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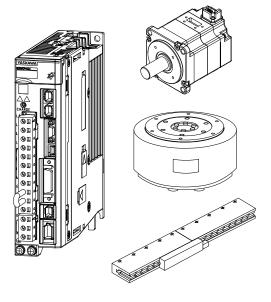
 Σ -7-Series AC Servo Drive

Σ -7S SERVOPACK with FT/EX Specification for Tracking Application

Product Manual

Model: SGD7S-□□□A00□□□□F19□, -□□□A20□□□□□F19□

Σ7



Basic Information on SERVOPACKs

SERVOPACK Ratings and Specifications

Less-Deviation Control

Maintenance

Parameter Lists

Maintenance

MANUAL NO. SIEP S800001 89E

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About this Manual

This manual describes the tracking application option for Σ -7-Series AC Servo Drive Σ -7S SERVO-PACKs.

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 you use the SERVOPACK, read this manual and the relevant product manual given in the following table.

ltem			Σ -7-Series AC Servo Drive Σ -73	S SERVOPACK Product Manual
		This Manual	SERVOPACKs with Analog Voltage/Pulse Train References (Manual No.: SIEP S800001 26)	SERVOPACKs with MECHATROLINK-III Communications References (Manual No.: SIEP S800001 28)
	The Σ -7 Series	-	1	.1
	Product Introduction	1.1	-	-
Basic	Interpreting the Name- plates	ı	1	.2
Informa-	Part Names	-	1	.3
tion on	Model Designations	-	1	.4
SERVO- PACKs	Combinations of SERVOPACKs and Servomotors	-	1	.5
	Functions	1.4	-	-
	SigmaWin+	1.5	-	-
	Ratings	2.1	-	-
	SERVOPACK Overload Protection Characteristics	2.2	-	-
Selecting	Specifications	2.3	-	-
a SERVO-	Block Diagrams	ı	2	.2
PACK	External Dimensions	-	2	.3
	Examples of Standard Connections between SERVOPACKs and Peripheral Devices	ı	2	.4
SERVOPA	CK Installation	1	Chap	oter 3
Wiring and Connecting SERVO- PACKs		-	Chap	oter 4
Basic Functions That Require Setting before Operation		-	Chap	oter 5
Application	Application Functions		Chap	oter 6
Trial Operation and Actual Operation		_	Chap	oter 7
Tuning		_	Char	oter 8

			Σ -7-Series AC Servo Drive Σ -75	S SERVOPACK Product Manual
Item		This Manual	SERVOPACKs with Analog Voltage/Pulse Train References (Manual No.: SIEP S800001 26)	SERVOPACKs with MECHATROLINK-III Communications References (Manual No.: SIEP S800001 28)
	Monitoring Product Information	_	9	.1
	Monitoring SERVO- PACK Status	_	9	.2
Monitoring	Monitoring Machine Operation Status and Signal Waveforms	3.6	-	-
	Monitoring Product Life	_	9	.4
Fully-Close	d Loop Control	_	Chap	ter 10
Safety Fund	ctions	-	Chap	ter 11
	Introduction	3.1	-	-
	Restrictions	3.2	-	-
Less- Deviation	Adjusting Less-Deviation Control 2	3.3	-	-
Control	Adjusting Less-Deviation Control 1	3.4	-	-
	Reference Compensation	3.5	-	-
	Inspections and Part Replacement	_	12	2.1
	Alarm Displays	4.1.1, 4.2.1	-	-
	List of Alarms	4.1.2, 4.2.2	-	-
	Troubleshooting Alarms	4.1.3, 4.2.3	-	-
Mainte-	Warning Displays	4.1.4, 4.2.4	-	_
nance	List of Warnings	4.1.5, 4.2.5	_	
	Troubleshooting Warnings	4.1.6, 4.2.6	-	-
	Troubleshooting Based on the Operation and Conditions of the Servomotor	4.1.7, 4.2.7	-	-
Panel Displ Procedures	ays and Panel Operator	_	Chapter 13	-
	Interpreting the Parameter Lists	5.1.1, 5.2.1	-	-
Parame-	List of Parameters and List of Servo Parame- ters	5.1.2, 5.2.2	-	-
ter Lists	List of MECHA- TROLINK-III Common Parameters	5.2.3	-	-
	Parameter Recording Table	5.1.3, 5.2.4	-	-
Appendices	S	_	Chapter 15	Chapter 14
·				

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.

System Components Servo Drives Machine Controllers (1) Catalogs Machine (3) Controller MP3300 Σ -7-Series and Servo Drive Catalog Catalog General Catalog Machine Controllers (5) SERVOPACKs with Built-in Controllers: Σ -7C Built-in Option Function Module User's 7 8 4 Manuals Manuals Enclosed Σ-7-Series Built-in Σ -7-Series **Documents** Σ-7C Function Σ-7C SERVOPACK SERVOPACK Manuals SERVOPACKs: Σ -7S and Σ -7W Troubleshooting Product Manual Manual Enclosed Σ -7-Series Σ-7-Series Σ-7-Series Option Documents Σ -7S/ Σ -7W Σ-7S/Σ-7W Σ-7S/Σ-7W Module SERVOPACK SERVOPACK SERVOPACK Hardware Option FT/EX User's Product Product Manuals Manual Manuals Manuals Product Manuals (such as this manual) Servomotors Enclosed Σ-7-Series Documents Servomotor Product Manuals Other Documents Σ-7-Series Programming Σ -7-Series Distributed Σ-7-Series MECHATROLINK Operation I/O Module Manuals Peripheral Interface Communications Device User's Command Operating Manual Selection Manuals Manuals Manual

Classification	Document Name	Document No.	Description
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.
	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.
Built-in Function Manuals	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 SERVO-PACKs.
	Machine Controller MP2000 Series Communication Module User's Manual	SIEP C880700 04	
	Machine Controller MP2000 Series 262IF-01 FL-net Communication Module User's Manual	SIEP C880700 36	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
⑤ Option Module	Machine Controller MP2000 Series 263IF-01 EtherNet/IP Communication Module User's Manual	SIEP C880700 39	SERVOPACKs.
User's Manuals	Machine Controller MP2000 Series I/O Module User's Manual	SIEP C880700 34	
	Machine Controller MP2000 Series Analog Input/Analog Output Module AI-01/AO-01 User's Manual	SIEP C880700 26	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 Counter Module CNTR-01 User's Manual	SIEP C880700 27	TO SELLIVOLVIOLO.

Classification	Document Name	Document No.	Description
	Σ -7-Series AC Servo Drive Σ -7S and Σ -7W 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.
© Enclosed Documents	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 SERVO-PACKs; installing, connecting, setting, testing in trial operation, and tuning Servo Drives; writing, monitoring, and maintaining programs; and other information.
\$Σ-7-SeriesΣ-7C SERVOPACKTroubleshootingManual	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.

Classification	Document Name	Document No.	Description
	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	
⑤Σ-7-SeriesΣ-7S/Σ-7W	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual	SIEP S800001 26	Provide detailed information on selecting Σ-7-Series Σ-7S and Σ-7W SERVOPACKs; installing, connecting, setting, testing in trial
SERVOPACK Product Manuals	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK Command Option Attachable Type with INDEXER Module Product Manual	SIEP S800001 64	operation, tuning, monitoring, and maintaining Servo Drives; and other information.
	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	29
	Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifica- tions Dynamic Brake Product Manual	SIEP S800001 73	Provide detailed information on
SERVOPACK with Hardware Option Specifications Product Manuals	Σ-7-Series AC Servo Drive Σ-7W/Σ-7C SERVOPACK with Hardware Option Specifica- tions HWBB Function Product Manual	SIEP S800001 72	Hardware Options for Σ-7-Series SERVOPACKs.

	_		Continued from previous page.
Classification	Document Name	Document No.	Description
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Index- ing Application Product Manual	SIEP S800001 84	
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Track- ing Application Product Manual	This 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	
$^{\oplus}$ Σ -7-Series	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Transfer and Alignment Application Product Manual	SIEP S800001 95	Provide detailed information on the FT/EX Option for Σ-7-Series SERVOPACKs.
Σ-7S/Σ-7W SERVOPACK FT/EX Product Manuals	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	SIEP S800002 29	

Classification	Document Name	Document No.	Continued from previous page.
Classification	AC Servo Drives	Document No.	Description
® Option Module User's Manual	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.
(B)	AC Servo Drive Rotary Servomotor Safety Precautions	TOBP C230260 00	Provides detailed information for the safe usage of Rotary Servomo- tors and Direct Drive Servomotors.
Enclosed Documents	AC Servomotor Linear Σ Series Safety Precautions	TOBP C230800 00	Provides detailed information for the safe usage of Linear Servomo- tors.
	Σ-7-Series AC Servo Drive Rotary Servomotor Product Manual	SIEP S800001 36	
[®] Σ-7-Series Servomotor Product Manuals	Σ-7-Series AC Servo Drive Linear Servomotor Product Manual	SIEP S800001 37	Provide detailed information on selecting, installing, and connecting the Σ -7-Series Servomotors.
	Σ-7-Series AC Servo Drive Direct Drive Servomotor Product Manual	SIEP S800001 38	
® 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
© Σ-7-Series	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.
MECHATROLINK Communications Command Manuals	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.
0	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.
Programming Manuals	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. Continued on next page.

Classification	Document Name	Document No.	Description
	Machine Controller MP2000/MP3000 Series Engineering Tool MPE720 Version 7 User's Manual	SIEP C880761 03	Describes in detail how to operate MPE720 version 7.
[®] Σ-7-Series Operation Interface Operating Manuals	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.
® 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.

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, Direct Drive Servomotor, or Linear Servomotor.
Rotary Servomotor	A generic term used for a Σ-7-Series Rotary Servomotor (SGM7M, SGM7J, SGM7A, SGM7P, SGM7G, or SGMMV) or a Direct Drive Servomotor (SGM7E, SGM7F, SGMCV, or SGMCS). The descriptions will specify when Direct Drive Servomotors are excluded.
Linear Servomotor	A Σ-7-Series Linear Servomotor (SGLG, SGLF, SGLT, or SGLC).
SERVOPACK	A Σ -7-Series Σ -7S Servo Amplifier with Analog Voltage/Pulse Train References or MECHA-TROLINK-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.

◆ 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.

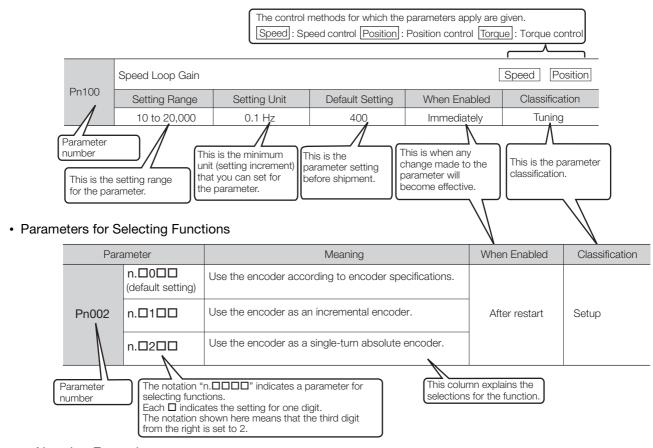
Notation Example

BK is written as /BK.

Notation for Parameters

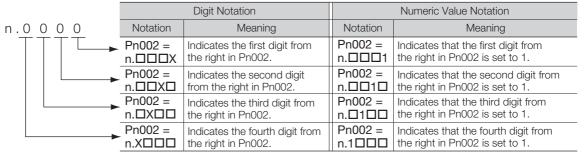
The notation depends on whether the parameter requires a numeric setting (parameter for numeric setting) or requires the selection of a function (parameter for selecting functions).

Parameters for Numeric Settings



Notation Example

Notation Examples for Pn002



◆ Engineering Tools Used in This Manual

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

♦ Trademarks

- MECHATROLINK is a trademark of the MECHATROLINK Members Association.
- QR code is a trademark of Denso Wave Inc.
- 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.



Indicates precautions or restrictions that must be observed.

Also indicates alarm displays and other precautions that will not result in machine damage.



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.

A 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.
- The person who designs the system that uses the hard wire base block safety function must have a complete knowledge of the related safety standards and a complete understanding of the instructions in this document.

There is a risk of injury, product damage, or machine damage.

• 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.

- 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

A 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

M 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.

- 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

M 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.

- 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

A 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/ \oplus and \ominus 2 terminals and the L1C and L2C terminals on the SERVOPACK.

There is a risk of failure or fire.

• If you use a SERVOPACK that supports a Dynamic Brake 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 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 SER-VOPACK 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 cable connector screws and lock mechanisms.

 Insufficient tightening may result in cable 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

MARNING

- 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 specifications 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.
 - \subseteq 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.

- 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.
- After you complete trial operation of the machine and facilities, use the SigmaWin+ to back up
 the settings of the SERVOPACK parameters. You can use them to reset the parameters after
 SERVOPACK replacement.

If you do not copy backed up parameter settings, normal operation may not be possible after a faulty SERVOPACK is replaced, possibly resulting in machine or equipment damage.

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 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 normally, 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.

MARNING

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, 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 document 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 document are sometimes shown without covers or
 protective guards. Always replace all covers and protective guards before you use the product.
- If you need a new copy of this document because it has been lost or damaged, contact your nearest Yaskawa representative or one of the offices listed on the back of this document.
- This document is subject to change without notice for product improvements, specifications changes, and improvements to the manual itself.
 We will update the document number of the document 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 Other Safety Standards

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.

North American Safety Standards (UL)



Product	Model	North American Safety Standards (UL File No.)
SERVOPACKs	SGD7S	UL 61800-5-1 (E147823) CSA C22.2 No.274
Rotary Servomotors	• SGM7M • SGM7A • SGM7J • SGM7P • SGM7G • SGMMV	UL 1004-1 UL 1004-6 (E165827)
Direct Drive Servomotors	SGM7E SGM7F-□□A, -□□B, -□□C, and -□□D (Small-Capacity Servomotors with Cores) SGMCV SGMCS-□□B, -□□C, -□□D, and -□□E (Small-Capacity, Coreless Servomotors)	UL 1004-1 UL 1004-6 (E165827)
Linear Servomotors	• SGLGW* • SGLFW* • SGLFW2 • SGLTW*	UL 1004-1 UL 1004-6 (E165827)

^{*} Only products with derating specifications are in compliance with the UL Standards. Estimates are available for those products. Contact your Yaskawa representative for details.

◆ EU Directives







Product	Model	EU Directives	Harmonized Standards
	SGD7S	Machinery Directive 2006/42/EC	EN ISO13849-1: 2015
SERVOPACKs		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 50178 EN 61800-5-1
		RoHS Directive 2011/65/EU	EN 50581
	COMM	EMC Directive 2004/108/EC	EN 55011 group 1, class A EN 61000-6-2 EN 61800-3 (Category C2, Second environment)
	SGMMV	Low Voltage Directive 2006/95/EC	EN 60034-1 EN 60034-5
Dotony		RoHS Directive 2011/65/EU	EN 50581
Rotary Servomotors	• SGM7M • SGM7J • SGM7A	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)
	• SGM7P • SGM7G	Low Voltage Directive 2014/35/EU	EN 60034-1 EN 60034-5
		RoHS Directive 2011/65/EU	EN 50581
Direct Drive	• SGM7E • SGM7F • SGMCV • SGMCS-□□B,	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)
Servomotors	- DC, - DD, and - DE (Small-Capacity, Coreless Servomotors)	Low Voltage Directive 2014/35/EU	EN 60034-1 EN 60034-5
		RoHS Directive 2011/65/EU	EN 50581
Linear	• SGLG* • SGLF*	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)
Servomotors	• SGLF□2 • SGLT*	Low Voltage Directive 2014/35/EU	EN 60034-1
		RoHS Directive 2011/65/EU	EN 50581

^{*} For Moving Coils, only models with "-E" at the end of model numbers are certified.

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.

♦ Safety Standards



Product	Model	Safety Standards	Standards
SERVOPACKs	SGD7S	Safety of Machinery	EN ISO13849-1: 2015 IEC 60204-1
		Functional Safety	IEC 61508 series IEC 62061 IEC 61800-5-2
		EMC	IEC 61326-3-1

■ Safety Parameters

Item	Standards	Performance Level	
Safety Integrity Level	IEC 61508	SIL3	
Safety integrity Level	IEC 62061	SILCL3	
Mission Time	IEC 61508	10 years	20 years
Probability of Dangerous Failure per Hour	IEC 61508 IEC 62061	PFH = 4.04×10 ⁻⁹ [1/h] (4.04% of SIL3)	PFH = 4.05×10 ⁻⁹ [1/h] (4.05% of SIL3)
Performance Level	EN ISO 13849-1	PLe (Category 3)	
Mean Time to Dangerous Failure of Each Channel	EN ISO 13849-1	MTTFd: High	
Average Diagnostic Coverage	EN ISO 13849-1	DCavg: Medium	
Stop Category	IEC 60204-1	Stop category 0	
Safety Function	IEC 61800-5-2	STO	
Hardware Fault Tolerance	IEC 61508	HFT = 1	
Subsystem	IEC 61508	В	

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Revision History

Basic Information on SERVOPACKs

This chapter provides information required to select SERVOPACKs, such as the SERVOPACK models.

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1.1

Product Introduction

The FT19 SERVOPACKs use less-deviation control to perform tracking. There are the following two modes for less-deviation control. Set the mode in Pn195 = $n.X\square\square\square$ (Less-Deviation Mode Selection).

Less-Deviation Control Mode	Remarks
Less-Deviation Control 1 (Pn195 = n.0□□□)	Use this mode for compatibility with the $\Sigma\textsc{-V-EX-Series}$ EX002 SERVO-PACKs.
Less-Deviation Control 2 (Pn195 = n.2□□□)	This mode reduces the maximum deviation and eliminates overshooting before reference distribution has been completed. Adjustments are possible for higher response than with Less-Deviation Control 1 Mode.

Refer to the following chapter for details on less-deviation control.

Gapter 3 Less-Deviation Control (page 3-1)

1.2 Model Designations

1.2.1 Interpreting SERVOPACK Model Numbers

SGD7S

 Σ -7-Series Σ -7S SERVOPACKs

1st+2nd+3rd digits









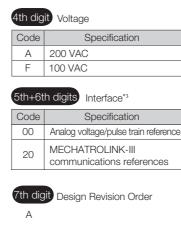






Hardware Options

1st+2nd	d+3rd digi	Maximum Applicable Motor Capacity
Voltage	Code	Specification
	R70*1	0.05 kW
	R90*1	0.1 kW
	1R6*1	0.2 kW
	2R8*1	0.4 kW
	3R8	0.5 kW
	5R5*1	0.75 kW
Three-	7R6	1.0 kW
Phase,	120*2	1.5 kW
200 VAC	180	2.0 kW
	200	3.0 kW
	330	5.0 kW
	470	6.0 kW
	550	7.5 kW
	590	11 kW
	780	15 kW
	R70	0.05 kW
Single- Phase,	R90	0.1 kW
100 \ // 0	2R1	0.2 kW



Code	Specification Applicable Mo		
000	Without options	All models	
11th+	12th+13th digits FI	/EX Specificat	
_		·	
11th+	12th+13th digits FI	·	
_		·	

THY digit 210 oppositionation			
Code	Specification		
None	None		
В	BTO specification		

14th digit BTO Specification*4

- *1. You can use these models with either a single-phase or three-phase input.
- *2. A model with a single-phase, 200-VAC power supply input is available as a hardware option (model: SGD7S-120A□□A008).
- *3. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.
- *4. The BTO specification indicates if the SERVOPACK is customized by using the MechatroCloud BTO service. This service is available on the e-mechatronics website. You need a BTO number to order SERVOPACKs with customized specifications.

Refer to the following catalog for details on the BTO specification.

AC Servo Drives Σ-7 Series (Catalog No.: KAEP S800001 23)

1.2.2 Interpreting Servomotor Model Numbers

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

- Ω Σ-7-Series Rotary Servomotor Product Manual (Manual No.: SIEP S800001 36)
- Ω Σ-7-Series Linear Servomotor Product Manual (Manual No.: SIEP S800001 37)
- \square Σ -7-Series Direct Drive Servomotor Product Manual (Manual No.: SIEP S800001 38)

1.3

Combinations of SERVOPACKs and Servomotors

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

- Ω Σ-7-Series Rotary Servomotor Product Manual (Manual No.: SIEP S800001 36)
- Ω Σ-7-Series Linear Servomotor Product Manual (Manual No.: SIEP S800001 37)
- \square Σ -7-Series Direct Drive Servomotor Product Manual (Manual No.: SIEP S800001 38)

1.4 Functions

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

- Σ-7-Series Σ-7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual (Manual No.: SIEP S800001 26)
- Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)

Functions given inside bold lines in the functions tables are restricted if less-deviation control is used for SERVOPACKs for tracking applications. Refer to the following section for details on restrictions to these functions.

1.4.2 Functional Restrictions on page 1-8

1.4.1 SERVOPACK Functions

· Functions Related to the Machine

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 Control Mode Selection
Current Gain Level Setting
Speed Detection Method Selection
Fully-Closed Loop Control
Safety Functions
External Latches*

^{*} These functions can be used with SERVOPACKs with MECHATROLINK-III Communications References.

1.4.1 SERVOPACK Functions

• Functions Related to the Host Controller

Function
Extended Address Setting
Electronic Gear Settings
I/O Signal Allocations
ALM (Servo Alarm) Signal
ALO1 to ALO3 (Alarm Code) Signals*
/WARN (Warning) Signal
/TGON (Rotation Detection) Signal
/S-RDY (Servo Ready) Signal
Speed Control*
Basic Settings for Speed Control*
Speed Reference Filter*
Zero Clamping*
/V-CMP (Speed Coincidence Detection) Signal
Position Control*
Reference Pulse Form*
CLR (Position Deviation Clear) Signal Function and Settings*
Reference Pulse Input Multiplication Switching*
/COIN (Positioning Completion) Signal
/NEAR (Near) Signal
Reference Pulse Inhibition and Settings*
Torque Control*
Basic Settings for Torque Control*
Torque Reference Filter Settings*
Speed Limit during Torque Control
/VLT (Speed Limit Detection) Signal
Encoder Divided Pulse Output
Selecting Torque Limits
Vibration Detection Level Initialization
Alarm Reset
Replacing the Battery
Setting the Position Deviation Overflow Alarm Level

 $[\]hbox{* These functions can be used with SERVOPACKs with Analog Voltage/Pulse Train References}.$

• Functions to Achieve Optimum Motions

Function
Speed Control*1
Soft Start Settings*1
Position Control*1
Smoothing Settings*1
Torque Control*1
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*2
Model Following Control
Compatible Adjustment Functions
Mechanical Analysis
Easy FFT

- *1. These functions can be used with SERVOPACKs with Analog Voltage/Pulse Train References.
- *2. These functions can be used with SERVOPACKs with MECHATROLINK-III Communications References.

• 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 Functional Restrictions

There are restrictions to the following functions when less-deviation control is used.

Function	Restriction
Tuning-less Function (Pn170 = n.□□□X)	The tuning-less function is given priority. Less-deviation control will be disabled even if you set the parameter for less-deviation control (Pn190 = n. \square \square \square 1).
Feedforward (Pn109)	This parameter cannot be used. Any parameter setting will be ignored.
Speed Loop Control Method (Pn10B = $n.\Box\Box X\Box$)	This parameter cannot be used with less-deviation control 2. Any parameter setting will be ignored. This parameter can be used with less-deviation control 1.
Automatic Gain Switching (Pn139 = n.□□□2)	This parameter cannot be used. Do not use it if less-deviation control is enabled.
Model Following Control (Pn140 = n.□□□X)	This parameter cannot be used. Any parameter setting will be ignored and less-deviation control will be given priority.
Reference Pulse Input Multiplier (Pn218) (This parameter is valid only for SERVO-PACKs with Analog Voltage/Pulse Train References.)	This parameter cannot be used. Any parameter setting will be ignored.
Tuning-less Level Setting (Fn200)	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.
One-Parameter Tuning (Fn203)	For less-deviation control 2, only Tuning Mode 5 can be used. For less-deviation control 1, only Tuning Mode 0 or 1 can be used.
Vibration Suppression (Fn205)	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.

1.6

Combining the SERVOPACKs with MP-Series Machine Controllers and the MPE720 Engineering Tool

If you combine the SERVOPACK with an MP-Series Machine Controller or the MPE720 Engineering Tool, it will be recognized as a SERVOPACK with standard specifications. To use the parameters that have been added or changed for the SERVOPACKs described in this manual, use the SigmaWin+.

SERVOPACK Ratings and Specifications

This chapter provides information required to select SERVOPACKs, such as specifications.

2.1	Rating	gs2-2
2.2	SERVO	PACK Overload Protection Characteristics 2-5
2.3	Speci	fications2-6
	2.3.1	SERVOPACKs with Analog Voltage/ Pulse Train References
	2.3.2	SERVOPACKs with MECHATROLINK-III Communications References

2.1 Ratings

This section gives the ratings of SERVOPACKs.

Three-Phase, 200 VAC

1	Model SG	D7S-	R70A	R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A	180A	200A	330A
Maximum Applicable Motor Capacity [kW]		0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5	2.0	3.0	5.0	
Continu [Arms]	uous Outp	ut Current	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6	18.5	19.6	32.9
	aneous Ma Current [A		2.1	3.2	5.9	9.3	11	16.9	17	28	42	56	84
Main	Power St	upply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz									
Circuit	Input Cui [Arms]*	rrent	0.4	0.8	1.3	2.5	3.0	4.1	5.7	7.3	10	15	25
Con-	Power St	upply			200 VA	C to 24	0 VAC,	-15% t	o +10%	6, 50 Hz	z/60 Hz		
trol	Input Cui [Arms]*	rrent	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.25	0.25	0.3
Power Supply Capacity [kVA]*			0.2	0.3	0.5	1.0	1.3	1.6	2.3	3.2	4.0	5.9	7.5
	Main Circ Loss [W]	cuit Power	5.0	7.0	11.9	22.5	28.5	38.9	49.2	72.6	104.2	114.2	226.6
Power		Control Circuit Power Loss [W]		12	12	12	14	14	14	15	16	16	19
Loss*		legenera- stor Power	-	-	_	-	8	8	8	12	12	12	36
	Total Pov	ver Loss [W]	17.0	19.0	23.9	34.5	50.5	60.9	71.2	97.6	136.2	146.2	281.6
Regen	Built-In Regen-	Resistance $[\Omega]$	-	_	-	_	40	40	40	20	12	12	8
era- tive	erative Resistor	Capacity [W]	_	-	-	-	40	40	40	60	60	60	180
Resis- tor			40	40	40	40	40	40	40	20	12	12	8
Overvo	Itage Cate	gory						III					

^{*} This is the net value at the rated load.

	Model SGD7S-	470A	550A	590A	780A
Maximum Applicable Motor Capacity [kW]		6.0	7.5	11	15
Continuous Outp	out Current [Arms]	46.9	54.7	58.6	78.0
Instantaneous M	laximum Output Current [Arms]	110	130	140	170
Main Circuit	Power Supply	200 VAC to	240 VAC, -15	5% to +10%, 5	0 Hz/60 Hz
Main Circuit	Input Current [Arms]*1	29	37	54	73
Caratual	Power Supply	200 VAC to	240 VAC, -15	5% to +10%, 5	0 Hz/60 Hz
Control Input Current [Arms]*1		0.3	0.3	0.4	0.4
Power Supply Capacity [kVA]*1		10.7	14.6	21.7	29.6
-	Main Circuit Power Loss [W]	271.7	326.9	365.3	501.4
	Control Circuit Power Loss [W]	21	21	28	28
Power Loss*1	External Regenerative Resistor Unit Power Loss [W]	180*2	350*3	350*3	350*³
	Total Power Loss [W]	292.7	347.9	393.3	529.4
	Resistance $[\Omega]$	6.25*2	3.13*3	3.13*3	3.13* ³
External Regenerative Resistor Unit	Capacity [W]	880*2	1760*3	1760*3	1760*3
	Minimum Allowable External Resistance $[\Omega]$	5.8	2.9	2.9	2.9
Overvoltage Cate	egory		l	II	

^{*1.} This is the net value at the rated load.

Single-Phase, 200 VAC

	Model SGD7S-	R70A	R90A	1R6A	2R8A	5R5A	120A			
Maximum Applio	cable Motor Capac	city [kW]	0.05	0.1	0.2	0.4	0.75	1.5		
Continuous Out	put Current [Arms]		0.66	0.91	1.6	2.8	5.5	11.6		
Instantaneous N	Maximum Output C	urrent [Arms]	2.1	3.2	5.9	9.3	16.9	28		
Main Circuit	Power Supply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz							
Main Girduit	Input Current [Ar	ms]*	0.8	1.6	2.4	5.0	8.7	16		
Control	Power Supply		200 VA	AC to 240	VAC, -15	% to +10	%, 50 Hz	/60 Hz		
Control Input Current [Arms]*		0.2	0.2	0.2	0.2	0.2	0.25			
Power Supply Capacity [kVA]*			0.2	0.3	0.6	1.2	1.9	4.0		
	Main Circuit Pow	5.0	7.1	12.1	23.7	39.2	71.8			
	Control Circuit P	Control Circuit Power Loss [W]			12	12	14	16		
Power Loss*	Built-in Regenera Power Loss [W]	_	_	_	_	8	12			
	Total Power Loss	17.0	19.1	24.1	35.7	61.2	103.8			
	Built-In Regen-	Resistance $[\Omega]$	_	_	_	_	40	12		
Regenerative Resistor	erative Resistor	Capacity [W]	_	_	_	_	40	60		
	Minimum Allowa Resistance $[\Omega]$	40	40	40	40	40	12			
Overvoltage Cat	tegory				l	II				

^{*} This is the net value at the rated load.

^{*2}. This value is for the optional JUSP-RA04-E Regenerative Resistor Unit.

^{*3.} This value is for the optional JUSP-RA05-E Regenerative Resistor Unit.

270 VDC

Model SGD7S-			R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A	
Maximum Applicable Motor Capacity [kW]		0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5	
Continuous Output Current	[Arms]	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6	
Instantaneous Maximum Ou	itput Current [Arms]	2.1	3.2	5.9	9.3	11.0	16.9	17.0	28.0	
Main Circuit	Power Supply		270	VDC to	324 VI	DC, -15	% to +1	0%		
Main Circuit	Input Current [Arms]*1	0.5	1.0	1.5	3.0	3.8	4.9	6.9	11	
0 1 1	Power Supply	270 VDC to 324 VDC, -15% to +10%								
Control	Input Current [Arms]*1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2*2	
Power Supply Capacity [kVA	A]*1	0.2	0.3	0.6	1	1.4	1.6	2.3	3.2	
	Main Circuit Power Loss [W]	4.4	5.9	9.8	17.5	23.0	30.7	38.7	55.8	
Power Loss*1	Control Circuit Power Loss [W]	12	12	12	12	14	14	14	15	
	Total Power Loss [W]	16.4	17.9	21.8	29.5	37.0	44.7	52.7	70.8	
Overvoltage Category					I	II				

^{*1.} This is the net value at the rated load.

^{*2.} The value is 0.25 Arms for the SGD7S-120A00A008.

Model SGD7S-			200A	330A	470A	550A	590A	780A	
Maximum Applicable Motor Capacity [kW]		2.0	3.0	5.0	6.0	7.5	11.0	15.0	
Continuous Output Current	[Arms]	18.5	19.6	32.9	46.9	54.7	58.6	78.0	
Instantaneous Maximum Ou	tput Current [Arms]	42.0	56.0	84.0	110	130	140	170	
Main Circuit	Power Supply		270 \	/DC to 32	24 VDC,	-15% to -	+10%	_	
Main Gircuit	Input Current [Arms]*	14	20	34	36	48	68	92	
Control	Power Supply	270 VDC to 324 VDC, -15% to +10%							
Control	Input Current [Arms]*	0.25	0.25	0.3	0.3	0.3	0.4	0.4	
Power Supply Capacity [kV/	/]*	4.0	5.9	7.5	10.7	14.6	21.7	29.6	
	Main Circuit Power Loss [W]	82.7	83.5	146.2	211.6	255.3	243.6	343.4	
Power Loss*	Control Circuit Power Loss [W]	16	16	19	21	21	28	28	
	Total Power Loss [W]	98.7	99.5	165.2	232.6	276.3	271.6	371.4	
Overvoltage Category					III				

^{*} This is the net value at the rated load.

Single-Phase, 100 VAC

	Model SGD7S-	R70F	R90F	2R1F	2R8F
Maximum App	olicable Motor Capacity [kW]	0.05	0.1	0.2	0.4
Continuous O	utput Current [Arms]	0.66	0.91	2.1	2.8
Instantaneous	Maximum Output Current [Arms]	2.1	3.2	6.5	9.3
Main Circuit	Power Supply	100 VAC to	120 VAC, -15	% to +10%, 5	0 Hz/60 Hz
Main Circuit	Input Current [Arms]*	1.5	2.5	5	10
Control	Power Supply	100 VAC to 120 VAC, -15% to +10%, 50 Hz/60 Hz			
Control	Input Current [Arms]*	0.38	0.38	0.38	0.38
Power Supply	Capacity [kVA]*	0.2	0.3	0.6	1.4
	Main Circuit Power Loss [W]	5.3	7.8	14.2	26.2
Power Loss*	Control Circuit Power Loss [W]	12	12	12	12
	Total Power Loss [W]	17.3	19.8	26.2	38.2
Regenera- tive Resistor	Minimum Allowable Resistance $[\Omega]$	40	40	40	40
Overvoltage C	ategory			I	

^{*} This is the net value at the rated load.

2.2 SERVOPACK Overload Protection Characteristics

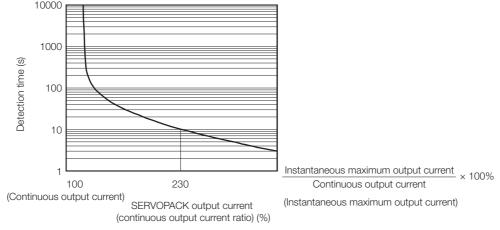
The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of 55°C.

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.

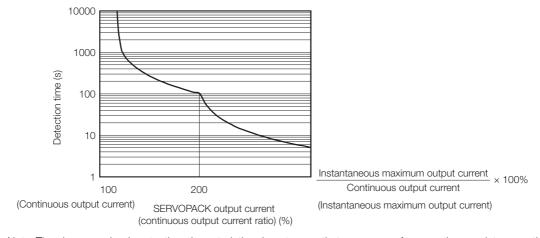
• SGD7S-R70A, -R90A, -1R6A, -2R8A, -R70F, -R90F, -2R1F, and -2R8F



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.

 SGD7S-3R8A, -5R5A, -7R6A, -120A, -180A, -200A, -330A, -470A, -550A, -590A, and -780A



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 general specifications of SERVOPACKs.

2.3.1 SERVOPACKs with Analog Voltage/ Pulse Train References

	Item	Specification			
Control Meth	hod	IGBT-based PWM control, sine wave current drive			
Facelle and	With Rotary Servomotor	Serial encoder: 17 bits (absolute encoder) 20 bits or 24 bits (incremental encoder/absolute encoder) 22 bits (absolute encoder)			
Feedback	With Linear Servomotor	lute line Increme	 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.) 		
	Surrounding Air Temperature*1	Refer to Σ-7-	rating, usage is p the following mar Series Σ-7S SERV	ossible between 55°C and 60°C.) nual for derating specifications. DPACK with Analog Voltage/Pulse Train Refer- (Manual No.: SIEP S800001 26)	
	Storage Temperature	-20°C to	85°C		
	Surrounding Air Humidity	95% relat	tive humidity max	(with no freezing or condensation)	
	Storage Humidity	95% relat	tive humidity max	x. (with no freezing or condensation)	
	Vibration Resistance	4.9 m/s ²			
	Shock Resistance	19.6 m/s ²			
Environ- mental Conditions	Degree of Protection	Degree IP20 IP10	e SERVOPACK Model: SGD7S- R70A, R90A, 1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A, R70F, R90F, 2R1F, 2R8F 120A00A008, 180A, 200A, 330A, 470A, 550A, 590A, 780A		
	Pollution Degree	Must b		flammable gases. water, oil, or chemicals. or iron dust.	
	Altitude*1	 1,000 m max. (With derating, usage is possible between 1,000 m 2,000 m.) Refer to the following manual for derating specifications. Σ-7-Series Σ-7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual (Manual No.: SIEP S800001 26) 			
	Others		e the SERVOPACK in the following locations: Locations sub- tic electricity noise, strong electromagnetic/magnetic fields, tivity		
Applicable Standards		Refer to the following section for details. © Compliance with UL Standards, EU Directives, and Other Safety Standards on page xxvii			
			Mounting	SERVOPACK Model: SGD7S-	
			nounted	All Models	
Mounting		Rack-m	nounted	R70A, R90A, 1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A, 180A, 200A, 330A, R70F, R90F, 2R1F, 2R8F	
		Duct-ventilated		470A, 550A, 590A, 780A	
		ļ		Continued on post page	

2.3.1 SERVOPACKs with Analog Voltage/Pulse Train References

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	Item		Specification		
	Speed Control Range		1:5000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)		
			±0.01% of rated speed max. (for a load fluctuation of 0% to 100%)		
	Coefficient		0% of rated speed max. (for a load fluctuation of ±10%)		
Perfor- mance	Fluctuation*	*2	±0.1% of rated speed max. (for a temperature fluctuation of 25°C ±25°C)		
	Torque Con sion (Repea		±1%		
	Soft Start T ting	ime Set-	0 s to 10 s (Can be set separately for acceleration and deceleration.)		
	Encoder Div Pulse Outpu		Phase A, phase B, phase C: Line-driver output Number of divided output pulses: Any setting is allowed.		
	Overheat P	rotection	Number of input points: 1		
	Input		Input voltage range: 0 V to +5 V		
		Fixed	Allowable voltage range: 5 VDC ±5% Number of input points: 1		
		Input	SEN (Absolute Data Request) signal		
I/O Signals	Sequence Input Signals	Input Signals That Can Be Allo- cated	Allowable voltage range: 24 VDC ±20% Number of input points: 7 (Input method: Sink inputs or source inputs) Input Signals • /S-ON (Servo ON) signal • /P-CON (Proportional Control) signal • P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals • /ALM-RST (Alarm Reset) signal • /P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals • /SPD-D (Motor Direction) signal • /SPD-A and /SPD-B (Internal Set Speed Selection) signals • /C-SEL (Control Selection) signal • /ZCLAMP (Zero Clamping) signal • /INHIBIT (Reference Pulse Inhibit) signal • /G-SEL (Gain Selection) signal • /P-DET (Polarity Detection) signal • /P-DET (Polarity Detection) signal • SEN (Absolute Data Request) signal • /PSEL (Reference Pulse Input Multiplication Switch) signal • FSTP (Forced Stop Input) signal A signal can be allocated and the positive and negative logic can be changed.		

2.3.1 SERVOPACKs with Analog Voltage/Pulse Train References

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	Item		Specification				
		Fixed Output	Allowable voltage range: 5 VDC to 30 VDC Number of output points: 1 (A photocoupler output (isolated) is used.) Output signal: ALM (Servo Alarm) signal				
			Allowable voltage range: 5 VDC to 30 VDC Number of output points: 6 (A photocoupler output (isolated) is used for three of the outputs.) (An open-collector output (non-isolated) is used for the other three outputs.)				
I/O Signals	Sequence Output Signals	Output Signals That Can Be Allocated	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 • /PSELA (Reference Pulse Input Multiplication Switching Output) sig-				
			nal • ALO1, ALO2, and ALO3 (Alarm Code) signals A signal can be allocated and the positive and negative logic can be changed.				
	RS-422A Communi- cations (CN3)	Inter- faces	Digital Operator (JUSP-OP05A-1-E) and personal computer (with SigmaWin+)				
		1:N Commu- nications	Up to N = 15 stations possible for RS-422A port				
Communi- cations		Axis Address Setting	Set with parameters.				
	USB	Interface	Personal computer (with SigmaWin+)				
	Communications (CN7)	Communica- tions Standard	Conforms to USB2.0 standard (12 Mbps).				
Displays/Ind	icators	i.	CHARGE indicator and five-digit seven-segment display				
Panel Opera	tor		Four push switches				
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 (An external resistor must be connected to the SGD7S-470A to -780A.) Refer to the following catalog for details. Ω AC Servo Drives Σ-7 Series (Manual No.: KAEP S800001 23)				
Overtravel (0	OT) Preventio	n	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 F	unctions		Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.				
Utility Functi	ons	·	Gain adjustment, alarm history, jogging, origin search, etc.				
			Continued on payt page				

2.3.1 SERVOPACKs with Analog Voltage/Pulse Train References

Continued from previous page.

		Iten	n		Specification		
		Input	S		/HWBB1 and /HWBB2: Base block signals for Power Modules		
Safe		Output			EDM1: Monitors the status of built-in safety circuit (fixed output).		
Fun	Functions		Applicable Stan- dards*3		ISO13849-1 PLe (Category 3) and IEC61508 SIL3		
App	olicable C	ption I	Module	es	Fully-closed Modules and Safety Modules Note: You cannot use a Fully-closed Module and a Safety Module together.		
		Soft Sting	Start T	ime Set-	0 s to 10 s (Can be set separately for acceleration and deceleration.)		
			Refer- ence Voltage		 Maximum input voltage: ±12 V (forward motor rotation for positive reference). 6 VDC at rated speed (default setting). Input gain setting can be changed. 		
		Input Signa		Input Imped- ance	Approx. 14 kΩ		
	Speed Con- trol			Circuit Time Con- stant	30 μs		
		Interi Set S	peed Selec-		With Proportional Control signal		
Controls				Speed Selec- tion	With Forward/Reverse External Torque Limit signals (speed 1 to 3 selection). Servomotor stops or another control method is used when both signals are OFF.		
Co		Feedforward Compensation			0% to 100%		
		tionin	Output Signal Posi- tioning Completed Width Setting		0 to 1,073,741,824 reference units		
				Reference ence Pulse Form	One of the following is selected: Sign + pulse train, CW + CCW pulse trains, and two-phase pulse trains with 90° phase differential		
	Posi-		Ref-	Input Form	Line driver or open collector		
C	tion Con- trol	In- put Sig- nals	eren ce ut puls ig- es	Maxi- mum Input Fre- quency	 Line Driver Sign + pulse train or CW + CCW pulse trains: 4 Mpps Two-phase pulse trains with 90° phase differential: 1 Mpps Open Collector Sign + pulse train or CW + CCW pulse trains: 200 kpps Two-phase pulse trains with 90° phase differential: 200 kpps 		
				Input Multiplica- tion Switching	1 to 100 times		
			Clear	Signal	Position deviation clear Line driver or open collector		

Continued from previous page.

		Item		Specification
Slo	Torque		Refer- ence Voltage	 Maximum input voltage: ±12 V (forward torque output for positive reference). 3 VDC at rated torque (default setting). Input gain setting can be changed.
Controls	Con- trol	Input Input Imped- ance	Approx. 14 k Ω	
			Circuit Time Constant	16 μs

^{*1.} If you combine a Σ -7-Series SERVOPACK with a Σ -V-Series Option Module, the following Σ -V-Series SERVOPACKs specifications must be used: a surrounding air temperature of 0°C to 55°C and an altitude of 1,000 m max. Also, the applicable surrounding range cannot be increased by derating.

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

2.3.2 SERVOPACKs with MECHATROLINK-III Communications References

	Item	Specification			
Control Meti	hod	IGBT-based PWM control, sine wave current drive			
	With Rotary Servomotor	Serial encoder: 17 bits (absolute encoder) 20 bits or 24 bits (incremental encoder/absolute encoder) 22 bits (absolute encoder)			
Feedback	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.) 			
	Surrounding Air Temperature*1	-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-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)			
	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)			
Environ-	Vibration Resistance	4.9 m/s ²			
mental Conditions	Shock Resistance	19.6 m/s ²			
		Degree SERVOPACK Model: SGD7S-			
	Degree of Protection	IP20 R70A, R90A, 1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A, R70F, R90F, 2R1F, 2R8F			
		IP10 120A20A008, 180A, 200A, 330A, 470A, 550A, 590A, 780A			
	Pollution Degree	Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no dust, salts, or iron dust.			

^{*2.} The coefficient of speed fluctuation for load fluctuation is defined as follows:

^{*3.} Always perform risk assessment for the system and confirm that the safety requirements are met.

Continued from previous page.

Item			Specification			
Environ- mental Conditions	Altitude*1		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-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)			
Conditions	Others			CK in the following locations: Locations subsec, strong electromagnetic/magnetic fields, or		
Applicable S	tandards		Refer to the following sec Compliance with UL St dards on page xxvii	tion for details. andards, EU Directives, and Other Safety Stan-		
			Mounting	SERVOPACK Model: SGD7S-		
			Base-mounted	All Models		
Mounting			Rack-mounted	R70A, R90A, 1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A, 180A, 200A, 330A, R70F, R90F, 2R1F, 2R8F		
			Duct-ventilated	470A, 550A, 590A, 780A		
	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*2		±0.01% of rated speed max. (for a load fluctuation of 0% to 100%)			
			0% of rated speed max. (for a load fluctuation of ±10%)			
Perfor- mance			±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 se	parately for acceleration and deceleration.)		
	Encoder Divided Pulse Output		Phase A, phase B, phase Number of divided output	C: Line-driver output pulses: Any setting is allowed.		
	Overheat Protection		Number of input points: 1 Input voltage range: 0 V to +5 V			
	Input		Allowable voltage range: 24 VDC ±20%			
			Number of input points: 7			
			(Input method: Sink inputs or source inputs)			
I/O Signals	Sequence	Input Signals	Input SignalsP-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals			
	Input Signals	That Can Be Allo-	· /P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals			
		cated	• /DEC (Origin Return Dec			
				al Latch Input 1 to 3) signals		
			FSTP (Forced Stop Input A signal can be allocated.)	at) signal and the positive and negative logic can be		
			changed.	and the positive and negative legic out be		

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			Continued from previous page.		
	Item		Specification		
		Fixed Output	Allowable voltage range: 5 VDC to 30 VDC Number of output points: 1 (A photocoupler output (isolated) is used.)		
			Output signal: ALM (Servo Alarm) signal Allowable voltage range: 5 VDC to 30 VDC Number of output points: 3 (A photocoupler output (isolated) is used.)		
I/O Signals	Sequence Output Signals	Output Signals That Can Be Allo- cated	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 • /WLT (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.		
		Inter- faces	Digital Operator (JUSP-OP05A-1-E) and personal computer (with SigmaWin+)		
	RS-422A Communications (CN3)	1:N Commu- nications	Up to N = 15 stations possible for RS-422A port		
Communi- cations		Axis Address Setting	03h to EFh (maximum number of slaves: 62) The rotary switches (S1 and S2) are used to set the station address.		
	USB	Interface	Personal computer (with SigmaWin+)		
	Communications (CN7)	Commu- nications Standard	Conforms to USB2.0 standard (12 Mbps).		
Displays/Ind	icators	1	CHARGE, PWR, CN, L1, and L2 indicators, and one-digit seven-segment display		
	Communica tocol	ations Pro-	MECHATROLINK-III		
MECHA- TROLINK-III	Station Address Settings		03h to EFh (maximum number of slaves: 62) The rotary switches (S1 and S2) are used to set the station address.		
Communi- cations	Baud Rate Transmission Cycle		100 Mbps 125 μs, 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 number of transmission bytes.		
Deference	Performano	е	Position, speed, or torque control with MECHATROLINK-III communications		
Reference Method	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		munica-	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 Bra	ake (DB)		Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.		

Continued from previous page.

	Item	Specification		
Regenerative Processing		Built-in (An external resistor must be connected to the SGD7S-470A to -780A.) Refer to the following catalog for details. \square AC Servo Drives Σ -7 Series (Manual No.: KAEP S800001 23)		
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 F	unctions	Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.		
Utility Funct	ions	Gain adjustment, alarm history, jogging, origin search, etc.		
	Inputs	/HWBB1 and /HWBB2: Base block signals for Power Modules		
Safety	Output	EDM1: Monitors the status of built-in safety circuit (fixed output).		
Functions	Applicable Standards*3	ISO13849-1 PLe (Category 3), IEC61508 SIL3		
Applicable (Option Modules	Fully-closed Modules and Safety Modules Note: You cannot use a Fully-closed Module and a Safety Module together.		

^{*1.} If you combine a Σ -7-Series SERVOPACK with a Σ -V-Series Option Module, the following Σ -V-Series SERVOPACKs specifications must be used: a surrounding air temperature of 0°C to 55°C and an altitude of 1,000 m max. Also, the applicable surrounding range cannot be increased by derating.

Coefficient of speed fluctuation = No-load motor speed - Total-load motor speed x 100% Rated motor speed

^{*2.} The coefficient of speed fluctuation for load fluctuation is defined as follows:

^{*3.} Always perform risk assessment for the system and confirm that the safety requirements are met.

Less-Deviation Control

3

This chapter describes less-deviation control.

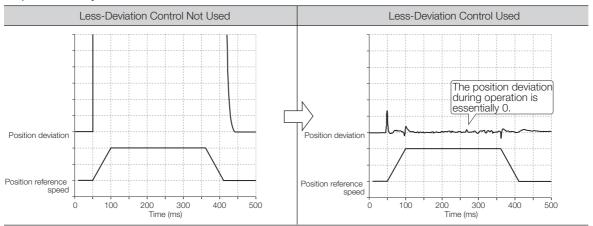
3.1	Introd	luction
3.2	Restr	ictions
	3.2.1 3.2.2 3.2.3 3.2.4	Control Mode Restrictions
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3.1

Introduction

You can use less-deviation control to reduce the deviation during movement and increase the locus tracking performance.

The FT19 SERVOPACKs are used for applications that require reference tracking performance during movement, including the decrease of tracking error and the prevention of interference between the equipment and moving parts, which can be caused by the influences of position response delay.



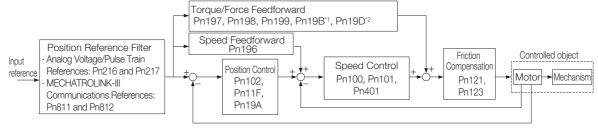
Less-deviation control is enabled or disabled with Pn190 = n.□□□X.

- Pn190 = n.□□□1: Use less-deviation control.
- Pn190 = n.□□□0: Do not use less-deviation control.

Adjusting less-deviation control depends on the less-deviation control mode that you use.

- Less-Deviation Control 1 (Pn195 = n.0□□□): Pn193 and Pn191
- Less-Deviation Control 2 (Pn195 = n.2□□□): Custom Tuning on the SigmaWin+

An outline of the control block diagram for Less-Deviation Control 2 is given below.



- *1. These parameters are used for adjustments for Rotary Servomotors.
- *2. These parameters are used for adjustments for Linear Servomotors.



If you use less-deviation control under any of the following conditions, vibration, noise, or over-shooting may occur.

- Condition 1: The machine has low rigidity. (Guideline: There is a large resonance point in the frequency band from 300 Hz and lower.)
- Condition 2: The machine has large variations in the load.
- Condition 3: The resolution of the encoder is low.

If the condition 1 or 2 is met, do not use less-deviation control.

If the condition 3 is met, we recommend using a motor with an encoder that has a resolution of 20 bits or higher.

Also, for fully-closed loop control, we recommend using a linear scale (external encoder) that has a resolution equivalent to the motor encoder.



The optimum feedforward is set inside the SERVOPACK for less-deviation control. A speed feedforward input or torque feedforward input from the host controller is normally not used at the same time as less-deviation control. However, they can be used together with less-deviation control if necessary. If they are used together and an inappropriate feedforward value is input, overshooting may occur.

Restrictions

3.2.1 Control Mode Restrictions

Less-deviation control can be used only in Position Control Mode. It cannot be used in Speed Control Mode or Torque Control Mode.

If you change from Speed Control Mode or Torque Control Mode to Position Control Mode, less-deviation control will be enabled after the motor stops.

3.2.2 Functional Restrictions

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

1.4.2 Functional Restrictions on page 1-8

3.2.3 SigmaWin+ Restrictions

Refer to the following section for details on restrictions to the SigmaWin+.

1.5 SigmaWin+ on page 1-9

3.2.4 Combining the SERVOPACKs with MP-Series Machine Controllers and the MPE720 Engineering Tool

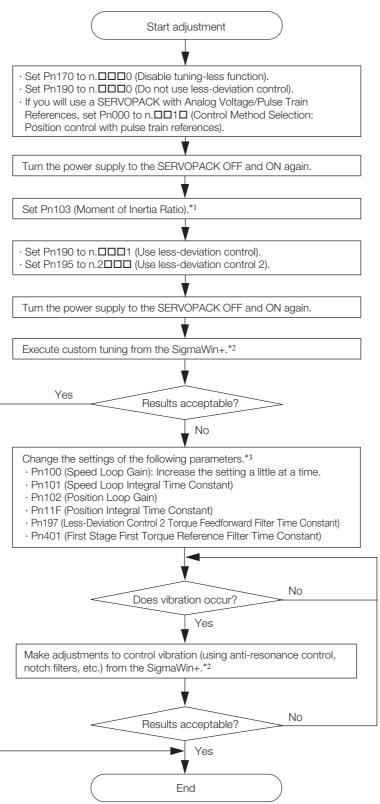
Refer to the following section for applications restrictions when the SERVOPACK is combined with an MP-Series Machine Controller or the MPE720 Engineering Tool.

1.6 Combining the SERVOPACKs with MP-Series Machine Controllers and the MPE720 Engineering Tool on page 1-10

3.3 Adjusting Less-Deviation Control 2

3.3.1 Adjustment Procedure

The basic adjustment flowchart for Less-Deviation Control 2 is given in the following figure. Make suitable adjustments considering the conditions and operating requirements of your machine.



Less-Deviation Control

3

- *1. Use one of the following calculation methods.

 - Calculate the value manually.
 Use the following SigmaWin+ function: Moment of Inertia Estimation.
- *2. Refer to one of the following manuals for details.
 - \square Σ -7-Series Σ -7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual (Manual No.: SIEP S800001 26)
 - Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)
- *3. Use the following formulas as guidelines to change the settings.

• Pn101 =
$$\frac{2000}{2\pi \times Pn100}$$

• Pn197 =
$$\frac{1000}{2 \times 4 \times 2\pi \times Pn100}$$

• Pn401 =
$$\frac{1000}{4 \times 2\pi \times \text{Pn100}}$$

The following setting examples are for Pn100 = 40.0 Hz.

• Pn101 =
$$\frac{2000}{2\pi \times 40.0} \cong 7.96$$

• Pn11F =
$$\frac{4000}{40.0}$$
 = 100.0

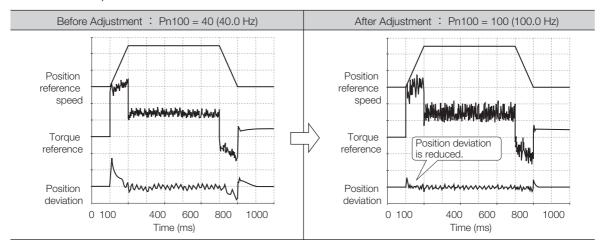
• Pn197 =
$$\frac{1000}{2 \times 4 \times 2\pi \times 40.0} \cong 0.50$$

• Pn401 =
$$\frac{1000}{4 \times 2\pi \times 40.0} \cong 0.99$$

3.3.2 Adjustment Example

Adjustment Example for Pn100, Pn101, Pn102, Pn11F, Pn197, and Pn401

The effects of Pn100 (Speed Loop Gain), Pn101 (Speed Loop Integral Time Constant), Pn102 (Position Loop Gain), Pn11F (Position Integral Time Constant), Pn197 (Less-Deviation Control 2 Torque Feedforward Filter Time Constant), and Pn401 (First Stage First Torque Reference Filter Time Constant) are shown below.



Adjustment Example for Less-Deviation Control 2 Torque Feedforward Gains (Pn198 and Pn199)

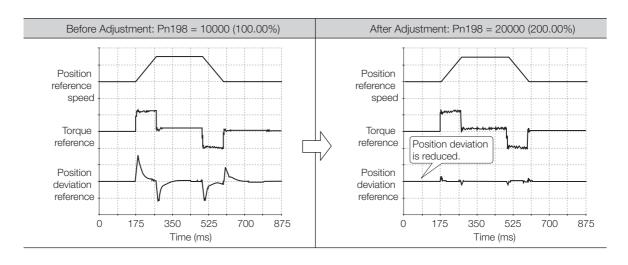
The effects of Pn198 (Less-Deviation Control 2 Forward Torque Feedforward Gain) and Pn199 (Less-Deviation Control 2 Reverse Torque Feedforward Gain) are shown below.

Torque feedforward is used for less-deviation control. The torque feedforward operation takes the differential of the input position reference, converts it to an acceleration rate, and multiplies it by the setting of Pn103 (Moment of Inertia Ratio (Mass Ratio)). Therefore, if the setting of Pn103 is smaller than the actual moment of inertia ratio (mass ratio), the effectiveness of reducing the position deviation will be diminished. On the other hand, if the setting of Pn103 is larger than the actual moment of inertia ratio (mass ratio), the position deviation can easily result in overshooting.

In this type of case, you can change the settings of Pn198 and Pn199 to effectively achieve the same things as changing Pn103 only for torque feedback.



It is best to correctly set Pn103 (Moment of Inertia Ratio) rather than to adjust the settings of Pn198 and Pn199. However, Pn103 will affect the entire control loop, so changing only the torque feedforward amounts (Pn198 and Pn199) after completing gain adjustment is useful for fine-tuning.



Adjustment Example for Less-Deviation Control 2 Viscous Friction Compensation Coefficients (Pn19B and Pn19D)

For mechanisms that are greatly affected by viscous friction, the effectiveness of torque feedforward (Pn198 and Pn199) is reduced. To allow for this, set one of the following parameters.

- Less-Deviation Control 2 Rotary Servomotor Viscous Friction Compensation Coefficient (Pn19B)
- Less-Deviation Control 2 Linear Servomotor Viscous Friction Compensation Coefficient (Pn19D)

By setting one of the above parameters, an equivalent viscous friction torque is added to the torque feedforward.

Set Pn19B to the percentage of the rated torque [N·m] that occurs at a motor speed of 100 min⁻¹.

The calculations for the setting of Pn19B are given below.

- 1. Operate the motor at a constant speed. In this procedure, 1,000 min⁻¹ is used.
- 2. Use a tracing operation on the SigmaWin+ or other means to measure the torque at the speed in step 1.

Here, we will assume it was 7.5%.

- 3. Calculate the torque at 100 min⁻¹.
 - Formula: Torque at speed in step 1 (%) × 100 min⁻¹ ÷ Speed in step 1 (min⁻¹)

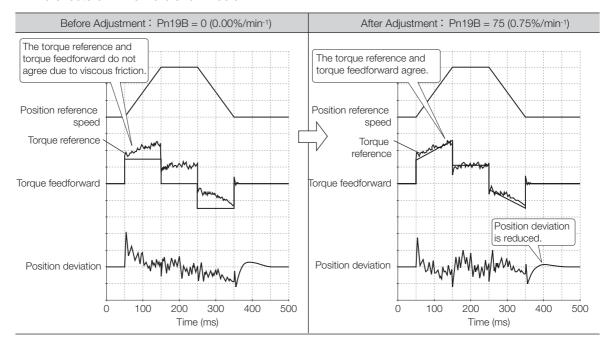
The calculation is as follows for this example:

• $7.5\% \times 100 \text{ min}^{-1} \div 1000 \text{ min}^{-1} = 0.75\%$

Therefore, Pn19B is set to 0.75.

3.3.2 Adjustment Example

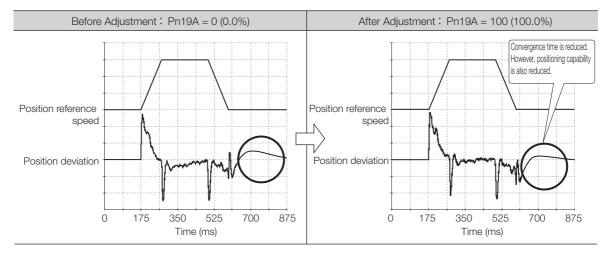
The effects of Pn19B are shown below.



Adjustment Example for Less-Deviation Control 2 Incomplete Integration Rate (Pn19A)

With less-deviation control, the position integral is used to bring the position deviation close to 0 during constant-speed operation. However, a long period of time is normally required for the position deviation to converge to 0 with only position integration. To reduce that trend, the incomplete integral, for which the integral effect falls off with time, is also used. The default setting of Pn19A is 10,000 (100%). In other words, 100% of the previous output from integrator will be subtracted from the current input to the integrator every control cycle.

Therefore, when the deviation settles, the effectiveness of the position integral is lost. However, you can adjust this parameter to increase positioning capability when stopping if you are willing to accept a somewhat longer settling time. If you set this parameter to 0%, operation will be the same as for a normal integrator.



3.3.3 Gain Switching Combinations

You can use gain switching to shorten the positioning time by increasing the gains during positioning and to suppress vibration by decreasing the gains while stopping.

SERVOPACKs with Analog Voltage/Pulse Train References

Selected Gains	Speed Loop Gain	Speed Loop Integral Time Constant	Position Loop Gain	Position Integral Time Constant	Torque Reference Filter	Friction Compen- sation Gain	Position Reference Acceleration/ Deceleration Filter Time Constant*
Gain Settings 1	Speed Loop Gain (Pn100)	Speed Loop Integral Time Constant (Pn101)	Position Loop Gain (Pn102)	Position Integral Time Constant (Pn11F)	First Stage First Torque Reference Filter Time Constant (Pn401)	Friction Compen- sation Gain (Pn121)	Position Reference Acceleration/ Deceleration Time Constant (Pn216)
Gain Settings 2	Second Speed Loop Gain (Pn104)	Second Speed Loop Inte- gral Time Constant (Pn105)	Second Position Loop Gain (Pn106)	Less- Deviation Control 2 Second Position Integral Time Constant (Pn13F)	First Stage Second Torque Ref- erence Fil- ter Time Constant (Pn412)	Second Friction Compen- sation Gain (Pn122)	Second Position Reference Acceleration/ Deceleration Time Constant (Pn234)

^{*} This parameter is valid only for SERVOPACKs with Analog Voltage/Pulse Train References. The gains are switched when there is no reference pulse input and reference distribution has been completed (/DEN). The timing for switching other gains and the timing for switching the Position Reference Acceleration/Deceleration Filter Time Constant are not the same.

SERVOPACKs with MECHATROLINK-III Communications References

Selected Gains	Speed Loop Gain	Speed Loop Integral Time Constant	Position Loop Gain	Position Integral Time Constant	Torque Reference Filter	Friction Compensa- tion Gain
Gain Settings 1	Speed Loop Gain (Pn100)	Speed Loop Integral Time Constant (Pn101)	Position Loop Gain (Pn102)	Position Integral Time Constant (Pn11F)	First Stage First Torque Reference Fil- ter Time Con- stant (Pn401)	Friction Compensa- tion Gain (Pn121)
Gain Settings 2	Second Speed Loop Gain (Pn104)	Second Speed Loop Integral Time Constant (Pn105)	Second Position Loop Gain (Pn106)	Less-Devia- tion Control 2 Second Posi- tion Integral Time Con- stant (Pn13F)	First Stage Second Torque Refer- ence Filter Time Con- stant (Pn412)	Second Friction Compensa- tion Gain (Pn122)

3.3.4 Method to Switch the Gain

SERVOPACKs with Analog Voltage/Pulse Train References

First, make sure that Pn139 is set to n. \$\square\$0 (manual gain switching).

To switch between gain settings 1 and gain settings 2, use the G_SEL external input signal.

Classification	Signal Name	Connector Pin	Setting	Meaning	
Input	/G-SEL	Must be assigned with Pn50D = n.□X□□.*	OFF	Changes the gains to gain settings 1.	
			ON	Changes the gains to gain settings 2.	

^{*} Refer to the following manual for details.

SERVOPACKs with MECHATROLINK-III Communications References

First, make sure that Pn139 is set to n. \(\sigma\) (manual gain switching).

To switch between gain settings 1 and gain settings 2, use G_SEL in the servo command output signals (SVCMD_IO).

Classification	Command Name	Setting	Meaning
Input	G_SEL in the Servo Command Output Signals (SVCMD_IO)	0	Changes the gains to gain settings 1.
		1	Changes the gains to gain settings 2.

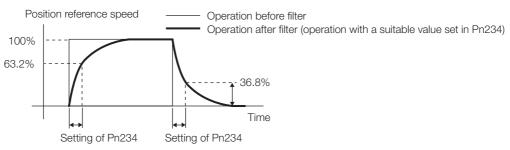
3.3.5 Settings for Low-speed Feeding

The tracking performance of less-deviation control is high. Therefore, if the position reference speed input is intermittent during homing or other low-speed operations, the machine may vibrate.

If that occurs, perform the following procedure.

SERVOPACKs with Analog Voltage/Pulse Train References

- 1. Set Pn234 (Second Position Reference Acceleration/Deceleration Time Constant) to an appropriate value.
- 2. During low-speed feeding, change the gains from gain settings 1 to gain settings 2. The setting of Pn234 is applied, the reference tracking performance decreases, and vibration is reduced.



Σ-7-Series Σ-7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual (Manual No.: SIEP S800001 26)



- Any change to the setting of Pn216 or Pn234 is not applied while the Servomotor is operating. Changes will be enabled the next time the Servomotor comes to a stop.
- Change the settings while there is no reference pulse input and the Servomotor is stopped.

There are the following two methods.

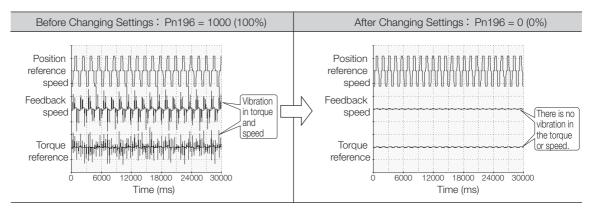
- Weakening reference tracking to reduce vibration
- Smoothing references to reduce vibration

Weakening Reference Tracking to Reduce Vibration

During low-speed feeding, the Servo Parameter Write command (SVPRM WR: 41h) is used to reduce the settings of the following three parameters.

- Pn196 (Less-Deviation Control 2 Speed Feedforward Gain)
- Pn198 (Less-Deviation Control 2 Forward Torque Feedforward Gain)
- Pn199 (Less-Deviation Control 2 Reverse Torque Feedforward Gain)

By reducing the settings of Pn196, Pn198, and Pn199, reference tracking is weakened to reduce vibration.



Smoothing References to Reduce Vibration

During low-speed feeding, the Servo Parameter Write command (SVPRM_WR: 41h) is used to increase the settings of the following two parameters.

- Pn811 (Exponential Acceleration/Deceleration Time Constant)
- Pn812 (Movement Average Time)

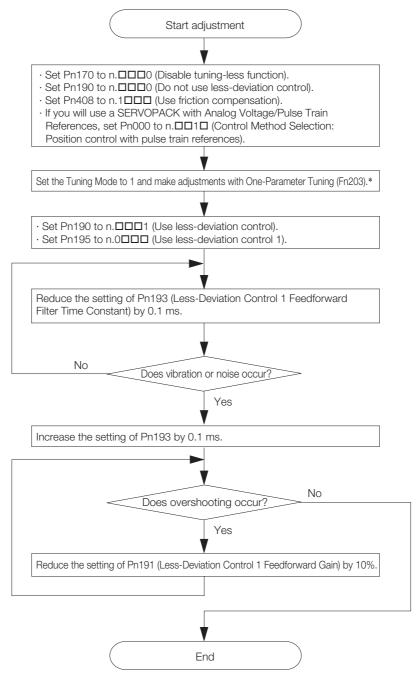
By increasing the settings of Pn811 and Pn812, the reference is smoothed to reduce vibration.

3.4

Adjusting Less-Deviation Control 1

3.4.1 Adjustment Procedure

The basic adjustment flowchart for Less-Deviation Control 1 is given in the following flowchart. Make suitable adjustments considering the conditions and operating requirements of your machine.



^{*} Refer to one of the following manuals for details.

Σ-7-Series Σ-7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual (Manual No.: SIEP S800001 26)

Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)

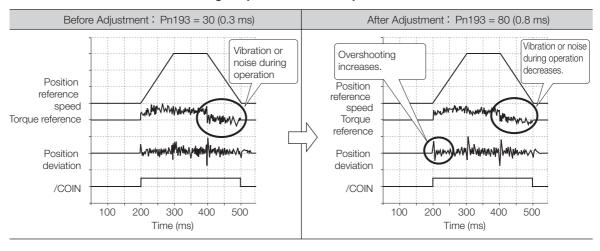
Adjustment Example

3.4.2

Pn193 Adjustment Example

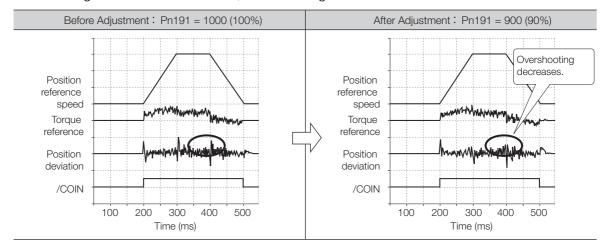
The effects of Pn193 (Less-Deviation Control 1 Feedforward Filter Time Constant) are shown below.

If vibration or noise occurs during operation, increase the setting of Pn193 to reduce vibration and noise. However, overshooting may increase when you do so.



Pn191 Adjustment Example

The effects of Pn191 (Less-Deviation Control 1 Feedforward Gain) are shown below. If the setting of Pn191 is decreased, overshooting decreases.



3.4.3 Gain Switching Combinations

You can use gain switching to shorten the positioning time by increasing the gains during positioning and to suppress vibration by decreasing the gains while stopping.

SERVOPACKs with Analog Voltage/Pulse Train References

Selected Gains	Speed Loop Gain	Speed Loop Integral Time Constant	Position Loop Gain	Torque Reference Filter	Friction Com- pensa- tion Gain	Position Reference Acceleration/ Deceleration Filter Time Constant*	Less- Deviation Control Feedforward Gain
Gain Settings 1	Speed Loop Gain (Pn100)	Speed Loop Inte- gral Time Constant (Pn101)	Position Loop Gain (Pn102)	First Stage First Torque Reference Filter Time Constant (Pn401)	Friction Com- pensa- tion Gain (Pn121)	Position Reference Acceleration/ Deceleration Time Constant (Pn216)	Less-Devia- tion Control 1 Feedforward Gain (Pn191)
Gain Settings 2	Second Speed Loop Gain (Pn104)	Second Speed Loop Inte- gral Time Constant (Pn105)	Second Position Loop Gain (Pn106)	First Stage Second Torque Ref- erence Fil- ter Time Constant (Pn412)	Second Friction Com- pensa- tion Gain (Pn122)	Second Position Ref- erence Acceleration/ Deceleration Time Con- stant (Pn234)	Less-Deviation Control 1 Second Feedforward Gain (Pn192)

^{*} This parameter is valid only for SERVOPACKs with Analog Voltage/Pulse Train References. The gains are switched when there is no reference pulse input and reference distribution has been completed (/DEN). The timing for switching other gains and the timing of switching the Position Reference Acceleration/Deceleration Filter Time Constant are not the same.

SERVOPACKs with MECHATROLINK-III Communications References

Selected Gains	Speed Loop Gain	Speed Loop Integral Time Constant	Position Loop Gain	Torque Reference Filter	Friction Compen- sation Gain	Less-Deviation Control Feedforward Gain
Gain Settings 1	Speed Loop Gain (Pn100)	Speed Loop Integral Time Constant (Pn101)	Position Loop Gain (Pn102)	First Stage First Torque Reference Fil- ter Time Con- stant (Pn401)	Friction Compen- sation Gain (Pn121)	Less-Deviation Control 1 Feed- forward Gain (Pn191)
Gain Settings 2	Second Speed Loop Gain (Pn104)	Second Speed Loop Integral Time Constant (Pn105)	Second Position Loop Gain (Pn106)	First Stage Second Torque Refer- ence Filter Time Con- stant (Pn412)	Second Friction Compen- sation Gain (Pn122)	Less-Deviation Control 1 Sec- ond Feedfor- ward Gain (Pn192)

Method to Switch the Gain

3.4.4

SERVOPACKs with Analog Voltage/Pulse Train References

First, make sure that Pn139 is set to n. \$\square\$00 (manual gain switching).

To switch between gain settings 1 and gain settings 2, use the G_SEL external input signal.

Classification	Signal Name Connector Pin		Setting	Meaning	
Input	/G-SEL	Must be assigned with Pn50D = n.□X□□.*	OFF	Changes the gains to gain settings 1.	
			ON	Changes the gains to gain settings 2.	

^{*} Refer to the following manual for details.

Σ-7-Series Σ-7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual (Manual No.: SIEP S800001 26)

SERVOPACKs with MECHATROLINK-III Communications References

First, make sure that Pn139 is set to n. \(\sigma\) (manual gain switching).

To switch between gain settings 1 and gain settings 2, use G_SEL in the servo command output signals (SVCMD_IO).

Classification	Command Name	Setting	Meaning
Input	G_SEL in the Servo Command Output Signals (SVCMD_IO)	0	Changes the gains to gain settings 1.
		1	Changes the gains to gain settings 2.

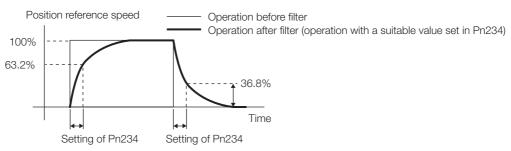
3.4.5 Settings for Low-speed Feeding

The tracking performance of less-deviation control is high. Therefore, if the position reference speed input is intermittent during homing or other low-speed operations, the machine may vibrate.

If that occurs, perform the following procedure.

SERVOPACKs with Analog Voltage/Pulse Train References

- 1. Set Pn234 (Second Position Reference Acceleration/Deceleration Time Constant) to an appropriate value.
- 2. During low-speed feeding, change the gains from gain settings 1 to gain settings 2. The setting of Pn234 is applied, the reference tracking performance decreases, and vibration is reduced.



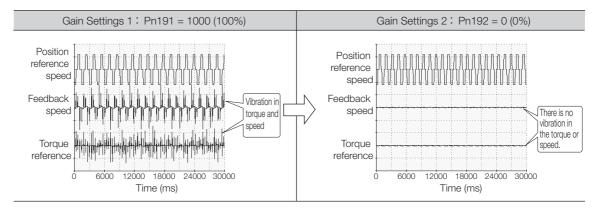
3.4.5 Settings for Low-speed Feeding



- Any change to the setting of Pn216 or Pn234 is not applied while the Servomotor is operating.
 Changes will be enabled the next time the Servomotor comes to a stop.
- · Change the settings while there is no reference pulse input and the Servomotor is stopped.

SERVOPACKs with MECHATROLINK-III Communications References

- 1. Set Pn192 (Less-Deviation Control 1 Second Feedforward Gain) to 0.
- 2. During low-speed feeding, change the gains from gain settings 1 to gain settings 2. The setting of Pn192 is applied, the reference tracking performance decreases, and vibration is reduced.



Reference Compensation

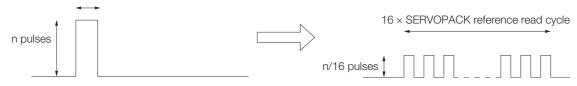
Reference compensation is used when pulse train references are input with SERVOPACKs with Analog Voltage/Pulse Train References.

If less-deviation control is enabled, reference compensation is used by the SERVOPACK to automatically divide the input references to smooth the references. Reference compensation can be used to suppress abnormal noise in motors. However, reference compensation cannot be used for an electronic gear ratio of 16/1 or less (e.g., 4/1 or 1/1).

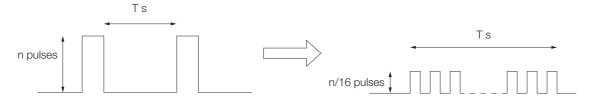
Also, the division method for the first reference input after the SERVOPACK's control power supply is turned ON is different from the second and later reference inputs, as described below.

• First Reference Input after Control Power Supply Is Turned ON
The input reference pulses are divided by 16 and the input time is multiplied by 16.

SERVOPACK reference read cycle



Second or Later Reference Input after Control Power Supply Is Turned ON
 The input reference pulses are divided by 16 and evenly spread over the difference between
 the last reference input time and this reference input time.



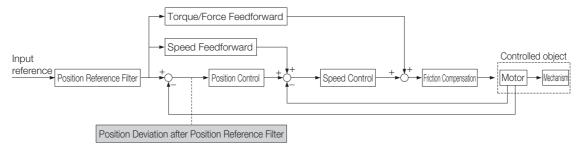
3.6

Monitoring Machine Operation Status and Signal Waveforms

To monitor waveforms, use the SigmaWin+ trace function or a measuring instrument, such as a memory recorder.

The monitoring function that is shaded in the following block diagram was added to SERVO-PACKs for tracking applications.

• Monitoring the Position Deviation after the Position Reference Filter



To use the SigmaWin+ to monitor the position deviation after the position reference filter, select the following signal name on the Data Tab Page in the Trace Setup Dialog Box. To display the Trace Setup Dialog Box, click the Setup Button on the Trace Dialog Box.

Signal Name	Unit
Position Deviation after Position Reference Filter	Reference units

To use a measuring instrument to monitor the position deviation after the position reference filter, set Pn006 or Pn007 (Analog Monitor 1/2 Signal Selection) as given in the following table.

Parameter			Description				
		Monitor Signal	Output Unit	Remarks			
Pn006 Pn007	n.□□25	Position Deviation after Position Reference Filter	0.05 V/Reference unit	_			

Refer to one of the following manuals for details on the monitor items other than the position deviation after the position reference filter.

- Σ -7-Series Σ -7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual (Manual No.: SIEP S800001 26)
- Σ -7-Series Σ -7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)

Maintenance

4

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

4.1	SERVO	PACKs with Analog Voltage/Pulse Train References 4-2
	4.1.1 4.1.2 4.1.3 4.1.4 4.1.5 4.1.6 4.1.7	Alarm Displays
4.2	SERVOP	ACKs with MECHATROLINK-III Communications References 4-58
	4.2.1 4.2.2 4.2.3 4.2.4 4.2.5 4.2.6 4.2.7	Alarm Displays

4.1.1 Alarm Displays

4.1

SERVOPACKs with Analog Voltage/Pulse Train References

4.1.1 Alarm Displays

If an error occurs in the SERVOPACK, an alarm number will be displayed on the panel display. However, if only "-" appears on the panel display, this indicates a SERVOPACK system error. Replace the SERVOPACK.



4.1.2 List of Alarms

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

Servomotor Stopping Method for Alarms

Refer to the following manual for information on the stopping method for alarms.

Σ-7-Series Σ-7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual (Manual No.: SIEP S800001 26)

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.

List of Alarms

Alarm	Alarm Name		Servo- motor	Alarm Reset	Alarm Code Output		
Number		Alarm Meaning	Stop- ping Method	Possi- ble?	ALO1	ALO2	ALO3
A.020	Parameter Checksum Error	There is an error in the parameter data in the SER-VOPACK.	Gr.1	No	Н	Н	Н
A.021	Parameter Format Error	There is an error in the parameter data format in the SERVOPACK.	Gr.1	No	Н	Н	Н
A.022	System Checksum Error	There is an error in the parameter data in the SER-VOPACK.	Gr.1	No	Н	Н	Н
A.024	System Alarm	An internal program error occurred in the SERVO-PACK.	Gr.1	No	Н	Н	Н
A.025	System Alarm	An internal program error occurred in the SERVO-PACK.	Gr.1	No	Н	Н	Н
A.030	Main Circuit Detector Error	There is an error in the detection data for the main circuit.	Gr.1	Yes	Н	Н	Н
A.040	Parameter Setting Error	A parameter setting is outside of the setting range.	Gr.1	No	Н	Н	Н

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Alarm	Alarm Name	Alarm Meaning	Servo- motor Stop-	Alarm Reset	Alarm Co Outpu		
Number	Alailli Naille	, ua moag	ping Method	Possi- ble?	ALO1	ALO2	ALO3
A.041	Encoder Output Pulse Setting Error	The setting of Pn212 (Number of Encoder Output Pulses) or Pn281 (Encoder Output Resolution) is outside of the setting range or does not satisfy the setting conditions.	Gr.1	No	Н	Н	Н
A.042	Parameter Combination Error	The combination of some parameters exceeds the setting range.	Gr.1	No	Н	Н	Н
A.044	Semi-Closed/Fully-Closed Loop Control Parameter Setting Error	The settings of the Option Module and Pn002 = n.X□□□ (External Encoder Usage) do not match.	Gr.1	No	Н	Н	Н
A.050	Combination Error	The capacities of the SER-VOPACK and Servomotor do not match.	Gr.1	Yes	Н	Н	Н
A.051	Unsupported Device Alarm	An unsupported device was connected.	Gr.1	No	Н	Н	Н
A.070	Motor Type Change Detected	The connected motor is a different type of motor from the previously connected motor.	Gr.1	No	Н	Н	Н
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	Н	Н	Н
A.0b0	Invalid Servo ON Com- mand Alarm	The /S-ON (Servo ON) signal was input from the host controller after a utility function that turns ON the Servomotor was executed.	Gr.1	Yes	Н	Н	Н
A.100	Overcurrent Detected	An overcurrent flowed through the power transistor or the heat sink overheated.	Gr.1	No	L	Н	Н
A.101	Motor Overcurrent Detected	The current to the motor exceeded the allowable current.	Gr.1	No	L	Н	Н
A.300	Regeneration Error	There is an error related to regeneration.	Gr.1	Yes	L	L	Н
A.320	Regenerative Overload	A regenerative overload occurred.	Gr.2	Yes	L	L	Н
A.330	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	L	L	Н
A.400	Overvoltage	The main circuit DC voltage is too high.	Gr.1	Yes	Н	Н	L
A.410	Undervoltage	The main circuit DC voltage is too low.	Gr.2	Yes	Н	Н	L
A.510	Overspeed	The motor exceeded the maximum speed.	Gr.1	Yes	L	Н	L

4.1.2 List of Alarms

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Alarm	Alarm Name	Alarm Meaning	Servo- motor	Alarm Reset	_	arm Co Outpu					
Number			Stop- ping Method	Possi- ble?	ALO1	ALO2	ALO3				
A.511	Encoder Output Pulse Overspeed	 Rotary Servomotor: The pulse output speed for the setting of Pn212 (Number of Encoder Output Pulses) was exceeded. Linear Servomotor: The motor speed upper limit for the setting of Pn281 (Encoder Output Resolution) was exceeded. 	Gr.1	Yes	L	Н	L				
A.520	Vibration Alarm	Abnormal oscillation was detected in the motor speed.	Gr.1	Yes	L	Н	L				
A.521	Autotuning Alarm	Vibration was detected during autotuning for the tuning-less function.	Gr.1	Yes	L	Н	L				
A.550	Maximum Speed Setting Error	The setting of Pn385 (Maximum Motor Speed) is greater than the maximum motor speed.	Gr.1	Yes	L	Н	L				
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	L	L	L				
A.720	Continuous Overload	The Servomotor was operating continuously under a torque that exceeded the rating.	Gr.1	Yes	L	L	L				
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	L	L	L				
A.740	Inrush Current Limiting Resistor Overload	The main circuit power supply was frequently turned ON and OFF.	Gr.1	Yes	L	L	L				
A.7A1	Internal Temperature Error 1 (Control Board Tempera- ture Error)	The surrounding temperature of the control PCB is abnormal.	Gr.2	Yes	L	L	L				
A.7A2	Internal Temperature Error 2 (Power Board Tempera- ture Error)	The surrounding temperature of the power PCB is abnormal.	Gr.2	Yes	L	L	L				
A.7A3	Internal Temperature Sensor Error	An error occurred in the temperature sensor circuit.	Gr.2	No	L	L	L				
A.7Ab	SERVOPACK Built-in Fan Stopped	The fan inside the SERVO-PACK stopped.	Gr.1	Yes	L	L	L				
A.810	Encoder Backup Alarm	The power supplies to the encoder all failed and the position data was lost.	Gr.1	No	Н	Н	Н				
A.820	Encoder Checksum Alarm	There is an error in the checksum results for encoder memory.	Gr.1	No	Н	Н	Н				
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	Н	Н	Н				

4

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			Servo-	Alarm	Alarm Code		
Alarm Number	Alarm Name	Alarm Meaning	motor Stop- ping Method	Reset Possi- ble?	ALO1	Outpu ALO2	ALO3
A.840	Encoder Data Alarm	There is an internal data error in the encoder.	Gr.1	No	Н	Н	Н
A.850	Encoder Overspeed	The encoder was operating at high speed when the power was turned ON.	Gr.1	No	Н	Н	Н
A.860	Encoder Overheated	The internal temperature of the rotary encoder or linear encoder is too high.	Gr.1	No	Н	Н	Н
A.861	Motor Overheated	The internal temperature of motor is too high.	Gr.1	No	Н	Н	Н
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	Н	Н	Н
A.890	Encoder Scale Error	A failure occurred in the linear encoder.	Gr.1	No	Н	Н	Н
A.891	Encoder Module Error	An error occurred in the linear encoder.	Gr.1	No	Н	Н	Н
A.8A0	External Encoder Error	An error occurred in the external encoder.	Gr.1	Yes	Н	Н	Н
A.8A1	External Encoder Module Error	An error occurred in the Serial Converter Unit.	Gr.1	Yes	Н	Н	Н
A.8A2	External Incremental Encoder Sensor Error	An error occurred in the external encoder.	Gr.1	Yes	Н	Н	Н
A.8A3	External Absolute Encoder Position Error	An error occurred in the position data of the external encoder.	Gr.1	Yes	Н	Н	Н
A.8A5	External Encoder Over- speed	An overspeed error occurred in the external encoder.	Gr.1	Yes	Н	Н	Н
A.8A6	External Encoder Over- heated	An overheating error occurred in the external encoder.	Gr.1	Yes	Н	Н	Н
A.b10	Speed Reference A/D Error	An error occurred in the A/D converter for the speed reference input.	Gr.2	Yes	Н	Н	Н
A.b11	Speed Reference A/D Data Error	An error occurred in the A/D conversion data for the speed reference.	Gr.2	Yes	Н	Н	Н
A.b20	Torque Reference A/D Error	An error occurred in the A/D converter for the torque reference input.	Gr.2	Yes	Н	Н	Н
A.b33	Current Detection Error 3	An error occurred in the current detection circuit.	Gr.1	No	Н	Н	Н
A.bF0	System Alarm 0	Internal program error 0 occurred in the SERVO-PACK.	Gr.1	No	Н	Н	Н
A.bF1	System Alarm 1	Internal program error 1 occurred in the SERVO-PACK.	Gr.1	No	Н	Н	Н
A.bF2	System Alarm 2	Internal program error 2 occurred in the SERVO-PACK.	Gr.1	No	Н	Н	Н

4.1.2 List of Alarms

Continued from previous page.

Alarm	Alarm Name	Alaca Maria	Servo- motor	Alarm Reset	Alarm Code Output		
Number	Alami Name	Alarm Meaning	Stop- ping Method	Possi- ble?	ALO1	ALO2	ALO3
A.bF3	System Alarm 3	Internal program error 3 occurred in the SERVO-PACK.	Gr.1	No	Н	Н	Н
A.bF4	System Alarm 4	Internal program error 4 occurred in the SERVO-PACK.	Gr.1	No	Н	Н	Н
A.bF5	System Alarm 5	Internal program error 5 occurred in the SERVO-PACK.	Gr.1	No	Н	Н	Н
A.bF6	System Alarm 6	Internal program error 6 occurred in the SERVO-PACK.	Gr.1	No	Н	Н	Н
A.bF7	System Alarm 7	Internal program error 7 occurred in the SERVO-PACK.	Gr.1	No	Н	Н	Н
A.bF8	System Alarm 8	Internal program error 8 occurred in the SERVO-PACK.	Gr.1	No	Н	Н	Н
A.C10	Servomotor Out of Control	The Servomotor ran out of control.	Gr.1	Yes	L	Н	L
A.C20	Phase Detection Error	The detection of the phase is not correct.	Gr.1	No	L	Н	L
A.C21	Polarity Sensor Error	An error occurred in the polarity sensor.	Gr.1	No	L	Н	L
A.C22	Phase Information Disagreement	The phase information does not match.	Gr.1	No	L	Н	L
A.C50	Polarity Detection Failure	The polarity detection failed.	Gr.1	No	L	Н	L
A.C51	Overtravel Detected during Polarity Detection	The overtravel signal was detected during polarity detection.	Gr.1	Yes	L	Н	L
A.C52	Polarity Detection Not Completed	The servo was turned ON before the polarity was detected.	Gr.1	Yes	L	Н	L
A.C53	Out of Range of Motion for Polarity Detection	The travel distance exceeded the setting of Pn48E (Polarity Detection Range).	Gr.1	No	L	Н	L
A.C54	Polarity Detection Failure 2	The polarity detection failed.	Gr.1	No	L	Н	L
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	L	Н	L
A.C90	Encoder Communications Error	Communications between the encoder and SERVO-PACK is not possible.	Gr.1	No	L	Н	L
A.C91	Encoder Communications Position Data Acceleration Rate Error	An error occurred in calculating the position data of the encoder.	Gr.1	No	L	Н	L
A.C92	Encoder Communications Timer Error	An error occurred in the communications timer between the encoder and SERVO-PACK.	Gr.1	No	L	Н	L
A.CA0	Encoder Parameter Error	The parameters in the encoder are corrupted.	Gr.1	No	L	Н	L

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Alarm			Servo- motor	Alarm Reset	Alarm Code Output		
Number	Alarm Name	Alarm Meaning	Stop- ping Method	Possi- ble?	ALO1	ALO2	ALO3
A.Cb0	Encoder Echoback Error	The contents of communications with the encoder are incorrect.	Gr.1	No	L	Н	L
A.CC0	Multiturn Limit Disagree- ment	Different multiturn limits have been set in the encoder and the SERVOPACK.	Gr.1	No	L	Н	L
A.CF1	Reception Failed Error in Feedback Option Module Communications	Receiving data from the Feedback Option Module failed.	Gr.1	No	L	Н	L
A.CF2	Timer Stopped Error in Feedback Option Module Communications	An error occurred in the timer for communications with the Feedback Option Module.	Gr.1	No	L	Н	L
A.d00	Position Deviation Over- flow	The setting of Pn520 (Position Deviation Overflow Alarm Level) was exceeded by the position deviation while the servo was ON.	Gr.1	Yes	L	L	Н
A.d01	Position Deviation Over- flow 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	L	L	Н
A.d02	Position Deviation Over- flow 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 reference pulses are input and the setting of Pn520 (Position Deviation Overflow Alarm Level) is exceeded before the limit is cleared.	Gr.2	Yes	L	L	Н
A.d10	Motor-Load Position Deviation Overflow	There was too much position deviation between the motor and load during fully-closed loop control.	Gr.2	Yes	L	L	Н
A.d30	Position Data Overflow	The position feedback data exceeded ±1,879,048,192.	Gr.1	No	L	L	Н
A.E71	Safety Option Module Detection Failure	Detection of the Safety Option Module failed.	Gr.1	No	Н	L	L
A.E72	Feedback Option Module Detection Failure	Detection of the Feedback Option Module failed.	Gr.1	No	Н	L	L
A.E74	Unsupported Safety Option Module	An unsupported Safety Option Module was con- nected.	Gr.1	No	Н	L	L
A.Eb1	Safety Function Signal Input Timing Error	An error occurred in the input timing of the safety function signal.	Gr.1	No	Н	L	L
A.EC8	Gate Drive Error 1	An error occurred in the gate drive circuit.	Gr.1	No	Н	L	L
A.EC9	Gate Drive Error 2	An error occurred in the gate drive circuit.	Gr.1	No	Н	L	L

4.1.2 List of Alarms

Continued from previous page.

Alarm	Alarm Name	Alarm Meaning	Servo- motor	Alarm Reset	Alarm Code Output		
Number			Stop- ping Method	Possi- ble?	ALO1	ALO2	ALO3
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.	Gr.2	Yes	Н	L	Н
FL-1*				No			
FL-2*			_		Undefined.		
FL-3*	System Alarm	An internal program error occurred in the SERVO-					
FL-4*	System Alarm	PACK.			Oridelinea.		
FL-5*							
FL-6*							
CPF00	Digital Operator Communications Error 1	Communications were not possible between the Digital			Undefined.		
CPF01	Digital Operator Commu- nications Error 2	Operator (model: JUSP- OP05A-1-E) and the SERVO- PACK (e.g., a CPU error occurred).	_	No			ed.

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

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
	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.	*1
A.020: Parameter	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 SER-VOPACK. Reconsider the method for writing the parameters.	-
Checksum Error (There is an error in the parameter data in the SER- VOPACK.)	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 SER-VOPACK.	_
	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 SER-VOPACK.	-
A.021: Parameter Format Error (There is an error in the parameter data format in the	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
SERVOPACK.)	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SER-VOPACK.	_
	The power supply voltage suddenly dropped.	Measure the power supply voltage.	The SERVOPACK may be faulty. Replace the SER-VOPACK.	-
A.022: System Check- sum Error (There is an error	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 SER-VOPACK.	_
in the parameter data in the SER- VOPACK.)	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 SER-VOPACK.	-

Continued from previous page.

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.024: System Alarm (An internal pro- gram error occurred in the SERVOPACK.)	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SER-VOPACK.	_
A.025: System Alarm (An internal pro- gram error occurred in the SERVOPACK.)	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SER-VOPACK.	-
A.030: Main Circuit Detector Error	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SER-VOPACK.	_
	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
A.040: Parameter Set-	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
ting Error (A parameter set- ting is outside of	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SER-VOPACK.	-
the setting range.)	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.041: Encoder Output Pulse Setting Error	The setting of Pn212 (Number of Encoder Output Pulses) or Pn281 (Encoder Output Resolution) is outside of the setting range or does not satisfy the setting conditions.	Check the setting of Pn212 or Pn281.	Set Pn212 or Pn281 to an appropriate value.	*1

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Alarm Number:			Continued from pre	
Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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*2 are satisfied.	Decrease the setting of the electronic gear ratio (Pn20E/Pn210).	*1
A.042: Parameter Com- bination Error	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*2 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*3 are satisfied.	Decrease the setting of the electronic gear ratio (Pn20E/Pn210).	*1
A.044: Semi-Closed/ Fully-Closed Loop Control Parameter Setting Error	The setting of the Fully-closed Module does not match the setting of Pn002 = n.XDDD (External Encoder Usage).	Check the setting of Pn002 = n.X□□□.	Make sure that the setting of the Fully-closed Module agrees with the setting of Pn002 = n.X□□□.	*1
A.050: Combination Error	The SERVOPACK and Servomotor capacities do not match each other.	Confirm that the follow- ing condition is met: 1/4 ≤ (Servomotor capacity/SERVOPACK capacity) ≤ 4	Select a proper combination of the SERVOPACK and Servomotor capacities.	*1
(The capacities of the SERVOPACK and Servomotor	A failure occurred in the encoder.	Replace the encoder and check to see if the alarm still occurs.	Replace the Servomotor or encoder.	-
do not match.)	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SER-VOPACK.	-
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 (e.g., an external 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 differ- ent type of motor from the previ- ously 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 SER- VOPACK 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 SER- VOPACK 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 /S-ON (Servo ON) signal was input 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

Continued from previous page.

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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.	*1
	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.	*1
A.100: Overcurrent	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 SER-VOPACK, or between the ground and terminals U, V, or W.	The SERVOPACK may be faulty. Replace the SER-VOPACK.	*1
Detected (An overcurrent flowed through the power tran-	The regenerative resistor is not wired correctly or there is faulty contact.	Check the wiring.	Correct the wiring.	*1
sistor or the heat sink overheated.)	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.	-
	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 SERVO-PACK minimum allowable resistance.	*4

Continued from previous page.

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.100: Overcurrent Detected (An overcurrent flowed through the power tran- sistor or the heat	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 envi- ronment, 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 SERVO-PACK's main circuit wire size.	-
sink overheated.)	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
	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.	*1
A.101: Motor Overcurrent Detected (The current to the motor exceeded the allowable current.)	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.	*1
	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 SER-VOPACK, or between the ground and terminals U, V, or W.	The SERVOPACK may be faulty. Replace the SER-VOPACK.	*1
	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.	-

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.101: Motor Overcurrent Detected (The current to	A malfunction was caused by noise.	Improve the noise envi- ronment, 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 SERVO-PACK's main circuit wire size.	-
the motor exceeded the allowable current.)	A failure occurred in the SERVOPACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
	When using the built-in regenerative resistor, the jumper between the regenerative resistor terminals (B2 and B3) was removed from one of the following SERVO-PACKs: SGD7S-3R8A, -5R5A, -7R6A, -120A, -180A, -200A, or -330A.	Check to see if the jumper is connected between power supply terminals B2 and B3.*5	Correctly connect a jumper.	*1
	The External Regenerative Resistor or Regenerative Resistor Unit is not wired correctly, or was removed or disconnected.	Check the wiring of the External Regenerative Resistor or Regenerative Resistor Unit.*5	Correct the wiring of the External Regenerative Resistor or Regenerative Resistor Unit.	*1
A.300: Regeneration Error	Pn600 (Regenerative Resistor Capacity) is not set to 0 and an External Regenerative Resistor is not con- nected to one of the following SERVO- PACKs: SGD7S- R70A, -R90A,-1R6A, -2R8A, -R70F, -R90F, -2R1F, or -2R8F.	Check to see if an External Regenerative Resistor is connected and check the setting of Pn600.	Connect an External Regenerative Resistor, or set Pn600 (Regenerative Resistor Capacity) to 0 (setting unit: ×10 W) if no Regenerative Resistor is required.	*1
	An External Regenerative Resistor is not connected to one of the following SERVO-PACKs: SGD7S-470A, -550A, -590A, or -780A.	Check to see if an External Regenerative Resistor or a Regenerative Resistor Unit is connected and check the setting of Pn600.	Connect an External Regenerative Resistor and set Pn600 to an appropri- ate value, or connect a Regenerative Resistor Unit and set Pn600 to 0.	*1
	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
	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.	_
A.320: Regenerative Overload	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 SER-VOPACK.	_

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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.	-
A 000:	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
A.330: Main Circuit Power Supply Wiring Error (Detected when the main circuit	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.	*1
the main circuit power supply is turned ON.)	Pn600 (Regenerative Resistor Capacity) is not set to 0 and an External Regenerative Resistor is not con- nected to one of the following SERVOPACKs: SGD7S-R70A, -R90A, -1R6A, -2R8A, -R70F, -R90F, -2R1F, or -2R8F.	Check to see if an External Regenerative Resistor is connected and check the setting of Pn600.	Connect an External Regenerative Resistor, or if an External Regenera- tive Resistor is not required, set Pn600 to 0.	*1
-	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SER-VOPACK.	-

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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 an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
A.400: Overvoltage (Detected in the	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.	-
main circuit power supply section of the SERVOPACK.)	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 an alarm still occurs, the SERVOPACK may be faulty. Replace 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.410: Undervoltage (Detected in the main circuit power supply section of the SERVOPACK.)	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.	_	Replace the SERVO- PACK 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 SER-VOPACK.	_

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Alarm Number:	Doggible Cause	Confirmation	Continued from pro	
Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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 Servo- motor is correctly wired.	-
A.510: Overspeed (The motor	A reference value that exceeded the over- speed detection level was input.	Check the input reference.	Reduce the reference value. Or, adjust the gain.	*1
exceeded the maximum speed.)	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.	*1
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SER-VOPACK.	-
A.511:	The encoder output pulse frequency exceeded the limit.	Check the encoder output pulse setting.	Decrease the setting of Pn212 (Number of Encoder Output Pulses) or Pn281 (Encoder Out- put Resolution).	*1
Encoder Output Pulse Overspeed	The encoder output pulse frequency exceeded the limit because the motor speed was too high.	Check the encoder output pulse setting and the motor speed.	Reduce the motor speed.	-
	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
A.520: Vibration Alarm	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 func- tion.)	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
	The wiring is not correct or there is a faulty connection in the motor or encoder wiring.	Check the wiring.	Make sure that the Servo- motor and encoder are correctly wired.	*1
	Operation was per- formed that exceeded the overload protec- tion characteristics.	Check the motor over- load characteristics and Run command.	Reconsider the load and operating conditions. Or, increase the motor capacity.	-
A.710: Instantaneous Overload A.720:	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.	-
Continuous Overload	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 SER-VOPACK.	-
A 720 and	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.	-
A.730 and A.731: Dynamic Brake Overload (An excessive power consumption by the dynamic brake was detected.)	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 SER-VOPACK.	-
A.740: Inrush Current Limiting Resistor Overload (The main circuit power supply	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.	-
was frequently turned ON and OFF.)	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SER-VOPACK.	_

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Alarm Number:			Continued from pr	evious page.
Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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 SERVO-PACK installation conditions.	*1
A.7A1:	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.	-
Internal Tempera- ture Error 1 (Control Board Temperature Error)	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 SER-VOPACK.	-
	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 SERVO-PACK installation conditions.	*1
A 7AO.	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.	-
A.7A2: Internal Temperature Error 2 (Power Board Temperature Error)	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 SER-VOPACK.	_
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 SER-VOPACK.	-

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Alarm Number:	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 an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
	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
A.810:	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.	*1
Encoder Backup Alarm (Detected at the encoder, but only when an abso- lute encoder is used.)	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.	*1
	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 SER-VOPACK.	-
A.820: Encoder Check- sum 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 Singleturn 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 SER-VOPACK.	_
A.830: Encoder Battery	The battery connection is faulty or a battery is not connected.	Check the battery connection.	Correct the battery connection.	*1
Alarm (The absolute encoder battery voltage was lower	The battery voltage is lower than the specified value (2.7 V).	Measure the battery voltage.	Replace the battery.	*1
than the speci- fied level.)	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SER-VOPACK.	_

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	The encoder malfunctioned.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servo- motor 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.	-
A.840: Encoder Data Alarm (Detected at the 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.	_
	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.	-
A.850: Encoder Over- speed (Detected at the	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.	-
encoder when the control power supply is turned ON.)	A failure occurred in the encoder.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servo- motor or linear encoder.	-
	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an 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 Over-	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.	-
heated (Detected when a Rotary Servomo- tor, Absolute Lin-	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
ear Encoder, or Direct Drive Ser- vomotor is con- nected. However, this alarm is not detected for SGMCS Servomotors with Incremental Encoders.) (Detected at the encoder.)	A failure occurred in the encoder.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an 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 an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
A.861: Motor Over- heated	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° 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 an alarm still occurs, the Serial Con- verter Unit may be faulty. Replace the Serial Con- verter Unit.	-
	A failure occurred in the SERVOPACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-

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Alarm Number: Continued from previous page.				
Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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.	-
A.862:	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.	-
Overheat 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 an alarm still occurs, the linear encoder may be faulty. Replace the linear encoder.	-
A.8A0: External Encoder Error	Setting the origin of the absolute linear encoder failed because the motor moved.	Before you set the origin, use the fully-closed feedback pulse counter to confirm that the motor is not moving.	The motor must be stopped while setting the origin position.	*1
	A failure occurred in the external encoder.	_	Replace the external encoder.	_
A.8A1:	A failure occurred in the external encoder.	-	Replace the external encoder.	_
External Encoder Module Error	A failure occurred in the Serial Converter Unit.	-	Replace the Serial Converter Unit.	-
A.8A2: External Incremental Encoder Sensor Error	A failure occurred in the external encoder.	_	Replace the external encoder.	-
A.8A3: External Absolute Encoder Position Error	A failure occurred in the external absolute encoder.	_	The external absolute encoder may be faulty. Refer to the encoder manufacturer's instruction manual for corrections.	-

Continued from previous page.

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.8A5: External Encoder Overspeed	An overspeed error was detected in the external encoder.	Check the maximum speed of the external encoder.	Keep the external encoder below its maximum speed.	-
A.8A6: External Encoder Overheated	An overheating error was detected in the external encoder.	_	Replace the external encoder.	_
A.b10: Speed Reference	A malfunction occurred in the speed reference input section.	_	Reset the alarm and restart operation.	*1
A/D Error (Detected when the servo is turned ON.)	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
A.b11:	A malfunction occurred in the speed reference input section.	_	Reset the alarm and restart operation.	*1
Speed Reference A/D Data Error	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
A.b20: Torque Refer-	A malfunction occurred in the reading section for the torque reference input.	_	Reset the alarm and restart operation.	*1
ence A/D Error (Detected when the servo is turned ON.)	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
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 an 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 an 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 an 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 an 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.bF3: System Alarm 3	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an 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 an 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 an 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 an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
A.bF7: System Alarm 7	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an 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 an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
	The order of phases U, V, and W in the motor wiring is not correct.	Check the Servomotor wiring.	Make sure that the Servo- motor is correctly wired.	-
A.C10:	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.C10: Servomotor Out of Control (Detected when the servo is turned ON.)	A failure occurred in the encoder.	_	If the motor wiring is correct and an 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 an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-

Continued from previous page.

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
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 countermea- sures 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.	_
A.C22: Phase Information Disagreement	The SERVOPACK phase information is different from the linear encoder phase information.	_	Perform polarity detection.	*1

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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 SER-VOPACK and that the FG terminal on the SER-VOPACK 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 $100~\mu m$ or higher, the SERVOPACK cannot detect the correct speed feedback. Use a linear encoder scale pitch with higher resolution. (We recommend a pitch of $40~\mu m$ 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.	_

Continued from previous page.

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 under the following circumstances. • Before polarity detection was completed • Before /P-DET was input	_	Input the /P-DET signal.	*1
A.C53: Out of Range of Motion for Polar- ity 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	A failure occurred in the encoder.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servomotor or linear encoder.	-
Limit Setting Error	A failure occurred in the SERVOPACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-

Continued from previous page.

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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 specifications.	-
A.C90: Encoder Communications Error	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 SER-VOPACK.	*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.	-
	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
A.C91: Encoder Communications Position Data Acceleration Rate	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.	-
Error	There is variation in the FG potential because of the influ- ence 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.	-

Continued from previous page.

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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.C92: Encoder Communications Timer Error	A failure occurred in the encoder.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servo- motor or linear encoder.	-
	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an 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 an alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servo- motor or linear encoder.	-
	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-

· Rotary Servomotors: The Encoder Cable wiring distance must be 50

• Linear Servomotors:

Reduce machine vibra-

Correctly install the Ser-

vomotor or linear encoder. Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still

occurs, the Servomotor or

linear encoder may be faulty. Replace the Servo-

Correct the setting of

The Encoder Cable wiring distance must be 20

it

m max.

m max

tion.

	Continued from previous pa			evious page.
Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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 .	_

A.Cb0: Encoder Echoback Error

The Encoder Cable is

Excessive vibration or

shock was applied to

A failure occurred in

setting of Pn205 (Mul-

titurn Limit) does not

the encoder.

the encoder.

too long and noise

entered on it.

Alarm

		111 111 65 (1
There is variation in the FG potential because of the influ- ence 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 from the FG of the encoder.

Check the operating

conditions.

motor or linear encoder. Turn the power supply to the SERVOPACK OFF and A failure occurred in ON again. If an alarm still the SERVOPACK. occurs, the SERVOPACK may be faulty. Replace the SERVOPACK. When using a Direct Drive Servomotor, the

Check the setting of

Pn205.

A.CC0: Multiturn Limit Disagreement

Pn205 (0 to 65,535). agree with the encoder. The multiturn limit of the encoder is different from that of the Check the setting of Change the setting if the SERVOPACK. Or, the Pn205 in the SERVOalarm occurs. multiturn limit of the PACK. SERVOPACK has been changed. Turn the power supply to the SERVOPACK OFF and A failure occurred in ON again. If an alarm still the SERVOPACK. occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.

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*1

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference		
A.CF1: Reception Failed Error in Feed- back Option Module Commu- nications	The cable between the Serial Converter Unit and SERVOPACK is not wired correctly or there is a faulty contact.	Check the wiring of the external encoder.	Correctly wire the cable between the Serial Converter Unit and SERVO-PACK.	*1		
	A specified cable is not being used between Serial Con- verter Unit and SER- VOPACK.	Check the wiring specifications of the external encoder.	Use a specified cable.	-		
	The cable between the Serial Converter Unit and SERVOPACK is too long.	Measure the length of the cable that connects the Serial Converter Unit.	The length of the cable between the Serial Converter Unit and SERVO-PACK must be 20 m or less.	-		
	The sheath on cable between the Serial Converter Unit and SERVOPACK is broken.	Check the cable that connects the Serial Converter Unit.	Replace the cable between the Serial Converter Unit and SERVO-PACK.	-		
A.CF2: Timer Stopped Error in Feed- back Option Module Commu- nications	Noise entered the cable between the Serial Converter Unit and SERVOPACK.	_	Correct the wiring around the Serial Converter Unit, e.g., separate I/O signal lines from the Main Circuit Cables or ground.	-		
	A failure occurred in the Serial Converter Unit.	_	Replace the Serial Converter Unit.	-		
	A failure occurred in the SERVOPACK.	-	Replace the SERVO- PACK.	-		
A.d00: Position Deviation Overflow (The setting of Pn520 (Position Deviation Overflow Alarm Level) was exceeded by the position deviation while the servo was ON.)	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 frequency of the position reference pulse is too high.	Reduce the reference pulse frequency and try operating the SERVO- PACK.	Reduce the position reference pulse frequency 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 SERVO-PACK.	Apply smoothing, i.e., by using Pn216 (Position Reference Acceleration/ Deceleration Time Constant).	*1		
	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 an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-		

Continued from previous page.

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
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.	Set the position deviation to be cleared 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 reference pulses are input and the setting of Pn520 (Position Deviation Overflow Alarm Level) is exceeded.	_	Set the position deviation to be cleared while the servo is OFF. Optimize the setting of Pn520 (Position Deviation Overflow Alarm Level). Or, adjust the setting of Pn529 or Pn584 (Speed Limit Level at Servo ON).	*1
A.d10: Motor-Load Position Deviation Overflow	The motor direction and external encoder installation orientation are backward.	Check the motor direction and the external encoder installation orientation.	Install the external encoder in the opposite direction, or change the setting of Pn002 = n.X□□□ (External Encoder Usage) to reverse the direction.	*1
	There is an error in the connection between the load (e.g., stage) and external encoder coupling.	Check the coupling of the external encoder.	Check the mechanical coupling.	-
A.d30: Position Data Overflow	The position data exceeded ±1,879,048,192.	Check the input reference pulse counter.	Reconsider the operating specifications.	-
A.E71: Safety Option Module Detec- tion Failure	There is a faulty connection between the SERVOPACK and the Safety Option Module.	Check the connection between the SERVO- PACK and the Safety Option Module.	Correctly connect the Safety Option Module.	-
	The Safety Option Module was discon- nected.	_	Execute Fn014 (Reset Option Module Configuration Error) from the Digital Operator or SigmaWin+ and then turn the power supply to the SERVO-PACK OFF and ON again.	*1
	A failure occurred in the Safety Option Module.	_	Replace the Safety Option Module.	-
	A failure occurred in the SERVOPACK.	_	Replace the SERVO-PACK.	_

4.1.3 Troubleshooting Alarms

Continued from previous page.

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	There is a faulty connection between the SERVOPACK and the Feedback Option Module.	Check the connection between the SERVO- PACK and the Feed- back Option Module.	Correctly connect the Feedback Option Module.	-
A.E72: Feedback Option Module Detec- tion Failure	The Feedback Option Module was discon- nected.	_	Reset the Option Module configuration error and turn the power supply to the SERVOPACK OFF and ON again.	*1
	A failure occurred in the Feedback Option Module.	_	Replace the Feedback Option Module.	-
	A failure occurred in the SERVOPACK.	_	Replace the SERVO- PACK.	_
A.E74: Unsupported Safety Option Module	A failure occurred in the Safety Option Module.	_	Replace the Safety Option Module.	-
	An unsupported Safety Option Module was connected.	Refer to the catalog of the connected Safety Option Module.	Connect a compatible Safety Option Module.	-
A.Eb1: Safety Function Signal Input Tim- ing Error	The delay between activation of the /HWBB1 and /HWBB2 input signals for the HWBB was ten second or longer.	Measure the time delay between the /HWBB1 and /HWBB2 signals.	The output signal circuits or devices for /HWBB1 and /HWBB2 or the SER-VOPACK input signal circuits may be faulty. Alternatively, the input signal cables may be disconnected. Check to see if any of these items are faulty or have been disconnected.	-
	A failure occurred in the SERVOPACK.	-	Replace the SERVO-PACK.	_
A.EC8: Gate Drive Error 1 (An error occurred in the gate drive circuit.) A.EC9: Gate Drive Error 2 (An error occurred in the gate drive circuit.)	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	_

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	The three-phase power supply wiring is not correct.	Check the power supply wiring.	Make sure that the power supply is correctly wired.	*1
A.F10: Power Supply	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.	-
Line Open Phase (The voltage was low for more than one second for phase R, S, or T when the main power supply	A single-phase power supply was input without specifying a signal-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
was ON.)	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
FL-1*6: System Alarm FL-2*6: System Alarm FL-3*6: System Alarm FL-4*6: System Alarm FL-5*6: System Alarm FL-5*6: System Alarm	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	_
CPF00: Digital Operator	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.	-
Communications Error 1	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 con- nect it again. If an alarm still occurs, the Digital Operator may be faulty. Replace the Digital Oper- ator.	-
	A failure occurred in the SERVOPACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-

4.1.4 Warning Displays

- *1. Refer to the following manual for details.
 - Σ-7-Series Σ-7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual (Manual No.: SIEP S800001 26)
- *2. Detection Conditions
 - Rotary Servomotor

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

• Pn533 [min⁻¹] ×
$$\frac{\text{Encoder resolution}}{6 \times 10^5} \le \frac{\text{Pn20E}}{\text{Pn210}}$$

• Maximum motor speed [min⁻¹]
$$\times$$
 Encoder resolution
Approx. 3.66×10^{12} \geq Pn20E
Pn210

· Linear Servomotor

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

- *3. Detection Conditions
 - · Rotary Servomotor

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

• Rated motor speed [min⁻¹]
$$\times$$
 1/3 \times $\frac{Encoder resolution}{6 \times 10^5} \le \frac{Pn20E}{Pn210}$

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

Linear Servomotor

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

- *4. Refer to the following manual for details.
 - Σ-7-Series Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)
- *5. The SERVOPACK will fail if the External Regenerative Resistor or Regenerative Resistor Unit is connected while the jumper is connected between the B2 and B3 terminals.
- *6. These alarms are not stored in the alarm history. They are only displayed on the panel display.

4.1.4 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.

4.1.5 List of Warnings

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

Warning Number	Warning Name	Meaning	Wai	rning C Output	
Nullibel			ALO1	ALO2	ALO3
A.900	Position Deviation Overflow	The position deviation exceeded the percentage set with the following formula: (Pn520 × Pn51E/100)	Н	Н	Н
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)	Н	Н	Н
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.	L	Н	Н
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 Selections).	L	Н	Н
A.912	Internal Temperature Warning 1 (Control Board Temperature Error)	The surrounding temperature of the control PCB is abnormal.	Н	L	Н
A.913	Internal Temperature Warning 2 (Power Board Temperature Error)	The surrounding temperature of the power PCB is abnormal.	Н	L	Н
A.920	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.	Н	L	Н
A.921	Dynamic Brake Over- load	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.	Н	L	Н
A.923	SERVOPACK Built-in Fan Stopped	The fan inside the SERVOPACK stopped.	Н	L	Н
A.930	Absolute Encoder Battery Error	This warning occurs when the voltage of absolute encoder's battery is low.	L	L	Н
A.93B	Overheat Warning	The input voltage (temperature) for the overheat protection input (TH) signal exceeded the setting of Pn61C (Overheat Warning Level).	L	L	Н
A.941	Change of Parameters Requires Restart	Parameters have been changed that require the power supply to be turned OFF and ON again.	Н	Н	L
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 SER-VOPACK.	Н	Н	L
A.971	Undervoltage	This warning occurs before an A.410 alarm (Undervoltage) occurs. If the warning is ignored and operation is continued, an alarm may occur.	L	L	L
A.9A0	Overtravel	Overtravel was detected while the servo was ON.	Н	L	L
A.9b0	Preventative Mainte- nance Warning	One of the consumable parts has reached the end of its service life.	Н	L	Н

4.1.6 Troubleshooting Warnings

- Note: 1. A warning code is not output unless you set Pn001 to n.1 \(\sigma\) (Output both alarm codes and warning codes).
 - 2. 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□□.

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.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)

4.1.6 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
	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 SERVO- PACK gains.	Increase the servo gain, e.g., by using autotuning without a host reference.	*
	The frequency of the position refer- ence pulse is too high.	Reduce the reference pulse frequency and try operating the SERVO- PACK.	Reduce the position reference pulse frequency or the reference acceleration rate, or reconsider the electronic gear ratio.	*
A.900: Position Deviation Overflow	The acceleration of the position reference is too high.	Reduce the reference acceleration and try operating the SERVO-PACK.	Apply smoothing, i.e., by using Pn216 (Position Reference Acceleration/ Deceleration Time Constant).	*
	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 SERVO-PACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an 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)	_	Set the position deviation to be cleared while the servo is OFF. Optimize the setting of Pn528 (Position Deviation Overflow Warning Level at Servo ON).	*

Warning Number:	Describle Occ	0	Continued from pre	
Warning Name	Possible Cause	Confirmation	Correction	Reference
	The wiring is not correct or there is a faulty connection in the motor or encoder wiring.	Check the wiring.	Make sure that the Servo- motor and encoder are cor- rectly wired.	-
	Operation was performed that exceeded the overload protection characteristics.	Check the motor over- load characteristics and Run command.	Reconsider the load and operating conditions. Or, increase the motor capacity.	-
A.910: Overload (warning before an A.710 or A.720 alarm occurs)	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 SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVO-PACK.	-
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).	*

4.1.6 Troubleshooting Warnings

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Warning Number:	Possible Cause	Confirmation	Continued from pre	Reference
Warning Name		Check the surrounding	333000	
	The surrounding temperature is too high.	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.	-
A.912: Internal Tempera- ture Warning 1 (Control Board Tem- perature Error)	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 SERVO- PACK installation con- ditions.	Install the SERVOPACK according to specifications.	*
	A failure occurred in the SERVO-PACK.	-	The SERVOPACK may be faulty. Replace the SERVO-PACK.	_
	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.	-
A.913: Internal Temperature Warning 2 (Power Board Temperature Error)	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 SERVO- PACK installation con- ditions.	Install the SERVOPACK according to specifications.	*
	A failure occurred in the SERVO-PACK.	-	The SERVOPACK may be faulty. Replace the SERVO-PACK.	_

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Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Reference	
	The power supply voltage exceeded the specified range.	Measure the power supply voltage.	Set the power supply voltage within the specified range.	-	
A.920: Regenerative Overload (warning before an A.320 alarm occurs)	There is insufficient external regenerative resistance, regenerative resistor capacity, or SER-VOPACK 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 Sigma-JunmaSize+ 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.	-	
	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.	-	
A.921: Dynamic Brake Overload (warning before an A.731 alarm occurs)	When the Servo- motor 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 SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVO-PACK.	-	
A.923: SERVOPACK Built- in Fan Stopped	The fan inside the SERVOPACK stopped.	Check for foreign mat- ter inside the SERVO- PACK.	Remove foreign matter from the SERVOPACK. If an alarm still occurs, the SER- VOPACK may be faulty. Replace the SERVOPACK.	-	
A.930: Absolute Encoder Battery Error (The absolute encoder battery voltage was lower than the spec- ified level.) (Detected only when an abso- lute encoder is con- nected.)	The battery con- nection 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 SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVO-PACK.	_	

4.1.6 Troubleshooting Warnings

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Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Reference
	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.93B: Overheat Warning	A failure occurred in the SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVO-PACK.	_
	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.941: Change of Parameters Requires Restart	Parameters have been changed that require the power supply to be turned OFF and ON again.	_	Turn the power supply to the SERVOPACK OFF and ON again.	-
	The speed ripple	_	Reset the speed ripple compensation value on the SigmaWin+.	*
A.942: Speed Ripple Compensation Information Disagreement	compensation information stored in the encoder does not agree with the speed ripple compensa-	_	Set Pn423 to n. □□1□ (Do not detect A.942 alarms). However, changing the setting may increase the speed ripple.	-
tion bisagreement	tion information stored in the SER- VOPACK.	_	Set Pn423 to n. \(\sum \sup 0\) (Disable speed ripple compensation). However, changing the setting may increase the speed ripple.	-
	For a 200-V SER- VOPACK, the AC power supply volt- age dropped below 140 V.	Measure the power supply voltage.	Set the power supply voltage within the specified range.	-
	For a 100-V SERVOPACK, the AC power supply voltage dropped below 60 V.	Measure the power supply voltage.	Set the power supply voltage within the specified range.	-
A.971: Undervoltage	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 SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVO-PACK.	-

4.1.6 Troubleshooting Warnings

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Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Reference
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 Mainte- nance Warning	One of the consumable parts has reached the end of its service life.	_	Replace the part. Contact your Yaskawa representative for replacement.	*

^{*} Refer to the following manual for details.

Σ-7-Series Σ-7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual (Manual No.: SIEP S800001 26)

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

Problem	Possible Cause	Confirmation	Correction	Reference
	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 between 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.	*
Servomotor Does Not Start	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. \(\Delta X \D\) (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.	*
	No speed or position reference is input.	Turn OFF the power supply to the servo system. Check the allocation status of the input signals.	Allocate an input signal so that the speed and position references are input correctly.	*
	There is a mistake in the input signal allocations (Pn50A to Pn50D, Pn515, and Pn516).	Check the input signal allocations (Pn50A to Pn50D, Pn515, and Pn516).	Correctly allocate the input signals (Pn50A to Pn50D, Pn515, and Pn516).	*
	The /S-ON (Servo ON) signal is OFF.	Check the settings of Pn50A = n.□□□X (Input Signal Allocation Mode) and Pn50A =n.□□X□ (/S-ON (Servo ON) Signal Allocation).	Set Pn50A = n.□□XX correctly and turn ON the /S-ON signal.	*
	The function setting of the / P-CON (Proportional Control) signal is not correct.	Check the setting of Pn000 = n.□□X□ (Control Method Selection).	Set the parameter to match the application.	*
	The SEN input is OFF.	Check the ON/OFF status of the SEN input.	If you are using an absolute encoder, turn ON the SEN signal.	*

4.1.7 Troubleshooting Based on the Operation and Conditions of the Servomotor

Problem	Possible Cause	Confirmation	Continued from pre	Reference
- Fromenia	The reference pulse mode selection is not correct.	Check the setting of Pn200 =n. □□□X (Reference Pulse Form) and the reference pulse form.	Set Pn200 =n. □□□X so that is agrees with the reference pulse form.	*
	Speed control: The speed reference input is not appropriate.	Check between the speed reference input (V-REF) and signal ground (SG) to see if the control method and the input agree.	Correctly set the control method and input method.	*
	Torque control: The torque reference input is not appropriate.	Check between the torque reference input (T-REF) and signal ground (SG) to see if the control method and the input agree.	Correctly set the control method and input method.	*
	Position control: The reference pulse input is not appropriate.	Check the setting of Pn200 =n. DDDX (Reference Pulse Form) and the sign and pulse signals.	Correctly set the control method and input method.	*
	The /CLR (Position Deviation Clear) input signal has not been turned OFF.	Check the /CLR signal (CN1-14 and CN1-15).	Turn OFF the /CLR signal.	*
	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.	*
Servomotor Does Not Start	The safety input signals (/HWBB1 or /HWBB2) were not turned ON.	Check the /HWBB1 and /HWBB2 input signals.	Turn ON the /HWBB1 and /HWBB2 input signals. If you are not using the safety function, connect the Safety Jumper Connector (provided as an accessory) to CN8.	*
	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.	*
	A failure occurred in the SER-VOPACK.	_	Turn OFF the power supply to the servo system. Replace the SERVO-PACK.	-
		Check the setting of Pn080 =n.□□□X (Polarity Sensor Selection).	Correct the parameter setting.	*
	The polarity detection was not executed.	Check the /S-ON (Servo ON) or /P-DET (Polarity Detection) input signal.	If you are using an incremental linear encoder, turn ON the /S-ON or /P-DET signal. If you are using an absolute linear encoder, turn OFF the external /S-ON signal and execute polarity detection.	*

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Problem	Possible Cause	Confirmation	Correction	Reference
	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.	-
Servomotor	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.	-
Moves Instanta- neously,	The setting of Pn282 (Linear Encoder Scale Pitch) is not correct.	Check the setting of Pn282.	Correct the setting of Pn282.	*
and Then Stops	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. \$\square\$ (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.	-

4.1.7 Troubleshooting Based on the Operation and Conditions of the Servomotor

Problem	Possible Cause	Confirmation	Continued from pre	Reference
2,7,5,00	Speed control: The speed reference input is not appro-	Check between the speed reference input (V-REF) and signal ground (SG) to see if the control	Correctly set the control method and input	*
	Torque control: The torque reference input is not appropriate.	method and the input agree. Check between the torque reference input (T-REF) and signal ground (SG) to see if the control method and the input agree.	Correctly set the control method and input method.	*
	The speed reference offset is not correct.	The SERVOPACK offset is adjusted incorrectly.	Adjust the SERVO- PACK offset.	*
Servomotor Moves with- out a Refer-	Position control: The reference pulse input is not appropriate.	Check the setting of Pn200 =n.□□□X (Reference Pulse Form) and the sign and pulse signals.	Correctly set the control method and input method.	-
ence Input	A failure occurred in the SER-VOPACK.	_	Turn OFF the power supply to the servo system. Replace the SERVO-PACK.	-
	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 SERVO-PACK. 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 SERVO-PACK.	-

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Problem	Possible Cause	Confirmation	Correction	Reference
	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.	*
		Turn OFF the power supply to the servo system. Check to see if there are any loose mounting screws.	Tighten the mounting screws.	-
	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.	-
Abnormal Noise from Servomotor		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 wire cables or screened twisted-pair cables with conductors of at least 0.12 mm ² .	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.	_

4.1.7 Troubleshooting Based on the Operation and Conditions of the Servomotor

Problem	Possible Cause	Confirmation	Correction	Reference
	Noise interference occurred because of incorrect Encoder Cable specifications.	Turn OFF the power supply to the servo system. Make sure that the rotary or Linear Encoder Cable satisfies the specifications. Use a shielded twisted-pair wire cable or a screened twisted-pair cable with a conductors of at least 0.12 mm ² .	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 envi- ronment.	-
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 lay- out 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 Servomo- tor.	-

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Problem	Possible Cause	Confirmation	Continued from pre	Reference
Abnormal	A failure occurred in the Serial Converter Unit.	-	Turn OFF the power supply to the servo system. Replace the Serial Converter Unit.	-
Noise from Servomotor	A failure occurred in the linear encoder.	-	Turn OFF the power supply to the servo system. Replace the linear encoder.	-
	The servo gains are not balanced.	Check to see if the servo gains have been correctly tuned.	Perform autotuning without a host reference.	*
Servomotor	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.	-
Vibrates at Frequency of Approx. 200 Hz to	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.	_
400 Hz.	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 appropri- ate.	Check the setting of Pn103.	Set Pn103 to an appropriate value.	_
	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.	-
Large Motor Speed	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.	_
Overshoot on Starting and Stop- ping	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 appropri- ate.	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 and Pn483 = 30% and Pn484 = 30%.	Set Pn483 and Pn484 to appropriate values.	*

4.1.7 Troubleshooting Based on the Operation and Conditions of the Servomotor

Problem	Possible Cause	Confirmation	Correction	Reference
	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 a shielded twisted-pair wire cable or a screened twisted-pair cable with conductors of at least 0.12 mm ² .	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.	-
Absolute Encoder Position Deviation Error (The	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 envi- ronment.	-
position that was saved in the host con- troller when the power	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 lay- out so that no surge is applied by high-current lines.	-
was turned OFF is dif- ferent from the posi- tion when	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.	-
the power was next turned ON.)	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 counter- measures 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.	-
	A failure occurred in the encoder.	_	Turn OFF the power supply to the servo system. Replace the Servomotor or linear encoder.	-

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Problem	Possible Cause	Confirmation	Correction	Reference
Absolute Encoder Position Deviation Error (The	A failure occurred in the SER-VOPACK.	_	Turn OFF the power supply to the servo system. Replace the SERVO-PACK.	-
position that was saved in the		Check the error detection section of the host controller.	Correct the error detection section of the host controller.	_
host con- troller when the power was turned	Host Controller Multiturn Data or Absolute Encoder	Check to see if the host controller is executing data parity checks.	Perform parity checks for the multiturn data or absolute encoder posi- tion data.	-
OFF is dif- ferent from the posi- tion when the power was next turned ON.)	Position Data Reading Error	Check for noise interference in the cable between the SERVO-PACK and the host controller.	Implement counter- measures against noise and then perform parity checks again for the multiturn data or abso- lute encoder position data.	-
		Check the external power supply (+24 V) voltage for the input signals.	Correct the external power supply (+24 V) voltage for the input signals.	-
	The P-OT/N-OT (Forward Drive Prohibit or Reverse Drive Prohibit) signal was input.	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).	Set the parameters to correct values.	*
Overtravel Occurred	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.	-
000404		Check to see if the operation of the overtravel limit switches is unstable.	Stabilize the operating condition of the over-travel 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.XDDD or Pn50B = n.DDDX.	Check to see if the P-OT signal is allocated in Pn50A = n.X□□□.	If another signal is allocated in Pn50A =n.XDDD, 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.	*
Overtravel Occurred	The selection of the Servo- motor stopping method is	Check the servo OFF stopping method set in Pn001 = $n.\square\square\square X$ or Pn001 = $n.\square\square X\square$.	Select a Servomotor stopping method other than coasting to a stop.	*
	not correct.	Check the torque control stopping method set in $Pn001 = n.\square\square\square X$ or $Pn001 = n.\square\square X\square$.	Select a Servomotor stopping method other than coasting to a stop.	*

4.1.7 Troubleshooting Based on the Operation and Conditions of the Servomotor

Problem	Possible Cause	Confirmation	Correction	Reference
Improper Stop Posi- tion for	The limit switch position and dog length are not appropriate.	-	Install the limit switch at the appropriate position.	-
Overtravel (OT) Signal	The overtravel limit switch position is too close for the coasting distance.	_	Install the overtravel limit switch at the appropriate position.	_
Position	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 a shielded twisted-pair wire cable or a screened twisted-pair cable with conductors of at least 0.12 mm ² .	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.	-
Deviation (without Alarm)	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 envi- ronment.	-
	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 lay- out 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 counter- measures against noise for the encoder wiring or Serial Converter Unit wiring.	_

Continued from previous page.

Problem	Possible Cause	Confirmation	Correction	Reference
	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.	-
Position Deviation (without Alarm)	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 a shielded twisted-pair wire cable or a screened twisted-pair cable with conductors of at least 0.12 mm ² .	Use cables that satisfy the specifications.	-
	If reference pulse input multiplication switching is being used, noise may be causing the I/O signals used for this function (/PSEL and /PSELA) to be falsely detected.	Turn OFF the power supply to the servo system. Check the I/O signal cables to see if they satisfy specifications. Use a shielded twisted-pair wire cable or a screened twisted-pair cable with conductors of at least 0.12 mm ² .	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 SER-VOPACK.	_	Turn OFF the power supply to the servo system. Replace the SERVO-PACK.	-

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Problem	Possible Cause	Confirmation	Correction	Reference
1 TODIETTI	1 Ossible Cause			Helefelice
	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.	-
Servomotor Overheated	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.	-

^{*} Refer to the following manual for details.

Σ-7-Series Σ-7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual (Manual No.: SIEP S800001 26)

4.2.1 Alarm Displays

4.2

SERVOPACKs with MECHATROLINK-III Communications References

4.2.1 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

4.2.2 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.

Servomotor Stopping Method for Alarms

Refer to the following manual for information on the stopping method for alarms.

Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)

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.

List of Alarms

Alarm Number	Alarm Name	Alarm Meaning	Servo- motor Stop- ping Method	Alarm Reset Possi- ble?
A.020	Parameter Checksum Error	There is an error in the parameter data in the SERVOPACK.	Gr.1	No
A.021	Parameter Format Error	There is an error in the parameter data format in the SERVOPACK.	Gr.1	No
A.022	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 SER-VOPACK.	Gr.1	No
A.025	System Alarm	An internal program error occurred in the SER-VOPACK.	Gr.1	No
A.030	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

Continued from previous page.

Alarm Number	Alarm Name	Alarm Meaning	Servo- motor Stop- ping Method	Alarm Reset Possi- ble?
A.041	Encoder Output Pulse Setting Error	The setting of Pn212 (Number of Encoder Output Pulses) or Pn281 (Encoder Output Resolution) is outside of the setting range or does not satisfy the setting conditions.	Gr.1	No
A.042	Parameter Combination Error	The combination of some parameters exceeds the setting range.	Gr.1	No
A.044	Semi-Closed/Fully-Closed Loop Control Parameter Setting Error	The settings of the Option Module and Pn002 = n.X□□□ (External Encoder Usage) do not match.	Gr.1	No
A.04A	Parameter Setting Error 2	There is an error in the bank members or bank data settings.	Gr.1	No
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 Set- ting 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 Com- mand 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	Regeneration Error	There is an error related to regeneration.	Gr.1	Yes
A.320	Regenerative Overload	A regenerative overload occurred.	Gr.2	Yes
A.330	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	Overvoltage	The main circuit DC voltage is too high.	Gr.1	Yes
A.410	Undervoltage	The main circuit DC voltage is too low.	Gr.2	Yes
A.510	Overspeed	The motor exceeded the maximum speed.	Gr.1	Yes
A.511	Encoder Output Pulse Overspeed	 Rotary Servomotor: The pulse output speed for the setting of Pn212 (Number of Encoder Out- put Pulses) was exceeded. Linear Servomotor: The motor speed upper limit for the setting of Pn281 (Encoder Output Resolution) was exceeded. 	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.		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

4.2.2 List of Alarms

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Alarm Number	Alarm Name	Alarm Meaning	Servo- motor Stop- ping Method	Alarm Reset Possi- ble?
A.740	Inrush Current Limiting Resistor Overload	The main circuit power supply was frequently turned ON and OFF.	Gr.1	Yes
A.7A1	Internal Temperature Error 1 (Control Board Tempera- ture Error)	The surrounding temperature of the control PCB is abnormal.	Gr.2	Yes
A.7A2	Internal Temperature Error 2 (Power Board Tempera- ture 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	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.8A0	External Encoder Error	An error occurred in the external encoder.	Gr.1	Yes
A.8A1	External Encoder Module Error	An error occurred in the Serial Converter Unit.	Gr.1	Yes
A.8A2	External Incremental Encoder Sensor Error	An error occurred in the external encoder.	Gr.1	Yes
A.8A3	External Absolute Encoder Position Error	An error occurred in the position data of the external encoder.	Gr.1	Yes
A.8A5	External Encoder Over- speed	An overspeed error occurred in the external encoder.	Gr.1	Yes
A.8A6	External Encoder Over- heated	An overheating error occurred in the external encoder.	Gr.1	Yes
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	System Alarm 0	Internal program error 0 occurred in the SERVO-PACK.	Gr.1	No
A.bF1	System Alarm 1	Internal program error 1 occurred in the SERVO-PACK.	Gr.1	No
A.bF2	System Alarm 2	Internal program error 2 occurred in the SERVO-PACK.	Gr.1	No

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Alarm Number	Alarm Name	Alarm Meaning	Servo- motor Stop- ping Method	Alarm Reset Possi- ble?
A.bF3	System Alarm 3	Internal program error 3 occurred in the SERVO-PACK.	Gr.1	No
A.bF4	System Alarm 4	Internal program error 4 occurred in the SERVO-PACK.	Gr.1	No
A.bF5	System Alarm 5	Internal program error 5 occurred in the SERVO-PACK.	Gr.1	No
A.bF6	System Alarm 6	Internal program error 6 occurred in the SERVO-PACK.	Gr.1	No
A.bF7	System Alarm 7	Internal program error 7 occurred in the SERVO-PACK.	Gr.1	No
A.bF8	System Alarm 8	Internal program error 8 occurred in the SERVO-PACK.	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
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 SER-VOPACK 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 Disagree- ment	Different multiturn limits have been set in the encoder and the SERVOPACK.	Gr.1	No
A.CF1	Reception Failed Error in Feedback Option Module Communications	Receiving data from the Feedback Option Module failed.	Gr.1	No
A.CF2	Timer Stopped Error in Feedback Option Module Communications	An error occurred in the timer for communications with the Feedback Option Module.	Gr.1	No
A.d00	Position Deviation Over- flow	The setting of Pn520 (Position Deviation Overflow Alarm Level) was exceeded by the position deviation while the servo was ON.	Gr.1	Yes

4.2.2 List of Alarms

Continued from previous page.

Alarm Number	Alarm Name	Alarm Meaning	Servo- motor Stop- ping Method	Alarm Reset Possi- ble?
A.d01	Position Deviation Over- flow 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 Over- flow 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.d10	Motor-Load Position Deviation Overflow	There was too much position deviation between the motor and load during fully-closed loop control.	Gr.2	Yes
A.d30	Position Data Overflow	The position feedback data exceeded ±1,879,048,192.	Gr.1	No
A.E02	MECHATROLINK Internal Synchronization Error 1	A synchronization error occurred during MECHA-TROLINK communications with the SERVO-PACK.	Gr.1	Yes
A.E40	MECHATROLINK Trans- mission Cycle Setting Error	The setting of the MECHATROLINK communications transmission cycle is not correct.	Gr.2	Yes
A.E41	MECHATROLINK Communications Data Size Setting Error	The setting of the MECHATROLINK communications data size is not correct.	Gr.2	Yes
A.E42	MECHATROLINK Station Address Setting Error	The setting of the MECHATROLINK station address is not correct.	Gr.2	No
A.E50*	MECHATROLINK Syn- chronization Error	A synchronization error occurred during MECHA-TROLINK communications.	Gr.2	Yes
A.E51	MECHATROLINK Syn- chronization Failed	Synchronization failed during MECHATROLINK communications.	Gr.2	Yes
A.E60*	Reception Error in MECHATROLINK Commu- nications	Communications errors occurred continuously during MECHATROLINK communications.	Gr.2	Yes
A.E61	Synchronization Interval Error in MECHATROLINK Transmission Cycle	An error occurred in the transmission cycle during MECHATROLINK communications.	Gr.2	Yes
A.E63	MECHATROLINK Syn- chronization Frame Not Received	Synchronization frames were continuously not received during MECHATROLINK communications.	Gr.2	Yes
A.E71	Safety Option Module Detection Failure	Detection of the Safety Option Module failed.	Gr.1	No
A.E72	Feedback Option Module Detection Failure	Detection of the Feedback Option Module failed.	Gr.1	No
A.E74	Unsupported Safety Option Module	An unsupported Safety Option Module was connected.	Gr.1	No
A.Eb1	Safety Function Signal Input Timing Error	An error occurred in the input timing of the safety function signal.	Gr.1	No
A.EC8	Gate Drive Error 1	An error occurred in the gate drive circuit.	Gr.1	No
A.EC9	Gate Drive Error 2	An error occurred in the gate drive circuit.	Gr.1	No
A.Ed1	Command Execution Timeout	A timeout error occurred for a MECHATROLINK command.	Gr.2	Yes

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Alarm Number	Alarm Name	Alarm Meaning	Servo- motor Stop- ping Method	Alarm Reset Possi- ble?
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.	Gr.2	Yes
FL-1*				
FL-2*				
FL-3*	System Alarm	An internal program error occurred in the SER-	_	No
FL-4*	System Alami	VOPACK.	_	INO
FL-5*				
FL-6*				
CPF00	Digital Operator Communications Error 1	Communications were not possible between the Digital Operator (model: JUSP-OP05A-1-E) and		No
CPF01	Digital Operator Communications Error 2	the SERVOPACK (e.g., a CPU error occurred).	_	INO

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

Note: The A.Eb0, A.Eb2 to A.Eb9, and A.EC0 to A.EC2 alarms can occur when a Safety Module is connected.

Refer to the following manual for details.

AC Servo Drive Σ-V-Series/Σ-V-Series for Large-Capacity Models/Σ-7-Series User's Manual Safety Module (Manual No.: SIEP C720829 06)

4.2.3 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
	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.	*1
A.020: Parameter	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 SER-VOPACK. Reconsider the method for writing the parameters.	-
Checksum Error (There is an error in the parameter data in the SER- VOPACK.)	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 SER-VOPACK.	-
	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 SER-VOPACK.	-
A.021: Parameter Format Error (There is an error in the parameter data format in the	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
SERVOPACK.)	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SER-VOPACK.	_
	The power supply voltage suddenly dropped.	Measure the power supply voltage.	The SERVOPACK may be faulty. Replace the SER-VOPACK.	_
A.022: System Check- sum Error (There is an error	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 SER-VOPACK.	_
in the parameter data in the SER- VOPACK.)	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 SER-VOPACK.	_

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.024: System Alarm (An internal pro- gram error occurred in the SERVOPACK.)	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SER-VOPACK.	-
A.025: System Alarm (An internal pro- gram error occurred in the SERVOPACK.)	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SER-VOPACK.	-
A.030: Main Circuit Detector Error	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SER-VOPACK.	-
	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
A.040: Parameter Set-	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
ting Error (A parameter setting is outside of	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SER-VOPACK.	-
the setting range.)	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.041: Encoder Output Pulse Setting Error	The setting of Pn212 (Number of Encoder Output Pulses) or Pn281 (Encoder Output Resolution) is outside of the setting range or does not satisfy the setting conditions.	Check the setting of Pn212 or Pn281.	Set Pn212 or Pn281 to an appropriate value.	*1

4.2.3 Troubleshooting Alarms

Continued from previous page.

Alarm Number:	Possible Cause	Confirmation	Continued from pre	Reference
Alarm Name		Commination	Correction	neielelice
	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*2 are satisfied.	Decrease the setting of the electronic gear ratio (Pn20E/Pn210).	*1
A.042: Parameter Combination Error	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*2 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*3 are satisfied.	Decrease the setting of the electronic gear ratio (Pn20E/Pn210).	*1
A.044: Semi-Closed/ Fully-Closed Loop Control Parameter Setting Error	The setting of the Fully-closed Module does not match the setting of Pn002 = n.X□□□ (External Encoder Usage).	Check the setting of Pn002 = n.X□□□.	Make sure that the setting of the Fully-closed Module agrees with the setting of Pn002 = n.X□□□.	*1
A.04A: Parameter Set-	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.	-
ting Error 2	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 SERVOPACK and Servomotor capacities do not match each other.	Confirm that the follow- ing condition is met: 1/4 ≤ (Servomotor capacity/SERVOPACK capacity) ≤ 4	Select a proper combination of the SERVOPACK and Servomotor capacities.	*1
(The capacities of the SERVOPACK and Servomotor	A failure occurred in the encoder.	Replace the encoder and check to see if the alarm still occurs.	Replace the Servomotor or encoder.	-
do not match.)	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SER-VOPACK.	_
A.051:	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
Unsupported Device Alarm	An unsupported Serial Converter Unit or encoder (e.g., an external encoder) is connected to the SERVOPACK.	Check the product combination specifications.	Change to a correct combination of models.	-

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.070: Motor Type Change Detected (The connected motor is a differ- ent type of motor from the previ- ously 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 SER- VOPACK 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 SER- VOPACK 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

4.2.3 Troubleshooting Alarms

Continued from previous page.

Alarm Number:			Continued from pro	
Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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.	*1
	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.	*1
A.100: Overcurrent	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 SER-VOPACK, or between the ground and terminals U, V, or W.	The SERVOPACK may be faulty. Replace the SER-VOPACK.	*1
Detected (An overcurrent flowed through the power tran-	The regenerative resistor is not wired correctly or there is faulty contact.	Check the wiring.	Correct the wiring.	*1
sistor or the heat sink overheated.)	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.	-
	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 SERVO-PACK minimum allowable resistance.	*4

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Alarm Number:	Possible Cause	Confirmation	Continued from pro-	Reference
	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.100: Overcurrent Detected (An overcurrent flowed through the power transistor or the heat	A malfunction was caused by noise.	Improve the noise envi- ronment, e.g. by improving the wiring or installation conditions, and check to see if the alarm still occurs.	Implement countermea- sures against noise, such as correct wiring of the FG. Use an FG wire size equivalent to the SERVO- PACK's main circuit wire size.	-
sink overheated.)	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
	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.	*1
	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.	*1
A.101: Motor Overcurrent Detected (The current to the motor exceeded the	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 SER-VOPACK, or between the ground and terminals U, V, or W.	The SERVOPACK may be faulty. Replace the SER-VOPACK.	*1
allowable cur- rent.)	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 envi- ronment, 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 SERVO-PACK's main circuit wire size.	-
	A failure occurred in the SERVOPACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-

4.2.3 Troubleshooting Alarms

Continued from previous page.

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.300: Regeneration Error	When using the built-in regenerative resistor, the jumper between the regenerative resistor terminals (B2 and B3) was removed from one of the following SERVO-PACKs: SGD7S-3R8A, -5R5A, -7R6A, -120A, -180A, -200A, or -330A.	Check to see if the jumper is connected between power supply terminals B2 and B3.*5	Correctly connect a jumper.	*1
	The External Regenerative Resistor or Regenerative Resistor Unit is not wired correctly, or was removed or disconnected.	Check the wiring of the External Regenerative Resistor or Regenerative Resistor Unit.*5	Correct the wiring of the External Regenerative Resistor or Regenerative Resistor Unit.	*1
	Pn600 (Regenerative Resistor Capacity) is not set to 0 and an External Regenerative Resistor is not con- nected to one of the following SERVO- PACKs: SGD7S- R70A, -R90A,-1R6A, -2R8A, -R70F, -R90F, -2R1F, or -2R8F.	Check to see if an External Regenerative Resistor is connected and check the setting of Pn600.	Connect an External Regenerative Resistor, or set Pn600 (Regenerative Resistor Capacity) to 0 (setting unit: ×10 W) if no Regenerative Resistor is required.	*1
	An External Regenerative Resistor is not connected to one of the following SERVO-PACKs: SGD7S-470A, -550A, -590A, or -780A.	Check to see if an External Regenerative Resistor or a Regenerative Resistor Unit is connected and check the setting of Pn600.	Connect an External Regenerative Resistor and set Pn600 to an appropri- ate value, or connect a Regenerative Resistor Unit and set Pn600 to 0.	*1
	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.	_

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 SER-VOPACK.	_

Continued from previous page.

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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.	-
A 000	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
A.330: Main Circuit Power Supply Wiring Error (Detected when the main circuit power supply is turned ON.)	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.	*1
	Pn600 (Regenerative Resistor Capacity) is not set to 0 and an External Regenerative Resistor is not con- nected to one of the following SERVOPACKs: SGD7S-R70A, -R90A, -1R6A, -2R8A, -R70F, -R90F, -2R1F, or -2R8F.	Check to see if an External Regenerative Resistor is connected and check the setting of Pn600.	Connect an External Regenerative Resistor, or if an External Regenera- tive Resistor is not required, set Pn600 to 0.	*1
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SER-VOPACK.	_

Continued from previous page.

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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 an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
A.400: Overvoltage (Detected in the	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.	-
main circuit power supply section of the SERVOPACK.)	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 an alarm still occurs, the SERVOPACK may be faulty. Replace 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.410: Undervoltage (Detected in the main circuit power supply section of the SERVOPACK.)	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.	_	Replace the SERVO-PACK 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 SER-VOPACK.	_

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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 Servo- motor is correctly wired.	-
A.510: Overspeed (The motor	A reference value that exceeded the overspeed detection level was input.	Check the input reference.	Reduce the reference value. Or, adjust the gain.	
exceeded the maximum speed.)	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 SER-VOPACK.	-
A.511: Encoder Output	The encoder output pulse frequency exceeded the limit.	Check the encoder output pulse setting.	Decrease the setting of Pn212 (Number of Encoder Output Pulses) or Pn281 (Encoder Out- put Resolution).	*1
Pulse Overspeed	The encoder output pulse frequency exceeded the limit because the motor speed was too high.	Check the encoder output pulse setting and the motor speed.	Reduce the motor speed.	-
	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
A.520: Vibration Alarm	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 func- tion.)	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 tuningless 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
	The wiring is not correct or there is a faulty connection in the motor or encoder wiring.	Check the wiring.	Make sure that the Servo- motor and encoder are correctly wired.	*1
	Operation was performed that exceeded the overload protection characteristics.	Check the motor over- load characteristics and Run command.	Reconsider the load and operating conditions. Or, increase the motor capacity.	-
A.710: Instantaneous Overload A.720:	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.	-
Continuous Overload	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 SER-VOPACK.	-
A 720 and	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.	-
A.730 and A.731: Dynamic Brake Overload (An excessive power consumption by the dynamic brake was detected.)	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 SER-VOPACK.	-
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 SER-VOPACK.	_

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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 SERVO-PACK installation conditions.	*1
A.7A1:	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.	-
Internal Temperature Error 1 (Control Board Temperature Error)	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 SER-VOPACK.	-
	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 SERVO-PACK installation conditions.	*1
A.7A2:	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.	-
Internal Temperature Error 2 (Power Board Temperature Error)	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 SER-VOPACK.	_
A.7A3: Internal Tempera- ture Sensor Error (An error occurred in the temperature sen- sor circuit.)	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SER-VOPACK.	-

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Alarm Number:	Describle O	0 film 1'	Continued from pro	
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 an alarm still occurs, the SERVOPACK may be faulty. Replace the SER- VOPACK.	-
	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
A.810:	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.	*1
Encoder Backup Alarm (Detected at the encoder, but only when an abso- lute encoder is used.)	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.	*1
	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 SER-VOPACK.	-
A.820: Encoder Check- sum 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 Singleturn 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 SER-VOPACK.	-
A.830: Encoder Battery	The battery connection is faulty or a battery is not connected.	Check the battery connection.	Correct the battery connection.	*1
Alarm (The absolute encoder battery voltage was lower than the speci- fied level.)	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 SER-VOPACK.	_

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Alarm Number:	Possible Cause	Confirmation	Correction	Reference
Alarm Name	FUSSIBLE Gause	Commitmation		neterence
	The encoder malfunctioned.	-	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servo- motor or linear encoder.	_
1.040	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.	_
A.840: Encoder Data Alarm (Detected at the 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 Over- speed (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 an alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servo- motor or linear encoder.	_
	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an 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 Over-	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.	-
heated (Detected when a Rotary Servomo- tor, Absolute Lin-	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
ear Encoder, or Direct Drive Ser- vomotor is con- nected. However, this alarm is not detected for SGMCS Servomotors with	A failure occurred in the encoder.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the Servomotor or absolute linear encoder may be faulty. Replace the Servomotor or absolute linear encoder.	-
Incremental Encoders.) (Detected at the encoder.)	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
	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° or less.	-
A.861: Motor Over- heated	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 an alarm still occurs, the Serial Con- verter Unit may be faulty. Replace the Serial Con- verter Unit.	-
	A failure occurred in the SERVOPACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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.	-
A.862:	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.	-
Overheat 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 an alarm still occurs, the linear encoder may be faulty. Replace the linear encoder.	-
A.8A0: External Encoder Error	Setting the origin of the absolute linear encoder failed because the motor moved.	Before you set the origin, use the fully-closed feedback pulse counter to confirm that the motor is not moving.	The motor must be stopped while setting the origin position.	*1
	A failure occurred in the external encoder.	-	Replace the external encoder.	
A.8A1:	A failure occurred in the external encoder.	_	Replace the external encoder.	-
External Encoder Module Error	A failure occurred in the Serial Converter Unit.	-	Replace the Serial Converter Unit.	-
A.8A2: External Incremental Encoder Sensor Error	A failure occurred in the external encoder.	_	Replace the external encoder.	-
A.8A3: External Absolute Encoder Position Error	A failure occurred in the external absolute encoder.	-	The external absolute encoder may be faulty. Refer to the encoder manufacturer's instruction manual for corrections.	-

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.8A5: External Encoder Overspeed	An overspeed error was detected in the external encoder.	Check the maximum speed of the external encoder.	Keep the external encoder below its maximum speed.	-
A.8A6: External Encoder Overheated	An overheating error was detected in the external encoder.	_	Replace the external 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 an 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 an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
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 MECHA-TROLINK Communications Cable and FG wiring. • Attach a ferrite core to the MECHATROLINK Communications Cable.	-
AGIG EIIGI Z	There is a fault in the SERVOPACK MECHATROLINK communications section.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an 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 an 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 an 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 an 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 an 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.bF4: System Alarm 4	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an 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 an 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 an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
A.bF7: System Alarm 7	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an 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 an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
	The order of phases U, V, and W in the motor wiring is not correct.	Check the Servomotor wiring.	Make sure that the Servo- motor is correctly wired.	-
A.C10: Servomotor Out of Control (Detected when the servo is turned ON.)	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 an 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 an 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.C20: Phase Detection Error	The linear encoder signal level is too low.	Check the voltage of the linear encoder sig- nal.	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 countermea- sures 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.	_
A.C22: Phase Information Disagreement	The SERVOPACK phase information is different from the linear encoder phase information.	_	Perform polarity detection.	*1

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Alarm Number:			Continued from pro	
Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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 SER-VOPACK and that the FG terminal on the SER-VOPACK 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. \(\subseteq \subseteq 1 \) (Detect polarity).	-
A.C53: Out of Range of Motion for Polar- ity 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 an alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servo- motor or linear encoder.	-
	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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 specifications.	-
A.C90: Encoder Communications Error	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 SER-VOPACK.	*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.C91: Encoder Communications Position Data Acceleration Rate	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.	-
Error	There is variation in the FG potential because of the influ- ence 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
	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.C92: Encoder Communications Timer Error	A failure occurred in the encoder.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servo- motor or linear encoder.	-
	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
A.CA0: Encoder Parame- ter Error	A failure occurred in the encoder.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servo- motor or linear encoder.	-
	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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.	-
A.Cb0: Encoder Echo- back Error	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 an alarm still occurs, the Servomotor or linear encoder may be faulty. Replace the Servo- motor or linear encoder.	-
	A failure occurred in the SERVOPACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
	When using a Direct Drive Servomotor, the setting of Pn205 (Mul- titurn Limit) does not agree with the encoder.	Check the setting of Pn205.	Correct the setting of Pn205 (0 to 65,535).	*1
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 SERVO-PACK.	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 an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK. Continued o	-

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	The cable between the Serial Converter Unit and SERVOPACK is not wired correctly or there is a faulty contact.	Check the wiring of the external encoder.	Correctly wire the cable between the Serial Converter Unit and SERVO-PACK.	*1
A.CF1: Reception Failed Error in Feed- back Option	A specified cable is not being used between Serial Con- verter Unit and SER- VOPACK.	Check the wiring specifications of the external encoder.	Use a specified cable.	-
Module Communications	The cable between the Serial Converter Unit and SERVOPACK is too long.	Measure the length of the cable that connects the Serial Converter Unit.	The length of the cable between the Serial Converter Unit and SERVO-PACK must be 20 m or less.	-
	The sheath on cable between the Serial Converter Unit and SERVOPACK is broken.	Check the cable that connects the Serial Converter Unit.	Replace the cable between the Serial Converter Unit and SERVO-PACK.	-
A.CF2: Timer Stopped Error in Feed-	Noise entered the cable between the Serial Converter Unit and SERVOPACK.	_	Correct the wiring around the Serial Converter Unit, e.g., separate I/O signal lines from the Main Circuit Cables or ground.	-
back Option Module Commu- nications	A failure occurred in the Serial Converter Unit.	_	Replace the Serial Converter Unit.	-
	A failure occurred in the SERVOPACK.	-	Replace the SERVO- PACK.	_
	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 SER-VOPACK.	Reduce the position reference speed or the reference acceleration rate, or reconsider the electronic gear ratio.	*1
A.d00: Position Deviation Overflow (The setting of Pn520 (Position Deviation Overflow Alarm Level) was exceeded by the position deviation while the servo was ON.)	The acceleration of the position reference is too high.	Reduce the reference acceleration and try operating the SERVO-PACK.	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 an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-

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Alarm Number:	Possible Cause	Confirmation	Continued from pro-	Reference
Alarm Name		Commination	Correction	neierence
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).	*1
A.d10: Motor-Load Position Deviation	The motor direction and external encoder installation orientation are backward.	Check the motor direction and the external encoder installation orientation.	Install the external encoder in the opposite direction, or change the setting of Pn002 = n.X□□□ (External Encoder Usage) to reverse the direction.	*1
Overflow	There is an error in the connection between the load (e.g., stage) and external encoder coupling.	Check the coupling of the external encoder.	Check the mechanical coupling.	-
A.d30: Position Data Overflow	The position data exceeded ±1,879,048,192.	Check the input reference pulse counter.	Reconsider the operating specifications.	-
A.E02:	The MECHATROLINK transmission cycle fluctuated.	_	Remove the cause of transmission cycle fluctuation at the host controller.	-
MECHATROLINK Internal Synchro- nization Error 1	A failure occurred in the SERVOPACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If an 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 MECHA- TROLINK communica- tions data size of the host controller.	Reset DIP switch S3 to change the number of transmission bytes to an appropriate value.	*1

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Continued from pro	Reference
A.E42: MECHATROLINK	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
Station Address Setting Error	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.	*1
A.E50*4:	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.	-
MECHATROLINK Synchronization Error	A failure occurred in the SERVOPACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If an 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 an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
	MECHATROLINK wiring is not correct.	Check the MECHA- TROLINK wiring.	Correct the MECHATROLINK Communications Cable wiring.	-
A.E60*4: Reception Error in MECHATROLINK Communications	A MECHATROLINK data reception error occurred due to noise.	_	Implement countermeasures against noise. (Check the MECHA-TROLINK 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 an 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.E61: Synchronization	The MECHATROLINK transmission cycle fluctuated.	Check the setting of the MECHATROLINK transmission cycle.	Remove the cause of transmission cycle fluctuation at the host controller.	-
Interval Error in MECHATROLINK Transmission Cycle	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
	MECHATROLINK wiring is not correct.	Check the Servomotor wiring.	Correct the MECHA- TROLINK Communica- tions Cable wiring.	_
A.E63: MECHATROLINK Synchronization Frame Not Received	A MECHATROLINK data reception error occurred due to noise.	_	Implement countermeasures against noise. (Check the MECHA-TROLINK 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 an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
	There is a faulty connection between the SERVOPACK and the Safety Option Module.	Check the connection between the SERVO-PACK and the Safety Option Module.	Correctly connect the Safety Option Module.	-
A.E71: Safety Option Module Detec- tion Failure	The Safety Option Module was discon- nected.	_	Execute Fn014 (Reset Option Module Configuration Error) from the Digital Operator or SigmaWin+ and then turn the power supply to the SERVO-PACK OFF and ON again.	*1
	A failure occurred in the Safety Option Module.	_	Replace the Safety Option Module.	-
	A failure occurred in the SERVOPACK.	_	Replace the SERVO-PACK.	_
A.E72: Feedback Option Module Detec- tion Failure	There is a faulty con- nection between the SERVOPACK and the Feedback Option Module.	Check the connection between the SERVO- PACK and the Feed- back Option Module.	Correctly connect the Feedback Option Module.	-
	The Feedback Option Module was discon- nected.	_	Reset the Option Module configuration error and turn the power supply to the SERVOPACK OFF and ON again.	*1
	A failure occurred in the Feedback Option Module.	-	Replace the Feedback Option Module.	-
	A failure occurred in the SERVOPACK.	_	Replace the SERVO-PACK.	

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.E74: Unsupported	A failure occurred in the Safety Option Module.	-	Replace the Safety Option Module.	-
Safety Option Module	An unsupported Safety Option Module was connected.	Refer to the catalog of the connected Safety Option Module.	Connect a compatible Safety Option Module.	-
A.Eb1: Safety Function Signal Input Tim- ing Error	The delay between activation of the /HWBB1 and /HWBB2 input signals for the HWBB was ten second or longer.	Measure the time delay between the /HWBB1 and /HWBB2 signals.	The output signal circuits or devices for /HWBB1 and /HWBB2 or the SER-VOPACK input signal circuits may be faulty. Alternatively, the input signal cables may be disconnected. Check to see if any of these items are faulty or have been disconnected.	-
	A failure occurred in the SERVOPACK.	-	Replace the SERVO- PACK.	-
A.EC8: Gate Drive Error 1 (An error occurred in the gate drive circuit.) A.EC9: Gate Drive Error 2 (An error occurred in the gate drive circuit.)	A failure occurred in the SERVOPACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
		Check the motor status when the command is executed.	Execute the SV_ON or SENS_ON command only when the motor is not operating.	-
A.Ed1: Command Exe- cution Timeout	A timeout error occurred for a MECHATROLINK command.	For fully-closed loop control, check the status of the external encoder when the command is executed. For other types of control, check the status of the linear encoder when the command is executed.	Execute the SENS_ON command only when an external encoder (e.g., a linear encoder) is connected.	-

Continued from previous page.

Alarm Number			Continued from pro	page.
Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.F10: Power Supply	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.	-
Line Open Phase (The voltage was low for more than one second for phase R, S, or T when the main power supply	A single-phase power supply was input without specifying a signal-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
was ON.)	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-
FL-1*6:				
System Alarm	_		Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	
FL-2*6: System Alarm	A failure occurred in	the SF ON ag occur may b		
FL-3*6:				
System Alarm				
FL-4*6:	the SERVOPACK.			
System Alarm FL-5*6:				
System Alarm				
FL-6 ^{*6} :	_			
System Alarm				
CPF00: Digital Operator	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.	-
Communications Error 1	A malfunction was caused by noise.	_	Keep the Digital Operator or the cable away from sources of noise.	_
CPF01: Digital Operator	A failure occurred in the Digital Operator.	_	Disconnect the Digital Operator and then con- nect it again. If an alarm still occurs, the Digital Operator may be faulty. Replace the Digital Oper- ator.	-
Communications Error 2	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-

- *1. Refer to the following manual for details.
 - Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)
- *2. Detection Conditions
 - · Rotary Servomotor

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

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

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

Linear Servomotor

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

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

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

- *3. Detection Conditions
 - · Rotary Servomotor

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

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

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

Linear Servomotor

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

$$\frac{\text{Rated motor speed [mm/s]} \times 1/3}{\text{Linear encoder pitch [μm]}} \times \frac{\text{Resolution of Serial Converter Unit}}{10} \leq \frac{\frac{\text{Pn20E}}{\text{Pn210}}}{\frac{\text{Pn385}}{\text{Einear encoder pitch [μm]}}} \times \frac{\frac{\text{Resolution of Serial Converter Unit}}{\text{Approx. } 6.10 \times 10^5}} \geq \frac{\frac{\text{Pn20E}}{\text{Pn210}}}{\frac{\text{Pn210}}{\text{Pn210}}}$$

- *4. Refer to the following manual for details.
 - Ω Σ-7-Series Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)
- *5. The SERVOPACK will fail if the External Regenerative Resistor or Regenerative Resistor Unit is connected while the jumper is connected between the B2 and B3 terminals.
- *6. These alarms are not stored in the alarm history. They are only displayed on the panel display.

4.2.4 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.

4.2.5 List of Warnings

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

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.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 Selections).	Required.
A.912	Internal Temperature Warning 1 (Control Board Temperature Error)	The surrounding temperature of the control PCB is abnormal.	Required.
A.913	Internal Temperature Warning 2 (Power Board Temperature Error)	The surrounding temperature of the power PCB is abnormal.	Required.
A.920	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 Over- load	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	SERVOPACK Built-in Fan Stopped	The fan inside the SERVOPACK stopped.	Required.
A.930	Absolute Encoder Bat- tery 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 Com- pensation 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.*
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 Com- mand Conditions)	A command was sent when the conditions for sending a command were not satisfied.	Automatically reset.*

Continued from previous page.

Warning Number	Warning Name	Meaning	Resetting
A.95b	Command Warning 2 (Unsupported Com- mand)	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 MECHA-TROLINK communications.	Required.
A.971	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.9A0	Overtravel	Overtravel was detected while the servo was ON.	Required.
A.9b0	Preventative Mainte- nance Warning	One of the consumable parts has reached the end of its service life.	Required.

^{*} If using the commands for the MECHATROLINK-III standard servo profile, the warning will automatically be cleared after the correct command is received. If you use MECHATROLINK-II-compatible profile commands, send an ALM_CLR (Clear Warning or Alarm) command to clear the warning.

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□□.

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 (Low Battery Voltage Alarm/Warning Selection) (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)

4.2.6 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
	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 SERVO- PACK gains.	Increase the servo gain, e.g., by using autotuning without a host reference.	*
A.900: Position Deviation Overflow	The acceleration of the position reference is too high.	Reduce the reference acceleration and try operating the SERVO-PACK.	Reduce the acceleration of the position reference using a MECHATROLINK com- mand. Or, smooth the posi- tion 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 SERVO-PACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If an 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).	-

Continued from previous page.

Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Reference
	The wiring is not correct or there is a faulty connection in the motor or encoder wiring.	Check the wiring.	Make sure that the Servo- motor and encoder are cor- rectly wired.	-
	Operation was performed that exceeded the overload protection characteristics.	Check the motor over- load characteristics and Run command.	Reconsider the load and operating conditions. Or, increase the motor capacity.	-
A.910: Overload (warning before an A.710 or A.720 alarm occurs)	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 SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVO-PACK.	_
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).	*

4.2.6 Troubleshooting Warnings

Continued from previous page.

Warning Number: Warning Name	Possible Cause	Confirmation	Correction Correction	Reference
	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.	-
A.912: Internal Tempera- ture Warning 1 (Control Board Tem- perature Error)	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 SERVO- PACK installation con- ditions.	Install the SERVOPACK according to specifications.	*
	A failure occurred in the SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVO-PACK.	-
	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.	-
A.913: Internal Tempera- ture Warning 2 (Power Board Tem- perature Error)	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 SERVO- PACK installation con- ditions.	Install the SERVOPACK according to specifications.	*
	A failure occurred in the SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVO-PACK.	_

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Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Reference
	The power supply voltage exceeded the specified range.	Measure the power supply voltage.	Set the power supply voltage within the specified range.	-
A.920: Regenerative Overload (warning before an A.320 alarm occurs)	There is insufficient external regenerative resistance, regenerative resistor capacity, or SER-VOPACK 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 Sigma-JunmaSize+ 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.	-
	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.	-
A.921: Dynamic Brake Overload (warning before an A.731 alarm occurs)	When the Servo- motor 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 SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVO-PACK.	-
A.923: SERVOPACK Built- in Fan Stopped	The fan inside the SERVOPACK stopped.	Check for foreign matter inside the SERVO-PACK.	Remove foreign matter from the SERVOPACK. If an alarm still occurs, the SER- VOPACK may be faulty. Replace the SERVOPACK.	-
A.930: Absolute Encoder Battery Error (The absolute encoder battery voltage was lower than the spec- ified level.) (Detected only when an abso-	The battery con- nection 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.	*
lute encoder is connected.)	A failure occurred in the SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVO-PACK.	_

4.2.6 Troubleshooting Warnings

Continued from previous page.

Warning Number:			Continued from pre	
Warning Name	Possible Cause	Confirmation	Correction	Reference
	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.93B: Overheat Warning	A failure occurred in the SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVO-PACK.	_
	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.	-
	The speed ripple	_	Reset the speed ripple compensation value on the SigmaWin+.	*
A.942: Speed Ripple Compensation Information Disagreement	compensation information stored in the encoder does not agree with the speed ripple compensa- tion information stored in the SER- VOPACK.	_	Set Pn423 to n. □□1□ (Do not detect A.942 alarms). However, changing the setting may increase the speed ripple.	-
tion bisagreement		_	Set Pn423 to n. \(\subseteq \subseteq 0\) (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 Warn- ing 2 (Out of Range)	The set com- mand data was clamped to the minimum or maxi- mum 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 Warn- ing 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.)	*

Continued from previous page.

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 Inter- ference)	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 Com- mand)	An undefined command was sent.	Check the command that caused the warning.	Do not send undefined commands.	*
	The MECHA- TROLINK Com- munications Cable is not wired cor- rectly.	Check the wiring conditions.	Correct the MECHA- TROLINK communications cable wiring.	*
A.960: MECHATROLINK Communications Warning	A MECHA- TROLINK data reception error occurred due to noise.	Confirm the installation conditions.	Implement the following countermeasures against noise. • Check the MECHA-TROLINK 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 SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVO-PACK.	_

4.2.6 Troubleshooting Warnings

Continued from previous page.

Warning Number:	D "1 0	0 " "	Continued from pre	
Warning Name	Possible Cause	Confirmation	Correction	Reference
	For a 200-V SER- VOPACK, the AC power supply volt- age dropped below 140 V.	Measure the power supply voltage.	Set the power supply voltage within the specified range.	-
	For a 100-V SERVOPACK, the AC power supply voltage dropped below 60 V.	Measure the power supply voltage.	Set the power supply voltage within the specified range.	-
A.971: Undervoltage	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 SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVO-PACK.	_
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.9A0: Overtravel (Over- travel 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 Mainte- nance Warning	One of the consumable parts has reached the end of its service life.	_	Replace the part. Contact your Yaskawa representative for replacement.	*

^{*} Refer to the following manual for details.

Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)

Troubleshooting Based on the Operation and Conditions of the Servomotor

4.2.7

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

Problem	Possible Cause	Confirmation	Correction	Reference
	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 connec- tor (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.	-
Servomotor Does Not Start	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. \(\sigma \times \sigma \sigma \sigma \sigma \times \sigma	Check the type of the encoder that is being used and the setting of $Pn002 = n.\square X \square \square$.	Set Pn002 = n.\(\pi\)X\(\pi\) according to the type of the encoder that is being used.	*
	There is a mistake in the input signal allocations (Pn50A, Pn50B, Pn511, and Pn516).	Check the input signal allocations (Pn50A, Pn50B, Pn511, and Pn516).	Correctly allocate the input signals (Pn50A, Pn50B, Pn511, and Pn516).	*
	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 safety input signals (/HWBB1 or /HWBB2) were not turned ON.	Check the /HWBB1 and /HWBB2 input signals.	Turn ON the /HWBB1 and /HWBB2 input signals. If you are not using the safety function, connect the Safety Jumper Connector (provided as an accessory) to CN8.	*

4.2.7 Troubleshooting Based on the Operation and Conditions of the Servomotor

Continued from previous page.

Drabless	Descible Orma	Confirmation	Continued from pre	
Problem	Possible Cause	Confirmation	Correction	Reference
	The FSTP (Forced Stop Input) signal is still OFF. A failure occurred in the SER-	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. Turn OFF the power supply to the servo	*
Servomotor Does Not Start	VOPACK.	Check the setting of	system. Replace the SERVO-PACK.	-
		Pn080 =n.□□□X (Polarity Sensor Selection).	Correct the parameter setting.	*
	The polarity detection was not executed.	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. 	*
	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.	-
Servomotor	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.	_
Moves Instanta- neously,	The setting of Pn282 (Linear Encoder Scale Pitch) is not correct.	Check the setting of Pn282.	Correct the setting of Pn282.	*
and Then Stops	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.	-

4.2.7 Troubleshooting Based on the Operation and Conditions of the Servomotor

Continued from previous page.

Problem	Possible Cause	Confirmation	Continued from pre	Reference
Servomotor Moves with- out a Refer- ence Input	A failure occurred in the SER-VOPACK.	-	Turn OFF the power supply to the servo system. Replace the SERVO-PACK.	-
	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.	-
	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.	-
Dynamic Brake Does Not Operate	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 SERVO-PACK. 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 SERVO-PACK.	-
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.	*

Continued from previous page.

Problem	Possible Cause	Confirmation	Correction	Reference
		Turn OFF the power supply to the servo system. Check to see if there are any loose mounting screws.	Tighten the mounting screws.	-
	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.	-
Abnormal Noise from	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.	-
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 wire cables or screened twisted-pair cables with conductors of at least 0.12 mm ² .	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. Make sure that the rotary or Linear Encoder Cable satisfies the specifications. Use a shielded twisted-pair wire cable or a screened twisted-pair cable with a conductors of at least 0.12 mm ² .	Use cables that satisfy the specifications.	-

			Continued from pre	
Problem	Possible Cause	Confirmation	Correction	Reference
	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 envi- ronment.	-
	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 lay- out 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.	-
Abnormal Noise from Servomotor	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 Con- verter Unit.	-
	A failure occurred in the linear encoder.	_	Turn OFF the power supply to the servo system. Replace the linear encoder.	-

Continued from previous page.

Problem	Possible Cause	Confirmation	Correction	Reference
	The servo gains are not balanced.	Check to see if the servo gains have been correctly tuned.	Perform autotuning without a host reference.	*
Servomotor	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.	-
Vibrates at Frequency of Approx. 200 to 400	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.	-
Hz.	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 appropri- ate.	Check the setting of Pn103.	Set Pn103 to an appropriate value.	-
	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.	-
Large Motor Speed	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.	-
Overshoot on Starting and Stop- ping	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 appropri- ate.	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 and Pn483 = 30% and Pn484 = 30%.	Set Pn483 and Pn484 to appropriate values.	*

Continued from previous page.

			Continued from pre	
Problem	Possible Cause	Confirmation	Correction	Reference
	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 a shielded twisted-pair wire cable or a screened twisted-pair cable with conductors of at least 0.12 mm ² .	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.	-
Absolute Encoder Position Deviation Error (The	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 envi- ronment.	-
position that was saved in the host con- troller when the power	Replace the Encoder Cable and correct the cable installation environment.	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 lay- out so that no surge is applied by high-current lines.	-
was turned OFF is dif- ferent from the posi- tion when	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.	-
the power was next turned ON.)	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 counter- measures 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.	-
	A failure occurred in the encoder.	_	Turn OFF the power supply to the servo system. Replace the Servomotor or linear encoder.	-

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Des la l	Describle O.	0	Continued from pre	
Problem Absolute	Possible Cause	Confirmation	Correction	Reference
Encoder Position Deviation Error (The position that was saved in the	A failure occurred in the SER-VOPACK.	_	Turn OFF the power supply to the servo system. Replace the SERVO-PACK.	-
		Check the error detection section of the host controller.	Correct the error detection section of the host controller.	_
host con- troller when the power was turned	Host Controller Multiturn Data or Absolute Encoder	Check to see if the host controller is executing data parity checks.	Perform parity checks for the multiturn data or absolute encoder posi- tion data.	-
OFF is dif- ferent from the posi- tion when the power was next turned ON.)	Position Data Reading Error	Check for noise interference in the cable between the SERVO-PACK and the host controller.	Implement countermeasures against noise and then perform parity checks again for the multiturn data or absolute encoder position data.	-
		Check the external power supply (+24 V) voltage for the input signals.	Correct the external power supply (+24 V) voltage for the input signals.	-
	The P-OT/N-OT (Forward Drive Prohibit or Reverse Drive Prohibit) signal was input.	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.	*
Overtravel Occurred		Check the settings of the overtravel input signal allocations (Pn50A/Pn50B).	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 over-travel 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	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.	*
Overtravel	Reverse Drive Prohibit) signal in Pn50A = $n.X\square\square\square$ or Pn50B = $n.\square\square\squareX$.	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.	*
Occurred	The selection of the Servo- motor stopping method is	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.	*
	not correct.	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.	*

4.2.7 Troubleshooting Based on the Operation and Conditions of the Servomotor

Continued from previous page.

Problem	Possible Cause Confirmation		Correction	Reference
Improper Stop Posi- tion for	The limit switch position and dog length are not appropriate.	-	Install the limit switch at the appropriate position.	-
Overtravel (OT) Signal	The overtravel limit switch position is too close for the coasting distance.	_	Install the overtravel limit switch at the appropriate position.	_
	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 a shielded twisted-pair wire cable or a screened twisted-pair cable with conductors of at least 0.12 mm ² .	Use cables that satisfy the specifications.	-
Position	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.	-
Deviation (without Alarm)	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 envi- ronment.	-
	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 lay- out 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 counter- measures against noise for the encoder wiring or Serial Converter Unit wiring.	_

Continued from previous page.

Problem	Possible Cause	Confirmation	Correction	Reference
	. 733.3.0 04400	Turn OFF the power supply to the servo system.		
	The encoder was subjected to excessive vibration or shock.	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.	-
Position Deviation (without Alarm)	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 a shielded twisted-pair wire cable or a screened twisted-pair cable with conductors of at least 0.12 mm ² .	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.	-
Position Deviation (without Alarm)	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 SER-VOPACK.	_	Turn OFF the power supply to the servo system. Replace the SERVO-PACK.	-
	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.	_
Servomotor Overheated	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.	_

^{*} Refer to the following manual for details.

Ω Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)

This chapter provides information on the parameters.

5.1	SERVOF	PACKs with Analog Voltage/Pulse Train References5-2	
	5.1.1 5.1.2 5.1.3	Interpreting the Parameter Lists	
5.2	SERVOPACKs with MECHATROLINK-III Communications References .		
	5.2.1 5.2.2 5.2.3	Interpreting the Parameter Lists 5-44 List of Servo Parameters	
	5.2.4	Parameters	

5.1.1 Interpreting the Parameter Lists

5.1

SERVOPACKs with Analog Voltage/Pulse Train References

5.1.1 Interpreting the Parameter Lists

The types of motors 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.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applica- ble Motors	When Enabled	Classi- fication	Refer- ence
	2	Basic Function Selections 0	0000h to 10B1h	-	0000h	All	After restart	Setup	-

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

There are the following two classifications.

- · Setup
- Tuning

Refer to the following manual for details.

Σ-7-Series Σ-7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual (Manual No.: SIEP S800001 26)

nce

	Rotation Direction Selection Movement Direction Selection				
		Use CCW as the forward direction.			
n.□□□X	0	Use the direction in which the linear encoder counts up as the forward direction.			
		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)			

	Control	Method Selection	Reference
	0	Speed control with analog references	
	1	Position control with pulse train references	
	2	Torque control with analog references	
	3	Internal set speed control with contact commands	
	4	Switching between internal set speed control with contact references and speed control with analog references	
	5	Switching between internal set speed control with contact references and position control with pulse train references	
n.□□X□	6	Switching between internal set speed control with contact references and torque control with analog references	_
	7	Switching between position control with pulse train references and speed control with analog references	
	8	Switching between position control with pulse train references and torque control with analog references	
	9	Switching between torque control with analog references and speed control with analog references	
	А	Switching between speed control with analog references and speed control with zero clamping	
	В	Switching between position control with pulse train references and position control with reference pulse inhibition	

n.□X□□	Reserved parameter (Do not change.)		
	Rotary/Li	near 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	When an encoder is not connected, start as SERVOPACK for Linear Servomotor.	_
	•		

Pn000

When

Classi-

Refer-

Parameter Lists

List of Parameters 5.1.2

Parameter

The following table lists the parameters.

Note: Do not change the following parameters from their default settings.

Reserved parameters

ze

Name

Parameters not given in this manual
Parameters that are not valid for the Servomotor that you are using, as given in the parameter table

Setting

Default Applicable

Setting

Basic Functions 0	Rotation D Movement 0 t t	Jse the direction i ion.	i on orward dir		All	After restart	Setup	*1					
n.□□□X	Movement 0 t t	Direction Select Use CCW as the formula the direction is ion.	i on orward dir										
n.□□□X	Movement 0 t t	Direction Select Use CCW as the formula the direction is ion.	i on orward dir										
n.□□□X	Movement 0 t t	Direction Select Use CCW as the formula the direction is ion.	i on orward dir										
n.□□□X	0 (t	Jse the direction i ion.			Use CCW as the forward direction.								
n.□□□X	1 L	ion.	n which th										
	1 ξ	Jse CW as the for	tion.										
		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)											
	Control Me	trol Method Selection											
	0 8	Speed control with	n analog re	eferences									
	1 F	Position control with pulse train references											
	2 7	orque control witl	h analog r	eferences									
		nternal set speed											
		Switching betweer speed control with			control with c	ontact refere	ences and						
	5 g	Switching betweer position control wi	n internal : th pulse ti	set speed o ain referen	control with c ces	ontact refere	ences and						
n.□□X□					control with c	ontact refere	ences and						
		Switching between position control with pulse train references and speed control with analog references											
	8 8	Switching between position control with pulse train references and torque control with analog references											
				ontrol with	analog refere	ences and sp	eed contr	ol					
				ontrol with	analog refere	nces and sp	eed contr	ol					
					h pulse train	references a	nd positio	n					
n.□X□□	Reserved	parameter (Do no	t change.)									
	Rotary/Lin	ear Servomotor S	Startup Se	election WI	nen Encoder	Is Not Conr	nected						
n.X□□□	0 1	When an encoder						0-					
			is not cor	nected, sta	When an encoder is not connected, start as SERVOPACK for Linear Servo-								
	n.□X□□	n.□□X□ 6 5 t t 7 5 c c 6 5 t 1 5 c c 6 5 c c 6 5	position control with Switching between torque control with 7 Switching between control with analog 8 Switching between control with analog reference A Switching between with analog reference A Switching between with zero clamping B Switching between control with refere B Switching between control with reference N.DXDD Reserved parameter (Do not not not not not not not not not no	n.□□X□ 6 Switching between internal storque control with analog reference 7 Switching between position control with analog reference 8 Switching between position control with analog reference 9 Switching between position control with analog reference with analog references A Switching between torque of with analog references A Switching between speed of with zero clamping B Switching between position control with reference pulse n.□X□□ Reserved parameter (Do not change.) Rotary/Linear Servomotor Startup Setup Setu	n.□□X□ 6 Switching between internal set speed of torque control with analog references 7 Switching between position control with control with analog references 8 Switching between position control with control with analog references 9 Switching between torque control with with analog references A Switching between torque control with with analog references A Switching between speed control with with zero clamping B Switching between position control with with zero clamping B Switching between position control with control with reference pulse inhibition n.□X□□ Reserved parameter (Do not change.) When an encoder is not connected, star motor. When an encoder is not connected, star motor.	n.□□X□ 6 Switching between internal set speed control with control with analog references 7 Switching between position control with pulse train control with analog references 8 Switching between position control with pulse train control with analog references 9 Switching between position control with pulse train control with analog references 9 Switching between torque control with analog references A Switching between speed control with analog references A Switching between speed control with analog references with zero clamping B Switching between position control with pulse train control with reference pulse inhibition n.□X□□ Reserved parameter (Do not change.) Rotary/Linear Servomotor Startup Selection When Encoder motor. When an encoder is not connected, start as SERVC motor. 1 When an encoder is not connected, start as SERVC	position control with pulse train references Switching between internal set speed control with contact refere torque control with analog references Switching between position control with pulse train references a control with analog references Switching between position control with pulse train references a control with analog references Switching between position control with pulse train references a control with analog references Switching between torque control with analog references and spwith analog references A Switching between speed control with analog references and spwith zero clamping B Switching between position control with pulse train references a control with reference pulse inhibition NUDD Reserved parameter (Do not change.) Rotary/Linear Servomotor Startup Selection When Encoder Is Not Control with an encoder is not connected, start as SERVOPACK for Romotor. When an encoder is not connected, start as SERVOPACK for Linear Servomotor Startup Selection with an analog references and spwith zero clamping and services and services and services and services a	position control with pulse train references Switching between internal set speed control with contact references and torque control with analog references Switching between position control with pulse train references and speed control with analog references Switching between position control with pulse train references and torque control with analog references Switching between torque control with analog references and speed control with analog references A Switching between speed control with analog references and speed control with zero clamping B Switching between position control with pulse train references and position control with reference pulse inhibition N.DXDD Reserved parameter (Do not change.) Rotary/Linear Servomotor Startup Selection When Encoder Is Not Connected When an encoder is not connected, start as SERVOPACK for Rotary Servemotor. When an encoder is not connected, start as SERVOPACK for Linear Servomotor.					

Name

ize

5.1.2 List of Parameters

Parameter

Continued from previous page.

Classi- Refer-

When

No.	Si	1	Range Unit Setting Motors Enabled fication									
	2	Application Selections	Function 1	0000h to 1142h	_	0000h	All	After restart	Setup	*1		
	١.											
			Motor Stop	oing Method for	Servo O	FF and Gro	oup 1 Alarms					
			0 St	op the motor by	applying	the dynam	ic brake.					
	'	n.□□□X		Stop the motor by the applying dynamic brake and then release the dynamic brake.								
			2 Co	past the motor to	o a stop v	ithout the	dynamic brak	ie.				
	Ī		Overtravel S	Stopping Metho	d							
				Apply the dynamic brake or coast the motor to a stop (use the stopping method set in Pn001 = n.□□□X).								
				Decelerate the motor to a stop using the torque set in Pn406 as the maximum torque and then servo-lock the motor.								
Pn001	'	n.□□X□	2 De	ecelerate the mo	tor to a st	op using th or coast.	e torque set i	n Pn406 as	the maxim	um		
				ecelerate the mo en servo-lock th		top using th	ne deceleratio	on time set ir	n Pn30A ai	nd		
				ecelerate the mo en let the motor		top using th	ne deceleratio	on time set ir	n Pn30A ai	nd		
			Main Circuit Power Supply AC/DC Input Selection									
		_	0 In	out AC power as inals (do not use	s the main s shared c	circuit pov onverter).	ver supply us	ing the L1, L	.2, and L3	ter-		
		n.□X□□	1 te	out DC power as rminals or the B ared converter).	1 and \ominus :					2		
	П		Warning Co	de Output Sele	ction							
			0 O	utput only alarm	codes on	the ALO1,	ALO2, and A	LO3 termina	als.			
		n.X□□□	1 te	Output only alarm codes on the ALO1, ALO2, and ALO3 terminals. Output both warning codes and alarm codes on the ALO1, ALO2, and terminals. However, while an warning code is being output, the ALM (So Alarm) output signal will remain ON (normal state).								
	/ Marriy datput digital will fortial dated).									_		

Setting

Default

Applicable

Setting

	_		
Continued	from	provious	nago
Continueu	11 0111	DIENIOUS	paye.

Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
	2	Application Selections	Function 2	0000h to 4213h	-	0000h	-	After restart	Setup	*1
			Speed/Pos	sition Control Op	tion (T-RE	F Input Al	location)		Applicat Motors	
			0 0	Do not use T-REF.						
		n.□□□X	1 l	Jse T-REF as an e						
			2 l	Jse T-REF as a to		All				
			3							
			Torque Control Option (V-REF Input Allocation)							ole s
		n.□□X□	0 0	Do not use V-REF					All	
			1 l	Jse V-REF as an	external s	oeed limit i	nput.		All	
Pn002			Encoder Usage							ole s
		n.□X□□	0 (Use the encoder according to encoder specifications.						
			1 l	Jse the encoder a		All				
			2 l	Jse the encoder a		Rotary	,			
			External E	ncoder Usage					Applicat Motors	
			0 0	Do not use an ext	ernal enco	oder.				
		n.X□□□		The external enco	der moves	s in the for	ward directior	for CCW		
			2 F	Reserved setting	(Do not us	e.)			Rotary	,
				The external enco	der moves	s in the rev	erse direction	for CCW	<i>-</i>	
			4 F	Reserved setting	(Do not us	e.)				
	Thousand dotting (50 Hot doc.)									

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Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
	2	Application Selections		0000h to 105Fh	_	0002h	All	Immedi- ately	Setup	*1		
						1	I					
			Analog Mo	nitor 1 Signal Se	election							
			00	Motor speed (1 Motor speed (1								
			01	Speed reference	e (1 V/1,00	00 min ⁻¹)						
			01	Speed reference	e (1 V/1,00	00 mm/s)						
			02	Torque reference (1 V/100% rated torque)								
				Force reference (1 V/100% rated force)								
			03	Position deviation	,		,					
			04	Position amplifie						unit)		
			04	Position amplifice pulse unit)	er deviation	n (after eled	ctronic gear) (0.05 V/linea	encoder			
			05	Position reference speed (1 V/1,000 min ⁻¹)								
				Position referen	•		mm/s)					
			06	Reserved setting	· ·							
		n.□□XX	07	Load-motor pos		•						
Pn006			08	Positioning completed: 0 V)	pletion (po	ositioning c	completed: 5 \	V, positionino	g not com-			
			09	Speed feedforw	ard (1 V/1	,000 min ⁻¹)						
				Speed feedforward (1 V/1,000 mm/s)								
			0A	Torque feedforward (1 V/100% rated torque)								
			0.0	Force feedforwa	•							
			0B	Active gain (1st				-1-11-5-1				
			0C	Completion of p pleted: 0 V)			,					
			0D	External encode			min ⁻¹ : value at	the motor s	haft)			
			0E	Reserved setting	•							
			0F	Reserved setting	•	use.)						
			10	Main circuit DC								
			11 to 24	Reserved setting	•	•	CH (0.4	25.77.6	***			
			25	Position deviation			ence filter (0.0	J5 V/referen	ce unit)			
			26 to 5F	Reserved setting	gs (Do not	use.)						
		n.□X□□	Reserved p	parameter (Do no	ot change.)						
		n.X□□□	Reserved p	parameter (Do no	ot change	.)						

Applicable

Motors

5.1.2 List of Parameters

Classi-

fication

Refer-

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Continued	from	provious	nago
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When

Enabled

	2	Application Selections		0000h to 105Fh	-	0000h	All	Immedi- ately	Setup	*1			
			Analog Mo	onitor 2 Signal Se	election								
			00	Motor speed (1	V/1,000 m	nin ⁻¹)							
			00	Motor speed (1	V/1,000 m	nm/s)							
			01	Speed reference	e (1 V/1,00	00 min ⁻¹)							
			01	Speed reference	e (1 V/1,00	00 mm/s)							
			02	Torque referenc	e (1 V/100	% rated to	rque)						
			02	Force reference	(1 V/100%	6 rated for	ce)						
			03	Position deviation	on (0.05 V/	reference	unit)						
			0.4	Position amplifie		•	9 ,		•	unit)			
			04	Position amplifice pulse unit)	er deviatior	n (after eled	ctronic gear) (0.05 V/linea	rencoder				
			05	Position referen	Position reference speed (1 V/1,000 min ⁻¹)								
				Position referen	ce speed (1 V/1,000	mm/s)						
			06	Reserved settin	g (Do not ι	use.)							
		n.□□XX	07	Load-motor pos		,		,					
Pn007		П. ЦЦХХ	08	Positioning completed: 0 V)	pletion (po	ositioning c	completed: 5	V, positionin	g not com-				
			09	Speed feedforw	ard (1 V/1	,000 min ⁻¹)	<u> </u>						
				Speed feedforw	ard (1 V/1	,000 mm/s	s)						
			0A	Torque feedforward (1 V/100% rated torque)									
				Force feedforwa	•								
			OB	Active gain (1st	•								
			0C	Completion of p pleted: 0 V)	osition ref	erence dis	tribution (com	ipleted: 5 V,	not com-				
			0D	External encode	er speed (1	V/1,000 r	min ⁻¹ : value at	the motor s	haft)				
			0E	Reserved settin	•								
			0F	Reserved settin	O (use.)							
			10	Main circuit DC									
			11 to 24	Reserved settin	` `		CH (O	05.)//('1\				
			25	Position deviation			ence filter (U.	05 V/referen	ce unit)				
			26 to 5F	Reserved settin	gs (Do not	use.)							
		n.□X□□	Reserved	parameter (Do no	ot change.	.)							
		n.X□□□	Reserved	parameter (Do no	ot change.	.)							

Setting

Range

Setting

Unit

Default

Setting

Parameter

No.

Size

Name

Continued from previous page.

Parameter No.	Size	N	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence			
	2	Applicatio Selections	n Function 8 8	0000h to 7121h	_	0000h	Rotary	After restart	Setup	*1			
										_			
				Voltage Alarm									
		n.□□□X		tput alarm (A.8	,								
			1 Ou	tput warning (A	930) for I	ow battery	voltage.						
			Function Se	ection for Und	ervoltage								
D=000			0 Dc	not detect und	lervoltage.								
Pn008		n.□□X□	1 De	tect undervolta	ge warning	g and limit	torque at hos	t controller.					
				Detect undervoltage warning and limit torque with Pn424 and Pn425 (i.e., only in SERVOPACK).									
			Warning Det	ection Selection	n								
		n.□X□□	0 De										
			1 Do	3									
		~ VDDD	Decemined no	warmatay (Da na	+ = = = = = =	\							
		n.X□□□	Reserved pa	rameter (Do no	or change.)							
		Applicatio	n Eupotion	0000h to				After					
	2	Selections	n Function s 9	0000h to 0121h	_	0010h	All	restart	Tuning	*1			
							•						
			1							_			
		n.□□□X	Reserved pa	rameter (Do no	t change.)							
			Current Con	trol Mode Sele	ction								
			0 Us	e current contro	ol mode 1.								
		- DDVD		ERVOPACK Mo		,	-R90A, -1R6A	A, -2R8A, -5	R5A, and	-			
Pn009		n.□□X□		R6A: Use curre ERVOPACK Mo			-180A -200A	-330A -47	ΛΔ -55ΛΔ				
111000				90A, and -780A				, 000/1, 47	OA, 000F	٠,			
			2 Us	e current contro	ol mode 2.								
			Speed Detec	tion Method S	election								
		n.ロXロロ	<u> </u>	e speed detecti									
				e speed detecti									
				'									
		- VDDD	Danasi		4 - 1	١							
		n.X□□□	Reserved pa	rameter (Do no	t change.)							

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Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
	2	Application Selections		0000h to 1044h	-	0001h	All	After restart	Setup	*1		
				1	ii.	1						
			Motor Stopp	oing Method fo	r Group 2	Alarms						
				ply the dynami ethod set in Pno			motor to a st	op (use the s	stopping			
			1 De tor	celerate the more	otor to a st etting of P	top using t n001 = n. l	he torque set □□□X for the	in Pn406 as e status after	the maxin	num		
		n.□□□X		celerate the mo que and then le			he torque set	in Pn406 as	the maxin	num 		
			3 De	celerate the mose setting of PnC	otor to a s 001 = n. □I	top using t ⊐□X for th	the deceleration ne status after	on time set in stopping.	n Pn30A.	Use		
				celerate the motor		top using t	the deceleration	on time set i	n Pn30A a	and		
Pn00A			Stopping Me	ethod for Force	ed Stops							
				ply the dynami ethod set in Pn			motor to a st	op (use the s	stopping			
				Decelerate the motor to a stop using the torque set in Pn406 as the maximum orque. Use the setting of Pn001 = n. \(\sigma\sigma\sigma\) as the status after stopping.								
		n.□□X□		celerate the mo			he torque set	in Pn406 as	the maxin	num		
			3 De	celerate the mose setting of PnC	otor to a s 001 = n. □I	top using t ⊐□X for th	the deceleration ne status after	on time set in stopping.	n Pn30A.	Use		
				celerate the meen let the motor		top using t	the deceleration	on time set i	n Pn30A a	and		
		n.□X□□	Reserved pa	arameter (Do n	ot change	.)						
		n.X□□□	Reserved pa	arameter (Do n	ot change	.)						
	2	Application Selections		0000h to 1121h	-	0000h	All	After restart	Setup	*1		
			Operator Para	ameter Display	Selection	ı						
	1	n.□□□X		olay only setup		rs.						
			1 Disp	olay all paramet	ters.							
			Motor Stoppi	ng Method for	Group 2	Alarms						
D=00D			0 Sto	p the motor by	setting th	e speed re	ference to 0.					
Pn00B	1	n.□□X□	1 Apr	oly the dynamic	brake or	coast the r	notor to a sto	p (use the s	topping			
			-	the stopping n		,	- n.□□□X.					
			Power Input S	Selection for T	hree-phas	e SERVOR	PACK					
	ı	n.□X□□		a three-phase								
			1 Use	a three-phase	power su	pply input	as a single-ph	nase power s	supply inp	ut.		
		n.X□□□	Reserved par	ameter (Do no	t change.)							
				(/_ /_ /_ /_ /_ /_ /_ /_ /_ /_ /_ /_								

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Parameter No.	Size		ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
	2	Application Selections	Function C	0000h to 0131h	-	0000h	_	After restart	Setup	*1
		n.□□□X		ection for Test					Applica Motor	ble s
				able tests with					All	
				solution for Tes					Applica Motor	ble
Pn00C		n.□□X□	1 Us	e 13 bits. e 20 bits. e 22 bits.					Rotar	у
			3 Us	e 24 bits.						
		n.OXOO		e Selection for			tor		Applica Motor	ble s
		/\		e an increment e an absolute e		:			All	
		n.X□□□	Reserved pa	rameter (Do no	ot change	.)				
						1				
	2	Application Selections		0000h to 1001h	-	0000h	All	After restart	Setup	*1
		n.□□□X	Reserved pa	rameter (Do no	ot change.	.)				
Pn00D		n.□□X□	Reserved pa	rameter (Do no	ot change.	.)				
		n.□X□□	Reserved pa	rameter (Do no	ot change.	.)				
		n.X□□□	Overtravel W 0 Do 1 De							
	2	Application Selections		0000h to 2011h	_	0000h	All	After restart	Setup	*1
Pn00F		n.□□□X	0 Dor	Maintenance of detect preventative	entative ma	aintenance	-			
		n.□□X□	Reserved pa	rameter (Do no	ot change	.)				
		n.□X□□	Reserved pa	rameter (Do no	ot change	.)				
		n.X□□□	Reserved pa	rameter (Do no	ot change.	.)				
Pn010	2		ss Selection JSB Commu-	0000h to 007Fh	-	0001h	All	After restart	Setup	-
Pn021	2	Reserved p	parameter (Do e.)	_	_	0000h	All	_	_	
Pn022	2	Reserved p	parameter (Do e.)	_	_	0000h	All	-	_	_
	•	-							-	-

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							Cor	tinued from	n previou	s page.		
Parameter No.	Size		Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
	2	Σ-V Com tion Swite	patible Func- ch	0000h to 2111h	-	0000h	-	After restart	Setup	_		
	n	.000X	Reserved para	ameter (Do not	change.)							
D:040			Encoder Reso	lution Compati	bility Sele	ction			Applica Motor			
Pn040	n	.00X0		the encoder res				M7 I	Rotar	v		
				17A, SGM7P, S					110101			
	n	.0X00	Reserved para	ameter (Do not	change.)							
	n	.X000	Reserved para	ameter (Do not	change.)							
	2	Application	on Function	0000h to	_	0000h	Linear	After	Setup	*1		
		Selection	s 80	1111h		000011	Lincai	restart	Octup			
		Delavity Canacy Calcation										
		n.□□□X	Polarity Sens		ν							
		1.000		e polarity senso not use polarity						—		
			Motor Phase	Sequence Sele	ection							
Pn080		n.□□X□	+	•								
			1 Set	a phase-B lead	d as a pha	se sequen	ce of U, V, an	d W.				
		n.□X□□	Reserved pa	rameter (Do no	t change.)							
	I		Calculation N	Calculation Method for Maximum Speed or Encoder Output Pulses O Calculate the encoder output pulse setting for a fixed maximum speed.								
	1	n.X000			· · · · · ·	•			•			
			1 Cal	culate the maxi	mum spee	d for a fixe	ed encoder ou	utput pulse s	etting.			
		Application	on Function	0000h to				After				
	2	Selection		1111h	_	0000h	All	restart	Setup	*1		
	Ī		Discos O D		1					_		
		n.□□□X		lse Output Sele		in the forv	vard direction	<u> </u>				
Pn081				itput phase-C p					ns.			
1 11001		n.□□X□	Reserved pa	arameter (Do no	ot change.)						
		n.□X□□	Reserved pa	arameter (Do no	ot change.)						
		n.X000	Reserved pa	arameter (Do no	ot change.)						
				,		,						
Pn100	2	Speed Lo	oop Gain	10 to 20,000	0.1 Hz	400	All	Immedi- ately	Tuning	*1		
Pn101	2	Speed Lo Time Cor	oop Integral nstant	15 to 51,200	0.01 ms	2000	All	Immedi- ately	Tuning	*1		
Pn102	2	Position I	Loop Gain	10 to 20,000	0.1/s	400	All	Immedi- ately	Tuning	*1		
Pn103	2	Moment	of Inertia Ratio	0 to 20,000	1%	100	All	Immedi- ately	Tuning	*1		
Pn104	2	Second S Gain	Speed Loop	10 to 20,000	0.1 Hz	400	All	Immedi- ately	Tuning	*1		
Pn105	2	Integral T	Speed Loop ime Constant	15 to 51,200	0.01 ms	2000	All	Immedi- ately	Tuning	*1		
Pn106	2	Second F Gain	Position Loop	10 to 20,000	0.1/s	400	All	Immedi- ately	Tuning	*1		

Second Friction Com-

Friction Compensation Coefficient

Friction Compensation

Frequency Correction

Friction Compensation Gain Correction

Gain Switching Time 1

Gain Switching Time 2

Gain Switching Waiting

Gain Switching Waiting

pensation Gain

10 to 1,000

0 to 100

-10,000 to 10,000

1 to 1,000

0 to 65,535

0 to 65,535

0 to 65,535

0 to 65,535

1%

1%

0.1 Hz

1%

1 ms

1 ms

1 ms

1 ms

100

0

0

100

0

0

0

0

All

Αll

ΑII

ΑII

All

ΑII

ΑII

All

Pn122

Pn123

Pn124

Pn125

Pn131

Pn132

Pn135

Pn136

2

2

2

2

2

2

2

2

Time 2

5.1.2 List of Parameters

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Parameter No.	Size	N	ame		Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refe ence	
Pn109	2	Feedforwa	rd		0 to 100	1%	0	All	Immedi- ately	Tuning	*1	
Pn10A	2	Feedforwa Constant	rd Filter Ti	me	0 to 6,400	0.01 ms	0	All	Immedi- ately	Tuning	*1	
	2	Gain Applications	cation Sele	ec-	0000h to 5334h	_	0004h	All	_	Setup	*1	
			Mode Sv	vitch	ing Selection					Whe Enabl		
			0		Use the internal torque reference as the condition (level setting: Pn10C).							
			4	Use	Use the speed reference as the condition (level setting: Pn10D).							
		- DDDV	1	Use	e the speed ref	erence as	the condit	ion (level setti	ng: Pn181).			
				Use the acceleration reference as the condition (level setting: Pn10E).					Imme atel			
Pn10B			2		e the accelerati 182).	on referen	ce as the	condition (leve	el setting:			
11100			3	Use	e the position o	leviation a	s the cond	ition (level set	tting: Pn10F)			
			4	Do	not use mode	switching.						
			Speed L	оор	Control Metho	d				Whe Enabl		
		n.□□X□	0	PI c	PI control							
			1	I-P control							er art	
			2 to 3	Reserved settings (Do not use.)								
		n.□X□□	Reserved	d pai	rameter (Do no	t change.)					
		n.X□□□	Reserved	d pai	rameter (Do no	ot change.	.)					
		T			T	Т		T		Т		
Pn10C	2	Mode Swit for Torque	Reference)	0 to 800	1%	200	All	Immedi- ately	Tuning	*1	
Pn10D	2	Mode Swit for Speed			0 to 10,000	1 min ⁻¹	0	Rotary	Immedi- ately	Tuning	*1	
Pn10E	2	Mode Swit for Acceler		el	0 to 30,000	1 min ⁻¹ /s	0	Rotary	Immedi- ately	Tuning	*1	
Pn10F	2	Mode Swit for Position	n Deviation	1	0 to 10,000	1 refer- ence unit	0	All	Immedi- ately	Tuning	*1	
Pn11F	2	Position In Constant	tegral Tim	е	0 to 50,000	0.1 ms	0	All	Immedi- ately	Tuning	*1	
Pn121	2	Friction Co Gain	mpensatio	on	10 to 1,000	1%	100	All	Immedi- ately	Tuning	*1	

Tuning Continued on next page.

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Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence	
	2	Automatic ing Selecti	Gain Switch- ons 1	0000h to 0052h	_	0000h	All	Immedi- ately	Tuning	*1	
Pn139		n.00X0	Th Re Us Th Sw See See Switch O /C 2 /N 3 /N 4 Po 5 Po	Use manual gain switching. The gain is switched manually with the /G-SEL (Gain Selection) signal. Reserved setting (Do not use.) Use automatic gain switching pattern 1. The gain is switched automatically from the first gain to the second gain when switching condition A is satisfied. The gain is switched automatically from the second gain to the first gain when switching condition A is not satisfied. Gain Switching Condition A /COIN (Positioning Completion Output) signal turns ON. /COIN (Positioning Completion Output) signal turns OFF. /NEAR (Near Output) signal turns ON. /NEAR (Near Output) signal turns OFF. Position reference filter output is 0 and reference pulse input is OFF.							
	n.X□□□ Reserved parameter (Do not change.)										
Pn13D	2	Current Ga	ain Level	100 to 2,000	1%	2000	All	Immedi- ately	Tuning	*1	
Pn13F	2		ation Control Position Inte- Constant	0 to 50,000	0.1 ms	0	All	Immedi- ately	Tuning	-	
	2		owing Con- d Selections								
		n.□□□X	0 Do r 1 Use	wing Control Senot use model following pression Selenot perform vibr	ollowing control.						
		n.□□X□	1 Perf	orm vibration su	uppression	n for a spec					
Pn140		n.□X□□	0 tur	ppression Adju o not adjust vibra ning without a haing. Ijust vibration suthout a host refe	ation suppost referer	pression au nce, autotu n automatio	ning with a ho cally during ex	ost reference kecution of a	, and cust utotuning	om	
		n.X000	Speed Feedforward (VFF)/Torque Feedforward (TFF) Selection O Do not use model following control and speed/torque feedforward together. 1 Use model following control and speed/torque feedforward together.							er.	
Pn141	2	Model Foll trol Gain	owing Con-	10 to 20,000	0.1/s	500	All	Immedi- ately	Tuning	*1	
		10.0011						a.o.y			

Model Following Control Gain Correction

500 to 2,000

0.1%

1000

ΑII

Pn142

2

Tuning Continued on next page.

Immedi-ately

Parameter Lists

*1

Continued from previous page.

Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
Pn143	2		owing Con- the Forward	0 to 10,000	0.1%	1000	All	Immedi- ately	Tuning	*1
Pn144	2	Model Follotrol Bias in Direction	owing Con- the Reverse	0 to 10,000	0.1%	1000	All	Immedi- ately	Tuning	*1
Pn145	2	Vibration S Frequency	Suppression 1 A	10 to 2,500	0.1 Hz	500	All	Immedi- ately	Tuning	*1
Pn146	2	Vibration S Frequency	Suppression 1 B	10 to 2,500	0.1 Hz	700	All	Immedi- ately	Tuning	*1
Pn147	2		owing Con- Feedforward ation	0 to 10,000	0.1%	1000	All	Immedi- ately	Tuning	*1
Pn148	2	Second Maing Contro	odel Follow- I Gain	10 to 20,000	0.1/s	500	All	Immedi- ately	Tuning	*1
Pn149	2		odel Follow- I Gain Correc-	500 to 2,000	0.1%	1000	All	Immedi- ately	Tuning	*1
Pn14A	2	Vibration S Frequency	Suppression 2	10 to 2,000	0.1 Hz	800	All	Immedi- ately	Tuning	*1
Pn14B	2	Vibration S Correction	Suppression 2	10 to 1,000	1%	100	All	Immedi- ately	Tuning	*1
	2	Control-Retions	elated Selec-	0000h to 0021h	-	0021h	All	After restart	Tuning	*1
Pn14F		n.00X0 n.0X00	Tuning-less 0 Use 1 Use 2 Use Reserved pa	e model following personal following selection to tuning-less type tuning-	pe 1. pe 2. pe 3.)				
	2	1	nance Con- d Selections	0000h to 0011h	-	0010h	All	Immedi- ately	Tuning	*1
Pn160		n.□□□X	0 Do 1 Use Anti-Resona Do tun	nce Control Se not use anti-re e anti-resonance nce Control Ad not adjust anti- ing without a he-	sonance de control. justment resonance	Selection e control a				
		n.□X□□	1 Adj	just anti-resona hout a host refe rameter (Do no	erence, au	totuning w				
		n.X000		rameter (Do no						
Pn161	2	Anti-Resor	nance Fre-	10 to 20,000	0.1 Hz	1000	All	Immedi- ately	Tuning	*1
Pn162	2		nance Gain	1 to 1,000	1%	100	All	Immedi- ately	Tuning	*1

Applicable

Motors

All

5.1.2 List of Parameters

Classi-

fication

Tuning

Refer-

ence

*1

	_		
Continued	from	provious	nago
Continueu	11 0111	DIENIOUS	paye.

When

Enabled

Immedi-ately

	1	_		1	1		I	1	I	l
Pn164	2		nance Filter stant 1 Cor-	-1,000 to 1,000	0.01 ms	0	All	Immedi- ately	Tuning	*1
Pn165	2		nance Filter stant 2 Cor-	-1,000 to 1,000	0.01 ms	0	All	Immedi- ately	Tuning	*1
Pn166	2	Anti-Resor	nance Damp	0 to 1,000	1%	0	All	Immedi- ately	Tuning	*1
	2	Tuning-less Related Se		0000h to 2711h	-	1400h	All	-	Setup	*1
Pn170		n.□□□X□ Tuning-less Selection 0 Disable tuning-less function. 1 Enable tuning-less function. Speed Control Method 0 Use for speed control. 1 Use for speed control and use host controller for position control. Rigidity Level 0 to 7 Set the rigidity level. Tuning-less Load Level 0 to 2 Set the load level for the tuning-less function.								en led er art led ed e
Pn181	2	Mode Swit for Speed	ching Level Reference	0 to 10,000	1 mm/s	0	Linear	Immedi- ately	Tuning	*1
Pn182	2	Mode Swit	ching Level ation	0 to 30,000	1 mm/s ²	0	Linear	Immedi- ately	Tuning	*1
	2	Less-Devia Related Sv	ation Contro vitches	l- 0000h to 1101h	_	0100h	All	After restart	Setup	_
Pn190	_	n.000X	0 D	ation Control Se o not use less-de se less-deviation	eviation con control.	ntrol.				
111190				,	. ,					
		n.□X□□	Reserved	oarameter (Do no	cnange.)					
		n.X000	0 L	dforward/Torque Less-deviation co Less-deviation co	ntrol and s	peed/torqu	ue feedforwar			er.
Pn191	2	Less-Devia	ation Control 0 to 10,000 0.1% 1000 All Immediately Tuning –							_
Pn192	2		ation Contro Feedforward		0.1%	1000	All	Immedi- ately	Tuning	-
Pn193	2	Less-Devia	ation Contro vard Filter stant	0 to 65,535	0.01 ms	30	All	Immedi- ately	Tuning	

Setting

Range

0 to 300

Setting

Unit

1%

Default

Setting

0

Parameter

No.

Pn163

Size

2

Name

Anti-Resonance Damping Gain

Continued from previous page.

Parameter No.	Size	Na	ıme		Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence			
	2	Less-Deviat			0000h to 2113h	-	2102h	All	After restart	Setup	_			
		1							1	I				
		n.□□□X	Reserve	ed pa	rameter (Do no	t change.)								
		n.□□X□	Reserve	ed pa	rameter (Do no	t change.)								
Pn195		n.□X□□	Reserve	ed parameter (Do not change.)										
		n.X□□□	Less-De	eviation Mode Selection										
						Use Less-Deviation Control 1 Mode when less-deviation control is enabled. (This mode is compatible with the Σ -V-series EX002.)								
			1	Res	erved setting (I	Do not use	e.)				<u> </u>			
			2	Use	Less-Deviation	n Control 2	2 Mode wh	en less-devia	ation control i	s enabled	<u></u>			
Pn196	2	Less-Deviat 2 Speed Fe Gain			0 to 10,000	0.1%	1000	All	Immedi- ately	Tuning	_			
Pn197	2	Less-Deviat 2 Torque Fe Filter Time (edforwa	rd	0 to 65,535	0.01 ms	50	All	Immedi- ately	Tuning	_			
Pn198	2	Less-Deviat 2 Forward 7 forward Gai	Forque Fe		0 to 10,000	0.1%	1000	All	Immedi- ately	Tuning	_			
Pn199	2	Less-Deviat 2 Reverse T forward Gai	oraue Fe		0 to 10,000	0.1%	1000	All	Immedi- ately	Tuning	_			
Pn19A	2	Less-Deviat 2 Incomplet tion Rate			0 to 10,000	0.01%	10000	All	Immedi- ately	Tuning	_			
Pn19B	2	Less-Deviat 2 Rotary Se Viscous Frid pensation C	ervomoto ction Cor	r n-	0 to 8,000	0.01%/ 100 min ⁻¹	0	Rotary	Immedi- ately	Tuning	-			
Pn19C	2	Reserved pa not change		(Do	-	-	0	All	Immedi- ately	Tuning	-			
Pn19D	2	Less-Deviat 2 Linear Se Viscous Frid pensation C	rvomotor ction Cor	n-	0 to 8,000	0.01%/ 100 mm/s	0	Linear	Immedi- ately	Tuning	_			
Pn19E	2	Reserved pa		(Do	-	-	0	All	Immedi- ately	Tuning	-			
Pn19F	2	Less-Deviat 2 Torque Fe Moving Ave	edforwa	rd	0 to 5,100	0.1 ms	0	All	Immedi- ately	Tuning				
Pn1A4	2	Reserved pa not change		(Do	_	_	36	_	Immedi- ately	Tuning	_			
Pn1A5	2	Reserved pa not change		(Do	_	-	0	_	Immedi- ately	Tuning	_			
Pn1AE	2	Reserved pa not change	.)	`	_	_	0	_	Immedi- ately	Tuning	_			
Pn1AF	2	Reserved pa not change		(Do	_	-	0	-	Immedi- ately	Tuning	-			

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Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
	2		ontrol Refer- Selections	0000h to 2236h	_	0000h	All	After restart	Setup	*1		
			Reference Pu	ilsa Form								
				n and pulse tra	in, positiv	e logic.						
			F	and CCW pul			aic					
			₂ Two	o-phase pulse t sitive logic		`		hase A and	phase B) :	×1,		
		n.□□□X		o-phase pulse t sitive logic	trains with	90° phase	e differential (p	hase A and	phase B):	×2,		
				o-phase pulse t sitive logic	rains with	90° phase	e differential (p	hase A and	phase B)	×4,		
			5 Sig	n and pulse tra	in, negativ	/e logic.						
			6 CW	and CCW pul	se trains, ı	negative lo	gic					
	İ		Clear Signal	Form								
Pn200				ar position dev	iation whe	n the sign	al is at high le	vel.				
		n.□□X□	1 Cle	ar position dev	iation on t	he rising e	dge of the sig	nal.				
			2 Cle	ar position dev	iation whe	n the sign	al is at low lev	el.				
			3 Cle	ar position dev	iation on t	he falling e	edge of the sig	gnal.				
	İ		Clear Operat	ear Operation								
			0 Clear position deviation at a base block (at servo OFF or when alarm occurs).									
		n.□X□□	Do	Do not clear position error (cleared only with CLR (Clear Position Deviation)								
			sigi	nal).						<u> </u>		
			2 Cle	ar position dev	iation whe	n an alarm	occurs.					
			Filter Selection	on								
		n.X□□□	0 Use	e the reference	input filter	for a line-	driver signal.	(1 Mpps max	x.)			
		11.7000	1 Use	e the reference	input filter	for an ope	en-collector si	gnal. (200 k	pps max.)	<u> </u>		
			2 Use	e reference inpu	ut filter 2 fo	or a line-dr	river signal. (1	to 4 Mpps)				
Pn205	2	Multiturn L	imit	0 to 65,535	1 rev	65535	Rotary	After restart	Setup	*1		
	2	Position Cotion Select	ontrol Func- ions	0000h to 2210h	_	1000h	All	After restart	Setup	*1		
	Ī	n.□□□X	Reserved na	rameter (Do no	t change)						
		11.000X		,		,						
		n.□□X□	Reserved par	rameter (Do no	t change.)						
		n.□X□□	Reserved par	rameter (Do no	t change.)						
Pn207			/COIN (Positi	oning Comple	tion Outp	ut) Signal	Output Timin	9				
				tput when the a n the setting of					same or le	SS		
		n.X□□□	1 the	tput when the a setting of Pn52 sition reference	22 (Positio							
			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.									
Pn20A	4	Number of Encoder S	External cale Pitches	4 to 1,048,576	1 scale pitch/ revolu- tion	32768	Rotary	After restart	Setup	*1		
Pn20E	4	Electronic (Numerato		1 to 1,073,741,824	1	64	All	After restart	Setup	*1		
							-	Cantinus		4		

Continued from previous page.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
Pn210	4	Electronic Gear Ratio (Denominator)	1 to 1,073,741,824	1	1	All	After restart	Setup	*1
Pn212	4	Number of Encoder Output Pulses	16 to 1,073,741,824	1 P/Rev	2048	Rotary	After restart	Setup	*1
Pn216	2	Position Reference Acceleration/Decelera- tion Time Constant	0 to 65,535	0.1 ms	0	All	Immedi- ately after the motor stops	Setup	*1
Pn217	2	Average Position Reference Movement Time	0 to 10,000	0.1 ms	0	All	Immedi- ately after the motor stops	Setup	*1
Pn218	2	Reference Pulse Input Multiplier	1 to 100	× 1	1	All	Immedi- ately	Setup	*1
	2	Fully-closed Control Selections	0000h to 1003h	_	0000h	Rotary	After restart	Setup	*1
		•		• -	· ·		•		· <u></u>

Pn22A

n.□□□X	Reserve	Reserved parameter (Do not change.)								
n.□□X□	Reserve	d parameter (Do not change.)								
	11000110	a parameter (50 not onango.)								
n.□X□□	Reserve	Reserved parameter (Do not change.)								
	Fully-clo	sed Control Speed Feedback Selection								
n.X□□□	□ 0 Use motor encoder speed.									
	1	Use external encoder speed.								

Pn234	2	Second Position Reference Acceleration/ Deceleration Time Constant	0 to 65,535	0.1 ms	0	All	Immedi- ately	Setup	_
Pn281	2	Encoder Output Resolution	1 to 4,096	1 edge/ pitch	20	All	After restart	Setup	*1
Pn282	4	Linear Encoder Scale Pitch	0 to 6,553,600	0.01 μm	0	Linear	After restart	Setup	*1
Pn300	2	Speed Reference Input Gain	150 to 3,000	0.01 V/ Rated motor speed	600	All	Immedi- ately	Setup	*1
Pn301	2	Internal Set Speed 1	0 to 10,000	Rotary: 1 min ⁻¹ Direct Drive: 0.1 min ⁻¹	100	Rotary	Immedi- ately	Setup	*1
Pn302	2	Internal Set Speed 2	0 to 10,000	Rotary: 1 min ⁻¹ Direct Drive: 0.1 min ⁻¹	200	Rotary	Immedi- ately	Setup	*1
Pn303	2	Internal Set Speed 3	0 to 10,000	Rotary: 1 min ⁻¹ Direct Drive: 0.1 min ⁻¹	300	Rotary	Immedi- ately	Setup	*1
Pn304	2	Jogging Speed	0 to 10,000	Rotary: 1 min ⁻¹ Direct Drive: 0.1 min ⁻¹	500	Rotary	Immedi- ately	Setup	*1
Pn305	2	Soft Start Acceleration Time	0 to 10,000	1 ms	0	All	Immedi- ately	Setup	*1
Pn306	2	Soft Start Deceleration Time	0 to 10,000	1 ms	0	All	Immedi- ately	Setup	*1
							Continuo	at a .a .a a .	4

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
Pn307	2	Speed Reference Filter Time Constant	0 to 65,535	0.01 ms	40	All	Immedi- ately	Setup	*1
Pn308	2	Speed Feedback Filter Time Constant	0 to 65,535	0.01 ms	0	All	Immedi- ately	Setup	*1
Pn30A	2	Deceleration Time for Servo OFF and Forced Stops	0 to 10,000	1 ms	0	All	Immedi- ately	Setup	*1
Pn30C	2	Speed Feedforward Average Movement Time	0 to 5,100	0.1 ms	0	All	Immedi- ately	Setup	*1
	2	Vibration Detection Selections	0000h to 0002h	_	0000h	All	Immedi- ately	Setup	*1

Pn310

	Vibration	Detection Selection
п.ПППХ	0	Do not detect vibration.
11.000	1	Output a warning (A.911) if vibration is detected.
	2	Output an alarm (A.520) if vibration is detected.
$n.\Box\Box X\Box$	Reserve	d parameter (Do not change.)
$n.\Box X\Box\Box$	Reserve	d parameter (Do not change.)
n.X□□□	Reserve	d parameter (Do not change.)

Vibration Detection Sen-Immedi-2 Pn311 50 to 500 1% 100 ΑII Tuning *1 sitivity ately Vibration Detection Immedi-Pn312 2 0 to 5,000 50 Rotary *1 1 min⁻¹ Tuning Level ately After Pn316 2 0 to 65,535 10000 *1 Maximum Motor Speed 1 min⁻¹ Rotary Setup restart Moment of Inertia Cal-Immedi-Pn324 2 300 0 to 20,000 1% ΑII Setup *1 culation Starting Level ately Immedi-Setup Pn380 2 Internal Set Speed 1 0 to 10,000 1 mm/s 10 Linear *1 ately Immedi-Pn381 2 0 to 10,000 *1 Internal Set Speed 2 1 mm/s 20 Setup Linear ately Immedi-Pn382 2 0 to 10,000 30 *1 Internal Set Speed 3 1 mm/s Linear Setup ately Immedi-Pn383 2 Jogging Speed 0 to 10,000 1 mm/s 50 Linear Setup *1 ately Vibration Detection Immedi-Pn384 2 *1 0 to 5,000 1 mm/s 10 Linear Tuning Level ately 100 After 2 *1 Pn385 Maximum Motor Speed 1 to 100 50 Linear Setup mm/s restart 0.1 V/ Torque Reference Input Immedi-Pn400 2 10 to 100 30 ΑII Setup rated Gain ately torque First Stage First Torque Immedi-Pn401 2 0 to 65,535 0.01 ms 100 ΑII *1 Reference Filter Time Tuning ately Constant Immedi-1%*2 2 *1 Pn402 Forward Torque Limit 0 to 800 800 Rotary Setup ately Immedi- $1\%^{*2}$ Pn403 2 0 to 800 800 *1 Reverse Torque Limit Rotary Setup ately Forward External Torque Immedi-Pn404 2 1%*² 0 to 800 100 ΑII Setup *1 Limit ately Reverse External Torque Immedi-1%*2 Pn405 2 0 to 800 100 AllSetup *1 Limit ately Immedi-Pn406 2 1%*2 ΑII *1 **Emergency Stop Torque** 0 to 800 800 Setup ately Speed Limit during Immedi-Pn407 2 0 to 10,000 10000 *1 1 min⁻¹ Rotary Setup Torque Control ately

Continued from previous page.

Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
	2	Torque-Rel tion Selecti		0000h to 1111h	-	0000h	All	ı	Setup	*1
			Notch Filter	Selection 1					Whe Enab	
		n.□□□X		sable first stage able first stage					Imme	
										en
			Speed Limit	e the smaller of	the mayir	num moto	r speed and t	Enab		
			0 Pn	407 as the spe						
Pn408		n.□□X□	Pn	e the smaller of 480 as the spec	ed limit.				Afte	
			1 set	e the smaller of tting of Pn407 a	as the spe	ed limit.				XI C
			Us set	e the smaller of tting of Pn480 a	the overs as the spe	peed alarr ed limit.	n detection sp	9		
			Notch Filter	Selection 2				Whe Enab		
		n.□X□□		sable second st	Imme					
			1 En	able second sta	age notch	filter.				
		n.X□□□		pensation Fun					Whe Enab	
				sable friction co able friction cor	<u> </u>				Imme atel	
					1		T			
Pn409	2	Frequency	Notch Filter	50 to 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1
Pn40A	2	Q Value	Notch Filter	50 to 1,000	0.01	70	All	Immedi- ately	Tuning	*1
Pn40B	2	First Stage Depth	Notch Filter	0 to 1,000	0.001	0	All	Immedi- ately	Tuning	*1
Pn40C	2	Second Stater Frequer	age Notch Fil- ncy	50 to 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1
Pn40D	2	Second Stater Q Value	age Notch Fil-	50 to 1,000	0.01	70	All	Immedi- ately	Tuning	*1
Pn40E	2	Second Stater Depth	age Notch Fil-	0 to 1,000	0.001	0	All	Immedi- ately	Tuning	*1
Pn40F	2		age Second erence Filter	100 to 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1
Pn410	2		age Second erence Filter	50 to 100	0.01	50	All	Immedi- ately	Tuning	*1
Pn412	2	First Stage Torque Ref Time Cons	erence Filter	0 to 65,535	0.01 ms	100	All	Immedi- ately	Tuning	*1
Pn415	2	T-REF Filte stant	r Time Con-	0 to 65,535	0.01 ms	0	All	Immedi- ately	Setup	*1

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Parameter No.	Size	N	ame		Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
	2	Torque-Re tion Select	lated Func- ions 2	C	0000h to 1111h	-	0000h	All	Immedi- ately	Setup	*1
		1		<u>'</u>			1	ı	L	1	
			Notch Filt	er Sele	ection 3						
		n.□□□X			third stage						
			1 1	Enable	third stage	notch filte	er.				
			Notch Filt	er Sele	ection 4						
Pn416		n.□□X□	0 1	Disable	fourth stag	ge notch f	ilter.				
			1 1	Enable	fourth stag	je notch fil	ter.				
			Notch Filt	h Filter Selection 5							
		n.□X□□		Disable fifth stage notch filter.							
			1 1	Enable	fifth stage	notch filte	r.				
		n.XDDD	Reserved	naram	eter (Do no	ot change	١				
		11.7000	neserveu	param	eter (DO IIC	or change.	.)				
Pn417	2	Frequency		50	to 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1
Pn418	2	Q Value	e Notch Filt	50	to 1,000	0.01	70	All	Immedi- ately	Tuning	*1
Pn419	2	Depth	e Notch Filt	U	to 1,000	0.001	0	All	Immedi- ately	Tuning	*1
Pn41A	2	ter Freque		30	to 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1
Pn41B	2	ter Q Value		30	to 1,000	0.01	70	All	Immedi- ately	Tuning	*1
Pn41C	2	ter Depth	ge Notch Fi	U	to 1,000	0.001	0	All	Immedi- ately	Tuning	*1
Pn41D	2	Frequency		50) to 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1
Pn41E	2	Q Value	Notch Filte	50	to 1,000	0.01	70	All	Immedi- ately	Tuning	*1
Pn41F	2	Depth	Notch Filte	U	to 1,000	0.001	0	All	Immedi- ately	Tuning	*1
	2	sation Sele	ple Comper ections	n- C	0000h to 1111h	-	0000h	Rotary	_	Setup	*1
			Speed Rip	ople Co	ompensatio	on Functio	n Selectio	n		Whe Enab	
		n.□□□X	0 1	Disable	speed ripp	ole compe	nsation.			Imme	
			1 1	Enable	speed ripp	le comper	nsation.			ate	ly
Pn423			Speed Rip		ompensatio	on Informa	ation Disaç	greement Wai	rning Detec-	Whe	
P11423		n.□□X□	0 1	Detect	A.942 aları	ns.				Afte	er
			1 1	Do not	detect A.9	42 alarms				resta	art
			Speed Rip	ople Co	ompensatio	on Enable	Condition	Selection		Whe	
		n.□X□□	0 !	Speed	reference					Afte	
	1 Motor speed									resta	
		- VESS			•	. t. a.l.	\				
		n.X□□□	Reserved	param	eter (Do no	ot change.	.)				
Pn424	2	Torque Lim cuit Voltag	nit at Main C e Drop	Cir- (O to 100	1%*2	50	All	Immedi- ately	Setup	*1

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							COI	itinued from	i previou:			
Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
Pn425	2	Release Tir Limit at Ma Voltage Dro		0 to 1,000	1 ms	100	All	Immedi- ately	Setup	*1		
Pn426	2	Torque Fee Average M Time		0 to 5,100	0.1 ms	0	All	Immedi- ately	Setup	*1		
Pn427	2	Speed Ripp sation Ena	ole Compen- ole Speed	0 to 10,000	1 min ⁻¹	0	Rotary Ser- vomotor	Immedi- ately	Tuning	*1		
Pn456	2	Sweep Tor- ence Ampl		1 to 800	1%	15	All	Immedi- ately	Tuning	*1		
	2	Notch Filte Selections	r Adjustment 1	0000h to 0101h	-	0101h	All	Immedi- ately	Tuning	*1		
			Notch Filter	Adjustment Se	lection 1							
			Notch Filter Adjustment Selection 1 Do not adjust the first stage notch filter automatically during execution of auto-							uto-		
		n.□□□X	0 tur	uning without a host reference, autotuning with a host reference, and custom uning.								
			1 Ad wit	just the first sta hout a host refe	ge notch ference, au	filter autom totuning w	natically during ith a host refe	g execution or rence, and c	of autotun custom tur	ing iing.		
Pn460		n.□□X□ Reserved parameter (Do not change.)										
			Notch Filter	Adjustment Se	lection 2							
		n.□X□□	0 fur	Do not adjust the second stage notch filter automatically when the tuning-less								
			Ad 1 tion	just the second n is enabled or totuning with a	I stage not during exe	tch filter au	itomatically water	hen the tuning thout a host	ng-less fur reference,	nc-		
				-				<u> </u>				
		n.X□□□ Reserved parameter (Do not change.)										
	2	Gravity Col Related Se	mpensation- lections	0000h to 0001h	_	0000h	All	After restart	Setup	*1		
	l	n.□□□X	Gravity Comp	pensation Selec	tion							
			0 Dis	sable gravity co	mpensatio	n.						
Pn475			1 En	able gravity cor	npensatio	n.						
		n.□□X□	Reserved par	rameter (Do not	change.)							
	li	n.□X□□	Reserved par	rameter (Do not	change.)							
		n.X000	Decented per	rameter (Do not	change \							
	-		neserveu par	מחופנפו (שט ווטנ	change.)							
Pn476	2	Gravity Cor Torque	mpensation	-1,000 to 1,000	0.1%	0	All	Immedi- ately	Tuning	*1		
Pn480	2	Speed Lim Force Cont		0 to 10,000	1 mm/s	10000	Linear	Immedi- ately	Setup	*1		
Pn481	2	Polarity De Speed Loc	tection	10 to 20,000	0.1 Hz	400	Linear	Immedi- ately	Tuning	_		
Pn482	2	Polarity De Speed Loo Time Cons	tection p Integral tant	15 to 51,200	0.01 ms	3000	Linear	Immedi- ately	Tuning	-		
Pn483	2	Forward Fo	orce Limit	0 to 800	1%*2	30	Linear	Immedi- ately	Setup	*1		
Pn484	2	Reverse Fo	orce Limit	0 to 800	1%*2	30	Linear	Immedi- ately	Setup	*1		
Pn485	2		Polarity Detection Reference Speed		1 mm/s	20	Linear	Immedi- ately	Tuning	ı		
Pn486	2	Polarity De ence Acce Deceleration		0 to 100	1 ms	25	Linear	Immedi- ately	Tuning	-		
		1		1	1	i .	1	Continue	d on nov	t page		

Continued from previous page.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
Pn487	2	Polarity Detection Constant Speed Time	0 to 300	1 ms	0	Linear	Immedi- ately	Tuning	_
Pn488	2	Polarity Detection Reference Waiting Time	50 to 500	1 ms	100	Linear	Immedi- ately	Tuning	_
Pn48E	2	Polarity Detection Range	1 to 65,535	1 mm	10	Linear	Immedi- ately	Tuning	_
Pn490	2	Polarity Detection Load Level	0 to 20,000	1%	100	Linear	Immedi- ately	Tuning	-
Pn495	2	Polarity Detection Confirmation Force Reference	0 to 200	1%	100	Linear	Immedi- ately	Tuning	-
Pn498	2	Polarity Detection Allowable Error Range	0 to 30	1 deg	10	Linear	Immedi- ately	Tuning	_
Pn49F	2	Speed Ripple Compensation Enable Speed	0 to 10,000	1 mm/s	0	Linear	Immedi- ately	Tuning	*1
Pn501	2	Zero Clamping Level	0 to 10,000	1 min ⁻¹	10	Rotary	Immedi- ately	Setup	*1
Pn502	2	Rotation Detection Level	1 to 10,000	1 min ⁻¹	20	Rotary	Immedi- ately	Setup	*1
Pn503	2	Speed Coincidence Detection Signal Output Width	0 to 100	1 min ⁻¹	10	Rotary	Immedi- ately	Setup	*1
Pn506	2	Brake Reference-Servo OFF Delay Time	0 to 50	10 ms	0	All	Immedi- ately	Setup	*1
Pn507	2	Brake Reference Out- put Speed Level	0 to 10,000	1 min ⁻¹	100	Rotary	Immedi- ately	Setup	*1
Pn508	2	Servo OFF-Brake Com- mand Waiting Time	10 to 100	10 ms	50	All	Immedi- ately	Setup	*1
Pn509	2	Momentary Power Inter- ruption Hold Time	20 to 50,000	1 ms	20	All	Immedi- ately	Setup	*1

Continued from previous page.

Dawasatas					0-44:	0-44:	D-flt							
Parameter No.	Size	N	ame		Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence			
	2	Input Signa	al Selection	ıs	0000h to		2100h	All	After	Cotup	*1			
		1			FFF2h	_	2100h	All	restart	Setup	*1			
			. ,		llocation Mod									
		n.□□□X	0		the sequence	·			tault allocation	ons.	<u></u>			
					nge the seque			cations.						
			2	Rese	erved setting ((Do not us	e.)							
			/S-ON (Se	ervo	ON) Signal A	llocation								
			0	Activ	re when CN1-	-40 input s	signal is ON	l (closed).						
					e when CN1-		_							
			2	Active when CN1-42 input signal is ON (closed).										
			3	Active when CN1-43 input signal is ON (closed).										
			4	Active when CN1-44 input signal is ON (closed).										
			5											
			6	Activ	e when CN1-	-46 input s	signal is ON	V (closed).						
		n.□□X□	7	The	signal is alwa	ys active.	-							
			8											
			9											
			Α											
			В	Active when CN1-42 input signal is OFF (open).										
			С	Active when CN1-43 input signal is OFF (open).										
5 5 6 1			D	Activ	e when CN1-	-44 input s	signal is OF	F (open).						
Pn50A			Е	Activ	e when CN1-	-45 input s	signal is OF	F (open).						
			F	Activ	e when CN1-	-46 input s	signal is OF	F (open).						
			/P-CON (Proportional Control) Signal Allocation											
	n. N O to F The allocations are the same as the /S-ON (Servo ON) signal allocations.													
			P-OT (Forward Drive Prohibit) Signal Allocation											
			`		ole forward dr	, ,			NI (closed)					
					ole forward dr				, ,					
					ole forward dr									
					ole forward dr			_						
					ole forward dr		•							
					ole forward dr			_						
					ole forward dr									
		n.X□□□			he signal to a				(0.00004).					
		,			he signal to a									
					ole forward dr)FF (open).					
					ole forward dr		•							
			В		ole forward dr				,					
					ole forward dr		•							
														
				1 0 (1)										
								o.g. iai io c	(0,001)					
									0 "					

Applicable

Classi-

Continued from previous page.

When

No.	Si		anic	Range	Unit	Setting	Motors	Enabled	fication	ence			
	2	Input Sign 2	al Selections	0000h to FFFFh	_	6543h	All	After restart	Setup	*1			
			N-OT (Rever	se Drive Prohib	oit) Signal	Allocation							
			0 En	able reverse dri	ve when (N1-40 inp	ut signal is O	N (closed).					
			1 En	able reverse dri	ve when (CN1-41 inp	ut signal is O	N (closed).					
				able reverse dri		<u> </u>		, ,					
				able reverse dri				, ,					
				able reverse dri		<u> </u>		, ,					
				able reverse dri		<u> </u>		, ,					
		n.□□□X		Enable reverse drive when CN1-46 input signal is ON (closed). Set the signal to always prohibit reverse drive.									
				Set the signal to always prombit reverse drive.									
			9 En	Enable reverse drive when CN1-40 input signal is OFF (open).									
			A En	able reverse dri	ve when (CN1-41 inp	ut signal is O	FF (open).					
				able reverse dri				,					
				able reverse dri		•		,					
				able reverse dri		<u> </u>		,					
				able reverse dri		<u> </u>		,					
						<u> </u>	at digital to 0	(Open).					
				Alarm Reset) Si					DEE (\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			
				Active on signal edge when CN1-40 input signal changes from OFF (open) to ON (closed). Active on signal edge when CN1-41 input signal changes from OFF (open) to									
				tive on signal ed I (closed).	dge when	CN1-41 in	out signal ch	anges from (OFF (open)) to			
D . 50D				tive on signal ed I (closed).	dge when	CN1-42 in	out signal ch	anges from (OFF (open)) to			
Pn50B				Active on signal edge when CN1-43 input signal changes from OFI ON (closed).									
				tive on signal ed I (closed).	dge when	CN1-44 in	out signal ch	anges from (OFF (open)) to			
				tive on signal ed I (closed).	dge when	CN1-45 inp	out signal ch	anges from (OFF (open)) to			
				tive on signal ed I (closed).	dge when	CN1-46 in	out signal ch	anges from (OFF (open)) to			
		n.□□X□	7 Re	served setting (Do not us	e.)							
			8 Th	e signal is alway	s inactive) .							
				tive on signal ed F (open).	dge when	CN1-40 inp	out signal cha	anges from C)N (closed)) to			
				tive on signal ed F (open).	dge when	CN1-41 inp	out signal cha	anges from C	N (closed)) to			
		B Active on signal edge when CN1-42 input signal changes fro OFF (open).							N (closed)) to			
				tive on signal ed F (open).	dge when	CN1-43 inp	out signal cha	anges from C	N (closed)) to			
			D Ac OF	tive on signal ed F (open).	dge when	CN1-44 inp	out signal cha	anges from C	N (closed)) to			
				tive on signal ed F (open).	dge when	CN1-45 inp	out signal cha	anges from C	N (closed)) to			
			_E Ac	tive on signal ed F (open).	dge when	CN1-46 inp	out signal cha	anges from C	N (closed)) to			
			1/2 01 /2	and Fritzman Ta									

/P-CL (Forward External Torque Limit Input) Signal Allocation

/N-CL (Reverse External Torque Limit Input) Signal Allocation

The allocations are the same as the /S-ON (Servo ON) signal allocations.

The allocations are the same as the /S-ON (Servo ON) signal allocations.

n.□X□□

n.X□□□

0 to F

Setting

Setting

Name

Parameter

Default

Continued from previous page.

Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
	2	Input Signa	al Selections	0000h to FFFFh	-	8888h	All	After restart	Setup	*1
Pn50C		n.□□□X	0	otor Direction) S ctive when CN1-	40 input s 41 input s 42 input s 43 input s 44 input s 45 input s 46 input s ys active ys inactive 40 input s 41 input s	cation signal is ON signal is OF signal is OF signal is OF	J (closed). J (closed). J (closed). J (closed). J (closed). J (closed). J (closed). J (closed). J (closed). F (open). F (open). F (open). F (open).	restart		
			FA	ctive when CN1-	-46 input s	signal is OF	·F (open).			
		- DDVD		ernal Set Speed		. , ,				
		n.□□X□	1 (110) - 1	he allocations arons.	e the same	e as the /S	PD-D (Motor	Direction) si	gnal alloca	-
			/SPD-B (In	ternal Set Speed	d Selection	n Input) Si	gnal Allocatio	on		
		n.□X□□		he allocations arons.	e the same	e as the /S	PD-D (Motor	Direction) si	gnal alloca	-
			/C-SEL (Co	ntrol Selection I	nput) Sigr	nal Allocat	ion			
		n.X□□□		The allocations are the same as the /SPD D (Motor Direction) signal alloca						

Applicable

Motors

5.1.2 List of Parameters

Classi-

fication

Refer-

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Continued	from	provious	nago
Continueu	11 0111	DIENIOUS	paye.

When

Enabled

	2	Input Signa 4	al Selectio	ns	0000h to FFFFh	-	8888h	_	After restart	Setup	*1
Pn50D		4	/ZCLAMP (Zero Clamping Input) Signal Allocation 0 Active when CN1-40 input signal is ON (closed). 1 Active when CN1-41 input signal is ON (closed). 2 Active when CN1-42 input signal is ON (closed). 3 Active when CN1-43 input signal is ON (closed). 4 Active when CN1-44 input signal is ON (closed).						Applicable Motors		
		n.□□□X	5 6 7 8	Active when CN1-45 input signal is ON (closed). Active when CN1-46 input signal is ON (closed). The signal is always active. The signal is always inactive.							
			9 A B	A Active when CN1-41 input signal is OFF (open).							
			C D E F	Act	ive when CN1- ive when CN1- ive when CN1- ive when CN1-	44 input s 45 input s	ignal is OF ignal is OF	F (open).			
		n.□□X□	/INHIBIT	BIT (Reference Pulse Inhibit Input) Signal Allocation						Applicable Motors	
		11.0000	0 to F	The allocations are the same as the /ZCLAMP (Zero Clamping Input) signal allocations.					All		
		n. 🗆 X 🗆 🗆	/G-SEL (Gain Selection Input) Signal Allocation						Applicable Motors		
		11.0700	0 to F	The allocations are the same as the /ZCLAMP (Zero Clamping Input) signal allocations.							
		n.X000	/P-DET ((Polarity Detection Input) Signal Allocation						Applicable Motors	
		11.7000	0 to F	The allocations are the same as the /ZCLAMP (Zero Clamping Input) signal allocations.						Linear	

Setting

Range

Setting

Default

Setting

Parameter

No.

Size

Name

Continued from previous page.

Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
	2	Output Sig tions 1	nal Selec-	0000h to 6666h	_	3211h	All	After restart	Setup	*1		
			` ,	/COIN (Positioning Completion Output) Signal Allocation								
				abled (the abo		<u> </u>						
				tput the signal			<u>.</u>					
		n.□□□X		tput the signal								
				tput the signal			·	ut terminal.				
				Output the signal from the CN1-37 output terminal. Output the signal from the CN1-38 output terminal								
				Output the signal from the CN1-38 output terminal.								
Pn50E			6 Ou	6 Output the signal from the CN1-39 output terminal.								
			/V-CMP (Spe	ed Coincidend	ce Detecti	on Output) Signal Alloc	ation				
		n.□□X□		e allocations are cations.	e the same	e as the /C	OIN (Position	ing Complet	ion) signal			
			/TGON (Rotation Detection Output) Signal Allocation									
		n.□X□□	0 to 6 The allocations are the same as the /COIN (Positioning Completion) signal allocations.									
			/S-RDY (Serv	(o Ready) Sign	al Allocat	ion						
		n.X□□□	/S-RDY (Servo Ready) Signal Allocation 0 to 6 The allocations are the same as the /COIN (Positioning Completion) signal allocations.									
	2	Output Sig	nal Selec-	0000h to	_	0000h	All	After	Setup	*1		
		tions 2		6666h				restart				
		n.□□□X	/CLT (Torque Limit Detection Output) Signal Allocation									
			0 Dis	Disabled (the above signal output is not used).								
			1 Ou	Output the signal from the CN1-25 or CN1-26 output terminal.								
				Output the signal from the CN1-27 or CN1-28 output terminal.								
				Output the signal from the CN1-29 or CN1-30 output terminal.								
				 Output the signal from the CN1-37 output terminal. Output the signal from the CN1-38 output terminal. 								
							•					
Pn50F			6 Ou	tput the signal	from the C	IN 1-39 OU	tput terminai.					
			/VLT (Speed Limit Detection) Signal Allocation									
		n.□□X□		allocations are allocations.	e the same	e as the /C	CLT (Torque Li	mit Detectior	n Output) :	sig-		
		n.□X□□	/BK (Brake Output) Signal Allocation									
			Oto 6 The	allocations are allocations.		e as the /C	CLT (Torque Li	mit Detection	n Output) :	sig-		
			ANADN (Mayaing Output) Signal Allocation									
		n.X□□□	O to 6 The	ARN (Warning Output) Signal Allocation to 6 The allocations are the same as the /CLT (Torque Limit Detection Output) signal allocations.								

Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
	2	Output Sig	gnal Selec-	0000h to 0666h	-	0000h	All	After restart	Setup	*1		
			/NEAR (Nea	ar Output) Signal Allocation								
			0 Disabled (the above signal output is not used).									
			1 Ou	tput the signal	from the C	N1-25 or	CN1-26 outpu	ut terminal.				
		n.□□□X	2 Ou	tput the signal	from the C	N1-27 or	CN1-28 outpu	ut terminal.				
			3 Ou	tput the signal	from the C	N1-29 or	CN1-30 outpu	ut terminal.				
				tput the signal			•					
Pn510				tput the signal								
			6 Ou	tput the signal	from the C	N1-39 ou	tput terminal.					
		n.□□X□	Reserved pa	eserved parameter (Do not change.)								
		n. 🗆 X 🗆 🗆	/PSELA (Ref	erence Pulse I	nput Multi	plication S	Switching Out	put) Signal	Allocation	1		
		11. LIXLIL	0 to 6 Th	e allocations ar	e the same	e as the /N	IEAR (Near) si	gnal allocati	ons.			
		n.X□□□	Reserved pa	rameter (Do no	ot change	.)						
			1.000.100 po		or on ango	.,						
	2	Output Sig Settings	gnal Inverse	0000h to	_	0000h	All	After restart	Setup	*1		
		Octungs		111111				rostart				
		n.□□□X	Output Signal Inversion for CN1-25 and CN1-26 Terminals									
				e signal is not i								
			1 Th	e signal is inver	ted.							
		n.□□X□	Output Signal Inversion for CN1-27 and CN1-28 Terminals									
			0 The signal is not inverted.									
Pn512			1 Th	e signal is inver	ted.							
		n.□X□□	Output Signal Inversion for CN1-29 and CN1-30 Terminals									
			0 The signal is not inverted.									
			1 Th	e signal is inver	ted.							
			Output Sign	al Inversion for	· CN1_37]	Terminal						
		n.X□□□		e signal is not i		TOTTIMIC						
				e signal is inver								
		1				I						
	2	Output Sig Settings 2	gnal Inverse	0000h to 0011h	_	0000h	All	After restart	Setup	*1		
		3										
		n.□□□X	Output Signal Inversion for CN1-38 Terminal									
				e signal is not i								
			1 Th	e signal is inver	ted.							
Pn513			Output Sign	al Inversion for	· CN1-39 T	Terminal						
		n.□□X□	0 The signal is not inverted.									
			1 Th	e signal is inver	ted.							
		n.□X□□	Reserved parameter (Do not change.)									
		n.X□□□	Reserved pa	rameter (Do no	ot change	.)						
	1											

Parameter Lists

5.1.2 List of Parameters

Continued from previous page.

Parameter No.	Size	N	Name		Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence	
	2	Output Sig tions 4	gnal Selec-	0000h to 0666h	-	0000h	All	After restart	Setup	*1	
	_	n.000X	Reserved parameter (Do not change.) Reserved parameter (Do not change.)								
	-										
			/PM (Preventative Maintenance Output) Signal Allocation 0 Disabled (the above signal output is not used).								
Pn514				Disabled (the above signal output is not used).							
111514		n.□X□□		Output the signal from the CN1-25 or CN1-26 output terminal.							
				Output the signal from the CN1-27 or CN1-28 output terminal.							
			3 Ou	Output the signal from the CN1-29 or CN1-30 output terminal.							
			4 Ou	Output the signal from the CN1-37 output terminal.							
			5 Ou	5 Output the signal from the CN1-38 output terminal.							
			6 Ou	tput the signal	from the C	N1-39 out	put terminal.				
	ı	n.X000	Reserved pa	rameter (Do no	ot change.)					

Applicable

5.1.2 List of Parameters

Classi-

Refer-

Continued :		

When

No.	Size	N	ame	Range	Unit	Setting	Motors	Enabled	fication	ence			
	2	Input Signa	al Selections	0000h to FFFFh	-	8888h	All	After restart	Setup	*1			
		1				1	II.	1	-11	1			
	CENT/Absolute Date Degreet Ing. (1) Circust Allegation												
			SEN (Absolute Data Request Input) Signal Allocation O Active when CN1-40 input signal is ON (closed).										
				ctive when CN1-			, ,						
							, ,						
				ctive when CN1-		0	,						
				Active when CN1-45 input signal is ON (closed).									
				ctive when CN1-									
		n.□□□X	7 T	he signal is alwa	ys active.		,						
			8 E	nable when 5 V i	s input to	CN1-4.							
			9 A	ctive when CN1-	40 input s	ignal is OF	F (open).						
			A A	ctive when CN1-	41 input s	ignal is OF	F (open).						
			ВА	ctive when CN1-	42 input s	ignal is OF	F (open).						
			C A	ctive when CN1-	43 input s	ignal is OF	F (open).						
				ctive when CN1-	44 input s	ignal is OF	F (open).						
				ctive when CN1-									
			FA	ctive when CN1-	46 input s	ignal is OF	F (open).						
Pn515			/PSEL (Reference Pulse Input Multiplication Switching Input) Signal Allocation										
			0 A	ctive when CN1-	40 input s	ignal is ON	V (closed).						
			1 A	ctive when CN1-	41 input s	ignal is ON	V (closed).						
			2 A	ctive when CN1-	42 input s	ignal is ON	V (closed).						
			3 A	ctive when CN1-	43 input s	ignal is ON	V (closed).						
				ctive when CN1-									
				ctive when CN1-			, ,						
				ctive when CN1-			V (closed).						
		n.□□X□		he signal is alwa									
				he signal is alway			/						
				ctive when CN1-			,						
				ctive when CN1-									
				ctive when CN1-			,						
				ctive when CN1- ctive when CN1-									
				ctive when CN1-									
				ctive when CN1-		0	· · · ·						
					•		. (0001).						
		n.□X□□	Reserved p	arameter (Do no	ot change.)							
		n.X□□□	Reserved p	arameter (Do no	ot change.)							
	_												

Setting

Name

Setting

Default

Parameter

5.1.2 List of Parameters

Continued from previous page.

Parameter No.	Size	1	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence	
	2	Input Sigr	nal Selections	0000h to FFFFh	-	8888h	All	After restart	Setup	*1	
					I.	I			ı	1	
	FSTP (Forced Stop Input) Signal Allocation										
				able drive wher	_		al is ON (close	∍d).			
				able drive wher			,				
				able drive wher							
			-	able drive wher		·	`				
				Enable drive when CN1-44 input signal is ON (closed). Enable drive when CN1-45 input signal is ON (closed).							
				Enable drive when CN1-46 input signal is ON (closed).							
		n.□□□X	-	Set the signal to always prohibit drive (always force the motor to stop).							
Pn516		11.000	8 Ser	t the signal to a	always ena	able drive (always disabl	e forcing the	motor to		
				able drive wher	n CN1-40	input signa	al is OFF (ope	n).			
			A En	able drive wher	n CN1-41	input signa	al is OFF (ope	n).			
			B En	able drive wher	n CN1-42	input signa	al is OFF (ope	n).			
				able drive wher							
				able drive wher							
			-	able drive wher			` '				
							aris Orr (ope	ii.j.		_	
		n.□□X□		ameter (Do not							
		n.□X□□	Reserved para	ameter (Do not	change.)						
		n.X□□□	Reserved para	ameter (Do not	change.)						
		1			I		I	I	T	Т	
	2	Output Signature	gnal Selec-	0000h to 0666h	_	0654h	All	After restart	Setup	*1	
							I				
			ALO1 (Alarm Code Output) Signal Allocation								
			0 Dis	abled (the abov	ve signal c	utput is no	ot used).				
				1 Output the signal from the CN1-25 or CN1-26 output terminal.							
		n.□□□X		tput the signal			· · · · · · · · · · · · · · · · · · ·				
				3 Output the signal from the CN1-29 or CN1-30 output terminal. 4 Output the signal from the CN1-37 output terminal.							
				tput the signal			•				
Pn517				tput the signal			<u> </u>				
			ALO2 (Alarm	arm Code Output) Signal Allocation							
		n.□□X□	The	allocations are			O1 (Alarm Co	ode Output)	signal allo	ca-	
			0 to 6 tion								
			ALO3 (Alarm	Code Output)	Signal All	ocation					
		n.□X□□		allocations are	e the same	e as the AL	O1 (Alarm Co	ode Output)	signal allo	ca-	
			tior	tions.							
		n.XDDD	Reserved par	rameter (Do no	t change)					
				.	ı	t	*	-	1	1	
Pn518*3	_		odule-Related	_	_	_	All	_	_	_	
1 110 10		Paramete	rs				All				
		Motor-Loa	ad Position	0 +0	1 refer-			Immodi			
Pn51B	4	Deviation Detection		0 to 1,073,741,824	ence unit	1000	Rotary	Immedi- ately	Setup	*1	
	L			I		l	l .	l .	I	l	

Lists
Parameter

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
Pn51E	2	Position Deviation Over- flow Warning Level	10 to 100	1%	100	All	Immedi- ately	Setup	*1
Pn520	4	Position Deviation Over- flow Alarm Level	1 to 1,073,741,823	1 refer- ence unit	524288 0	All	Immedi- ately	Setup	*1
Pn522	4	Positioning Completed Width 0 to 1,073,741,824 ence unit 7 All Immediately		Setup	*1				
Pn524	4	Near Signal Width	1 to 1,073,741,824	1 refer- ence unit	107374 1824	All	Immedi- ately	Setup	*1
Pn526	4	flow Alarm Level at		1 refer- ence unit	524288 0	All	Immedi- ately	Setup	*1
Pn528	2	Position Deviation Over- flow Warning Level at Servo ON	10 to 100	1%	100	All	Immedi- ately	Setup	*1
Pn529	2	Speed Limit Level at Servo ON	0 to 10,000	1 min ⁻¹	10000	Rotary	Immedi- ately	Setup	*1
Pn52A	2	Multiplier per Fully- closed Rotation	0 to 100	1%	20	Rotary	Immedi- ately	Tuning	*1
Pn52B	2	Overload Warning Level	1 to 100	1%	20	All	Immedi- ately	Setup	*1
Pn52C	52C 2 Base Current Derating at Motor Overload 10 to 100 1% 100 All Detection		All	After restart	Setup	*1			
Pn52F	2	Monitor Display at Startup	0000h to 0FFFh	-	0FFFh	All	Immedi- ately	Setup	*1
	2	Program Jogging- Related Selections	0000h to 0005h	-	0000h	All	Immedi- ately	Setup	*1

	_	
	Program	Jogging Operation Pattern
	0	(Waiting time in Pn535 \rightarrow Forward by travel distance in Pn531) \times Number of movements in Pn536
	1	(Waiting time in Pn535 \rightarrow Reverse by travel distance in Pn531) \times Number of movements in Pn536
n.□□□X	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 \rightarrow Forward by travel distance in Pn531 \rightarrow Waiting time in Pn535 \rightarrow Reverse by travel distance in Pn531) \times Number of movements in Pn536
	5	(Waiting time in Pn535 \rightarrow Reverse by travel distance in Pn531 \rightarrow Waiting time in Pn535 \rightarrow Forward by travel distance in Pn531) \times Number of movements in Pn536
~ DDVD	Dagamia	d navamatay (Da not shangs)
n.□□X□	Reserve	d parameter (Do not change.)

Pn530

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 refer- ence	32768	All	Immedi- ately	Setup	*1
Pn533	2	Program Jogging Movement Speed	1 to 10,000	unit Rotary: 1 min ⁻¹ Direct Drive: 0.1 min ⁻¹	500	Rotary	Immedi- ately	Setup	*1

5.1.2 List of Parameters

Continued from previous page.

Parameter	Size	Name	Setting	Setting	Default	Applicable	When	Classi-	Refer-
No.	Si		Range	Unit	Setting	Motors	Enabled	fication	ence
Pn534	2	Program Jogging Acceleration/Deceleration Time	2 to 10,000	1 ms	100	All	Immedi- ately	Setup	*1
Pn535	2	Program Jogging Wait- ing Time	0 to 10,000	1 ms	100	All	Immedi- ately	Setup	*1
Pn536	2	Program Jogging Number of Movements	0 to 1,000	Times	1	All	Immedi- ately	Setup	*1
Pn550	2	Analog Monitor 1 Offset Voltage	-10,000 to 10,000	0.1 V	0	All	Immedi- ately	Setup	*1
Pn551	2	Analog Monitor 2 Offset Voltage	-10,000 to 10,000	0.1 V	0	All	Immedi- ately	Setup	*1
Pn552	2	Analog Monitor 1 Mag- nification	-10,000 to 10,000	× 0.01	100	All	Immedi- ately	Setup	*1
Pn553	2	Analog Monitor 2 Mag- nification	-10,000 to 10,000	× 0.01	100	All	Immedi- ately	Setup	*1
Pn55A	2	Power Consumption Monitor Unit Time	1 to 1,440	1 min	1	All	Immedi- ately	Setup	ı
Pn560	2	Residual Vibration Detection Width	1 to 3,000	0.1%	400	All	Immedi- ately	Setup	
Pn561	2	Overshoot Detection Level	0 to 100	1%	100	All	Immedi- ately	Setup	*1
Pn580	2	Zero Clamping Level	0 to 10,000	1 mm/s	10	Linear	Immedi- ately	Setup	*1
Pn581	2	Zero Speed Level	1 to 10,000	1 mm/s	20	Linear	Immedi- ately	Setup	*1
Pn582	2	Speed Coincidence Detection Signal Output Width	0 to 100	1 mm/s	10	Linear	Immedi- ately	Setup	*1
Pn583	2	Brake Reference Output Speed Level	0 to 10,000	1 mm/s	10	Linear	Immedi- ately	Setup	*1
Pn584	2	Speed Limit Level at Servo ON	0 to 10,000	1 mm/s	10000	Linear	Immedi- ately	Setup	*1
Pn585	2	Program Jogging Move- ment Speed	1 to 10,000	1 mm/s	50	Linear	Immedi- ately	Setup	*1
Pn586	2	Motor Running Cooling Ratio	0 to 100	1%/ Max. speed	0	Linear	Immedi- ately	Setup	-
Pn600	2	Regenerative Resistor Capacity*4	Depends on model.*5	10 W	0	All	Immedi- ately	Setup	*1
Pn601	2	Dynamic Brake Resistor Allowable Energy Consumption	0 to 65,535	10 J	0	All	After restart	Setup	*6
Pn603	2	Regenerative Resistance	0 to 65,535	10 mΩ	0	All	Immedi- ately	Setup	*1
Pn604	2	Dynamic Brake Resistance	0 to 65,535	10 mΩ	0	All	After restart	Setup	*6
	2	Overheat Protection Selections	0000h to 0003h	-	0000h	Linear	After restart	Setup	*1

Pn61	Α

n.□□□X	Overheat	t 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.)

5.1.2 List of Parameters

Continued from previous page.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
Pn61B *8	2	Overheat Alarm Level	0 to 500	0.01 V	250	All	Immedi- ately	Setup	*1
Pn61C *8	2	Overheat Warning Level	0 to 100	1%	100	All	Immedi- ately	Setup	*1
Pn61D *8	2	Overheat Alarm Filter Time	0 to 65,535	1 s	0	All	Immedi- ately	Setup	*1
Pn621 to Pn628*3	-	Safety Module-Related Parameters	_	-	-	All	-	-	_

- *1. Refer to the following manual for details.
 - Σ -7-Series Σ -7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual (Manual No.: SIEP S800001 26)
- *2. Set a percentage of the motor rated torque.
- *3. These parameters are for SERVOPACKs with a Safety Module. Refer to the following manual for details.
 - Σ-V-Series/Σ-V-Series for Large-Capacity Models/Σ-7-Series User's Manual Safety Module (Manual No.: SIEP C720829 06)
- *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 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.
 - Ω Σ-7-Series 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.

5.1.3 Parameter Recording Table

Use the following table to record the settings of the parameters.

Parameter No.	Default Setting	Name	When Enabled
Pn000	0000h	Basic Function Selections 0	After restart
Pn001	0000h	Application Function Selections 1	After restart
Pn002	0000h	Application Function Selections 2	After restart
Pn006	0002h	Application Function Selections 6	Immediately
Pn007	0000h	Application Function Selections 7	Immediately
Pn008	0000h	Application Function Selections 8	After restart
Pn009	0010h	Application Function Selections 9	After restart
Pn00A	0001h	Application Function Selections A	After restart
Pn00B	0000h	Application Function Selections B	After restart
Pn00C	0000h	Application Function Selections C	After restart
Pn00D	0000h	Application Function Selections D	After restart
Pn00F	0000h	Application Function Selections F	After restart
Pn010	0001h	Axis Address Selection for UART/USB Communications	After restart
Pn021	0000h	Reserved parameter	_
Pn022	0000h	Reserved parameter	-
Pn040	0000h	Σ-V Compatible Function Switch	After restart
Pn080	0000h	Application Function Selections 80	After restart
Pn081	0000h	Application Function Selections 81	After restart
Pn100	400	Speed Loop Gain	Immediately
Pn101	2000	Speed Loop Integral Time Constant	Immediately
Pn102	400	Position Loop Gain	Immediately
Pn103	100	Moment of Inertia Ratio	Immediately
Pn104	400	Second Speed Loop Gain	Immediately
Pn105	2000	Second Speed Loop Integral Time Constant	Immediately
Pn106	400	Second Position Loop Gain	Immediately
Pn109	0	Feedforward	Immediately
Pn10A	0	Feedforward Filter Time Constant	Immediately
Pn10B	0004h	Gain Application Selections	*
Pn10C	200	Mode Switching Level for Torque Reference	Immediately
Pn10D	0	Mode Switching Level for Speed Reference	Immediately

Parameter No.	Default Setting	Name	When Enabled
Pn10E	0	Mode Switching Level for Acceleration	Immediately
Pn10F	0	Mode Switching Level for Position Deviation	Immediately
Pn11F	0	Position Integral Time Constant	Immediately
Pn121	100	Friction Compensation Gain	Immediately
Pn122	100	Second Friction Compensation Gain	Immediately
Pn123	0	Friction Compensation Coefficient	Immediately
Pn124	0	Friction Compensation Frequency Correction	Immediately
Pn125	100	Friction Compensation Gain Correction	Immediately
Pn131	0	Gain Switching Time 1	Immediately
Pn132	0	Gain Switching Time 2	Immediately
Pn135	0	Gain Switching Waiting Time 1	Immediately
Pn136	0	Gain Switching Waiting Time 2	Immediately
Pn139	0000h	Automatic Gain Switching Selections 1	Immediately
Pn13D	2000	Current Gain Level	Immediately
Pn13F	0	Less-Deviation Control 2 Second Position Integral Time Constant	Immediately
Pn140	0100h	Model Following Control- Related Selections	Immediately
Pn141	500	Model Following Control Gain	Immediately
Pn142	1000	Model Following Control Gain Correction	Immediately
Pn143	1000	Model Following Control Bias in the Forward Direction	Immediately
Pn144	1000	Model Following Control Bias in the Reverse Direction	Immediately
Pn145	500	Vibration Suppression 1 Frequency A	Immediately
Pn146	700	Vibration Suppression 1 Frequency B	Immediately
Pn147	1000	Model Following Control Speed Feedforward Com- pensation	Immediately
Pn148	500	Second Model Following Control Gain	Immediately
Pn149	1000	Second Model Following Control Gain Correction	Immediately
Pn14A	800	Vibration Suppression 2 Frequency	Immediately
Pn14B	100	Vibration Suppression 2 Correction	Immediately
Pn14F	0021h	Control-Related Selections	After restart

5.1.3 Parameter Recording Table

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		Continued from p	
Parameter No.	Default Setting	Name	When Enabled
Pn160	0010h	Anti-Resonance Control-Related Selections	Immediately
Pn161	1000	Anti-Resonance Frequency	Immediately
Pn162	100	Anti-Resonance Gain Correction	Immediately
Pn163	0	Anti-Resonance Damping Gain	Immediately
Pn164	0	Anti-Resonance Filter Time Constant 1 Correction	Immediately
Pn165	0	Anti-Resonance Filter Time Constant 2 Correction	Immediately
Pn166	0	Anti-Resonance Damping Gain 2	Immediately
Pn170	1400h	Tuning-less Function- Related Selections	*
Pn181	0	Mode Switching Level for Speed Reference	Immediately
Pn182	0	Mode Switching Level for Acceleration	Immediately
Pn190	0100h	Less-Deviation Control- Related Switches	After restart
Pn191	1000	Less-Deviation Control 1 Feedforward Gain	Immediately
Pn192	1000	Less-Deviation Control 1 Second Feedforward Gain	Immediately
Pn193	30	Less-Deviation Control 1 Feedforward Filter Time Constant	Immediately
Pn195	2102h	Less-Deviation Function Selection Switches	After restart
Pn196	1000	Less-Deviation Control 2 Speed Feedforward Gain	Immediately
Pn197	50	Less-Deviation Control 2 Torque Feedforward Filter Time Constant	Immediately
Pn198	1000	Less-Deviation Control 2 Forward Torque Feedfor- ward Gain	Immediately
Pn199	1000	Less-Deviation Control 2 Reverse Torque Feedforward Gain	Immediately
Pn19A	10000	Less-Deviation Control 2 Incomplete Integration Rate	Immediately
Pn19B	0	Less-Deviation Control 2 Rotary Servomotor Vis- cous Friction Compensa- tion Coefficient	Immediately
Pn19C	0	Reserved parameter	Immediately
Pn19D	0	Less-Deviation Control 2 Linear Servomotor Viscous Friction Compensation Coefficient	Immediately
Pn19E	0	Reserved parameter	Immediately
Pn19F	0	Less-Deviation Control 2 Torque Feedforward Mov- ing Average Time	Immediately
Pn1A4	36	Reserved parameter	Immediately
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Parameter No.	Default Setting	Name	When Enabled
Pn1A5	0	Reserved parameter	Immediately
Pn1AE	0	Reserved parameter	Immediately
Pn1AF	0	Reserved parameter	Immediately
Pn200	0000h	Position Control Reference Form Selections	After restart
Pn205	65535	Multiturn Limit	After restart
Pn207	1000h	Position Control Function Selections	After restart
Pn20A	32768	Number of External Scale Pitches	After restart
Pn20E	64	Electronic Gear Ratio (Numerator)	After restart
Pn210	1	Electronic Gear Ratio (Denominator)	After restart
Pn212	2048	Number of Encoder Output Pulses	After restart
Pn216	0	Position Reference Acceleration/Deceleration Time Constant	Immediately after the motor stops
Pn217	0	Average Position Reference Movement Time	Immediately after the motor stops
Pn218	1	Reference Pulse Input Multiplier	Immediately
Pn22A	0000h	Fully-closed Control Selections	After restart
Pn234	0	Second Position Reference Acceleration/Deceleration Time Constant	Immediately
Pn281	20	Encoder Output Resolution	After restart
Pn282	0	Linear Encoder Scale Pitch	After restart
Pn300	600	Speed Reference Input Gain	Immediately
Pn301	100	Internal Set Speed 1	Immediately
Pn302	200	Internal Set Speed 2	Immediately
Pn303	300	Internal Set Speed 3	Immediately
Pn304	500	Jogging Speed	Immediately
Pn305	0	Soft Start Acceleration Time	Immediately
Pn306	0	Soft Start Deceleration Time	Immediately
Pn307	40	Speed Reference Filter Time Constant	Immediately
Pn308	0	Speed Feedback Filter Time Constant	Immediately
Pn30A	0	Deceleration Time for Servo OFF and Forced Stops	Immediately
Pn30C	0	Speed Feedforward Average Movement Time	Immediately
Pn310	0000h	Vibration Detection Selections	Immediately
Pn311	100	Vibration Detection Sensitivity	Immediately
Pn312	50	Vibration Detection Level	Immediately
Pn316	10000	Maximum Motor Speed	After restart

5.1.3 Parameter Recording Table

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		Continued from p	
Parameter No.	Default Setting	Name	When Enabled
Pn324	300	Moment of Inertia Calculation Starting Level	Immediately
Pn380	10	Internal Set Speed 1	Immediately
Pn381	20	Internal Set Speed 2	Immediately
Pn382	30	Internal Set Speed 3	Immediately
Pn383	50	Jogging Speed	Immediately
Pn384	10	Vibration Detection Level	Immediately
Pn385	50	Maximum Motor Speed	After restart
Pn400	30	Torque Reference Input Gain	Immediately
Pn401	100	First Stage First Torque Reference Filter Time Con- stant	Immediately
Pn402	800	Forward Torque Limit	Immediately
Pn403	800	Reverse Torque Limit	Immediately
Pn404	100	Forward External Torque Limit	Immediately
Pn405	100	Reverse External Torque Limit	Immediately
Pn406	800	Emergency Stop Torque	Immediately
Pn407	10000	Speed Limit during Torque Control	Immediately
Pn408	0000h	Torque-Related Function Selections	*
Pn409	5000	First Stage Notch Filter Frequency	Immediately
Pn40A	70	First Stage Notch Filter Q Value	Immediately
Pn40B	0	First Stage Notch Filter Depth	Immediately
Pn40C	5000	Second Stage Notch Filter Frequency	Immediately
Pn40D	70	Second Stage Notch Filter Q Value	Immediately
Pn40E	0	Second Stage Notch Filter Depth	Immediately
Pn40F	5000	Second Stage Second Torque Reference Filter Frequency	Immediately
Pn410	50	Second Stage Second Torque Reference Filter Q Value	Immediately
Pn412	100	First Stage Second Torque Reference Filter Time Con- stant	Immediately
Pn415	0	T-REF Filter Time Constant	Immediately
Pn416	0000h	Torque-Related Function Selections 2	Immediately
Pn417	5000	Third Stage Notch Filter Frequency	Immediately
Pn418	70	Third Stage Notch Filter Q Value	Immediately
Pn419	0	Third Stage Notch Filter Depth	Immediately

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Parameter No.	Default Setting	Name	When Enabled	
Pn41A	5000	Fourth Stage Notch Filter Frequency	Immediately	
Pn41B	70	Fourth Stage Notch Filter Q Value	Immediately	
Pn41C	0	Fourth Stage Notch Filter Depth	Immediately	
Pn41D	5000	Fifth Stage Notch Filter Frequency	Immediately	
Pn41E	70	Fifth Stage Notch Filter Q Value	Immediately	
Pn41F	0	Fifth Stage Notch Filter Depth	Immediately	
Pn423	0000h	Speed Ripple Compensation Selections	*	
Pn424	50	Torque Limit at Main Circuit Voltage Drop	Immediately	
Pn425	100	Release Time for Torque Limit at Main Circuit Voltage Drop	Immediately	
Pn426	0	Torque Feedforward Average Movement Time	Immediately	
Pn427	0	Speed Ripple Compensation Enable Speed	Immediately	
Pn456	15	Sweep Torque Reference Amplitude	Immediately	
Pn460	0101h	Notch Filter Adjustment Selections 1	Immediately	
Pn475	0000h	Gravity Compensation- Related Selections	After restart	
Pn476	0	Gravity Compensation Torque	Immediately	
Pn480	10000	Speed Limit during Force Control	Immediately	
Pn481	400	Polarity Detection Speed Loop Gain	Immediately	
Pn482	3000	Polarity Detection Speed Loop Integral Time Con- stant	Immediately	
Pn483	30	Forward Force Limit	Immediately	
Pn484	30	Reverse Force Limit Polarity Detection Refer-	Immediately	
Pn485	20	ence Speed	Immediately	
Pn486	25	Polarity Detection Reference Acceleration/Deceleration Time	Immediately	
Pn487	0	Polarity Detection Constant Speed Time	Immediately	
Pn488	100	Polarity Detection Reference Waiting Time	Immediately	
Pn48E	10	Polarity Detection Range	Immediately	
Pn490	100	Polarity Detection Load Level	Immediately	
Pn495	100	Polarity Detection Confirmation Force Reference	Immediately	
Pn498	10	Polarity Detection Allowable Error Range	Immediately	
-				

5.1.3 Parameter Recording Table

Continued from previous page.

Parameter No. Default Setting Name When Enabled Pn49F 0 Speed Ripple Compensa- tion Enable Speed Immediately Immediately Pn501 10 Zero Clamping Level Immediately Pn502 20 Rotation Detection Level Immediately Pn503 10 Speed Connictence Detection Signal Output Width Immediately Pn506 0 Brake Reference-Survo Immediately Pn507 100 Brake Reference Output Speed Level Immediately Pn508 50 Servo OFF-Brake Com- mand Walting Time Immediately Pn509 20 Momentary Power Interrup- tion Hold Time Immediately 10 Input Signal Selections 1 After restart After restart Pn508 65 434h Input Signal Selections 2 After restart Pn509 20 Immediately Immediately Pn500 8888h Input Signal Selections 2 After restart Pn501 3211h Output Signal Selections 3 After restart Pn502 3211h Output Signal Selections 3 <th></th> <th colspan="4">Continued from previous pag</th>		Continued from previous pag			
Pn501 10		Default Setting			
Pn502 20	Pn49F	0		Immediately	
Pn503 10 Speed Coincidence Detection Signal Output William Immediately Immediately Pn506 0 Brake Reference-Servo OFF Delay Time Immediately OFF Delay Time Immediately Den507 100 Brake Reference Output Speed Level Immediately Pn508 50 Servo OFF-Brake Command Weating Time Immediately Pn508 50 Momentary Power Interruption Hold Time Immediately Pn509 20 Momentary Power Interruption Hold Time Immediately Pn50A 2100h Input Signal Selections 1 After restart Input Signal Selections 2 After restart Input Signal Selections 2 After restart Input Signal Selections 3 After restart Pn50C 8888h Input Signal Selections 4 After restart Input Signal Selections 4 After restart Pn50C 3211h Output Signal Selections 4 After restart Pn50F 0000h Output Signal Selections 2 After restart Output Signal Selections 3 After restart Ings 2 After Selections 2 Output Signal Selections 3 After restart Ings 2 After Selections 2 After restart Ings 2 After Selections 2 After restart Ings 2 After Selections 2 After Restart Ings 2 After Selections 3 After restart Ings 2 After Selections 4 After restart Ings 2 After Selections 4 After restart Ings 2 After Selections 5 After Restart Ings 2 After Restart Ing	Pn501	10	Zero Clamping Level	Immediately	
Pn506 0	Pn502	20	Rotation Detection Level	Immediately	
Pn507 100 Brake Reference Output Immediately Pn508 50 Servo OFF-Brake Command Waiting Time Immediately Pn508 50 Servo OFF-Brake Command Waiting Time Immediately	Pn503	10		Immediately	
Pn508 50	Pn506	0		Immediately	
Pn509 20 mand Waiting Time Immediately Pn509 20 Momentary Power Interruption Hold Time Immediately Pn50A 2100h Input Signal Selections 1 After restart Pn50B 6543h Input Signal Selections 2 After restart Pn50C 8888h Input Signal Selections 3 After restart Pn50D 3838h Input Signal Selections 3 After restart Pn50E 3211h Output Signal Selections 1 After restart Pn50F 0000h Output Signal Selections 2 After restart Pn510 0000h Output Signal Selections 3 After restart Pn512 0000h Output Signal Inverse Settings After restart Pn513 0000h Output Signal Inverse Settings After restart Pn514 0000h Output Signal Selections 3 After restart Pn515 888th Input Signal Selections 4 After restart Pn516 8888h Input Signal Selections 5 After restart Pn517 0654h Output Signal Selectio	Pn507	100		Immediately	
Prison 20	Pn508	50		Immediately	
Pn50B 6543h Input Signal Selections 2 After restart Pn50C 8888h Input Signal Selections 3 After restart Pn50D 8888h Input Signal Selections 4 After restart Pn50E 3211h Output Signal Selections 1 After restart Pn50F 0000h Output Signal Selections 2 After restart Pn510 0000h Output Signal Inverse Settings After restart Pn512 0000h Output Signal Inverse Settings After restart Pn513 0000h Output Signal Selections 3 After restart Pn514 0000h Output Signal Selections 4 After restart Pn515 8888h Input Signal Selections 6 After restart Pn516 8888h Input Signal Selections 7 After restart Pn517 0654h Output Signal Selections 5 After restart Pn518 1000 Position Deviation Overflow Detection Immediately Pn51B 100 Position Deviation Overflow Detection Immediately Pn520 5242880 <	Pn509	20	tion Hold Time	Immediately	
Pn50C 8888h Input Signal Selections 3 After restart Pn50D 8888h Input Signal Selections 4 After restart Pn50E 3211h Output Signal Selections 1 After restart Pn50F 0000h Output Signal Selections 2 After restart Pn510 0000h Output Signal Inverse Settings After restart Pn512 0000h Output Signal Inverse Settings After restart Pn513 0000h Output Signal Selections 4 After restart Pn514 0000h Output Signal Selections 4 After restart Pn515 8888h Input Signal Selections 4 After restart Pn516 8888h Input Signal Selections 7 After restart Pn517 0654h Output Signal Selections 5 After restart Pn518 1000 Motor-Load Position Deviation Deviation Deviation Over-flow Detection Level Immediately Pn518 100 Position Deviation Over-flow Alarm Level Immediately Pn520 5242880 Position Deviation Over-flow Alarm Level Immediately					
Pn50D 8888h Input Signal Selections 4 After restart Pn50E 3211h Output Signal Selections 1 After restart Pn50F 0000h Output Signal Selections 2 After restart Pn510 0000h Output Signal Selections 3 After restart Pn512 0000h Output Signal Inverse Settings After restart Pn513 0000h Output Signal Inverse Settings After restart Pn514 0000h Output Signal Selections 4 After restart Pn515 8888h Input Signal Selections 6 After restart Pn516 8888h Input Signal Selections 7 After restart Pn517 0654h Output Signal Selections 5 After restart Pn518 1000 Motor-Load Position 5 After restart Pn51B 1000 Position Deviation Over- flow Warning Level Immediately Pn520 5242880 Position Deviation Over- flow Alarm Level Immediately Pn524 1073741824 Near Signal Width Immediately Pn528 100 <		6543h		After restart	
Pn50E 3211h Output Signal Selections 1 After restart Pn50F 0000h Output Signal Selections 2 After restart Pn510 0000h Output Signal Selections 3 After restart Pn512 0000h Output Signal Inverse Settings After restart Pn513 0000h Output Signal Inverse Settings 2 After restart Pn514 0000h Output Signal Selections 4 After restart Pn515 8888h Input Signal Selections 6 After restart Pn516 8888h Input Signal Selections 7 After restart Pn517 0654h Output Signal Selections 5 After restart Pn518 1000 Motor-Load Position Deviation Deviation Overlow Prosition Deviation Overflow Deviation Overflow Warning Level Immediately Pn520 5242880 Position Deviation Overflow Warning Completed Width Immediately Pn524 1073741824 Near Signal Width Immediately Pn526 5242880 Position Deviation Overflow Varning Level at Servo ON Immediately Pn528 100 Position Deviation Overfl					
Pn50F 0000h Output Signal Selections 2 After restart Pn510 0000h Output Signal Selections 3 After restart Pn512 0000h Output Signal Inverse Settings After restart Pn513 0000h Output Signal Inverse Settings 2 After restart Pn514 0000h Output Signal Selections 4 After restart Pn515 8888h Input Signal Selections 6 After restart Pn516 8888h Input Signal Selections 7 After restart Pn517 0654h Output Signal Selections 5 After restart Motor-Load Position Deviation Deviation Overflow Detection Level Immediately Pn518 1000 Position Deviation Overflow Deviation Overflow Alarm Level Immediately Pn520 5242880 Position Deviation Overflow Deviation Overflow Alarm Level Immediately Pn524 1073741824 Near Signal Width Immediately Pn528 100 Position Deviation Deviation Overflow Alarm Level at Servo ON Immediately Pn529 10000 Speed Limit Level at Servo ON Immediately	Pn50D	8888h	Input Signal Selections 4	After restart	
Pn510 0000h Output Signal Selections 3 After restart Pn512 0000h Output Signal Inverse Settings After restart Pn513 0000h Output Signal Inverse Settings 2 After restart Pn514 0000h Output Signal Selections 4 After restart Pn515 8888h Input Signal Selections 6 After restart Pn516 8888h Input Signal Selections 7 After restart Pn517 0654h Output Signal Selections 5 After restart Pn518 1000 Motor-Load Position Deviation Deviation Overflow Warning Level Immediately Pn518 100 Position Deviation Overflow Alarm Level Immediately Pn520 5242880 Position Deviation Overflow Alarm Level Immediately Pn522 7 Position Deviation Overflow Alarm Level at Servo ON Immediately Pn524 1073741824 Near Signal Width Immediately Pn526 5242880 Position Deviation Overflow Warning Level at Servo ON Immediately Pn528 100 Position Deviation Overflow Warning Level at Servo ON <td>Pn50E</td> <td></td> <td></td> <td>After restart</td>	Pn50E			After restart	
Pn512 0000h Output Signal Inverse Settings After restart Pn513 0000h Output Signal Inverse Settings 2 After restart Pn514 0000h Output Signal Selections 4 After restart Pn515 8888h Input Signal Selections 6 After restart Pn516 8888h Input Signal Selections 7 After restart Pn517 0654h Output Signal Selections 5 After restart Pn518 1000 Motor-Load Position Deviation Over- flow Overflow Detection Level Immediately Pn518 100 Position Deviation Over- flow Warning Level Immediately Pn520 5242880 Position Deviation Over- flow Alarm Level Immediately Pn524 1073741824 Near Signal Width Immediately Pn526 5242880 Position Deviation Over- flow Alarm Level at Servo ON Immediately Pn528 100 Position Deviation Over- flow Warning Level at Servo ON Immediately Pn529 10000 Speed Limit Level at Servo ON Immediately Pn529 10000 Multiplier per Fully-closed Rotation Immediately Pn520 20 M	Pn50F	0000h	Output Signal Selections 2	After restart	
Pn512 0000h tings Atter restart Pn513 0000h Output Signal Inverse Settings 2 After restart Pn514 0000h Output Signal Selections 4 Pn515 8888h Input Signal Selections 6 After restart Pn516 8888h Input Signal Selections 7 After restart Pn517 0654h Output Signal Selections 5 After restart Pn518 1000 Motor-Load Position Deviation Overflow Detection Level Pn51B 100 Position Deviation Overflow Warning Level Pn520 5242880 Position Deviation Overflow Alarm Level Pn522 7 Position Deviation Overflow Alarm Level Pn524 1073741824 Near Signal Width Immediately Pn526 5242880 Position Deviation Overflow Alarm Level at Servo ON Pn528 100 Position Deviation Overflow Warning Level at Servo ON Pn529 10000 Speed Limit Level at Servo ON Pn529 10000 Speed Limit Level at Servo ON Multiplier per Fully-closed Rotation Pn52B 20 Overload Warning Level Immediately Pn52C 100 After restart After restart	Pn510	0000h	Output Signal Selections 3	After restart	
Pn514 0000h	Pn512	0000h		After restart	
Pn515 8888h Input Signal Selections 6 After restart Pn516 8888h Input Signal Selections 7 After restart Pn517 0654h Output Signal Selections 5 After restart Pn518 1000 Motor-Load Position Deviation Deviation Overflow Detection Level Immediately Pn51E 100 Position Deviation Overflow Warning Level Immediately Pn520 5242880 Position Deviation Overflow Alarm Level Immediately Pn522 7 Position Deviation Completed Width Immediately Pn524 1073741824 Near Signal Width Immediately Pn526 5242880 Position Deviation Overflow Alarm Level at Servo ON Immediately Pn528 100 Position Deviation Overflow Warning Level at Servo ON Immediately Pn529 10000 Speed Limit Level at Servo ON Immediately Pn529 20 Multiplier per Fully-closed Rotation Immediately Pn52B 20 Overload Warning Level Immediately Pn52C 100 Base Current Derating at Motor Overload Detection After restart	Pn513	0000h		After restart	
Pn5168888hInput Signal Selections 7After restartPn5170654hOutput Signal Selections 5After restartPn5181000Motor-Load Position Deviation Overflow Detection LevelImmediatelyPn51E100Position Deviation Deviation Overflow Warning LevelImmediatelyPn5205242880Position Deviation Overflow Alarm LevelImmediatelyPn5227Positioning Completed WidthImmediatelyPn5241073741824Near Signal WidthImmediatelyPn5265242880Position Deviation Overflow Alarm Level at Servo ONImmediatelyPn528100Position Deviation Overflow Warning Level at Servo ONImmediatelyPn52910000Speed Limit Level at Servo ONImmediatelyPn52A20Multiplier per Fully-closed RotationImmediatelyPn52B20Overload Warning LevelImmediatelyPn52C100Base Current Derating at Motor Overload DetectionAfter restart	Pn514	0000h	Output Signal Selections 4		
Pn517 0654h Output Signal Selections 5 After restart Pn51B 1000 Motor-Load Position Deviation Deviation Overflow Detection Level Immediately Pn51E 100 Position Deviation Overflow Warning Level Immediately Pn520 5242880 Position Deviation Overflow Alarm Level Immediately Pn522 7 Positioning Completed Width Immediately Pn524 1073741824 Near Signal Width Immediately Pn526 5242880 Position Deviation Overflow Alarm Level at Servo ON Immediately Pn528 100 Position Deviation Overflow Warning Level at Servo ON Immediately Pn529 10000 Speed Limit Level at Servo ON Immediately Pn52A 20 Multiplier per Fully-closed Rotation Immediately Pn52B 20 Overload Warning Level Immediately Pn52C 100 After restart	Pn515	8888h		After restart	
Pn51B 1000 Motor-Load Position Deviation Overflow Detection Level Immediately Pn51E 100 Position Deviation Over-flow Warning Level Immediately Pn520 5242880 Position Deviation Over-flow Alarm Level Immediately Pn522 7 Position Deviation Over-flow Alarm Level Immediately Pn524 1073741824 Near Signal Width Immediately Pn526 5242880 Position Deviation Over-flow Alarm Level at Servo ON Pn528 100 Position Deviation Over-flow Warning Level at Servo ON Pn529 10000 Speed Limit Level at Servo Immediately Pn52A 20 Multiplier per Fully-closed Rotation Immediately Pn52B 20 Overload Warning Level Immediately Pn52C 100 Base Current Derating at Motor Overload Detection After restart	Pn516	8888h		After restart	
Pn51B1000tion Overflow Detection LevelImmediatelyPn51E100Position Deviation Overflow Warning LevelImmediatelyPn5205242880Position Deviation Deviation Overflow Alarm LevelImmediatelyPn5227Positioning Completed Positioning Completed WidthImmediatelyPn5241073741824Near Signal WidthImmediatelyPn5265242880Position Deviation Overflow Alarm Level at Servo ONImmediatelyPn528100Position Deviation Overflow Warning Level at Servo ONImmediatelyPn52910000Speed Limit Level at Servo ONImmediatelyPn52A20Multiplier per Fully-closed RotationImmediatelyPn52B20Overload Warning LevelImmediatelyPn52C100Base Current Derating at Motor Overload DetectionAfter restart	Pn517	0654h		After restart	
Pn520 5242880 Position Deviation Over- flow Alarm Level Immediately Pn522 7 Positioning Completed Width Immediately Pn524 1073741824 Near Signal Width Immediately Pn526 5242880 Position Deviation Over- flow Alarm Level at Servo ON Immediately Pn528 100 Position Deviation Over- flow Warning Level at Servo ON Immediately Pn529 10000 Speed Limit Level at Servo ON Immediately Pn52A 20 Multiplier per Fully-closed Rotation Immediately Pn52B 20 Overload Warning Level Immediately Pn52C 100 Base Current Derating at Motor Overload Detection After restart	Pn51B	1000	tion Overflow Detection	Immediately	
Pn520 5242880 flow Alarm Level immediately Pn522 7 Positioning Completed Width Immediately Pn524 1073741824 Near Signal Width Immediately Pn526 5242880 Position Deviation Overflow Alarm Level at Servo ON Position Deviation Overflow Warning Level at Servo ON Immediately Pn528 100 Speed Limit Level at Servo ON Immediately Pn529 10000 Speed Limit Level at Servo ON Immediately Pn52A 20 Multiplier per Fully-closed Rotation Immediately Pn52B 20 Overload Warning Level Immediately Pn52C 100 Base Current Derating at Motor Overload Detection After restart	Pn51E	100		Immediately	
Pn524 1073741824 Near Signal Width Immediately Pn526 5242880 Pn528 100 Position Deviation Over- flow Alarm Level at Servo ON Immediately Pn528 100 Speed Limit Level at Servo ON Immediately Pn529 10000 Speed Limit Level at Servo ON Immediately Pn52A 20 Multiplier per Fully-closed Rotation Pn52B 20 Overload Warning Level Immediately Pn52C 100 Base Current Derating at Motor Overload Detection After restart	Pn520	5242880		Immediately	
Pn526 5242880 Position Deviation Over- flow Alarm Level at Servo ON Position Deviation Over- flow Warning Level at Servo ON Immediately Pn529 10000 Speed Limit Level at Servo ON Immediately Pn52A 20 Multiplier per Fully-closed Rotation Pn52B 20 Overload Warning Level Immediately Pn52C 100 Base Current Derating at Motor Overload Detection After restart	Pn522	7		Immediately	
Pn526 5242880 flow Alarm Level at Servo ON Immediately Pn528 100 Position Deviation Overflow Warning Level at Servo ON Immediately Pn529 10000 Speed Limit Level at Servo ON Immediately Pn52A 20 Multiplier per Fully-closed Rotation Immediately Pn52B 20 Overload Warning Level Immediately Pn52C 100 Base Current Derating at Motor Overload Detection After restart	Pn524	1073741824	Near Signal Width	Immediately	
Pn528100flow Warning Level at Servo ONImmediatelyPn52910000Speed Limit Level at Servo ONImmediatelyPn52A20Multiplier per Fully-closed RotationImmediatelyPn52B20Overload Warning LevelImmediatelyPn52C100Base Current Derating at Motor Overload DetectionAfter restart	Pn526	5242880	flow Alarm Level at Servo	Immediately	
Pn52A 20 Multiplier per Fully-closed Rotation Immediately Pn52B 20 Overload Warning Level Immediately Pn52C 100 Base Current Derating at Motor Overload Detection After restart	Pn528	100	flow Warning Level at Servo	Immediately	
Pn52B 20 Rotation Immediately Pn52B 20 Overload Warning Level Immediately Pn52C 100 Base Current Derating at Motor Overload Detection After restart	Pn529	10000		Immediately	
Pn52C 100 Base Current Derating at Motor Overload Detection After restart	Pn52A	20		Immediately	
Motor Overload Detection After restart	Pn52B	20	Overload Warning Level	Immediately	
Pn52F 0FFFh Monitor Display at Startup Immediately	Pn52C	100		After restart	
	Pn52F	0FFFh	Monitor Display at Startup	Immediately	

Lists
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Parameter No.	Default Setting	Name	When Enabled
Pn530	0000h	Program Jogging-Related Selections	Immediately
Pn531	32768	Program Jogging Travel Distance	Immediately
Pn533	500	Program Jogging Move- ment Speed	Immediately
Pn534	100	Program Jogging Acceleration/Deceleration Time	Immediately
Pn535	100	Program Jogging Waiting Time	Immediately
Pn536	1	Program Jogging Number of Movements	Immediately
Pn550	0	Analog Monitor 1 Offset Voltage	Immediately
Pn551	0	Analog Monitor 2 Offset Voltage	Immediately
Pn552	100	Analog Monitor 1 Magnifi- cation	Immediately
Pn553	100	Analog Monitor 2 Magnifi- cation	Immediately
Pn55A	1	Power Consumption Monitor Unit Time	Immediately
Pn560	400	Residual Vibration Detection Width	Immediately
Pn561	100	Overshoot Detection Level	Immediately
Pn580	10	Zero Clamping Level	Immediately
Pn581	20	Zero Speed Level	Immediately
Pn582	10	Speed Coincidence Detection Signal Output Width	Immediately
Pn583	10	Brake Reference Output Speed Level	Immediately
Pn584	10000	Speed Limit Level at Servo ON	Immediately
Pn585	50	Program Jogging Movement Speed	Immediately
Pn586	0	Motor Running Cooling Ratio	Immediately
Pn600	0	Regenerative Resistor Capacity	Immediately
Pn601	0	Dynamic Brake Resistor Allowable Energy Con- sumption	After restart
Pn603	0	Regenerative Resistance	Immediately
Pn604	0	Dynamic Brake Resistance	After restart
Pn61A	0000h	Overheat Protection Selections	After restart
Pn61B	250	Overheat Alarm Level	Immediately
Pn61C	100	Overheat Warning Level	Immediately
Pn61D	0	Overheat Alarm Filter Time	Immediately

5.2.1 Interpreting the Parameter Lists

5.2

SERVOPACKs with MECHATROLINK-III Communications References

5.2.1 Interpreting the Parameter Lists

List of Servo Parameters

The types of motors 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

"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 setting report is available.
- A software reset is executed.

			SI VOITIOTOIS	on pa	.go xii			(// //			. ,	
Parameter No.	Size	N	lame		Setting Range	Setting Unit	Default Setting	Applica- ble Motors	When Enabled	Classi- fication	Refer- ence	
	2	Basic Funct	ion Selection	ns 0	0000h to 10B1h	_	0000h	All	After restart	Setup	_	
		 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 Selection There are the following two classific • Setup • Tuning Refer to the following manual for de Transportion Selection • Top row: For Rotary Servomotors Bottom Pirection Selection • Selection • Setup • Tuning Refer to the following manual for de Transportion • Trouble Transportion • Selection • Direction • Selection • Selection • Selection • Setup • Tuning Refer to the following manual for de Transportion • Trouble Transportion • Setup • Tuning • Trouble Transportion • Selection • Selection • Setup • Tuning • Trouble Transportion • Top row: For Rotary Selection • Top row: For Rotary Selection • Setup • Tuning • Trouble Transportion • Setup • Tuning • Trouble Transportion • Setup • Tuning • Trouble Transportion • Top row: For Rotary Selection • Trouble Transportion • Top row: For Rotary Selection • Trouble Transportion • Top row: For Rotary Selection • Top row: For Rotary Selection • Top row: For Rotary Selection • Trouble Transportion • Trouble Transport • Trouble Transport • Trouble Transport • Trouble Transport • Trouble Transport • Trouble Transport • Trouble Transport • Trouble Transport • Trouble Transport • Trouble Transport • Trouble Transport • Trouble Transport • Trouble Transport • Trouble Transport • Trouble Transport • Trouble Transport • Trouble Transport<									s Prod-	
			Rotation D	otation Direction Selection								
				lovement Direction Selection								
			Use CCW as the forward direction.									
Pn000	,	n.□□□X		Use the direction in which the linear encoder counts up as the forward direction. $$								
M3			l	Use CW as the forward direction. (Reverse Rotation Mode)					_			
	П			Use the direction in which the linear encoder counts down as the forward direction. (Reverse Movement Mode)								
Symbols	are p	provided when	a parameter	r is valid	d only for a spe	ecific profile.						
• M2	Paran	neters that are val	id only for a ME	ECHATR	OLINK-II-compati OLINK-III standar	ble profile.						
			Rotary/Line	ear Se	ervomotor Sta	rtup Selec	tion When I	Encoder Is N	ot Connected	Referer	nce	
	,	n.X000		When an encoder is not connected, start as SERVOPACK for								
					an encoder i ervomotor.	s not conn	ected, star	t as SERVOI	PACK for Lin-			

List of MECHATROLINK-III Common Parameters

The types of motors 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	Classi- fication
61 PnAC2	4	Speed Loop Gain	1,000h to 2,000,000h	0.001 Hz [0.1 Hz]	40000h	All	Immedi- ately	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.

Applicable

Motors

When

Enabled

Classi-

fication

Refer-

ence

5.2.2 List of Servo Parameters

The following table lists the parameters.

Note: Do not change the following parameters from their default settings.

Reserved parameter

Size

Parameter

No.

· Parameters not given in this manual

Name

· Parameters that are not valid for the Servomotor that you are using, as given in the parameter table

Setting

Range

Setting

Unit

Default

Setting

	2	Basic Func tions 0	tion Selec	0000h to 10B1h	-	0000h	All	After restart	Setup	*1
			Rotation	Direction Selection	n					
			Moveme	nt Direction Selec	tion					
				Use CCW as the	forward dir	rection.				
	1	n.□□□X	0	Use the direction tion.	in which th	ne linear en	coder counts	up as the fo	orward dire	€C-
				Use CW as the fo	rward dire	ction. (Rev	erse Rotation	Mode)		
Pn000			1	Use the direction direction. (Revers			coder counts	down as th	e forward	
		n.□□X□	Reserved	d parameter (Do n	ot change	.)				
	I	n.□X□□	Reserved	d parameter (Do n	ot change	.)				
			Rotary/L	inear Servomotor	Startup Se	election W	hen Encoder	Is Not Conr	nected	
	1	n.X□□□	0	When an encoder motor.	is not cor	nected, st	art as SERVC	PACK for Ro	otary Servo)-
			1	When an encoder tor.	is not con	nected, sta	art as SERVO	PACK for Lin	near Servo	mo-
										-

Continued from previous page.

Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
	2	Application Selections	r Function 1	0000h to 1142h	_	0000h	All	After restart	Setup	*1		
			1							_		
			Motor Stopp	oing Method for	r Servo Of	F and Gro	oup 1 Alarms					
			0 St	op the motor by	applying	the dynam	ic brake.					
		n.□□□X		Stop the motor by the applying dynamic brake and then release the dynam brake. Coast the motor to a stop without the dynamic brake.								
			2 Co									
	Ī		Overtravel S	Overtravel Stopping Method								
		n.□□X□	Apply the dynamic brake or coast the motor to a stop (use the stopping method set in Pn001 = n.□□□X).									
				celerate the mo			ne torque set i	n Pn406 as	the maxim	ium		
Pn001				Decelerate the motor to a stop using the torque set in Pn406 as the maximum torque and then let the motor coast.								
			3 De	Decelerate the motor to a stop using the deceleration time set in Pn30A then servo-lock the motor.								
				celerate the moen let the motor		op using tl	he deceleration	on time set ir	n Pn30A ai	nd		
			Main Circuit	Power Supply	AC/DC In	put Select	ion					
		n.□X□□		out AC power as nals (do not use			wer supply us	ing the L1, L	2, and L3	ter-		
		11.0700	1 tei	out DC power a minals or the B ared converter).	1 and Θ 2			•		2		
	n.X□□□ Reserved parameter (Do not change.)											

5.2.2 List of Servo Parameters

Continued from previous page.

Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
	2	Application Selections	Function 2	0000h to 4213h	-	0011h	-	After restart	Setup	_
	ī									_
			Option	LINK Comman	d Position	and Spe	ed Control	Applicable Motors	Refere	ence
		~ UUUV	0 R	eserved setting ((Do not us	e.)				
		n.□□□X	1 U:	se TLIM as the t	orque limit	t.		All	*2	
			2 R	eserved setting (Do not us	e.)		7 111		
			3 R	eserved setting ((Do not us					
			Torque Con	trol Option				Applicable Motors	Refere	ence
		n.□□X□	0 R	eserved setting ((Do not us	e.)				
	Pn002			se the speed lim eed limit.	All	*2				
				Encoder Usage						
Pn002			Encoder Us	age				Applicable Motors	Refere	ence
Pn002		n. 🗆 X 🗆 🗆	O Us	age se the encoder ans.	according	to encode	r specifica-		Refere	ence
Pn002		n.0X00	O Us	se the encoder a				Motors	Refere	
Pn002		n.□X□□	0 Us	se the encoder ans.	as an incre	emental en	coder.	Motors	Refere	
Pn002		n.0X00	0 Us	se the encoder ans. se the encoder as	as an incre	emental en	coder.	Motors	*1	
Pn002	_	n.ロXロロ	0 Ustic 1 Ustic 2 Ustic er	se the encoder ans. se the encoder as the encoder accoder.	as an incre as a single	emental en e-turn absc	coder.	Motors All Rotary Applicable	*!	
Pn002		n.0X00	0 Us tic 1 Us 2 Us er External En 0 Do	se the encoder ans. se the encoder act the encoder accoder.	as an increas a single	emental en e-turn abso oder.	coder. lute	Motors All Rotary Applicable	*!	
Pn002			0 Us tic 1 Us 2 Us er External En 0 Do 1 Tr tic	se the encoder and the encoder acceptation and the encoder acceptation and the encoder acceptation and the encoder acceptation and the encoder acceptation and the encoder acceptation and the encoder acceptation and the encoder acceptation and the encoder acceptation and the encoder acceptation and the encoder acceptation acceptation and the encoder acceptation acc	ernal enco	emental en the turn absorbeder. oder. s in the for	coder. lute	Motors All Rotary Applicable	*!	ence
Pn002			0 Us tic 1 Us 2 Us er External En 0 Do 1 Th tic 2 Re 2 Th 2 Th 2 Th 2 Th 2 Th 2 Th 2 Th 2 T	se the encoder and the encoder and the encoder and the encoder and the encoder and the encoder and the encoder. Coder Usage In not use an extended encoder and the external encoder and the external encoder and the encoder	ernal encoder moves or rotation	emental en e-turn abso oder. s in the for e.)	coder. lute	Motors All Rotary Applicable Motors	*!	ence
Pn002			0 Us tick 1 Us 2 Us er External En 0 Do 1 Tr tick 2 Re 3 Tr tick	se the encoder and the encoder and the encoder and the encoder and the encoder and the encoder and the external encoder and the external encoder and the external encoder external encoder external encoder and the external encoder and the e	ernal encoder moves or rotation (Do not us or rotation rotation)	oder. s in the for e.) s in the rev	coder. lute	Motors All Rotary Applicable Motors	*!	ence

Continued from previous page.

Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
	2	Application Selections		0000h to 105Fh	_	0002h	All	Immedi- ately	Setup	*1		
								-				
			Analog Mo	nitor 1 Signal Se	election							
			00	Motor speed (1								
				Speed reference		· · ·						
			01	Speed reference								
				Torque reference	•		rauo)					
			02	•	•							
			03	Force reference (1 V/100% rated force) Position deviation (0.05 V/reference unit)								
				Position amplifier deviation (after electronic gear) (0.05 V/encoder pulse unit)								
			04	Position amplified pulse unit)						<u></u>		
				Position reference speed (1 V/1,000 min ⁻¹)								
		05	Position reference speed (1 V/1,000 mm/s)									
		06	Reserved setting (Do not use.)									
			07		•		V/reference u	ınit)				
Pn006		n.□□XX	08	Load-motor position deviation (0.01 V/reference unit) Positioning completion (positioning completed: 5 V, positioning not completed: 0 V)								
			00	Speed feedforw	ard (1 V/1	,000 min ⁻¹						
			09	Speed feedforw	ard (1 V/1	,000 mm/s	3)					
				Torque feedforw	ard (1 V/1	00% rated	torque)					
			0A	Force feedforwa	ard (1 V/10	0% rated	force)					
			0B	Active gain (1st	gain: 1 V,	2nd gain: 2	2 V)			-		
			0C	Completion of p	osition ref	erence dis	tribution (com	pleted: 5 V,	not com-			
			0D	External encode	er speed (1	V/1,000 r	min ⁻¹ : value at	the motor s	shaft)			
			0E	Reserved setting	g (Do not i	use.)				-		
			0F	Reserved setting	g (Do not i	use.)						
			10	Main circuit DC	voltage							
			11 to 24	Reserved setting	gs (Do not	use.)						
			25	Position deviation	n after po	sition refer	ence filter (0.	05 V/referen	ce unit)			
			26 to 5F	Reserved setting	gs (Do not	use.)						
		n.□X□□	Reserved	parameter (Do no	ot change.	.)						
	İ	n.XDDD	Reserved	parameter (Do no	ot change)						
			1 loodi ved	saramotor (bo ne	or orialige.							

Applicable

Motors

5.2.2 List of Servo Parameters

Continued from previous page.

Classi-

fication

Refer-

ence

When

Enabled

IVO.	0,			Hange	Offic	Octing	MOTORS	Lilabica	Heation	CITCC
	2	Application Selections		0000h to 105Fh	_	0000h	All	Immedi- ately	Setup	*1
			Analog Mo	nitor 2 Signal Se	election					
			00	Motor speed (1	V/1,000 m	nin ⁻¹)				
			00	Motor speed (1	V/1,000 m	nm/s)				
			01	Speed reference	e (1 V/1,00	00 min ⁻¹)				
			01	Speed reference	e (1 V/1,00	00 mm/s)				
			02	Torque referenc	e (1 V/100	% rated to	rque)			
			02	Force reference	(1 V/1009	6 rated for	ce)			
			03	Position deviation	on (0.05 V	reference (unit)			
				Position amplifie	er deviation	n (after elec	ctronic gear) (0.05 V/enco	der pulse	unit)
			04	Position amplified pulse unit)	er deviation	n (after eled	ctronic gear) (0.05 V/linear	encoder	
			05	Position referen	ce speed (1 V/1,000	min ⁻¹)			
			03	Position referen	ce speed (1 V/1,000	mm/s)			
			06	Reserved settin	g (Do not ı	use.)				
	007 n.□□XX	07	Load-motor position deviation (0.01 V/reference unit)							
Pn007		08	Positioning completed: 0 V)	pletion (po	ositioning c	ompleted: 5	V, positioning	g not com-	-	
			09	Speed feedforw	ard (1 V/1	,000 min ⁻¹)				
			09	Speed feedforw	ard (1 V/1	,000 mm/s)			
			0A	Torque feedforw	ard (1 V/1	00% rated	torque)			
			UA .	Force feedforwa	ard (1 V/10	00% rated f	orce)			
			0B	Active gain (1st	gain: 1 V,	2nd gain: 2	2 V)			
			0C	Completion of p pleted: 0 V)	osition ref	erence dist	tribution (com	pleted: 5 V,	not com-	
			0D	External encode	er speed (1	V/1,000 r	nin ⁻¹ : value at	the motor s	haft)	
			0E	Reserved settin	g (Do not ı	use.)				
			0F	Reserved settin	g (Do not ı	use.)				
			10	Main circuit DC	voltage					
			11 to 24	Reserved setting	gs (Do not	use.)				
			25	Position deviation	on after po	sition refer	ence filter (0.0	05 V/reference	ce unit)	
			26 to 5F	Reserved setting	gs (Do not	use.)				
		n.□X□□	Reserved	parameter (Do no	ot change	.)				
		n.X□□□	Reserved	parameter (Do no	ot change.	.)				
	-									

Setting

Range

Parameter

No.

Size

Name

Setting

Unit

Default

Setting

Continued from previous page.

Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
	2	Applicatio Selections	n Function 88	0000h to 7121h	-	4000h	Rotary	After restart	Setup	*1		
										_		
				ery Voltage Alarm								
		n.□□□X		Output alarm (A.8	*							
			1	Output warning (A	4.930) for I	ow battery	voltage.					
			Function	Selection for Und	ervoltage							
D : 000			0	Do not detect und	dervoltage.							
Pn008		n.□□X□	1	Detect undervolta	ge warnin	g and limit	torque at hos	t controller.				
				Detect undervolta in SERVOPACK).	ge warninç	g and limit t	torque with Pr	n424 and Pn	425 (i.e., o	nly		
			Warning [Detection Selection	n							
		n.□X□□	0	Detect warnings.								
			1	Do not detect war	nings exc	ept for A.9	71.					
		n.X□□□ Reserved parameter (Do not change.)										
		11.7000	neserveu	parameter (Do no	or change.	.)						
		A 1' 1' -		00001-1-				A.Cl.				
	2	Selections	n Function 9	0000h to 0121h	-	0010h	All	After restart	Tuning	*1		
		_					I		1			
	l											
		n.□□□X	Reserved	parameter (Do no	ot change.)						
		n.□□□X		parameter (Do no)						
		n.□□□X	Current C		ction)						
			Current C	ontrol Mode Sele Use current contro SERVOPACK Mo	ction ol mode 1. odels SGD	7S-R70A,	-R90A, -1R6 <i>A</i>	4, -2R8A, -5	R5A, and			
Pn000	-	n. 🗆 🗆 X	Current C	ontrol Mode Sele Use current control SERVOPACK Mo -7R6A: Use curr	ction of mode 1. odels SGD ent contro	7S-R70A, I mode 1.						
Pn009			Current C	ontrol Mode Sele Use current control SERVOPACK Mo -7R6A: Use curre SERVOPACK Mo	ction of mode 1. odels SGD ent contro	7S-R70A, I mode 1. 7S-120A,	-180A, -200A			,		
Pn009			Current C 0	ontrol Mode Sele Use current control SERVOPACK Mo -7R6A: Use curr	ction ol mode 1. odels SGD ent contro odels SGD A: Use cu	7S-R70A, I mode 1. 7S-120A, rrent contr	-180A, -200A			.,		
Pn009			Current C 0 1	ontrol Mode Sele Use current control SERVOPACK Mo -7R6A: Use curre SERVOPACK Mo -590A, and -780 Use current control	ction ol mode 1. odels SGD ent contro odels SGD A: Use cu ol mode 2.	7S-R70A, I mode 1. 7S-120A, rrent contr	-180A, -200A			,		
Pn009		n.□□X□	Current C 0 1 2 Speed De	ontrol Mode Sele Use current control SERVOPACK Mo -7R6A: Use curre SERVOPACK Mo -590A, and -780 Use current control tection Method S	ction of mode 1. odels SGD ent contro odels SGD A: Use cui of mode 2.	7S-R70A, I mode 1. 7S-120A, rrent contr	-180A, -200A			,		
Pn009]		Current C 0 1 2 Speed De 0	ontrol Mode Sele Use current control SERVOPACK Mo -7R6A: Use curre SERVOPACK Mo -590A, and -780 Use current control tection Method S Use speed detection	ction ol mode 1. odels SGD ent contro odels SGD A: Use cu ol mode 2. election ion 1.	7S-R70A, I mode 1. 7S-120A, rrent contr	-180A, -200A			,		
Pn009		n.□□X□ n.□X□□	Current C 0 1 2 Speed De 0 1	ontrol Mode Sele Use current control SERVOPACK Mo -7R6A: Use curre SERVOPACK Mo -590A, and -780 Use current control tection Method S Use speed detect Use speed detect	ction ol mode 1. odels SGD ent contro odels SGD A: Use cu ol mode 2. election ion 1. ion 2.	7S-R70A, I mode 1. 7S-120A, rrent contr	-180A, -200A			,		
Pn009		n.□□X□	Current C 0 1 2 Speed De 0 1	ontrol Mode Sele Use current control SERVOPACK Mo -7R6A: Use curre SERVOPACK Mo -590A, and -780 Use current control tection Method S Use speed detection	ction ol mode 1. odels SGD ent contro odels SGD A: Use cu ol mode 2. election ion 1. ion 2.	7S-R70A, I mode 1. 7S-120A, rrent contr	-180A, -200A			,		

Continued	trom	previous	nage

Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
	2	Application Selections	Function A	0000h to 1044h	-	0001h	All	After restart	Setup	*1
				•		l				
			Motor Stops	oing Method fo	r Group 2	Alarms				
				pply the dynami ethod set in Pn			motor to a st	op (use the s	stopping	
				ecelerate the more						
		n.□□□X	² to	ecelerate the morque and then l	et the mot	or coast.				
			3 De	ecelerate the me e setting of Pn0	otor to a s 001 = n.□I	top using t ⊐□X for th	he deceleration ne status after	on time set in stopping.	in Pn30A. Use	
				ecelerate the meen let the motor		top using t	the deceleration	on time set i	n Pn30A a	ind
Pn00A			Stopping M	ethod for Force	ed Stops					
			O Ap	pply the dynami ethod set in Pn	c brake or 001 = n.□	coast the	motor to a st	op (use the s	stopping	
				ecelerate the more rque. Use the s						
		n.□□X□		ecelerate the more			he torque set	in Pn406 as	the maxin	num
			ecelerate the mees setting of Pn0					n Pn30A.	Use	
				ecelerate the metor		top using t	the deceleration	on time set i	n Pn30A a	ind
		n.□X□□	Reserved pa	arameter (Do n	ot change	.)				
		n.X□□□	Reserved pa	arameter (Do n	ot change	.)				
	2	Application Selections	Function B	0000h to 1121h	_	0000h	All	After restart	Setup	*1
		•		•	•	•	•	•	•	,
	ı		Operator Par	ameter Display	Selection	1				
		n.□□□X	0 Dis	olay only setup	paramete	rs.				
			1 Disp	olay all parame	ters.					
			Motor Stoppi	ng Method for	Group 2	Alarms				
D 00D		-		p the motor by	•		ference to 0.			_
Pn00B		n.□□X□		oly the dynamic thod set in Pn0			motor to a sto	p (use the s	topping	
			2 Set	the stopping n	nethod wit	h Pn00A =	n.□□□X.			
	Power Input Selection for Three-phase SERVOPACK n.□X□□ 0 Use a three-phase power supply input.									
			1 Use	a three-phase	power su	pply input	as a single-ph	nase power s	supply inp	ut.
		n.X□□□	Reserved par	rameter (Do no	t change.)					
	-									
	L									

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Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
	2	Application Selections	Function C	0000h to 0131h	-	0000h	_	After restart	Setup	*1
					1	1		1	I	
			Function Sele	ection for Test	without a	Motor			Applica Motor	ble
		n.□□□X	0 Disa	able tests with	out a moto	or.				
			1 Ena	able tests withou	out a moto	r.			All	
			Encoder Res	olution for Tes	ts without	a Motor			Applica Motor	ble s
Pn00C		n.□□X□		e 13 bits.						
		11.00/0		20 bits.					Rotar	y
			-	e 22 bits.						
			0 030	, 24 DIG.						
		~ DVDD	Encoder Type	e Selection for	Tests wit	hout a Mo	tor		Applica Motor	ble s
		n.□X□□	-	an increment					All	
			1 Use	an absolute e	encoder.					
		n.X□□□	Reserved par	rameter (Do no	ot change.	.)				
	2	Application Selections	Function D	0000h to 1001h	_	0000h	All	After restart	Setup	*1
		n.□□□X	Reserved par	rameter (Do no	ot change	.)				
		n.□□X□	Reserved par	rameter (Do no	ot change)				
Pn00D		n. 🗆 X 🗆 🗆		rameter (Do no						
		11.07.00								
		\\	 	arning Detecti						
		n.X□□□	-	not detect ove		rnings.				
			I Det	ect overtraver	warriirigs.					
	2	Application Selections	n Function F	0000h to 2011h	_	0000h	All	After restart	Setup	*1
			D lai' .	N 4 - 1 - 1 1	M	vala alta a				
		n.□□□X		Maintenance of detect prevenue.			warnings			
Pn00F		11.000		ct preventative						—
1 11001		n.□□X□		rameter (Do no			.9			
		n. 🗆 X 🗆 🗆								
		11. LI ALL	neserveu par	rameter (Do no	ot change.	.)				
		n.X□□□	Reserved par	rameter (Do no	ot change	.)				
Pn021	2	Reserved p	parameter (Do e.)	_	_	0000h	All	-	-	-
Pn022	2		parameter (Do	-	-	0000h	All	_	-	_
		1 29	*		1	<u> </u>	1	Continue	d on nov	t page

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D	-			0.11.	0.11.	D . (II		itinued from						
Parameter No.	Size		Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence				
	2	Σ-V Com tion Swite	patible Func- ch	0000h to 2111h	_	0000h	-	After restart	Setup	_				
		i.				1	1	I	i.					
			Communication	ons Interface C	ompatibili	ty Selectio	on		Applica Moto					
	n.i	пппх		orm Σ-7 commu					All					
Pn040			1 Perfo	orm Σ-V commu	inications.				Applicable					
	- DDVD		Encoder Reso	lution Compati	bility Sele	ction			Applicable Motors					
	n.□□X□			Lise a resolution of 20 bits when connected to an SGM7 I										
				17A, SGM7P, SC					Rotar					
	n.l		Reserved parameter (Do not change.)											
	n.2	XDDD	Reserved para	ımeter (Do not	change.)									
	2	Application Function 0000h to – 0000h Linear Setur												
		2 Selections 80 1111h - 000011 Linear restart								<u> </u>				
			Dala il Occasi	0										
	n	X		Olarity Sensor Selection Use polarity sensor.										
				not use polarity										
			Motor Phase Sequence Selection											
Pn080	n	X		a phase-A lead		se sequen	ce of U, V, an	d W.						
			1 Set	a phase-B lead	d as a pha	se sequen	ce of U, V, an	d W.						
	n	.DXDD	□□ Reserved parameter (Do not change.)											
			Calculation Method for Maximum Speed or Encoder Output Pulses											
	n	.X000		Calculate the encoder output pulse setting for a fixed maximum speed. Calculate the maximum speed for a fixed encoder output pulse setting.										
			I Cal	Calculate the maximum speed for a fixed encoder output pulse setting.										
	2	Application Selection	on Function s 81	0000h to 1111h	_	0000h	All	After restart	Setup	*1				
		n.□□□X		se Output Sele		in the forv	vard direction							
Pn081				tput phase-C p	,				ns.					
111001	1	n.□□X□	Reserved pa	rameter (Do no	ot change.	.)								
	ı	n.□X□□	Reserved pa	rameter (Do no	ot change.)								
	ı	n.XDDD	Reserved pa	rameter (Do no	ot change.	.)								
	_			,		,								
Pn100	2	Speed Lo	oop Gain	10 to 20,000	0.1 Hz	400	All	Immedi- ately	Tuning	*1				
Pn101	2		oop Integral nstant	15 to 51,200	0.01 ms	2000	All	Immedi- ately	Tuning	*1				
Pn102	Time Constant						All	Immedi- ately	Tuning	*1				
Pn103	2	Moment	of Inertia Ratio	0 to 20,000	1%	100	All	Immedi- ately	Tuning	*1				
Pn104	2	Second S Gain	Speed Loop	10 to 20,000	0.1 Hz	400	All	Immedi- ately	Tuning	*1				

Continued from previous page.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
Pn105	2	Second Speed Loop Integral Time Constant	15 to 51,200	0.01 ms	2000	All	Immedi- ately	Tuning	*1
Pn106	2	Second Position Loop Gain	10 to 20,000	0.1/s	400	All	Immedi- ately	Tuning	*1
Pn109	2	Feedforward	0 to 100	1%	0	All	Immedi- ately	Tuning	*1
Pn10A	2	Feedforward Filter Time Constant	0 to 6,400	0.01 ms	0	All	Immedi- ately	Tuning	*1
	2	Gain Application Selections	0000h to 5334h	-	0004h	All	-	Setup	*1
						•			

Pn10B

	Mode Sv	witching Selection	When Enabled			
	0	Use the internal torque reference as the condition (level setting: Pn10C).				
п.ПППХ	1	Use the speed reference as the condition (level setting: Pn10D).				
	_ '	Use the speed reference as the condition (level setting: Pn181).				
II.LLLA	2	Use the acceleration reference as the condition (level setting: Pn10E).	Immedi- ately			
	2	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.				

	Speed L	oop Control Method	When Enabled
n.□□X□	0	PI control	
	1	I-P control	After restart
•	2 to 3	Reserved settings (Do not use.)	rootart

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

Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
	2	Automatic ing Selection	Gain Switch- ons 1	0000h to 0052h	_	0000h	All	Immedi- ately	Tuning	*1		
			Gain Switch	ing Selection								
			0 Us	e manual gain s e gain is switch ls (SVCMD_IO).	switching. ed manua	lly with G-	SEL in the ser	vo comman	d output s	ig-		
		n.□□□X		served setting (Do not us	e.)						
			2 The	e automatic gai e gain is switch itching conditio cond gain to the	ed automa n A is sati	atically fron sfied. The	n the first gair gain is switch	ed automati	cally from	hen the		
Pn139			Gain Switch	ing Condition A	\							
				OIN (Positioning		on Output) signal turns	ON.				
			1 /C	OIN (Positioning	g Completi	on Output) signal turns	OFF.				
		n.□□X□	2 /NI	EAR (Near Outp	out) signal	turns ON.						
			3 /NEAR (Near Output) signal turns OFF.									
			4 Position reference filter output is 0 and position reference input is OFF.									
			5 Po	5 Position reference input is ON.								
		n.□X□□	Reserved parameter (Do not change.)									
		n.XDDD	Reserved pa	rameter (Do no	ot change.)						
						,						
		1		1	1		1					
Pn13D	2	Current Ga		100 to 2,000	1%	2000	All	Immedi- ately	Tuning	*1		
Pn13F	2		ation Control Position Inte- Constant	0 to 50,000	0.1 ms	0	All	Immedi- ately	Tuning	-		
	2		owing Con- d Selections	0000h to 1121h	_	0100h	All	Immedi- ately	Tuning	*1		
			Model Folloy	wing Control Se	election							
		n.□□□X	<u> </u>	not use model for		ontrol.						
				model following								
			\/:b==+:== C		_+:							
				ppression Sele		ression						
		n.□□X□		orm vibration su			cific frequency	V.				
				orm vibration su	• •			<u> </u>				
Pn140			Vibration Su	ppression Adju	stment Se	election						
				not adjust vibr			ıtomatically dı	uring execut	on of auto)-		
		n.□X□□	0 tur	ning without a ha ning.	ost referer	ice, autotu	ning with a ho	ost reference	, and cust	om		
				just vibration su	uppression	automatio	cally during ex	ecution of a	utotuning			
				hout a host refe						∩-		
			Speed Feed	forward (VFF)/1	oraue Fee	edforward	(TFF) Selecti	on				
		n.X□□□	<u> </u>	not use model	•		` ,		rd togethe	er.		
				e model followi								
Pn141	2	Model Foll- trol Gain	owing Con-	10 to 20,000	0.1/s	500	All	Immedi- ately	Tuning	*1		
Pn142	2	Model Foll- trol Gain C	owing Con- Correction	500 to 2,000	0.1%	1000	All	Immedi- ately	Tuning	*1		
	_	-		·	-			O 1:		. —		

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Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
Pn143	2	Model Follotrol Bias in Direction	owing Con- the Forward	0 to 10,000	0.1%	1000	All	Immedi- ately	Tuning	*1
Pn144	2		owing Con- the Reverse	0 to 10,000	0.1%	1000	All	Immedi- ately	Tuning	*1
Pn145	2	Vibration S Frequency	Suppression 1 A	10 to 2,500	0.1 Hz	500	All	Immedi- ately	Tuning	*1
Pn146	2	Vibration S Frequency	Suppression 1 B	10 to 2,500	0.1 Hz	700	All	Immedi- ately	Tuning	*1
Pn147	2		owing Con- Feedforward Ition	0 to 10,000	0.1%	1000	All	Immedi- ately	Tuning	*1
Pn148	2	Second Me ing Contro	odel Follow- I Gain	10 to 20,000	0.1/s	500	All	Immedi- ately	Tuning	*1
Pn149	2		odel Follow- I Gain Correc-	500 to 2,000	0.1%	1000	All	Immedi- ately	Tuning	*1
Pn14A	2	Vibration S Frequency	Suppression 2	10 to 2,000	0.1 Hz	800	All	Immedi- ately	Tuning	*1
Pn14B	2	Vibration S Correction	Suppression 2	10 to 1,000	1%	100	All	Immedi- ately	Tuning	*1
	2	Control-Retions	elated Selec-	0000h to 0021h	_	0021h	All	After restart	Tuning	*1
		n.□□□X	0 Us	ving Control Ty e model following e model following	ng control	type 1.				
Pn14F		n.00X0 n.0X00 n.X000	0 Use 1 Use 2 Use Reserved pa	Type Selection to tuning-less ty to tuning-less ty to tuning-less ty to tuning-less ty trameter (Do no trameter (Do no	pe 2. pe 3. ot change.	,				
	2		nance Con- d Selections	0000h to 0011h	_	0010h	All	Immedi- ately	Tuning	*1
		n.□□□X	0 Do	nce Control Se not use anti-re e anti-resonanc	sonance o	control.				
Pn160	Pn160 Anti-Resonance Control Adjustment Selection Do not adjust anti-resonance control automatically during execution of ar tuning without a host reference, autotuning with a host reference, and cust tuning. Adjust anti-resonance control automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom ting.								, and custonated autotuning	om
		n.□X□□	Reserved pa	rameter (Do no	t change.)				
		n.X□□□	Reserved pa	rameter (Do no	t change.)				
Pn161	2	Anti-Resor	nance Fre-	10 to 20,000	0.1 Hz	1000	All	Immedi- ately	Tuning	*1
Pn162	2	<u> </u>	nance Gain	1 to 1,000	1%	100	All	Immedi- ately	Tuning	*1
		1		I .	I	1	I.	Continue	d on nov	t nago

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Continued	1110111	previous	page.

							Cor	itinuea tron	ı previou	s page.	
Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence	
Pn163	2	Anti-Reson ing Gain	ance Damp-	0 to 300	1%	0	All	Immedi- ately	Tuning	*1	
Pn164	2	Anti-Reson Time Cons rection		-1,000 to 1,000	0.01 ms	0	All	Immedi- ately	Tuning	*1	
Pn165	2	Anti-Reson Time Cons rection		-1,000 to 1,000	0.01 ms	0	All	Immedi- ately	Tuning	*1	
Pn166	2	Anti-Reson ing Gain 2	ance Damp-	0 to 1,000	1%	0	All	Immedi- ately	Tuning	*1	
	2	Tuning-less Related Se	Function- lections	0000h to 2711h	_	1400h	All	_	Setup	*1	
									Whe	en	
			Tuning-less :	Selection					Enab		
		n.□□□X	0 Dis	able tuning-les	s function.				Afte	er	
			1 Enable tuning-less function.							art ——	
	-	~ DDVD	Speed Control Method								
Pn170		n.□□X□	0 Us								
. 11170			1 Use for speed control and use host controller for position control.							art ——	
	Ī	n.□X□□	Rigidity Leve	Whe Enab							
	_	0 to 7 Set the rigidity level.							Imme ate		
	-	~ V000	Tuning-less I	Load Level					Whe Enab		
		n.X□□□	0 to 2 Se	t the load level	for the tun	ing-less fu	nction.		Imme		
Pn181	2	Mode Switt for Speed I	ching Level Reference	0 to 10,000	1 mm/s	0	Linear	Immedi- ately	Tuning	*1	
Pn182	2	Mode Swite for Acceler	ching Level ation	0 to 30,000	1 mm/s ²	0	Linear	Immedi- ately	Tuning	*1	
	2	Less-Devia Related Sw	tion Control- vitches	0000h to 1101h	_	0100h	All	After restart	Setup	-	
		n.□□□X	Less-Devia	tion Control Se	lection						
				o not use less-		control.					
			1 U	se less-deviatio	on control.						
Pn190		n.□□X□	Reserved p	parameter (Do n	ot change	.)					
		n.□X□□	Reserved r	parameter (Do n	ot change	.)				_	
			722.00	(2011		,					
		n.X□□□	Speed Fee	dforward/Torqu	e Feedforv	vard Selec	tion				
			0 L	ess-deviation c	control and	speed/to	que feedforw	vard are not u	used toge	ther.	
			1 L	ess-deviation c	control and	l speed/to	que feedforw	ard are used	I together.		
Pn191	2	Less-Devia	tion Control ard Gain	0 to 10,000	0.1%	1000	All	Immedi- ately	Tuning	-	
Pn192	2		tion Control eedforward	0 to 10,000	0.1%	1000	All	Immedi- ately	Tuning	_	
Pn193	2			0 to 65,535	0.01 ms	30	All	Immedi- ately	Tuning	-	
			-	1							

Continued from previous page.

Parameter No.	Size	Na	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence			
	2	Less-Deviation Selection	tion Func- on Switches	0000h to 2113h	_	2102h	All	After restart	Setup	_			
		n.□□□X	Reserved na	rameter (Do no	t change)								
		n.00X0		,	<u> </u>								
D. 405				served parameter (Do not change.) served parameter (Do not change.)									
Pn195		n. 🗆 X 🗆 🗆			,								
		n.X□□□	Llec	on Mode Selec Less-Deviation		Mode wh	en less-devia	tion control i	s enabled	. (This			
			mod	de is compatibl	e with the	Σ-V-series							
				erved setting (I Less-Deviation		<u> </u>	ion loss-dovia	tion control i	is anablad				
			2 036	Less-Deviation	1 00111101 2	I Wode W	ien iess-devia	tion control	3 GHADIGU	<u>. </u>			
Pn196	2	Less-Devia 2 Speed Fe Gain	tion Control eedforward	0 to 10,000	0.1%	1000	All	Immedi- ately	Tuning	_			
Pn197	2	Less-Devia 2 Torque Fe Filter Time		0 to 65,535	0.01 ms	50	All	Immedi- ately	Tuning	-			
Pn198	2		tion Control Torque Feed- in	0 to 10,000	0.1%	1000	All	Immedi- ately	Tuning	_			
Pn199	2	2 Reverse	Less-Deviation Control 2 Reverse Torque Feed- forward Gain		0.1%	1000	All	Immedi- ately	Tuning	-			
Pn19A	2	Less-Devia 2 Incomple tion Rate	tion Control te Integra-	0 to 10,000	0.01%	10000	All	Immedi- ately	Tuning	_			
Pn19B	2	Less-Devia 2 Rotary Se Viscous Frid pensation (ction Com-	0 to 8,000	0.01%/ 100 min ⁻¹	0	Rotary	Immedi- ately	Tuning	-			
Pn19C	2	Reserved p not change	arameter (Do .)	_	_	0	All	Immedi- ately	Tuning	-			
Pn19D	2	Less-Devia 2 Linear Se Viscous Frid pensation C	ction Com-	0 to 8,000	0.01%/ 100 mm/s	0	Linear	Immedi- ately	Tuning	_			
Pn19E	2	Reserved p not change	arameter (Do .)	-	-	0	All	Immedi- ately	Tuning	_			
Pn19F	2	Less-Devia 2 Torque Fe Moving Ave	eedforward	0 to 5,100	0.1 ms	0	All	Immedi- ately	Tuning	_			
Pn1A4	2	Reserved p not change	arameter (Do .)	_	_	36	-	Immedi- ately	Tuning	_			
Pn1A5	2	Reserved p not change	arameter (Do .)	_	_	0	_	Immedi- ately	Tuning	_			
Pn1AE	2	Reserved p not change	arameter (Do .)	_	_	0	_	Immedi- ately	Tuning	-			
Pn1AF	2	Reserved p not change	arameter (Do .)	_	_	0	-	Immedi- ately	Tuning	_			
Pn205	2	Multiturn Li	mit	0 to 65,535	1 rev	65535	Rotary	After restart	Setup	*1			

Continued from previous page.

Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
	2	Position Cotion Select	ontrol Func- ions	0000h to 2210h	_	1000h	All	After restart	Setup	*1
		n.□□□X	Reserved pa	rameter (Do no	ot change.	.)				
		n.□□X□	Reserved pa	rameter (Do no	ot change.)				
		n.□X□□	Reserved pa	rameter (Do no	ot change.	.)				
Pn207	Ī		`	ioning Comple	•	, ,				
			U tha	tput when the a	f Pn522 (P	ositioning	Completed W	/idth).		
		n.X□□□	1 the	Output when the absolute value of the position error is the same or less than he setting of Pn522 (Positioning Completed Width) and the reference after he position reference filter is 0.						
				tput when the a setting of Pn5						
Pn20A	4		umber of External 4 to pitch/ revolution 32768 Rotary After restart Setup							
Pn20E	4	Electronic (Numerato		1 to 1,073,741,824	1	16	All	After restart	Setup	*1
Pn210	4	Electronic (Denomina		1 to 1,073,741,824	1	1	All	After restart	Setup	*1
Pn212	4	Number of Output Pul	Encoder ses	16 to 1,073,741,824	1 P/Rev	2048	Rotary	After restart	Setup	*1
	2	Fully-close Selections	d Control	0000h to 1003h	-	0000h	Rotary	After restart	Setup	*1
		1		l	1	I		1	1	
		n.□□□X	Reserved pa	rameter (Do no	ot change.	.)				
Pn22A		n.□□X□	Reserved pa	rameter (Do no	ot change.)				
111227		n.□X□□	Reserved pa	rameter (Do no	ot change.	.)				
	Ī		Fully-closed	Control Speed	l Feedbac	k Selectio	n			
		n.X□□□		e motor encode e external encc	· ·	l.				
									1	
	2	Position Co sion Funct	ontrol Expan- ion Selections	0000h to 0001h	_	0000h	All	After restart	Setup	*1
				mpensation Di						
Pn230		n.□□□X		mpensate forw mpensate reve						
200	n.□□X□ Reserved parameter (Do not change.)									
	n.□X□□ Reserved parameter (Do not change.)									
	n.X□□□ Reserved parameter (Do not change.)									
										T
Pn231	4	Backlash (Compensation	-500,000 to 500,000	0.1 ref- erence units	0	All	Immedi- ately	Setup	*1
Pn233	2	Backlash (tion Time (Compensa- Constant	0 to 65,535	0.01 ms	0	All	Immedi- ately	Setup	*1

Continued from previous page.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
Pn234	2	Second Position Reference Acceleration/ Deceleration Time Constant	0 to 65,535	0.1 ms	0	All	Immedi- ately	Setup	-		
Pn281	2	Encoder Output Resolution	1 to 4,096	1 edge/ pitch	20	All	After restart	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	Immedi- ately	Setup	*1		
Pn305	2	Soft Start Acceleration Time	0 to 10,000	1 ms	0	All	Immedi- ately	Setup	*2		
Pn306	2	Soft Start Deceleration Time	0 to 10,000	1 ms	0	All	Immedi- ately	Setup	*2		
Pn308	2	Speed Feedback Filter Time Constant	0 to 65,535	0.01 ms	0	All	Immedi- ately	Setup	*1		
Pn30A	2	Deceleration Time for Servo OFF and Forced Stops	0 to 10,000	1 ms	0	All	Immedi- ately	Setup	*1		
Pn30C	2	Speed Feedforward Average Movement Time	0 to 5,100	0.1 ms	0	All	Immedi- ately	Setup	*1		
	2	Vibration Detection Selections	0000h to 0002h	_	0000h	All	Immedi- ately	Setup	*1		
Pn310	<u> </u>	1 0 2 0 n.□□X□ Reserved p n.□X□□ Reserved p	1 Output a warning (A.911) if vibration is detected.								
	_		,		,						
Pn311	2	Vibration Detection Sen sitivity	50 to 500	1%	100	All	Immedi- ately	Tuning	*1		
Pn312	2	Vibration Detection Level	0 to 5,000	1 min ⁻¹	50	Rotary	Immedi- ately	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 Cal- culation Starting Level	0 to 20,000	1%	300	All	Immedi- ately	Setup	*1		
Pn383	2	Jogging Speed	0 to 10,000	1 mm/s	50	Linear	Immedi- ately	Setup	*1		
Pn384	2	Vibration Detection Level	0 to 5,000	1 mm/s	10	Linear	Immedi- ately	Tuning	*1		
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	Immedi- ately	Tuning	*1		
Pn402	2	Forward Torque Limit	0 to 800	1%*3	800	Rotary	Immedi- ately	Setup	*1		
Pn403	2	Reverse Torque Limit	0 to 800	1%*3	800	Rotary	Immedi- ately	Setup	*1		
	I	Forward External Torque	0 to 800	1%*3			Immedi-	1	1		

When Enabled

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
Pn405	2	Reverse External Torque Limit	0 to 800	1%*3	100	All	Immedi- ately	Setup	*1
Pn406	2	Emergency Stop Torque	0 to 800	1%*3	800	All	Immedi- ately	Setup	*1
Pn407	2	Speed Limit during Torque Control	0 to 10,000	1 min ⁻¹	10000	Rotary	Immedi- ately	Setup	*1
	2	Torque-Related Function Selections	0000h to 1111h	-	0000h	All	-	Setup	*1

Notch Filter Selection 1

	11.000	0	Disable first stage notch filter.	Immedi-					
		1	Enable first stage notch filter.	ately					
				When					
		Speed L	Speed Limit Selection						
		0	Use the smaller of the maximum motor speed and the setting of Pn407 as the speed limit.						
	n.□□X□		Use the smaller of the maximum motor speed and the setting of Pn480 as the speed limit.	After					
Pn408		1	Use the smaller of the overspeed alarm detection speed and the setting of Pn407 as the speed limit.	restart					
		'	Use the smaller of the overspeed alarm detection speed and the setting of Pn480 as the speed limit.						
		Notch Fi	ilter Selection 2	When Enabled					
	n.□X□□	0	Disable second stage notch filter.	Immedi-					
		1	Enable second stage notch filter.	ately					
	[

V	Friction	Friction Compensation Function Selection											
n.X□□□	0	0 Disable friction compensation.											
	1	Ena	Enable friction compensation.										
First Stage Notch Filter Immedi-													

Pn409	2	First Stage Notch Filter Frequency	50 to 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1
Pn40A	2	First Stage Notch Filter Q Value	50 to 1,000	0.01	70	All	Immedi- ately	Tuning	*1
Pn40B	2	First Stage Notch Filter Depth	0 to 1,000	0.001	0	All	Immedi- ately	Tuning	*1
Pn40C	2	Second Stage Notch Filter Frequency	50 to 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1
Pn40D	2	Second Stage Notch Filter Q Value	50 to 1,000	0.01	70	All	Immedi- ately	Tuning	*1
Pn40E	2	Second Stage Notch Filter Depth	0 to 1,000	0.001	0	All	Immedi- ately	Tuning	*1
Pn40F	2	Second Stage Second Torque Reference Filter Frequency	100 to 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1
Pn410	2	Second Stage Second Torque Reference Filter Q Value	50 to 100	0.01	50	All	Immedi- ately	Tuning	*1
Pn412	2	First Stage Second Torque Reference Filter Time Constant	0 to 65,535	0.01 ms	100	All	Immedi- ately	Tuning	*1

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Parameter No.	Size		ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence				
	2	Torque-Rel tion Select	ated Func- ions 2	0000h to 1111h	_	0000h	All	Immedi- ately	Setup	*1				
	Ī		Notch Filter	Selection 3										
		n.□□□X	0 Disable third stage notch filter.											
			1 Ena	able third stage	notch filte	er.								
	Ī		Notch Filter :	Notch Filter Selection 4										
Pn416		n.□□X□	0 Dis											
			0 Disable fourth stage notch filter.1 Enable fourth stage notch filter.											
	Ī		Notch Filter Selection 5											
		n.□X□□	0 Dis		_									
			1 Ena	able fifth stage	notch filte	r.								
	li	n.X□□□	Reserved pa	Reserved parameter (Do not change.)										
	neserved parameter (D0 not change.)													
Pn417	2	Third Stage Frequency	e Notch Filter	50 to 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1				
Pn418	2	Third Stage Q Value	e Notch Filter	50 to 1,000	0.01	70	All	Immedi- ately	Tuning	*1				
Pn419	2	Third Stage Depth	e Notch Filter	0 to 1,000	0.001	0	All	Immedi- ately	Tuning	*1				
Pn41A	2	Fourth Stater Frequen	ge Notch Fil- ncy	50 to 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1				
Pn41B	2	Fourth Stater Q Value	ge Notch Fil-	50 to 1,000	0.01	70	All	Immedi- ately	Tuning	*1				
Pn41C	2	Fourth Stater Depth	ge Notch Fil-	0 to 1,000	0.001	0	All	Immedi- ately	Tuning	*1				
Pn41D	2	Fifth Stage Frequency	Notch Filter	50 to 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1				
Pn41E	2	Q Value	Notch Filter	50 to 1,000	0.01	70	All	Immedi- ately	Tuning	*1				
Pn41F	2	Depth	Notch Filter	0 to 1,000	0.001	0	All	Immedi- ately	Tuning	*1				
	2	Speed Rip sation Sele	ple Compen- ections	0000h to 1111h	_	0000h	Rotary	-	Setup	*1				
		n.□□□X		Speed Ripple Compensation Function Selection										
				able speed rippable speed ripp					Imme ate					
			Speed Ripple	e Compensation			greement War	rning Detec-	- Whe	en				
Pn423		n.□□X□	tion Selection	n tect A.942 aları	ms				Enab					
				not detect A.9					Afte					
			Speed Ripple	e Compensatio	on Enable	Condition	Selection		Whe					
		n.□X□□	0 Spe	eed reference					Afte					
	1 Motor speed resta													
		n.X□□□	Reserved pa	rameter (Do no	ot change	.)								
			pa	יוספון וסנסיוונב	. J Change	,								
Pn424	2	Torque Lim	nit at Main Cir- e Drop	0 to 100	1%*2	50	All	Immedi- ately	Setup	*1				
			•	1	I	l .	1	Continue	d on nov	t naga				

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Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence			
Pn425	2	Release Ti Limit at Ma Voltage Dr		0 to 1,000	1 ms	100	All	Immedi- ately	Setup	*1			
Pn426	2	Torque Fee Average M Time	edforward ovement	0 to 5,100	0.1 ms	0	All	Immedi- ately	Setup	*1			
Pn427	2	Speed Rip sation Ena	ple Compen- ble Speed	0 to 10,000	1 min ⁻¹	0	Rotary Ser- vomotor	Immedi- ately	Tuning	*1			
Pn456	2	Sweep Tor ence Ampl	que Refer- itude	1 to 800	1%	15	All	Immedi- ately	Tuning	*1			
	2	Notch Filte Selections	r Adjustment 1	0000h to 0101h	_	0101h	All	Immedi- ately	Tuning	*1			
	-	n.□□□X	0 tur	tuning. Adjust the first stage notch filter automatically during execution of autotuning									
Pn460	n.□□X□ Reserved parameter (Do not change.)												
	_	n. 🗆 X 🗆 🗆	Notch Filter Adjustment Selection 2 Do not adjust the second stage notch filter automatically when the tun function is enabled or during execution of autotuning without a host reautotuning with a host reference, and custom tuning. Adjust the second stage notch filter automatically when the tuning-les tion is enabled or during execution of autotuning without a host refere autotuning with a host reference, and custom tuning. Reserved parameter (Do not change.)										
	2	Gravity Co Related Se	mpensation- lections	0000h to 0001h	_	0000h	All	After restart	Setup	*1			
	1	n.□□□X	Gravity Compensation Selection										
Pn475			1 En	able gravity cor	npensatio	٦.							
		n.□□X□	Reserved pa	rameter (Do not	change.)								
		n.□X□□	Reserved pa	rameter (Do not	change.)								
		n.X000	Reserved pa	rameter (Do not	change.)								
Pn476	2	Gravity Co Torque	mpensation	-1,000 to 1,000	0.1%	0	All	Immedi- ately	Tuning	*1			
Pn480	2	Speed Lim Force Con	it during trol	0 to 10,000	1 mm/s	10000	Linear	Immedi- ately	Setup	*1			
Pn481	2	Polarity De		10 to 20,000	0.1 Hz	400	Linear	Immedi- ately	Tuning	-			
Pn482	2	Polarity De Speed Loc Time Cons	p Integral	15 to 51,200	0.01 ms	3000	Linear	Immedi- ately	Tuning	-			
Pn483	2	Forward Fo	orce Limit	0 to 800	1%*3	30	Linear	Immedi- ately	Setup	*1			
	1	1	-		1.		1 -		1.				

1%*3

1 mm/s

1 ms

30

20

25

Linear

Linear

Linear

0 to 800

0 to 100

0 to 100

Pn484

Pn485

Pn486

2

2

2

Reverse Force Limit

Polarity Detection Reference Speed

Polarity Detection Reference Acceleration/ Deceleration Time

Tuning Continued on next page.

Setup

Tuning

*1

Immedi-

ately

Immedi-

ately

Immedi-

Continued from previous page.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
Pn487	2	Polarity Detection Constant Speed Time	0 to 300	1 ms	0	Linear	Immedi- ately	Tuning	_
Pn488	2	Polarity Detection Reference Waiting Time	50 to 500	1 ms	100	Linear	Immedi- ately	Tuning	_
Pn48E	2	Polarity Detection Range	1 to 65,535	1 mm	10	Linear	Immedi- ately	Tuning	-
Pn490	2	Polarity Detection Load Level	0 to 20,000	1%	100	Linear	Immedi- ately	Tuning	-
Pn495	2	Polarity Detection Confirmation Force Reference	0 to 200	1%	100	Linear	Immedi- ately	Tuning	_
Pn498	2	Polarity Detection Allow- able Error Range	0 to 30	1 deg	10	Linear	Immedi- ately	Tuning	-
Pn49F	2	Speed Ripple Compensation Enable Speed	0 to 10,000	1 mm/s	0	Linear	Immedi- ately	Tuning	*1
Pn502	2	Rotation Detection Level	1 to 10,000	1 min ⁻¹	20	Rotary	Immedi- ately	Setup	*1
Pn503	2	Speed Coincidence Detection Signal Output Width	0 to 100	1 min ⁻¹	10	Rotary	Immedi- ately	Setup	*1
Pn506	2	Brake Reference-Servo OFF Delay Time	0 to 50	10 ms	0	All	Immedi- ately	Setup	*1
Pn507	2	Brake Reference Output Speed Level	0 to 10,000	1 min ⁻¹	100	Rotary	Immedi- ately	Setup	*1
Pn508	2	Servo OFF-Brake Com- mand Waiting Time	10 to 100	10 ms	50	All	Immedi- ately	Setup	*1
Pn509	2	Momentary Power Inter- ruption Hold Time	20 to 50,000	1 ms	20	All	Immedi- ately	Setup	*1
	2	Input Signal Selections	0000h to FFF2h	_	1881h	All	After restart	Setup	*1

	n.□□□X	Rese	rved parameter (Do not change.)								
	II.BBBX	11030	rved parameter (50 not change.)								
	n.□□X□	Rese	Reserved parameter (Do not change.)								
	n.□X□□	n.□X□□ Reserved parameter (Do not change.)									
		P-OT	(Forward Drive Prohibit) Signal Allocation								
		0	Enable forward drive when CN1-13 input signal is ON (closed).								
		1	Enable forward drive when CN1-7 input signal is ON (closed).								
		2	Enable forward drive when CN1-8 input signal is ON (closed).								
		3	Enable forward drive when CN1-9 input signal is ON (closed).								
Pn50A		4	Enable forward drive when CN1-10 input signal is ON (closed).								
		5	Enable forward drive when CN1-11 input signal is ON (closed).								
		6	Enable forward drive when CN1-12 input signal is ON (closed).								
	n.X□□□	7	Set the signal to always prohibit forward drive.								
		8	Set the signal to always enable forward drive.								
		9	Enable forward drive when CN1-13 input signal is OFF (open).								
		А	Enable forward drive when CN1-7 input signal is OFF (open).								
		В	Enable forward drive when CN1-8 input signal is OFF (open).								
		С	Enable forward drive when CN1-9 input signal is OFF (open).								
		D	Enable forward drive when CN1-10 input signal is OFF (open).								
		E	Enable forward drive when CN1-11 input signal is OFF (open).								
		F	Enable forward drive when CN1-12 input signal is OFF (open).								

Applicable

Motors

Continued from previous page.

Classi-

fication

Refer-

ence

When

Enabled

							0							
	2	Input Signa 2	al Selection	IS	0000h to FFFFh	-	8882h	All	After restart	Setup	*1			
				,			1							
	١.,		N OT (Po	voro	e Drive Prohib	sit\ Signal	Allocation							
			<u> </u>			, ,								
			0	Ena	ble reverse dri	ve when C	N1-13 inp	ut signal is O	N (closed).					
			1	Enable reverse drive when CN1-7 input signal is ON (closed).										
			2	Ena	ble reverse dri	ve when C	N1-8 inpu	t signal is ON	(closed).					
			3	Ena	ble reverse dri	ve when C	N1-9 inpu	t signal is ON	(closed).					
			4	Ena	ble reverse dri	ve when C	N1-10 inp	ut signal is O	N (closed).					
			5	Ena	ble reverse dri	ve when C	N1-11 inp	ut signal is O	N (closed).					
			6	Ena	ble reverse dri	ve when C	N1-12 inp	ut signal is O	N (closed).					
		n.□□□X	7	Set	the signal to a	lways prol	hibit revers	e drive.						
			8	Set the signal to always enable reverse drive.										
			9	Enable reverse drive when CN1-13 input signal is OFF (open).										
			А	Enable reverse drive when CN1-7 input signal is OFF (open).										
			В	Enable reverse drive when CN1-8 input signal is OFF (open).										
			С	Enable reverse drive when CN1-9 input signal is OFF (open).										
			D	Enable reverse drive when CN1-10 input signal is OFF (open).										
			Е	Ena	ble reverse dri	ve when C	N1-11 inp	ut signal is O	FF (open).					
			F	Ena	ble reverse dri	ve when C	N1-12 inp	ut signal is O	FF (open).					
		n.□□X□	Pagaryad	nor	ameter (Do no	t obongo	1							
Pn50B		11.0000	neserveu	pai	ameter (Do no	n change.	.)							
1 11300	li		/P-CL (Fo	rwa	rd External To	rque Limit	t Input) Sig	nal Allocatio	n					
			0	Acti	ve when CN1-	13 input s	ignal is ON	l (closed).						
			1	Acti	ve when CN1-	7 input sig	gnal is ON	(closed).						
			2	Acti	ve when CN1-	8 input sig	gnal is ON	(closed).						
			3	Acti	ve when CN1-	9 input sig	gnal is ON	(closed).						

Active when CN1-10 input signal is ON (closed).

Active when CN1-11 input signal is ON (closed).

Active when CN1-12 input signal is ON (closed).

Setting

Unit

Default

Setting

Setting

Range

n.□X□□

Parameter

No.

Size

Name

9 Active when CN1-13 input signal is OFF (open). Α Active when CN1-7 input signal is OFF (open). В Active when CN1-8 input signal is OFF (open).

4

5

6

7

8

С Active when CN1-9 input signal is OFF (open). D Active when CN1-10 input signal is OFF (open). Ε Active when CN1-11 input signal is OFF (open).

Input) signal allocations.

The signal is always active.

The signal is always inactive.

F Active when CN1-12 input signal is OFF (open). /N-CL (Reverse External Torque Limit Input) Signal Allocation n.XDDD The allocations are the same as the /P-CL (Forward External Torque Limit 0 to F

Continued from previous page.

Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence			
	2	Output Sig tions 1	ınal Selec-	0000h to 6666h	-	0000h	All	After restart	Setup	*1			
			1										
			<u> </u>	ioning Comple	•	, ,							
				abled (the abo									
		n.□□□X		tput the signal									
				tput the signal			<u> </u>						
				served setting (ON 1-20 Outpi	ut terriiriai.					
			7 10 0 110	sorvou sotting (Do not do	J.)				_			
Pn50E		- DDVD		V-CMP (Speed Coincidence Detection Output) Signal Allocation The allocations are the same as the /COIN (Positioning Completion) signal									
		n.□□X□		e allocations are ecations.	e the same	e as the /C	OIN (Position	ing Complet	ion) signal				
		/TGON (Rotation Detection Output) Signal Allocation											
		n.□X□□		e allocations are	e the same	as the /C	OIN (Position	ing Complet	ion) signal				
			/S-RDY (Ser	/S-RDY (Servo Ready) Signal Allocation									
		n.X□□□	O to 6 The	e allocations are			OIN (Position	ing Complet	ion) signal				
	_	Output Sic	ınal Selec-	0000h to				After					
	2	tions 2	1101 00100	6666h	_	0100h	All	restart	Setup	*1			
			/CLT (Torque	Limit Detection	n Outnut)	Signal All	ocation						
				abled (the above									
				tput the signal				terminal.					
		n.□□□X		tput the signal			•						
			3 Ou	tput the signal	from the C	N1-25 or	CN1-26 outp	ut terminal.					
			4 to 6 Re	served setting (Do not us	э.)							
Pn50F			/VLT (Speed	Limit Detectio	n) Signal <i>F</i>	Allocation							
		n.□□X□		e allocations are allocations.	e the same	e as the /C	CLT (Torque Lin	mit Detectior	n Output) s	sig-			
			/BK (Brake C	Output) Signal	Allocation								
		n.□X□□	O to 6 The	e allocations are allocations.		e as the /C	LT (Torque Li	mit Detection	o Output) s	sig-			
			/WARN (War	ning Output) S	ignal Alloc	cation							
		n.X□□□			e the same	e as the /C	LT (Torque Li	mit Detectior	Output) s	sig-			
	n.X□□□ /WARN (Warning Output) Signal Allocation O to 6 The allocations are the same as the /CLT (Torque Limit Detection Output) nal allocations.								Output) s	sig-			

Continued from previous page.

Parameter	Size	N	ame	Setting	Setting	Default	Applicable	When	Classi-	Refer-		
No.		Output Sig		Range 0000h to	Unit	Setting	Motors	Enabled After	fication	ence		
	2	tions 3		0666h	-	0000h	All	restart	Setup	*1		
			1									
				ear Output) Signa								
				Disabled (the abo								
		n.□□□X		Output the signal								
				Output the signal			•					
Pn510				Output the signal			CNT-26 outp	ut terminai.				
			4100 1	Reserved setting	DO HOL US	e.)						
		n.□□X□	Reserved	parameter (Do no	ot change.	.)						
		n.□X□□	Reserved	parameter (Do no	ot change.	.)						
		n.X□□□	Reserved	parameter (Do no	ot change	.)						
		Inna d Cina	-l O-lti	00001-1-				۸.64				
	2	5	al Selections	0000h to FFFFh	-	6543h	All	After restart	Setup	*1		
							1					
			/DEC (Orio	gin Return Decele	eration Sw	itch Input) Signal Alloc	ation				
				Active when CN1		•	,					
				Active when CN1-		<u> </u>						
				Active when CN1								
				Active when CN1-								
			4	Active when CN1-	-10 input s	signal is Ol	V (closed).					
	5 Active when CN1-11 input signal is ON (closed).											
			6 /	Active when CN1	-12 input s	signal is Of	V (closed).					
		n.□□□X	7									
			8	The signal is alwa	ys inactive	٠.						
			9 /	Active when CN1-	-13 input s	signal is OF	F (open).					
			A A	Active when CN1-	·7 input siç	gnal is OFF	(open).					
				Active when CN1-	·8 input si	gnal is OFF	(open).					
				Active when CN1-								
			D A	Active when CN1-	·10 input s	signal is OF	F (open).					
Pn511				Active when CN1								
			F A	Active when CN1-	·12 input s	signal is Of	-F (open).					
			/EXT1 (Ext	ternal Latch Inpu	t 1) Signal	Allocation	n					
			0 to 3	The signal is alwa	ys inactive							
			4 /	Active when CN1	-10 input s	signal is Ol	V (closed).					
				Active when CN1								
		n.□□X□		Active when CN1								
				Active when CN1		<u> </u>						
				Active when CN1		0	(1 /					
				Active when CN1		-	-F (open).					
			7 to C	The signal is alwa	ys inactive	·.						
			/EXT2 (Ext	ternal Latch Inpu	t 2) Signal	Allocation	n					
		n.□X□□		The allocations ar cations.	e the same	e as the /E	XT1 (External	Latch Input	1) signal a	ıllo-		
			/EXT3 (Ext	ternal Latch Inpu	t 3) Signal	Allocation	n					
		n.X□□□		The allocations ar	e the same	e as the /E	XT1 (External	Latch Input	1) signal a	ıllo-		
			0.01	cations.								

Continued on next page.

Parameter Lists

Continued from previous page.

Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence	
	2	Output Sig Settings	gnal Inverse	0000h to 1111h	_	0000h	All	After restart	Setup	*1	
			_								
				al Inversion for		nd CN1-2	Terminals				
		n.□□□X		e signal is not in							
			1 Th	e signal is inver	ted.						
				al Inversion for		and CN1-2	4 Terminals				
Pn512		n.□□X□		e signal is not ir							
	1 The signal is inverted.										
			Output Signal Inversion for CN1-25 and CN1-26 Terminals								
		n.□X□□	0 Th	e signal is not ir	nverted.						
			1 Th	e signal is inver	ted.						
		n.X□□□	Reserved pa	rameter (Do no	ot change.	.)					
	2	Output Sig	gnal Selec-	0000h to 0666h	-	0000h	All	After restart	Setup	*1	
			1							_	
		n.□□□X	Reserved pa	rameter (Do no	ot change.	.)					
		n.□□X□	Reserved pa	rameter (Do no	ot change.	.)					
			/PM (Preven	tative Maintena	ance Outp	ut) Signal	Allocation				
Pn514			0 Dis	sabled (the abo	ve signal c	utput is no	ot used).				
		n.□X□□		tput the signal			•				
		11.0700		tput the signal							
				tput the signal			CN1-26 outp	ut terminal.			
			4 to 6 Re	served setting ((Do not us	e.)					
		n.XDDD	Reserved pa	rameter (Do no	ot change.)					

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
	2	Input Signal Selections 7	0000h to FFFFh	-	8888h	All	After restart	Setup	*1

		FSTP (For	rced Stop Input) Signal Allocation
		0	Enable drive when CN1-13 input signal is ON (closed).
		1	Enable drive when CN1-7 input signal is ON (closed).
		2	Enable drive when CN1-8 input signal is ON (closed).
		3	Enable drive when CN1-9 input signal is ON (closed).
		4	Enable drive when CN1-10 input signal is ON (closed).
		5	Enable drive when CN1-11 input signal is ON (closed).
		6	Enable drive when CN1-12 input signal is ON (closed).
h516	n.□□□X	7	Set the signal to always prohibit drive (always force the motor to stop).
	III.DDDX	8	Set the signal to always enable drive (always disable forcing the motor to stop).
		9	Enable drive when CN1-13 input signal is OFF (open).
		А	Enable drive when CN1-7 input signal is OFF (open).
		В	Enable drive when CN1-8 input signal is OFF (open).
		С	Enable drive when CN1-9 input signal is OFF (open).
		D	Enable drive when CN1-10 input signal is OFF (open).
		Е	Enable drive when CN1-11 input signal is OFF (open).
		F	Enable drive when CN1-12 input signal is OFF (open).
	n.□□X□	Reserved	parameter (Do not change.)
	n.□X□□	Reserved	parameter (Do not change.)
	n.X□□□	Reserved	parameter (Do not change.)

Pn518*4	_	Safety Module-Related Parameters	-	-	_	All	_	-	_
Pn51B	4	Motor-Load Position Deviation Overflow Detection Level	0 to 1,073,741,824	1 refer- ence unit	1000	Rotary	Immedi- ately	Setup	*1
Pn51E	2	Position Deviation Over- flow Warning Level	10 to 100	1%	100	All	Immedi- ately	Setup	*1
Pn520	4	Position Deviation Over- flow Alarm Level	1 to 1,073,741,823	1 refer- ence unit	524288 0	All	Immedi- ately	Setup	*1
Pn522	4	Positioning Completed Width	0 to 1,073,741,824	1 refer- ence unit	7	All	Immedi- ately	Setup	*1
Pn524	4	Near Signal Width	1 to 1,073,741,824	1 refer- ence unit	107374 1824	All	Immedi- ately	Setup	*1
Pn526	4	Position Deviation Over- flow Alarm Level at Servo ON	1 to 1,073,741,823	1 refer- ence unit	524288 0	All	Immedi- ately	Setup	*1
Pn528	2	Position Deviation Over- flow Warning Level at Servo ON	10 to 100	1%	100	All	Immedi- ately	Setup	*1
Pn529	2	Speed Limit Level at Servo ON	0 to 10,000	1 min ⁻¹	10000	Rotary	Immedi- ately	Setup	*1
Pn52A	2	Multiplier per Fully- closed Rotation	0 to 100	1%	20	Rotary	Immedi- ately	Tuning	*1
Pn52B	2	Overload Warning Level	1 to 100	1%	20	All	Immedi- ately	Setup	*1

Name

Size

5.2.2 List of Servo Parameters

Parameter

Pn550

Pn551

Pn552

Pn553

Pn55A

Pn560

Pn561

Pn581

2

2

2

2

2

2

2

2

Level

Voltage

Voltage

Analog Monitor 1 Offset

Analog Monitor 2 Offset

Analog Monitor 1 Mag-nification

Analog Monitor 2 Mag-nification

Power Consumption

Overshoot Detection

Monitor Unit Time

Residual Vibration

Detection Width

Zero Speed Level

Continued from previous page.

Classi-

fication ence

Refer-

When

Enabled

Applicable

Motors

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ΑII

ΑII

Αll

ΑII

ΑII

Αll

Linear

INO.	(O			narige	Ullit	Setting	MOLOIS	Enabled	lication	ence
Pn52C	2	Base Curre at Motor C Detection	ent Derating Overload	10 to 100	1%	100	All	After restart	Setup	*1
	2	Program J Related Se		0000h to 0005h	-	0000h	All	Immedi- ately	Setup	*1
			Program Jog	ging Operation	n Pattern					
				aiting time in Provements in Pna		orward by	travel distanc	e in Pn531) >	Number	of
				aiting time in Pr vements in Pn5		everse by t	travel distance	e in Pn531) >	Number	of
			2 mc (Wa	aiting time in Provements in Prosaiting time in Provements in Provements in Professional Profess	536 n535 → Re	•		,		
Pn530		n.□□□X	3 mc (Wa	aiting time in Provements in Pros aiting time in Provements in Provement	536 n535 → Fo	,		,		
			4 in f	aiting time in Pr Pn535 → Rever 536						
			5 in F	aiting time in Pr Pn535 → Forwa 536						
	li	n.□□X□	Reserved pa	rameter (Do no	t change.	.)				
		n. 🗆 X 🗆 🗆	Posonyod pa	rameter (Do no	t change	1				
			neserveu pa	rameter (Do no	or change.	.)				
		n.X□□□	Reserved pa	rameter (Do no	t change.	.)				
			•							
Pn531	4	Program J Distance	ogging Travel	1 to 1,073,741,824	1 refer- ence unit	32768	All	Immedi- ately	Setup	*1
Pn533	2	Program J ment Spee	ogging Move- ed	1 to 10,000	Rotary: 1 min ⁻¹ Direct Drive: 0.1 min ⁻¹	500	Rotary	Immedi- ately	Setup	*1
Pn534	2	Program Jeration/DeTime	ogging Accel- celeration	2 to 10,000	1 ms	100	All	Immedi- ately	Setup	*1
Pn535	2	Program Jing Time	ogging Wait-	0 to 10,000	1 ms	100	All	Immedi- ately	Setup	*1
Pn536	2	Program Jober of Mov	ogging Num- rements	0 to 1,000	Times	1	All	Immedi- ately	Setup	*1
	1	1 -	-	1	1 7	1 -	1 -	1	1 7	1

-10,000 to

10,000

-10,000 to

10,000

-10,000 to

10,000

-10,000 to 10,000

1 to 1,440

1 to 3,000

0 to 100

1 to 10,000

0.1 V

0.1 V

 $\times 0.01$

 $\times 0.01$

1 min

0.1%

1%

1 mm/s

0

0

100

100

1

400

100

20

Setting

Default

Setting

Setting

Range

Setup Continued on next page.

Setup

Setup

Setup

Setup

Setup

Setup

Setup

Immedi-

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Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
Pn582	2	Speed Coi Detection : Width	incidence Signal Output	0 to 100	1 mm/s	10	Linear	Immedi- ately	Setup	*1
Pn583	2	Brake Refe put Speed	erence Out- Level	0 to 10,000	1 mm/s	10	Linear	Immedi- ately	Setup	*1
Pn584	2	Speed Lim Servo ON	nit Level at	0 to 10,000	1 mm/s	10000	Linear	Immedi- ately	Setup	*1
Pn585	2	Program J ment Spec	ogging Move- ed	1 to 10,000	1 mm/s	50	Linear	Immedi- ately	Setup	*1
Pn586	2	Motor Run Ratio	ning Cooling	0 to 100	1%/ Max. speed	0	Linear	Immedi- ately	Setup	-
	2		etection Selection for inear Encode	0000h to 0001h	_	0000h	Linear	Immedi- ately	Setup	*1
Pn587		n.□□□X	0 Do i	ection Selection not detect polarity.		olute Linea	r Encoder			
	-	n.□□X□	-	arameter (Do no		,				
	-	n.□X□□		arameter (Do no		,				
		n.X□□□	Reserved pa	arameter (Do no	ot change.	.)				
		D	' - D'-I	D						
Pn600	2	Capacity*5		Depends on model.*6	10 W	0	All	Immedi- ately	Setup	*1
Pn601	2	Dynamic E tor Allowak Consumpt	Brake Resis- ole Energy ion	0 to 65,535	10 J	0	All	After restart	Setup	*7
Pn603	2	Regenerat tance	ive Resis-	0 to 65,535	10 mΩ	0	All	Immedi- ately	Setup	*1
Pn604	2	Dynamic E tance	Brake Resis-	0 to 65,535	10 mΩ	0	All	After restart	Setup	*7
	2	Overheat F Selections		0000h to 0003h	_	0000h	All	After restart	Setup	*1
	_									
		n.□□□X		otection Selection						
				sable overheat i				*0		
			₂ Mo	se overheat prot onitor a negative	e voltage ii				nachine ar	nd
Pn61A			y Me	e overheat protonitor a positive	voltage in	put from a	sensor attac	hed to the m	achine an	d
			us	e overheat prot						
		n.□□X□	•	rameter (Do not	<u> </u>					
	<u> </u>	n.□X□□	Reserved pa	rameter (Do not	change.)					
	1	n.X000	Reserved pa	rameter (Do not	change.)					
Pn61B	2	Overheat A	Alarm Level	0 to 500	0.01 V	250	All	Immedi- ately	Setup	*1
Pn61C *9	2	Overheat V	Warning Level	0 to 100	1%	100	All	Immedi- ately	Setup	*1
		1		1	1		l		t	

Pn61D

2

Overheat Alarm Filter Time

0 to 65,535

0

1 s

ΑII

Setup Continued on next page.

*1

Immedi-ately

Continued from previous page.

Parameter No.	Size	N	lame		Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence			
											31100			
Pn621 to Pn628*4	-	Safety Mod Parameter		ted	-	_	-	All	_	_	_			
	2	Communio trols	cations Co	n-	0000h to 1FF3h	-	1040h	All	Immedi- ately	Setup	-			
	,		1								_			
					INK Communi	ications C	heck Mas	k for Debugg	ing		l			
					ot mask.	IN II Z		/A FG	10)		=			
		n.□□□X			e MECHATROL		nunication	s errors (A.Ec	50).		_			
					e WDT errors (ations arrara	(A E60) and	WDT	=			
					e both MECHA (A.E50).	II ROLINK	communic	cations errors	(A.E60) and	וטעע	_			
			Warning	Che	ck Masks									
			0	Do no	ot mask.						= .			
			1	Ignor	e data setting	warnings (A.94 □).				_			
			2	Ignor	e command wa	arnings (A	.95 □).				_			
			3	Ignor	e both A.94□	and A.95] warnings				_			
					e communicati						_			
Pn800					e both A.94□						_			
				0	e both A.95						_			
		n.□□X□		<u> </u>	e A.94□, A.95						=			
					e data setting						_			
					e A.94□, A.97						_			
					e A.95□, A.97						=			
					e A.94□, A.95						=			
				<u> </u>	e A.96□, A.97.			arnings. A.97b warnings.						
				<u> </u>	e A.95 □ , A.96						_			
			_		e A.94 □ , A.95				ninge		_			
					·	·		10 A.575 Wai	93.		_ =			
		n.□X□□			ameter (Do no									
		n.X□□□	Automat	tic Wa	arning Clear S	election fo	or Debugg	ing^{*10}						
		M3 *10			n warnings for		-				=			
			1 .	Autor	natically clear	warnings (MECHATR	OLINK-III spe	ecification).		_			
	2	Application Selections Limits)			0000h to 0103h	_	0003h	All	Immedi- ately	Setup	*1			
			Software	e Lim	it Selection						Ī			
			0	Enab	e both forward	and reve	rse softwa	re limits.			-			
		n.□□□X	1	Disab	le forward soft	ware limit					_			
			2	Disab	le reverse soft	ware limit.					_			
Pn801			3	Disab	le both forwar	d and reve	erse softwa	ıre limits.			_			
		n.□□X□	Reserve	d par	ameter (Do no	ot change.)							
			Software	e Lim	it Check for R	eferences					Ī			
		n.□X□□			ot perform soft			references.			-			
					rm software lin									
			D		/5	1 . 1.					- 			
		n.X□□□	Reserve	d par	ameter (Do no	t change.)							

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
Pn803	2	Origin Range	0 to 250	1 refer- ence unit	10	All	Immedi- ately	Setup	*2
Pn804	4	Forward Software Limit	-1,073,741,823 to 1,073,741,823	1 refer- ence unit	107374 1823	All	Immedi- ately	Setup	*1
Pn806	4	Reverse Software Limit	-1,073,741,823 to 1,073,741,823	1 refer- ence unit	-10737 41823	All	Immedi- ately	Setup	*1
Pn808	4	Absolute Encoder Origin Offset	-1,073,741,823 to 1,073,741,823	1 refer- ence unit	0	All	Immedi- ately *11	Setup	*1
Pn80A	2	First Stage Linear Acceleration Constant	1 to 65,535	10,000 refer- ence units/s ²	100	All	Immedi- ately *12	Setup	*2
Pn80B	2	Second Stage Linear Acceleration Constant	1 to 65,535	10,000 refer- ence units/s ²	100	All	Immedi- ately *12	Setup	*2
Pn80C	2	Acceleration Constant Switching Speed	0 to 65,535	100 reference units/s	0	All	Immedi- ately *12	Setup	*2
Pn80D	2	First Stage Linear Deceleration Constant	1 to 65,535	10,000 refer- ence units/s ²	100	All	Immedi- ately *12	Setup	*2
Pn80E	2	Second Stage Linear Deceleration Constant	1 to 65,535	10,000 refer- ence units/s ²	100	All	Immedi- ately *12	Setup	*2
Pn80F	2	Deceleration Constant Switching Speed	0 to 65,535	100 reference units/s	0	All	Immedi- ately *12	Setup	*2
Pn810	2	Exponential Accelera- tion/Deceleration Bias	0 to 65,535	100 reference units/s	0	All	Immedi- ately *13	Setup	*2
Pn811	2	Exponential Acceleration/Deceleration Time Constant	0 to 5,100	0.1 ms	0	All	Immedi- ately *13	Setup	*2
Pn812	2	Movement Average Time	0 to 5,100	0.1 ms	0	All	Immedi- ately *13	Setup	*2
Pn814	4	External Positioning Final Travel Distance	-1,073,741,823 to 1,073,741,823	1 refer- ence unit	100	All	Immedi- ately	Setup	*2
	2	Origin Return Mode Set- tings	0000h to 0001h	-	0000h	All	Immedi- ately	Setup	*14

P	n	A	1	6	

M2 *15

	Origin	Return Direction					
n.□□□X	0 Return in forward direction.						
	1	Return in reverse direction.					
n.□□X□	Reserv	ed parameter (Do not change.)					
n.□X□□	Reserv	ed parameter (Do not change.)					
n.X□□□	Reserved parameter (Do not change.)						

Pn817 *16	2	Origin Approach Speed	0 to 65,535	100 reference units/s	50	All	Immedi- ately *12	Setup	*2
Pn818 *17	2	Origin Approach Speed 2	0 to 65,535	100 reference units/s	5	All	Immedi- ately *12	Setup	*2

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Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
Pn819	4	Final Trave Origin Retu	l Distance for urn	-1,073,741,823 to 1,073,741,823	1 refer- ence unit	100	All	Immedi- ately	Setup	*2
	2	Input Signa Selections	al Monitor	0000h to 7777h	_	0000h	All	Immedi- ately	Setup	*14
			IO12 Signal	Mapping						Ī
			0 Do n	ot map.						_
			1 Mon	itor CN1-13 inp	ut termina	d.				_
			2 Mon	itor CN1-7 inpu	t terminal.					—" =:
		n.□□□X	3 Mon	itor CN1-8 inpu	t terminal.					_
D 045			4 Mon	itor CN1-9 inpu	t terminal.					_
Pn81E				itor CN1-10 inp						=
M2 *15				itor CN1-11 inp						_
			7 Mon	itor CN1-12 inp	ut termina	ıl.				_
			IO13 Signal	Mapping						Ī
		n.□□X□	0 to 7 The	mappings are tl	ne same a	s the IO12	signal mappi	ngs.		-
			IO14 Signal	Manning						_
		n.□X□□	-	mappings are ti	no samo a	e the IO12	eignal manni	nge		
	-		0 10 7 1110	mappings are ti	ic same a	3 110 10 12	Signal mappi	1193.		_ _
		n.X□□□	IO15 Signal							
			0 to 7 The	mappings are the same as the IO12 signal mappings.						
_	2	Command tions	Data Alloca-	0000h to 1111h	-	0010h	All	After restart	Setup	*14
	Ī		Option Field	Allocation						Ī
		n.□□□X		ble option field	allocation.					-
Pn81F			1 Enak	ole option field a	allocation.					_
*15	Ī		Position Cor	ntrol Command	TFF/TLIM	1 Allocatio	n			Ī
M2 *15		n.□□X□	0 Disa	ble allocation.						-
			1 Enak	ole allocation.						_
	Ī	n. 🗆 X 🗆 🗆	Reserved pa	rameter (Do no	ot change.)				_
	i	n.XDDD	Decemined no	rameter (Do no	t change	\				-
		11.7000	neserved pa	rameter (Do no	n change.	·)				1
Pn820	4	Forward La	atching Area	-2,147,483,648 to 2,147,483,647	1 refer- ence unit	0	All	Immedi- ately	Setup	*2
Pn822	4	Reverse La	atching Area	-2,147,483,648 to 2,147,483,647	1 refer- ence unit	0	All	Immedi- ately	Setup	*2

Continued from previous page.

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
	2	Option Monitor 1 Selection	0000h to FFFFh	-	0000h	_	Immedi- ately	Setup	*2

S	etting	Monitor	Applicable Mot
Hig	h-Speed	d Monitor Region	
000	00h	Motor speed [overspeed detection speed*18/1000000h]	All
000)1h	Speed reference [overspeed detection speed*18/1000000h]	All
000)2h	Torque [maximum torque/1000000h]	All
000)3h	Position deviation (lower 32 bits) [reference units]	All
000)4h	Position deviation (upper 32 bits) [reference units]	All
000	DAh	Encoder count (lower 32 bits) [reference units]	All
000	DBh	Encoder count (upper 32 bits) [reference units]	All
000)Ch	FPG count (lower 32 bits) [reference units]	All
000	DDh	FPG count (upper 32 bits) [reference units]	All
Lov	v-Speed	Monitor Region	
00	10h	Un000: Motor speed [min ⁻¹]	All
00-	11h	Un001: Speed Reference [min ⁻¹]	All
00	12h	Un002: Torque Reference [%]	All
00-	13h	Un003: Rotational Angle 1 [encoder pulses] Number of encoder pulses from origin within one encoder rotation displayed in decimal	All
		Un003: Rotational Angle 1 [linear encoder pulses] Linear encoder pulses from the polarity origin displayed in decimal	
00-	14h	Un004: Rotational Angle 2 [deg] Electrical angle from polarity origin	All
		Un004: Electrical Angle 2 [deg] Electrical angle from polarity origin	
00	15h	Un005: Input Signal Monitor	All
00-	16h	Un006: Output Signal Monitor	All
00	17h	Un007: Input Reference Speed [min-1]	All
00	18h	Un008: Position Deviation [reference units]	All
00	19h	Un009: Accumulated Load Ratio [%]	All
00	1Ah	Un00A: Regenerative Load Ratio [%]	All
00	1Bh	Un00B: Dynamic Brake Resistor Power Consumption [%]	All
00	1Ch	Un00C: Input Reference Pulse Counter [reference units]	All
00	1Dh	Un00D: Feedback Pulse Counter [encoder pulses]	All
00-	1Eh	Un00E: Fully-closed Loop Feedback Pulse Counter [external encoder resolution]	Rotary
002	23h	Initial multiturn data [Rev]	Rotary
002	24h	Initial incremental data [pulses]	Rotary
002	25h	Initial absolute position data (lower 32 bits) [pulses]	Linear
002	26h	Initial absolute position data (upper 32 bits) [pulses]	Linear
004	40h	Un025: SERVOPACK Installation Environment Monitor	All
004	41h	Un026: Servomotor Installation Environment Monitor	All
004	12h	Un027: Built-in Fan Remaining Life Ratio	All
004	43h	Un028: Capacitor Remaining Life Ratio	All
004	14h	Un029: Surge Prevention Circuit Remaining Life Ratio	All
004	45h	Un02A: Dynamic Brake Circuit Remaining Life Ratio	All
004	16h	Un032: Instantaneous Power	All
004	17h	Un033: Power Consumption	All
004	18h	Un034: Cumulative Power Consumption	All

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Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	W	hen Ibled	Classi- fication	Refer- ence
		Setting			Monitor				Applic	cable Moto	ors
		Communica	ations Module	Only							
D=004		0080h	Previous valuunits]	e of latched fee	edback po	sition (LPC	S1) [reference)		All	
Pn824		0081h	Previous valuunits]	e of latched fee	edback po	sition (LPC	S2) [reference	e		All	
M3 *10		0084h	Continuous L	atch Status (EX	(STATUS)					All	
		All Areas									
		Other values	Reserved set	Reserved settings (Do not use.)						All	
	2	Option Mo	onitor 2 Selec-	0000h to FFFFh	-	0000h	All		nedi- ely	Setup	*2
Pn825		0000h to 0084h	The settings	s are the same	as those f	or the Opt	ion Monitor 1	Selec	tion.		_
Pn827	2	Linear Dec Constant	celeration 1 for Stopping	1 to 65,535	10,000 refer- ence units/s ²	100	All		nedi- ly *12	Setup	*2
Pn829	2	SVOFF Wa SVOFF at to Stop)	aiting Time (for Deceleration	0 to 65,535	10 ms	0	All		nedi- ly *12	Setup	*2
	2	Option Field Allocations 0000h to - 1813h All After restart Setup *									*12
	-	2 1 1E1Eh - 101011 All restart Setup									
			ACCFIL Allo	cation (Option)							
			0 Allocate bits 0 and 1 to ACCFIL.							_	
			1 Allocate bits 1 and 2 to ACCFIL.								_
				ate bits 2 and							_
				ate bits 3 and							_
			4 Allocate bits 4 and 5 to ACCFIL. 5 Allocate bits 5 and 6 to ACCFIL.							_	
				ate bits 6 and							_
		n.□□□X		ate bits 7 and							_
				ate bits 8 and							_
			9 Alloc	ate bits 9 and	10 to ACC	FIL.					_
Pn82A			A Alloc	ate bits 10 and	111 to AC	CFIL.					_
				ate bits 11 and							_
M2 *15				ate bits 12 and							_
				ate bits 13 and							_
			E Alloc	ate bits 14 and	1 15 to AC	CFIL.					=
			ACCFIL Allo	cation Enable/l	Disable Se	election					
		n.□□X□		ole ACCFIL allo							_
			1 Enab	ole ACCFIL allo	cation.						_
			G SEL Alloc	ation (Option)							
		n.□X□□		settings are the	same as	for the AC	CFIL allocation	ns.			_
			G SEL Alloc	ation Enable/D	isable Sel	ection					
		n. X🗆 🗆 🗆		ole G_SEL alloc							
				le G_SEL alloc							_
			<u> </u>								_

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Parameter No.	Size		Na	ame		Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
	2	2	Option Field 2	d Alloca	tions	0000h to 1F1Fh	_	1D1Ch	All	After restart	Setup	*14
					Allocat Alloca Alloca Alloca Alloca Alloca Alloca Alloca Alloca Alloca Alloca	ate bit 4 to V_F ate bit 5 to V_F ate bit 5 to V_F ate bit 5 to V_F ate bit 7 to V_F ate bit 8 to V_F ate bit 8 to V_F	PPI. PPI. PPI. PPI. PPI. PPI. PPI. PPI.	IDIGI	All	restart	Setup	
Pn82B M2 *15				9 A B C D E	Alloca Alloca Alloca Alloca	ate bit 9 to V_F ate bit 10 to V_ ate bit 11 to V_ ate bit 12 to V_ ate bit 13 to V_ ate bit 14 to V_ ate bit 15 to V_	_PPIPPIPPIPPIPPI.					
		n.I	ппхп	0 1	Disab	ion Enable/Di le V_PPI alloca e V_PPI alloca	ation.	ection				
		n.I	ПΧПП	P_PI_C 0 to F		ocation (Option ettings are the		for the V_F	PPI allocations	S.		
		n.)	X000	P_PI_C 0 1	Disab	ocation Enabl le P_PI_CLR a e P_PI_CLR a	allocation.	Selection				
	2	(Option Field 3	d Alloca	tions	0000h to 1F1Fh	-	1F1Eh	All	After restart	Setup	*14
		n.I		P_CL <i>A</i> 0 to F		on (Option) ettings are the	same as	for the V_F	PPI allocations	S.		1
Pn82C		n.l		P_CL A 0 1	Disab	on Enable/Dis le P_CL alloca e P_CL alloca	ation.	ction				
M2 *15		n.l		N_CL A		ion (Option) ettings are the	e same as	for the V_F	PPI allocations	S.		
		n.)	XDDD	N_CL A 0 1	Disab	ion Enable/Dis le N_CL alloca e N_CL alloca	ation.	ction				

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Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence			
	2	Option Fie 4	ld Allocations	0000h to 1F1Ch	_	0000h	All	After restart	Setup	*14			
			BANK_SEL1	Allocation (Op	tion)								
			0 Allo	cate bits 0 to 3	to BANK_	SEL1.							
				cate bits 1 to 4						_			
				cate bits 2 to 5						_			
			3 Allo	cate bits 3 to 6	to BANK_	SEL1.				_			
				cate bits 4 to 7						_			
		n.□□□X		cate bits 5 to 8						_			
				cate bits 6 to 9						_			
			7 Allocate bits 7 to 10 to BANK_SEL1.										
				cate bits 8 to 11						_			
Pn82D				cate bits 9 to 12						_			
				cate bits 10 to 1						_			
M2 *15				cate bits 11 to 1						_			
			C Allo	ate bits 12 to 1	5 to BAN	K_SEL1.				_			
	İ		BANK SEL1	Allocation Ena	able/Disab	ole Selection	on						
		n.□□X□		ble BANK_SEL						_			
				ole BANK_SEL1						_			
										_			
		n.□X□□	LT_DISABLE	Allocation (Op	otion)								
		11.07.00	0 to F The	settings are the	same as	for the V_F	PPI allocations	S.		_			
			I							_			
		.,		Allocation En			on						
		n.X□□□	n.XDDD 0 Disable LT_DISABLE allocation.										
			1 Ena	ole LT_DISABLE	allocation	٦.				_			

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Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence			
	2	Option Fie	eld Allocations	0000h to 1D1Fh	-	0000h	All	After restart	Setup	*14			
			15 iiii										
	١ .	n.□□□X	Reserved parameter (Do not change.)										
				,		,				_			
		n.□□X□	Reserved pa	rameter (Do no	.)								
			OUT_SIGNAL	_ Allocation (O	ption)								
				ate bits 0 to 2						_			
				ate bits 1 to 3						_			
			2 Allocate bits 2 to 4 to OUT_SIGNAL. 3 Allocate bits 3 to 5 to OUT_SIGNAL.										
				ate bits 4 to 6						_			
Pn82E				ate bits 5 to 7						_			
M2 *15		n.□X□□		ate bits 6 to 8						_			
IVIZ			7 Alloc	ate bits 7 to 9	to OUT_SI	GNAL.				_			
			8 Alloc	ate bits 8 to 10	to OUT_9	SIGNAL.				_			
					_								
				ate bits 10 to 1						_			
		B Allocate bits 11 to 13 to OUT_SIGNAL.								_			
			C Allocate bits 12 to 14 to OUT_SIGNAL. D Allocate bits 13 to 15 to OUT_SIGNAL.										
		OUT_SIGNAL Allocation Enable/Disable Selection											
							ion						
		n.X□□□		ole OUT_SIGNA						_			
			1 Enab	le OUT_SIGNA	L allocatio	n.				_			
					T				T				
	2	Motion Se	ettings	0000h to 0001h	_	0000h	All	After restart	Setup	*2			
									I				
			Linear Accele	eration/Decele	ration Cor	nstant Sele	ection						
		n.□□□X	0 Use I ignor	Pn80A to Pn80	F and Pn8	327. (The s	ettings of Pn8	334 to Pn840	o are				
Pn833		п.шших	ا موا ا	eu., Pn834 to Pn84	0. (The se	ttings of P	n80A to Pn80	F and Pn82	7 are	_			
7 11000			1 ignor				22.7.00 1 1100			_			
	1	n.□□X□	Reserved par	rameter (Do no	ot change.)				I			
		n.□X□□	Reserved par	rameter (Do no	ot change.)				_			
		n.X000	Reserved par	rameter (Do no	ot change.)				Ī			
	-		Troop, roa par	amotor (20 m	71 011a11g01					_			
					10,000								
Pn834	4		e Linear Accel-	1 to	refer-	100	All	Immedi-	Setup	*2			
	′	eration Co	onstant 2	20,971,520	ence units/s ²		/ 111	ately *12	Jordp				
					10,000								
Pn836	4		tage Linear on Constant 2	1 to 20,971,520	refer- ence	100	All	Immedi- ately *12	Setup	*2			
		, looolorall	on constant Z	20,011,020	units/s ²			асыу					
Dn929	4	Accelerati	on Constant	0 to	1 refer-	0	ΛII	Immedi-	Sotus	*2			
Pn838	4	Switching		2,097,152,000	ence unit/s	U	All	ately *12	Setup				
		First Ot -	. 1 :	4.1.	10,000			Immad:					
Pn83A	4	First Stage Decelerati	e Linear on Constant 2	1 to 20,971,520	refer- ence	100	All	Immedi- ately *12	Setup	*2			
	I				units/s2								

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
Pn83C	4	Second Stage Linear Deceleration Constant 2	1 to 20,971,520	10,000 refer- ence units/s ²	100	All	Immedi- ately *12	Setup	*2
Pn83E	4	Deceleration Constant Switching Speed 2	0 to 2,097,152,000	1 refer- ence unit/s	0	All	Immedi- ately *12	Setup	*2
Pn840	4	Linear Deceleration Constant 2 for Stopping	1 to 20,971,520	10,000 refer- ence units/s ²	100	All	Immedi- ately *12	Setup	*2
Pn842 *16	4	Second Origin Approach Speed 1	0 to 20,971,520	100 reference units/s	0	All	Immedi- ately *12	Setup	*2
Pn844 *17	4	Second Origin Approach Speed 2	0 to 20,971,520	100 ref- erence units/s	0	All	Immedi- ately *12	Setup	*2
Pn846	2	POSING Command Scurve Acceleration/ Deceleration Rate	0 to 50	1%	0	All	Immedi- ately *12	Setup	_
Pn850	2	Number of Latch Sequences	0 to 8	-	0	All	Immedi- ately	Setup	*2
Pn851	2	Continuous Latch Sequence Count	0 to 255	-	0	All	Immedi- ately	Setup	*2
	2	Latch Sequence 1 to 4 Settings	0000h to 3333h	-	0000h	All	Immedi- ately	Setup	*2
			!						

		Latch :	Sequence 1 Signal Selection
		0	Phase C
	n.□□□X	1	EXT1 signal
		2	EXT2 signal
		3	EXT3 signal
Pn852		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.

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Parameter No.	Size	N	lame		Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
	2	Latch Seq Settings	uence 5 t	0 8	0000h to 3333h	-	0000h	All	Immedi- ately	Setup	*2
			Latch S	equei	nce 5 Signal S	election					
			0	Phas	e C						_
		n.□□□X	1	EXT1	signal						_
				EXT2	signal						=
			3 EXT3 signal								_
D050			Latch Sequence 6 Signal Selection								
Pn853		n.□□X□		The s tion.	ettings are the	same as	those for t	he Latch Seq	uence 5 Sigr	nal Selec-	_
			Latch S	equei	nce 7 Signal S	election					Ī
		n.□X□□	0 to 3	The s	ettings are the		those for t	he Latch Sequ	uence 5 Sigr	nal Selec-	-
			tion.								
		V	Latch Sequence 8 Signal Selection 1 to 3 The settings are the same as those for the Latch Sequence 5 Signal Selection.								
		n.X□□□									
											_
						1	1	T.			
	2	SVCMD_IOMONITOR AI	D Input Sig locations	gnal 1	0000h to 1717h	-	0000h	All	Immedi- ately	Setup	*2
	Input Signal Monitor Allocation for CN1-13 (SVCMD_IO)										I
			0	Allocate bit 24 (IO_STS1) to CN1-13 input signal monitor.							-
			1	Alloca	ate bit 25 (IO_S	STS2) to C	N1-13 inp	ut signal mon	itor.		_
			2	Allocate bit 26 (IO_STS3) to CN1-13 input signal monitor.							= =
		n.□□□X	3	Alloca	ate bit 27 (IO_S	STS4) to C	N1-13 inp	ut signal mon	itor.		_
			-		ate bit 28 (IO_S						=
D - 000					ate bit 29 (IO_9		·				=
Pn860					ate bit 30 (IO_S						_
M3 *10			7	Alloca	ate bit 31 (IO_S	5158) 10 C	ли 1-13 inp	ut signai mon	itor.		_
			CN1-13	Input	t Signal Monit	or Enable	/Disable S	election			
		n.□□X□			le allocation fo						_
			1	Enab	le allocation fo	r CN1-13	input signa	al monitor.			=
		-	Input Si	gnal I	Monitor Alloca	tion for C	N1-7 (SVC	CMD_IO)			
		n.□X□□	Input Signal Monitor Allocation for CN1-7 (SVCMD_IO) 0 to 7 The settings are the same as the CN1-13 allocations.							_	
			CN1-7 I	nput	Signal Monito	r Enable/[Disable Se	lection			ī
		n.X□□□		CN1-7 Input Signal Monitor Enable/Disable Selection O Disable allocation for CN1-7 input signal monitor.					-		
					le allocation fo						_
			-								_

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Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
	2	SVCMD_ICMonitor All	O Input Signal locations 2	0000h to 1717h	-	0000h	All	Immedi- ately	Setup	*2		
		n.□□□X	Input Signal I	Monitor Alloca	tion for C	N1-8 (SVC	MD_IO)					
			0 to 7 The settings are the same as the CN1-13 allocations.							<u> </u>		
			CN1-8 Input	Signal Monito	r Enable/D	Disable Sel	ection			Ī		
Pn861		n.□□X□	0 Disab	ole allocation fo	or CN1-8 in	nput signal	monitor.			_		
M3 *10			1 Enab	le allocation fo	r CN1-8 in	put signal	monitor.			=		
IVIO			Input Signal I	Monitor Alloca	tion for C	N1-9 (SVC	MD_IO)			Ī		
		n.□X□□	0 to 7 The s	ettings are the	same as	the CN1-1	3 allocations.			_		
			CN1-9 Input	Signal Monito	r Fnable/Γ)isable Sel	ection			ī		
		n.X□□□ CN1-9 Input Signal Monitor Enable/Disable Selection O Disable allocation for CN1-9 input signal monitor.										
			1 Enab	le allocation fo	r CN1-9 in	put signal	monitor.			_		
	2	SVCMD_IC Monitor All	O Input Signal locations 3	0000h to 1717h	_	0000h	All	Immedi- ately	Setup	*2		
							-					
		n.□□□X	Input Signal I	Monitor Alloca	tion for C	N1-10 (SV	CMD_IO)			Ī		
		II.LLLLX	0 to 7 The s	ettings are the	same as	the CN1-1	3 allocations.			_		
			CN1-10 Inpu	t Signal Monit	or Enable/	Disable S	election			Ī		
Pn862		n.□□X□	Disable allocation for CN1-10 input signal monitor.									
M3 *10			1 Enable allocation for CN1-10 input signal monitor.									
IVI3			Input Signal I	Monitor Alloca	tion for C	N1-11 (SV	CMD_IO)			ī		
		n.□X□□	0 to 7 The s	settings are the	same as	the CN1-1	3 allocations.			-		
			CN1-11 Input	t Signal Monit	or Fnable/	Disable S	election			Ī		
		n.X□□□		ole allocation fo						-		
			1 Enab	le allocation fo	r CN1-11	input signa	al monitor.			_		
	2		O Input Signal locations 4	0000h to 1717h	_	0000h	All	Immedi- ately	Setup	*2		
										_		
		n.□□□X		Monitor Alloca			-					
			0 to 7 The s	settings are the	same as	the CN1-1	3 allocations.			_		
Pn863			CN1-12 Inpu	t Signal Monit	or Enable/	Disable S	election			Ī		
M3 *10		n.□□X□	0 Disab	ole allocation fo	or CN1-12	input signa	al monitor.					
_			1 Enable allocation for CN1-12 input signal monitor.									
		n.□X□□	Reserved par	rameter (Do no	ot change.)				Ī		
		n.X000	Reserved par	rameter (Do no	ot change)				1		
			110001 Vou pai	amotor (DO III	onange.	1				1		

Continued	trom	previous	nage

D	_			0 - 11'	0.11	D.C. II		NAME OF THE PARTY				
Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
	2	SVCMD_IC nal Monitor 1	Output Sign Allocations	0000h to	-	0000h	All	Immedi- ately	Setup	*2		
	Ī		Output Sic	nal Monitor Allo	cation for	CN1-1 and	d CN1-2 (SV(CMD IO)		1		
				ocate bit 24 (IO_S			•					
				ocate bit 25 (IO_S			<u> </u>			=		
				ocate bit 26 (IO_S						_		
		n.□□□X	3 All	ocate bit 27 (IO_S	STS4) to C	N1-1/CN1	-2 output sig	nal monitor.		=		
			4 All	ocate bit 28 (IO_S	STS5) to C	N1-1/CN1	-2 output sig	nal monitor.		_		
D - 000			5 All	ocate bit 29 (IO_S	STS6) to C	N1-1/CN1	-2 output sig	nal monitor.		_		
Pn868				ocate bit 30 (IO_S						_		
M3 *10			7 All	ocate bit 31 (IO_S	STS8) to C	N1-1/CN1	-2 output sig	nal monitor.		=		
_		CN1-1/CN1-2 Output Signal Monitor Enable/Disable Selection										
		n.□□X□	0 Di	sable allocation fo	or CN1-1/0	CN1-2 outp	out signal mo	nitor.		_		
			1 Enable allocation for CN1-1/CN1-2 output signal monitor.									
	Ī		Output Signal Monitor Allocation for CN1-23 and CN1-24 (SVCMD_IO)									
		n.□X□□	Output Signal Monitor Allocation for CN1-23 and CN1-24 (SVCMD_IO) 0 to 7 The settings are the same as the CN1-1/CN1-2 allocations.									
		0 to 7 The settings are the same as the CN1-1/CN1-2 allocations.										
		n.X□□□		N1-24 Output Signable allocation for						1		
		11.7000		sable allocation fo						-		
			, ,	able anotation to	1 0111 20/	0111 24 00	atput oigilai ii	101111011		_		
							1					
	2		Output Sign Allocations		_	0000h	All	Immedi- ately	Setup	*2		
		'		,				11				
	1		Output Sid	nal Monitor Allo	nation for	CN1 25 a	nd CN1 26 (9	SVCMD IO)				
		n.□□□X		e settings are the								
Pn869										_		
M3 *10				N1-26 Output Sig	•							
IVIO		n.□□X□		sable allocation fo						_		
				able allocation fo	r GN1-25/	CIN 1-26 00	utput signai n	ioriitor.		_		
		n.□X□□	Reserved	parameter (Do no	ot change	.)						
	Ī	n.X□□□	Reserved	parameter (Do no	ot change	.)						
										_		
		Station Ad	dress Moni-									
Pn880	2	tor (for mai		03h to EFh	-	-	All	-	Setup	_		
		read only)	nission Byte									
Pn881	2	Count Mor	nitor (bytés)	47 00 40	_	_	All	_	Setup	_		
111001	_	(for mainte only)	nance, read	11, 02, 10			7 111		Cotap			
			on Cycle Se									
Pn882	2		or [x 0.25 μs nance, read		-	_	All	-	Setup	_		
		only)										
Pn883	2	Setting Mo	ations Cycle nitor [trans-			_	All	_	Satura	_		
1 11003	_	mission cy		0 10 32	_	_	All	_	Setup	_		
		areonari	,	,,	1	1		Continue	ıd on nex	t page.		

Continued from previous page.

Parameter No.	Size		Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi-	Refer- ence
	2	Commur trols 2	nications Con-	0000h to 0001h	-	0000h	All	Immedi- ately	Setup	*2
		1	MECHATRO	LINK Communic	eations Err	or Holding	ı Brake Signa	I Setting	l .	
Pn884	n.	пппх	_ Maii	ntain the status s LINK communica	et by the E	BRK_ON o	<u> </u>		en a MECI	HA-
M3 *10			1 App	y the holding bra	ike when a	a MECHAT	ROLINK com	munications	error occu	ırs.
_	n.		Reserved pa	ırameter (Do not	change.)					
	n.	Reserved parameter (Do not change.)								
	n.	n.X□□□ Reserved parameter (Do not change.)								
		MECHATROLINK								
Pn88A	2	Monitor	Error Counter tenance, reac	0 to 65,535	_	0	All	_	Setup	_
Pn890 to Pn8A6	4	tor during	nd Data Moni- g Alarm/Warn tenance, reac	CEEEEEE	_	Oh	All	-	Setup	*2
Pn8A8 to Pn8BE	4	during Al	e Data Monito arm/Warning tenance, reac	Oh to	-	Oh	All	_	Setup	*2
Pn900	2	Number Banks	of Parameter	0 to 16	-	0	All	After restart	Setup	*2
Pn901	2	Number Bank Me	of Parameter mbers	0 to 15	_	0	All	After restart	Setup	*2
Pn902 to Pn910	2	Paramete ber Defin	er Bank Mem- nition	0000h to 08FFh	_	0000h	All	After restart	Setup	*2
Pn920 to Pn95F	2		er Bank Data ed in nonvolati)	e 0000h to FFFFh	_	0000h	All	Immedi- ately	Setup	*2

- *1. Refer to the following manual for details.
 - Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)
- *2. Refer to the following manual for details.
 - Σ-7-Series MECHATROLINK-III Communications Standard Servo Profile Command Manual (Manual No.: SIEP S800001 31)
- *3. Set a percentage of the motor rated torque.
- *4. These parameters are for SERVOPACKs with a Safety Module. Refer to the following manual for details.
 - Σ-V-Series/Σ-V-Series for Large-Capacity Models/Σ-7-Series User's Manual Safety Module (Manual No.: SIEP C720829 06)
- *5. Normally set this parameter to 0. If you use an External Regenerative Resistor, set the capacity (W) of the External Regenerative Resistor.
- *6. The upper limit is the maximum output capacity (W) of the SERVOPACK.
- *7. These parameters are for SERVOPACKs with the dynamic brake option. Refer to the following manual for details.
 - Σ-7-Series Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)
- *8. The SGLFW2 is the only Yaskawa Linear Servomotor that supports this function.
- *9. Enabled only when Pn61A is set to n.□□□2 or n.□□□3.
- *10. This parameter is valid only when the MECHATROLINK-III standard servo profile is used.
- *11. The parameter setting is enabled after SENS_ON command execution is completed.
- *12. 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.
- *13.The settings are updated only if the reference is stopped (i.e., only if DEN is set to 1).
- *14.Refer to the following manual for details.
 - Σ-7-Series AC Servo Drive MECHATROLINK-II Communications Command Manual (Manual No.: SIEP S800001 30)
- *15.This parameter is valid only when the MECHATROLINK-II-compatible profile is used.
- *16. The setting of Pn842 is valid while Pn817 is set to 0.
- *17. The setting of Pn844 is valid while Pn818 is set to 0.
- *18. You can check overspeed detection speed with MECHATROLINK-III Common Parameter 05 PnA0A (Maximum Output Speed).

Parameter List

List of MECHATROLINK-III Common Parameters

5.2.3

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	Nar	ne	Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classi- fication
	4	Encoder Ty tion (read o		0h, 1h	ı	-	All	-	
01									
PnA02		0000h	Absolute	encoder					
		0001h	Increment	tal encoder					
	4	Motor Type (read only)	Selection	0h, 1h	-	_	All	-	
00		•							
02 PnA04		0000h	Rotary Se	ervomotor					tion
		0001h	Linear Se	rvomotor					rma
			1						info
	4	Semi-close closed Sele (read only)		0h, 1h	-	-	All	-	Device information
03		1		1		1	II.	1	
PnA06		0000h	Semi-clos	sed					
		0001h	Fully-clos	sed					
04 PnA08	4	Rated Moto (read only)	or Speed	Oh to FFFFFFFh	1 min ⁻¹	-	All	-	
05 PnA0A	4	Maximum (Speed (rea		Oh to FFFFFFFh	1 min ⁻¹	-	All	-	
06 PnA0C	4	Speed Mul (read only)	tiplier	-1,073,741,823 to 1,073,741,823	ſ	_	All	_	
07 PnA0E	4	Rated Torq (read only)	ue	Oh to FFFFFFFh	1 N·m	_	All	_	
08 PnA10	4	Maximum (Torque (rea	Output id only)	Oh to FFFFFFFh	1 N·m	-	All	_	nation
09 PnA12	4	Torque Mul (read only)	tiplier	-1,073,741,823 to 1,073,741,823	-	-	All	-	Device information
0A PnA14	4	Resolution (read only)		Oh to FFFFFFFh	1 pulse/rev	_	Rotary	-	Devic
0B PnA16	4	Scale Pitch	1	0 to 65,536,000	1 nm [0.01 μm]	0	Linear	After restart*1	
0C PnA18	4	Pulses per Pitch (read		Oh to FFFFFFFh	1 pulse/ pitch	-	Linear	-	

5.2.3 List of MECHATROLINK-III Common Parameters

Continued from previous page.

Parameter No.	Size	Name		Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classi- fication
21 PnA42	4	Electronic Ge (Numerator)	ar Ratio	1 to 1,073,741,824	-	16	All	After restart	
22 PnA44	4	Electronic Ge (Denominator		1 to 1,073,741,824	-	1	All	After restart	
23 PnA46	4	Absolute Enc Origin Offset	oder	-1,073,741,823 to 1,073,741,823	1 reference unit	0	All	Immedi- ately*1	
24 PnA48	4	Multiturn Limi Setting	it	0 to 65,535	1 Rev	65535	Rotary	After restart	
	4	Limit Setting		0h to 33h	-	0000h	All	After restart	
		Bit 0	P-OT	(0: Enabled, 1: Di	sabled)				Suc
		Bit 1	N-O7	Г (0: Enabled, 1: Di	sabled)				zatic
25		Bit 2	Rese	rved.	,				cific
PnA4A		Bit 3	Rese	rved.					spe
		Bit 4		OT (0: Disabled, 1:	Enabled)				ne
		Bit 5		OT (0: Disabled, 1:					Machine specifications
		Bits 6 to 31	Rese						Σ
			1						
26		Forward Soft	ware	-1,073,741,823	1 reference	10737418		Immedi-	
PnA4C	4	Limit	waro	to 1,073,741,823	unit	23	All	ately	
27		Reserved par	ameter	1,010,111,020				Immedi-	
PnA4E	4	(Do not chang	ge.)	_	I	0	All	ately	
28 PnA50	4	Reverse Softv Limit	ware	-1,073,741,823 to 1,073,741,823	1 reference unit	-1073741 823	All	Immedi- ately	
29 PnA52	4	Reserved par (Do not chang		-	-	0	All	Immedi- ately	
	4	Speed Unit Selection*2		Oh to 4h	-	0h	All	After restart	
		0000h F	Reference	e units/s				_	
41		0001h F	Reference	e units/min					
PnA82		0002h	Percenta	ge (%) of rated spe	ed*3			_	
		0003h r	min ^{-1*3}						
		0004h	Maximum	n motor speed/400	00000h*4			-	
									SD
				T		T	1	1	Unit settings
		Speed Base I Selection*3, *4							it se
42		(Set the value	of n					After	Uni
PnA84	4	from the follo		-3 to 3	-	0	All	restart	
		selection (41	PnA82)						
		× 10 ⁿ)							
	4	Position Unit Selection		0h	-	0h	All	After restart	
43						-	-		
PnA86	0000h Reference units								
								<u></u>	

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D					0.111.		Continued in	'		
Parameter No.	Size	Nar	me	Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classi- fication	
44 PnA88	4	Position Ba Selection (Set the val from the fo formula: Po selection (4 × 10 ⁿ)	lue of n llowing osition un		-	0	All	After restart		
	4	Acceleratio Selection	n Unit	Oh	_	Oh	All	After restart		
45 PnA8A		0000h	Reference	ce units/s²						
46 PnA8C	4	Acceleratio Unit Selecti (Set the val from the fo formula: Ac unit selection PnA8A) x 1	ion lue of n llowing celeratio on (45	4 to 6	-	4	All	After restart		
	4	Torque Unit Selection	t	1h, 2h	-	1h	All	After restart	-	
47 PnA8E		0001h 0002h		rage (%) of rated tord						
48 PnA90	4	Torque Bas Selection*5 (Set the val from the fo formula: To selection (4 × 10 ⁿ)	lue of n llowing rque unit	-5 to 0	-	0	All	After restart	Unit settings	
	4	Supported tems (read			_	0601011F h	All	-	ر ا	
		Speed Unit		Deference unita/o/1.	[nobled)					
		Bit 0		Reference units/s (1:						
		Bit 1		Reference units/min	*	-nabla -1\				
		Bit 2		Percentage (%) of rat		i iabied)				
		Bit 3		nin ⁻¹ (rpm) (1: Enable		(4. E I-1 - ^				
		Bit 4		Maximum motor spe		(i: Enabled)				
		Bits 5 to 7		Reserved (0: Disable	u).					
49		Position Ur Bit 8		Reference units (1: E	inahlad)					
PnA92		Bits 9 to 15		Reserved (0: Disable						
		Acceleratio		issuited (o. Disable	<i>∽,.</i>					
		Bit 16		Reference units/s² (1	· Enabled)					
		Bit 17		ns (acceleration time		ach rated sr	need) (0: Disa	bled)		
		Bits 18 to 2		Reserved (0: Disable		aon ratou of	, 500, (O. DISA	~.ou,		
		Torque Uni								
		Bit 24		N·m (0: Disabled)						
		Bit 25		Percentage (%) of rated torque (1: Enabled)						
		Bit 26		Maximum torque/40000000h (1: Enabled)						
		Bits 27 to 3		Reserved (0: Disable		,				
				, 22,210	•					

5.2.3 List of MECHATROLINK-III Common Parameters

Continued from previous page.

							Continued fr	om previo	us pagi
Parameter No.	Size	Nam	ie	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	Immedi- ately	
62 PnAC4	4	Speed Loop Time Consta		150 to 512,000	1 μs [0.01 ms]	20000	All	Immedi- ately	
63 PnAC6	4	Position Loc	op Gain	1,000 to 2,000,000	0.001/s [0.1/s]	40000	All	Immedi- ately	
64 PnAC8	4	Feedforward pensation	d Com-	0 to 100	1%	0	All	Immedi- ately	
65 PnACA	4	Position Loc gral Time C		0 to 5,000,000	1 μs [0.1 ms]	0	All	Immedi- ately	
66 PnACC	4	Positioning Completed Width		0 to 1,073,741,824	1 reference unit	7	All	Immedi- ately	
67 PnACE	4	Near Signal		1 to 1,073,741,824	1 reference unit	10737418 24	All	Immedi- ately	
81 PnB02	4	Exponential Acceleration/Deceleration Time Constant		0 to 510,000	1 μs [0.1 ms]	0	All	Immedi- ately*6	
82 PnB04	4	Movement A Time	Average	0 to 510,000	1 μs [0.1 ms]	0	All	Immedi- ately*6	
83 PnB06	4	External Pos Final Travel		-1,073,741,823 to 1,073,741,823	1 reference unit	100	All	Immedi- ately	
84 PnB08	4	Origin Appro	oach	Oh to 3FFFFFFh	10 ⁻³ min ⁻¹	× 5,000h reference units/s con- verted to 10 ⁻³ min ⁻¹	All	Immedi- ately	
85 PnB0A	4	Origin Retur Speed	n Creep	Oh to 3FFFFFFh	10 ⁻³ min ⁻¹	× 500h reference units/s con- verted to 10 ⁻³ min ⁻¹	All	Immedi- ately	Tuning
86 PnB0C	4	Final Travel for Origin Re		-1,073,741,823 to 1,073,741,823	1 reference unit	100	All	Immedi- ately	
	4	Fixed Monitorium 1	or Selec-	Oh to Fh	-	1h	All	Immedi- ately	
87 PnB0E		0000h 0001h 0002h 0003h 0004h 0005h 0006h 0007h 0008h 0009h 000Ah 000Bh 000Ch 000Dh 000Eh 000Fh	Reserved CMN1 (co CMN2 (co OMN1 (o	(undefined value). (undefined value). ommon monitor 1) ommon monitor 2) ptional monitor 2)					

Continued from previous page.

Parameter No.	Size	Nan	ne	Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Cla	
	4	Fixed Monit tion 2	tor Selec-	0h to Fh	-	0h	All	Immedi- ately		
88 PnB10		0000h to 000Fh	I INA SATTINAS ARA THA SAMA AS THOSA TON FIVAN MICHITAN SAIACTION I							
	4	SEL_MON Monitor Sel		Oh to 9h	-	Oh	All	Immedi- ately		
		00001	TD00 //-			-11				
		0000h	1		reference coordin					
		0001h 0002h	,	•	in reference coordin POS_SET (Set			amand)		
		0002H	_	rget speed)	IIIFO3_3L1 (3et	Coordinate	System) Con	imanu)		
		0003H	,	l (speed limit)						
		0004H		1 (torque limit)						
			Monitor I Byte 1: C 00h: Ph 01h: Ph 02h: Ph 03h: Ph Byte 2: C 00h: Pc 02h: To Byte 3: F	pase 1 pase 2 pase 3 Current control notified control move	node ode de de					
		0006h	Bit	Name	Description	Value	Settin	g		
			Bit 0	Bit 0	LT_RDY1	Processing statu latch detection for LT_REQ1 in SVC D_CTRL region	or	Latch dete not yet pro cessed. Processing detection in	latch	
39 PnB12			Bit 1	LT_RDY1	Processing statu		Latch dete not yet pro cessed.			
					LT_REQ2 in SVCN D_CTRL region	CM- 1	Processing detection in progress.			
						0	Phase C			
			Bits 2			1	External in signal 1	out		
			and 3	LT_SEL1R	Latch signal	2	External inpsignal 2	out		
						3	External in signal 3	out		
						0	Phase C			
			Bits 4			1	External in	out		
			and 5	LT_SEL2R	Latch signal	2	External input signal 2	out		
						3	External input signal 3	out		
		000=	Bit 6	Reserved (0).					
		0007h	Reserved	1.	1	-4:-''' '				
		0008h	INIT_PGF	POS (Low)	Lower 32 bits verted to 64-	bit position	reference dat	a		
		0009h	INIT_PGF	POS (High)	Upper 32 bits verted to 64-					

5.2.3 List of MECHATROLINK-III Common Parameters

Continued from previous page.

Parameter No.	Size	Name		Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classi- fication
	4	SEL_MON (CMN Monitor Selection	2) 1 2	0h to 9h	-	0h	All	Immedi- ately	
8A PnB14		0000h to 0009h The se	etting	gs are the same as	those for SEL	_MON Monit	tor Selection	1.	
8B PnB16	4	Origin Detection Width		0 to 250	1 reference unit	10	All	Immedi- ately	
8C PnB18	4	Forward Torque I	_imit	0 to 800	1%	100	All	Immedi- ately	
8D PnB1A	4	Reverse Torque I	_imit	0 to 800	1%	100	All	Immedi- ately	
8E PnB1C	4	Zero Speed Dete tion Range	:C-	1,000 to 10,000,000	10 ⁻³ min ⁻¹	20000	All	Immedi- ately	· · ·
8F PnB1E	4	Speed Coincidence Signal Detection Width		0 to 100,000	10 ⁻³ min ⁻¹	10000	All	Immedi- ately	ameter
	4	Servo Command Control Field Enable/ Disable Selections (read only)		-	-	0FFF3F3F h	All	_	Command-related parameters
		- D'' O	01	4D DALIOE (4 E	- I- II\				nand-r
		Bit 0	_	MD_PAUSE (1: Ena	· · · · · · · · · · · · · · · · · · ·				L L
		Bit 1	_	MD_CANCEL (1: E					ဝိ
		Bits 2 and 3 Bits 4 and 5		OP_MODE (1: Enabled)	,				
		Bits 4 and 5	_	CCFIL (1: Enabled)					
90		Bit 8	_	eserved (0: Disable REQ1 (1: Enabled	,				
PnB20		Bit 9		_REQ2 (1: Enabled	·				
		Bits 10 and 11		_NEQ2 (1: Enabled					
		Bits 12 and 13	_	_SEL2 (1: Enabled	•				
		Bits 14 and 15	_	eserved (0: Disable					
		Bits 16 to 19		EL_MON1 (1: Enab	,				
		Bits 20 to 23	_	 EL_MON2 (1: Enab	•				
		Bits 24 to 27	SE	EL_MON3 (1: Enab	oled)				
		Bits 28 to 31	Re	eserved (0: Disable	ed).				

Default

Setting

007F01F0

ΑII

Setting Unit

[Resolution]

Setting Range

Reserved (0: Disabled).

Reserved (0: Disabled)

L_CMP1 (1: Enabled)

L_CMP2 (1: Enabled)

PON (1: Enabled)

M_RDY (1: Enabled)

SV_ON (1: Enabled)

Reserved (0: Disabled)

SEL_MON1 (1: Enabled)

SEL_MON2 (1: Enabled)

SEL_MON3 (1: Enabled)

Reserved (0: Disabled)

Reserved (0: Disabled).

SO1 to SO3 (1: Enabled)

Reserved (0: Disabled)

Reserved (0: Disabled)

V_PPI (1: Enabled)

POS_RDY (1: Enabled)

ACCFIL (1: Enabled)

CMD_PAUSE_CMP (1: Enabled)

CMD_CANCEL_CMP (1: Enabled)

Applicable

Motors

ΑII

When

Enabled

Classi-

fication

Parameter

No.

91

92

PnB22

Size

4

Name

Servo Status Field Enable/Disable

Selections (read

only)

Bit 0

Bit 1

Bit 8

Bit 9

Bit 10

Bit 11

Bit 12

Bit 13

Bits 14 and 15

Bits 16 to 19

Bits 20 to 23

Bits 24 to 27

Bits 28 to 31

(read only)

Bits 0 to 3

Bits 20 to 22

Bits 24 to 31

Bit 23

Bit 4

4

Output Bit Enable/

Disable Selections

Bit 2 and 3

Bits 4 and 5

Bits 6 and 7

5.2.3 List of MECHATROLINK-III Common Parameters

Continued from previous page

Parameter No.	Size	Name	Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classi- fication
	4	Input Bit Enable/Dis able Selections (rea only)		-	FF0FFEFE h	All	_	
93 PnB26		Bit 0 Bit 1 Bit 2 Bit 3 Bit 4 Bit 5 Bit 6 Bit 7 Bit 8 Bit 9 Bit 10 Bit 11 Bit 12 Bit 13 Bit 14 Bit 15 Bit 18 Bit 19 Bit 10 Bit 11 Bit 12 Bit 13 Bit 14 Bit 15 Bit 16 Bit 17 Bit 18 Bit 19 Bits 20 to 23 Bits 24 to 31	Reserved (0: Disable DEC (1: Enabled) P-OT (1: Enabled) N-OT (1: Enabled) EXT1 (1: Enabled) EXT2 (1: Enabled) EXT3 (1: Enabled) EXT3 (1: Enabled) ESTP (1: Enabled) Reserved (0: Disable BRK_ON (1: Enabled) N-SOT (1: Enabled) N-SOT (1: Enabled) DEN (1: Enabled) DEN (1: Enabled) PSET (1: Enabled) ZPOINT (1: Enabled) T_LIM (1: Enabled) V_LIM (1: Enabled) V_CMP (1: Enabled) Reserved (0: Disable IO_STS1 to IO_STS1	ed).				Command-related parameters

- *1. The parameter setting is enabled after SENS_ON command execution is completed.
- *2. When using fully-closed loop control, set the reference units/s.
- *3. If you set the Speed Unit Selection (parameter 41) to either 0002h or 0003h, set the Speed Base Unit Selection (parameter 42) to a number between -3 and 0.
- *4. If you set the Speed Unit Selection (parameter 41) to 0004h, set the Speed Base Unit Selection (parameter 42) to 0.
- *5. If you set the Torque Unit Selection (parameter 47) to 0002h, set the Torque Base Unit Selection (parameter 48) to 0.
- *6. 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.

Parameter Recording Table

5.2.4

Use the following table to record the settings of the parameters.

Parameter No.	Default Setting		Name	When Enabled
Pn000	0000h		Basic Function Selections 0	After restart
Pn001	0000h		Application Function Selections 1	After restart
Pn002	0011h		Application Function Selections 2	After restart
Pn006	0002h		Application Function Selections 6	Immediately
Pn007	0000h		Application Function Selections 7	Immediately
Pn008	4000h		Application Function Selections 8	After restart
Pn009	0010h		Application Function Selections 9	After restart
Pn00A	0001h		Application Function Selections A	After restart
Pn00B	0000h		Application Function Selections B	After restart
Pn00C	0000h		Application Function Selections C	After restart
Pn00D	0000h		Application Function Selections D	After restart
Pn00F	0000h		Application Function Selections F	After restart
Pn021	0000h		Reserved parameter	_
Pn022	0000h		Reserved parameter	_
Pn040	0000h		Σ-V Compatible Function Switch	After restart
Pn080	0000h		Application Function Selections 80	After restart
Pn081	0000h		Application Function Selections 81	After restart
Pn100	400		Speed Loop Gain	Immediately
Pn101	2000		Speed Loop Integral Time Constant	Immediately
Pn102	400		Position Loop Gain	Immediately
Pn103	100		Moment of Inertia Ratio	Immediately
Pn104	400		Second Speed Loop Gain	Immediately
Pn105	2000		Second Speed Loop Integral Time Constant	Immediately
Pn106	400		Second Position Loop Gain	Immediately
Pn109	0		Feedforward	Immediately
Pn10A	0		Feedforward Filter Time Constant	Immediately
Pn10B	0004h		Gain Application Selections	*1
Pn10C	200		Mode Switching Level for Torque Reference	Immediately
Pn10D	0		Mode Switching Level for Speed Reference	Immediately
Pn10E	0		Mode Switching Level for Acceleration	Immediately
Pn10F	0		Mode Switching Level for Position Deviation	Immediately

5.2.4 Parameter Recording Table

Continued from previous page.

D-:-		Continued from p	1 0
Parameter No.	Default Setting	Name	When Enabled
Pn11F	0	Position Integral Time Constant	Immediately
Pn121	100	Friction Compensation Gain	Immediately
Pn122	100	Second Friction Compensation Gain	Immediately
Pn123	0	Friction Compensation Coefficient	Immediately
Pn124	0	Friction Compensation Frequency Correction	Immediately
Pn125	100	Friction Compensation Gain Correction	Immediately
Pn131	0	Gain Switching Time 1	Immediately
Pn132	0	Gain Switching Time 2	Immediately
Pn135	0	Gain Switching Waiting Time 1	Immediately
Pn136	0	Gain Switching Waiting Time 2	Immediately
Pn139	0000h	Automatic Gain Switching Selections 1	Immediately
Pn13D	2000	Current Gain Level	Immediately
Pn13F	0	Less-Deviation Control 2 Second Position Integral Time Constant	Immediately
Pn140	0100h	Model Following Control- Related Selections	Immediately
Pn141	500	Model Following Control Gain	Immediately
Pn142	1000	Model Following Control Gain Correction	Immediately
Pn143	1000	Model Following Control Bias in the Forward Direction	Immediately
Pn144	1000	Model Following Control Bias in the Reverse Direction	Immediately
Pn145	500	Vibration Suppression 1 Frequency A	Immediately
Pn146	700	Vibration Suppression 1 Frequency B	Immediately
Pn147	1000	Model Following Control Speed Feedforward Compensation	Immediately
Pn148	500	Second Model Following Control Gain	Immediately
Pn149	1000	Second Model Following Control Gain Correction	Immediately
Pn14A	800	Vibration Suppression 2 Frequency	Immediately
Pn14B	100	Vibration Suppression 2 Correction	Immediately
Pn14F	0021h	Control-Related Selections	After restart
Pn160	0010h	Anti-Resonance Control-Related Selections	Immediately
Pn161	1000	Anti-Resonance Frequency	Immediately
Pn162	100	Anti-Resonance Gain Correction	Immediately

_		Continued from p	
Parameter No.	Default Setting	Name	When Enabled
Pn163	0	Anti-Resonance Damping Gain	Immediately
Pn164	0	Anti-Resonance Filter Time Constant 1 Correction	Immediately
Pn165	0	Anti-Resonance Filter Time Constant 2 Correction	Immediately
Pn166	0	Anti-Resonance Damping Gain 2	Immediately
Pn170	1400h	Tuning-less Function- Related Selections	*1
Pn181	0	Mode Switching Level for Speed Reference	Immediately
Pn182	0	Mode Switching Level for Acceleration	Immediately
Pn190	0100h	Less-Deviation Control- Related Switches	After restart
Pn191	1000	Less-Deviation Control 1 Feedforward Gain	Immediately
Pn192	1000	Less-Deviation Control 1 Second Feedforward Gain	Immediately
Pn193	30	Less-Deviation Control 1 Feedforward Filter Time Constant	Immediately
Pn195	2102h	Less-Deviation Function Selection Switches	After restart
Pn196	1000	Less-Deviation Control 2 Speed Feedforward Gain	Immediately
Pn197	50	Less-Deviation Control 2 Torque Feedforward Filter Time Constant	Immediately
Pn198	1000	Less-Deviation Control 2 Forward Torque Feedforward Gain	Immediately
Pn199	1000	Less-Deviation Control 2 Reverse Torque Feedforward Gain	Immediately
Pn19A	10000	Less-Deviation Control 2 Incomplete Integration Rate	Immediately
Pn19B	0	Less-Deviation Control 2 Rotary Servomotor Vis- cous Friction Compensa- tion Coefficient	Immediately
Pn19C	0	Reserved parameter	Immediately
Pn19D	0	Less-Deviation Control 2 Linear Servomotor Viscous Friction Compensation Coefficient	Immediately
Pn19E	0	Reserved parameter	Immediately
Pn19F	0	Less-Deviation Control 2 Torque Feedforward Moving Average Time	Immediately
Pn1A4	36	Reserved parameter	Immediately
Pn1A5	0	Reserved parameter	Immediately
Pn1AE	0	Reserved parameter	Immediately
Pn1AF	0	Reserved parameter	Immediately
Pn205	65535	Multiturn Limit	After restart

5.2.4 Parameter Recording Table

Continued from previous page.

Parameter No. Default Setting Name When Enabled Enabled Pn207 1000h Position Control Function Selections After restart Selections Pn20A 32768 Number of External Scale After restart Selections Pn20E 16 Electronic Gear Ratio (Numerator) After restart Selections Pn210 1 Electronic Gear Ratio (Denominator) After restart Selections Pn212 2048 Number of Encoder Output After restart Function Selections After restart Selections Pn22A 0000h Position Control Expansion Function Selections After restart Function Selections Pn230 0000h Position Control Expansion Function Selections After restart Function Selections Pn231 0 Backlash Compensation Immediately Immediately Immediately Time Constant Immediately Imm			Continued from p	
Page 1		Default Setting	Name	
Pn20E 16 Electronic Gear Ratio After restart Electronic Gear Ratio Numerator) After restart Electronic Gear Ratio Cheominator) After restart Electronic Gear Ratio Cheominator) After restart Pn212 2048 Pulses	Pn207	1000h		After restart
Pn210	Pn20A	32768		After restart
Pn212 2048 Number of Encoder Output Pulses Pn22A	Pn20E	16		After restart
Pn22A 0000h Fully-closed Control Selections After restart fully-closed Control Selections Pn230 0000h Position Control Expansion Function Selections After restart function Selections Immediately Pn231 0 Backlash Compensation Immediately Backlash Compensation Immediately Pn233 0 Backlash Compensation Immediately Time Constant Immediately Time Constant Immediately Time Constant Immediately Time Constant Immediately Time Constant Immediately Time Constant Immediately Time Constant Immediately Time Constant Immediately Time Constant Immediately Pn281 20 Encoder Output Resolution After restart Pn282 0 Encoder Output Resolution After restart Pn282 0 Encoder Output Resolution After restart Jogging Speed Immediately Pn304 500 Jogging Speed Immediately Immediately Immediately Immediately Immediately Immediately Immediately Pn306 0 Soft Start Acceleration Immediately Immediately Immediately Pn308 0 Speed Feedback Filter Immediately Immediately Pn308 0 Encoder Of Fand Forced Stops Immediately Immediately Pn308 0 Encoder Of Speed Feedforward Average Movement Time Immediately Immediately Pn310 0000h Vibration Detection Selections Encoder Of Speed Feedforward Average Movement Time Immediately Vibration Detection Selections Selections Immediately Immediately Pn312 50 Vibration Detection Level Immediately Pn312 50 Vibration Detection Level Immediately Pn314 100 Maximum Motor Speed After restart Moment of Inertia Calculation Starting Level Immediately Pn383 50 Jogging Speed Immediately Pn384 10 Vibration Detection Level Immediately Pn385 50 Maximum Motor Speed After restart Pn302 800 Forward Torque Limit Immediately	Pn210	1		After restart
Pn230 0000h Position Control Expansion Function Selections Pn231 0 Backlash Compensation Immediately Backlash Compensation Immediately Backlash Compensation Immediately Backlash Compensation Immediately Time Constant Immediately Time Constant Immediately Time Constant Immediately Time Constant Immediately Time Constant Immediately Time Constant Immediately Time Constant Immediately Time Constant Immediately Time Constant Immediately Time Constant Immediately Time Constant Immediately Deceleration Immediately Deceleration Immediately Deceleration Immediately Immediately Immediately Immediately Immediately Immediately Immediately Deceleration Immediately Immediately Deceleration Immediately Immediately Deceleration Immediately Immediately Immediately Deceleration Immediately Immediately Deceleration Immediately Immediately Deceleration Immediately Immediately Deceleration Immediately Immediately Deceleration Immediately Immediately Deceleration Detection Selections Immediately Deceleration Detection Detection Selections Understant Detection D	Pn212	2048		After restart
Pn231 0 Backlash Compensation Immediately Pn233 0 Backlash Compensation Immediately Pn233 0 Backlash Compensation Immediately Immediately Pn234 0 Backlash Compensation Immediately Immediately Time Constant Immediately Time Constant Immediately Time Constant Immediately Time Constant Immediately Time Constant Immediately Time Constant Immediately Time Constant After restart After Pn282 0 Encoder Output Resolution After restart Jogging Speed Immediately Jogging Speed Immediately Soft Start Acceleration Immediately Soft Start Acceleration Immediately Soft Start Deceleration Immediately Pn306 0 Soft Start Deceleration Immediately Immediately Deceleration Time Immediately Deceleration Time Immediately Deceleration Time Onstant Immediately Deceleration Time Onstant Immediately Deceleration Time Immediately Deceleration Time Immediately Deceleration Time Immediately Deceleration Time Immediately Deceleration Time Immediately Deceleration Time Immediately Deceleration Detection Selections Selections Detection Selections Detection Selections Detection Selections Detection Selections Detection Selections Detection Detection Detection Selections Detection Detection Detection Detection Detection Detection Detection Detection Sensitivity Under Detection Detec	Pn22A	0000h		After restart
Pn233 0 Backlash Compensation Time Constant Immediately Pn234 0 Second Position Reference Acceleration/Deceleration Time Constant Immediately Pn281 20 Encoder Output Resolution After restart Pn282 0 Linear Encoder Scale Pitch After restart Pn304 500 Jogging Speed Immediately Pn305 0 Soft Start Acceleration Time Immediately Pn306 0 Soft Start Deceleration Time Immediately Pn308 0 Speed Feedback Filter Time Constant Immediately Pn30A 0 Deceleration Time for Servo OFF and Forced Stops OFF and	Pn230	0000h		After restart
Pn284 0 Second Position Reference Acceleration/Deceleration Time Constant Immediately Time Constant Pn282 0 Encoder Output Resolution After restart Pn282 0 Linear Encoder Scale Pitch After restart Pn304 500 Jogging Speed Immediately Pn305 0 Soft Start Acceleration Immediately Pn306 0 Soft Start Acceleration Immediately Pn306 0 Soft Start Deceleration Immediately Pn308 0 Soft Start Deceleration Immediately Pn308 0 Soft Start Deceleration Immediately Pn308 0 Soft Start Deceleration Immediately Pn308 0 Soft Start Deceleration Immediately Pn308 0 Soft Start Deceleration Immediately Speed Feedback Filter Immediately OFF and Forced Stops Immediately OFF and Forced Stops Immediately OFF and Forced Stops Immediately Pn300 Speed Feedforward Average Movement Time Immediately Vibration Detection Selections Selections Immediately Vibration Detection Sensitivity Vibration Detection Level Immediately Pn312 50 Vibration Detection Level Immediately Novement Stops Immediately Novement Stops Immediately Novement Stops Immediately Novement Stops Immediately Novement Stops Immediately Novement Stops Immediately Novement Stops Immediately Novement Stops Immediately Novement Stops Immediately Novement Stops Immediately Immediately Novement Stops Immediately Immediatel	Pn231	0	Backlash Compensation	Immediately
Pn281 0 Acceleration/Deceleration Time Constant Immediately Time Constant Pn282 0 Encoder Output Resolution After restart Pn304 500 Linear Encoder Scale Pitch After restart Pn305 0 Soft Start Acceleration Time Immediately Pn306 0 Soft Start Deceleration Time Immediately Pn308 0 Speed Feedback Filter Time Constant Immediately Pn30A 0 Deceleration Time for Servo OFF and Forced Stops Immediately Pn30C 0 Speed Feedforward Average Movement Time Immediately Pn310 0000h Vibration Detection Selections Immediately Pn311 100 Vibration Detection Sensitivity Immediately Pn312 50 Vibration Detection Level Immediately Pn316 10000 Maximum Motor Speed After restart Pn324 300 Moment of Inertia Calculation Starting Level Immediately Pn383 50 Jogging Speed Immediately Pn384 10 Vi	Pn233	0		Immediately
Pn282 0 Linear Encoder Scale Pitch After restart Pn304 500 Jogging Speed Immediately Pn305 0 Soft Start Acceleration Time Immediately Pn306 0 Soft Start Deceleration Time Immediately Pn308 0 Speed Feedback Filter Time Constant Immediately Pn30A 0 Deceleration Time for Servo OFF and Forced Stops Immediately Pn30C 0 Speed Feedforward Average Movement Time Immediately Pn310 0000h Vibration Detection Selections Immediately Pn311 100 Vibration Detection Sensitivity Immediately Pn312 50 Vibration Detection Level Immediately Pn316 10000 Maximum Motor Speed After restart Pn324 300 Moment of Inertia Calculation Starting Level Immediately Pn383 50 Jogging Speed Immediately Pn384 10 Vibration Detection Level Immediately Pn385 50 Maximum Motor Speed After	Pn234	0	Acceleration/Deceleration	Immediately
Pn304 500 Jogging Speed Immediately Pn305 0 Soft Start Acceleration Time Immediately Pn306 0 Soft Start Deceleration Time for Start Deceleration Time for Start Dimediately Immediately Pn308 0 Speed Feedback Filter Time Constant Immediately Immediately Pn30A 0 Deceleration Time for Servo OFF and Forced Stops Immediately Pn30C 0 Speed Feedfonward Average Movement Time Immediately Immediately Pn310 0000h Vibration Detection Selections Immediately Pn311 100 Vibration Detection Level Immediately Immediately Pn312 50 Vibration Detection Level Immediately Immediately Pn316 10000 Maximum Motor Speed After restart Immediately Pn324 300 Jogging Speed Immediately Immediately Pn383 50 Jogging Speed Immediately Immediately Pn384 10 Vibration Detection Level Immediately Immediately Pn385 50 Maximum Motor Speed After restart Immediately	Pn281	20	Encoder Output Resolution	After restart
Pn305 0 Soft Start Acceleration Time Immediately Pn306 0 Soft Start Deceleration Time Immediately Pn308 0 Speed Feedback Filter Time Constant Immediately Pn30A 0 Deceleration Time for Servo OFF and Forced Stops Immediately Pn30C 0 Speed Feedforward Average Movement Time Immediately Pn310 0000h Vibration Detection Selection Selection Immediately Pn311 100 Vibration Detection Sensitivity Immediately Pn312 50 Vibration Detection Level Immediately Pn316 10000 Maximum Motor Speed After restart Pn324 300 Moment of Inertia Calculation Starting Level Immediately Pn383 50 Jogging Speed Immediately Pn384 10 Vibration Detection Level Immediately Pn385 50 Maximum Motor Speed After restart Pn401 100 Forward Torque Limit Immediately Pn402 800 Forward Torque Limit	Pn282	0	Linear Encoder Scale Pitch	After restart
Pn306 0 Time Immediately Pn306 0 Soft Start Deceleration Immediately Pn308 0 Deceleration Time Constant Immediately Pn30A 0 Deceleration Time for Servo OFF and Forced Stops Pn30C 0 Speed Feedforward Average Movement Time Immediately Pn310 0000h Vibration Detection Selections Pn311 100 Vibration Detection Sensitivity Pn312 50 Vibration Detection Level Immediately Pn316 10000 Maximum Motor Speed After restart Pn324 300 Moment of Inertia Calculation Starting Level Pn383 50 Jogging Speed Immediately Pn384 10 Vibration Detection Level Immediately Pn385 50 Maximum Motor Speed After restart Pn401 100 Pn401 100 Pn401 Immediately Pn402 800 Forward Torque Entire Time Constant Pn403 800 Reverse Torque Limit Immediately Pn404 100 Reverse External Torque Immediately Pn405 100 Reverse External Torque Immediately Immediately Immediately Immediately Immediately Pn405 Immediately Immediately Immediately Immediately Immediately Immediately Immediately Immediately	Pn304	500	Jogging Speed	Immediately
Pn308 0 Time Immediately Pn308 0 Speed Feedback Filter Time Constant Immediately Pn30A 0 Deceleration Time for Servo OFF and Forced Stops OFF and Forced Stops OFF and Forced Stops OFF and Forced Stops OFF and Forced Stops Immediately Pn30C 0 Speed Feedforward Average Movement Time Immediately Pn310 0000h Vibration Detection Selections Immediately Pn311 100 Vibration Detection Sensitivity Immediately Pn312 50 Vibration Detection Level Immediately Pn316 10000 Maximum Motor Speed After restart Pn324 300 Moment of Inertia Calculation Starting Level Immediately Pn383 50 Jogging Speed Immediately Pn384 10 Vibration Detection Level Immediately Pn385 50 Maximum Motor Speed After restart Pn326 First Stage First Torque Reference Filter Time Constant Pn401 100 Forward Torque Limit Immediately Pn403 800 Forward Torque Limit Immediately Pn404 100 Reverse External Torque Limit Immediately Pn405 100 Reverse External Torque Limit Immediately	Pn305	0		Immediately
Pn30A 0 Deceleration Time for Servo OFF and Forced Stops Immediately Pn30C 0 Speed Feedforward Average Movement Time Pn310 0000h Vibration Detection Selections Immediately Pn311 100 Vibration Detection Sensitivity Immediately Pn312 50 Vibration Detection Level Immediately Pn316 10000 Maximum Motor Speed After restart Pn324 300 Moment of Inertia Calculation Starting Level Immediately Pn383 50 Jogging Speed Immediately Pn384 10 Vibration Detection Level Immediately Pn385 50 Maximum Motor Speed After restart Pn401 100 Reference Filter Time Constant Pn402 800 Forward Torque Limit Immediately Pn403 800 Reverse Torque Limit Immediately Pn404 100 Reverse External Torque Immediately Pn405 100 Reverse External Torque Immediately Immediately Pn405 Immediately Immediately Immediately	Pn306	0		Immediately
Pn30C 0 Speed Feedforward Average Movement Time Immediately Pn310 0000h Vibration Detection Selections Pn311 100 Vibration Detection Sensitivity Immediately Pn312 50 Vibration Detection Level Immediately Pn316 10000 Maximum Motor Speed After restart Pn324 300 Moment of Inertia Calculation Starting Level Immediately Pn383 50 Jogging Speed Immediately Pn384 10 Vibration Detection Level Immediately Pn385 50 Maximum Motor Speed After restart Pn401 100 First Stage First Torque Reference Filter Time Constant Pn402 800 Forward Torque Limit Immediately Pn403 800 Reverse Torque Limit Immediately Pn404 100 Reverse External Torque Immediately Immediately Pn405 100 Reverse External Torque Immediately	Pn308	0		Immediately
Pn310 0000h Vibration Detection Selections Immediately Pn311 100 Vibration Detection Sensitivity Immediately Pn312 50 Vibration Detection Level Immediately Pn316 10000 Maximum Motor Speed After restart Pn324 300 Moment of Inertia Calculation Starting Level Immediately Pn383 50 Jogging Speed Immediately Pn384 10 Vibration Detection Level Immediately Pn385 50 Maximum Motor Speed After restart Pn401 100 Forward Torque Limit Immediately Pn402 800 Forward Torque Limit Immediately Pn403 800 Reverse Torque Limit Immediately Pn404 100 Reverse External Torque Limit Immediately Pn405 100 Reverse External Torque Limit Immediately Immediately Pn405 Inmediately Immediately	Pn30A	0		Immediately
Pn311 100 Vibration Detection Sensitivity Pn312 50 Vibration Detection Level Immediately Pn316 10000 Maximum Motor Speed After restart Pn324 300 Moment of Inertia Calculation Starting Level Immediately Pn383 50 Jogging Speed Immediately Pn384 10 Vibration Detection Level Immediately Pn385 50 Maximum Motor Speed After restart Pn401 100 First Stage First Torque Reference Filter Time Constant Pn402 800 Forward Torque Limit Immediately Pn403 800 Reverse Torque Limit Immediately Pn404 100 Reverse External Torque Immediately Pn405 100 Reverse External Torque Immediately Immediately Pn405 Inmediately Immediately	Pn30C	0	age Movement Time	Immediately
Pn312 50 Vibration Detection Level Immediately Pn316 10000 Maximum Motor Speed After restart Pn324 300 Moment of Inertia Calculation Starting Level Immediately Pn383 50 Jogging Speed Immediately Pn384 10 Vibration Detection Level Immediately Pn385 50 Maximum Motor Speed After restart Pn401 100 First Stage First Torque Reference Filter Time Constant Pn402 800 Forward Torque Limit Immediately Pn403 800 Reverse Torque Limit Immediately Pn404 100 Reverse External Torque Immediately Pn405 100 Reverse External Torque Immediately Pn405 Inmediately	Pn310	0000h	tions	Immediately
Pn31610000Maximum Motor SpeedAfter restartPn324300Moment of Inertia Calculation Starting LevelImmediatelyPn38350Jogging SpeedImmediatelyPn38410Vibration Detection LevelImmediatelyPn38550Maximum Motor SpeedAfter restartPn401100First Stage First Torque Reference Filter Time ConstantImmediatelyPn402800Forward Torque LimitImmediatelyPn403800Reverse Torque LimitImmediatelyPn404100Forward External Torque LimitImmediatelyPn405100Reverse External Torque LimitImmediately			tivity	,
Pn324300Moment of Inertia Calculation Starting LevelImmediatelyPn38350Jogging SpeedImmediatelyPn38410Vibration Detection LevelImmediatelyPn38550Maximum Motor SpeedAfter restartPn401100First Stage First Torque Reference Filter Time ConstantImmediatelyPn402800Forward Torque LimitImmediatelyPn403800Reverse Torque LimitImmediatelyPn404100Forward External Torque LimitImmediatelyPn405100Reverse External Torque LimitImmediately				_
Pn383 50 Jogging Speed Immediately Pn384 10 Vibration Detection Level Immediately Pn385 50 Maximum Motor Speed After restart Pn401 100 First Stage First Torque Reference Filter Time Constant Pn402 800 Forward Torque Limit Immediately Pn403 800 Reverse Torque Limit Immediately Pn404 100 Forward External Torque Limit Reverse External Torque Limit Immediately Reverse External Torque Limit Immediately Immediately	Pn316	10000	·	After restart
Pn38410Vibration Detection LevelImmediatelyPn38550Maximum Motor SpeedAfter restartPn401100First Stage First Torque Reference Filter Time ConstantImmediatelyPn402800Forward Torque LimitImmediatelyPn403800Reverse Torque LimitImmediatelyPn404100Forward External Torque LimitImmediatelyPn405100Reverse External Torque LimitImmediately			tion Starting Level	
Pn38550Maximum Motor SpeedAfter restartPn401100First Stage First Torque Reference Filter Time Con- stantImmediatelyPn402800Forward Torque LimitImmediatelyPn403800Reverse Torque LimitImmediatelyPn404100Forward External Torque LimitImmediatelyPn405100Reverse External Torque LimitImmediately				
Pn401 100 First Stage First Torque Reference Filter Time Constant Immediately Stant Forward Torque Limit Immediately Pn403 800 Reverse Torque Limit Immediately Pn404 100 Forward External Torque Limit Immediately Reverse External Torque Limit Immediately Immediately Pn405 100 Reverse External Torque Limit Immediately				
Pn401100Reference Filter Time ConstantImmediatelyPn402800Forward Torque LimitImmediatelyPn403800Reverse Torque LimitImmediatelyPn404100Forward External Torque LimitImmediatelyPn405100Reverse External Torque LimitImmediately	Pn385	50	·	After restart
Pn403 800 Reverse Torque Limit Immediately Pn404 100 Forward External Torque Limit Immediately Pn405 100 Reverse External Torque Limit Immediately	Pn401	100	Reference Filter Time Con-	Immediately
Pn404 100 Forward External Torque Limit Immediately Pn405 100 Reverse External Torque Limit Immediately	Pn402	800	Forward Torque Limit	Immediately
Pn405 100 Limit Reverse External Torque Limit Immediately	Pn403	800	Reverse Torque Limit	Immediately
Limit Immediately	Pn404	100		Immediately
Pn406 800 Emergency Stop Torque Immediately			Limit	
	Pn406	800	Emergency Stop Torque	Immediately

Continued from previous page.

D 1		Continued from p	
Parameter No.	Default Setting	Name	When Enabled
Pn407	10000	Speed Limit during Torque Control	Immediately
Pn408	0000h	Torque-Related Function Selections	*1
Pn409	5000	First Stage Notch Filter Frequency	Immediately
Pn40A	70	First Stage Notch Filter Q Value	Immediately
Pn40B	0	First Stage Notch Filter Depth	Immediately
Pn40C	5000	Second Stage Notch Filter Frequency	Immediately
Pn40D	70	Second Stage Notch Filter Q Value	Immediately
Pn40E	0	Second Stage Notch Filter Depth	Immediately
Pn40F	5000	Second Stage Second Torque Reference Filter Frequency	Immediately
Pn410	50	Second Stage Second Torque Reference Filter Q Value	Immediately
Pn412	100	First Stage Second Torque Reference Filter Time Constant	Immediately
Pn416	0000h	Torque-Related Function Selections 2	Immediately
Pn417	5000	Third Stage Notch Filter Frequency	Immediately
Pn418	70	Third Stage Notch Filter Q Value	Immediately
Pn419	0	Third Stage Notch Filter Depth	Immediately
Pn41A	5000	Fourth Stage Notch Filter Frequency	Immediately
Pn41B	70	Fourth Stage Notch Filter Q Value	Immediately
Pn41C	0	Fourth Stage Notch Filter Depth	Immediately
Pn41D	5000	Fifth Stage Notch Filter Frequency	Immediately
Pn41E	70	Fifth Stage Notch Filter Q Value	Immediately
Pn41F	0	Fifth Stage Notch Filter Depth	Immediately
Pn423	0000h	Speed Ripple Compensation Selections	*1
Pn424	50	Torque Limit at Main Circuit Voltage Drop	Immediately
Pn425	100	Release Time for Torque Limit at Main Circuit Voltage Drop	Immediately
Pn426	0	Torque Feedforward Average Movement Time	Immediately
Pn427	0	Speed Ripple Compensation Enable Speed	Immediately

5.2.4 Parameter Recording Table

Continued from previous page.

		Continued from p	
Parameter No.	Default Setting	Name	When Enabled
Pn456	15	Sweep Torque Reference Amplitude	Immediately
Pn460	0101h	Notch Filter Adjustment Selections 1	Immediately
Pn475	0000h	Gravity Compensation- Related Selections	After restart
Pn476	0	Gravity Compensation Torque	Immediately
Pn480	10000	Speed Limit during Force Control	Immediately
Pn481	400	Polarity Detection Speed Loop Gain	Immediately
Pn482	3000	Polarity Detection Speed Loop Integral Time Constant	Immediately
Pn483	30	Forward Force Limit	Immediately
Pn484	30	Reverse Force Limit	Immediately
Pn485	20	Polarity Detection Reference Speed	Immediately
Pn486	25	Polarity Detection Reference Acceleration/Deceleration Time	Immediately
Pn487	0	Polarity Detection Constant Speed Time	Immediately
Pn488	100	Polarity Detection Reference Waiting Time	Immediately
Pn48E	10	Polarity Detection Range	Immediately
Pn490	100	Polarity Detection Load Level	Immediately
Pn495	100	Polarity Detection Confirmation Force Reference	Immediately
Pn498	10	Polarity Detection Allowable Error Range	Immediately
Pn49F	0	Speed Ripple Compensa- tion Enable Speed	Immediately
Pn502	20	Rotation Detection Level	Immediately
Pn503	10	Speed Coincidence Detection Signal Output Width	Immediately
Pn506	0	Brake Reference-Servo OFF Delay Time	Immediately
Pn507	100	Brake Reference Output Speed Level	Immediately
Pn508	50	Servo OFF-Brake Com- mand Waiting Time	Immediately
Pn509	20	Momentary Power Interruption Hold Time	Immediately
Pn50A	1881h	Input Signal Selections 1	After restart
Pn50B	8882h	Input Signal Selections 2	After restart
Pn50E	0000h	Output Signal Selections 1	After restart
Pn50F	0100h	Output Signal Selections 2	After restart
Pn510	0000h	Output Signal Selections 3	After restart
Pn511	6543h	Input Signal Selections 5	After restart
Pn512	0000h	Output Signal Inverse Settings	After restart
Pn514	0000h	Output Signal Selections 4	After restart

Continued from previous page.

		Continued from p	orevious page.
Parameter No.	Default Setting	Name	When Enabled
Pn516	8888h	Input Signal Selections 7	After restart
Pn51B	1000	Motor-Load Position Deviation Overflow Detection Level	Immediately
Pn51E	100	Position Deviation Over- flow Warning Level	Immediately
Pn520	5242880	Position Deviation Over- flow Alarm Level	Immediately
Pn522	7	Positioning Completed Width	Immediately
Pn524	1073741824	Near Signal Width	Immediately
Pn526	5242880	Position Deviation Over- flow Alarm Level at Servo ON	Immediately
Pn528	100	Position Deviation Over- flow Warning Level at Servo ON	Immediately
Pn529	10000	Speed Limit Level at Servo ON	Immediately
Pn52A	20	Multiplier per Fully-closed Rotation	Immediately
Pn52B	20	Overload Warning Level	Immediately
Pn52C	100	Base Current Derating at Motor Overload Detection	After restart
Pn530	0000h	Program Jogging-Related Selections	Immediately
Pn531	32768	Program Jogging Travel Distance	Immediately
Pn533	500	Program Jogging Move- ment Speed	Immediately
Pn534	100	Program Jogging Acceleration/Deceleration Time	Immediately
Pn535	100	Program Jogging Waiting Time	Immediately
Pn536	1	Program Jogging Number of Movements	Immediately
Pn550	0	Analog Monitor 1 Offset Voltage	Immediately
Pn551	0	Analog Monitor 2 Offset Voltage	Immediately
Pn552	100	Analog Monitor 1 Magnifi- cation	Immediately
Pn553	100	Analog Monitor 2 Magnifi- cation	Immediately
Pn55A	1	Power Consumption Monitor Unit Time	Immediately
Pn560	400	Residual Vibration Detection Width	Immediately
Pn561	100	Overshoot Detection Level	Immediately
Pn581	20	Zero Speed Level	Immediately
Pn582	10	Speed Coincidence Detection Signal Output Width	Immediately
Pn583	10	Brake Reference Output Speed Level	Immediately
Pn584	10000	Speed Limit Level at Servo ON	Immediately

5.2.4 Parameter Recording Table

Continued from previous page.

Parameter		Continued from p	When
No.	Default Setting	Name	Enabled
Pn585	50	Program Jogging Movement Speed	Immediately
Pn586	0	Motor Running Cooling Ratio	Immediately
Pn587	0000h	Polarity Detection Execution Selection for Absolute Linear Encoder	Immediately
Pn600	0	Regenerative Resistor Capacity	Immediately
Pn601	0	Dynamic Brake Resistor Allowable Energy Consumption	After restart
Pn603	0	Regenerative Resistance	Immediately
Pn604	0	Dynamic Brake Resistance	After restart
Pn61A	0000h	Overheat Protection Selections	After restart
Pn61B	250	Overheat Alarm Level	Immediately
Pn61C	100	Overheat Warning Level	Immediately
Pn61D	0	Overheat Alarm Filter Time	Immediately
Pn800	1040h	Communications Controls	Immediately
Pn801	0003h	Application Function Selections 6 (Software Limits)	Immediately
Pn803	10	Origin Range	Immediately
Pn804	1073741823	Forward Software Limit	Immediately
Pn806	-1073741823	Reverse Software Limit	Immediately
Pn808	0	Absolute Encoder Origin Offset	Immedi- ately ^{*2}
Pn80A	100	First Stage Linear Acceleration Constant	Immedi- ately*3
Pn80B	100	Second Stage Linear Acceleration Constant	Immedi- ately*3
Pn80C	0	Acceleration Constant Switching Speed	Immedi- ately*3
Pn80D	100	First Stage Linear Deceleration Constant	Immedi- ately*3
Pn80E	100	Second Stage Linear Deceleration Constant	Immedi- ately*3
Pn80F	0	Deceleration Constant Switching Speed	Immedi- ately*3
Pn810	0	Exponential Acceleration/ Deceleration Bias	Immedi- ately*3
Pn811	0	Exponential Acceleration/ Deceleration Time Constant	Immedi- ately*3
Pn812	0	Movement Average Time	Immedi- ately*3
Pn814	100	External Positioning Final Travel Distance	Immedi- ately*3
Pn816	0000h	Origin Return Mode Settings	Immedi- ately*3
Pn817	50	Origin Approach Speed 1	Immedi- ately*3
Pn818	5	Origin Approach Speed 2	Immedi- ately*3

Continued	from	previous	page.

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Parameter No.	Default Setting	Name	When Enabled
Pn819	100	Final Travel Distance for Origin Return	Immedi- ately*3
Pn81E	0000h	Input Signal Monitor Selections	Immediately
Pn81F	0010h	Command Data Allocations	After restart
Pn820	0	Forward Latching Area	Immediately
Pn822	0	Reverse Latching Area	Immediately
Pn824	0000h	Option Monitor 1 Selection	Immediately
Pn825	0000h	Option Monitor 2 Selection	Immediately
Pn827	100	Linear Deceleration Constant 1 for Stopping	Immedi- ately*3
Pn829	0	SVOFF Waiting Time (for SVOFF at Deceleration to Stop)	Immediately
Pn82A	1813h	Option Field Allocations 1	After restart
Pn82B	1D1Ch	Option Field Allocations 2	After restart
Pn82C	1F1Eh	Option Field Allocations 3	After restart
Pn82D	0000h	Option Field Allocations 4	After restart
Pn82E	0000h	Option Field Allocations 5	After restart
Pn833	0000h	Motion Settings	After restart
Pn834	100	First Stage Linear Acceleration Constant 2	Immedi- ately*3
Pn836	100	Second Stage Linear Acceleration Constant 2	Immedi- ately*3
Pn838	0	Acceleration Constant Switching Speed 2	Immedi- ately*3
Pn83A	100	First Stage Linear Deceleration Constant 2	Immedi- ately*3
Pn83C	100	Second Stage Linear Deceleration Constant 2	Immedi- ately*3
Pn83E	0	Deceleration Constant Switching Speed 2	Immedi- ately*3
Pn840	100	Linear Deceleration Constant 2 for Stopping	Immedi- ately*3
Pn842	0	Second Origin Approach Speed 1	Immedi- ately*3
Pn844	0	Second Origin Approach Speed 2	Immedi- ately*3
Pn846	0	POSING Command Scurve Acceleration/Deceleration Rate Immediately*	
Pn850	0	Number of Latch Sequences	Immediately
Pn851	0	Continuous Latch Sequence Count	Immediately
Pn852	0000h	Latch Sequence 1 to 4 Settings	Immediately
Pn853	0000h	Latch Sequence 5 to 8 Settings	Immediately
Pn860	0000h	SVCMD_IO Input Signal Monitor Allocations 1	Immediately
Pn861	0000h	SVCMD_IO Input Signal Monitor Allocations 2	Immediately

5.2.4 Parameter Recording Table

Continued from previous page.

		Continued from p		
Parameter No.	Default Setting	Name	When Enabled	
Pn862	0000h	SVCMD_IO Input Signal Monitor Allocations 3	Immediately	
Pn863	0000h	SVCMD_IO Input Signal Monitor Allocations 4	Immediately	
Pn868	0000h	SVCMD_IO Output Signal Monitor Allocations 1	Immediately	
Pn869	0000h	SVCMD_IO Output Signal Monitor Allocations 2	Immediately	
Pn880	-	Station Address Monitor (for maintenance, read only)	Immediately	
Pn881	_	Set Transmission Byte Count Monitor [bytes] (for maintenance, read only)	Immediately	
Pn882	-	Transmission Cycle Setting Monitor [× 0.25 μs] (for maintenance, read only)	Immediately	
Pn883	-	Communications Cycle Setting Monitor [transmis- sion cycles] (for mainte- nance, read only)	Immediately	
Pn884	0000h	Communications Controls 2	Immediately	
Pn88A	0	MECHATROLINK Receive Error Counter Monitor (for maintenance, read only)	Immediately	
Pn890 to Pn8A6	0h	Command Data Monitor during Alarm/Warning (for maintenance, read only)	Immediately	
Pn8A8 to Pn8BE	Oh	Response Data Monitor during Alarm/Warning (for maintenance, read only)	Immediately	
Pn900	0	Number of Parameter Banks	After restart	
Pn901	0	Number of Parameter Bank Members	After restart	
Pn902 to Pn910	0000h	Parameter Bank Member Definition	After restart	
Pn920 to Pn95F	0000h	Parameter Bank Data (Not saved in nonvolatile memory.)	Immediately	
01 PnA02	-	Encoder Type Selection (read only)	Encoder Type Selection	
02 PnA04	-	Motor Type Selection (read only)	-	
03 PnA06	-	Semi-closed/Fully-closed Selection (read only)	-	
04 PnA08	-	Rated Motor Speed (read only)	_	
05 PnA0A	-	Maximum Output Speed (read only)	_	
06 PnA0C	-	Speed Multiplier (read only)	_	
07 PnA0E	-	Rated Torque (read only)	_	

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		Continued from p	revious page.
Parameter No.	Default Setting	Name	When Enabled
08 PnA10	-	Maximum Output Torque (read only)	_
09 PnA12	_	Torque Multiplier (read only)	_
0A PnA14	_	Resolution (read only)	_
0B PnA16	0	Scale Pitch	After restart
0C PnA18	-	Pulses per Scale Pitch (read only)	_
21 PnA42	16	Electronic Gear Ratio (Numerator)	After restart
22 PnA44	1	Electronic Gear Ratio (Denominator)	After restart
23 PnA46	0	Absolute Encoder Origin Offset	Immedi- ately ^{*2}
24 PnA48	65535	Multiturn Limit Setting	After restart
25 PnA4A	0000h	Limit Setting	After restart
26 PnA4C	1073741823	Forward Software Limit	Immediately
27 PnA4E	0	Reserved parameter (Do not change.)	Immediately
28 PnA50	-1073741823	Reverse Software Limit	Immediately
29 PnA52	0	Reserved parameter (Do not change.)	Immediately
41 PnA82	0h	Speed Unit Selection	After restart
42 PnA84	0	Speed Base Unit Selection	After restart
43 PnA86	0h	Position Unit Selection	After restart
44 PnA88	0	Position Base Unit Selection	After restart
45 PnA8A	0h	Acceleration Unit Selection	After restart
46 PnA8C	4	Acceleration Base Unit Selection	After restart
47 PnA8E	1h	Torque Unit Selection	After restart
48 PnA90	0	Torque Base Unit Selection	After restart
49 PnA92	0601011Fh	Supported Unit Systems (read only)	-
61 PnAC2	40000	Speed Loop Gain	Immediately
62 PnAC4	20000	Speed Loop Integral Time Constant	Immediately
63 PnAC6	40000	Position Loop Gain	Immediately
64 PnAC8	0	Feedforward Compensation	Immediately
			•

5.2.4 Parameter Recording Table

Continued from previous page.

Parameter No.	Default Setting	Name	When Enabled	
65 PnACA	0	Position Loop Integ Constant	ral Time Immediately	
66 PnACC	7	Positioning Comple Width	eted Immediately	
67 PnACE	1073741824	Near Signal Width	Immediately	
81 PnB02	0	Exponential Accele Deceleration Time		
82 PnB04	0	Movement Average	Time Immediately*3	
83 PnB06	100	External Positioning Travel Distance	g Final Immediately	
84 PnB08	× 5,000h reference units/s converted to 10 ⁻³ min ⁻¹	Origin Approach Sp	peed Immediately	
85 PnB0A	× 500h reference units/s converted to 10 ⁻³ min ⁻¹	Origin Return Cree	p Speed Immediately	
86 PnB0C	100	Final Travel Distanc Origin Return	e for Immediately	
87 PnB0E	1h	Fixed Monitor Selection	ction 1 Immediately	
88 PnB10	Oh	Fixed Monitor Selection	ction 2 Immediately	
89 PnB12	Oh	SEL_MON (CMN1) Selection 1	Monitor Immediately	
8A PnB14	0h	SEL_MON (CMN2) Selection 2	Monitor Immediately	
8B PnB16	10	Origin Detection W	idth Immediately	
8C PnB18	100	Forward Torque Lin	nit Immediately	
8D PnB1A	100	Reverse Torque Lin	nit Immediately	
8E PnB1C	20000	Zero Speed Detect Range	Zero Speed Detection Range Immediately	
8F PnB1E	10000	Speed Coincidence Detection Width	e Signal Immediately	
90 PnB20	0FFF3F3Fh	Servo Command C Field Enable/Disabl tions (read only)		
91 PnB22	0FFF3F33h	Servo Status Field Disable Selections only)		
92 PnB24	007F01F0h	Output Bit Enable/I Selections (read on		
93 PnB26	FF0FFEFEh	Input Bit Enable/Dis Selections (read on		

^{*1.} The enable timing depends on the digit that is changed. Refer to the following section for details.

^{5.2.2} List of Servo Parameters on page 5-45

^{5.2.3} List of MECHATROLINK-III Common Parameters on page 5-85

^{*2.} The parameter setting is enabled after SENS_ON command execution is completed.

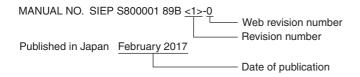
^{*3.} Change the setting when the reference is stopped (i.e., while DEN is set to 1). If you change the setting during operation, the reference output will be affected.



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The revision dates and numbers of the revised manuals are given on the bottom of the back cover.



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Σ -7-Series AC Servo Drive

Σ -7S SERVOPACK with FT/EX Specification for Tracking Application

Product Manual

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