual. If the fixing	ntrol unit and servo amplifier to the given served and the serve of the served served and the served ser	e machine according to the instruction off during operation.	}		
⚠	Always install the s so may lead to oil I	ervomotor with reduction gears in eaks.	the designated direction. Failing to do)		
\triangle	Store and use the	unit in the following environmenta	I conditions.			
	Environment	Cond	itions			
	Environment	Control unit/servo amplifier	Servomotor			
	Ambient	0°C to +55°C	0°C to +40°C			
	temperature	(With no freezing)	(With no freezing)			
	Ambient humidity	According to each instruction manual.	80%RH or less (With no dew condensation)			
	Storage According to each instruction -20°C to +65°C manual.					
	Atmosphere	Indoors (where not sub No corrosive gases, flammable g	pject to direct sunlight). Jases, oil mist or dust must exist.			
	Altitude	1000m or less a	above sea level.			
	Vibration According to each instruction manual.					

- 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.
- Mhen not using the unit for a long time, disconnect the power line from the control unit or servo amplifier.

 \triangle Place the control unit and servo amplifier in static electricity preventing vinyl bags and \triangle store.

(4) Wiring

- ▲ 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.
- \triangle 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.



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

(5) Trial operation and adjustment



(6) Usage methods

- 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.
- \triangle The units must be disassembled and repaired by a qualified technician.
- \triangle 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.
- \triangle 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



(8) Maintenance, inspection and part replacement

- \triangle Perform the daily and periodic inspections according to the instruction manual.
- 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.
- A Periodically replace consumable parts such as batteries according to the instruction manual.

\triangle Do not touch the lead sections such as ICs or the connector contacts. 1 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. Mhen replacing the control unit or servo amplifier, always set the new unit settings correctly. \triangle When the controller or absolute value motor has been replaced, carry out a home position return operation using one of the following methods, otherwise position displacement could occur. 1) After writing the servo data to the PC using peripheral device software, switch on the power again, then perform a home position return operation. 2) Using the backup function of the peripheral device software, load the data backed up before replacement. After maintenance and inspections are completed, confirm that the position detection of the absolute position detector function is correct. 1 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. A 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

- $\underline{\wedge}$ Dispose of this unit as general industrial waste.
- ▲ Do not disassemble the control unit, servo amplifier or servomotor parts.
- \triangle Dispose of the battery according to local laws and regulations.

(10) General cautions

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.

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1. INTRODUCTION

1. INTRODUCTION

(1) This manual describes the procedures for operating the two software packages used to create the programs and designate the settings required for positioning control by the motion controller. The software packages are as follows: SW2SRX-GSV13PE software package (hereafter referred to as "GSV13PE"). SW[]SRX-SV13[] INSTALL floppy disk package (hereafter referred to as "SV1[]").

⚠	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.

- (2) When any of the following devices are started using the software packages, the functions shown below will be operative:
 - IBM PC/AT or 100 % compatible machine personal computer with PC-DOS 5.0 or higher.

Operative Functions (hereafter, the above hardware will be referred to simply as "personal computer"):



IBM is a registered trademark of International Business Machines Corporation.

(3) The A171SCPU/A273UHCPU (hereafter referred to as "servo system CPU") comes with the following OS.

CPU type	os		
A171SCPU	SV42L		
A273UHCPU	Not installed		

Install the OS used for positioning control from the INSTALL floppy disk to the servo system CPU.

(4) The software package and INSTALL floppy disk package described in this manual are shown below.

		are Floppy ge Disk ne Package Name	CPU			
Periph-	Software Package		A1718	SCPU	A273	JHCPU
vice	Name		Teaching Function		Teaching Function	
			Without	With	Without	With
		SWOSRX- SV13M		0		
		SW0SRX- SV13L	0			
IBM PC	SW2SRX- GSV13PE software package	SW2SRX- SV13J			(8-axis specs.)	
		SW2SRX- SV13K				(8-axis specs.)
		SW2SRX- SV13U			O(32-axis specs.)	
		SW2SRX- SV13V				(32-axis specs.)

(5) Detailed explanations of the GPP and SFC functions which are included in the GSV13PE package are not given in this manual. For details regarding these functions, refer to the operating manuals shown below.

Function	Manual Name	IB No.
GPP	SWOIX-GPPAE Operating Manual	IB-66314
SFC	SWOIX-SAP2E Operating Manual	IB-66313

(6) Unless otherwise stated, the GSV13PE display screens shown in this manual are those displayed when the A273UHCPU (8-axis specs.) is used.

1. INTRODUCTION

IMPC	RTANT				
(1)	The GS	V13PE software package is exclusively for the servo system CPU.			
(2)	Persona system	I computers started up with GSV13PE can communicate only with the servo CPU where an SV13 positioning OS is registered.			
(3)	(3) Before conducting GV13PE ONLINE mode operation, verify the name of the positioning OS registered at the servo system CPU. When conducting this check, press the LED reset switch on the front of the servo system CPU.				
	(When A273UHCPU is used) The name and version of the positioning OS registered at the servo system CPU is indicated at the LED display as shown below.				
	LED	display for A273UHCPU with SV13 registered:			
		S V 1 3 V E R . 0 0 A			
	OS name Version				
(When A171SCPU is used) Turn the A171SCPU "install" switch ON. (Refer to the A171SCPU User's Manual IB- 67276.)Use the GSV13PE to execute the install function.					
SERVO function 7 INSTALL function selection window 7 1					
	The name and version of the positioning OS registered at the servo system CPU will be displayed on-screen.				
(4)	12MB o verify th	f space is required to install the GSV13PE at the hard disk. Therefore, be sure to hat the hard disk's remaining memory capacity exceeds 12MB.			

Shipping Container Contents

The following items are shipped together with the GSV13PE package.

ltem	Name		
Software package	SW2SRX-GSV13PE 1-9		

REMARK

1) The abbreviations used in this manual are shown in the table below.

Name	Abbreviation		
A171SCPU unit	A171SCPU		
A273UHCPU unit	A273UHCPU		
Operating system	OS		
Hard disk	HD		
Floppy disk	FD		
SW[]SRX-GPPA Type GPP function software package	GPP		
AC motor drive unit	ADU		
MR-H-B / MR-J-B / MR-J2-B servo amplifier	MR- 🗌 - B		
Dynamic brake unit	DY		
Capacitor unit	CU		

1.1 Features

The GSV13PE features are described below.

- (1) A maximum of 32 axes can be controlled (with A273UHCPU). Servo motor control for up to 32 axes is possible when an A273UHCPU is used with a 32-axis OS.
- (2) Sequence programs can be created using the SFC ladder diagram. The SFC program can be used to create a program which starts the servo program. (Files created at the SW1SRX-GSV12PE cannot be directly read out at the SW2SRX-GSV13PE. Refer to Section 10.2.6 for details.)
- (3) Data settings which enable feed forward control can be designated. A feed forward coefficient can be designated which minimizes the servo motor's follow-up error.
- (4) S-curve ratio settings are possible. An S-curve ratio can be designated for gentler acceleration/deceleration processing than that provided by trapezoidal acceleration/deceleration processing.
- (5) Direct mutual switching to sequence programs is possible while creating positioning programs. Switching to the ladder programming mode is possible while positioning programs (servo programs) are being created by servo instructions. The sequence program required to start a newly created servo program can be created simultaneously with the servo program.
- (6) Direct mutual switching to a PC test is possible during test runs. Switching to the PC test is possible while in the servo test mode. This makes wiring checks and debugging of the new sequence program possible while watching the test run results.
- (7) Direct mutual switching to the ladder monitor is possible during servo PC / servo monitoring. Switching to the ladder monitor is possible while in the servo PC/servo monitor mode. The status of the sequence ladder used to start the servo program can therefore be monitored while checking the positioning data and/or errors.
- (8) Positioning data and servo program settings can be designated in an interactive manner. Creation and revision of positioning data and servo programs is possible by either selecting the desired on-screen item, or by entering the desired setting value.
- (9) Teaching is possible. The A30TU teaching module makes address & program teaching possible.

1.2 Upgraded Functions

The functions newly added or upgraded from the previous version are described below. For details of each function, refer to the Programming Manual.

(1) Addition of high-speed data read function

The function to read out up to 11 kinds of data simultaneously to the designated device is added. The signal input from the input module which is mounted to the motion controller base is used as the trigger for reading processing. 11 kinds of data are specified among a total of 16 kinds of data including present position data, deviation counter data, etc.

(2) Addition of the function to cancel and start the servo program presently executed

By entering the cancel function to a servo program, it is possible to decelerate and stop an axis movement in response to turning ON of the cancel signal (designated bit device) during the execution of a servo program.

If the start function is designated with the cancel function, the designated servo program automatically starts after the stop.

(3) Upgraded constant speed control instruction

The following three functions are added.

(a) Skip function

By setting a skip signal (designated bit device) at pass points, it is possible to interrupt positioning at the pass point for which the skip signal is turned ON and to execute positioning at the next point.

(b) FIN signal wait function

By designating the FIN signal wait function with an M code set for pass points, the function synchronizes the completion of positioning at individual pass points with turning ON of the FIN signal.

(c) Circular interpolation function using CPSTART3 and CPSTART4

Circular interpolation in two axes is made possible.

(4) Addition of high-speed oscillation function

The control of reciprocating movement in sine wave form using a single axis is made possible.

- (5) Compatibility with MR-J2-B servo amplifiers
- (6) Improved management of present value when using an absolute encoder (see Section 1.2.1).

1.2.1 Improved present value management

By adding the functions described below, present value management when using an absolute encoder has been improved.

- (1) Added functions
 - (a) An encoder data validity check is now possible during operation.
 - It is checked whether the amount of change at the encoder in 3.5 ms intervals corresponds to rotation within 180° at the motor shaft. (If abnormal, an error is displayed.)
 - Consistency between the encoder data and the feedback position controlled at the servo amplifier is checked. (If abnormal, an error is displayed.)
 - (b) Addition of the present value history monitor has enabled monitoring of the following data at a peripheral device.
 - Encoder present value/servo command value/monitor present value when the power is switched ON.
 - Encoder present value/servo command value/monitor present value when the power is switched OFF.
 - Encoder present value/servo command value/monitor present value when a home position return is performed.
 - (c) By setting the allowable travel while the power is OFF, a change in the encoder data to a value outside the setting range while the power is OFF can now be checked when the the servo amplifier power is turned ON. (If abnormal, an error is displayed.)

1. INTRODUCTION

1.3 Procedural Flowchart to System Start

The following flowchart shows the procedure for starting the designed system.



1. INTRODUCTION



POINT

(1) Positioning control program

The program used for positioning control can be created in the GPP function's programming SFC mode. For details regarding use of the SFC program to create the program

which starts the servo program, refer to Section 10, and to the Motion Controller (SV13/22) (Real Mode) Programming Manual.

1.3.1 Procedural flowchart for the GSV13PE

The main GSV13PE related procedures are shown in the following flow-chart.

BEG			
	_		
		1	
	ition & start-up		
		-	
System se	ettings		Refer to Section 7
	 Based on the designate the and amplifier. 	devices used in the system configuration, settings for the base unit, axis No., motor,	
Positioning da	ita settings]	Refer to Section 8
	 Designate the the operation of 	parameter & data settings which determine of the servo motors and servo amplifiers	
Servo program	m creation	}	Refer to Section 9
	 Create a program ing control form 	ram which designates each motor's position- nat and positioning data settings.	
Register the pos	itioning data	7	Refer to Section 11
& servo pr	rogram		
	 Write the position of the second secon	tioning data settings (designated at d the servo program to the servo system	
Start the	servo]	Refer to Section 12.2
	 Check the folk rection, upper 	- owing: initial status, model name, rotation di- limit LS & lower limit LS, and rotation speed.	
Conduct a serv	o diagnosis]	Refer to Section 12.3
	 Verify that the used) and the 	speed control gain 1 (only when ADU is position control gain 1 are appropriate.	
Test the JOG, manua and home position r	l pulse generator, eturn operations]	Refer to Sections 12.4 to 12.6
	 Check the stro Check for vibra Check the hon point dog posi 	ke limit and emergency stop effectiveness. ation and hunting. ne position return direction and the near-zero tion.	
Conduct a servo prog	ram test operation	}	Refer to Section 12.7
	 Run the servo its operation. 	_ program which has been created and check	
0			

1. INTRODUCTION

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2. SYSTEM CONFIGURATION

This section describes the system configuration required for GSV13PE operation.

2.1 System Configuration

2

2.1.1 System configuration when IBM PC is used

The system configuration for GSV13PE operation using an IBM PC is shown below.



2-1

POINTS

(1) *1: A	personal	computer	or serial	mouse	can be	connected	to the
R	S-232C ir	nterface.					

- (2) *2: The PC-DOS system FDs, and the "GSV13PE function" system FD data are to be installed at the IBM PC.
- (3) *3: The main OS system FD is inserted in the floppy disk drive for installation to the servo system CPU.
- (4) *4: Operation environment is indicated below.
 CPU: 80386 or above
 Free main memory area: 560 KB or more
 EMS memory: 1 MB or more

At the start of GSV13PE, the hard disk must have at least 1 MB free area.



2.2 Further Information Regarding The System Configuration

Further information regarding the system configuration for GSV13PE operation is given below.

2.2.1 Applicable CPU

The following CPUs are compatible with GSV13PE:

- A171SCPU
- A273UHCPU

2.2.2 Personal computer & servo system CPU connection method

(1) IBM-PC & servo system CPU connection method



REMARK

The following converters are recommended in the IBM-PC and servo system CPU connection.

Diatrend Co., Osaka, Japan

 (1) DCNV-RS24 ([1]) DCNV-RS24L (with operation indicators) ([1]) DCNV-RS42R ([5]) DAFX-CAB interface built-in cable ([6])



2.2.3 Printer

A parallel printer (ESC/P 24-J84) is usable.

2.2.4 Note on accessing other stations in a data link system

Other station access involving the motion controller is not possible. For example the following are not possible: accessing the motion controller from a peripheral device connected to the PC CPU; accessing the PC CPU from a peripheral device connected to the motion controller; and accessing the motion controller from a personal computer in the network.



Peripheral device

3. FUNCTION LIST

The GSV13PE functions are listed below.







REMARK

1) The GSV13PE package includes the GPP and SFC functions. For details regarding these functions, see Section 10.

4. REGISTERING GSV13PE AT THE PERSONAL COMPUTER

The procedure for registering (installing) GSV13PE at the hard disk is shown below.

4.1 Registering GSV13PE at an IBM-PC

(1) Registration procedure

The procedure described below assumes a hardware configuration like the one shown below.



4. REGISTERING GSV13PE AT THE PERSONAL COMPUTER



BUFFERS=20 FILES=30 DOS=HIGH, UMB SHELL=C:\DOS\COMMAND.COM /P /E: 512 DEVICE=C:\DOS\HIMEM.SYS DEVICE=C:\DOS\EMM386.EXE RAM 2048 X=C800-CFFF D=64 FRAME=D000 DEVICEHIGH=C:\DOS\SETVER.EXE DEVICEHIGH=C:\DOS\ANSI.SYS /X

(a) Batch file

In order to start up the GSV13PE function, GSV13PE2.BAT is copied to the root directory, with the following data contents, as the batch file. The system re-writes the drive name as the drive name designated at installation.

ECHO OFF		
MOUSE		
CLS		
CD\GPP\2GSV		
GSV13P		
CD\		
5. COMMON ITEMS

This section describes items which are common to all GSV13PE operations.

5.1 Common File Management Items

Procedures common to all GSV13PE file management operations are described here.

5.1.1 System name





The system name comprises several sub-system names where data created by the user has been stored.

A maximum of 8 alphanumeric characters, hyphens, and underline marks may be used in the system name, but the name must begin with an alphabetic character.

5.1.2 Sub-system name

The sub-system name is a directory name where data created by the user is stored. As shown in Fig.5.1, multiple sub-system names are possible. A maximum of 8 alphanumeric characters, hyphens, and underline marks may be used in the sub-system name, but the name must begin with an alphabetic character.

POINT

(1) Comment & Comment GPP

- A "comment" is a comment related to the system name or the subsystem name. A comment which indicates the program content or the creation date, etc., is useful when conducting data searches. A maximum of 32 alphanumeric characters and special symbols may be used in the comment.
- A "comment GPP" is a comment which enables interchangeability with A6GPP file comments. These comments are added to program files created by the GPP function, and which have been converted for A6GPP use. These comments are displayed in the "comment" column when a directory display is executed at the A6GPP.

A maximum of 20 alphanumeric characters and special symbols may be used in the comment GPP.

5-2

5.2 File Configuration

The GSV13PE file configuration is shown below.



,

,

(2) File name

Files are created under the GSV13PE sub-system names according to the data content.

			(File Name)		
	1.	Parameter	PARAM.BIN	\mathbf{i}	
	2.	Main sequence (includes T/C setting value)	MSEQUENC.BIN		
	З.	Sub-sequence (includes T/C setting value)	SSEQUENC.BIN		
	4.	SFC block title	SFCBTTL.BIN		
	5.	SFC step comment	SFCn.BIN		
			(n=0-255)		
	6.	Step trace	STPTRACE.BIN	5	File name is fixed.
	7.	Main microcomputer	MMICRO.BIN		
	8.	Sub microcomputer	SMICRO.BIN		
	9.	Comment 1	KANACOM.BIN		
	10.	Comment 2	KANJICOM.BIN		
	11.	Main statement	MSTATEM.BIN		
	12.	Sub statement	SSTATEM.BIN		
	13.	Main note	MNOTE.BIN		
	14.	Sub note	SNOTE.BIN	/	
	15.	Sampling trace	[Data name].STR		Identifier is fixed. File
	16.	Status latch	[Data name].SLT	4	name may consist of up
	17.	Device memory	[Data name].DEV		to o origis.
	18.	System information	GPPA.CNF	\mathbf{X}	
		(PC type, comment, printer informa	ition)		
	19.	PC type (for PCPU)	GSVP.CNF		
	20.	Print header	PHEADER.BIN		
	21.	Extension comment	NEWCOM.BIN		
	22.	System settings data	SVSYSTEM.BIN	5	File name is fixed.
	23.	Servo data	SVDATA.BIN		
•	24.	Servo program	SVPROG.BIN		
	25.	Trace graph data	SVTRCEn.BIN		
			(n=01-31)	ĺ	
	26.	Backup data	SVBACKUP.BIN	/	

5.3 Common Display Format

The display layout and content which are common to all GSV13PE operations are described here.

- (1) Display items common to all GSV13PE operations
 - (a) Display items when in any mode other than "System Settings"

The display items common to all modes other than the "system settings" mode are described below.



No.	Name	Description
(1)	Mode/Function Display Area	The mode or function which is currently active is displayed.
(2)	PC Type - PC No Monitor Destination Display Area	The following items designated by the initial settings are displayed here: PC type, channel No., PC No., monitor destination (PC, DM (device memory), SL (status latch)), and network No.
(3)	Memory Status Display Area (number of steps used & remaining number of steps)	When in the PROGRAMMING mode, the number of steps used and the remaining number of steps are displayed here.
(4)	Drive Name: Sub-System Name Display Area	The drive name and sub-system name designated by the initial settings are displayed here.
(5)	Main (Sub) Display Area	This display indicates whether the current program is a "main" or "sub" program.
(6)	[F11] Function Display Area	F11: MENU (when the [F11] function key is pressed, the menu selection window is displayed.)
(7)	[F12] Function Display Area	F12: HELP (when the [F12] function key is pressed, the HELP window is displayed.)
(8)	Key-In Data Display Area	The key-in data for the GPP (ladder mode, list mode) and SFC functions are displayed here.
(9)	Guidance/Error Message Display Area	Guidance and error messages are displayed here.
(10)	Function Key Name Display Area	The names of function keys [F1] to [F10] are displayed here.

(b) Display items when in the SYSTEM SETTINGS mode:



No.	Name	Description
(1)	Menu bar display area	The menu bar is displayed when the right mouse button or the [ESC] key is pressed.
(2)	System setting area	This entire window is for system settings. Unit allocations, etc., are designated here.
(3)	Base unit display area	The designated base unit and the module mounting status are displayed here.
(4)	Servo amplifier display area	The operation status of servo amplifiers d1 to d4 are displayed (at A171SCPU).
(-)		The operation status of servo amplifiers d1 to d8 are displayed (at A273UHCPU (8/32 axis specification)).
(5)	Dialog Box/Alert Display Area	This is the dialog box/alert display area.
(6)	System Message Display Line	The current EDIT mode, etc., is displayed here.
(7)	SSC Network Selection Button (For A273UHCPU (32-axis specification) only)	Selection of SSC network 1 to 4 occurs here.

5.4 Windows/Guidance

GSV13PE operations include the following 6 types of windows & guidance messages.

- Menu selection window......See Section 5.5.1
- Sub-function selection window See Section 5.5.3
- EXECUTE/SET window See Section 5.5.4

The following 3 methods can be used to select a desired function.

(1) Selection by numerical key input..... The desired item can be selected from the menu or option selection display by entering the number of that item.

(2) Selection by cursor position (cursor control keys)

• •		• •
		The desired item can be selected from the menu, etc., by using the cursor control keys to move the cursor to that item, and then pressing the [Enter] key.
(3)	Selection by mouse	Select a function from the menu bar by executing a mouse right- drag and right-release. Select an item from a selection display by executing a mouse left- click at that item.

Function selection by mouse is only possible in the GSV13PE's SYSTEM SETTINGS mode.

5.4.1 Menu selection window

The menu selection window can be used for all operation selections related to the GPP function. Except when in the GSV13PE's INITIAL SET-TINGS or SYSTEM SETTINGS modes, the menu selection window can be displayed during any operation by pressing the [F11] function key. The INITIAL SETTINGS or SYSTEM SETTINGS mode must be canceled in order to display the menu selection window.



[Key Operation]



5.4.2 Mode & function selection window

Mode and function selection windows are provided for each of the main window items at the menu window, etc., with additional sub-windows displayed for lower ranking setting items.



[Key Operation]



• Press the [ESC] key to return to the main window.

5.4.3 Function selection sub-window

When a mode/function is selected, function selection sub-windows are provided when additional selection items exist.



[Key Operation]

Key explanation



• Press the [ESC] key to return to the main window.

5.4.4 EXECUTE/SET window

The EXECUTE/SET window is where numerical value inputs, option selections, etc., occur, depending on the selected function.



[Key Operation]

[xxxx window] ____ [Data setting] ____ End

- Press the [ESC] key to return to the main window.
- When multiple EXECUTE/SET windows exist, use the [PAGE UP] key to display the previous page, and the [PAGE DOWN] key to display the next page.

5.4.5 Check dialog box

The check dialog box is used for the following:

- Error message is displayed when the error prevents further operation.
- Processing confirmation messages are displayed.

When an error message is displayed, check the error content and take the appropriate action to correct the problem. When a confirmation message is displayed, confirm execution of the processing.

[Confirmation Dialog Box]



[Key/Mouse Operation]

Error message check



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5.4.6 Option selection dialog box

Questions, messages, and setting options are displayed at the option selection dialog box.

The two types of dialog box are shown below. Each type features question, message, and YES/NO, OK/CANCEL option displays. In response to the questions and messages, the desired YES/NO or OK/CANCEL option can be selected by using the mouse or by moving the cursor to the desired item.

[YES/NO Selection Dialog Box]



[Key/Mouse Operation]



[OK/CANCEL Selection Dialog Box]



[Key/Mouse Operation]



5.5 Basic Mouse Operation

The basic procedures for using the mouse in GSV13PE operations are described here.

(1) Mouse appearance & mouse cursor

[Mouse Appearance]



As shown at left, the mouse is equipped with left and right buttons.

[Mouse Cursor]



The mouse cursor is used to select functions and items, and to designate settings.

The mouse cursor is displayed in the SYSTEM SETTINGS mode.

- (2) Mouse operation & functions
 - (a) Button press (ON)

Pressing the right-side button is referred to as a "right-press".

Right Press

 Menu bar display The menu bar will be displayed in response to a right-press during a system "waiting for input" status. (b) Button Release (OFF)

Lifting the finger from the pressed button to release it is referred to as a "right-release".

Left-Release	 Designates drag destination position Dragging of a selected item ends at the position where a left-release occurs.
Right-Release	 Designates a menu item selection After dragging the cursor to the desired pull- down menu item, a right-release is executed to select that item. (Refer to item(e) below

(c) Click

Pressing and immediately releasing the left-button is referred to as "left-click".



• Function selection & execution Move the mouse cursor to the desired item, then execute a left-click to select and execute the function.

for details regarding "drag" operations.)

(d) Double-Click



A double-click is two left-clicks in rapid succession.

Left Double-Click

 Dialog box display for unit/module data setting Move the mouse cursor to the unit/module where data settings are to be designated, then execute a left double-click to display the dialog boxes. (e) Drag



Moving the mouse body to a desired position while the left or right button is pressed is referred to as a "drag" operation. Mouse movement with the left-button pressed is referred to as a "left-drag". Mouse movement with the right-button pressed is referred to as a "right-drag".

Left-Drag	

- Moving a selected item
 A left-drag is executed to move a selected item.
 When the desired position is reached, execute a left-release.
- Right-Drag
- Selection of menu bar & pull-down menu items A right-drag is executed to move to the position of the desired item at the menu bar displayed by a right-press. When positioned at the desired item, execute a right-release.

5. COMMON ITEMS

5.6 Keyboard

The keyboard layouts and key applications used with the GSV13PE package are shown below.

5.6.1 For IBM-PC

The IBM-PC keyboard layout is shown below.



5.6.2 Common keys

The keys and key applications common to all GSV13PE operations are described below.

- (1) For and IBM-PC
 - (a) Key applications

Key Name	Application
Esc	Closes windows and aborts operations.
Tab	Displays the HELP menu.
Ctri	Used in combination with alphanumeric keys. (Refer to item (b) below.)
Shift	Used in combination with function keys.
Caps Lock	Switches between upper-case and lower-case alphabetic characters.
Alt	Used in combination with the [F11] function key. (Refer to item (b) below.)
Back Space	Deletes 1 character to the left of the cursor position.During the TEST mode, this key executes an rapid stop of all axes.
J (Enter)	Registers an input or item selection.
Page Up	Displays the previous page for ladder, list, HELP, and SFC diagrams, etc. This key is also used for axis No. switching (-1) during servo monitor and servo test operations, etc.
Page Down	Displays the next page for ladder, list, HELP, and SFC diagrams, etc. This key is also used for axis No. switching (+1) during servo monitor and servo test operations, etc.
Insert	Inserts a space at the cursor position.
Delete	Deletes 1 character at the cursor position.
Home	Moves the cursor to the home position.
End	Closes windows and ends setting operations.
Cursor control keys	These keys are used to move the cursor.
Print Screen	Copies the TEXT screen.
Num Lock	Designates the ten-key pad for exclusive numerical key use.
F11	Displays the menu selection window.
F12	Displays the HELP window.

Key Input	Function
Ctrl+E	Moves the cursor UP (same as the [1] key).
+X	Moves the cursor DOWN (same as the [\downarrow] key).
+D	Moves the cursor to the right (same as the $[\rightarrow]$ key).
+S	Moves the cursor to the left (same as the [\leftarrow] key).
+F	Moves the cursor 1 word rightward. At ladders, this key moves the cursor to the right edge.
+A	Moves the cursor 1 word leftward. At ladders, this key moves the cursor to the left edge.
+R	Displays the previous page (same as [PAGE UP] key).
+C	Displays the next page (same as [PAGE DOWN] key).
+G	Deletes 1 character at the cursor position (same as the [DELETE] key).
+Y	Deletes 1 line at the key-in data area.
+H	Deletes 1 character to the left of the cursor position.
+F1	Saves positioning data and servo program files.
+F11	Switches between servo programming and ladder editing. Switches between servo programming and SFC program editing. Switches from ladder monitoring to servo programming. Switches from SFC monitoring to servo programming. Switches from servo PC / servo monitoring to PC TEST. Switches between SERVO TEST and PC TEST.
Alt+F11	Switches from servo PC to ladder monitoring. Switches between servo monitoring and ladder monitoring. Switches between servo PC / servo monitoring and SFC monitoring. Switches from servo TEST to ladder monitoring.

(b) Control key & alternate key specifications

POINTS	
(1) In th	is manual, key inputs are indicated as shown below.
• At A	Procedural Explanation: + $\begin{bmatrix} B \\ \dots \end{bmatrix}$ The [B] key is pressed while the [A] key is being pressed. $\rightarrow \\ \begin{bmatrix} B \\ \dots \end{bmatrix}$ The [B] key is pressed after the [A] key has been pressed.
• At [A [A]	Key Operation Explanations: + [B]The [B] key is pressed while the [A] key is being pressed. \rightarrow [B]The [B] key is pressed after the [A] key has beenpressed.
(2) When dialo the s sub-s aban	n the [Ctrl] + [F1] keys are pressed, a < "Write to file? YES/NO > g (confirmation) message will be displayed. If "YES" is selected, etting data will be written to the file of the currently designated system. If "NO" is selected, the file writing operation will be doned, and the YES/NO dialog box will be closed.

5.7 HELP Function

The HELP function explains functions, operations, and corrective action procedures for errors.

The GSV13PE package consists of the following 3 types of HELP functions:

- For guidance
- For troubleshooting
- For menu

The HELP types which correspond to each function are shown below.

Eunction	HELP Function Type			
Function	Guidance HELP	Troubleshooting HELP	HELP Menu	
System setting	0			
Servo data setting	0	0	0	
Servo programming	0	0	0	
Servo printer	0	0	0	
Servo file	0	0	0	
Online	0	0	0	
Install	0	0	0	
Backup	0	0	0	
A273U → A273UH conversion	0	0	0	

(1) Guidance HELP window

The guidance HELP window explains operation procedures. To display this HELP window, verify that "F12:HELP" is displayed at the upper right of the screen, then press the [F12] function key. (For details regarding the guidance HELP window when in the SYSTEM SETTING mode, see Section 4.)

An example of the guidance HELP window is shown below.

LAUDER URENE ACC [HELP] 3.1.4 AEAG GDTAIDA HAT STAA	0- FF -PC	3	17.8197 CUTCHER	MAIN FILIMON	F12:HELF
[845]C OPERATION] 1. Step number \rightarrow [F	[ater] (ste	ip nund	er designation) (n	o setting key)	
2. Ladder symbol key ladder symbol des)→ Nevice (ignation)	: → H	mber → [Enter] (d	evice with	
3. Device → Humber	→ [Eater]	Clev	ice designation)		
4. [F8](-[]-) → Ins	truction -	→[Ent	er](instruction des	ignation)	
 [f#](-[]-) → Inst (instruction dest 	(ruction _→ ignation)	[Spac	e]→Device → Hund	er [Enter]	
6. [E][N][0]→[Ente	er] (ond ci	ircuit	designation)		
7. Bevice> Humber (device used in f	→[Space] instructie	$\rightarrow [/]$	[[] → [Enter] digit is also sear	ched)	
[ah:HiiP MiN0			Fg Up;Flit€f###S	Pg Unititities	¢:01081
IVALLE 2 BEAR 7 MON	4 AUX (_ - / ⊢	6 Har 1 - 8 -	⊢ 9 — -1	

[Key Operation]

as < [4] - .

Page change	Press the PAGE UP key to display the previous page, and the PAGE DOWN key to display the next page.
HELP menu display	Press the TAB key to display the HELP menu.
Ending the guidance HELP display	Press the [ESC] key to end the guidance HELP display

A 40 A 1 A 1 A

1 - 1

5 – 18

- (2) Troubleshooting HELP window
 - The troubleshooting HELP window displays the causes of, and corrective actions for, errors which occur at each of the functions. To display this HELP window, press the [SHIFT] + [F12] keys while an error message is displayed. An example of the troubleshooting HELP

BVO PROCRAM A3U O FE PC - O HELPING (ENO, COMMAND,	D/14334 C:TEMP8 MAIN F11:MENU F	12:H
Lause	Action	
A program which does not contain	Write END instruction.	
A serve program which does not iontain noither VEND nor CPEND instruction is displayed.	Write VEHD or GPEHD instruction at and of sorve program.	the
	•	

[Key Operation]

Page change Press the PAGE UP key to display the previous page, and the PAGE DOWN key to display the next page.

Ending the Press the [ESC] key to end the troubleshooting HELP display. HELP display

(3) HELP menu

The HELP menu is the table of contents for the guidance HELP function. To display the HELP menu window, press the [TAB] key while the guidance HELP window is displayed. An example of the HELP menu is shown below.

A 1000 - 100	TOBUER URIT; THELP URIU] 1.1.4 READ 1.1.4 READ 1.1	ABU OFF PC T D D ASUTCH SUTCH ASU	U 176 Line Pg U ET LED TEL CONVERSION	TAZ C.TEMP8 9:PREUTOUS P (41(TC)	MntH F11:MUN 9 On:NEXT	F12:HELP
	Tab:HELP MENU		Pg	Up:PREVIOUS	Fater: OPEN For Pg Da:NLXI Es	CLOSE
	1VRITE 2 READ 3	MON 4 AUX S	6	7 ⊢ 8(· 9 ·0	

[Key Operation]

Page change Press the PAGE UP key to display the previous page, and the PAGE DOWN key to display the next page.

Ending the HELP Press the [ESC] key to end the HELP menu display.

POINT

(1) If the [SHIFT] + [F12] keys are pressed when no error message is displayed, a beep will sound and the troubleshooting HELP window will not be displayed.

- (4) Guidance HELP window in SYSTEM SETTING mode
 In the SYSTEM SETTING mode, there is a HELP table of contents
 window and a HELP window.
 To display the HELP table of contents, execute a left-click at the menu
 bar's "HELP" item.
 - HELP table of contents window An example of the HELP table of contents window is shown below.

CONT			
SELECT BASE	UNIT AND EXECUTE UNIT		
LINE, NUMBER OF UNIT, AXIS NO.,			
AND MOTOR SETTING.			
FOLLOWING I	TEMS SHOW DETAILS.		
(A)UNIT SET	(D)EX.SERVO AMP.SET		
(B)MOTOR SE	(E)REL.CHK.		
(C)AXNO.SET	(F)HI-SPEED DATA READ SET		
	Esc : CANCEL		

[Key Operation]

Selecting a HELP table of contents item

Ending the HELP table of contents display

Execute a left-click at the desired display item, or press the [A]-[F] key which corresponds to the desired item.

To end the table of contents display, execute a left-click at the "CANCEL" position, or press the [ESC] key.

• HELP window An example of a HELP window is shown below.

	-
UNIT SET UNIT TYPE, NUMBER OF UNIT, BASE SLOT LOCATION SETTING.	
 CONNECT EX.REGENERATIVE RESISTANCE TO POWER UNIT. EX.SIGNAL UNIT IS NECESSARRY TO USE DYNAMIC. BRAKE CAN SET 256PT. I/O SUM(IN-OUT UNIT)IN MOTION IN MOTION UNIT. IF USE ABS MOTOR(ADU) OR ABS SYNC.ENCORDER BATTERY UNIT IS NECESARRY(BASE UNIT). 	
((Z) (X)> (H)HELP CONT.	

[Key Operation]

Page changes	To display the previous page, execute a left-click at the "(Z)" item, or press the [Z] key. To display the next page, execute a left-click at the "X-" item, or press the [X] key.
Displaying the HELP table of contents	To display the HELP table of contents, execute a left- click at the "(H) To HELP Table of Contents" item, or
Quitting the HELP display	To quit the HELP display, execute a left-click at the "CANCEL" item, or press the [ESC] key.

5.8 Switching Between the Servo Functions and GPP/SFC Functions

When using GSV13PE, it is possible to switch to GPP or SFC functions while executing servo functions, and vice versa. Details of the possible switching operations are presented below.



- *1 If [Ctrl] + [F11] is pressed in the servo programming mode without first having entered the SFC mode/ladder mode at least once, the system will swithch to the ladder mode.
- the SFC mode/ladder mode at least once, the system will switch to the ladder mode.
 If [Alt] + [F11] is pressed in the servo monitor/servo PC mode without first having entered the SFC mode/ladder mode at least once, the system will switch to the ladder monitor function.
- *3 It is not possible to switch from the ladder monitor function to the servo PC mode.

6. STARTING & QUITTING GSV13PE

6. STARTING & QUITTING GSV13PE

6.1 Start-Up Procedure

This section describes the procedure for displaying the GPP function's initial screen after starting the personal computer where GSV13PE has been registered (installed).

6.1.1 Start-up procedure at IBM-PC



6. STARTING & QUITTING GSV13PE



The servo function's selection window will then be displayed.

6.2 Ending GSV13PE Operation

The procedure for ending GSV13PE operation and returning to the DOS screen is described below.

Either press the [ESC] key to close the data setting windows and sub-function selection windows, or press the [F11] function key to display the menu selection window.





- (1) "End after file writing" operation:
 - When the servo function has been ended without file writing, select the "SAVE & QUIT" item at the GPP function's QUIT window to write the current program's data to the file before operation is ended.

7. SYSTEM SETTING

Base unit selection, module allocation, program axis No. settings, servomotor settings, and servo amplifier settings are all made in accordance with the actual system configuration. Moreover, the designated system configuration should be checked to ensure that it is the correct one.

Unless otherwise stated, display screen examples are the screens of the A273UHCPU (8-axis specification).

7.1 System Setting

System	System	The following fund	ctions are executed after the system has been built:	7.1.1, 7.1.5 to 7.1.8
		display, system in	itializing, and HELP window display.	
		HELP	Precautions and explanations for each function are displayed.	7.1.1
		Relative Check	System match is checked.	7.1.5
		Module Information	Information regarding the PC input/output modulesis displayed.	7.1.6
		System Initializing	The designated system configuration is cleared and initialized.	7.1.7
	L	QUIT	Ends the SYSTEM SETTING mode.	7.1.8
P	Unit/Module Edit	Used to edit unit/r	nodule data settings.	7.1.3(2)
		Cancel	The most recently designated unit/module data setting is canceled, and the previous setting is re-established.	7.1.3(2)
		Copy	Unit/module data is copied	7.1.3(2)
		Cut	Unit/module data is cut.	7.1.3(2)
		Paste	Cut unit/module data is pasted (re-display)	7.1.3(2)
	L	Delete	Unit/module data is deleted (pasting not possible)	7.1.3(2)
	Unit/Module Setting	—— Unit/module data are designated.	(units used and servomotor/servo amplifier, etc.) settings	7.1.2, 7.1.3(1) 7.1.4
		Base Unit	The base unit to be used is selected/changed	7.1.2
		Module Allocation	Module data settings are designated	7.1.3(1)
		Axis No. Setting	Axis No. settings are designated for motors connectedto ADU, MR- \Box -B.	7.1.4
	L	High speed data read setting	Sets the high-speed data read for PC input, input/output composite, and pulse/synchronous encoder I/F module	7.1.9

(1) Function summary The following functions are available in the SYSTEM SETTING mode.

(2) Outline flowchart The basic procedures for the SYSTEM SETTING mode are shown in the following flowchart.



..... When the base unit is designated at the base unit selection dialog box, the base unit default configuration will be displayed at the SYSTEM SETTING screen.

7. SYSTEM SETTING

7.1.1 Common items

The following items are common to all SYSTEM SETTING mode operations.

- (1) Menu selection
 - (a) Selection by mouse and key inputs
 - Menu items can be selected by using the mouse or by key inputs. Both methods are described below.



- (2) Terminology used in this section
 - (a) Unit/module frame...Frame which indicates that a module or unit selection has been determined.



- (3) HELP function In the SYSTEM SETTING mode, the HELP function displays precautions and explanations for each of the functions. (Refer to section 5.8(4)).
- (4) Basic operation
 - (a) Module selection
 - 1) Module selection by key input
 - Use the $[\leftarrow]/[\rightarrow]$ keys to move the unit/module frame to the desired module.

[Key Input Selection Screen]

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	- :	a				
	[←]	<u></u>		~		
2010		······································			 	

If the $[\leftarrow]$ key is pressed when the frame is at the left-most module position, the frame will move to the right-most module position. If the $[\rightarrow]$ key is pressed when the frame is at the right-most module position, the frame will move to the left-most module position.

2) Module selection by mouse

Mouse click

i) Move the mouse cursor to the desired module position and execute a left-click.

ii) The selected module will then be framed.

[Selection (by click) Execution Screen]







7.1.2 Base unit setting

Designate the base unit to be used in the manner described below.

Base unit selection
 A base unit selection is required when a "no base unit setting" status exists.

If a base unit setting already exists, the base unit selection procedure is unnecessary.

[SYSTEM SETTING Screen]

[Base Unit Setting Procedure]



[Base Unit Setting Dialog Box]



[Display/Setting Content]

Base unit model
name setting areaThe selectable base unit model names are displayed here.Selection indicator
markIndicates the selected model name.Unit/module frame
displayThe frame used for selecting units is displayed.Base unit modelThe name of the selected base unit is displayed here.

[Mouse Operation Procedure]

name display

Base unit selection1) If SYSTEM SETTING data has not been set, select the "SYSTEM SET-
TING" item at the servo function selection window in order to display the
SYSTEM SETTING screen. The base unit setting dialog box will also be
displayed at this time.
Either move the mouse cursor to the desired base unit model name and
execute a left-click, or key-in the number shown at the left of the desired
base unit model name.
The selection indicator mark will then be displayed at the selected model
name.

7. SYSTEM SETTING

 Setting END
 1) After the base unit has been designated, execute a left-click at the "OK" item, or press the [Enter] key. The setting will then be registered, and the system will return to the base unit display screen where the default configuration for the designated base unit will be displayed.

Setting Abort 1) To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key. The entered settings will be canceled, and the system will return to the SYSTEM SETTING screen. (2) Changing the base unit setting The procedure for changing an existing base unit setting is described below.

[Base Unit Change Procedure]







[Mouse Operation Procedure]

Base unit change

- 1) In order to change an existing base unit setting, execute a right-press at any position on the EDIT screen in order to display the menu bar.
- 2) With the right-button pressed, move the mouse cursor to the menu's "UNIT SETTING (U)" item to display the pull-down menu. At the pull-down menu, execute a right-release at the "BASE UNIT SELECTION (B)" item. The base unit dialog box will then be displayed.
- 3) Move the mouse cursor to the base unit model name to be newly designated and execute a left-click, or key-in the number shown at the left of the model name.

The selection indicator mark will then be displayed at the selected model name.

4) To end the setting operation after the new base unit setting has been designated, execute a left-click at the "OK" item, or press the [Enter] key. The "Base Unit Initialize YES/NO" dialog box will then be displayed.

To save data settings which existed prior to the base unit change, execute a left-click at the "NO" item.

The base unit setting will then be changed and the pre-change settings will be saved (within the possible range).

If the pre-change data settings are no longer required, execute a left-click at the "YES" item.

The default configuration for the newly designated base unit will be displayed.

5) To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key.

The entered settings will be canceled, and the system will return to the Base Unit screen status which existed prior to the change.

7.1.3 Designation of system modules & servomotor/servo amplifier

The procedures for designating and editing the system module and the servomotor/servo amplifier settings are described below.

- (1) Designation of system modules & servomotor/servo amplifier The type/model name of the system modules and the servo motor/servo amplifier are designated.
 - (a) Designation of modules to be used (system modules)

[Procedure For Displaying System Module Designation Dialog Box]

Base unit display Move the unit/module frame to the screen module to be designated	Execute left double-click inside the unit/module frame / press the [Enter] key / menu item (module allocation) selection
--	--

1) Motion extension base unit & battery setting (for A273UHCPU (8/32 axis specification) only)

[Motion Extension Base Unit & Battery Setting Dialog Box]



[Display/Setting Content]

 Motion extension
 The name of the selected motion extension base unit is displayed here.

 base unit model
 name display area

 Metion extension
 Opene the metion extension have unit extinct displayed here.

base unit SET	Opens the motion extension base unit setting dialog box.
Battery model name setting area	The model names of selectable battery units are displayed here.

Selection indicator Indicates the model name of the selected battery unit. mark

[Mouse Operation Procedure]

Selecting the motion extension base unit	1)	To select the motion extension base unit, execute a left-click at the motion extension base SET button, or press the [A] key. The motion extension base setting dialog box will then be displayed.
Battery model name setting	1)	Move the mouse cursor to the model name to be selected and execute a left-click, or enter the number shown at the left of the model name. The selection indicator mark will move to the selected name.

Be sure to set a battery unit when an ABS motor or A273EX is connected.

 Setting END

 To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key. The entered settings will be confirmed, and the system will return to the base unit display screen.

 Setting Abort

 To abort the setting operation, execute a left-click at the "CANCEL" item,

or press the [ESC] key. The entered settings will be canceled, and the system will return to the base unit display screen.



[Display/Setting Content]

Motion extension The selectable motion extension base unit names are displayed here. base unit model

name setting area

Selection indicator Indicates the model name of the selected motion extension base unit. mark

[Mouse Operation Procedure]

Motion extension base unit model name	 Move the mouse cursor to the name to be selected and execute a left-click, or key in the number shown at the left of the name. The selection indicator mark will move to the selected name.
Setting END	 To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key. The entered settings will be confirmed, and the system will return to the motion extension base & battery setting dialog box.
Setting Abort	 To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key. The entered settings will be canceled, and the system will return to the motion extension base & battery setting dialog box.

2) Selecting separate servo amplifiers

[Separate Servo Amplifier Setting Dialog Box]



[Display/Setting Content]

Separate servo The USE/NO USE setting is designated here for the separate servo amplifier. amplifier USED/NOT USED setting area

[Mouse Operation Procedure]

Separate servo amplifier USED/NOT USED setting	 Move the mouse to the USE or NO USE item and execute a left-click, or key in the number shown at the left of the item. The selection indicator mark will move to the selected item.
Setting END	 To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key. The entered settings will be confirmed, and the system will return to the base unit display screen.
Setting Abort	 To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key. The entered settings will be canceled, and the system will return to the base unit display screen.

[SSC Network Selection] (For A273UHCPU (32-axis specification) only)



* The screen shown above is the A273UHCPU (32-axis specification) screen.

[Display/Setting Content]

SSC network The No. of the currently selected SSC network is displayed (SSCNET 1-4). **display**

SSC network Changes the SSC network No. selection button

[Mouse Operation Procedure]

SSC network	1) Execute a left-click at the BEF. NET or NXT. NET item, or key in [A] or [S].
selection	The SSC network No. will change accordingly.

3) I/O slot setting

[I/O Slot Setting Dialog Box]



[Display/Setting Content]

Module model name The name of the selected module is displayed here. display area

Module NOT USED	Designated when the I/O slot is not used (vacant).
setting area	

Module typeModule types which are installable at the I/O slot are displayed here.selection areaWhen a selection is made, a model name setting dialog box for that
module will be opened.

[Mouse Operation Procedure]

Module type setting
 1) Move the mouse cursor to the desired module type and execute a left-click, or key in the number shown at the left of the module type.
 A model name setting dialog box for the selected module will then be displayed.

Setting END 1) To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key. The entered settings will be confirmed, and the system will return to the base unit display screen.

Setting Abort

 To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key. The entered settings will be canceled, and the system will return to the base unit display screen.

With an A17 following mo	1SCPU, the module frame does not move to the dules
Base module	e model name:
A172B:	Right side I/O module (S-I/00 slot)
A178B:	Second slot from the left end and
	on (S-I/00 to S-I/06 slots)
A178B-S1:	Third slot from the left end and
	on (S-I/00 to S-I/05 slots)
A PC module be installed User's Manu	e can be installed at S-I/0 slot (for modules that car in thisslot, see the Motion Controller (A171SCPU) al.
Note that the and,	ese modules are not related to the motion controlle
accordingly,	setting of amodel name is not necessary
in the syster	n setting operation.
To Install A Motion Module

[Motion Module Setting Dialog Box]



* The screen shown above is the A273UHCPU (32-axis specification) screen.

[Display/Setting Content]

Motion module model name setting area	The selectable motion module names and types are displayed here.
External signal setting button	Opens the external signal setting dialog box (for installing a servo external signal module).
Servo power supply module system setting button*	Opens the servo power supply module system designation SET dialog box. (For installing an AC motor drive module / dynamic brake module / servo external signal module.)
HI-SPD data read SET button	Opens the high-speed data read setting dialog box (when high-speed data read function is used).
Active axis No. SET button*	Opens the active axis No. dialog box. (Only when a limit output module is installed.)
[Mouse Operation Procedure]	
Motion module model name setting	 Move the mouse cursor to the desired motion module name and execute a left-click, or key-in the number shown at the left of the name. The selection indicator mark will move to the selected name. To make external signal, servo power supply module system, or active axis No. settings for each module after setting the module name, either execute a left-click on the relevant SET button, or press the function key ([A] to [E]) which corresponds to it. The setting dialog box for that item will then be opened. (Servo power supply module system & active axis No. settings apply only for the A273UHCPU (32-axis specification) module.
Setting END	 To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key. The entered settings will be confirmed and the I/O slot setting dialog box will be opened.
Setting Abort	 To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key. The entered settings will be canceled, and the system will return to the I/O slot setting dialog box.

* Displayed only at the A273UHCPU (32-axis specification) module.

[External Signal Setting Dialog Box]

42789	
	Axis No. setting area
1.10.1 3.10.3	
2-216 2 6-316 6	
3.516.3 7:816.7	
4:316 4 . 8:350.8	
NTR NRK OR ROG 316	Motor brake or dynamic brake setting area
	DOG signal setting area
	Selection indicator mark
AX12 NO. SET HORE	1

[Display/Setting Content]

Axis No. setting area	Designate the axis No. which corresponds to the input signal of the servo external signal module here.
Motor brake or dynamic brake setting area	Designate a USE or NO USE setting for the motor brake or dynamic brake here.
DOG signal setting area	Designate an N/O INPUT or N/C INPUT input setting for the DOG signal here.
Selection indicator mark	Indicates the USE/NO USE status for the motor brake or dynamic brake, and the N/O INPUT or N/C INPUT status of the DOG signal.
Mouse Operation Pro	ocedurel
Axis No. setting area	 Move the mouse cursor to the axis No. setting area and execute a left-click, or key-in the number shown at the left of the signal No. The cursor will move to the axis No. setting area.
Axis No. setting	 To change the displayed axis No. setting, press the [BACK SPACE] key to delete the displayed No., then key-in the desired axis No. Next, execute a left-click outside the axis No. setting area, or press the [Enter] key. If a number outside the permissible range is designated, an error message will be displayed at the system message display line. In this case, re-designate the axis No. setting.
Motor brake or dynamic brake setting	 Move the mouse cursor to the USE or NO USE position and execute a left-click, or key-in the alphanumeric character shown at the left of the USE or NO USE item. The selection indicator mark will move to the selected item.
DOG signal setting	 Move the mouse cursor to the N/O INPUT or N/C INPUT item and execute a left-click, or key-in the alphabetic character shown at the left of the N/O INPUT or N/C INPUT item. The selection indicator mark will move to the selected item.
Setting END	 To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key. The entered settings will be confirmed and the system will return to the motion module setting window.
Setting Abort	 To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key. The entered settings will be canceled, and the system will return to the motion module setting window.

POINT

External servo signals indicate FLS, RLS, STOP, and CHANGE of A171SENC/A278LX. By setting an axis No. for signals 1 to 8, input of the corresponding external servo signal. For details of signals, see the Programming Manual.

[Servo Power Supply Module System Setting Dialog Box] (For A273UHCPU (32-axis specification) only)



* The above screen is the A273UHCPU (32-axis specification) screen.

[Display/Setting Content]

Servo power supply module system for each module (AC motor drive module system odule, dynamic brake module, servo external signal module, servo power supply module) is indicated here.

Servo power supply The servo power supply module system for the selected module (AC motor module system setting drive module, dynamic brake module, servo external signal module, servo area power supply module) is designated here.

Setting area for A setting is designated when a dynamic brake is used for the separate amplifier. separate amplifier*

Selection indicator Indicates the selected item. mark*

• • • • • • • • • • • •	
Servo power supply module system designation	 Move the mouse cursor to the servo power supply module system designation area and execute a left-click, or key-in the number shown at the left of the desired servo power supply module system. A cursor is displayed at the servo power supply module system designation area. (When a "dynamic brake module" is selected, a selection indicator mark is displayed.)
Servo power supply module system No.` change	 To change the displayed servo power supply module system No., press the [BACK SPACE] key, key-in the desired system No., then execute a left-click outside the servo power supply module setting area, or press the [Enter] key. If a number outside the permissible range is designated, an error message will be displayed at the system message display line. In this case, re-designate the servo power module system No. setting.
Setting area for separate amplifier*	 Move the mouse cursor to the separate amplifier setting area and execute a left-click, or key-in the number shown at the left of the separate amplifier setting area. A selection indicator mark will be displayed.
Setting END	 To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key. The entered settings will be confirmed and the system will return to the motion module setting window.
Setting Abort	 To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key. The entered settings will be canceled, and the system will return to the motion module setting window.
	• Display/setting occurs only for the "dynamic brake module" setting operation.

POINT

An error will occur if the same servo power supply module system No. is used more than once when making settings for multiple servo power supply modules.

[High-speed Data Read Setting Dialog Box]

High-speed data read setting area

[Display/Setting Content]

High-speed data Whether or not high-speed data read is used is set. read setting area

Selection indicator The set processing is indicated. mark

High-speed data read setting	 Move the mouse cursor to the item to be set and execute left-click, or key-in the number shown at the left of the item. The selection indicator mark will move to the selected item.
Setting END	 To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key. The content of setting will be confirmed and the system returns to the motion module setting dialog box.
Setting Abort	 To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [Esc] key. The content of setting will be canceled, and the system returns to the motion module setting dialog box.

[Active Axis No. Setting Dialog Box] (For A273UHCPU (32-axis specification) only)



* The screen shown above is the A273UHCPU (32-axis specification) screen.

[Display/Setting Content]

Axis No. setting area The axis No. to be used at the limit output module is designated.

Axis No. setting area	 Move the mouse cursor to the axis No. setting area and execute a left-click, or key-in the number shown at the left of the desired signal No. A cursor is displayed in the axis No. setting area.
Axis No. change	 To change the displayed axis No. setting, press the [BACK SPACE] key, key-in the desired axis No., then execute a left-click outside the axis No. setting area, or press the [Enter] key. If a No. outside the permissible range is designated, an error message will be displayed at the system message display line. In this case, re-designate the axis No. setting.
Setting END	 To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key. The entered settings will be confirmed and the system will return to the motion module setting window.
Setting Abort	 To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key. The entered settings will be canceled, and the system will return to the motion module setting window.

Installing PC Input/Output Modules

[PC Input/Output Module Setting Dialog Box]



[Display/Setting Content]

PC input/output The selectable PC input/output module types, and the number of points are displayed.

Head I/O No. setting The first I/O No. of the I/O No. range occupied by the PC input/output module is designated here.

Selection indicator The selected PC input/output module type, and the number of points are displayed.

HI-SPD data readOpen the high-speed data read setting dialog box (when high-speed data readSET buttonfunction is used.)

[Mouse Operation Procedure]

PC input/output module setting

 Move the mouse cursor to the PC input/output module setting area and execute a left-click, or key-in the number shown at the left of the number of points.

A cursor will be displayed in the PC input/output module setting area.

- **Head I/O No. setting** 1) Move the mouse cursor to the "head input/output No." setting area and execute a left-click, or key-in the [A] key. A cursor will be displayed in the "head input/output No." setting area.
 - 2) Key-in the desired head input/output No., then execute a left-click outside the "head input/output No." setting area, or press the [Enter] key.
 - 3) To change the displayed head input/output No., delete the No. by pressing the [BACK SPACE] key, then enter the desired No.
 - 4) If a number outside the permissible range is designated, an error message will be displayed at the system message display line. In this case, re-designate the "head input/output No." setting.

Setting END 1) To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key. The entered settings will be confirmed and the system will return to the I/O slot setting dialog box.

Setting Abort 1) To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key. The entered settings will be canceled, and the system will return to the I/O slot dialog box.

Installing Servo Power Supply Modules

[Servo Power Supply Module Setting Dialog Box]



• The screen shown above is the A273UHCPU (32-axis specification) screen.

[Display/Setting Content]

Servo power supply The selectable servo power supply module names are displayed here. **module model name designation area**

External regenerative The designated external regenerative resistor name is displayed here. **resistor model name display area**

External regenerative Opens the external regenerative resistor setting dialog box. **resistor SET button**

Servo power supply Opens the servo power supply module system designation dialog box. module system SET button*1

ADU servo error Opens the servo error processing setting dialog box. processing SET button (For A273UHCPU (32-axis specification) only)

Servo power supply module model name designation	1)	Move the mouse cursor to the desired name and execute a left-click, or key-in the number shown at the left of the desired name. The selection indicator mark will be displayed at the selected name.
External regenerative resistor setting	1)	Move the mouse cursor to the External regenerative resistor SET button position and execute a left-click, or press the [A] key. The external regenerative resistor setting dialog box will then be opened.
Servo power supply module system setting *2	1) I	Move the mouse cursor to the Servo power supply module system SET button position and execute a left-click, or press the [B] key. The servo power supply module system setting dialog box will then be opened.
ADU servo error processing setting	1)	Move the mouse cursor to the ADU servo error processing SET button position and execute a left-click, or press the [C] key. The ADU servo error processing setting dialog box will then be opened.

Setting END

 To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key. The entered settings will be confirmed and the system will return to the I/O slot setting dialog box.

Setting Abort 1) To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key. The entered settings will be canceled, and the system will return to the I/O slot dialog box.

- *1 Displayed only when using A273UHCPU (32-axis specification).
- *2 Set only when using A273UHCPU (32-axis specification). (For details, see Section 7.1.3 (1)(a)[3])

[External Regenerative Resistor Setting Dialog Box]



[Display/Setting Content]

External regenerative The selectable regenerative resistor names are displayed here. resistor model name

designation area

Selection indicator Indicates the selected model name. mark

fundage obergring the	preduie!
External regenerative resistor model name designation	 Move the mouse cursor to the desired name and execute a left-click, or key-in the number shown at the left of the desired name. The selection indicator mark will move to the selected name position.
Setting END	 To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key. The entered settings will be confirmed and the system will return to the servo power supply module setting dialog box.
Setting Abort	 To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key. The entered settings will be canceled, and the system will return to the servo power supply module setting dialog box.

[ADU Servo Error Processing Setting Dialog Box] (For A273UHCPU (32-axis specification) only)



[Display/Setting Content]

ADU servo error The selectable servo error processing items are displayed. processing items setting area

Selection indicator Indicates the selected processing item. mark

ADU servo error processing items setting area	 Move the mouse cursor to the desired setting item and execute left-click, or key-in the number shown at the left of the desired item. The selection indicator mark will move to the selected item position.
Setting END	 To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key. The entered settings will be confirmed and the system will return to the servo power supply module setting dialog box.
Setting Abort	 To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key. The entered settings will be canceled, and the system will return to the servo power supply module setting dialog box.

4) Manual pulse generator setting

[Manual Pulse Generator/Synchronous Encoder Setting Dialog Box]



[Display/Setting Content]

Manual pulseDesignate whether or not the manual pulse generator is to be used.generator setting

Manual pulse	1) Move the mouse to the NO USE or MAN-PLS. position and execute a
generator setting	left-click, or key-in the number shown at the left of the NO USE or
	MAN-PLS. item.
	The selection indicator mark will move to the selected item position.

- Setting END
 1) To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key. The entered settings will be confirmed and the system will return to the base unit display screen.
- Setting Abort 1) To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key. The entered settings will be canceled, and the system will return to the base unit display screen.

(b) Servomotor setting

[Procedure For Displaying The Servomotor Setting Dialog Box]

Base unit display screen	Position the unit/module frame at the desired servo- motor model name	Execute one of the following: • A left double-click inside the unit/module fram • Press the [Enter] key • Select the desired menu item (unit/module ellection)	ne
		(unit/module allocation)	

[Servomotor Setting Dialog Box]

	Servomotor model name display area Servomotor type SET button Allowable travel during power OFF setting area Encoder type setting area Selection indicator mark
[Display/Setting Content]	ν.

isplay/setting co ite •••

Servomotor model	The selected servomotor name is displayed here.
name display area	

Opens the servomotor model name designation dialog box. Servomotor type SET button

Designates whether the servomotor is an absolute data method or incremen-**Encoder type** setting area tal method type.

Set the value for the amount of travel allowable while the servo amplifier Allowable travel power is OFF. (Set as the number of motor revolutions.) during power **OFF** setting area The allowable tavel during power OFF setting is only valid when an absolute encoder is used.

Selection indicator Indicates the selected servomotor type.

[Mouse Operation Procedure]

mark

Servomotor type setting	1)	Move the mouse cursor to the desired servomotor type position and execute a left-click, or key-in the alphabetic character shown at the desired type. The servomotor model name designation dialog box for the selected servomotor type will then be opened.
Encoder type setting	1)	Move the mouse cursor to the INC or ABS position and execute a left-click, or key-in the number shown at the left of the INC or ABS item. The selection indicator mark will move to the selected item position.
Selecting the allowable travel during powe OFF setting area	1) r	Move the mouse cursor to the allowable travel during power OFF setting area and click the left mouse button or press the "G" key. The cursor will be displayed in the allowable travel during power OFF setting area.

...

Changing the allowable travel (number of revolutions)	 To change the displayed allowable travel value (number of revolutions), delete the existingvalue by pressing the [Back Space] key, enter the required allowable travevalue with the alphanumeric keys, then either left click on the allowable travel during power OFF setting area or press the [Enter] key. If an out-of-range value is set, an error message is displayed on the system message display check the setting.
Setting END	 To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key. The entered settings will be confirmed and the system will return to the base unit display screen.
Setting Abort	 To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key. The entered settings will be canceled, and the system will return to the base unit display screen.
	POINT Set the allowable travel during power OFF within the range indicated below.

 $0 \le$ POWER OF ALLOWED TRAVELLING POINTS ≤ 65535 (Number of revolutions)

[Servomotor Model Name Designation Dialog Box] (For HA-FH Series)



[Display/Setting Content]

Servomotor model The selectable servo motor names are displayed here. name designation area

Selection indicator Indicates the selected model name. mark

[Mouse Operation Procedure]

Servomotor model name designation	 Move the mouse cursor to the desired name and execute a left-click, or key-in the number shown at the left of the desired name. The selection indicator mark will move to the selected name position.
Setting END	 To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key. The entered settings will be confirmed and the system will return to the servomotor setting dialog box.
Setting Abort	 To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key. The entered settings will be canceled, and the system will return to the servo motor setting dialog box.

POINT

- (1) The unit/module frame can be moved to the servomotor position by the following 2 methods:
 - a) By Key Operation
 - Press the [↓] key to move the unit/module frame from the "CPU module/control power supply module" item to the "servomotor" item, then use the [←]/[→]keys to move the unit/module frame to the desired servomotor.
 (If the [↑] key is pressed, the unit/module frame will move to

(If the [1] key is pressed, the unit/module frame will move to the ADU position.)

- b) By mouse operation
 - Move the mouse cursor to the desired servomotor and execute a left-click.

(c) MR-□-B setting The model name of the MR-□-B to be used is designated.

[Procedure For Displaying The Separate Servo Amplifier Setting Dialog Box]

[Base unit display screen]	Position the → at the MR- □ a setting is o	unit/module frame] -B position where desired		Execute one of the following: • A left double-click inside the unit/module frame • Press the [Enter] key • Select the desired menu item (unit/module allocation)
-------------------------------	--	---	--	---

[Separate Servo Amplifier Setting Dialog Box]



[Display/Setting Content]

SET button

MR---B model name The selected MR-**--B name is displayed. display area**

MR---B SET button Opens the MR-**--B** model name setting dialog box.

Servomotor model	The name of the selected servomotor is displayed here.
name display area	

Servomotor type Opens the servomotor model name setting dialog box.

Allowable tavel
during power OFF
setting areaSet the value for the amount of travel allowable while the servo amplifer power
is OFF. (Set as the number of motor revolutions.)
The allowable travel during power OFF setting is only valid when an absolute
encoder is used

POINT

- (1) The unit/module frame can be moved to the MR-
 B items by the following 2 methods:
 - a) By Key Operation
 - Press the [J] key to move the unit/module frame from the "CPU module/control power supply module" item to the "MR-□-B" items, then use the [←]/[→] keys to move the unit/ module frame to the desired MR-□-B item.
 (If the [1] key is pressed, the unit/module frame will move to the CPU module position.)
 - b) By mouse operation
 - Move the mouse cursor to the desired MR- B item and execute a left-click.
- 2) Set the allowable travel during power OFF within the range indicated below.
 - 0 ≤ POWER OF ALLOWED TRAVELLING POINTS ≤ 65535 (Number of revolutions)

Dynamic brake setting area	Designates whether or not the dynamic brake is to be operative.
Amplifier type setting area	Designates whether the servo motor is an absolute data method or incremen- tal method type.
Mouse Operation Dr	
Servo amplifier setting	 Move the mouse cursor to the MR B SET button position and execute a left-click, or press the [A] key. The servo amplifier model name setting dialog box will then be opened. (See Section 7.2.3 (1)(c)[1] for details)
Amplifier type setting	 Move the mouse cursor to the INC or ABS position and execute a left-click, or key-in the number shown at the left of the INC or ABS item. The selection indicator mark will move to the selected item.
Dynamic brake setting	 Move the mouse cursor to the NO or YES position and execute a left-click, or key-in the number shown at the left of the NO or YES item. The selection indicator mark will move to the selected item.
Selecting the allowable travel during power OFF setting area	 Move the mouse cursor to the allowable travel during power OFF setting area and click the left mouse button or press the "W" key. The cursor will be displayed in the allowable travel during power OFF setting area.
Changing the allowable travel (number of revolutions)	 To change the displayed allowable travel value (number of revolutions), delete the existing value by pressing the [Back Space] key, enter the required allowable travel value with the alphanumeric keys, then either left click on the allowable travel during power OFF setting area or press the [Enter] key. If an out-of-range value is set, an error message is displayed on the system message display line. If a message is displayed, check the setting. To end the setting operation, execute a left-click at the "OK" item, or press
Setting END	the [Enter] key. The entered settings will be confirmed and the system will return to the base unit display screen.
Setting Abort	 To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key. The entered settings will be canceled, and the system will returen to the separate servo amplifier setting dialog box.

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1) MR-D-B model name setting

[MR--B Model Name Setting Dialog Box]



[Display/Setting Content]

MR-□-B model name The selectable MR-□-B names are displayed. setting area

Regenerative resistor model name display area	The designated regenerative resistor name is displayed.
Regenerative resistor SET button	Opens the regenerative resistor setting dialog box.
Selection indicator mark	Indicates the designated model name.
[Mouse Operation Pro	ocedure]
MR-D-B model name setting	 Move the mouse cursor to the desired name and execute a left-click, or key-in the alphabetic character shown at the left of the name. The selection indicator mark will move to the designated name.
Regenerative resistor setting	 To designate the regenerative resistor setting, execute a left-click at the regenerative resistor SET button, or press the [D] key. The regenerative resistor setting dialog box will then be opened.
Setting END	 To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key. The entered settings will be confirmed and the system will return to the separate servo amplifier setting dialog box.
Setting Abort	 To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key. The entered settings will be canceled, and the system will return to the separate servo amplifier setting dialog box.

[Regenerative Resistor Setting Dialog Box]



[Display/Setting Content]

Regenerative The selectable regenerative resistor names are displayed here. resistor model name setting area

Selection indicator Indicates the designated model name. mark

Regenerative resistor model name setting	1)	Move the mouse cursor to the desired name and execute a left-click, or key-in the number shown at the left of the name. The selection indicator mark will move to the designated name.
Setting END	1)	To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key. The entered settings will be confirmed and the system will return to the MR-[]-B model name setting dialog box.
Setting Abort	1)	To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key. The entered settings will be canceled, and the system will return to the MRB model name setting dialog box.

[Servomotor Model Name Setting Dialog Box]



[Display/Setting Content]

Servomotor model The selectable servo motor names are displayed. name setting area

Selection indicator Indicates the selected model name. mark

[Mouse Operation Procedure]

fundage obergroup	
Servomotor model name setting	 Move the mouse cursor to the desired name and execute a left-click, or key-in the number shown at the left of the name. The selection indicator mark will move to the designated name.
Setting END	 To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key. The entered settings will be confirmed and the system will return to the separate servo amplifier setting dialog box.
Setting Abort	 To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key. The entered settings will be canceled, and the system will return to the separate servo amplifier setting dialog box.

POINT

(1) When an MR-J-B ABS motor setting has been designated at the A273UH (32-axis specification), be sure to designate a battery unit setting. (See Section 7.1.3 (1)(c)[3] for details.) 3) Designating a battery setting when an MR-J-B ABS motor setting is designated (for A273UHCPU (8/32 axis specification) only)

[Procedure For Displaying The Battery Setting Dialog Box When An MR-J-B ABS Motor Is Used]

Base unit	Execute one of the following:
display screen Position the unit/module frame at the bat-	• A left double-click inside the unit/module frame
tery unit of the SSC network where the	• Press the [Enter] key
MR-J-B ABS motor setting is designated.	• Select the desired menu item (module allocation)

[Battery Setting Dialog Box]



* The screen shown above is the A273UHCPU (32-axis specification) screen.

[Display/Setting Content]

Battery model The selectable battery unit~names are displayed here. **name setting area**

function obergroup	
Battery model name setting	 Move the mouse cursor to the desired name and execute a left-click, or key-in the number shown at the left of the name. The selection indicator mark will move to the designated name. A battery unit setting is required when an MR-J-B ABS motor is connected in the currently selected SSC network.
Setting END	 To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key. The entered settings will be confirmed and the system will return to the base unit display screen.
Setting Abort	 To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key. The entered settings will be canceled, and the system will return to the base unit display screen.

- (2) Editing unit/module data settings
 - Existing unit/module data settings can be edited as described below.
 - (a) Unit/module cancel
 - Cancels the most recently entered setting and re-establishes the setting which existed prior to the canceled setting.

[After Data Setting]

[Procedure For Unit/Module Cancel]



[Before Data Setting]



[Mouse Operation Procedure]

Designating the CANCEL function

- 1) Execute a right-press at any point on the base unit display screen in order to display the menu bar.
- 2) With the right button still pressed, move the mouse cursor to the "UNIT EDIT (E)" menu to display the pull-down menu, then release the right button (right-release) at the "UNDO (Z)" position. The most recently entered setting will be canceled, and the system will return to the setting which existed prior to the canceled setting.

POINT

(1) Canceled data can be restored by executing the CANCEL function again (first time cancels the data, second time restores it).

- (b) Copying unit/module data settings
 - Unit/module and servomotor/servo amplifier setting data can be copied as described below.

[Procedure For Copying Unit/Module Data]

Base unit display screen

Position the unit/module frame at the copy source unit/module, servomotor or MR-D -B.

[Before Operation]





[After Operation]



[Mouse Operation Procedure]

Designating the COPY function

- 1) Execute a right-press at any point on the base unit display screen in order to display the menu bar.
- With the right button still pressed, move the mouse cursor to the "UNIT EDIT (E)" menu to display the pull-down menu, then release the right button (rightrelease) at the "COPY (C)" position.

At this time, "COPY MODE" will be displayed at the system message line indicating that the copy function is operative. ($\nabla/\mathbb{A}/\mathbb{A}$ marks are displayed)

Designating the COPY 1) Execute a left-press at the copy source unit/module frame, then, with the left button & executing the COPY function
1) Execute a left-press at the copy source unit/module frame, then, with the left button still pressed, move the unit/module frame to the copy destination and release the left button (left-release). The COPY function will then be executed. To execute the COPY function by key operation, use the [←]/[→] keys to move the [♥]/[▲]/[◀] marks to the COPY destination, then press the [Enter]

move the [♥]/[▲]/[◀] marks to the COPY destination, then press the [Enter] key. (nrting 1) To end or abort the COPY function, execute a left-click outside the unit/

Ending & Aborting
 1) To end or abort the COPY function, execute a left-click outside the unit/ module frame.
 The system will then return to the base unit display screen.

(To end or abort the COPY function by key operation, press the [ESC] key.)

REMARK

 The COPY function remains operative at the COPY source unit/module after the COPY operation has been executed.
 This enables consecutive COPY operations by simply repeating the COPY destination selection and executing the COPY operation.

~

< <u>A171SCPU></u> Motion module < <u>A273UHCPU</u>	Manual pulse (A171SENC)	generator & synchronou		
Motion module	Manual pulse (A171SENC)	generator & synchronou		
<a273uhcpu< td=""><td>I imit outout m</td><td></td><td>s encoder I/F module</td><td>COPY impossible</td></a273uhcpu<>	I imit outout m		s encoder I/F module	COPY impossible
<a273uhcpu< td=""><td></td><td colspan="3"></td></a273uhcpu<>				
	l (8-axis spe	cification)>		
	Limit input & brake output module (A278LX)			COPY impossible
	Manual pulse generator & synchronous encoder I/F module (A273EX)			EX) COPY impossible
Motion module	Limit output m	nodule (AY42)		COPY impossible
	DY (A240DY)			2 or less
	ADU (A2**AM)		COPY possible
	Servo power s	supply module (A230P)		COPY impossible
<a273uhcpu< td=""><td>l (32-axis sp</td><td>ecification)></td><td></td><td></td></a273uhcpu<>	l (32-axis sp	ecification)>		
	Limit input & I	brake output module (A2	78LX)	4 or less
	Manual pulse	generator & synchronou	s encoder I/F module (A273)	EX) COPY impossible
Motion module	limit outout module (AY42)			
	Limit output rr	nodule (AY42)		4 or less
	Limit output m DY (A240DY)	nodule (AY42)		4 or less 8 or less
, ,	Limit output n DY (A240DY) ADU (A2**AM	nodule (AY42))		4 or less 8 or less COPY possible
a) Copied data	Limit output m DY (A240DY) ADU (A2**AM Servo power s	nodule (AY42)) supply module (A230P)		4 or less 8 or less COPY possible 4 or less
a) Copied data <a171scpu> Servomotor Manual pulse ge</a171scpu>	Limit output n DY (A240DY) ADU (A2**AM Servo power s a nerator & synch	supply module (A230P)	ame, encoder type	4 or less 8 or less COPY possible 4 or less
a) Copied data <a171scpu> Servomotor Manual pulse ge nous encoder</a171scpu>	Limit output n DY (A240DY) ADU (A2**AM Servo power s 3 nerator & synch	supply module (A230P) Servomotor model n Pro- Setting information	ame, encoder type	4 or less 8 or less COPY possible 4 or less
a) Copied data <a171scpu> Servomotor Manual pulse ge nous encoder PC input/output t</a171scpu>	Limit output n DY (A240DY) ADU (A2**AM Servo power s a nerator & synch module	Servomotor model n Setting information	ame, encoder type	4 or less 8 or less COPY possible 4 or less
a) Copied data <a171scpu> Servomotor Manual pulse ge nous encoder PC input/output i MR-□-B</a171scpu>	Limit output n DY (A240DY) ADU (A2**AM Servo power s a nerator & synch module	Servomotor model n Setting information Module model name Servo amplifier mod	ame, encoder type el name, regenerative resist	4 or less 8 or less COPY possible 4 or less
a) Copied data <a171scpu> Servomotor Manual pulse ge nous encoder PC input/output f MR-□-B <a273uhcpu< td=""><td>Limit output n DY (A240DY) ADU (A2**AM Servo power s a nerator & synch module</td><td>Servomotor model n Servomotor model n Pro- Setting information Module model name Servo amplifier mod</td><td>ame, encoder type 9 el name, regenerative resist</td><td>4 or less 8 or less COPY possible 4 or less</td></a273uhcpu<></a171scpu>	Limit output n DY (A240DY) ADU (A2**AM Servo power s a nerator & synch module	Servomotor model n Servomotor model n Pro- Setting information Module model name Servo amplifier mod	ame, encoder type 9 el name, regenerative resist	4 or less 8 or less COPY possible 4 or less
a) Copied data <a171scpu> Servomotor Manual pulse ge nous encoder PC input/output f MR-□-B <a273uhcpu< td=""><td>Limit output n DY (A240DY) ADU (A2**AM Servo power s a nerator & synch module</td><td>Servomotor model n Servomotor model n Nro- Setting information Module model name Servo amplifier mod Specification)> DY</td><td>ame, encoder type el name, regenerative resist Module model na</td><td>4 or less 8 or less COPY possible 4 or less or, servo motor</td></a273uhcpu<></a171scpu>	Limit output n DY (A240DY) ADU (A2**AM Servo power s a nerator & synch module	Servomotor model n Servomotor model n Nro- Setting information Module model name Servo amplifier mod Specification)> DY	ame, encoder type el name, regenerative resist Module model na	4 or less 8 or less COPY possible 4 or less or, servo motor
a) Copied data <a171scpu> Servomotor Manual pulse ge nous encoder PC input/output f MR-□-B <a273uhcpu Motion module</a273uhcpu </a171scpu>	Limit output n DY (A240DY) ADU (A2**AM Servo power s a nerator & synch module	Servomotor model n Servomotor model n Nro-Setting information Module model name Servo amplifier mod Specification)> DY ADU	ame, encoder type el name, regenerative resist Module model na Module model na	4 or less 8 or less COPY possible 4 or less or, servo motor me me, servomotor
a) Copied data <a171scpu> Servomotor Manual pulse ge nous encoder PC input/output f MR-[]-B <a273uhcpu Motion module Servomotor</a273uhcpu </a171scpu>	Limit output n DY (A240DY) ADU (A2**AM Servo power s a nerator & synch module	Servomotor model n Servomotor model n Setting information Module model name Servo amplifier mod Specification)> DY ADU Servomotor model n	ame, encoder type el name, regenerative resist Module model na Module model na ame, encoder type	4 or less 8 or less COPY possible 4 or less or, servo motor me me, servomotor
a) Copied data <a171scpu> Servomotor Manual pulse ge nous encoder PC input/output I MR-□-B <a273uhcpu Motion module Servomotor Manual pulse ge</a273uhcpu </a171scpu>	Limit output n DY (A240DY) ADU (A2**AM Servo power s a nerator & synch module	Servomotor model n Servomotor model n Setting information Module model name Servo amplifier mod Specification)> DY ADU Servomotor model n Setting information	ame, encoder type el name, regenerative resist Module model na Module model na ame, encoder type	4 or less 8 or less COPY possible 4 or less or, servo motor
a) Copied data <a171scpu> Servomotor Manual pulse ge nous encoder PC input/output t MR-□-B <a273uhcpu Motion module Servomotor Manual pulse ge PC input/output t</a273uhcpu </a171scpu>	Limit output n DY (A240DY) ADU (A2**AM Servo power s a nerator & synch module (8/32-axis s nerator nodule	Servomotor model n Servomotor model n Nro- Setting information Module model name Servo amplifier mod Specification)> DY ADU Servomotor model n Setting information Number of I/O points	ame, encoder type el name, regenerative resist Module model na Module model na ame, encoder type s, head I/O No.	4 or less 8 or less COPY possible 4 or less or, servo motor me me, servomotor

- (c) Editing by CUT & PASTE The cut and paste procedure for module, servomotor/servo amplifier setting data is described below. 1) CUT
 - Setting data is moved to the system buffer.

[CUT Procedure]



[Before Operation]



[After Operation]



[Mouse Operation Procedure]

and ending the CUT function

- Selecting, executing, 1) Execute a right-press at any point on the base unit display screen in order to display the menu bar.
 - 2) With the right button still pressed, move the mouse cursor to the "UNIT EDIT (E)" menu to display the pull-down menu, then release the right button (right-release) at the "CUT (X)" position.

The CUT function will then be executed, and the unit/module data within the unit/module frame will be deleted.

POINTS

(1) The unit/module or servomotor/servo amplifier setting data which has been moved to the system buffer by the CUT function represents 1 unit.

If subsequent data is moved to the buffer by another CUT operation, the previous data will be overwritten.

- (2) The unit/module or servomotor/servo amplifier setting data which has been CUT remains valid even if the base unit is changed. Another base unit can be displayed again using the PASTE function.
- (3) The CUT function is operative for the following units/modules: motion extension base units, battery connector information, MR--B connection information, motion modules, PC input/output modules, servomotors, MR-D-B, and manual pulse generators. The location where a CUT has occurred will be designated as "NOT USED".
- (4) Regarding CUTS at a motion extension base unit and battery connector, a "NO USE" status will be designated for the battery information but not for the motion extension base unit. The motion extension base information remains as is.
- (5) Because MR-D-B connections are designated at the CPU slot, a CUT at the CPU slot will cause all the MR-D-B connection information to be CUT as well.

2) PASTE

Setting data which has been moved to the system buffer by the CUT function can be returned to the base unit display screen by the PASTE function.

[PASTE Procedure]



[Before Operation]





[After Operation]



[Mouse Operation Procedure]

Selecting the PASTE function

- 1) Execute a right-press at any point on the base unit display screen in order to display the menu bar.
- 2) With the right button still pressed, move the mouse cursor to the "UNIT EDIT (E)" menu to display the pull-down menu, then release the right button (right-release) at the "PASTE (V)" position. The PASTE function will then be executed, and the unit/module data within

The PASTE function will then be executed, and the unit/module data within the unit/module frame will be displayed on-screen again.

POINTS

- (1) Overwriting will occur if subsequent pasting occurs where previous data exists.
 - (Overwriting of previous data is impossible at the I/O slot.)
- (2) When unit/module data which has been CUT is then PASTED at several locations, the axis No. can be pasted at the first location only; the axis No. will be "0" at subsequent PASTE locations.
- (3) The PASTE function is operative for the following units/modules: motion extension base units, battery connector information, MR-D-B connection information, motion modules, PC input/output modules, servomotors, MR-D-B, and manual pulse generators.
- (4) PASTING is impossible if the CUT function has never been executed.
- (5) PASTING is only possible for the most recent CUT data.
- (6) PASTING can only occur at locations of the same type as that where the CUT function was executed.

- (d) Unit/module data delete
 - The procedure for deleting unit/module & servomotor/servo amplifier setting data is described below.

[Unit/Module Data Delete Procedure]

Base unit display screen

Position the unit/module frame at the unit/module or MR-□-B data to be deleted.

[Before Operation]





[After Operation]



[Mouse Operation Procedure]

Selecting the DELETE function

- 1) Execute a right-press at any point on the base unit display screen in order to display the menu bar.
- 2) With the right button still pressed, move the mouse cursor to the "UNIT EDIT (E)" menu to display the pull-down menu, then release the right button (right-release) at the "DELETE (D)" position. The DELETE function will then be executed, and the unit/module data within the unit/module frame will be deleted.

POINTS

- (1) The DELETE function is operative for the following units/modules: motion extension bases, battery connector information, MR-□-B connection information, motion modules, PC input/output modules, servomotors, MR-□-B, and manual pulse generators. A "NO USE" status will be designated at the location where data has been deleted.
- (2) Regarding DELETIONS at a motion extension base unit and battery connector, a "NO USE" status will be designated for the battery information but not for the motion extension base unit. The motion extension base information remains as is.
- (3) Because MR-D-B connections are designated at the CPU slot, a DELETE at the CPU slot will cause all the MR-D-B connection information to be deleted as well.

7.1.4 Axis No. setting

The procedure for designating the program axis Nos. for the motors connected to each ADU and MR-D-B is described below.

[Procedure For Displaying The Axis No. Setting Dialog Box]



[Axis No. Setting Dialog Box]



The screen shown above is the A273UHCPU (32-axis specification) screen.

[Display/Setting Content]

Axis No. setting area Axis Nos. are displayed here.

Selection indicator mark	Indicates the selected axis No.
Axis No. selector buttons *1	Change the axis No. setting range.

Axis No. setting	 Move the mouse cursor to the desired axis No. and execute a left-click, or key-in the number shown at the left of the axis No. The selection indicator mark will move to the selected axis No.
Axis No. range selection ^{*2}	 To change the displayed axis No. range, execute a left-click at the "BF or NX" item, or press the [A] or [S] key.
Setting END	 To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key. This will confirm the setting and the system will return to the base unit display screen.
Setting Abort	 To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [ESC] key. The entered settings will be canceled, and the system will return to the base unit display screen.
	*1 Displayed only when using A273UHCPU (32-axis specification). *2 Setting occurs only when using A273UHCPU (32-axis specification).

7.1.5 Relative check

The procedure for checking the match status of a constructed system is described below.

[Relative Check Procedure]



When Operation Was Error-Free



[Display/Setting Content]

Message display area "NO ERROR." is displayed.

[Mouse Operation Procedure]

- Dialog box CLOSE 1) T
 - To close the dialog box, execute a left-click at the "CONF" item, or press the [Enter] key.
- When An Error Occurred

[Check Completed Dialog Box]



[Display/Setting Content]

Message display area Error description for each check item is displayed.

[Mouse Operation Procedure]

Dialog box CLOSE

 To close the dialog box, execute a left-click at the "CONF" item, or press the [Enter] key.

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7.1.6 Unit/module information

The procedure for displaying information regarding the designated PC input/output module is described below.

[Procedure For Displaying The Unit/Module Information]



[Unit/Module Information Dialog Box]



[Display/Setting Content]

Unit/module

information

display area

The following PC input/output module information is displayed: Connected slots, module model names, number of I/O points, and I/O Nos. If no PC input/output module setting has been designated, a "IN-OUT UNIT IS NOT REGISTERED." message will be displayed.

[Mouse Operation Procedure]

Dialog box CLOSE 1) To close the dialog box, execute a left-click at the "CONF" item, or press the [Enter] key.

7.1.7 System data initialize

The procedure for initializing all the system's setting data is described below.

[System Data Initialize Procedure]



[SYSTEM INITIALIZE YES/NO Selection Dialog Box]



[Mouse Operation Procedure]

For NO (do not

For YES (initialize) To initialize the system, execute a left-click at the YES item, or press the [Y] selection key. The base unit setting dialog box will then be displayed. Select the desired base unit.

1) If system initializing is not desired, execute a left-click at the NO item, initialize) selection or press the [ESC]/[Enter] key. Initializing will not occur, and the system will return to the base unit display screen.

POINT

(1) If the system data initialization is executed, the high-speed data read setting is also initialized and cannot be recovered.

System setting END 7.1.8

The procedure for ending the system setting operation and returning to the servo function selection window is described below.

[Mouse Operation Procedure]

System setting END

1

- 1) Execute a right-press at any point on the base unit display screen in order to display the menu bar.
- 2) With the right button still pressed, move the mouse cursor to the "SYSTEM (S)" menu to display the pull-down menu, then release the right button (right-release) at the "QUIT (Q)" position. The system setting operation will be ended, and the system will return to the servo function selection window.

System Setting END When An Error Exists

[Warning Dialog Box]



[Display/Setting Content]

display

Warning message A warning message is displayed when an attempt to end the system setting operation is made while an error status exists.

To correct the system setting	 To modify the system setting, execute a left-click at the NO item, or press the [ESC]/[Enter] key. The warning dialog box will then be closed. Execute the relative check function to determine the error cause, then make the necessary corrections.
To end system setting	 To end the system setting operation while an error status is in effect, execute a left-click at the YES item, or press the [Y] key. The system will then return to the servo function selection window.

7.1.9 High-speed data read setting

The procedure for setting the high-speed data read for the PC CPU module, input/output composite module, and pulser/synchronous encoder interface module.

[Procedure for displaying the high-speed data read set dialog box]



[High-speed data read set dialog box]



The display is for A273UHCPU (32-axis specifications)

signal.

[Display/Setting Content]

selection area

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Pulser/<br/>synchronous encoder<br/>I/F module setting<br/>areaAxis number, setting data, and device set for the TREN signal of the<br/>pulser/synchronous encoder I/F module are displayed.PC input<br/>module setting areaAxis number, setting data, and device set for the input signal of the PC<br/>input module are displayed.PC input<br/>module setting areaAxis number, setting data, and device set for the input signal of the PC<br/>input module are displayed.Axis No. selection<br/>areaSelect the axis No. to be set for the TERM signal and the input signal.<br/>Select the setting data item to be set for the TERM signal and the input
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[Mouse Operation Procedure]

SET DATA setting	1)	Execute left-click at the set data area of the TREN signal or input signal where the setting is made. The selected area is highlighted.
	<i>~</i>)	highlighted. At the same time, the selected data item is displayed in the highlighted set data area.
		end in the set data area
		 For the setting in the set data area of the TREN signal, the item for which "X" mark is displayed in the data item selection area cannot be selected.
		• If OPT. ADRS (optional address) is selected, the DEVICE/ADDRESS WINDOW is displayed. Set the address in this window. The procedure is described later.
DEVICE setting	1)	Execute left-click at the DEVICE area of the TREN signal or input signal to be set.
	2)	Set the device in the DEVICE/ADDRESS WINDOW is displayed. Set the device in the DEVICE/ADDRESS WINDOW. The procedure is described
AXIS NO. setting	1)	Left-click the axis number of the data to be set. The selected axis number is highlighted.
DEL button	1)	Deletes the contents in the highlighted SET DATA area.
TREN-CLR button	1)	Clears all contents in the SET DATA and DEVICE areas of the TREN signal.
X-CLR button	1)	Clears all contents in the SET DATA and DEVICE areas of the input signal.
Setting END	1)	To end the setting operation, execute a left-click at the "OK" item, or press the [Enter] key.
		The content of setting will be confirmed and the system returns to the base unit display screen.
Setting ABORT	1)	To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [Esc] key. The content of setting will be canceled, and the system returns to the base unit display screen.

POINT

High-speed data read set is possible only by using a mouse. When setting high-speed data read, set the mouse in the operable state before starting up the GSV13PE.

[DEVICE / ADDRESS WINDOW]



[Mouse Operation Procedure]

Device setting

- 1) At the device selection button of the device to be selected, execute leftclick.
- 2) Execute left-click at number selection buttons to set the device number. [Device D : Only 0 to 9 are valid.]
 - [Device W : 0 to 9 and A to F are valid.]
- 3) The content of setting is displayed in the setting content display area.

Address setting 1) Execute left-click at number selection buttons to set the address.

- 2) The content of setting is displayed in the setting content display area.
- Del button
 1) Left-click at the Del button deletes the contents displayed in the setting content.
- Setting END1) To end the setting operation, execute a left-click at the "OK" item, or
press the [Enter] key.
The content of setting will be confirmed and the system returns to the
high-speed data read set dialog box display screen.
- Setting ABORT 1) To abort the setting operation, execute a left-click at the "CANCEL" item, or press the [Esc] key. The content of setting will be canceled, and the system returns to highspeed data read set dialog box display screen.

8. DATA SETTING FOR POSITIONING

The SERVO DATA SETTING mode is the mode in which positioning related data settings are designated.

 Function summary The GSV13PE SERVO DATA SETTING mode consists of the functions shown below.

Data settings	Axis data Setting	— Designation of parameter settings for positioning	8.1
for positioning		Fixed parameter Machine characteristics values required for positioning related setting servo operation are designated.	8.1.1
		Servo parameter Servo characteristics values required for positioning related	8.1.2
		Home position Data settings required for a home position return are designated	8.1.3
		JOG data setting Data settings required for JOG operation are designated	8.1.4
	Parameter block setting	Parameter block settings used for home position return and JOG data, and for	8.1.5
	Limit switch setting	— The limit switch output ON/OFF setting for the specified axis is designated	8.1.6
	Auxiliary	Positioning Positioning related data settings are copied.	8.2
		Axis data COPY Data for a given axis is copied to another axis	8.2.1
		Parameter Specified parameter block data is copied to	8.2.2
		Positioning The positioning data list is displayed	8.3
		Axis data list A list of axis data settings is displayed	8.3.1
		L Parameter A list of parameter block settings is displayed	8.3.2
		Positioning Positioning data is checked.	8.4
		Axis data A relative check of axis data occurs	8.4.1
		Parameter A relative check of parameter block data occurs block check	8.4.2
		Positioning — Positioning data is cleared	8.5
		Axis data clear Axis data settings are cleared	8.5.1
		Parameter Parameter block data settings are cleared	8.5.2
		Limit switch Limit switch output data settings are cleared	8.5.3
		File WRITE Setting data is written to the user file.	8.6
(2) Procedure outline An outline of the procedure for designating positioning data settings is shown below.



A CAUTION

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

POINTS

- (1) When selecting a function from the servo data setting function selection window, a "SYSTEM NOT SET" error message will be displayed if the system setting hasn't been designated. The system settings should be designated before selecting the servo data setting function.
- (2) If an axis setting is designated for a "UNUSED AXIS." axis during system settings, an "axis not used" error message will be displayed.

8.1 Designating the Positioning Data Settings

The procedure for designating the data settings (fixed parameters, servo parameters, home position return data, JOG operation data) required for positioning control is described below.

8.1.1 Designating the fixed parameter (axis data) settings

When constructing the positioning system, the machine characteristic value settings required for machine operation must be designated. The fixed parameter settings must therefore be designated before the positioning data settings. Fixed parameter settings are designated for each axis.

[Procedure For Displaying The Fixed Parameter Setting Window]



[Fixed Parameters Setting Window]



[Display/Setting Contents]

Setting data area Either the default value or the previously designated value is displayed here.

Setting range area The setting range for each setting item is indicated here.

Relative error The relative check range is displayed here (in the currently selected system**display area** of-units) when an error is detected by the relative check function.

[Mouse Operation Procedure]

Setting item selection	1) Use the $[\uparrow]/[\downarrow]$ keys to move the cursor to the desired data setting item.
Data setting	 Using the numeric keys, key in the desired setting value at the cursor position. Be sure that the designated setting is within the setting range shown at the right side of the window. After entering the desired setting value, press the [Enter] key to register the setting. If a setting which violates the prescribed range is designated, an "OUT OF SETTING RANGE" error message will be displayed. In this case, the setting should be re-designated within the prescribed range.

Axis setting change	1)	Press the [F10] function key to change axis settings. When the [F10] key is pressed, the Axis Setting Change window will be displayed.
	2)	Using the numeric keys, key in the desired axis No. and press the [Enter] key
		The Fixed Parameter Setting window for that axis No. will then be dis- played.
		If an axis No. outside the prescribed axis No. range is designated, an "OUT OF SETTING RANGE" error message will be displayed. In this case, the setting should be re-designated within the prescribed range.
	3)	To abort the axis No. setting operation, press the [ESC] key.
Fixed parameter setting END	1)	To end the fixed parameter setting operation, press the [END] key. A relative check of the setting data will then occur, and if no error is found, the system will return to the Axis Data Setting Function Selection window. If an error is found, a highlighted "E" will be displayed next to the error item. At this time, the relative check range will be shown at the relative error display area, and an error message will be displayed at the message area. After checking the setting data, make the necessary corrections then press the [END] key again.
Window CLOSE	1)	To close the window, press the [ESC] key. The system will then return to the Axis Data Setting Function Selection window.
File WRITE	1)	To write the setting data to a file, press the [F1] key while the [Ctrl] key is pressed. A dialog box containing the message "File Write YES/NO" will then be displayed.
	2)	If file writing is desired, press the [Enter] key when "YES" is highlighted. (If "NO" is highlighted, press the $[\leftarrow]$ key to move the highlight to the "YES"

item.)
3) If file writing is not desired, press the [→] key to move the highlight to the "NO" item, then press the [Enter] key.

POINTS

- (1) The setting range shown at the setting range display area varies according to the "system-of-units" designation.
- (2) The backlash compensation amount, stroke upper/lower limits, and command in-position ranges will change in accordance with changes made at the "number of pulses per revolution", "travel distance per revolution", and "unit magnification" settings. If "degrees" is the designated system-of-units, the stroke upper/lower limit values will not change.

8.1.2 Servo parameter (axis data) settings

When constructing the positioning system, the servo characteristic value settings required for servo operation must be designated. The setting procedure is described below.

Data settings are designated for each axis.

[Procedure For Displaying The Servo Parameter Setting Window]



(1) When ADU is used(a) Setting the basic parameters

[Servo Parameter (Basic Parameter) Setting Window]



[Display/Setting Contents]

Setting data area Either the default value or the previously designated value is displayed here.

Setting range area The setting range for each setting item is displayed here.

Relative error The relative check range is displayed (in the currently selected system-of**display area** units) when an error is detected by the relative check function.

[Key Operations]

Setting item selection	1) Use the $[\uparrow]/[\downarrow]$ keys to move the cursor to the desired data setting item.
Data setting	 Using the numeric keys, key in the desired setting value at the cursor position. Be sure that the designated setting is within the setting range shown at the right side of the window. After entering the desired setting value, press the [Enter] key to register the setting. If a setting which violates the prescribed range is designated, an "OUT OF SETTING RANGE" error message will be displayed. In this case, the setting should be re-designated within the prescribed range.

Setting the servo parameters (adjustment) To set the servo parameters (adjustment parameter), press the [F1] key. The following checks will then be performed:
	 A relative check of the fixed parameter data
parameter)	 A check of the servo parameter (basic parameter) setting ranges
	• A relative check between the fixed parameter data and the servo parameter (basic parameter) data
	If no error is found, the system will return to the servo parameter (adjustment parameter) setting window (see Section 8.1.2 (1) (b)). If an error is found in the relative check, highlighted "E" will be displayed in the left of the corresponding item. At the same time, the relative check range will be shown at the relative error display area, and the error message will be displayed at the message area. After checking the setting data, make the necessary corrections then press the [F1] key.
Axis setting change) Press the [F10] function key to change axis settings. When the [F10] key is pressed, the Axis Setting Change window will be displayed.
) Using the numeric keys, key in the desired axis No. and press the [Enter] key.
	The Servo Parameter (basic parameter) Setting window for that axis No. will then be displayed.
	If an axis No. outside the prescribed axis No. range is designated, an "OUT OF SETTING RANGE" error message will be displayed.
	range.
) To abort the axis No. setting operation, press the [ESC] key.
Servo parameter setting END) To end the servo parameter setting operation, press the [END] key. The following checks will then be performed:
	 A relative check of the fixed parameter data.
	• A check of the servo parameter setting ranges.
	• A relative check of the fixed parameter data and servo parameter data. If no error is found, the system will return to the Axis Data Setting Function Selection window
	If an error is found, a highlighted "E" will be displayed next to the error item. At this time, the relative check range will be shown at the relative error display area, and an error message will be displayed at the message area. After checking the setting data, make the necessary corrections then press the [END] key again.
Servo parameter setting ABORT) To abort the servo parameter setting operation, press the [ESC] key. The system will then return to the Axis Data Setting Function Selection window.
File WRITE) To write the setting data to a file, press the [F1] key while the [Ctrl] key is
	A dialog box containing the message "File Write YES/NO" will then be displayed.
) If file writing is desired, press the [Enter] key when "YES" is highlighted. (If "NO" is highlighted, press the [\leftarrow] key to move the highlight to the "YES" item.)
) If file writing is not desired, press the $[\rightarrow]$ key to move the highlight to the "NO" item, then press the [Enter] key.

POINTS

- (1) Setting values for items not highlighted at the servo parameter (basic parameter) setting window are values which are based on data designated by the System Setting function. These setting values cannot be designated by the Servo Parameter (basic parameter) Setting function. Data settings can only be designated at the highlighted items.
- (2) The setting range for servo parameter (basic parameter) data varies according to the system-of-units designated with the Fixed Parameter Setting function.
 - (b) Setting the adjustment parameters

[Servo Parameter (Adjustment Parameter) Setting Window]



[Display/Setting Contents]

Setting data area Either the default value or the previously designated value is displayed here.

Setting range area The setting range for each setting item is displayed here.

Relative error The relative check range is displayed (in the currently selected system-of**display area** units) when an error is detected by the relative check function.

[Key Operations] Setting item selection

1) Use the $[\uparrow]/[\downarrow]$ keys to move the cursor to the desired data setting item.

Data setting

 Using the numeric keys, key in the desired setting value at the cursor position.

Be sure that the designated setting is within the setting range shown at the right side of the window.

2) After entering the desired setting value, press the [Enter] key to register the setting.

If a setting which violates the prescribed range is designated, an "OUT OF SETTING RANGE" error message will be displayed.

In this case, the setting should be re-designated within the prescribed range.

Setting the servo parameters (basic parameter)	 To set the servo parameters (basic parameter), press the [F1] key. The following checks will then be performed: A relative check of the fixed parameter data A check of the servo parameter (adjustment parameter) setting ranges A relative check between the fixed parameter data and the servo parameter (adjustment parameter) data If no error is found, the system will return to the servo parameter (basic parameter) setting window (see Section 8.1.2 (1) (b)). If an error is found in the relative check, highlighted "E" will be displayed in the left of the corresponding item. At the same time, the relative check range will be shown at the relative error display area, and the error message will be displayed at the message area. After checking the setting data, make the necessary corrections then press the [F1] key.
Axis setting change	 Press the [F10] function key to change axis settings. When the [F10] key is pressed, the Axis Setting Change window will be displayed. Using the numeric keys, key in the desired axis No. and press the [Enter] key. The Servo Parameter (basic parameter) Setting window for that axis No. will then be displayed. If an axis No. outside the prescribed axis No. range is designated, an "OUT OF SETTING RANGE" error message will be displayed. In this case, the setting should be re-designated within the prescribed range. To abort the axis No. setting operation, press the [ESC] key.
Servo parameter setting END	 To end the servo parameter setting operation, press the [END] key. The following checks will then be performed: A relative check of the fixed parameter data. A check of the servo parameter setting ranges. A relative check of the fixed parameter data and servo parameter data. If no error is found, the system will return to the Axis Data Setting Function Selection window. If an error is found, a highlighted "E" will be displayed next to the error item. At this time, the relative check range will be shown at the relative error display area, and an error message will be displayed at the message area. After checking the setting data, make the necessary corrections then press the [END] key again.
Servo parameter setting ABORT	 To abort the servo parameter setting operation, press the [ESC] key. The system will then return to the Axis Data Setting Function Selection window. POINTS For items not highlighted at the servo parameter (adjustment parameter) setting window, the values are displayed based on the data designated by the System Settingfunction. For these items, setting is not possible by the Servo Parameter (adjustment parameter) Setting function. Data setting is allowed only for the highlighted items.

(2) The setting range for servo parameter (adjustment parameters) data varies according to the system-of-units designated with the Fixed Parameter Setting function.

File WRITE

1) To write the setting data to a file, press the [F1] key while the [Ctrl] is pressed.

A dialog box containing the message "File Write YES/NO" will then be displayed.

- If file writing is desired, press the [Enter] key when "YES" is highlighted. (If "NO" is highlighted, press the [←] key to move the highlight to the "YES" item.)
- If file writing is not desired, press the [→] key to move the highlight to the "NO" item, then press the [Enter] key.
- (2) When MR-D-B
 - (a) Basic parameter setting

[Servo Parameter (Basic Parameter) Setting Window] (For MR-H-B)



[Display/Setting Contents]

Setting data area Either the default value or the previously designated value is displayed here.

Setting range area The setting range for each setting item is displayed here.

Relative error The relative check range is displayed (in the currently selected system-ofdisplay area units) when an error is detected by the relative check function.

[Key Operations] Setting item selection

1) Use the $[\uparrow]/[\downarrow]$ keys to move the cursor to the desired data setting item.

Data setting

1) Using the numeric keys, key in the desired setting value at the cursor

position. Be sure that the designated setting is within the setting range shown at the right side of the window.

 2) After entering the desired setting value, press the [Enter] key to register the setting.
 If a setting which violates the prescribed range is designated, an "OUT OF"

SETTING RANGE" error message will be displayed.

In this case, the setting should be re-designated within the prescribed range.

Servo parameter (adjustment parameter) setting	 To designate the servo parameter (adjustment parameter) settings, press the [F1] key. The following checks will then be performed: A relative check of the fixed parameter data. A check of the servo parameter (basic parameter) setting ranges. A relative check of the fixed parameter data and servo parameter (basic parameter) data. If no error is found, the system will return to the Servo Parameter (Adjustment) Setting window. (See Section 8.1.2 [2][b].) If an error is found, a highlighted "E" will be displayed next to the error item. At this time, the relative check range will be shown at the relative error display area, and an error message will be displayed at the message area. After checking the setting data, make the necessary corrections then press the [F1] key again.
Servo parameter (expansion parameter) setting	 To designate the servo parameter (expansion parameters) settings, press the [F2] key. The following checks will then be performed: A relative check of the fixed parameter data. A check of the servo parameter (basic parameters) setting ranges. A relative check of the fixed parameter data and servo parameter (basic parameters) data. If no error is found, the system will return to the Servo Parameter (Expansion Parameters) Setting window. (See Section 8.1.2 [2][c].) If an error is found, a highlighted "E" will be displayed next to the error item. At this time, the relative check range will be shown at the relative error display area, and an error message will be displayed at the message area. After checking the setting data, make the necessary corrections then press the [F2] key again.
Axis setting change	 Press the [F10] function key to change axis settings. When the [F10] key is pressed, the Axis Setting Change window will be displayed. Using the numeric keys, key in the desired axis No. and press the [Enter] key. The Servo Parameter (basic parameter) Setting window for that axis No. will then be displayed. If an axis No. outside the prescribed axis No. range is designated, an "OUT OF SETTING RANGE" error message will be displayed. In this case, the setting should be re-designated within the prescribed range. To abort the axis No. setting operation, press the [ESC] key.

POINTS

(1) Setting values for items not highlighted at the servo parameter (basic parameter) setting window are values which are based on data designated by the System Setting function. These setting values cannot be designated by the Servo Parameter (Basic Parameters) Setting function.

Data settings can only be designated at the highlighted items.

(2) The setting range for servo parameter (basic parameters) data varies according to the system-of-units designated with the Fixed Parameter Setting function.

Servo parameter setting END	 To end the servo parameter setting operation, press the [END] key. The following checks will then be performed: A relative check of the fixed parameter data. A check of the servo parameter setting ranges. A relative check of the fixed parameter data and servo parameter data. If no error is found, the system will return to the Axis Data Setting Function Selection window. If an error is found, a highlighted "E" will be displayed next to the error item. At this time, the relative check range will be shown at the relative error display area, and an error message will be displayed at the message area. After checking the setting data, make the necessary corrections then press the [END] key again.
Servo parameter setting ABORT	 To abort the servo parameter setting operation, press the [ESC] key. The system will then return to the Axis Data Setting Function Selection window.
File WRITE	 To write the setting data to a file, press the [F1] key while the [Ctrl] key is pressed. A dialog box containing the message "File Write YES/NO" will then be displayed. If file writing is desired, press the [Enter] key when "YES" is highlighted. (If "NO" is highlighted, press the [←] key to move the highlight to the "YES" item.) If file writing is not desired, press the [→] key to move the highlight to the "NO"

- item, then press the [Enter] key. .1
 - (b) Adjustment parameter setting

[Servo Parameter (Adjustment Parameters) Setting Window] (For MR-H-B)

SERVO PERIMETERENO (UN THE	AL PREAMETER 1		
10X18 (PULSE)	SET BOTO	SETTING BANGE	
A THREAM FRANCISCO BALLER D FUSITION LUOP GAIN 1 C VELOCITY LUOP GAIN 1 D POSITION LOOP GAIN 2 E VELOCITY LOOP GAIN 2 F VELOCITY LOOP GAIN 2 G WATCH FAITH	3.8* 71 1268 25 600 21	1 - 118.0 (1871)07 1 - 9999 (rad/sac) 1 - 9999 (rad/sac) 0 - 11155 2756 37562 - 456	Setting data area
N FEED FORWARD GAIN I IN-FORTION RANGE J SOLENNIN BRAKE OFT	109 109	5:375 6:321 7:381 (1) 0 1 - 100 (1) 1 - 211/7/83667 (7) 0 - 1000 (resc)	Dalatin and the law of
FSTD, PO2FSP, Po3 NEXT 4	<u> </u>	Tod:SEE Exc:SEP	Relative error display area

[Display/Setting Cont Setting data area	ents] Either the default value or the previously designated value is displayed here.
Setting range area	The setting range for each setting item is displayed here.
Relative error display area	The relative check range is displayed (in the currently selected system-of- units) when an error is detected by the relative check function.
[Key Operations] Setting item selection	1) Use the [\uparrow]/[\downarrow] keys to move the cursor to the desired data setting item.
Data setting	 Using the numeric keys, key in the desired setting value at the cursor position. Be sure that the designated setting is within the setting range shown at the right side of the window. After entering the desired setting value, press the [Enter] key to register the setting. If a setting which violates the prescribed range is designated, an "OUT OF SETTING RANGE" error message will be displayed. In this case, the setting should be re-designated within the prescribed range
	8-11

Servo parameter (basic parameter) setting	1)	 To designate the servo parameter (basic parameter) settings, press the [F1] key. The following checks will then be performed: A relative check of the fixed parameter data. A check of the servo parameter (adjustment parameter) setting ranges. A relative check of the fixed parameter data and servo parameter (adjustment parameter) data. If no error is found, the system will return to the Servo Parameter (Basic Parameters) Setting window. (See Section 8.1.2 [2][a].) If an error is found, a highlighted "E" will be displayed next to the error item. At this time, the relative check range will be shown at the relative error display area, and an error message will be displayed at the message area. After checking the setting data, make the necessary corrections then press the [F1] key again.
Servo parameter (expansion parameter) setting	1)	 To designate the servo parameter (expansion parameters) settings, press the [F2] key. The following checks then be performed: A relative check of the fixed parameter data. A check of the servo parameter (adjustment parameters) setting ranges. A relative check of the fixed parameter data and servo parameter (adjustment parameters) data. If no error is found, the system will return to the Servo Parameter (expansion parameters) Setting window. (See Section 8.1.2 [2][c].) If an error is found, a highlighted "E" will be displayed next to the error item. At this time, the relative check range will be shown at the relative error display area, and an error message will be displayed at the message area. After checking the setting data, make the necessary corrections then press the [F2] key again.
Page change	1)	Press the [F3] key to switch between the next and previous setting data display pages.
Axis setting change	1) 2) 3)	 Press the [F10] function key to change axis settings. When the [F10] key is pressed, the Axis Setting Change window will be displayed. Using the numeric keys, key in the desired axis No. and press the [Enter] key. The Servo Parameter (basic parameter) Setting window for that axis No. will then be displayed. If an axis No. outside the prescribed axis No. range is designated, an "OUT OF SETTING RANGE" error message will be displayed. In this case, the setting should be re-designated within the prescribed range. To abort the axis No. setting operation, press the [ESC] key. OINTS (1) Setting values for items not highlighted at the servo parameter (adjustment parameters) setting function. These setting values cannot be designated by the Servo Parameter (Adjustment Parameters) Setting function. Data settings can only be designated at the highlighted items.
		(2) The setting range for servo parameter (adjustment parameters) data varies according to the system-of-units designated with the Fixed Parameter Setting function.

Servo parameter setting END	 To end the servo parameter setting operation, press the [END] key. The following checks will then be performed: A relative check of the fixed parameter data. A check of the servo parameter setting ranges. A relative check of the fixed parameter data and servo parameter data. If no error is found, the system will return to the Axis Data Setting Function Selection window. If an error is found, a highlighted "E" will be displayed next to the error item. At this time, the relative check range will be shown at the relative error display area, and an error message will be displayed at the message area. After checking the setting data, make the necessary corrections then press the [END] key again.
Servo parameter setting ABORT	 To abort the servo parameter setting operation, press the [ESC] key. The system will then return to the Axis Data Setting Function Selection window.
File WRITE	 To write the setting data to a file, press the [F1] key while the [Ctrl] key is pressed. A dialog box containing the message "File Write YES/NO" will then be displayed.

- If file writing is desired, press the [Enter] key when "YES" is highlighted. (If "NO" is highlighted, press the [←] key to move the highlight to the "YES" item.)
- If file writing is not desired, press the [→] key to move the highlight to the "NO" item, then press the [Enter] key.
 - (c) Expansion parameter setting

[Servo Parameter (Expansion Parameters) Setting Window] (For MR-H-B)



[Display/Setting Contents]

Setting data area Either the default value or the previously designated value is displayed here.

Setting range area The setting range for each setting item is displayed here.

Relative error The relative check range is displayed (in the currently selected system-of**display area** units) when an error is detected by the relative check function.

[Key Operations] Setting item selection	1) Use the $[\uparrow]/[\downarrow]$ keys to move the cursor to the desired data setting item.
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Data setting	 Using the numeric keys, key in the desired setting value at the cursor position. Be sure that the designated setting is within the setting range shown at the right side of the window. After entering the desired setting value, press the [Enter] key to register the setting. If a setting which violates the prescribed range is designated, an "OUT OF SETTING RANGE" error message will be displayed. In this case, the setting should be re-designated within the prescribed range.
Servo parameter (basic parameter) setting	 To designate the servo parameter (basic parameter) settings, press the [F1] key. The following checks will then be performed: A relative check of the fixed parameter data. A check of the servo parameter (expansion parameters) setting ranges. A relative check of the fixed parameter data and servo parameter (expansion parameters) data. If no error is found, the system will return to the Servo Parameter (Basic Parameters) Setting window. (See Section 8.1.2 [2][a].) If an error is found, a highlighted "E" will be displayed next to the error item. At this time, the relative check range will be shown at the relative error display area, and an error message will be displayed at the message area. After checking the setting data, make the necessary corrections then press the [F1] key again.
Servo parameter (adjustment parameter) setting	 To designate the servo parameter (adjustment parameters) settings, press the [F2] key. The following checks will then be performed: A relative check of the fixed parameter data. A check of the servo parameter (expansion parameters) setting ranges. A relative check of the fixed parameter data and servo parameter (expansion parameters) data. If no error is found, the system will return to the Servo Parameter (adjustment parameters) Setting window. (See Section 8.1.2 [2][b].) If an error is found, a highlighted "E" will be displayed next to the error item. At this time, the relative check range will be shown at the relative error display area, and an error message will be displayed at the message area. After checking the setting data, make the necessary corrections then press the [F2] key again.
Page change	 Press the [F3] key to switch between the next and previous setting data display pages.
	POINTS
	 Setting values for items not highlighted at the servo parameter (expansion parameters) setting window are values which are based on data designated by the System Setting function. These setting values cannot be designated by the Servo Parameter (Expansion Parameters) Setting function. Data settings can only be designated at the highlighted items. The setting range for servo parameter (expansion parameters) data varies according to the system-of-units designated with the Fixed Parameter Setting function.

Axis setting change	1) 2) 3)	Press the [F10] function key to change axis settings. When the [F10] key is pressed, the Axis Setting Change window will be displayed. Using the numeric keys, key in the desired axis No. and press the [Enter] key. The Servo Parameter (basic parameter) Setting window for that axis No. will then be displayed. If an axis No. outside the prescribed axis No. range is designated, an "OUT OF SETTING RANGE" error message will be displayed. In this case, the setting should be re-designated within the prescribed range. To abort the axis No. setting operation, press the [ESC] key.
Servo parameter setting END	1)	 To end the servo parameter setting operation, press the [END] key. The following checks will then be performed: A relative check of the fixed parameter data. A check of the servo parameter setting ranges. A relative check of the fixed parameter data and servo parameter data. If no error is found, the system will return to the Axis Data Setting Function Selection window. If an error is found, a highlighted "E" will be displayed next to the error item. At this time, the relative check range will be shown at the relative error display area, and an error message will be displayed at the message area. After checking the setting data, make the necessary corrections then press the [END] key again.
Servo parameter setting ABORT	1)	To abort the servo parameter setting operation, press the [ESC] key. The system will then return to the Axis Data Setting Function Selection window.
File WRITE	1) 2)	To write the setting data to a file, press the [F1] key while the [Ctrl] key is pressed. A dialog box containing the message "File Write YES/NO" will then be displayed. If file writing is desired, press the [Enter] key when "YES" is highlighted. (If "NO" is highlighted, press the [\leftarrow] key to move the highlight to the "YES" item.)

 If file writing is not desired, press the [→] key to move the highlight to the "NO" item, then press the [Enter] key.

8.1.3 Home position return data (axis data) setting

The procedure for designating the "home position return" settings is described below.

[Procedure For Displaying The Home Position Return Setting Window]



[Home Position Return Setting Window] (For A171S/A273UHCPU)



[Display/Setting Contents]

Setting data area Either the default value or the previously designated value is displayed here. The setting range for each setting item is indicated here. Setting range area Either an error message or the relative check range is displayed here (in the **Relative error** displav area currently selected system-of-units) when an error is detected by the relative check function. [Key Operations] Setting item 1) Use the $[\uparrow]/[\downarrow]$ keys to move the cursor to the desired data setting item. selection 1) Using the numeric keys, key in the desired setting value at the cursor Data setting position. Be sure that the designated setting is within the setting range shown at the right side of the window. 2) After entering the desired setting value, press the [Enter] key to register the setting. If a setting which violates the prescribed range is designated, an "OUT OF SETTING RANGE" error message will be displayed. In this case, the setting should be re-designated within the prescribed range. Axis setting change 1) Press the [F10] function key to change axis settings. When the [F10] key is pressed, the Axis Setting Change window will be displayed. 2) Using the numeric keys, key in the desired axis No. and press the [Enter] key. The Servo Parameter Setting window for that axis No. will then be displayed. If an axis No. outside the prescribed axis No. range is designated, an "OUT OF SETTING RANGE" error message will be displayed. In this case, the setting should be re-designated within the prescribed range. 3) To abort the axis No. setting operation, press the [ESC] key.

Home Position return setting END	 To end the home position return setting operation, press the [END] key. A relative check of the setting data will then be executed, and if no error is found, the system will return to the Axis Data Setting Function Selection window. If an error is found, a highlighted "E" will be displayed next to the error item. At this time, the relative check range will be shown at the relative error display area, and an error message will be displayed at the message area. After checking the setting data, make the necessary corrections then press the [END] key again.
Home position return setting ABORT	 To abort the home position return setting operation, press the [ESC] key. The system will then return to the Axis Data Setting Function Selection window.
File WRITE	 To write the setting data to a file, press the [F1] key while the [Ctrl] key is pressed. A dialog box containing the message "File Write YES/NO" will then be displayed. If file writing is desired, press the [Enter] key when "YES" is highlighted. (If "NO" is highlighted, press the [←] key to move the highlight to the "YES"

item.)
3) If file writing is not desired, press the [→] key to move the highlight to the "NO" item, then press the [Enter] key.

POINTS

- (1) The home position return setting range will vary according to the system-of-units designated with the Fixed Parameter Setting function.
- (2) Items for which settings can be designated will vary according to the home position return method which is used.
 - 1) Dog type: Settings can be designated for items A-E, and G. No setting can be designated for item F.
 - 2) Count type: Settings can be designated for all items.
 - 3) Data set type: Settings can be designated for items A, B, C only. Settings cannot be designated for any other items.

8.1.4 JOG operation data (axis data) setting

The procedure for designating the JOG operation data settings is described below.

Data settings are designated for each axis.

[Procedure For Displaying The JOG Operation Data Setting Window]



[JOG Operation Data Setting Window] (For A171S/A273UHCPU)



[Display/Setting Contents]

Setting data area Either the default value or the previously designated value is displayed here.

Setting range area The setting range for each setting item is indicated here.

[Key Operations] Setting item

- 1) Use the $[\uparrow]/[\downarrow]$ keys to move the cursor to the desired data setting item.
- Data setting

selection

 Using the numeric keys, key in the desired setting value at the cursor position.

Be sure that the designated setting is within the setting range shown at the right side of the window.

2) After entering the desired setting value, press the [Enter] key to register the setting.

If a setting which violates the prescribed range is designated, an "OUT OF SETTING RANGE" error message will be displayed. In this case, the setting should be re-designated within the prescribed range.

Axis setting change 1) Press the [F10] function key to change axis settings.
 When the [F10] key is pressed, the Axis Setting Change window will be displayed.

2) Using the numeric keys, key in the desired axis No. and press the [Enter] key.

The Servo Parameter Setting window for that axis No. will then be displayed.

If an axis No. outside the prescribed axis No. range is designated, an "OUT OF SETTING RANGE" error message will be displayed.

In this case, the setting should be re-designated within the prescribed range.

To abort the axis No. setting operation, press the [ESC] key.

JOG operation data setting END	 To end the JOG operation data setting procedure, press the [END] key. A relative check of the setting data will then be executed, and if no error is found, the system will return to the Axis Data Setting Function Selection window. If an error is found, an "OUT OF SETTING RANGE" error message will be displayed. After checking the setting data, make the necessary corrections then press the [END] key again.
JOG operation data setting ABORT	 To abort the JOG operation data setting procedure, press the [ESC] key. The system will then return to the Axis Data Setting Function Selection window.
File WRITE	 To write the setting data to a file, press the [F1] key while the [Ctrl] key is pressed. A dialog box containing the message "File Write YES/NO" will then be displayed. If file writing is desired, press the [Enter] key when "YES" is highlighted. (If "NO" is highlighted, press the [1 key to move the highlight to the "YES"

item.)
3) If file writing is not desired, press the [→] key to move the highlight to the "NO" item, then press the [Enter] key.

POINT

(1) The setting range for JOG operation data varies according to the system-of-units designated with the Fixed Parameter Setting function.

8.1.5 Parameter block setting

The procedure for designating the parameter block settings used at home position return data, JOG operation data, and servo programs is described below.

Parameter block data is used for acceleration/deceleration control, etc., during positioning operations.

[Procedure For Displaying The Parameter Block Setting Window]



[Parameter Block No. Setting Window] (For A171S/A273UHCPU)



[Display/Setting Contents]

Parameter block Either the default value or the previously designated setting value is displayed No. setting area here. Parameter block The range of parameter block Nos. for which setting is possible is displayed. No. display area [Key Operations] Parameter block No. 1) Using the numeric keys, key in the block No. where a parameter block data setting setting is to be designated, then press the [Enter] key. After the parameter block No. is designated, the system will return to the Parameter Block Data Setting window. If a block No. outside the prescribed range is designated, an "OUT OF SETTING RANGE" error message will be displayed. In this case, the setting should be re-designated within the prescribed range. Parameter block 1) To abort the parameter block No. setting operation, press the [ESC] key. The system will then return to the Servo Data Setting Function Selection No. setting ABORT window.

[Parameter Block Setting Window]

E BATA STIFIE			
BLOCK 1	SET DATA	SETTING RANGE	Sotting data area
CONTRO UNIT SPEED RESTRICTION MERGINATION DI LAN DECELERATION TANE S RATIS TOPO METROS STOP METROS STOP METROS	0 2000_00 1000 1000 1000 1000 0 300 8 4 8	0:mm 1:intb 1:degree 1:00000 0.0000000 (0000000000000000000000000000	Setting tange area
g Up Page Down	,,,L	End.st1 Exc.(N109-1)	Relative error display area
2 3 4	6	2 8 9 11	1

[Display/Setting Contents]

Setting data area	Either the default value or the previously designated value is displayed here.
Setting range area	The setting range for each setting item is displayed here.
Relative error display area	When an error is detected by the relative check, the relative check calculation formula and error message are displayed here.
[Key Operations] Setting item selection	1) Use the $[\uparrow]/[\downarrow]$ keys to move the cursor to the desired data setting item.
Data setting	 Using the numeric keys, key in the desired setting value at the cursor position. After entering the desired setting value, press the [Enter] key to register the setting
	If a setting which violates the prescribed range is designated, an "OUT OF SETTING RANGE" error message will be displayed. In this case, the setting should be re-designated within the prescribed range.
Block No. change	 Use the [PAGE UP]/[PAGE DOWN] keys to change the block No. The [PAGE DOWN] key reduces the current block No. by 1. The [PAGE UP] key increases the current block No. by 1.
Parameter block data setting END	 To end the parameter block data setting operation, press the [END] key. A relative check of the setting data will then be executed, and if no error is found, the system will return to the Servo Data Setting Function Selec- tion window. If an error is found, a highlighted "E" will be displayed next to the error item. At this time, the relative check range will be shown at the relative error display area, and an error message will be displayed at the message area. After checking the setting data, make the necessary corrections then press the IEND1 key again
Parameter block data setting ABORT	 To abort the parameter block data setting operation, press the [ESC] key. The system will then return to the Servo Data Setting Function Selection window.

POINT

(1) The parameter block setting range varies according to the systemof-units designated with the Fixed Parameter Setting function.

File WRITE

1) To write the setting data to a file, press the [F1] key while the [Ctrl] key is pressed.

A dialog box containing the message "File Write YES/NO" will then be displayed.

- If file writing is desired, press the [Enter] key when "YES" is highlighted. (If "NO" is highlighted, press the [←] key to move the highlight to the "YES" item.)
- If file writing is not desired, press the [→] key to move the highlight to the "NO" item, then press the [Enter] key.

8.1.6 Limit switch output data setting

The procedure for designating the limit switch output ON/OFF setting for a given axis is described below.

A limit switch ON/OFF setting can be designated only at axes where a "USE" status has been selected at the fixed parameter data settings.

[Procedure For Displaying The Limit Switch ON/OFF Point Setting Window]



[Axis Designation Window] (For A273UHCPU)



[Display/Setting Contents]

Axis No. setting area	Either the default value or the previously designated setting value is displayed here.
Axis No. display area	The range of selectable axis Nos. is displayed here.
[Key Operations]	
Axis No. setting	 Using the numeric keys, key in the axis No. where a limit switch ON/OFF setting is to be designated, then press the [Enter] key. The limit switch ON/OFF point setting window will then be displayed. If an axis No. setting which violates the prescribed range is designated, an "OUT OF SETTING RANGE" error message will be displayed. In this case, the setting should be re-designated within the prescribed range.
Axis No. setting ABORT	 To abort the axis No. setting operation, press the [ESC] key. The system will then return to the Servo Data Setting Function Selection window.

[Limit Switch ON/OFF Point Setting Window]

Partyr: Absolute: Absolut	Address setting area ON/OFF setting area
1 ST 770 CO 1 3 SUBT GUNZOLL 1, 6 7 8 9 0	

[Display/Setting Contents]

Function display
areaA highlight display of the selected function occurs here.Address setting
areaThe designated address setting is displayed here.ON/OFF setting
areaA highlight display occurs between points where ON/OFF settings are designated and points to the right of those points.

[Key Operations]

Selecting the "Addr	ess Setting" Function of Limit Switch ON/OFF Point
Selecting the "Address setting" function	 Point addresses can be designated when the "ADDRESS SETTING" item at the function display area is highlighted. If the "ADDRESS SETTING" item is not highlighted, press the [F1] key to highlight it.
Point No. selection	1) Use the $[\uparrow]/[\downarrow]$ keys to select the point No. where an address setting is to be designated.
Address setting procedure	 Using the numeric keys, key in the desired address. Be sure that the address is within the MIN to MAX range. If a setting which violates the prescribed range is designated, an "OUT OF SETTING RANGE" error message will be displayed. In this case, the setting should be re-designated within the prescribed range.
Address setting ABORT	1) To abort the address setting operation, press the [ESC] key.
Deleting Address S	ettings
Selecting the "address delete" function	 Press the [F2] key to highlight the "POINT DELETE" item at the function display area. The address data at the cursor line will also be highlighted at this time.
Address selection	 Use the [↑]/[↓] keys to select the address to be deleted, then press the [Enter] key. The selected address will then be deleted. The address setting area for the point No. where the deletion occurred will become blank.
Address deletion ABORT	 To abort the address deletion operation, press the [ESC] key. The "ADDRESS SETTING" item will then be highlighted, indicating that address settings can be designated.

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Sorting Addresses	
Address SORT	 Press the [F3] key to sort the address settings in ascending order. Addresses will be displayed, beginning from point No. 1. If an address setting which is the same as the MIN or MAX value exists at point Nos.1-10, it will automatically be deleted, and the subsequent addresses will be moved up to fill that vacant position. If identical addresses exist, one of them will be designated at a point No., and the others will be deleted. Subsequent addresses will be moved up to fill those vacant positions.
Limit Switch ON/OF	F Setting
Selecting the ON/OFFsetting function	 Press the [F4] key. The cursor will move to the uppermost MIN position, and the "ON/OFF SETTING" item at the function display area will be highlighted. The limit switch ON/OFF pattern can now be designated. The limit switch ON/OFF pattern is designated in 1-point (LYDD) units, with up to 8 points per axis.
ON/OFF setting procedure	 Using the cursor control keys (arrow keys), move the cursor to the position where an ON setting is desired, then press the [SPACE] key to designate the setting. ON settings will be designated for the point where the cursor is positioned, and for the point which follows, with the points then being highlighted. To designate an OFF setting for the highlighted points, press the [SPACE]
	key again. However, ON/OFF settings will not be made if the [SPACE] key is pressed while the cursor is at the MAX position. In this case, the cursor will simply move down one level to the LYDD "MIN" position. If there is no LYDD one level down, the cursor will move to the lowest LYDD "MIN" position for the axis in question.
Address setting procedure	 Press the [F4] key when the "ON/OFF SETTING" item at the function display area is highlighted. "ADDRESS SETTING" will then be highlighted at the same position, and the cursor will return to the address setting area.
ON/OFF setting operation ABORT	 To abort the ON/OFF setting operation, press the [ESC] key. The system will then return to the Servo Data Setting Function Selection window.
File WRITE	 To write the setting data to a file, press the [F1] key while the [Ctrl] key is pressed. A dialog box containing the message "File Write YES/NO" will then be displayed.
	 2) If file writing is desired, press the [Enter] key when "YES" is highlighted. (If "NO" is highlighted, press the [←] key to move the highlight to the "YES" item.) 3) If file writing is not desired, press the [→] key to move the highlight to the
	"NO" item, then press the [Enter] key.
	 POINTS (1) After setting, modifying, changing, or deleting point addresses, always execute the SORT function by pressing the [F3] key. If a limit switch ON/OFF setting operation is attempted by pressing the [F4] key without first executing the SORT function, a "SORT." message will be displayed. (2) When designating limit switch ON/OFF settings, the cursor will only move to point positions where point addresses have been designated.

8.2 Positioning Data COPY

The procedure for copying positioning data is described below.

8.2.1 Axis data COPY

The procedure for copying axis data (fixed parameters, servo parameters, home position return data, JOG operation data) to another axis is described below.

The axis data COPY operation is designated from the Servo Data Setting Auxiliary Function window.

[Axis Data COPY Designation Procedure]



[Servo Data Setting Auxiliary Function Window] (For A273UHCPU)



[Display/Setting Contents]

area

Copy source axis Either the default value or the designated copy source axis No. is displayed **No. setting area** here.

Copy destinationEither the default value or the designated copy destination axis No. isaxis No. settingdisplayed here.area

Axis No. display The range of selectable axis Nos. is displayed here.

 [Key Operations]
 Selecting the axis data to be copied
 1) Use the numeric keys to designate the axis data to be copied. The axis data to be copied can also be designated using the [↑]/[↓] keys, followed by pressing the [Enter] key. The designated axis data will be highlighted, and the cursor will flash at the "copy source axis No." setting area.

Designating the copy source axis No.
 1) Using the numeric keys, key in the desired copy source axis No.
 If an axis No. setting which violates the prescribed range is designated, an "OUT OF SETTING RANGE" error message will be displayed.
 In this case, the setting should be re-designated within the prescribed range.

 After entering the axis No., press either the [Enter] or [→] key. The cursor will then move to the "copy destination axis No." setting area.

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Designating the copy destination axis No.	 Using the numeric keys, key in the desired copy destination axis No. The [←] key can be pressed to return the cursor to the "copy source axis No." setting area. If an axis No. setting which violates the prescribed range is designated, an "OUT OF SETTING RANGE" error message will be displayed. In this case, the setting should be re-designated within the prescribed range. If the same axis No. is designated for both the copy source and copy destination, an "INCORRECT DATA" error message will be displayed. After entering the axis No., press the [Enter] key. A dialog box containing the message "AXIS DATA COPY YES/NO" will then be displayed.
Copy EXECUTE	 To execute the axis data copy operation press the [Enter] key with "YES" highlighted. (If "NO" is highlighted, press the [←] key to move the highlight to the "YES" position.) When copying of the axis data is completed, the system will return to the Servo Data Setting Auxiliary Function window.
Copy CANCEL	 To cancel the axis data copy operation, press the [→] key to move the highlight to the "NO" position, then press the [Enter] key. The system will then return to the Servo Data Setting Auxiliary Function window without executing the copy operation.
Copy ABORT	 To abort a copy operation, press the [ESC] key. The system will then return to the Servo Data Setting Auxiliary Function window.

8.2.2 Parameter block data COPY

The procedure for copying parameter block data to another parameter block is described below.

The parameter block data COPY operation is designated from the Servo Data Setting Auxiliary Function window.

[Parameter Block COPY Designation Procedure]



[Servo Data Setting Auxiliary Function Window] (For A273UHCPU)



[Display/Setting Contents]

Copy sourceEither the default value or the designated copy source parameter blockparameter blockis displayed here.No. setting areaIs displayed here.

Copy destinationEither the default value or the designated copy destination parameter blockparameter blockNo. is displayed here.

The range of selectable parameter block Nos. is displayed here.

[Key Operations] Designating the copy source parameter block No.

No. setting area Parameter block

No. display area

1) Using the numeric keys, key in the desired copy source parameter block No. If a parameter block No. setting which violates the prescribed range is designated, an "OUT OF SETTING RANGE" error message will be displayed.

In this case, the setting should be re-designated within the prescribed range.

 After entering the parameter block No., press either the [Enter] or [→] key. The cursor will then move to the "copy destination parameter block No." setting area.

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Designating the copy destination parameter block No.	 Using the numeric keys, key in the desired copy destination parameter block No. The [←] key can be pressed to return the cursor to the "copy source parameter block No." setting area. If a parameter block No. setting which violates the prescribed range is designated, an "OUT OF SETTING RANGE" error message will be dis- played. In this case, the setting should be re-designated within the prescribed range. If the same parameter block No. is designated for both the copy source and copy destination, an "INCORRECT DATA" error message will be displayed. After entering the parameter block No., press the [Enter] key. A dialog box containing the message "PARAMETER BLOCK DATA COPY YES/NO" will then be displayed.
Copy EXECUTE	 To execute the parameter block data copy operation press the [Enter] key with "YES" highlighted. (If "NO" is highlighted, press the [←] key to move the highlight to the "YES" position.) When copying of the parameter block data is completed, the system will return to the Servo Data Setting Auxiliary Function window.
Copy CANCEL	 To cancel the parameter block data copy operation, press the [→] key to move the highlight to the "NO" position, then press the [Enter] key. The system will then return to the Servo Data Setting Auxiliary Function window without executing the copy operation.
Copy ABORT	 To abort a copy operation, press the [ESC] key. The system will then return to the Servo Data Setting Auxiliary Function window.

8.3 Positioning Data LIST

The procedure for displaying a list of the setting data is described below.

8.3.1 Axis data LIST

A list of the axis data (fixed parameters, servo parameters, home position return data, JOG operation data) settings for a designated axis is displayed. The axis data LIST operation is designated from the Servo Data Setting Auxiliary Function window.

[Procedure For Displaying The Axis Data LIST]



[Servo Data Setting Auxiliary Function Window] (For A273UHCPU)



[Display/Setting Contents]

Axis No. setting Either the default value or the previously designated setting value is displayed here.

[Key Operations]

Designating the axis No.

- 1) Use the numeric keys to designate the axis No. for which an axis data LIST is desired.
- 2) Press the [Enter] key. The Axis Data LIST window for the designated axis No. will then be displayed.

If an axis No. setting which violates the prescribed range is designated, an "OUT OF SETTING RANGE" error message will be displayed. In this case, the setting should be re-designated within the prescribed range.

(1) When ADU is used

The second secon	Axis Data LISI W			1.
1 DIRECTION DIRECTORY 1 JOS DIRECTION BUT 20000 3 DIRECTORY 2 JOS DIRECTORY 20000 3 SPEEDS 2 JOS DIRECTORY 20000 5 SPEED SPEEDS 1 6 MODERNI OFTEN NOS 1 7 J.L. MD. 1 JOS DIRECTORY 20000 1 JOS DIRECTORY 200000 1 JOS DIRECTORY 2000000 1 JOS DIRECTORY 2000000 1 JOS DIRECTORY 20000000 1 JOS DIRECTORY 2000000000000000000000000000000000000	Barry and Annual Control (10) Control (10) Barry and Control (10) Control (10)	D T AFF. SETTING 2 RESTANCE 3 RESTANCE 4 NOTER TYPE 4 NOTER TYPE 5 NOTER STERIC/Anal 5 STERICAL 9 STERICAL 9 STERICAL 9 SETTING 1 SERVE RESTANCE 0 JDG GPERATION BATA 5 1 JOB GPERATION BATA	1:000_003 3:00-10 0.50 2000 15304 0:F00.(ccw) 2:0000 1 2:0000 1	⊶Axis data display area

[Display/Setting Contents]

Axis data display Settings designated with the Axis Data Setting function are displayed here. **area**

[Key Operations] Highlight display of setting items & data

1) Each of the setting items and setting data can be highlighted for confirmation by using the cursor control keys (arrow keys).

Axis data LIST operation ABORT

- To abort the axis data LIST operation, press the [ESC] key. The system will then return to the Servo Data Setting Auxiliary Function window.
- (2) When MR-D-B is used

[Axis Data LIST Window] (For MR-H-B)



[Display/Setting Contents]

Axis data display Settings designated with the Axis Data Setting function are displayed here. **area**

[Key Operations] Highlight display of setting items & data	 Each of the setting items and setting data can be highlighted for confirma- tion by using the cursor control keys (arrow keys).
Page changes	 Press the [F1] key for previous/next page switching of data displayed at the axis data display area.
Axis data LIST operation ABORT	 To abort the axis data LIST operation, press the [ESC] key. The system will then return to the Servo Data Setting Auxiliary Function window.

8.3.2 Parameter block LIST

A list of the parameter block setting data is displayed. The parameter block data LIST operation is designated from the Servo Data Setting Auxiliary Function window.

[Procedure For Displaying The Parameter Block List]



[Parameter Block LIST Window] (For A273UHCPU)



[Display/Setting Contents]

Settings designated with the Parameter Block Data Setting function are **Parameter block** data display area displayed here.

The system-of-units for the highlighted parameter block data is displayed System-of-units here.

[Key Operations] Highlight display of setting items & data

display area

- 1) Each of the setting items and setting data can be highlighted for confirmation by using the $[\uparrow]/[\downarrow]$ keys.
- 2) The $[\leftarrow]/[\rightarrow]$ keys are used for switching the display to the remaining items.

Parameter block data LIST operation ABORT

1) To abort the parameter block data LIST operation, press the [ESC] key. The system will then return to the Servo Data Setting Auxiliary Function window.

8.4 Positioning Data Check

The procedure for conducting a relative check of setting data to check for errors is described below.

8.4.1 Axis data check

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A relative check of the designated axis No. data (fixed parameters, servo parameters, home position return data, JOG operation data) and parameter block setting data is executed to check for errors.

The axis data check operation is designated from the Servo Data Setting Auxiliary Function window.

[Axis Data Check Designation Procedure]



[Servo Data Setting Auxiliary Function Window] (For A273UHCPU)



[Display/Setting Contents]

Axis data check

selection area

"All axes" or "designated axis" is selected here.

[Key Operations]	
All Axes Check	
Selecting "all axes check"	 Select the "ALL AXIS" item by pressing the [1] key or by using the [[↑]]/[↓] keys, then press the [Enter] key. A dialog box containing the message "ALL AXES CHECK? YES/NO" will then be displayed.
	then be displayed.
All axes check EXECUTE	 To execute the "all axes check" operation press the [Enter] key with "YES" highlighted. (If "NO" is highlighted, press the [←] key to move the highlight to the "YES" position.)
	 When the "all axes check" operation is completed, the Axis Data Error window will be displayed.
All axes check CANCEL	 To cancel the "all axes check" operation, press the [→] key to move the highlight to the "NO" position, then press the [Enter] key. The system will then return to the Servo Data Setting Auxiliary Function window without executing the "all axes check" operation.

Designated Axis Che	eck
Selecting the "designated axis" item	 Select the "designated axis" item by pressing the [2] key or by using the [↑]/[↓] keys, then press the [Enter] key. The Axis No. Designation window will then be displayed.
Designating the axis No.	 Use the cursor control keys (arrow keys) to move the cursor to the axis No. to be designated, then press the [SPACE] key. The designated axis No. will be highlighted. To cancel an axis No. desig- nation, press the [SPACE] key again. To cancel all axis No. designations, press the [DELETE] key. Multiple axes can be designated for the axis data check. To refer to the error codes for the previous/next page axis data, use the [PAGE UP] / [PAGE DOWN] keys. Press the [PAGE UP] key to display the previous error code page. Press the [PAGE DOWN] key to display the next error code page. (For the A273UHCPU (32-axis specs), error codes for 1-32 axes are displayed.)
Axis No. designation ABORT	 To abort the axis No. designation procedure, press the [ESC] key. The system will then return to the Servo Data Setting Auxiliary Function window.
Axis No. designation END	 After the axis No. (Nos.) has been designated for the axis data check operation, press the [END] key. A dialog box containing the message "DESIGNATED AXIS CHECK? YES/ NO" will then be displayed.
Designated axis check EXECUTE	 To execute the "designated axis check" operation press the [→] key with "YES" highlighted. (If "NO" is highlighted, press the [Enter] key to move the highlight to the "YES" position.) When the "designated axis check" is completed, the Axis Data Error window will be displayed.
Designated axis check CANCEL	 To cancel the "designated axis check" operation, press the [→] key to move the highlight to the "NO" position, then press the [Enter] key. The system will then return to the Axis No. Designation window without executing the "designated axis check" operation.

[Axis Data Error Window] (For A273UHCPU)



[Display/Setting Contents]

()	
Error code display area	An error code is displayed when an error has occurred, and "NO ERROR" is displayed when no error has occurred. Up to 9 error codes are displayed for each axis.
Error list display area	A list of error contents is displayed here.
[Key Operations]	
Displaying the axis data error code list	 Press the [F10] key when the Axis Data Error window is displayed. An Axis Data Error Code List window will then be displayed at the upper right of the Axis Data Error window. Use the [PAGE UP]/[PAGE DOWN] keys to refer to the previous or next display page of the error list. Press the [PAGE UP] key to display the previous error code list page. Press the [PAGE DOWN] key to display the next page of the error code list.
Closing the Axis Data Error Code List window	 Press the [ESC] key to close the Axis Data Error Code List window. The system will then return to the Axis Data Error window.
Closing the Axis Data Error window	 Press the [ESC] key to close the Axis Data Error window. The system will then return to the Servo Data Setting Auxiliary Function window.

8.4.2 Parameter block check

A relative check of the designated parameter block data is conducted to check for errors.

The Parameter Block Check function is designated from the Servo Data Setting Auxiliary Function window.

[Parameter Block Check Designation Procedure]



[Servo Data Setting Auxiliary Function Window] (For A273UHCPU)



[Display/Setting Contents]

Parameter block "All blocks" or "designated blocks" is selected here. data check selection area

[Key Operations]

[] •perenene]	
All Blocks Check	
Selecting "all blocks check"	 Select the "ALL P.B." item by pressing the [1] key or by using the [↑]/[↓] keys, then press the [Enter] key. A dialog box containing the message "ALL BLOCKS CHECK YES/NO" will then be displayed.
All blocks check EXECUTE	 To execute the "all blocks check" operation press the [Enter] key with "YES" highlighted. (If "NO" is highlighted, press the [←] key to move the highlight to the "YES" position.) When the "all blocks check" is completed, the Parameter Block Data Error window will be displayed.
All blocks check CANCEL	 To cancel the "all blocks check" operation, press the [→] key to move the highlight to the "NO" position, then press the [Enter] key. The system will then return to the Servo Data Setting Auxiliary Function window without executing the "all blocks check" operation.

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Designated Blocks Check		
Selecting the "designated blocks" item	1)	Select the "designated blocks" item by pressing the [2] key or by using the $[\uparrow]/[\downarrow]$ keys, then press the [Enter] key. The Parameter Block No. Designation window will then be displayed.
Designating the block No.	1) 2)	Use the cursor control keys (arrow keys) to move the cursor to the block No. to be designated, then press the [SPACE] key. The designated block No. will be highlighted. To cancel a block No. designation, press the [SPACE] key again. To cancel all block No. desig- nations, press the [DELETE] key. Multiple blocks can be designated for the parameter block data check. To refer to the error codes for the previous/next page axis data, use the [PAGE UP] / [PAGE DOWN] keys. Press the [PAGE UP] key to display the previous error code page. Press the [PAGE DOWN] key to display the next error code page. (For the A273UHCPU (32-axis specification), error codes for parameter block Nos. 1-64 are displayed.)
Parameter block No. designation ABORT	1)	To abort the parameter block No. designation procedure, press the [ESC] key. The system will then return to the Servo Data Setting Auxiliary Function window.
Parameter block No. designation END	1)	After the block No. (Nos.) has been designated for the parameter block data check operation, press the [END] key. A dialog box containing the message "DESIGNATED BLOCK CHECK YES/NO" will then be displayed.
Designated parameter block check EXECUTE	1) 2)	To execute the "designated block check" operation press the [\downarrow] key with "YES" highlighted. (If "NO" is highlighted, press the [\leftarrow] key to move the highlight to the "YES" position.) When the "designated block check" is completed, the Parameter Block Data Error window will be displayed.
Designated parameter block check CANCEL	1)	To cancel the "designated block check" operation, press the $[\rightarrow]$ key to move the highlight to the "NO" position, then press the [Enter] key. The system will then return to the Parameter Block No. Designation window without executing the "designated block check" operation.


[Display/Setting Contents]

Error code display area An error code is displayed when an error has occurred, and "NO ERROR" is displayed when no error has occurred. Up to 5 error codes are displayed for each parameter block.

Error list display area

A list of the error content is displayed.

[Key Operations] Displaying the parameter block error list

Closing the Parameter Block Error List window

Closing the Parameter Block Error window

- Press the [F10] key when the Parameter Block Error window is displayed. A Parameter Block Error List window will then be displayed at the upper right of the Parameter Block Error window.
- 1) Press the [ESC] key to close the Parameter Block Error List window. The system will then return to the Parameter Block Error window.
- 1) Press the [ESC] key to close the Parameter Block Error window. The system will then return to the Servo Data Setting Auxiliary Function window.

8.5 Positioning Data CLEAR

The procedure for clearing positioning data (restoring the default values) is described below.

8.5.1 Axis Data CLEAR

This function clears the setting data (fixed parameters, servo parameters, home position return data, JOG operation data) for a designated axis, and restores the default values.

The Axis Data CLEAR function is designated from the Servo Data Setting Auxiliary Function window.

[Axis Data CLEAR Designation Procedure]



[Servo Data Setting Auxiliary Function Window] (For A273UHCPU)



[Display/Setting Contents]

Axis data CLEAR

selection area

"All axes" or "designated axis" is selected here.

[Key Operations]	
All Axes CLEAR	
Selecting "all axes CLEAR"	 Select the "ALL AXIS" item by pressing the [1] key or by using the [[↑]]/[↓] keys, then press the [Enter] key. A dialog box containing the message "ALL AXES DATA CLEAR? YES/NO"
	will then be displayed.
All axes CLEAR EXECUTE	 To execute the "all axes CLEAR" operation press the [Enter] key with "YES" highlighted. (If "NO" is highlighted, press the [←] key to move the highlight to the "YES" position.)
	2) When the "all axes CLEAR" operation is completed, the Servo Data Setting Auxiliary Function window will be displayed.
All axes CLEAR CANCEL	 To cancel the "all axes CLEAR" operation, press the [→] key to move the highlight to the "NO" position, then press the [Enter] key. The system will then return to the Servo Data Setting Auxiliary Function window without executing the "all axes CLEAR" operation.

8. DATA SETTING FOR POSITIONING

Designated Axis CLEAR			
Selecting the "designated blocks" item	 Select the "ALL AXIS" item by pressing the [2] key or by using the [↑]/[↓] keys, then press the [Enter] key. The Parameter Block No. Designation window will then be displayed. 		
Designating the block No.	 Use the cursor control keys (arrow keys) to move the cursor to the block No. to be designated, then press the [SPACE] key. The designated block No. will be highlighted. To cancel a block No. designation, press the [SPACE] key again. To cancel all block No. desig- nations, press the [DELETE] key. Multiple axes can be designated for the axis data CLEAR operation. 		
Parameter block No. designation ABORT	 To abort the parameter block No. designation procedure, press the [ESC] key. The system will then return to the Servo Data Setting Auxiliary Function window. 		
Parameter block No. designation END	 After the axis No. (Nos.) has been designated for the axis data CLEAR operation, press the [END] key. A dialog box containing the message "DESIGNATED AXIS DATA CLEAR? YES/NO" will then be displayed. 		
Designated axis CLEAR EXECUTE	 To execute the "designated axis CLEAR" operation press the [Enter] key with "YES" highlighted. (If "NO" is highlighted, press the [←] key to move the highlight to the "YES" position.) When the "designated axis CLEAR" operation is completed, the Servo Data Setting Auxiliary Function window will be displayed. 		
Designated axis CLEAR CANCEL	 To cancel the "designated axis CLEAR" operation, press the [→] key to move the highlight to the "NO" position, then press the [Enter] key. The system will then return to the Axis No. Designation window without executing the "designated axis CLEAR" operation. 		

8.5.2 Parameter block CLEAR

Data at the designated parameter block No. is cleared, and the default values are restored.

The Parameter Block CLEAR function is designated from the Servo Data Setting Auxiliary Function window.

[Parameter Block CLEAR Designation Procedure]



[Servo Data Setting Auxiliary Function Window] (For A273UHCPU)



[Display/Setting Contents]

Parameter block "All blocks" or "designated blocks" is selected here. data CLEAR

[Key Operations]

selection area

All Blocks CI EAR

All DIUCKS CLEAR		
Selecting "all blocks CLEAR"	 Select the "ALL P.B." item by pressing the [1] key or by using the [↑]/[↓] keys, then press the [Enter] key. A dialog box containing the message "ALL BLOCKS DATA CLEAR? YES/ NO" will then be displayed. 	
All blocks CLEAR EXECUTE	 To execute the "all blocks CLEAR" operation press the [Enter] key with "YES" highlighted. (If "NO" is highlighted, press the [←] key to move the highlight to the "YES" position.) When the "all blocks CLEAR" operation is completed, the Servo Data Setting Auxiliary Function window will be displayed. 	
All blocks CLEAR	1) To cancel the "all blocks CLEAR" operation, press the [\rightarrow] key to move the	

CANCEL highlight to the "NO" position, then press the [Enter] key. The system will then return to the Servo Data Setting Auxiliary Function window without executing the "all blocks CLEAR" operation.

Designated Blocks CLEAR			
Selecting the "designated blocks" item	1)	Select the "designated blocks" item by pressing the [2] key or by using the $[\uparrow]/[\downarrow]$ keys, then press the [Enter] key. The Parameter Block No. Designation window will then be displayed.	
Designating the block No.	1)	Use the cursor control keys (arrow keys) to move the cursor to the block No. to be designated, then press the [SPACE] key. The designated block No. will be highlighted. To cancel a block No. designation, press the [SPACE] key again. To cancel all block No. desig- nations, press the [DELETE] key. Multiple parameter blocks can be designated for the block data CLEAR operation.	
Parameter block No. designation ABORT	1)	To abort the parameter block No. designation procedure, press the [ESC] key. The system will then return to the Servo Data Setting Auxiliary Function window.	
Parameter block No. designation END	1)	After the block No. (Nos.) has been designated for the block data CLEAR operation, press the [END] key. A dialog box containing the message "DESIGNATED BLOCK DATA CLEAR? YES/NO" will then be displayed.	
Designated parameter block data CLEAR EXECUTE	1) 2)	To execute the "designated block CLEAR" operation press the [Enter] key with "YES" highlighted. (If "NO" is highlighted, press the [\leftarrow] key to move the highlight to the "YES" position.) When the "designated block CLEAR" operation is completed, the Servo Data Setting Auxiliary Function window will be displayed.	
Designated parameter block data CLEAR CANCEL	1)	To cancel the "designated block CLEAR" operation, press the $[\rightarrow]$ key to move the highlight to the "NO" position, then press the [Enter] key. The system will then return to the Parameter Block No. Designation window without executing the "designated block CLEAR" operation.	

8.5.3 Limit switch output data CLEAR

Limit switch output data at the designated axis No. is cleared. The Limit Switch Output Data CLEAR function is designated from the Servo Data Setting Auxiliary Function window.

[Limit Switch Output Data CLEAR Designation Procedure]



[Servo Data Setting Auxiliary Function Window] (For A273UHCPU)



[Display/Setting Contents]

Limit switch CLEAR "All axes" or "designated axis" is selected here. selection area

[Key Operations]

All Axes Limit Switch Output Data CLEAR

Selecting "all axes limit switch output data CLEAR"	 Select the "ALL AXIS" item by pressing the [1] key or by using the [↑]/[↓] keys, then press the [Enter] key. A dialog box containing the message "ALL AXES LIMIT SWITCH OUTPUT DATA CLEAR? YES/NO" will then be displayed.
All axes limit switch output data CLEAR EXECUTE	 To execute the "all axes limit switch output data CLEAR" operation press the [Enter] key with "YES" highlighted. (If "NO" is highlighted, press the [←] key to move the highlight to the "YES" position.) When the "all axes limit switch output data CLEAR" operation is completed, the Servo Data Setting Auxiliary Function window will be displayed.
All axes limit switch output data CLEAR CANCEL	 To cancel the "all axes limit switch output data CLEAR" operation, press the [→] key to move the highlight to the "NO" position, then press the [Enter] key. The system will then return to the Servo Data Setting Auxiliary Function window without executing the "all axes limit switch output data CLEAR" operation.

8. DATA SETTING FOR POSITIONING

Designated Axis Limit Switch Output Data CLEAR			
Selecting the "designated axis" item	 Select the "designated axis" item by pressing the [2] key or by using the [↑]/[↓] keys, then press the [Enter] key. The Axis No. Designation window will then be displayed. 		
Designating the axis No.	 Use the cursor control keys (arrow keys) to move the cursor to the axis No. to be designated, then press the [SPACE] key. The designated axis No. will be highlighted. To cancel an axis No. desig- nation, press the [SPACE] key again. To cancel all axis No. designations, press the [DELETE] key. Multiple axis Nos. can be designated for the limit switch output data CLEAR operation. 		
Axis No. designation ABORT	 To abort the axis No. designation procedure, press the [ESC] key. The system will then return to the Servo Data Setting Auxiliary Function window. 		
Axis No. designation END	 After the axis No. (Nos.) has been designated for the limit switch output data CLEAR operation, press the [END] key. A dialog box containing the message "DESIGNATED AXIS LIMIT SWITCH OUTPUT DATA CLEAR? YES/NO" will then be displayed. 		
Designated axis limit switch output data CLEAR EXECUTE	 To execute the "designated axis limit switch output data CLEAR" operation press the [Enter] key with "YES" highlighted. (If "NO" is highlighted, press the [←] key to move the highlight to the "YES" position.) When the "designated axis limit switch output data CLEAR" operation is completed, the Servo Data Setting Auxiliary Function window will be 		
Designated axis limit switch output data CLEAR CANCEL	 displayed. 1) To cancel the "designated axis limit switch output data CLEAR" operation, press the [→] key to move the highlight to the "NO" position, then press the [Enter] key. The system will then return to the Axis No. Designation window without executing the "designated axis limit switch output data CLEAR" operation. 		

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8.6 Writing Positioning Data To A File

The procedure for writing positioning data to a user file (HD/FD) is described below.

This File WRITE function is designated from the Servo Data Setting Auxiliary Function window.

[File WRITE Designation Procedure]



[File WRITE window] (For A273UHCPU)



[Display/Setting Contents]

Drive name setting area	The currently designated drive name is displayed.
System name setting area	The currently designated system name is displayed.
System name comment setting area	The currently designated system name comment is displayed.
Sub-system name setting area	The currently designated sub-system name is displayed.
Sub-system name comment setting area	The currently designated sub-system name comment is displayed.
Comment (GPP) setting area	The currently designated comment (GPP) is displayed.
[Key Operations] System name comment setting	 Designate (or change) the system name comment. If the displayed comment is to be used as is, press the [Enter] key. The cursor will then move to the sub-system name comment setting area.
Sub-system name comment setting	 Designate (or change) the sub-system name comment. The cursor can be moved back to the system name comment setting area by pressing the [1] key. If the displayed comment is to be used as is, press the [Enter] key. The cursor will then move to the comment (GPP) setting area.

Comment (GPP) setting	1) 2)	Designate (or change) the comment (GPP). The cursor can be moved back to the sub-system name comment setting area by pressing the [1] key. If the displayed comment (GPP) is to be used as is, press the [Enter] key. A dialog box containing the message "FILE WRITE? YES/NO" will then be displayed.
File Write EXECUTE	1) 2)	To execute the File WRITE operation press the [Enter] key with "YES" highlighted. (If "NO" is highlighted, press the [\leftarrow] key to move the highlight to the "YES" position.) When the File WRITE operation is completed, the Servo Data Setting Auxiliary Function window will be displayed.
File Write CANCEL	1)	To cancel the File WRITE operation, press the $[\rightarrow]$ key to move the highlight to the "NO" position, then press the [Enter] key. The system will then return to the File WRITE window without executing the File WRITE operation.

POINT

(1) The drive name, system name, and sub-system name settings are fixed and cannot be re-designated.

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The PROGRAMMING mode is used to designate the positioning method and positioning speed settings, etc., and to create servo programs.

Outline of functions The GSV13PE PROGRAMMING mode consists of the following functions.

Servo Program- ming		Used for servo program creation/modification, and to check the created/modified programs.	9.2
	READ	Used to read a designated servo program.	9.1
		Program No	9.1.1
		- Axis No The servo program for the designated axis No. is read	9.1.2
		- Servo instruction The servo program which contains the designated servo instruction is read.	9.1.3
		- Indirect device The servo program at the designated indirect device is read	9.1.4
		Final program The final program is read	9.1.5
	DELETE	Used to delete servo programs	9.2.3
	Auxiliary Functions	PROGRAM LIST Used to display a servo program use list	9.3
	L	No. use list A list of program No. use statuses	9.3.1
		Program list A list of program use statuses is displayed	9.3.2
		Axis No. An axis No. use status list is displayed	9.3.3
		Designated A servo instruction use status list is displayed servo instruction	9.3.4
		└─ Designated An indirect device use status list is displayed indirect device	9.3.5
		SORT Servo programs are moved up to fill vacant positions, and programs which can't be decoded are deleted.	9.4
		COPY Servo programs are copied.	9.5
		BATCH Axis No. batch changes occur	9.6
		All created servo programs are cleared.	9.7
		FILE WRITE Servo programs are written to the user file.	9.8
		PC WRITE SET — The setting for direct writing of created/modified servo programs to the servo system CPU is designated.	9.9
		Axes used in the motion program are automatically entered at the axis	9.11

(2) Procedural flowchart The procedural flowchart for the SERVO PROGRAMMING mode is shown below.



- *1. At the instruction selection window, select the instruction type and the servo instruction, then execute the EDIT function.
- *2. To switch to the GPP function's LADDER mode, press the [F11] key while the [Ctrl] key is pressed.

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(3) Servo instruction selection display The servo instruction area content varies depending on which instruction category is highlighted.

The servo instruction area contents for each type are shown below.

1) Positioning				
1 : ABS-1	9 : INC-1			
2 : ABS-2	A : INC-2			
3 : ABS-3	B: INC-3			
4 : ABS-4	C: INC-4			
2) Positioning Circular Interpolation				
1 : ABS 🔭	8 : INC 🔭			
2 : ABS 🎧	9 : INC			
3 : ABS 🛛 😏	A:INC 🕑			
4 : ABS 🛛 🔿	B:INC 🔿			

6) Speed Switching Control			
(Start)	(Point)		
1 : VSTART	8 : VABS		
(End-point)	9 : VINC		
2 : ABS-1	(End)		
3 : ABS-2	A: VEND		
4 : ABS-3	(Repeat)		
5 : INC-1	B: FOR-ON		
6 : INC-2	C: FOR-OFF		
7 : INC-3	D: FOR-TIMES		
	E:NEXT		

7) Constant Speed Control				
(Start)	(Point)			
1 : CPSTART1	E:ABS -	M: INC -		
2 : CPSTART2	F: ABS 🔭	N:INC 🎢		
3 : CPSTART3	G: ABS 🔿	O: INC 🔿		
4 : CPSTART4	H: ABS 🕑	P : INC 🕑		
(End)	I : ABS 🔿	Q: INC		
9 : CPEND	J : ABS 🎧	R: INC C		
(Repeat)	K : ABS 🛥	S:INC 🛹		
A : FOR-ON	L : ABS 🕩	T : INC 🕩		
B: FOR-OFF				
C: FOR-TIMES				
D: NEXT				

	B:
	C :
	D:
need/Position Switching Control	ר
predit Galifori Gwitchnig Collifor	

C: INC

_ **_** _

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D: INC

E: INC

8)	Position	Follow-Up	
: PFSTART			

A) High-speed Oscillation 1: OSC

B) Home Position Return 1 : ZERO

C) Simultanous Start 1:START

3 : FEED-3		
	4) Speed Control	
1 : VF		
2 : VR		
3 : VVF		
4 : VVR		

3) Fixed-Pitch Feed

	5) Speed	Position	Switching	Control
	: VPF			

- 2 : VPR
- 3: VPSTART

5: ABS 🔿

6 : ABS 🛛 🛶

7:ABS 🔱

1 : FEED-1 2 : FEED-2

9.1 Servo Program READ

Existing servo programs can be read from the personal computer's memory and displayed on-screen.

Servo program readouts can be designated by the following 5 methods:

- Readout by program No. designation.
- Readout by axis No. designation.
- Readout by servo instruction designation.
- Readout by indirect device designation.
- Readout by "final program" designation.

At the Servo Program READ window, designate the desired readout method, then execute the servo program readout operation.

POINT

Program No. designation at servo program creation The servo program READ function can also be used when designating a program No. at the servo program creation operation.

9.1.1 Readout of servo program by program No. designation

The desired servo program can be displayed by designating that servo program No.

[Procedure For Displaying The Servo Program READ Window]



[Servo Program READ Window] (For A273UHCPU)



[Display/Setting Contents]

Program No. settingEither the No. of the program currently being read, or the designated programareaNo. is displayed here.

[Key Operations] Designating a readout by program No.	 Press the [F1] key. The "PROG. NO." item will then be highlighted, and the cursor will be displayed at the program No. setting area.
Designating the program No.	 Using the numeric keys, key-in the program No. of the servo program to be read, then press the [Enter] key. The corresponding servo program will then be displayed at the right side of the screen.
	2) If a program No. outside the permissible range is designated, an "OUT OF SETTING RANGE" error message will be displayed. In this case, the setting should be re-designated within the prescribed range.

 Program search
 1) Use the [PAGE UP]/[PAGE DOWN] keys to conduct a program search. Press the [PAGE UP] key to search for, and display, the preceding servo program. Press the [PAGE DOWN] key to search for, and display, the next servo program.

Readout of servo program by axis No. designation 9.1.2

The lowest No. servo program that uses a particular axis can be displayed by designating that axis.

[Procedure For Displaying The Servo Program READ Window]



[Servo Program READ Window] (For A273UHCPU)



[Display/Setting Contents]

Axis No. setting The designated axis No. is displayed here. area

[Key	Operations]
_		

1) Press the [F2] key.

- Designating a readout by axis No. The "AXIS NO." item will then be highlighted, and the cursor will be displayed at the axis No. setting area.
- **Designating the** 1) Using the numeric keys, key-in the axis No. of the servo program to be axis No. read, then press the [Enter] key. The lowest No. servo program for that axis will then be displayed at the right side of the screen.
 - 2) If an axis No. outside the permissible range is designated, an "OUT OF SETTING RANGE" error message will be displayed. In this case, the setting should be re-designated within the prescribed range.
- 1) Use the [PAGE UP]/[PAGE DOWN] keys to conduct a program search. **Program search** Press the [PAGE UP] key to search for, and display, the servo program used at the previously designated axis No. Press the [PAGE DOWN] key to search for, and display, the servo program used at the subsequently designated axis No.

9.1.3 Readout of servo program by servo instruction designation

The lowest No. servo program which contains a particular instruction can be displayed by designating that instruction.

[Procedure For Displaying The Instruction Selection Window]



[Servo Instruction Selection Window] (For A273UHCPU)



[Display/Setting Contents]

Servo instruction The selectable servo instructions are displayed here. **setting area**

[Key Operations]	
Selecting the instruction category	 Key in the instruction category No. of the servo program to be read, or use the [↑]/[↓] keys to move the cursor to the desired instruction category, then press the [Enter] key. The selected instruction category will then be highlighted, and the cursor will move to the Servo Instruction Designation area. The servo instructions for the selected type will be displayed at the servo instruction esignation area.
Designating the servo instruction	 Key in the number or letter of the desired servo instruction, or use the [↑]/[↓] keys to move the cursor to that instruction, then press the [Enter] key. The Servo Instruction Selection window will then be closed, and the lowest No. servo program which contains the designated servo instruction will be displayed.
Program search	 Use the [PAGE UP]/[PAGE DOWN] keys to conduct a program search. Press the [PAGE UP] key to search for, and display, the servo program which contains the previously esignated servo instruction. Press the [PAGE DOWN] key to search for, and display, the servo program which contains the subsequently designated servo instruction.

9.1.4 Servo program readout by indirect device designation

The lowest No. servo program in which a particular device is used can be displayed by designating the device name.

A servo program readout by indirect device designation can be executed by the following 3 methods:

- Readout of all servo programs where indirect devices are used.
- Readout of servo programs where the designated device name (D/W) is used.
- Readout of servo programs where the designated device No. (D0 to D1023/D8191, W0 to W3FF/W1FFF) is used.

[Procedure For Displaying The Servo Program READ Window]



[Servo Program READ Window] (For A273UHCPU)



[Display/Setting Contents]

Indirect device The designated device is displayed. setting area

[Key Operations]

Readout of all servo	programs where indirect devices are used
Selecting the "indirect device" designation method	1) Press the [F4] key. The "INDIRCT DEV" item will be highlighted, and the cursor will be displayed at the device setting area.
"All-Devices" designation	1) Press the [Enter] key to display (at right of screen) the lowest No. servo program where an indirect device (D/W) is used.
Program search	 Use the [PAGE UP]/[PAGE DOWN] keys to conduct a search of servo programs where the designated device is used. Press the [PAGE UP] key to search for, and display, the servo program for the previously designated device. Press the [PAGE DOWN] key to search for, and display, the servo program for the subsequently designated device.

Readout of servo pro	ograms where the designated device name (D/W) is used
Selecting the "indirect device" designation method	1) Press the [F4] key. The "INDIRCT DEV" item will be highlighted, and the cursor will be displayed at the device setting area.
Designating the device name	 Press the [D] or [W] key to designate the device name for which a readout is desired, then press the [Enter] key to display (at right side of screen) the lowest No. servo program where that device name (D/W) is used will be displayed at the right side of the screen.
Program search	 Use the [PAGE UP]/[PAGE DOWN] keys to conduct a search of servo programs where the designated device is used. Press the [PAGE UP] key to search for, and display, the servoprogram for the previously designated device name. Press the [PAGE DOWN] key to search for, and display, the servo program for the subsequently designated device name.

Readout of servo programs where the designated device No. (D0 to D1023/D8191, W0 to W3FF/W1FFF) is used

Selecting the "indirect device" designation method	 Press the [F4] key. The "INDIRCT DEV" item will be highlighted, and the cursor will be displayed at the device setting area.
Designating the device No.	1) Enter the indirect device name and device No. for which a readout is desired, then press the [Enter] key to display (at right side of screen) the lowest No. servo program where that device No. is used will be displayed at the right side of the screen.

2) The device No. setting range is shown in the table below.

CPU Register	A171S	A273UH(S1/S3)
Data register (D)	D0 to D1023*	D0 to D8191*
Link register (W)	W0 to W3FF	W0 to W1FFF

*: 800-1023 are used by the servo system CPU.

3) If a device No. outside the permissible range is designated, an "DEVICE NUMBER OUT OF RANGE" error message will be displayed. In this case, the setting should be re-designated within the prescribed range.

Program search1) Use the [PAGE UP]/[PAGE DOWN] keys to conduct a search of servo
programs where the designated device is used.
Press the [PAGE UP] key to search for, and display, the servoprogram for
the previously designated device No.
Press the [PAGE DOWN] key to search for, and display, the servo program

Press the [PAGE DOWN] key to search for, and display, the servo program for the subsequently designated device No.

9.1.5 Readout by "Final Program" designation

A "final program" designation can be made to display only the final servo program.

[Procedure For Displaying The Servo Program READ Window]



[Servo Program READ Window] (For A273UHCPU)



[Display/Setting Contents]

Final programThe "final program" readout function is selected here.setting area

[Key Operations] Selecting the "final program" designation method

1) Press the [F5] key.

The "END PROGRAM" item will be highlighted, and the final servo program will be displayed at the right side of the screen.

9.2 Servo Program Creation

The procedure for creating, modifying, and deleting servo programs is described below.

(1) Servo programming screen The screen used for creating servo programs is shown below.



- 3) System-of-units The system-of-units is displayed here. display area
- 4) Servo program
display areaAfter servo instruction selection, the servo instructions, required setting
items, and setting values are displayed.

A 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.

POINT

Designating a position follow-up instruction

At the A171S/A273UHCPU units, the indirect device designation at the servo program's positioning address must be an even-numbered device.

If an odd-numbered device is designated, error "141" will be activated when peration is started, and operation will be disabled.

9.2.1 Servo program creation

Servo programs are created at the Servo Programming screen, and are written one by one to the personal computer's internal memory.

[Procedure For Displaying The Instruction Selection Window]



[Instruction Selection Window]



[Display/Setting Contents]

Instruction category selection area	The servo instruction categories are displayed here.
Servo instruction selection area	The servo instructions in the selected instruction category are displayed here.
Speed type selection window	For 2 to 4 axes linear interpolation setting operations, the selectable position- ing speed types are displayed here.
Program display area	Servo programs are displayed here. (This display area will be vacant when the status of a designated program No. is not used.)

[Key Operations] Selecting the instruction category

 Designate the desired instruction category by a numeric key input, or by using the [↑]/[↓] keys to move the cursor to the desired type, then press the [Enter] key.

The selectedinstruction category will be highlighted, and the cursor will move to the servo instruction selection area.

The servo instructions which correspond to the designated instructiontype will be displayed at the Servo Instruction Selection area.

POINT

Selection of "*9: HELICAL" in the instruction category is not possible.

Selecting the servo instruction	 Designate the desired servo instruction by a numeric key input, or by using the [↑]/[↓] keys to move the cursor to the desired instruction, then press the [Enter] key. After a servo instruction is selected, the Servo Instruction Selection window will be closed, and the selected instruction will be displayed at the program display area. (For 2 to 4 axes linear interpolation control designations, a Speed Type Selection window will be displayed.)
Selecting the speed type	 When 2 to 4 axes linear interpolation control is selected, the positioning speed must be designated at the Speed Type Selection window. Designate the desired speed type by a numeric key input, or by using the [↑]/[↓] keys to move the cursor to the desired speed type, then press the [Enter] key. After a speed type is selected, the Servo Instruction Selection window will be closed, and the selected servo instruction and speed type will be displayed at the program display area.

POINT

Servo program No. designation

Always designate the program No. before creating a servo program. The program No. can be designated by the following 2 methods:

- Program No. designation by servo program readout (see section 9.1).
- Program No. designation by [F7]/[F8] key input (see following page).

With either method, the number of the servo program to be created should be designated by a servo program readout operation.

END CONTAIND SELECT	ITEM SET	<t 8=""></t>		Additional item display area
	4: P. B. 5: UNIT 6: 1. R. 7: 2 8: 5			Serve Instruction display area
	AIP.TONG. BISTOP CIA BISTOP BISTRED BISTRED BISTRED BISTRED CIANCEL	L		Setting item display area
тослимы од казар от склада.	HISTART L IIFIN ACC. (HICAN SET)	PRODUCTION OF THE PRODUCTION O	MAN STEPS 0/4056	Program check display area

[Display Explanations]

Intohing exhibition	
Servo instruction display area	The designated servo instructions are displayed here.
Setting item display area	The designated items are displayed here.
Setting value display area	The designated setting values are displayed here.
Additional item display area	Setting items which can be added to the servo program are displayed here. (Selectable items are indicated by an asterisk (*) to their left. The selectable items vary according to the servo instruction which has been designated.)
Program check display area	An error message is displayed here when an error is detected by the program check function.
[Key Operations] Designating data settings	 At the setting value display area, use the numeric keys to key in the desired setting value, then press either the [Enter] or [↓] key to register the setting. The cursor will then move to the next setting value display area. When the final data setting for the displayed setting items is registered, the cursor will move to the next line where "additional item" settings are possible.
Designating additional items	 Refer to the additional item display area to see which items can be added, then use the numeric or alphabetic keys to designate the desired item. Selected items will be displayed atthe setting item display area. At the setting value display area, use the numeric keys to key in the desired setting values, then press either the [Enter] or [↓] key to register the setting.

The cursor will then move tothe next line.

Program STORE procedure	 When the servo program creation operation is completed, press the [F10] key. The created program will then undergo the following checks: data check, grammar check, device No. check, memory overflow check. If no errors are found, the created program will be written to the internal memory. If an error is found, an "E" will appear to the left of the erroneous item, and
	 an error message will be displayed. If this occurs, re-designate the setting correctly. 3) If the [F2], [F4], [F7], [F8], [F11], [SHIFT]+[F1], or [Ctrl]+[F11] key is pressed before pressing the [F10] key after completing a servo program creation operation, a dialog box containing the message "NOT STORED. OK?" will be displayed. After the created servo program has been written to the servo system CPU,
	 4) If "PC AUTO WRITE" has been designated as an auxiliary function, the servo program will automatically be written to the servo system CPU when the [F10] key is pressed.
Batch check of all programs	1) Press the [END] key to execute a batch check of all servo programs (refer to section 9.10).
Switching Between Program Nos.	 To switch to another servo program No., press the [F7] or [F8] key. Press the [F7] key to designate the program No. which immediately precedes the currently displayed servo program. Press the [F8] key to designate the program No. which immediately follows the currently displayed servo program.
File WRITE	 When the [Ctrl]+[F1] keys are pressed, a dialog box containing the message "FILE WRITE? YES/NO" will be displayed. To execute the File WRITE operation press the [Enter] key with "YES" highlighted. (If "NO" is highlighted, press the [←] key to move the highlight to the "YES" position.) If file writing is not desired, press the [→] key to move the highlight to the "NO"position, then press the [Enter] key.
Servo programming END	1) To end the servo programming operation, press the [SHIFT]+[F1] keys. The system will then return to the Servo Function Selection window.

POINT

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A maximum of 768 steps per program can be created. If the step count exceeds 768, screen scrolling by cursor operation will be disabled, and servo program creation will be impossible.

9.2.2 Servo program modification

This function is used to modify created servo programs.

[Procedure For Displaying The Servo Instruction Data Setting Screen]



[Servo Programming Screen]



[Display/Setting Contents]

Program display area The program which was read is displayed here.

Program check When an error is detected by the program check function, an error message is displayed here.

[Key Operations]

Modifying data settings	
Modifying data 1) settings	Use the cursor control keys (arrow keys) to move the cursor to the item where a modification is desired, then enter the new data setting.
Program STORE 1) procedure 2) 3) 4)	When the servo program modification operation is completed, press the [F10] key. The modified program will then undergo the following checks: data check, grammar check, device No. check, memory overflow check. If no errors are found, the modified program will be written to the internal memory. If an error is found, an "E" will appear to the left of the erroneous item, and an error message will be displayed. If this occurs, re-designate the setting correctly. If the [F2], [F4], [F7], [F8], [F11], [SHIFT]+[F1], or [Ctrl]+[F11] key is pressed before pressing the [F10] key after completing a servo program modification operation, a dialog box containing the message "NOT STORED. OK?" will be displayed. After the modified servo program has been written to the servo system CPU, proceed to another function. If "PC AUTO WRITE" has been designated as an auxiliary function, the servo program will automatically be written to the servo system CPU when the [F10] key is pressed.

Batch check of all programs	1)	Press the [END] key to execute a batch check of all servo programs (refer to section 9.10).
Switching between program Nos.	1)	To switch to another servo program No., press the [F7] or [F8] key. Press the [F7] key to designate the program No. which immediately precedes the currently displayed servo program. Press the [F8] key to designate the program No. which immediately follows the currently displayed servo program.
File WRITE	1) 2) 3)	When the [Ctrl]+[F1] keys are pressed, a dialog box containing the message "FILE WRITE? YES/NO" will be displayed. To execute the File WRITE operation press the [Enter] key with "YES" highlighted. (If "NO" is highlighted, press the [\leftarrow] key to move the highlight to the "YES" position.) If file writing is not desired, press the [\rightarrow] key to move the highlight to the "NO" position, then press the [Enter] key.
Servo programming END	1)	To end the servo programming operation, press the [SHIFT]+[F1] keys. The system will then return to the Servo Function Selection window.
Deleting data setting	s	
Selecting data to be deleted	1)	Use the cursor control keys (arrow keys) to move the cursor to the data position where a deletion is desired.
Program DELETE	1)	To delete a servo instruction other than the first instruction, or to delete a single setting item, press any of the following keys: [F3], [DELETE], or [SHIFT]+[F2]. The designated position will then be highlighted, and a dialog box containing the message "DELETE? YES/NO" will be displayed. If YES is selected, the highlighted content will be deleted, and the system will return to the Servo Programming screen. If NO is selected, the highlighted content will not be deleted, and the system will return to the Servo Programming screen where an "STOPPED" message will be displayed.
Program STORE procedure (This procedure is not required if an entire block was deleted)	1) 2) 3) 4)	 When the servo program modification operation is completed, press the [F10] key. The modified program will then undergo the following checks: data check, grammar check, device No. check, memory overflow check. If no errors are found, the modified program will be written to the internal memory. If an error is found, an "E" will appear to the left of the erroneous item, and an error message will be displayed. If this occurs, re-designate the setting correctly. If the [F2], [F4], [F7], [F8], [F11], [SHIFT]+[F1], or [Ctrl]+[F11] key is pressed before pressing the [F10] key after completing a servo program modification operation, a dialog box containing the message "NOT STORED. OK?" will be displayed. After the modified servo program has been written to the servo system CPU, proceed to another function. If "PC AUTO WRITE" has been designated as an auxiliary function, the servo program will automatically be written to the servo system CPU when the [F10] key is pressed.

Batch check of all programs	1) Press the [END] key to execute a batch check of all servo programs (refer to section 9.10).
Switching between program Nos.	 To switch to another servo program No., press the [F7] or [F8] key. Press the [F7] key to designate the program No. which immediately precedes the currently displayed servo program. Press the [F8] key to designate the program No. which immediately follows the currently displayed servo program.
File WRITE	 When the [Ctrl]+[F1] keys are pressed, a dialog box containing the message "FILE WRITE? YES/NO" will be displayed. To execute the File WRITE operation press the [Enter] key with "YES" highlighted. (If "NO" is highlighted, press the [←] key to move the highlight to the "YES" position.) If file writing is not desired, press the [→] key to move the highlight to the "NO" position, then press the [Enter] key.
Servo programming END	1) To end the servo programming operation, press the [SHIFT]+[F1] keys. The system will then return to the Servo Function Selection window.

Cursor Position	Deleted Data
First instruction line	1 program
Speed switching & constant speed servo instruction point line	1 point
Setting item line	Setting item

9.2.3 Servo program deletion

Servo programs which have been written to the internal memory can be read out and deleted, one by one.

[Procedure For Displaying The Servo Program DELETE YES/NO Dialog Box]



[Servo Program Delete? YES/NO Dialog Box]



[Display/Setting Contents]

Program-to-be-de- The program which has been read out for deletion is displayed here. **leted display area**

Program delete The program deletion YES/NO selection is designated here. YES/NO selection area

[Key Operations]

Servo Program Delete 1) To delete the servo program, press the [←] key to highlight the YES item, the press the [Enter] key. (The default setting is "NO".) When servo program deletion is completed, the highlighted content will be deleted.

Servo Program Delete CANCEL	1)	To cancel the program deletion operation, press the [Enter] key while the "NO" item is highlighted. (If "YES" is highlighted, press the $[\rightarrow]$ key to move the highlight to the "NO" position.) The system will then return to the Servo Programming screen without deleting the servo program.
Batch check of all programs	1)	Press the [END] key to execute a batch check of all servo programs (refer to section 9.10).
Switching between program Nos.	1)	To switch to another servo program No., press the [F7] or [F8] key. Press the [F7] key to designate the program No. which immediately precedes the currently displayed servo program. Press the [F8] key to designate the program No. which immediately follows the currently displayed servo program.
File WRITE	1) 2) 3)	When the [Ctrl]+[F1] keys are pressed, a dialog box containing the message "FILE RITE? YES/NO" will be displayed. To execute the File WRITE operation press the [Enter] key with "YES" highlighted. (If "NO" is highlighted, press the [\leftarrow] key to move the highlight to the "YES" position.) If file writing is not desired, press the [\rightarrow] key to move the highlight to the "NO" position, then press the [Enter] key.
Servo programming END	1)	To end the servo programming operation, press the [SHIFT]+[F1] keys. The system will then return to the Servo Function Selection window.

POINTS

(1) Cursor position confirmation
To delete an entire program, verify that the cursor is at the first
instruction line, then press one of the following keys: [SHIFT]+[F2],
[DELETE], or [F3].
(2) Deleting additional items
When additional items have been designated at a servo program,
they can be deleted in 1-line units.
Move the cursor to the line to be deleted, then press one of the
following keys: [SHIFT]+[F2], [DELETE], or [F3].

9.3 Servo Program Use List Display

A servo program use list is displayed at the Servo Programming screen, showing the servo program use status.

The program use list display can be designated by following 4 methods:

- By program No. designation
- By axis No. designation
- By servo instruction designation
- By indirect device designation

At the Program Use List Selection window, select the list format, and execute a list readout.

(1) Program use list display data The data items shown in Table 9.1 below are displayed at the program use list for confirmation.

Desig- nated Item	Display Data							
	Use Status	Program No.	Servo Instruction	Axis No.	Number of Steps	Additional Item	Section	
Program No.	0						9.3.1	
		0	0	0	0	0	9.3.2	
Axis No.		0	0	0	O (Interpola- tion axis)	ο	9.3.3	
Servo Instruction		0		ο	0	0	9.3.4	
Indirect Device		0	ο	ο	0	ο	9.3.5	

Table 9.1 Program Use List Confirmation Data

- (2) Regarding the "additional Item" entry at Table 9.1 above, a single additional item can be selected from the items designated at the servo program to display the setting data for that item. The additional items are listed below.
 - Address
 - Speed
 - Dwell time
 - M-code
 - Torque
 - Parameter block No.
 - Control unit
 - Speed limit value
 - Acceleration time
 - Deceleration time
 - Rapid stop deceleration time
 - Parameter & torque limit value
 - Deceleration processing at STOP input
 - Allowable error range for circular interpolation
 - Constant speed control & change speed
 - S-curve ratio

POINT

The setting data for an additional item not designated at the servo program will not be displayed.

- Skip
- Cancel
- Start
- FIN acceleration/ deceleration

9.3.1 No. use list

A program No. is designated to display a list showing that servo program's use status (USED/NOT USED).

[Procedure For Displaying The Program No. Use List Setting Window]



[Program No. Use List Setting Window]



[Display/Setting Contents]

Program No. Either the default value or the designated program No. is displayed here. setting area

[Key Operations] De

Designating the program No.	1) Using the numeric keys, key-in the program No. from which the list is to begin, then press the [Enter] key.			
	If a program No. outside the prescribed No. range is designated, an "OUT OF SETTING RANGE" error message will be displayed.			
	 2) A list showing the USED/NOT USED statuses of 224 programs will then be displayed, beginning with the program No. which was designated above. 			
	 "USE"program Nos. will be highlighted. "NO USE"program Nos. will not be highlighted (normal display). 			
Page switching	 Use the [PAGE UP]/[PAGE DOWN] keys to switch display pages. Press the [PAGE UP] key to display the previous 224 programs. Press the [PAGE DOWN] key to display the next 224 programs. 			

9.3.2 Program list

When a program No. is designated, a list of programs (program No., servo instruction, axis No., number of steps) will be displayed, beginning with the designated program No.

If an "additional item" is designated, the data for that item will also be displayed.

[Procedure For Displaying The Program List Setting Window]



[Additional Item Setting Window]



[Display/Setting Contents]

Additional item The designated additional item is displayed here. setting area

[Key Operations] Designating the additional item

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 Select the desired additional item by using the numeric/character keys, or by using the [↑]/[↓] keys to move the cursor to the desired item, then press the [Enter] key.

When an additional item is selected, the Program List Setting window will be displayed.

[Program List Setting Window]

PHOS. NO. T (NC. SERVO CO	8) (8—4975) Thig Axis St	E P AD DREES		
				Program No. setting area
The fact	4	с_?_в	1	

[Display/Setting Contents]

Program No. Either the default value or the designated program No. is displayed here. setting area

[Key Operations] Designating the program No.

- Using the numeric keys, key in the program No. from which the list is to begin, then press the [Enter] key.
 If a program No. outside the prescribed No. range is designated, an "OUT OF SETTING RANGE" error message will be displayed.
 - If this occurs, re-designate a No. within the prescribed range.
- 2) A program list will then be displayed, beginning with the program No. which was designated above.
- 3) The Program List contains 18 lines per screen.

Displaying the next screen

1) Press the [PAGE DOWN] key to display the remainder of the list. When the program list readout is completed, a "COMPLETED" message will be displayed.

9.3.3 Axis No. designation

When an axis No. is designated, a list of programs (program No., servo instruction, interpolation axis, number of steps) where the designated axis No. is used will be displayed.

[Procedure For Displaying The Axis No. Designation Window]



[Additional Item Setting Window]



[Display/Setting Contents]

Additional item The designated additional item is displayed here. setting area

[Key Operations]

Designating the additional item

 Select the desired additional item by using the numeric/character keys, or by using the [↑]/[↓] keys to move the cursor to the desired item, then press the [Enter] key.

When an additional item is selected, the Axis No. Designation window will be displayed.

[Axis No. Designation Window]



[Display/Setting Contents]

Axis No. setting The designated axis No. is displayed here. area

[Key Operations]

Designating the axis No.

1) Use the numeric keys to select the desired axis No., then press the [Enter] key.

If an axis No. outside the prescribed No. range is designated, an "OUT OF SETTING RANGE" error message will be displayed.

- If this occurs, re-designate a No. within the prescribed range.
- 2) A list of servo programs where the designated axis No. is used will then be displayed, beginning from the lowest program No. The total number programs where the axis No. is used is shown at the upper right of the window.
- 3) The Program List contains 18 lines per screen.

Displaying the next screen Press the [PAGE DOWN] key to display the remainder of the list. When the program list readout is completed, a "COMPLETED" message will be displayed.

9.3.4 Servo instruction designation

When a servo instruction is designated, a list of programs (program No., servo instruction, axis No., number of steps) where the designated servo instruction is used will be displayed.

[Procedure For Displaying The Additional Item Setting Window]



[Additional Item Setting Window]



[Display/Setting Contents]

The designated additional item is displayed here.

[Key Operations]

Additional item

setting area

Designating the additional item

1) Select the desired additional item by using the numeric/character keys, or by using the $[\uparrow]/[\downarrow]$ keys to move the cursor to the desired item, then press the [Enter] key.

When an additional item is selected, the Servo Instruction Designation window will be displayed.
[Servo Instruction Designation Window]

1:000000000000000000000000000000000000

[Display/Setting Contents]

Servo instruction The servo instruction selected at the Servo Instruction Selection window is display area displayed here.

[Key Operations] Selecting the

- 1) Use the numeric keys to select the instruction category which includes instruction category the servo instruction to be displayed, or use the $\lceil \uparrow \rceil / \lceil \downarrow \rceil$ keys to move the cursor to the category, then press the[Enter] key. When an instruction category is selected, that category is highlighted, and the cursor moves to the servo instruction display area. The servo instructions in each servo instruction category are displayed in the servo nstruction display area.
- Selecting servo 1) Use the numeric keys to select the servo instruction to be displayed, or instructions use the $[\uparrow]/[\downarrow]$ keys to move the cursor to the instruction, then press the [Enter] key. Only the first servo instruction can be selected.
 - 2) When a servo instruction is selected, the Servo Instruction Selection window will be closed, and a list of servo programs where the designation servo instruction is used will be displayed, beginning from the lowest program No.
 - The total number of programs is shown at the upper right of the window.
 - 3) The Program List contains 18 lines per screen.
- **Displaying the** next screen
- 1) Press the [PAGE DOWN] key to display the remainder of the list. When the program list readout is completed, a "COMPLETED" message will be displayed.

9.3.5 Indirect device designation

When an indirect device is designated, a list of programs (program No., servo instruction, axis No., number of steps, setting item, device No.) where the designated device is used will be displayed.

A list display by indirect device designation can be executed by the following 3 methods:

- Display of all servo programs where indirect devices are used.
- Display of servo programs where the designated device name (D/W) is used.
- Display of servo programs where the designated device No. is used. (D0 to D1023/D8191, W0 to W3FF/W1FFF).

[Procedure For Displaying The Indirect Device Designation Window]



[Indirect Device Designation Window]



[Display/Setting Contents]

The designated device is displayed here. Device setting area

[Key Operations]

	To display all servo programs where the indirect device is used	
1		

"All devices" (D/W)	1) Press the [Enter] key at the Indirect Device Designation window to display
designation	a list of all servo programs (in ascending program No. order) where indirect
	devices (D/W) are used.
	The total number of programs where indirect devices are used is shown at
	the upper right of the window.
	2) The Brogram List contains 18 lines per screen

The Program List contains 18 lines p

9. SERVO PROGRAM CREATION/MODIFICATION

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Page switching	1)	Use the [PAGE UP]/[PAG Press the [PAGE UP] ke Press the [PAGE DOWN When the program list r will be displayed.	GE DOWN] keys to swite y to display the previous I] key to display the nexi eadout is completed, a	ch display pages. s 18 programs. t 18 programs. "COMPLETED" message
To display servo pro	gra	ms where the designate	ed device name (D/W) i	s used
Designating the device name	1) 2)	Press either the [D] or [V press the [Enter] key. A list of servo programs then be displayed in asc	V] key to designate the c where the designated	lesired device name, then device name is used will
	3)	The total number of prog the upper right of the win The Program List contain	grams where the device ndow. ns 18 lines per screen.	name is used is shown at
Page switching	1)	Use the [PAGE UP]/[PAGE UP] ke Press the [PAGE UP] ke Press the [PAGE DOWN When the program list re will be displayed.	GE DOWN] keys to swith by to display the previous I] key to display the nex eadout is completed, a "	ch display pages. s 18 programs. t 18 programs. COMPLETED" message
Changing the device name setting	1)	To change the device na name, then enter the ner	ime, press the [DELETE w name.] key to clear the old
To display servo pro W0 to W3FF/W1FFF)	gra is ı	ms where the designate	ed device No. (D0 to D	1023/D8191,
Designating the device No.	1) 2) 3) 4)	Enter the name and No. of the indirect device to be displayed, then press the [Enter] key. A list of servo programs where the designated device No. is used will then be displayed in ascending program No. order. The total number of programs where the device No. is used is shown at the upper right of the window. The Program List contains 18 lines per screen. The device number setting range is shown below.		
		CPU	A171S	A273UH (8/32-axis specification)
		Data register (D)	D0 to D1023	D0 to D8191•
		Link register (W)	W0 to W3FF	W0 to W1FFF
		*: The following device r A273UH 8-axis s A273UH 32-axis	numbers are used by the pecification : D800 to specification : D0 to D7	e servo system CPU: D1023 '99
	5)	If a device No. outside t NUMBER OUT OF RAN If this occurs, re-designa range.	he prescribed range is c GE" error message will ate the device No. settin	lesignated, an "DEVICE be displayed. Ig within the prescribed
Page switching	1)	Use the [PAGE UP]/[PA Press the [PAGE UP] ke Press the [PAGE DOWN When the program list re will be displayed.	GE DOWN] keys to swit by to display the previou I] key to display the nex eadout is completed, a "	ch display pages. s 18 programs. t 18 programs. COMPLETED" message
Changing the device name & No. setting	1)	To change the device na clear the old name and i	ame and device No., pre No., then enter the new	ess the [DELETE] key to name and No.

9.4 Servo Program SORT

In order to conserve space, servo programs stored in the internal memory are moved up to fill vacant areas.

[Procedure For Displaying The Program SORT? YES/NO Selection Dialog Box]



[Program SORT? YES/NO Dialog Box]



[Display/Setting Contents]

Program SORT YES/NO selection area

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A YES/NO selection is made here to determine if the program SORT function is to be executed.

[Key Operations] Program Sort EXECUTE	 To execute the program SORT function, press the [←] key to highlight the "YES" item, the press the [Enter] key. (The default setting is "NO".) When program sorting is completed, the system will return to the Servo Programming screen, and "COMPLETED" will be displayed.
	"Number of programs" and "number of steps" values which have been updated by the program SORT function will be displayed again.
Program Sort CANCEL	 To cancel the program SORT function, press the [Enter] key with the "NO" item highlighted. (If YES is highlighted, press the [→] key to highlight NO, then press the [Enter] key.) The system will then return to the Auxiliary Function Selection window

without executing the program SORT function.

Servo Program COPY 9.5

Servo programs within the designated program No. range are copied.

[Procedure For Displaying The Program Copy Setting Window]



[Display/Setting Contents]

Copy source The designated copy source FIRST program No. is displayed here. FIRST program No. setting area

Copy source LAST program No. setting area	The designated copy source LAST program No. is displayed here.
Copy destination FIRST program No. setting area	The designated copy destination FIRST program No. is displayed here.
[Key Operations] Designating the copy source FIRST program No.	 Use the numeric keys to key-in the desired copy source FIRST program No., then press the [Enter] key. The cursor will then move to the Copy Source LAST Program No. setting area.
Designating the copy source LAST program No.	 Use the numeric keys to key-in the desired copy source LAST program No., then press the [Enter] key. The cursor will then move to the Copy Destination FIRST Program No. setting area.

Copy source program No. setting condition:

[Copy source FIRST program No.] ≤ [Copy source LAST program No.]

9. SERVO PROGRAM CREATION/MODIFICATION

Designating the copy 1) destination FIRST program No.	Use the numeric keys to key in the desired copy destination program No., then press the [Enter] key. A dialog box containing the message "PROGRAM COPY? YES/NO" will then be displayed.
	 Copy destination program No. setting conditions: [Copy source FIRST program No.], or [Copy source LAST program No.] [Copy destination FIRST program No.] [Copy destination FIRST program No.] + [Copy source LAST program No Copy source FIRST program No.] < 4096

 [Copy source FIRST program No.] ≠ [Copy destination FIRST program No.]

Copy EXECUTE 1) To execute the COPY function, press the [Enter] key with the "YES" item highlighted. (If NO is highlighted, press the [←] key to highlight YES, then press the [Enter] key.)

2) When copying is completed, the system will return to the Servo Programming screen, and "COMPLETED" will be displayed.

Copy CANCEL1) To cancel the COPY function, press the [→] key to highlight the NO item,
then press the [Enter] key.
The cursor will then return to the Copy Source FIRST Program No. Setting
area without the COPY function being executed.

When a program exists at the COPY destination

[OVERWRITE? YES/NO Dialog Box]



[Display/Setting Contents]

Program No. display area	If a servo program exists at the copy destination, 10 copy destination FIRST program Nos. will be checked in ascending order, and the relevant program Nos. will be displayed.
Program overwrite copy YES/NO selection area	The Overwrite YES/NO dialog box is displayed here. This setting determines whether or not overwriting occurs.
[Key Operations] Overwrite Copy EXECUTE	 To execute program overwriting, press the [←] key to highlight the YES item, then press the [Enter] key. (The default setting is "NO".) The "PROGRAM COPY? YES/NO" dialog box will then be displayed. Select YES to execute overwrite copying, or NO if overwriting is not desired.
Overwrite Copy CANCEL	 If overwrite copying is not desired, press the [Enter] key while the NO item is highlighted. The cursor will then return to the Copy Source FIRST Program No. Setting area without copying being executed.

9.6 Batch Change of Servo Program Axis No.

An axis No. batch change can be executed at servo programs within a designated program No. range.

[Procedure For Displaying The Axis No. Batch Change Setting Window]



[Axis No. Batch Change Setting Window]



[Display/Setting Contents]

FIRST program No. setting area	Either the default value or the designated FIRST program No. is displayed here.
LAST program No. setting area	Either the default value or the designated LAST program No. is displayed here.
Pre-change axis No. setting area	The pre-change axis No. is displayed here.
Post-change axis No. setting area	The post-change axis No. is displayed here.
[Key Operations] Designating the program range	 Using the numeric keys, key-in the FIRST and LAST servo program Nos. to designate the range where an axis No. batch change is desired, then press the [Enter] key. The cursor will then move to the pre-change axis No. setting area.
	Program No. setting condition: • [FIRST program No.] ≤ [LAST program No.]
Designating the pre-change axis No.	 Using the numeric keys, key-in the pre-change axis No., then press the [Enter] key. The cursor will then move to the post-change axis No. setting area.

9. SERVO PROGRAM CREATION/MODIFICATION

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Designating the post-change axis No.	1)	Using the numeric keys, key-in the post-change axis No., then press the [Enter] key. A dialog box containing the message "BATCH CHANGE? YES/NO" will then be displayed.
		Axis No. setting condition: ● [Pre-change axis No.] ≠ [Post-change axis No.]
Batch Change EXECUTE	1)	To execute the batch change, press the [Enter] key while the YES item is highlighted. (If "NO" is highlighted, press the [\leftarrow] key to move the highlight to the "YES" item, then press the [Enter] key.)
	2)	When the axis No. batch change is completed, the system will return to the Servo Programming screen, and "COMPLETED" will be displayed.
Batch Change CANCEL	1)	To cancel the batch change function, press the $[\rightarrow]$ key to highlight the "NO" item, then press the [Enter] key. The cursor will then return to the servo program FIRST program No. setting area without the batch change function being executed.

9.7 Servo Program ALL-CLEAR

All servo programs stored in the internal memory are cleared.

[Procedure For Displaying The Program All-Clear? YES/NO Selection Dialog Box]



[Program All-Clear? YES/NO Dialog Box]



[Display/Setting Contents]

Program all-clearThe all-clear YES/NO dialog box is displayed here.YES/NO selectionThis setting determines whether or not the all-clear function is executed.area

[Key Operations] All-Clear EXECUTE

- To execute the all-clear function, press the [←] key to highlight the "YES" item, then press the [Enter] key. (The default setting is "NO".)
- 2) When the program all-clear function is completed, system will return to the Servo Programming screen, and "COMPLETED" will be displayed.

All-Clear CANCEL

 To cancel the all-clear function, press the [Enter] key while the "NO" item is highlighted. (If "YES" is highlighted, press the [→] to move the highlight to the "NO" position, then press the [Enter] key.) The system will then return to the Auxiliary Function Selection window without the all-clear function being executed.

9. SERVO PROGRAM CREATION/MODIFICATION

9.8 Writing Servo Programs To The User File

Servo programs are written to the user file.

[Procedure For Displaying The File WRITE Setting Window]



[File WRITE Setting Window]



[Display/Setting Contents]

Drive name setting The currently designated drive name is displayed. **area**

System name The currently designated system name is displayed.

setting area

System name The currently designated system name comment is displayed. comment setting area

Sub-system name The currently designated sub-system name is displayed.

setting area

Sub-system name The currently designated sub-system name comment is displayed. **comment setting area**

Comment (GPP)	The currently designated comment (GPP) is displayed.
setting area	

[Key Operations]	 Designate (or change) the system name comment.
System name	If the displayed comment is to be used as is, press the [Enter] key.
comment setting	The cursor will then move to the sub-system name comment setting area.
Sub-system name	1) Designate (or change) the sub-system name comment.

comment setting If no setting or change is required, simply press the [Enter] key. The cursor will then move to the sub-system name comment setting area and will begin to flash.

2) If the [1] key is pressed before pressing the [Enter] key, the cursor will return to the system name comment setting area.

9. SERVO PROGRAM CREATION/MODIFICATION

Comment (GPP) setting	1) Desig If no A File 2) If the return	Designate (or change) the sub-system name comment (GPP). If no setting or change is required, simply press the [Enter] key. A File WRITE confirmation dialog box will then be displayed. If the [1] key is pressed before pressing the [Enter] key, the cursor return to the sub-system name comment setting area.	
YES/NO (EXECUTE/CANCEL) Selection	1) YES NO	:The file WRITE function will be executed. :The file WRITE function will not be executed.	

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9.9 Automatic Writing of Servo Programs To The Servo System CPU

By connecting the servo system CPU to a personal computer, the created/ modified servo programs can be written directly to the servo system CPU.

[Procedure For Displaying The PC Automatic WRITE Setting Window]



[PC WRITE Setting Window]



[Display/Setting Contents]

Automatic WRITE Either the default value or the previously designated setting value is displayed setting area here. When the automatic WRITE function is on, "Y" is displayed; when off, "N" is displayed. [Key Operations] Automatic WRITE 1) To turn the PC automatic writing function ON, press the [Y] key, then press "ON" (Y) setting the [Enter] or [END] key. (The default setting is "N".) After the PC automatic write function is turned ON, the system will return to the Servo Programming screen where "A" will be displayed after the mode name. When the PC automatic write function is ON, created/modified servo programs will automatically be written to the servo system CPU when the [F10] key is pressed (following a program check). **Automatic WRITE** 1) The PC automatic writing function will be turned OFF by any of the "OFF" (N) setting conditions shown below. To continue the automatic writing function, it must be turned ON again. When "N" is designated at the PC Write Setting window. • When the personal computer power is switched OFF, or a reset is executed.

- When a COPY, BATCH CHANGE, or ALL-CLEAR function is executed from the Servo Program Auxiliary Function Selection window.
- When an error occurs during automatic writing.
- When the operation mode is changed to any mode other than SERVO PROGRAMMING.

IMPORTANT

Never turn the programmable controller READY signal ON while automatic writing is in progress. If the READY signal is turned ON at this time, the contents of the program memory may be lost.

POINT

Before executing the automatic writing operation, it is advisable to establish the SERVO PC mode in order to verify that the content of the servo system CPU memory matches that of the personal computer's internal memory.

9. SERVO PROGRAM CREATION/MODIFICATION

9.10 Program Check

After servo program creation/modification, a batch check of all servo programs is executed.

[Batch Check Procedure]



[Error Program & List Display Window]



[Display/Setting Contents]

Error display area

When an error is detected by the program check function, an error message is displayed here.

[Key Operations] Next page display

- 1) Press the [PAGE DOWN] key to display the next page.
- Window CLOSE
- 1) Press the [ESC] key to close the window and return to the Servo Programming screen.

POINT

If an error is found at a displayed servo program, that error will be displayed, and other programs will not be checked. The program check function should be executed again after correcting the displayed program error.

9. SERVO PROGRAM CREATION/MODIFICATION

[Program Check Content]

Error Item	Error Cause		
Instruction code error	• An improper instruction code which cannot be read was designated.		
Program No. outside applicable range	 At the simultaneous start instruction, the designated program No. is outside the 0 to 4095 range. 		
Program doesn't exist	 At the simultaneous start instruction, the designated program (K0 to K4095) has not yet been created. 		
	• The "previous No." [F7] key was pressed when program No.0 was displayed.		
	◆ The "next No." [F8] key was pressed when program No.4095 was displayed.		
START instruction designated	 At the simultaneous start instruction, the designated program (K0 to K4095) is a start instruction. 		
Duplicated START axes	 There is duplication among the axes to be started in the programs (K0 to K4095) designated in the simultaneous START instruction. 		
	 Duplication of interpolation control START axes. 		
Incorrect end-point instruction position	 At the speed change instruction (VSTART), the end-point instruction (ABS-1 to ABS-4, INC-1 to INC-3) is at an incorrect position. (Should be positioned just after VSTART.) 		
No end-point instruction	◆At the speed change instruction (VSTART), there is no end-point instruction.		
Multiple end-point instructions	◆At the speed change instruction (VSTART), there is more than one end-point nstruction.		
Incorrect FOR-NEXT instruction	◆ At the constant speed / speed change instruction, the repeat instruction (FOR-ON, FOR- OFF, FOR-TIMES, NEXT) is used incorrectly. (Nesting status exists. Either FOR-□ or NEXT must be designated.)		
Axis No. outside	The designated axis No. is outside the applicable range.		
applicable range	• The same axis No. has been designated at multiple locations.		
Interpolation control units mismatch	At the interpolation control instruction, the system-of-units for the interpolation axis is ifferent from the control unit specified in the designated parameter block.		
No END command	◆ At the speed change instruction (VSTART), there is no END instruction (VEND).		
	◆At the constant speed instruction (CPSTART), there is no END instruction (CPEND).		
Incorrect setting data	◆ The designated setting is outside the applicable range.		
Stroke limit range violation	 At the "absolute method" instruction (ABS**) or fixed-pitch feed instruction (FEED-**), the positioning address (end-point address for circular interpolation) is outside the stroke limit range specified in the fixed parameters. 		
Speed control value over	The speed setting value exceeds the speed limit value specified in the relevant parameter block.		
Incorrect indirect device setting	 The indirect setting value is outside the applicable range for the designated device. The setting ranges are as shown below. For A171SCPU D0 to D1023, W0 to W3FF For A273UHCPU (8/32 axis specs) D0 to D8191, W0 to W1FFF 		
	● The following device settings are used for 2-word data items: For A171SCPU D1023, W3FF For A273UHCPU (8/32 axis specs) D8191, W1FFF		
	At the speed/position instruction (VPF, VPR), the travel value is other than that at the indirect device travel value change register.		

\triangle CAUTION

M When an error occurs, check the error items described above before resetting it. Failure to do so could disable the CPU PROTECT function.

9.11 Batch Copy of SVST Instruction

Automatically copies the axis numbers used in the motion program to the axis designation area of the SVST instruction entered with the GPP function in the sequence program.

[Procedure For Displaying The Screen Where Batch Copy of The SVST Instruction Is Possible]



[Servo Programming Screen]



[Key Operations] Executing the

batch copy

- 1) At the Programming screen, press the [F5] (SVST AXIS) key.
- 2) If there is no motion program or sequence program, an error message will be displayed.

If there is no motion program, a "PROGRAM NOT FOUND" message is displayed.

If there is no sequence program, a "PC PROGRAM NOT FOUND" message is displayed.

3) A message indicates that the batch copy to the SVST instruction has been successfully completed.

[Cautions]

- 1) This function does not work if the program number is indirectly designated in the SVST instruction.
- Interlocks applied to the axes that correspond to the SVST instruction axis numbers in the SFC program transition conditions are not copied by the batch copy function.
- If the simultaneous start instruction is used in the motion program, only the first axis number declared in the simultaneously started programs is copied.

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The GSV13PE incorporates both GPP functions and SFC functions. See the SW0IX-GPPAE Operating Manual (IB-66314) on the GPP functions.

See the following manual for information on the SFC functions:

SW0IX-SAP2E(MELSAP-II) Operating Manual IB-66313

However, the GSV13PE GPP functions and SFC functions differ somewhat from those of the SW0IX-GPPAE GPP function software package and the SW0IX-SAP2E software package.

These differences are described below.

Information on system configuration and GSV13PE registration is not presented in the manuals listed above. Refer to Sections 2 and 4 of this manual for details.

10.1 GPP Functions

10.1.1 Additional servo function to SW0IX-GPPAE

The servo instructions listed below can be edited and monitored in the GPP programming mode or printed in the GPP printer mode.

• DSFRP instruction..... start request instruction for 1- to 3-axis servo programs *1

- DSFLP instruction present value change, speed change instructions
- SVST instruction...... start request instruction for 1- to 4-axis servo programs *1
- CHGA instruction present value change instruction
- CHGV instruction speed value change instruction

These instructions can be used with both the ladder and list programming languages.

The example below shows the procedure for writing an SVST instruction in a ladder program.

*1 This becomes the GPP wordshift instruction when using an A273UH (32-axis specification).

[Procedure to Display Ladder Program Editing Screen]



[Ladder Program Editing Screen]



[Kay Operations]	
[Key Operations] Writing an SVST instruction	 Input the SVST instruction execution command (condition part) and press the [Enter] key. Input the instruction part and press the [Enter] key. Follow the procedure below to input the instruction part. [F8] (-[]-) → [S] → [V] → [S] → [T] → [SP] → [J + start axis No.] → [SP] → [servo program No.] Replace the 'start axis number' in the procedure above by the numbers of all axes to be started. A maximum of eight axes can be input. Alternatively, the axis designation area may be left blank. The servo program number can be set using either direct designation or indirect designation. After pressing the [Enter] key to write the instruction part, the ladder block is displayed as shown in the example below. (Setting Example) Axis 1, Axis 2, and Axis 4 started by servo program No. 10 (Servo program number set by direct designation)
	K 1
Writing a CHGA instruction (present value change)	 1) Input the CHGA instruction execution command (condition part) and press the [Enter] key. 2) Input the instruction part and press the [Enter] key. Follow the procedure below to input the instruction part. [F8] (-f →) → [C] → [H] → [G] → [A] → [SP] → [J + present value change axis No.] → [SP] → [changed value] The 'changed value' can be set using either direct designation or indirect designation. After pressing the [Enter] key to write the instruction part, the ladder block is displayed as shown in the example below. (Setting Example) Axis 4 changed to a present value of 100. (Servo program number set by direct designation) Imput the instruction part is applied to only one axis
Writing a CHGV instruction (speed change)	number per instruction. 1) Input the CHGV instruction execution command (condition part) and press the [Enter] key. 2) Input the instruction part and press the [Enter] key. Follow the procedure below to input the instruction part. [F8] (-[]-) → [C] → [H] → [G] → [V] → [SP] → [J +speed change axis No.] → [SP] → [changed speed] The changed speed can be set using either direct designation or indirect designation. After pressing the [Enter] key to write the instruction part, the ladder block is displayed as shown in the example below. (Setting Example) Axis 4 changed to a speed of 10. (Servo program number set by direct designation)
	instruction. $10-2$

Conversion

 Press the [Shift]+[F4] keys to convert a ladder program after it is written. After conversion is successfully completed, a message indicates "that the step number has changed".

[Ladder Program Editing Screen]

[Servo Programming Screen]



Selecting the servo programming function

- During editing of a ladder program, the servo programming function allows one-touch selection for viewing or editing the servo program started by the servo instruction. This function is not available for editing list programs. Move the cursor to the position of the ladder block where the start instruction for the servo program to be viewed or edited was created.
- 2) Hold down the [Ctrl] key and press the [F11] key. The servo programming function is selected. If the servo program to be started was directly designated in the servo instruction, the designated servo program is displayed. However, if the servo program to be started was indirectly designated in the servo instruction, servo program No. 0 is displayed. The servo program can now be viewed or edited.
- 3) To switch back from the servo programming function to ladder program editing, hold down the [Ctrl] key and press the [F11] key. The system returns to the ladder program editing screen, displaying the same ladder program which was displayed before the servo programming function was selected.

10.1.2 Axis No. batch copy to SVST instruction

Automatically copies the axis numbers used in the motion program to the axis designation area of all SVST instructions in the sequence program.

[Procedure to Display Ladder Program Editing Screen]



[Ladder Program Editing Screen]



[Display/Setting Contents]

Running batch copy

- 1) Press the [Shift]+[F7] (SVST axis) keys from the ladder program editing screen.
- 2) If no motion program or sequence program exists, the error message "PROGRAM NOT FOUND" is displayed.
- 3) A message indicates that the batch copy to the SVST instruction has been "successfully completed".

[Cautions]

- 1) This function does not work if the program number is indirectly designated in the SVST instruction.
- 2) Interlocks applied to the SVST instruction axis numbers in the SFC program transition conditions are not copied by the batch copy function.
- 3) If the simultaneous start instruction is used in the motion program, only the first axis number declared in the simultaneously started programs is copied.
- 4) Copying to a sub-program is not possible during editing of the main program.
- 5) This function can be executed only in the readout function. Execution is not possible in other functions such as write and insert.

10.2 SFC Functions

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Servo program start conditions can be set in the SFC program to control the system.

10.2.1 Table of differences with SW0IX-SAP2E

The differences between the GSV13PE SFC functions and the SFC functions in the SW0IX-SAP2E software package are listed in the table below. The GSV13PE offers the following additional functions.

Modes with Added Functions	Additional Function	Description	
	Servo-dedicated SFC diagram symbol editing function	Permits editing of the servo program start symbol	
	Servo instructions to create transition condition and operation output programs.	Permits editing of sequence programs using the DSFRP*, DSFLP*, and SVST instructions.	
SFC program editing function	Transition condition automatic insertion and de- letion functions.	Automatic insertion and deletion of interlock con- ditions during editing of DSFRP*, DSFLP*, and SVST instructions.	
	Switching to servo programming function.	Permits switching to/from servo programming functions during editing of operation output and transition condition ladder blocks.	
SFC monitor function	Monitor function for servo instructions set in tran- sition condition and operation output programs	Permits monitoring of DSFRP*, DSFLP*, and SVST instructions.	
	Servo program display during SFC diagram moni- toring	Permits viewing of the running servo program during SFC diagram monitoring.	
SFC printing function	Servo-dedicated SFC diagram symbol printing function	Permits printing of the servo program start symbol SV.	
	Printing function for servo instructions to create transition condition and operation output pro- grams.	Permits printing of the DSFRP*, DSFLP*, and SVST instructions.	

*This becomes the GPP wordshift instruction when using an A273UH (32-axis specification).

10.2.2 Servo-dedicated SFC diagram symbol

The SFC diagram symbols shown in the table below can be used as step symbols.

(1) Servo-dedicated symbols

Class	Name	Symbol	Quantity	Allocated Function Key	Application
Step	Servo program start step	SV	Max. 254 (i=1 to 254) per block including other steps	F9	Inserts into a sequence program the servo program start SVS T instruction.

(2) Creating a sequence program to start a servo program using SFC programming

The diagram below shows the procedure from the SFC program editing screen to create a sequence program which starts a servo program.

[Procedure to Write a Servo Program Start Step]



[SFC Program Editing Screen]



[Display/Setting Contents]

Make sure that the SFC program in which the servo program start step is to be written is displayed on the SFC program editing screen.

Alternatively, create a new SFC program.

[Key Operations] Writing servo 1) When writing the servo program start step, check that the write function is program start step selected. If it isn't, press the [F1] key to select the write function. 2) Move the cursor to the position where the servo program start step is to be written. 3) Press the [F9] key. The servo program start symbol " [SV] " is displayed on the screen with the step number to the right. This symbol indicates that the sequence program to start the servo program is not yet created. 1) Press the [F4] key to convert the step after it is written. Conversion After conversion is successfully completed, the block conversion setting window is displayed.

[Servo Program Select Window]



[Display/Setting Contents]

Servo program Sets the servo program number to be started by the designated servo program start step.

Axis number setting Set the axis number to be started by the designated servo program start step. area

Creating the sequence program to start the servo program

- (Servo program number 2 and axis number settings.)
- When creating a sequence program to start a servo program with a written servo program start step, check that the display function is selected. If the write function is selected, press the [F2] key to switch to the display function.
- Move the cursor to the position of the servo program start symbol
 "[SV]" for which the servo program number and axis number are to be
 designated.
 - 3) Press the [F8] key to display the servo program select window. Move the cursor to the servo program number setting area.
 - 4) Input the number of the servo program to start, and press the [Enter] key. The servo program number setting range is between 0 and 4095, and indirect designation can be used.

Move the cursor to the axis number setting area.

- 5) Input the numbers of the axes to be started. (Eight axes maximum can be designated, in the range between 1 and 32.)
 - (Setting Example)

Enter the following in the axis number setting area to start Axis 1, Axis 2, and Axis 4.

Axis No.

[J1J2J4]

Ending settings

 Press the [End] key to write the set servo program number and axis number data and close the servo program select window. The servo instruction is automatically created from the set servo program number and axis number data, and the system returns to the SFC program editing screen.

(Servo Instruction Example)

If servo program number 1 and Axis 1, Axis 2, and Axis 4 are set, the following sequence program is created.



The designated " [SV] " display changes to " SV ".

- 2) Press the [F8] key to check the set data.
- The automatically created sequence program is displayed on the screen.3) The "Incorrect set data" message is displayed if the servo program number was set outside the setting range. Correct the set data.

Quitting settings

Modifying the sequence program to start the servo program

- Press the [Esc] key to close the servo program select window without writing the set servo program number and axis number data. The system returns to the SFC program editing screen but no sequence program to start the servo program is created.
- 1) When modifying a sequence program to start a servo program, check that the display function is selected from the SFC program editing screen.
 If the write function is selected, press the [F2] key to switch to the display function.
 - 2) Move the cursor to the servo program start step to be modified and press the [F8] key.

The sequence program editing screen is displayed.

- 3) Press the [F1] key to select the write function. Modify the start axis number and servo program and press the [Enter] key. Follow the input procedure below.
 - $[F8] (-[]] \rightarrow [S] \rightarrow [V] \rightarrow [S] \rightarrow [T] \rightarrow [SP]$
 - \rightarrow [J + start axis No.] \rightarrow [SP] \rightarrow [servo program No.]
- 4) Hold down the [Shift] key and press the [F4] key to run the conversion. After conversion is successfully completed, a message indicates that the step number has changed.
- 5) After modification is complete, press the F4 key to return to the SFC program editing screen.



Selecting the servo programming function 1) The servo programming function allows one-touch selection for viewing or editing the servo program started by the servo instruction.

Before selecting the servo program function, check that the display function is selected.

If another function is selected, press the [F2] key to switch to the display function.

- Move the cursor to the position of the servo program start step symbol where the start instruction was created for the servo program to be viewed or edited.
- Hold down the [Ctrl] key and press the [F11] key. The servo programming function is selected. The servo program designated in the start instruction is displayed. The servo program can now be viewed or edited.
- 4) To switch back from the servo programming function to SFC program editing, hold down the [Ctrl] key and press the [F11] key. The system returns to the same SFC program editing screen that was displayed before the servo programming function was selected.

10.2.3 Servo instructions to create transition condition and operation output programs

The editing of the following servo instructions is possible at each step of the created SFC program, when creating a transition condition and operation output program.

- DSFRP instruction* ... start request instruction for 1- to 3-axis servo programs
- DSFLP instruction*.... present value change, speed change instructions
- SVST instruction...... start request instruction for 1- to 4-axis servo programs
- CHGA instruction present value change instruction
- CHGV instruction...... speed value change instruction

The example below shows the procedure for writing an SVST instruction in a ladder program.

*This becomes the GPP wordshift instruction when using an A273UH (32-axis specification).

[Procedure to Select the Ladder Program]



*The ladder program is selected in the default programming language if this operation is omitted.

[Sequence Program Editing Screen]



[Display/Setting Contents]

Make sure that the SFC program in which the servo instruction is to be written is displayed on the SFC program editing screen.

Alternatively, create a new SFC program.

[Key Operations] Designating step to write a servo instruction

- 1) When writing the servo program start step, check that the display function is selected.
- If it isn't, press the [F2] key to select the display function.
- 2) Move the cursor to the position where the servo instruction is to be written.
- 3) Press the [F8] key to display the sequence program editing screen.

Writing the servo instruction

1) Input the SVST instruction execution commands (condition part) and press the [Enter] key.

2) Input the instruction part and press the [Enter] key. Follow the procedure below to input the instruction part

Follow the	procedure below to input the instruction i	bart.

	[F8] $(\neg f \rightarrow) \rightarrow [S] \rightarrow [V] \rightarrow [S] \rightarrow [T] \rightarrow [SP] \rightarrow [J + start axis No.] \rightarrow [SP] \rightarrow [Servo program No.]$ Input the numbers of all axes to be started. A maximum of eight axes can be input. Alternatively, the axis designation area may be left blank. The servo program number can be set using either direct designation or indirect designation. After pressing the [Enter] key to write the instruction part, the program section is displayed as shown in the example below. (Setting Example) Axis 1, Axis 2, Axis 3, and Axis 4 started by servo program No. 10 (Servo program number set by direct designation)
	K - }
Writing a CHGA instruction (present value change)	 Input the CHGA instruction execution command (condition part) and press the [Enter] key. Input the instruction part and press the [Enter] key. Follow the procedure below to input the instruction part. [F8] (-[]-) → [C] → [H] → [G] → [A] → [SP] → [J + present value change axis No.]→ [SP] → [changed value] The 'changed value' can be set using either direct designation or indirect designation. After pressing the [Enter] key to write the instruction part, the ladder block is displayed as shown in the example below. (Setting Example) Axis 4 changed to a present value of 100. (Servo program number set by direct designation)
	Note: The present value change can be applied to only one axis number per instruction.
Writing a CHGV instruction (speed change)	 1) Input the CHGV instruction execution command (condition part) and press the [Enter] key. 2) Input the instruction part and press the [Enter] key. Follow the procedure below to input the instruction part. [F8] (-[)-) → [C] → [H] → [G] → [V] → [SP] → [J +speed change axis No.] → [SP] → [changed speed] The changed speed can be set using either direct designation or indirect designation. After pressing the [Enter] key to write the instruction part, the ladder block is displayed as shown in the example below. (Setting Example) Axis 4 changed to a speed of 10. (Servo program number set by direct designation) ↓ - xr
	Note: The speed change can be applied to only one axis number per instruction.

Conversion

1) Press the [Shift]+[F4] keys to convert a ladder program after it is written. After conversion is successfully completed, a message indicates that the step number has changed.

Ending sequence program creation

1) After sequence program creation is complete for the designated step, press the [F4] key to return to the SFC program editing screen.



Selecting the servo programming function During editing of a ladder program, the servo programming function allows one-touch selection for viewing or editing the servo program started by the servo instruction. This function is not available for editing list programs. Move the cursor to the position of the ladder block where the start instruction for the servo program to be viewed or edited was created.

- 2) Hold down the [Ctrl] key and press the [F11] key. The servo programming function is selected. If the servo program to be started was directly designated in the servo instruction, the designated servo program is displayed. However, if the servo program to be started was indirectly designated in the servo instruction, servo program No. 0 is displayed. The servo program can now be viewed or edited.
- 3) To switch back from the servo programming function to SFC program editing, hold down the [Ctrl] key and press the [F11] key. The system returns to the sequence program editing screen, displaying the same SFC program which was displayed before the servo programming function was selected.

10.2.4 Transition condition automatic insertion and deletion functions

When conversion is carried out after the servo instructions listed below are edited to create a transition condition and operation output program, interlock signals are automatically inserted or deleted at the transition conditions above and below each step of the created SFC program.

Comio	Incerted/Deleted	Device		
Instruction	Interlock Signal	A171SCPU/A273UHCPU (8-Axis Specification)	A273UHCPU (32-Axis Specification)	
DSFRP*/CHGA	Start accent bits	M2001	M2001	
SVST	for axes used	to M2008	to M2032	
DSFLP*/CHGV	Speed change flags	M2021 to M2028	M2061 to M2092	

*: Used only as a normal sequence instruction flag for the A273UH (32-axis specification). No automatic insertion or deletion of interlock signals.

(1) Automatic insertion of transition conditions

(a) During editing of DSFRP*/CHGA/SVST instructions

(DSFRP* for A171SCPU/A273UHCPU (8-axis specification) only.) 1) Serial transition

The [____] region is automatically inserted into the transition condition ladder blocks above and below the servo instruction creation step.

(Example)

If Axis 1, Axis 2, and Axis 3 are used at Step 1, interlock signals are automatically inserted in transition conditions 1 and 2.



2) Selective branching

The [____] region is automatically inserted into all the transition condition ladder blocks connected above and below the servo instruction creation step.

(Example)

If Axis 1, Axis 2, and Axis 3 are used at Step 1, interlock signals are automatically inserted in transition conditions 1, 2, and 3.



POINT

- (1) After the addition or insertion of a step, the interlocks may not be automatically inserted into or deleted from the transition conditions correctly during conversion. Always use zoom display at the transition conditions to check the interlocks after the addition or insertion of a step.
 - 3) Parallel coupling
 - a) If a servo instruction is created in one of the queued steps in a parallel coupling.

(Example)

If Axis 1, Axis 2, and Axis 3 are used at Step 4, interlock signals are automatically inserted in transition conditions 2 and 4.





b) If servo instructions are created in multiple queued steps in a parallel coupling.



If Axis 1, Axis 2, and Axis 3 are used at Step 4, and Axis 2, Axis 3, and Axis 4 are used at Step 5, interlock signals are automatically inserted in transition conditions 2, 3 and 4.



Interlock signal is automatically inserted before the dummy coil for each of the axes used at Step 4 or Step 5. Interlocks are not duplicated for duplicated axes.

Servo instruction creation step

4) In continuous servo instruction creation steps with duplicated axes used at each step and duplicated interlock signals, the duplicated interlock signals are automatically replaced by one interlock signal.

(Example)

If Axis 1 and Axis 2 are used at Step 1, and Axis 2 and Axis 3 are used at Step 2, the interlock signals shown below are automatically inserted in transition conditions 1, 2, and 3.



If Axis 1, Axis 2, and Axis 3 are used at Step 1, interlock signals are automatically inserted in transition conditions 1, 2, and 3.



- 3) Parallel coupling
 - a) If the servo instruction is created in one of the queued steps in a parallel coupling.
 - (Example)

If Axis 1, Axis 2, and Axis 3 are used at Step 4, interlock signals are automatically inserted in transition conditions 2 and 4.



Interlock signal is automatically inserted before the dummy coil for each of the axes started by the servo instruction.

- b) If a servo instruction is created in multiple queued steps in a parallel coupling.
- (Example)

If Axis 1, Axis 2, and Axis 3 are used at Step 4, and Axis 2, Axis 3, and Axis 4 are used at Step 5, interlock signals are automatically inserted in transition conditions 2, 3 and 4.



Interlock signal is automatically inserted before the dummy coil for each of the axes used at Step 4 or Step 5. Interlocks are not duplicated for duplicated axes.

4) In continuous servo instruction creation steps with duplicated axes used at each step and duplicated interlock signals, the duplicated interlock signals are automatically replaced by one interlock signal.

(Example)

If Axis 1 and Axis 2 are used at Step 1, and Axis 2 and Axis 3 are used at Step 2, the interlock signals shown below are automatically inserted in transition conditions 1, 2, and 3.



- (2) Automatic deletion of transition conditions When a step containing a servo instruction is deleted, the interlock signals automatically inserted into the transition conditions at previous or subsequent steps are automatically deleted.
 - (Example)

If Step 1 is deleted, the [____] regions that were automatically inserted into the transition condition 1 and 2 ladder blocks are automatically deleted.



10.2.5 Axis No. batch copy to SVST instruction

Automatically copies the axis numbers used in the motion program to the axis designation area of all SVST instructions in the sequence program.

[Procedure to Display the Operation Output Ladder Monitor Screen for Servo Program Start Steps]



[Transition Condition, Operation Output Ladder Monitor Screen]



[Key Operations] Running batch

сору

- 1) Press the [Shift]+[F7] (SVST axis) keys from the programming screen.
- 2) If no motion program or sequence program exists, the error message "PROGRAM NOT FOUND" is displayed.
- 3) A message indicates that the batch copy to the SVST instruction has been successfully completed.

[Cautions]

- 1) This function does not work if the program number is indirectly designated in the SVST instruction.
- 2) Interlocks applied to the SVST instruction axis numbers in the SFC program transition conditions are not copied by the batch copy function.
- 3) If the simultaneous start instruction is used in the motion program, only the first axis number declared in the simultaneously started programs is copied.
- 4) Copying to a sub-program is not possible during editing of the main program.
- 5) This function can be executed only in the readout function. Execution is not possible in other functions such as write and insert.

10.2.6 Reading an SFC program file created with SW1SRX-GSV13PE

An SFC program file created with a SW1SRX-GSV13PE cannot be directly read with SW2SRX-GSV13PE.

The procedure for reading an SFC program file created with SW1SRX-GSV13PE is shown below.

[Procedure to Display the Read Screen]



[Read Screen]

16	SYSTEN (C)(AN SUD-SYSTEM (XY	ç]	PRES \$	(Enter), WHEN DISPLAY DIRECTORY
	10 - 6 ¥0 TEH+	(CONINI, IA)	5468	IV/C_2ELECT I IV/C_2ELECT IV/C IV/C_2ELECT IV/C
	Page Hp 1 sp 3			Freizhe e felzh e f
1 45-410	<u>witti</u> - 000000 640	660 <u>0</u>	68 68 1 0	J 40.19, 9.8 SHE F F OH SHOULD

[Key Operations]

- 1) Press the $[\uparrow]/[\downarrow]$ keys to move the cursor to "Microcomputer".
- 2) Press the [F6] key to display the "microcomputer" select window.
- Press the [↑]/[↓] keys to move the cursor to "Main program/Sub-program", and press the [F6] (Select) key.
 - The " " on the screen changes to " # ".
- 4) Press the [Enter] key to execute the read operation.
- 5) A message indicates that the read operation has been successfully completed.

REMARK

See the SW0IX-GPPAE Operating Manual for details about the file maintenance functions available from the menu.

10.2.7 Differences between SFC monitor functions

The points of difference between the monitor functions and those of the SW0IX-SAP2E are as follows:

- Monitoring of servo program start steps created in an SFC program;
- Monitoring of servo instructions created during creation of a transition condition and operation output program;
- Servo program display during transition condition and operation output monitoring.
- Monitoring of servo program start steps Selecting the SFC diagram monitor function allows the servo program start steps created in an SFC program to be monitored. When a servo program start step is active it is displayed highlighted in the same way as other steps, and the servo program start step operation output ladder monitor can be run.

[Procedure to Display the Operation Output Ladder Monitor Screen for Servo Program Start Steps]



[Transition Condition, Output Ladder Monitor Screen]



[Display/Setting Contents]

Displaying active step	The servo program start step presently monitored by the ladder monitor function is displayed as ON I when active and OFF I when inactive.
Active device display	The device presently monitored by the ladder monitor function is displayed as ON(-Ⅰ ►) when active and OFF (-[-]) when inactive.
SFC monitor area	Displays the SFC diagram.
Ladder monitor area	Runs the ladder monitor for the designated transition condition and operation output.
[Key Operations] Start monitoring	1) Press the [F3] key to start the ladder monitor.
End monitoring	 Press the [F4] key to end the ladder monitor and return to the SFC diagram screen.
programming

function



Selecting the servo 1) During SVST instruction monitoring, the servo programming function can be selected for viewing or editing of the designated servo program. However, monitoring of the servo program is not possible. Hold down the [Ctrl] key and press the [F11] key to view the servo program. If the servo program to be started was directly designated in the SVST instruction, the designated servo program is displayed. However, if the servo program to be started was indirectly designated in the SVST instruction, servo program No. 0 is displayed. The servo program can now be viewed or edited.

2) To switch back from the servo programming function to the transition condition and operation output monitor, hold down the [Ctrl] key and press the [F11] key.

The system returns to the ladder monitor screen which was displayed before the servo programming function was selected.

(2) Servo instruction monitor Monitoring of servo instruction creation steps is possible during transition condition and operation output monitoring.

The following servo instructions can be monitored.

- DSFRP*
- DSFLP*
- SVST
- CHGV
- CHGA

*This becomes the GPP wordshift instruction when using an A273UHCPU (32-axis specification).

[Procedure to Display the Operation Output Ladder Monitor Screen for Servo Instruction **Creation Steps**]



[Transition Condition, Operation Output Ladder Monitor Screen]



[Disnlay/Setting Contents]

Displaying active step	The step presently monitored by the ladder monitor function is displayed as ON ■ when active and OFF □ when inactive.
Active device display	The device presently monitored by the ladder monitor function is displayed as ON (-I I-) when active and OFF (-I \rightarrow) when inactive.
SFC monitor area	Displays the SFC diagram.
Ladder monitor area	Runs the ladder monitor for the designated transition condition and operation output.
[Key Operations]	
Start monitoring	 Press the [F3] key to start the ladder monitor.
End monitoring	 Press the [F4] key to end the ladder monitor and return to the SFC diagram screen.



Selecting the servo programming function

1) During DSFRP* or SVST instruction monitoring, the servo programming function can be selected for viewing or editing of the designated servo program.

However, monitoring of the servo program is not possible. Hold down the [Ctrl] key and press the [F11] key to view the servo program. If the servo program to be started was directly designated in the DSFRP* or SVST instruction, the designated servo program is displayed. However, if the servo program to be started was indirectly designated in the DSFRP* or SVST instruction, servo program No. 0 is displayed. The servo program can now be viewed or edited.

2) To switch back from the servo programming function to the transition condition and operation output monitor, hold down the [Ctrl] key and press the [F11] key.

The system returns to the ladder monitor screen which was displayed before the servo programming function was selected.

* When using an A273UHCPU (32-axis specification), this becomes the GPP word shift instruction.

10.2.8 Differences with SFC printing functions



• Printing of the servo program start step symbol, as shown:



- L_____ Step No.
- Printing of the DSFRP, DSFLP, SVST, CHGV, and CHGA servo instructions.
- Some sample print-outs are shown below.
- Sample print-out with operation outputs and transition conditions (using dedicated symbols)





(2) Sample print-out with SFC comments

Block No.0 [10/15	1	Active[]	Shift []	Clear []	Stop[] Register []	
1 2 3 4 5 6 / 1 🖸 0	8	-910	1112-	1314	1516	51/+18-	19-	s0	Machining start operation	'n
								tO	Workpiece pallet confirm	ı
								si	Workpiece transfer base advance processing	,
								t1	Machining operation star	rt
7 🖓 2								v2	Positioning processing	
8 - 2 9								12	Positioning complete	
								s3	Workpiece clamping	
11 + 3								t3	Workpiece clamp confirm	n
								s4	Headstock advance	
14 + 4 15								t4	Machining start position confirm	
								s5	Headstock low-speed advance	
								15	Machining complete con	.tirm
								55	Headstock retract	
20 21 + 6 + 7								10	confirm	
								67	Spindle rotation stop	
								-9 -9		
								+9	Hoodstock rotract config	
								t9	Workpiece unclamp confirm	m
								s9	Headstock stop and processing flag reset	
26 10 11								s10	Synchronous processing	J
								110		
								s11	Synchronous processing	9
								t12		
30										
Ť										
									. <u></u>	

(3) Sample print-out with right-justified SFC comments

(4) Sample print-out of SFC diagram only

(5) Operation output print-out Only the operation output ladder blocks of the designated block are printed out in order of step number.



(6) Transition condition print-out Only the transition condition ladder blocks of the designated block are printed out in order of step number.



(7) Operation output + transition condition print-out The operation output ladder blocks and transition condition ladder blocks of the designated block are printed out in their order in the SFC diagram.



11. SERVO SYSTEM CPU WRITING, READING, AND VERIFICATION (SERVO PC MODE)

11. SERVO SYSTEM CPU WRITING, READING, AND VERIFICATION (SERVO PC MODE)

The servo PC mode is a mode to write, read, and verify the data listed below when the servo system CPU is connected to a personal computer.

- All servo data (servo setting data, servo programs);
- Servo setting data (system setting data, axis data, parameter block data, limit switch output data)
- Servo programs.
- Outline of the functions The functions below are offered by the GSV13PE servo PC mode.

Servo PC	Write	Write the compute	r memory contents to servo system CPU	11.1
L		- All servo data	Write positioning data and servo programs	11.1
		Servo setting data	Write positioning data	11.1
		- Servo programs	Write servo programs	11.1
	Read	Reads the servo s	system CPU memory contents to computer memory	11.2
		- All servo data	Read positioning data and servo programs	11.2
		- Servo setting data	Read positioning data	11.2
	L	. Servo programs	Read servo programs	11.2
	Verify	Verifies the servo and the computer	system CPU memory contents memory contents	11.3
		- All servo data	Verify positioning data and servo programs	11.3
	<u> </u>	- Servo setting data	Verify positioning data	11.3
	L	- Servo programs	Verify servo programs	11.3

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11. SERVO SYSTEM CPU WRITING, READING, AND VERIFICATION (SERVO PC MODE)

(2) Outline of the procedure The procedure is shown below to write, read, and verify the data with the servo system CPU.



- (3) Switching to other functions Follow the appropriate procedure described below from the servo PC function select window to select a GPP function.
 - (a) Program section monitor
 - Press the [Alt] + [F11] keys to select the program section monitor.
 - (b) PC test Press the [Ctrl] + [F11] keys to select the PC test.

11. SERVO SYSTEM CPU WRITING, READING, AND VERIFICATION (SERVO PC MODE)

11.1 Writing to the Servo System CPU

Write the computer memory contents to the servo system CP.

[Procedure to Display the Write Data Select Window]



[Write Data Select Window]



[Display/Setting Contents]

Write data select The selected data is displayed highlighted. area

[Key Operations] Selecting data	 Select the data to write by pressing the [F1] to [F3] keys or move the cursor to the data to write by pressing the [↑]/[↓] keys and press the [Enter] key. A YES/NO dialog box prompts whether to execute the data write operation.
Executing data write	 To write the data, highlight the word "YES" and press the [Enter] key. If "NO" is highlighted, press the [←] key to highlight "YES". After the data write operation is "successfully completed", a message indicates that the data is written and the system returns to the write data select window.
Cancelling data write	 To cancel the data write operation, press the [→] key to highlight "NO" and press the [Enter] key. The data is not written and the system returns to the write data select window.

▲ CAUTION

▲ In some cases the machine may make unpredicted movements after the servo system CPU contents are rewritten. To prevent this problem, check the program and parameters and make the necessary adjustments before operating the machine.

POINTS

- (1) It is not possible to write data to another station in the data link system.
- (2) Turn OFF the PC ready flag (M2000) when executing the data write operation.

A message indicates that the data cannot be written if a data write operation is attempted when the PC ready flag (M2000) is ON. If this occurs, turn OFF the PC ready flag (M2000).

11. SERVO SYSTEM CPU WRITING, READING, AND VERIFICATION (SERVO PC MODE)

11.2 Reading from the Servo System CPU

Read the servo system CPU memory contents to the computer memory.

[Procedure to Display the Read Data Select Window]



[Read Data Select Window]



[Display/Setting Contents]

Verification data The selected data is displayed highlighted. select window

select window.

[Key Operations] Selecting data

1) Select the verification data by pressing the [F1] to [F3] keys or move the cursor to the verification data by pressing the [↑]/[↓] keys and press the [Enter] key.

A YES/NO dialog box prompts whether to execute the data verification.

Executing data verification

 To verify the data, highlight the word YES and press the [Enter] key. If "NO" is highlighted, press the [←] key to highlight "YES".
 After the data verification is successfully completed, a message indicates that the data is verified and the system returns to the verification data

Cancelling data verification

 To cancel the data verification, press the [→] key to highlight "NO" and press the [Enter] key. The data is not verified and the system returns to the verification data select window.

POINT

(1) It is not possible to read data from another station in the data link system.

11.3 Verifying the Servo System CPU

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Verifies the servo system CPU memory contents and the computer memory contents.

[Procedure to Display the Verification Data Select Window]



(1) Running the verification

[Verification data Select Window]



[Display/Setting Contents]

Verification data The selected data is displayed highlighted. select window

[Key Operations]	
Selecting data	 Select the verification data by pressing the [F1] to [F3] keys or move the cursor to the verification data by pressing the [↑]/[↓] keys and press the [Enter] key. A YES/NO dialog box prompts whether to execute the data verification.
Executing data verification	 To verify the data, highlight the word "YES" and press the [Enter] key. If "NO" is highlighted, press the [←] key to highlight "YES". After the data verification is successfully completed, a message indicates that the data is verified and the system returns to the verification data select window.
Cancelling data verification	 To cancel the data verification, press the [→] key to highlight "NO" and press the [Enter] key. The data is not verified and the system returns to the verification data select window.

POINTS

- (1) It is not possible to verify data at another station in the data link system.
- (2) Servo program verification is not run if a discrepancy was found in the servo setting data during verification of all servo data.

11. SERVO SYSTEM CPU WRITING, READING, AND VERIFICATION (SERVO PC MODE)

(2) Checking verification results

[Verification Results Window]

No discrepancies in servo program verification



Discrepancies in servo program verification



Verification results display area

[Display/Setting Contents]

Verification results Displays the results after verification. display area

[Key Operations]	
No Discrepancies	
Closing window	 Press the [Esc] key to close the window and return to the verification data select window.
Discrepancies	
Continuing/ending verification	 Details of up to 11 discrepancies can be displayed on one page. (For more details, see Section 19 Error Messages).
	 After 11 discrepancies are found, press the [Enter] key to display the next page and continue the verification.
	3) The verification is continued and the results displayed.
Interrupting verification	 Press the [Esc] key to interrupt a verification operation. A YES/NO dialog box prompts whether to interrupt the data verification.
	 To interrupt the verification, press the [←] key to highlight "YES" and press the [Enter] key. (The default setting is "NO".)
	A message indicates that the verification is interrupted and the system returns to the verification data select window.
	 To cancel interruption of the verification, press the [Enter] key while "NO" is highlighted. The verification continues.
Closing window	 Press the [Esc] key to close the window and return to the verification data select window.

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The GSV13PE SERVO TEST mode is used to execute a test run to check whether the servomotors are operating as designed. The test run is conducted by connecting the servo system CPU to a personal computer.



The GSV13PE SERVO TEST mode includes the following functions.

Servo Test	Servo start-up	The positioning data transfer operation, the servo system CPU & servo amplifier connection status, and the servomotor operation are checked.	12.2
······		-Initial check	12.2.1
		-Model name check The servo amplifier and servomotor model names, etc., are checked.	12.2.2
		Rotation direction The servo motor rotation direction in which the address check value increases is checked.	12.2.3
		_Upper & lower limit The upper & lower limit switch operation is checked LS check	12.2.4
		-RPM check The motor rotation speed at the high-speed command is checked.	12.2.5
	-Servo diagnosis	The speed control gain 1 and position control gain 1 values designated in the Servo Parameter Set mode are checked to determine if they are appropriate for the servomotor load.	12.3
		- Speed control When using the ADU, the speed control gain 1 setting gain 1 is checked to determine if it is appropriate.	12.3.1(1)
	L	 Position control The position control gain 1 setting is checked to gain 1 determine if it is appropriate. 	12.3.2(1)
	JOG operation	JOG operation is conducted to determine if the servomotor is operating properly.	12.4
	Manual pulse generator operation	Manual pulse generator operation is conducted to determine if the servomotor is operating properly.	12.5
	Home position return test	A home position return test is conducted to check the return direction and the dog position.	12.6
	Servo program test operation	A servo program test operation is conducted to determine if the servomotor is operating in accordance with the program.	12.7
		- Individual START Individual servo program operation is checked - Sequential START Sequential operation of multiple registered servo programs is checked.	12.7.1 12.7.2
	Teaching	Addresses designated by JOG and manual pulse generator positioning operations are written to the specified servo program.	12.8
	Error reset	The servo system CPU's error code storage area is cleared, and an error flag reset is executed.	12.9
	Present value change	A forced change of the servo system CPU's feed present value is executed.	12.10
	Servo ON/OFF	Servo ON/OFF switching is executed.	12.11

(2) Procedual flowchart A procedual flowchart for the SERVO TEST mode is shown below.



- *1 The [F8] key can be pressed at each of the execute windows in order to switch to the Error Reset function.
- *2 The [F9] key can be pressed at each of the execute windows in order to switch to the Present Value Change function.
- *3 After the Servo Test Function Selection window has been displayed (during TEST mode), press the [Ctrl] + [F11] keys to switch to the TEST function for the GPP function's PC mode.

POINTS	
(1) All axes rapid stop Press the [Back Space] key during a TEST run to execute a rapi stop of all active axes.	d
(2) Checking the displayed error code Press the [F12] key to display a guidance HELP window for detail regarding SERVO TEST mode error codes.	S

12.1 Establishing And Ending The TEST Mode

A test run can be conducted when the servo system CPU is stopped or when it is running.

However, when it is executed while the servo system CPU is running, the START instructions (DSFRP/SVST) from the sequence program will be ignored.

12.1.1 Switching to the TEST mode

Switch to the TEST mode after control by the servo program has been completed at the servo system CPU, and after all axes have been stopped.

(1) TEST mode execution

[Procedure to Display The TEST Mode Execute YES/NO Dialog Box]



[TEST Mode Execute YES/NO Dialog Box]



[Display/Setting Contents]

In order to conduct a test run, be sure to select the "YES" item at the "START COMMAND WILL BE DISABLED. OK?" dialog box. (If "NO" is selected, the test run will not be executed.)

[Key Operations] Designating the TEST mode

 To switch to the TEST mode, press the [←] key to highlight the "YES" item, then press the [Enter] key.

The Servo Test Function Selection window will then be displayed. (The default selection is "NO".)

2) If "NO" is selected, the system will return to the Online Function Selection window.

▲ If the "CANNOT EXECUTE DURING START" error message is displayed when the above procedure occurs, this indicates that the servomotor is running due to a START command from the servo system CPU.
After checking that all axes have stopped, re-designate the SERVO TEST item at the Online

After checking that all axes have stopped, re-designate the SERVO TEST item at the Online Function Selection window in order to execute the TEST mode operation.

(2) Selecting the servo test function After switching to the TEST mode is completed, the Servo Test Function Selection window will be displayed. Designate the desired function at this window.

[Procedure to Display The Servo Test Function Selection Window]



[Servo Test Function Selection Window]



	Function	Selection Procedure
1)	Servo start-up	Press the [F1] key to execute a servo start-up. The "CONDITION" item will then be highlighted. Use the numeric keys to key in the number of the check function to be executed. If "YES" is then selected at the Execute YES/NO dialog box, the execute window for the designated check function will be displayed.
2)	Servo diagnosis	Press the [F2] key to execute a servo diagnosis. The "DIAGNOSIS" item will then be highlighted. Use the numeric keys to key in the number of the diagnosis function to be executed. If "YES" is then selected at the Execute YES/NO dialog box, the execute window for the designated diagnosis function will be displayed.
3)	Jog operation	Press the [F3] key to execute a JOG operation. If "YES" is then selected at the Execute YES/NO dialog box, the execute window for the test run will be displayed.
4)	Manual pulse generator operation	Press the [F4] key to execute a manual pulse generator operation. If "YES" is then selected at the Execute YES/NO dialog box, the execute window for the test run will be displayed.
5)	Home position return test	Press the [F5] key to execute a home position return test. If "YES" is then selected at the Execute YES/NO dialog box, the execute window for the home position return will be displayed.

POINT

(1) To select a function, use the cursor control keys (arrow keys) to highlight the desired function, then press the [Enter] key.

Γ	Function	Selection Procedure
6)	Servo program test run	Press the [F6] key to execute a servo program test run. The "Servo Program Test Run" item will then be highlighted. Use the numeric keys to key in the number of the servo program test run function to be executed. If "YES" is then selected at the Execute YES/NO dialog box, the setting window for the designated test run will be displayed.
7)	Teaching	Press the [F7] key to execute a teaching operation. If "YES" is then selected at the Execute YES/NO dialog box, the setting window for the teaching operation will be displayed.
8)	Error reset	Press the [F8] key to execute an error reset. If "YES" is then selected at the Execute YES/NO dialog box, the execute window for the error reset function will be displayed.
9)	Servo ON/OFF switching	Press the [F9] key to execute servo ON/OFF switching. If "YES" is then selected at the Execute YES/NO dialog box, the execute window for servo ON/OFF switching will be displayed.

12.1.2 Ending the TEST mode

The procedure for ending the TEST mode is described below. Sequence program START commands are operative while the servo system CPU is running.

The TEST mode can be ended by the following 2 methods:

• Ending the TEST mode at the Servo Test Function Selection window.

• Ending the TEST mode at the Check & Test Run Execute windows. Both methods are explained below.

(1) Ending the TEST mode at the Servo Test Function Selection Window

Closing The Servo Test Function Selection Window

The TEST mode will be ended when the Servo Test Function Selection window is closed.

[Servo Test Function Selection Window]



[Key Operations]

Ending the TEST mode

- 1) Press the [Esc] key to end the TEST mode.
- An "END TEST MODE? YES/NO" dialog box will then be displayed.
- 2) Press the [←] key to highlight the "YES" item, then press the [Enter] key. The SERVO TEST mode will be ended, the Online Function Selection window will be displayed, and the servo system CPU's TEST mode will be canceled.
- 3) If "NO" is selected, or if the [Esc] key is pressed, the Servo Test Function Selection window will be displayed, and the servo system CPU TEST mode will be canceled.

Switching To The "PC TEST" Function

The TEST mode can also be canceled by switching to the GPP function's PC TEST function.

[Key Operations] Switching to PC TEST function

- Press the [Ctrl]+[F11] keys to switch to the PC TEST function. An "END TEST MODE? YES/NO" dialog box will then be displayed.
- 2) Press the [←] key to highlight the "YES" item, then press the [Enter] key. The SERVO TEST mode will be ended, the PC TEST function will become operative, and the servo system CPU's TEST mode will be canceled.

GPP Function Menu Selection

;

The TEST mode can be canceled by selecting the GPP Function Menu at the Menu Selection window.

[Key Operations] Switching to GPP function	 Press the [F11] key to switch to the GPP function. An "END TEST MODE? YES/NO" dialog box will then be displayed. If "NO" is selected, or if the [Esc] key is pressed, the system will return to the original window. Prose the [a block to bigblight the "YES" item, then prove the [Enter] key
	 2) Press the [←] key to highlight the "YES" item, then press the [Enter] key. The Menu Selection window will then be displayed. To return to the original window from the Menu Selection window, press the [Esc] key. 3) Use the [[↑]]/[¹] keys to highlight the desired function name, then press the

3) Use the $[\uparrow]/[\downarrow]$ keys to highlight the desired function name, then press the [Enter] key.

The SERVO TEST mode will then be ended, the designated GPP function will be established, and the servo system CPU's TEST mode will be canceled.

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(2) Ending the TEST mode at the Check & Test Run Execute Windows

Switching To The "PC TEST" Function

The TEST mode can also be canceled by switching to the GPP function's PC TEST function.

[Model Name Check Window] (For A273UHCPU)



[Key Operations] Switching to PC TEST function

- 1) Press the [Ctrl]+[F11] keys to switch to the PC TEST function.
- An "END TEST MODE? YES/NO" dialog box will then be displayed.
 2) Press the [←] key to highlight the "YES" item, then press the [Enter] key. The SERVO TEST mode will be ended, the PC TEST function will become operative, and the servo system CPU's TEST mode will be canceled.

GPP Function Menu Selection

The TEST mode can be canceled by selecting the GPP Function Menu at the Menu Selection window.

[Key Operations] Switching to GPP function

- Press the [F11] key to switch to the GPP function. An "END TEST MODE? YES/NO" dialog box will then be displayed. If "NO" is selected, or if the [Esc] key is pressed, the system will return to the original window.
- Press the [←] key to highlight the "YES" item, then press the [Enter] key. The Menu Selection window will then be displayed. To return to the original window from the Menu Selection window, press the [Esc] key.
- 3) Use the $[\uparrow]/[\downarrow]$ keys to highlight the desired function name, then press the [Enter] key.

The SERVO TEST mode will then be ended, the designated GPP function will be established, and the servo system CPU's TEST mode will be canceled.

12.2 Servo Start-Up

In order to determine if the servomotor is functioning properly, the following items are checked at each axis: the status of connected servo amplifiers, the motor's rotation direction and rotation speed, and limit switch operation, etc. The servo start-up check operation consists of the following 5 functions:

- Initial check
- Model name check
- Rotation direction check
- Upper/lower limit LS check
- RPM check
- (1) "Execute" window transition at servo start-up procedure

The execute window for the desired servo start-up check function is designated at the Servo Test Function Selection «MDNM» window. Once an execute window is opened, switching to the execute windows for other check functions is possible by pressing the [F2] key (the switching progression is shown below).



▲ CAUTION

Always check (and adjust if necessary) the parameter settings before beginning operation. Failure to do so can result in unexpected machine motion.

12.2.1 Initial check

Active servo amplifier errors are displayed. Check these errors.

[Procedure to Display The Initial Check Window]



[Initial Check Window]



[Display/Setting Contents]

The statuses of all connected servo amplifiers are checked, and the results displayed. Minor,major, and servo errors (max. of 1 each) are displayed for each axis. (If all axes are free of errors, only the item heading will be displayed.)

[Key Operations] Check results display area	 Error axis
Monitoring mark	Indicates that monitoring is in progress. (Not displayed when monitoring is stopped.)
[Key Operations]	
Page switching	 If more than 15 errors have occurred, use the [PAGE UP]/[PAGE DOWN] keys to switch display pages. Press the [PAGE DOWN] key to display subsequent errors, and the [PAGE UP] key to display preceding errors.
Comment scroll	1) To view the entire comment, use the $[\leftarrow]/[\rightarrow]$ keys to scroll the comment display right and left.
Switching to the Model Name Check window	 Press the [F2] key to conduct a model name check. The Model Name Check window will then be displayed. (See Section 12.2.2)
Error reset	 Press the [F8] key to execute an error reset. An Error Reset window will then be displayed. (See Section 12.9)
Closing the Initial Check window	1) Press the [Esc] key to close the Initial Check window and return to the Servo Test Function Selection window.

12.2.2 Model name check

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A list of connected servo amplifier and servomotor model names is displayed. Verify that the names conform to the system design.

[Procedure to Display The Model Name Check Window]



[Model Name Check Window] (For A273UHCPU)



[Display/Setting Contents]

When the servo system CPU power is switched ON, the "servo parameter" data written at the servo amplifier is displayed.

The displayed data should be checked against the system design to verify that all connections are correct.

Check results dis- play area	1) Axis NoCorresponds to the axis No. settings designated in the System Setting mode.
	2) Base typeIndicates whether the ADU is installed at a "main base unit" or an "extension base unit".
	 3) Slot NoSlot numbers which correspond to the axis numbers are displayed here. 0 to 7: ADU d1 to d8: MR-□-B
	4) ENCO NoIndicates the encoder's connection position. (Only when ADU is used.) Number of connectable motors [1] ADU: 1 Number of connectable motors [2] ADU:
	1 (connector for upper encoder) 2 (connector for lower encoder)
	 Amplifier model The servo amplifier's model name is displayed. name
	6) ENCO setting Indicates the positioning method "absolute" or "incre- mental".
	7) Motor typeIndicates the servomotor type.
	8) Motor capacityIndicates the motor capacity based on the settings designated in the System Setting mode.
	9) Motor rpmIndicates the motor's rpm based on the settings desig- nated in the System Setting mode.

	10) 11)	LX slot Indicates the servo external signal unit's installation location. Base No Slot No. Base No. 0: Main base unit Base No. 1: Extension base unit Slot No. : 0 to 7 Signal NoIndicates the servo external signal unit's signal num- bers which correspond to the axis numbers	
Monitoring mark	Ind sto	ndicates that monitoring is in progress. (Not displayed when monitoring is stopped.)	
[Key Operations] Switching to the Rotation Direction Check window	1)	Press the [F2] key to conduct a rotation direction check. The Rotation Direction Check window will then be displayed. (See Sec- tion 12.2.3)	
Error reset	1)	Press the [F8] key to execute an error reset. An Error Reset window will then be displayed. (See Section 12.9)	
Cross check with set data (when MR-J2-B is used)	 To check if the motor set in the system setting agrees with the a motor connected to MR-J2-B, press the [F10] key. If there is a discrepancy between the actually connected MR-J2-B n and the setting data written to the controller, the display appear shown below. 		
		AX ACTUALLY-LOADED STATE CONTROLLER SETTING DATA No TYPE CORR BOTATION EXCODE TYPE CUER ROTATION EXCODE 1 SPET 50W 3000 8192 84-WE 50W 3000 8192	

 AX
 ACTUALLY-LOADED STATE TYPE
 CONTROLLER
 SETTING DATA ROTATION

 1
 SPEC
 SOW
 3000
 8192
 84-ME
 50W
 3000
 8192

 3
 SPEC
 100W
 3000
 8192
 84-ME
 50W
 3000
 8192

 3
 BC-MF
 50W
 3000
 8192
 84-FF
 50W
 3000
 8192

 4
 FFF
 50W
 3000
 8192
 84-FF
 50W
 3000
 8192

 3
 BC-MF
 50W
 3000
 8192
 84-FF
 50W
 3000
 8192

 4
 FF
 50W
 3000
 8192
 84-FF
 50W
 3000
 8192

Axis switching at the model name check (For A273UHCPU 32-axis specifications)

 Use the [PAGE UP]/[PAGE DOWN] keys to conduct the model name check at axes subsequent to axis No. 8.
 Press the [PAGE UP] key to select the preceding axis No., and the [PAGE DOWN] key to select the next axis No.

1) Press the [Esc] key to close the Model Name Check window and return to the Servo Test Function Selection window.

Closing the Model Name Check window

12.2.3 Rotation direction check

The servomotor's rotation direction in which the positioning address value increases, or therotation direction which corresponds to forward JOG operation, is displayed.

(1) Conducting the rotation direction check When the START conditions are established, the servomotor at the designated axis is actually rotated 1/120th of a turn to check the motor's rotation direction.

[Procedure to Display The Rotation Direction Check Execute Window]



[Rotation Direction Check Execute Window] (For A273UHCPU)



[Display/Setting Contents]

area

The motor shaft rotation direction should be checked at each axis.

Motor shaft rotation will begin only when the START conditions shown below are satisfied. The rotation direction check should be executed after checking the device ON/OFF statuses (START conditions) shown at the right side of the window (see below).

START conditions			
Servo error detect	Servo error detection		
External signal	FLS		ON
		ON	
	STOP		OFF
Servo READY			ON
TEST mode			ON
TEST mode reque		OFF	

If the above conditions are not satisfied, the check will not be executed when the [F4] key is pressed. The monitor item which fails to satisfy the START conditions will be highlighted, and a "CANNOT START" error message will be displayed.

Monitor itemThe feed present value and the device ON/OFF statuses, etc., are displayeddisplay areahere.

Axis No. display The axis number where the check is to be executed is displayed here.

Note display area Remarks relating to the check operation are displayed here.

Monitoring mark Indicates that monitoring is in progress. (Not displayed when monitoring is stopped.)

[Key Operations] Executing the check function	1)	Press the [F4] key to execute the rotation direction check. A Rotation Results window will then be displayed. (See Section 12.2.3). Check the rotation direction.
Designating the axis number	1) 2)	To change the designated axis number, press the [F1] key. The Axis Designation window will then be displayed, and the axis number which follows the currently designated axis number will be displayed. Enter the number of the axis where a check is to be executed, then press the [Enter] key. After the axis number has been designated, the system will return to the Rotation Direction Check Execute window. To abort the axis designation procedure, press the [Esc] key. Use the [PAGE UP]/[PAGE DOWN] keys to switch to the previous axis number or the next axis number at the Present Axis No. display area.
Monitor STOP/ RESTART	1)	Press the [F3] key to stop the monitoring operation, or to resume the monitoring operation.
Switching to the Upper/Lower Limit LS Check window	1)	Press the [F1] key to conduct an upper/lower limit LS check. The Upper/Lower Limit LS Check window will then be displayed. (See Section 12.2.4)
Error reset	1)	Press the [F8] key to execute an error reset at the Error Reset window which is displayed. (See Section 12.9)
Closing the window	1)	Press the [Esc] key to close the Rotation Direction Check Execute window and return to the Servo Test Function Selection window.

(2) Rotation results display When a rotation direction check is executed, the servomotor is rotated 1/120th of a turn, and the rotation direction results are displayed. Check that the rotation direction is correct.

[Rotation Direction Results Window] (For A273UHCPU)



[Display/Setting Contents]

Viewed from the motor's load side, the motor rotation direction in which the positioning address value increases is indicated by a highlighted display of the CCW (forward) or CW (reverse) item. The direction is also indicated by arrows.



[Key Operations]

Closing the window

1) Press the [Esc] key to close the Rotation Direction Results window and return to the Rotation Direction Check Execute window.

12.2.4 Upper/lower limit LS check

Execute forward and reverse JOG operations to determine if the upper limit LS (FLS) and the lower limit LS (RLS) are functioning properly. Be sure to designate the necessary JOG data settings before beginning the JOG operation, designating the settings at the parameter block which is to be used.

(1) Executing the upper/lower limit LS check

[Procedure to Display The Upper/Lower Limit LS Check Window]



[Upper/Lower Limit LS Check Window] (For A273UHCPU)



[Display/Setting Contents]

Execute forward and reverse JOG operations at each axis, checking that the servomotor stops when the FLS (forward LS) and RLS (reverse LS) switch OFF.

JOG operation is only possible when the START conditions shown below are satisfied.

Before beginning the upper/lower LS check, check that the START conditions shown at the right side of the window (monitor item display area) are satisfied.

Forward JOG START conditions

Servo error dete	OFF	
External signal	ON	
	STOP	OFF
Servo READY	ON	

Reverse JOG START conditions

Servo error dete	OFF	
External signal	ON	
	STOP	OFF
Servo READY	ON	

If the monitoring results indicate that the above START conditions are not satisfied, the JOG operation will not start when the [F5] or [F6] key is pressed.

The monitor item which fails to satisfy the START conditions will be highlighted, and a "CANNOT START" error message will be displayed.

Monitor Item display area	1) Feed present value The positioning address/travel value for the axis in question is displayed here.
	2) Error The most recent error which has occurred at the axis in question is displayed here.
Axis No. display area	The axis number where the check is being executed is displayed here.
JOG speed display area	The JOG speed designated at the JOG Speed Setting window is displayed here.
Direction display area	The JOG direction (forward or reverse) is indicated here.

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Monitoring mark	Indicates that monitoring is in progress. (Not displayed when monitoring is stopped.)
[Key Operations]	
JOG speed setting/ change	 Press the [F4] key to set or change the JOG speed. At the JOG Speed Setting window which is then displayed, designate the desired speed setting. (See Section 12.2.4(2))
Executing the Check operation (forward)	 After designating the JOG speed setting, press and hold down the [F6] key (or [Shift] + [Alt] key) to execute an upper limit LS check (forward). After checking that the motor stops when the FLS monitor item goes OFF, release the [F6] key (or [Shift] + [Alt] key).
Executing the Check operation (reverse)	 After designating the JOG speed setting, press and hold down the [F5] key (or [Shift] + [Ctrl] key) to execute an lower limit LS check (reverse). After checking that the motor stops when the RLS monitor item goes OFF, release the [F5] key (or [Shift] + [Ctrl] key).
Designating the axis number	 To change the axis number where the upper/lower limit LS check is to be executed, press the [F1] key. The Axis Designation window will then be displayed, and the axis number which follows the currently designated axis number will be displayed. Enter the number the axis where a check is to be executed, then press the [Enter] key. After the axis number has been designated, the system will return to the Upper/Lower Limit LS Check window. To abort the axis designation procedure, press the [Esc] key. Use the [PAGE UP]/[PAGE DOWN] keys to switch to the previous axis number or the next axis number (relative to the axis number indicated at the Present Axis No. display area).
Monitor STOP/ RESTART	1) Press the [F3] key to stop the monitoring operation, or to resume the monitoring operation.
Switching to the RPM Check window	 Press the [F2] key to conduct an RPM check. The RPM Check window will then be displayed. (See Section 12.2.5)
Error reset	1) Press the [F8] key to execute an error reset at the Error Reset window which is displayed. (See Section 12.9)
Closing the window	 Press the [Esc] key to close the Upper/Lower Limit LS Check window, and to return to the Servo Test Function Selection window.
	POINT
	It previously used JOG operation keys ([F6]/[F5]) are held pressed

when a personal computer with high processing speed, there are cases that JOG operation cannot be executed correctly with a beep keep sounding.

Use the following keys to execute JOG operation when using a personal computer with high processing speed.

 Forward rotation [Shift] + [Alt] keys (previously [F6] key was used)
 Reverse rotation [Shift] + [Ctrl] keys (previously [F5] key was used)

(2) Designating the JOG speed setting The JOG operation speed must be designated at the JOG Speed Setting window before executing a JOG operation.

[JOG Speed Setting Window] (For A273UHCPU)



[Display/Setting Contents]

The designated JOG speed setting must not exceed the JOG speed limit designated at the Servo Data Setting mode.

Axis No. display area	The axis No. where a JOG speed setting is to be executed is displayed here.
JOG speed display area	The current JOG speed setting is displayed here.
JOG speed setting area	The JOG speed setting is designated here.
[Key Operations] Setting the JOG speed	 Use the numeric keys to key in the desired JOG speed setting, then press the [END] key. The system will then return to the original window. (The designated JOG speed setting will be displayed at the JOG Speed display area.) If a JOG speed setting which violates the JOG speed limit is designated, an "OUT OF SETTING RANGE" error message will be displayed. If this occurs, re-designate the JOG speed setting within the prescribed range.
Setting ABORT	 Press the [Esc] key to abort the setting procedure. The system will then return to the original window.

POINTS

- 1) Operation disabled when A171SENC is not used (For A171SCPU systems)
 - The upper/lower limit LS check cannot be performed if the A171SENC servo input module is designated as "not used" in the System Setting mode.
- 2) Operation disabled when A278LX is not used (For A273UHCPU systems)
 - The upper/lower limit LS check cannot be performed if the A278LX servo external signal module is designated as "not used" in the System Setting mode.

12.2.5 RPM check

Execute a forward or reverse JOG operation and verify that the servomotor's maximum rotation speed (rpm) doesn't exceed the motor rpm setting designated at the Servo Parameter setting.

Be sure to designate the necessary JOG data settings before beginning the JOG operation, designating the settings at the parameter block which is to be used.

[Procedure to Display The RPM Check Window]



[Display/Setting Contents]

Execute forward and reverse JOG operations at each axis, checking that the servomotor's rotation speed (rpm) doesn't exceed the maximum rpm setting.

JOG operation is only possible when the START conditions shown below are satisfied.

Before beginning the RPM check, check that the START conditions shown at the right side of the window (monitor item display area) are satisfied.

Forward JOG	START	conditions
External signal	FLS	■ ON
	STOP	OFF
Servo READY		

Reverse JOG START conditions



If the monitoring results indicate that the above START conditions are not satisfied, the JOG operation will not start when the [F5] or [F6] key is pressed.

The monitor item which fails to satisfy the START conditions will be highlighted, and a "CANNOT START" error message will be displayed.

Monitor Item display area	1) Feed present value	The positioning address/travel value for the axis in question is displayed here.	
	2) Error	The most recent error which has occurred at the axis in question is displayed here.	
	3) Motor rpm (parameter)	The motor rpm parameter setting is displayed here.	
Axis No. display area	The axis number where the check is being executed is displayed here.		
Max. rpm display area	The motor's maximum JOG rpm is displayed here. (The display continues even if the motor is stopped.)		
JOG speed display area	The JOG speed designated at the JOG Speed Setting window is displayed here.		

Direction display area	The JOG direction (forward or reverse) is indicated here.
Monitoring mark	Indicates that monitoring is in progress. (Not displayed when monitoring is stopped.)
[Key Operations] Executing the Check operation (forward)	 After designating the JOG speed setting, press and hold down the [F6] key (or [Shift] + [Alt] key) to execute a FORWARD check. After checking the motor's maximum rpm at the "MOTOR RPM (R/MIN)" monitor item, release the [F6] key (or [Shift] + [Alt] key). The motor will then decelerate and stop.
Executing the Check operation (reverse)	 After designating the JOG speed setting, press and hold down the [F5] key (or [Shift] + [Ctrl] key) to execute a REVERSE check. After checking the motor's maximum rpm at the "MOTOR RPM (R/MIN)" monitor item, release the [F5] key (or [Shift] + [Ctrl] key). The motor will then decelerate and stop.
JOG speed setting/ change	 Press the [F4] key to set or change the JOG speed. At the JOG Speed Setting window which is then displayed, designate the desired speed setting. (See Section 12.2.4(2)) Set the maximum speed used in the created servo program as the operat- ing speed.
Designating the axis number	 To change the axis number where an RPM check is to be executed, press the [F1] key. The Axis Designation window will then be displayed, and the axis number which follows the currently designated axis number will be indicated. Enter the number of the axis where a check is to be executed, then press the [Enter] key. After the axis number has been designated, the system will return to the RPM Check window. To abort the axis designation procedure, press the [Esc] key. Use the [PAGE UP]/[PAGE DOWN] keys to switch to the previous axis number or the next axis number (relative to the axis number indicated at the Present Axis Number display area).
Monitor STOP/ RESTART	1) Press the [F3] key to stop the monitoring operation, or to resume the monitoring operation.
Error reset	1) Press the [F8] key to execute an error reset at the Error Reset window which is displayed. (See Section 12.9)
Closing the window	1) Press the [Esc] key to close the RPM Check window and return to the Servo Test Function Selection window.
	POINT
	If previously used JOG operation keys ([F6]/[F5]) are held pressed when a personal computer with high processing speed, there are cases that JOG operation cannot be executed correctly with a beep keep sounding. Use the following keys to execute JOG operation when using a personal computer with high processing speed.
	 Forward rotation [Shift] + [Alt] keys (previously [F6] key was used) Reverse rotation [Shift] + [Ctrl] keys (previously [F5] key was used)

12.3 Servo Diagnosis

A diagnosis function is executed at each axis to determine if the "speed control gain 1" and "position control gain 1" values designated at the Servo Data Setting mode are appropriate for the servomotor load.

The servo diagnosis procedure consists of the following 2 functions:

- 1) Speed control gain 1 check
- This occurs only when the ADU is used.
- 2) Position control gain 1 check
- "Execute" window transition during servo diagnosis procedure The execute window for the desired servo diagnosis check function is designated at the Servo Test Function Selection window. Once an execute window is opened, switching to the execute windows for other check functions is possible by pressing the [F4] key (the switching progression is shown below).



POIN	TS
1)	Conditions for servo diagnosis execution • A servo diagnosis can only be conducted when the Servo READY
	signal is ON. If a "CANNOT EXECUTE, SERVO READY ON." error message is displayed, try again after checking that the Servo READY signal is ON.
2)	Precautions regarding parameter setting changes
	 The speed control gain 1 & position control gain 1 parameter settings can be changed in the servo diagnosis operation. If a "CANNOT CHANGE SERVO PARAMETER." error message is displayed, this indicates that the in-position signal is OFF. Try again after checking that the in-position signal is ON.
3)	 GSV13PE operation restrictions during a servo diagnosis When the Servo Diagnosis Execute window is open, the Menu Selection window will not be displayed when the [F11] key is pressed.
	To display the Menu Selection window, press the [Esc] key to return to the Servo Test Function Selection window, then press the [F11] key.
	• The HELP function is inoperative when the Servo Diagnosis Exe- cute window is open.
12.3.1 Speed control gain 1 check

The speed control gain 1 check involves checking the servomotor's responsibility and stability in response to input commands (rpm) from the servo system CPU.

The following items should be checked: the response time (settling time on stopping), the overshoot amount, and a vibration check while stopped.

(1) Executing the speed control gain 1 check

[Procedure to Display The Speed Control Gain 1 Check Window]



[Speed Control Gain 1 Check Window]



[Display/Setting Contents]

The servomotor is rotated 1.6 turns (forward/reverse) in accordance with designated setting value, and the results are displayed at the Check Results display area at the right side of the window. (Results for 3 operations are displayed. When more than 3 operations are executed, the results are updated to show the 3 most recent results.)

The rotation speed (rpm) and settling time are shown at the graph.

Verify that the designated speed control gain 1 setting is appropriate.

If the settling time is too long, or if the overshoot amount is excessive, the setting value should be changed.

Axis number display area	The axis number where the check is to be executed is displayed here.
Setting value display area	The current speed control gain 1 setting value is displayed here.
Graph display area	The overshoot amount and settling time detected when the motor was stopped are indicated here.
Check results display area	The overshoot amount, settling time, and speed control gain 1 setting value detected when the motor was stopped are shown in a table format.
Monitoring mark	Indicates that monitoring is in progress. (Not displayed when monitoring is stopped.)

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	POINTS
	 Servomotor operation during check function When a check is executed, the motor is rotated 1.6 turns in one direction, then 1.6 turns in the opposite direction, returning to its original position. Results display content The overshoot amount and settling time are calculated according to the formulas shown below. Overshoot amount: [Max. rpm - 200 rpm]/[200 rpm × 100%] Setting time : Time required until rpm is 200 rpm ± 10 rpm. The display data is cleared when the TEST mode is established. When there is no data for the previous 2 operations, "0" is displayed for those items.
[Key Operations] Executing the Check operation (forward)	 Press the [F6] key to execute a speed control gain 1 check in the FORWARD direction (rotation direction in which address value increases). At the "MOTOR FORWARD? YES/NO" dialog box which is then displayed, select the "YES" item. The motor will be rotated 1.6 turns in the forward direction, the speed control gain 1 setting will be checked, and the results will be displayed at the window.
Executing the Check operation (reverse)	 Press the [F5] key to execute a speed control gain 1 check in the REVERSE direction (rotation direction in which address value decreases). At the "MOTOR REVERSE? YES/NO" dialog box which is then displayed, select the "YES" item. The motor will be rotated 1.6 turns in the reverse direction, the speed control gain 1 setting will be checked, and the results will be displayed at the window.
Changing the parameter setting	 Press the [F2] key to change the speed control gain 1 setting value. The Parameter Change window will then be displayed (See Section 12.3.1(1)).
Changing the axis number	 To change the axis number where a check is to be executed, press the [F1] key. The Axis Designation window will then be displayed, and the axis number which follows the currently designated axis number will be displayed. Enter the number of the axis where a check is to be executed, then press the [Enter] key. After the axis number has been designated, the system will return to the Speed Control Gain 1 Check window. To abort the axis designation procedure, press the [Esc] key. Use the [PAGE UP]/[PAGE DOWN] keys to switch to the previous axis number or the next axis number (relative to the axis number indicated at the Present Axis Number display area).
Switching to the Position Loop Gain Check window	 Press the [F4] key to conduct a position control gain 1 check at the currently selected axis. The Position Control Gain 1 Check window will then be displayed (See Section 12.3.1(2)).
Error reset	1) Press the [F8] key to execute an error reset at the Error Reset window which is displayed. (See Section 12.9)
Closing the window	 Press the [Esc] key to close the Speed Control Gain 1 Check window, and return to the Servo Test Function Selection window.

POINT

Stroke limit check

- If a "CANNOT START" (error code: 106) error message is displayed when the [F6] or [F5] key is pressed, this indicates that the stroke limit max/min values designated with the Fixed Parameter Setting function of the "Axis Data Setting" item in the Servo Data Setting mode either exceed +19200PLS or fall below -19200PLS in the command pulse conversion operation.
- Designate appropriate stroke limit max/min value settings before

(2) Changing the speed control gain 1 setting value If the check results indicate that the speed control gain 1 setting is inappropriate, the setting value can be changed at the Parameter Change window.

[Speed Control Gain 1 Parameter Change Window]



[Display/Setting Contents]

Change the speed control gain 1 setting value as follows:

If the settling time is too long, increase the speed control gain 1 setting value. If the overshoot amount is excessive, reduce the speed control gain 1 setting value.

Setting value display area	The current speed control gain 1 setting value is displayed here.
Data input area	The newly entered speed control gain 1 value is displayed here.
[Key Operations] Data SET	 Using the numeric keys, key in the desired setting value, then press the [Enter] key.
Setting END	 After the new data has been registered, press the [END] key to close the Parameter Change window. The system will then return to the Speed Control Gain 1 Check window where the newly designated setting will be displayed at the setting value display area.
Setting ABORT	 To close the Parameter Change window without registering the newly entered data, press the [Esc] key. The system will then return to the Speed Control Gain 1 Check window where the unchanged setting will be displayed at the setting value display area.

▲ If the speed control gain 1 value is increased by too much when changing the setting, the overshoot amount will become excessive, and the motor will vibrate (abnormal motor noise) while stopped. Use care to prevent increasing the speed control gain 1 value excessively.

12.3.2 Position control gain 1 check

The position control gain 1 check involves checking the servomotor's responsibility and stability in response to input commands (rpm) from the servo system CPU.

The following items should be checked: the settling time on stopping, the undershoot amount, and a vibration check while stopped.

(1) Executing the position control gain 1 check

[Procedure to Display The Position Control Gain 1 Check Window]



[Position Control Gain 1 Check Window]



[Display/Setting Contents]

The servomotor is rotated 1.5 turns (forward/reverse) in accordance with designated setting value, and the results are displayed at the Check Results display area at the right side of the window. (Results for 3 operations are displayed. When more than 3 operations are executed, the results are updated to show the 3 most recent results.) The rotation speed (rpm) and settling time are shown at the graph.

Check that the designated position control gain 1 setting is appropriate.

If the settling time is too long, or if the undershoot amount is excessive, the setting value should be changed.

Axis number display area	The axis number where the check is to be executed is displayed here.
Setting value display area	The current position control gain 1 setting value is displayed here.
Graph display area	The overshoot amount and settling time detected when the motor was stopped are indicated here.
Check results display area	The undershoot amount, settling time, vibration amplitude, and position con- trol gain 1 setting value detected when the motor was stopped are shown in a table format.
Monitoring mark	Indicates that monitoring is in progress. (Not displayed when monitoring is stopped.)

ſ	PO	INT	
	<u>ر او ا</u>	Contents of results display	
	•	The undershoot amount and	I settling time are calculated according to
		the formulas shown below. Undershoot amount	: Max. rpm of reverse rotation when motor is stopped] / [100rpm × 100%]
		Setting time Vibration amplitude	 Time required from a command value of "0" until motor stops. The display data is cleared when the
		The display data is cleared	TEST mode is established.
		When there is no data for th	e previous 2 operations "0" is displayed
		for those items.	
[Key Operations] Executing the Check operation (forward)	1)	Press the [F6] key to exect FORWARD direction (rotatio At the "MOTOR FORWARD? select the "YES" item. The motor will be rotated 1. control gain 1 setting will be	sute a position control gain 1 check in the n direction in which address value increases). YES/NO" dialog box which is then displayed, 5 turns in the forward direction, the position checked, and the results will be displayed at
		the window.	
Executing the Check operation (reverse)	1)	Press the [F5] key to exec REVERSE direction (rotation At the "MOTOR REVERSE? select the "YES" item. The motor will be rotated 1. control gain 1 setting will be the window.	sute a position control gain 1 check in the direction in which address value decreases). YES/NO" dialog box which is then displayed, 5 turns in the reverse direction, the position checked, and the results will be displayed at
Changing the parameter setting	1)	Press the [F2] key to change Parameter Change window w	the position control gain 1 setting value. The vill then be displayed (See Section 12.3.2(1)).
Changing the axis	1)	To change the axis number	where a check is to be executed, press the
number		[H] key. The Axis Designation window which follows the currently d Enter the number of the axis the [Enter] key.	w will then be displayed, and the axis number esignated axis number will be indicated. where a check is to be executed, then press
		Position Control Gain 1 Che	cen designated, the system will return to the ck window.
	2)	To abort the axis designation Use the [PAGE UP]/[PAGE number or the next axis num the Present Axis Number dis	n procedure, press the [Esc] key. DOWN] keys to switch to the previous axis ober (relative to the axis number indicated at splay area).
Error reset	1)	Press the [F8] key to execu which is displayed. (See Sec	te an error reset at the Error Reset window stion 12.9)
Closing the window	1)	Press the [Esc] key to close and return to the Servo Test	the Position Control Gain 1 Check window, Function Selection window.

*

POINT

Contents of results display

• The undershoot amount ar the formulas shown below.	nd settling time are calculated according to
Undershoot amount	: Max. rpm of reverse rotation when motor is stopped] / [100rpm × 100%]
Setting time	: Time required from a command value of "0" until motor stops.
Vibration amplitude	: The display data is cleared when the TEST mode is established.
• The display data is cleared	when the TEST mode is established.

• When there is no data for the previous 2 operations, "0" is displayed for those items.

POINT

Stroke limit check

- If a "CANNOT START" (error code: 106) error message is displayed when the [F6] or [F5] key is pressed, this indicates that the stroke limit max/min values designated with the Fixed Parameter Setting function of the "Axis Data Setting" item in the Servo Data Setting mode either exceed +18000PLS or fall below -18000PLS at the command pulse conversion operation.
- Designate appropriate stroke limit max/min value settings before

(2) Changing the position control gain 1 setting If the check results indicate that the position control gain 1 setting is inappropriate, the setting value can be changed at the Parameter Change window.

[Position Control Gain 1 Parameter Change Window]

Sivel ¹⁹ 1-9 -618 - 019	10	11V	100 67 8	1 - 15 - 1	a akt
N VILL NOTATE 1 5 ERVOLUTIONS	CHECK	GA IN	UNDIRSH	RET TIME	VISIMT
WETER CHANGE [363	1.	×	20 K	35	3 912
\	1-3	34	18 4		ها# د
X	1-2	32	16 ×	25	2 PL#
Y.	ue ns		ANUE NUET	as Less 1	1641 54
	_				
1 DATA E 367 (4-1665)4	1.10				
	(post)		n itteriore	10 1 1 P	

Setting value display area

[Display/Setting Contents]

ţ,

Change the position control gain 1 setting value as follows:

If the settling time is too long, increase the speed control gain 1 setting value. If the undershoot amount is excessive, reduce the position control gain 1 setting value.

Setting value display area	The current position control gain 1 setting value is displayed here.
Data input area	The newly entered position control gain 1 value is displayed here.
[Key Operations] Data SET	1) Using the numeric keys, key in the desired setting value, then press the [Enter] key. The setting range is shown below.
Setting END	 After the new data has been registered, press the [END] key to close the Parameter Change window. The system will then return to the Position Control Gain 1 Check window where the newly designated setting will be displayed at the setting value display area.
Setting ABORT	 To close the Parameter Change window without registering the newly entered data, press the [Esc] key. The system will then return to the Position Control Gain 1 Check window where the unchanged setting will be displayed at the setting value display area.

A If the position control gain 1 setting value is decreased by too much, a servo error will occur during high-speed operation. Be careful not to decrease the speed control gain 1 value excessively.

12.4 JOG Operation

JOG operation can be executed individually for each axis, based on the designated JOG operation data settings.

JOG operation can also be executed at the servomotors connected to an ADU or MR-H- \square -B.

Be sure to designate the necessary JOG data settings before beginning JOG operation, designating the settings at the parameter block which is to be used.

[Procedure to Display The JOG Execute Window]



[JOG Execute Window] (For A273UHCPU)



[Display/Setting Contents]

Execute forward and reverse JOG operations at each axis after checking that the START conditions shown at the right side of the window (monitor item display area) are satisfied.

Forward JOG START conditions

Servo error		OFF
External signal	FLS	ON
	STOP	OFF
Servo READY		ON

Reverse JOG START conditions

Servo error		
External signal	RLS	
_	STOP	OFF
Servo READY		

If the monitoring results indicate that the above START conditions are not satisfied, the JOG operation will not occur when the [F5] or [F6] key is pressed.

The monitor item which fails to satisfy the START conditions will be highlighted, and a "CANNOT START" error message will be displayed.

Monitor Item display area	Either the feed present value, or the ON/OFF status of the monitored device is displayed here.
Axis number display area	The axis number where the JOG operation is occurring is displayed here.
JOG speed display area	The JOG speed setting is displayed here.
Direction display area	The JOG direction (forward or reverse) is indicated here (highlight display).
Monitoring mark	Indicates that monitoring is in progress. (Not displayed when monitoring is stopped.)

[Key Operations]	
JOG speed setting/ change	 Press the [F4] key to change the JOG speed setting. At the JOG Speed Setting window which is then displayed, designate the desired speed setting. (See Section 12.2.4(2))
Executing forward JOG	 After designating the JOG speed setting, press and hold down the [F6] key (or [Shift] + [Alt] key) to execute a forward JOG operation. The motor will rotate at the designated JOG speed as long as the [F6] key (or [Shift] + [Alt] key) remains pressed. When the [F6] key (or [Shift] + [Alt] key) is released, the motor will decelerate and stop.
Executing reverse JOG	 After designating the JOG speed setting, press and hold down the [F5] key (or [Shift] + [Ctrl] key) to execute a reverse JOG operation. The motor will rotate at the designated JOG speed as long as the [F5] key (or [Shift] + [Ctrl] key) remains pressed. When the [F5] key (or [Shift] + [Ctrl] key) is released, the motor will decelerate and stop.
Designating the axis number	 To change the axis number where a JOG operation is to be executed, press the [F1] key. The Axis Designation window will then be displayed, and the axis number which follows the currently designated axis number will be indicated. Enter the number of the axis where a JOG operation is to be executed, then press the [Enter] key. After the axis number has been designated, the system will return to the JOG Execute window. To abort the axis designation procedure, press the [Esc] key. Use the [PAGE UP]/[PAGE DOWN] keys to switch to the previous axis number or the next axis number (relative to the axis number indicated at the Present Axis Number display area).
Monitor STOP/ RESTART	1) Press the [F3] key to stop the monitoring operation, or to resume the monitoring operation.
Error reset	1) Press the [F8] key to execute an error reset at the Error Reset window which is displayed. (See Section 12.9)
Changing the present value	 Press the [F9] key to change the feed present value. The feed present value can then be changed at the Present Value Change window which will be displayed (See Section 12.10).
Closing the window	1) Press the [Esc] key to close the JOG Execute window and return to the Servo Test Function Selection window.
	POINT
	If previously used JOG operation keys ([F6]/[F5]) are held pressed when a personal computer with high processing speed, there are cases that JOG operation cannot be executed correctly with a beep

keep sounding. Use the following keys to execute JOG operation when using a personal computer with high processing speed.

12.5 Manual Pulse Generator Operation

The designated axis is controlled in accordance with the number of pulse inputs from the manual pulse generator.

Manual pulse generator inputs can also be used to operate servomotors connected to an ADU or MR- \Box -B.

(When in the TEST mode, the simultaneous use of multiple manual pulse generators, or the use of a single manual pulse generator to simultaneously start more than one axis, is prohibited.)

Before executing manual pulse generator operation, the 1-6 procedure shown below is required. After the 1-6 settings have been designated, execute a test run using the manual pulse generator.

- 1. Manual pulse generator DISABLE setting
- 2. Manual pulse generator selection (A171SCPU selection impossible)
- 3. Axis number setting
- 4. 1-pulse input magnification setting
- 5. Smoothing magnification setting
- 6. Manual pulse generator ENABLE setting (writing of manual pulse generator operation data to the servo system CPU)
- (1) Executing manual pulse generator operation

[Procedure to Display The Manual Pulse Generator Execute Window]



[Manual Pulse Generator Execute Window] (For A273UHCPU)

THE PLATER PLATE THE PLATE	Axis number display area
THE PLA. GEN. PERMIT ENGLISE EXECUTE ENDOR CODE LOW 0	Manual pulse generator display area
ETE 1 PULSE MAG. SET ()	Manual pulse generator enabled/disabled display area
EMODINING MAG. SET L QICE-59> ENT.GIG. SOOD PILO ANIE 13145678	1-pulse input magnification display area
HNHUAL PLA.COM.1 PULKI HOUINHAT I 03 PLA STATT ACCEPT H2001 IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Smoothing magnification display area• ——— Monitor item display area ——— Travel value display area
SNOOTHING MAG. 19192 8	Monitoring mark
B Page Up Page 2000 Dack Space (IMMEDIALE STOL EsciCLOSE)	

POINT

The travel value per manual pulse generator pulse is as shown below.

- The travel value is calculated by the following formula: [Travel value]
- The "A" value varies according to the system-of-units being used, as shown below.= [manual pulse generator 1-pulse input magnification] × [A]

System-Of-Units	A
μm	0.1
inch	0.00001
degree	0.00001
PULSE	2

[Display/Setting Conf Monitor Item display area	tents] Either the feed present value, or the ON/OFF status of the monitored device is indicated here.
Axis number display area	The axis number where the manual pulse generator operation is being exe- cuted is displayed here.
Manual Pulse Generator display area	The manual pulse generator which is being used is indicated here.
Manual Pulse Generator Enabled/ Disabled display area	The manual pulse generator ENABLED/DISABLED status is indicated here by a highlight display.
1-Pulse Input Magnification display area	The magnification per manual pulse generator pulse input is indicated here.
Smoothing Magnification display area	The magnification which smooths the manual pulse generator's leading and trailing edges is indicated here.
Travel value display area	The travel value per manual pulse generator pulse is indicated here.
Monitoring mark display area	Indicates that monitoring is in progress. (Not displayed when monitoring is stopped.)
[Key Operations] Designating a manual pulse generator DISABLED setting	 If a manual pulse generator ENABLED setting is in effect when designating the manual pulse generator's operation data settings (axis number, 1- pulse input magnification, smoothing magnification), press the [F5] key to open the Manual Pulse Generator ENABLED/DISABLED window, select the DISABLED item, then designate the manual pulse generator's opera- tion data settings.
Selecting the manual pulse generator	 Press the [F2] key to select the manual pulse generator where operation is to be executed. The selection is made at the Manual Pulse Generator Setting window which will be displayed. (See Section 12.5(2)) (Not possible with A171SCPU).
Selecting the axis number	 Press the [F1] key to designate the axis number where manual pulse generator operation is to be executed. The Axis Designation window will then be displayed, and the axis number which follows the currently designated axis number will be indicated. Enter the number of the axis where manual pulse generator operation is to be executed, then press the [Enter] key. After the axis number has been designated, the system will return to the Manual Pulse Generator Execute window. To abort the axis designation procedure, press the [Esc] key. Use the [PAGE UP]/[PAGE DOWN] keys to switch to the previous axis number or the next axis number (relative to the axis number indicated at the Present Axis number display area).
Designating the 1-pulse input magnification	 Press the [F6] key to designate the 1-pulse input magnification setting at the 1-Pulse Input Magnification Setting window which will then be dis- played. (See Section 12.5(3))

/

Designating the smoothing magnification	1)	Press the [F7] key to designate the smoothing magnification at the Smoothing Magnification Setting window which will then be displayed. (See Section $12.5(4)$)
Writing (registering) the manual pulse generator data	1)	To write the designated manual pulse generator data settings (axis num- ber, 1-pulse input magnification, smoothing magnification) to the servo system CPU, press the [F5] key to open the Manual Pulse Generator ENABLED/DISABLED window, then select the ENABLED item. The operation data settings will then be written to the servo system CPU.
Monitor STOP/ RESTART	1)	Press the [F3] key to stop the monitoring operation, or to resume the monitoring operation.
Error reset	1)	Press the [F8] key to execute an error reset at the Error Reset window which is displayed. (See Section 12.9)
Changing the present value	1)	Press the [F9] key to change the feed present value. The feed present value can then be changed at the Present Value Change window which will be displayed (See Section 12.10).
Closing the window	1)	Press the [Esc] key to close the Manual Pulse Generator Execute window and return to the Servo Test Function Selection window.

- A Before executing manual pulse generator operation, always confirm that "ENABLE" is highlighted at the Manual Pulse Generator Enabled/Disabled display area.
- Multiply When manual pulse generator operation is completed, be sure to change the ENABLE status to DISABLE. Failure to do so could result in unexpected machine motion at certain machine models.

POINT

Precautions when ending manual pulse generator operation

• Axes where a manual pulse operation has been designated (where ENABLE has been designated at the Manual Pulse Generator Enabled/Disabled display area of the Manual Pulse Generator Execute window) can only be started from the manual pulse generator. When manual pulse generator operation is not being executed, the DISABLE setting must be designated.

(2) Manual pulse generator setting (Does not apply when using A171SCPU) Designate the manual pulse generator which is to be used as shown below.

[Manual Pulse Generator Setting Window) (For A273UHCPU)



[Display/Setting Contents]

Designate the desired manual pulse generator from those which are connected to connector SIF2 terminals P1-P3 at the servo input module.

[Key Operations]	
Selecting the manual pulse	generator.
generator	• For the manual pulse generator connected to terminal P1 (manual pulse generator No. 1)Enter [1].
	• For the manual pulse generator connected to terminal P2 (manual pulse generator No. 2)Enter [2].
	• For the manual pulse generator connected to terminal P3 (manual pulse generator No. 3)Enter [3].
	When a [1] to [3] key is pressed, the system will return to the Manual Pulse Generator Execute window, and the No. of the selected manual pulse generator will be displayed at the Manual Pulse Generator display area.
	2) The manual pulse generator can also be selected by using the $[\leftarrow]/[\rightarrow]$ keys to move the cursor to the desired manual pulse generator position, and then pressing the [Enter] key.
	The system will then return to the Manual Pulse Generator Execute window, and the number of the selected manual pulse generator will be displayed at the Manual Pulse Generator display area.
Setting ABORT	1) Press the [Esc] key to abort the manual pulse generator selection proce- dure.

(3) 1-pulse input magnification setting Designate the magnification setting per-pulse input from the manual pulse generator, as shown below.

[1-Pulse Input Magnification Setting Window] (For A273UHCPU)



[Display/Setting Contents]

Axis number display area	The axis number where a magnification setting is to be executed is displayed here.	
Input magnification display area	The previously designated input magnification setting is displayed here.	
Input magnification setting area	The input magnification setting is designated here.	
[Key Operations] Designating the 1-pulse input magnification setting	 Using the numeric keys, key in the desired 1-pulse input magnification setting, then press the [END] key. The setting operation will be ended, and the system will return to the Manual Pulse Generator Execute window. The designated setting value will be displayed at the 1-Pulse Input Mag- nification display area. 	
Setting ABORT	1) Press the [Esc] key to abort the setting operation.	

(4) Smoothing magnification setting Designate a magnification setting which ensures a smooth leading and trailing edge in manual pulse generator operation, as shown below.

[Smoothing Magnification Setting Window] (For A273UHCPU)



[Display/Setting Contents]

2

Axis number display area	The axis number where a magnification setting is to be executed is displayed here.
Smoothing magnification display area	The previously designated smoothing magnification setting is displayed here.
Smoothing magnification setting area	The smoothing magnification setting is designated here.
[Key Operations] Designating the smoothing magnification setting	 Using the numeric keys, key in the desired smoothing magnification set- ting, then press the [END] key. The setting operation will be ended, and the system will return to the Manual Pulse Generator Execute window. The designated setting value will be displayed at the Smoothing Magnifi- cation display area.
Setting ABORT	1) Press the [Esc] key to abort the setting operation.

12.6 Home Position Return Test

A home position return operation is executed as shown below.

[Procedure to Display The Home Position Return Test Execute Window]



[Home Position Return Test Execute Window] (For 273UHCPU)



[Display/Setting Contents]

Execute a home position return operation to determine if the home position return data (designated with the Axis Data Setting function of the Servo Data Setting mode) is appropriate.

- Home position return direction
- Home position return format
- Home position address
- Home position return speed
- Creep speed
- Travel value after dog
- Home position return second travel value

1) Home position return request	.Indicates whether or not a home position return is in progress.
2) Home position return END	.Indicates whether or not a home position return has been executed.
3) External signal dog	.Indicates whether or not the near-zero point dog has switched ON.
4) Travel value after dog	.Indicates the travel value which occurred after the dog (for "count type" home position returns).
5) Home position return second travel value	.Indicates the travel value that was required to reach the zero-point position after operation was stopped by near-zero dog OFF (at "near-zero point" home position returns).
The axis number where a here.	home position return is being executed is indicated
Indicates that monitoring stopped.)	is in progress. (Not displayed when monitoring is
	 Home position return request Home position return END External signal dog Travel value after dog Home position return second travel value The axis number where a here. Indicates that monitoring stopped.)

[Key Operations] Starting the home position return	 To execute the home position return operation, designate the axis number where the operation is to be executed, then press the [F5] key. A home position return will then be executed at the designated axis. For "near-zero point" formats, switch the near-zero point dog from ON to OFF. For "count" formats, switch the near-zero point dog ON. The home position return operation is completed when the home position return END signal switches ON.
Selecting the axis number	 Press the [F1] key to designate the axis number where a home position return operation is to be executed. The Axis Designation window will then be displayed, and the axis number which follows the currently designated axis number will be indicated. Enter the number of the axis where a home position return is to be executed, then press the [Enter] key. After the axis number has been designated, the system will return to the Home Position Return Test Execute window. To abort the axis designation procedure, press the [Esc] key. Use the [PAGE UP]/[PAGE DOWN] keys to switch to the previous axis number or the next axis number (relative to the axis number indicated at the Present Axis number display area).
Monitor STOP/ RESTART	1) Press the [F3] key to stop the monitoring operation, or to resume the monitoring operation.
Error reset	1) Press the [F8] key to execute an error reset at the Error Reset window which is displayed. (See Section 12.9)
Closing the window	 Press the [Esc] key to close the Home Position Test Execute window and return to the Servo Test Function Selection window.

12.7 Servo Program Test Operation

Start the servo program which has been written to the servo system CPU, in order to execute a test run.

The test run can be executed by either of the following 2 methods.

- Individual START.....Only the designated servo program (1 type) is started in order to check its operation.
- Sequential START.... Sequential operation of multiple servo programs (up to 30) can be started in their registered START order to check their operation. There are two methods for sequential START: the "continuous START" and "interrupted START" methods described below.
 - a) Continuous START
 - Following execution of the No. "n" program, the No. "n+1" program is automatically started. After execution of all designated programs is completed, operation is automatically stopped.
 - b) Interrupted START
 Following execution of the No. "n" program, operation is automatically stopped.
 In order to start the No. "n+1" program, the [F5] key must be pressed.

12.7.1 Individual START

Only the designated servo program is executed. (The designated program will be shown on-screen for confirmation.)

 Servo program test run (Individual START) setting The procedure for reading out the test run servo program in order to check it is described below.

[Procedure to Display The Servo Program Test Run (Individual START) Setting Window]



[Servo Program Test Run (Individual START) Setting Window]



[Display/Setting Contents]

Designate the servo program No. for which a test run is to be executed.

Program No. display area	The program No. read at the Program Readout window is displayed here.
Program display area	The servo program which was read out is displayed here.
[Key Operations] Designating a program readout	 Press the [F1] key to read out the servo program to be started. The Program Readout window will then be displayed. Using the numeric keys, key in the number of the program to be started, then press the [Enter] key. The system will then return to the Servo Program Test Run (Individual START) Setting window where the designated program No. will be dis- played at the Program No. display area. The content of that servo program will be displayed at the Program display area. If the designated servo program No. doesn't exist, a "PROGRAM NOT FOUND" error message will be displayed. If this occurs, repeat the pro- gram readout procedure, designating an existing program No.
Checking the program	 Check the readout of the speed switching & constant speed control instruc- tions. If the servo program contents cannot be contained in the Program display area, use the [Page Up]/[Page Down] keys to scroll up and down.
Setting END	1) Press the [END] key to end the servo program setting procedure. The Servo Program Test Run (Individual START) Execute window will then be displayed (See Section 12.7.1(2)), and an "SINGLE START COM- PLETED" message will be displayed at that window's message area.

Setting ABORT	 Press the [Esc] key to abort the servo program test run (individual START) setting operation and return to the Servo Test Function Selection window. The Servo Program Test Run (Individual START) Execute window is displayed (See 12.7.1 (2)).
Error reset	1) Press the [F8] key to execute an error reset at the Error Reset window which is displayed. (See Section 12.9)
Changing the present value	 Press the [F9] key to change the feed present value. The feed present value can then be changed at the Present Value Change

window which will be displayed (See Section 12.10).

(2) Executing the servo program test run (Individual START)

[Servo Program Test Run (Individual START) Execute Window] (For A273UHCPU)

EXFRUE FRUGRIGH (FS) (0FFR3) (5215) (F2)(0) (0) (FS)(1) (0) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (Nº CONTRACT REAL UINT. 1000 THTEL SUID REAL UINT. 1000 THEL REAL UINT. 12345678 0 0 0 SUID REAL 12345678 0 0 0 SUID REAL 12345678 0 0 SUID NID 12345678	Feed present value display area Error code display area Monitor device ON/OFF status display area Execution program No. display area Program setting error display area Error program No. display area
1 2 3 <u>\$101' 4</u>	Rank SpacestHad Deficits stup (Exections) (Starf 5 2 Starf ZPRESTAG	Monitoring mark

[Display/Setting Contents]

Check the servo program content by running the program. Error checks and feed present value changes can be executed at this time.

Feed present value display area	The positioning address and travel value of the operating axis are displayed here.
Error Code display area	Error codes of minor/major positioning errors which occurred at the operating axis are displayed here.
Monitor Device ON/OFF Status display area	1) START accept The axis number for which the START accept signal is ON is highlighted.
	2) Servo READYThe axis number for which the servo READY signal is ON is highlighted.
	3) Positioning STARTThe axis number for which the positioning START completed completed signal is ON is highlighted.
	4) Positioning The axis number for which the positioning completed completed signal is ON is highlighted.
Execution Program No. display area	The program No. which is currently being executed is indicated here.
Program Setting Error display area	The servo program setting error flag's ON/OFF status is indicated here.
Error Program No. display area	The servo program No. where a setting error occurred is indicated here.
Error Item display area	The error code for the servo program setting error is indicated here.
Monitoring mark	Indicates that monitoring is in progress. (Not displayed when monitoring is stopped.)

[Key Operations] Program START	1)	Press the [F5] key to execute a test run operation.
Program STOP	1)	Press the [F6] key to stop a servo program which is in progress. The servomotor will decelerate and stop in accordance with the "deceleration time" setting designated with the Parameter Block Setting function of the Servo Data Setting mode.
	2) 3)	To start the same servo program again, press the [F5] key. To change the program No., press the [Esc] key to return to the Servo Program Test Run Setting window, then designate the desired program No.
Monitor STOP/ RESTART	1)	Press the [F3] key to stop the monitoring operation, or to resume the monitoring operation.
Error reset	1)	Press the [F8] key to execute an error reset at the Error Reset window which is displayed. (See section 12.9)
Changing the present value	1)	Press the [F9] key to change the feed present value. The feed present value can then be changed at the Present Value Change window which will be displayed (see Section 12.10).
Switching the axis where status monitoring is executed (For A273UHCPU, 32-axis specifications)	1)	To monitor the signals shown below at axes subsequent to axis No. 8, press the [F10] (status) key. The monitored axis will be changed to the previous axis No. and next axis No. • START accept • Servo READY • Positioning START completed • Positioning completed
Closing the window	1)	Press the [Esc] key to close the Servo Program Test Run (Individual START) Execute window and return to the Servo Program Test Run (Individual START) Setting window.

POINT

START conditions

• A servo program operation START is possible only when all axes are stopped.

12.7.2 Sequential START of up to 30 programs

The starting order of the created servo programs is registered, and the programs are then executed consecutively.

(1) Servo program test run (Sequential START) setting

[Procedure to Display The Servo Program Test Run (Sequential START) Setting Window]



[Servo Program Test Run (Sequential START) Setting Window]



[Display/Setting Contents]

The numbers of the programs to be started, and their start sequence must be designated.

Program No. setting area	The numbers of the programs to be started are entered here.
Program display area	The contents of the designated program number are displayed here.
Program No <i>.</i> display area	The program number of the program content display is indicated here.
[Key Operations] Setting the program No.	 Use the cursor control keys (arrow keys) to move the cursor to the desired start sequence position, then use the numeric keys to key in the program number for that position.
Displaying the program	 To check the contents of a servo program, move the cursor to the start sequence position (line) where the program to be checked is located, then press the [F2] key. The contents of that program will then be displayed at the Program display area. Check the readout of the speed switching & constant speed control instruc- tions. If the servo program contents cannot be contained in the Program display area, use the [PAGE UP]/[PAGE DOWN] keys to scroll up and down.
Inserting a program No.	 To insert 1 line in the start sequence list, use the cursor control keys (arrow keys) to move the cursor to the position (line) where an insertion is desired, then press the [F1] key while pressing the [SHIFT] key. 1 line will be inserted at the cursor position, and subsequent lines will be moved down accordingly. Finally, enter the inserted program No.

Deleting a program No.	1)	To delete a program No. (1 line), use the cursor control keys (arrow keys) to move the cursor to the start sequence line to be deleted, then press the [F2] key while the [SHIFT] key is pressed. The program No. at the cursor position will be deleted, and the subsequent lines will be moved up accordingly.
Setting data ALL CLEAR	1)	Press the [F10] key to clear all servo programs shown at the Program No. display area.
Setting END	1)	Press the [END] key to end the execution program No. setting procedure. The Servo Program Test Run (Sequential START) Execute window will then be displayed (see Section 12.7.2(2)).
Setting ABORT	1)	Press the [F8] key to abort the Servo Program Test Run (Sequential START) Setting operation and return to the Servo Test Function Selection window.
Error reset	1)	Press the [F8] key to execute an error reset at the Error Reset window which is displayed. (See Section 12.9)
Changing the present value	1)	Press the [F9] key to change the feed present value. The feed present value can then be changed at the Present Value Change window which will be displayed (see Section 12.10).

(2) Executing the servo program test run (Sequential START)

[Servo Program Test Run (Sequential START) Execute Window] (For A273UHCPU)

SERVO PROGRAM LEST OPERATION: (SINGLE START)	
TXEE FTED DEFENSE ONCO. TANIL TANIL COLOR TANIL COLOR	Feed present value display area Error code display area Monitor device ON/OFF status display area Execution program No. display area Next program No. display area Frogram setting error display area Error program No. display area Error item display area Start method display area Monitoring mark

[Display/Setting Contents]

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Check the servo program content by running the program.

Error checks and feed present value changes can be executed at this time.

Feed present value display area	The positioning address and travel value of the operating axis are displayed here.
Error Code display area	Error codes of minor/major servo errors which occurred at the operating axis are displayed here.
Monitor Device ON/OFF Status	1) START accept The axis number for which the START accept signal is ON is highlighted.
display area	2) Servo READYThe axis number for which the servo READY signal is ON is highlighted.
	3) Positioning STARTThe axis number for which the positioning START completed completed signal is ON is highlighted.
	4) Positioning The axis number for which the positioning completed signal is ON is highlighted.
Execution Program No. display area	The program number which is currently being executed is indicated here.
Next Program No. display area	The program number to be started following completion of the current pro- gram is indicated here.
Program Setting Error display area	The servo program setting error flag's ON/OFF status is indicated here.
Error Program No. display area	The servo program number where a setting error occurred is indicated here.
Error Item display area	The error code for the servo program setting error is indicated here.
Start Method display area	The START method ("CONTINUOUS" or "INTERRUPTED") for sequential program operation is indicated by a highlight display. With the "CONTINUOUS" method, each successive program is started in a continuous manner without a break. With the "INTERRUPTED" method, a break occurs between successive pro- grams.
Monitoring mark	Indicates that monitoring is in progress. (Not displayed when monitoring is stopped.)

[Key Operations] START method switching	1)	Press the [F2] key to switch from the "CONTINUOUS" to the "INTER- RUPTED" method, and the [F1] key to switch from the "INTERRUPTED" to the "CONTINUOUS" method. (The default setting is "CONTINUOUS".) START method switching can be executed either before or during servo program operation.
Program START	1)	 Press the [F5] key to execute the test run operation. a) For "CONTINUOUS" start: Servo programs are started in order, beginning from the first program. After all registered programs are completed, the servomotor will stop, and a "COMPLETED" message will be displayed. b) For "INTERRUPTED" start: The servomotor will stop after the first program is completed. To start the second program, press the [F5] key again. When all registered programs are completed, a "COMPLETED" message will be displayed.
Program STOP	1)	Press the [F6] key to stop a servo program which is in progress. The servomotor will decelerate and stop in accordance with the "decelera- tion time" setting designated at the Parameter Block Setting function of the Servo Data Setting mode. To re-start the servo program, press the [Esc] key to return to the Servo Program Test Run Setting window, then designate the desired program No.
Monitor STOP/ RESTART	1)	Press the [F3] key to stop the monitoring operation, or to resume the monitoring operation.
Error reset	1)	Press the [F8] key to execute an error reset at the Error Reset window which is displayed. (See Section 12.9)
Changing the present value	1)	Press the [F9] key to change the feed present value. The feed present value can then be changed at the Present Value Change window which will be displayed (see Section 12.10).
Switching the axis where status monitoring is executed (For A273UHCPU, 32-axis specifications)	1)	To monitor the signals shown below at axes subsequent to axis No. 8, press the [F10] (status) key. The monitored axis will be changed to the previous axis number and next axis number. • START accept • Servo READY • Positioning START completed • Positioning completed
Closing the window	1)	Press the [Esc] key to close the Servo Program Test Run (Sequential START) Execute window and return to the Servo Program Test Run (Sequential START) Setting window.

|--|

START conditions

• A servo program operation START is possible only when all axes are stopped.

12.8 Designating Servo Program Addresses By The Teaching Function

An address reached by a JOG or manual pulse generator operation can be written to a specified servo program.

The servo program to be specified must be created in advance in the Servo Programming mode and written to the CPU. (An address of "0", with a rather slow commanded speed is recommended.)

(1) Teaching setting

[Procedure to Display The Teaching Setting Window]



[Teaching Setting Window]



[Display/Setting Contents]

The teaching procedure shown below is required for each operation.

- 1. Program readout
- 2. JOG or manual pulse generator operation
- 3. Present value writing
- 4. Program registration

Program No. The number of the program which was read out at the Program Readout window is displayed here.

Program display The content of the readout servo program is displayed here. **area**

[Key Operations]	
Designating a program readout	 Press the [F4] key to read out the servo program where an address is to be written.
	The Program Readout window will then be displayed.
	2) Using the numeric keys, key in the number of the servo program where an address is to written, then press the [Enter] key.
	The system will then return to the Teaching Setting window where the designated program number will be displayed at the Program No. display
	area. The sector of the transmission of the diserboard of the Decement diserboard of the transmission of t
	The content of that servo program will be displayed at the Program display
	area. If the designated servo program No. doesn't exist, a "PROGRAM

NOT FOUND" error message will be displayed. If this occurs, repeat the program readout procedure, designating an existing program number.

Checking the program	1)	Check the readout of the speed switching & constant speed control instruc- tions. If the servo program contents cannot be contained in the Program display area, use the [PAGE UP]/[PAGE DOWN] keys to scroll up and down.
Switching to the JOG Execute Window	1)	Press the [F2] key to execute a JOG operation in order to reach the feed present value which is to be written to the specified servo program. The JOG operation can be executed when the JOG Execute window is displayed (see Section 12.8(2)).
Switching to the Manual Pulse Generator Execute Window	1)	Press the [F3] key to execute a manual pulse generator operation in order to reach the feed present value which is to be written to the specified servo program. The manual pulse generator operation can be executed when the Manual Pulse Generator Execute window is displayed (see Section 12.8(3)).
Switching to the Teaching Execute Window	1)	Press the [F4] key to write the feed present value reached by a JOG or manual pulse generator operation to the specified servo program. The feed present value and the servo program can be registered at the Teaching Execute window which will be displayed (see Section 12.8(4)).
Error reset	1)	Press the [F8] key to execute an error reset at the Error Reset window which is displayed. (See Section 12.9)
Changing the present value	1)	Press the [F9] key to change the feed present value. The feed present value can then be changed at the Present Value Change window which will be displayed (see Section 12.10).
Closing the window	1)	Press the [Esc] key to close the Teaching Execute window and return to the Servo Program Test Function Selection window.

(2) Executing JOG operation
 The feed present value to be written to the specified servo program can
 be reached by executing JOG operation.
 Be sure to designate the JOG operation settings at the parameter block
 to be used before attempting JOG operation.

[JOG Execute Window]

7



[Display/Setting Contents]

Feed present value The feed present value of the monitored axis is displayed here. **display area**

Axis number display area	The axis number where the JOG operation is being executed is displayed here.
JOG speed display area	The JOG speed setting is displayed here.
Direction display area	The JOG direction (forward or reverse) is indicated here (highlight display).
Monitoring mark	Indicates that monitoring is in progress. (Not displayed when monitoring is stopped.)
[Key Operations] JOG speed setting/ change	 Press the [F4] key to change the JOG speed setting. At the JOG Speed Setting window which is then displayed, designate the desired speed setting. (See Section 12.2.4(2))
Designating the axis number	 Press the [F1] key to select the axis number where the JOG operation is to be executed. The Axis Designation window will then be displayed, and the axis number which follows the currently designated axis number will be indicated. Enter the number of the axis where JOG operation is to be executed, then press the [Enter] key. After the axis number has been designated, the system will return to the JOG Execute window. To abort the axis designation procedure, press the [Esc] key.
Executing forward JOG	 After designating the JOG speed setting, press and hold down the [F6] key (or [Shift] + [Alt] key) to execute forward JOG operation. The motor will rotate at the designated JOG speed as long as the [F6] key (or [Shift] + [Alt] key) remains pressed. When the [F6] key (or [Shift] + [Alt] key) is released, the motor will decelerate and stop.
Executing reverse JOG	 After designating the JOG speed setting, press and hold down the [F5] key (or [Shift] + [Ctrl] key) to execute reverse JOG operation. The motor will rotate at the designated JOG speed as long as the [F5] key (or [Shift] + [Ctrl] key) remains pressed. When the [F5] key (or [Shift] + [Ctrl] key) is released, the motor will decelerate and stop.

Error reset	1) Press the [F8] key to execute an error reset at the Error Reset window which is displayed. (See Section 12.9)
Changing the present value	 Press the [F9] key to change the feed present value. The feed present value can then be changed at the Present Value Change window which will be displayed (see Section 12.10).
Closing the window	1) Press the [Esc] key to close the JOG Execute window and return to the Servo Test Function Selection window.
	POINTS
	1) JOG operation start condition
	 If the monitoring results indicate that the START conditions shown below are not satisfied, a "CANNOT START" error mes- sage will be displayed. Check that the conditions are satisfied, then try the JOG opera- tion again.
	Forward JOG START conditions Beverse JOG START conditions
	Servo error OFF Servo error OFF
	External signal FLS 🔳 ON 🛛 External signal RLS 🔳 ON
	STOP OFF STOP OFF
	Servo READY ON Servo READY ON
	 2) If previously used JOG operation keys ([F6]/[F5]) are held pressed when a personal computer with high processing speed, there are cases that JOG operation cannot be executed correctly with a beep keep sounding. Use the following keys to execute JOG operation when using a personal computer with high processing speed. Forward rotation [Shift] + [Alt] keys (previously [F6] key was used) Reverse rotation [Shift] + [Ctrl] keys
	(previously [F5] key was used)

- (3) Executing a manual pulse generator operation The feed present value to be written to the specified servo program can be reached by executing a manual pulse generator operation. Before executing manual pulse generator operation, settings 1 to 6 shown below must be designated. After the settings have been designated, execute a test run using the manual pulse generator.
 - 1. Manual pulse generator DISABLE setting
 - 2. Manual pulse generator selection (A171SCPU selection impossible)
 - 3. Axis number setting
 - 4. 1-pulse input magnification setting
 - 5. Smoothing magnification setting
 - 6. Manual pulse generator ENABLE setting (writing of manual pulse generator operation data to the servo system CPU)

[Manual Pulse Generator Execute Window] (For A273UHCPU)

	Axis number display area
FIT AXIS FIT FIT AXIS FIT FIT </th <th>Manual pulse generator display area Manual pulse generator enabled/disabled display area </th>	Manual pulse generator display area Manual pulse generator enabled/disabled display area

[Display/Setting Contents]

Feed present value The feed present value of the monitored axis is displayed here.

Axis number display area	cuted is displayed here.
Manual Pulse Generator display area	The manual pulse generator which is being used is indicated here.
1-Pulse Input Magnification display area	The magnification per manual pulse generator pulse input is indicated here.
Smoothing Magnification display area	The magnification which smooths the manual pulse generator's leading and trailing edges is indicated here.
Manual Pulse Generator Enabled/ Disabled display area	The manual pulse generator ENABLED/DISABLED status is indicated here by a highlight display.
Travel value display area	The travel value per manual pulse generator pulse is indicated here.
Monitoring mark	Indicates that monitoring is in progress. (Not displayed when monitoring is stopped.)

POINT

The travel value per manual pulse generator pulse is as shown below.

- The travel value is calculated by the following formula: [Travel value]
 - = [manual pulse generator 1-pulse input magnification] × [A]
- The "A" value varies according to the system-of-units being used, as shown below.

System-Of-Units	A
μm	0.1
inch	0.00001
degree	0.00001
PULSE	2

[Key Operations] Designating a manual pulse generator DISABLED setting	1)	If a manual pulse generator ENABLED setting is in effect when designating the manual pulse generator's operation data settings (axis number, 1- pulse input magnification, smoothing magnification), press the [F5] key to open the Manual Pulse Generator ENABLED/DISABLED window, select the DISABLED item, then designate the manual pulse generator's opera- tion data settings.
Selecting the manual pulse generator	1)	Press the [F4] key to select the manual pulse generator where operation is to be executed. The selection is made at the Manual Pulse Generator Setting window which will be displayed. (See Section 12.5(2)) (Not possible with A171SCPU).
Selecting the axis number	1) 2)	Press the [F1] key to designate the axis number where manual pulse generator operation is to be executed. The Axis Designation window will then be displayed, and the axis number which follows the currently designated axis number will be indicated. Enter the number of the axis where manual pulse generator operation is to be executed, then press the [Enter] key. After the axis number has been designated, the system will return to the Manual Pulse Generator Execute window. To abort the axis designation procedure, press the [Esc] key.
Designating the 1-pulse input magnification	1)	Press the [F6] key to designate the 1-pulse input magnification setting at the 1-Pulse Input Magnification Setting window which will then be displayed. (See Section 12.5(3))
Designating the smoothing magnification	1)	Press the [F7] key to designate the smoothing magnification at the Smoothing Magnification Setting window which will then be displayed. (See Section $12.5(4)$)
Writing (registering) the manual pulse generator data	1)	To write the designated manual pulse generator data settings (axis num- ber, 1-pulse input magnification, smoothing magnification) to the servo system CPU, press the [F5] key to open the Manual Pulse Generator ENABLED/DISABLED window, then select the ENABLED item. The operation data settings will then be written to the servo system CPU.
Monitor STOP/ RESTART	1)	Press the [F3] key to stop the monitoring operation, or to resume the monitoring operation.
Error reset	1)	Press the [F8] key to execute an error reset at the Error Reset window which is displayed. (See Section 12.9)

Changing the present value	 Press the [F9] key to change the feed present value. The feed present value can then be changed at the Present Value Change window which will be displayed (see Section 12.10).
Olegian the window	1) Proce the (East) you to close the Manuel Pulse Concreter Evolute window

Closing the window 1) Press the [Esc] key to close the Manual Pulse Generator Execute window and return to the Servo Test Function Selection window.

- A Before executing manual pulse generator operation, always check that "ENABLE" is highlighted at the Manual Pulse Generator Enabled/Disabled display area.
- Multiply When manual pulse generator operation is completed, be sure to change the ENABLE status to DISABLE. Failure to do so could result in unexpected machine motion with some machines.

POINT

Precautions when ending manual pulse generator operation

• Axes where a manual pulse operation has been designated (where ENABLE has been designated at the Manual Pulse Generator Enabled/Disabled display area of the Manual Pulse Generator Execute window) can only be started from the manual pulse generator. When manual pulse generator operation is not being executed, the DIS-ABLE setting must be designated.

(4) Executing the teaching function The teaching function is executed to write the feed present value (reached by a JOG or manual pulse generator operation) to the specified servo program.

[Teaching Execute Window]



[Display/Setting Contents]

After designating the axis or point, the feed present value is written to the specified servo program which is then registered in the servo system CPU's internal memory.

- Writing by axis designation Writing is executed only for the specified axes within the point range.
- Writing by point designation Writing is executed for all axes within the point range.

Feed present value display area	The feed present values of axes involved in the JOG or manual pulse generator operation are displayed here.
Program display area	The content of the servo program where the feed present value is to be written is displayed here.
Point Designation display area	When the point designation writing format is designated, the "POINT" item is highlighted. When the axis designation writing format is designated, the "POINT" item is not highlighted.
Point No. display area	Switching point numbers for speed switching control, and pass point numbers for constant speed control are displayed here. (The number of points for other servo instructions is indicated by a "1" display.)
Write Designation mark	This mark is displayed to the left of axes where feed present value writing is being executed. (Axes where this mark is not displayed are not included in the writing operation.)
Monitoring mark	Indicates that monitoring is in progress. (Not displayed when monitoring is stopped.)

[Key Operations] Selecting the axis designation writing format	1) 2)	Before designating the axis where writing is to be executed, make sure that the "Point Designation" display item is not highlighted. If it is highlighted, press the [F1] key to cancel the highlight display. Use the $[\uparrow]/[\downarrow]$ keys to move the Program display area cursor to the line for the axis where feed present value writing is to be executed. A "write mark" (#) will be displayed to the left of the designated axis.
Selecting the POINT DESIGNATION writing format	1) 2)	Before designating the axis where writing is to be executed, make sure that the "Point Designation" display item is highlighted. If it is not highlighted, press the [F1] key to highlight it. Use the $[\uparrow]/[\downarrow]$ keys to move the Program display area cursor to the lines of the axes included in the feed present value writing operation. A "write mark" (#) will be displayed to the left of all axes included in the point range.
Write EXECUTE	1)	After making the axis designation or POINT DESIGNATION setting, press the [F5] key to execute writing. The feed present value displayed at the Present Value display area will then be written to the specified servo program.
Registering the program	1)	When writing to the specified servo program is completed, press the [F6] key to register the program at the servo system CPU. When registration is completed, a "COMPLETED" message will be displayed.
Monitor STOP/ RESTART	1)	Press the [F3] key to stop the monitoring operation, or to resume the monitoring operation.
Closing the window	1)	Press the [Esc] key to close the Teaching Execute window and return to the Teaching Setting window.

POINT

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Programs where writing is prohibited Writing of values shown at the feed present value display area is prohibited when INC \Box instructions exist.
12.9 Error Reset

An error reset can be executed to clear the servo system CPU's error code storage area, and to reset the error flag. Execute an error reset after eliminating the error cause.

[Procedure to Display The Error Reset Window]



[Error Reset Window] (For A273UHCPU)



[Display/Setting Contents]

Error information for each axis is displayed. After checking the error content and correcting the problem, execute an all-axis error reset.

Axis number display area	The axis number is displayed here.
Error Detection display area	A highlight display occurs when minor/major errors are detected.
Servo Error Detection display area	A highlight display occurs when a servo amplifier error is detected.
Error Code display area	The error codes of minor/major/servo errors which have occurred are displayed here.
Monitoring mark	Indicates that monitoring is in progress. (Not displayed when monitoring is stopped.)

-

[Key Operations]		
Executing an error reset	1) 2)	Press the [F5] key to execute an error reset. An "EXECUTE? YES/NO" dialog box will then be displayed. With the YES item highlighted, press the [Enter] key. An error reset will then occur, the error detection and servo error detection signals will switch OFF, and "0" will be displayed for all items at the Error Code display area.
Monitor STOP/ RESTART	1)	Press the [F3] key to stop the monitoring operation, or to resume the monitoring operation.
Switching the monitored axis (For A273UHCPU 32-axis specs)	1)	To display error statuses at axes subsequent to axis No. 8, use the [PAGE UP]/[PAGE DOWN] keys. The monitored axis will change to the previous or next axis No. accordingly.
Closing the window	1)	Press the [Esc] key to close the Teaching Execute window and return to the Teaching Setting window.

12.10 Changing The Present Value

A forced change of the present value sent to the servo system CPU can be executed in the Servo Test mode.

[Procedure to Display The Present Value Change Window]



[Present Value Change Window] (For A273UHCPU)



[Display/Setting Contents]

Designate the axis number where a present value change is desired, then enter the change value.

Axis number display area	The axis number where a feed present value change is to be executed is displayed.
START Accept ON/ OFF display area	The ON/OFF status of the START accept signal is indicated here. If the feed present value is to be changed, make sure that this signal is OFF.
Feed present value display area	The feed present value of each axis is displayed here.
Change Data Input area	The change data is entered here.
Setting Range display area	The setting ranges for each control system-of-units are displayed here.
Monitoring mark	Indicates that monitoring is in progress. (Not displayed when monitoring is stopped.)
[Key Operations] Designating the axis number	1) Use the $[\uparrow]/[\downarrow]$ keys to move the cursor to the axis number line where the feed present value change is to be executed.
Entering the change data	 Move the cursor to the axis for which the present value is changed and press the [Enter] key to display the input cursor in the change data input area. Using the numeric, [.], and [-] keys, key in the desired change value, then press the [Enter] key.

Monitor STOP/ RESTART	1) Press the [F3] key to stop the monitoring operation, or to resume the monitoring operation.
Switching the monitored axis (For A273UHCU 32-axis specifications)	 To display error statuses at axes subsequent to axis No. 8, use the [PAGE UP]/[PAGE DOWN] keys. The monitored axis will change to the previous or next axis number accordingly.
Closing the window	 Press the [Esc] key to close the Present Value Change window and return to the Servo Test Function Setting/Execute window.

POINT

Precautions when changing the feed present value

• A feed present value change cannot be executed at axes which are operating, or at axes where a servo error is active. Before changing the value, stop the axis or confirm that the servo error signal is OFF.

12.11 Servo ON/OFF

ON/OFF switching can be executed for all axes or for individual axes.

[Procedure to Display The Servo ON/OFF Switching Window]



1

- All Axis Servo OFF 1) Press the [F10] key to set all axes to the servo OFF status. The highlight display of all Servo ON/OFF items (except those designated as OFF) will switch OFF. The highlight display at the All Axis Servo START Accept ON/OFF display area will also be switched OFF.
- **Closing the window** 1) Press the [Esc] key to close the Servo ON/OFF Switching window and return to the Servo Test Function Selection window.

The servo monitor mode is a mode to monitor the positioning status, including present values and errors.

Outline of the functions The functions below are offered by the GSV13PE servo monitor mode.





(2) Outline of the procedure The procedure is shown below use the servo monitor mode.

- (3) Switching to other functions Press the [Alt] + [F11] keys to switch between the servo monitor mode and the "ladder monitor" in the ladder mode of the GPP functions. Details of this switching are given below.
 - (a) If the ladder monitor is selected from the servo monitor, monitoring begins from the first step of the sequence program section.
 - (b) If the servo monitor is selected from the ladder monitor, the present value enlarged monitor window is displayed.
 - (c) If the ladder monitor is selected from the servo monitor and then the servo monitor is selected again, monitoring starts from the monitor function selected during the previous servo monitor mode.
 - (d) If the servo monitor is selected from the ladder monitor and then the ladder monitor is selected again, monitoring begins from the step at which the servo monitor mode was switched.

POINTS

- Checking the meaning of displayed error codes
 In the servo monitor mode, the meaning of any error code monitored
 in a window can be checked by pressing the [F12] key to open the
 guidance HELP window and checking the error code meaning from
 there.
 However, the guidance HELP window cannot be displayed from the
- (2) The menu selection window is not displayed from the present value monitor.

13.1 Present Value Monitor

Batch monitors the present values and error codes for all operated axes. Use the present value monitor during system operation to check the present values or to determine whether an error has occurred.

- (1) Types of present value monitor function
 - The present value monitor offers the following two functions:
 - Present value enlarged monitor... Displays the feed present values or actual present values in enlarged
 - characters

 Present value detailed monitor.....Displays details about the feed
 present values and error codes
- (2) Starting the present value enlarged monitor Select the present value enlarged monitor from the servo monitor function selection window to display the present value enlarged monitor window and start monitoring of the feed present values.
- (3) Starting the present value detailed monitor Press the [F8] key from the present value enlarged monitor window to display the present value detailed monitor window and start monitoring of the feed present values.
- (4) Switching between the present value enlarged monitor and present value detailed monitor

When the present value enlarged monitor window or the present value detailed monitor window is displayed, press the [F8] key to switch from the present value enlarged monitor to the present value detailed monitor, or from the present value detailed monitor to the present value enlarged monitor.



13.1.1 Present value enlarged monitor

Displays the feed present values or actual present values for all axes in enlarged characters.

[Procedure to Display the Present Value Enlarged Monitor Window]



[Present Value Enlarged Monitor Window] (A273UHCPU)

	<u> </u>		
AU 13	THE F WAL THE SHOLEN ANTS	7233 7 WK, 2388, 540 824	Avis number display area
1	200000 5	00	
2			Present value display area
3	1888854 7		Servo error display area
4			Emergency stop display area
	11. 2012 - 11. 2014 -		———Monitoring mark

[Display/Setting Contents]

Axis number display Displays the operated axis numbers. area

Present valueDisplays the present value from the servo system CPU to the operated axis,display areaor the feedback present value from the operated axis to the servo system
CPU.

Error display area Indicates if a minor error or major error occurred in the operated axis.

Servo error display Indicates if a servo error occurred in the operated axis.

Emergency stop Mark highlighted if an emergency stop was applied to the axis.

Monitoring mark Indicates that monitoring is being carried out. Not displayed when monitoring is stopped.

REMARKS

- 1) If a servomotor is mounted but the Servo Ready signal is OFF, the display of the corresponding axis number and present value is highlighted.
- 2) If no servomotor is mounted and the Servo Ready signal is OFF, the display of the corresponding axis number and present value is not highlighted.

[Key Operations] Switching Present Value Display

area

display area

1) Press the [F1] key to switch between the feed present value display and the actual present value display.

Selecting to Present Value Detailed Monitor

1) Press the [F8] key to select the present value detailed monitor and display the present value detailed monitor window. (See Section 13.1.2.)

Stopping and Restarting Monitoring	1) Press the [F3] key to stop monitoring or to restart monitoring.
Switching Present Value Monitored Axes (when using A273UHCPU (32-axis specifications))	 When monitoring more than 8 axes, press the [Page Up] or [Page Down] key to switch to the previous or subsequent page of monitored axes.
Closing the Window	1) Press the [Esc] key to close the present value enlarged monitor window and revert to the servo monitor function selection window.

13.1.2 Present value detailed monitor

Displays information including the present values, error codes, and executed program number for all operated axes.

[Procedure to Display the Present Value Detailed Monitor Window]



[Present Value Detailed Monitor Window] (A273UHCPU)



[Display/Setting Contents]

display area

Axis number display The operated axis numbers are highlighted when the servo is OFF. area

Start accept ON/OFF Highlighted when the start accept signal is ON. display

Feed present value	Displays the present value from the servo system CPU to the operated axis.
display area	

Program number Displays the executed servo program number.

REMARK

- During jog operation, manual pulse generator operation, or a test operation, the program number is displayed as listed below:
 - JOG operation.....JOG

 - No positioning control blank

Command address display area	Displays the command address output from the servo system CPU to the servo amplifier (actual controlled data after unit conversion).
Commanded speed display area	Displays the commanded speed output from the servo system CPU to the servo amplifier (actual controlled data after unit conversion).

Error display area	Displays the error code of a major or minor error occurring in the operated axis.
Torque limit value display area	Displays the torque limit value.
PC Ready ON/OFF display	Highlighted when the PC ready signal (M2000) is ON.
PCPU ready ON/OFF display	Highlighted when the PCPU is normal.
Test mode ON/OFF display	Highlighted during test mode operation.
Program setting error display	Highlighted if an abnormality exists in the positioning data of the currently executing servo program.
Emergency stop display area	Mark highlighted if an emergency stop was applied to the axis.
Monitoring mark	Indicates that monitoring is being carried out. (Not displayed when monitoring is stopped.)
[Key Operations] Selecting Present Value Enlarged Monitor	 Press the [F8] key to select the present value enlarged monitor and display the present value enlarged monitor window. (See Section 13.1.1.)
Stopping and Restarting Monitoring	1) Press the [F3] key to stop monitoring or to restart monitoring.
Switching Present Value Monitored Axes (when using A273UHCPU (32-axls specifications))	 When monitoring more than 8 axes, press the [Page Up] or [Page Down] key to switch to the previous or subsequent page of monitored axes.
Switching Servo Ready Monitored Axes (when using A273UHCPU (32-axis specifications))	 When monitoring the servo ready signal for more than 8 axes, press the [F10] (servo ready) key to switch between the previous or subsequent pages of monitored axes.
Closing the Window	1) Press the [Esc] key to close the present value detailed monitor window and revert to the servo monitor function selection window.

13.2 Displaying the Error Lists

Displays the error codes and error contents for up to 15 of the most recent errors.

The error list monitor functions are useful for checking the control status of the servo system CPU and the causes of errors.

Check the servo system and correct the positioning data and servo program after referring to the error contents.

(1) Types of error list monitor function

The error list monitor offers the following two functions:

- Normal monitor..... Monitors the errors occurring in all axes
- Designated-axis monitor..... Monitors the errors occurring in desig-
- nated axes
 (2) Starting the normal monitor Select the error list monitor from the servo monitor function selection window to display the "error list monitor" (normal) window and start

monitoring the errors occurring in all operated axes.

- (3) Starting the designated-axis monitor Press the [F8] key from the error list monitor (normal) window to display the error list monitor (designated-axis) and monitor the error occurring in Axis 1.
- (4) Switching between the normal monitor and designated-axis monitor When the error list monitor (normal) window or error list monitor (designated-axis) window is displayed, press the [F8] key to switch from the normal monitor to the designated-axis monitor, or from the designatedaxis monitor to the normal monitor.



(5) Clearing of the error list

The error list is cleared at the following times:

- On the leading edge of the PC ready (M2000) signal
- When the PC ready signal is OFF and the servo system CPU is switched to test mode

(The error list is not cleared if the servo system CPU is switched to test mode while the PC ready signal is ON.)

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.

13.2.1 Error list monitor (Normal)

Displays a maximum of 15 of the following errors occurring since the leading edge of the PC ready (M2000):

- Minor error
- Major error
- Servo error
- Servo program setting error

[Procedure to Display the Error List Monitor (Normal) Wind]



[Error List Monitor (Normal) Window] (A273UHCPU)



[Display/Setting Contents]

LED display area An error message is displayed here if an error occurs at the PCPU.

Error number display area	Displays the sequence in which the error occurred. Number 1 is the oldest error and number 15 the most recent.
Error axis number display area	Displays the number of the axis where the error occurred.
Program number display area	Displays the number of the servo program running when the error occurred.

REMARK

- If the error occurs during JOG operation, manual pulse generator operation, or a test operation, the error is displayed as listed below:
 - JOG operation.....JOG
 - Manual pulse generator...... MAN

Error code display area

Displays the type and error code of the error.

REMARK

1) The error is type is displayed as follows:

٠	Minor error	LOW
٠	Major error	HIGH
•	Servo error	SERVO
•	Servo program setting error	SVO.P

Error contents display area	Displays the contents of the error which occurred.
Set data display area	Displays the set data after a data setting error occurs.
Servo ready ON/OFF display area	Highlights the motor numbers for which the servo ready is ON.
Start accept ON/OFF display area	Highlights the motor numbers for which the start accept signal is ON.
Manual pulse generator axis setting error display	Highlighted if an abnormality exists in the manual pulse generator operation set data (axis umber, manual pulse generator input magnification, etc.). The register number containing the abnormal set data is also displayed.
Test mode request error display	Highlighted if the servo system CPU did not switch to test mode after a test mode request was made at the GSV13PE.
PC Ready ON/OFF display	Highlighted when the PC ready signal (M2000) is ON.
PCPU ready ON/OFF display	Highlighted when the PCPU is normal.
Test mode ON/OFF display	Highlighted during test mode operation.
Program setting error display	Highlighted if an abnormality exists in the positioning data of the currently executing servo program.
Emergency stop display area	Mark highlighted if an emergency stop was applied to the axis.
Monitoring mark	Indicates that monitoring is being carried out. Not displayed when monitoring is stopped.
[Key Operations] Selecting to Designated-axis Monitor	1) Press the [F8] key to select the designated-axis monitor and display the error list monitor (designated-axis) window. (See Section 13.2.2.)
Stopping and Restarting Monitoring	1) Press the [F3] key to stop monitoring or to restart monitoring.
Switching Status Display Axes (when using A273UHCPU (32-axis specifications))	 When monitoring the servo ready signal for more than 8 axes, press the [F10] (status) key to switch between the previous or subsequent pages of monitored axes.
Closing the Window	1) Press the [Esc] key to close the error list monitor (normal) window and revert to the servo monitor function selection window.

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13.2.2 Error list monitor (designated-axis)

Displays the most recent error which occurred for the designated axis.

[Procedure to Display the Error List Monitor (Designated-axis) Window]



[Error List Monitor (Designated-axis) Window] (A273UHCPU)



[Display/Setting Contents]

Axis number display area	Displays the currently monitored axis number.
Error code display area	Displays the error codes for the current minor error, major error, servo error, or servo program setting error.
Error contents display area	Displays the contents of the error which occurred.
Program number display area	Displays the number of the program which was executing when the error occurred.
,	REMARKS
	 If the error occurs during JOG operation, manual pulse generator operation, or a test operation, the error is displayed as listed below: JOG operation

- Positioning control Gain 1 check (servo diagnosis)...... TEST
- Rotation direction check (servo startup)...... TEST
- No positioning control..... blank
- 2) See Section 13.2.1 for any items displayed on the screen but not described in this section.

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[Key Operations] Selecting to Normal Monitor	1)	Press the [F8] key to monitor all axes and display the error list monitor (normal) window. (See Section 13.2.1.)
Changing Axis Number	1) 2)	Press the [F1] key to change the axis designated for the designated-axis monitor. A window is displayed to designate the axis. (The displayed axis number is the next axis number after the currently monitored axis number.) Input the axis number to be monitored and press the [Enter] key to end axis designation and revert to the error list monitor (designated-axis) window. Press the [Page Up] or [Page Down] key to display the axis number before or after the axis number displayed in the axis number display area.
Stopping and Restarting Monitoring	1)	Press the [F3] key to stop monitoring or to restart monitoring.
Switching to Servo Ready Monitor (when using A273UHCPU (32-axis specifications))	1) 2)	When the start accept monitor is displayed, press the [F10] key to display the servo ready monitor. When monitoring the servo ready signal for more than 8 axes, press the [F10] key again to switch between the previous or subsequent pages of monitored axes.
Switching to Start Accept Monitor (when using A273UHCPU (32-axis specifications))	1) 2)	When the servo ready monitor is displayed, press the [F9] key to display the start accept monitor. When monitoring the start accept signal for more than 8 axes, press the [F9] key again to switch between the previous or subsequent pages of monitored axes.
Closing the Window	1)	Press the [Esc] key to close the error list monitor (designated-axis) window and revert to the servo monitor function selection window.

13.3 Monitoring Designated-Axis Positioning Data

Monitors positioning details for any axis. Use this monitoring during trial operation and to check an abnormal operation. The torque trace is used to view the actual load status when checking motor selection.

(1) Types of axis monitor function

The axis monitor offers the following three functions:

- Positioning monitor......Monitors detailed positioning data
- Servo monitor......Monitors servo data and runs the torque trace for the designated axis
 - Trace graph......Traces and graphically displays position commands, position droop, motor speed, motor current, or speed commands
- (2) Starting the positioning monitor Select the axis monitor from the servo monitor function selection window to display the positioning monitor window and start monitoring the positioning data set for Axis 1.
- (3) Starting the servo monitor Press the [F8] key from the positioning window to display the servo monitor window and start monitoring the servo data set for the axis which was monitored in the positioning window.
- (4) Trace graph display Press the [F7] key from the positioning window to display the trace graph display window.
 Designate the axis and set the trace data, then run the trace to display the trace results as a graph.
- (5) Switching between the positioning monitor and the servo monitor or trace graph

Switch between the positioning monitor and servo monitor or trace graph by pressing the key shown below from the appropriate window.



13.3.1 Positioning monitor

Monitors detailed positioning data set for any axis.

[Procedure to Display the Positioning Monitor Window]



[Display/Setting Contents]

Axis number display area	Displays the currently monitored axis number.			
Monitored data	Displays the positioning data under PCPU control.			
display area	1) Feed present value larget address output to servo amplifier.			
	 Actual present value Present value determined on the basis of actual travel 			

- 3) Deviation counter value ... Difference between feed present value and actual present value
- 4) Execution program Number of executing servo program number
- 5) Actual servo instruction ... Servo instruction being executed
- 6) Command address..... Actual controlled data after unit conversion (position control)
- 7) Command speed Actual controlled speed after unit conversion (speed control)
- 8) Error code Error code of most recent minor, major, servo error
- 9) M code/torque M code/torque limit value of executing servo limit value program
- 10) Actual present value Actual present value when external stop signal (STOP) is input
- 11) Changed travel value Changed travel value for position control under speed/position switching control
- 12) Changed present value Feed present value after it is changed
- 13) Changed speed Speed after it is changed

	 14) JOG speed		
	16) SV from dog ON Travel value from near-zero point dog until home position return is complete		
	17) Home position return Second travel value from stop position to zero second travel value point		
Positioning signal (input) ON/OFF status display area	Displays the ON/OFF status of each signal which indicates the control status of each axis.		
Positioning signal (output) ON/OFF status display area	Displays the ON/OFF status of the positioning control command signals.		
Servo ready ON/OFF display area	Highlights the motor numbers for which the servo ready is ON.		
Start accept ON/OFF display area	Highlights the motor numbers for which the start accept signal is ON.		
Manual pulse generator enabled display area	Highlighted during positioning control using inputs from the manual pulse generator.		
Jog operation simultaneous start command display area	Highlighted during jog operation simultaneous start.		
PC Ready ON/OFF display	Highlighted when the PC ready signal (M2000) is ON.		
PCPU ready ON/OFF display	Highlighted when the PCPU is normal.		
Test mode ON/OFF display	Highlighted during test mode operation.		
Program setting error display	Highlighted if an abnormality exists in the positioning data of the currently executing servo program.		
Emergency stop display area	Mark highlighted if an emergency stop was applied to the axis.		
Monitoring mark	Indicates that monitoring is being carried out. Not displayed when monitoring is stopped.		
[Key Operations] Changing Axis Number	 Press the [F1] key to change the axis designated for the positioning monitor. A window is displayed to designate the axis. (The displayed axis number is the next axis number after the currently monitored axis number.) Input the axis number to be monitored and press the [Enter] key to end axis designation and revert to the positioning monitor window. Press the [Page Up] or [Page Down] key to display the axis number before or after the axis number displayed in the axis number display area. 		

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Switching Status/Command Signal Names	1) To display the names of the currently monitored status signals and command signals on the screen, first press the [F4] key to display the auxiliary function selection window.
	 Select the name display status with the [←]/[→] keys and press the [Enter] key.
	Alternatively, select the name display status with the number keys.
	3) The positioning monitor window changes to the selected name display status.
	Press the [Esc] key to close the auxiliary function selection window without selecting an auxiliary function.
	The positioning monitor window name display status remains unchanged.
Selecting the Trace Graph Functions	 Press the [F7] key to run the data trace or display the trace results. The trace graph display window is displayed (see Section 13.3.3).
Selecting the Servo Monitor Functions	 Press the [F8] key to use the servo monitor or run the torque trace. The servo monitor window is displayed (see Section 13.3.2).
Stopping and Restarting Monitoring	1) Press the [F3] key to stop monitoring or to restart monitoring.
Closing the Window	1) Press the [Esc] key to close the positioning monitor window and revert to the servo monitor function selection window.

(b) Status signal ON/OFF display (with status names)

Displays the present PCPU positioning control data and the names and ON/OFF status of the signals which indicate the positioning status (status signals).

[Positioning Monitor Window] (with status name display)

	A CANADA ANA ANA ANA ANA ANA ANA ANA ANA AN		Axis number display area
PRBRI DEDI EXIC SERVI ADDR SPRR	DAT ULARE —	START PLETE ON 2 TINOL TINOL	
H COMPANY	II (34/4 STAID) 8/ 8/16 MIG (36/6) 22 NO NO DE/TOMONT 18/25 X MIG (37/5) 25 NO MIC VALAR (STOP) 8/12 MIG (37/5) 25 NO MIC VALAR (STOP) 8/12 MIG (37/5) 25 NO MIC VALAR (STOP) 22 NO MIC 2 MIC VALAR CAMARX 8/12 MIG (32 ZZ NO MIC 1 8/17 VALAR CAMARX 8/12 MIG (32 ZZ NO MIC 1	ECTION (712812) IOR () IOR () INGRIEST (712813) OMPLETE (712813)	Positioning signal (input) ON/OEE status display area
JOC /	9 CHINNES 9 FL2/2000 FL2 PIED CHINNES 9 FL2/2000 FL2 CHINNER NOUZHENNT 9 FL2 HENT (DOG ON) 9 FL2 HIST(DOG ON) 9 FL2 HISTED ERIOD REAL FL2 HISTED ERIOD REAL FL2 HISTED ERIOD REAL		
ar C Eage T ist	A BUT ALL AND A CARACTER AND A CARAC	Provide B	Monitored data display area

[Display/Setting Contents]

Axis number display area	Displays the currently monitored axis number.		
Monitored data display area	Displays the positioning data under PCPU control.		
Positioning Signal (input) ON/OFF	1)	Positioning start	Signal turns ON when positioning control start is completed for the designated axis.
status display area	2)	Positioning completed	Signal turns ON when positioning control is completed for the designated axis.
	3)	In-position	Signal turns ON if the number of accumulated pulses at the deviation counter is within the in-position range.
	4)	Command in-position	Signal turns ON if the difference between the command position and feed present value is within the command in-position range.
	5)	Speed control	Signal turns ON during speed control.
	6)	Speed/position switching latch	Signal turns ON when control switches from speed control to position control.
	7)	Zero point passed	Signal turns ON when the zero point is passed.
	8)	Error detected	Signal turns ON when a minor or major error is detected.
	9)	Servo error detected	Signal turns ON when an error is detected in the servo amplifier.
	10)	Home position return request	Signal turns ON when confirmation of the home position address is required.
	11)	Home position return complete	Signal turns ON when the home position return is completed normally.
	12)	External signal FLS	Signal turns ON when the upper limit switch input turns OFF.
	13)	External signal RLS	Signal turns ON when the lower limit switch input turns OFF.
	14)	External signal STOP	Signal turns ON when the stop signal turns ON.
	15)	External signal DOG/CHANGE	Signal turns ON when the speed/position switching input turns ON.
	16)	PC ready	Signal turns ON when the designated servo amplifier is in READY status.

REMARK

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1) See Section 13.3.1 (1)(a) for any items displayed on the screen but not described in this section.

[Key Operations] Changing the Axis Number	 Press the [F1] key to change the axis designated for the positioning monitor. A window is displayed to designate the axis. (The displayed axis number is the next axis number after the currently monitored axis number.) Input the axis number to be monitored and press the [Enter] key to end axis designation and revert to the positioning monitor window. Press the [Page Up] or [Page Down] key to display the axis number before or after the axis number displayed in the axis number display area.
Switching Status/Command Signal Names	 To display the command signal ON/OFF status and the names on the screen, first press the [F4] key to display the auxiliary function selection window. Select the name display status with the [←]/[→] keys and press the [Enter] key. Alternatively, select the name display status with the number keys. The positioning monitor window changes to the selected name display status. Press the [Esc] key to close the auxiliary function selection window without selecting an auxiliary function. The positioning monitor window name display status remains unchanged.
Selecting the Trace Graph Functions	 Press the [F7] key to run the data trace or display the trace results. The trace graph display window is displayed (see Section 13.3.3).
Selecting the Servo Monitor Functions	 Press the [F8] key to use the servo monitor or run the torque trace. The servo monitor window is displayed (see Section 13.3.2).
Stopping and Restarting Monitoring	1) Press the [F3] key to stop monitoring or to restart monitoring.
Closing the Window	 Press the [Esc] key to close the positioning monitor window and revert to the servo monitor function selection window.

(c) Command signal ON/OFF display with signal names Displays the present PCPU positioning control data and the names and ON/OFF status of the positioning signals (command signals).

[Positioning Monitor Window] (with signal name display)



[Display/Setting Contents]

Axis number display area	Displays the currently monitored axis number.		
Monitored data display area	Dis	plays the positioning data	under PCPU control.
Positioning signal (output) ON/OFF status display area	1) 2)	Stop command Rapid stop command	An external signal to stop an operated axis An external signal for rapid stop of an operated axis
	3)	Forward JOG start	ON during JOG operation in direction of in- creasing address
	4)	Reverse JOG start	ON during JOG operation in direction of decreasing address
	5)	Completion signal OFF command	Signal to turn OFF the positioning start com- pleted signal and positioning completed sig- nal.
	6)	Speed/position switching enable	External signal to enable switching from speed control to position control.
	7)	Limit switch output	Signal to enable the limit switch output.
	8)	Error reset	Signal to clear the error code storage area for minor/major errors and reset the error detected signal.
	9)	Servo error reset	Signal to clear the error code storage area for servo errors and reset the servo error detected signal.
	10)	STOP input valid/invalid	Signal to enable or disable external inputs. Inputs are disabled when this signal is ON and enabled when it is OFF.
	11)	Feed present value modify command	Signal to determine whether the feed present values are cleared at the start of operation under speed/position switching control. Pre- sent values are not cleared when this signal is ON but are cleared when it is OFF.
	12)	Servo OFF	Signal to set a servo motor in the free running state.

REMARK

See Section 13.3.1 (1)(a) for any items displayed on the screen but not described in this section.

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[Key Operations]	
Changing the Axis Number	 Press the [F1] key to change the axis designated for the positioning monitor. A window is displayed to designate the axis. (The displayed axis number is the next axis number after the currently monitored axis number.) Input the axis number to be monitored and press the [Enter] key to end axis designation and revert to the positioning monitor window. Press the [Page Up] or [Page Down] key to display the axis number before or after the axis number displayed in the axis number display area.
Switching Status/Command Signal Names	1) To display the command signal ON/OFF status and the names on the screen, first press the [F4] key to display the auxiliary function selection window.
	 2) Select the name display status with the [←]/[→] keys and press the [Enter] key. Alternatively, select the name display status with the number keys. The positioning monitor window changes to the selected name display status. 3) Press the [Esc] key to close the auxiliary function selection window without selecting an auxiliary function. The positioning monitor window name display status remains unchanged.
Selecting the Trace Graph Functions	 Press the [F7] key to run the data trace or display the trace results. The trace graph display window is displayed (see Section 13.3.3).
Selecting the Servo Monitor Functions	 Press the [F8] key to use the servo monitor or run the torque trace. The servo monitor window is displayed (see Section 13.3.2).
Stopping and Restarting Monitoring	1) Press the [F3] key to stop monitoring or to restart monitoring.
Closing the Window	1) Press the [Esc] key to close the positioning monitor window and revert to the servo monitor function selection window.

- (2) Using A273UHCPU (8/32-axis specifications)
 - (a) Status signal and command signal display Displays the present PCPU positioning control data and the ON/OFF status of the positioning signals (status and command signals).

[Positioning Monitor Window]

(without signal name display, using A273UHCPU (8-axis specifications))

	Axis number display area
DEVIATION UPLUE - LOUBOUGH FLS 1990 BB 1991 CO EXECUTION PROGRAM NO. 19 KLS 1992 CO EXECUTION PROGRAM NO. 19 KLS 1 KEN 1993 CO EXECUTION CONVERSION - 1994	Positioning signal (output) ON/OFF status display area
SPEED 19980900 PLZ-sec 2996 C) INTERPRETO C) D40/H10/KERWO 6 / 8 6 / 8 10 10 20 10 20 10 20 10 20 10 20 10 20 10 20 10 20 10 20 10 20 10 20 10 20 10 20 10 20 10 20 10 20 10 20 10 10 20 10 20 10 20 10 10 20 10<	——Monitored data display area
TREEDINT VALUE GAANGE 9 FLZ KONN COUNS COUNT (1997)	Positioning signal (input) ON/OFF status display area
HOUPENEDT (NOG OND) 8 PLS X8208 (S) STUTIENT (> REFRAT X870 (NC NO) (C) PC(U X87, () T (C) () (C) (C) (C) (C) (C) (C) (C) (C)	Emergency stop display area
I MANERA DE LA COLLET I MANERA DE LA COLLET I MALE 2 SIDI A GUX S C 2189001901800 0 0	Monitoring mark

[Display/Setting Cont	g Contents]			
Axis number display area	Displays the currently monitored axis number.			
Monitored data	Dis	plays the positioning data	under PCPU control.	
display area	1)	Feed present value	Target address output to servo amplifier.	
	2)	Actual present value	Present value determined on the basis of actual travel	
	3)	Deviation counter value	Difference between feed present value and actual present value	
	4)	Execution programnumber	Number of executing servo program	
	5)	Actual servo instruction	Executing servo instruction	
	6)	Command address	Actual controlled data after unit conversion (position control)	
	7)	Command speed	Actual controlled speed after unit conversion (speed control)	
	8)	Error code	Error code of most recent minor, major, servo error	
	9)	M code/torque limit value	M code/torque limit value of executing servo program	
	10)	Actual present value (STOP)	Actual present value when external stop signal is input	
	11)	Changed travel value	Changed travel value for position control under speed/position switching control	
	12)	Changed present value	Feed present value after it is changed	
	13)	Changed speed	Speed after it is changed	
	14)	JOG speed	JOG speed during JOG operation	
	15)	DOG/CHANGE travel value	Travel value for position control changed externally under speed/position switching control	
	16)	SV from dog ON	Travel value from near-zero point dog until home position return is complete	
	17)	Home position return second travel value	Second travel value from stop position to zero point	

Positioning signal (input) ON/OFF status display area	Displays the ON/OFF status of each signal which indicates the control status of each axis.		
Positioning signal (output) ON/OFF status display area	Displays the ON/OFF status of the positioning control command signals.		
Servo ready ON/OFF display area	Highlights the motor numbers for which the servo ready is ON.		
Start accept ON/OFF display area	Highlights the motor numbers for which the start accept signal is ON.		
Manual pulse generator enabled display area	Highlighted during positioning control using inputs from the manual pulse generator 1, 2, or 3.		
Jog operation simultaneous start command display area	Highlighted during jog operation simultaneous start.		
PC Ready ON/OFF display	Highlighted when the PC ready signal (M2000) is ON.		
PCPU ready ON/OFF display	Highlighted when the PCPU is normal.		
Test mode ON/OFF display	Highlighted during test mode operation.		
Program setting error display	Highlighted if an abnormality exists in the positioning data of the currently executing servo program.		
Emergency stop display area	Mark highlighted if an emergency stop was applied to the axis.		
Monitoring mark	Indicates that monitoring is being carried out. Not displayed when monitoring is stopped.		
[Key Operations] Changing Axis Number	 Press the [F1] key to change the axis designated for the positioning monitor. A window is displayed to designate the axis. (The displayed axis number is the next axis number after the currently monitored axis number.) Input the axis number to be monitored and press the [Enter] key to end axis designation and revert to the positioning monitor window. Press the [Page Up] or [Page Down] key to display the axis number before or after the axis number displayed in the axis number display area. 		

Switching Status/Command Signal Names	1) 2) 3)	To display the names of the currently monitored status signals and command signals on the screen, first press the [F4] key to display the auxiliary function selection window. Select the name display status with the $[\leftarrow]/[\rightarrow]$ keys and press the [Enter] key. Alternatively, select the name display status with the number keys. The positioning monitor window changes to the selected name display status. Press the [Esc] key to close the auxiliary function selection window without selecting an auxiliary function. The positioning monitor window name display status remains unchanged.
Selecting the Trace Graph Functions	1)	Press the [F7] key to run the data trace or display the trace results. The trace graph display window is displayed (see Section 13.3.3).
Selecting the Servo Monitor Functions	1)	Press the [F8] key to use the servo monitor or run the torque trace. The servo monitor window is displayed (see Section 13.3.2).
Stopping and Restarting Monitoring	1)	Press the [F3] key to stop monitoring or to restart monitoring.
Switching to Servo Ready Monitor (when using A273UHCPU (32-axis specifications))	1) 2)	When the start accept monitor is displayed, press the [F10] key to display the servo ready monitor. When monitoring the servo ready signal for more than 8 axes, press the [F10] key again to switch between the previous or subsequent pages of monitored axes.
Switching to Start Accept Monitor (when using A273UHCPU (32-axis specifications))	1) 2)	When the servo ready monitor is displayed, press the [F9] key to display the start accept monitor. When monitoring the start accept signal for more than 8 axes, press the [F9] key again to switch between the previous or subsequent pages of monitored axes.
Closing the Window	1)	Press the [Esc] key to close the positioning monitor window and revert to the servo monitor function selection window.

(b) Status signal ON/OFF display (with status names)

Displays the present PCPU positioning control data and the names and ON/OFF status of the signals which indicate the positioning status (status signals).

[Positioning Monitor Window] (with status name display, using A273UHCPU (8-axis specifications))



[Dis

[Display/Setting Cont	olay/Setting Contents]				
Axis number display area	Displays the currently monitored axis number.				
Monitored data display area	Dis	Displays the positioning data under PCPU control.			
Positioning Signal (input) ON/OFF	1)	Positioning start	Signal turns ON when positioning control start is completed for the designated axis.		
status display area	2)	Positioning completed	Signal turns ON when positioning control is completed for the designated axis.		
	3)	In-position	Signal turns ON if the number of accumulated pulses in the deviation counter is within the in-position range.		
	4)	Command in-position	Signal turns ON if the difference between the command position and feed present value is within the command in-position range.		
	5)	Speed control	Signal turns ON during speed control.		
	6)	Speed/position switching latch	Signal turns ON when control switches from speed control to position control.		
	7)	Zero point passed	Signal turns ON when the zero point is passed.		
	8)	Error detected	Signal turns ON when a minor or major error is detected.		
	9)	Servo error detected	Signal turns ON when an error is detected in the servo amplifier.		
	10)	Home position return request	Signal turns ON when confirmation of the home position address is required.		
	11)	Home position return complete	Signal turns ON when the home position return is completed normally.		
	12)	External signal FLS	Signal turns ON when the upper limit switch input turns OFF.		
	13)	External signal RLS	Signal turns ON when the lower limit switch input turns OFF.		
	14)	External signal STOP	Signal turns ON when the stop signal turns ON.		
	15)	External signal DOG	Signal turns ON at home position return (near- zero point dog ON).		

16)	External signal	Signal	turns	ON	wher	n th	e speed/po	sition
	CHANGE	switchi	ng inp	ut tu	rns ON	۱.		
17)	PC ready	Signal	turns	ON	when	the	designated	servo

amplifier is in READY status.

REMARK

1) See Section 13.3.1 (2)(a) for any items displayed on the screen but not described in this section.

[Key Operations] Changing the Axis Number	 Press the [F1] key to change the axis designated for the positioning monitor. A window is displayed to designate the axis. (The displayed axis number is the next axis number after the currently monitored axis number.) Input the axis number to be monitored and press the [Enter] key to end axis designation and revert to the positioning monitor window. Press the [Page Up] or [Page Down] key to display the axis number before or after the axis number displayed in the axis number display area.
Switching Status/Command Signal Names	 To display the command signal ON/OFF status and the names on the screen, first press the [F4] key to display the auxiliary function selection window. Select the name display status with the [←]/[→] keys and press the [Enter] key. Alternatively, select the name display status with the number keys. The positioning monitor window changes to the selected name display status. Press the [Esc] key to close the auxiliary function selection window without selecting an auxiliary function. The positioning monitor window name display status remains unchanged.
Selecting the Trace Graph Functions	 Press the [F7] key to run the data trace or display the trace results. The trace graph display window is displayed (see Section 13.3.3).
Selecting the Servo Monitor Functions	 Press the [F8] key to use the servo monitor or run the torque trace. The servo monitor window is displayed (see Section 13.3.2).
Stopping and Restarting Monitoring	1) Press the [F3] key to stop monitoring or to restart monitoring.
Closing the Window	1) Press the [Esc] key to close the positioning monitor window and revert to the servo monitor function selection window.

(c) Command signal ON/OFF display with signal names Displays the present PCPU positioning control data and the names and ON/OFF status of the positioning signals (command signals).

[Positioning Monitor Window] (with signal name display, using A273UHCPU (8-axis specifications))



[Display/Setting Contents]

Axis numberDisplays the currently monitored axis number.display area

1)

Monitored data display area Displays the positioning data under PCPU control.

Positioning signal (output) ON/OFF status display area

2)	Rapid stop command	An external signal for rapid stop of an operated axis
3)	Forward JOG start	ON during JOG operation in direction of in- creasing address
4)	Reverse JOG start	ON during JOG operation in direction of decreasing address
5)	Completion signal OFF command	Signal to turn OFF the positioning start com- pleted signal and positioning completed sig- nal.
6)	Speed/position switching enable	External signal to enable switching from speed control to position control.
7)	Limit switch output enable	Signal to enable the limit switch output.
8)	Error reset	Signal to clear the error code storage area for minor/major errors and reset the error detected signal.
9)	Servo error reset	Signal to clear the error code storage area for servo errors and reset the servo error detected signal.
10)	STOP input valid/invalid	Signal to enable or disable external inputs. Inputs are disabled when this signal is ON and enabled when it is OFF.
11)	Feed present value modify command	Signal to determine whether the feed present values are cleared at the start of operation under speed/position switching control. Pre- sent values are not cleared when this signal is ON but are cleared when it is OFF.
12)	Servo OFF	Signal to set a servo motor in the free running state.

Stop command An external signal to stop an operated axis

REMARK

1) See Section 13.3.1 (2)(a) for any items displayed on the screen but not described in this section.

[Key Operations]		
Changing the Axis Number	1)	Press the [F1] key to change the axis designated for the positioning monitor.
		A window is displayed to designate the axis. (The displayed axis number is the next axis number after the currently monitored axis number.) Input the axis number to be monitored and press the [Enter] key to end axis designation and revert to the positioning monitor window.
	2)	Press the [Page Up] or [Page Down] key to display the axis number before or after the axis number displayed in the axis number display area.
Switching Status/Command Signal Names	1)	To display the command signal ON/OFF status and the names on the screen, first press the [F4] key to display the auxiliary function selection window.
	2)	Select the name display status with the $[\leftarrow]/[\rightarrow]$ keys and press the [Enter] key. Alternatively, select the name display status with the number keys. The positioning monitor window changes to the selected name display status.
	3)	Press the [Esc] key to close the auxiliary function selection window without selecting an auxiliary function. The positioning monitor window name display status remains unchanged.
Selecting the Trace Graph Functions	1)	Press the [F7] key to run the data trace or display the trace results. The trace graph display window is displayed (see Section 13.3.3).
Selecting the Servo Monitor Functions	1)	Press the [F8] key to use the servo monitor or run the torque trace. The servo monitor window is displayed (see Section 13.3.2).
Stopping and Restarting Monitoring	1) I	Press the [F3] key to stop monitoring or to restart monitoring.
Closing the Window	1)	Press the [Esc] key to close the positioning monitor window and revert to the servo monitor function selection window.

13.3.2 Servo monitor

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Monitors the servo motor designated in the positioning monitor window. Also runs the torque trace and displays the results. Change the monitored axis number from the positioning monitor window.

[Procedure to Display the Servo Monitor Window]



— Emergency stop display area — Servo ready ON/OFF display area — PC ready ON/OFF display area

Monitoring mark

[Display/Setting Contents]

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Axis number display area	Displays the axis number designated in the positioning monitor window.					
Servo monitor data	Displays data about the servo motors and servo amplifiers.					
display area	1) Position control gain 1 Control response speed for position control					
	2) Position droop Error in actual present value with respect to feed present value.					
	3) Motor speed Actual rotational speed of the servo motor.					
	4) Motor current Motor current as a percentage of the rated cur- rent.					
	5) Regenerative level Data for monitoring the regenerative resistor load.					
	6) Servo alarm Alarms detected in the servo amplifier (max. 2 alarms)					
	7) Motor rated current					
	8) Amp S/W version Servo amplifier software version					
Torque trace results display	The torque trace results are displayed after actual operation is started. Use the results to check the actual servo amplifier load status.					
area	1) Trace time					
	2) Peak torque The maximum torque during the torque trace as a percentage of the rated torque.					
	3) Effective torque The effective torque during the torque trace as a percentage of the rated torque.					

PC Ready ON/OFF display	Highlighted when the PC ready signal (M2000) is ON.		
Servo ready ON/OFF display area	Highlights the motor numbers for which the servo ready is ON.		
Emergency stop display area	Mark highlighted if an emergency stop was applied to the axis.		
Monitoring mark	Indicates that monitoring is being carried out. Not displayed when monitoring is stopped.		
[Key Operations] Running Torque Trace	 Press the [F1] key to start the torque trace. A message in the message area indicates that the torque trace is running. Press the [F2] key to stop the torque trace. A message in the message area indicates that the torque trace is complete and the trace results are displayed in the torque trace display area. 		
Selecting the Positioning Monitor Functions	1) Press the [F8] key to select the positioning monitor and revert to the positioning monitor window.		
Stopping and Restarting Monitoring	1) Press the [F3] key to stop monitoring or to restart monitoring.		
Switching Servo Ready Monitored Axes (when using A273UHCPU (32-axis specifications))	 When monitoring the servo ready signal for more than 8 axes, press the [F10] (servo ready) key to switch between the previous or subsequent pages of monitored axes. 		
Closing the Window	1) Press the [Esc] key to close the servo monitor window and revert to the servo monitor function selection window.		

POINTS

- (1) Stopping torque trace
 - Other functions cannot be executed while the torque trace is running.

Before executing any other function, press the [F2] key to stop the torque trace.

- (2) Torque trace time
 - The maximum permitted torque trace time is 1 hour 2 minutes 8 seconds.
 - If the torque trace time exceeds 1 hour 2 minutes 8 seconds, the torque trace stops automatically, even if it is not stopped by pressing the [F2] key.
- (3) Checking that the servo ready signal is ON
 - Before running the torque trace, check in the servo ready ON/OFF display area that the servo ready signal is ON for the monitored axis.
 If the [F1] key is pressed to start the torque trace while the servo

ready signal is OFF, the torque trace does not start and a message indicates that the servo ready signal is OFF.

13.3.3 Trace graph

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Traces up to three of the following data and displays a graph of the results: position command, position droop, motor speed, motor current, and speed command.

[Procedure to Display the Trace Graph Display Window]



(1) Displaying the trace graphs This section describes data trace execution and the graph displaying the trace results.

[Trace Graph Display Window]



[Display/Setting Contents]

Axis numberDisplays the axis number for which the data trace is executed.display area

Graph display area	Displays the designated trace data as a graph.					
	1) Data 1 The trace graph for the data name displayed in the left-hand trace data name display area.					
	2) Data 2 The trace graph for the data name displayed in the center trace data name display area.					
	3) Data 3 The trace graph for the data name displayed in the right-hand trace data name display area.					
	4) Vertical cursor Indicates the data pick-up point.					
	5) Horizontal cursor Indicates the zero value for the data.					
Maximum value display area	The maximum values of Data 1, Data 2, and Data 3 during the data trace.					
Minimum value display area	The minimum values of Data 1, Data 2, and Data 3 during the data trace.					
Trace data name display area	Displays the names of the data (Data 1, Data 2, and Data 3) selected to be traced from the trace data setting window. The highlighted data name indicates that the data graph can be vertically scrolled.					
Traced time display area	Displays the time at which the trace data is picked up from the graphs by the vertical cursor, between the trace start and trace end times.					
---	---					
Trace data display area	Displays the data values picked up by the vertical cursor.					
Trigger condition display area	Displays the start conditions to start the data trace.					
Trace interval display area	Displays the number of milliseconds (ms) between traces.					
Trace time display area	Displays the times at which the start and end of the graph displayed in the graph display area were traced.					
Monitoring mark	Indicates that monitoring is being carried out. Not displayed when monitoring is stopped.					
[Key Operations] Changing the Axis Number	 Press the [F1] key to change the axis designated for the data trace. (The axis number set is the axis number that was designated in the positioning monitor window when the trace graph window was opened from the positioning monitor window.) A window is displayed to designate the axis. (The displayed axis number is the axis number after the currently designated axis number.) Input the axis number for the data trace and press the [Enter] key to end axis designation and revert to the trace graph display window. 					
Setting Trace Data	1) To set the type of trace data, trace start conditions, and trace interval, press the [F4] key to display the trace data setting window (see Section 13.3.3 (2)).					
Starting The Data Trace	 Press the [F5] key to start the data trace. A YES/NO dialog box prompts whether to start the data trace. To start the data trace, press the [←] key to highlight "YES" then press the [Enter] key. The data trace is started, based on the data set in the trace data setting window. The cancel the data trace, press the [Enter] key while "NO" is highlighted. 					
Stopping the Data Trace	 Press the [F6] key to stop the data trace. The data trace stops and the trace results are displayed graphically in the graph display area. 					
Writing to a File	 Press the [F3] key to write the trace results to a file. A YES/NO dialog box prompts whether to write the data. Press the [Enter] key while "YES" is highlighted. The trace results from the trace graph display window are written to the file and the display reverts to the trace graph display window. To cancel writing to the file, press the [→] key to highlight "NO" then press the [Enter] key. 					

Reading a File	 If trace results have been written to a file, press the [F2] key to read the trace results from the file and display them graphically. A YES/NO dialog box prompts whether to read the data. Press the [Enter] key while "YES" is highlighted. The display reverts to the trace graph display window with the trace results from the file displayed. To cancel reading from the file, press the [→] key to highlight "NO" then press the [Enter] key.
Data Pick-up (Moving the Vertical Cursor)	 To display in the trace data display area the data values from the displayed graphs at a particular time, press the [←]/[→] keys to move the vertical cursor to the required time in the trace time range. The trace data from the points of intersection of the vertical cursor with the graphs is displayed in the trace data display areas. The screen scrolls horizontally when the vertical cursor is moved to the left or right edge of the graph display area.
Scrolling the Screen Horizontally	 Hold down the [Shift] key and press the [←]/[→] keys to scroll the displayed graphs to the left or right.
Scrolling the Screen Vertically (Moving the Horizontal Cursor)	 Press the [Tab] key to select which of the data in the graph display area (Data 1, Data 2, Data 3) is to be scrolled vertically. Each time the [Tab] key is pressed, the highlighting moves one position to the right. The data graph with the highlighted data name can be vertically scrolled. Press the [↑]/[↓] keys to vertically scroll the selected graph. Only the selected graph scrolls vertically; the other graphs do not move.
Changing the Graph Display Format (Horizontal Enlargement and Reduction)	 Press the [F9] key to enlarge the currently displayed graphs by a factor of two horizontally. The graph is enlarged horizontally by a factor of two each time the [F9] key is pressed. However, the display cannot be enlarged to produce a trace time range less than 0 to 7 ms. Press the [F10] key to horizontally reduce by a factor of 1/2 a graph which has been enlarged horizontally by a factor of two using the [F9] key. The graph is reduced horizontally by a factor of 1/2 each time the [F10] key is pressed. However, the display cannot be reduced to display times outside the trace

[Graph before horizontal enlargement]

time range.

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[Graph after horizontal enlargement]



Changing the Graph Display Format (Vertical Enlargement and Reduction)	1) 2)	Hold down the [Shift] key and press the [F9] key to enlarge the currently displayed graphs by a factor of two vertically. The graph is enlarged vertically by a factor of two each time the [F9] key is pressed while the [Shift] key is held down. Hold down the [Shift] key and press the [F10] key to vertically reduce by a factor of 1/2 a graph which has been enlarged vertically by a factor of two using the [Shift] + [F9] keys. The graph is reduced vertically by a factor of 1/2 each time the [F10] key is pressed while the [Shift] key is held down. However, the display cannot be reduced to display values outside the applicable display range of the data axis.
Selecting the Tuning Function	1)	If the data trace results indicate that any of the following servo parameters need to be changed, press the [F8] key to select the tuning function: • position control gain 1 • speed control gain 1 • speed integral compensation • feed forward coefficient The tuning window is displayed (see Section 13.3.3(3)). Change the set values as required.
Selecting the Positioning Monitor Function	1)	Press the [F7] key to select the positioning monitor. The positioning monitor window (without signal name display) is displayed and monitoring starts for the axis selected in the trace graph display window (see Section 13.3.1).
Closing the Window	1)	Press the [Esc] key to close the trace graph display window and revert to the servo monitor function selection window.

POINTS
 (1) Saving trace results When the trace graph display window is closed, all results from the data trace run from that window are lost. To save these trace results, use file write from the trace graph functions to write the data to file before closing the trace graph display window. (2) Restrictions while trace graph display window is open The menu selection window is not displayed if the [F11] key is pressed. The help functions are not available. (3) Stopping data trace Other functions cannot be executed while the data trace is running. Before executing any other function, press the [F6] key to stop the data trace.

(2) Setting the trace data

This section describes how to set the type of trace data, trace start conditions, and trace interval.

[Trace Data Setting Window]



[Display/Setting Contents]

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Setting item select key display area	Displays the keys to select the setting item numbers.		
Setting item display area	Displays the data settings required to run the data trace.		
ltem number display area	Displays the number for each setting item.		
ltem display area	Displays the selections for each setting item.		
Device setting area	If the leading edge of an M device is designated as the trigger to start the data trace, set the device number in this area.		
Trace interval setting area	Sets the interval between running data traces.		
[Key Operations]			
Setting Data Type	 Press the [F1] key to set the type of data to be traced. "Trace data" and "1" in the selected item display area are highlighted. Press the [↑]/[↓] keys to highlight the item number of the required trace data name and press the [Enter] key. The data name corresponding to the selected item number is highlighted. Repeat step 2) until all the data names to be traced are highlighted. Up to three data names can be highlighted. Set other items or press the [End] key to enter the conditions and close the trace data setting window. To cancel the data trace setting of any selected item, press the [↑]/[↓] keys to highlight the item number and press the [Enter] key. The highlighted data name reverts to a normal display and the setting is cleared. 		

Setting the Trigger Condition	1) 2) 3) 4)	 Press the [F2] key to set to the condition to start the data trace. "Trigger condition" and "1" in the item number display area are highlighted. Press the [↑]/[↓] keys to highlight the required condition to start the data trace, and press the [Enter] key. Set "NO CONDITION" as the trigger condition to start the data trace using trace start from the trace graph display functions. Select "START ACCEPT ON" to start the data trace when the start accept signal turns ON. Select "M DEVICE ON" to start the data trace on the leading edge of a designated device. Press the [Enter] key to select "M DEVICE ON" as the trigger condition. A cursor is displayed in the device setting area. Input the required device number and press the [Enter] key. Set other items or press the [End] key to enter the conditions and close the trace data setting window.
Setting the Trace Interval	1) 2)	Press the [F3] key to set the data trace interval. "DISTANCE" is highlighted and a cursor appears in the trace interval setting area. The trace interval is set in multiples of 3.5 ms. Enter the number of multiples between 1 and 256 and press the [Enter] key.
Ending the Settings	1)	Press the [End] key to write the set data and close the trace data setting window. The display reverts to the trace graph display window with the set data displayed in the trace data name display area, trigger condition display area, and trace interval display area.
Cancelling the Settings	1)	Press the [Esc] key to close the trace data setting window and revert to the trace graph display window without writing the set data.

- (3) Tuning
 - (a) If ADU is used
 - The following servo parameters can be changed
 - Position control gain 1 value
 - Speed control gain 1 value
 - Speed integral compensation value
 - Feed forward gain

If the data trace results indicate that any of the set values need to be changed, use the tuning function to make the required changes.

[Tuning Window]



Axis number display area Speed control gain 1 setting area Speed integral compensation setting area Feed forward gain setting area

[Display/Setting Contents]

Axis numberDisplays the axis number for which the servo parameters are to be changed.display areaThis axis number is set in the trace graph display window.

Position control Displays the position control gain 1 value set in the ADU or the changed position control gain 1.

Speed control Displays the speed control gain 1 value set in the ADU or the changed speed control gain 1.

Speed integral com- Displays the speed integral compensation value set in the ADU or the **pensation setting** changed speed integral compensation. **area**

Feed forward gain setting area

Displays the feed forward gain value set in the ADU or the changed feed forward gain.

POINTS

(1) Servo parameter setting ranges

The servo parameter setting ranges are shown in the table below.

СРО	A273UH
Amplifier Type Servo Parameter	ADU
Position control gain 1	1 to 9999(5 to 500)
Speed control gain 1	1 to 9999(20 to 5000)
Speed integral compensation	2 to 240(2 to 240)
Feed forward gain	0 to 150(0 to 150)

[Key Operations]	
Changing Data) Press the $[T]/[\downarrow]$ keys to highlight the item for which the setting is to be changed.
) Enter the data with the numeric keys or press the [←]/[→] keys to increase or decrease the set value in steps of 1.
) Repeat steps 1) and 2) until all the required setting changes are made, then press the [Enter] key.
	A range check is conducted on all the settings. If the check ends normally, the changed data is written for the appropriate axis to the ADU or MR- \Box -B.
	A message indicates when the data has been written and the tuning window closes. A message indicates if any of the settings is out of range. Correct the settings if this occurs.
Parameter WRITE) If the data trace results are satisfactory after the settings are changed, press the [F8] key to open the tuning window.
) Press the [End] key to write the changed data to the Internal memory in the servo system CPU.
	A message indicates when the data has been written and the display reverts to the data trace graph display window.
	If there is a problem with the Internal memory in the servo system CPU, a message indicates that a write error occurred.
	A message indicates that the data could not be written because the PC ready (M2000) signal was ON. Turn OFF the PC ready signal and try again.
Closing the Window) Press the [Esc] key to close the tuning window and revert to the data trace graph display window without changing the set values.

POINTS

- (1) Not executing parameter write After set values have been changed in the tuning window, follow the procedure below to cancel the changes and not write the changed data to the Internal memory in the servo system CPU.
 - Turn on the servo system CPU power supply. OFF \rightarrow ON
 - Turn ON the PC ready (M2000) signal. OFF \rightarrow ON
 - Servo error reset
 - Select the test mode with the PC ready signal (M2000) OFF. To operate the designated axis using the changed data, the data changed in the tuning window must be written to the Internal memory in the servo system CPU.
- (2) Executing parameter write Make sure that the PC ready (M2000) signal is OFF when writing the changed data to the Internal memory in the servo system CPU.

(b) If MR- -B is used

- The following servo parameters can be changed:
- position control gain 1 value
- speed control gain 1 value
- speed integral compensation value
- feed forward gain

If the data trace results indicate that any of the set values need to be changed, use the tuning function to make the required changes.

[Tuning Window]



[Display/Setting Contents]

Axis number display area	Displays the axis number for which the servo parameters are to be changed . This axis number is set in the trace graph display window.
Position control gain 1 setting area	Displays the position control gain 1 value set for the MR B or the changed position control gain 1.
Speed control gain 1 setting area	Displays the speed control gain 1 value set for the MR- \Box -B or the changed speed control gain 1.
Speed integral compensation setting area	Displays the speed integral compensation value set for the MRB or the changed speed integral compensation.
Feed forward gain setting area	Displays the feed forward gain value set for the MR B or the changed feed forward gain.

POINT

Servo parameter setting ranges

The servo parameter setting ranges are shown in the table below.

Amplifier Type Servo Parameter	MR- 🔲 - B	
Position control gain 1	1 to 9999(4 to 1000)	
Speed control gain 1	1 to 9999(20 to 5000)	
Speed integral compensation	1 to 9999(1 to 1000)	
Feed forward gain	0 to 100	

[Key Operations]	
Changing Data	 Press the [↑]/[↓] keys to highlight the item for which the setting is to be changed. Enter the data with the numeric keys or press the [←]/[→] keys to increase or decrease the set value in steps of 1. Repeat steps 1) and 2) until all the required setting changes are made, then press the [Enter] key. A range check is conducted on all the settings. If the check ends normally, the changed data is written for the appropriate axis to the ADU or MR-□-B. A message indicates when the data has been written and the tuning window closes. A message indicates if any of the settings is out of range. Correct the settings if this occurs.
Parameter WRITE	 If the data trace results are satisfactory after the settings are changed, press the [F8] key to open the tuning window. Press the [End] key to write the changed data to the Internal memory in the servo system CPU. A message indicates when the data has been written and the display reverts to the data trace graph display window. If there is a problem with the Internal memory in the servo system CPU, a message indicates that a write error occurred. A message indicates that the data could not be written because the PC ready (M2000) signal was ON. Turn OFF the PC ready signal and try again.
Closing the Window	1) Press the [Esc] key to close the tuning window and revert to the data

Closing the Window 1) Press the [Esc] key to close the tuning window and revert to the data trace graph display window without changing the set values.

POINTS

- (1) Not executing parameter write After set values have been changed in the tuning window, follow the procedure below to cancel the changes and not write the changed data to the Internal memory in the servo system CPU.
 - $\bullet\,$ Turn on the servo system CPU power supply. OFF $\to\,$ ON
 - Turn ON the PC ready (M2000) signal. OFF \rightarrow ON
 - Servo error reset
 - Select the test mode with the PC ready signal (M2000) OFF.

To operate the designated axis using the changed data, the data changed in the tuning window must be written to the Internal memory in the servo system CPU.

(2) Executing parameter write Make sure that the PC ready (M2000) signal is OFF when writing the changed data to the Internal memory in the servo system CPU.

13.4 Scroll Monitor

Displays a sequential list of up to 15 servo instructions, down to the currently executing servo program.

When a servo program is run, the servo instruction is displayed in the last line and all the previously executed servo programs move up one line. If the maximum of 15 servo programs is displayed, the servo program on the top line is deleted from the screen.

The scroll monitor is run by selecting the scroll monitor item from the servo monitor function selection window.

[Scroll Monitor Window] (A273UHCPU)



[Display/Setting Contents]

[Display/Setting Con	
Sequence number display area	Displays the order in which the monitored servo programs were executed. The largest number corresponds to the most recent servo program.
Program number display area	Displays the number of the executed servo program.
Axis number display area	Displays the axis number used by the servo instruction displayed to the right. This display area is blank during the START instruction.
Servo instruction display area	Displays the servo instruction used by the executed servo program. TEST is displayed for home position return test operation and the position control gain 1 check in the servo test mode.
Program display area	Displays the positioning data for the servo instruction selected from the displayed servo program list.
Monitoring mark	Indicates that monitoring is being carried out. Not displayed when monitoring is stopped.

[Key Operations]	
Reading Programs	 Press the [F1] key to read the contents of an executed servo program which is displayed in the list.
	 Monitoring stops and the monitoring mark disappears from the window. Press the [↑]/[↓] keys to select the servo program to be read from the list and press the [Enter] key.
	The contents of the selected servo program are read to the program display area.
	If the entire servo program cannot be displayed in the program display area, press the [Page Up] or [Page Down] key to scroll through the servo program.
:	3) If the START instruction was selected with the [↑]/[↓] keys, press the [←]/[→] keys to select the servo program number to be read and press the [Enter] key.
	4) Repeat steps 2) and 3) to read the contents of another servo program. When the [Enter] key is pressed, the displayed servo program contents are cleared and the selected servo program is displayed.
Stopping and Restart- ing Monitoring	1) Press the [F3] key to stop monitoring or to restart monitoring.
Switching Servo	1) When monitoring the servo ready signal for more than 8 axes, press the

Switching Servo Ready Monitor Axes (when using A273UHCPU (32-axis specifications)) When monitoring the servo ready signal for more than 8 axes, press the [F10] (servo ready) key to switch between the previous or subsequent pages of monitored axes.

Closing the Window 1) Press the [Esc] key to close the scroll monitor window.

13.5 Present Value History Monitor

For absolute axes, displays a history of the encoder present value/servo command value/monitor present value when the servo amplifier power is switched ON/OFF and when home position return is performed.

Since the time display is based on the programmable controller's clock (D9025, D9026, D9027), set M9028 when the programmable controller is in the RUN state.

When an incremental axis is designated, all of the data are undefined.

[Present Value History Monitor Window]



[Display/Setting Contents]

Axis No. display area Displays the axis number currently being monitored.

Servo amplifier type	Displays the servo amplifier type currently being monitored.
display area	

Monitor value at	Displays the following items:
home position return	1) Time of completion of home position return
display area	2) Encoder present value

- Multiple revolution data in the absolute position reference point data
 - Position within one revolution in the absolute position reference point data
- 3) Servo command value
- 4) Monitor present value

Present monitor value display area

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- 1) Present time
- 2) Encoder present value

Displays the following items:

- Present multiple revolution data of the encoder present value
- Present position within one revolution of the encoder present value
- 3) Present servo command value
- 4) Present monitor present value

Monitor value at servo amplifier power ON/OFF display area

- Displays the present values for an absolute axis at the last four times that the servo amplifier power was switched ON/OFF. [When power switched ON]
- 1) Time when power switched ON
- 2) Encoder present value Encoder's initial multiple revolution data Encoder's initial 1-revolution data
- 3) Servo command value after reset
- 4) Monitor present value after reset
- 5) Information on alarm occurrence on present value reset (error code for minor/major errors)

	[When power switched OFF]
	 Time immediately before servo amplifier power switched OFF Encoder present value Encoder's initial multiple revolution data immediately before servo amplifier power switched OFF Encoder's initial 1-revolution data immediately before servo amplifier power switched OFF Servo command value immediately before servo amplifier power switched OFF Monitor present value immediately before servo amplifier power switched OFF Monitor present value immediately before servo amplifier power switched OFF
Error contents display area	Displays details of errors indicated by error codes displayed when the power is switched ON.
[Key Operation Pro	ocedure]
Axis No. change	 To change the axis number subject to present value history monitoring by designating an axis number, press the [F1] key. The axis designation window will be displayed. (When this window is displayed, the axis number following that of the axis for which present value history monitoring is currently being conducted is displayed.) Enter the axis number to be subject to monitoring and press the [Enter] key. On completing this axis designation, the present value history monitor window will reappear. Press the [Page Up]/[Page Down] keys to display, respectively, the axis numbers preceding and following the axis No. currently displayed in the axis number display area.
Monitor stop/redisplay	1) To stop monitoring, or redisplay the monitor data, press the [F3] key.
Window close	 To close the present value history monitor window, press the [Esc] key. The servo monitor function selection window will be redisplayed.

The servo file mode is a mode to read and write servo files containing the following data to and from hard disks (HD) and floppy disks (FD): •Servo data

- Servo program
- (1) Outline of the functions The functions below are offered by the GSV13PE servo file mode.

Servo -	System name	-Sub-system	File name		
L			- Read	Reads the contents of a servo file from a hard disk or floppy disk.	14.3
			– Write	Writes the internal memory contents to a designated file on hard disk or floppy disk.	14.4
			_ Verify	Verifies the contents of a servo file on hard disk or floppy disk and in internal memory.	14.5
			L Delete	Deletes a designated servo file from the file data registered on hard disk or floppy disk.	14.6.3
			— Сору	Copies the designated contents from a designated drive.	14.7.2
			Directory	Displays the directory of file names	14.1
			Change display format	Sets the display of commentsand titles and selects the display order.	14.8
			L Print directory	Prints the system names, sub-system names, and file-type names.	14.2
		- Delete	Deletes servo file: name registered d	s from a designated sub-system on hard disk or floppy disk.	14.6.2
		— Сору	Copies all servo fi name in a design	les from a designated sub-system ated drive.	14.7.1
		Directory	Displays the direct	tory of file names	14.1
		 Change display format 	y Sets the display o selects the displa	f comments and titles and y order.	14.8
		L Print directory.	Prints the system and file-type nam	names, sub-system names, es.	14.2
	- Delete	Deletes ser on hard dis	rvo files from a designated sk or floppy disk.	d system name registered	14.6.1
	Create	Creates sys	stem names and commen	ts	14.9
	Directory	Displays th	e directory of file names.		14.1
	— Change displ format	ay Sets the dis	splay of comments and tit	les and selects the display order	14.8
	Print director	y Prints the s	ystem names, sub-syster	n names, and file-type names	14.2

POINT

When writing files to a floppy disk, a formatted floppy disk must be used.



(2) Outline of the procedure The procedure to use the servo monitor mode is shown below.

* : Select file type before selecting the operation.

POINT

- The following two file types can be selected:
- Servo data
- Servo program

14.1 Directory Display

Displays on the screen a list of file names stored in the hard disk or floppy disk.

[Procedure to Display the Servo File Screen]



[Servo File Screen]



[Display/Setting Contents]

Drive name setting Displays the current drive name or the set drive name. **area**

System name setting Displays the set system name.

area

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Sub-system name Displays the set sub-system name. setting area

[Key Operations]	
Directory of Syste	m Names
Setting Drive	 Set the drive name for which the directory is to be displayed. Make sure that the cursor is in the drive name setting area. Enter the drive name A, C, or D (see Section 5.1) and press the [Enter] key. If the drive name for which the directory is to be displayed already appears in the drive name setting area, just press the [Enter] key. The cursor moves to the system name setting area.
Displaying the Directory	 To display the directory of system names, make sure that the cursor is in the system name setting area and press the [Enter] key. The system names in the designated drive are displayed in the system name directory window.
Switching the System Name Display	 If the designated drive contains more than 13 system names, press the [Page Up] or [Page Down] key to display the other system names. The [Page Up] key displays the system names before the currently displayed system names. The [Page Down] key displays the system names after the currently displayed system names.

Directory of Sub-sy	vstem Names
Setting System Name	 Set the system name for which the sub-system name directory is to be displayed. Press the [↑]/[↓] keys to highlight the system name in the system name directory window or directly key in the system name. Press the [Enter] key to display the designated system name in the system name setting area and move the cursor to the sub-system name setting area.
Displaying the Directory	 To display the directory of sub-system names, make sure that the cursor is in the sub-system name setting area and press the [Enter] key. The sub-system names under the designated system name are displayed in the sub-system name directory window.
Switching the Sub-system Name Display	 If the designated system name contains more than 13 sub-system names, press the [Page Up] or [Page Down] key to display the other sub-system names. The [Page U]p key displays the sub-system names before the currently displayed sub-system names. The [Page Down] key displays the sub-system names after the currently displayed sub-system names.
Resetting the System Name	 Press the [F8] key to reset the system name. Select the system name from the displayed system name directory, or directly key in the system name.

POINT

- (1) Directory display using wildcard characters Wildcard characters can be used to specify and display a system name or sub-system name directory. The wildcard characters "?" and "*" represent one or more other characters, respectively. Using these wildcard characters simplifies file designation. * Replaces a character string ? Replaces a single character

14.2 Printing Directories

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Prints designated system names, sub-system names, and file-type names. The following three types of print directory operation are available:

- Print sub-system names and file-type names
- Print sub-system names
- Print file-type names

[Procedure to Print Directories]



[System Name Directory Window]



[Display/Setting Contents]

System name Highlighted display of the set system name. setting area

[Key Operations] Selecting System Name	1) Press the $[\uparrow]/[\downarrow]$ keys to highlight the required system name.
Selecting Printing	1) Press the [F10] key. A YES/NO dialog box prompts whether to start printing.
Starting Printing	 Press the [Enter] key while "YES" is highlighted to start printing. (The default display is "YES".) A message indicates when the printing is complete.
Cancelling Printing	 To cancel printing, press the [→] key to highlight "NO", then press the [Enter] key.
Interrupting Printing	 Press the [Esc] key to interrupt printing. A YES/NO dialog box prompts whether to cancel or restart printing. "YES": Cancel printing "NO" : Restart printing

Printing All Sub-system Names and File-type Names

If printing is started when the system name directory is displayed, the sub-system names and file name types under the designated system name are printed.

[Example print-out]

* • * SUB-SYSTEM NAM	E + TYPE NAME LIST	* * *		
[SYSTEM] SAMPLE1 [SAR	VO FILE	1		
[SUB-SYSTEM]	TEST1 (A3U)	(SAMPLE PROGRAM	1	1
[TYPE]	SERVO DATA SERVO PROGRAM			
[SUB-SYSTEM]	TEST2 (A3U)	SAMPLE PROGRAM	ı	1
[TYPE]	SERVO DATA SERVO PROGRAM	<i>p</i> , <i>z</i>	1	
[SUB-SYSTEM]	TEST3 (A3U)	[SAMPLE PROGRAM [A-3]]
[TYPE]	SERVO DATA SERVO PROGRAM			

Printing All Sub-system Names

If printing is started when the sub-system name directory is displayed, all file name types under the designated sub-system name are printed.

[Example print-out]

• • • SUB-SYSTEN	NAME LIST	* • *			
[SYSTEM] SAMPLE1	[SARVO FILE		1		
[SUB-SYST	EMJ TEST1	(A 3U)	[SAMPLE PROGRAM [A-1	1	1
(SUB-SYST	EM] TEST2	(A3U)	(SAMPLE PROGRAM [A-2]]
[SUB-SYST	EMJ TEST3	(A3U)	[SAMPLE PROGRAM [A-3	}	1

Printing All File-type Names

If printing is started when the file-type selection window is displayed, a file-type directory is printed.

[Example print-out]

• • • T	YPE NAME LIST	• • •				
[SYSTEM]] SAMPLE1 [SAR	VO FILE		1		
	[SUB-SYSTEM]	TEST1	(A3U)	(SAMPLE PROGRAM	1	3
	[TYPE]	SERVO DA SERVO PRO	TA DGRAM	fw. i	1	

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14.3 Reading Data from Hard Disk or Floppy Disk

Reads data of the designated file type from the files stored in the hard disk or floppy disk to internal memory.

The following two file types can be selected:

- Servo data
- Servo program

[Procedure to Display the Read File-type Selection window]



[Read File-type Selection window]



[Display/Setting Contents]

Read file-type select area	Highlighted display of the selected file type. (File types containing data are marked with an asterisk "*".)
[Key Operations] Selecting File Type	 Press the [↑]/[↓] keys to highlight the file type to be read. Press the [Enter] key. A YES/NO dialog box prompts whether to read the data.
Reading	 Press the [Enter] key while "YES" is highlighted to read the data. (The default display is "YES".) A message indicates when the data has been read and the system returns to the read file-type selection window.
Cancelling Reading	 To cancel reading, press the [→] key to highlight "NO", then press the [Enter] key. The data is not read and the system returns to the read file-type selection window.

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POINTS

(1) Designating multiple file types to read Data can be read from designated multiple file types, as follows.
1) To designate multiple file types, press the [↑]/[↓] keys to highlight the file type to be read. Press the [F6] key. The "*" by the file type changes to a "#".
2) The YES/NO dialog box is displayed when the [Enter] key is pressed.
(2) Reading with different CPU types The possibility of reading with different CPU types is shown in the following table.
File Type Reading Possible/Not Possible Serve data Beading not possible with all CPU types

Corvo data	
Servo program	Reading possible with all CPU types

(3) Servo programs created with SW1SRX-GSV13PE can be "read". Other servo programs cannot be read.

14.4 Writing Data to Hard Disk or Floppy Disk

Writes data of the designated file type from internal memory to the hard disk or floppy disk.

The following two file types can be selected:

- Servo data
- Servo program

[Procedure to Display the Write File-type Selection window]



[Write File-type Selection window]



[Display/Setting Contents]

Write file-type select Highlighted display of the selected file type. (File types containing data are marked with an asterisk "*".)

[Key Operations]

Selecting File Type

1) Press the $[\uparrow]/[\downarrow]$ keys to highlight the file type to write. Press the [Enter] key.

The file write window is displayed.

[File Write Window]

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USE SVESTEM (C) (SAMPLE) SUB-SVSTEM (DEMO) PRESS SUB-SVSTEM (DEMO) PRESS SUB-SVSTEM (DEMO) COMMENTS SUB-SVSTEM (DEMO) COMENTS SUB-SVSTEM (DEMO) COMENTS SUB-SVSTEM (DEMO) COMENTS SUB-SVSTEM (DEMO) COMENTS SUB-SVSTEM (DEMO) COMENTS	Centry LINE DISPLAY DIRECTORY ASKNO PROCEED TO SERVE PROCEED TO
[Display/Setting Cont	ents]
Drive name setting area	Displays the currently set drive name.
System name setting area	Displays the currently set system name.
System name comment setting area	Displays the currently set system name comment.
Sub-system name setting area	Displays the currently set sub-system name.
Sub-system name comment setting area	Displays the currently set sub-system name comment.
Title setting area	Displays the currently set title.
[Key Operations] Setting System Name Comment	 To set or change the system name comment, make sure that the cursor is in the system name comment setting area. Key in the new or changed comment and press the [Enter] key. Just press the [Enter] key to leave the system name comment unchanged. The cursor moves and flashes in the sub-system name comment setting area.
Setting Sub-system Name Comment	 To set or change the sub-system name comment, make sure that the cursor is in the sub-system name comment setting area. The cursor can be returned to the system name comment setting area by pressing the [[↑]] key. Key in the new or changed comment and press the [Enter] key. Just press the [Enter] key to leave the sub-system name comment unchanged. The cursor moves and flashes in the title comment setting area.
Setting Title	 To set or change the title, make sure that the cursor is in the title setting area. The cursor can be returned to the sub-system name comment setting area by pressing the [1] key. Key in the new or changed title and press the [Enter] key. Just press the [Enter] key to leave the title unchanged. A YES/NO dialog box prompts whether to write the file.

Writing

- 1) Press the [Enter] key while "YES" is highlighted to write the data. (The default display is "YES".)
- 2) A message indicates when the data has been written and the system returns to the write file-type selection window.
- **Cancelling Writing** 1) To cancel writing, press the $[\rightarrow]$ key to highlight "NO", then press the [Enter] key.

The data is not written and the system returns to the file write window.

If the Sub-system Name Already Exists

[Overwrite File YES/NO Dialog Box]

	SYSTEM IC SUB-SYSTE VSTITH NAME IE> KPC IYP U A.U	iicampli Nideno Iirid E>	E]] (Comfient)>	PRESS	LEnterl, WHEN I KIYPE NLAU REBUG ON SERVO PRO	DISPLAY DIRECTOR	
SEEREN SYSTEM CONNENT SUB-SYST CONNENT CONNENT CONNENT	CCICSANPL CCICSANPL IEH CDEHO L (CPP) (2 J] 10530	URI:	LE TO PILE? VIE 3 72 8	N O	

[Display/Setting Contents]

If the designated sub-system name already exists when the file is written, a YES/NO dialog box prompts whether to overwrite the existing file.

[Key Operations] Overwriting

- 1) Press the [Enter] key while "YES" is highlighted to overwrite the subsystem name. (The default display is "YES".)
- 2) A message indicates when the data has been overwritten and the system returns to the write file-type selection window.

Cancelling Overwriting

 To cancel overwriting the sub-system name, press the [→] key to highlight "NO", then press the [Enter] key. The data is not overwritten and the system returns to the file write window.

POINTS

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- (1) Designating multiple file types to write
 - Data can be written to designated multiple file types, as follows.
 - To designate multiple file types, press the [↑]/[↓] keys to highlight the file type to be written. Press the [F6] key. The "*" by the file type changes to a "#".
 - 2) The YES/NO dialog box is displayed when the [Enter] key is pressed.
- (2) Inputting new system name or sub-system name for writing If a new system name and sub-system name are input from the directory, the new system name and sub-system name are created, and the file is written to the new sub-system name.
- (3) Writing with different CPU types The possibility of writing with different CPU types is shown in the following table.

File Type	Writing Possible/Not Possible
Servo data	Writing not possible with all CPU types
Servo program	Writing possible with all CPU types

14.5 Verifying Data on Hard Disk or Floppy Disk

Verifies data in a designated file type in internal memory with the contents of a hard disk or floppy disk.

The following two file types can be designated:

- Servo data
- Servo program

[Procedure to Display the Verify File-type Selection window]



[Verify File-type Selection window]



[Display/Setting Contents]

Verify file-typeHighlighted display of the selected file type (File types containing data are
marked with an asterisk "*".)

[Key Operations]

Selecting File Type

Press the [↑]/[↓] keys to highlight the file type to verify.
Press the [Enter] key.
A YES/NO dialog box prompts whether to verify the data.

Press the [Enter] key while "YES" is highlighted to verify the data. (The default display is "YES".)
When verification is complete, a message indicates the results.
To cancel verification, press the [→] key to highlight "NO", then press the [Enter] key.
The data is not verified and the system returns to the verify file-type selection window.

[Verify Results Display Window]

If Servo Program Matches



If Discrepancy Found in Servo Program

Verify Results Display Area

[Display/Setting Contents]

Displays the results after verification is complete. Verify results display area

[Key	Operations]	
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If Servo Program Matches

Closing the Window 1) Press the [Esc] key to close the window and revert to the verify file-type selection window.

If Discrepancy Found	l in Sei	vo Program		
Continuing and Ending Verification	1) Det refe 2) If m nex 3) The	ails of up to 11 dis r to Section 19. E ore than 11 discr t page and continu results are displa	crepancies can be displayed. (For error descripti rror Messages.) epancies exist, press the [Enter] key to display ue verification. ayed when verification is complete.	ons, / the
Interrupting Verification	 Pre A Y To a [En A m retu Pre The 	ss the [Esc] key to ES/NO dialog box cancel verification ter] key. (The defa essage indicates irns to the verify fi ss the [Enter] key e verification contin	o interrupt verification. prompts whether to cancel or continue verificat , press the [←] key to highlight "YES", then press ault display is "NO".) that verification has been interrupted and the sys le-type selection window. while "NO" is highlighted to continue verification nues.	tion. s the stem on.
Closing the Window	1) Pre sele	ss the [Esc] key t ection window.	o close the window and revert to the verify file-	∙type
	POIN	rs		
	(1) (2)	Verification with d The possibility of shown in the follo Servo programs o Other servo progr	lifferent CPU types verification of files with different CPU types i wing table. reated with SW1SRX-GSV13PE can be verified ams cannot be verified.	is d.
		File Type	Verification Possible/Not Possible	
		Servo data	Verification not possible with all CPU types	
		Servo program	Verification possible with all CPU types	

14.6 Deleting Hard Disk or Floppy Disk Data

Deletes unnecessary files from hard disk or floppy disk.

14.6.1 Deleting designated system names

Deletes a system name designated from the system name directory window.

[Procedure to Display the Delete System Name YES/NO Dialog box]



[Delete System Name YES/NO Dialog box]



[Key Operations] Deleting

Cancelling Delete

- 1) To delete the data, press the $[\leftarrow]$ key to highlight "YES" and press the [Enter] key. (The default display is "NO".)
- 2) A message indicates when the data has been deleted and the system returns to the system name directory window.
- To cancel the delete, press the [Enter] key while "NO" is highlighted. The data is not deleted and the system returns to the system name directory window.

POINT

Conditions for deleting a system name A system name can only be deleted if all sub-system names under the system name have already been deleted. A message indicates that sub-system names exist under the system name. Delete all sub-system names under the system name. (See Section 14.6.2.)

14.6.2 Deleting designated sub-system names

Deletes a sub-system name designated from the sub-system name directory window and deletes all data registered for the sub-system name.

[Procedure to Display the Delete Sub-system Name YES/NO Dialog box]



[Delete Sub-system Name YES/NO Dialog box]



[Key Operations] Deleting

- To delete the data, press the [←] key to highlight "YES" and press the [Enter] key. (The default display is "NO".)
- 2) A message indicates when the data has been deleted and the system returns to the sub-system name directory window.

Cancelling Delete

1) To cancel the delete, press the [Enter] key while "NO" is highlighted. The data is not deleted and the system returns to the sub-system name directory window.

POINT

Caution when deleting a sub-system name When a sub-system name is deleted, all data stored under the sub-system name is also deleted.

14.6.3 Deleting designated file-type names

Deletes all files of the file-type name which is designated from the file-type selection window for a designated sub-system name.

[Procedure to Display the Delete File-type Selection window]



[Delete File-type Selection window]



[Display/Setting Contents]

Delete file type Highlighted display of the selected file type. (File types containing data are marked with an asterisk "*".)

[Kev Operations]	
Selecting File Type	 Press the [↑]/[↓] keys to highlight the file type to be deleted. Press the [Enter] key. A YES/NO dialog box prompts whether to delete the data.
Deleting	 To delete the data, press the [←] key to highlight "YES" and press the [Enter] key. (The default display is "NO".) A message indicates when the data has been deleted and the system returns to the delete file-type selection window.
Cancelling Delete	 To cancel the delete, press the [Enter] key while "NO" is highlighted. The data is not deleted and the system returns to the delete file-type selection window.

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POINTS			
 (1) Designating multip Data can be deleted 1) Press the [↑]/ Press the [F6] The "*" by the 2) The YES/NO of pressed. (2) Deleting with diffe The possibility of of CPU type is show 	ble file types to delete ed from designated multiple file types, as follows. [↓] keys to highlight the file type to be deleted. key. file type changes to a "#". dialog box is displayed when the [Enter] key is rent CPU types leleting files if the CPU type differs from the edited n in the following table.		
File Type	Delete Possible/Not Possible		
Servo data Delete not possible with all CPU types			
Servo program Delete possible with all CPU types			

14.7 Copying Hard Disk or Floppy Disk Data

Copies files from a designated hard disk or floppy disk to a designated hard disk or floppy disk.

14.7.1 Copying sub-system names

Copies all files under a sub-system name from a designated hard disk or floppy disk to a designated hard disk or floppy disk.

[Procedure to Display the Copy Destination Selection Window]



[Copy Destination Selection Window]



[Display/Setting Contents]

Copy destination
drive name setting
areaDisplays the current drive name or the set drive name.Copy destination
system name setting
areaDisplays the set system name.Copy destination
sub-system name
setting areaDisplays the set sub-system name.[Key Operations]
Setting the Copy
Destination Drive1) The cursor moves to the copy destination sub-system r
Make sure that the cursor is in the copy destination of

- The cursor moves to the copy destination sub-system name setting area. Make sure that the cursor is in the copy destination drive name setting area. Enter the drive name A, C, or D (see Section 5.1) and press the [Enter] key. If the copy destination drive name already appears in the corpy destination drive name setting area, just press the [Enter] key.
 - 2) The cursor moves to the copy destination system name setting area.

Setting the Copy Destination System Name	 Set the copy destination system name. Make sure that the cursor is in the copy destination system name setting area. Enter the copy destination system name and press the [Enter] key. The cursor moves to the copy destination sub-system name setting area.
Setting the Copy Destination Sub-system Name	 Set the copy destination sub-system name. Make sure that the cursor is in the copy destination sub-system name setting area. Enter the copy destination sub-system name and press the [Enter] key. A YES/NO dialog box prompts whether to copy the data.
Copying	 Press the [Enter] key while "YES" is highlighted to copy the data. The default display is "YES". A message indicates that the data has been copied and the system returns to the sub-system name directory window.
Cancelling Copying	 To cancel copying, press the [→] key to highlight "NO", then press the [Enter] key. The data is not copied and the system returns to the copy destination selection window.

If the Sub-system Name Already Exists

[Overwrite File YES/NO Dialog Box]



[Display/Setting Contents]

If the designated sub-system name already exists when the file is copied, a YES/NO dialog box prompts whether to overwrite the existing file.

[Key Operations] Overwriting	1) Press the [Enter] key while "YES" is highlighted to overwrite the sub-
-	system name. The default display is "YES".2) A message indicates that the data has been overwritten and the system returns to the sub-system name directory window.
Cancelling Overwriting	 To cancel overwriting the sub-system name, press the [→] key to highlight "NO", then press the [Enter] key. The data is not overwritten and the system returns to the copy destination selection window.
	POINTS
	(1) Inputting a new system name for copying If a new copy destination system name is input from the directory, the new system name is created and all files under the duplicated sub-system name are copied to it.
	 (2) Checking copy source and copy destination Copying is not possible if the copy source and copy destination have the same drive name, system name, and sub-system name. Change the drive name, system name, and sub-system name.

14.7.2 Copying designated file-type names

Copies all files of the file-type name which is designated from the file-type selection window for a designated sub-system name.

[Procedure to Display the Copy File-type Selection Window]



[Copy File-type Selection Window]



[Display/Setting Contents]

Copy file type selectarea Highlighted display of the selected file type (File types containing data are marked with an asterisk " * ".)

[Key Operations] Selecting File Type

 Press the [↑] / [↓] keys to highlight the file type to be copied. Press the [Enter] key.

The copy destination selection window is displayed.

[Copy Destination Selection Window]



[Display/Setting Contents]

Copy destination drive name setting area	Displays the current drive name or the set drive name.
Copy destination system name setting area	Displays the set system name.
Copy destination sub-system name setting area	Displays the set sub-system name.
[Key Operations]	
Setting the Copy Destination Drive	 Make sure that the cursor is in the copy destination drive name setting area. Enter the drive name A, C, or D (see Section 5.1) and press the [Enter] key. If the copy destination drive name already appears in the copy destination drive name setting area, just press the [Enter] key. The cursor moves to the copy destination system name setting area.
Setting the Copy Destination System Name	 Make sure that the cursor is in the copy destination system name setting area. Enter the copy destination system name and press the [Enter] key. The cursor moves to the copy destination sub-system name setting area.
Setting the Copy Destination Sub-system Name	 Make sure that the cursor is in the copy destination sub-system name setting area. Enter the copy destination sub-system name and press the [Enter] key. A YES/NO dialog box prompts whether to copy the data.
Copying	 Press the [Enter] key while "YES" is highlighted to copy the data. The default display is "YES". A message indicates when the data has been copied and the system returns to the copy file-type selection window.
Cancelling Copying	 To cancel copying, press the [→] key to highlight "NO", then press the [Enter] key. The data is not copied and the system returns to the copy destination selection window.
If the File Already Exists

[Overwrite File YES/NO Dialog Box]



[Display/Setting Contents]

If the file designated as the copy destination file already exists when the file is copied, a YES/NO dialog box prompts whether to overwrite the existing file.

[Key Operations] Overwriting

- 1) Press the [Enter] key while "YES" is highlighted to overwrite the file. The default display is "YES".
- 2) A message indicates that the data has been overwritten and the system returns to the copy file-type selection window.

Cancelling Overwriting

- 1) To cancel overwriting the file, press the $[\rightarrow]$ key to highlight "NO", then press the [Enter] key.
- 2) The data is not overwritten and the system returns to the copy destination selection window.

POINTS

(1) (2) (3)	Copying to the sa The copy source a name must be diff when copying a fi displayed if the system names are Copy the file usin and sub-system n Inputting a new sy If a new copy des input when desig system name are system name. Copying with diffe The possibility of the following table	me drive and copy destination system name and sub-system ferent le to the drive it already exists on. A message is source anddestination system names and sub- e the same. g different source and destination system names ames. ystem name and sub-system name for copying stination system name and sub-system name are inating a copy, the new system name and sub- o created and the file is copied to the new sub- perent CPU types copying files with different CPU types is shown in e.	า ร- ธ อ
	File Type	Copying Possible/Not Possible	
	Servo data	Copy not possible with all CPU types	
	Servo program	Copy possible with all CPU types	

14. FILE MAINTENANCE

14.8 Display Format

Sets whether comments and titles are displayed in the directory and selects the directory display order.

[Procedure to Display the Display Format Setting Window]



[Display Format Setting Window]



[Display/Setting Contents]

Comment and title	The set item is highlighted
display a rea	

Display order select The set item is highlighted. area

[Key Operations]

Setting the Comment and Title Display

Selecting Setting	 Press the [F1] key to set whether the comments and titles are displayed
Item	in the directory. The "DISPLAY WITH COMMENT" item is highlighted.
Making the Setting	 To display the comments and titles, press the [1] key or the [Enter] key to select the item: "1. YES." The default display is "1. YES. " For no display of the comments and titles, press the [2] key or the [↓] key to highlight "2. NO." then press the [Enter] key. The cursor moves to the display order setting area and the "ORDER" item is highlighted.
Completing the	 Press the [End] key to complete the setting operation.
Setting	The settings are entered and the system returns to the servo file screen. The directory is displayed. Check that the display format matches the settings.
Interrupting	 Press the [Esc] key to interrupt the settings and revert to the servo file
Settings	screen.

14. FILE MAINTENANCE

Setting the Display Order

Selecting Setting Item	 Press the [F2] key to set the display order. The "ORDER" item is highlighted.
Making the Setting	 For directory display in the order of registration, press the [1] key or the [Enter] key to select "DIRECT.". The default display is "DIRECT.". For display in the order of date, press the [2] key or the [↑]/[↓] keys to select "TIME", then press the [Enter] key. For display in alphabetical order, press the [3] key or the [↑]/[↓] keys to select "ALPHABET", then press the [Enter] key. The selected display order is highlighted.
Completing the	 Press the [End] key to complete the setting operation.
Setting	The settings are entered and the system returns to the servo file screen. The directory is displayed. Check that the display format matches the settings.
Interrupting	 Press the [Esc] key to interrupt the settings and revert to the servo file
Settings	screen.

14.9 Creating New System Names

Creates new system names in a hard disk or floppy disk.

[Procedure to Display the System Name Create Window]



[System Name Create Window]



[Display/Setting Contents]

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Drive name setting area	Displays the current drive name or the set drive name.
System name setting area	Displays the set system name.
Comment s etting area	Displays the set comment.
[Key Operations] Setting the Drive	 Set the drive name in which the system name is to be created. Make sure that the cursor is in the drive name setting area. Enter the drive name A, C, or D (see section 5.1) and press the [Enter] key. If the drive name in which the system name is to be created already appears in the drive name setting area, just press the [Enter] key. The cursor moves to the system name setting area.
Setting a New System Name	 Set the new system name. Make sure that the cursor is in the system name setting area. Enter the system name and press the [Enter] key. The cursor moves to the comment setting area.
Setting System Name Comment	 To set the system name comment, make sure that the cursor is in the comment setting area. Enter the comment and press the [Enter] key. If no comment is required, just press the [Enter] key. A YES/NO dialog box prompts whether to create the system name.

14. FILE MAINTENANCE

Creating System Name

- 1) Press the [Enter] key while "YES" is highlighted to create the system name. The default display is "YES".
- 2) A message indicates that the system name has been created and the system returns to the system name directory window.

Cancelling Creating System Name 1) To cancel system name creation, press the $[\rightarrow]$ key to highlight "NO", then press the [Enter] key.

The system name is not created and the system returns to the system name create window.

POINT

If the system name already exists. If the system name input already exists, the message "SYSTEM NAME ALREADY EXISTS" will be displayed. If this happens, set another system name.

15. PRINTING

5

The servo printer mode is a mode to print out servo programs, positioning data, and system setting data set with the GSV13PE.

 Outline of the functions The functions below are offered by the GSV13PE servo printer mode.





(2) Outline of the procedure The printing procedure is shown below.

- (3) Types of printer
 - The following types of printer can be used with GSV13PE.
 - General ESC/P-compatible printer

3

15.1 Setting Printer Data

Sets the print format, including paper setting, paper width, paper length, margin, and headers.

The valid settings depend on the type of paper used, as shown in the table below.

Banar Sattlan)		
Paper Setting	Paper Width	Paper Length	Margin	Headers
Continuous form	0	0	0	0
Cut-form (A3 portrait)		_	0	0
Cut-form (A4 portrait)		_	0	0

(Paper width and paper length settings are ignored if cut-form paper is selected.)

[Procedure to Display the Printer Data Setting Window]



[Printer Data Setting Window]



[Display/Setting Contents]

Printer function Displays the model name of the printer selected with the basic utilities. **display area**

[Key Operations] Setting Paper	1) Press the [F1] key to set the type of paper for printing. Enter the paper type with the numeric keys or press the $[\uparrow]/[\downarrow]$ keys to move the cursor to select the paper type, then press the [Enter] key.
Setting Paper Width1	1) Press the [F2] key to set the paper width. Enter the paper width with the numeric keys or press the $[\uparrow]/[\downarrow]$ keys to move the cursor to select the paper width, then press the [Enter] key.
Setting Paper Length	1) Press the [F3] key to set the paper length. Enter the paper length with the numeric keys or press the $[\uparrow]/[\downarrow]$ keys to move the cursor to select the paper length, then press the [Enter] key.
Setting the Margin	 Press the [F5] key to set the print margin. Enter the margin as a value between 0 and 16 characters with the numeric keys.

15. PRINTING

Setting the Print Header	 Press the [F6] key to set the print header. Press the [↑]/[↓] keys to move the cursor to select "YES" (print headers) or "NO" (do not print headers), then press the [Enter] key.
Ending Printer Data Settings	 Press the [End] key to print out using the set printer data. A YES/NO dialog box prompts whether to write the file.
Writing File	 Press the [Enter] key while "YES" is highlighted to write the set printer data to internal memory. If "NO" is highlighted, press the [Enter] key to highlight "YES". The system returns to the servo printer function select window when the file is written. The set printer data is used when the GSV1 PE is subsequently started up.
Cancelling Writing File	 To cancel writing the file, press the [→] key to highlight "NO", then press the [Enter] key. The set printer data is not written to internal memory and the display reverts to the servo printer function select window.
Interrupting Printer Data Settings	 Press the [Esc] key to interrupt the printer data settings and clear the set printer data. The printer data reverts to the previous settings and the display reverts to the servo printer function select window.

POINT

Set the paper width and paper length only if continuous-form paper is selected.

15.2 Printing Out

Prints out servo programs created in the servo programming mode, positioning data (axis data, parameter block data, limit switch output data) set in the servo data setting mode, and system setting data set in the system setting mode.

[Procedure to Display the Servo Printing Window]



[Servo Printer Window] (A273UHCPU)



[Display/Setting Contents]

Printing format display area

Displays the printer name and the print format set by the printer data setting functions.

[Key Operations]Setting the Printed1) Set the printed data type from the following types:Data• Servo programs

- Axis data
- Parameter block data
- Limit switch output data
- System setting data
- 2) If multiple data types are selected, they are printed out in the sequence: servo programs, axis data, parameter block data, limit switch output data, and system setting data.
- 3) Set the print condition for each data type with the numeric keys or press the $[\uparrow]/[\downarrow]$ keys to highlight the required setting.

<Servo Program>

Prints out the programs used/unused lists for the created servo programs or the servo programs themselves.

- 1) Press the [F1] key to select the program data item. This item can be set to "W/O, PROGRAMS USED LIST, ALL PROGRAMS," or "RANGE".
 - W/O..... No print out
 - PROGRAMS USED LIST....Prints out the programs used/unused list.
 - •ALL PROGRAMS......Prints out all the created servo programs.
 - RANGE......Prints out the created servo programs in the designated program number range.

*** PROGRAM USED LIST *** ··· PROGRAMLIST ···· 0> = USED PROGRAMS USED STEPS LEFT STEPS æ 4096/ 4096 POINT ABS-1 AXIS SPEED CHG 2000 (PLS) ≫ec) PROGRAMSTEPS 1000 1010 1020 1001 1011 1021 1031 1002 1012 1022 1003 1013 1023 1033 1004 1014 1024 1005 1015 1025 1009 1019 1029 1039 1007 1017 1027 1006 1016 1026 1008

<Axis Data>

Prints out fixed parameters, servo parameters, home position return data, and JOG operation data.

- Press the [F2] key to select the axis data item. This item can be set to "W/O, ALL," or "RANGE".
 - ◆W/O.....No print out
 - •ALL.....Prints out data for all axes with data set.
 - RANGE...... Prints out the data for the designated axis range.



<Parameter Block>

Prints out parameter block data for 16 blocks.

- 1) Press the [F3] key to select the parameter block data item. This item can be set to "W/O" or " ALL".
 - W/O..... No print out
 - ALL.....Prints out 16 blocks of parameter data.

		NO 1	NO 2	NO 3	NO 4
1	CONTROL UNIT	3 PULSE	3 PULSE	3 PULSE	3 PULSE
2	SPEED RESTRICTIO	200000	200000	200000	20000
3	ACCELERATION TIM	1000	1000	1000	100
4	DECELERATION TIM	1000	1000	1000	1000
5	SHORT STOP TIME	1000	1000	1000	1000
6	SRATIO	٥	•	0	
7	TORQUE LIMIT	300	300	300	30
8	STOP METHOD	0 DECEL	O DECEL	O DECEL	0 DECEL
9	CIRCULAR ERROR R	100	100	100	100

<Limit Switch Output Data>

Prints out the limit switch output data.

- 1) Press the [F4] key to select the limit switch item. This item can be set to "W/O, ALL", or "RANGE".
 - W/O..... No print out
 - ALL.....Prints out data for all axes with data set.
 - RANGE......Prints out the data for the designated axis range.



<System Setting Data>

Prints out the system setting data.

Prints out the I/O allocation data if a PC I/O Unit is set.

- 1) Press the [F6] key to select the system setting item. This item can be set to "W/O" or "ALL".
 - W/O..... No print out
 - ALL.....Prints out data for all axes with data set.



SLOT IND POIN BASIC BASE I/O 0 INPUT UNIT 16 BASIC BASE I/O 3 INPUT UNIT 16 ADDITIONAL MOTION BASE I/O 0 INPUT UNIT 16	VO ALLOC	CATIO	4	
BASIC BASE I/O 0 INPUT UNIT 16 BASIC BASE I/O 3 INPUT UNIT 16 ADDITIONAL MOTION BASE I/O 0 INPUT UNIT 16 ADDITIONAL MOTION BASE I/O 0 INPUT UNIT 16	SLOT		KIND	POINT
BASIC BASE I/O 3 INPUT UNIT 16 ADDITIONAL MOTION BASE I/O 0 INPUT UNIT 16	BASIC BASE I/O 0		INPUT UNIT	16
ADDITIONAL MOTION BASE VO 0 INPUT UNIT 16	BASIC BASE I/O 3		INPUT UNIT	16
	ADDITIONAL MOTION BASE VO	0	INPUT UNIT	16

<Page>

Sets whether the page numbers are added to the data print-outs.

- 1) Press the [F7] key to select the system setting item. This item can be set to "W/O" or "WITH".
 - W/O.....No page numbers on print-out.
 - WITH..... Page numbers added to print-out, sequentially from 1 to 9999.

15. PRINTING

Selecting Printing	1)	Press the [F9] key. A YES/NO dialog box prompts whether to print.
Printing	1) 2) 3)	Press the [Enter] key while "YES" is highlighted to make the print out. If "NO" is highlighted, press the [←] key to highlight "YES". The message "CANNOT PRINT" indicates that the printer is not ready if no printer is connected. A YES/NO dialog box prompts whether to interrupt printing. Select "YES" to interrupt printing or "NO" to continue printing, then press the [Enter] key. A message indicates that printing is complete.
Cancelling Printing	1)	To cancel printing, press the $[\rightarrow]$ key to highlight "NO", then press the [Enter] key. A message indicates that printing was interrupted.
Interrupting Printing	1) 2))Press the [Esc] key to interrupt a printing operation. A YES/NO dialog box prompts whether to interrupt printing. Select "YES" to interrupt printing or "NO" to continue printing, then press the [Enter] key.
Ending Printed Data Setting	1)	After writing the set printed data, press the [End] key to close the servo printing window and revert to the servo printer function select window.
Interrupting Printed Data Setting	1)	Press the [Esc] key to clear the set printed data. The printed data reverts to the previous settings. The servo printing window closes and the system returns to the servo printer function select window.

15.3 Sample Print-Outs

Sample print-outs of servo programs, positioning data, and system setting data are shown below.

- (1) Sample servo program print-out (Printer: ESC/P; Paper: cut-form)
 - Servo programns used list

	*** PROGF	M USED LIST ***		
USED PROGRAMS USED STEPS LEFT STEPS	2048 / 4096 8192 / 13312 5120			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$		9 19 29 40 55 66 77 78 78 79 76 79 76 79 70 109 119 129 139 149 159 149 159 219 229 249 249 259 269 269 269 269 269 269 269 26	
NO	DATE	REV DATE	PC A3U	
REV NO	DESIGNER	NAME	PAGE 1	

POINT

The servo program list prints created program numbers only. Uncreated program numbers are not printed out.

Servo program



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15. PRINTING

(2) Sample axis data print-out (a) Using ADU(A273UHCPU)



(b) Using MR- ----------B



J,



(3) Sample parameter block data print-out

		NO. 1	NO. 2	NO, 3	NO 4
1	CONTROL UNIT	3:PULSE	3:PULSE	3:PULSE	3:PULSE
2	SPEED RESTRICTIO	200000	200000	200000	200000
3	ACCELERATION TIM	1000	1000	1000	1000
4	DECELERATION TIM	1000	1000	1000	1000
5	SHORT STOP TIME	1000	1000	1000	1000
6	S RATIO	0	0	0	0
7	TORQUE LIMIT	300	300	300	300
8	STOP METHOD	0:DECEL.	0'DECEL.	0:DECEL.	0:DECEL.
9	CIRCULAR ERROR R	100	100	100	100

*** P.B. BLK. DATA ***

		NO. 5	NO 6	NO. 7	NO. 8
1	CONTROL UNIT	3:PULSE	3:PULSE	3-PULSE	3:PULSE
2	SPEED RESTRICTIO	200000	200000	200000	200000
3	ACCELERATION TIM	1000	1000	1000	1000
4	DECELERATION TIM	1000	1000	1000	1000
5	SHORT STOP TIME	1000	1000	1000	1000
6	S RATIO	0	0	0	0
7	TORQUE LIMIT	300	300	300	300
8	STOP METHOD	0:DECEL.	0:DECEL.	0:DECEL.	0:DECEL.
9	CIRCULAR ERROR R	100	100	100	100

		NO. 9	NO. 10	NO. 11	NO 12
1	CONTROL UNIT	3:PULSE	3:PULSE	3:PULSE	3:PULSE
2	SPEED RESTRICTIO	200000	200000	200000	200000
3	ACCELERATION TIM	1000	1000	1000	1000
4	DECELERATION TIM	1000	1000	1000	1000
5	SHORT STOP TIME	1000	1000	1000	1000
6	S RATIO	0	0	0	0
7	TORQUE LIMIT	300	300	300	300
8	STOP METHOD	O'DECEL.	0'DECEL.	0.DECEL	0.DECEL
9	CIRCULAR ERROR R	100	100	100	100

		NO. 13	NO. 14	NO, 15	NO 16
<u>├</u>	CONTROL UNIT	3:PULSE	3:PULSE	3:PULSE	3:PULSE
2	SPEED RESTRICTIO	200000	200000	200000	200000
3	ACCELERATION TIM	1000	1000	1000	1000
4	DECELERATION TIM	1000	1000	1000	1000
5	SHORT STOP TIME	1000	1000	1000	1000
6	S RATIO	0	0	0	0
7	TORQUE LIMIT	300	300	300	300
8	STOP METHOD	0:DECEL.	0:DECEL.	0:DECEL.	0:DECEL.
9	CIRCULAR ERROR R	100	100	100	100



⁽⁴⁾ Sample limit switch output data print-out

*** SYSTEM SETTING DATA *** BASIC SIDE BASE UNIT : A172B A171S A171S UN-ENC USABLE CPU MR-NO USE NO USE NO USE H10B INC 1AXIS HA-FH053

(5) Sample system setting data print-out (a) Using A171SCPU



15. PRINTING





Public/Cyncinenedds Eneodal interfade module .AE/OEA				
Signal Name	Data	Device	Number of Words	
TREN1	5 - Servo command value	W000	2	
TREN2	3 - Position droop	W034	2	

D 0

2

Pulse/Synchronous Encoder Interface Module :A273EX

PC I/O Module

6 - Motor Speed

TREN3

Input No.	Data	Device	Number of Words
X**0			
X**1		_	
X**2			
X**3			
X**4			
X**5			
X**6			
X**7			

The internal positioning OS (operating system) of the servo system CPU can be written or rewritten from a personal computer.

The positioning OS is stored in the installation FD.

"Installation" and "verification" of the OS are possible using a personal computer running the GSV13PE software.

 "Installation" means writing the positioning OS from the personal computer to the servo system CPU.
 The serve system CPU.

The servo system CPU executes positioning control in accordance with the installed positioning OS.

 "Verification" means checking the positioning OS against the positioning OS installed in the servo system CPU.



(1) Outline of the functions

The following functions are available in the Install mode of the GSV13PE software package.



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16.1 Installation of the OS for Positioning

- (1) The OS is installed in the following cases:
 - To change the positioning OS installed in the servo system CPU to one with a different model name.
 - To change to the new version of the positioning OS when there has been a version upgrade.
- (2) Procedure for installation The procedure for installing the positioning OS in the servo system CPU is indicated below.



POINTS

- (1) The servo system CPU is shipped with the positioning OS already installed.
 - Check the model name and version of the positioning OS installed in the servo system CPU before installing another positioning OS.
- (2) Installing a positioning OS does not cause the positioning data and servo programs written in the servo system CPU to be rewritten.
- (3) Setting the install switch















16.2 Verification of the Positioning OS

The procedure for verification is described below.

(1) Procedure for verification The procedure for verifying the positioning OS installed in the servo system CPU against the positioning OS at the personal computer is as follows.



POINTS	
 Verification of the positioning OS is possible regardle	ss of the
ON/OFF position of the servo system CPU's install switch If the message "OPERATING SYSTEM MISMATCH" is dis	n.
the message area, verification is not possible.	splayed in




17. BACKUP FUNCTION

- (1) The backup function is a function whereby the following data in the servo system CPU is backed up by being read to the internal memory of the personal computer and is then loaded (written) again to the servo system CPU.
 - 1) System setting data
 - 2) Positioning data
 - 3) Servo program data
 - 4) Data required for home position return in the servo system CPU
- (2) The backup function is used when replacing the servo system CPU. It is possible to read the data indicated in 1) to 4) in (1) above into the current servo system CPU in the backup mode before replacement, then, in the load mode, write the data in the personal computer to the servo system CPU after replacement.

After the data has been written to the servo system CPU, reset the servo system CPU or switch the power OFF and back ON (normal operation cannot be guaranteed if this is not done).

- 1) With an absolute position system, use of the backup function makes startup operations such as home position return unnecessary after replacement.
- 2) With systems other than an absolute position system, this function can be used to batch write data 1) to 3) in (1) above (data 4) is cleared).

In this case it is essential to execute a home position return after replacement.

(3) The backup function does not create a backup file.

The data read from the servo system CPU to the internal memory of the personal computer is stored in the FD/HD as a backup file when "SAVE & QUIT" is executed.

The data in the backup file is read by selecting " file read" in the initial settings (see Section 6.1) when the GSV13PE is started up.





(5) Summary of procedure

A summary of the procedure for executing backup/load is presented below.



POINTS

- (1) The backup function can be used when replacing the servo system CPU to load the servo system CPU backup data to the new servo system CPU so as to maintain the same data after replacement.
- (2) The servo system CPU data backup file is stored in the file SVBACKUP. BIN in \GPP\USR\system name\sub-system name.

17.1 Servo System CPU Backup

This function creates a backup of the system setting data, positioning data and servo program data currently written in the servo system CPU, and of the current device data, data required for home position return, etc., of the servo system CPU, and writes it to a personal computer.

[Procedure to Display the Backup Function Execution Window]



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[Backup Function Execution Window] (When using A273UHCPU)



[Display/Setting Contents]

[Diopid]/ ooking oon	
Caution display area	Cautions relating to execution of backup/load are displayed here.
Indicator display area	The progress of the backup/load operation is displayed here by the indicator.
[Key Operations]	
Selecting backup	 Press the [F1] key to select backup. The backup execution YES/NO dialog box will be displayed.
Selecting backup execution	 To execute the backup operation, first check the cautions to be observed when executing backup, then press the [Enter] key while "YES" is high- lighted. (If "NO" is highlighted, press the [←] key to highlight "YES".) Backup will be executed and the message "EXECUTING" will be displayed. Carry out verification when the indicator has reached 100%.
Cancelling backup	 To cancel the backup operation, highlight "NO" by pressing the [→] key, then press the [Enter] key. The system will return to the backup function execution window without executing backup.
Closing the window	 To close the backup function execution window, press the [Esc] key. The system will return to the servo function selection window.

17.2 Loading Backup Data to the Servo System CPU

This function loads the servo system CPU backup data currently written in the personal computer (backup of system setting data, positioning data and servo program data currently written in the servo system CPU, and of the current device data, data required for home position return, etc., of the servo system CPU) to the servo system CPU.

[Procedure to Display the Backup Function Execution Window]



[Backup Function Execution Window] (When using A273UHCPU)



[Display/Setting Contents]

Caution display area Cautions relating to execution of backup/load are displayed here.

Indicator display area	The progress of the backup/load operation is displayed here by the indicator.
[Key Operations] Selecting load	 Press the [F2] key to select load. The load execution YES/NO dialog box will be displayed.
Selecting load execution	 To execute the load operation, first check the cautions to be observed when executing load, then press the [Enter] key while "YES" is highlighted. (If "NO" is highlighted, press the [←] key to highlight "YES".) Load will be executed and the message "EXECUTING" will be displayed. Carry out verification when the indicator has reached 100%.
Cancelling load	 To cancel the load operation, highlight "NO" by pressing the [→] key, then press the [Enter] key. The system will return to the backup function execution window without executing load.
Closing the window	 To close the backup function execution window, press the [Esc] key. The system will return to the servo function selection window.

18. A273U \rightarrow A273UH FILE CONVERSION

The A273U \rightarrow A273UH conversion mode is the mode in which files created for use with A273UCPU are converted for use with A273UHCPU (8-axis specifications).

(1) Outline of functions The following functions are available with the A273U \rightarrow A273U conversion mode of the GSV13PE.



(2) Summary of procedure A summary of the procedure for executing A273U \rightarrow A273UH file conversion is presented below.



* The user files that are applicable for "A273U \rightarrow A273UH file conversion" and the conversion details are indicated below.

	Conversion Source File for A273U	Conversion Destination File for A273UH (8-axis specifications)	Conversion Details
РС Туре	GSV.CNF	GSVP.CNF	Converted to A273UH (8-axis specifications) PC type.
System set- ting servo data	SVDATA.BIN	SVSYSTEM.BIN	"System setting" data made compatible with A273UHCPU.
		SVDATA.BIN	 The parameters added for A273UHCPU are set to their initial values. The servo parameters added for the ADU axis are set to the default. If necessary, set other values.
Servo program	SVPROG.BIN	SVPROG.BIN	 Only the file size is changed. The program contents remain unchanged.

18.1 Sub-System Name Designation

This function is used to designate the drive name, system name, and subsystem name for the conversion source, and the drive name and system name for the conversion destination.

When designating the system name or drive name for a conversion source/conversion destination, it is possible to display a list of the system names under the designated drive name or of the sub-system names under the designated system name for reference.

[Procedure to Execute the Sub-System Name Designation Function]



[A273U → A273UH File Conversion Function Selection Window]



[Display/Setting Contents]

Conversion source The drive name currently being read is displayed here. Set the conversion drive name setting source drive name.

area

Conversion source The system name currently being read is displayed here. Set the conversion system name setting source system name. area

Conversion sourc The sub-system name currently being read is displayed here. Set the sub-system name conversion source sub-system name. setting area

Conversion destination drive name setting area Set the drive name in which the A273U \rightarrow A273UH converted file is to be stored here. ("A" is set as the default.)

Conversion destination system name setting area

Set the system name in which the A273U \rightarrow A273UH converted file is to be stored here.

Selecting the sub-system name designation function
When the A273U \rightarrow A273UH file conversion execution window is open,
the sub-system name designation function is selected as a default.
There is therefore no need to select it.
To select the sub-system name function again after having quit it, press
the [F1] key.

A list of the system names under the designated drive name, or a list of Directory display area sub-system names under the designated system name is displayed here. [Key Operations] Setting the 1) Set the drive name in which the file to be converted is stored. conversion source Make sure that the cursor is located at the conversion source drive name drive name setting area, input the drive name (A, C, or D: see Section 5.1), then press the [Enter] key. (If the conversion source drive name is displayed in the conversion source drive name setting area, just press the [Enter] key.) The cursor will move to the conversion source system name setting area. 2) To view the conversion source system names that can be set, make sure that the cursor is in the conversion source drive name setting area or conversion source system name setting area, then press the [F8] key. A list of the system names under the set drive name will be displayed. Setting the 1) Set the system name in which the file to be converted is stored. conversion source Make sure that the cursor is located in the conversion source system name system name setting area, input the system name for the conversion source, then press the [Enter] key. (If the conversion source system name is displayed in the conversion source system name setting area, just press the [Enter] key.) The cursor will move to the conversion source sub-system name setting area. 2) To view the conversion source system names that can be set, make sure that the cursor is in the conversion source drive name setting area or conversion source system name setting area, then press the [F8] key. A list of the system names under the set drive name will be displayed. 1) Set the sub-system name in which the file to be converted is stored. Setting the Make sure that the cursor is located in the conversion source sub-system conversion source name setting area, input the sub-system name for the conversion source, sub-system name then press the [Enter] key. (If the conversion source sub-system name is displayed in the conversion source sub-system name setting area, just press the [Enter] key.) The cursor will move to the conversion source sub-system name setting area. 2) To view the conversion source sub-system names that can be set, make sure that the cursor is in the conversion source sub-system name setting area, then press the [F8] key. A list of the sub-system names under the set system name will be displayed. Setting the 1) Set the drive name in which the file to be converted is to be stored. conversion Make sure that the cursor is located in the conversion destination drive destination drive name setting area, input the drive name for the conversion destination, then press the [Enter] key. (If the conversion destination drive name is name displayed in the conversion destination drive name setting area, just press the [Enter] key.) The cursor will move to the conversion destination system name setting area 2) To view the conversion destination drive names that can be set, make sure that the cursor is located in the conversion destination drive name setting area or conversion destination system name setting area, then press the [F8] key. A list of the system names under the set drive name will be displayed.

Setting the conversion destination system name (quitting the subsystem name designation function) 1) Set the system name in which the converted file is to be stored.

Make sure that the cursor is located in the conversion destination system name setting area, input the system name of the conversion destination, then press the [Enter] key.

The sub-system name designation function will be quit, and the conversion execution function will be selected.

POINTS

£1

(1) Cursor motion when selecting the sub-system name designation function

With the exception of the conversion destination drive name, it is possible to return to the previous setting area by using the $[\uparrow]/[\leftarrow]$ keys after making each setting.

(2) When setting the conversion destination drive name/system name it is not possible to set the same drive name or system name for the destination as was set for the source. If conversion is attempted with the same drive name and system name set for source and destination, the message "PC SELECTION ERROR" will be displayed and the conversion will not be executed.

18.2 Executing Conversion

This is the procedure for converting the designated conversion source A273UCPU data to data for A273UHCPU use, and storing it in the conversion destination file.

Set the conversion source/conversion destination in advance using the subsystem name designation function. The conversion execution function cannot be selected if these settings have not been made.

[Procedure to Display the Conversion Execution YES/NO Dialog Box]



[Conversion Execution YES/NO Dialog Box]



[Display/Setting Contents]

When the conversion destination system name has been set using the sub-system name setting function, the conversion execution function is selected, and the conversion execution YES/NO dialog box is displayed.

[Key Operations]	
Executing conversion	 To execute conversion, select "YES" and press the [Enter] key. ("YES" is set as the default.) The message "EXECUTING" will be displayed and file conversion will start.
	2) When "COMPLETED" is displayed, the file converted for use with A273UH is stored under the designated conversion destination system name, under the same sub-system name as the designated conversion source system name.
	3) If the error message "PC SELECTION ERROR" is displayed, the set conversion source drive name and system name are the same as the drive name and system name for the conversion destination. In this case, change the drive name or the system name.
	4) If the error message "FILE NOT FOUND" is displayed, the set conversion source file does not exist. Re-set the drive name/system name/sub-system name for the conversion source.
	5) If the same sub-system name as the designated conversion source sub- system name exists under the designated conversion destination system name, and the same file name exists, servo program files will be overwrit- ten: care is required.
Cancelling conversion	 To cancel execution of conversion, press the [→] key to highlight "NO", then press the [Enter] key. Execution will be discontinued.

Selecting the sub-system name designation function destination.
 1) To execute conversion again, press the [F1] key to select the sub-system name designation function, and set the conversion source and conversion destination.
 2) In the same way, if an error message is displayed when conversion is

 In the same way, if an error message is displayed when conversion is executed, press the [F1] key and repeat setting of the sub-system name and other settings.

Quitting the A273U → A273UH file conversion function 1) Press the [Esc] key. (If the directory has been displayed, press the [Esc] key twice.)

The system returns to the servo function selection window.

This section describes the error messages which can occur during GSV13P operation, the error contents, and appropriate remedies. The cause of the error and remedy can be displayed in the troubleshooting help window by pressing the [Shift] + [F12] keys when an error message is displayed. (See Section 5.8.)

Error Message	Description	Remedy
Amplifier discrepancy	Different copy source and copy destina- tion amplifiers during axis data copy in servo data setting mode.	Copy between axes of the same amplifier.
Cannot print	Printer not turned on. Defective connection to printer.	Check printer connections and cables.
Install switch OFF	CPU install switch was off during installa- tion.	Turn on the install switch.
Could not install	Installation was unsuccessful.	Install again.
Operating system not installed	Operating system is not installed in the servo system CPU.	Use the install functions to install and verify the operating system.
Operating system discrepancy	The model or version of the operating system installed in the servo system CPU did not match the operating system it was compared with.	Conduct verification between operating systems with the same model and version.
File does not exist	The designated file is not available.	Check the file name.
Program does not exist	The designated program does not exist. The [F7] key was pressed to display the previous program number while program number 0 was displayed. The [F8] key was pressed to display the next program number while program num- ber 4095 was displayed. The copy source program does not exist.	Check the program number.
A write error occurred	Data could not be written to the program memory in the servo PC.	Defective internal memory of CPU. Replace.
Two-byte characters not allowed	A two-byte character was used where it is not permitted.	Use one-byte characters.
Incorrect indirect device setting	An inappropriate device was set as the indirect device in the servo program.	Correctly set the indirect device.
Incorrect sub-system name	An attempt was made to copy files using the same drive and sub-system name.	Change the copy destination sub-system name.
	Sub-system name is incorrect.	Set a correct sub-system name.
Sub-system name XXXXXXXX does not exist	The designated sub-system name XXXXXXXX is not set.	Set sub-system name XXXXXXXX.
No control power supply module set at main base unit	No control power supply module was set at the main base during system set-up.	Set a control power supply module for the main base unit in system set-up.
No battery unit (MR-JBAT- []) set at the main base unit	Although ABS servomotors have been set during system set-up, no battery unit was set at the main base unit.	Set a battery unit when ABS servomotors are used.
Cannot set present values	An attempt was made to set a present value in some position which is not a positioning address.	Set the present value for a positioning address.
No servo power supply module set	No control power supply module unit was set at the main base unit during system set-up.	Use a servo power supply module when using the ADU.

(1) Troubleshooting tables

Error Message	Description	Remedy
No external regenerative resistor	No external regenerative resistor was set	Set an external regenerative resistor for
set for servo power supply module	for the servo power supply MODULE dur- ing system set-up.	the servo power supply module.
Cannot change servo parameters	When an attempt was made to change the servo parameters for the servo sys- tem CPU, the servo system CPU status did not allow changes (in-position signal: OFF).	Turn the in-position signal ON to set the servo system CPU to the status in which changes are possible and change the servo system parameters.
Total servomotor rated current exceeds the servo power supply module capacityby <u>XXXX</u> A. <u>L Excess current</u>	The total of the rated currents of the servomotors connected to the ADU exceeded the servo power supply module capacity at system set-up.	Connect servomotors within the capacity of the servomotor power supply module.
Servo Ready is OFF. Cannot run.	During servo test, a start command was issued to an axis with the Servo Ready signal OFF.	Turn ON the Servo Ready signal before issuing the start command.
	When the servo monitor torque trace was started, Servo Ready was OFF for the axis.	Turn ON the Servo Ready signal to start monitoring with the torque trace.
Servo Ready is ON. Cannot run.	An attempt was made to write data in the servo PC mode while the Servo Ready signal was ON.	Turn OFF the Servo Ready signal before writing data.
Cannot delete	When deleting a servo program, the [F3] key or [Shift] + [F2] keys were pressed with the cursor at a required item posi- tion.	Make sure that the item is an additional item before attempting to delete it. Alternatively, delete the entire program.
ltem already set	When editing a servo program, the desig- nated additional setting item has already been set.	Duplicate settings of the same item are not permitted.
Duplicated axis number. X-axis allocation: Main base (I/01)* Separate servo- amplifier (d2) Axis number	An axis number was duplicated during system set-up.	Check the axis numbers.
Axis number not set	No axis number set for any axis during system set-up.	An axis number must be set for at least one axis.
Axis number out-of-range	The designated axis number is out-of- range. Or, the same axis number is al- ready set.	Check the set axis numbers.
Total PC I/O module I/O points exceeds 256	The total number of PC I/O unit I/O points exceeded 256 at system set-up.	Set the data within the setting ranges.
Duplicate PC I/O module I/O numbers. <u>Main base (I/00)/</u> motion expansion base (I/07)*	PC I/O Unit I/O numbers were duplicated at system set-up.	Check the I/O numbers.
PC Ready (M2000) is ON. Cannot run.	An attempt was made to write data in the servo PC mode while the PC Ready signal (M2000) was ON.	Turn OFF the PC Ready signal (M2000) before writing data.
Incorrect execution position	A function was executed in an inappropri- ate position.	Execute the function in an appropriate po- sition.
System not set up	The servo data setting mode was se- lected before data was set in the system setting mode. Or, an error occurred dur- ing the system setting relative check.	Set up the system before setting the servo data. Or run the relative check after setting up the system and check that no error occurs.

*: Underlined display messages differ according to the settings.

Error Message	Description	Remedy
Incorrect setting range	Copy source range set with the start num- ber greater than the end number. Or, the copy source and copy destination ranges overlap.	Designate the correct range.
	An attempt was made to set data out-of- range.	
Duplicate start axes	During servo programming, duplicate start axes existed in the programs (K0 to K4095) set for the simultaneous start (START) instruction.	Check the start axes.
Cannot execute during operation	During servo test, a start command was issued to a moving axis.	Stop the axis and repeat.
Cannot start: XX L Error code	For details, see Table (2) in the section "E Not Start."	rror Codes Displayed When Axis Does
No end instruction	No end instruction for the servo program- ming speed-switching instruction (VSTART).	Set the end instruction.
Duplicate end instructions	Duplicated end instructions for the servo programming speed-switching instruction (VSTART).	Check the end instructions.
Incorrect end instruction position	The end instruction (ABS-1 to ABS-3, INC-1 to INC-3) is not set in the correct position for a servo programming speed- switching instruction (VSTART). Or, no end instruction exists.	Place the end instruction after the speed- switching instruction. Or, check the end instruction.
Outside stroke limit range	During servo programming, the position- ing address (end address for circular in- terpolation) for an absolute data method instruction (ABS []) was outside the range between the fixed parameter stroke upper and lower limits.	Set the address inside the stroke limit range.
All axes unused. Stopping print- ing.	Printing was attempted although no data was set during system set-up.	Set up the system before printing out the axis data.
Connected PC different from set PC	An attempt was made to read, write, verify, or install data when the connected CPU was not the servo system CPU.	Connect the servo system CPU.
Setting out-of-range	An attempt was made to set data out-of- range.	Set the data inside the setting range.
Capacity of set battery unit too small	During system set-up, the capacity of the currently set battery pack was insuffi- cient for the total number of ABS servo motors and ABS synchronization encoders.	Check the capacity of the battery pack against the ABS servomotors.
Incorrect set data	Data was set out-of-range.	Set data inside the setting range.
Cannot set	An attempt was made to set data although data cannot be set.	Check whether or not data item requires setting.
Setting not required	An attempt was made to set a parameter which does not require setting.	Do not set the parameter.
Cannot select	An attempt was made to select an item which cannot be selected.	Select the correct item.
Sorting required	When setting the limit switch for servo data setting, an attempt was made to execute the ON/OFF setting before the point addresses were sorted.	Sort the point address before running the ON/OFF point setting.
	During servo programming, insufficient free space to store.	Sort to secure sufficient free space.

Error Message	Description	Remedy
Servo external signal unit (A278LX) required to use dynamic brake unit (A240DY)	The dynamic brake unit (A240DY) was set during system set-up, but no servo external signal unit (A278LX) was set.	Always set the servo external signal unit (A278LX) when using the dynamic brake unit (A240DY).
Press correct key	An invalid key was pressed.	Press the correct key.
Units discrepancy	Servo program control units do not match the axis units.	Modify the servo program additional items "Units" and "P.B." such that the servo program control units match for at least one axis.
No data	GSV13PE incorrectly installed.	Correctly install the GSV13PE.
	An attempt was made to print before printed data was set in the servo printer mode.	Set the printed data before printing.
Data error	Back-up data is abnormal and cannot be loaded.	Back-up the data again.
Data discrepancy	Data discrepancy during servo file verifi- cation.	Check the servo data and servo program data.
Cannot cancel test mode	An attempt was made to cancel the test mode after axis operation started.	Stop the axis before cancelling the test mode.
Device number out-of-range	When a servo program was read, a de- vice number was designated outside the ranges: D0 to D1023/D8191 and W000 to W3FF/W1FFF.	Set the correct device number.
	When reading a program with the servo on-line, an attempt was made to read a non-existent servo program.	Designate the correct servo program number.
Drive error	Abnormal hard disk drive.	Check the hard disk. (This error should not normally occur.)
Drive not ready	No hard disk or floppy disk drive.	Check the hard disk or floppy disk drive. (This error should not normally occur.)
Cannot run torque trace	During servo monitoring, the torque trace could not be run because of a trace from a peripheral device.	Run the torque trace after the other trace is complete.
Input out-of-range	The input exceeded the limit value.	Check the limit value and repeat the input
Incorrect input order	The Page key was pressed before the servo program data was read.	Read the servo program data before pressing the Page key.
Cannot open file	A file could not be opened when writing the file.	Check the free space on the hard disk.
Printer not ready	Cannot print because the printer is not ready.	Set up the printer.
Program number out-of-range	A program number was out of the range 0 to 4095 for the simultaneous start (START) instruction.	Correctly set the program number
Incorrect syntax: No.= XXX L Program number	A syntax error occurred with the use of repeated operation instructions during servo programming.	Correct the program.
Axis not used	An axis which is not used was desig- nated at system set-up.	An axis with no amplifier cannot be se- lected. The amplifier power was turned off dur- ing servo monitoring or test operation. Turn on the amplifier power supply.

Error Message	Description	Remedy
Instruction code error	A set instruction code was not a normal instruction code and could not be deci- phered during servo programming.	Set the correct instruction code.
	A servo program read from the servo sys- tem CPU contained an illegal instruction during the servo test.	Correct the servo program and rewrite it to the servo system CPU.
Incorrect instruction input form	An error was found in a set item during the servo program check.	Correctly set the item.
Check the memory cassette	Data could not be written to the servo system CPU memory when writing data to the servo system CPU. Or, abnormal E ² ROM.	Defective Internal memory of CPU. Replace.
Write protect switch ON. Cannot write.	An attempt was made to write to a write- protected floppy disk.	Set the switch to enable writing to the floppy disk.
Press [Enter] key when Drive A is ready.	The disk was not ready to read or write a file.	Insert a floppy disk into Drive A and press the [Enter] key.
Cannot connect HA-LH52 *to A221AM (main base I/03). (For A273UHCPU only)	During system set-up, the wrong motor type was connected to an amplifier.	Check the amplifier and motor types.
No END instruction	No End instruction (CPEND, VEND) with constant-speed or speed-switching con- trol.	Set the END instruction.
Incorrect END instruction position	Instructions exist after the END instruction (CPEND, VEND) in a servo program.	Delete any instructions after the END instruction.
Incorrect FOR-NEXT instructions	Incorrect use of repeated operation in- structions (FOR-ON, FOR-OFF, FOR- TIMES, NEXT) for constant-speed or speed-switching control. Instructions are nested or only one exists.	Correctly set the repeated operation in- structions.
ABS motor cannot be used with MR-H100B-S70 (separate servo amplifier d1)	A motor that cannot be connected to MR- H 🗍 B-S70 by the system setting is connected.	An ABS motor cannot be connected MR- H 🗋 B-S70 (full-closed system amplifier). Check the motor and amplifier types.
No PC communications	An error occurred in communications with the servo system CPU .	Check the servo system CPU connec- tions and cables.
	Data reading, writing, or verification was attempted with no servo system CPU con- nected.	
	Defective connection to servo system CPU.	
	Monitor data cannot be correctly read.	Key in again and retry. Module defective if error occurs again.
	A time-over error occurred during the servo test.	Check that the servo system CPU is oper- ating correctly.
PC running. Cannot write.	The servo system PC was running when writing was attempted with the servo PC. Back-up was executed while the servo system CPU was running.	Stop the servo system CPU, then write.
START instruction designated	During servo programming, a START in- struction was designated in the programs (K0 to K4095) set for the simultaneous start (START) instruction.	Set program numbers for simultaneous start which do not contain a START in- struction.

*: Underlined display messages differ according to the settings.

Error Code	Description	Remedy
1	Cannot start because the servo error detected sig- nal is ON.	Eliminate the cause of the servo error, and start the operation again.
2	Cannot start because the in-position signal is OFF.	Move the motor inside its designated movement range and start the operation again.
3 *1	Cannot start because the external FLS signal is OFF.	Start the operation again after the external FLS sig- nal turns ON.
4 *1	Cannot start because the external RLS signal is OFF.	Start the operation again after the external RLS sig- nal turns ON.
5 *1	Cannot start because the external STOP signal is ON.	Start the operation again after the external STOP signal turns OFF.
6	Cannot start because the servo ready signal is OFF.	Start the operation again after the servo ready sig- nal turns ON.
7	Cannot start because no MR-H-B/MR-J-B or ADU is mounted.	Amplifier is not turned on or an unused axis is set. Turn on the amplifier and check which axis is set.
8	Cannot start because fixed parameter upper or lower limits are exceeded.	Set the data such that the upper or lower limits are not exceeded and start the operation again.
9	An attempt was made to use the dog or count method of home position~ return with no A278LX present.	Home position return is not possible.
10	Cannot start because the start reception signal is ON.	Start the operation again after the motor stops.
11	Cannot start because the test mode signal (M9075) is OFF.	Re-enter the test mode, and start the operation again after the test mode signal (M9075) turns ON.
12	Cannot start because the test mode request error signal (M9078) is ON.	Eliminate the cause of the test mode request error, and start the operation again.
13	Cannot start because a torque trace is being exe- cuted.	Start the operation again after the torque trace stops.
14 *2	A forward jog operation was attempted using the teaching functions before the following signal conditions had been met: STOP = OFF, FLS = ON, servo error = OFF, servo ready = ON.	Start the operation again after all the signal condi- tions have been met.
15 *3	A reverse jog operation was attempted using the teaching functions before the following signal condi- tions had been met: STOP = OFF, RLS = ON, servo error = OFF, servo ready = ON.	Start the operation again after all the signal condi- tions have been met.
16	Jog operation or manual pulse generator operation was attempted using the teaching functions, but op- eration cannot start because no axis is designated	Start the operation again after designating an axis.

(2)	Error codes	displayed	when axis	does not start
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*1 : Error occurs only if A278LX is used.
*2 : FLS and STOP are checked only if A278LX is used.
*3 : RLS and STOP are checked only if A278LX is used.



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