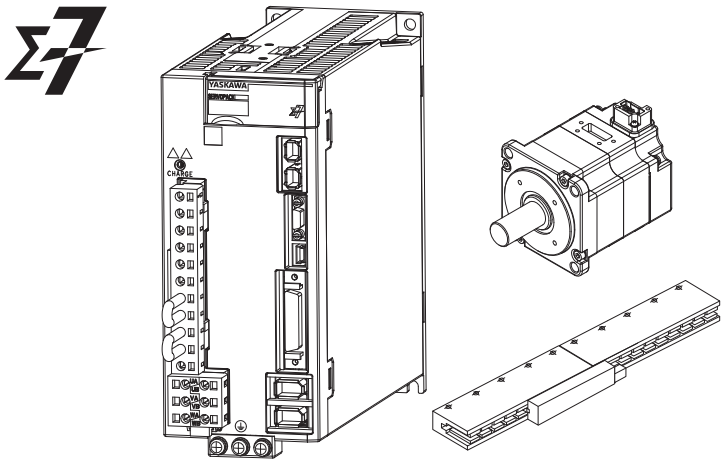
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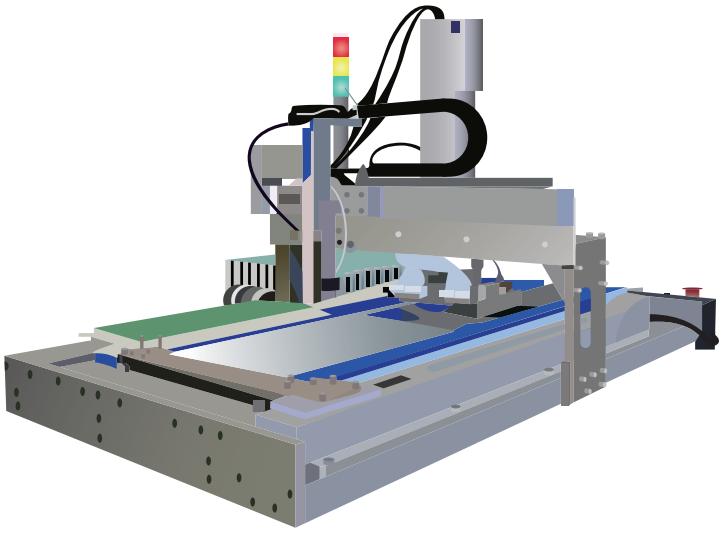
Σ-7-Series AC Servo Drive

Σ-7W SERVOPACK with FT/EX Specification for Gantry Applications

Product Manual

Model: SGD7W-□□□A20A000F70





Basic Information on SERVOPACKs 1

SERVOPACK Ratings and Specifications 2

Position Correction Table 3

Synchronized Stopping 4

Position Deviation between Axes Overflow Detection 5

Maintenance 6

Parameter Lists 7

MANUAL NO. SIEP S800002 29J

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About this Manual

This manual provides information on the Σ-7-Series AC Servo Drive Σ-7W SERVOPACK for Gantry Applications.

Read and understand this manual to ensure correct usage of the Σ-7-Series AC Servo Drives.

Keep this manual in a safe place so that it can be referred to whenever necessary.

Outline of Manual

The contents of the chapters of this manual are described in the following table.

When using the Σ-7-Series for Gantry Applications, read and understand this manual and the manuals given in the following table.

Item		This Manual	Σ-7-Series AC Servo Drive Σ-7W SERVOPACK Product Manual MECHATROLINK-III Communications Reference (Manual No.: SIEP S800001 29)
Basic Information on SERVOPACKs	The Σ-7 Series	–	1.1
	Product Introduction	1.1	–
	Interpreting the Nameplate	–	1.2
	Part Names	–	1.3
	Model Designations	1.2	–
	Combinations of SERVOPACKs and Servomotors	–	1.5
	Functions	1.4	–
	SigmaWin+	1.5	–
Selecting a SERVOPACK	Ratings	2.1	–
	SERVOPACK Overload Protection Characteristics	2.2	–
	Specifications	2.3	–
	Block Diagrams	–	2.2
	External Dimensions	–	2.3
	Examples of Standard Connections between SERVOPACKs and Peripheral Devices	–	2.4
SERVOPACK Installation		–	Chapter 3
Wiring and Connecting SERVOPACKs		–	Chapter 4
Basic Functions That Require Setting before Operation		–	Chapter 5
Application Functions		–	Chapter 6
Trial Operation and Actual Operation		–	Chapter 7
Tuning		–	Chapter 8
Monitoring		–	Chapter 9
Position Correction Table		Chapter 3	–
Synchronized Stopping		Chapter 4	–
Position Deviation between Axes Overflow Detection		Chapter 5	–

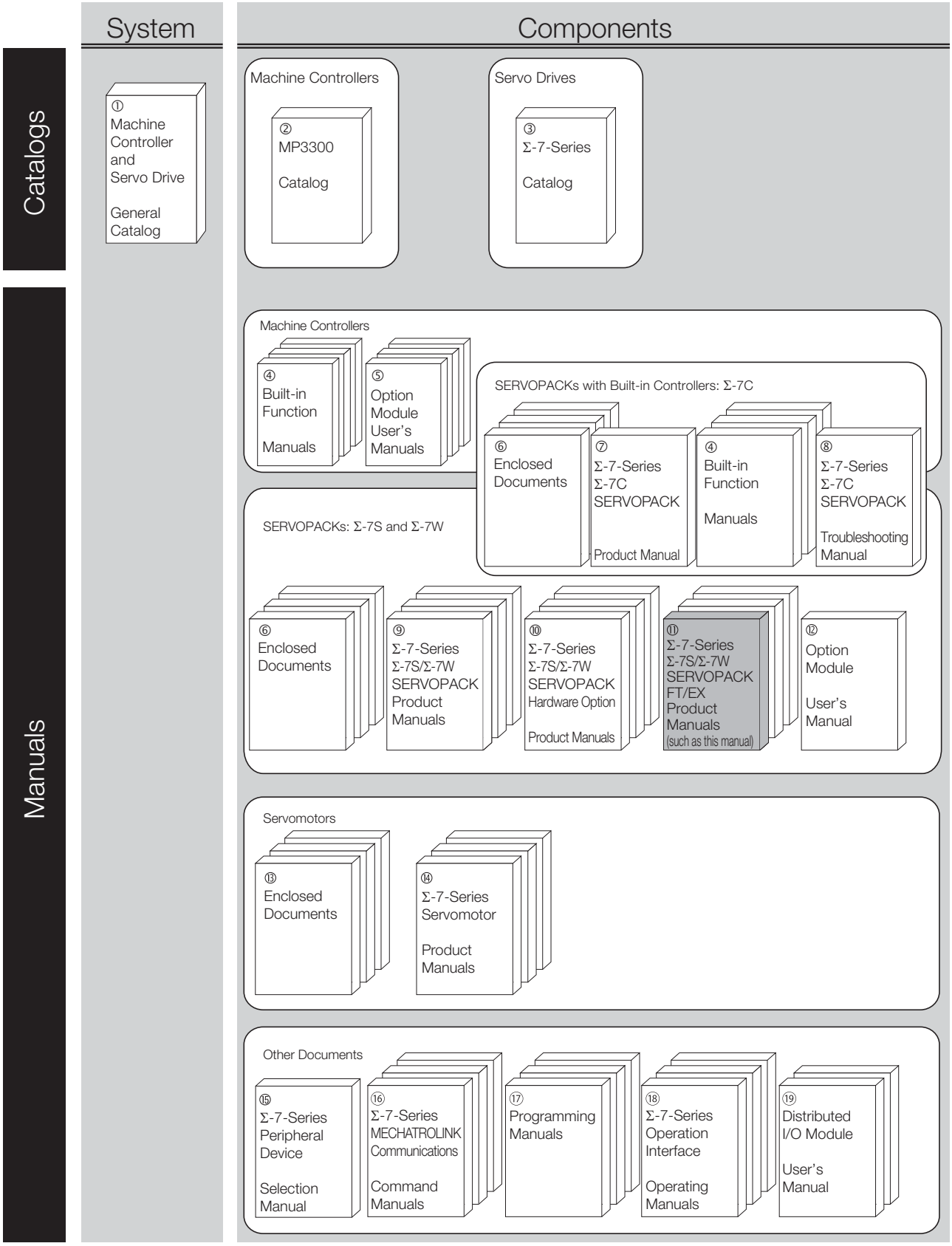
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Item		This Manual	Σ-7-Series AC Servo Drive Σ-7W SERVOPACK Product Manual
			MECHATROLINK-III Communications Reference (Manual No.: SIEP S800001 29)
Maintenance	Inspections and Part Replacement	–	10.1
	Alarm Displays	6.1	–
	Warning Displays	6.2	–
	Troubleshooting Based on the Operation and Conditions of the Servomotor	6.3	–
Parameter Lists	Interpreting the Parameter Lists	7.1	–
	List of Servo Parameters	7.2	–
	List of MECHATROLINK-III Common Parameters	7.3	–
Appendices	Interpreting Panel Displays	–	12.1
	Corresponding SERVOPACK and SigmaWin+ Function Names	–	12.2

Related Documents

The relationships between the documents that are related to the Servo Drives are shown in the following figure. The numbers in the figure correspond to the numbers in the table on the following pages. Refer to these documents as required.



Classification	Document Name	Document No.	Description
① Machine Controller and Servo Drive General Catalog	Machine Controller and AC Servo Drive Solutions Catalog	KAEP S800001 22	Describes the features and application examples for combinations of MP3000-Series Machine Controllers and Σ-7-Series AC Servo Drives.
② MP3300 Catalog	Machine Controller MP3300	KAEP C880725 03	Provides detailed information on MP3300 Machine Controllers, including features and specifications.
③ Σ-7-Series Catalog	AC Servo Drives Σ-7 Series	KAEP S800001 23	Provides detailed information on Σ-7-Series AC Servo Drives, including features and specifications.
④ Built-in Function Manuals	Σ-7-Series AC Servo Drive Σ-7C SERVOPACK Motion Control User's Manual	SIEP S800002 03	Provides detailed information on the specifications, system configuration, and application methods of the Motion Control Function Modules (SVD, SVC4, and SVR4) for Σ-7-Series Σ-7C SERVOPACKs.
	Machine Controller MP3000 Series Communications User's Manual	SIEP C880725 12	Provides detailed information on the specifications, system configuration, and communications connection methods for the Ethernet communications that are used with MP3000-Series Machine Controllers and Σ-7-Series Σ-7C SERVOPACKs.
⑤ Option Module User's Manuals	Machine Controller MP2000 Series Communication Module User's Manual	SIEP C880700 04	Provide detailed information on the specifications and communications methods for the Communications Modules that can be mounted to MP3000-Series Machine Controllers and Σ-7-Series Σ-7C SERVOPACKs.
	Machine Controller MP2000 Series 262IF-01 FL-net Communication Module User's Manual	SIEP C880700 36	
	Machine Controller MP2000 Series 263IF-01 EtherNet/IP Communication Module User's Manual	SIEP C880700 39	
	Machine Controller MP2000 Series I/O Module User's Manual	SIEP C880700 34	Provide detailed information on the specifications and communications methods for the I/O Modules that can be mounted to MP3000-Series Machine Controllers and Σ-7-Series Σ-7C SERVOPACKs.
	Machine Controller MP2000 Series Analog Input/Analog Output Module AI-01/AO-01 User's Manual	SIEP C880700 26	
	Machine Controller MP2000 Series Counter Module CNTR-01 User's Manual	SIEP C880700 27	

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Classification	Document Name	Document No.	Description
⑥ Enclosed Documents	Σ-7-Series AC Servo Drive Σ-7S, Σ-7W, and Σ-7C SERVOPACK Safety Precautions	TOMP C710828 00	Provides detailed information for the safe usage of Σ-7-Series SERVOPACKs.
	Σ-V-Series/Σ-V-Series for Large-Capacity Models/ Σ-7-Series Safety Precautions Option Module	TOBP C720829 00	Provides detailed information for the safe usage of Option Modules.
	Σ-V-Series/Σ-V-Series for Large-Capacity Models/ Σ-7-Series Installation Guide Command Option Module	TOBP C720829 01	Provides detailed procedures for installing the Command Option Module in a SERVOPACK.
	Σ-V-Series/Σ-V-Series for Large-Capacity Models/ Σ-7-Series Installation Guide Fully-closed Module	TOBP C720829 03	Provides detailed procedures for installing the Fully-closed Module in a SERVOPACK.
	Σ-V-Series/Σ-V-Series for Large-Capacity Models/ Σ-7-Series Installation Guide Safety Module	TOBP C720829 06	Provides detailed procedures for installing the Safety Module in a SERVOPACK.
	Σ-V-Series/Σ-V-Series for Large-Capacity Models/ Σ-7-Series Installation Guide INDEXER Module	TOBP C720829 02	Provides detailed procedures for installing the INDEXER Module in a SERVOPACK.
	Σ-V-Series/Σ-V-Series for Large-Capacity Models/ Σ-7-Series Installation Guide DeviceNet Module	TOBP C720829 07	Provides detailed procedures for installing the DeviceNet Module in a SERVOPACK.
⑦ Σ-7-Series Σ-7C SERVOPACK Product Manual	Σ-7-Series AC Servo Drive Σ-7C SERVOPACK Product Manual	SIEP S800002 04	Provides detailed information on selecting Σ-7-Series Σ-7C SERVOPACKs; installing, connecting, setting, testing in trial operation, and tuning Servo Drives; writing, monitoring, and maintaining programs; and other information.
⑧ Σ-7-Series Σ-7C SERVOPACK Troubleshooting Manual	Σ-7-Series AC Servo Drive Σ-7C SERVOPACK Troubleshooting Manual	SIEP S800002 07	Provides detailed troubleshooting information for Σ-7-Series Σ-7C SERVOPACKs.

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Classification	Document Name	Document No.	Description
⑨ Σ-7-Series Σ-7S/Σ-7W SERVOPACK Product Manuals	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with MECHATROLINK-4 Communications References Product Manual	SIEP S800002 31	Provide detailed information on selecting Σ-7-Series Σ-7S and Σ-7W SERVOPACKs; installing, connecting, setting, testing in trial operation, tuning, monitoring, and maintaining Server Drives; and other information.
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual	SIEP S800001 28	
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with MECHATROLINK-II Communications References Product Manual	SIEP S800001 27	
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual	SIEP S800001 26	
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK Command Option Attachable Type with INDEXER Module Product Manual	SIEP S800001 64	
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK Command Option Attachable Type with DeviceNet Module Product Manual	SIEP S800001 70	
	Σ-7-Series AC Servo Drive Σ-7W SERVOPACK with MECHATROLINK-III Communications References Product Manual	SIEP S800001 29	
⑩ Σ-7-Series Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Product Manuals	Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual	SIEP S800001 73	Provide detailed information on Hardware Options for Σ-7-Series SERVOPACKs.
	Σ-7-Series AC Servo Drive Σ-7W/Σ-7C SERVOPACK with Hardware Option Specifications HWBB Function Product Manual	SIEP S800001 72	

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Classification	Document Name	Document No.	Description
⑪ Σ-7-Series Σ-7S/Σ-7W SERVOPACK FT/EX Product Manuals	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Indexing Application Product Manual	SIEP S800001 84	Provide detailed information on the FT/EX Option for Σ-7-Series SERVOPACKs.
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Tracking Application Product Manual	SIEP S800001 89	
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Application with Special Motor, SGM7D Motor Product Manual	SIEP S800001 91	
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Press and Injection Molding Application Product Manual	SIEP S800001 94	
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Transfer and Alignment Application Product Manual	SIEP S800001 95	
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Torque/Force Assistance for Conveyance Application Product Manual	SIEP S800002 09	
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Cutting Application Feed Shaft Motor Product Manual	SIEP S800002 10	
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Three-Point Latching for Conveyance Application Product Manual	SIEP S800002 17	
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Semi-/Fully-Closed Loop Control Online Switching for Conveyance Application Product Manual	SIEP S800002 27	
	Σ-7-Series AC Servo Drive Σ-7W SERVOPACK with FT/EX Specification for Gantry Applications Product Manual	This manual (SIEP S800002 29)	

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Classification	Document Name	Document No.	Description
⑫ Option Module User's Manual	AC Servo Drives Σ-V Series/Σ-V Series for Large-Capacity Models/ Σ-7 Series User's Manual Safety Module	SIEP C720829 06	Provides detailed information required for the design and maintenance of a Safety Module.
⑬ Enclosed Documents	AC Servo Drive Rotary Servomotor Safety Precautions	TOBP C230260 00	Provides detailed information for the safe usage of Rotary Servomotors and Direct Drive Servomotors.
	AC Servomotor Linear Σ Series Safety Precautions	TOBP C230800 00	Provides detailed information for the safe usage of Linear Servomotors.
⑭ Σ-7-Series Servomotor Product Manuals	Σ-7-Series AC Servo Drive Rotary Servomotor Product Manual	SIEP S800001 36	Provide detailed information on selecting, installing, and connecting the Σ-7-Series Servomotors.
	Σ-7-Series AC Servo Drive Linear Servomotor Product Manual	SIEP S800001 37	
	Σ-7-Series AC Servo Drive Direct Drive Servomotor Product Manual	SIEP S800001 38	
⑮ Σ-7-Series Peripheral Device Selection Manual	Σ-7-Series AC Servo Drive Peripheral Device Selection Manual	SIEP S800001 32	Provides the following information in detail for Σ-7-Series Servo Systems. • Cables: Models, dimensions, wiring materials, connector models, and connection specifications • Peripheral devices: Models, specifications, diagrams, and selection (calculation) methods
⑯ Σ-7-Series MECHATROLINK Communications Command Manuals	Σ-7-Series AC Servo Drive MECHATROLINK-II Communications Command Manual	SIEP S800001 30	Provides detailed information on the MECHATROLINK-II communications commands that are used for a Σ-7-Series Servo System.
	Σ-7-Series AC Servo Drive MECHATROLINK-III Communications Standard Servo Profile Command Manual	SIEP S800001 31	Provides detailed information on the MECHATROLINK-III communications standard servo profile commands that are used for a Σ-7-Series Servo System.
	Σ-7-Series AC Servo Drive MECHATROLINK-4 Communications Standard Servo Profile Command Manual	SIEP S800002 32	Provides detailed information on the MECHATROLINK-4 communications standard servo profile commands that are used for a Σ-7-Series Servo System.

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Classification	Document Name	Document No.	Description
⑰ Programming Manuals	Machine Controller MP3000 Series Ladder Programming Manual	SIEP C880725 13	Provides detailed information on the ladder programming specifications and instructions for MP3000-Series Machine Controllers and Σ-7-Series Σ-7C SERVOPACKs.
	Machine Controller MP3000 Series Motion Programming Manual	SIEP C880725 14	Provides detailed information on the motion programming and sequence programming specifications and instructions for MP3000-Series Machine Controllers and Σ-7-Series Σ-7C SERVOPACKs.
⑱ Σ-7-Series Operation Interface Operating Manuals	System Integrated Engineering Tool MPE720 Version 7 USER'S MANUAL	SIEP C880761 03	Describes in detail how to operate MPE720 version 7.
	Σ-7-Series AC Servo Drive Digital Operator Operating Manual	SIEP S800001 33	Describes the operating procedures for a Digital Operator for a Σ-7-Series Servo System.
	AC Servo Drive Engineering Tool SigmaWin+ Operation Manual	SIET S800001 34	Provides detailed operating procedures for the SigmaWin+ Engineering Tool for a Σ-7-Series Servo System.
⑲ Distributed I/O Module User's Manual	MECHATROLINK-III Compatible I/O Module User's Manual	SIEP C880781 04	Describes the functions, specifications, operating methods, and MECHATROLINK-III communications for the Remote I/O Modules for MP2000/MP3000-Series Machine Controllers.
	MECHATROLINK-4 Compatible I/O Module User's Manual	SIEP C880782 01	Describes the functions, specifications, operating methods, and MECHATROLINK-4 communications for the Remote I/O Modules for MP3000-Series Machine Controllers.

Using This Manual

◆ Technical Terms Used in This Manual

The following terms are used in this manual.

Term	Meaning
Servomotor	A Σ-7-Series Rotary Servomotor or Linear Servomotor.
Rotary Servomotor	A generic term used for a Σ-7-Series Rotary Servomotor (SGM7M, SGM7J, SGM7A, SGM7P, SGM7G, or SGMMV).
Linear Servomotor	A generic term used for a Σ-7-Series Linear Servomotor (SGLG, SGLF, or SGLT).
SERVOPACK	A Σ-7-Series Σ-7W Servo Amplifier with MECHATROLINK-III Communications References.
Servo Drive	The combination of a Servomotor and SERVOPACK.
Servo System	A servo control system that includes the combination of a Servo Drive with a host controller and peripheral devices.
servo ON	Supplying power to the motor.
servo OFF	Not supplying power to the motor.
base block (BB)	Shutting OFF the power supply to the motor by shutting OFF the base current to the power transistor in the SERVOPACK.
servo lock	A state in which the motor is stopped and is in a position loop with a position reference of 0.
Main Circuit Cable	One of the cables that connect to the main circuit terminals, including the Main Circuit Power Supply Cable, Control Power Supply Cable, and Servomotor Main Circuit Cable.
SigmaWin+	The Engineering Tool for setting up and tuning Servo Drives or a computer in which the Engineering Tool is installed.
active alarm axis	The axis on which the alarm is active.
synchronized stopping axis	The axis that is synchronized to and stopped with the axis on which the alarm is active when Synchronized Stopping is enabled.
Absolute Encoder	The general term used for absolute encoders with batteries and batteryless absolute encoders. In cases where the general term causes confusion, the term “batteryless absolute encoder” may also be used.
MDevice	An abbreviation for a Main Device.
SDevice	An abbreviation for a Subordinate Device.

◆ Differences in Terms for Rotary Servomotors and Linear Servomotors

There are differences in the terms that are used for Rotary Servomotors and Linear Servomotors. This manual primarily describes Rotary Servomotors. If you are using a Linear Servomotor, you need to interpret the terms as given in the following table.

Rotary Servomotors	Linear Servomotors
torque	force
moment of inertia	mass
rotation	movement
forward rotation and reverse rotation	forward movement and reverse movement
CW and CCW pulse trains	forward and reverse pulse trains
rotary encoder	linear encoder
absolute rotary encoder	absolute linear encoder
incremental rotary encoder	incremental linear encoder
unit: min^{-1}	unit: mm/s
unit: N·m	unit: N

◆ Notation Used in this Manual

■ Notation for Reverse Signals

The names of reverse signals (i.e., ones that are valid when low) are written with a forward slash (/) before the signal abbreviation.

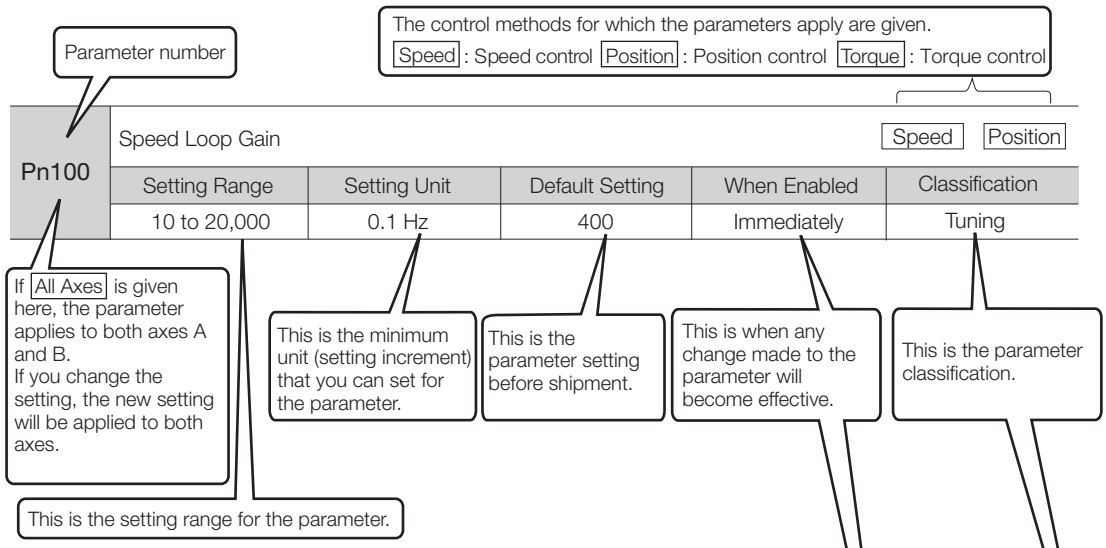
Notation Example

$\overline{BK}$ is written as /BK.

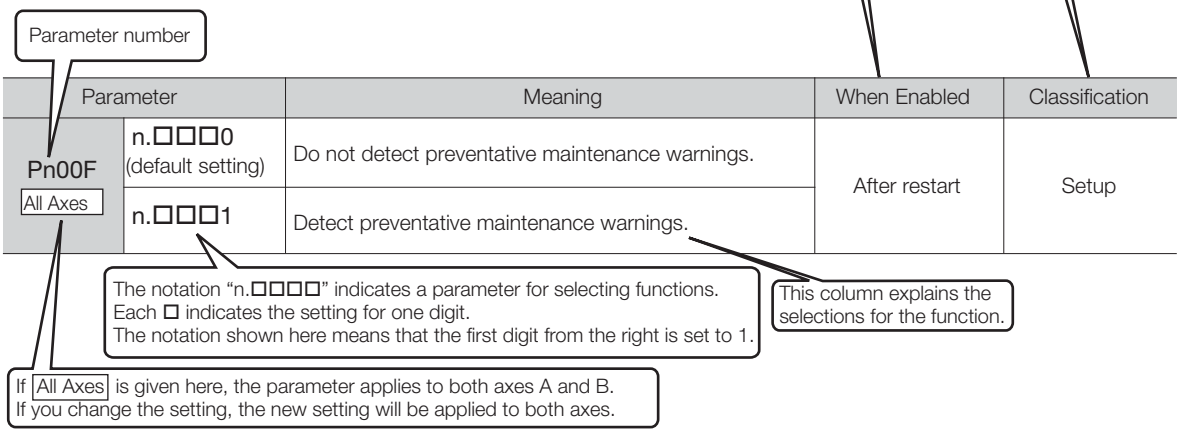
■ Notation for Parameters

The notation depends on whether the parameter requires a numeric setting (parameter for numeric setting) or requires the selection of a function (parameter for selecting functions).

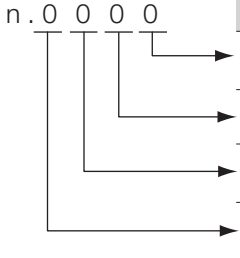
- Parameters for Numeric Settings



- Parameters for Selecting Functions



Notation Example



Notation Examples for Pn002

Digit Notation		Numeric Value Notation	
Notation	Meaning	Notation	Meaning
Pn002 = n.□□□X	Indicates the first digit from the right in Pn002.	Pn002 = n.□□□1	Indicates that the first digit from the right in Pn002 is set to 1.
Pn002 = n.□□X□	Indicates the second digit from the right in Pn002.	Pn002 = n.□□1□	Indicates that the second digit from the right in Pn002 is set to 1.
Pn002 = n.□X□□	Indicates the third digit from the right in Pn002.	Pn002 = n.□1□□	Indicates that the third digit from the right in Pn002 is set to 1.
Pn002 = n.X□□□	Indicates the fourth digit from the right in Pn002.	Pn002 = n.1□□□	Indicates that the fourth digit from the right in Pn002 is set to 1.

◆ Engineering Tools Used in This Manual

This manual uses the interfaces of the SigmaWin+ for descriptions.

◆ Trademarks

- QR code is a trademark of Denso Wave Inc.
- MECHATROLINK is a trademark of the MECHATROLINK Members Association.
- Other product names and company names are the trademarks or registered trademarks of the respective company. “TM” and the ® mark do not appear with product or company names in this manual.

◆ Visual Aids

The following aids are used to indicate certain types of information for easier reference.



Important

Indicates precautions or restrictions that must be observed.
Also indicates alarm displays and other precautions that will not result in machine damage.



Term

Indicates definitions of difficult terms or terms that have not been previously explained in this manual.

Example Indicates operating or setting examples.

Information Indicates supplemental information to deepen understanding or useful information.

Safety Precautions

◆ Safety Information

To prevent personal injury and equipment damage in advance, the following signal words are used to indicate safety precautions in this document. The signal words are used to classify the hazards and the degree of damage or injury that may occur if a product is used incorrectly. Information marked as shown below is important for safety. Always read this information and heed the precautions that are provided.

⚠ DANGER

- Indicates precautions that, if not heeded, are likely to result in loss of life, serious injury, or fire.

⚠ WARNING

- Indicates precautions that, if not heeded, could result in loss of life, serious injury, or fire.

⚠ CAUTION

- Indicates precautions that, if not heeded, could result in relatively serious or minor injury, or in fire.

NOTICE

- Indicates precautions that, if not heeded, could result in property damage.

◆ Safety Precautions That Must Always Be Observed

■ General Precautions

⚠ DANGER

- Read and understand this manual to ensure the safe usage of the product.
- Keep this manual in a safe, convenient place so that it can be referred to whenever necessary. Make sure that it is delivered to the final user of the product.
- Do not remove covers, cables, connectors, or optional devices while power is being supplied to the SERVOPACK.
  There is a risk of electric shock, operational failure of the product, or burning.

⚠ WARNING

- Use a power supply with specifications (number of phases, voltage, frequency, and AC/DC type) that are appropriate for the product.
  There is a risk of burning, electric shock, or fire.
- Connect the ground terminals on the SERVOPACK and Servomotor to ground poles according to local electrical codes (100 Ω or less for a SERVOPACK with a 100-VAC or 200-VAC power supply, and 10 Ω or less for a SERVOPACK with a 400-VAC power supply).
  There is a risk of electric shock or fire.
- Do not attempt to disassemble, repair, or modify the product.
  There is a risk of fire or failure.
  The warranty is void for the product if you disassemble, repair, or modify it.

⚠ CAUTION

- The SERVOPACK heat sinks, regenerative resistors, External Dynamic Brake Resistors, Servomotors, and other components can be very hot while power is ON or soon after the power is turned OFF. Implement safety measures, such as installing covers, so that hands and parts such as cables do not come into contact with hot components.
  There is a risk of burn injury.
- For a 24-VDC power supply, use a power supply device with double insulation or reinforced insulation.
  There is a risk of electric shock.
- Do not damage, pull on, apply excessive force to, place heavy objects on, or pinch cables.
  There is a risk of failure, damage, or electric shock.
- Do not use the product in an environment that is subject to water, corrosive gases, or flammable gases, or near flammable materials.
  There is a risk of electric shock or fire.

NOTICE

- Do not attempt to use a SERVOPACK or Servomotor that is damaged or that has missing parts.
- Install external emergency stop circuits that shut OFF the power supply and stops operation immediately when an error occurs.
- In locations with poor power supply conditions, install the necessary protective devices (such as AC reactors) to ensure that the input power is supplied within the specified voltage range.
  There is a risk of damage to the SERVOPACK.
- Use a Noise Filter to minimize the effects of electromagnetic interference.
  Electronic devices used near the SERVOPACK may be affected by electromagnetic interference.
- Always use a Servomotor and SERVOPACK in one of the specified combinations.
- Do not touch a SERVOPACK or Servomotor with wet hands.
  There is a risk of product failure.

■ Storage Precautions

⚠ CAUTION

- Do not place an excessive load on the product during storage. (Follow all instructions on the packages.)
  There is a risk of injury or damage.

NOTICE

- Do not install or store the product in any of the following locations.
  - Locations that are subject to direct sunlight
  - Locations that are subject to ambient temperatures that exceed product specifications
  - Locations that are subject to relative humidities that exceed product specifications
  - Locations that are subject to condensation as the result of extreme changes in temperature
  - Locations that are subject to corrosive or flammable gases
  - Locations that are near flammable materials
  - Locations that are subject to dust, salts, or iron powder
  - Locations that are subject to water, oil, or chemicals
  - Locations that are subject to vibration or shock that exceeds product specifications
  - Locations that are subject to radiation

  If you store or install the product in any of the above locations, the product may fail or be damaged.

■ Transportation Precautions

⚠ CAUTION

- Transport the product in a way that is suitable to the mass of the product.
- Do not use the eyebolts on a SERVOPACK or Servomotor to move the machine.
  There is a risk of damage or injury.
- When you handle a SERVOPACK or Servomotor, be careful of sharp parts, such as the corners.
  There is a risk of injury.
- Do not place an excessive load on the product during transportation. (Follow all instructions on the packages.)
  There is a risk of injury or damage.

NOTICE

- Do not hold onto the front cover or connectors when you move a SERVOPACK.
  There is a risk of the SERVOPACK falling.
- A SERVOPACK or Servomotor is a precision device. Do not drop it or subject it to strong shock.
  There is a risk of failure or damage.
- Do not subject connectors to shock.
  There is a risk of faulty connections or damage.
- If disinfectants or insecticides must be used to treat packing materials such as wooden frames, plywood, or pallets, the packing materials must be treated before the product is packaged, and methods other than fumigation must be used.
  Example: Heat treatment, where materials are kiln-dried to a core temperature of 56°C for 30 minutes or more.
  If the electronic products, which include stand-alone products and products installed in machines, are packed with fumigated wooden materials, the electrical components may be greatly damaged by the gases or fumes resulting from the fumigation process. In particular, disinfectants containing halogen, which includes chlorine, fluorine, bromine, or iodine can contribute to the erosion of the capacitors.
- Do not overtighten the eyebolts on a SERVOPACK or Servomotor.
  If you use a tool to overtighten the eyebolts, the tapped holes may be damaged.

■ Installation Precautions

⚠ CAUTION

- Install the Servomotor or SERVOPACK in a way that will support the mass given in technical documents.
- Install SERVOPACKs, Servomotors, regenerative resistors, and External Dynamic Brake Resistors on nonflammable materials.
  Installation directly onto or near flammable materials may result in fire.
- Provide the specified clearances between the SERVOPACK and the control panel as well as with other devices.
  There is a risk of fire or failure.
- Install the SERVOPACK in the specified orientation.
  There is a risk of fire or failure.
- Do not step on or place a heavy object on the product.
  There is a risk of failure, damage, or injury.
- Do not allow any foreign matter to enter the SERVOPACK or Servomotor.
  There is a risk of failure or fire.

NOTICE

- Do not install or store the product in any of the following locations.
  - Locations that are subject to direct sunlight
  - Locations that are subject to ambient temperatures that exceed product specifications
  - Locations that are subject to relative humidities that exceed product specifications
  - Locations that are subject to condensation as the result of extreme changes in temperature
  - Locations that are subject to corrosive or flammable gases
  - Locations that are near flammable materials
  - Locations that are subject to dust, salts, or iron powder
  - Locations that are subject to water, oil, or chemicals
  - Locations that are subject to vibration or shock that exceeds product specifications
  - Locations that are subject to radiation

  If you store or install the product in any of the above locations, the product may fail or be damaged.
- Use the product in an environment that is appropriate for the product specifications.
  If you use the product in an environment that exceeds product specifications, the product may fail or be damaged.
- A SERVOPACK or Servomotor is a precision device. Do not drop it or subject it to strong shock.
  There is a risk of failure or damage.
- Always install a SERVOPACK in a control panel.
- Do not allow any foreign matter to enter a SERVOPACK or a Servomotor with a Cooling Fan and do not cover the outlet from the Servomotor's cooling fan.
  There is a risk of failure.

■ Wiring Precautions

⚠ DANGER

- Do not change any wiring while power is being supplied.
  There is a risk of electric shock or injury.

⚠ WARNING

- **Wiring and inspections must be performed only by qualified engineers.**
  There is a risk of electric shock or product failure.
- **Check all wiring and power supplies carefully.**
  Incorrect wiring or incorrect voltage application to the output circuits may cause short-circuit failures. If a short-circuit failure occurs as a result of any of these causes, the holding brake will not work. This could damage the machine or cause an accident that may result in death or injury.
- **Connect the AC and DC power supplies to the specified SERVOPACK terminals.**
  - Connect an AC power supply to the L1, L2, and L3 terminals and the L1C and L2C terminals on the SERVOPACK.
  - Connect a DC power supply to the B1/⊕ and ⊖2 terminals and the L1C and L2C terminals on the SERVOPACK.

  There is a risk of failure or fire.
- **If you use a SERVOPACK with the Dynamic Brake Hardware Option, connect an External Dynamic Brake Resistor that is suitable for the machine and equipment specifications to the specified terminals.**
  There is a risk of unexpected operation, machine damage, burning, or injury when an emergency stop is performed.

⚠ CAUTION

- **Wait for at least six minutes after turning OFF the power supply (with a SERVOPACK for a 100-VAC power supply input, wait for at least nine minutes) and then make sure that the CHARGE indicator is not lit before starting wiring or inspection work. Do not touch the power supply terminals while the CHARGE lamp is lit because high voltage may still remain in the SERVOPACK even after turning OFF the power supply.**
  There is a risk of electric shock.
- **Observe the precautions and instructions for wiring and trial operation precisely as described in this document.**
  Failures caused by incorrect wiring or incorrect voltage application in the brake circuit may cause the SERVOPACK to fail, damage the equipment, or cause an accident resulting in death or injury.
- **Check the wiring to be sure it has been performed correctly.**
  Connectors and pin layouts are sometimes different for different models. Always confirm the pin layouts in technical documents for your model before operation.
  There is a risk of failure or malfunction.
- **Connect wires to power supply terminals and motor connection terminals securely with the specified methods and tightening torque.**
  Insufficient tightening may cause wires and terminal blocks to generate heat due to faulty contact, possibly resulting in fire.
- **Use shielded twisted-pair cables or screened unshielded multi-twisted-pair cables for I/O Signal Cables and Encoder Cables.**
- **The maximum wiring length is 3 m for I/O Signal Cables, and 50 m for Encoder Cables or Servomotor Main Circuit Cables.**
- **Observe the following precautions when wiring the SERVOPACK's main circuit terminals.**
  - Turn ON the power supply to the SERVOPACK only after all wiring, including the main circuit terminals, has been completed.
  - If a connector is used for the main circuit terminals, remove the main circuit connector from the SERVOPACK before you wire it.
  - Insert only one wire per insertion hole in the main circuit terminals.
  - When you insert a wire, make sure that the conductor wire (e.g., whiskers) does not come into contact with adjacent wires and cause a short-circuit.
- **Install molded-case circuit breakers and other safety measures to provide protection against short circuits in external wiring.**
  There is a risk of fire or failure.

NOTICE

- Whenever possible, use the Cables specified by Yaskawa.
  If you use any other cables, confirm the rated current and application environment of your model and use the wiring materials specified by Yaskawa or equivalent materials.
- Securely tighten connector screws and lock mechanisms.
  Insufficient tightening may result in connectors falling off during operation.
- Do not bundle power lines (e.g., the Main Circuit Cable) and low-current lines (e.g., the I/O Signal Cables or Encoder Cables) together or run them through the same duct. If you do not place power lines and low-current lines in separate ducts, separate them by at least 30 cm.
  If the cables are too close to each other, malfunctions may occur due to noise affecting the low-current lines.
- Install a battery at either the host controller or on the Encoder Cable.
  If you install batteries both at the host controller and on the Encoder Cable at the same time, you will create a loop circuit between the batteries, resulting in a risk of damage or burning.
- When connecting a battery, connect the polarity correctly.
  There is a risk of battery rupture or encoder failure.

■ Operation Precautions

⚠ WARNING

- Before starting operation with a machine connected, change the settings of the switches and parameters to match the machine.
  Unexpected machine operation, failure, or personal injury may occur if operation is started before appropriate settings are made.
- Do not radically change the settings of the parameters.
  There is a risk of unstable operation, machine damage, or injury.
- Install limit switches or stoppers at the ends of the moving parts of the machine to prevent unexpected accidents.
  There is a risk of machine damage or injury.
- For trial operation, securely mount the Servomotor and disconnect it from the machine.
  There is a risk of injury.
- Forcing the motor to stop for overtravel is disabled when the Jog, Origin Search, or Easy FFT utility function is executed. Take necessary precautions.
  There is a risk of machine damage or injury.
- When an alarm occurs, the Servomotor will coast to a stop or stop with the dynamic brake according to the SERVOPACK Option and settings. The coasting distance will change with the moment of inertia of the load and the resistance of the External Dynamic Brake Resistor. Check the coasting distance during trial operation and implement suitable safety measures on the machine.
- Do not enter the machine's range of motion during operation.
  There is a risk of injury.
- Do not touch the moving parts of the Servomotor or machine during operation.
  There is a risk of injury.

⚠ CAUTION

- Design the system to ensure safety even when problems, such as broken signal lines, occur. For example, the P-OT and N-OT signals are set in the default settings to operate on the safe side if a signal line breaks. Do not change the polarity of this type of signal.
- When overtravel occurs, the power supply to the motor is turned OFF and the brake is released. If you use the Servomotor to drive a vertical load, set the Servomotor to enter a zero-clamped state after the Servomotor stops. Also, install safety devices (such as an external brake or counterweight) to prevent the moving parts of the machine from falling.
- Always turn OFF the servo before you turn OFF the power supply. If you turn OFF the main circuit power supply or control power supply during operation before you turn OFF the servo, the Servomotor will stop as follows:
  - If you turn OFF the main circuit power supply during operation without turning OFF the servo, the Servomotor will stop abruptly with the dynamic brake.
  - If you turn OFF the control power supply without turning OFF the servo, the stopping method that is used by the Servomotor depends on the model of the SERVOPACK. For details, refer to the manual for the SERVOPACK.
  - If you use a SERVOPACK with the Dynamic Brake Hardware Option, the Servomotor stopping methods will be different from the stopping methods used without the Option or with other Hardware Options. For details, refer to the following manual.

    📖 Σ-7-Series Σ-7S/Σ-7W SERVOPACK with Dynamic Brake Hardware Option Specifications Product Manual (Manual No.: SIEP S800001 73)
- Do not use the dynamic brake for any application other than an emergency stop.
  There is a risk of failure due to rapid deterioration of elements in the SERVOPACK and the risk of unexpected operation, machine damage, burning, or injury.

NOTICE

- When you adjust the gain during system commissioning, use a measuring instrument to monitor the torque waveform and speed waveform and confirm that there is no vibration.
  If a high gain causes vibration, the Servomotor will be damaged quickly.
- Do not frequently turn the power supply ON and OFF. After you have started actual operation, allow at least one hour between turning the power supply ON and OFF (as a guideline).
  Do not use the product in applications that require the power supply to be turned ON and OFF frequently.
  The elements in the SERVOPACK will deteriorate quickly.
- An alarm or warning may occur if communications are performed with the host controller while the SigmaWin+ or Digital Operator is operating.
  If an alarm or warning occurs, it may interrupt the current process and stop the system.
- With this product, set the same Servomotor stopping method for both axis A and axis B.
  If the Servomotor stopping methods are different, the machine may be damaged.
- Set appropriate values for the correction amounts in the Position Correction Table.
  The machine may be damaged if the correction amounts are too large.

■ Maintenance and Inspection Precautions

⚠ DANGER

- Do not change any wiring while power is being supplied.
  There is a risk of electric shock or injury.

⚠ WARNING

- Wiring and inspections must be performed only by qualified engineers.
  There is a risk of electric shock or product failure.

⚠ CAUTION

- Wait for at least six minutes after turning OFF the power supply (with a SERVOPACK for a 100-VAC power supply input, wait for at least nine minutes) and then make sure that the CHARGE indicator is not lit before starting wiring or inspection work. Do not touch the power supply terminals while the CHARGE lamp is lit because high voltage may still remain in the SERVOPACK even after turning OFF the power supply.
  There is a risk of electric shock.
- Before you replace a SERVOPACK, back up the settings of the SERVOPACK parameters. Copy the backed up parameter settings to the new SERVOPACK and confirm that they were copied correctly.
  If you do not copy backed up parameter settings or if the copy operation is not completed correctly, normal operation may not be possible, possibly resulting in machine or equipment damage.

NOTICE

- Discharge all static electricity from your body before you operate any of the buttons or switches inside the front cover of the SERVOPACK.
  There is a risk of equipment damage.

■ Troubleshooting Precautions

⚠ DANGER

- If the safety device (molded-case circuit breaker or fuse) installed in the power supply line operates, remove the cause before you supply power to the SERVOPACK again. If necessary, repair or replace the SERVOPACK, check the wiring, and remove the factor that caused the safety device to operate.
  There is a risk of fire, electric shock, or injury.

⚠ WARNING

- The product may suddenly start to operate when the power supply is recovered after a momentary power interruption. Design the machine to ensure human safety when operation restarts.
  There is a risk of injury.

⚠ CAUTION

- When an alarm occurs, remove the cause of the alarm and ensure safety. Then reset the alarm or turn the power supply OFF and ON again to restart operation.
  There is a risk of injury or machine damage.
- If the Servo ON signal is input to the SERVOPACK and an alarm is reset, the Servomotor may suddenly restart operation. Confirm that the servo is OFF and ensure safety before you reset an alarm.
  There is a risk of injury or machine damage.
- Always insert a magnetic contactor in the line between the main circuit power supply and the main circuit power supply terminals on the SERVOPACK so that the power supply can be shut OFF at the main circuit power supply.
  If a magnetic contactor is not connected when the SERVOPACK fails, a large current may flow continuously, possibly resulting in fire.
- If an alarm occurs, shut OFF the main circuit power supply.
  There is a risk of fire due to a regenerative resistor overheating as the result of regenerative transistor failure.
- Install a ground fault detector against overloads and short-circuiting or install a molded-case circuit breaker combined with a ground fault detector.
  There is a risk of SERVOPACK failure or fire if a ground fault occurs.
- The holding brake on a Servomotor will not ensure safety if there is the possibility that an external force (including gravity) may move the current position and create a hazardous situation when power is interrupted or an error occurs. If an external force may cause movement, install an external braking mechanism that ensures safety.

■ Disposal Precautions

- Correctly discard the product as stipulated by regional, local, and municipal laws and regulations. Be sure to include these contents in all labelling and warning notifications on the final product as necessary.



■ General Precautions

- Figures provided in this manual are typical examples or conceptual representations. There may be differences between them and actual wiring, circuits, and products.
- The products shown in illustrations in this manual are sometimes shown with their covers or protective guards removed to illustrate detail. Always replace all covers and protective guards before you use the product.
- If you need a new copy of this manual because it has been lost or damaged, contact your nearest Yaskawa representative or one of the offices listed on the back of this manual.
- This manual is subject to change without notice for product improvements, specifications changes, and improvements to the manual itself.
  We will update the manual number of the manual and issue revisions when changes are made.
- Any and all quality guarantees provided by Yaskawa are null and void if the customer modifies the product in any way. Yaskawa disavows any responsibility for damages or losses that are caused by modified products.

Warranty

◆ Details of Warranty

■ Warranty Period

The warranty period for a product that was purchased (hereinafter called the “delivered product”) is one year from the time of delivery to the location specified by the customer or 18 months from the time of shipment from the Yaskawa factory, whichever is sooner.

■ Warranty Scope

Yaskawa shall replace or repair a defective product free of charge if a defect attributable to Yaskawa occurs during the above warranty period.
This warranty does not cover defects caused by the delivered product reaching the end of its service life and replacement of parts that require replacement or that have a limited service life.

This warranty does not cover failures that result from any of the following causes.

- Improper handling, abuse, or use in unsuitable conditions or in environments not described in product catalogs or manuals, or in any separately agreed-upon specifications
- Causes not attributable to the delivered product itself
- Modifications or repairs not performed by Yaskawa
- Use of the delivered product in a manner in which it was not originally intended
- Causes that were not foreseeable with the scientific and technological understanding at the time of shipment from Yaskawa
- Events for which Yaskawa is not responsible, such as natural or human-made disasters

◆ Limitations of Liability

- Yaskawa shall in no event be responsible for any damage or loss of opportunity to the customer that arises due to failure of the delivered product.
- Yaskawa shall not be responsible for any programs (including parameter settings) or the results of program execution of the programs provided by the user or by a third party for use with programmable Yaskawa products.
- The information described in product catalogs or manuals is provided for the purpose of the customer purchasing the appropriate product for the intended application. The use thereof does not guarantee that there are no infringements of intellectual property rights or other proprietary rights of Yaskawa or third parties, nor does it construe a license.
- Yaskawa shall not be responsible for any damage arising from infringements of intellectual property rights or other proprietary rights of third parties as a result of using the information described in catalogs or manuals.

◆ Suitability for Use

- It is the customer's responsibility to confirm conformity with any standards, codes, or regulations that apply if the Yaskawa product is used in combination with any other products.
- The customer must confirm that the Yaskawa product is suitable for the systems, machines, and equipment used by the customer.
- Consult with Yaskawa to determine whether use in the following applications is acceptable. If use in the application is acceptable, use the product with extra allowance in ratings and specifications, and provide safety measures to minimize hazards in the event of failure.
  - Outdoor use, use involving potential chemical contamination or electrical interference, or use in conditions or environments not described in product catalogs or manuals
  - Nuclear energy control systems, combustion systems, railroad systems, aviation systems, vehicle systems, medical equipment, amusement machines, and installations subject to separate industry or government regulations
  - Systems, machines, and equipment that may present a risk to life or property
  - Systems that require a high degree of reliability, such as systems that supply gas, water, or electricity, or systems that operate continuously 24 hours a day
  - Other systems that require a similar high degree of safety
- Never use the product for an application involving serious risk to life or property without first ensuring that the system is designed to secure the required level of safety with risk warnings and redundancy, and that the Yaskawa product is properly rated and installed.
- The circuit examples and other application examples described in product catalogs and manuals are for reference. Check the functionality and safety of the actual devices and equipment to be used before using the product.
- Read and understand all use prohibitions and precautions, and operate the Yaskawa product correctly to prevent accidental harm to third parties.

◆ Specifications Change

The names, specifications, appearance, and accessories of products in product catalogs and manuals may be changed at any time based on improvements and other reasons. The next editions of the revised catalogs or manuals will be published with updated code numbers. Consult with your Yaskawa representative to confirm the actual specifications before purchasing a product.

Compliance with UL Standards, EU Directives and UK Regulations

Certification marks for the standards for which the product has been certified by certification bodies are shown on nameplate. Products that do not have the marks are not certified for the standards.

Refer to the Servomotor manual for compliant standards of Servomotors.

◆ North American Safety Standards (UL)

Product	Model	North American Safety Standards (UL File No.)
SERVOPACKs	SGD7W	UL 61800-5-1 (E147823) CSA C22.2 No.274

◆ EU Directives

Product	Model	EU Directives	Harmonized Standards
SERVOPACKs	SGD7W	EMC Directive 2014/30/EU	EN 55011 Group 1,Class A EN 61000-6-2 EN 61000-6-4 EN 61800-3 (Category C2, Second environment)
		Low Voltage Directive 2014/35/EU	EN 61800-5-1
		RoHS Directive 2011/65/EU (EU)2015/863	EN IEC 63000

Note: 1. We declared the CE Marking based on the harmonized standards in the above table.

2. These products are for industrial use. In home environments, these products may cause electromagnetic interference and additional noise reduction measures may be necessary.

◆ UK Conformity Assessed (UKCA)

Product	Model	UK Regulations	Designated Standards
SERVOPACKs	SGD7W	Electromagnetic Compatibility Regulations S.I. 2016/1091	EN 55011 Group 1, Class A EN 61000-6-2 EN 61000-6-4 EN 61800-3 (Category C2, Second environment)
		Electrical Equipment (Safety) Regulations S.I. 2016/1101	EN 61800-5-1
		Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations S.I. 2012/3032	EN IEC 63000

Note: We declared the UKCA marking based on the designated standards in the above table.

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Basic Information on SERVOPACKs

1

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1.1 Product Introduction

The FT70 features three built-in functions optimized for driving a gantry to provide an optimal solution for problems with gantry mechanisms.

- Position Correction Table (minimizes wasted torque produced by mechanical differences to improve cycle times)
- Synchronized Stopping (prevents mechanical damage if alarms occur)
- Position Deviation between Axes Overflow Detection (detects twisting of the machine frame to prevent mechanical damage and provide a useful function for preventative maintenance)

1.2 Model Designations

1.2.1 Interpreting SERVOPACK Model Numbers

SGD7W - 1R6 A 20 A 000 F70

- SGD7W: Σ-7-Series Σ-7W SERVOPACKs
- 1st+2nd+3rd digits: 1R6
- 4th digit: A
- 5th+6th digits: 20
- 7th digit: A
- 8th+9th+10th digits: 000
- 11th+12th+13th digits: F70

1st+2nd+3rd digits Maximum Applicable Motor Capacity per Axis

Voltage	Code	Specification
Three-Phase, 200 VAC	1R6*1	0.2 kW
	2R8*1	0.4 kW
	5R5*1*2	0.75 kW
	7R6	1.0 kW

4th digit Voltage

Code	Specification
A	200 VAC

5th+6th digits Interface*3

Code	Specification
20	MECHATROLINK-III communications reference

7th digit Design Revision Order

A

8th+9th+10th digits Hardware Options Specification

Code	Specification
000	Without options

11th+12th+13th digits FT/EX Specification

Code	Specification
F70	For gantry applications

*1. You can use these models with either a single-phase or three-phase input.

*2. If you use the Servomotor with a single-phase 200-VAC power supply input, derate the load ratio to 65%. An example is given below. If the load ratio of the first axis is 90%, use a load ratio of 40% for the second axis so that average load ratio for both axes is 65%.
((90% + 40%)/2 = 65%)

*3. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.

1.2.2 Interpreting Servomotor Model Numbers

Refer to the following manuals for information on interpreting Σ-7-Series Servomotor model numbers.

Σ-7-Series Rotary Servomotor Product Manual (Manual No.: SIEP S800001 36)
Σ-7-Series Linear Servomotor Product Manual (Manual No.: SIEP S800001 37)

1.3 Combinations of SERVOPACKs and Servomotors

Refer to the following manuals for details on combinations with Σ-7-Series Servomotors.

📖 Σ-7-Series Rotary Servomotor Product Manual (Manual No.: SIEP S800001 36)
📖 Σ-7-Series Linear Servomotor Product Manual (Manual No.: SIEP S800001 37)

1.4 Functions

This section lists the functions provided by SERVOPACKs. Refer to the following manual for details on the functions.

Σ-7-Series Σ-7W SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 29)

Refer to the following section for details on restrictions to these functions.

1.4.2 Function Application Restrictions on page 1-7

1.4.1 SERVOPACK Functions

- Functions Related to the Machine

Function
Power Supply Type Settings for the Main Circuit and Control Circuit
Automatic Detection of Connected Motor
Motor Direction Setting
Linear Encoder Pitch Setting
Writing Linear Servomotor Parameters
Selecting the Phase Sequence for a Linear Servomotor
Polarity Sensor Setting
Polarity Detection
Overtravel Function and Settings
Holding Brake
Motor Stopping Methods for Servo OFF and Alarms
Resetting the Absolute Encoder
Setting the Origin of the Absolute Encoder
Setting the Regenerative Resistor Capacity
Operation for Momentary Power Interruptions
SEMI F47 Function
Setting the Motor Maximum Speed
Software Limits and Settings
Multiturn Limit Setting
Adjustment of Motor Current Detection Signal Offset
Forcing the Motor to Stop
Overheat Protection
Speed Ripple Compensation
Current Gain Level Setting
Speed Detection Method Selection
External Latches
Synchronized Stopping*
Position Deviation between Axes Overflow Detection*
Position Correction Table*

* Functions unique to this product.

- Functions Related to the Host Controller

Function
Extended Address Setting
Electronic Gear Settings
I/O Signal Allocations
ALM (Servo Alarm) Signal
/WARN (Warning) Signal
/TGON (Rotation Detection) Signal
/S-RDY (Servo Ready) Signal
/V-CMP (Speed Coincidence Detection) Signal
/COIN (Positioning Completion) Signal
/NEAR (Near) Signal
Speed Limit during Torque Control
/VLT (Speed Limit Detection) Signal
Selecting Torque Limits
Vibration Detection Level Initialization
Alarm Reset
Replacing the Battery
Setting the Position Deviation Overflow Alarm Level

- Functions to Achieve Optimum Motions

Function
Tuning-less Function
Autotuning without a Host Reference
Autotuning with a Host Reference
Custom Tuning
Anti-Resonance Control Adjustment
Vibration Suppression
Gain Selection
Friction Compensation
Gravity Compensation
Backlash Compensation
Model Following Control
Compatible Adjustment Functions
Mechanical Analysis
Easy FFT

- Functions for Trial Operation during Setup

Function
Software Reset
Trial Operation for the Servomotor without a Load
Program Jogging
Origin Search
Test without a Motor
Monitoring Machine Operation Status and Signal Waveforms

• Functions for Inspection and Maintenance

Function
Write Prohibition Setting for Parameters
Initializing Parameter Settings
Automatic Detection of Connected Motor
Monitoring Product Information
Monitoring Product Life
Alarm History Display
Alarm Tracing

1.4.2 Function Application Restrictions

The following functional restrictions apply when the SERVOPACKs described in this manual are used.

Function	Restriction
Motor Stopping Method for Group 2 Alarms (Pn00A = n.□□□0, Pn00B = n.□□2□)	In this SERVOPACK, the default setting of the Servomotor stopping method for the group 2 alarms is stopping by applying the dynamic brake. The Servomotor stopping method can be changed by changing the parameter settings, but stopping by applying the dynamic brake is recommended. Set both axis A and axis B to the same stopping method for alarms.
Moment of Inertia Estimation	This function cannot be used.
Advanced Autotuning without Reference (Fn201)	This function cannot be used.
Advanced Autotuning with Reference (Fn202)	This function cannot be used.
Mechanical Analysis	This function cannot be used.
IO_STS8 in SVCMD_IO (I/O Signal Monitor)	This function cannot be used.

1.5 SigmaWin+

To use the SigmaWin+, a model information file for the SERVOPACK must be added to SigmaWin+ version 7. Contact your Yaskawa representative for the model information file.

SERVOPACK Ratings and Specifications

2

This chapter provides the specifications required to select SERVOPACKs.

2.1 Ratings 2-2

2.2 SERVOPACK Overload Protection Characteristics . . 2-4

2.3 Specifications 2-5

2.1 Ratings

This section gives the ratings of SERVOPACKs.

Three-Phase, 200 VAC

Model SGD7W-			1R6A	2R8A	5R5A	7R6A
Maximum Applicable Motor Capacity per Axis [kW]			0.2	0.4	0.75	1.0
Continuous Output Current per Axis [Arms]			1.6	2.8	5.5	7.6
Instantaneous Maximum Output Current per Axis [Arms]			5.9	9.3	16.9	17.0
Main Circuit	Power Supply		200 VAC to 240 VAC, 50 Hz/60 Hz			
	Permitted Voltage Fluctuation		-15% to +10%			
	Input Current [Arms]*		2.5	4.7	7.8	11
Control	Power Supply		200 VAC to 240 VAC, 50 Hz/60 Hz			
	Permitted Voltage Fluctuation		-15% to +10%			
	Input Current [Arms]*		0.25	0.25	0.25	0.25
Power Supply Capacity [kVA]*			1.0	1.9	3.2	4.5
Power Loss*	Main Circuit Power Loss [W]		24.0	43.3	78.9	94.2
	Control Circuit Power Loss [W]		17	17	17	17
	Built-in Regenerative Resistor Power Loss [W]		8	8	16	16
	Total Power Loss [W]		49.0	68.3	111.9	127.2
Regenerative Resistor	Built-In Regenerative Resistor	Resistance [Ω]	40	40	12	12
		Capacity [W]	40	40	60	60
	Minimum Allowable External Resistance [Ω]		40	40	12	12
Overvoltage Category			III			

* This is the net value at the rated load.

Single-Phase, 200 VAC

Model SGD7W-			1R6A	2R8A	5R5A*1
Maximum Applicable Motor Capacity per Axis [kW]			0.2	0.4	0.75
Continuous Output Current per Axis [Arms]			1.6	2.8	5.5
Instantaneous Maximum Output Current per Axis [Arms]			5.9	9.3	16.9
Main Circuit	Power Supply		200 VAC to 240 VAC, 50 Hz/60 Hz		
	Permitted Voltage Fluctuation		-15% to +10%		
	Input Current [Arms]*2		5.5	11	12
Control	Power Supply		200 VAC to 240 VAC, 50 Hz/60 Hz		
	Permitted Voltage Fluctuation		-15% to +10%		
	Input Current [Arms]*2		0.25	0.25	0.25
Power Supply Capacity [kVA]*2			1.3	2.4	2.7
Power Loss*2	Main Circuit Power Loss [W]		24.1	43.6	54.1
	Control Circuit Power Loss [W]		17	17	17
	Built-in Regenerative Resistor Power Loss [W]		8	8	16
	Total Power Loss [W]		49.1	68.6	87.1
Regenerative Resistor	Built-In Regenerative Resistor	Resistance [Ω]	40	40	12
		Capacity [W]	40	40	60
	Minimum Allowable External Resistance [Ω]		40	40	12
Overvoltage Category			III		

*1. If you use the SGD7W-5R5A with a single-phase 200-VAC power supply input, derate the load ratio to 65%. An example is given below. If the load ratio of the first axis is 90%, use a load ratio of 40% for the second axis so that average load ratio for both axes is 65%.
((90% + 40%)/2 = 65%)

*2. This is the net value at the rated load. However, a load ratio of 65% was used for the SGD7W-5R5A.

270 VDC

Model SGD7W-		1R6A	2R8A	5R5A	7R6A
Maximum Applicable Motor Capacity per Axis [kW]		0.2	0.4	0.75	1.0
Continuous Output Current per Axis [Arms]		1.6	2.8	5.5	7.6
Instantaneous Maximum Output Current per Axis [Arms]		5.9	9.3	16.9	17.0
Main Circuit	Power Supply	270 VDC to 324 VDC			
	Permitted Voltage Fluctuation	-15% to +10%			
	Input Current [Arms]*	3.0	5.8	9.7	14
Control	Power Supply	270 VDC to 324 VDC			
	Permitted Voltage Fluctuation	-15% to +10%			
	Input Current [Arms]*	0.25	0.25	0.25	0.25
Power Supply Capacity [kVA]*		1.2	2	3.2	4.6
Power Loss*	Main Circuit Power Loss [W]	18.7	33.3	58.4	73.7
	Control Circuit Power Loss [W]	17	17	17	17
	Total Power Loss [W]	35.7	50.3	75.4	90.7
Overvoltage Category		III			

* This is the net value at the rated load.

2.2 SERVOPACK Overload Protection Characteristics

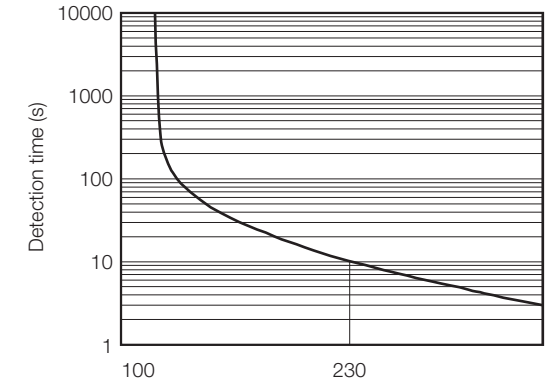
The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of 55°C.

An overload alarm (A.710 or A.720) will occur if overload operation that exceeds the overload protection characteristics shown in the following diagram (i.e., operation on the right side of the applicable line) is performed.

The actual overload detection level will be the detection level of the connected SERVOPACK or Servomotor that has the lower overload protection characteristics.

In most cases, that will be the overload protection characteristics of the Servomotor.

- SGD7W-1R6, -2R8

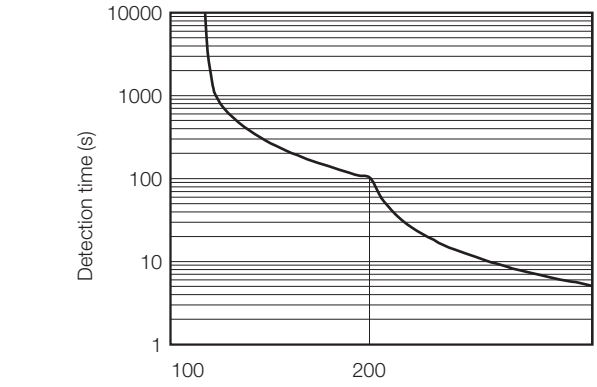


$$\frac{\text{Instantaneous maximum output current}}{\text{Continuous output current}} \times 100\%$$

(Instantaneous maximum output current)

Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.
For a Yaskawa-specified combination of SERVOPACK and Servomotor, maintain the effective torque within the continuous duty zone of the torque-motor speed characteristic of the Servomotor.

- SGD7W-5R5, -7R6



$$\frac{\text{Instantaneous maximum output current}}{\text{Continuous output current}} \times 100\%$$

(Instantaneous maximum output current)

Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.
For a Yaskawa-specified combination of SERVOPACK and Servomotor, maintain the effective torque within the continuous duty zone of the torque-motor speed characteristic of the Servomotor.

2.3 Specifications

This section gives the specifications of SERVOPACKs.

Item		Specification
Control Method		IGBT-based PWM control, sine wave current drive
Feedback	With Rotary Servomotor	Serial encoder: 17 bits (absolute encoder) 20 bits or 24 bits (incremental encoder/absolute encoder) 22 bits (absolute encoder)
	With Linear Servomotor	• Absolute linear encoder (The signal resolution depends on the absolute linear encoder.) • Incremental linear encoder (The signal resolution depends on the incremental linear encoder or Serial Converter Unit.)
Environmental Conditions	Surrounding Air Temperature	-5°C to 55°C (With derating, usage is possible between 55°C and 60°C.) Refer to the following manual for derating specifications. Σ-7-Series Σ-7W SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 29)
	Storage Temperature	-20°C to 85°C
	Surrounding Air Humidity	95% relative humidity max. (with no freezing or condensation)
	Storage Humidity	95% relative humidity max. (with no freezing or condensation)
	Vibration Resistance	4.9 m/s^2
	Shock Resistance	19.6 m/s^2
	Degree of Protection	IP20
	Pollution Degree	2 • Must be no corrosive or flammable gases. • Must be no exposure to water, oil, or chemicals. • Must be no dust, salts, or iron dust.
	Altitude	1,000 m max. (With derating, usage is possible between 1,000 m and 2,000 m.) Refer to the following manual for derating specifications. Σ-7-Series Σ-7W SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 29)
	Others	Do not use the SERVOPACK in the following locations: Locations subject to static electricity, noise, strong electromagnetic/magnetic fields, or radioactivity
Compliant Standards		Refer to the following section for details. *Compliance with UL Standards, EU Directives and UK Regulations* on page xxvi
Mounting		Base-mounted or rack-mounted
Performance	Speed Control Range	1:5000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)
	Coefficient of Speed Fluctuation*	±0.01% of rated speed max. (for a load fluctuation of 0% to 100%)
		0% of rated speed max. (for a voltage fluctuation of ±10%)
		±0.1% of rated speed max. (for a temperature fluctuation of 25°C ±25°C)
	Torque Control Precision (Repeatability)	±1%
	Soft Start Time Setting	0 s to 10 s (Can be set separately for acceleration and deceleration.)

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Item			Specification
I/O Signals	Overheat Protection Input		Number of input points: 2 Input voltage range: 0 V to +5 V
	Sequence Input Signals		Allowable voltage range: 24 VDC ±20% Number of input points: 12 (Input method: Sink inputs or source inputs)
		Input Signals That Can Be Allocated	Input Signals • P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals • /P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals • /DEC (Origin Return Deceleration Switch) signal • /EXT1 to /EXT3 (External Latch Input 1 to 3) signals • FSTP (Forced Stop Input) signal A signal can be allocated and the positive and negative logic can be changed.
	Sequence Output Signals	Fixed Output	Allowable voltage range: 5 VDC to 30 VDC Number of output points: 2 (A photocoupler output (isolated) is used.)
			Output signal: ALM (Servo Alarm) signal
		Output Signals That Can Be Allocated	Allowable voltage range: 5 VDC to 30 VDC Number of output points: 5 (A photocoupler output (isolated) is used.)
			Output Signals • /COIN (Positioning Completion) signal • /V-CMP (Speed Coincidence Detection) signal • /TGON (Rotation Detection) signal • /S-RDY (Servo Ready) signal • /CLT (Torque Limit Detection) signal • /VLT (Speed Limit Detection) signal • /BK (Brake) signal • /WARN (Warning) signal • /NEAR (Near) signal A signal can be allocated and the positive and negative logic can be changed.
Communications	RS-422A Communications (CN3)	Interfaces	Digital Operator (JUSP-OP05A-1-E) and personal computer (with SigmaWin+)
		1:N Communications	Up to N = 15 stations possible for RS-422A port
		Axis Address Settings	03h to EFh (maximum number of SDevices: 62) The rotary switches (S1 and S2) are used to set the station address.
	USB Communications (CN7)	Interface	Personal computer (with SigmaWin+)
		Communications Standard	Conforms to USB2.0 standard (12 Mbps).
Displays/Indicators			CHARGE, PWR, CN, L1, and L2 indicators, and two, one-digit seven-segment displays

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Item		Specification
MECHATROLINK-III Communications	Communications Protocol	MECHATROLINK-III
	Station Address Settings	03h to EFh (maximum number of SDevices: 62) The rotary switches (S1 and S2) are used to set the station address.
	Extended Address Setting	Axis A: 00h, Axis B: 01h
	Transmission Speed	100 Mbps
	Transmission Cycle	250 μs, 500 μs, 750 μs, 1.0 ms to 4.0 ms (multiples of 0.5 ms)
	Number of Transmission Bytes	32 or 48 bytes/station A DIP switch (S3) is used to select the transmission speed.
Reference Method	Performance	Position, speed, or torque control with MECHATROLINK-III communications
	Reference Input	MECHATROLINK-III commands (sequence, motion, data setting, data access, monitoring, adjustment, etc.)
	Profile	MECHATROLINK-III standard servo profile
MECHATROLINK-III Communications Setting Switches		Rotary switch (S1 and S2) positions: 16
		Number of DIP switch (S3) pins: 4
Analog Monitor (CN5)		Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)
Dynamic Brake (DB)		Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.
Regenerative Processing		Built-in
Overtravel (OT) Prevention		Stopping with dynamic brake, deceleration to a stop, or coasting to a stop for the P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal
Protective Functions		Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.
Utility Functions		Gain adjustment, alarm history, jogging, origin search, etc.
Applicable Option Modules		None

* The coefficient of speed fluctuation for load fluctuation is defined as follows:

$$\text{Coefficient of speed fluctuation} = \frac{\text{No-load motor speed - Total-load motor speed}}{\text{Rated motor speed}} \times 100\%$$

Position Correction Table

3

This chapter provides information on the Position Correction Table.

3.1 Outline 3-2
3.1.1 Position Correction Table Block Diagram 3-3

3.2 Parameter Settings Related to the Position Correction Table . . 3-4
3.2.1 Position Correction Table Enable/Disable 3-4
3.2.2 Position Correction Axis Selection 3-4
3.2.3 Position Correction Table-Related Monitor Selection 3-4

3.3 Alarm Related to the Position Correction Table . . 3-5

3.4 Position Correction Table Settings 3-6
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3.4.2 Position Correction Table Details 3-7
3.4.3 Setting Method with the SigmaWin+ 3-8
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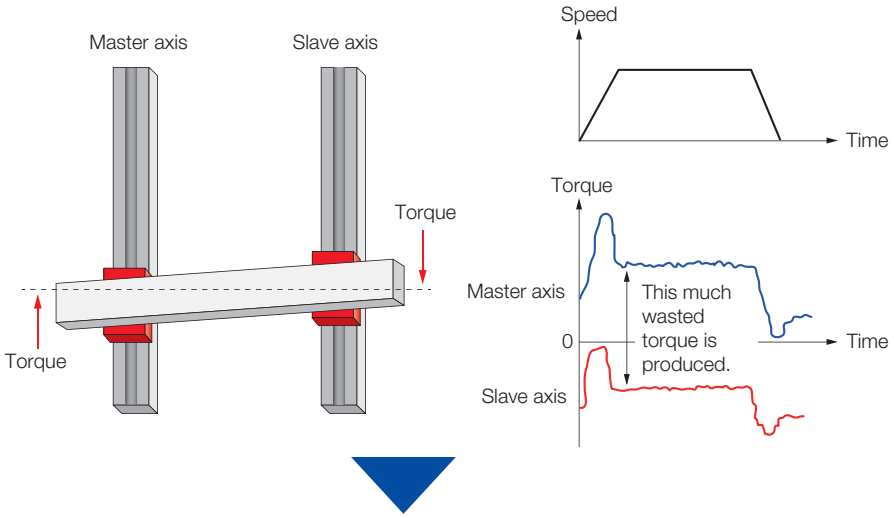
3.5 Monitoring 3-25
3.5.1 Monitoring with the SigmaWin+ 3-25
3.5.2 Monitoring with the Digital Operator 3-25
3.5.3 MECHATROLINK-III Monitoring 3-25

3.1 Outline

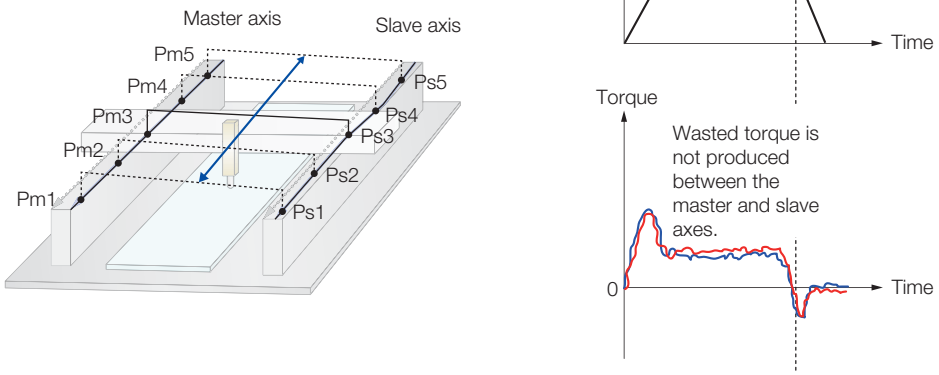
The Position Correction Table is used to drive the Servomotors while correcting the position based on the correction amounts set in the table in order to minimize wasted torque produced by mechanical differences in the machine.

Using this function can reduce cycle time because it can drive the Servomotors without producing wasted torque between two axes.

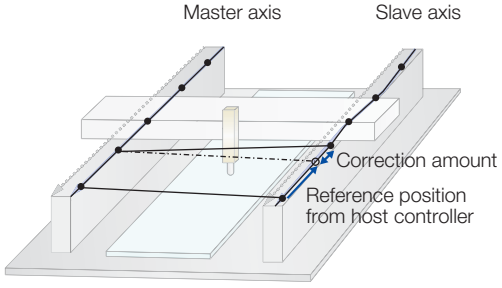
Tension is produced between the axes when the Servomotors are driven due to mechanical differences, and this produces wasted torque.



Wasted torque produced due to mechanical differences can be minimized by driving the Servomotors while correcting the position of the slave axis based on the correction amounts set in the table.



Information The SERVOPACK adds the correction amount to the reference position from the host controller, and then it moves the slave axis.
For this reason, the coordinate position of the slave axis is offset from the reference position from the host controller by only the added correction amount.



This function is enabled after either of the following operations is performed during position control.

- When using an absolute encoder
  The SENS_ON (Turn Sensor ON: 23h) command is sent from the host controller.
- When using an incremental encoder
  - The ZRET (Zero Point Return: 3Ah) command is sent from the host controller.
  - The reference point is set (REFE = 1) using the POS_SET (Set Coordinate System: 20h) command from the host controller.

Information

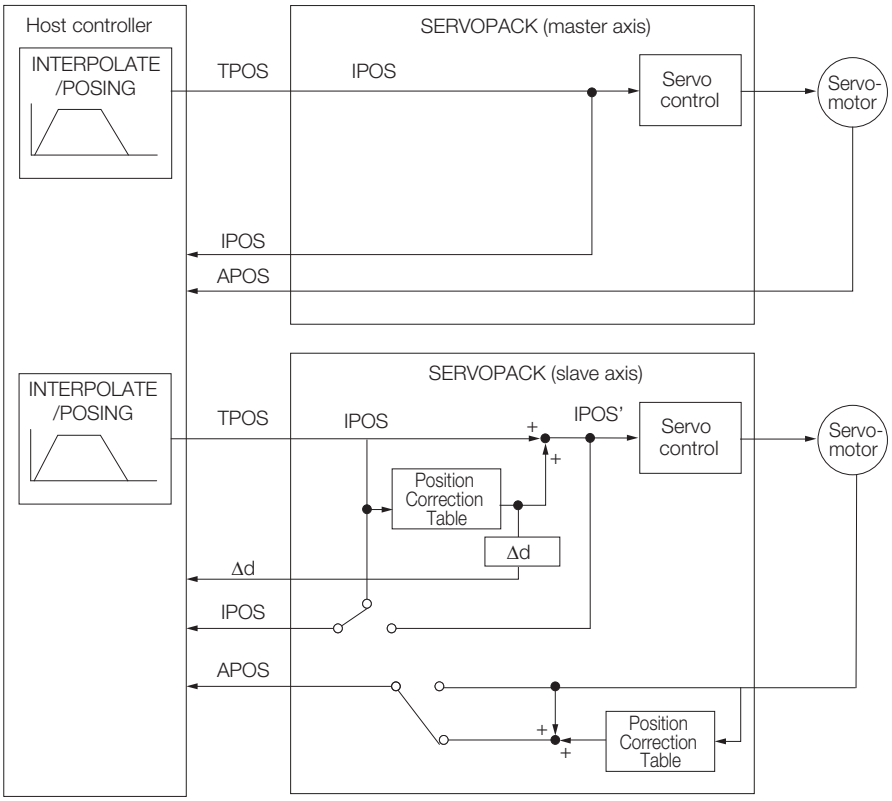
- The PSET and NEAR signals are output based on the corrected position.
- The software limit function uses the uncorrected position.
- This product assumes a system that issues commands for the same target position to the master axis and slave axis.
  To use this product for any other application, contact your Yaskawa representative.

Important

If there is a deviation in the position of the origin, a deviation will occur in the values set in the Position Correction Table, and the function may not work effectively. Configure the system so that the position of the origin does not deviate.

3.1.1 Position Correction Table Block Diagram

With each control cycle in the Servo (less than or equal to the communications cycle), the position of IPOS (Internal Reference Position) is corrected by the Position Correction Table.



3.2 Parameter Settings Related to the Position Correction Table

This section describes the parameters necessary to use the Position Correction Table.

3.2.1 Position Correction Table Enable/Disable

Enable and disable the Position Correction Table with Pn847 = n.□□□X (Position Correction Table Function Selections).

Parameter		Description	When Enabled	Classification
Pn847 All Axes	n.□□□0 (default setting)	Do not use Position Correction Table.	After restart	Setup
	n.□□□1	Use Position Correction Table.		

3.2.2 Position Correction Axis Selection

Select the axis for which the position will be corrected with Pn847 = n.X□□□ (Position Correction Axis Selection for Position Correction Table).

Parameter		Description	When Enabled	Classification
Pn847 All Axes	n.0□□□ (default setting)	Correct the position of axis A.	After restart	Setup
	n.1□□□	Correct the position of axis B.		

3.2.3 Position Correction Table-Related Monitor Selection

Select the value to monitor in the Position Correction Table with Pn847 = n.□X□□ (Position Correction Table-Related Monitor Selection).

Refer to the following section for details on the item that can select whether to monitor position information before correction or after correction.

☞ *3.5.3 MECHATROLINK-III Monitoring* on page 3-25

Parameter		Description	When Enabled	Classification
Pn847 All Axes	n.□0□□ (default setting)	Monitor the position information before position correction.	After restart	Setup
	n.□1□□	Monitor the position information after position correction.		

3.3 Alarm Related to the Position Correction Table

The alarm related to the Position Correction Table is given in the following table.

Refer to the following section for details on the causes of and corrections for the alarm.

☞ *6.1.2 Troubleshooting Alarms* on page 6-7

Alarm Number	Alarm Name	Alarm Meaning
A.E94 All Axes	Position Correction Table Setting Error	There are errors in setting values in the Position Correction Table.

3.4 Position Correction Table Settings

The Position Correction Table settings are configured with the following steps.

1. Measure positions required for the Position Correction Table.
2. Create the Position Correction Table.*1
3. Write the Position Correction Table to the SERVOPACK.*1, *2
4. Select Pn847 = n.□□□1 (Position Correction Table Selection) to enable the Position Correction Table.
5. Turn the power supply to the SERVOPACK OFF and ON again.*3

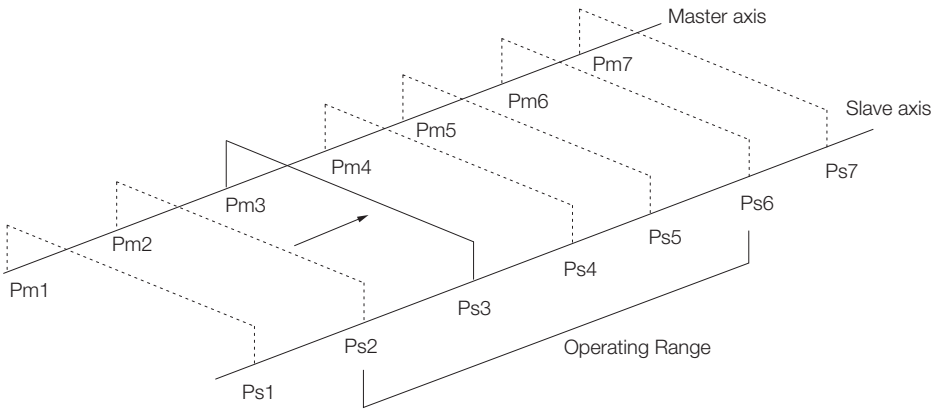
*1. The SigmaWin+ or MEM_WR command can be used to create the Position Correction Table and write it to the SERVOPACK.
Refer to the following sections for details.
☞ *3.4.3 Setting Method with the SigmaWin+* on page 3-8
☞ *3.4.4 Setting Method with the MEM_WR Command* on page 3-20

*2. The Position Correction Table (table entries, pre-correction positions, and correction amounts) cannot be written to the SERVOPACK when the servo is ON. Write the Position Correction Table when the servo is OFF.

*3. The Position Correction Table can also be enabled with the CONFIG command (CONFIG_MOD = 0).
In this case, ensure that both axes are in the servo OFF state before sending the command.

3.4.1 Measure the Positions Required for the Position Correction Table

Measure positions in order to learn the size of the correction amount necessary for the slave axis in regard to measured positions along the master axis.



The measurement method of positions is given below.

1. Turn ON the servo.
2. When using an incremental encoder, move the gantry to the machine origin.
When using an absolute encoder, proceed to the next step.
3. Use a movement command and move the gantry to the measurement position.
4. Turn OFF the servo.
5. Monitor the value of APOS (Feedback Position) of each axis.
6. Write down the monitored values.
7. Repeat steps 1 to 6 for the number of measurements that will be registered to the Position Correction Table.

3.4.2 Position Correction Table Details

This section provides the following details on the Position Correction Table.

Important

Set the Position Correction Table as given below.
If the Position Correction Table is not set as given below, A.E94 (Position Correction Table Setting Error) will occur, and the Position Correction Table cannot be written to the SERVOPACK.

- Ensure that the values for consecutive pre-correction positions in the Position Correction Table satisfy the following condition: value of pre-correction position < value of next pre-correction position.
- Ensure that the values for consecutive correction positions calculated by the Position Correction Table satisfy the following condition: value of correction position < value of next correction position. The correction position is the reference position of the slave axis after correction (pre-correction position + correction amount in Position Correction Table).
- Set the correction positions and correction amounts between -2,147,483,648 and 2,147,483,647.

Example: Table entries is 7.

	① No.	② Pre-correction Positions [Reference unit]	③ Correction Value [Reference unit]	
④→	1	-500,000	100	
	2	-400,000	100	Operating Range
	3	-300,000	150	
	4	-200,000	250	
	5	-100,000	100	
	6	0	-50	
④→	7	100,000	-50	

① No.
Up to 128 table entries can be set.

② Pre-correction Position
Enter the value of APOS (Feedback Position) of the master axis.

Note: For consecutive table numbers, the difference between the pre-correction positions and the difference between the correction amounts cannot exceed 1,073,741,823 [reference unit].

③ Correction Value
Enter the numeric value which is the result of subtracting the feedback position value of the master axis from the feedback position value of the slave axis.

④ Start and End Table Numbers
Enter a pre-correction position and adjustment amount for a position that exceeds the operating range.
If the operating range set in the Position Correction Table is exceeded, the correction cannot be applied to the position and unstable operation may occur at the coordinate positions set at both ends of the table.

Information

- If the gantry cannot be moved to a position that exceeds the operating range due to the mechanism, enter a value that exceeds the end of the operating range for the pre-correction position. In the above example, set the same correction amount as table numbers 2 and 6.
- Positions are corrected by performing linear interpolation on the correction amounts of the positions between consecutive table numbers.

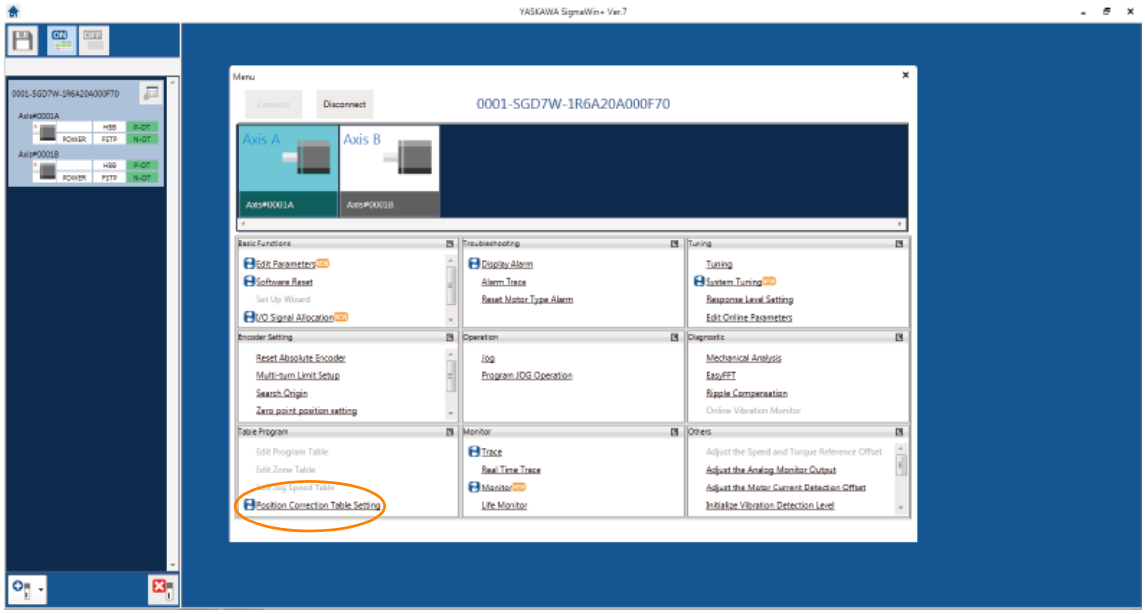
NOTICE

- Set appropriate values for the correction amounts in the Position Correction Table.
  The machine may be damaged if the correction amounts are too large.

3.4.3 Setting Method with the SigmaWin+

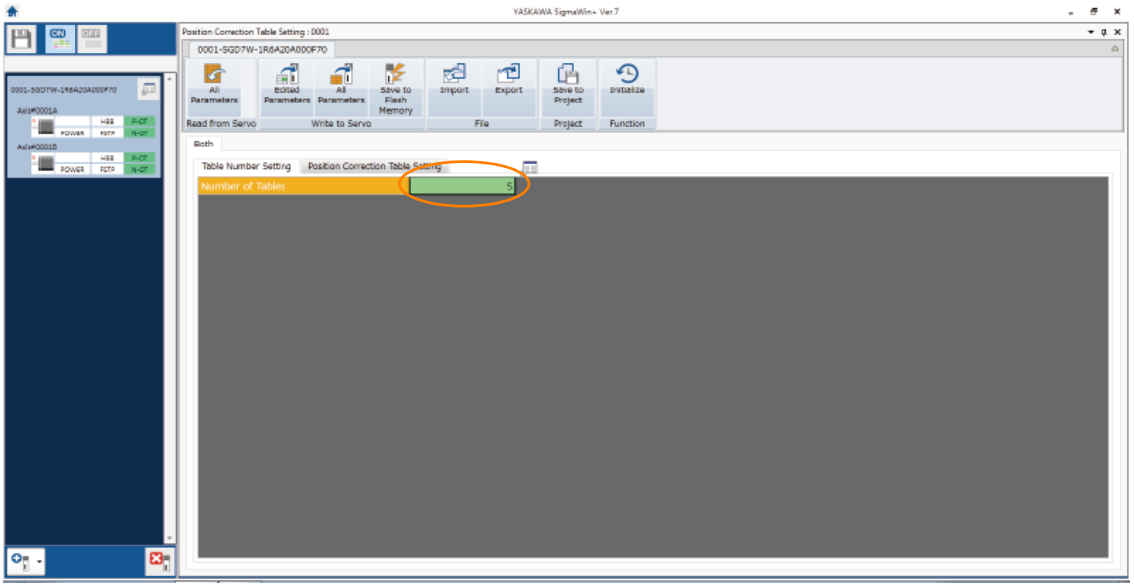
Use the following procedure to configure the Position Correction Table.

1. Click the [ ] Servo Drive Button in the workspace of the Main Window of the SigmaWin+.
2. Click **Position Correction Table Setting** in the Menu Dialog Box.



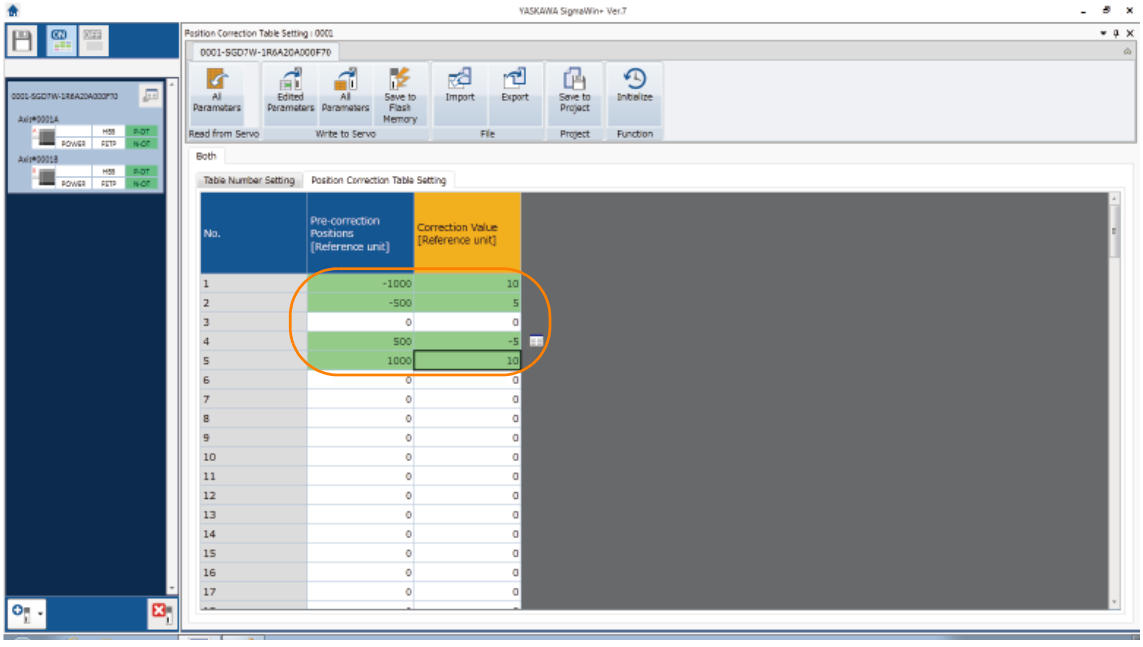
The Position Correction Table Setting Dialog Box will be displayed.
Refer to the following section to initialize the Position Correction Table.
☞ *Initializing the Position Correction Table* on page 3-13

3. On the Table Number Setting Tab, enter the number of table entries.



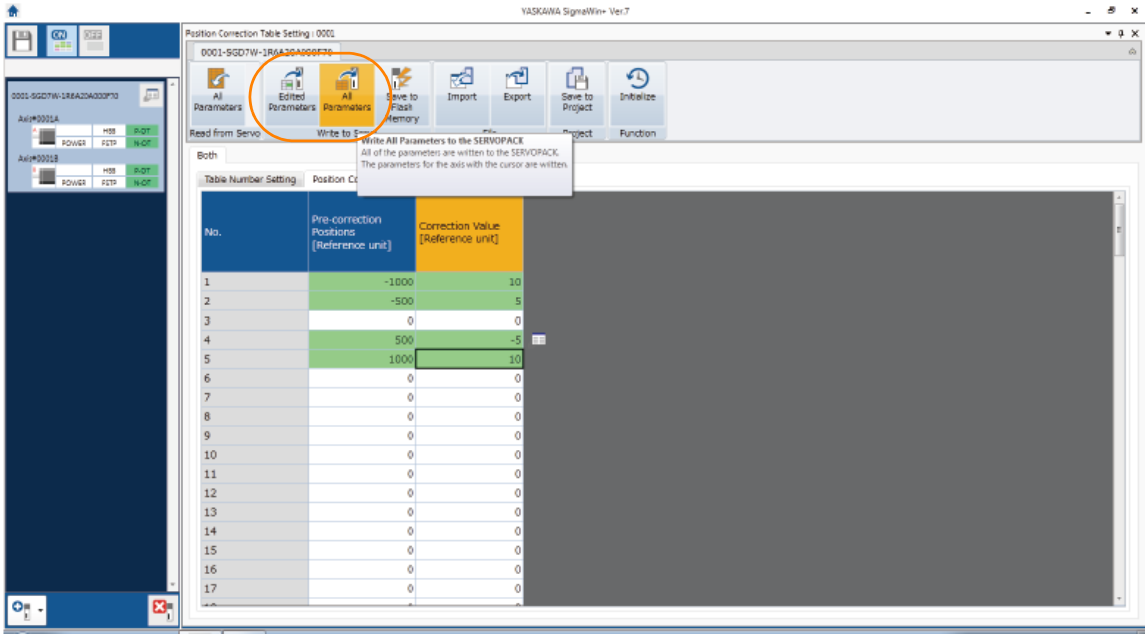
4. On the Position Correction Table Setting Tab, enter the pre-correction positions and correction amounts.

Information You can also copy data in Excel and paste it on the Position Correction Table.

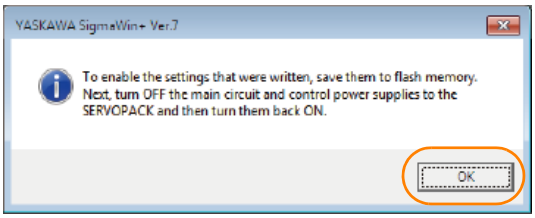


5. To write only the parts of the Position Correction Table that were edited to the SERVOPACK, click **Edited Parameters** in the **Write to Servo** Group.
To write the entire Position Correction Table to the SERVOPACK, click **All Parameters** in the **Write to Servo** Group.

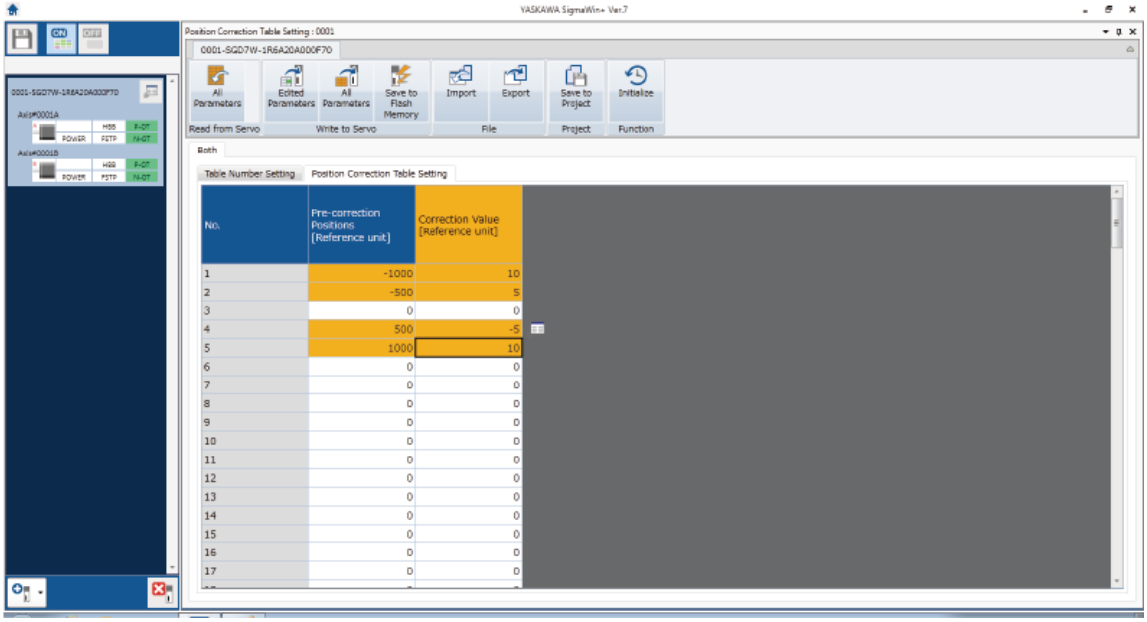
Information Parameter will be used in the dialog box, but parameters are not written to the SERVOPACK.
The Position Correction Table is written to the SERVOPACK.



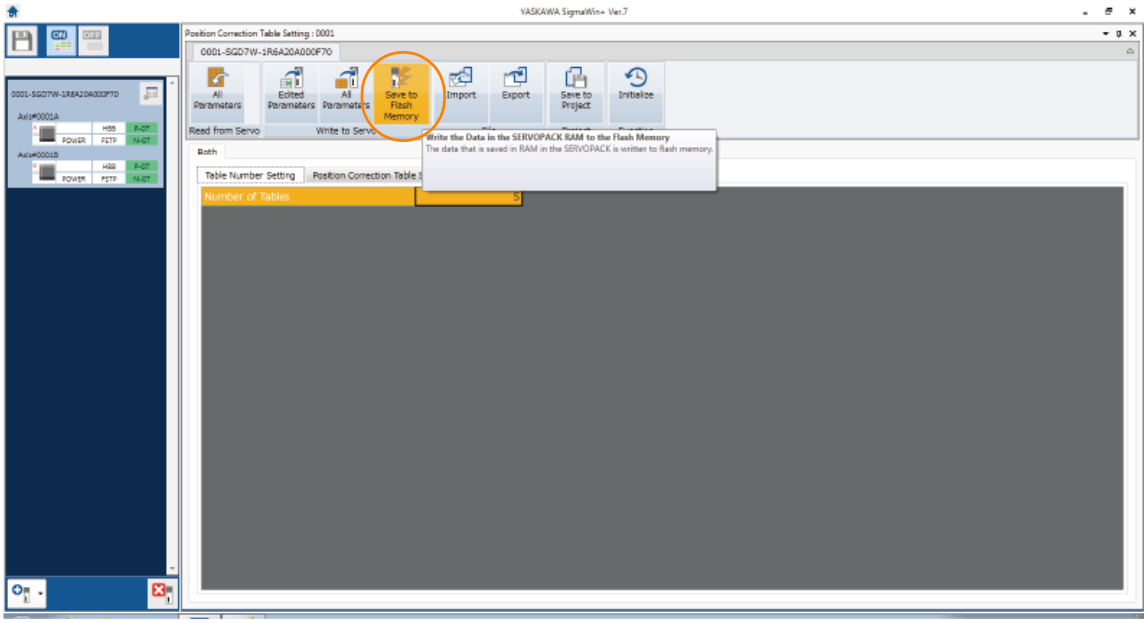
6. Click the **OK** Button.



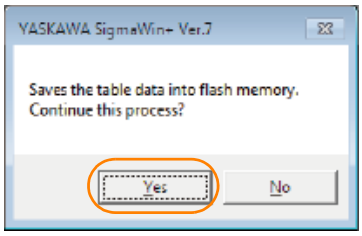
The created Position Correction Table was written to the volatile memory in the SERVOPACK.
The background of the edited parameter cell will change to orange.



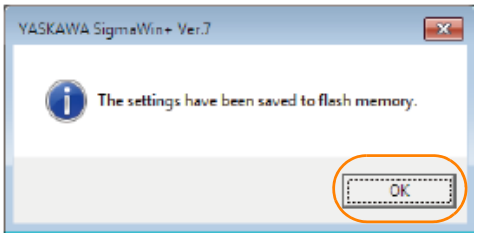
7. Click **Save to Flash Memory** in the **Write to Servo** Group.



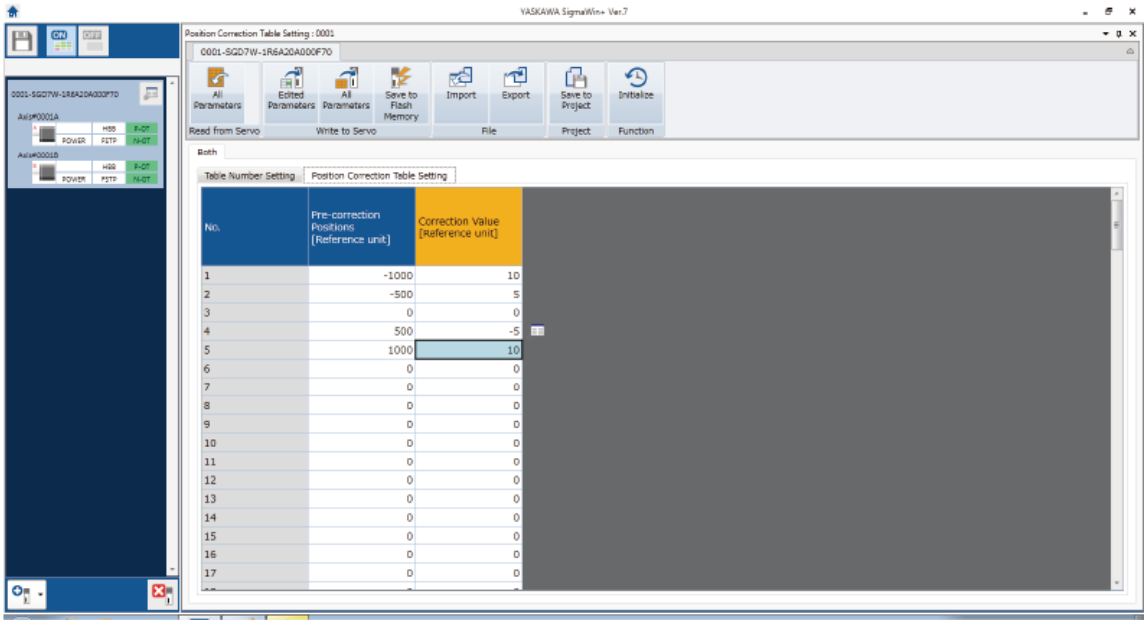
8. Click the **Yes** Button.



9. Click the **OK** Button.



Saving to flash memory is completed. The background of the edited parameter cell will change to white.



10. Turn the power supply to the SERVOPACK OFF and ON again.

This concludes the procedure to configure the Position Correction Table.

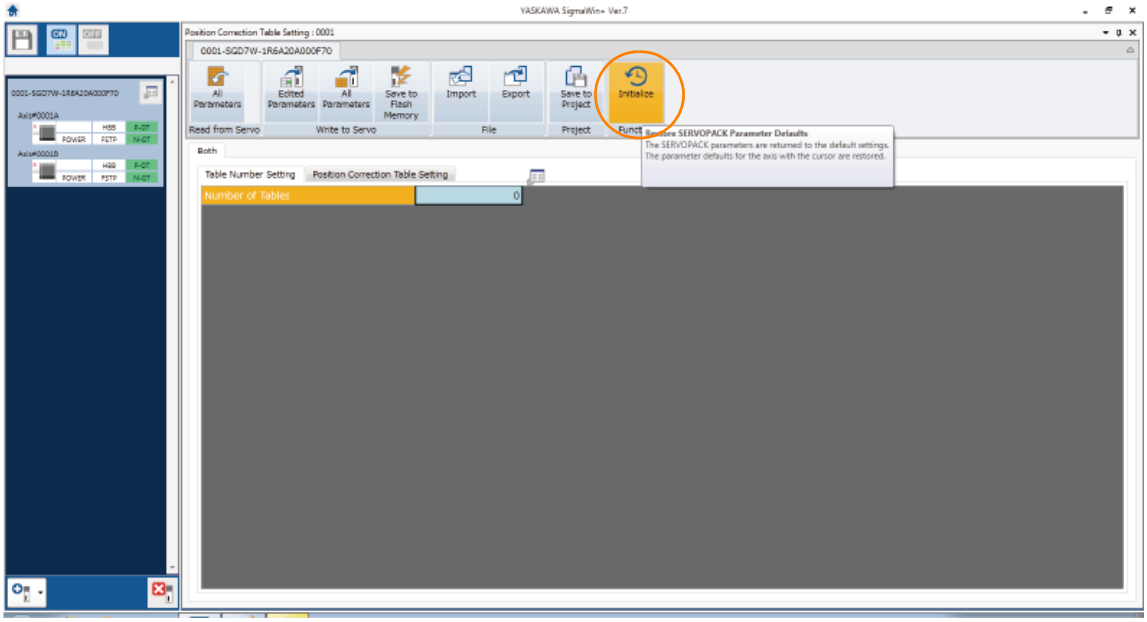
Initializing the Position Correction Table

Use the following procedure to initialize the Position Correction Table.

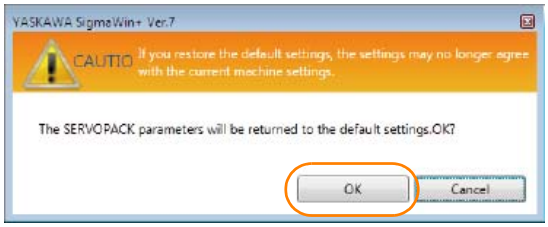
1. Click **Initialize** in the **Function** Group.

Information

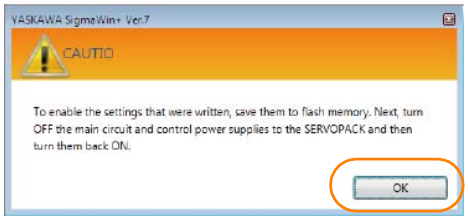
When the cursor is positioned on Initialize in the window, the “The SERVOPACK parameters are returned to the default settings” message will be displayed, but the parameters will not be initialized.
The Position Correction Table will be initialized.



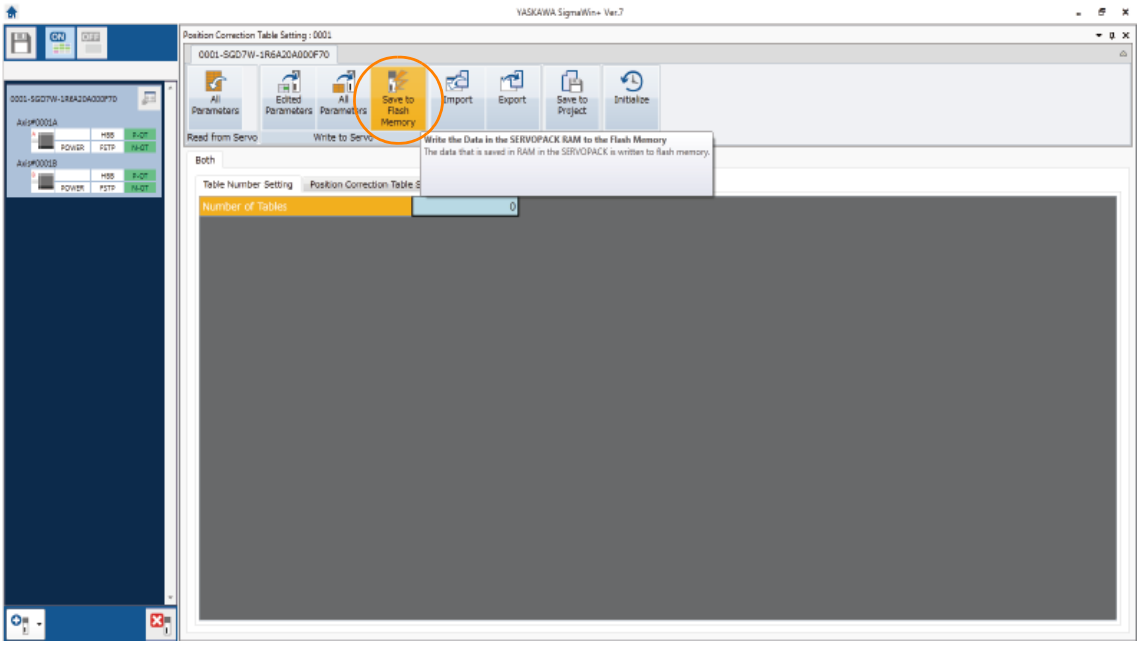
2. Click the **OK** Button.



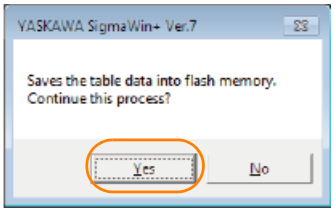
3. Click the **OK** Button.



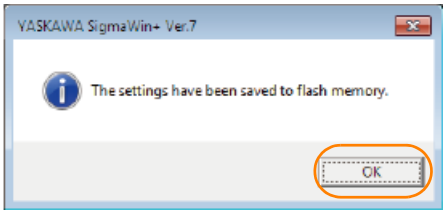
4. Click **Save to Flash Memory** in the **Write to Servo** Group.



5. Click the **Yes** Button.



6. Click the **OK** Button.



7. Turn the power supply to the SERVOPACK OFF and ON again.

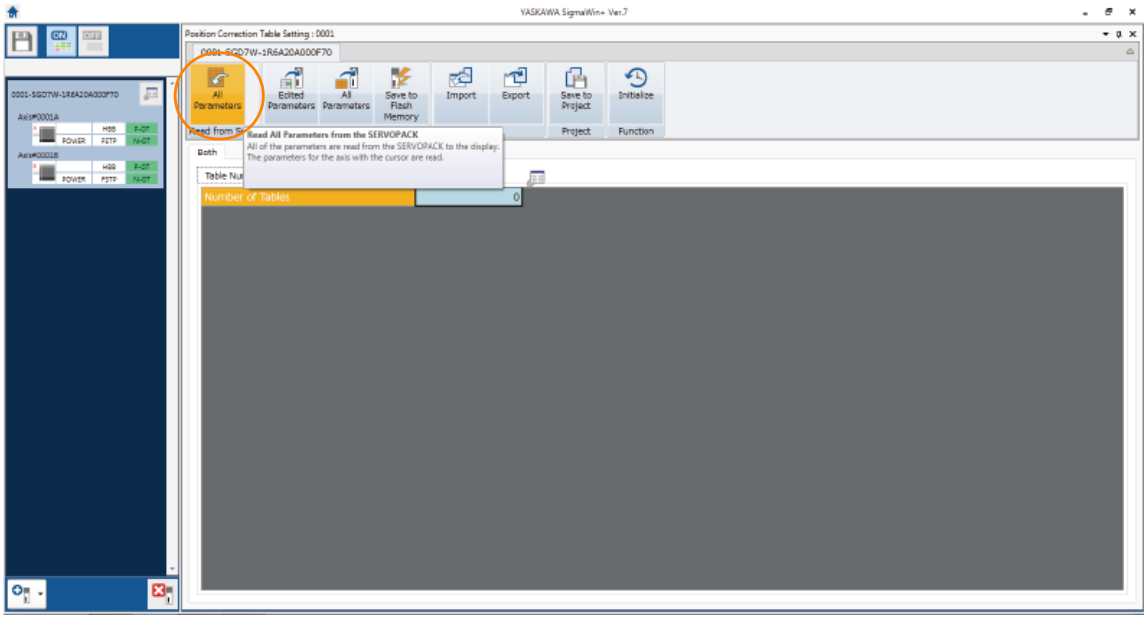
This concludes the procedure to initialize the Position Correction Table.

Reading the Position Correction Table from the SERVOPACK

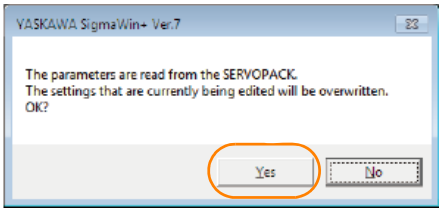
Use the following procedure to read the Position Correction Table from the SERVOPACK.

1. Click **All Parameters** in the **Read from Servo** Group.

   Information: Parameter will be used in the dialog box, but parameters are not read from the SERVOPACK.
   The Position Correction Table is read from the SERVOPACK.



2. Click the **Yes** Button.



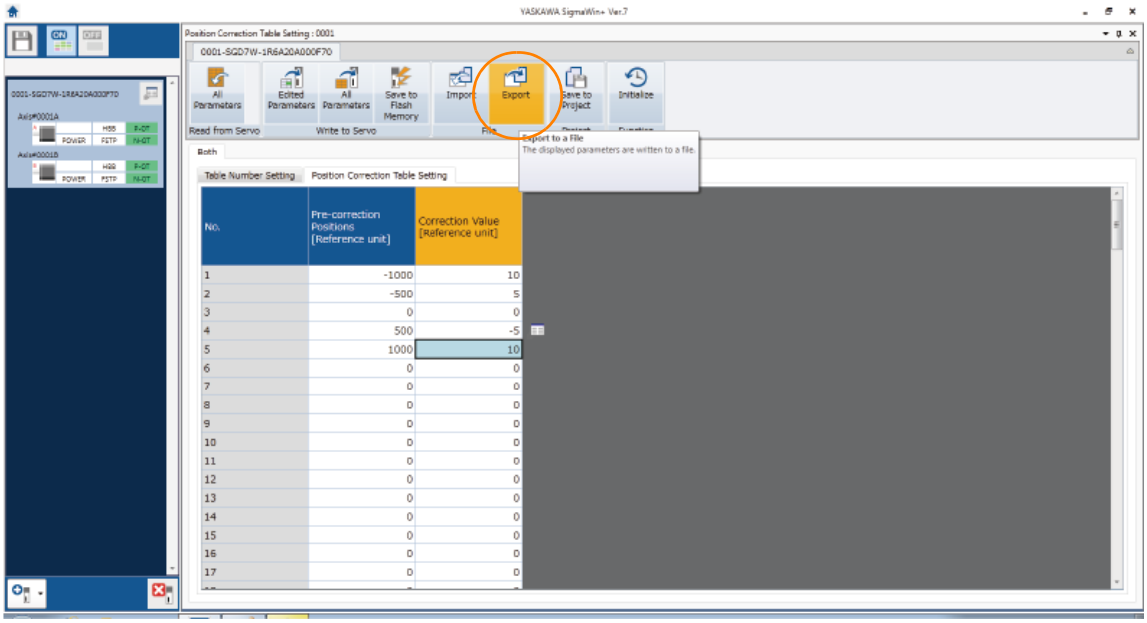
This concludes the procedure to read the Position Correction Table from the SERVOPACK.

Writing the Position Correction Table

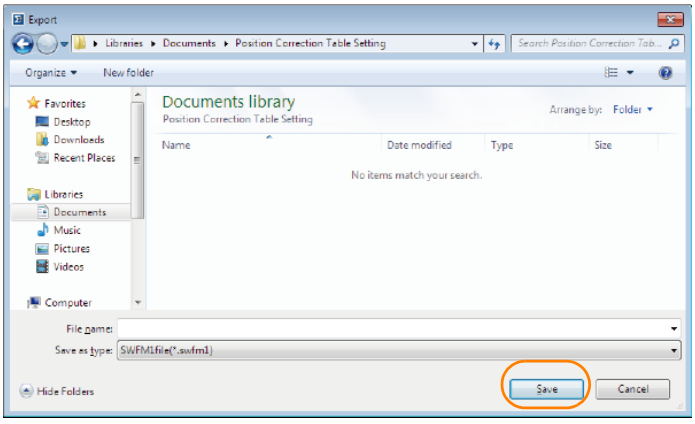
Use the following procedure to write the Position Correction Table to a file.

1. Click **Export** in the **File** Group.

Information When the cursor is positioned on Export in the window, the “The displayed parameters are written to a file” message will be displayed, but the parameters will not be written to the file.
The Position Correction Table will be written to the file.



2. Enter the file name and click the **Save** Button.



This concludes the procedure to write the Position Correction Table to a file.

Information You can also copy Position Correction Table data and paste it to a spreadsheet in Excel.

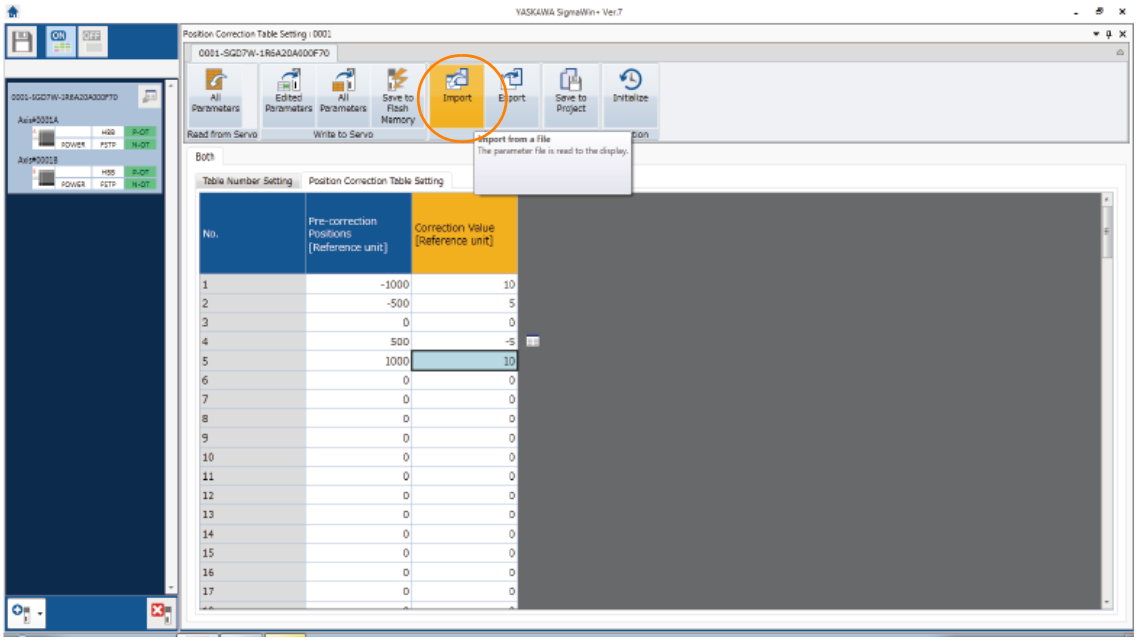
Reading a Position Correction Table File

Use the following procedure to read a Position Correction Table file.

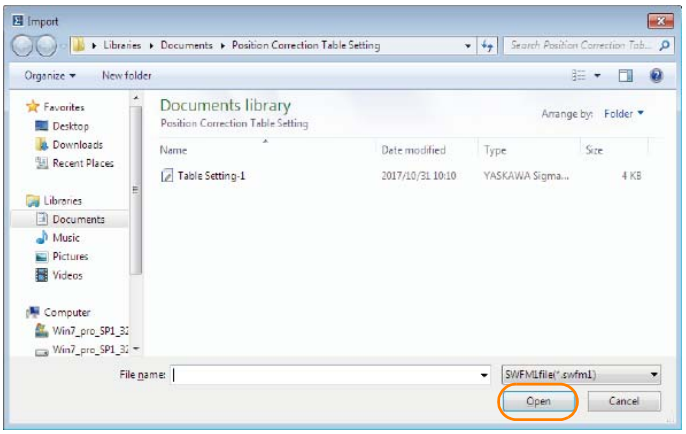
1. Click **Import** in the **File** Group.

Information

When the cursor is positioned on Import in the window, the “The parameters file is read to the display” message will be displayed, but the parameters will not be read.
The Position Correction Table is read from the file.



2. Select the file to read and click the **Open** Button.



This concludes the procedure to read the Position Correction Table from a file.

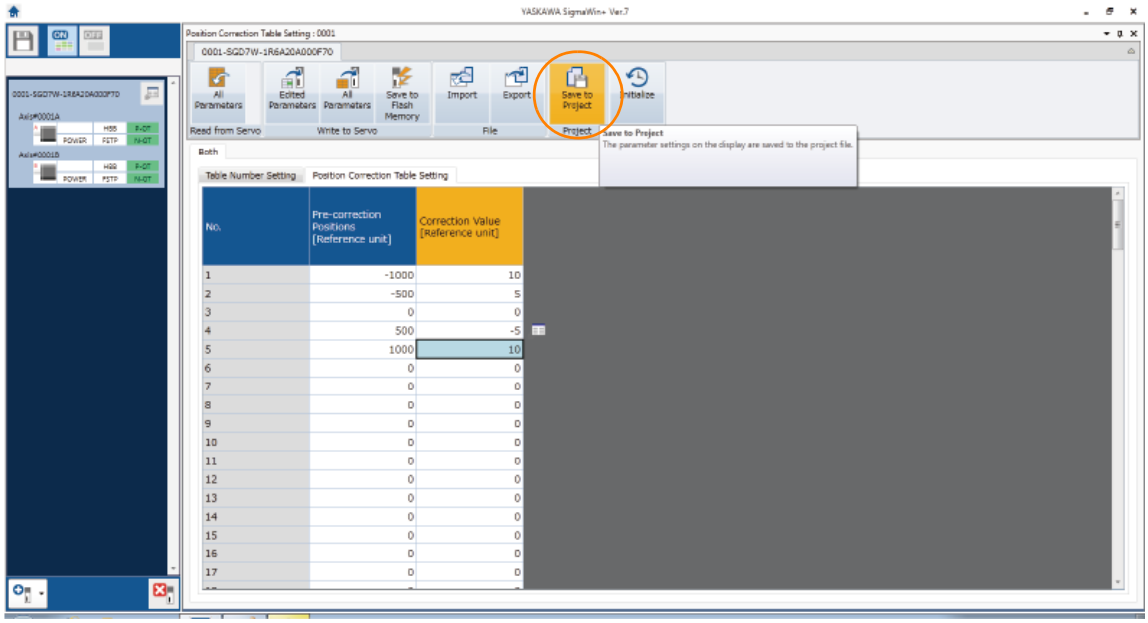
Saving the Position Correction Table to a Project File

Use the following procedure to save the Position Correction Table to a project file.

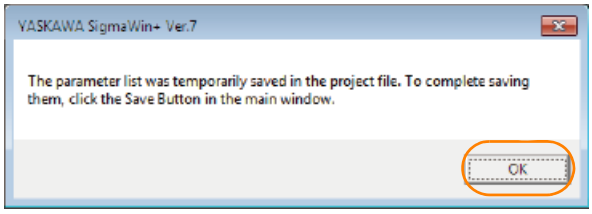
1. Click **Save to Project** in the **Project** Group.

Information

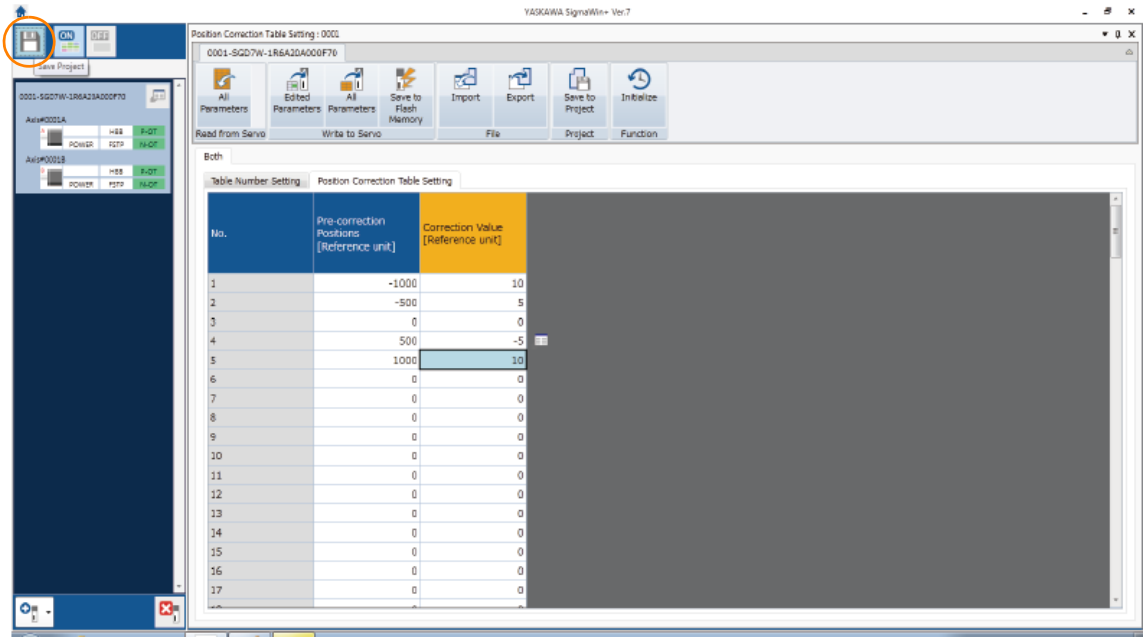
When the cursor is positioned on Save to Project in the window, the “The parameter settings on the display are saved to a project file” message will be displayed, but the parameter setting values will not be saved to the project file.
The Position Correction Table will be saved to the project file.



2. Click the **OK** Button.



3. Click the **Save** Button in the main window.



This concludes the procedure to save the Position Correction Table to the project file.

3.4.4 Setting Method with the MEM_WR Command

Use the MEM_WR (Write Memory) command to set the Position Correction Table from the host controller.

Setting the Position Correction Table

◆ Writing the Position Correction Table to Volatile Memory

Set the Position Correction Table based on the following table.

Register	Description	Size [No. of Registers]	Setting Range	Unit
0xF0040000	Table entries	2	0 to 128	No. of entries
0xF0040004	Pre-correction position [1]	2	-2,147,483,648 to 2,147,483,647	Reference unit
0xF0040008	Correction amount [1]	2		
0xF004000C	Pre-correction position [2]	2		
0xF0040010	Correction amount [2]	2		
0xF0040014	Pre-correction position [3]	2		
0xF0040018	Correction amount [3]	2		
0xF004001C	Pre-correction position [4]	2		
0xF0040020	Correction amount [4]	2		
・ ・ ・ ・	・ ・ ・ ・	・ ・ ・ ・		
0xF00403E4	Pre-correction position [125]	2		
0xF00403E8	Correction amount [125]	2		
0xF00403EC	Pre-correction position [126]	2		
0xF00403F0	Correction amount [126]	2		
0xF00403F4	Pre-correction position [127]	2		
0xF00403F8	Correction amount [127]	2		
0xF00403FC	Pre-correction position [128]	2		
0xF0040400	Correction amount [128]	2		

■ Example of Setting Pre-Correction Position [1] in the Position Correction Table to -500,000

The follow examples writes a pre-correction position in the Position Correction Table to volatile memory.

ADDRESS = 0xF0040004

MODE/DATA_TYPE = 0x13

SIZE = 0x01

DATA = -500000

◆ Saving the Position Correction Table to Non-Volatile Memory

■ How to Save Position Correction Table Data

Save the current values in volatile memory to non-volatile memory. Send the commands in the following order.

Step	Description	Setting Example
1	Sets the request code for writing to non-volatile memory.	ADDRESS = 0x80004000 MODE/DATA_TYPE = 0x12 SIZE = 0x0001 DATA = 0x2025
2	Executes preparation processing 1 for writing to non-volatile memory.	ADDRESS = 0x800041E0 MODE/DATA_TYPE = 0x12 SIZE = 0x0001 DATA = 0x0000
3	Executes preparation processing 2 for writing to non-volatile memory.	ADDRESS = 0x800041E4 MODE/DATA_TYPE = 0x13 SIZE = 0x0001 DATA = 0xF0040000
4	Executes preparation processing 3 for writing to non-volatile memory.	ADDRESS = 0x80004002 MODE/DATA_TYPE = 0x12 SIZE = 0x0001 DATA = 0x0002
5	Executes writing to non-volatile memory.	ADDRESS = 0x80004002 MODE/DATA_TYPE = 0x12 SIZE = 0x0001 DATA = 0x0001
6	Terminates writing to non-volatile memory.	ADDRESS = 0x80004000 MODE/DATA_TYPE = 0x12 SIZE = 0x0001 DATA = 0x0000

This concludes the procedure to save the Position Correction Table to non-volatile memory.

Initializing the Position Correction Table

◆ Example of Initializing the Position Correction Table

Initialize the setting values in non-volatile memory to the default setting values of the settings table. Refer to the following section for details on the settings table.

☞ *3.4.2 Position Correction Table Details* on page 3-7

Send the commands in the following order.

Step	Description	Setting Example
1	Sets the request code for initializing non-volatile memory.	ADDRESS = 0x80004000 MODE/DATA_TYPE = 0x12 SIZE = 0x0001 DATA = 0x2025
2	Executes preparation processing 1 for initializing non-volatile memory.	ADDRESS = 0x800041E0 MODE/DATA_TYPE = 0x12 SIZE = 0x0001 DATA = 0x0003
3	Executes preparation processing 2 for initializing non-volatile memory.	ADDRESS = 0x800041E4 MODE/DATA_TYPE = 0x13 SIZE = 0x0001 DATA = 0xF0040000
4	Executes preparation processing 3 for initializing non-volatile memory.	ADDRESS = 0x80004002 MODE/DATA_TYPE = 0x12 SIZE = 0x0001 DATA = 0x0002
5	Executes initialization of non-volatile memory.	ADDRESS = 0x80004002 MODE/DATA_TYPE = 0x12 SIZE = 0x0001 DATA = 0x0001
6	Terminates initialization of non-volatile memory.	ADDRESS = 0x80004000 MODE/DATA_TYPE = 0x12 SIZE = 0x0001 DATA = 0x0000

This concludes the procedure to initialize the Position Correction Table data.

Reference: Details of Settings with MEM_WR (Write Memory: 1EH) Command

◆ Data Format

Phases in which the Command can be Executed		2, 3	Command Classification	Common command	Asynchronous command
Processing Time		📖 Σ-7-Series MECHATROLINK-III Communications Standard Servo Profile Command Manual (Manual No.: SIEP S800001 31)	Subcommand	Cannot be used	

Byte	MEM_WR		Description
	Command	Response	
0	1EH	1EH	• The MEM_WR command writes the data in virtual memory by specifying the initial address, the data size and the data for writing. • This command provides an adjustment function equivalent to that of the ADJ command of the MECHATROLINK-II compatible profile. • Confirm the completion of the command execution by checking that RCMD = MEM_WR (= 1EH) and CMD_STAT.CMDRDY = 1, and also checking the setting for ADDRESS, SIZE, MODE/DATA_TYPE and DATA. In the following cases, an alarm will occur and the command will not be executed. • When the ADDRESS data is invalid: CMD_ALM = 9H (A.94A) • When the MODE/DATA_TYPE data is invalid: CMD_ALM = 9H (A.94B) • When the SIZE data is invalid: CMD_ALM = 9H (A.94D) • When the DATA data is invalid: CMD_ALM = 9H (A.94B) • When the conditions for executing the adjustment operation are not satisfied: CMD_ALM=AH (A.95A) • While editing using the SigmaWin or Digital Operator: CMD_ALM = AH (A.95A) For details, refer to the following manual. 📖 Σ-7-Series MECHATROLINK-III Communications Standard Servo Profile Command Manual (Manual No.: SIEP S800001 31)
1	WDT	RWDT	
2	CMD_CTRL	CMD_STAT	
3			
4	Reserved.	Reserved.	
5	MODE/ DATA_TYPE	MODE/ DATA_TYPE	
6	SIZE	SIZE	
7			
8	ADDRESS	ADDRESS	
9			
10			
11			
12	DATA	DATA	
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			

◆ Command Parameters

The details of MODE/DATA_TYPE are described below.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
MODE				DATA_TYPE			

MODE = 1: Volatile memory, 2: Non-volatile memory*
DATA_TYPE = 1: Byte, 2: Short, 3: Long, 4: Not supported

* MECHATROLINK-III common parameters can directly write to non-volatile memory.
Other parameters first write to volatile memory, and then write to non-volatile memory.

SIZE: Data size for writing (type specified by DATA_TYPE)
ADDRESS: Initial address for writing
DATA: Data to be written

◆ Command Warnings

The details of CMD_ALM of the MEM_RD/MEM_WR command are described below.

CMD_ALM	Displayed Code	Error Details
9H	A.94A	When an initial address outside the defined areas is specified
		When an address within the reserved ranges of common parameter or vendor-specific areas is specified
		When a value other than a multiple of the data size specified in DATA_TYPE is set for ADDRESS
	A.94B	When the MODE or DATA_TYPE data is invalid
	A.94D	When the initial address is within the defined areas but the specified size goes beyond those areas
		When a data size beyond the specification of the command format is set for SIZE

3.5 Monitoring

3.5.1 Monitoring with the SigmaWin+

The current correction amount in the Position Correction Table can be monitored with the Motion Monitor Window.

Button in Menu Dialog Box	Name [Unit]
Motion Monitor	Current Correction Amount in Position Correction Table [reference unit]

Refer to the following manual for detailed operating procedures for the SigmaWin+.
Engineering Tool SigmaWin+ Operation Manual (Manual No.: SIET S800001 34)

3.5.2 Monitoring with the Digital Operator

Un04D can be used to monitor the current correction amount in the Position Correction Table with the Digital Operator.

Un No.	Sign	Unit	Name	Description
Un04D*	Yes	1 reference unit	Current Correction Amount in Position Correction Table	Current correction amount calculated from the Position Correction Table

* The correction amount of only the symmetrical axis (slave axis) for position correction is output. 0 is always output for the master axis.

Refer to the following manual for monitor data other than that listed above.
Σ-7-Series Digital Operator Operating Manual (Manual No.: SIEP S800001 33)

3.5.3 MECHATROLINK-III Monitoring

Monitor Information

The following MECHATROLINK-III monitor data is selected with common parameters PnB0E (Monitor Select 1) and PnB10 (Monitor Select 2).

The correction amount added in the SERVOPACK is checked with 004Dh of Pn824 (Option Monitor 1 Selection) and Pn825 (Option Monitor 2 Selection).

The code that can select whether to monitor position information before position correction or after position correction with Pn847 = n.□X□□ (Position Correction Table-Related Monitor Selection) is given next. The other selection codes are the same as the Σ-7W SERVOPACK with MECHATROLINK-III Communications References (SGD7W-□□□A20), and the position information does not change before position correction and after correction.

Selection Code	Monitor Name	Monitor Name When CMN or OMN Is Selected	Description	Information
0	APOS	-	Feedback Position	-
1	CPOS	-	Command Position (after filtering)	-
2	PERR	-	Position Error	-
3	LPOS1	-	Latched Position 1	-
4	LPOS2	-	Latched Position 2	-
9	MPOS	-	Command Position (including control delay)	-

Continued on next page.

Continued from previous page.

Selection Code	Monitor Name	Monitor Name When CMN or OMN Is Selected	Description	Information
C	CMN1	TPOS	Target Position	PnB12 (PnB14) = 0000H
		IPOS	Command Position (before filtering)	PnB12 (PnB14) = 0001H
D	CMN2	TPOS	Target Position	PnB12 (PnB14) = 0000H
		IPOS	Command Position (before filtering)	PnB12 (PnB14) = 0001H
E	OMN1	LstLpos1	Last Latched Position 1	Pn824 (Pn825) = 0080H
		LstLpos2	Last Latched Position 2	Pn824 (Pn825) = 0081H
F	OMN2	LstLpos1	Last Latched Position 1	Pn824 (Pn825) = 0080H
		LstLpos2	Last Latched Position 2	Pn824 (Pn825) = 0081H

SVCMD_IO (Servo Command Input Signal) Monitoring

The output specification of servo command input signal monitoring is given in the following table.

Information

Servo command input signal monitoring not listed in the following table has the same output specification as the Σ-7W SERVOPACK with MECHATROLINK-III Communications References (SGD7W-□□□A20).

Signal Name	Description
DEN	DEN = 1 when distribution of TPOS + correction amount has completed.
PSET	PSET = 1 when DEN = 1 (Distribution Completed) and position deviation is | (TPOS + correction amount) - (APOS + correction amount) | ≤ Pn522 (Positioning Completed Width).
NEAR	NEAR = 1 when position deviation is | (TPOS + correction amount) - (APOS + correction amount) | ≤ Pn524 (Near Signal Width).

Synchronized Stopping

4

This chapter provides information on Synchronized Stopping.

4.1 Outline 4-2
4.1.1 Synchronized Stopping Timing Chart 4-3

4.2 Parameter Settings Related to Synchronized Stopping . . 4-4
4.2.1 Synchronized Stopping Mode Selection 4-4
4.2.2 Synchronized Stopping End Speed Setting 4-4
4.2.3 Adjusting Synchronized Stopping 4-5

4.3 Alarms Related to Synchronized Stopping . . . 4-6

4.4 Warning Related to Synchronized Stopping . . 4-7

4.5 CSTP_S in the I/O Signal Status Monitor . . 4-8
4.5.1 SVCMD_IO (I/O Signal Status) Field 4-8
4.5.2 Details of I/O Signal Status Bits 4-8

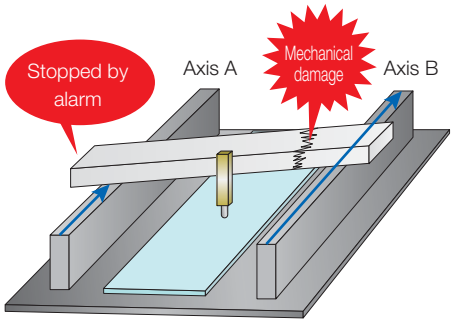
4.6 Servomotor Stopping Method for Alarms . . 4-9

4.1 Outline

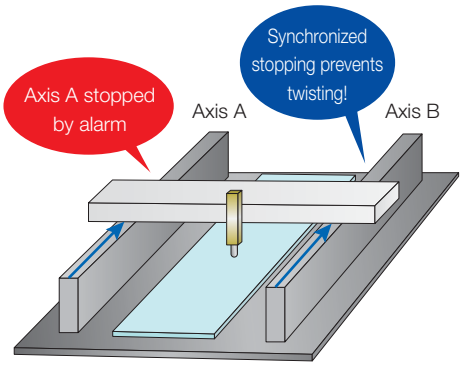
Synchronized Stopping is a function that synchronizes the axes and stops the Servomotors when an alarm occurs. Specifically, when an alarm occurs on either axis A or axis B, the synchronized stopping axis is synchronized to the active alarm axis, and both Servomotors are stopped together.

This function can prevent damage to the machine by synchronizing and stopping axis A and axis B.

Not Using Synchronized Stopping



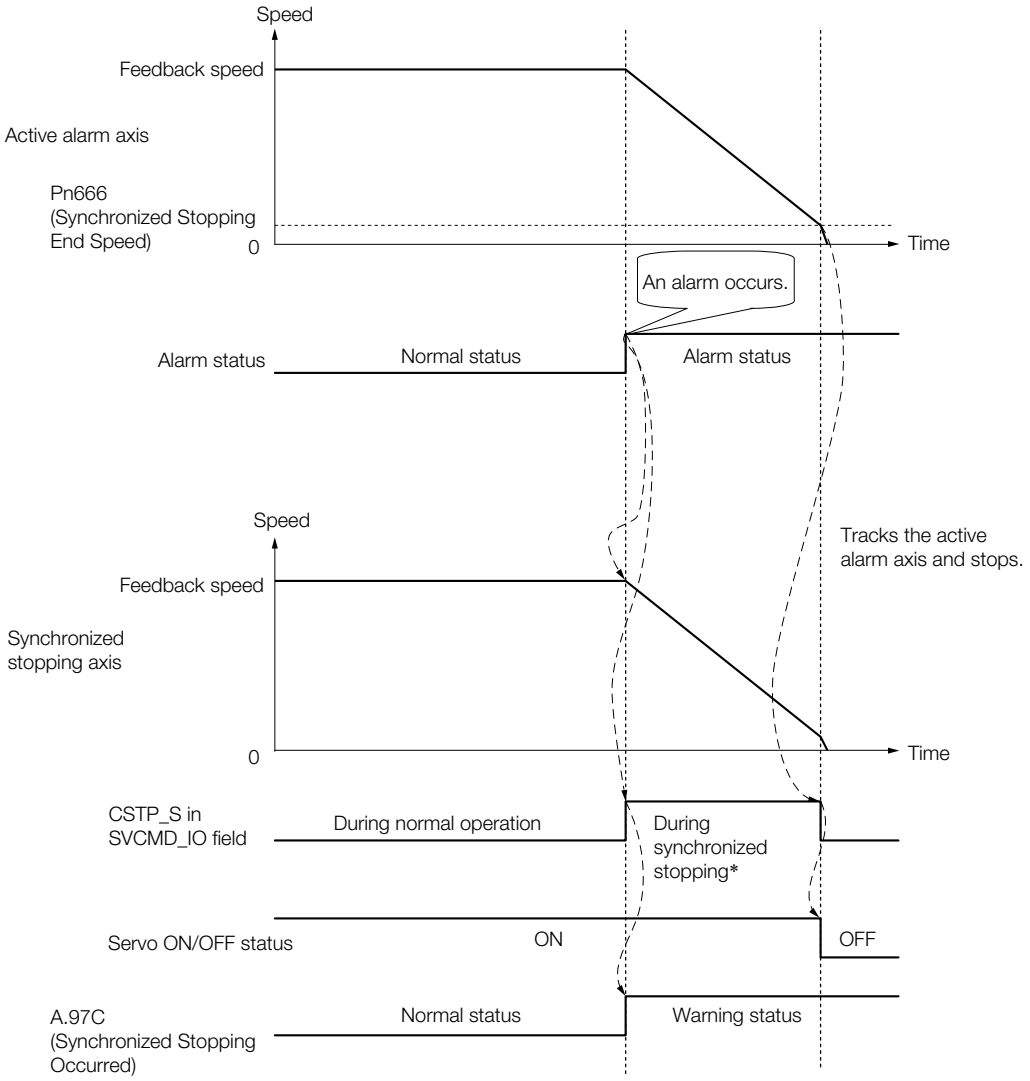
Using Synchronized Stopping



4.1.1 Synchronized Stopping Timing Chart

The following timing chart shows when Synchronized Stopping mode 1 or 2 is selected.

Information In Synchronized Stopping mode 3, both axes are almost simultaneously set to the servo OFF state immediately after an alarm occurs. Therefore, CSTP_S which represents the synchronized stopping status will not change, but it will instead remaining as the during normal operation status.



* During synchronized stopping, only emergency commands will be received.

Refer to the following section for details on CSTP_S (Synchronized Stopping Status).

☞ *Details of I/O Signal Status Bits* on page 4-8

Information Ending Synchronized Stopping

When any of the following states occur, CSTP_S (Synchronized Stopping Status) in the SVCMD_IO field will become "0: During normal operation", and synchronized stopping will end with the servo OFF state.

- When feedback speed is less than Pn666 (Synchronized Stopping End Speed) (normal end)
- When the SV_OFF or DISCONNECT command was received
- When the synchronized stopping axis changes to the servo OFF state due to an alarm or for other reasons

After synchronized stopping ends, commands can be received from the host controller.

4.2 Parameter Settings Related to Synchronized Stopping

4.2.1 Synchronized Stopping Mode Selection

Synchronized Stopping has three modes, and these modes are set with Pn665 = n.□□□X (Synchronized Stopping Selection).

Synchronized Stopping Mode 1

If an alarm occurs on either axis A or axis B, position control will be performed on the synchronized stopping axis using the feedback position of the active alarm axis as the target position.

Synchronized Stopping Mode 2

If an alarm occurs on either axis A or axis B, speed control will be performed on the synchronized stopping axis using the feedback speed of the active alarm axis as the target speed.

Synchronized Stopping Mode 3

If an alarm occurs on either axis A or axis B, the synchronized stopping axis is also set to the servo OFF state.

Both axes are changed to the servo OFF state almost simultaneously, and both axes are stopped according to the Servomotor stopping method when the servo is turned OFF.

Parameter		Description	When Enabled	Classification
Pn665 All Axes	n.□□□0 (default setting)	Disable synchronized stopping.	After restart	Setup
	n.□□□1	Enable synchronized stopping mode 1.		
	n.□□□2	Enable synchronized stopping mode 2.		
	n.□□□3	Enable synchronized stopping mode 3.		


Important

With synchronized stopping mode 1 and 2, the Servomotor may vibrate and the deviation between axes may increase when synchronized stopping is performed due to the mechanical characteristics or gain setting.
Use this function by first operating the machine or product at low speed and confirming that the deviation between axes causes no problems.

4.2.2 Synchronized Stopping End Speed Setting

Synchronized stopping will be ended when the feedback speed of the active alarm axis is less than Pn666 (Synchronized Stopping End Speed).

Use Pn666 (Synchronized Stopping End Speed) to set the speed for judging that the Servomotor has stopped and ending synchronized stopping. This parameter is valid for synchronized stopping mode 1 and 2.

Pn666 All Axes	Synchronized Stopping End Speed			Position	
	Setting Range	Setting Unit	Default Setting	When Enabled	Classification
	1 to 65,535	1000 reference units/s	256	Immediately	Setup

4.2.3 Adjusting Synchronized Stopping

Set Pn668 (Synchronized Stopping Speed Feedforward) to apply feedforward compensation which can reduce the deviation between the feedback position of the active alarm axis and the position of the synchronized stopping axis. This parameter is valid for synchronized stopping mode 1.

For details on the setting of this parameter, contact your Yaskawa representative.

Pn668 All Axes	Synchronized Stopping Speed Feedforward			Position	
	Setting Range	Setting Unit	Default Setting	When Enabled	Classification
	0 to 100	%	80	Immediately	Tuning

Note: During model following control, select Pn140 = n.1□□□ (Use model following control and speed/torque feedforward together). This parameter is not valid if Pn140 = n.0□□□ (Do not use model following control and speed/torque feedforward together) is selected.

4.3 Alarms Related to Synchronized Stopping

If an alarm without valid position data occurs, the servo will be turned OFF for the synchronized stopping axis and synchronized stopping will not be performed.

The alarms without valid position data are given in the following table.

Alarm Number	Alarm Name	Alarm Meaning
A.810	Encoder Backup Alarm	The power supplies to the encoder all failed and the position data was lost.
A.820	Encoder Checksum Alarm	There is an error in the checksum results for encoder memory.
A.840	Encoder Data Alarm	There is an internal data error in the encoder.
A.850	Encoder Overspeed	The encoder was operating at high speed when the power was turned ON.
A.890	Encoder Scale Error	A failure occurred in the linear encoder.
A.891	Encoder Module Error	An error occurred in the linear encoder.
A.C90	Encoder Communications Error	Communications between the encoder and SERVOPACK is not possible.
A.C91	Encoder Communications Position Data Acceleration Rate Error	An error occurred in calculating the position data of the encoder.
A.C92	Encoder Communications Timer Error	An error occurred in the communications timer between the encoder and SERVOPACK.

4.4 Warning Related to Synchronized Stopping

The warning related to Synchronized Stopping is given in the following table.

Warning Number	Warning Name	Warning Meaning
A.97C	Synchronized Stopping Occurred	Synchronized stopping occurred.

Note: The warning can be hidden by setting Pn800 = n.□□X□ (Warning Check Masks) to 8 to F.

4.5 CSTP_S in the I/O Signal Status Monitor

CSTP_S (Synchronized Stopping Status) can be checked with bit 31 of the servo command I/O signal (SVCMD_IO) command through MECHATROLINK-III communications.

4.5.1 SVCMD_IO (I/O Signal Status) Field

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
ESTP	EXT3	EXT2	EXT1	N-OT	P-OT	DEC	Reserved (0)

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8
ZPOINT	PSET	NEAR	DEN	N-SOT	P-SOT	BRK_ON	Reserved (0)

Bit 23	Bit 22	Bit 21	Bit 20	Bit 19	Bit 18	Bit 17	Bit 16
Reserved (0)				ZSPD	V_CMP	V_LIM	T_LIM

Bit 31	Bit 30	Bit 29	Bit 28	Bit 27	Bit 26	Bit 25	Bit 24
CSTP_S	IO_STS7	IO_STS6	IO_STS5	IO_STS4	IO_STS3	IO_STS2	IO_STS1

4.5.2 Details of I/O Signal Status Bits

The following table shows the details of CSTP_S.

Bit	Name	Description	Value	Setting
31	CSTP_S	Synchronized Stopping Status	0	During normal operation
			1	During synchronized stopping
	The status used to judge the state of synchronized stopping.			

Note: IO_STS8 is allocated to bit 31 in the Σ-7W SERVOPACK with MECHATROLINK-III Communications References (SGD7W-□□□A20), but CSTP_S is allocated to bit 31 in this product.

Information

In synchronized stopping mode 3, both axes are almost simultaneously set to the servo OFF state immediately after an alarm occurs. Therefore, CSTP_S which represents the synchronized stopping status will not change, but it will instead remaining as the during normal operation status.

4.6 Servomotor Stopping Method for Alarms

Important

- Set both axis A and axis B to the same stopping method for alarms.
- In this product, the default setting of the Servomotor stopping method for group 1 and group 2 alarms is stopping by applying the dynamic brake. The Servomotor stopping method can be changed by setting the parameter, but stopping by applying the dynamic brake is recommended.

- If an alarm occurs during synchronized stopping on the synchronized stopping axis, synchronized stopping is canceled and the Servomotor is stopped according to the Servomotor stopping method.
- The status after synchronized stopping conforms to the settings of Pn001 = n.□□□X (Motor Stopping Method for Servo OFF and Group 1 Alarms), Pn00A = n.□□□X, and Pn00B = n.□□X□ (Motor Stopping Method for Group 2 Alarms).

Position Deviation between Axes Overflow Detection

5

This chapter provides information on Position Deviation between Axes Overflow Detection.

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5.2 Parameter Settings Related to Position Deviation between Axes Overflow Detection . . 5-3

5.3 Alarm Related to Position Deviation between Axes Overflow Detection . . 5-4

5.4 Warning Related to Position Deviation between Axes Overflow Detection . . 5-5

5.5 Monitoring 5-6

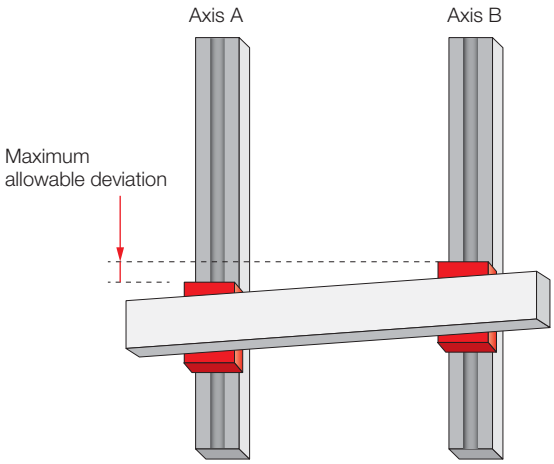
5.5.1 Monitoring with the SigmaWin+ 5-6
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5.1 Outline

When the operation of axis A and axis B is not synchronized, the frame of the machine may twist as shown in the below figure, which can damage the machine or impact the quality of products.

Position Deviation between Axes Overflow Detection detects twisting of the frame of the machine. To do this, the allowable position deviation between both axes is set in advance, and an alarm or warning is generated when the allowable position deviation is exceeded.

The position deviation between axes is the difference between the feedback position (APOS) of axis A and the feedback position (APOS) of axis B.



Issues an alarm if the threshold is exceeded to prevent problems before they happen!

5.2 Parameter Settings Related to Position Deviation between Axes Overflow Detection

These parameters set the position deviation between axes allowed for the machine or product.

Pn669 All Axes	Position Deviation between Axes Overflow Warning Level			Position	
	Setting Range	Setting Unit	Default Setting	When Enabled	Classification
	10 to 100	%	100	Immediately	Setup
Pn66A All Axes	Position Deviation between Axes Overflow Alarm Level			Position	
	Setting Range	Setting Unit	Default Setting	When Enabled	Classification
	0 to 1,073,741,823*	Reference unit	5,242,880	Immediately	Setup

* If the setting value of Pn66A is 0, the position deviation between axes overflow alarm and warning are disabled.

Note: Adjust the settings of Pn669 and Pn66A after setting the origin of the machine. If the values of Pn669 and Pn66A are decreased before the origin of the machine is set, a warning or alarm may occur when the origin is set.

5.3 Alarm Related to Position Deviation between Axes Overflow Detection

The alarm related to Position Deviation between Axes Overflow Detection is given in the following table.

Alarm Number	Alarm Name	Alarm Meaning
A.50D All Axes	Position Deviation between Axes Overflow Alarm	The position deviation between axes A and B during the servo ON state exceeded the setting value of Pn66A (Position Deviation Between Axes Overflow Alarm Level).

5.4 Warning Related to Position Deviation between Axes Overflow Detection

The warning related to Position Deviation between Axes Overflow Detection is given in the following table.

A.90D (Position Deviation Between Axes Overflow Warning) occurs when the value obtained with Pn66A × Pn669/100 is exceeded.

Warning Number	Warning Name	Warning Meaning
A.90D All Axes	Position Deviation Between Axes Overflow Warning	The position deviation between axes A and B has exceeded the percentage set with the following equation during the servo ON state. (Pn66A × Pn669/100)

5.5 Monitoring

Monitoring the position deviation between axes can be useful for preventative maintenance.

Position deviation between axes is an all axes monitor. Axis A and axis B both show the deviation based on axis A.

5.5.1 Monitoring with the SigmaWin+

Position deviation between axes can be monitored with the Motion Monitor Window.

Button in Menu Dialog Box	Name [Unit]
Motion Monitor	Position Deviation between Axes [reference unit]

Refer to the following manual for detailed operating procedures for the SigmaWin+.

Engineering Tool SigmaWin+ Operation Manual (Manual No.: SIET S800001 34)

5.5.2 Monitoring with the Digital Operator

Un04E can be used to monitor position deviation between axes with the Digital Operator.

Un No.	Sign	Unit	Name	Description
Un04E All Axes	Yes	1 reference unit	Position Deviation between Axes	Position deviation between axis A and axis B

Refer to the following manual for monitor data other than that listed above.

Σ-7-Series Digital Operator Operating Manual (Manual No.: SIEP S800001 33)

Maintenance

6

This chapter provides information on the meaning of, causes of, and corrections for alarms and warnings.

6.1 Alarm Displays 6-2
6.1.1 List of Alarms 6-2
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6.2 Warning Displays 6-36
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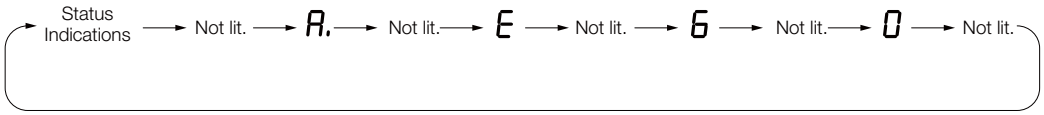
6.3 Troubleshooting Based on the Operation and Conditions of the Servomotor . . 6-46

6.1 Alarm Displays

If an error occurs in the SERVOPACK, an alarm number will be displayed on the panel display. However, if no alarm number appears on the panel display, this indicates a SERVOPACK system error. Replace the SERVOPACK.

If there is an alarm, the display will change in the following order.

Example: Alarm A.E60



6.1.1 List of Alarms

The list of alarms gives the alarm name, alarm meaning, alarm stopping method, and alarm reset possibility in order of the alarm numbers.

Alarm Reset Possibility

Yes: You can use an alarm reset to clear the alarm. However, this assumes that the cause of the alarm has been removed.
No: You cannot clear the alarm.

Alarms for Both Axes

If “All Axes” is given below the alarm number, the alarm applies to both axes. If an alarm occurs for one axis, the same alarm status will occur for the other axis.

List of Alarms

Alarm Number	Alarm Name	Alarm Meaning	Servomotor Stopping Method	Alarm Reset Possible?
A.020	Parameter Checksum Error	There is an error in the parameter data in the SERVOPACK.	Gr.1	No
A.021 All Axes	Parameter Format Error	There is an error in the parameter data format in the SERVOPACK.	Gr.1	No
A.022 All Axes	System Checksum Error	There is an error in the parameter data in the SERVOPACK.	Gr.1	No
A.024	System Alarm	An internal program error occurred in the SERVOPACK.	Gr.1	No
A.025	System Alarm	An internal program error occurred in the SERVOPACK.	Gr.1	No
A.030 All Axes	Main Circuit Detector Error	There is an error in the detection data for the main circuit.	Gr.1	Yes
A.040	Parameter Setting Error	A parameter setting is outside of the setting range.	Gr.1	No
A.042	Parameter Combination Error	The combination of some parameters exceeds the setting range.	Gr.1	No
A.04A	Parameter Setting Error 2	There is an error in the bank members or bank data settings.	Gr.1	No

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Alarm Number	Alarm Name	Alarm Meaning	Servomotor Stopping Method	Alarm Reset Possible?
A.050	Combination Error	The capacities of the SERVOPACK and Servomotor do not match.	Gr.1	Yes
A.051	Unsupported Device Alarm	An unsupported device was connected.	Gr.1	No
A.070	Motor Type Change Detected	The connected motor is a different type of motor from the previously connected motor.	Gr.1	No
A.080	Linear Encoder Pitch Setting Error	The setting of Pn282 (Linear Encoder Scale Pitch) has not been changed from the default setting.	Gr.1	No
A.0b0	Invalid Servo ON Command Alarm	The SV_ON (Servo ON) command was sent from the host controller after a utility function that turns ON the Servomotor was executed.	Gr.1	Yes
A.100	Overcurrent Detected	An overcurrent flowed through the power transistor or the heat sink overheated.	Gr.1	No
A.101	Motor Overcurrent Detected	The current to the motor exceeded the allowable current.	Gr.1	No
A.300 All Axes	Regeneration Error	There is an error related to regeneration.	Gr.1	Yes
A.320 All Axes	Regenerative Overload	A regenerative overload occurred.	Gr.2	Yes
A.330 All Axes	Main Circuit Power Supply Wiring Error	• The AC power supply input setting or DC power supply input setting is not correct. • The power supply wiring is not correct.	Gr.1	Yes
A.400 All Axes	Overvoltage	The main circuit DC voltage is too high.	Gr.1	Yes
A.410 All Axes	Undervoltage	The main circuit DC voltage is too low.	Gr.2	Yes
A.50D All Axes	Position Deviation between Axes Overflow Alarm	The position deviation between axes A and B during the servo ON state exceeded the setting value of Pn66A (Position Deviation Between Axes Overflow Alarm Level).	Gr.1	Yes
A.510	Overspeed	The motor exceeded the maximum speed.	Gr.1	Yes
A.51A All Axes	Synchronized Stopping Overspeed Alarm	The feedback speed of the axis undergoing synchronized stopping has more than doubled from the starting speed of synchronized stopping.	Gr.1	Yes
A.520	Vibration Alarm	Abnormal oscillation was detected in the motor speed.	Gr.1	Yes
A.521	Autotuning Alarm	Vibration was detected during autotuning for the tuning-less function.	Gr.1	Yes
A.550	Maximum Speed Setting Error	The setting of Pn385 (Maximum Motor Speed) is greater than the maximum motor speed.	Gr.1	Yes
A.710	Instantaneous Overload	The Servomotor was operating for several seconds to several tens of seconds under a torque that largely exceeded the rating.	Gr.2	Yes
A.720	Continuous Overload	The Servomotor was operating continuously under a torque that exceeded the rating.	Gr.1	Yes
A.730 A.731	Dynamic Brake Overload	When the dynamic brake was applied, the rotational or linear kinetic energy exceeded the capacity of the dynamic brake resistor.	Gr.1	Yes
A.740 All Axes	Inrush Current Limiting Resistor Overload	The main circuit power supply was frequently turned ON and OFF.	Gr.1	Yes
A.7A1 All Axes	Internal Temperature Error 1 (Control Board Temperature Error)	The surrounding temperature of the control PCB is abnormal.	Gr.2	Yes

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Alarm Number	Alarm Name	Alarm Meaning	Servomotor Stopping Method	Alarm Reset Possible?
A.7A2 All Axes	Internal Temperature Error 2 (Power Board Temperature Error)	The surrounding temperature of the power PCB is abnormal.	Gr.2	Yes
A.7A3	Internal Temperature Sensor Error	An error occurred in the temperature sensor circuit.	Gr.2	No
A.7Ab All Axes	SERVOPACK Built-in Fan Stopped	The fan inside the SERVOPACK stopped.	Gr.1	Yes
A.810	Encoder Backup Alarm	The power supplies to the encoder all failed and the position data was lost.	Gr.1	No
A.820	Encoder Checksum Alarm	There is an error in the checksum results for encoder memory.	Gr.1	No
A.830	Encoder Battery Alarm	The battery voltage was lower than the specified level after the control power supply was turned ON.	Gr.1	Yes
A.840	Encoder Data Alarm	There is an internal data error in the encoder.	Gr.1	No
A.850	Encoder Overspeed	The encoder was operating at high speed when the power was turned ON.	Gr.1	No
A.860	Encoder Overheated	The internal temperature of encoder is too high.	Gr.1	No
A.861	Motor Overheated	The internal temperature of motor is too high.	Gr.1	No
A.862	Overheat Alarm	The input voltage (temperature) for the overheat protection input (TH) signal exceeded the setting of Pn61B (Overheat Alarm Level).	Gr.1	Yes
A.890	Encoder Scale Error	A failure occurred in the linear encoder.	Gr.1	No
A.891	Encoder Module Error	An error occurred in the linear encoder.	Gr.1	No
A.b33	Current Detection Error 3	An error occurred in the current detection circuit.	Gr.1	No
A.b6A	MECHATROLINK Communications ASIC Error 1	ASIC error 1 occurred in MECHATROLINK communications.	Gr.1	No
A.b6b	MECHATROLINK Communications ASIC Error 2	ASIC error 2 occurred in MECHATROLINK communications.	Gr.2	No
A.bF0 All Axes	System Alarm 0	Internal program error 0 occurred in the SERVOPACK.	Gr.1	No
A.bF1 All Axes	System Alarm 1	Internal program error 1 occurred in the SERVOPACK.	Gr.1	No
A.bF2 All Axes	System Alarm 2	Internal program error 2 occurred in the SERVOPACK.	Gr.1	No
A.bF3 All Axes	System Alarm 3	Internal program error 3 occurred in the SERVOPACK.	Gr.1	No
A.bF4 All Axes	System Alarm 4	Internal program error 4 occurred in the SERVOPACK.	Gr.1	No
A.bF5 All Axes	System Alarm 5	Internal program error 5 occurred in the SERVOPACK.	Gr.1	No
A.bF6 All Axes	System Alarm 6	Internal program error 6 occurred in the SERVOPACK.	Gr.1	No
A.bF7 All Axes	System Alarm 7	Internal program error 7 occurred in the SERVOPACK.	Gr.1	No
A.bF8 All Axes	System Alarm 8	Internal program error 8 occurred in the SERVOPACK.	Gr.1	No
A.C10	Servomotor Out of Control	The Servomotor ran out of control.	Gr.1	Yes
A.C20	Phase Detection Error	The detection of the phase is not correct.	Gr.1	No
A.C21	Polarity Sensor Error	An error occurred in the polarity sensor.	Gr.1	No

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Alarm Number	Alarm Name	Alarm Meaning	Servomotor Stopping Method	Alarm Reset Possible?
A.C22	Phase Information Disagreement	The phase information does not match.	Gr.1	No
A.C50	Polarity Detection Failure	The polarity detection failed.	Gr.1	No
A.C51	Overtravel Detected during Polarity Detection	The overtravel signal was detected during polarity detection.	Gr.1	Yes
A.C52	Polarity Detection Not Completed	The servo was turned ON before the polarity was detected.	Gr.1	Yes
A.C53	Out of Range of Motion for Polarity Detection	The travel distance exceeded the setting of Pn48E (Polarity Detection Range).	Gr.1	No
A.C54	Polarity Detection Failure 2	The polarity detection failed.	Gr.1	No
A.C80	Encoder Clear Error or Multiturn Limit Setting Error	The multiturn data for the absolute encoder was not correctly cleared or set.	Gr.1	No
A.C90	Encoder Communications Error	Communications between the encoder and SERVOPACK is not possible.	Gr.1	No
A.C91	Encoder Communications Position Data Acceleration Rate Error	An error occurred in calculating the position data of the encoder.	Gr.1	No
A.C92	Encoder Communications Timer Error	An error occurred in the communications timer between the encoder and SERVOPACK.	Gr.1	No
A.CA0	Encoder Parameter Error	The parameters in the encoder are corrupted.	Gr.1	No
A.Cb0	Encoder Echoback Error	The contents of communications with the encoder are incorrect.	Gr.1	No
A.CC0	Multiturn Limit Disagreement	Different multiturn limits have been set in the encoder and the SERVOPACK.	Gr.1	No
A.d00	Position Deviation Overflow	The setting of Pn520 (Position Deviation Overflow Alarm Level) was exceeded by the position deviation.	Gr.1	Yes
A.d01	Position Deviation Overflow Alarm at Servo ON	The servo was turned ON after the position deviation exceeded the setting of Pn526 (Position Deviation Overflow Alarm Level at Servo ON) while the servo was OFF.	Gr.1	Yes
A.d02	Position Deviation Overflow Alarm for Speed Limit at Servo ON	If position deviation remains in the deviation counter, the setting of Pn529 or Pn584 (Speed Limit Level at Servo ON) limits the speed when the servo is turned ON. This alarm occurs if a position reference is input and the setting of Pn520 (Position Deviation Overflow Alarm Level) is exceeded before the limit is cleared.	Gr.2	Yes
A.d30	Position Data Overflow	The position feedback data exceeded ±1,879,048,192.	Gr.1	No
A.E02 All Axes	MECHATROLINK Internal Synchronization Error 1	A synchronization error occurred during MECHATROLINK communications with the SERVOPACK.	Gr.1	Yes
A.E40 All Axes	MECHATROLINK Transmission Cycle Setting Error	The setting of the MECHATROLINK communications transmission cycle is not correct.	Gr.2	Yes
A.E41 All Axes	MECHATROLINK Communications Data Size Setting Error	The setting of the MECHATROLINK communications data size is not correct.	Gr.2	Yes
A.E42 All Axes	MECHATROLINK Station Address Setting Error	The setting of the MECHATROLINK station address is not correct.	Gr.2	No

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Alarm Number	Alarm Name	Alarm Meaning	Servomotor Stopping Method	Alarm Reset Possible?
A.E50*	MECHATROLINK Synchronization Error	A synchronization error occurred during MECHATROLINK communications.	Gr.2	Yes
A.E51 All Axes	MECHATROLINK Synchronization Failed	Synchronization failed during MECHATROLINK communications.	Gr.2	Yes
A.E60*	Reception Error in MECHATROLINK Communications	Communications errors occurred continuously during MECHATROLINK communications.	Gr.2	Yes
A.E61 All Axes	Synchronization Interval Error in MECHATROLINK Transmission Cycle	An error occurred in the transmission cycle during MECHATROLINK communications.	Gr.2	Yes
A.E63 All Axes	MECHATROLINK Synchronization Frame Not Received	Synchronization frames were continuously not received during MECHATROLINK communications.	Gr.2	Yes
A.E94 All Axes	Position Correction Table Setting Error	There are errors in setting values in the Position Correction Table.	Gr.1	Yes
A.Ed1	Command Execution Timeout	A timeout error occurred for a MECHATROLINK command.	Gr.2	Yes
A.F10 All Axes	Power Supply Line Open Phase	The voltage was low for more than one second for phase R, S, or T when the main power supply was ON.	Gr.2	Yes
FL-1* All Axes	System Alarm	An internal program error occurred in the SERVOPACK.	–	No
FL-2* All Axes				
FL-3* All Axes				
FL-4* All Axes				
FL-5* All Axes				
FL-6* All Axes				
CPF00 All Axes	Digital Operator Communications Error 1	Communications were not possible between the Digital Operator (model: JUSP-OP05A-1-E) and the SERVOPACK (e.g., a CPU error occurred).	–	No
CPF01 All Axes	Digital Operator Communications Error 2			

* These alarms are not stored in the alarm history. They are only displayed on the panel display.

6.1.2 Troubleshooting Alarms

The causes of and corrections for the alarms are given in the following table. Contact your Yaskawa representative if you cannot solve a problem with the correction given in the table.

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.020: Parameter Checksum Error (There is an error in the parameter data in the SERVOPACK.)	The power supply voltage suddenly dropped.	Measure the power supply voltage.	Set the power supply voltage within the specified range, and initialize the parameter settings.	*1
	The power supply was shut OFF while writing parameter settings.	Check the timing of shutting OFF the power supply.	Initialize the parameter settings and then set the parameters again.	
	The number of times that parameters were written exceeded the limit.	Check to see if the parameters were frequently changed from the host controller.	The SERVOPACK may be faulty. Replace the SERVOPACK. Reconsider the method for writing the parameters.	–
	A malfunction was caused by noise from the AC power supply, ground, static electricity, or other source.	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, noise may be the cause.	Implement countermeasures against noise.	*1
	Gas, water drops, or cutting oil entered the SERVOPACK and caused failure of the internal components.	Check the installation conditions.	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
	A failure occurred in the SERVOPACK.	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may have failed.	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.021: Parameter Format Error (There is an error in the parameter data format in the SERVOPACK.)	The software version of the SERVOPACK that caused the alarm is older than the software version of the parameters specified to write.	Read the product information to see if the software versions are the same. If they are different, it could be the cause of the alarm.	Write the parameters from another SERVOPACK with the same model and the same software version, and then turn the power OFF and ON again.	*1
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.022: System Checksum Error (There is an error in the parameter data in the SERVOPACK.)	The power supply voltage suddenly dropped.	Measure the power supply voltage.	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
	The power supply was shut OFF while setting a utility function.	Check the timing of shutting OFF the power supply.	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
	A failure occurred in the SERVOPACK.	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may have failed.	The SERVOPACK may be faulty. Replace the SERVOPACK.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.024: System Alarm (An internal program error occurred in the SERVOPACK.)	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.025: System Alarm (An internal program error occurred in the SERVOPACK.)	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.030: Main Circuit Detector Error	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
	The jumper between the DC Reactor terminals (⊖1 and ⊖2) was removed or there is faulty contact.	–	Correct the wiring between the DC Reactor terminals.	–
	The cable between the DC Reactor and SERVOPACK is not wired correctly or there is a faulty contact.			
A.040: Parameter Setting Error (A parameter setting is outside of the setting range.)	The SERVOPACK and Servomotor capacities do not match each other.	Check the combination of the SERVOPACK and Servomotor capacities.	Select a proper combination of SERVOPACK and Servomotor capacities.	*1
	The motor parameter file was not written to the linear encoder. (This applies only when not using a Serial Converter Unit.)	Check to see if the motor parameter file was written to the linear encoder.	Write the motor parameter file to the linear encoder.	*1
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
	A parameter setting is outside of the setting range.	Check the setting ranges of the parameters that have been changed.	Set the parameters to values within the setting ranges.	–
	The electronic gear ratio is outside of the setting range.	Check the electronic gear ratio. The ratio must be within the following range: 0.001 < (Pn20E/Pn210) < 64,000.	Set the electronic gear ratio in the following range: 0.001 < (Pn20E/Pn210) < 64,000.	*1
	A pin number that does not exist on the SERVOPACK was allocated in Pn590 to Pn5BC. (An alarm will not occur, however, if the signal is disabled.)	For input signals (Pn590 to Pn599), make sure that the allocated pin numbers are between 003 and 014. For output signals (Pn5B0 to Pn5BC), make sure that the allocated pin numbers are between 023 and 031.	Allocate pins that actually exist in Pn590 to Pn5BC.	*1

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.042: Parameter Combination Error	The speed of program jogging went below the setting range when the electronic gear ratio (Pn20E/ Pn210) or the Servomotor was changed.	Check to see if the detection conditions*1 are satisfied.	Decrease the setting of the electronic gear ratio (Pn20E/Pn210).	*1
	The speed of program jogging went below the setting range when Pn533 or Pn585 (Program Jogging Movement Speed) was changed.	Check to see if the detection conditions*1 are satisfied.	Increase the setting of Pn533 or Pn585.	*1
	The movement speed of advanced autotuning went below the setting range when the electronic gear ratio (Pn20E/ Pn210) or the Servomotor was changed.	Check to see if the detection conditions*2 are satisfied.	Decrease the setting of the electronic gear ratio (Pn20E/Pn210).	*1
A.04A: Parameter Setting Error 2	For 4-byte parameter bank members, there are two consecutive members with nothing registered.	–	Change the number of bytes for bank members to an appropriate value.	–
	The total amount of bank data exceeds 64 (Pn900 × Pn901 > 64).	–	Reduce the total amount of bank data to 64 or less.	–
A.050: Combination Error (The capacities of the SERVOPACK and Servomotor do not match.)	The SERVOPACK and Servomotor capacities do not match each other.	Confirm that the following condition is met: 1/4 < (Servomotor capacity/SERVOPACK capacity) < 4 However, the above formula does not apply to the following products. • SGD7W-2R8A SERVOPACK and SGM7J-A5A Servomotor • SGD7W-2R8A SERVOPACK and SGM7A-A5A Servomotor	Select a proper combination of the SERVOPACK and Servomotor capacities.	*1
	A failure occurred in the encoder.	Replace the encoder and check to see if the alarm still occurs.	Replace the Servomotor or encoder.	–
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.051: Unsupported Device Alarm	The motor parameter file was not written to the linear encoder. (This applies only when not using a Serial Converter Unit.)	Check to see if the motor parameter file was written to the linear encoder.	Write the motor parameter file to the linear encoder.	*1
	An unsupported Serial Converter Unit or encoder is connected to the SERVOPACK.	Check the product combination specifications.	Change to a correct combination of models.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.070: Motor Type Change Detected (The connected motor is a different type of motor from the previously connected motor.)	A Rotary Servomotor was removed and a Linear Servomotor was connected.	–	Set the parameters for a Linear Servomotor and reset the motor type alarm. Then, turn the power supply to the SERVOPACK OFF and ON again.	*1
	A Linear Servomotor was removed and a Rotary Servomotor was connected.	–	Set the parameters for a Rotary Servomotor and reset the motor type alarm. Then, turn the power supply to the SERVOPACK OFF and ON again.	*1
A.080: Linear Encoder Pitch Setting Error	The setting of Pn282 (Linear Encoder Scale Pitch) has not been changed from the default setting.	Check the setting of Pn282.	Correct the setting of Pn282.	*1
A.0b0: Invalid Servo ON Command Alarm	The SV_ON (Servo ON) command was sent from the host controller after a utility function that turns ON the Servomotor was executed.	–	Turn the power supply to the SERVOPACK OFF and ON again. Or, execute a software reset.	*1
A.100: Overcurrent Detected (An overcurrent flowed through the power transistor or the heat sink overheated.)	The Main Circuit Cable is not wired correctly or there is faulty contact.	Check the wiring.	Correct the wiring.	*1
	There is a short-circuit or ground fault in a Main Circuit Cable.	Check for short-circuits across Servomotor phases U, V, and W, or between the ground and Servomotor phases U, V, and W.	The cable may be short-circuited. Replace the cable.	
	There is a short-circuit or ground fault inside the Servomotor.	Check for short-circuits across Servomotor phases U, V, and W, or between the ground and Servomotor phases U, V, or W.	The Servomotor may be faulty. Replace the Servomotor.	
	There is a short-circuit or ground fault inside the SERVOPACK.	Check for short-circuits across the Servomotor connection terminals U, V, and W on the SERVOPACK, or between the ground and terminals U, V, or W.	The SERVOPACK may be faulty. Replace the SERVOPACK.	
	The regenerative resistor is not wired correctly or there is faulty contact.	Check the wiring.	Correct the wiring.	*1
	The dynamic brake (DB, emergency stop executed from the SERVOPACK) was frequently activated, or a DB overload alarm occurred.	Check the power consumed by the DB resistor to see how frequently the DB is being used. Or, check the alarm display to see if a DB overload alarm (A.730 or A.731) has occurred.	Change the SERVOPACK model, operating methods, or the mechanisms so that the dynamic brake does not need to be used so frequently.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.100: Overcurrent Detected (An overcurrent flowed through the power transistor or the heat sink overheated.)	The regenerative processing capacity was exceeded.	Check the regenerative load ratio in the SigmaWin+ Motion Monitor Tab Page to see how frequently the regenerative resistor is being used.	Recheck the operating conditions and load.	*4
	The SERVOPACK regenerative resistance is too small.	Check the regenerative load ratio in the SigmaWin+ Motion Monitor Tab Page to see how frequently the regenerative resistor is being used.	Change the regenerative resistance to a value larger than the SERVOPACK minimum allowable resistance.	
	A heavy load was applied while the Servomotor was stopped or running at a low speed.	Check to see if the operating conditions exceed Servo Drive specifications.	Reduce the load applied to the Servomotor. Or, increase the operating speed.	–
	A malfunction was caused by noise.	Improve the noise environment, e.g. by improving the wiring or installation conditions, and check to see if the alarm still occurs.	Implement countermeasures against noise, such as correct wiring of the FG. Use an FG wire size equivalent to the SERVOPACK's main circuit wire size.	–
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.101: Motor Overcurrent Detected (The current to the motor exceeded the allowable current.)	The Main Circuit Cable is not wired correctly or there is faulty contact.	Check the wiring.	Correct the wiring.	*1
	There is a short-circuit or ground fault in a Main Circuit Cable.	Check for short-circuits across cable phases U, V, and W, or between the ground and cable phases U, V, and W.	The cable may be short-circuited. Replace the cable.	
	There is a short-circuit or ground fault inside the Servomotor.	Check for short-circuits across Servomotor phases U, V, and W, or between the ground and Servomotor phases U, V, or W.	The Servomotor may be faulty. Replace the Servomotor.	
	There is a short-circuit or ground fault inside the SERVOPACK.	Check for short-circuits across the Servomotor connection terminals U, V, and W on the SERVOPACK, or between the ground and terminals U, V, or W.	The SERVOPACK may be faulty. Replace the SERVOPACK.	
	A heavy load was applied while the Servomotor was stopped or running at a low speed.	Check to see if the operating conditions exceed Servo Drive specifications.	Reduce the load applied to the Servomotor. Or, increase the operating speed.	–
	A malfunction was caused by noise.	Improve the noise environment, e.g. by improving the wiring or installation conditions, and check to see if the alarm still occurs.	Implement countermeasures against noise, such as correct wiring of the FG. Use an FG wire size equivalent to the SERVOPACK's main circuit wire size.	–
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.300: Regeneration Error	When using the built-in regenerative resistor, the jumper between the regenerative resistor terminals (B2 and B3) was removed.	Check to see if the jumper is connected between power supply terminals B2 and B3.*4	Correctly connect a jumper.	*1
	The External Regenerative Resistor is not wired correctly, or was removed or disconnected.	Check the wiring of the External Regenerative Resistor.*4	Correct the wiring of the External Regenerative Resistor.	
	A failure occurred in the SERVOPACK.	–	While the main circuit power supply is OFF, turn the control power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.320: Regenerative Overload	The power supply voltage exceeded the specified range.	Measure the power supply voltage.	Set the power supply voltage within the specified range.	–
	The external regenerative resistance value or regenerative resistor capacity is too small, or there has been a continuous regeneration state.	Check the operating conditions or the capacity using the SigmaJunmaSize+ Capacity Selection Software or other means.	Change the regenerative resistance value or capacity. Reconsider the operating conditions using the SigmaJunmaSize+ Capacity Selection Software or other means.	*4
	There was a continuous regeneration state because a negative load was continuously applied.	Check the load applied to the Servomotor during operation.	Reconsider the system including the servo, machine, and operating conditions.	–
	The setting of Pn600 (Regenerative Resistor Capacity) is smaller than the capacity of the External Regenerative Resistor.	Check to see if a Regenerative Resistor is connected and check the setting of Pn600.	Correct the setting of Pn600.	*1
	The setting of Pn603 (Regenerative Resistance) is smaller than the capacity of the External Regenerative Resistor.	Check to see if a Regenerative Resistor is connected and check the setting of Pn603.	Correct the setting of Pn603.	*1
	The external regenerative resistance is too high.	Check the regenerative resistance.	Change the regenerative resistance to a correct value or use an External Regenerative Resistor of an appropriate capacity.	*4
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.330: Main Circuit Power Supply Wiring Error (Detected when the main circuit power supply is turned ON.)	The regenerative resistor was disconnected when the SERVOPACK power supply voltage was high.	Measure the resistance of the regenerative resistor using a measuring instrument.	If you are using the regenerative resistor built into the SERVOPACK, replace the SERVOPACK. If you are using an External Regenerative Resistor, replace the External Regenerative Resistor.	–
	DC power was supplied when an AC power supply input was specified in the settings.	Check the power supply to see if it is a DC power supply.	Correct the power supply setting to match the actual power supply.	*1
	AC power was supplied when a DC power supply input was specified in the settings.	Check the power supply to see if it is an AC power supply.	Correct the power supply setting to match the actual power supply.	
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.400: Overvoltage (Detected in the main circuit power supply section of the SERVOPACK.)	The power supply voltage exceeded the specified range.	Measure the power supply voltage.	Set the AC/DC power supply voltage within the specified range.	–
	The power supply is not stable or was influenced by a lightning surge.	Measure the power supply voltage.	Improve the power supply conditions, install a surge absorber, and then turn the power supply OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
	The voltage for AC power supply was too high during acceleration or deceleration.	Check the power supply voltage and the speed and torque during operation.	Set the AC power supply voltage within the specified range.	–
	The external regenerative resistance is too high for the operating conditions.	Check the operating conditions and the regenerative resistance.	Select a regenerative resistance value that is appropriate for the operating conditions and load.	*4
	The moment of inertia ratio or mass ratio exceeded the allowable value.	Check to see if the moment of inertia ratio or mass ratio is within the allowable range.	Increase the deceleration time, or reduce the load.	–
	A failure occurred in the SERVOPACK.	–	While the main circuit power supply is OFF, turn the control power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.410: Undervoltage (Detected in the main circuit power supply section of the SERVOPACK.)	The power supply voltage went below the specified range.	Measure the power supply voltage.	Set the power supply voltage within the specified range.	–
	The power supply voltage dropped during operation.	Measure the power supply voltage.	Increase the power supply capacity.	–
	A momentary power interruption occurred.	Measure the power supply voltage.	If you have changed the setting of Pn509 (Momentary Power Interruption Hold Time), decrease the setting.	*1
	The SERVOPACK fuse is blown out.	Check the power supply wiring.	Correct the power supply wiring and replace the SERVOPACK.	–
	The SERVOPACK fuse is blown out.	–	Replace the SERVOPACK and connect a reactor to the DC reactor terminals (⊖1 and ⊖2) on the SERVOPACK.	–
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
	The jumper between the DC Reactor terminals (⊖1 and ⊖2) was removed or there is faulty contact.	–	Correct the wiring between the DC Reactor terminals.	–
	The cable between the DC Reactor and SERVOPACK is not wired correctly or there is a faulty contact.			
A.50D: Position Deviation Between Axes Overflow Alarm	Twisting of mechanical parts has occurred between axes A and B.	Check the position deviation between the axes.	Resolve the twisting of mechanical parts between the axes.	–
			Set the Position Correction Table to appropriate values.	page 3-7
	Axis A and axis B are not synchronized with the reference.	Check the reference position for axis A and axis B.	The host controller should command the system to synchronize operation of axis A and axis B.	–
	Pn66A (Position Deviation Between Axes Overflow Alarm Level) is low for the operating conditions.	Check if Pn66A (Position Deviation Between Axes Overflow Alarm Level) is appropriate.	Set Pn66A to an appropriate value.	page 5-3

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.510: Overspeed (The motor exceeded the maximum speed.)	The order of phases U, V, and W in the motor wiring is not correct.	Check the wiring of the Servomotor.	Make sure that the Servomotor is correctly wired.	–
	A reference value that exceeded the overspeed detection level was input.	Check the input reference.	Reduce the reference value. Or, adjust the gain.	–
	The motor exceeded the maximum speed.	Check the waveform of the motor speed.	Reduce the speed reference input gain and adjust the servo gain. Or, reconsider the operating conditions.	
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.51A: Synchronized Stopping Overspeed Alarm	The axis undergoing synchronized stopping was accelerating.	Check the feedback speed of the axis undergoing synchronized stopping.	Remove the cause of acceleration for the axis undergoing synchronized stopping.	–
A.520: Vibration Alarm	Abnormal oscillation was detected in the motor speed.	Check for abnormal motor noise, and check the speed and torque waveforms during operation.	Reduce the motor speed. Or, reduce the setting of Pn100 (Speed Loop Gain).	*1
	The setting of Pn103 (Moment of Inertia Ratio) is greater than the actual moment of inertia or was greatly changed.	Check the moment of inertia ratio or mass ratio.	Set Pn103 (Moment of Inertia Ratio) to an appropriate value.	*1
	The vibration detection level (Pn312 or Pn384) is not suitable.	Check that the vibration detection level (Pn312 or Pn384) is suitable.	Set a suitable vibration detection level (Pn312 or Pn384).	*1
A.521: Autotuning Alarm (Vibration was detected while executing the custom tuning, Easy FFT, or the tuning-less function.)	The Servomotor vibrated considerably while performing the tuning-less function.	Check the waveform of the motor speed.	Reduce the load so that the moment of inertia ratio is within the allowable value. Or increase the load level or reduce the rigidity level in the tuning-less level settings.	*1
	The Servomotor vibrated considerably while performing custom tuning or Easy FFT.	Check the waveform of the motor speed.	Check the operating procedure of corresponding function and implement corrections.	*1
A.550: Maximum Speed Setting Error	The setting of Pn385 (Maximum Motor Speed) is greater than the maximum speed.	Check the setting of Pn385, and the upper limits of the maximum motor speed setting and the encoder output resolution setting.	Set Pn385 to a value that does not exceed the maximum motor speed.	*1

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.710: Instantaneous Overload A.720: Continuous Overload	The wiring is not correct or there is a faulty contact in the motor or encoder wiring.	Check the wiring.	Make sure that the Servomotor and encoder are correctly wired.	*1
	Operation was performed that exceeded the overload protection characteristics.	Check the motor overload characteristics and Run command.	Reconsider the load and operating conditions. Or, increase the motor capacity.	–
	An excessive load was applied during operation because the Servomotor was not driven due to mechanical problems.	Check the operation reference and motor speed.	Correct the mechanical problem.	–
	Operation was performed with a load applied to the shaft of the servomotor that exceeded the allowable value.	Check the condition of the machine to determine if a load was applied to the shaft of the servomotor that exceeded the allowable value.	Correct the condition of the machine so that the load on the shaft during servomotor operation does not exceed the allowable value.	–
	There is an error in the setting of Pn282 (Linear Encoder Scale Pitch).	Check the setting of Pn282.	Correct the setting of Pn282.	*1
	There is an error in the setting of Pn080 = n.□□X□ (Motor Phase Sequence Selection).	Check the setting of Pn080 = n.□□X□.	Set Pn080 = n.□□X□ to an appropriate value.	*1
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.730 and A.731: Dynamic Brake Overload (An excessive power consumption by the dynamic brake was detected.)	The Servomotor was rotated by an external force.	Check the operation status.	Implement measures to ensure that the motor will not be rotated by an external force.	–
	When the Servomotor was stopped with the dynamic brake, the rotational or linear kinetic energy exceeded the capacity of the dynamic brake resistor.	Check the power consumed by the DB resistor to see how frequently the DB is being used.	Reconsider the following: • Reduce the Servomotor command speed. • Decrease the moment of inertia ratio or mass ratio. • Reduce the frequency of stopping with the dynamic brake.	–
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.740: Inrush Current Limiting Resistor Overload (The main circuit power supply was frequently turned ON and OFF.)	The allowable frequency of the inrush current limiting resistor was exceeded when the main circuit power supply was turned ON and OFF.	–	Reduce the frequency of turning the main circuit power supply ON and OFF.	–
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.7A1: Internal Temperature Error 1 (Control Board Temperature Error)	The surrounding air temperature is too high.	Check the surrounding air temperature using a thermometer. Or, check the operating status with the SERVOPACK installation environment monitor.	Decrease the surrounding temperature by improving the SERVOPACK installation conditions.	*1
	An overload alarm was reset by turning OFF the power supply too many times.	Check the alarm display to see if there is an overload alarm.	Change the method for resetting the alarm.	–
	There was an excessive load or operation was performed that exceeded the regenerative processing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenerative load ratio to check the regenerative processing capacity.	Reconsider the load and operating conditions.	–
	The SERVOPACK installation orientation is not correct or there is insufficient space around the SERVOPACK.	Check the SERVOPACK installation conditions.	Install the SERVOPACK according to specifications.	*1
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.7A2: Internal Temperature Error 2 (Power Board Temperature Error)	The surrounding air temperature is too high.	Check the surrounding air temperature using a thermometer. Or, check the operating status with the SERVOPACK installation environment monitor.	Decrease the surrounding temperature by improving the SERVOPACK installation conditions.	*1
	An overload alarm was reset by turning OFF the power supply too many times.	Check the alarm display to see if there is an overload alarm.	Change the method for resetting the alarm.	–
	There was an excessive load or operation was performed that exceeded the regenerative processing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenerative load ratio to check the regenerative processing capacity.	Reconsider the load and operating conditions.	–
	The SERVOPACK installation orientation is not correct or there is insufficient space around the SERVOPACK.	Check the SERVOPACK installation conditions.	Install the SERVOPACK according to specifications.	*1
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.7A3: Internal Temperature Sensor Error (An error occurred in the temperature sensor circuit.)	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.7Ab: SERVOPACK Built-in Fan Stopped	The fan inside the SERVOPACK stopped.	Check for foreign matter inside the SERVOPACK.	Remove foreign matter from the SERVOPACK. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.810: Encoder Backup Alarm (Detected at the encoder, but only when an absolute encoder is used.)	The power to the absolute encoder was turned ON for the first time.	Check to see if the power supply was turned ON for the first time.	Set up the encoder.	*1
	The Encoder Cable was disconnected and then connected again.	Check to see if the power supply was turned ON for the first time.	Check the encoder connection and set up the encoder.	
	Power is not being supplied both from the control power supply (+5 V) from the SERVOPACK and from the battery power supply.	Check the encoder connector battery and the connector status.	Replace the battery or implement similar measures to supply power to the encoder, and set up the encoder.	
	A failure occurred in the absolute encoder.	–	If the alarm still occurs after setting up the encoder again, replace the Servomotor.	–
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.820: Encoder Checksum Alarm (Detected at the encoder.)	A failure occurred in the encoder.	–	■ When Using an Absolute Encoder Set up the encoder again. If the alarm still occurs, the Servomotor may be faulty. Replace the Servomotor. ■ When Using a Single-turn Absolute Encoder or Incremental Encoder • The Servomotor may be faulty. Replace the Servomotor. • The linear encoder may be faulty. Replace the linear encoder.	*1
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.830: Encoder Battery Alarm (The absolute encoder battery voltage was lower than the specified level.)	The battery connection is faulty or a battery is not connected.	Check the battery connection.	Correct the battery connection.	*1
	The battery voltage is lower than the specified value (2.7 V).	Measure the battery voltage.	Replace the battery.	*1
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.840: Encoder Data Alarm (Detected at the encoder.)	The encoder malfunctioned.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servomotor or linear encoder.	–
	An error occurred in reading data from the linear encoder.	–	The linear encoder is not mounted within an appropriate tolerance. Correct the mounting of the linear encoder.	–
	Excessive speed occurred in the linear encoder.	–	Control the motor speed within the range specified by the linear encoder manufacturer and then turn ON the control power supply.	–
	The encoder malfunctioned due to noise.	–	Correct the wiring around the encoder by separating the Encoder Cable from the Servomotor Main Circuit Cable or by grounding the encoder.	–
	The polarity sensor is not wired correctly.	Check the wiring of the polarity sensor.	Correct the wiring of the polarity sensor.	–
	The polarity sensor failed.	–	Replace the polarity sensor.	–
A.850: Encoder Overspeed (Detected at the encoder when the control power supply is turned ON.)	Rotary Servomotor: The Servomotor speed was 200 min^{-1} or higher when the control power supply was turned ON.	Check the motor speed when the power supply is turned ON.	Reduce the Servomotor speed to a value less than 200 min^{-1}, and turn ON the control power supply.	–
	Linear Servomotor: The Servomotor exceeded the specified speed when the control power supply was turned ON.	Check the motor speed when the power supply is turned ON.	Control the motor speed within the range specified by the linear encoder manufacturer and then turn ON the control power supply.	–
	A failure occurred in the encoder.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servomotor or linear encoder.	–
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.860: Encoder Overheated (Detected when a Rotary Servomotor or Absolute Linear Encoder is connected. (Detected at the encoder.)	The surrounding air temperature around the Servomotor is too high.	Measure the surrounding air temperature around the Servomotor.	Reduce the surrounding air temperature of the Servomotor to 40°C or less.	–
	The Servomotor load is greater than the rated load.	Use the accumulated load ratio to check the load.	Operate the Servo Drive so that the motor load remains within the specified range.	*1
	A failure occurred in the encoder.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the Servomotor or absolute linear encoder may be faulty. Replace the Servomotor or absolute linear encoder.	–
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.861: Motor Overheated	The surrounding temperature around the Servomotor is too high.	Measure the surrounding temperature around the Servomotor.	Reduce the surrounding air temperature of the Servomotor to 40°C or less.	–
	The motor load is greater than the rated load.	Check the load with the accumulated load ratio on the Motion Monitor Tab Page on the SigmaWin+.	Operate the Servo Drive so that the motor load remains within the specified range.	*1
	A failure occurred in the Serial Converter Unit.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the Serial Converter Unit may be faulty. Replace the Serial Converter Unit.	–
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.862: Overheat Alarm	The surrounding temperature is too high.	Check the surrounding temperature using a thermometer.	Lower the surrounding temperature by improving the installation conditions of the Linear Servomotor or the machine.	–
	The overheat protection input signal line is disconnected or short-circuited.	Check the input voltage with the overheat protection input information on the Motion Monitor Tab Page on the SigmaWin+.	Repair the line for the overheat protection input signal.	–
	An overload alarm was reset by turning OFF the power supply too many times.	Check the alarm display to see if there is an overload alarm.	Change the method for resetting the alarm.	–
	Operation was performed under an excessive load.	Use the accumulated load ratio to check the load during operation.	Reconsider the load and operating conditions.	–
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
	The temperature detection circuit in the Linear Servomotor is faulty or the sensor attached to the machine is faulty.	–	The temperature detection circuit in the Linear Servomotor may be faulty or the sensor attached to the machine may be faulty. Replace the Linear Servomotor or repair the sensor attached to the machine.	–
A.890: Encoder Scale Error	A failure occurred in the linear encoder.	–	The linear encoder may be faulty. Replace the linear encoder.	–
A.891: Encoder Module Error	A failure occurred in the linear encoder.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the linear encoder may be faulty. Replace the linear encoder.	–
A.b33: Current Detection Error 3	A failure occurred in the current detection circuit.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.b6A: MECHATROLINK Communications ASIC Error 1	There is a fault in the SERVOPACK MECHATROLINK communications section.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.b6b: MECHATROLINK Communications ASIC Error 2	A malfunction occurred in the MECHATROLINK communications section due to noise.	–	Implement the following countermeasures against noise. • Check the MECHATROLINK Communications Cable and FG wiring. • Attach a ferrite core to the MECHATROLINK Communications Cable.	–
	There is a fault in the SERVOPACK MECHATROLINK communications section.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.bF0: System Alarm 0	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.bF1: System Alarm 1	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.bF2: System Alarm 2	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.bF3: System Alarm 3	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.bF4: System Alarm 4	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.bF5: System Alarm 5	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.bF6: System Alarm 6	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.bF7: System Alarm 7	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.bF8: System Alarm 8	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.C10: Servomotor Out of Control (Detected when the servo is turned ON.)	The order of phases U, V, and W in the motor wiring is not correct.	Check the Servomotor wiring.	Make sure that the Servomotor is correctly wired.	–
	There is an error in the setting of Pn080 = n.□□X□ (Motor Phase Sequence Selection).	Check the setting of Pn080 = n.□□X□.	Set Pn080 = n.□□X□ to an appropriate value.	*1
	A failure occurred in the encoder.	–	If the motor wiring is correct and the alarm still occurs after turning the power supply OFF and ON again, the Servomotor or linear encoder may be faulty. Replace the Servomotor or linear encoder.	–
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.C20: Phase Detection Error	The linear encoder signal level is too low.	Check the voltage of the linear encoder signal.	Fine-tune the mounting of the scale head. Or, replace the linear encoder.	–
	The count-up direction of the linear encoder does not match the forward direction of the Moving Coil in the motor.	Check the setting of Pn080 = n.□□X□ (Motor Phase Sequence Selection). Check the installation orientation for the linear encoder and Moving Coil.	Change the setting of Pn080 = n.□□X□. Correctly reinstall the linear encoder or Moving Coil.	*1
	The polarity sensor signal is being affected by noise.	–	Correct the FG wiring. Implement countermeasures against noise for the polarity sensor wiring.	–
	The setting of Pn282 (Linear Encoder Scale Pitch) is not correct.	Check the setting of Pn282 (Linear Encoder Scale Pitch).	Check the specifications of the linear encoder and set a correct value.	*1
A.C21: Polarity Sensor Error	The polarity sensor is protruding from the Magnetic Way of the motor.	Check the polarity sensor.	Correctly reinstall the Moving Coil or Magnetic Way of the motor.	–
	The polarity sensor is not wired correctly.	Check the wiring of the polarity sensor.	Correct the wiring of the polarity sensor.	–
	The polarity sensor failed.	–	Replace the polarity sensor.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.C22: Phase Information Disagreement	The SERVOPACK phase information is different from the linear encoder phase information.	–	Perform polarity detection.	*1
	The parameter settings are not correct.	Check the linear encoder specifications and feedback signal status.	The settings of Pn282 (Linear Encoder Scale Pitch) and Pn080 = n.□□X□ (Motor Phase Sequence Selection) may not match the installation. Set the parameters to correct values.	*1
	There is noise on the scale signal.	Check to make sure that the frame grounds of the Serial Converter Unit and Servomotor are connected to the FG terminal on the SERVOPACK and that the FG terminal on the SERVOPACK is connected to the frame ground on the power supply. And, confirm that the shield is properly processed on the Linear Encoder Cable. Check to see if the detection reference is repeatedly output in one direction.	Implement appropriate countermeasures against noise for the Linear Encoder Cable.	–
A.C50: Polarity Detection Failure	An external force was applied to the Moving Coil of the motor.	–	The polarity cannot be properly detected if the detection reference is 0 and the speed feedback is not 0 because of an external force, such as cable tension, applied to the Moving Coil. Implement measures to reduce the external force so that the speed feedback goes to 0. If the external force cannot be reduced, increase the setting of Pn481 (Polarity Detection Speed Loop Gain).	–
	The linear encoder resolution is too low.	Check the linear encoder scale pitch to see if it is within 100 μm.	If the linear encoder scale pitch is 100 μm or higher, the SERVOPACK cannot detect the correct speed feedback. Use a linear encoder scale pitch with higher resolution. (We recommend a pitch of 40 μm or less.) Or, increase the setting of Pn485 (Polarity Detection Reference Speed). However, increasing the setting of Pn485 will increase the Servomotor movement range that is required for polarity detection.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.C51: Overtravel Detected during Polarity Detection	The overtravel signal was detected during polarity detection.	Check the overtravel position.	Wire the overtravel signals. Execute polarity detection at a position where an overtravel signal would not be detected.	*1
A.C52: Polarity Detection Not Completed	The servo was turned ON when using an absolute linear encoder, Pn587 was set to n.□□□0 (Do not detect polarity), and the polarity had not been detected.	–	When using an absolute linear encoder, set Pn587 to n.□□□1 (Detect polarity).	–
A.C53: Out of Range of Motion for Polarity Detection	The travel distance exceeded the setting of Pn48E (Polarity Detection Range) in the middle of detection.	–	Increase the setting of Pn48E (Polarity Detection Range). Or, increase the setting of Pn481 (Polarity Detection Speed Loop Gain).	–
A.C54: Polarity Detection Failure 2	An external force was applied to the Servomotor.	–	Increase the setting of Pn495 (Polarity Detection Confirmation Force Reference). Increase the setting of Pn498 (Polarity Detection Allowable Error Range). Increasing the allowable error will also increase the motor temperature.	–
A.C80: Encoder Clear Error or Multiturn Limit Setting Error	A failure occurred in the encoder.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servomotor or linear encoder.	–
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.C90: Encoder Communications Error	There is a faulty contact in the connector or the connector is not wired correctly for the encoder.	Check the condition of the encoder connector.	Reconnect the encoder connector and check the encoder wiring.	*1
	There is a cable disconnection or short-circuit in the encoder. Or, the cable impedance is outside the specified values.	Check the condition of the Encoder Cable.	Use the Encoder Cable within the specified specifications.	–
	One of the following has occurred: corrosion caused by improper temperature, humidity, or gas, a short-circuit caused by entry of water drops or cutting oil, or faulty contact in connector caused by vibration.	Check the operating environment.	Improve the operating environment, and replace the cable. If the alarm still occurs, replace the SERVOPACK.	*1
	A malfunction was caused by noise.	–	Correct the wiring around the encoder by separating the Encoder Cable from the Servomotor Main Circuit Cable or by grounding the encoder.	*1
	A failure occurred in the SERVOPACK.	–	Connect the Servomotor to another SERVOPACK, and turn ON the control power supply. If no alarm occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
	A failure occurred in the encoder.	–	Connect the Servomotor to another SERVOPACK, and turn ON the control power supply. If the alarm occurs, the Servomotor may be faulty. Replace the Servomotor.	–
A.C91: Encoder Communications Position Data Acceleration Rate Error	Noise entered on the signal lines because the Encoder Cable is bent or the sheath is damaged.	Check the condition of the Encoder Cable and connectors.	Check the Encoder Cable to see if it is installed correctly.	*1
	The Encoder Cable is bundled with a high-current line or installed near a high-current line.	Check the installation condition of the Encoder Cable.	Confirm that there is no surge voltage on the Encoder Cable.	–
	There is variation in the FG potential because of the influence of machines on the Servomotor side, such as a welder.	Check the installation condition of the Encoder Cable.	Properly ground the machine to separate it from the FG of the encoder.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.C92: Encoder Communications Timer Error	Noise entered on the signal line from the encoder.	–	Implement countermeasures against noise for the encoder wiring.	*1
	Excessive vibration or shock was applied to the encoder.	Check the operating conditions.	Reduce machine vibration. Correctly install the Servomotor or linear encoder.	–
	A failure occurred in the encoder.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servomotor or linear encoder.	–
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.CA0: Encoder Parameter Error	A failure occurred in the encoder.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servomotor or linear encoder.	–
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.Cb0: Encoder Echoback Error	The encoder is wired incorrectly or there is faulty contact.	Check the wiring of the encoder.	Make sure that the encoder is correctly wired.	*1
	The specifications of the Encoder Cable are not correct and noise entered on it.	–	Use a shielded twisted-pair wire cable or a screened twisted-pair cable with conductors of at least 0.12 mm^2.	–
	The Encoder Cable is too long and noise entered on it.	–	• Rotary Servomotors: The Encoder Cable wiring distance must be 50 m max. • Linear Servomotors: The Encoder Cable wiring distance must be 20 m max.	–
	There is variation in the FG potential because of the influence of machines on the Servomotor side, such as a welder.	Check the condition of the Encoder Cable and connectors.	Properly ground the machine to separate it from the FG of the encoder.	–
	Excessive vibration or shock was applied to the encoder.	Check the operating conditions.	Reduce machine vibration. Correctly install the Servomotor or linear encoder.	–
	A failure occurred in the encoder.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servomotor or linear encoder.	–
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.CC0: Multiturn Limit Disagreement	The multiturn limit of the encoder is different from that of the SERVOPACK. Or, the multiturn limit of the SERVOPACK has been changed.	Check the setting of Pn205 in the SERVOPACK.	Change the setting if the alarm occurs.	*1
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.d00: Position Deviation Overflow (The setting of Pn520 (Position Deviation Overflow Alarm Level) was exceeded by the position deviation.)	The Servomotor U, V, and W wiring is not correct.	Check the wiring of the Servomotor's Main Circuit Cables.	Make sure that there are no faulty contacts in the wiring for the Servomotor and encoder.	–
	The position command speed is too fast.	Reduce the position command speed and try operating the SERVOPACK.	Reduce the position reference speed or the reference acceleration rate, or reconsider the electronic gear ratio.	*1
	The acceleration of the position reference is too high.	Reduce the reference acceleration and try operating the SERVOPACK.	Reduce the acceleration of the position reference using a MECHATROLINK command. Or, smooth the position reference acceleration by selecting the position reference filter (ACCFIL) using a MECHATROLINK command.	–
	The setting of Pn520 (Position Deviation Overflow Alarm Level) is too low for the operating conditions.	Check Pn520 (Position Deviation Overflow Alarm Level) to see if it is set to an appropriate value.	Optimize the setting of Pn520.	*1
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.d01: Position Deviation Overflow Alarm at Servo ON	The servo was turned ON after the position deviation exceeded the setting of Pn526 (Position Deviation Overflow Alarm Level at Servo ON) while the servo was OFF.	Check the position deviation while the servo is OFF.	Optimize the setting of Pn526 (Position Deviation Overflow Alarm Level at Servo ON).	*1
A.d02: Position Deviation Overflow Alarm for Speed Limit at Servo ON	If position deviation remains in the deviation counter, the setting of Pn529 or Pn584 (Speed Limit Level at Servo ON) limits the speed when the servo is turned ON. This alarm occurs if a position reference is input and the setting of Pn520 (Position Deviation Overflow Alarm Level) is exceeded.	–	Optimize the setting of Pn520 (Position Deviation Overflow Alarm Level). Or, adjust the setting of Pn529 or Pn584 (Speed Limit Level at Servo ON).	
A.d30: Position Data Overflow	The position data exceeded ±1,879,048,192.	Check the input reference pulse counter.	Reconsider the operating specifications.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.E02: MECHATROLINK Internal Synchronization Error 1	The MECHATROLINK transmission cycle fluctuated.	–	Remove the cause of transmission cycle fluctuation at the host controller.	–
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.E40: MECHATROLINK Transmission Cycle Setting Error	The setting of MECHATROLINK transmission cycle is outside of the specified range.	Check the setting of the MECHATROLINK transmission cycle.	Set the MECHATROLINK transmission cycle to an appropriate value.	–
A.E41: MECHATROLINK Communications Data Size Setting Error	The number of transmission bytes set on DIP switch S3 is not correct.	Check the MECHATROLINK communications data size of the host controller.	Reset DIP switch S3 to change the number of transmission bytes to an appropriate value.	*1
A.E42: MECHATROLINK Station Address Setting Error	The station address is outside of the setting range.	Check rotary switches S1 and S2 to see if the station address is between 03 and EF.	Check the setting of the station address of the host controller, and reset rotary switches S1 and S2 to change the address to an appropriate value between 03 and EF.	*1
	Two or more stations on the communications network have the same address.	Check to see if two or more stations on the communications network have the same address.	Check the setting of the station address of the host controller, and reset rotary switches S1 and S2 to change the address to an appropriate value between 03 and EF.	
A.E50*5: MECHATROLINK Synchronization Error	The WDT data in the host controller was not updated normally.	Check to see if the WDT data is being updated at the host controller.	Correctly update the WDT data at the host controller.	–
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.E51: MECHATROLINK Synchronization Failed	The WDT data at the host controller was not updated correctly at the start of synchronous communications, so synchronous communications could not be started.	Check to see if the WDT data is being updated in the host controller.	Correctly update the WDT data at the host controller.	–
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.E60*5: Reception Error in MECHATROLINK Communications	MECHATROLINK wiring is not correct.	Check the MECHATROLINK wiring.	Correct the MECHATROLINK Communications Cable wiring.	–
	A MECHATROLINK data reception error occurred due to noise.	–	Implement countermeasures against noise. (Check the MECHATROLINK Communications Cable and FG wiring, and implement measures such as attaching a ferrite core to the MECHATROLINK Communications Cable.)	–
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.E61: Synchronization Interval Error in MECHATROLINK Transmission Cycle	The MECHATROLINK transmission cycle fluctuated.	Check the setting of the MECHATROLINK transmission cycle.	Remove the cause of transmission cycle fluctuation at the host controller.	–
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.E63: MECHATROLINK Synchronization Frame Not Received	MECHATROLINK wiring is not correct.	Check the Servomotor wiring.	Correct the MECHATROLINK Communications Cable wiring.	–
	A MECHATROLINK data reception error occurred due to noise.	–	Implement countermeasures against noise. (Check the MECHATROLINK Communications Cable and FG wiring, and implement measures such as attaching a ferrite core to the MECHATROLINK Communications Cable.)	–
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.E94: Position Correction Table Setting Error	The data set in the Position Correction Table (pre-correction positions and correction amounts) is corrupted.	Check the pre-correction positions and correction amounts in the Position Correction Table.	Initialize the Position Correction Table. Restart the SERVOPACK after initialization. If it starts normally, set the Position Correction Table again. If the SERVOPACK does not start normally after initialization, it may be faulty. Replace the SERVOPACK.	page 3-8 page 3-20
	The Position Correction Table was set with values outside the setting range.	Check if the table entries, pre-correction positions, correction amounts, correction positions (pre-correction positions+correction amounts) have exceeded the setting ranges.	Set the number of Position Correction Table entries between 2 and 128.	page 3-7
			Set pre-correction positions, correction amounts, and correction positions between -2,147,483,648 and 2,147,483,647.	
			Set the difference between one pre-correction position and the following pre-correction position between -1,073,741,824 and 1,073,741,823.	
			Set the difference between one correction amount and the following correction amount between -1,073,741,824 and 1,073,741,823.	
	The pre-correction positions in the Position Correction Table are not set in ascending order.	Check if the pre-correction positions are set in ascending order.	Set the Position Correction Table so that the pre-correction positions are in ascending order.	page 3-7
	The correction positions calculated from the pre-correction positions and correction amounts in the Position Correction Table are not in ascending order.	Check if the correction positions (pre-correction positions+correction amounts) are set in ascending order.	Set the Position Correction Table so that the correction positions are in ascending order.	page 3-7
A.Ed1: Command Execution Timeout	A timeout error occurred for a MECHATROLINK command.	Check the motor status when the command is executed.	Execute the SV_ON or SENS_ON command only when the motor is not operating.	–
		Check the encoder status when the command is executed.	Execute the SENS_ON command only when an encoder is connected.	–

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.F10: Power Supply Line Open Phase (The voltage was low for more than one second for phase R, S, or T when the main power supply was ON.)	The three-phase power supply wiring is not correct.	Check the power supply wiring.	Make sure that the power supply is correctly wired.	*1
	The three-phase power supply is unbalanced.	Measure the voltage for each phase of the three-phase power supply.	Balance the power supply by changing phases.	–
	A single-phase power supply was input without specifying a single-phase AC power supply input (Pn00B = n.□1□□).	Check the power supply and the parameter setting.	Match the parameter setting to the power supply.	*1
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
FL-1*5: System Alarm FL-2*5: System Alarm FL-3*5: System Alarm FL-4*5: System Alarm FL-5*5: System Alarm FL-6*5: System Alarm	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
CPF00: Digital Operator Communications Error 1	There is a faulty connection between the Digital Operator and the SERVOPACK.	Check the connector contact.	Disconnect the connector and insert it again. Or, replace the cable.	–
	A malfunction was caused by noise.	–	Keep the Digital Operator or the cable away from sources of noise.	–
CPF01: Digital Operator Communications Error 2	A failure occurred in the Digital Operator.	–	Disconnect the Digital Operator and then connect it again. If the alarm still occurs, the Digital Operator may be faulty. Replace the Digital Operator.	–
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–

*1. For details, refer to the following manual.
Σ-7-Series Σ-7W SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 29)

*2. Detection Conditions
• Rotary Servomotor
If either of the following conditions is detected, an alarm will occur.

$$\text{Pn533 [min}^{-1}\text{]} \times \frac{\text{Encoder resolution}}{6 \times 10^5} \leq \frac{\text{Pn20E}}{\text{Pn210}}$$

$$\text{Maximum motor speed [min}^{-1}\text{]} \times \frac{\text{Encoder resolution}}{\text{Approx. } 3.66 \times 10^{12}} \geq \frac{\text{Pn20E}}{\text{Pn210}}$$

• Linear Servomotor
If either of the following conditions is detected, an alarm will occur.

$$\frac{\text{Pn585 [mm/s]}}{\text{Linear encoder pitch [μm]}} \times \frac{\text{Resolution of Serial Converter Unit}}{10} \leq \frac{\text{Pn20E}}{\text{Pn210}}$$

$$\frac{\text{Pn385 [100 mm/s]}}{\text{Linear encoder pitch [μm]}} \times \frac{\text{Resolution of Serial Converter Unit}}{\text{Approx. } 6.10 \times 10^5} \geq \frac{\text{Pn20E}}{\text{Pn210}}$$

*3. Detection Conditions
• Rotary Servomotor
If either of the following conditions is detected, an alarm will occur.

$$\text{Rated motor speed [min}^{-1}\text{]} \times 1/3 \times \frac{\text{Encoder resolution}}{6 \times 10^5} \leq \frac{\text{Pn20E}}{\text{Pn210}}$$

$$\text{Maximum motor speed [min}^{-1}\text{]} \times \frac{\text{Encoder resolution}}{\text{Approx. } 3.66 \times 10^{12}} \geq \frac{\text{Pn20E}}{\text{Pn210}}$$

• Linear Servomotor
If either of the following conditions is detected, an alarm will occur.

$$\frac{\text{Rated motor speed [mm/s]} \times 1/3}{\text{Linear encoder pitch [μm]}} \times \frac{\text{Resolution of Serial Converter Unit}}{10} \leq \frac{\text{Pn20E}}{\text{Pn210}}$$

$$\frac{\text{Pn385 [100 mm/s]}}{\text{Linear encoder pitch [μm]}} \times \frac{\text{Resolution of Serial Converter Unit}}{\text{Approx. } 6.10 \times 10^5} \geq \frac{\text{Pn20E}}{\text{Pn210}}$$

*4. Refer to the following manual for details.
Σ-7-Series Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

*5. If an External Regenerative Resistor is connected while the jumper remains connected between B2 and B3, the SERVOPACK may be damaged.

*6. These alarms are not stored in the alarm history. They are only displayed on the panel display.

6.2 Warning Displays

If a warning occurs in the SERVOPACK, a warning number will be displayed on the panel display. Warnings are displayed to warn you before an alarm occurs.

6.2.1 List of Warnings

The list of warnings gives the warning name and warning meaning in order of the warning numbers.

If "All Axes" is given below the warning number, the warning applies to both axes. If a warning occurs for one axis, the same warning status will occur for the other axis.

Warning Number	Warning Name	Meaning	Resetting
A.900	Position Deviation Overflow	The position deviation exceeded the percentage set with the following formula: (Pn520 × Pn51E/100)	Required.
A.901	Position Deviation Overflow Alarm at Servo ON	The position deviation when the servo was turned ON exceeded the percentage set with the following formula: (Pn526 × Pn528/100)	Required.
A.910	Overload	This warning occurs before an overload alarm (A.710 or A.720) occurs. If the warning is ignored and operation is continued, an alarm may occur.	Required.
A.90D All Axes	Position Deviation Between Axes Overflow Warning	The position deviation between axes A and B has exceeded the percentage set with the following equation during the servo ON state. (Pn66A × Pn669/100)	Required.
A.911	Vibration	Abnormal vibration was detected during motor operation. The detection level is the same as A.520. Set whether to output an alarm or a warning by setting Pn310 (Vibration Detection Selection).	Required.
A.912 All Axes	Internal Temperature Warning 1 (Control Board Temperature Error)	The surrounding temperature of the control PCB is abnormal.	Required.
A.913 All Axes	Internal Temperature Warning 2 (Power Board Temperature Error)	The surrounding temperature of the power PCB is abnormal.	Required.
A.920 All Axes	Regenerative Overload	This warning occurs before an A.320 alarm (Regenerative Overload) occurs. If the warning is ignored and operation is continued, an alarm may occur.	Required.
A.921	Dynamic Brake Overload	This warning occurs before an A.731 alarm (Dynamic Brake Overload) occurs. If the warning is ignored and operation is continued, an alarm may occur.	Required.
A.923 All Axes	SERVOPACK Built-in Fan Stopped	The fan inside the SERVOPACK stopped.	Required.
A.930	Absolute Encoder Battery Error	This warning occurs when the voltage of absolute encoder's battery is low.	Required.
A.93B	Overheat Warning	The input voltage (temperature) for the overheat protection input (TH) signal exceeded the setting of Pn61C (Overheat Warning Level).	Required.
A.942	Speed Ripple Compensation Information Disagreement	The speed ripple compensation information stored in the encoder does not agree with the speed ripple compensation information stored in the SERVOPACK.	Required.
A.94A	Data Setting Warning 1 (Parameter Number Error)	There is an error in the parameter number for a Data Setting Warning 1 (Parameter Number) command.	Automatically reset.*

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Warning Number	Warning Name	Meaning	Resetting
A.94b	Data Setting Warning 2 (Out of Range)	The command data is out of range.	Automatically reset.*
A.94C	Data Setting Warning 3 (Calculation Error)	A calculation error was detected.	Automatically reset.*
A.94d	Data Setting Warning 4 (Parameter Size)	The data sizes do not match.	Automatically reset.*
A.94E	Data Setting Warning 5 (Latch Mode Error)	A latch mode error was detected.	Required.
A.95A	Command Warning 1 (Unsatisfied Command Conditions)	A command was sent when the conditions for sending a command were not satisfied.	Automatically reset.*
A.95b	Command Warning 2 (Unsupported Command)	An unsupported command was sent.	Automatically reset.*
A.95d	Command Warning 4 (Command Interference)	There was command interference, particularly latch command interference.	Automatically reset.*
A.95E	Command Warning 5 (Subcommand Not Possible)	The subcommand and main command interfere with each other.	Automatically reset.*
A.95F	Command Warning 6 (Undefined Command)	An undefined command was sent.	Automatically reset.*
A.960	MECHATROLINK Communications Warning	A communications error occurred during MECHATROLINK communications.	Required.
A.971 All Axes	Undervoltage	This warning occurs before an A.410 alarm (Undervoltage) occurs. If the warning is ignored and operation is continued, an alarm may occur.	Required.
A.97A	Command Warning 7 (Phase Error)	A command that cannot be executed in the current phase was sent.	Automatically reset.*
A.97b	Data Clamp Out of Range	The set command data was clamped to the minimum or maximum value of the allowable setting range.	Automatically reset.*
A.97C	Synchronized Stopping Occurred	Synchronized stopping occurred.	Required.
A.9A0	Overtravel	Overtravel was detected while the servo was ON.	Required.
A.9b0 All Axes	Preventative Maintenance Warning	One of the consumable parts has reached the end of its service life.	Required.

* The warning will automatically be cleared after the correct command is received.

Note: Use Pn008 = n.□X□□ (Warning Detection Selection) to control warning detection.
However, the following warnings are not affected by the setting of Pn008 = n.□X□□ and other parameter settings are required in addition to Pn008 = n.□X□□
For details, refer to the following manual.
Σ-7-Series Σ-7W SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 29)

Warning	Parameters That Must Be Set to Select Warning Detection
A.911	Pn310 = n.□□□X (Vibration Detection Selection)
A.923	– (Not affected by the setting of Pn008 = n.□X□□.)
A.930	Pn008 = n.□□□X (Low Battery Voltage Alarm/Warning Selection)
A.942	Pn423 = n.□□X□ (Speed Ripple Compensation Information Disagreement Warning Detection Selection)
A.94A to A.960 and A.97A to A.97b	Pn800=n.□□X□ (Warning Check Masks)
A.971	Pn008 = n.□□X□ (Function Selection for Undervoltage) (Not affected by the setting of Pn008 = n.□X□□.)
A.9A0	Pn00D = n.X□□□ (Overtravel Warning Detection Selection) (Not affected by the setting of Pn008 = n.□X□□.)
A.9b0	Pn00F = n.□□□X (Preventative Maintenance Warning Selection)

6.2.2 Troubleshooting Warnings

The causes of and corrections for the warnings are given in the following table. Contact your Yaskawa representative if you cannot solve a problem with the correction given in the table.

Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Reference
A.900: Position Deviation Overflow	The Servomotor U, V, and W wiring is not correct.	Check the wiring of the Servomotor's Main Circuit Cables.	Make sure that there are no faulty connections in the wiring for the Servomotor and encoder.	–
	A SERVOPACK gain is too low.	Check the SERVOPACK gains.	Increase the servo gain, e.g., by using autotuning without a host reference.	*
	The acceleration of the position reference is too high.	Reduce the reference acceleration and try operating the SERVOPACK.	Reduce the acceleration of the position reference using a MECHATROLINK command. Or, smooth the position reference acceleration by selecting the position reference filter (ACCFIL) using a MECHATROLINK command.	–
	The excessive position deviation alarm level (Pn520 × Pn51E/100) is too low for the operating conditions.	Check excessive position deviation alarm level (Pn520 × Pn51E/100) to see if it is set to an appropriate value.	Optimize the settings of Pn520 and Pn51E.	*
	A failure occurred in the SERVOPACK.	–	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.901: Position Deviation Overflow Alarm at Servo ON	The position deviation when the servo was turned ON exceeded the percentage set with the following formula: (Pn526 × Pn528/100)	–	Optimize the setting of Pn528 (Position Deviation Overflow Warning Level at Servo ON).	–
A.90D: Position Deviation Between Axes Overflow Warning	Twisting of mechanical parts has occurred between axes A and B.	Check the position deviation between the axes.	Resolve the twisting of mechanical parts between the axes.	–
			Set the Position Correction Table to appropriate values.	page 3-7
	Axis A and axis B are not synchronized with the reference.	Check the reference position for Axis A and Axis B.	The host controller should command the system to synchronize operation of axis A and axis B.	–
	The value of (Pn66A × Pn669/100) is low for the operating conditions.	Check if the value of (Pn66A × Pn669/100) is appropriate.	Set Pn66A and Pn669 to appropriate values.	page 5-3

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Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Reference
A.910: Overload (warning before an A.710 or A.720 alarm occurs)	The wiring is not correct or there is a faulty contact in the motor or encoder wiring.	Check the wiring.	Make sure that the Servomotor and encoder are correctly wired.	–
	Operation was performed that exceeded the overload protection characteristics.	Check the motor overload characteristics and Run command.	Reconsider the load and operating conditions. Or, increase the motor capacity.	–
	An excessive load was applied during operation because the Servomotor was not driven because of mechanical problems.	Check the operation reference and motor speed.	Remove the mechanical problem.	–
	The overload warning level (Pn52B) is not suitable.	Check that the overload warning level (Pn52B) is suitable.	Set a suitable overload warning level (Pn52B).	*
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.911: Vibration	Abnormal vibration was detected during motor operation.	Check for abnormal motor noise, and check the speed and torque waveforms during operation.	Reduce the motor speed. Or, reduce the servo gain with custom tuning.	*
	The setting of Pn103 (Moment of Inertia Ratio) is greater than the actual moment of inertia or was greatly changed.	Check the moment of inertia ratio or mass ratio.	Set Pn103 (Moment of Inertia Ratio) to an appropriate value.	*
	The vibration detection level (Pn312 or Pn384) is not suitable.	Check that the vibration detection level (Pn312 or Pn384) is suitable.	Set a suitable vibration detection level (Pn312 or Pn384).	*

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Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Reference
A.912: Internal Temperature Warning 1 (Control Board Temperature Error)	The surrounding temperature is too high.	Check the surrounding temperature using a thermometer. Or, check the operating status with the SERVOPACK installation environment monitor.	Decrease the surrounding temperature by improving the SERVOPACK installation conditions.	*
	An overload alarm was reset by turning OFF the power supply too many times.	Check the alarm display to see if there is an overload alarm.	Change the method for resetting the alarm.	–
	There was an excessive load or operation was performed that exceeded the regenerative processing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenerative load ratio to check the regenerative processing capacity.	Reconsider the load and operating conditions.	–
	The SERVOPACK installation orientation is not correct or there is insufficient space around the SERVOPACK.	Check the SERVOPACK installation conditions.	Install the SERVOPACK according to specifications.	*
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.913: Internal Temperature Warning 2 (Power Board Temperature Error)	The surrounding temperature is too high.	Check the surrounding temperature using a thermometer. Or, check the operating status with the SERVOPACK installation environment monitor.	Decrease the surrounding temperature by improving the SERVOPACK installation conditions.	*
	An overload alarm was reset by turning OFF the power supply too many times.	Check the alarm display to see if there is an overload alarm.	Change the method for resetting the alarm.	–
	There was an excessive load or operation was performed that exceeded the regenerative processing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenerative load ratio to check the regenerative processing capacity.	Reconsider the load and operating conditions.	–
	The SERVOPACK installation orientation is not correct or there is insufficient space around the SERVOPACK.	Check the SERVOPACK installation conditions.	Install the SERVOPACK according to specifications.	*
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–

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Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Reference
A.920: Regenerative Overload (warning before an A.320 alarm occurs)	The power supply voltage exceeded the specified range.	Measure the power supply voltage.	Set the power supply voltage within the specified range.	–
	There is insufficient external regenerative resistance, regenerative resistor capacity, or SERVOPACK capacity, or there has been a continuous regeneration state.	Check the operating conditions or the capacity using the SigmaJunmaSize+ Capacity Selection Software or another means.	Change the regenerative resistance value, regenerative resistance capacity, or SERVOPACK capacity. Reconsider the operating conditions using the SigmaJunmaSize+ Capacity Selection Software or other means.	–
	There was a continuous regeneration state because a negative load was continuously applied.	Check the load applied to the Servomotor during operation.	Reconsider the system including the servo, machine, and operating conditions.	–
A.921: Dynamic Brake Overload (warning before an A.731 alarm occurs)	The Servomotor was rotated by an external force.	Check the operation status.	Implement measures to ensure that the motor will not be rotated by an external force.	–
	When the Servomotor was stopped with the dynamic brake, the rotational or linear kinetic energy exceeded the capacity of the dynamic brake resistor.	Check the power consumed by the DB resistor to see how frequently the DB is being used.	Reconsider the following: • Reduce the Servomotor command speed. • Decrease the moment of inertia or mass. • Reduce the frequency of stopping with the dynamic brake.	–
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.923: SERVOPACK Built-in Fan Stopped	The fan inside the SERVOPACK stopped.	Check for foreign matter inside the SERVOPACK.	Remove foreign matter from the SERVOPACK. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.930: Absolute Encoder Battery Error (The absolute encoder battery voltage was lower than the specified level.) (Detected only when an absolute encoder is connected.)	The battery connection is faulty or a battery is not connected.	Check the battery connection.	Correct the battery connection.	*
	The battery voltage is lower than the specified value (2.7 V).	Measure the battery voltage.	Replace the battery.	*
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–

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Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Reference
A.93B: Overheat Warning	The surrounding temperature is too high.	Check the surrounding temperature using a thermometer.	Lower the surrounding temperature by improving the installation conditions of the Linear Servomotor or the machine.	–
	Operation was performed under an excessive load.	Use the accumulated load ratio to check the load during operation.	Reconsider the load and operating conditions.	–
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
	The temperature detection circuit in the Linear Servomotor is faulty or the sensor attached to the machine is faulty.	–	The temperature detection circuit in the Linear Servomotor may be faulty or the sensor attached to the machine may be faulty. Replace the Linear Servomotor or repair the sensor attached to the machine.	–
A.942: Speed Ripple Compensation Information Disagreement	The speed ripple compensation information stored in the encoder does not agree with the speed ripple compensation information stored in the SERVOPACK.	–	Reset the speed ripple compensation value on the SigmaWin+.	*
		–	Set Pn423 to n.□□1□ (Do not detect A.942 alarms). However, changing the setting may increase the speed ripple.	*
		–	Set Pn423 to n.□□□0 (Disable speed ripple compensation). However, changing the setting may increase the speed ripple.	*
A.94A: Data Setting Warning 1 (Parameter Number Error)	An invalid parameter number was used.	Check the command that caused the warning.	Use the correct parameter number.	*
A.94b: Data Setting Warning 2 (Out of Range)	The set command data was clamped to the minimum or maximum value of the setting range.	Check the command that caused the warning.	Set the parameter within the setting range.	*
A.94C: Data Setting Warning 3 (Calculation Error)	The calculation result of the setting is not correct.	Check the command that caused the warning.	Set the parameter within the setting range.	*
A.94d: Data Setting Warning 4 (Parameter Size)	The parameter size set in the command is not correct.	Check the command that caused the warning.	Set the correct parameter size.	*
A.94E: Data Setting Warning 5 (Latch Mode Error)	A latch mode error was detected.	Check the command that caused the warning.	Change the setting of Pn850 or the LT_MOD data for the LTMOD_ON command sent by the host controller to an appropriate value. (This applies when using the MECHATROLINK-II-compatible profile.)	*

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Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Reference
A.95A: Command Warning 1 (Unsatisfied Command Conditions)	The command conditions are not satisfied.	Check the command that caused the warning.	Send the command after the command conditions are satisfied.	*
A.95b: Command Warning 2 (Unsupported Command)	An unsupported command was received.	Check the command that caused the warning.	Do not send unsupported commands.	*
A.95d: Command Warning 4 (Command Interference)	The command sending conditions for latch-related commands was not satisfied.	Check the command that caused the warning.	Send the command after the command conditions are satisfied.	*
A.95E: Command Warning 5 (Subcommand Not Possible)	The command sending conditions for subcommands was not satisfied.	Check the command that caused the warning.	Send the command after the conditions are satisfied.	*
A.95F: Command Warning 6 (Undefined Command)	An undefined command was sent.	Check the command that caused the warning.	Do not send undefined commands.	*
A.960: MECHATROLINK Communications Warning	The MECHATROLINK Communications Cable is not wired correctly.	Check the wiring conditions.	Correct the MECHATROLINK communications cable wiring.	*
	A MECHATROLINK data reception error occurred due to noise.	Confirm the installation conditions.	Implement the following countermeasures against noise. • Check the MECHATROLINK Communications Cable and FG wiring and implement countermeasures to prevent noise from entering. • Attach a ferrite core to the MECHATROLINK Communications Cable.	–
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–
A.971: Undervoltage	For a 200-V SERVOPACK, the AC power supply voltage dropped below 140 V.	Measure the power supply voltage.	Set the power supply voltage within the specified range.	–
	The power supply voltage dropped during operation.	Measure the power supply voltage.	Increase the power supply capacity.	–
	A momentary power interruption occurred.	Measure the power supply voltage.	If you have changed the setting of Pn509 (Momentary Power Interruption Hold Time), decrease the setting.	*
	The SERVOPACK fuse is blown out.	–	Replace the SERVOPACK and connect a reactor.	*
	A failure occurred in the SERVOPACK.	–	The SERVOPACK may be faulty. Replace the SERVOPACK.	–

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Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Reference
A.97A: Command Warning 7 (Phase Error)	A command that cannot be executed in the current phase was sent.	–	Send the command after the command conditions are satisfied.	–
A.97b: Data Clamp Out of Range	The set command data was clamped to the minimum or maximum value of the setting range.	–	Set the command data within the setting ranges.	–
A.97C: Synchronized Stopping Occurred	An alarm occurred on a single axis.	Check the alarm that occurred on the single axis.	Troubleshoot the problem according to the correction methods for the alarm that occurred on the single axis.	–
A.9A0: Overtravel (Overtravel status was detected.)	Overtravel was detected while the servo was ON.	Check the status of the overtravel signals on the input signal monitor.	Even if an overtravel signal is not shown by the input signal monitor, momentary overtravel may have been detected. Take the following precautions. • Do not specify movements that would cause overtravel from the host controller. • Check the wiring of the overtravel signals. • Implement countermeasures against noise.	*
A.9b0: Preventative Maintenance Warning	One of the consumable parts has reached the end of its service life.	–	Replace the part. Contact your Yaskawa representative for replacement.	*

* For details, refer to the following manual.
Σ-7-Series Σ-7W SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 29)

6.3 Troubleshooting Based on the Operation and Conditions of the Servomotor

This section provides troubleshooting based on the operation and conditions of the Servomotor, including causes and corrections.

Problem	Possible Cause	Confirmation	Correction	Reference
Servomotor Does Not Start	The control power supply is not turned ON.	Measure the voltage between control power supply terminals.	Turn OFF the power supply to the servo system. Correct the wiring so that the control power supply is turned ON.	–
	The main circuit power supply is not turned ON.	Measure the voltage across the main circuit power input terminals.	Turn OFF the power supply to the servo system. Correct the wiring so that the main circuit power supply is turned ON.	–
	The I/O signal connector (CN1) pins are not wired correctly or are disconnected.	Turn OFF the power supply to the servo system. Check the wiring condition of the I/O signal connector (CN1) pins.	Correct the wiring of the I/O signal connector (CN1) pins.	*
	The wiring for the Servomotor Main Circuit Cables or Encoder Cable is disconnected.	Check the wiring conditions.	Turn OFF the power supply to the servo system. Wire the cable correctly.	–
	There is an overload on the Servomotor.	Operate the Servomotor with no load and check the load status.	Turn OFF the power supply to the servo system. Reduce the load or replace the Servomotor with a Servomotor with a larger capacity.	–
	The type of encoder that is being used does not agree with the setting of Pn002 = n.□X□□ (Encoder Usage).	Check the type of the encoder that is being used and the setting of Pn002 = n.□X□□.	Set Pn002 = n.□X□□ according to the type of the encoder that is being used.	*
	There is a mistake in the input signal allocations (Pn50A, Pn50B, Pn511, Pn516, or Pn590 to Pn599).	Check the input signal allocations (Pn50A, Pn50B, Pn511, Pn516, and Pn590 to Pn599).	Correctly allocate the input signals (Pn50A, Pn50B, Pn511, Pn516, and Pn590 to Pn599).	*
	The SV_ON command was not sent.	Check the commands sent from the host controller.	Send the SV_ON command from the host controller.	–
	The SENS_ON (Turn ON Sensor) command was not sent.	Check the commands sent from the host controller.	Send the commands to the SERVOPACK in the correct sequence.	–
	The P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal is still OFF.	Check the P-OT and N-OT signals.	Turn ON the P-OT and N-OT signals.	*
	The FSTP (Forced Stop Input) signal is still OFF.	Check the FSTP signal.	• Turn ON the FSTP signal. • If you will not use the function to force the motor to stop, set Pn516 = n.□□□X (FSTP (Forced Stop Input) Signal Allocation) to disable the signal.	*

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Problem	Possible Cause	Confirmation	Correction	Reference
Servomotor Does Not Start	A failure occurred in the SERVOPACK.	–	Turn OFF the power supply to the servo system. Replace the SERVOPACK.	–
	The polarity detection was not executed.	Check the setting of Pn080 =n.□□□X (Polarity Sensor Selection).	Correct the parameter setting.	*
		Check the inputs to the SV_ON (Servo ON) command.	• If you are using an incremental linear encoder, send the SV_ON command from the host controller. • If you are using an absolute linear encoder, execute polarity detection.	*
Servomotor Moves Instantaneously, and Then Stops	There is a mistake in the Servomotor wiring.	Turn OFF the power supply to the servo system. Check the wiring.	Wire the Servomotor correctly.	–
	There is a mistake in the wiring of the encoder or Serial Converter Unit.	Turn OFF the power supply to the servo system. Check the wiring.	Wire the Serial Converter Unit correctly.	–
	There is a mistake in the linear encoder wiring.	Turn OFF the power supply to the servo system. Check the wiring.	Wire the cable correctly.	–
	The setting of Pn282 (Linear Encoder Scale Pitch) is not correct.	Check the setting of Pn282.	Correct the setting of Pn282.	*
	The count-up direction of the linear encoder does not match the forward direction of the Moving Coil in the motor.	Check the directions.	Change the setting of Pn080 = n.□□X□ (Motor Phase Sequence Selection). Place the linear encoder and motor in the same direction.	*
	Polarity detection was not performed correctly.	Check to see if electrical angle 2 (electrical angle from polarity origin) at any position is between ±10°.	Correct the settings for the polarity detection-related parameters.	–
Servomotor Speed Is Unstable	There is a faulty connection in the Servomotor wiring.	The connector connections for the power line (U, V, and W phases) and the encoder or Serial Converter Unit may be unstable. Turn OFF the power supply to the servo system. Check the wiring.	Tighten any loose terminals or connectors and correct the wiring.	–

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Problem	Possible Cause	Confirmation	Correction	Reference
Servomotor Moves without a Reference Input	A failure occurred in the SERVOPACK.	–	Turn OFF the power supply to the servo system. Replace the SERVOPACK.	–
	The count-up direction of the linear encoder does not match the forward direction of the Moving Coil in the motor.	Check the directions.	Change the setting of Pn080 = n.□□X□ (Motor Phase Sequence Selection). Match the linear encoder direction and Servomotor direction.	*
	Polarity detection was not performed correctly.	Check to see if electrical angle 2 (electrical angle from polarity origin) at any position is between ±10°.	Correct the settings for the polarity detection-related parameters.	–
Dynamic Brake Does Not Operate	The setting of Pn001 = n.□□□X (Motor Stopping Method for Servo OFF and Group 1 Alarms) is not suitable.	Check the setting of Pn001 = n.□□□X.	Set Pn001 = n.□□□X correctly.	–
	The dynamic brake resistor is disconnected.	Check the moment of inertia, motor speed, and dynamic brake frequency of use. If the moment of inertia, motor speed, or dynamic brake frequency of use is excessive, the dynamic brake resistance may be disconnected.	Turn OFF the power supply to the servo system. Replace the SERVOPACK. To prevent disconnection, reduce the load.	–
	There was a failure in the dynamic brake drive circuit.	–	There is a defective component in the dynamic brake circuit. Turn OFF the power supply to the servo system. Replace the SERVOPACK.	–
Abnormal Noise from Servomotor	The Servomotor vibrated considerably while performing the tuning-less function with the default settings.	Check the waveform of the motor speed.	Reduce the load so that the moment of inertia ratio or mass ratio is within the allowable value, or increase the load level or reduce the rigidity level in the tuning-less level settings. If the situation is not improved, disable the tuning-less function (i.e., set Pn170 to n.□□□0) and execute autotuning either with or without a host reference.	*
	The machine mounting is not secure.	Turn OFF the power supply to the servo system. Check to see if there are any loose mounting screws.	Tighten the mounting screws.	–

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Problem	Possible Cause	Confirmation	Correction	Reference
Abnormal Noise from Servomotor	The machine mounting is not secure.	Turn OFF the power supply to the servo system. Check to see if there is misalignment in the coupling.	Align the coupling.	–
		Turn OFF the power supply to the servo system. Check to see if the coupling is balanced.	Balance the coupling.	–
	The bearings are defective.	Turn OFF the power supply to the servo system. Check for noise and vibration around the bearings.	Replace the Servomotor.	–
	There is a vibration source at the driven machine.	Turn OFF the power supply to the servo system. Check for any foreign matter, damage, or deformation in the machine's moving parts.	Consult with the machine manufacturer.	–
	Noise interference occurred because of incorrect I/O signal cable specifications.	Turn OFF the power supply to the servo system. Check the I/O signal cables to see if they satisfy specifications. Use shielded twisted-pair cables or screened twisted-pair cables with conductors of at least 0.12 mm^2 (stranded wire).	Use cables that satisfy the specifications.	–
	Noise interference occurred because an I/O signal cable is too long.	Turn OFF the power supply to the servo system. Check the lengths of the I/O signal cables.	The I/O signal cables must be no longer than 3 m.	–
	Noise interference occurred because of incorrect Encoder Cable specifications.	Turn OFF the power supply to the servo system. Check the Encoder Cable to see if it satisfies specifications. Use shielded twisted-pair cables or screened twisted-pair cables with conductors of at least 0.12 mm^2 (stranded wire).	Use cables that satisfy the specifications.	–
	Noise interference occurred because the Encoder Cable is too long.	Turn OFF the power supply to the servo system. Check the length of the Encoder Cable.	• Rotary Servomotors: The Encoder Cable length must be 50 m max. • Linear Servomotors: Make sure that the Serial Converter Unit cable is no longer than 20 m and that the Linear Encoder Cable and the Sensor Cable are no longer than 15 m each.	–
	Noise interference occurred because the Encoder Cable is damaged.	Turn OFF the power supply to the servo system. Check the Encoder Cable to see if it is pinched or the sheath is damaged.	Replace the Encoder Cable and correct the cable installation environment.	–

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Problem	Possible Cause	Confirmation	Correction	Reference
Abnormal Noise from Servomotor	The Encoder Cable was subjected to excessive noise interference.	Turn OFF the power supply to the servo system. Check to see if the Encoder Cable is bundled with a high-current line or installed near a high-current line.	Correct the cable layout so that no surge is applied by high-current lines.	–
	There is variation in the FG potential because of the influence of machines on the Servomotor side, such as a welder.	Turn OFF the power supply to the servo system. Check to see if the machines are correctly grounded.	Properly ground the machines to separate them from the FG of the encoder.	–
	There is a SERVOPACK pulse counting error due to noise.	Check to see if there is noise interference on the signal line from the encoder.	Turn OFF the power supply to the servo system. Implement countermeasures against noise for the encoder wiring.	–
	The encoder was subjected to excessive vibration or shock.	Turn OFF the power supply to the servo system. Check to see if vibration from the machine occurred. Check the Servomotor installation (mounting surface precision, securing state, and alignment). Check the linear encoder installation (mounting surface precision and securing method).	Reduce machine vibration. Improve the mounting state of the Servomotor or linear encoder.	–
	A failure occurred in the encoder.	–	Turn OFF the power supply to the servo system. Replace the Servomotor.	–
	A failure occurred in the Serial Converter Unit.	–	Turn OFF the power supply to the servo system. Replace the Serial Converter Unit.	–
	A failure occurred in the linear encoder.	–	Turn OFF the power supply to the servo system. Replace the linear encoder.	–

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Problem	Possible Cause	Confirmation	Correction	Reference
Servomotor Vibrates at Frequency of Approx. 200 to 400 Hz.	The servo gains are not balanced.	Check to see if the servo gains have been correctly tuned.	Perform autotuning without a host reference.	*
	The setting of Pn100 (Speed Loop Gain) is too high.	Check the setting of Pn100. The default setting is Kv = 40.0 Hz.	Set Pn100 to an appropriate value.	–
	The setting of Pn102 (Position Loop Gain) is too high.	Check the setting of Pn102. The default setting is Kp = 40.0/s.	Set Pn102 to an appropriate value.	–
	The setting of Pn101 (Speed Loop Integral Time Constant) is not appropriate.	Check the setting of Pn101. The default setting is Ti = 20.0 ms.	Set Pn101 to an appropriate value.	–
	The setting of Pn103 (Moment of Inertia Ratio or Mass Ratio) is not appropriate.	Check the setting of Pn103.	Set Pn103 to an appropriate value.	–
Large Motor Speed Overshoot on Starting and Stopping	The servo gains are not balanced.	Check to see if the servo gains have been correctly tuned.	Perform autotuning without a host reference.	*
	The setting of Pn100 (Speed Loop Gain) is too high.	Check the setting of Pn100. The default setting is Kv = 40.0 Hz.	Set Pn100 to an appropriate value.	–
	The setting of Pn102 (Position Loop Gain) is too high.	Check the setting of Pn102. The default setting is Kp = 40.0/s.	Set Pn102 to an appropriate value.	–
	The setting of Pn101 (Speed Loop Integral Time Constant) is not appropriate.	Check the setting of Pn101. The default setting is Ti = 20.0 ms.	Set Pn101 to an appropriate value.	–
	The setting of Pn103 (Moment of Inertia Ratio or Mass Ratio) is not appropriate.	Check the setting of Pn103.	Set Pn103 to an appropriate value.	–
	The torque reference is saturated.	Check the waveform of the torque reference.	Use the mode switch.	–
	The force limits (Pn483 and Pn484) are set to the default values.	The default values of the force limits are Pn483 = 30% and Pn484 = 30%.	Set Pn483 and Pn484 to appropriate values.	*

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Problem	Possible Cause	Confirmation	Correction	Reference
Absolute Encoder Position Deviation Error (The position that was saved in the host controller when the power was turned OFF is different from the position when the power was next turned ON.)	Noise interference occurred because of incorrect Encoder Cable specifications.	Turn OFF the power supply to the servo system. Check the Encoder Cable to see if it satisfies specifications. Use shielded twisted-pair cables or screened twisted-pair cables with conductors of at least 0.12 mm^2 (stranded wire).	Use cables that satisfy the specifications.	–
	Noise interference occurred because the Encoder Cable is too long.	Turn OFF the power supply to the servo system. Check the length of the Encoder Cable.	• Rotary Servomotors: The Encoder Cable length must be 50 m max. • Linear Servomotors: Make sure that the Serial Converter Unit cable is no longer than 20 m and that the Linear Encoder Cable and the Sensor Cable are no longer than 15 m each.	–
	Noise interference occurred because the Encoder Cable is damaged.	Turn OFF the power supply to the servo system. Check the Encoder Cable to see if it is pinched or the sheath is damaged.	Replace the Encoder Cable and correct the cable installation environment.	–
	The Encoder Cable was subject to excessive noise interference.	Turn OFF the power supply to the servo system. Check to see if the Encoder Cable is bundled with a high-current line or installed near a high-current line.	Correct the cable layout so that no surge is applied by high-current lines.	–
	There is variation in the FG potential because of the influence of machines on the Servomotor side, such as a welder.	Turn OFF the power supply to the servo system. Check to see if the machines are correctly grounded.	Properly ground the machines to separate them from the FG of the encoder.	–
	There is a SERVOPACK pulse counting error due to noise.	Turn OFF the power supply to the servo system. Check to see if there is noise interference on the I/O signal line from the encoder or Serial Converter Unit.	Implement countermeasures against noise for the encoder or Serial Converter Unit wiring.	–
	The encoder was subjected to excessive vibration or shock.	Turn OFF the power supply to the servo system. Check to see if vibration from the machine occurred. Check the Servomotor installation (mounting surface precision, securing state, and alignment). Check the linear encoder installation (mounting surface precision and securing method).	Reduce machine vibration. Improve the mounting state of the Servomotor or linear encoder.	–

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Problem	Possible Cause	Confirmation	Correction	Reference
Absolute Encoder Position Deviation Error (The position that was saved in the host controller when the power was turned OFF is different from the position when the power was next turned ON.)	A failure occurred in the encoder.	–	Turn OFF the power supply to the servo system. Replace the Servomotor or linear encoder.	–
	A failure occurred in the SERVOPACK.	–	Turn OFF the power supply to the servo system. Replace the SERVOPACK.	–
	Host Controller Multiturn Data or Absolute Encoder Position Data Reading Error	Check the error detection section of the host controller.	Correct the error detection section of the host controller.	–
		Check to see if the host controller is executing data parity checks.	Perform parity checks for the multiturn data or absolute encoder position data.	–
		Check for noise interference in the cable between the SERVOPACK and the host controller.	Implement countermeasures against noise and then perform parity checks again for the multiturn data or absolute encoder position data.	–
Overtravel Occurred	The P-OT/N-OT (Forward Drive Prohibit or Reverse Drive Prohibit) signal was input.	Check the external power supply (+24 V) voltage for the input signals.	Correct the external power supply (+24 V) voltage for the input signals.	–
		Check the operating condition of the overtravel limit switches.	Make sure that the overtravel limit switches operate correctly.	–
		Check the wiring of the overtravel limit switches.	Correct the wiring of the overtravel limit switches.	*
		Check the settings of the overtravel input signal allocations (Pn50A/ Pn50B or Pn590/Pn591).	Set the parameters to correct values.	*
	The P-OT/N-OT (Forward Drive Prohibit or Reverse Drive Prohibit) signal malfunctioned.	Check for fluctuation in the external power supply (+24 V) voltage for the input signals.	Eliminate fluctuation from the external power supply (+24 V) voltage for the input signals.	–
		Check to see if the operation of the overtravel limit switches is unstable.	Stabilize the operating condition of the overtravel limit switches.	–
		Check the wiring of the overtravel limit switches (e.g., check for cable damage and loose screws).	Correct the wiring of the overtravel limit switches.	–
	There is a mistake in the allocation of the P-OT or N-OT (Forward Drive Prohibit or Reverse Drive Prohibit) signal in Pn50A = n.X□□□ or Pn50B = n.□□□X.	Check to see if the P-OT signal is allocated in Pn50A = n.X□□□.	If another signal is allocated in Pn50A = n.X□□□, allocate the P-OT signal instead.	*
		Check to see if the N-OT signal is allocated in Pn50B = n.□□□X.	If another signal is allocated in Pn50B = n.□□□X, allocate the N-OT signal instead.	

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Problem	Possible Cause	Confirmation	Correction	Reference
Overtravel Occurred	The selection of the Servomotor stopping method is not correct.	Check the servo OFF stopping method set in Pn001 = n.□□□X or Pn001 = n.□□X□.	Select a Servomotor stopping method other than coasting to a stop.	*
		Check the torque control stopping method set in Pn001 = n.□□□X or Pn001 = n.□□X□.	Select a Servomotor stopping method other than coasting to a stop.	
Improper Stop Position for Overtravel (OT) Signal	The limit switch position and dog length are not appropriate.	–	Install the limit switch at the appropriate position.	–
	The overtravel limit switch position is too close for the coasting distance.	–	Install the overtravel limit switch at the appropriate position.	–
Position Deviation (without Alarm)	Noise interference occurred because of incorrect Encoder Cable specifications.	Check the Encoder Cable to see if it satisfies specifications. Use shielded twisted-pair cables or screened twisted-pair cables with conductors of at least 0.12 mm^2 (stranded wire).	Use cables that satisfy the specifications.	–
	Noise interference occurred because the Encoder Cable is too long.	Turn OFF the power supply to the servo system. Check the length of the Encoder Cable.	• Rotary Servomotors: The Encoder Cable length must be 50 m max. • Linear Servomotors: Make sure that the Serial Converter Unit cable is no longer than 20 m and that the Linear Encoder Cable and the Sensor Cable are no longer than 15 m each.	–
	Noise interference occurred because the Encoder Cable is damaged.	Turn OFF the power supply to the servo system. Check the Encoder Cable to see if it is pinched or the sheath is damaged.	Replace the Encoder Cable and correct the cable installation environment.	–
	The Encoder Cable was subjected to excessive noise interference.	Turn OFF the power supply to the servo system. Check to see if the Encoder Cable is bundled with a high-current line or installed near a high-current line.	Correct the cable layout so that no surge is applied by high-current lines.	–
	There is variation in the FG potential because of the influence of machines on the Servomotor side, such as a welder.	Turn OFF the power supply to the servo system. Check to see if the machines are correctly grounded.	Properly ground the machines to separate them from the FG of the encoder.	–
	There is a SERVOPACK pulse counting error due to noise.	Turn OFF the power supply to the servo system. Check to see if there is noise interference on the I/O signal line from the encoder or Serial Converter Unit.	Implement countermeasures against noise for the encoder wiring or Serial Converter Unit wiring.	–

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Problem	Possible Cause	Confirmation	Correction	Reference
Position Deviation (without Alarm)	The encoder was subjected to excessive vibration or shock.	Turn OFF the power supply to the servo system. Check to see if vibration from the machine occurred. Check the Servomotor installation (mounting surface precision, securing state, and alignment). Check the linear encoder installation (mounting surface precision and securing method).	Reduce machine vibration. Improve the mounting state of the Servomotor or linear encoder.	–
	The coupling between the machine and Servomotor is not suitable.	Turn OFF the power supply to the servo system. Check to see if position offset occurs at the coupling between machine and Servomotor.	Correctly secure the coupling between the machine and Servomotor.	–
	Noise interference occurred because of incorrect I/O signal cable specifications.	Turn OFF the power supply to the servo system. Check the I/O signal cables to see if they satisfy specifications. Use shielded twisted-pair cables or screened twisted-pair cables with conductors of at least 0.12 mm^2 (stranded wire).	Use cables that satisfy the specifications.	–
	Noise interference occurred because an I/O signal cable is too long.	Turn OFF the power supply to the servo system. Check the lengths of the I/O signal cables.	The I/O signal cables must be no longer than 3 m.	–
	An encoder fault occurred. (The pulse count does not change.)	–	Turn OFF the power supply to the servo system. Replace the Servomotor or linear encoder.	–
	A failure occurred in the SERVOPACK.	–	Turn OFF the power supply to the servo system. Replace the SERVOPACK.	–
Servomotor Overheated	The surrounding air temperature is too high.	Measure the surrounding air temperature around the Servomotor.	Reduce the surrounding air temperature to 40°C or less.	–
	The surface of the Servomotor is dirty.	Turn OFF the power supply to the servo system. Visually check the surface for dirt.	Clean dirt, dust, and oil from the surface.	–
	There is an overload on the Servomotor.	Check the load status with a monitor.	If the Servomotor is overloaded, reduce the load or replace the Servo Drive with a SERVOPACK and Servomotor with larger capacities.	–
	Polarity detection was not performed correctly.	Check to see if electrical angle 2 (electrical angle from polarity origin) at any position is between ±10°.	Correct the settings for the polarity detection-related parameters.	–

* For details, refer to the following manual.
Σ-7-Series Σ-7W SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 29)

Parameter Lists

7

This chapter provides information on the parameters.

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7.1 Parameter Lists

7.1.1 Interpreting the Servo Parameter Lists

The types of Servomotors to which the parameter applies.
- All: The parameter is used for both Rotary Servomotors and Linear Servomotors.
- Rotary: The parameter is used for only Rotary Servomotors.
- Linear: The parameter is used for only Linear Servomotors.

Rotary Servomotor terms are used for parameters that are applicable to all Servomotors. If you are using a Linear Servomotor, you need to interpret the terms accordingly. Refer to the following section for details.

☞ ◆ *Differences in Terms for Rotary Servomotors and Linear Servomotors* on page xii

Indicates when a change to the parameter will be effective.
"After restart" indicates parameters that will be effective after one of the following is executed.
- The power supply is turned OFF and ON again.
- The CONFIG command is sent.
- A software reset is executed.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn000 All Axes	2	Basic Function Selections 0	0000h to 10B1h	–	0000h	All	After restart	Setup	–

There are the following two classifications.
- Setup
- Tuning

For details, refer to the following manual.
Σ-7-Series Σ-7W SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 29)

If there are differences in the parameters for Rotary Servomotor and Linear Servomotor, information is provided for both.
- Top row: For Rotary Servomotors
- Bottom row: For Linear Servomotors

	Rotation Direction Selection / Movement Direction Selection		Reference
n.□□□X	0	Use CCW as the forward direction.	–
		Use the direction in which the linear encoder counts up as the forward direction.	
	1	Use CW as the forward direction. (Reverse Rotation Mode)	
		Use the direction in which the linear encoder counts down as the forward direction. (Reverse Movement Mode)	
n.□□X□	Reserved parameter (Do not change.)		
n.□X□□	Reserved parameter (Do not change.)		
n.X□□□	ar Servomotor Startup Selection When Encoder Is Not Connected		Reference
	0	When an encoder is not connected, start as SERVOPACK for Rotary Servomotor.	–
	1	When an encoder is not connected, start as SERVOPACK for Linear Servomotor.	

This parameter applies to both axis A and axis B. If you change the setting, the new setting will be applied to both axes.

7.1.2 Interpreting the MECHATROLINK-III Common Parameter Lists

The types of Servomotors to which the parameter applies.
- All: The parameter is used for both Rotary Servomotors and Linear Servomotors.
- Rotary: The parameter is used for only Rotary Servomotors.
- Linear: The parameter is used for only Linear Servomotors.

Rotary Servomotor terms are used for parameters that are applicable to all Servomotors. If you are using a Linear Servomotor, you need to interpret the terms accordingly. Refer to the following section for details.

☞ ◆ *Differences in Terms for Rotary Servomotors and Linear Servomotors* on page xii

Indicates when a change to the parameter will be effective.
"After restart" indicates parameters that will be effective after one of the following is executed.
- The power supply is turned OFF and ON again.
- The CONFIG command is sent.
- A software reset is executed.

Parameter No.	Size	Name	Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classification
61 PnAC2	4	Speed Loop Gain	1,000 to 2,000,000	0.001 Hz [0.1 Hz]	40000	All	Immediately	Tuning

You can set the parameter in increments of the setting unit.
However, if a unit is given in square brackets, the setting is automatically converted to the resolution given in the square brackets.

7.2 List of Servo Parameters

The following table lists the parameters.

Note: Do not change the following parameters from their default settings.
- Reserved parameters
- Parameters not given in this manual
- Parameters that are not valid for the Servomotor that you are using, as given in the parameter table

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn000	2	Basic Function Selections 0	0000h to 10B1h	–	0000h	All	After restart	Setup	–

	Rotation Direction Selection / Movement Direction Selection		Reference
n.□□□X	0	Use CCW as the forward direction.	*1
		Use the direction in which the linear encoder counts up as the forward direction.	
	1	Use CW as the forward direction. (Reverse Rotation Mode)	
		Use the direction in which the linear encoder counts down as the forward direction. (Reverse Movement Mode)	

n.□□X□	Reserved parameter (Do not change.)

n.□X□□	Reserved parameter (Do not change.)

	Rotary/Linear Servomotor Startup Selection When Encoder Is Not Connected		Reference
n.X□□□	0	When an encoder is not connected, start as SERVOPACK for Rotary Servomotor.	*1
	1	When an encoder is not connected, start as SERVOPACK for Linear Servomotor.	

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn001	2	Application Function Selections 1	0000h to 1142h	–	0000h	All	After restart	Setup	–

	Motor Stopping Method for Servo OFF and Group 1 Alarms		Reference
n.□□□X	0	Stop the motor by applying the dynamic brake.	*1
	1	Stop the motor by the applying dynamic brake and then release the dynamic brake.	
	2	Coast the motor to a stop without the dynamic brake.	

	Overtravel Stopping Method		Reference
n.□□X□	0	Apply the dynamic brake or coast the motor to a stop.	*1
	1	Decelerate the motor to a stop using the torque set in Pn406 as the maximum torque and then servo-lock the motor.	
	2	Decelerate the motor to a stop using the torque set in Pn406 as the maximum torque and then let the motor coast.	
	3	Decelerate the motor to a stop using the deceleration time set in Pn30A and then servo-lock the motor.	
	4	Decelerate the motor to a stop using the deceleration time set in Pn30A and then let the motor coast.	

	Main Circuit Power Supply AC/DC Input Selection		Reference
n.□X□□ All Axes	0	Input AC power as the main circuit power supply using the L1, L2, and L3 terminals (do not use shared converter).	*1
	1	Input DC power as the main circuit power supply using the B1/⊕ and ⊖ 2 terminals or the B1 and ⊖ 2 terminals (use an external converter or the shared converter).	

n.X□□□	Reserved parameter (Do not change.)

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn002	2	Application Function Selections 2	0000h to 4213h	–	0011h	–	After restart	Setup	–

n.□□□X	MECHATROLINK Command Position and Speed Control Option		Applicable Motors	Reference
	0	Reserved setting (Do not use.)	All	*2
	1	Use TLIM as the torque limit.		
	2	Reserved setting (Do not use.)		
	3	Reserved setting (Do not use.)		

n.□□X□	Torque Control Option		Applicable Motors	Reference
	0	Reserved setting (Do not use.)	All	*2
	1	Use the speed limit for torque control (VLIM) as the speed limit.		

n.□X□□	Encoder Usage		Applicable Motors	Reference
	0	Use the encoder according to encoder specifications.	All	*1
	1	Use the encoder as an incremental encoder.		
	2	Use the encoder as a single-turn absolute encoder.	Rotary	

n.X□□□	Reserved parameter (Do not change.)

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn006 All Axes	2	Application Function Selections 6	0000h to 105Fh	–	0002h	All	Immediately	Setup	*1

n.□□XX	Analog Monitor 1 Signal Selection		
	00	Motor speed (1 V/1,000 min^{-1})	
		Motor speed (1 V/1,000 mm/s)	
	01	Speed reference (1 V/1,000 min^{-1})	
		Speed reference (1 V/1,000 mm/s)	
	02	Torque reference (1 V/100% rated torque)	
		Force reference (1 V/100% rated force)	
	03	Position deviation (0.05 V/reference unit)	
	04	Position amplifier deviation (after electronic gear) (0.05 V/encoder pulse unit)	
		Position amplifier deviation (after electronic gear) (0.05 V/linear encoder pulse unit)	
	05	Position reference speed (1 V/1,000 min^{-1})	
		Position reference speed (1 V/1,000 mm/s)	
	06	Reserved setting (Do not use.)	
	07	Reserved setting (Do not use.)	
	08	Positioning completion (positioning completed: 5 V, positioning not completed: 0 V)	
	09	Speed feedforward (1 V/1,000 min^{-1})	
		Speed feedforward (1 V/1,000 mm/s)	
	0A	Torque feedforward (1 V/100% rated torque)	
		Force feedforward (1 V/100% rated force)	
	0B	Active gain (1st gain: 1 V, 2nd gain: 2 V)	
	0C	Completion of position reference distribution (completed: 5 V, not completed: 0 V)	
	0D	Reserved setting (Do not use.)	
	0E	Reserved setting (Do not use.)	
	0F	Reserved setting (Do not use.)	
	10	Main circuit DC voltage	
	11 to 5F	Reserved settings (Do not use.)	

n.□X□□	Reserved parameter (Do not change.)	

n.X□□□	Output Axis Selection	
	0	Output axis A data.
	1	Output axis B data.

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn007 All Axes	2	Application Function Selections 7	0000h to 105Fh	–	0000h	All	Immediately	Setup	*1

n.□□XX	Analog Monitor 2 Signal Selection	
	00	Motor speed (1 V/1,000 min^{-1})
		Motor speed (1 V/1,000 mm/s)
	01	Speed reference (1 V/1,000 min^{-1})
		Speed reference (1 V/1,000 mm/s)
	02	Torque reference (1 V/100% rated torque)
		Force reference (1 V/100% rated force)
	03	Position deviation (0.05 V/reference unit)
	04	Position amplifier deviation (after electronic gear) (0.05 V/encoder pulse unit)
		Position amplifier deviation (after electronic gear) (0.05 V/linear encoder pulse unit)
	05	Position reference speed (1 V/1,000 min^{-1})
		Position reference speed (1 V/1,000 mm/s)
	06	Reserved setting (Do not use.)
	07	Reserved setting (Do not use.)
	08	Positioning completion (positioning completed: 5 V, positioning not completed: 0 V)
	09	Speed feedforward (1 V/1,000 min^{-1})
		Speed feedforward (1 V/1,000 mm/s)
	0A	Torque feedforward (1 V/100% rated torque)
		Force feedforward (1 V/100% rated force)
	0B	Active gain (1st gain: 1 V, 2nd gain: 2 V)
	0C	Completion of position reference distribution (completed: 5 V, not completed: 0 V)
	0D	Reserved setting (Do not use.)
	0E	Reserved setting (Do not use.)
	0F	Reserved setting (Do not use.)
	10	Main circuit DC voltage
	11 to 5F	Reserved settings (Do not use.)

n.□X□□	Reserved parameter (Do not change.)	

n.X□□□	Output Axis Selection	
	0	Output axis A data.
	1	Output axis B data.

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn008	2	Application Function Selections 8	0000h to 7121h	–	4000h	Rotary	After restart	Setup	–

	Low Battery Voltage Alarm/Warning Selection		Reference
n.□□□X	0	Output alarm (A.830) for low battery voltage.	*1
	1	Output warning (A.930) for low battery voltage.	

	Function Selection for Undervoltage		Reference
n.□□X□	0	Do not detect undervoltage.	*1
	1	Detect undervoltage warning and limit torque at host controller.	
	2	Detect undervoltage warning and limit torque with Pn424 and Pn425 (i.e., only in SERVOPACK).	

	Warning Detection Selection		Reference
n.□X□□	0	Detect warnings.	*1
	1	Do not detect warnings except for A.971.	

n.X□□□	Reserved parameter (Do not change.)

Pn009	2	Application Function Selections 9	0000h to 0121h	–	0010h	All	After restart	Tuning	–

n.□□□X	Reserved parameter (Do not change.)

	Current Control Mode Selection		
n.□□X□	0	Use current control mode 1.	*1
	1		
	2	Use current control mode 2.	

	Speed Detection Method Selection		Reference
n.□X□□	0	Use speed detection 1.	*1
	1	Use speed detection 2.	

n.X□□□	Reserved parameter (Do not change.)

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn00A	2	Application Function Selections A	0000h to 1044h	–	0001h	All	After restart	Setup	–

	Motor Stopping Method for Group 2 Alarms		Reference
n.□□□X	0	Apply the dynamic brake or coast the motor to a stop (use the stopping method set in Pn001 = n.□□□X).	*1
	1	Decelerate the motor to a stop using the torque set in Pn406 as the maximum torque. Use the setting of Pn001 = n.□□□X for the status after stopping.	
	2	Decelerate the motor to a stop using the torque set in Pn406 as the maximum torque and then let the motor coast.	
	3	Decelerate the motor to a stop using the deceleration time set in Pn30A. Use the setting of Pn001 = n.□□□X for the status after stopping.	
	4	Decelerate the motor to a stop using the deceleration time set in Pn30A and then let the motor coast.	

	Stopping Method for Forced Stops		Reference
n.□□X□	0	Apply the dynamic brake or coast the motor to a stop (use the stopping method set in Pn001 = n.□□□X).	*1
	1	Decelerate the motor to a stop using the torque set in Pn406 as the maximum torque. Use the setting of Pn001 = n.□□□X for the status after stopping.	
	2	Decelerate the motor to a stop using the torque set in Pn406 as the maximum torque and then let the motor coast.	
	3	Decelerate the motor to a stop using the deceleration time set in Pn30A. Use the setting of Pn001 = n.□□□X for the status after stopping.	
	4	Decelerate the motor to a stop using the deceleration time set in Pn30A and then let the motor coast.	

n.□X□□	Reserved parameter (Do not change.)
n.X□□□	Reserved parameter (Do not change.)

Pn00B	2	Application Function Selections B	0000h to 1121h	–	0000h	All	After restart	Setup	–

	Operator Parameter Display Selection		Reference
n.□□□X	0	Display only setup parameters.	*1
	1	Display all parameters.	

	Motor Stopping Method for Group 2 Alarms		Reference
n.□□X□	0	Stop the motor by setting the speed reference to 0.	*1
	1	Apply the dynamic brake or coast the motor to a stop (use the stopping method set in Pn001 = n.□□□X).	
	2	Set the stopping method with Pn00A = n.□□□X.	

	Power Input Selection for Three-phase SERVOPACK		Reference
n.□X□□ All Axes	0	Use a three-phase power supply input.	*1
	1	Use a three-phase power supply input as a single-phase power supply input.	

n.X□□□	Reserved parameter (Do not change.)

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn00C	2	Application Function Selections C	0000h to 0131h	–	0000h	–	After restart	Setup	*1

n.□□□X	Function Selection for Test without a Motor		Applicable Motors
	0	Disable tests without a motor.	All
	1	Enable tests without a motor.	

n.□□X□	Encoder Resolution for Tests without a Motor		Applicable Motors
	0	Use 13 bits.	Rotary
	1	Use 20 bits.	
	2	Use 22 bits.	
	3	Use 24 bits.	

n.□X□□	Encoder Type Selection for Tests without a Motor		Applicable Motors
	0	Use an incremental encoder.	All
	1	Use an absolute encoder.	

n.X□□□	Reserved parameter (Do not change.)

Pn00D	2	Application Function Selections D	0000h to 1001h	–	0000h	All	Immediately	Setup	*1

n.□□□X	Reserved parameter (Do not change.)

n.□□X□	Reserved parameter (Do not change.)

n.□X□□	Reserved parameter (Do not change.)

n.X□□□	Overtravel Warning Detection Selection	
	0	Do not detect overtravel warnings.
	1	Detect overtravel warnings.

Pn00F All Axes	2	Application Function Selections F	0000h to 2011h	–	0000h	All	After restart	Setup	–

n.□□□X	Preventative Maintenance Warning Selection		Reference
	0	Do not detect preventative maintenance warnings.	*1
	1	Detect preventative maintenance warnings.	

n.□□X□	Reserved parameter (Do not change.)

n.□X□□	Reserved parameter (Do not change.)

n.X□□□	Reserved parameter (Do not change.)

Pn021	2	Reserved parameter (Do not change.)	–	–	0000h	All	–	–	–
Pn022	2	Reserved parameter (Do not change.)	–	–	0000h	All	–	–	–

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn080	2	Application Function Selections 80	0000h to 1111h	–	0000h	Linear	After restart	Setup	–

	Polarity Sensor Selection		Reference
n.□□□X	0	Use polarity sensor.	*1
	1	Do not use polarity sensor.	

	Motor Phase Sequence Selection		Reference
n.□□X□	0	Set a phase-A lead as a phase sequence of U, V, and W.	*1
	1	Set a phase-B lead as a phase sequence of U, V, and W.	

n.□X□□	Reserved parameter (Do not change.)

n.X□□□	Reserved parameter (Do not change.)

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn100	2	Speed Loop Gain	10 to 20,000	0.1 Hz	400	All	Immediately	Tuning	*1
Pn101	2	Speed Loop Integral Time Constant	15 to 51,200	0.01 ms	2000	All	Immediately	Tuning	*1
Pn102	2	Position Loop Gain	10 to 20,000	0.1/s	400	All	Immediately	Tuning	*1
Pn103	2	Moment of Inertia Ratio	0 to 20,000	1%	100	All	Immediately	Tuning	*1
Pn104	2	Second Speed Loop Gain	10 to 20,000	0.1 Hz	400	All	Immediately	Tuning	*1
Pn105	2	Second Speed Loop Integral Time Constant	15 to 51,200	0.01 ms	2000	All	Immediately	Tuning	*1
Pn106	2	Second Position Loop Gain	10 to 20,000	0.1/s	400	All	Immediately	Tuning	*1
Pn109	2	Feedforward	0 to 100	1%	0	All	Immediately	Tuning	*1
Pn10A	2	Feedforward Filter Time Constant	0 to 6,400	0.01 ms	0	All	Immediately	Tuning	*1

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn10B	2	Gain Application Selections	0000h to 5334h	–	0000h	All	–	Setup	–

n.□□□X	Mode Switching Selection		When Enabled	Reference
	0	Use the internal torque reference as the condition (level setting: Pn10C).	Immediately	*1
	1	Use the speed reference as the condition (level setting: Pn10D).		
		Use the speed reference as the condition (level setting: Pn181).		
	2	Use the acceleration reference as the condition (level setting: Pn10E).		
		Use the acceleration reference as the condition (level setting: Pn182).		
	3	Use the position deviation as the condition (level setting: Pn10F).		
	4	Do not use mode switching.		

n.□□X□	Speed Loop Control Method		When Enabled	Reference
	0	PI control	After restart	*1
	1	I-P control		
	2 and 3	Reserved settings (Do not use.)		

n.□X□□	Reserved parameter (Do not change.)
n.X□□□	Reserved parameter (Do not change.)

Pn10C	2	Mode Switching Level for Torque Reference	0 to 800	1%	200	All	Immediately	Tuning	*1
Pn10D	2	Mode Switching Level for Speed Reference	0 to 10,000	1 min^{-1}	0	Rotary	Immediately	Tuning	*1
Pn10E	2	Mode Switching Level for Acceleration	0 to 30,000	1 min^{-1}/s	0	Rotary	Immediately	Tuning	*1
Pn10F	2	Mode Switching Level for Position Deviation	0 to 10,000	1 reference unit	0	All	Immediately	Tuning	*1
Pn11F	2	Position Integral Time Constant	0 to 50,000	0.1 ms	0	All	Immediately	Tuning	*1
Pn121	2	Friction Compensation Gain	10 to 1,000	1%	100	All	Immediately	Tuning	*1
Pn122	2	Second Friction Compensation Gain	10 to 1,000	1%	100	All	Immediately	Tuning	*1
Pn123	2	Friction Compensation Coefficient	0 to 100	1%	0	All	Immediately	Tuning	*1
Pn124	2	Friction Compensation Frequency Correction	-10,000 to 10,000	0.1 Hz	0	All	Immediately	Tuning	*1
Pn125	2	Friction Compensation Gain Correction	1 to 1,000	1%	100	All	Immediately	Tuning	*1
Pn131	2	Gain Switching Time 1	0 to 65,535	1 ms	0	All	Immediately	Tuning	*1
Pn132	2	Gain Switching Time 2	0 to 65,535	1 ms	0	All	Immediately	Tuning	*1
Pn135	2	Gain Switching Waiting Time 1	0 to 65,535	1 ms	0	All	Immediately	Tuning	*1
Pn136	2	Gain Switching Waiting Time 2	0 to 65,535	1 ms	0	All	Immediately	Tuning	*1

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn139	2	Automatic Gain Switching Selections 1	0000h to 0052h	–	0000h	All	Immediately	Tuning	*1

n.□□□X	Gain Switching Selection
0	Use manual gain switching. The gain is switched manually with G-SEL in the servo command output signals (SVCMD_IO).
1	Reserved setting (Do not use.)
2	Use automatic gain switching pattern 1. The gain settings 1 switch automatically to 2 when switching condition A is satisfied. The gain settings 2 switch automatically to 1 when switching condition A is not satisfied.

n.□□X□	Gain Switching Condition A
0	/COIN (Positioning Completion Output) signal turns ON.
1	/COIN (Positioning Completion Output) signal turns OFF.
2	/NEAR (Near Output) signal turns ON.
3	/NEAR (Near Output) signal turns OFF.
4	Position reference filter output is 0 and position reference input is OFF.
5	Position reference input is ON.

n.□X□□	Reserved parameter (Do not change.)

n.X□□□	Reserved parameter (Do not change.)

Pn13D	2	Current Gain Level	100 to 2,000	1%	2000	All	Immediately	Tuning	*1
Pn140	2	Model Following Control-Related Selections	0000h to 1121h	–	0100h	All	Immediately	Tuning	–

n.□□□X	Model Following Control Selection		Reference
	0	Do not use model following control.	*1
	1	Use model following control.	

n.□□X□	Vibration Suppression Selection		Reference
	0	Do not perform vibration suppression.	*1
	1	Perform vibration suppression for a specific frequency.	
	2	Perform vibration suppression for two specific frequencies.	

n.□X□□	Vibration Suppression Adjustment Selection		Reference
	0	Do not adjust vibration suppression automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.	*1
	1	Adjust vibration suppression automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.	

n.X□□□	Speed Feedforward (VFF)/Torque Feedforward (TFF) Selection		Reference
	0	Do not use model following control and speed/torque feedforward together.	*1
	1	Use model following control and speed/torque feedforward together.	

Pn141	2	Model Following Control Gain	10 to 20,000	0.1/s	500	All	Immediately	Tuning	*1
Pn142	2	Model Following Control Gain Correction	500 to 2,000	0.1%	1000	All	Immediately	Tuning	*1
Pn143	2	Model Following Control Bias in the Forward Direction	0 to 10,000	0.1%	1000	All	Immediately	Tuning	*1

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn144	2	Model Following Control Bias in the Reverse Direction	0 to 10,000	0.1%	1000	All	Immediately	Tuning	*1
Pn145	2	Vibration Suppression 1 Frequency A	10 to 2,500	0.1 Hz	500	All	Immediately	Tuning	*1
Pn146	2	Vibration Suppression 1 Frequency B	10 to 2,500	0.1 Hz	700	All	Immediately	Tuning	*1
Pn147	2	Model Following Control Speed Feedforward Compensation	0 to 10,000	0.1%	1000	All	Immediately	Tuning	*1
Pn148	2	Second Model Following Control Gain	10 to 20,000	0.1/s	500	All	Immediately	Tuning	*1
Pn149	2	Second Model Following Control Gain Correction	500 to 2,000	0.1%	1000	All	Immediately	Tuning	*1
Pn14A	2	Vibration Suppression 2 Frequency	10 to 2,000	0.1 Hz	800	All	Immediately	Tuning	*1
Pn14B	2	Vibration Suppression 2 Correction	10 to 1,000	1%	100	All	Immediately	Tuning	*1
Pn14F	2	Control-Related Selections	0000h to 0021h	–	0021h	All	After restart	Tuning	–

	Model Following Control Type Selection		Reference
n.□□□X	0	Use model following control type 1.	*1
	1	Use model following control type 2.	

	Tuning-less Type Selection		Reference
n.□□X□	0	Use tuning-less type 1.	*1
	1	Use tuning-less type 2.	
	2	Use tuning-less type 3.	

n.□X□□	Reserved parameter (Do not change.)
n.X□□□	Reserved parameter (Do not change.)

Pn160	2	Anti-Resonance Control-Related Selections	0000h to 0011h	–	0010h	All	Immediately	Tuning	–

	Anti-Resonance Control Selection		Reference
n.□□□X	0	Do not use anti-resonance control.	*1
	1	Use anti-resonance control.	

	Anti-Resonance Control Adjustment Selection		Reference
n.□□X□	0	Do not adjust anti-resonance control automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.	*1
	1	Adjust anti-resonance control automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.	

n.□X□□	Reserved parameter (Do not change.)
n.X□□□	Reserved parameter (Do not change.)

Pn161	2	Anti-Resonance Frequency	10 to 20,000	0.1 Hz	1000	All	Immediately	Tuning	*1
Pn162	2	Anti-Resonance Gain Correction	1 to 1,000	1%	100	All	Immediately	Tuning	*1
Pn163	2	Anti-Resonance Damping Gain	0 to 300	1%	0	All	Immediately	Tuning	*1

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn164	2	Anti-Resonance Filter Time Constant 1 Correction	-1,000 to 1,000	0.01 ms	0	All	Immediately	Tuning	*1
Pn165	2	Anti-Resonance Filter Time Constant 2 Correction	-1,000 to 1,000	0.01 ms	0	All	Immediately	Tuning	*1
Pn166	2	Anti-Resonance Damping Gain 2	0 to 1,000	1%	0	All	Immediately	Tuning	*1
Pn170	2	Tuning-less Function-Related Selections	0000h to 2711h	–	1401h	All	–	Setup	*1

n.□□□X	Tuning-less Selection		When Enabled
	0	Disable tuning-less function.	After restart
	1	Enable tuning-less function.	

n.□□X□	Speed Control Method		When Enabled
	0	Use for speed control.	After restart
	1	Use for speed control and use host controller for position control.	

n.□X□□	Rigidity Level		When Enabled
	0 to 7	Set the rigidity level.	Immediately

n.X□□□	Tuning-less Load Level		When Enabled
	0 to 2	Set the load level for the tuning-less function.	Immediately

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn181	2	Mode Switching Level for Speed Reference	0 to 10,000	1 mm/s	0	Linear	Immediately	Tuning	*1
Pn182	2	Mode Switching Level for Acceleration	0 to 30,000	1 mm/s^2	0	Linear	Immediately	Tuning	*1
Pn205	2	Multiturn Limit	0 to 65,535	1 rev	65535	Rotary	After restart	Setup	*1
Pn207	2	Position Control Function Selections	0000h to 2210h	–	0010h	All	After restart	Setup	–

n.□□□X	Reserved parameter (Do not change.)
n.□□X□	Reserved parameter (Do not change.)
n.□X□□	Reserved parameter (Do not change.)

n.X□□□	/COIN (Positioning Completion Output) Signal Output Timing		Reference
	0	Output when the absolute value of the position deviation is the same or less than the setting of Pn522 (Positioning Completed Width).	*1
	1	Output when the absolute value of the position error is the same or less than the setting of Pn522 (Positioning Completed Width) and the reference after the position reference filter is 0.	
	2	Output when the absolute value of the position error is the same or less than the setting of Pn522 (Positioning Completed Width) and the reference input is 0.	

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn20E	4	Electronic Gear Ratio (Numerator)	1 to 1,073,741,824	1	16	All	After restart	Setup	*1
Pn210	4	Electronic Gear Ratio (Denominator)	1 to 1,073,741,824	1	1	All	After restart	Setup	*1

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn230	2	Position Control Expansion Function Selections	0000h to 0001h	–	0000h	All	After restart	Setup	*1

n.□□□X	Backlash Compensation Direction	
	0	Compensate forward references.
	1	Compensate reverse references.
n.□□X□	Reserved parameter (Do not change.)	
n.□X□□	Reserved parameter (Do not change.)	
n.X□□□	Reserved parameter (Do not change.)	

Pn231	4	Backlash Compensation	-500,000 to 500,000	0.1 reference units	0	All	Immediately	Setup	*1
Pn233	2	Backlash Compensation Time Constant	0 to 65,535	0.01 ms	0	All	Immediately	Setup	*1
Pn282	4	Linear Encoder Scale Pitch	0 to 6,553,600	0.01 μm	0	Linear	After restart	Setup	*1
Pn304	2	Jogging Speed	0 to 10,000	Rotary: 1 min^{-1} Direct Drive: 0.1 min^{-1}	500	Rotary	Immediately	Setup	*1
Pn305	2	Soft Start Acceleration Time	0 to 10,000	1 ms	0	All	Immediately	Setup	*2
Pn306	2	Soft Start Deceleration Time	0 to 10,000	1 ms	0	All	Immediately	Setup	*2
Pn308	2	Speed Feedback Filter Time Constant	0 to 65,535	0.01 ms	0	All	Immediately	Setup	*1
Pn30A	2	Deceleration Time for Servo OFF and Forced Stops	0 to 10,000	1 ms	0	All	Immediately	Setup	*1
Pn30C	2	Speed Feedforward Average Movement Time	0 to 5,100	0.1 ms	0	All	Immediately	Setup	–
Pn310	2	Vibration Detection Selections	0000h to 0002h	–	0000h	All	Immediately	Setup	*1

n.□□□X	Vibration Detection Selection	
	0	Do not detect vibration.
	1	Output a warning (A.911) if vibration is detected.
	2	Output an alarm (A.520) if vibration is detected.
n.□□X□	Reserved parameter (Do not change.)	
n.□X□□	Reserved parameter (Do not change.)	
n.X□□□	Reserved parameter (Do not change.)	

Pn311	2	Vibration Detection Sensitivity	50 to 500	1%	100	All	Immediately	Tuning	*1
Pn312	2	Vibration Detection Level	0 to 5,000	1 min^{-1}	50	Rotary	Immediately	Tuning	*1
Pn316	2	Maximum Motor Speed	0 to 65,535	1 min^{-1}	10000	Rotary	After restart	Setup	*1
Pn324	2	Moment of Inertia Calculation Starting Level	0 to 20,000	1%	300	All	Immediately	Setup	*1
Pn383	2	Jogging Speed	0 to 10,000	1 mm/s	50	Linear	Immediately	Setup	*1
Pn384	2	Vibration Detection Level	0 to 5,000	1 mm/s	10	Linear	Immediately	Tuning	*1

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn385	2	Maximum Motor Speed	1 to 100	100 mm/s	50	Linear	After restart	Setup	*1
Pn401	2	First Stage First Torque Reference Filter Time Constant	0 to 65,535	0.01 ms	100	All	Immediately	Tuning	*1
Pn402	2	Forward Torque Limit	0 to 800	1%*3	800	Rotary	Immediately	Setup	*1
Pn403	2	Reverse Torque Limit	0 to 800	1%*3	800	Rotary	Immediately	Setup	*1
Pn404	2	Forward External Torque Limit	0 to 800	1%*3	100	All	Immediately	Setup	*1
Pn405	2	Reverse External Torque Limit	0 to 800	1%*3	100	All	Immediately	Setup	*1
Pn406	2	Emergency Stop Torque	0 to 800	1%*3	800	All	Immediately	Setup	*1
Pn407	2	Speed Limit during Torque Control	0 to 10,000	1 min^{-1}	10000	Rotary	Immediately	Setup	*1
Pn408	2	Torque-Related Function Selections	0000h to 1111h	–	0000h	All	–	Setup	–

n.□□□X	Notch Filter Selection 1		When Enabled	Reference
	0	Disable first stage notch filter.	Immediately	*1
	1	Enable first stage notch filter.		

n.□□X□	Speed Limit Selection		When Enabled	Reference
	0	Use the smaller of the maximum motor speed and the setting of Pn407 as the speed limit.	After restart	*1
		Use the smaller of the maximum motor speed and the setting of Pn480 as the speed limit.		
	1	Use the smaller of the overspeed alarm detection speed and the setting of Pn407 as the speed limit.		
		Use the smaller of the overspeed alarm detection speed and the setting of Pn480 as the speed limit.		

n.□X□□	Notch Filter Selection 2		When Enabled	Reference
	0	Disable second stage notch filter.	Immediately	*1
	1	Enable second stage notch filter.		

n.X□□□	Friction Compensation Function Selection		When Enabled	Reference
	0	Disable friction compensation.	Immediately	*1
	1	Enable friction compensation.		

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn409	2	First Stage Notch Filter Frequency	50 to 5,000	1 Hz	5000	All	Immediately	Tuning	*1
Pn40A	2	First Stage Notch Filter Q Value	50 to 1,000	0.01	70	All	Immediately	Tuning	*1
Pn40B	2	First Stage Notch Filter Depth	0 to 1,000	0.001	0	All	Immediately	Tuning	*1
Pn40C	2	Second Stage Notch Filter Frequency	50 to 5,000	1 Hz	5000	All	Immediately	Tuning	*1
Pn40D	2	Second Stage Notch Filter Q Value	50 to 1,000	0.01	70	All	Immediately	Tuning	*1
Pn40E	2	Second Stage Notch Filter Depth	0 to 1,000	0.001	0	All	Immediately	Tuning	*1
Pn40F	2	Second Stage Second Torque Reference Filter Frequency	100 to 5,000	1 Hz	5000	All	Immediately	Tuning	*1
Pn410	2	Second Stage Second Torque Reference Filter Q Value	50 to 100	0.01	50	All	Immediately	Tuning	*1

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn412	2	First Stage Second Torque Reference Filter Time Constant	0 to 65,535	0.01 ms	100	All	Immediately	Tuning	*1
Pn416	2	Torque-Related Function Selections 2	0000h to 1111h	–	0000h	All	Immediately	Setup	*1

n.□□□X	Notch Filter Selection 3	
	0	Disable third stage notch filter.
	1	Enable third stage notch filter.
n.□□X□	Notch Filter Selection 4	
	0	Disable fourth stage notch filter.
	1	Enable fourth stage notch filter.
n.□X□□	Notch Filter Selection 5	
	0	Disable fifth stage notch filter.
	1	Enable fifth stage notch filter.
n.X□□□	Reserved parameter (Do not change.)	

Pn417	2	Third Stage Notch Filter Frequency	50 to 5,000	1 Hz	5000	All	Immediately	Tuning	*1
Pn418	2	Third Stage Notch Filter Q Value	50 to 1,000	0.01	70	All	Immediately	Tuning	*1
Pn419	2	Third Stage Notch Filter Depth	0 to 1,000	0.001	0	All	Immediately	Tuning	*1
Pn41A	2	Fourth Stage Notch Filter Frequency	50 to 5,000	1 Hz	5000	All	Immediately	Tuning	*1
Pn41B	2	Fourth Stage Notch Filter Q Value	50 to 1,000	0.01	70	All	Immediately	Tuning	*1
Pn41C	2	Fourth Stage Notch Filter Depth	0 to 1,000	0.001	0	All	Immediately	Tuning	*1
Pn41D	2	Fifth Stage Notch Filter Frequency	50 to 5,000	1 Hz	5000	All	Immediately	Tuning	*1
Pn41E	2	Fifth Stage Notch Filter Q Value	50 to 1,000	0.01	70	All	Immediately	Tuning	*1
Pn41F	2	Fifth Stage Notch Filter Depth	0 to 1,000	0.001	0	All	Immediately	Tuning	*1
Pn423	2	Speed Ripple Compensation Selections	0000h to 1111h	–	0000h	Rotary	–	Setup	*1

n.□□□X	Speed Ripple Compensation Function Selection		When Enabled
	0	Disable speed ripple compensation.	Immediately
	1	Enable speed ripple compensation.	
n.□□X□	Speed Ripple Compensation Information Disagreement Warning Detection Selection		When Enabled
	0	Detect A.942 alarms.	After restart
	1	Do not detect A.942 alarms.	
n.□X□□	Speed Ripple Compensation Enable Condition Selection		When Enabled
	0	Speed reference	After restart
	1	Motor speed	
n.X□□□	Reserved parameter (Do not change.)		

Pn424	2	Torque Limit at Main Circuit Voltage Drop	0 to 100	1%*2	50	All	Immediately	Setup	*1

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn425	2	Release Time for Torque Limit at Main Circuit Voltage Drop	0 to 1,000	1 ms	100	All	Immediately	Setup	*1
Pn426	2	Torque Feedforward Average Movement Time	0 to 5,100	0.1 ms	0	All	Immediately	Setup	–
Pn427	2	Speed Ripple Compensation Enable Speed	0 to 10,000	1 min^{-1}	0	Rotary	Immediately	Tuning	*1
Pn456	2	Sweep Torque Reference Amplitude	1 to 800	1%	15	All	Immediately	Tuning	*1
Pn460	2	Notch Filter Adjustment Selections 1	0000h to 0101h	–	0101h	All	Immediately	Tuning	*1

n.□□□X	Notch Filter Adjustment Selection 1	
	0	Do not adjust the first stage notch filter automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.
	1	Adjust the first stage notch filter automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.
n.□□X□	Reserved parameter (Do not change.)	
n.□X□□	Notch Filter Adjustment Selection 2	
	0	Do not adjust the second stage notch filter automatically when the tuning-less function is enabled or during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.
	1	Adjust the second stage notch filter automatically when the tuning-less function is enabled or during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.
n.X□□□	Reserved parameter (Do not change.)	

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn475	2	Gravity Compensation-Related Selections	0000h to 0001h	–	0000h	All	After restart	Setup	*1

n.□□□X	Gravity Compensation Selection	
	0	Disable gravity compensation.
	1	Enable gravity compensation.
n.□□X□	Reserved parameter (Do not change.)	
n.□X□□	Reserved parameter (Do not change.)	
n.X□□□	Reserved parameter (Do not change.)	

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn476	2	Gravity Compensation Torque	-1,000 to 1,000	0.1%	0	All	Immediately	Tuning	*1
Pn480	2	Speed Limit during Force Control	0 to 10,000	1 mm/s	10000	Linear	Immediately	Setup	*1
Pn481	2	Polarity Detection Speed Loop Gain	10 to 20,000	0.1 Hz	400	Linear	Immediately	Tuning	–
Pn482	2	Polarity Detection Speed Loop Integral Time Constant	15 to 51,200	0.01 ms	3000	Linear	Immediately	Tuning	–
Pn483	2	Forward Force Limit	0 to 800	1%*2	30	Linear	Immediately	Setup	*1
Pn484	2	Reverse Force Limit	0 to 800	1%*2	30	Linear	Immediately	Setup	*1
Pn485	2	Polarity Detection Reference Speed	0 to 100	1 mm/s	20	Linear	Immediately	Tuning	–
Pn486	2	Polarity Detection Reference Acceleration/ Deceleration Time	0 to 100	1 ms	25	Linear	Immediately	Tuning	–

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn487	2	Polarity Detection Constant Speed Time	0 to 300	1 ms	0	Linear	Immediately	Tuning	–
Pn488	2	Polarity Detection Reference Waiting Time	50 to 500	1 ms	100	Linear	Immediately	Tuning	–
Pn48E	2	Polarity Detection Range	1 to 65,535	1 mm	10	Linear	Immediately	Tuning	–
Pn490	2	Polarity Detection Load Level	0 to 20,000	1%	100	Linear	Immediately	Tuning	–
Pn495	2	Polarity Detection Confirmation Force Reference	0 to 200	1%	100	Linear	Immediately	Tuning	–
Pn498	2	Polarity Detection Allowable Error Range	0 to 30	1 deg	10	Linear	Immediately	Tuning	–
Pn49F	2	Speed Ripple Compensation Enable Speed	0 to 10,000	1 mm/s	0	Linear	Immediately	Tuning	*1
Pn502	2	Rotation Detection Level	1 to 10,000	1 min^{-1}	20	Rotary	Immediately	Setup	*1
Pn503	2	Speed Coincidence Detection Signal Output Width	0 to 100	1 min^{-1}	10	Rotary	Immediately	Setup	*1
Pn506	2	Brake Reference-Servo OFF Delay Time	0 to 50	10 ms	0	All	Immediately	Setup	*1
Pn507	2	Brake Reference Output Speed Level	0 to 10,000	1 min^{-1}	100	Rotary	Immediately	Setup	*1
Pn508	2	Servo OFF-Brake Command Waiting Time	10 to 100	10 ms	50	All	Immediately	Setup	*1
Pn509 All Axes	2	Momentary Power Interruption Hold Time	20 to 50,000	1 ms	20	All	Immediately	Setup	*1

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn50A	2	Input Signal Selections 1	0000h to FFF2h	–	0881h	All	After restart	Setup	–

n.□□□X	I/O Signal Allocation Mode		Reference
	0	Reserved setting (Do not use.)	*1
	1	Use Σ-7S-compatible I/O signal allocations (Pn50A to Pn517).	
	2	Use multi-axis I/O signal allocations (Pn590 to Pn5BC).	

n.□□X□	Reserved parameter (Do not change.)

n.□X□□	Reserved parameter (Do not change.)

n.X□□□	P-OT (Forward Drive Prohibit) Signal Allocation		Reference
	0	Axis A: Enable forward drive when CN1-3 input signal is ON (closed). Axis B: Enable forward drive when CN1-9 input signal is ON (closed).	*1
	1	Axis A: Enable forward drive when CN1-4 input signal is ON (closed). Axis B: Enable forward drive when CN1-10 input signal is ON (closed).	
	2	Axis A: Enable forward drive when CN1-5 input signal is ON (closed). Axis B: Enable forward drive when CN1-11 input signal is ON (closed).	
	3	Axis A: Enable forward drive when CN1-6 input signal is ON (closed). Axis B: Enable forward drive when CN1-12 input signal is ON (closed).	
	4	Axis A: Enable forward drive when CN1-7 input signal is ON (closed). Axis B: Enable forward drive when CN1-13 input signal is ON (closed).	
	5	Axis A: Enable forward drive when CN1-8 input signal is ON (closed). Axis B: Enable forward drive when CN1-14 input signal is ON (closed).	
	6	Reserved setting (Do not use.)	
	7	Set the signal to always prohibit forward drive.	
	8	Set the signal to always enable forward drive.	
	9	Axis A: Enable forward drive when CN1-3 input signal is OFF (open). Axis B: Enable forward drive when CN1-9 input signal is OFF (open).	
	A	Axis A: Enable forward drive when CN1-4 input signal is OFF (open). Axis B: Enable forward drive when CN1-10 input signal is OFF (open).	
	B	Axis A: Enable forward drive when CN1-5 input signal is OFF (open). Axis B: Enable forward drive when CN1-11 input signal is OFF (open).	
	C	Axis A: Enable forward drive when CN1-6 input signal is OFF (open). Axis B: Enable forward drive when CN1-12 input signal is OFF (open).	
	D	Axis A: Enable forward drive when CN1-7 input signal is OFF (open). Axis B: Enable forward drive when CN1-13 input signal is OFF (open).	
	E	Axis A: Enable forward drive when CN1-8 input signal is OFF (open). Axis B: Enable forward drive when CN1-14 input signal is OFF (open).	
	F	Reserved setting (Do not use.)	

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi-fication	Refer-ence
Pn50B	2	Input Signal Selections 2	0000h to FFFFh	–	8881h	All	After restart	Setup	–

	N-OT (Reverse Drive Prohibit) Signal Allocation		Reference
n.□□□X	0	Axis A: Enable reverse drive when CN1-3 input signal is ON (closed). Axis B: Enable reverse drive when CN1-9 input signal is ON (closed).	*1
	1	Axis A: Enable reverse drive when CN1-4 input signal is ON (closed). Axis B: Enable reverse drive when CN1-10 input signal is ON (closed).	
	2	Axis A: Enable reverse drive when CN1-5 input signal is ON (closed). Axis B: Enable reverse drive when CN1-11 input signal is ON (closed).	
	3	Axis A: Enable reverse drive when CN1-6 input signal is ON (closed). Axis B: Enable reverse drive when CN1-12 input signal is ON (closed).	
	4	Axis A: Enable reverse drive when CN1-7 input signal is ON (closed). Axis B: Enable reverse drive when CN1-13 input signal is ON (closed).	
	5	Axis A: Enable reverse drive when CN1-8 input signal is ON (closed). Axis B: Enable reverse drive when CN1-14 input signal is ON (closed).	
	6	Reserved setting (Do not use.)	
	7	Set the signal to always prohibit reverse drive.	
	8	Set the signal to always enable reverse drive.	
	9	Axis A: Enable reverse drive when CN1-3 input signal is OFF (open). Axis B: Enable reverse drive when CN1-9 input signal is OFF (open).	
	A	Axis A: Enable reverse drive when CN1-4 input signal is OFF (open). Axis B: Enable reverse drive when CN1-10 input signal is OFF (open).	
	B	Axis A: Enable reverse drive when CN1-5 input signal is OFF (open). Axis B: Enable reverse drive when CN1-11 input signal is OFF (open).	
	C	Axis A: Enable reverse drive when CN1-6 input signal is OFF (open). Axis B: Enable reverse drive when CN1-12 input signal is OFF (open).	
	D	Axis A: Enable reverse drive when CN1-7 input signal is OFF (open). Axis B: Enable reverse drive when CN1-13 input signal is OFF (open).	
	E	Axis A: Enable reverse drive when CN1-8 input signal is OFF (open). Axis B: Enable reverse drive when CN1-14 input signal is OFF (open).	
	F	Reserved setting (Do not use.)	

n.□□X□	Reserved parameter (Do not change.)

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi-fication	Refer-ence

Pn50B

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	/P-CL (Forward External Torque Limit Input) Signal Allocation		Reference
n.□X□□	0	Axis A: Active when CN1-3 input signal is ON (closed). Axis B: Active when CN1-9 input signal is ON (closed).	*1
	1	Axis A: Active when CN1-4 input signal is ON (closed). Axis B: Active when CN1-10 input signal is ON (closed).	
	2	Axis A: Active when CN1-5 input signal is ON (closed). Axis B: Active when CN1-11 input signal is ON (closed).	
	3	Axis A: Active when CN1-6 input signal is ON (closed). Axis B: Active when CN1-12 input signal is ON (closed).	
	4	Axis A: Active when CN1-7 input signal is ON (closed). Axis B: Active when CN1-13 input signal is ON (closed).	
	5	Axis A: Active when CN1-8 input signal is ON (closed). Axis B: Active when CN1-14 input signal is ON (closed).	
	6	Reserved setting (Do not use.)	
	7	The signal is always active.	
	8	The signal is always inactive.	
	9	Axis A: Active when CN1-3 input signal is OFF (open). Axis B: Active when CN1-9 input signal is OFF (open).	
	A	Axis A: Active when CN1-4 input signal is OFF (open). Axis B: Active when CN1-10 input signal is OFF (open).	
	B	Axis A: Active when CN1-5 input signal is OFF (open). Axis B: Active when CN1-11 input signal is OFF (open).	
	C	Axis A: Active when CN1-6 input signal is OFF (open). Axis B: Active when CN1-12 input signal is OFF (open).	
	D	Axis A: Active when CN1-7 input signal is OFF (open). Axis B: Active when CN1-13 input signal is OFF (open).	
	E	Axis A: Active when CN1-8 input signal is OFF (open). Axis B: Active when CN1-14 input signal is OFF (open).	
	F	Reserved setting (Do not use.)	

	/N-CL (Reverse External Torque Limit Input) Signal Allocation		Reference
n.X□□□	0 to F	The allocations are the same as the /P-CL (Forward External Torque Limit Input) signal allocations.	*1

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn50E	2	Output Signal Selections 1	0000h to 6666h	–	0000h	All	After restart	Setup	–

n.□□□X	/COIN (Positioning Completion Output) Signal Allocation		Reference
	0	Disabled (the above signal output is not used).	*1
	1	Axis A: Output the signal from the CN1-23 or CN1-24 output terminal. Axis B: Output the signal from the CN1-25 or CN1-26 output terminal.	
	2	Axis A: Output the signal from the CN1-27 or CN1-28 output terminal. Axis B: Output the signal from the CN1-29 or CN1-30 output terminal.	
	3 to 6	Reserved settings (Do not use.)	

n.□□X□	/V-CMP (Speed Coincidence Detection Output) Signal Allocation		Reference
	0 to 6	The allocations are the same as the /COIN (Positioning Completion) signal allocations.	*1

n.□X□□	/TGON (Rotation Detection Output) Signal Allocation		Reference
	0 to 6	The allocations are the same as the /COIN (Positioning Completion) signal allocations.	*1

n.X□□□	/S-RDY (Servo Ready) Signal Allocation		Reference
	0 to 6	The allocations are the same as the /COIN (Positioning Completion) signal allocations.	*1

Pn50F	2	Output Signal Selections 2	0000h to 6666h	–	0100h	All	After restart	Setup	–

n.□□□X	/CLT (Torque Limit Detection Output) Signal Allocation		Reference
	0	Disabled (the above signal output is not used).	*1
	1	Axis A: Output the signal from the CN1-23 or CN1-24 output terminal. Axis B: Output the signal from the CN1-25 or CN1-26 output terminal.	
	2	Axis A: Output the signal from the CN1-27 or CN1-28 output terminal. Axis B: Output the signal from the CN1-29 or CN1-30 output terminal.	
	3 to 6	Reserved settings (Do not use.)	

n.□□X□	/VLT (Speed Limit Detection) Signal Allocation		Reference
	0 to 6	The allocations are the same as the /CLT (Torque Limit Detection Output) signal allocations.	*1

n.□X□□	/BK (Brake Output) Signal Allocation		Reference
	0 to 6	The allocations are the same as the /CLT (Torque Limit Detection Output) signal allocations.	*1

n.X□□□	/WARN (Warning Output) Signal Allocation		Reference
	0 to 6	The allocations are the same as the /CLT (Torque Limit Detection Output) signal allocations.	*1

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn510	2	Output Signal Selections 3	0000h to 0666h	–	0000h	All	After restart	Setup	–

	/NEAR (Near Output) Signal Allocation		Reference
n.□□□X	0	Disabled (the above signal output is not used).	*1
	1	Axis A: Output the signal from the CN1-23 or CN1-24 output terminal. Axis B: Output the signal from the CN1-25 or CN1-26 output terminal.	
	2	Axis A: Output the signal from the CN1-27 or CN1-28 output terminal. Axis B: Output the signal from the CN1-29 or CN1-30 output terminal.	
	3 to 6	Reserved settings (Do not use.)	

n.□□X□	Reserved parameter (Do not change.)
n.□X□□	Reserved parameter (Do not change.)
n.X□□□	Reserved parameter (Do not change.)

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn511	2	Input Signal Selections 5	0000h to FFFFh	–	5432h	All	After restart	Setup	*1

	/DEC (Origin Return Deceleration Switch Input) Signal Allocation	
n.□□□X	0	Axis A: Active when CN1-3 input signal is ON (closed). Axis B: Active when CN1-9 input signal is ON (closed).
	1	Axis A: Active when CN1-4 input signal is ON (closed). Axis B: Active when CN1-10 input signal is ON (closed).
	2	Axis A: Active when CN1-5 input signal is ON (closed). Axis B: Active when CN1-11 input signal is ON (closed).
	3	Axis A: Active when CN1-6 input signal is ON (closed). Axis B: Active when CN1-12 input signal is ON (closed).
	4	Axis A: Active when CN1-7 input signal is ON (closed). Axis B: Active when CN1-13 input signal is ON (closed).
	5	Axis A: Active when CN1-8 input signal is ON (closed). Axis B: Active when CN1-14 input signal is ON (closed).
	6	Reserved setting (Do not use.)
	7	The signal is always active.
	8	The signal is always inactive.
	9	Axis A: Active when CN1-3 input signal is OFF (open). Axis B: Active when CN1-9 input signal is OFF (open).
	A	Axis A: Active when CN1-4 input signal is OFF (open). Axis B: Active when CN1-10 input signal is OFF (open).
	B	Axis A: Active when CN1-5 input signal is OFF (open). Axis B: Active when CN1-11 input signal is OFF (open).
	C	Axis A: Active when CN1-6 input signal is OFF (open). Axis B: Active when CN1-12 input signal is OFF (open).
	D	Axis A: Active when CN1-7 input signal is OFF (open). Axis B: Active when CN1-13 input signal is OFF (open).
	E	Axis A: Active when CN1-8 input signal is OFF (open). Axis B: Active when CN1-14 input signal is OFF (open).
	F	Reserved setting (Do not use.)

	/EXT1 (External Latch Input 1) Signal Allocation	
n.□□X□	0 to 2	The signal is always inactive.
	3	Axis A: Active when CN1-6 input signal is ON (closed). Axis B: Active when CN1-12 input signal is ON (closed).
	4	Axis A: Active when CN1-7 input signal is ON (closed). Axis B: Active when CN1-13 input signal is ON (closed).
	5	Axis A: Active when CN1-8 input signal is ON (closed). Axis B: Active when CN1-14 input signal is ON (closed).
	6 to B	The signal is always inactive.
	C	Axis A: Active when CN1-6 input signal is OFF (open). Axis B: Active when CN1-12 input signal is OFF (open).
	D	Axis A: Active when CN1-7 input signal is OFF (open). Axis B: Active when CN1-13 input signal is OFF (open).
	E	Axis A: Active when CN1-8 input signal is OFF (open). Axis B: Active when CN1-14 input signal is OFF (open).
	F	The signal is always inactive.

	/EXT2 (External Latch Input 2) Signal Allocation	
n.□X□□	0 to F	The allocations are the same as the /EXT1 (External Latch Input 1) signal allocations.

	/EXT3 (External Latch Input 3) Signal Allocation	
n.X□□□	0 to F	The allocations are the same as the /EXT1 (External Latch Input 1) signal allocations.

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn512	2	Output Signal Inverse Settings	0000h to 1111h	–	0000h	All	After restart	Setup	*1

n.□□□X	Output Inversion for CN1-23, CN1-24, CN1-25, and CN1-26 Terminals (Axis A: CN1-23 and CN1-24, Axis B: CN1-25 and CN1-26)	
	0	The signal is not inverted.
	1	The signal is inverted.

n.□□X□	Output Inversion for CN1-27, CN1-28, CN1-29, and CN1-30 Terminals (Axis A: CN1-27 and CN1-28, Axis B: CN1-29 and CN1-30)	
	0	The signal is not inverted.
	1	The signal is inverted.

n.□X□□	Reserved parameter (Do not change.)

n.X□□□	Reserved parameter (Do not change.)

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn514	2	Output Signal Selections 4	0000h to 0666h	–	0000h	All	After restart	Setup	–

n.□□□X	Reserved parameter (Do not change.)

n.□□X□	Reserved parameter (Do not change.)

	/PM (Preventative Maintenance Output) Signal Allocation		Reference
n.□X□□	0	Disabled (the above signal output is not used).	*1
	1	Axis A: Output the signal from the CN1-23 or CN1-24 output terminal. Axis B: Output the signal from the CN1-25 or CN1-26 output terminal.	
	2	Axis A: Output the signal from the CN1-27 or CN1-28 output terminal. Axis B: Output the signal from the CN1-29 or CN1-30 output terminal.	
	3 to 6	Reserved settings (Do not use.)	

n.X□□□	Reserved parameter (Do not change.)

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn516	2	Input Signal Selections 7	0000h to FFFFh	–	8888h	All	After restart	Setup	–

	FSTP (Forced Stop Input) Signal Allocation		Reference
n.□□□X	0	Axis A: Enable drive when CN1-3 input signal is ON (closed). Axis B: Enable drive when CN1-9 input signal is ON (closed).	*1
	1	Axis A: Enable drive when CN1-4 input signal is ON (closed). Axis B: Enable drive when CN1-10 input signal is ON (closed).	
	2	Axis A: Enable drive when CN1-5 input signal is ON (closed). Axis B: Enable drive when CN1-11 input signal is ON (closed).	
	3	Axis A: Enable drive when CN1-6 input signal is ON (closed). Axis B: Enable drive when CN1-12 input signal is ON (closed).	
	4	Axis A: Enable drive when CN1-7 input signal is ON (closed). Axis B: Enable drive when CN1-13 input signal is ON (closed).	
	5	Axis A: Enable drive when CN1-8 input signal is ON (closed). Axis B: Enable drive when CN1-14 input signal is ON (closed).	
	6	Reserved setting (Do not use.)	
	7	Set the signal to always prohibit drive (always force the motor to stop).	
	8	Set the signal to always enable drive (always disable forcing the motor to stop).	
	9	Axis A: Enable drive when CN1-3 input signal is OFF (open). Axis B: Enable drive when CN1-9 input signal is OFF (open).	
	A	Axis A: Enable drive when CN1-4 input signal is OFF (open). Axis B: Enable drive when CN1-10 input signal is OFF (open).	
	B	Axis A: Enable drive when CN1-5 input signal is OFF (open). Axis B: Enable drive when CN1-11 input signal is OFF (open).	
	C	Axis A: Enable drive when CN1-6 input signal is OFF (open). Axis B: Enable drive when CN1-12 input signal is OFF (open).	
	D	Axis A: Enable drive when CN1-7 input signal is OFF (open). Axis B: Enable drive when CN1-13 input signal is OFF (open).	
	E	Axis A: Enable drive when CN1-8 input signal is OFF (open). Axis B: Enable drive when CN1-14 input signal is OFF (open).	
	F	Reserved setting (Do not use.)	

n.□□X□	Reserved parameter (Do not change.)
n.□X□□	Reserved parameter (Do not change.)
n.X□□□	Reserved parameter (Do not change.)

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn51E	2	Position Deviation Overflow Warning Level	10 to 100	1%	100	All	Immediately	Setup	*1
Pn520	4	Position Deviation Overflow Alarm Level	1 to 1,073,741,823	1 reference unit	5242880	All	Immediately	Setup	*1
Pn522	4	Positioning Completed Width	0 to 1,073,741,824	1 reference unit	7	All	Immediately	Setup	*1
Pn524	4	Near Signal Width	1 to 1,073,741,824	1 reference unit	1073741824	All	Immediately	Setup	*1
Pn526	4	Position Deviation Overflow Alarm Level at Servo ON	1 to 1,073,741,823	1 reference unit	5242880	All	Immediately	Setup	*1
Pn528	2	Position Deviation Overflow Warning Level at Servo ON	10 to 100	1%	100	All	Immediately	Setup	*1
Pn529	2	Speed Limit Level at Servo ON	0 to 10,000	1 min^{-1}	10000	Rotary	Immediately	Setup	*1
Pn52B	2	Overload Warning Level	1 to 100	1%	20	All	Immediately	Setup	*1

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn52C	2	Base Current Derating at Motor Overload Detection	10 to 100	1%	100	All	After restart	Setup	*1
Pn530	2	Program Jogging-Related Selections	0000h to 0005h	–	0000h	All	Immediately	Setup	*1

n.□□□X	Program Jogging Operation Pattern	
	0	(Waiting time in Pn535 → Forward by travel distance in Pn531) × Number of movements in Pn536
	1	(Waiting time in Pn535 → Reverse by travel distance in Pn531) × Number of movements in Pn536
	2	(Waiting time in Pn535 → Forward by travel distance in Pn531) × Number of movements in Pn536 (Waiting time in Pn535 → Reverse by travel distance in Pn531) × Number of movements in Pn536
	3	(Waiting time in Pn535 → Reverse by travel distance in Pn531) × Number of movements in Pn536 (Waiting time in Pn535 → Forward by travel distance in Pn531) × Number of movements in Pn536
	4	(Waiting time in Pn535 → Forward by travel distance in Pn531 → Waiting time in Pn535 → Reverse by travel distance in Pn531) × Number of movements in Pn536
	5	(Waiting time in Pn535 → Reverse by travel distance in Pn531 → Waiting time in Pn535 → Forward by travel distance in Pn531) × Number of movements in Pn536
n.□□X□	Reserved parameter (Do not change.)	
n.□X□□	Reserved parameter (Do not change.)	
n.X□□□	Reserved parameter (Do not change.)	

Pn531	4	Program Jogging Travel Distance	1 to 1,073,741,824	1 reference unit	32768	All	Immediately	Setup	*1
Pn533	2	Program Jogging Movement Speed	1 to 10,000	1 min^{-1}	500	Rotary	Immediately	Setup	*1
Pn534	2	Program Jogging Acceleration/Deceleration Time	2 to 10,000	1 ms	100	All	Immediately	Setup	*1
Pn535	2	Program Jogging Waiting Time	0 to 10,000	1 ms	100	All	Immediately	Setup	*1
Pn536	2	Program Jogging Number of Movements	0 to 1,000	1 time	1	All	Immediately	Setup	*1
Pn550 All Axes	2	Analog Monitor 1 Offset Voltage	-10,000 to 10,000	0.1 V	0	All	Immediately	Setup	*1
Pn551 All Axes	2	Analog Monitor 2 Offset Voltage	-10,000 to 10,000	0.1 V	0	All	Immediately	Setup	*1
Pn552 All Axes	2	Analog Monitor 1 Magnification	-10,000 to 10,000	× 0.01	100	All	Immediately	Setup	*1
Pn553 All Axes	2	Analog Monitor 2 Magnification	-10,000 to 10,000	× 0.01	100	All	Immediately	Setup	*1
Pn55A All Axes	2	Power Consumption Monitor Unit Time	1 to 1,440	1 min	1	All	Immediately	Setup	–
Pn560	2	Residual Vibration Detection Width	1 to 3,000	0.1%	400	All	Immediately	Setup	*1
Pn561	2	Overshoot Detection Level	0 to 100	1%	100	All	Immediately	Setup	*1

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn56A	2	Output Signal Reference Method Selections 1	0000h to 1111h	–	0000h	All	After restart	Setup	*1

n.□□□X	SO1 Output Signal Reference Method Selection	
	0	Output parameter-assigned SO1 signal.
	1	Output OR of parameter-assigned SO1 signal and signal set by SVCMD_IO.
n.□□X□	SO2 Output Signal Reference Method Selection	
	0	Output parameter-assigned SO2 signal.
	1	Output OR of parameter-assigned SO2 signal and signal set by SVCMD_IO.
n.□X□□	SO3 Output Signal Reference Method Selection	
	0	Output parameter-assigned SO3 signal.
	1	Output OR of parameter-assigned SO3 signal and signal set by SVCMD_IO.
n.X□□□	SO4 Output Signal Reference Method Selection	
	0	Output parameter-assigned SO4 signal.
	1	Output OR of parameter-assigned SO4 signal and signal set by SVCMD_IO.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn56B	2	Output Signal Reference Method Selections 2	0000h to 00001h	–	0000h	All	After restart	Setup	*1

n.□□□X	SO5 Output Signal Reference Method Selection	
	0	Output parameter-assigned SO5 signal.
	1	Output OR of parameter-assigned SO5 signal and signal set by SVCMD_IO.
n.□□X□	Reserved parameter (Do not change.)	
n.□X□□	Reserved parameter (Do not change.)	
n.X□□□	Reserved parameter (Do not change.)	

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn581	2	Zero Speed Level	1 to 10,000	1 mm/s	20	Linear	Immediately	Setup	*1
Pn582	2	Speed Coincidence Detection Signal Output Width	0 to 100	1 mm/s	10	Linear	Immediately	Setup	*1
Pn583	2	Brake Reference Output Speed Level	0 to 10,000	1 mm/s	10	Linear	Immediately	Setup	*1
Pn584	2	Speed Limit Level at Servo ON	0 to 10,000	1 mm/s	10000	Linear	Immediately	Setup	*1
Pn585	2	Program Jogging Movement Speed	1 to 10,000	1 mm/s	50	Linear	Immediately	Setup	*1
Pn586	2	Motor Running Cooling Ratio	0 to 100	1%/ Max. speed	0	Linear	Immediately	Setup	–

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn587	2	Polarity Detection Execution Selection for Absolute Linear Encoder	0000h to 0001h	–	0000h	Linear	Immediately	Setup	–

	Polarity Detection Selection for Absolute Linear Encoder		Reference
n.□□□X	0	Do not detect polarity.	*1
	1	Detect polarity.	

n.□□X□	Reserved parameter (Do not change.)
n.□X□□	Reserved parameter (Do not change.)
n.X□□□	Reserved parameter (Do not change.)

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn590	2	P-OT (Forward Drive Prohibit) Signal Allocation	0000h to 3019h	–	Axis A: 1003h, Axis B: 1009h	All	After restart	Setup	*1

	Allocated Pin Number	
n.□XXX	003	Allocate the signal to CN1-3.
	004	Allocate the signal to CN1-4.
	005	Allocate the signal to CN1-5.
	006	Allocate the signal to CN1-6.
	007	Allocate the signal to CN1-7.
	008	Allocate the signal to CN1-8.
	009	Allocate the signal to CN1-9.
	010	Allocate the signal to CN1-10.
	011	Allocate the signal to CN1-11.
	012	Allocate the signal to CN1-12.
	013	Allocate the signal to CN1-13.
	014	Allocate the signal to CN1-14.

	Polarity Selection	
n.X□□□	0	Set the signal to always enable forward drive.
	1	Active when input signal is ON (closed).
	2	Active when input signal is OFF (open).
	3	Set the signal to always prohibit forward drive.

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn591	2	N-OT (Reverse Drive Prohibit) Signal Allocation	0000h to 3019h	–	Axis A: 1004h, Axis B: 1010h	All	After restart	Setup	*1

	Allocated Pin Number	
n.□XXX	003	Allocate the signal to CN1-3.
	004	Allocate the signal to CN1-4.
	005	Allocate the signal to CN1-5.
	006	Allocate the signal to CN1-6.
	007	Allocate the signal to CN1-7.
	008	Allocate the signal to CN1-8.
	009	Allocate the signal to CN1-9.
	010	Allocate the signal to CN1-10.
	011	Allocate the signal to CN1-11.
	012	Allocate the signal to CN1-12.
	013	Allocate the signal to CN1-13.
	014	Allocate the signal to CN1-14.

	Polarity Selection	
n.X□□□	0	Set the signal to always enable reverse drive.
	1	Active when input signal is ON (closed).
	2	Active when input signal is OFF (open).
	3	Set the signal to always prohibit reverse drive.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn592	2	/DEC (Origin Return Deceleration Switch Input) Signal Allocation	0000h to 3019h	–	Axis A: 1005h, Axis B: 1011h	All	After restart	Setup	–

	Allocated Pin Number	
n.□XXX	003	Allocate the signal to CN1-3.
	004	Allocate the signal to CN1-4.
	005	Allocate the signal to CN1-5.
	006	Allocate the signal to CN1-6.
	007	Allocate the signal to CN1-7.
	008	Allocate the signal to CN1-8.
	009	Allocate the signal to CN1-9.
	010	Allocate the signal to CN1-10.
	011	Allocate the signal to CN1-11.
	012	Allocate the signal to CN1-12.
	013	Allocate the signal to CN1-13.
	014	Allocate the signal to CN1-14.

	Polarity Selection	
n.X□□□	0	The signal is always inactive.
	1	Active when input signal is ON (closed).
	2	Active when input signal is OFF (open).
	3	The signal is always active.

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn593	2	/EXT1 (External Latch Input 1) Signal Allocation	0000h to 2019h	–	Axis A: 1006h, Axis B: 1012h	All	After restart	Setup	–

n.□XXX	Allocated Pin Number	
	000 to 005	The signal is always inactive.
	006	Allocate the signal to CN1-6.
	007	Allocate the signal to CN1-7.
	008	Allocate the signal to CN1-8.
	009 to 011	The signal is always inactive.
	012	Allocate the signal to CN1-12.
	013	Allocate the signal to CN1-13.
	014	Allocate the signal to CN1-14.

n.X□□□	Polarity Selection	
	0	The signal is always inactive.
	1	Active when input signal is ON (closed).
	2	Active when input signal is OFF (open).

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn594	2	/EXT2 (External Latch Input 2) Signal Allocation	0000h to 2019h	–	Axis A: 1007h, Axis B: 1013h	All	After restart	Setup	–

n.□XXX	Allocated Pin Number	
	000 to 005	The signal is always inactive.
	006	Allocate the signal to CN1-6.
	007	Allocate the signal to CN1-7.
	008	Allocate the signal to CN1-8.
	009 to 011	The signal is always inactive.
	012	Allocate the signal to CN1-12.
	013	Allocate the signal to CN1-13.
	014	Allocate the signal to CN1-14.

n.X□□□	Polarity Selection	
	0	The signal is always inactive.
	1	Active when input signal is ON (closed).
	2	Active when input signal is OFF (open).

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn595	2	/EXT3 (External Latch Input 3) Signal Allocation	0000h to 2019h	–	Axis A: 1008h, Axis B: 1014h	All	After restart	Setup	–

	Allocated Pin Number	
n.□XXX	000 to 005	The signal is always inactive.
	006	Allocate the signal to CN1-6.
	007	Allocate the signal to CN1-7.
	008	Allocate the signal to CN1-8.
	009 to 011	The signal is always inactive.
	012	Allocate the signal to CN1-12.
	013	Allocate the signal to CN1-13.
	014	Allocate the signal to CN1-14.

	Polarity Selection	
n.X□□□	0	The signal is always inactive.
	1	Active when input signal is ON (closed).
	2	Active when input signal is OFF (open).

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn597	2	FSTP (Forced Stop Input) Signal Allocation	0000h to 3019h	–	0000h	All	After restart	Setup	*1

	Allocated Pin Number	
n.□XXX	003	Allocate the signal to CN1-3.
	004	Allocate the signal to CN1-4.
	005	Allocate the signal to CN1-5.
	006	Allocate the signal to CN1-6.
	007	Allocate the signal to CN1-7.
	008	Allocate the signal to CN1-8.
	009	Allocate the signal to CN1-9.
	010	Allocate the signal to CN1-10.
	011	Allocate the signal to CN1-11.
	012	Allocate the signal to CN1-12.
	013	Allocate the signal to CN1-13.
	014	Allocate the signal to CN1-14.

	Polarity Selection	
n.X□□□	0	Set the signal to always enable drive (always disable forcing the motor to stop).
	1	Enable drive when the input signal is ON (closed).
	2	Enable drive when the input signal is OFF (open).
	3	Set the signal to always prohibit drive (always force the motor to stop).

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn598	2	/P-CL (Forward External Torque Limit Input) Signal Allocation	0000h to 3019h	–	0000h	All	After restart	Setup	*1

	Allocated Pin Number	
n.□XXX	003	Allocate the signal to CN1-3.
	004	Allocate the signal to CN1-4.
	005	Allocate the signal to CN1-5.
	006	Allocate the signal to CN1-6.
	007	Allocate the signal to CN1-7.
	008	Allocate the signal to CN1-8.
	009	Allocate the signal to CN1-9.
	010	Allocate the signal to CN1-10.
	011	Allocate the signal to CN1-11.
	012	Allocate the signal to CN1-12.
	013	Allocate the signal to CN1-13.
	014	Allocate the signal to CN1-14.

	Polarity Selection	
n.X□□□	0	The signal is always inactive.
	1	Active when input signal is ON (closed).
	2	Active when input signal is OFF (open).
	3	The signal is always active.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn599	2	/N-CL (Reverse External Torque Limit Input) Signal Allocation	0000h to 3019h	–	0000h	All	After restart	Setup	*1

	Allocated Pin Number	
n.□XXX	003	Allocate the signal to CN1-3.
	004	Allocate the signal to CN1-4.
	005	Allocate the signal to CN1-5.
	006	Allocate the signal to CN1-6.
	007	Allocate the signal to CN1-7.
	008	Allocate the signal to CN1-8.
	009	Allocate the signal to CN1-9.
	010	Allocate the signal to CN1-10.
	011	Allocate the signal to CN1-11.
	012	Allocate the signal to CN1-12.
	013	Allocate the signal to CN1-13.
	014	Allocate the signal to CN1-14.

	Polarity Selection	
n.X□□□	0	The signal is always inactive.
	1	Active when input signal is ON (closed).
	2	Active when input signal is OFF (open).
	3	The signal is always active.

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn5B0	2	/COIN (Positioning Completion Output) Signal Allocation	0000h to 2039h	–	0000h	All	After restart	Setup	*1

n.□XXX	Allocated Pin Number	
	023	Allocate the signal to CN1-23.
	025	Allocate the signal to CN1-25.
	027	Allocate the signal to CN1-27.
	029	Allocate the signal to CN1-29.
	031	Allocate the signal to CN1-31.

n.X□□□	Polarity Selection	
	0	Disabled (the above signal output is not used).
	1	Output the above signal.
	2	Invert the above signal and output it.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn5B1	2	/V-CMP (Speed Coincidence Detection Output) Signal Allocation	0000h to 2039h	–	0000h	All	After restart	Setup	*1

n.□XXX	Allocated Pin Number	
	023	Allocate the signal to CN1-23.
	025	Allocate the signal to CN1-25.
	027	Allocate the signal to CN1-27.
	029	Allocate the signal to CN1-29.
	031	Allocate the signal to CN1-31.

n.X□□□	Polarity Selection	
	0	Disabled (the above signal output is not used).
	1	Output the above signal.
	2	Invert the above signal and output it.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn5B2	2	/TGON (Rotation Detection Output) Signal Allocation	0000h to 2039h	–	0000h	All	After restart	Setup	*1

n.□XXX	Allocated Pin Number	
	023	Allocate the signal to CN1-23.
	025	Allocate the signal to CN1-25.
	027	Allocate the signal to CN1-27.
	029	Allocate the signal to CN1-29.
	031	Allocate the signal to CN1-31.

n.X□□□	Polarity Selection	
	0	Disabled (the above signal output is not used).
	1	Output the above signal.
	2	Invert the above signal and output it.

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn5B3	2	/S-RDY (Servo Ready) Signal Allocation	0000h to 2039h	–	0000h	All	After restart	Setup	*1

	Allocated Pin Number	
n.□XXX	023	Allocate the signal to CN1-23.
	025	Allocate the signal to CN1-25.
	027	Allocate the signal to CN1-27.
	029	Allocate the signal to CN1-29.
	031	Allocate the signal to CN1-31.

	Polarity Selection	
n.X□□□	0	Disabled (the above signal output is not used).
	1	Output the above signal.
	2	Invert the above signal and output it.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn5B4	2	/CLT (Torque Limit Detection Output) Signal Allocation	0000h to 2039h	–	0000h	All	After restart	Setup	*1

	Allocated Pin Number	
n.□XXX	023	Allocate the signal to CN1-23.
	025	Allocate the signal to CN1-25.
	027	Allocate the signal to CN1-27.
	029	Allocate the signal to CN1-29.
	031	Allocate the signal to CN1-31.

	Polarity Selection	
n.X□□□	0	Disabled (the above signal output is not used).
	1	Output the above signal.
	2	Invert the above signal and output it.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn5B5	2	/VLT (Speed Limit Detection) Signal Allocation	0000h to 2039h	–	0000h	All	After restart	Setup	*1

	Allocated Pin Number	
n.□XXX	023	Allocate the signal to CN1-23.
	025	Allocate the signal to CN1-25.
	027	Allocate the signal to CN1-27.
	029	Allocate the signal to CN1-29.
	031	Allocate the signal to CN1-31.

	Polarity Selection	
n.X□□□	0	Disabled (the above signal output is not used).
	1	Output the above signal.
	2	Invert the above signal and output it.

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn5B6	2	/BK (Brake Output) Signal Allocation	0000h to 2039h	–	Axis A: 1023h, Axis B: 1025h	All	After restart	Setup	*1

n.□XXX	Allocated Pin Number	
	023	Allocate the signal to CN1-23.
	025	Allocate the signal to CN1-25.
	027	Allocate the signal to CN1-27.
	029	Allocate the signal to CN1-29.
	031	Allocate the signal to CN1-31.

n.X□□□	Polarity Selection	
	0	Disabled (the above signal output is not used).
	1	Output the above signal.
	2	Invert the above signal and output it.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn5B7	2	/WARN (Warning Output) Signal Allocation	0000h to 2039h	–	0000h	All	After restart	Setup	*1

n.□XXX	Allocated Pin Number	
	023	Allocate the signal to CN1-23.
	025	Allocate the signal to CN1-25.
	027	Allocate the signal to CN1-27.
	029	Allocate the signal to CN1-29.
	031	Allocate the signal to CN1-31.

n.X□□□	Polarity Selection	
	0	Disabled (the above signal output is not used).
	1	Output the above signal.
	2	Invert the above signal and output it.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn5B8	2	/NEAR (Near Output) Signal Allocation	0000h to 2039h	–	0000h	All	After restart	Setup	*1

n.□XXX	Allocated Pin Number	
	023	Allocate the signal to CN1-23.
	025	Allocate the signal to CN1-25.
	027	Allocate the signal to CN1-27.
	029	Allocate the signal to CN1-29.
	031	Allocate the signal to CN1-31.

n.X□□□	Polarity Selection	
	0	Disabled (the above signal output is not used).
	1	Output the above signal.
	2	Invert the above signal and output it.

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn5BC	2	/PM (Preventative Maintenance Output) Signal Allocation	0000h to 2039h	–	0000h	All	After restart	Setup	*1

n.□XXX	Allocated Pin Number	
	023	Allocate the signal to CN1-23.
	025	Allocate the signal to CN1-25.
	027	Allocate the signal to CN1-27.
	029	Allocate the signal to CN1-29.
	031	Allocate the signal to CN1-31.

n.X□□□	Polarity Selection	
	0	Disabled (the above signal output is not used).
	1	Output the above signal.
	2	Invert the above signal and output it.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn600 All Axes	2	Regenerative Resistor Capacity*4	Depends on model.*5	10 W	0	All	Immediately	Setup	*1
Pn601	2	Dynamic Brake Resistor Allowable Energy Consumption	0 to 65,535	10 J	0	All	After restart	Setup	*6
Pn603 All Axes	2	Regenerative Resistance	0 to 65,535	10 mΩ	0	All	Immediately	Setup	*1
Pn604	2	Dynamic Brake Resistance	0 to 65,535	10 mΩ	0	All	After restart	Setup	*6
Pn61A	2	Overheat Protection Selections	0000h to 0003h	–	0000h	All	After restart	Setup	*1

n.□□□X	Overheat Protection Selection	
	0	Disable overheat protection.
	1	Use overheat protection in the Yaskawa Linear Servomotor.*7
	2	Monitor a negative voltage input from a sensor attached to the machine and use overheat protection.
	3	Monitor a positive voltage input from a sensor attached to the machine and use overheat protection.

n.□□X□	Reserved parameter (Do not change.)

n.□X□□	Reserved parameter (Do not change.)

n.X□□□	Reserved parameter (Do not change.)

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn61B All Axes *8	2	Overheat Alarm Level	0 to 500	0.01 V	250	All	Immediately	Setup	*1
Pn61C All Axes *8	2	Overheat Warning Level	0 to 100	1%	100	All	Immediately	Setup	*1
Pn61D All Axes *8	2	Overheat Alarm Filter Time	0 to 65,535	1 s	0	All	Immediately	Setup	*1

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn665 All Axes	2	Synchronized Stopping Function Selections	0000h to 0003h	–	0000h	All	After restart	Setup	page 4-4

n.□□□X	Synchronized Stopping Selection	
	0	Disable synchronized stopping.
	1	Enable synchronized stopping mode 1.
	2	Enable synchronized stopping mode 2.
	3	Enable synchronized stopping mode 3.
n.□□X□	Reserved parameter (Do not change.)	
n.□X□□	Reserved parameter (Do not change.)	
n.X□□□	Reserved parameter (Do not change.)	

Pn666 All Axes	2	Synchronized Stopping End Speed	1 to 65,535	1000 reference units/s	256	All	Immediately	Setup	page 4-4
Pn667 All Axes	2	Reserved parameter (Do not change.)	–	–	0	All	–	–	–
Pn668 All Axes	2	Synchronized Stopping Speed Feedforward	0 to 100	%	80	All	Immediately	Tuning	page 4-5
Pn669 All Axes	2	Position Deviation between Axes Overflow Warning Level	10 to 100	%	100	All	Immediately	Setup	page 5-3
Pn66A All Axes	4	Position Deviation between Axes Overflow Alarm Level	0 to 1073741823	Reference unit	5,242,880	All	Immediately	Setup	page 5-3

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn800	2	Communications Controls	0000h to 1FF3h	–	1040h	All	Immediately	Setup	–

n.□□□X	MECHATROLINK Communications Check Mask for Debugging	
	0	Do not mask.
	1	Ignore MECHATROLINK communications errors (A.E60).
	2	Ignore WDT errors (A.E50).
	3	Ignore both MECHATROLINK communications errors (A.E60) and WDT errors (A.E50).

n.□□X□	Warning Check Masks	
	0	Do not mask.
	1	Ignore data setting warnings (A.94□).
	2	Ignore command warnings (A.95□).
	3	Ignore both A.94□ and A.95□ warnings.
	4	Ignore communications warnings (A.96□).
	5	Ignore both A.94□ and A.96□ warnings.
	6	Ignore both A.95□ and A.96□ warnings.
	7	Ignore A.94□, A.95□, and A.96□ warnings.
	8	Ignore data setting warnings (A.97A, A.97b, and A.97C).
	9	Ignore A.94□, A.97A, A.97b, and A.97C warnings.
	A	Ignore A.95□, A.97A, A.97b, and A.97C warnings.
	B	Ignore A.94□, A95□, A.97A, A.97b, and A.97C warnings.
	C	Ignore A.96□, A.97A, A.97b, and A.97C warnings.
	D	Ignore A.94□, A96□, A.97A, A.97b, and A.97C warnings.
	E	Ignore A.95□, A96□, A.97A, A.97b, and A.97C warnings.
	F	Ignore A.94□, A95□, A96□, A.97A, A.97b, and A.97C warnings.

n.□X□□	Reserved parameter (Do not change.)

n.X□□□	Automatic Warning Clear Selection for Debugging	
	0	Retain warnings for debugging.
	1	Automatically clear warnings (MECHATROLINK-III specification).

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn801	2	Application Function Selections 6 (Software Limits)	0000h to 0103h	–	0003h	All	Immediately	Setup	*1

n.□□□X	Software Limit Selection	
	0	Enable both forward and reverse software limits.
	1	Disable forward software limit.
	2	Disable reverse software limit.
	3	Disable both forward and reverse software limits.

n.□□X□	Reserved parameter (Do not change.)

n.□X□□	Software Limit Check for References	
	0	Do not perform software limit checks for references.
	1	Perform software limit checks for references.

n.X□□□	Reserved parameter (Do not change.)

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn803	2	Origin Range	0 to 250	1 reference unit	10	All	Immediately	Setup	*2
Pn804	4	Forward Software Limit	-1,073,741,823 to 1,073,741,823	1 reference unit	1073741823	All	Immediately	Setup	*1

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn806	4	Reverse Software Limit	-1,073,741,823 to 1,073,741,823	1 reference unit	-10737 41823	All	Immediately	Setup	*1
Pn808	4	Absolute Encoder Origin Offset	-1,073,741,823 to 1,073,741,823	1 reference unit	0	All	Immediately *9	Setup	*1
Pn80A	2	First Stage Linear Acceleration Constant	1 to 65,535	10,000 reference units/s^2	100	All	Immediately *10	Setup	*2
Pn80B	2	Second Stage Linear Acceleration Constant	1 to 65,535	10,000 reference units/s^2	100	All	Immediately *10	Setup	*2
Pn80C	2	Acceleration Constant Switching Speed	0 to 65,535	100 reference units/s	0	All	Immediately *10	Setup	*2
Pn80D	2	First Stage Linear Deceleration Constant	1 to 65,535	10,000 reference units/s^2	100	All	Immediately *10	Setup	*2
Pn80E	2	Second Stage Linear Deceleration Constant	1 to 65,535	10,000 reference units/s^2	100	All	Immediately *10	Setup	*2
Pn80F	2	Deceleration Constant Switching Speed	0 to 65,535	100 reference units/s	0	All	Immediately *10	Setup	*2
Pn810	2	Exponential Acceleration/Deceleration Bias	0 to 65,535	100 reference units/s	0	All	Immediately *11	Setup	*2
Pn811	2	Exponential Acceleration/Deceleration Time Constant	0 to 5,100	0.1 ms	0	All	Immediately *11	Setup	*2
Pn812	2	Movement Average Time	0 to 5,100	0.1 ms	0	All	Immediately *11	Setup	*2
Pn814	4	External Positioning Final Travel Distance	-1,073,741,823 to 1,073,741,823	1 reference unit	100	All	Immediately	Setup	*2
Pn816	2	Reserved parameters (Do not change.)	–	–	0000h	All	–	–	–
Pn817 *12	2	Origin Approach Speed 1	0 to 65,535	100 reference units/s	50	All	Immediately *10	Setup	*2
Pn818 *13	2	Origin Approach Speed 2	0 to 65,535	100 reference units/s	5	All	Immediately *10	Setup	*2
Pn819	4	Final Travel Distance for Origin Return	-1,073,741,823 to 1,073,741,823	1 reference unit	100	All	Immediately	Setup	*2
Pn81E	2	Reserved parameters (Do not change.)	–	–	0000h	All	–	–	–
Pn81F	2	Reserved parameters (Do not change.)	–	–	0010h	All	–	–	–

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn824	2	Option Monitor 1 Selection	0000h to FFFFh	–	0000h	–	Immediately	Setup	*2

Setting	Monitor	Applicable Motors
High-Speed Monitor Region		
0000h	Motor speed [overspeed detection speed/1000000h]	All
0001h	Speed reference [overspeed detection speed/1000000h]	All
0002h	Torque [maximum torque/1000000h]	All
0003h	Position deviation (lower 32 bits) [reference units]	All
0004h	Position deviation (upper 32 bits) [reference units]	All
000Ah	Encoder count (lower 32 bits) [reference units]	All
000Bh	Encoder count (upper 32 bits) [reference units]	All
004Dh	Current Correction Amount in Position Correction Table [reference unit]	All
008Dh	Position Deviation between Axes [reference unit]	All
Low-Speed Monitor Region		
0010h	Un000: Motor speed [min^{-1}]	All
0011h	Un001: Speed Reference [min^{-1}]	All
0012h	Un002: Torque Reference [%]	All
0013h	Un003: Rotational Angle 1 [encoder pulses] Number of encoder pulses from encoder phase C displayed in decimal	All
	Un003: Electrical Angle 1 [linear encoder pulses] Linear encoder pulses from the polarity origin displayed in decimal	
0014h	Un004: Rotational Angle 2 [deg] Electrical angle from polarity origin	All
	Un004: Electrical Angle 2 [deg] Electrical angle from polarity origin	
0015h	Un005: Input Signal Monitor	All
0016h	Un006: Output Signal Monitor	All
0017h	Un007: Input Reference Speed [min^{-1}]	All
0018h	Un008: Position Deviation [reference units]	All
0019h	Un009: Accumulated Load Ratio [%]	All
001Ah	Un00A: Regenerative Load Ratio [%]	All
001Bh	Un00B: Dynamic Brake Resistor Power Consumption [%]	All
001Ch	Un00C: Input Reference Pulse Counter [reference units]	All
001Dh	Un00D: Feedback Pulse Counter [encoder pulses]	All
0023h	Initial multiturn data [Rev]	Rotary
0024h	Initial incremental data [pulses]	Rotary
0025h	Initial absolute position data (lower 32 bits) [pulses]	Linear
0026h	Initial absolute position data (upper 32 bits) [pulses]	Linear
0040h	Un025: SERVOPACK Installation Environment Monitor	All
0041h	Un026: Servomotor Installation Environment Monitor	All
0042h	Un027: Built-in Fan Remaining Life Ratio	All
0043h	Un028: Capacitor Remaining Life Ratio	All
0044h	Un029: Surge Prevention Circuit Remaining Life Ratio	All
0045h	Un02A: Dynamic Brake Circuit Remaining Life Ratio	All
0046h	Un032: Instantaneous Power	All
0047h	Un033: Power Consumption	All
0048h	Un034: Cumulative Power Consumption	All

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn824									

Setting	Monitor	Applicable Motors
Low-Speed Monitor Region (Communications Module only)		
0080h	Previous value of latched feedback position (LPOS1) [reference units]	All
0081h	Previous value of latched feedback position (LPOS2) [reference units]	All
0084h	Continuous Latch Status (EX STATUS)	All
All Areas		
Other values	Reserved settings (Do not use.)	All

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn825	2	Option Monitor 2 Selection	0000h to FFFFh	–	0000h	All	Immediately	Setup	*2

0000h to 008Dh	The settings are the same as those for the Option Monitor 1 Selection.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn827	2	Linear Deceleration Constant 1 for Stopping	1 to 65,535	10,000 reference units/s^2	100	All	Immediately *10	Setup	*2
Pn829	2	SVOFF Waiting Time (for SVOFF at Deceleration to Stop)	0 to 65,535	10 ms	0	All	Immediately *10	Setup	*2
Pn82A	2	Reserved parameters (Do not change.)	–	–	1813h	All	–	–	–
Pn82B	2	Reserved parameters (Do not change.)	–	–	1D1Ch	All	–	–	–
Pn82C	2	Reserved parameters (Do not change.)	–	–	1F1Eh	All	–	–	–
Pn82D	2	Reserved parameters (Do not change.)	–	–	0000h	All	–	–	–
Pn82E	2	Reserved parameters (Do not change.)	–	–	0000h	All	–	–	–
Pn833	2	Motion Settings	0000h to 0001h	–	0000h	All	After restart	Setup	*2

n.□□□X	Linear Acceleration/Deceleration Constant Selection	
	0	Use Pn80A to Pn80F and Pn827. (The settings of Pn834 to Pn840 are ignored.)
	1	Use Pn834 to Pn840. (The settings of Pn80A to Pn80F and Pn827 are ignored.)
n.□□X□	Reserved parameter (Do not change.)	
n.□X□□	Reserved parameter (Do not change.)	
n.X□□□	Reserved parameter (Do not change.)	

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn834	4	First Stage Linear Acceleration Constant 2	1 to 20,971,520	10,000 reference units/s^2	100	All	Immediately *10	Setup	*2
Pn836	4	Second Stage Linear Acceleration Constant 2	1 to 20,971,520	10,000 reference units/s^2	100	All	Immediately *10	Setup	*2
Pn838	4	Acceleration Constant Switching Speed 2	0 to 2,097,152,000	1 reference unit/s	0	All	Immediately *10	Setup	*2

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn83A	4	First Stage Linear Deceleration Constant 2	1 to 20,971,520	10,000 reference units/s^2	100	All	Immediately *10	Setup	*2
Pn83C	4	Second Stage Linear Deceleration Constant 2	1 to 20,971,520	10,000 reference units/s^2	100	All	Immediately *10	Setup	*2
Pn83E	4	Deceleration Constant Switching Speed 2	0 to 2,097,152,000	1 reference unit/s	0	All	Immediately *10	Setup	*2
Pn840	4	Linear Deceleration Constant 2 for Stopping	1 to 20,971,520	10,000 reference units/s^2	100	All	Immediately *10	Setup	*2
Pn842 *12	4	Second Origin Approach Speed 1	0 to 20,971,520	100 reference units/s	0	All	Immediately *10	Setup	*2
Pn844 *13	4	Second Origin Approach Speed 2	0 to 20,971,520	100 reference units/s	0	All	Immediately *10	Setup	*2
Pn846	2	POSING Command Scurve Acceleration/ Deceleration Rate	0 to 50	1%	0	All	Immediately *10	Setup	–
Pn847 All Axes	2	Position Correction Table Function Selections	0000h to 1111h	–	0000h	All	After restart	Setup	

n.□□□X	Position Correction Table Selection
0	Do not use Position Correction Table.
1	Use Position Correction Table.

n.□□X□	Reserved parameter (Do not change.)

n.□X□□	Position Correction Table-Related Monitor Selection
0	Monitor the position information before position correction.
1	Monitor the position information after position correction.

n.X□□□	Position Correction Axis Selection for Position Correction Table
0	Correct the position of axis A.
1	Correct the position of axis B.

Pn850	2	Number of Latch Sequences	0 to 8	–	0	All	Immediately	Setup	*2
Pn851	2	Continuous Latch Sequence Count	0 to 255	–	0	All	Immediately	Setup	*2

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn852	2	Latch Sequence 1 to 4 Settings	0000h to 3333h	–	0000h	All	Immediately	Setup	*2

	Latch Sequence 1 Signal Selection	
n.□□□X	0	Phase C
	1	EXT1 signal
	2	EXT2 signal
	3	EXT3 signal

	Latch Sequence 2 Signal Selection	
n.□□X□	0 to 3	The settings are the same as those for the Latch Sequence 1 Signal Selection.

	Latch Sequence 3 Signal Selection	
n.□X□□	0 to 3	The settings are the same as those for the Latch Sequence 1 Signal Selection.

	Latch Sequence 4 Signal Selection	
n.X□□□	0 to 3	The settings are the same as those for the Latch Sequence 1 Signal Selection.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn853	2	Latch Sequence 5 to 8 Settings	0000h to 3333h	–	0000h	All	Immediately	Setup	*2

	Latch Sequence 5 Signal Selection	
n.□□□X	0	Phase C
	1	EXT1 signal
	2	EXT2 signal
	3	EXT3 signal

	Latch Sequence 6 Signal Selection	
n.□□X□	0 to 3	The settings are the same as those for the Latch Sequence 5 Signal Selection.

	Latch Sequence 7 Signal Selection	
n.□X□□	0 to 3	The settings are the same as those for the Latch Sequence 5 Signal Selection.

	Latch Sequence 8 Signal Selection	
n.X□□□	0 to 3	The settings are the same as those for the Latch Sequence 5 Signal Selection.

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn860	2	SVCMD_IO Input Signal Monitor Allocations 1	0000h to 1616h	–	0000h	All	Immediately	Setup	*2

n.□□□X	Input Signal Monitor Allocation for CN1-3 (SVCMD_IO)	
	0	Allocate bit 24 (IO_STS1) to CN1-3 input signal monitor.
	1	Allocate bit 25 (IO_STS2) to CN1-3 input signal monitor.
	2	Allocate bit 26 (IO_STS3) to CN1-3 input signal monitor.
	3	Allocate bit 27 (IO_STS4) to CN1-3 input signal monitor.
	4	Allocate bit 28 (IO_STS5) to CN1-3 input signal monitor.
	5	Allocate bit 29 (IO_STS6) to CN1-3 input signal monitor.
	6	Allocate bit 30 (IO_STS7) to CN1-3 input signal monitor.

n.□□X□	CN1-3 Input Signal Monitor Enable/Disable Selection	
	0	Disable allocation for CN1-3 input signal monitor.
	1	Enable allocation for CN1-3 input signal monitor.

n.□X□□	Input Signal Monitor Allocation for CN1-4 (SVCMD_IO)	
	0 to 6	The settings are the same as the CN1-3 allocations.

n.X□□□	CN1-4 Input Signal Monitor Enable/Disable Selection	
	0	Disable allocation for CN1-4 input signal monitor.
	1	Enable allocation for CN1-4 input signal monitor.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn861	2	SVCMD_IO Input Signal Monitor Allocations 2	0000h to 1616h	–	0000h	All	Immediately	Setup	*2

n.□□□X	Input Signal Monitor Allocation for CN1-5 (SVCMD_IO)	
	0 to 6	The settings are the same as the CN1-3 allocations.

n.□□X□	CN1-5 Input Signal Monitor Enable/Disable Selection	
	0	Disable allocation for CN1-5 input signal monitor.
	1	Enable allocation for CN1-5 input signal monitor.

n.□X□□	Input Signal Monitor Allocation for CN1-6 (SVCMD_IO)	
	0 to 6	The settings are the same as the CN1-3 allocations.

n.X□□□	CN1-6 Input Signal Monitor Enable/Disable Selection	
	0	Disable allocation for CN1-6 input signal monitor.
	1	Enable allocation for CN1-6 input signal monitor.

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn862	2	SVCMD_IO Input Signal Monitor Allocations 3	0000h to 1616h	–	0000h	All	Immediately	Setup	*2

n.□□□X	Input Signal Monitor Allocation for CN1-7 (SVCMD_IO)	
	0 to 6	The settings are the same as the CN1-3 allocations.
n.□□X□	CN1-7 Input Signal Monitor Enable/Disable Selection	
	0	Disable allocation for CN1-7 input signal monitor.
	1	Enable allocation for CN1-7 input signal monitor.
n.□X□□	Input Signal Monitor Allocation for CN1-8 (SVCMD_IO)	
	0 to 6	The settings are the same as the CN1-3 allocations.
n.X□□□	CN1-8 Input Signal Monitor Enable/Disable Selection	
	0	Disable allocation for CN1-8 input signal monitor.
	1	Enable allocation for CN1-8 input signal monitor.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn863	2	SVCMD_IO Input Signal Monitor Allocations 4	0000h to 1616h	–	0000h	All	Immediately	Setup	*2

n.□□□X	Input Signal Monitor Allocation for CN1-9 (SVCMD_IO)	
	0 to 6	The settings are the same as the CN1-3 allocations.
n.□□X□	CN1-9 Input Signal Monitor Enable/Disable Selection	
	0	Disable allocation for CN1-9 input signal monitor.
	1	Enable allocation for CN1-9 input signal monitor.
n.□X□□	Input Signal Monitor Allocation for CN1-10 (SVCMD_IO)	
	0 to 6	The settings are the same as the CN1-3 allocations.
n.X□□□	CN1-10 Input Signal Monitor Enable/Disable Selection	
	0	Disable allocation for CN1-10 input signal monitor.
	1	Enable allocation for CN1-10 input signal monitor.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn864	2	SVCMD_IO Input Signal Monitor Allocations 5	0000h to 1616h	–	0000h	All	Immediately	Setup	*2

n.□□□X	Input Signal Monitor Allocation for CN1-11 (SVCMD_IO)	
	0 to 6	The settings are the same as the CN1-3 allocations.
n.□□X□	CN1-11 Input Signal Monitor Enable/Disable Selection	
	0	Disable allocation for CN1-11 input signal monitor.
	1	Enable allocation for CN1-11 input signal monitor.
n.□X□□	Input Signal Monitor Allocation for CN1-12 (SVCMD_IO)	
	0 to 6	The settings are the same as the CN1-3 allocations.
n.X□□□	CN1-12 Input Signal Monitor Enable/Disable Selection	
	0	Disable allocation for CN1-12 input signal monitor.
	1	Enable allocation for CN1-12 input signal monitor.

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn865	2	SVCMD_IO Input Signal Monitor Allocations 6	0000h to 1616h	–	0000h	All	Immediately	Setup	*2

n.□□□X	Input Signal Monitor Allocation for CN1-13 (SVCMD_IO)	
	0 to 6	The settings are the same as the CN1-3 allocations.

n.□□X□	CN1-13 Input Signal Monitor Enable/Disable Selection	
	0	Disable allocation for CN1-13 input signal monitor.
	1	Enable allocation for CN1-13 input signal monitor.

n.□X□□	Input Signal Monitor Allocation for CN1-14 (SVCMD_IO)	
	0 to 6	The settings are the same as the CN1-3 allocations.

n.X□□□	CN1-14 Input Signal Monitor Enable/Disable Selection	
	0	Disable allocation for CN1-14 input signal monitor.
	1	Enable allocation for CN1-14 input signal monitor.

Pn868	2	SVCMD_IO Output Signal Monitor Allocations 1	0000h to 1616h	–	0000h	All	Immediately	Setup	*2

n.□□□X	Output Signal Monitor Allocation for CN1-23 and CN1-24 (SVCMD_IO)	
	0	Allocate bit 24 (IO_STS1) to CN1-23/CN1-24 output signal monitor.
	1	Allocate bit 25 (IO_STS2) to CN1-23/CN1-24 output signal monitor.
	2	Allocate bit 26 (IO_STS3) to CN1-23/CN1-24 output signal monitor.
	3	Allocate bit 27 (IO_STS4) to CN1-23/CN1-24 output signal monitor.
	4	Allocate bit 28 (IO_STS5) to CN1-23/CN1-24 output signal monitor.
	5	Allocate bit 29 (IO_STS6) to CN1-23/CN1-24 output signal monitor.
	6	Allocate bit 30 (IO_STS7) to CN1-23/CN1-24 output signal monitor.

n.□□X□	CN1-23/CN1-24 Output Signal Monitor Enable/Disable Selection	
	0	Disable allocation for CN1-23/CN1-24 output signal monitor.
	1	Enable allocation for CN1-23/CN1-24 output signal monitor.

n.□X□□	Output Signal Monitor Allocation for CN1-25 and CN1-26 (SVCMD_IO)	
	0 to 6	The settings are the same as the CN1-23/CN1-24 allocations.

n.X□□□	CN1-25/CN1-26 Output Signal Monitor Enable/Disable Selection	
	0	Disable allocation for CN1-25/CN1-26 output signal monitor.
	1	Enable allocation for CN1-25/CN1-26 output signal monitor.

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn869	2	SVCMD_IO Output Signal Monitor Allocations 2	0000h to 1616h	–	0000h	All	Immediately	Setup	*2

n.□□□X	Output Signal Monitor Allocation for CN1-27 and CN1-28 (SVCMD_IO)	
	0 to 6	The settings are the same as the CN1-23/CN1-24 allocations.
n.□□X□	CN1-27/CN1-28 Output Signal Monitor Enable/Disable Selection	
	0	Disable allocation for CN1-27/CN1-28 output signal monitor.
	1	Enable allocation for CN1-27/CN1-28 output signal monitor.
n.□X□□	Output Signal Monitor Allocation for CN1-29 and CN1-30 (SVCMD_IO)	
	0 to 6	The settings are the same as the CN1-23/CN1-24 allocations.
n.X□□□	CN1-29/CN1-30 Output Signal Monitor Enable/Disable Selection	
	0	Disable allocation for CN1-29/CN1-30 output signal monitor.
	1	Enable allocation for CN1-29/CN1-30 output signal monitor.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn86A	2	SVCMD_IO Output Signal Monitor Allocations 3	0000h to 1616h	–	0000h	All	Immediately	Setup	*2

n.□□□X	Output Signal Monitor Allocation for CN1-31 and CN1-32 (SVCMD_IO)	
	0 to 6	The settings are the same as the CN1-23/CN1-24 allocations.
n.□□X□	CN1-31/CN1-32 Output Signal Monitor Enable/Disable Selection	
	0	Disable allocation for CN1-31/CN1-32 output signal monitor.
	1	Enable allocation for CN1-31/CN1-32 output signal monitor.
n.□X□□	Reserved parameter (Do not change.)	
n.X□□□	Reserved parameter (Do not change.)	

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn880	2	Station Address Monitor (for maintenance, read only)	03h to EFh	–	–	All	–	Setup	*1
Pn881	2	Set Transmission Byte Count Monitor [bytes] (for maintenance, read only)	17, 32, 48	–	–	All	–	Setup	*1
Pn882	2	Transmission Cycle Setting Monitor [× 0.25 μs] (for maintenance, read only)	0h to FFFFh	–	–	All	–	Setup	*1
Pn883	2	Communications Cycle Setting Monitor [transmission cycles] (for maintenance, read only)	0 to 32	–	–	All	–	Setup	*1

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn884	2	Communications Controls 2	0000h to 0001h	–	0000h	All	Immediately	Setup	*2

n.□□□X	MECHATROLINK Communications Error Holding Brake Signal Setting	
	0	Maintain the status set by the BRK_ON or BRK_OFF command when a MECHATROLINK communications error occurs.
	1	Apply the holding brake when a MECHATROLINK communications error occurs.
n.□□X□	Reserved parameter (Do not change.)	
n.□X□□	Reserved parameter (Do not change.)	
n.X□□□	Reserved parameter (Do not change.)	

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classification	Reference
Pn88A	2	MECHATROLINK Receive Error Counter Monitor (for maintenance, read only)	0 to 65,535	–	0	All	–	Setup	–
Pn890 to Pn8A6	4	Command Data Monitor during Alarm/Warning (for maintenance, read only)	0h to FFFFFFFFh	–	0h	All	–	Setup	*1
Pn8A8 to Pn8BE	4	Response Data Monitor during Alarm/Warning (for maintenance, read only)	0h to FFFFFFFFh	–	0h	All	–	Setup	*1
Pn900	2	Number of Parameter Banks	0 to 16	–	0	All	After restart	Setup	*2
Pn901	2	Number of Parameter Bank Members	0 to 15	–	0	All	After restart	Setup	*2
Pn902 to Pn910	2	Parameter Bank Member Definition	0000h to 08FFh	–	0000h	All	After restart	Setup	*2
Pn920 to Pn95F	2	Parameter Bank Data (Not saved in nonvolatile memory.)	0000h to FFFFh	–	0000h	All	Immediately	Setup	*2

*1. Refer to the following manual for details.
Σ-7-Series Σ-7W SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 29)

*2. Refer to the following manual for details.
Σ-7-Series AC Servo Drive MECHATROLINK-III Communications Standard Servo Profile Command Manual (Manual No.: SIEP S800001 31)

*3. Set a percentage of the motor rated torque.

*4. Normally set this parameter to 0. If you use an External Regenerative Resistor, set the capacity (W) of the External Regenerative Resistor.

*5. The upper limit is two times the maximum output capacity (W) of the SERVOPACK.

*6. These parameters are for SERVOPACKs with the dynamic brake option. Refer to the following manual for details.
Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Dynamic Brake Hardware Option Specifications Product Manual (Manual No.: SIEP S800001 73)

*7. The SGLFW2 is the only Yaskawa Linear Servomotor that supports this function.

*8. Enabled only when Pn61A is set to n.□□□2 or n.□□□3.

*9. The parameter setting is enabled after SENS_ON command execution is completed.

*10. Change the setting when the reference is stopped (i.e., while DEN is set to 1). If you change the setting during operation, the reference output will be affected.

*11. The settings are updated only if the reference is stopped (i.e., only if DEN is set to 1).

*12. The setting of Pn842 is valid while Pn817 is set to 0.

*13. The setting of Pn844 is valid while Pn818 is set to 0.

7.3 List of MECHATROLINK-III Common Parameters

The following table lists the common MECHATROLINK-III parameters. These common parameters are used to make settings from the host controller via MECHATROLINK communications. Do not change the settings with the Digital Operator or any other device.

Parameter No.	Size	Name	Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classification
01 PnA02	4	Encoder Type Selection (read only)	0h or 1h	–	–	All	–	Device information
	0000h: Absolute encoder 0001h: Incremental encoder							
02 PnA04	4	Motor Type Selection (read only)	0h or 1h	–	–	All	–	
	0000h: Rotary Servomotor 0001h: Linear Servomotor							
04 PnA08	4	Rated Speed (read only)	0h to FFFFFFFFh	x10^PnA0C min^{-1}	–	All	–	
05 PnA0A	4	Maximum Output Speed (read only)	0h to FFFFFFFFh	x10^PnA0C min^{-1}	–	All	–	
06 PnA0C	4	Speed Multiplier (read only)	-1,073,741,823 to 1,073,741,823	–	–	All	–	Device information
07 PnA0E	4	Rated Torque (read only)	0h to FFFFFFFFh	x10^PnA12 N·m	–	All	–	
08 PnA10	4	Maximum Output Torque (read only)	0h to FFFFFFFFh	x10^PnA12 N·m	–	All	–	
09 PnA12	4	Torque Multiplier (read only)	-1,073,741,823 to 1,073,741,823	–	–	All	–	
0A PnA14	4	Resolution (read only)	0h to FFFFFFFFh	1 pulse/rev	–	Rotary	–	
0B PnA16	4	Linear Scale Pitch	0 to 65,536,000	1 nm [0.01 μm]	0	Linear	After restart	
0C PnA18	4	Pulses per Scale Pitch (read only)	0h to FFFFFFFFh	1 pulse/ pitch	–	Linear	–	

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Parameter No.	Size	Name	Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classification
21 PnA42	4	Electronic Gear Ratio (Numerator)	1 to 1,073,741,824	–	16	All	After restart	Machine specifications
22 PnA44	4	Electronic Gear Ratio (Denominator)	1 to 1,073,741,824	–	1	All	After restart	
23 PnA46	4	Absolute Encoder Origin Offset	-1,073,741,823 to 1,073,741,823	1 reference unit	0	All	Immediately[*1]	
24 PnA48	4	Multiturn Limit	0 to 65,535	1 Rev	65535	Rotary	After restart	
25 PnA4A	4	Limit Setting	0h to 33h	–	0000h	All	After restart	
26 PnA4C	4	Forward Software Limit	-1,073,741,823 to 1,073,741,823	1 reference unit	1073741823	All	Immediately	
27 PnA4E	4	Reserved parameter (Do not change.)	–	–	0	All	Immediately	
28 PnA50	4	Reverse Software Limit	-1,073,741,823 to 1,073,741,823	1 reference unit	-1073741823	All	Immediately	
29 PnA52	4	Reserved parameter (Do not change.)	–	–	0	All	Immediately	
41 PnA82	4	Speed Unit Selection	0h to 4h	–	0h	All	After restart	Unit settings
42 PnA84	4	Speed Base Unit Selection [*2, *3, *4] (Set the value of n from the following formula: Speed unit selection (41 PnA82) × 10^n)	-3 to 3	–	0	All	After restart	
43 PnA86	4	Position Unit Selection	0h	–	0h	All	After restart	

25 PnA4A

Bit 0	P-OT (0: Enabled, 1: Disabled)
Bit 1	N-OT (0: Enabled, 1: Disabled)
Bit 2	Reserved.
Bit 3	Reserved.
Bit 4	P-SOT (0: Disabled, 1: Enabled)
Bit 5	N-SOT (0: Disabled, 1: Enabled)
Bits 6 to 31	Reserved.

41 PnA82

0000h	Reference units/s
0001h	Reference units/min
0002h	Percentage (%) of rated speed[*2, *3]
0003h	min^{-1} [*3]
0004h	Maximum motor speed/40000000h[*4]

43 PnA86

0000h	Reference units

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Parameter No.	Size	Name	Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classification
44 PnA88	4	Position Base Unit Selection (Set the value of n from the following formula: Position unit selection (43 PnA86) × 10^n)	0	–	0	All	After restart	Unit settings
45 PnA8A	4	Acceleration Unit Selection	0h	–	0h	All	After restart	
	0000h: Reference units/s^2							
46 PnA8C	4	Acceleration Base Unit Selection (Set the value of n from the following formula: Acceleration unit selection (45 PnA8A) × 10^n)	4 to 6	–	4	All	After restart	
47 PnA8E	4	Torque Unit Selection	1h or 2h	–	1h	All	After restart	
	0001h: Percentage (%) of rated torque*5 0002h: Maximum torque/40000000h*6							
48 PnA90	4	Torque Base Unit Selection*5, *6 (Set the value of n from the following formula: Torque unit Selection (47 PnA8E) × 10^n)	-5 to 0	–	0	All	After restart	
49 PnA92	4	Supported Unit (read only)	–	–	0601011Fh	All	–	

Speed Units	
Bit 0	Reference units/s (1: Enabled)
Bit 1	Reference units/min (1: Enabled)
Bit 2	Percentage (%) of rated speed (1: Enabled)
Bit 3	min^{-1} (rpm) (1: Enabled)
Bit 4	Maximum motor speed/4000000h (1: Enabled)
Bits 5 to 7	Reserved (0: Disabled).
Position Units	
Bit 8	Reference units (1: Enabled)
Bits 9 to 15	Reserved (0: Disabled).
Acceleration Units	
Bit 16	Reference units/s^2 (1: Enabled)
Bit 17	ms (acceleration time required to reach rated speed) (0: Disabled)
Bits 18 to 23	Reserved (0: Disabled).
Torque Units	
Bit 24	N·m (0: Disabled)
Bit 25	Percentage (%) of rated torque (1: Enabled)
Bit 26	Maximum torque/40000000h (1: Enabled)
Bits 27 to 31	Reserved (0: Disabled).

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Parameter No.	Size	Name	Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classification
61 PnAC2	4	Speed Loop Gain	1,000 to 2,000,000	0.001 Hz [0.1 Hz]	40000	All	Immediately	Tuning
62 PnAC4	4	Speed Loop Integral Time Constant	150 to 512,000	1 µs [0.01 ms]	20000	All	Immediately	
63 PnAC6	4	Position Loop Gain	1,000 to 2,000,000	0.001/s [0.1/s]	40000	All	Immediately	
64 PnAC8	4	Feed Forward Compensation	0 to 100	1%	0	All	Immediately	
65 PnACA	4	Position Loop Integral Time Constant	0 to 5,000,000	1 µs [0.1 ms]	0	All	Immediately	
66 PnACC	4	In-position Range	0 to 1,073,741,824	1 reference unit	7	All	Immediately	
67 PnACE	4	Near-position Range	1 to 1,073,741,824	1 reference unit	1073741824	All	Immediately	
81 PnB02	4	Exponential Function Acceleration/ Deceleration Time Constant	0 to 510,000	1 µs [0.1 ms]	0	All	Immediately*7	
82 PnB04	4	Movement Average Time	0 to 510,000	1 µs [0.1 ms]	0	All	Immediately*7	
83 PnB06	4	Final Travel for External Input Positioning	-1,073,741,823 to 1,073,741,823	1 reference unit	100	All	Immediately	
84 PnB08	4	Zero Point Return Approach Speed	0h to 3FFFFFFFh	10^{-3} min^{-1}	× 5,000h reference units/s converted to 10^{-3} min^{-1}	All	Immediately	
85 PnB0A	4	Zero Point Return Creep Speed	0h to 3FFFFFFFh	10^{-3} min^{-1}	× 500h reference units/s converted to 10^{-3} min^{-1}	All	Immediately	
86 PnB0C	4	Final Travel for Zero Point Return	-1,073,741,823 to 1,073,741,823	1 reference unit	100	All	Immediately	
87 PnB0E	4	Monitor Select 1	0h to Fh	–	1h	All	Immediately	

0000h	APOS
0001h	CPOS
0002h	PERR
0003h	LPOS1
0004h	LPOS2
0005h	FSPD
0006h	CSPD
0007h	TRQ
0008h	ALARM
0009h	MPOS
000Ah	Reserved (undefined value).
000Bh	Reserved (undefined value).
000Ch	CMN1 (common monitor 1)
000Dh	CMN2 (common monitor 2)
000Eh	OMN1 (optional monitor 1)
000Fh	OMN2 (optional monitor 2)

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Parameter No.	Size	Name	Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classification
88 PnB10	4	Monitor Select 2	0h to Fh	–	0h	All	Immediately	

0000h to 000Fh	The settings are the same as those for Fixed Monitor Selection 1.

Parameter No.	Size	Name	Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classification
89 PnB12	4	Monitor Select for SEL_MON1	0h to 9h	–	0h	All	Immediately	

0000h	TPOS (target position in reference coordinate system)
0001h	IPOS (reference position in reference coordinate system)
0002h	POS_OFFSET (offset set in POS_SET (Set Coordinate System) command)
0003h	TSPD (target speed)
0004h	SPD_LIM (speed limit)
0005h	TRQ_LIM (torque limit)
0006h	SV_STAT (servo actual operating status) Monitor Description Byte 1: Current communications phase 00h: Phase 0 01h: Phase 1 02h: Phase 2 03h: Phase 3 Byte 2: Current control mode 00h: Position control mode 01h: Speed control mode 02h: Torque control mode Byte 3: Reserved Byte 4: Expansion signal monitor

Bit	Name	Description	Value	Setting
Bit 0	LT_RDY1	Processing status for latch detection for LT_REQ1 in SVCMD_CTRL region	0	Latch detection not yet processed.
			1	Processing latch detection in progress.
Bit 1	LT_RDY1	Processing status for latch detection for LT_REQ2 in SVCMD_CTRL region	0	Latch detection not yet processed.
			1	Processing latch detection in progress.
Bits 2 and 3	LT_SEL1R	Latch signal	0	Phase C
			1	External input signal 1
			2	External input signal 2
			3	External input signal 3
Bits 4 and 5	LT_SEL2R	Latch signal	0	Phase C
			1	External input signal 1
			2	External input signal 2
			3	External input signal 3
Bit 6	Reserved (0).			

0007h	Reserved.	
0008h	INIT_PGPOS (Low)	Lower 32 bits of initial encoder position converted to 64-bit position reference data
0009h	INIT_PGPOS (High)	Upper 32 bits of initial encoder position converted to 64-bit position reference data

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Parameter No.	Size	Name	Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classification
8A PnB14	4	Monitor Select for SEL_MON2	0h to 9h	–	0h	All	Immediately	Command-related parameters
	0000h to 0009h	The settings are the same as those for SEL_MON Monitor Selection 1.						
8B PnB16	4	Zero Point Detection Range	0 to 250	1 reference unit	10	All	Immediately	
8C PnB18	4	Forward Torque Limit	0 to 800	1%	100	All	Immediately	
8D PnB1A	4	Reverse Torque Limit	0 to 800	1%	100	All	Immediately	
8E PnB1C	4	Zero Speed Detection Range	1,000 to 10,000,000	10^{-3} min^{-1}	20000	All	Immediately	
8F PnB1E	4	Speed Match Signal Detection Range	0 to 100,000	10^{-3} min^{-1}	10000	All	Immediately	
90 PnB20	4	SVCMD_CTRL bit Enabled/Disabled (read only)	–	–	0FFF3F3Fh	All	–	
	Bit 0	CMD_PAUSE (1: Enabled)						
	Bit 1	CMD_CANCEL (1: Enabled)						
	Bits 2 and 3	STOP_MODE (1: Enabled)						
	Bits 4 and 5	ACCFIL (1: Enabled)						
	Bits 6 and 7	Reserved (0: Disabled).						
	Bit 8	LT_REQ1 (1: Enabled)						
	Bit 9	LT_REQ2 (1: Enabled)						
	Bits 10 and 11	LT_SEL1 (1: Enabled)						
	Bits 12 and 13	LT_SEL2 (1: Enabled)						
	Bits 14 and 15	Reserved (0: Disabled).						
	Bits 16 to 19	SEL_MON1 (1: Enabled)						
	Bits 20 to 23	SEL_MON2 (1: Enabled)						
	Bits 24 to 27	SEL_MON3 (1: Enabled)						
	Bits 28 to 31	Reserved (0: Disabled).						

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Parameter No.	Size	Name	Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classification
91 PnB22	4	SVCMD_STAT bit Enabled/Disabled (read only)	–	–	0FFF3F33 h	All	–	Command-related parameters

Bit 0	CMD_PAUSE_CMP (1: Enabled)
Bit 1	CMD_CANCEL_CMP (1: Enabled)
Bit 2 and 3	Reserved (0: Disabled).
Bits 4 and 5	ACCFIL (1: Enabled)
Bits 6 and 7	Reserved (0: Disabled).
Bit 8	L_CMP1 (1: Enabled)
Bit 9	L_CMP2 (1: Enabled)
Bit 10	POS_RDY (1: Enabled)
Bit 11	PON (1: Enabled)
Bit 12	M_RDY (1: Enabled)
Bit 13	SV_ON (1: Enabled)
Bits 14 and 15	Reserved (0: Disabled).
Bits 16 to 19	SEL_MON1 (1: Enabled)
Bits 20 to 23	SEL_MON2 (1: Enabled)
Bits 24 to 27	SEL_MON3 (1: Enabled)
Bits 28 to 31	Reserved (0: Disabled).

Parameter No.	Size	Name	Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classification
92 PnB24	4	I/O Bit Enabled/Disabled (Output) (read only)	–	–	01FF01F0 h	All	–	Command-related parameters

Bits 0 to 3	Reserved (0: Disabled).
Bit 4	V_PPI (1: Enabled)
Bit 5	P_PPI (1: Enabled)
Bit 6	P_CL (1: Enabled)
Bit 7	N_CL (1: Enabled)
Bit 8	G_SEL (1: Enabled)
Bits 9 to 11	G_SEL (0: Disabled)
Bits 12 to 15	Reserved (0: Disabled).
Bits 16 to 19	BANK_SEL (1: Enabled)
Bits 20 to 24	SO1 to SO5 (1: Enabled)
Bits 25 to 31	Reserved (0: Disabled).

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Parameter No.	Size	Name	Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classification
93 PnB26	4	I/O Bit Enabled/Disabled (Input) (read only)	–	–	FF0FFEFEh	All	–	Command-related parameters

Bit 0	Reserved (0: Disabled).
Bit 1	DEC (1: Enabled)
Bit 2	P-OT (1: Enabled)
Bit 3	N-OT (1: Enabled)
Bit 4	EXT1 (1: Enabled)
Bit 5	EXT2 (1: Enabled)
Bit 6	EXT3 (1: Enabled)
Bit 7	ESTP (1: Enabled)
Bit 8	Reserved (0: Disabled).
Bit 9	BRK_ON (1: Enabled)
Bit 10	P-SOT (1: Enabled)
Bit 11	N-SOT (1: Enabled)
Bit 12	DEN (1: Enabled)
Bit 13	NEAR (1: Enabled)
Bit 14	PSET (1: Enabled)
Bit 15	ZPOINT (1: Enabled)
Bit 16	T_LIM (1: Enabled)
Bit 17	V_LIM (1: Enabled)
Bit 18	V_CMP (1: Enabled)
Bit 19	ZSPD (1: Enabled)
Bits 20 to 23	Reserved (0: Disabled).
Bits 24 to 31	IO_STS1 to IO_STS8 (1: Enabled)

*1. The parameter setting is enabled after SENS_ON command execution is completed.

*2. If you set the Speed Unit Selection (parameter 41: PnA82) to 0002h adjust the Speed Base Unit Selection (parameter 42: PnA84) to satisfy the following formula.
Rotary Servomotor: $1.28 \times$ Rated speed [min^{-1}] $\times 10^{PnA84}$ < Maximum speed [min^{-1}]
Linear Servomotor: $1.28 \times$ Rated speed [mm/s] $\times 10^{PnA84}$ < Maximum speed [mm/s]

*3. If you set the Speed Unit Selection (parameter 41: PnA82) to either 0002h or 0003h, set the Speed Base Unit Selection (parameter 42: PnA84) to a number between -3 and 0.

*4. If you set the Speed Unit Selection (parameter 41: PnA82) to 0004h, set the Speed Base Unit Selection (parameter 42: PnA84) to 0.

*5. If you set the Torque Unit Selection (parameter 47: PnA8E) to 0001h, adjust the Torque Base Unit Selection (parameter 48: PnA90) to satisfy the following formula.
128×10^{PnA90} < Maximum torque [%]

*6. If you set the Torque Unit Selection (parameter 47: PnA8E) to 0002h, set the Torque Base Unit Selection (parameter 48: PnA90) to 0.

*7. Change the setting when the reference is stopped (i.e., while DEN is set to 1). If you change the setting during operation, the reference output will be affected.

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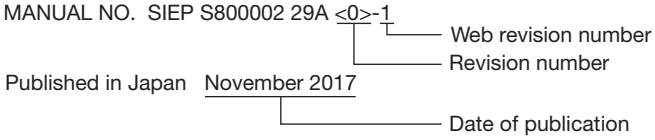
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Σ-7-Series AC Servo Drive

Σ-7W SERVOPACK with FT/EX Specification for Gantry Applications

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