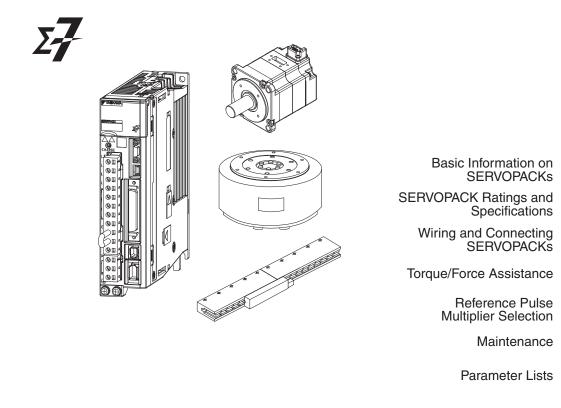
# YASKAWA

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# $\Sigma$ -7-Series AC Servo Drive $\Sigma$ -7S SERVOPACK with FT/EX Specification for Torque/Force Assistance for Conveyance Application Product Manual

Model: SGD7S-000000000770, -000020000770



MANUAL NO. SIEP S800002 09C

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# About this Manual

This manual describes torque/force assistance of  $\Sigma$ -7-Series AC Servo Drive  $\Sigma$ -7S SERVOPACKs for conveyance applications.

Read and understand this manual to ensure correct usage of the  $\Sigma$ -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.

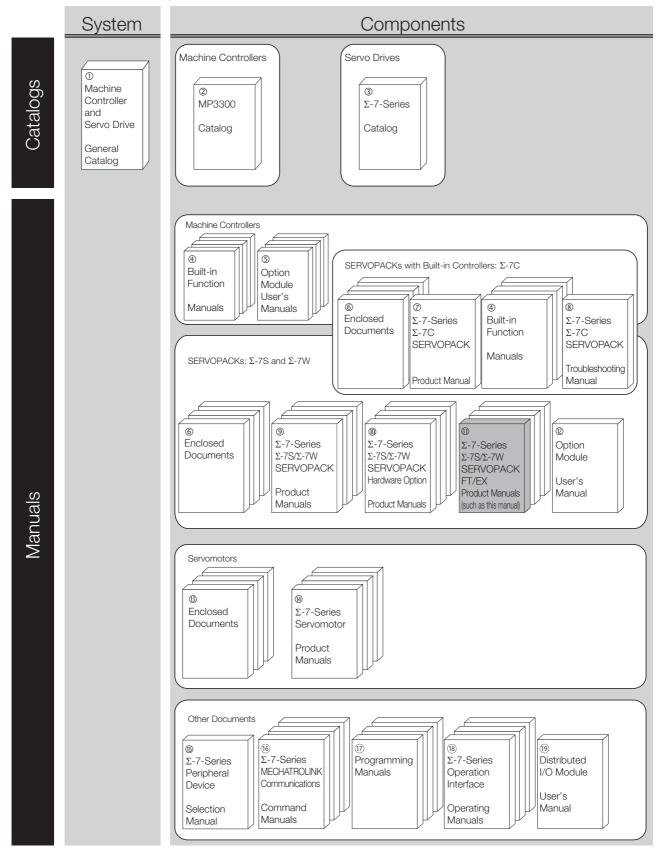
Item		This Manual	Σ-7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual (Manual No.: SIEP S800001 26)	Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)	
	The $\Sigma$ -7 Series	-	1.1	1.1	
	Product Introduction	1.1	-	_	
	Interpreting the Name- plate	-	1.2	1.2	
	Part Names	-	1.3	1.3	
	Model Designations	1.2	-	_	
Basic Information on	Combinations of SERVO- PACKs and Servomotors	-	1.5	1.5	
SERVOPACKs	Functions	1.4	_	_	
	Restrictions	1.5	-	_	
	SigmaWin+	1.6	-	_	
	Combining the SERVO- PACKs with MP-Series Machine Controllers and the MPE720 Engineering Tool	1.7	_	-	
	Ratings	2.1	_	_	
	SERVOPACK Overload Protection Characteristics	2.2	_	-	
	Specifications	2.3	-	_	
Selecting a	Block Diagrams	-	2.2	2.2	
SERVOPACK	External Dimensions	-	2.3	2.3	
	Examples of Standard Connections between SERVOPACKs and Peripheral Devices	_	2.4	2.4	
SERVOPACK Ir	nstallation	-	Chapter 3	Chapter 3	
	Continued on next page				

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	Item	This Manual	Σ-7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual (Manual No.: SIEP S800001 26)	Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)
	Wiring Precautions	_	4.1	4.1
	Basic Wiring Diagrams	_	4.2	4.2
	Wiring the Power Supply to the SERVOPACK	_	4.3	4.3
	Wiring Servomotors	3.1	4.4	4.4
	I/O Signal Connections	3.2	4.5	4.5
Wiring and Connecting	Connecting Safety Func- tion Signals	_	4.6	4.6
SERVOPAČKs	Connecting MECHA- TROLINK Communica- tions Cables	-	_	4.7
	Connecting the Other Connectors	_	4.7	4.8
	Connecting Serial Com- munications Cables for Torque/Force Assistance	3.3	_	_
Basic Functions before Operation	s That Require Setting on	-	Chapter 5	Chapter 5
Application Fur	octions	-	Chapter 6	Chapter 6
Trial Operation	and Actual Operation	-	Chapter 7	Chapter 7
Tuning		-	Chapter 8	Chapter 8
	Monitoring Product Infor- mation	-	9.1	9.1
	Monitoring SERVOPACK Status	-	_	_
	Servo Drive Status	-	9.2.1	9.2.1
Monitoring	Monitoring Status and Operations	4.1.3, 4.2.3, 5.4	9.2.2	9.2.2
	I/O Signal Monitor	_	9.2.3	9.2.3
	Monitoring Machine Oper- ation Status and Signal Waveforms	_	9.3	9.3
	Monitoring Product Life	_	9.4	9.4
Fully-Closed Lo	oop Control	_	Chapter 10	Chapter 10
Safety Function	IS	_	Chapter 11	Chapter 11
	Introduction	4.1.1, 4.2.1	_	_
Torque/Force Assistance	Setup Procedure	4.1.2, 4.2.2	_	_
	Monitoring	4.1.3, 4.2.3	_	_
	Introduction	5.1	-	_
Reference Pulse Multi-	Setup Procedure	5.2	-	-
plier Selection	Operating Procedure	5.3	-	_
	Monitoring	5.4	_	_

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Item			This Manual	Σ-7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual (Manual No.: SIEP S800001 26)	Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)
	Inspections Replaceme		-	12.1	12.1
	Alarm Disp	lays	6.1.1, 6.2.1	_	_
		List of Alarms	6.1.2, 6.2.2	_	-
		Trouble- shooting Alarms	6.1.3, 6.2.3	_	_
		Resetting Alarms	_	12.2.3	12.2.3
		Displaying the Alarm History	_	12.2.4	12.2.4
		Clearing the Alarm History	-	12.2.5	12.2.5
Maintenance		Resetting Alarms Detected in Option Mod- ules	_	12.2.6	12.2.6
		Resetting Motor Type Alarms	-	12.2.7	12.2.7
	Warning Displays		6.1.4, 6.2.4	-	-
		List of Warn- ings	6.1.5, 6.2.5	_	-
		Trouble- shooting Warnings	6.1.6, 6.2.6	_	-
	Monitoring Communica- tions Data during Alarms or Warnings		-	_	12.4
	Troubleshooting Based on the Operation and Condi- tions of the Servomotor		6.1.7, 6.2.7	_	-
	List of Para	imeters	7.1.1, 7.2.1	_	-
Parameter Lists	List of MECHATROLINK-III Common Parameters		7.2.2	_	-
	Parameter Table	Recording	7.1.2, 7.2.3	_	-
Appendices			_	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.



Classification	Document Name	Document No.	Description	
① Machine Controller and Servo Drive General Catalog	Machine Controller and AC Servo Drive Solutions Catalog	KAEP S800001 22	Describes the features and applica- tion examples for combinations of MP3000-Series Machine Control- lers and $\Sigma$ -7-Series AC Servo Drives.	
② MP3300 Catalog	Machine Controller MP3300	KAEP C880725 03	Provides detailed information on MP3300 Machine Controllers, including features and specifica- tions.	
<ul> <li>③</li> <li>Σ-7-Series Catalog</li> </ul>	AC Servo Drives $\Sigma$ -7 Series	KAEP S800001 23	Provides detailed information on $\Sigma$ - 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 configu- ration, and application methods of the Motion Control Function Mod- ules (SVD, SVC4, and SVR4) for $\Sigma$ - 7-Series $\Sigma$ -7C SERVOPACKs.	
④ Built-in Function Manuals	Machine Controller MP3000 Series Communications User's Manual	SIEP C880725 12	Provides detailed information on the specifications, system configu- ration, and communications con- nection methods for the Ethernet communications that are used with MP3000-Series Machine Control- lers and $\Sigma$ -7-Series $\Sigma$ -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 communica- tions methods for the Communica- tions Modules that can be mounted to MP3000-Series Machine Con- trollers and $\Sigma$ -7-Series $\Sigma$ -7C	
© 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		Provide detailed information on the specifications and communica- tions methods for the I/O Modules that can be mounted to MP3000- Series Machine Controllers and $\Sigma$ - 7-Series $\Sigma$ -7C SERVOPACKs.	
	Machine Controller MP2000 Series Counter Module CNTR-01 User's Manual	SIEP C880700 27	Continued on part page	

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Classification	Document Name	Document No.	Description
	$\Sigma$ -7-Series AC Servo Drive $\Sigma$ -7S and $\Sigma$ -7W SERVOPACK Safety Precautions	TOMP C710828 00	Provides detailed information for the safe usage of $\Sigma$ -7-Series SERVOPACKs.
	$\begin{array}{l} \Sigma \text{-V-Series} \\ \text{for Large-Capacity Models} \\ \Sigma \text{-7-Series} \\ \text{Safety Precautions} \\ \text{Option Module} \end{array}$	TOBP C720829 00	Provides detailed information for the safe usage of Option Modules.
	$\Sigma$ -V-Series/ $\Sigma$ -V-Series for Large-Capacity Models/ $\Sigma$ -7-Series Installation Guide Command Option Module	TOBP C720829 01	Provides detailed procedures for installing the Command Option Module in a SERVOPACK.
© Enclosed Documents	$\begin{array}{l} \Sigma \text{-V-Series} \\ \text{for Large-Capacity Models} \\ \Sigma \text{-7-Series} \\ \text{Installation Guide} \\ \text{Fully-closed Module} \end{array}$	TOBP C720829 03	Provides detailed procedures for installing the Fully-closed Module in a SERVOPACK.
	$\begin{array}{l} \Sigma \text{-V-Series} \\ \text{for Large-Capacity Models} \\ \Sigma \text{-7-Series} \\ \text{Installation Guide} \\ \text{Safety Module} \end{array}$	TOBP C720829 06	Provides detailed procedures for installing the Safety Module in a SERVOPACK.
	$\begin{array}{l} \Sigma \text{-V-Series} \\ \text{for Large-Capacity Models} \\ \Sigma \text{-7-Series} \\ \text{Installation Guide} \\ \text{INDEXER Module} \end{array}$	TOBP C720829 02	Provides detailed procedures for installing the INDEXER Module in a SERVOPACK.
	$\begin{array}{l} \Sigma \text{-V-Series} \\ \text{for Large-Capacity Models} \\ \Sigma \text{-7-Series} \\ \text{Installation Guide} \\ \text{DeviceNet Module} \end{array}$	TOBP C720829 07	Provides detailed procedures for installing the DeviceNet Module in a SERVOPACK.
<ul> <li>Ø</li> <li>Σ-7-Series</li> <li>Σ-7C SERVOPACK</li> <li>Product Manual</li> </ul>	Σ-7-Series AC Servo Drive Σ-7C SERVOPACK Product Manual	SIEP S800002 04	Provides detailed information on selecting $\Sigma$ -7-Series $\Sigma$ -7C SERVO- PACKs; installing, connecting, set- ting, testing in trial operation, and tuning Servo Drives; writing, moni- toring, and maintaining programs; and other information.
$^{\textcircled{8}}$ Σ-7-Series Σ-7C SERVOPACK Troubleshooting Manual	$\Sigma$ -7-Series AC Servo Drive $\Sigma$ -7C SERVOPACK Troubleshooting Manual	SIEP S800002 07	Provides detailed troubleshooting information for $\Sigma$ -7-Series $\Sigma$ -7C SERVOPACKs.

			Continued from previous page.	
Classification	Document Name	Document No.	Description	
	$\Sigma$ -7-Series AC Servo Drive $\Sigma$ -7S SERVOPACK with MECHATROLINK-III Communications References Product Manual	SIEP S800001 28		
	$\Sigma$ -7-Series AC Servo Drive $\Sigma$ -7S SERVOPACK with MECHATROLINK-II Communications References Product Manual	SIEP S800001 27		
<ul> <li>⑨</li> <li>Σ-7-Series</li> <li>Σ-7S/Σ-7W</li> </ul>	$\Sigma$ -7-Series AC Servo Drive $\Sigma$ -7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual	SIEP S800001 26	Provide detailed information on selecting $\Sigma$ -7-Series SERVO-PACKs and information on install-	
SERVOPACK Product Manuals	$\Sigma$ -7-Series AC Servo Drive $\Sigma$ -7S SERVOPACK Command Option Attachable Type with INDEXER Module Product Manual	SIEP S800001 64	ing, connecting, setting, performin trial operation for, tuning, and mc itoring the Servo Drives.	
	$\Sigma$ -7-Series AC Servo Drive $\Sigma$ -7S SERVOPACK Command Option Attachable Type with DeviceNet Module Product Manual	SIEP S800001 70		
	$\Sigma$ -7-Series AC Servo Drive $\Sigma$ -7W SERVOPACK with MECHATROLINK-III Communications References Product Manual	SIEP S800001 29		
<sup>1</sup> Σ-7-Series Σ-7S/Σ-7W SERVOPACK with	$\Sigma$ -7-Series AC Servo Drive $\Sigma$ -7S/ $\Sigma$ -7W SERVOPACK with Hardware Option Specifica- tions Dynamic Brake Product Manual	SIEP S800001 73	Provide detailed information on Hardware Options for Σ-7-Series	
Hardware Option Specifications Product Manuals	<ul> <li>Σ-7-Series AC Servo Drive</li> <li>Σ-7W/Σ-7C SERVOPACK with</li> <li>Hardware Option Specifica- tions</li> <li>HWBB Function</li> <li>Product Manual</li> </ul>	SIEP S800001 72	SERVOPACKs.	

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Classification	Document Name	Document No.	Continued from previous page. Description	
	$\Sigma$ -7-Series AC Servo Drive $\Sigma$ -7S SERVOPACK with FT/EX Specification for Index- ing Application Product Manual	SIEP S800001 84		
	$\Sigma$ -7-Series AC Servo Drive $\Sigma$ -7S SERVOPACK with FT/EX Specification for Track- ing Application Product Manual	SIEP S800001 89	-	
	$\Sigma$ -7-Series AC Servo Drive $\Sigma$ -7S SERVOPACK with FT/EX Specification for Application with Special Motor, SGM7D Motor Product Manual	SIEP S800001 91		
	$\Sigma$ -7-Series AC Servo Drive $\Sigma$ -7S SERVOPACK with FT/EX Specification for Press and Injection Molding Application Product Manual	SIEP S800001 94	Provide detailed information on the FT/EX Option for $\Sigma$ -7-Series SERVOPACKs.	
	$\Sigma$ -7-Series AC Servo Drive $\Sigma$ -7S SERVOPACK with FT/EX Specification for Transfer and Alignment Application Product Manual	SIEP S800001 95	-	
	$\Sigma$ -7-Series AC Servo Drive $\Sigma$ -7S SERVOPACK with FT/EX Specification for Torque/Force Assistance for Conveyance Application Product Manual	This manual (SIEP S800002 09)		
	$\Sigma$ -7-Series AC Servo Drive $\Sigma$ -7S SERVOPACK with FT/EX Specification for Cutting Application Feed Shaft Motor Product Manual	SIEP S800002 10		
® Option Module User's Manual	AC Servo Drives $\Sigma$ -V Series/ $\Sigma$ -V Series for Large-Capacity Models/ $\Sigma$ -7 Series User's Manual Safety Module	SIEP C720829 06	Provides details information required for the design and mainte- nance of a Safety Module.	
()	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 $\Sigma$ 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		
<sup>®</sup> 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 $\Sigma$ -7-Series Servomotors.	
	$\Sigma$ -7-Series AC Servo Drive Direct Drive Servomotor Product Manual	SIEP S800001 38		

Classification	Document Name	Document No.	Description
<sup>®</sup> Σ-7-Series Peripheral Device Selection Manual	Σ-7-Series AC Servo Drive Peripheral Device Selection Manual	SIEP S800001 32	Describes the peripheral devices for a $\Sigma$ -7-Series Servo System.
© 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 $\Sigma$ -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 communi- cations standard servo profile com- mands that are used for a $\Sigma$ -7- Series Servo System.
1	Machine Controller MP3000 Series Ladder Programming Manual	SIEP C880725 13	Provides detailed information on the ladder programming specifica- tions and instructions for MP3000- Series Machine Controllers and $\Sigma$ - 7-Series $\Sigma$ -7C SERVOPACKs.
Programming Manuals	Machine Controller MP3000 Series Motion Programming Manual	SIEP C880725 14	Provides detailed information on the motion programming and sequence programming specifica- tions and instructions for MP3000- Series Machine Controllers and $\Sigma$ - 7-Series $\Sigma$ -7C SERVOPACKs.
(18)	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 proce- dures for a Digital Operator for a $\Sigma$ -7-Series Servo System.
	AC Servo Drive Engineering Tool SigmaWin+ Operation Manual	SIET S800001 34	Provides detailed operating proce- dures for the SigmaWin+ Engineer- ing Tool for a $\Sigma$ -7-Series Servo System.
<sup>®</sup> Distributed I/O Module User's Manuals	MECHATROLINK-III Compatible I/O Module User's Manual	SIEP C880781 04	Describes the functions, specifica- tions, operating methods, and MECHATROLINK-III communica- tions 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 $\Sigma$ -7-Series Rotary Servomotor (SGMMV, SGM7J, SGM7A, SGM7 or SGM7G) 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, or SGLT).			
SERVOPACK	A $\Sigma$ -7-Series $\Sigma$ -7S Servo Amplifier with Analog Voltage/Pulse Train References and MECHA-TROLINK-III Communications References			
Drive axis SERVOPACK	A SERVOPACK that controls a drive axis with torque/force assistance.			
Auxiliary axis SERVOPACK	A SERVOPACK that controls an auxiliary axis with torque/force assistance.			
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 <sup>-1</sup>	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.

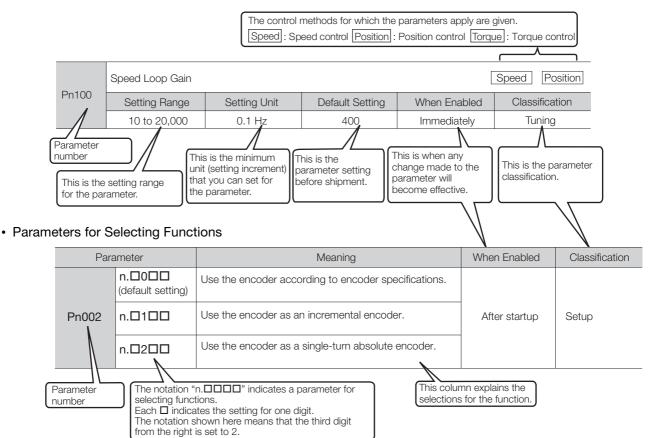
### Notation Example

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



		Digit Notation	Numeric Value Notation		
n.0000	Notation	Meaning	Notation	Meaning	
	Pn002 = n.□□□X	Indicates the first digit from the right in Pn002.	Pn002 = n.□□□1	Indicates that the first digit from the right in Pn002 is set to 1.	
Pn002 = n.□□X		Indicates the second digit from the right in Pn002.	Pn002 = n.□□1□	Indicates that the second digit from the right in Pn002 is set to 1.	
	Pn002 = n.□X□□	Indicates the third digit from the right in Pn002.	Pn002 = n.⊡1⊡⊡	Indicates that the third digit from the right in Pn002 is set to 1.	
L	Pn002 = n.X□□□	Indicates the fourth digit from the right in Pn002.	Pn002 = n.1□□□	Indicates that the fourth digit from the right in Pn002 is set to 1.	

### • Engineering Tools Used in This Manual

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

### ♦ Trademarks

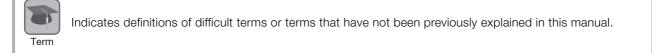
- QR code is a trademark of Denso Wave Inc.
- Other product names and company names are the trademarks or registered trademarks of the respective company. "TM" and the ® mark do not appear with product or company names in this manual.

### 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.



**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.

# 

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

# 

• 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

### 

- 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.

# 

- 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  $\Omega$  or less for a SERVOPACK with a 100-VAC or 200-VAC power supply, and 10  $\Omega$  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.

# 

- 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

# 

• 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

# 

- 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

# 

- 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

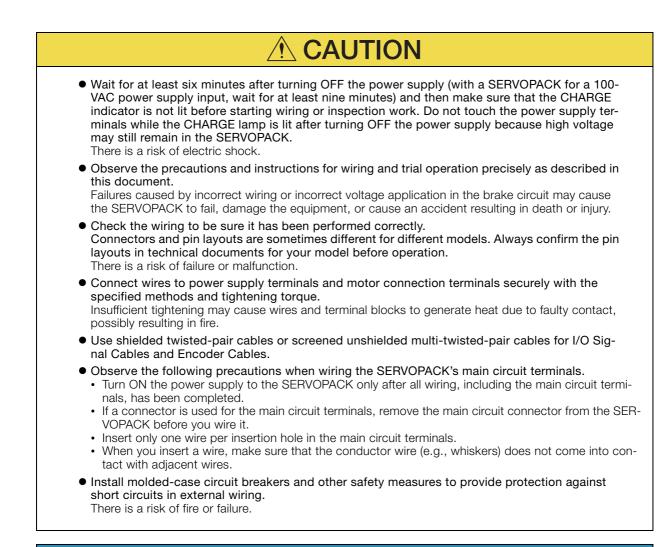
# **A** DANGER

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

# 

- 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.



- 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

# **WARNING**

• Before starting operation with a machine connected, change the settings of the switches and parameters to match the machine.

Unexpected machine operation, failure, or personal injury may occur if operation is started before appropriate settings are made.

- Do not radically change the settings of the parameters. There is a risk of unstable operation, machine damage, or injury.
- Install limit switches or stoppers at the ends of the moving parts of the machine to prevent unexpected accidents.

There is a risk of machine damage or injury.

- For trial operation, securely mount the Servomotor and disconnect it from the machine. There is a risk of injury.
- Forcing the motor to stop for overtravel is disabled when the Jog (Fn002), Origin Search (Fn003), or Easy FFT (Fn206) 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.

# 

- 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 that supports a Dynamic Brake Option, the Servomotor stopping methods will be different from the stopping methods used without the Option or for other Hardware Option specifications. For details, refer to the following manual.
     Σ-7-Series Σ-7S/Σ-7W SERVOPACK with Dynamic Brake Hardware Option Specifications Product Manual (Manual No.: SIEP S800001 73)
- Do not use the dynamic brake for any application other than an emergency stop.
   There is a risk of failure due to rapid deterioration of elements in the SERVOPACK and the risk of unexpected operation, machine damage, burning, or injury.
- Do not change the reference pulse multiplier when a pulse reference is being input from the host controller to the SERVOPACK. Depending on when the reference pulse multiplier is changed, position offset or unintentional operation may occur.

- 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.

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

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- 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 after turning OFF the power supply because high voltage may still remain in the SERVOPACK. 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

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• 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.

# 

• 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.

# 

- 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

• When disposing of the product, treat it as ordinary industrial waste. However, local ordinances and national laws must be observed. Implement all labeling and warnings as a final product as required.

### 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	<ul> <li>SGMMV</li> <li>SGM7A</li> <li>SGM7J</li> <li>SGM7P</li> <li>SGM7G</li> </ul>	UL 1004-1 UL 1004-6 (E165827)
Direct Drive Servomotors	<ul> <li>SGM7E<sup>*1</sup></li> <li>SGM7F<sup>*2</sup></li> <li>SGMCV</li> </ul>	UL 1004-1 UL 1004-6 (E165827)
Linear Servomotors	<ul> <li>SGLGW</li> <li>SGLFW</li> <li>SGLFW2<sup>*1</sup></li> <li>SGLTW</li> </ul>	UL 1004 (E165827)

\*1. Certification is pending.

\*2. SGM7F-DDB, -DDC, and -DD: Certified; SGM7F-DDA: Certification is pending.

### ♦ European Directives

CE			
Product	Model	EU Directive	Harmonized Standards
		Machinery Directive 2006/42/EC	EN ISO13849-1: 2015
SERVOPACKs	SGD7S	EMC Directive 2004/108/EC	EN 55011 group 1, class A EN 61000-6-2 EN 61000-6-4 EN 61800-3
		Low Voltage Directive 2006/95/EC	EN 50178 EN 61800-5-1
	SGMMV	EMC Directive 2004/104/EC	EN 55011 group 1, class A EN 61000-6-2 EN 61800-3
Rotary		Low Voltage Directive 2006/95/EC	EN 60034-1 EN 60034-5
Servomotors	• SGM7J • SGM7A • SGM7P • SGM7G	EMC Directive 2004/108/EC	EN 55011 group 1, class A EN 61000-6-2 EN 61000-6-4 EN 61800-3
		Low Voltage Directive 2006/95/EC	EN 60034-1 EN 60034-5
Direct Drive Servomotors	SGM7E <sup>*1</sup> SGM7F <sup>*1</sup> SGMCV     SGMCS-	EMC Directive 2004/108/EC	EN 55011 group 1, class A EN 61000-6-2 EN 61000-6-4 <sup>*2</sup> EN 61800-3 <sup>*3</sup>
Servomotors	□□B, □□C, □□D, □□E (Small-Capacity, Coreless Servomotors)	Low Voltage Directive 2006/95/EC	EN 60034-1 EN 60034-5
Linear Servomotors	• SGLG • SGLF • SGLFW2	EMC Directive 2004/108/EC	EN 55011 group 1, class A EN 61000-6-2 EN 61000-6-4
Gervomotors	• SGLT	Low Voltage Directive 2006/95/EC	EN 60034-1

\*1. Certification is pending.

1 S 1

\*2. Certification is pending for the SGM7F and SGMCV. No application has been made for SGMCS certification.

\*3. No application has been made for SGMCS certification.

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

### ♦ Safety Standards

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

### Safety Parameters

Item	Standards	Performance Level
Sefety Integrity Level	IEC 61508	SIL3
Safety Integrity Level	IEC 62061	SILCL3
Probability of Dangerous Failure per Hour	IEC 61508 IEC 62061	PFH = 4.04×10 <sup>-9</sup> [1/h] (4.04% 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
Mission Time	IEC 61508	10 years
Hardware Fault Tolerance	IEC 61508	HFT = 1
Subsystem	IEC 61508	В

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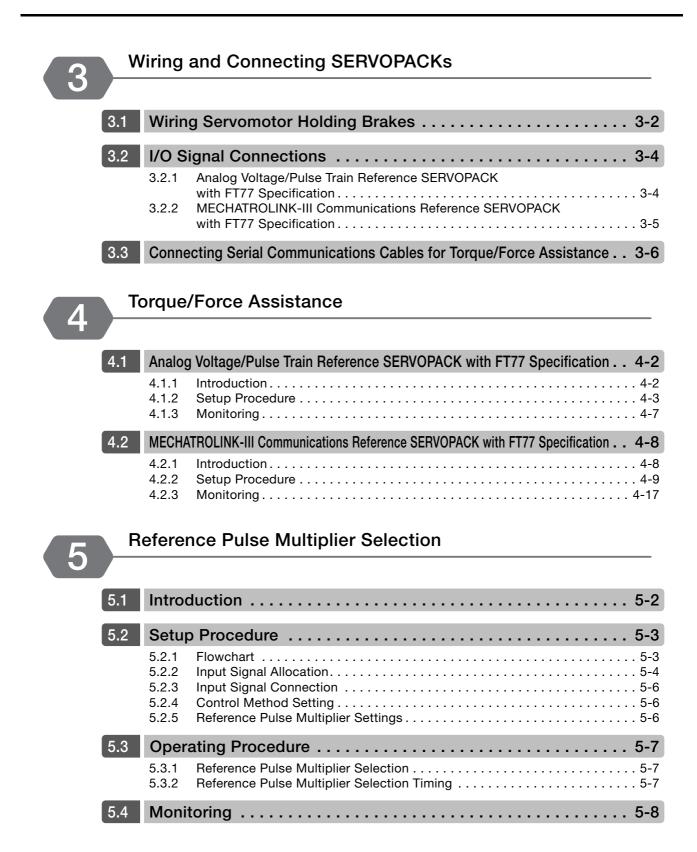
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# **1.1 Product Introduction**

The SERVOPACKs described in this manual support torque/force assistance and reference pulse multiplier selection.

Function	Description	Reference
Torque/force assistance for Analog Volt- age/Pulse Train Reference SER- VOPACK with FT77 specifica- tion that uses serial communi- cations	The operation of two SERVOPACKs is coordinated so that they output the same torque. One SERVOPACK controls a drive axis and the other SERVOPACK controls an auxiliary axis. This function is convenient for driving workpieces that are difficult to drive with one axis.	page 4-1
Torque/force assistance for MECHA- TROLINK-III Communications Reference SER- VOPACK with FT77 specifica- tion that uses MECHA- TROLINK-III com- munications	By using one SERVOPACK for the drive axis and up to five SERVO- PACKS for auxiliary axes, the torque output for the drive axis SERVO- PACK is multiplied. This function is convenient for driving workpieces that are difficult to drive with one axis. Also, because MECHATROLINK-III communications are used, no extra cables are required and the system can be configured simply with less wiring.	page 4-8
Reference pulse multiplier selec- tion	The /GEAR1 (Reference Pulse Multiplier Selection 1) and /GEAR2 (Refer- ence Pulse Multiplier Selection 2) signals can be used to change the ref- erence pulse multiplier that is applied to the pulse reference input to change the speed of the Servomotor between four speeds for the same number of input pulses.	page 5-1

1.2.1 Interpreting SERVOPACK Model Numbers

### **Model Designations** 1.2 1.2.1 Interpreting SERVOPACK Model Numbers SGD7S B А 00Д 000 $\vdash$ / / 4th digi st+2nd+3rc 3th+9th+10th 11th+12th+13th $\Sigma$ -7-Series Σ-7S SERVOPACKs Maximum Applicable Hardware Options 8th+9th+10th digits Specification 1st+2nd+3rd digits 4th digit Voltage Motor Capacity Voltage Code Specification Code Specification Applicable Code Specification R70<sup>\*1</sup> Models 0.05 kW A 200 VAC 000 Without options All models R90\*1 0.1 kW F 100 VAC 1R6<sup>\*1</sup> 0.2 kW 11th+12th+13th digits FT/EX Specification 2R8\*1 0.4 kW 5th+6th digits Interface\*2 Specification 3R8 0.5 kW Code Code Specification 5R5\*1 Torque/force assistance for 0.75 kW 00 Analog voltage/pulse train reference F77 conveyance applications 7R6 1.0 kW Three-MECHATROLINK-III 20 Phase, 1.5 kW 120 Communications References 200 VAC 14th digit BTO Specification\*3 180 2.0 kW 200 3.0 kW 7th digit Design Revision Order Code Specification 330 5.0 kW None None 470 6.0 kW В **BTO** specification 7.5 kW 550 590 11 kW 780 15 kW R70 0.05 kW Single R90 0.1 kW Phase, 2R1 0.2 kW 100 VAC

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

2R8

0.4 kW

\*2. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.

\*3. The BTO specification indicates if the SERVOPACK is customized by using the MechatroCloud BTO service. You need a BTO number to order SERVOPACKs with customized specifications. Refer to the following catalog for details on the BTO specification.

 $\square$  AC Servo Drives  $\Sigma$ -7 Series (Manual No.: KAEP S800001 23)

### 1.2.2 Interpreting Servomotor Model Numbers

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

 $\square$   $\Sigma$ -7-Series Rotary Servomotor Product Manual (Manual No.: SIEP S800001 36)

- $\square$   $\Sigma$ -7-Series Linear Servomotor Product Manual (Manual No.: SIEP S800001 37)
- $\square$   $\Sigma$ -7-Series Direct Drive Servomotor Product Manual (Manual No.: SIEP S800001 38)

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# 1.3 Combinations of SERVOPACKs and Servomotors

Refer to the following manuals for information on combinations with  $\Sigma$ -7-Series Servomotors.

 $\square$   $\Sigma$ -7-Series Rotary Servomotor Product Manual (Manual No.: SIEP S800001 36)  $\square$   $\Sigma$ -7-Series Linear Servomotor Product Manual (Manual No.: SIEP S800001 37)

 $\square$   $\Sigma$ -7-Series Direct Drive Servomotor Product Manual (Manual No.: SIEP S800001 38)

## 1.4 Functions

# 1.4.1 Analog Voltage/Pulse Train Reference SERVOPACK with FT77 Specification

This section lists the functions provided by an Analog Voltage/Pulse Train Reference SERVO-PACK with the FT77 specification. Refer to the following manual for details on the functions.  $\square$   $\Sigma$ -7-Series  $\Sigma$ -7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual (Manual No.: SIEP \$800001 26)

Functions given inside bold lines in the functions tables are restricted if torque/force assistance or reference pulse multiplier selection are used in SERVOPACKs for conveyance applications. Refer to the following section for details on restrictions to these functions.  $\square$  1.5.2 Function Application Restrictions on page 1-12

Function		
Power Supply Type Settings for the Main Circuit and Control Circuit		
Automatic Detection of Connected Motor		
Motor Direction Setting		
Linear Encoder Pitch Setting		
Writing Linear Servomotor Parameters		
Selecting the Phase Sequence for a Linear Servomotor		
Polarity Sensor Setting		
Polarity Detection		
Overtravel Function and Settings		
Holding Brake		
Motor Stopping Methods for Servo OFF and Alarms		
Resetting the Absolute Encoder		
Setting the Origin of the Absolute Encoder		
Setting the Regenerative Resistor Capacity		
Operation for Momentary Power Interruptions		
SEMI F47 Function		
Setting the Motor Maximum Speed		
Multiturn Limit Setting		
Adjustment of Motor Current Detection Signal Offset		
Forcing the Motor to Stop		
Speed Ripple Compensation		
Current Control Mode Selection		
Current Gain Level Setting		
Speed Detection Method Selection		
Fully-Closed Loop Control		
Safety Functions		

#### · Functions Related to the Machine

#### • Functions Related to the Host Controller

Function
Electronic Gear Settings
I/O Signal Allocations
ALM (Servo Alarm) Signal
ALO1 to ALO3 (Alarm Code) Signals
/WARN (Warning Output) 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

• Functions to Achieve Optimum Motions

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

#### Functions for Trial Operation during Setup

Function

Software Reset
Trial Operation for the Servomotor without a Load
Program Jogging
Origin Search
Test without a Motor

Monitoring Machine Operation Status and Signal Waveforms

#### • Functions for Inspection and Maintenance

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

1.4.2 MECHATROLINK-III Communications Reference SERVOPACK with FT77 Specification

## 1.4.2 MECHATROLINK-III Communications Reference SER-VOPACK with FT77 Specification

This section lists the functions provided by a MECHATROLINK-III Communications Reference SERVOPACK with the FT77 specification. Refer to the following manual for details on the functions.

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

Functions given inside bold lines in the functions tables are restricted for a MECHATROLINK-III Communications Reference SERVOPACK with the FT77 specification. Refer to the following section for details on restrictions to these functions.

3.5 Restrictions on page 1-11

#### · Functions Related to the Machine

Function		
Power Supply Type Settings for the Main Circuit and Control Circuit		
Automatic Detection of Connected Motor		
Motor Direction Setting		
Linear Encoder Pitch Setting		
Writing Linear Servomotor Parameters		
Selecting the Phase Sequence for a Linear Servomotor		
Polarity Sensor Setting		
Polarity Detection		
Overtravel Function and Settings		
Holding Brake		
Motor Stopping Methods for Servo OFF and Alarms		
Resetting the Absolute Encoder		
Setting the Origin of the Absolute Encoder		
Setting the Regenerative Resistor Capacity		
Operation for Momentary Power Interruptions		
SEMI F47 Function		
Setting the Motor Maximum Speed		
Software Limits and Settings		
Multiturn Limit Setting		
Adjustment of Motor Current Detection Signal Offset		
Forcing the Motor to Stop		
Speed Ripple Compensation		
Current Control Mode Selection		
Current Gain Level Setting		
Speed Detection Method Selection		
Fully-Closed Loop Control		
Safety Functions		
External Latches		

1.4.2 MECHATROLINK-III Communications Reference SERVOPACK with FT77 Specification

#### • Functions Related to the Host Controller

Function
Electronic Gear Settings
I/O Signal Allocations
ALM (Servo Alarm) Signal
/WARN (Warning Output) Signal
/TGON (Rotation Detection) Signal
/S-RDY (Servo Ready Output) Signal
/V-CMP (Speed Coincidence Detection) Signal
/COIN (Positioning Completion) Signal
/NEAR (Near) Signal
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

#### • Functions to Achieve Optimum Motions

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

#### • Functions for Trial Operation during Setup

Function	
Software Reset	
Trial Operation for the Servomotor without a Load	
Program Jogging	
Origin Search	
Test without a Motor	

Monitoring Machine Operation Status and Signal Waveforms

#### 1.4.2 MECHATROLINK-III Communications Reference SERVOPACK with FT77 Specification

#### 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

## 1.5 Restrictions

This section describes restrictions that apply when using the SERVOPACKs described in this manual.

## 1.5.1 Control Mode Restrictions

# Analog Voltage/Pulse Train Reference SERVOPACK with FT77 Specification

The control mode restrictions are different when torque/force assistance is used and when reference pulse multiplier selection is used. The control mode restrictions are described in this section.

#### Restrictions when Using Torque/Force Assistance

The following control mode restrictions apply when you use torque/force assistance.

## ■ Drive Axis SERVOPACK (SERVOPACK with Pn0D4 Set to n.□□□1)

There are no control mode restrictions.

#### ■ Auxiliary Axis SERVOPACK (SERVOPACK with Pn0D4 Set to n.□□□2 or n.□□□3)

Torque/force assistance can be executed only in Torque Control Mode. It cannot be used in Speed Control Mode or Position Control Mode.

#### Restrictions When Using Reference Pulse Multiplier Selection

Reference pulse multiplier selection 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, reference pulse multiplier selection will be enabled after the motor stops.

#### MECHATROLINK-III Communications Reference SERVO-PACK with FT77 Specification

The following control mode restrictions apply when you use torque/force assistance.

#### ■ Drive Axis SERVOPACK (SERVOPACK with Pn0D4 Set to n.□□□4) There are no control mode restrictions.

#### ■ Auxiliary Axis SERVOPACK (SERVOPACK with Pn0D4 Set to n.□□□5)

Torque/force assistance can be executed only in Torque Control Mode. It cannot be used in Speed Control Mode or Position Control Mode.

1.5.2 Function Application Restrictions

## 1.5.2 Function Application Restrictions

# Analog Voltage/Pulse Train Reference SERVOPACK with FT77 Specification

The following functional restrictions apply when you use torque/force assistance for the SER-VOPACK.

#### ◆ Drive Axis SERVOPACK (SERVOPACK with Pn0D4 Set to n.□□□1)

Function Name	Restriction
Polarity Sensor Setting	Cannot be used.
Polarity Detection	Cannot be used.

#### ◆ Auxiliary Axis SERVOPACK (SERVOPACK with Pn0D4 Set to n.□□□2 or n.□□□3)

Function Name	Restriction
Torque/Force Assistance Output Polarity Selection	Cannot be used.
Reference Pulse Multiplier Selection	Cannot be used.
Polarity Sensor Setting	Cannot be used.
Polarity Detection	Cannot be used.
Fully-closed Loop Control	Cannot be used.
Speed Control	Cannot be used.
Basic Settings for Speed Control	Cannot be used.
Manually Adjust Speed Reference Offset	Cannot be used.
Speed Reference Filter	Cannot be used.
Zero Clamping	Cannot be used.
/V-CMP (Speed Coincidence Detection) Signal	Cannot be used.
Position Control	Cannot be used.
Reference Pulse Form	Cannot be used.
CLR (Position Deviation Clear) Signal Function and Settings	Cannot be used.
Reference Pulse Input Multiplication Switching	Cannot be used.
/COIN (Positioning Completion) Signal	Cannot be used.
/NEAR (Near) Signal	Cannot be used.
Reference Pulse Inhibition and Settings	Cannot be used.
Vibration Detection Level Initialization	Cannot be used.
Soft Start Settings	Cannot be used.
Smoothing Settings	Cannot be used.
Manually Adjust Torque Reference Offset	Cannot be used.
Autotuning without Host Reference	Cannot be used.
Autotuning with Host Reference	Cannot be used.
Custom Tuning	Cannot be used.
Anti-Resonance Control Adjustment	Cannot be used.
Vibration Suppression	Cannot be used.
Friction Compensation	Cannot be used.
Model Following Control	Cannot be used.
Compatible Adjustment Functions	Cannot be used.
Mechanical Analysis	Cannot be used.
EasyFFT	Cannot be used.
Software Reset	Cannot be used.
Trial Operation for the Servomotor without a Load	Cannot be used.

Continued on next page.

1.5.2 Function Application Restrictions

Continued from previous page.

Function Name	Restriction
Program Jogging	Cannot be used.
Origin Search	Cannot be used.
Tuning-less Level Setting	Cannot be used.

#### MECHATROLINK-III Communications Reference SERVO-PACK with FT77 Specification

The following functional restrictions apply when you use torque/force assistance for the SER-VOPACK.

#### Drive Axis SERVOPACK (SERVOPACK with Pn0D4 Set to n. DDD4)

Function Restrictions

Function Name	Restriction
Torque/Force Assistance Output Polarity Selection	Cannot be used.
Reference Pulse Multiplier Selection	Cannot be used.
Polarity Sensor Setting	Cannot be used.
Polarity Detection	Cannot be used.

#### MECHATROLINK-III Command Restrictions

To ensure that the motor is controlled correctly, there are restrictions on the commands that can be used while another station is being monitored.

The command restrictions are given below.

Status <sup>*1</sup>	Usable Commands	Others
When no other station is being monitored	All commands, the same as for the standard profile	The same as for the standard profile
When another station is being monitored	<ul> <li>POS_SET</li> <li>BRK_ON</li> <li>BRK_OFF</li> <li>SENS_ON</li> <li>SENS_OFF</li> <li>SMON</li> <li>SV_ON</li> <li>SV_OFF</li> <li>INTERPOLATE</li> <li>POSING</li> <li>FEED</li> <li>EX_FEED</li> <li>EX_FEED</li> <li>EX_POSING</li> <li>ZRET</li> <li>VELCTRL</li> <li>TRQCTRL</li> <li>SVPRM_WR*2</li> <li>SVPRM_RD*2</li> </ul>	Always allocate the torque refer- ence to either a SEL_MON1 to SEL_MON3 main command or SEL_MON4 to SEL_MON6 sub- command.

\*1. Another station is being monitored is when SVCMD\_IO (output) bit 28 is set to TRUE to request monitoring another station.

\*2. When using the SVPRM\_WR main command or SVPRM\_RD main command, the torgue reference cannot be monitored with a main command.

When reading or writing parameters while monitoring another station, do the following:
 Use the SVPRM\_WR subcommand or SVPRM\_RD subcommand.

• When using the SVPRM\_WR main command or SVPRM\_RD main command, use the SMON command and allocate torque reference to any of SEL\_MON4 to SEL\_MON6.

To clear an alarm, use the CMD\_CTRL main command or ALM\_CLR subcommand. However, if you use the ALM\_CLR subcommand, it is necessary to monitor the torque reference with a main command.

1.5.2 Function Application Restrictions

# Auxiliary Axis SERVOPACK (SERVOPACK with Pn0D4 Set to n. DD5) Function Restrictions

Reference Pulse Multiplier Selection       Cannot be used.         Polarity Detection       Cannot be used.         Fully-Closed Loop Control       Cannot be used.         Speed Control       Cannot be used.         Basic Settings for Speed Control       Cannot be used.         Speed Ference Filter       Cannot be used.         Zero Clamping       Cannot be used.         Av-CMP (Speed Control       Cannot be used.         Position Control       Cannot be used.         Position Control       Cannot be used.         Position Control       Cannot be used.         Reference Filter       Cannot be used.         Position Control       Cannot be used.         Reference Pulse Form       Cannot be used.         CLR (Position Deviation Clear) Signal Function and Settings       Cannot be used.         //COIN (Positioning Completion) Signal       Cannot be used.         //REAR (Near) Signal       Cannot be used.         //REAR (Near) Signal       Cannot be used.         Soft Start Settings       Cannot be used.         Soft Start Settings       Cannot be used.         Manually Adjust Torque Reference Offset       Cannot be used.         Autotuning with Host Reference       Cannot be used.         Manually Adjust Torque Reference	Function Name	Restriction
Polarity Detection       Cannot be used.         Fully-Closed Loop Control       Cannot be used.         Speed Control       Cannot be used.         Basic Settings for Speed Control       Cannot be used.         Manually Adjust Speed Reference Offset       Cannot be used.         Speed Reference Filter       Cannot be used.         Zero Clamping       Cannot be used.         /V-CMP (Speed Control       Cannot be used.         Position Control       Cannot be used.         Reference Pulse Form       Cannot be used.         CCIR (Position Deviation Clear) Signal Function and Settings       Cannot be used.         Reference Pulse Input Multiplication Switching       Cannot be used.         //COIN (Positioning Completion) Signal       Cannot be used.         //KEAR (Near) Signal       Cannot be used.         //KEAR (Near) Signal       Cannot be used.         //Station Detection Level Initialization       Cannot be used.         Soft Start Settings       Cannot be used.         Smoothing Settings       Cannot be used.         Autotuning without Host Reference       Cannot be used.         Autotuning with Host Reference       Cannot be used.         Autotuning With Host Reference       Cannot be used.         Model Following Control       Cannot be used. <td>Reference Pulse Multiplier Selection</td> <td>Cannot be used.</td>	Reference Pulse Multiplier Selection	Cannot be used.
Fully-Closed Loop Control       Cannot be used.         Speed Control       Cannot be used.         Basic Settings for Speed Control       Cannot be used.         Manually Adjust Speed Reference Offset       Cannot be used.         Speed Reference Filter       Cannot be used.         Zero Clamping       Cannot be used.         /V-CMP (Speed Coincidence Detection) Signal       Cannot be used.         Position Control       Cannot be used.         Reference Pulse Form       Cannot be used.         CLR (Position Deviation Clear) Signal Function and Settings       Cannot be used.         Reference Pulse Input Multiplication Switching       Cannot be used.         //COIN (Positioning Completion) Signal       Cannot be used.         /NEAR (Near) Signal       Cannot be used.         /Vibration Detection Level Initialization       Cannot be used.         Soft Start Settings       Cannot be used.         Soft Start Settings       Cannot be used.         Manually Adjust Torque Reference Offset       Cannot be used.         Autotuning without Host Reference       Cannot be used.         Autotuning with Host Reference       Cannot be used.         Vibration Suppression       Cannot be used.         Friction Compensation       Cannot be used.         Model Following Contro	Polarity Sensor Setting	Cannot be used.
Speed Control       Cannot be used.         Basic Settings for Speed Control       Cannot be used.         Manually Adjust Speed Reference Offset       Cannot be used.         Speed Reference Filter       Cannot be used.         Zero Clamping       Cannot be used.         /v-CMP (Speed Coincidence Detection) Signal       Cannot be used.         Position Control       Cannot be used.         Reference Pulse Form       Cannot be used.         CCIN (Position Deviation Clear) Signal Function and Settings       Cannot be used.         Reference Pulse Input Multiplication Switching       Cannot be used.         //COIN (Positioning Completion) Signal       Cannot be used.         /NEAR (Near) Signal       Cannot be used.         /Vibration Detection Level Initialization       Cannot be used.         Soft Start Settings       Cannot be used.         Manually Adjust Torque Reference Offset       Cannot be used.         Autotuning without Host Reference       Cannot be used.         Autotuning with Host Reference       Cannot be used.         Vibration Suppression       Cannot be used.         Friction Componation       Cannot be used.         Autotuning with Host Reference       Cannot be used.         Vibration Suppression       Cannot be used.         Friction Compen	Polarity Detection	Cannot be used.
Basic Settings for Speed Control       Cannot be used.         Manually Adjust Speed Reference Offset       Cannot be used.         Speed Reference Filter       Cannot be used.         Zero Clamping       Cannot be used.         //-CMP (Speed Coincidence Detection) Signal       Cannot be used.         Position Control       Cannot be used.         Reference Pulse Form       Cannot be used.         CLR (Position Deviation Clear) Signal Function and Settings       Cannot be used.         Reference Pulse Input Multiplication Switching       Cannot be used.         //COIN (Positioning Completion) Signal       Cannot be used.         //COIN (Positioning Completion) Signal       Cannot be used.         //NEAR (Near) Signal       Cannot be used.         Niefarion Detection Level Initialization       Cannot be used.         Vibration Detection Level Initialization       Cannot be used.         Soft Start Settings       Cannot be used.         Manually Adjust Torque Reference Offset       Cannot be used.         Autotuning with Host Reference       Cannot be used.         Autotuning with Host Reference       Cannot be used.         Quistrion Suppression       Cannot be used.         Friction Compensation       Cannot be used.         Model Following Control       Cannot be used.	Fully-Closed Loop Control	Cannot be used.
Manually Adjust Speed Reference Offset       Cannot be used.         Speed Reference Filter       Cannot be used.         Zero Clamping       Cannot be used.         N-CMP (Speed Coincidence Detection) Signal       Cannot be used.         Position Control       Cannot be used.         Reference Pulse Form       Cannot be used.         CLR (Position Deviation Clear) Signal Function and Settings       Cannot be used.         Reference Pulse Input Multiplication Switching       Cannot be used.         //COIN (Positioning Completion) Signal       Cannot be used.         //REAR (Near) Signal       Cannot be used.         Reference Pulse Inhibition and Settings       Cannot be used.         Vibration Detection Level Initialization       Cannot be used.         Soft Start Settings       Cannot be used.         Manually Adjust Torque Reference Offset       Cannot be used.         Autotuning without Host Reference       Cannot be used.         Autotuning with Host Reference       Cannot be used.         Vibration Suppression       Cannot be used.         Friction Compensation       Cannot be used.         Model Following Control       Cannot be used.         Compatible Adjustment Functions       Cannot be used.         Model Following Control       Cannot be used.	Speed Control	Cannot be used.
Speed Reference Filter       Cannot be used.         Zero Clamping       Cannot be used.         AV-CMP (Speed Coincidence Detection) Signal       Cannot be used.         Position Control       Cannot be used.         Reference Pulse Form       Cannot be used.         CLR (Position Deviation Clear) Signal Function and Settings       Cannot be used.         Reference Pulse Input Multiplication Switching       Cannot be used.         /COIN (Positioning Completion) Signal       Cannot be used.         /REAR (Near) Signal       Cannot be used.         /NEAR (Near) Signal       Cannot be used.         /Wibration Detection Level Initialization       Cannot be used.         Soft Start Settings       Cannot be used.         Smoothing Settings       Cannot be used.         Manually Adjust Torque Reference Offset       Cannot be used.         Autotuning without Host Reference       Cannot be used.         Quistom Tuning       Cannot be used.         Vibration Suppression       Cannot be used.         Friction Compensation       Cannot be used.         Model Following Control       Cannot be used.         Compatible Adjustment Functions       Cannot be used.         Model Following Control       Cannot be used.         Compatible Adjustment Functions       Canno	Basic Settings for Speed Control	Cannot be used.
Zero ClampingCannot be used./V-CMP (Speed Coincidence Detection) SignalCannot be used.Position ControlCannot be used.Reference Pulse FormCannot be used.CLR (Position Deviation Clear) Signal Function and SettingsCannot be used.Reference Pulse Input Multiplication SwitchingCannot be used.(COIN (Positioning Completion) SignalCannot be used.//NEAR (Near) SignalCannot be used.//NEAR (Near) SignalCannot be used.Nibration Detection Level InitializationCannot be used.Soft Start SettingsCannot be used.Soft Start SettingsCannot be used.Manually Adjust Torque Reference OffsetCannot be used.Autotuning with Host ReferenceCannot be used.Custom TuningCannot be used.Anti-Resonance Control AdjustmentCannot be used.Vibration SuppressionCannot be used.Friction CompensationCannot be used.Model Following ControlCannot be used.Compatible Adjustment FunctionsCannot be used.Mechanical AnalysisCannot be used.EasyFFTCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Origin SearchCannot be used.Origin SearchCannot be used.	Manually Adjust Speed Reference Offset	Cannot be used.
<i>N</i> -CMP (Speed Coincidence Detection) Signal       Cannot be used.         Position Control       Cannot be used.         Reference Pulse Form       Cannot be used.         CLR (Position Deviation Clear) Signal Function and Settings       Cannot be used.         Reference Pulse Input Multiplication Switching       Cannot be used.         //COIN (Positioning Completion) Signal       Cannot be used.         //EAR (Near) Signal       Cannot be used.         Reference Pulse Inhibition and Settings       Cannot be used.         Vibration Detection Level Initialization       Cannot be used.         Soft Start Settings       Cannot be used.         Manually Adjust Torque Reference Offset       Cannot be used.         Autotuning with Host Reference       Cannot be used.         Autotuning with Host Reference       Cannot be used.         Vibration Suppression       Cannot be used.         Friction Compensation       Cannot be used.         Model Following Control       Cannot be used.         Compatible Adjustment Functions       Cannot be used.         Mechanical Analysis       Cannot be used.         Friction Compensation       Cannot be used.         Model Following Control       Cannot be used.         Compatible Adjustment Functions       Cannot be used.	Speed Reference Filter	Cannot be used.
Position ControlCannot be used.Reference Pulse FormCannot be used.CLR (Position Deviation Clear) Signal Function and SettingsCannot be used.Reference Pulse Input Multiplication SwitchingCannot be used.//COIN (Positioning Completion) SignalCannot be used.//NEAR (Near) SignalCannot be used.Soft Start SettingsCannot be used.Soft Start SettingsCannot be used.Smoothing SettingsCannot be used.Manually Adjust Torque Reference OffsetCannot be used.Autotuning without Host ReferenceCannot be used.Custom TuningCannot be used.Autotuning with Host ReferenceCannot be used.Vibration SuppressionCannot be used.Friction CompensationCannot be used.Model Following ControlCannot be used.Compatible Adjustment FunctionsCannot be used.Mechanical AnalysisCannot be used.EasyFFTCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Origin SearchCannot be used.	Zero Clamping	Cannot be used.
Reference Pulse FormCannot be used.CLR (Position Deviation Clear) Signal Function and SettingsCannot be used.Reference Pulse Input Multiplication SwitchingCannot be used./COIN (Positioning Completion) SignalCannot be used./NEAR (Near) SignalCannot be used.Reference Pulse Inhibition and SettingsCannot be used.Vibration Detection Level InitializationCannot be used.Soft Start SettingsCannot be used.Smoothing SettingsCannot be used.Manually Adjust Torque Reference OffsetCannot be used.Autotuning without Host ReferenceCannot be used.Custom TuningCannot be used.Vibration SuppressionCannot be used.Friction CompensationCannot be used.Model Following ControlCannot be used.Custom TuningCannot be used.Model Following ControlCannot be used.Compatible Adjustment FunctionsCannot be used.Model Following ControlCannot be used.Compatible Adjustment FunctionsCannot be used.Mechanical AnalysisCannot be used.EasyFFTCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Origin SearchCannot be used.Origin SearchCannot be used.	/V-CMP (Speed Coincidence Detection) Signal	Cannot be used.
CLR (Position Deviation Clear) Signal Function and SettingsCannot be used.Reference Pulse Input Multiplication SwitchingCannot be used./COIN (Positioning Completion) SignalCannot be used./NEAR (Near) SignalCannot be used.Reference Pulse Inhibition and SettingsCannot be used.Vibration Detection Level InitializationCannot be used.Soft Start SettingsCannot be used.Smoothing SettingsCannot be used.Manually Adjust Torque Reference OffsetCannot be used.Autotuning without Host ReferenceCannot be used.Custom TuningCannot be used.Autotuning with Host ReferenceCannot be used.Vibration SuppressionCannot be used.Friction CompensationCannot be used.Model Following ControlCannot be used.Compatible Adjustment FunctionsCannot be used.Mechanical AnalysisCannot be used.EasyFFTCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Origin SearchCannot be used.	Position Control	Cannot be used.
Reference Pulse Input Multiplication SwitchingCannot be used./COIN (Positioning Completion) SignalCannot be used./NEAR (Near) SignalCannot be used.Reference Pulse Inhibition and SettingsCannot be used.Vibration Detection Level InitializationCannot be used.Soft Start SettingsCannot be used.Smoothing SettingsCannot be used.Manually Adjust Torque Reference OffsetCannot be used.Autotuning without Host ReferenceCannot be used.Custom TuningCannot be used.Autotuning with Host ReferenceCannot be used.Vibration SuppressionCannot be used.Vibration SuppressionCannot be used.Friction CompensationCannot be used.Model Following ControlCannot be used.Compatible Adjustment FunctionsCannot be used.Mechanical AnalysisCannot be used.EasyFFTCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Origin SearchCannot be used.Origin SearchCannot be used.	Reference Pulse Form	Cannot be used.
/COIN (Positioning Completion) SignalCannot be used./NEAR (Near) SignalCannot be used.Reference Pulse Inhibition and SettingsCannot be used.Vibration Detection Level InitializationCannot be used.Soft Start SettingsCannot be used.Smoothing SettingsCannot be used.Manually Adjust Torque Reference OffsetCannot be used.Autotuning without Host ReferenceCannot be used.Autotuning with Host ReferenceCannot be used.Custom TuningCannot be used.Vibration SuppressionCannot be used.Friction CompensationCannot be used.Model Following ControlCannot be used.Compatible Adjustment FunctionsCannot be used.Mechanical AnalysisCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Origin SearchCannot be used.Origin SearchCannot be used.	CLR (Position Deviation Clear) Signal Function and Settings	Cannot be used.
/NEAR (Near) SignalCannot be used.Reference Pulse Inhibition and SettingsCannot be used.Vibration Detection Level InitializationCannot be used.Soft Start SettingsCannot be used.Smoothing SettingsCannot be used.Manually Adjust Torque Reference OffsetCannot be used.Autotuning without Host ReferenceCannot be used.Autotuning with Host ReferenceCannot be used.Custom TuningCannot be used.Anti-Resonance Control AdjustmentCannot be used.Vibration SuppressionCannot be used.Friction CompensationCannot be used.Model Following ControlCannot be used.Compatible Adjustment FunctionsCannot be used.Mechanical AnalysisCannot be used.EasyFFTCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Program JoggingCannot be used.Origin SearchCannot be used.	Reference Pulse Input Multiplication Switching	Cannot be used.
Reference Pulse Inhibition and SettingsCannot be used.Vibration Detection Level InitializationCannot be used.Soft Start SettingsCannot be used.Smoothing SettingsCannot be used.Manually Adjust Torque Reference OffsetCannot be used.Autotuning without Host ReferenceCannot be used.Autotuning with Host ReferenceCannot be used.Custom TuningCannot be used.Anti-Resonance Control AdjustmentCannot be used.Vibration SuppressionCannot be used.Friction CompensationCannot be used.Model Following ControlCannot be used.Compatible Adjustment FunctionsCannot be used.Mechanical AnalysisCannot be used.EasyFFTCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Program JoggingCannot be used.Origin SearchCannot be used.	/COIN (Positioning Completion) Signal	Cannot be used.
Vibration Detection Level InitializationCannot be used.Soft Start SettingsCannot be used.Smoothing SettingsCannot be used.Manually Adjust Torque Reference OffsetCannot be used.Autotuning without Host ReferenceCannot be used.Autotuning with Host ReferenceCannot be used.Custom TuningCannot be used.Anti-Resonance Control AdjustmentCannot be used.Vibration SuppressionCannot be used.Friction CompensationCannot be used.Model Following ControlCannot be used.Compatible Adjustment FunctionsCannot be used.Mechanical AnalysisCannot be used.EasyFFTCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Program JoggingCannot be used.Origin SearchCannot be used.	/NEAR (Near) Signal	Cannot be used.
Soft Start SettingsCannot be used.Smoothing SettingsCannot be used.Manually Adjust Torque Reference OffsetCannot be used.Autotuning without Host ReferenceCannot be used.Autotuning with Host ReferenceCannot be used.Autotuning with Host ReferenceCannot be used.Custom TuningCannot be used.Anti-Resonance Control AdjustmentCannot be used.Vibration SuppressionCannot be used.Friction CompensationCannot be used.Model Following ControlCannot be used.Compatible Adjustment FunctionsCannot be used.Mechanical AnalysisCannot be used.EasyFFTCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Program JoggingCannot be used.Origin SearchCannot be used.	Reference Pulse Inhibition and Settings	Cannot be used.
Smoothing SettingsCannot be used.Manually Adjust Torque Reference OffsetCannot be used.Autotuning without Host ReferenceCannot be used.Autotuning with Host ReferenceCannot be used.Custom TuningCannot be used.Anti-Resonance Control AdjustmentCannot be used.Vibration SuppressionCannot be used.Friction CompensationCannot be used.Model Following ControlCannot be used.Compatible Adjustment FunctionsCannot be used.Mechanical AnalysisCannot be used.EasyFFTCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Origin SearchCannot be used.	Vibration Detection Level Initialization	Cannot be used.
Manually Adjust Torque Reference OffsetCannot be used.Autotuning without Host ReferenceCannot be used.Autotuning with Host ReferenceCannot be used.Custom TuningCannot be used.Anti-Resonance Control AdjustmentCannot be used.Vibration SuppressionCannot be used.Friction CompensationCannot be used.Model Following ControlCannot be used.Compatible Adjustment FunctionsCannot be used.Mechanical AnalysisCannot be used.EasyFFTCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Program JoggingCannot be used.Origin SearchCannot be used.	Soft Start Settings	Cannot be used.
Autotuning without Host ReferenceCannot be used.Autotuning with Host ReferenceCannot be used.Custom TuningCannot be used.Anti-Resonance Control AdjustmentCannot be used.Vibration SuppressionCannot be used.Friction CompensationCannot be used.Model Following ControlCannot be used.Compatible Adjustment FunctionsCannot be used.Mechanical AnalysisCannot be used.EasyFFTCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Origin SearchCannot be used.	Smoothing Settings	Cannot be used.
Autotuning with Host ReferenceCannot be used.Custom TuningCannot be used.Anti-Resonance Control AdjustmentCannot be used.Vibration SuppressionCannot be used.Friction CompensationCannot be used.Model Following ControlCannot be used.Compatible Adjustment FunctionsCannot be used.Mechanical AnalysisCannot be used.EasyFFTCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Origin SearchCannot be used.	Manually Adjust Torque Reference Offset	Cannot be used.
Custom TuningCannot be used.Anti-Resonance Control AdjustmentCannot be used.Vibration SuppressionCannot be used.Friction CompensationCannot be used.Model Following ControlCannot be used.Compatible Adjustment FunctionsCannot be used.Mechanical AnalysisCannot be used.EasyFFTCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Program JoggingCannot be used.Origin SearchCannot be used.	Autotuning without Host Reference	Cannot be used.
Anti-Resonance Control AdjustmentCannot be used.Vibration SuppressionCannot be used.Friction CompensationCannot be used.Model Following ControlCannot be used.Compatible Adjustment FunctionsCannot be used.Mechanical AnalysisCannot be used.EasyFFTCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Program JoggingCannot be used.Origin SearchCannot be used.	Autotuning with Host Reference	Cannot be used.
Vibration SuppressionCannot be used.Friction CompensationCannot be used.Model Following ControlCannot be used.Compatible Adjustment FunctionsCannot be used.Mechanical AnalysisCannot be used.EasyFFTCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Program JoggingCannot be used.Origin SearchCannot be used.	Custom Tuning	Cannot be used.
Friction CompensationCannot be used.Model Following ControlCannot be used.Compatible Adjustment FunctionsCannot be used.Mechanical AnalysisCannot be used.EasyFFTCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Program JoggingCannot be used.Origin SearchCannot be used.	Anti-Resonance Control Adjustment	Cannot be used.
Model Following ControlCannot be used.Compatible Adjustment FunctionsCannot be used.Mechanical AnalysisCannot be used.EasyFFTCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Program JoggingCannot be used.Origin SearchCannot be used.	Vibration Suppression	Cannot be used.
Compatible Adjustment FunctionsCannot be used.Mechanical AnalysisCannot be used.EasyFFTCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Program JoggingCannot be used.Origin SearchCannot be used.	Friction Compensation	Cannot be used.
Mechanical AnalysisCannot be used.EasyFFTCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Program JoggingCannot be used.Origin SearchCannot be used.	Model Following Control	Cannot be used.
EasyFFTCannot be used.Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Program JoggingCannot be used.Origin SearchCannot be used.	Compatible Adjustment Functions	Cannot be used.
Software ResetCannot be used.Trial Operation for the Servomotor without a LoadCannot be used.Program JoggingCannot be used.Origin SearchCannot be used.	Mechanical Analysis	Cannot be used.
Trial Operation for the Servomotor without a LoadCannot be used.Program JoggingCannot be used.Origin SearchCannot be used.	EasyFFT	Cannot be used.
Program JoggingCannot be used.Origin SearchCannot be used.	Software Reset	Cannot be used.
Origin Search     Cannot be used.	Trial Operation for the Servomotor without a Load	Cannot be used.
	Program Jogging	Cannot be used.
Tuning-less Level SettingCannot be used.	Origin Search	Cannot be used.
	Tuning-less Level Setting	Cannot be used.

#### MECHATROLINK-III Command Restrictions

When an auxiliary axis SERVOPACK is monitoring another station, basically use the SMON command.

Status <sup>*1</sup>	Usable Commands	Others
When no other station is being monitored	All commands, the same as for the standard profile	The same as for the standard profile
When another station is being monitored <sup>*2</sup>	<ul> <li>POS_SET</li> <li>BRK_ON</li> <li>BRK_OFF</li> <li>SENS_ON</li> <li>SENS_OFF</li> <li>SMON</li> <li>SV_OF</li> <li>INTERPOLATE*<sup>3</sup></li> <li>POSING*<sup>3</sup></li> <li>FEED*<sup>3</sup></li> <li>EX_FEED*<sup>3</sup></li> <li>EX_FEED*<sup>3</sup></li> <li>EX_POSING*<sup>3</sup></li> <li>ZRET*<sup>3</sup></li> <li>VELCTRL*<sup>3</sup></li> <li>SVPRM_WR*<sup>4</sup></li> <li>SVPRM_RD*<sup>4</sup></li> </ul>	_

There are the following restrictions on using any other command.

\*1. Another station is being monitored is when SVCMD\_IO (output) bit 28 is set to TRUE to request monitoring another station.

\*2. For an auxiliary axis SERVOPACK, we recommend using the SMON command.

\*3. If an auxiliary axis SERVOPACK receives a motion command when the servo is ON while monitoring another station, Command Warning 1 (Unsatisfied Command Conditions) (A.95A) will occur.

\*4. When using the SVPRM\_WR main command or SVPRM\_RD main command, the torque reference cannot be monitored with a main command.

When reading or writing parameters while monitoring another station, do one of the following:

• Use the SVPRM\_WR subcommand or SVPRM\_RD subcommand.

• When using the SVPRM\_WR main command or SVPRM\_RD main command, use the SMON command and allocate torque reference to any of SEL\_MON4 to SEL\_MON6.

To clear an alarm, use the CMD\_CTRL main command or ALM\_CLR subcommand. However, if you use the ALM\_CLR subcommand, it is necessary to monitor the torque reference with a main command.

1.5.3 Restrictions on Specifications

## 1.5.3 Restrictions on Specifications

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

	Item	Specification				
Feedback With Linear Servomotor		Polarity detection is not possible when torque/force assistance is used. Either use a Linear Servomotor with a polarity sensor or combine a Linear Servomotor without a polarity sensor with an absolute linear encoder.				
Mounting		There are no rack-mounted models or duct-ventilated models				
Communica- tions	RS-422A Communica- tions (CN3)	You cannot use communications when torque/force assistance is used.				
Option Modules		You cannot use a Safety Module.				

# 1.5.4 SERVOPACK Models (Maximum Applicable Motor Capacity)

When you use torque/force assistance, the drive axis SERVOPACK and auxiliary axis SERVO-PACK must have the same maximum applicable motor capacity.

#### 1.5.5 Motor Stopping Methods for Servo OFF and Gr. 1 Alarms

Set the stopping method for when the servo is turned OFF or when a Gr. 1 alarm occurs in  $Pn001 = n.\Box\Box\BoxX$  (Motor Stopping Method for Servo OFF and Group 1 Alarms).

When you use torque/force assistance, always set  $Pn001 = n.\Box\Box\BoxX$  to the same setting for the drive axis SERVOPACK and auxiliary axis SERVOPACK.

## 1.6 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.

## **1.7** 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	Ratin	gs2-2
2.2	SERVO	OPACK Overload Protection Characteristics 2-5
2.3	Spec	ifications2-6
	2.3.1	Analog Voltage/Pulse Train Reference SERVOPACK with FT77 Specification
	2.3.2	MECHATROLINK-III Communications Reference SERVOPACK with FT77 Specification

## 2.1 Ratings

This section gives the ratings of SERVOPACKs.

## Three-Phase, 200 VAC

Ν	Nodel SGI	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	
Continuo	ous Output Cu	urrent [Arms]	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6	18.5	19.6	32.9
	aneous M t Current [/		2.1	3.2	5.9	9.3	11	16.9	17	28	42	56	84
Main	Power St	upply			200 VA	C to 24	0 VAC,	-15% t	0 +10%	, 50 Hz	z/60 Hz		
Circuit	Input Curr	rent [Arms]*	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	0 +10%	, 50 Hz	z/60 Hz		
trol	Input Current		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.25	0.25	0.3
Power	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 Loss*	Control C Power Lo		12	12	12	12	14	14	14	15	16	16	19
L055.	Built-in Reg Resistor Po	generative ower Loss [W]	-	-	-	-	8	8	8	10	16	16	36
	Total Powe	r 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 Regener-	Resis- tance $[\Omega]$	-	_	_	_	40	40	40	20	12	12	8
erative Resis- tor	ative Resistor	Capacity [W]	_	_	_	_	40	40	40	60	60	60	180
	Minimum Allowable External Resistance [Ω]		40	40	40	40	40	40	40	20	12	12	8
Overvo	oltage Cate	egory											

\* This is the net value at the rated load.

	Model SGD7S-		470A	550A	590A	780A
Maximum Appli	cable Motor Capad	6.0	7.5	11	15	
Continuous Out	put Current [Arms]		46.9	54.7	58.6	78.0
Instantaneous N	laximum Output C	urrent [Arms]	110	130	140	170
Main Circuit	Power Supply		200 VAC to	240 VAC, -15	% to +10%, 5	0 Hz/60 Hz
Main Circuit	Input Current [Ai	rms] <sup>*1</sup>	29	37	54	73
Operatural	Power Supply		200 VAC to	240 VAC, -15	% to +10%, 5	0 Hz/60 Hz
Control	Input Current [A	rms]*1	0.3	0.3	0.4	0.4
Power Supply C	Capacity $[kVA]^{*1}$		10.7	14.6	21.7	29.6
	Main Circuit Pov	ver Loss [W]	271.7	326.9	365.3	501.4
<b>D ,</b> *1	Control Circuit P	ower Loss [W]	21	21	28	28
Power Loss <sup>*1</sup>	External Regenerative I	Resistor Power Loss [W]	180 <sup>*2</sup>	350 <sup>*3</sup>	350 <sup>*3</sup>	350 <sup>*3</sup>
	Total Power Los	s [W]	292.7	347.9	393.3	529.4
	External Regen-	Resistance $[\Omega]$	6.25 <sup>*2</sup>	3.13 <sup>*3</sup>	3.13 <sup>*3</sup>	3.13 <sup>*3</sup>
Regenerative Resistor	erative Resistor	Capacity [W]	880 <sup>*2</sup>	1760 <sup>*3</sup>	1760 <sup>*3</sup>	1760 <sup>*3</sup>
	Minimum Allowable E	xternal Resistance [ $\Omega$ ]	5.8	2.9	2.9	2.9
Overvoltage Category					II	

\*1. 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.

	R70A	R90A	1R6A	2R8A	5R5A		
Maximum Applicable Motor Capacity [kW]			0.05	0.1	0.2	0.4	0.75
Continuous O	utput Current [Arms	6]	0.66	0.91	1.6	2.8	5.5
Instantaneous	Maximum Output	Current [Arms]	2.1	3.2	5.9	9.3	16.9
Main Circuit	Power Supply		200 VAC	C to 240 VA	C, -15% to	+10%, 50 H	lz/60 Hz
Main Circuit	Input Current [Arn	าร]*	0.8	1.6	2.4	5.0	8.7
Control	Power Supply		200 VAC	C to 240 VA	C, -15% to	+10%, 50 H	lz/60 Hz
Control	Input Current [Arn	าร]*	0.2	0.2	0.2	0.2	0.2
Power Supply	Capacity [kVA]*		0.2	0.3	0.6	1.2	1.9
	Main Circuit Powe	er Loss [W]	5.0	7.1	12.1	23.7	39.2
	Control Circuit Po	12	12	12	12	14	
Power Loss*	Built-in Regenerative Resistor Power Loss [W]		-	-	-	-	8
	Total Power Loss	Total Power Loss [W]			24.1	35.7	61.2
	Built-In Regener-	Resistance $[\Omega]$	-	-	-	-	40
Regenera- tive Resistor	ative Resistor	Capacity [W]	-	-	-	-	40
แพล กลอเอเปเ	Minimum Allowable Ex	40	40	40	40	40	
Overvoltage Category						•	

## Single-Phase, 200 VAC

\* This is the net value at the rated load.

#### 270 VDC

Model	SGD7S-	R70A	R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A
Maximum Applicable M	lotor Capacity [kW]	0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5
Continuous Output Cu	rrent [Arms]	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6
Instantaneous Maximum	n Output 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	o 324 VI	DC, -15	% to +1	0%	
	Input Current [Arms]*	0.5	1.0	1.5	3.0	3.8	4.9	6.9	11
Control	Power Supply	270 VDC to 324 VDC, -15% to +10%							
Control	Input Current [Arms]*	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Power Supply Capacity	y [kVA]*	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*	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					l				

\* This is the net value at the rated load.

2

2-3

Model SGD7S-			200A	330A	470A	550A	590A	780A	
Maximum Applicable	Notor Capacity [kW]	2.0	3.0	5.0	6.0	7.5	11.0	15.0	
Continuous Output Cu	ırrent [Arms]	18.5	19.6	32.9	46.9	54.7	58.6	78.0	
Instantaneous Maximur	n Output 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 Circuit	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 Capacit	y [kVA]*	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			•	•					

\* This is the net value at the rated load.

## Single-Phase, 100 VAC

Мо	del SGD7S-	R70F	R90F	2R1F	2R8F
Maximum Applicat	ole Motor Capacity [kW]	0.05	0.1	0.2	0.4
Continuous Outpu	t Current [Arms]	0.66	0.91	2.1	2.8
Instantaneous Max [Arms]	kimum Output Current	2.1	3.2	6.5	9.3
Main Circuit	Power Supply	100 VAC t	o 120 VAC, -15	5% to +10%, 50	Hz/60 Hz
	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 Cap	acity [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
RegenerativeMinimum AllowableResistorResistance [Ω]		40	40	40	40
Overvoltage Categ	ory				

\* This is the net value at the rated load.

## 2.2 SERVOPACK Overload Protection Characteristics

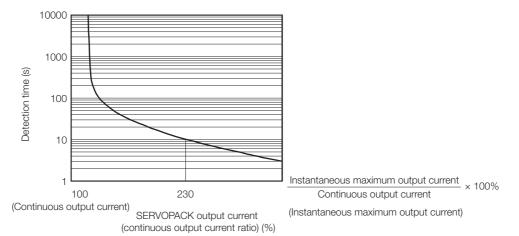
The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of 55°C.

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.

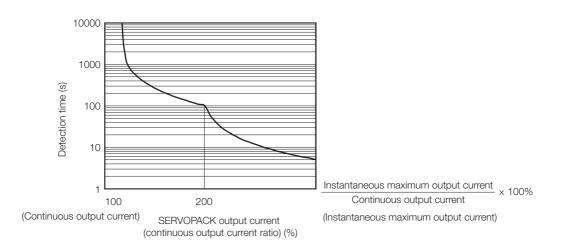
#### • SGD7S-R70A, -R90A, -1R6A, -2R8A, -R70F, -R90F, -2R1F, and -2R8F



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 Analog Voltage/Pulse Train Reference SERVOPACK with FT77 Specification

Item		Specification			
Control Met	Control Method		IGBT-based PWM control, sine wave current drive		
Feedback	With Rotary Servomotor	Serial encoder: 17 bits (absolute encoder) 20 bits or 24 bits (incremental encoder/absolute encoder) 22 bits (absolute encoder)			
Teeuback	With Linear Servomotor	lute line Increment increment	te linear encoder (The signal resolution depends on the abso- ear encoder.) ental linear encoder (The signal resolution depends on the ental linear encoder or Serial Converter Unit.)		
	Surrounding Air Temperature <sup>*1</sup>	Refer to $\Sigma$	55°C rating, usage is possible between 55°C and 60°C.) the following manual for derating specifications. Series Σ-7S SERVOPACK with Analog Voltage/Pulse Train Refer- s Product Manual (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% relative humidity max. (with no freezing or condensation)			
	Vibration Resistance	4.9 m/s <sup>2</sup>			
	Shock Resistance	19.6 m/s <sup>2</sup>			
	Degree of Protection	Degree	SERVOPACK Model: SGD7S-		
Environ- mental Conditions		IP20	R70A, R90A, 1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A, R70F, R90F, 2R1F, and 2R8F		
Conditions		IP10	180A, 200A, 330A, 470A, 550A, 590A, and 780A		
	Pollution Degree	<ul> <li>2</li> <li>Must be no corrosive or flammable gases.</li> <li>Must be no exposure to water, oil, or chemicals.</li> <li>Must be no dust, salts, or iron dust.</li> </ul>			
	Altitude <sup>*1</sup>	<ul> <li>1,000 m max. (With derating, usage is possible between 1,000 m a 2,000 m.)</li> <li>Refer to the following manual for derating specifications.</li> <li>Ω Σ-7-Series Σ-7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual (Manual No.: SIEP S800001 26)</li> </ul>			
	Others	Do not use the SERVOPACK in the following locations: Locations ject to static electricity noise, strong electromagnetic/magnetic fiel or radioactivity			
Applicable S	Applicable Standards		the following section for details. pliance with UL Standards, EU Directives, and Other Safety Stan- s on page xxvii		
Mounting		Base-mounted			
		1	Continued on pout page		

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	Item		Specification	
	Speed Control Ra		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		$\pm 0.1\%$ of rated speed max. (for a temperature fluctuation of 25°C $\pm 25$ °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 Outp		Phase A, phase B, phase C: Line-driver output Number of divided output pulses: Any setting is allowed.	
	Overheat P Input	Protection	Number of input points: 1 Input voltage range: 0 V to +5 V	
		Fixed Input	Allowable voltage range: 5 VDC ±5% Number of input points: 1 SEN (Absolute Data Request) signal	
			Allowable voltage range: 24 VDC ±20% Number of input points: 7	
I/O Signals	Sequence Input Signals	Input Signals That Can Be Allo- cated	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) sig- nals /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 /P-DET (Polarity Detection) signal /P-DET (Polarity Detection) signal /PSEL (Reference Pulse Input Multiplication Switch) Signal /GEAR1 (Reference Pulse Multiplier Selection 1) signal /GEAR2 (Reference Pulse Multiplier Selection 2) signal A signal can be allocated and the positive and negative logic can be changed.	

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	Itom		Continued from previous page.		
	Item		Specification Allowable voltage range: 5 VDC to 30 VDC		
		Fixed Output	Number of output points: 1 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 out- puts.)		
I/O Signals	Sequence Output Signals	Output Signals That Can Be Allocated	<ul> <li>Output Signals</li> <li>/COIN (Positioning Completion) Signal</li> <li>/V-CMP (Speed Coincidence Detection) Signal</li> <li>/TGON (Rotation Detection) Signal</li> <li>/S-RDY (Servo Ready) signal</li> <li>/CLT (Torque Limit Detection) Signal</li> <li>/VLT (Speed Limit Detection) Signal</li> <li>/VLT (Speed Limit Detection) Signal</li> <li>/WARN (Warning) Signal</li> <li>/NEAR (Near) signal</li> <li>/PSELA (Reference Pulse Input Multiplication Switching Output) signal</li> <li>ALO1, ALO2, and ALO3 (Alarm Code) signals</li> <li>A signal can be allocated and the positive and negative logic can be changed.</li> </ul>		
	RS-422A Communi- cations (CN3)	Inter- faces 1:N Commu- nications	Digital Operator (JUSP-OP05A-1-E) and personal computer (with Sig- maWin+) Up to N = 15 stations possible for RS-422A port		
Communi- cations		Axis Address Setting	Set with parameters.		
	USB	Interface	Personal computer (with SigmaWin+)		
	Communi- cations (CN7)	Commu- nica- tions Standard	Conforms to USB2.0 standard (12 Mbps).		
Displays/Ind	licators		CHARGE indicator and five-digit seven-segment display		
Panel Opera	ator		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, overtravel (OT), or forced stop (FSTP) occurs, or when the power supply to the main circuit or servo is OFF.		
Regenerativ	e 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 $\Sigma$ -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.		

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					Continued from previous page.
		Iter			Specification
		Input			/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 <sup>*3</sup>		Stan-	ISO13849-1 PLe (Category 3) and IEC61508 SIL3	
Арр	Applicable Option Modules		es	Fully-Closed Modules	
	-		Start T	ime Set-	0 s to 10 s (Can be set separately for acceleration and deceleration.)
			Refer- ence Voltage		<ul> <li>Maximum input voltage: ±12 V (forward motor rotation for positive reference).</li> <li>6 VDC at rated speed (default setting). Input gain setting can be changed.</li> </ul>
		Input Signa		Input Imped- ance	Approx. 14 kΩ
	Speed Con- trol			Circuit Time Con- stant	30 μs
		Internal Set Spe	Soloc-		With Proportional Control signal
Controls		Cont		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.
Con		Feedforward Compensation			0% to 100%
		Output Signal Posi- tioning Completed Width Setting		npleted	0 to 1,073,741,824 reference units
				Refer- 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
	tion Con- trol	In- put Sig- nals	eren ce puls es	Maxi- mum Input Fre- quency	<ul> <li>Line Driver Sign + pulse train or CW + CCW pulse trains: 4 Mpps Two-phase pulse trains with 90° phase differential: 1 Mpps</li> <li>Open Collector Sign + pulse train or CW + CCW pulse trains: 200 kpps Two-phase pulse trains with 90° phase differential: 200 kpps</li> </ul>
				Input Multiplica- tion Switching	1 to 100 times
			Clear	Signal	Position deviation clear Line driver or open collector

SERVOPACK Ratings and Specifications

Continued on next page.

Continued from previous page. Item Specification • Maximum input voltage: ±12 V (forward torque output for positive ref-Refererence). ence • 3 VDC at rated torque (default setting). Input gain setting can be Voltage changed. Controls Torque Input Input Con-Signal Imped-Approx. 14 k $\Omega$ trol ance Circuit Time 16 µs Constant

\*1. If you combine a Σ-7-Series SERVOPACK with a Σ-V-Series Option Module, the following Σ-V-Series SERVO-PACKs 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.

\*2. The coefficient of speed fluctuation for load fluctuation is defined as follows:

Coefficient of speed fluctuation = <u>No-load motor speed - Total-load motor speed</u> × 100% Rated motor speed

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

## 2.3.2 MECHATROLINK-III Communications Reference SER-VOPACK with FT77 Specification

	Item	Specification		
Drive Method		IGBT-based PWM control, sine wave current drive		
Foodbook	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	<ul> <li>Absolute linear encoder (The signal resolution depends on the absolute linear encoder.)</li> <li>Incremental linear encoder (The signal resolution depends on the incremental linear encoder or Serial Converter Unit.)</li> </ul>		
	Surrounding Air Tem- perature <sup>*1</sup>	<ul> <li>-5°C to 55°C</li> <li>(With derating, usage is possible between 55°C and 60°C.)</li> <li>Refer to the following manual for derating specifications.</li> <li>Ω Σ-7 Series Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)</li> </ul>		
	Storage Temperature	-20°C to 85°C		
	Surrounding Air Humidity	95% relative humidity max. (with no freezing or condensation)		
	Storage Humidity	95% relative humidity max. (with no freezing or condensation)		
	Vibration Resistance	4.9 m/s <sup>2</sup>		
	Shock Resistance	19.6 m/s <sup>2</sup>		
		Degree SERVOPACK Model: SGD7S-		
Environ- mental Conditions	Degree of Protection	IP20         R70A, R90A, 1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A, R70F, R90F, 2R1F, 2R8F		
Conditions		IP10 120A20A008, 180A, 200A, 330A, 470A, 550A, 590A, 780A		
	Pollution Degree	<ul> <li>2</li> <li>Must be no corrosive or flammable gases.</li> <li>Must be no exposure to water, oil, or chemicals.</li> <li>Must be no dust, salts, or iron dust.</li> </ul>		
	Altitude <sup>*1</sup>	<ul> <li>1,000 m max. (With derating, usage is possible between 1,000 m an 2,000 m.)</li> <li>Refer to the following manual for derating specifications.</li> <li>Ω Σ-7 Series Σ-7S SERVOPACK with MECHATROLINK-III Communication References Product Manual (Manual No.: SIEP S800001 28)</li> </ul>		
	Others	Do not use the SERVOPACK in the following locations: Locations subject to static electricity noise, strong electromagnetic/magnetic fields, radioactivity		
Applicable S	Standards	Refer to the following section for details. Compliance with UL Standards, EU Directives, and Other Safety Stan- dards on page xxvii		
Mounting		Base-mounted		
	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 of Speed	0% of rated speed max. (for a voltage fluctuation of $\pm 10\%$ )		
Perfor- mance	Fluctuation*2	$\pm$ 0.1% of rated speed max. (for a temperature fluctuation of 25°C $\pm$ 25°C)		
	Torque Control Preci- sion (Repeatability)	±1%		
	Soft Start Time Setting	0 s to 10 s (Can be set separately for acceleration and deceleration.)		
	*	Continued on next name		

#### 2.3.2 MECHATROLINK-III Communications Reference SERVOPACK with FT77 Specification

Continued from previous page.

	Item		Specification
	Encoder Div Pulse Outpu		Phase A, phase B, phase C: Line-driver output Number of divided output pulses: Any setting is allowed.
	Overheat Protection Input		Number of input points: 1 Input voltage range: 0 V to +5 V
			Allowable voltage range: 24 VDC ±20% Number of input points: 7
	Sequence Input Signals Signals Be Allo- cated		<ul> <li>Input method: Sink inputs or source inputs</li> <li>Input Signals</li> <li>P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals</li> <li>/P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals</li> <li>/DEC (Origin Return Deceleration Switch) signal</li> <li>/EXT1 to /EXT3 (External Latch Input 1 to 3) signals</li> <li>FSTP (Forced Stop Input) signal</li> <li>A signal can be allocated and the positive and negative logic can be changed.</li> </ul>
I/O Signals		Fixed Output	Allowable voltage range: 5 VDC to 30 VDC Number of output points: 1 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.)
	Sequence Output Signals	output Output	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 • /VLT (Speed Limit Detection) signal • /WARN (Warning) signal • /WARN (Warning) 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 Sig- maWin+)
	RS-422A Communi- cations	1:N Commu- nications	Up to N = 15 stations possible for RS-422A port
Communi- cations	(CN3)	Axis Address Setting	03 to EF hex (maximum number of slaves: 62) The rotary switches (S1 and S2) are used to set the station address.
	USB	Interface	Personal computer (with SigmaWin+)
	Communi- cations (CN7)	Commu- nications Standard	Conforms to USB2.0 standard (12 Mbps).
Displays/Indicators			CHARGE, PWR, CN, L1, and L2 indicators, and one-digit seven-segment display
	Communica tocol	ations Pro-	MECHATROLINK-III
MECHA-	Station Add Settings	lress	03 to EF hex (maximum number of slaves: 62) The rotary switches (S1 and S2) are used to set the station address.
TROLINK-III Communi-	Transmissic	n Speed	100 Mbps
cations	Transmissic	n Cycle	125 μs, 250 μs, 500 μs, 750 μs, 1.0 ms to 4.0 ms (multiples of 0.5 ms)
	Number of Transmis- sion Bytes		32 or 48 bytes/station A DIP switch (S3) is used to select the number of transmission bytes.

Continued on next page.

#### 2.3.2 MECHATROLINK-III Communications Reference SERVOPACK with FT77 Specification

Continued from previous page.

Continued from previous pa			
	Item	Specification	
Defense	Performance	Position, speed, or torque control with MECHATROLINK-III communi- cations	
Reference Method	Reference Input	MECHATROLINK-III commands (sequence, motion, data setting, data access, monitoring, adjustment, etc.)	
	Profile	MECHATROLINK-III standard servo profile	
MECHATRO	LINK-III Communica-	Rotary switch (S1 and S2) positions: 16	
tions Setting	y Switches	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.	
Regenerativ	e 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 (Catalog No.: KAEP S800001 23)	
Overtravel (0	DT) 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 Functi	ons	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 <sup>*3</sup>	ISO13849-1 PLe (Category 3), IEC61508 SIL3	
Applicable C	Option Modules	Fully-closed Modules	

\*1. If you combine a Σ-7-Series SERVOPACK with a Σ-V-Series Option Module, the following Σ-V-Series SERVO-PACKs 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.

\*2. The coefficient of speed fluctuation for load fluctuation is defined as follows:

Coefficient of speed fluctuation = <u>No-load motor speed - Total-load motor speed</u> × 100% Rated motor speed

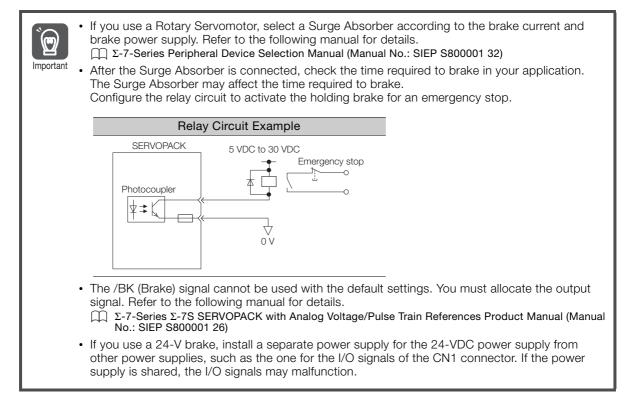
\*3. Always perform risk assessment for the system and confirm that the safety requirements are met.

## Wiring and Connecting SERVOPACKs

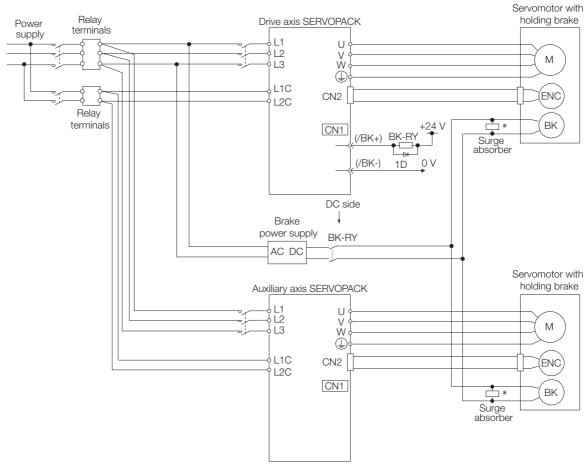
This chapter provides information on wiring and connecting SERVOPACK when torque/force assistance is used.

3.1	Wirin	g Servomotor Holding Brakes
3.2	I/O S	ignal Connections
	3.2.1	Analog Voltage/Pulse Train Reference SERVOPACK with FT77 Specification
	3.2.2	MECHATROLINK-III Communications Reference SERVOPACK with FT77 Specification
3.3	Connect	ing Serial Communications Cables for Torque/Force Assistance 3-6

## 3.1 Wiring Servomotor Holding Brakes



If you use a Servomotor with a holding brake, refer to the following figure and wire the brake power supply.



BK-RY: Brake control relays 1D: Flywheel diode

\* Install the surge absorber near the brake terminals on the Servomotor.

## 3.2 I/O Signal Connections

# 3.2.1 Analog Voltage/Pulse Train Reference SERVOPACK with FT77 Specification

## **Reference Input**

Input an analog voltage speed reference or pulse train position reference from the host controller to the drive axis SERVOPACK only. A reference input to the auxiliary axis SERVOPACK is not necessary.

# /S-ON (Servo ON) Signal, SEN (Absolute Data Request) Signal, and /ALM-RST (Alarm Reset) Signal

There are two ways to connect the /S-ON (Servo ON) signal, SEN (Absolute Data Request) signal, and /ALM-RST (Alarm Reset) signal.

- Connecting the signals only to the drive axis SERVOPACK (recommended)
- Connecting the signals to both the drive axis SERVOPACK and auxiliary axis SERVOPACK
- Connecting the Signals Only to the Drive Axis SERVOPACK (Recommended)

Connect the /S-ON (Servo ON) signal, SEN (Absolute Data Request) signal, and /ALM-RST (Alarm Reset) signal to the drive axis SERVOPACK.



If you connect the /S-ON (Servo ON) signal, SEN (Absolute Data Request) signal, and /ALM-RST (Alarm Reset) signal only to the drive axis SERVOPACK, always set Pn0D4 to n. DDD 3 in the auxiliary axis SERVOPACK.

#### Connecting the Signals to Both the Drive Axis SERVOPACK and Auxiliary Axis SERVOPACK

Connect the /S-ON (Servo ON) signal, SEN (Absolute Data Request) signal, and /ALM-RST (Alarm Reset) signal to the drive axis SERVOPACK and the auxiliary axis SERVOPACK.



If you connect the /S-ON (Servo ON) signal, SEN (Absolute Data Request) signal, and /ALM-RST (Alarm Reset) signal to both the drive axis SERVOPACK and auxiliary axis SERVOPACK, always set Pn0D4 to n. DDD2 in the auxiliary axis SERVOPACK.

 Input the /S-ON (Servo ON) signal so that the servo turns ON simultaneously in both the drive axis SERVOPACK and auxiliary axis SERVOPACK or so that the servo turns ON in the auxiliary axis SERVOPACK before the drive axis SERVOPACK.

## **Overtravel Signals**

Connect the overtravel signals (P-OT and N-OT) to either the drive axis SERVOPACK or auxiliary axis SERVOPACK. However, even if you connect the overtravel signals to the auxiliary axis SERVOPACK, use the operation direction of the drive axis SERVOPACK for P-OT and N-OT.

Both the drive axis SERVOPACK and auxiliary axis SERVOPACK will enter overtravel status if the other SERVOPACK enters overtravel status.

The overtravel stopping method for the drive axis SERVOPACK and auxiliary axis SERVOPACK is set in the drive axis SERVOPACK (Pn001 =  $n.\Box\Box X\Box$ ).

- If you use the overtravel signals (P-OT and N-OT), always set Pn0D4 to n. DDD3 in the auxiliary axis SERVOPACK.
- The Servomotor will be in the following status after it is stopped for overtravel. Drive axis Servomotor: The setting of Pn001=n□□X□ (Overtravel Stopping Method) will be used.
  - Auxiliary axis Servomotor: The Servomotor will be coasting.
  - If the drive axis SERVOPACK cannot hold the load on a vertical axis by itself, provide a holding brake.

## FSTP (Forced Stop) Signal

Connect the FSTP (Forced Stop) signal only to the drive axis SERVOPACK.



0

Set the same stopping method for when the servo turns OFF or when a Gr. 1 alarm occurs  $(Pn001 = n.\Box\Box\Box\Delta$ ) in both the drive axis SERVOPACK and auxiliary axis SERVOPACK. If you use the FSTP (Forced Stop) signal, always set Pn0D4 to  $n.\Box\Box\Box$ 3 in the auxiliary axis SERVOPACK.

## 3.2.2

#### 2 MECHATROLINK-III Communications Reference SER-VOPACK with FT77 Specification

Connect the overtravel signals (P-OT and N-OT) only to the drive axis SERVOPACK.

When the drive axis SERVOPACK enters overtravel status, only the drive axis SERVOPACK enters overtravel status.

The overtravel stopping method for the drive axis SERVOPACK is set in the drive axis SERVO-PACK (Pn001 =  $n.\square\square X\square$ ).

The overtravel stopping method for an auxiliary axis SERVOPACK depends on the torque of the drive axis SERVOPACK.

When the overtravel stopping method for the drive axis SERVOPACK is set to the dynamic brake (Pn001 =  $\square \square \square \square$ ), the overtravel stopping method for an auxiliary axis SERVOPACK will be to coast to a stop with 0% torque. At this time, the drive axis SERVOPACK dynamic brake may become overloaded. Therefore, do not set Pn001 to  $\square \square \square \square$  in any of the SERVOPACKs unless there is some particular reason to do so.



 The Servomotor will be in the following status after it is stopped for overtravel. Drive axis Servomotor: The setting in Pn001 = n. DXD (Overtravel Stopping Method) will be used.

- Auxiliary axis Servomotor: The Servomotor will be coasting.
- If the drive axis SERVOPACK cannot hold the load on a vertical axis by itself, provide a holding brake.

## Forced Stop (FSTP) Signal

Connect the FSTP (Forced Stop) signal only to the drive axis SERVOPACK.



Set the same stopping method for when the servo turns OFF or when a Gr. 1 alarm occurs (Pn001=  $n.\square\square\squareX$ ) in both the drive axis SERVOPACK and auxiliary axis SERVOPACKs.

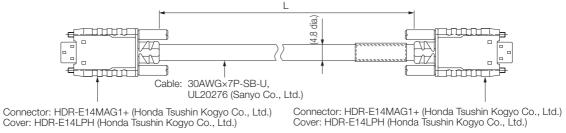
## 3.3 Connecting Serial Communications Cables for Torque/Force Assistance

A torque/force assistance communications cable is connected between CN3 on the drive axis Analog Voltage/Pulse Train Reference SERVOPACK with FT77 specification and CN3 on the auxiliary axis SERVOPACK to perform serial torque/force assistance communications between the drive axis SERVOPACK and auxiliary axis SERVOPACKs.

#### **Selection Table**

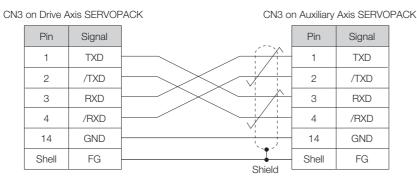
Order Number	Length (L)	Inquiries
FA376044-00P3-E	0.3 m	Yaskawa Controls Co., Ltd.
FA376044-00P7-E	0.7 m	Taskawa Controis CO., Ltu.

## **Dimensional Drawing**



Unit: mm

## Wiring Specifications



# Torque/Force Assistance

This chapter describes torque/force assistance in detail.

4.1	Analog V	Analog Voltage/Pulse Train Reference SERVOPACK with FT77 Specification 4-2							
	4.1.1 4.1.2 4.1.3	Introduction         4-2           Setup Procedure         4-3           Monitoring         4-7							
4.2	MECHATR	OLINK-III Communications Reference SERVOPACK with FT77 Specification 4-8							
	4.2.1 4.2.2 4.2.3	Introduction         4-8           Setup Procedure         4-9           Monitoring         4-17							

4.1.1 Introduction

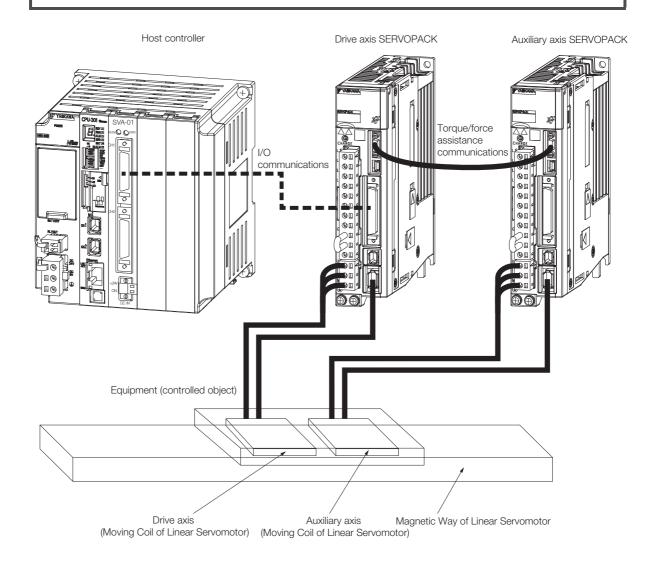
## Analog Voltage/Pulse Train Reference SERVOPACK with FT77 Specification

## 4.1.1 Introduction

Torque/force assistance is used to output twice the torque of a drive axis SERVOPACK by using two SERVOPACKs: a drive axis SERVOPACK and an auxiliary axis SERVOPACK. The auxiliary axis SERVOPACK performs serial torque/force assistance communications with the drive axis SERVOPACK to receive a torque reference and output the same torque as the drive axis SERVOPACK.

However, the torque output from the auxiliary axis SERVOPACK can be changed based on the torque output by the drive axis SERVOPACK. Refer to the following section for details. Setting Parameters in the Auxiliary Axis SERVOPACK on page 4-5

- The drive axis SERVOPACK and auxiliary axis SERVOPACK must have the same maximum applicable motor capacity.
   To use targue/farea assistance, you must prepare a targue/farea assistance communication
- To use torque/force assistance, you must prepare a torque/force assistance communications cable to connect the drive axis SERVOPACK and auxiliary axis SERVOPACK.
  - Information on any alarms that occur in the drive axis SERVOPACK or auxiliary axis SERVO-PACK are shared between the two SERVOPACKs, i.e., if an alarm occurs in either SERVO-PACK, it will occur in both of them.

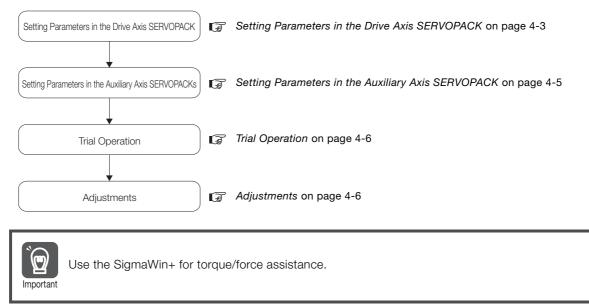


4.1.2 Setup Procedure

## 4.1.2 Setup Procedure

#### Flowchart

The following flowchart gives the setup procedure for torque/force assistance.



## Setting Parameters in the Drive Axis SERVOPACK

To use torque/force assistance, you must set parameters in the drive axis SERVOPACK. The parameters that are set in the drive axis SERVOPACK are described in this section.

#### ◆ Torque/Force Assistance Mode Setting

Set Pn0D4 to n. DDD1 for the drive axis SERVOPACK for torque/force assistance.

Parameter		Meaning	When Enabled	Classification
	n.□□□0 (default set- ting)	Disable torque/force assistance.		
	n.0001	Use the SERVOPACK to control a drive axis.		
Pn0D4	n.□□□2	Use the SERVOPACK to control an auxiliary axis. Do not synchronize the following input signals with the SERVOPACK for the drive axis. • /S-ON (Servo ON) signal • SEN (Absolute Data Request) signal • /ALM-RST (Alarm Reset) signal	After restart	Setup
	n.0003	Use the SERVOPACK to control an auxiliary axis. Synchronize the following input signals with the SERVOPACK for the drive axis. • /S-ON (Servo ON) signal • SEN (Absolute Data Request) signal • /ALM-RST (Alarm Reset) signal		

#### Torque/Force Assistance Transmission Speed Setting

Set  $Pn0D4 = n.\square\squareX\square$  (Torque/Force Assistance Transmission Speed Selection) to the transmission speed to use for torque/force assistance communications.

Pa	rameter	Meaning	When Enabled	Classification
	n.□□0□	Transmission Speed 1 (reference communications cycle: 12,000 $\mu$ s or less)		Setup
	n.0010	Transmission Speed 2 (reference communications cycle: 6,000 $\mu$ s or less)		
	n.0020	Transmission Speed 3 (reference communications cycle: 5,000 $\mu$ s or less)		
Pn0D4	n.🗆🗆 3🗆	Transmission Speed 4 (reference communications cycle: 3,000 $\mu$ s or less)		
	n.0040	Transmission Speed 5 (reference communications cycle: 1,000 $\mu$ s or less)		
	n.□□5□ (default set- ting)	Transmission Speed 6 (reference communications cycle: 500 $\mu s$ or less)		



Always set the same torque/force assistance transmission speed for both the drive axis SER-VOPACK and auxiliary axis SERVOPACK.

• If A.E90 alarms (Torque/Force Assistance Communications Error) occur while using torque/ force assistance, set Pn0D4 =  $n.\square\square X\square$  (Torque/Force Assistance Transmission Speed Selection) to a slower transmission speed.

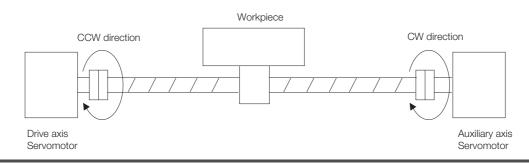
#### Torque/Force Assistance Output Polarity Selection

Depending on how the Servomotors are used, it may be necessary to reverse the torque/force assistance output polarity.

Use  $Pn0D4 = n.\Box X \Box \Box$  (Torque/Force Assistance Output Polarity Selection) to set the torque/force assistance output polarity.

Parameter		Meaning	When Enabled	Classification
n.□0□□ Pn0D4 (default setting)		Do not reverse the polarity.	After restart Setu	
	n.🗆 1 🗆 🗆	Reverse the polarity.		

**Example** If you use Servomotors for a drive axis and an auxiliary axis to rotate a ball screw and move a workpiece, the rotation direction will be different for the drive axis and auxiliary axis. This can be easily achieved by reversing the polarity of the torque/force assistance output (Pn0D4 = n.D1DD) sent from the drive axis SERVOPACK to the auxiliary axis SERVOPACK.





The setting of Pn0D4 =  $n.\Box X \Box \Box$  (Torque/Force Assistance Output Polarity Selection) is valid only in the drive axis SERVOPACK. The setting in the auxiliary axis SERVOPACK is ignored.

### Setting Parameters in the Auxiliary Axis SERVOPACK

To use torque/force assistance, you must set parameter in the auxiliary axis SERVOPACK. The parameters that are set in the auxiliary axis SERVOPACK are described in this section.

### Control Method Setting

The auxiliary axis SERVOPACK to use for torque/force assistance can be used only in Torque Control Mode.

Set the control method to Torque Control Mode (Pn000 =  $n.\Box\Box2\Box$ ).

#### Torque/Force Assistance Mode Setting

Set Pn0D4 to n. DD2 or n. DD3 and set the auxiliary axis SERVOPACK for torque/force assistance.



 If you do not set Torque Control Mode (Pn000 = n.□□2□) and set Pn0D4 to n.□□13 or n.□□12, an A.042 alarm (Parameter Combination Error) will occur. Always set Pn000 to n.□□2□ first and then set Pn0D4 to n.□□13 or n.□□12.

Always set Ph000 to 11.0020 first and then set Ph004 to 11.0003 of 11.0002.
Always set Pn0D4 to n.00003 to use the overtravel signals (P-OT and N-OT) and FSTP (Forced Stop) signal.

The connection method for the /S-ON (Servo ON) signal, SEN (Absolute Data Request) signal, and /ALM-RST (Alarm Reset) signal determines whether you set Pn0D4 to n. DD2 or n. DD3.

Connecting the /S-ON Signal, SEN Signal, and /ALM-RST Signal Only to the Auxiliary Axis SERVOPACK

Set Pn0D4 to n. DDD3 (Use the SERVOPACK to control an auxiliary axis and synchronize the following input signals with the SERVOPACK for the drive axis: /S-ON signal, SEN signal, and /ALM-RST signal) in the SERVOPACK for auxiliary axis.

Connecting the /S-ON Signal, SEN Signal, and /ALM-RST Signal to Both the Drive Axis SERVOPACK and Auxiliary Axis SERVOPACK

Set Pn0D4 to n. DDD2 (Use the SERVOPACK to control an auxiliary axis and do not synchronize the following input signals with the SERVOPACK for the drive axis: /S-ON signal, SEN signal, and /ALM-RST signal) in the SERVOPACK for auxiliary axis.

Parameter		Meaning	When Enabled	Classification
	n.□□□0 (default set- ting)	Disable torque/force assistance.		
	n.🗆 🗆 🗆 1	Use the SERVOPACK to control a drive axis.		
Pn0D4	n.0002	Use the SERVOPACK to control an auxiliary axis. Do not synchronize the following input signals with the SERVOPACK for the drive axis. • /S-ON (Servo ON) signal • SEN (Absolute Data Request) signal • /ALM-RST (Alarm Reset) signal	After restart	Setup
	n.□□□3	Use the SERVOPACK to control an auxiliary axis. Synchronize the following input signals with the SERVOPACK for the drive axis. • /S-ON (Servo ON) signal • SEN (Absolute Data Request) signal • /ALM-RST (Alarm Reset) signal		

#### Torque/Force Assistance Transmission Speed Setting

Set  $Pn0D4 = n.\square\squareX\square$  (Torque/Force Assistance Transmission Speed Selection) to the transmission speed to use for torque/force assistance communications.

P	arameter	Meaning	When Enabled	Classification
Pn0D4	n.000	Transmission Speed 1 (reference communica- tions cycle: 12,000 µs or less)		Setup
	n.0010	Transmission Speed 2 (reference communica- tions cycle: 6,000 μs or less)		
	n.0020	Transmission Speed 3 (reference communications cycle: $5,000 \ \mu s$ or less)		
	n.🗆 🗆 3 🗆	Transmission Speed 4 (reference communica- tions cycle: 3,000 μs or less)	-	
	n.0040	Transmission Speed 5 (reference communications cycle: 1,000 $\mu$ s or less)		
	n.□□5□ (default set- ting)	Transmission Speed 6 (reference communications cycle: 500 $\mu s$ or less)		



Always set the same torque/force assistance transmission speed for both the drive axis SER-VOPACK and auxiliary axis SERVOPACK.

• If A.E90 alarms (Torque/Force Assistance Communications Error) occur while using torque/ force assistance, set Pn0D4 = n.  $\Box \Box X \Box$  (Torque/Force Assistance Transmission Speed Selection) to a slower transmission speed.

#### Torque/Force Assistance Rate Setting

The torque output from the auxiliary axis SERVOPACK can be changed based on the torque output by the drive axis SERVOPACK. Set Pn428 (Torque/force Assistance Rate) to the torque/force assistance rate for the torque output from the auxiliary axis SERVOPACK.

	Torque/Force Assis	Position			
Pn428	Setting Range	Setting Unit	Default Setting	When Enabled	Classification
	0 to 65,535	×0.01	100	Immediately	Setup

### **Trial Operation**

Perform trial operation for torque/force assistance on the drive axis SERVOPACK.

Refer to the following manual for information on trial operation.

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

### Adjustments

Input a reference from the host controller to the drive axis SERVOPACK and make adjustments.

Refer to the following manual for information on adjustments.

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

# 4.1.3 Monitoring

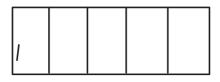
You can monitor the communications status and operating status of torque/force assistance.

# Monitoring the Communications Status of Torque/Force Assistance

The communications status of torque/force assistance is displayed on the indicators on the SERVOPACK's panel display.

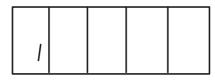
#### ♦ Drive Axis SERVOPACK

The panel display will be as follows when the drive axis SERVOPACK is performing serial communications for torque/force assistance:



#### Auxiliary Axis SERVOPACK

The panel display will be as follows when the auxiliary axis SERVOPACK is performing serial communications for torque/force assistance.



## Monitoring the Operating Status of Torque/Force Assistance

You can use the SigmaWin+ to monitor the operating status of torque/force assistance.

Control	I/F 🖌	Item 🗸	Unit	0001-SGD7S-R70A00A000F77
Control	1/F 🖌	item 🗸		Axis A
POS SPD TRQ	Common	Motor rotating speed	min-1	(
SPD	Common	Speed reference	min-1	
POS SPD TRQ	Common	Internal torque reference	%	
POS SPD TRQ	Common	Current Alarm State	-	A.C90 : Encoder Communications Erro
POS SPD TRQ	Common	Torque/Force Assistance Operating Status	-	0 : Disable
POS SPD TRQ	Common	Reference Pulse Multiplier Selection	_	3 : Reference pulse multiplier

4.2.1 Introduction

# .2 MECHATROLINK-III Communications Reference SERVOPACK with FT77 Specification

### 4.2.1 Introduction

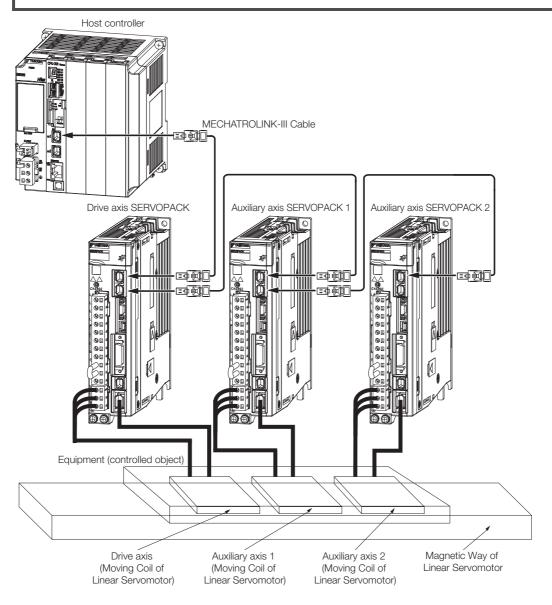
Torque/force assistance is used to output many times the torque of a drive axis SERVOPACK by using a drive axis SERVOPACK together with up to five auxiliary axis SERVOPACKs. The auxiliary axis SERVOPACKs receive torque references from MECHATROLINK-III communications between the host controller and the drive axis SERVOPACK and output the same torque as the drive axis SERVOPACK.

However, the torque output from an auxiliary axis SERVOPACK can be changed based on the torque output by the drive axis SERVOPACK. Refer to the following section for details. Setting Parameters in the Auxiliary Axis SERVOPACK on page 4-5

• The drive axis SERVOPACK and auxiliary axis SERVOPACKs must have the same maximum applicable motor capacity.



- For a MECHATROLINK-III Communications Reference SERVOPACK with the FT77 specification, no torque/force assistance communications cable is required to receive torque references from MECHATROLINK-III communications.
- Information on any alarms that occur in the drive axis SERVOPACK or an auxiliary axis SERVO-PACK are shared between all of the SERVOPACKs, i.e., if an alarm occurs in any SERVOPACK, it will occur in all of them.

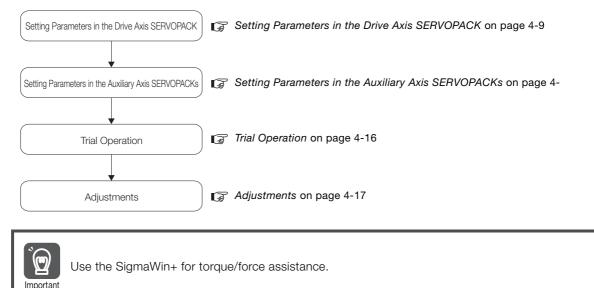


### 4.2.2 Setup Procedure

Important	<ul> <li>You may set any stopping method for when the servo turns OFF or when a Gr. 1 alarm occurs (Pn001 = n.□□□X). However, set the same method for all the SERVOPACKs.</li> <li>The stopping method for when a Gr. 2 alarm occurs must always be the same method as for when a Gr. 1 alarm occurs. Set Pn00B to n.□□1□. Also, set the same method for all the SERVOPACKs.</li> <li>Any stopping method may be set for forced stops (Pn00A = n.□□X□). However, set the same method for all the SERVOPACKs.</li> <li>When the overtravel stopping method for the drive axis SERVOPACK is set to dynamic brake (Pn001 = □□0□), the overtravel stopping method for an auxiliary axis SERVOPACK will be to coast to a stop with 0% torque. At this time, the drive axis SERVOPACK dynamic brake may become overloaded. Therefore, do not set Pn001 to □□0□ in any of the SERVOPACKs unless there is some particular reason to do so.</li> </ul>

### Flowchart

The following flowchart gives the setup procedure for torque/force assistance.



### Setting Parameters in the Drive Axis SERVOPACK

To use torque/force assistance, you must set parameters in the drive axis SERVOPACK. The parameters that are set in the drive axis SERVOPACK are described in this section.

#### ◆ Torque/Force Assistance Mode Setting

Set Pn0D4 to n. DDD4 for the drive axis SERVOPACK for torque/force assistance.

Para	ameter	Meaning	When Enabled	Classification
	n.□□□0 (default setting)	Disable torque/force assistance.		Setup
	n.0001	Reserved setting (Do not use.)	After restart	
Pn0D4	n.🗆 🗆 🗠 2	Reserved setting (Do not use.)		
111004	n.🗆 🗆 🗆 3	Reserved setting (Do not use.)		
	n.🗆 🗆 🗆 4	Use the SERVOPACK to control a drive axis.		
	n.□□□5	Use the SERVOPACK to control an auxiliary axis.		

#### Setting Up Other Station Monitoring

By assigning the drive axis SERVOPACK to other station monitoring, you can monitor torque references sent from the host controller to the drive axis SERVOPACK with the auxiliary axis SERVOPACKs.

The following section explains an example in which one drive axis SERVOPACK and five auxiliary axis SERVOPACKs are used under the following conditions:

	Drive Axis SERVOPACK	Auxiliary Axis SERVOPACK 1	Auxiliary Axis SERVOPACK 2	Auxiliary Axis SERVOPACK 3	Auxiliary Axis SERVOPACK 4	Auxiliary Axis SERVOPACK 5
MECHATROLINK-III communications sta- tion address: Set using the rotary switches (S1 and S2).	03 hex	04 hex	05 hex	06 hex	07 hex	08 hex
Number of transmis- sion bytes for MECHA- TROLINK-III communications: Set using the DIP switch (S3).	48 bytes	48 bytes	48 bytes	48 bytes	48 bytes	48 bytes
Other Station Monitor 1	Monitor the data for auxil- iary axis SER- VOPACK 1 (04 hex).	Monitor the data for the drive axis SERVOPACK (03 hex).				
Other Station Monitor 2	Monitor the data for auxil- iary axis SER- VOPACK 2 (05 hex).	_	_	_	_	_
Other Station Monitor 3	Monitor the data for auxil- iary axis SER- VOPACK 3 (06 hex).	_	_	_	_	_
Other Station Monitor 4	Monitor the data for auxil- iary axis SER- VOPACK 4 (07 hex).	_	_	_	_	_
Other Station Monitor 5	Monitor the data for auxil- iary axis SER- VOPACK 5 (08 hex).	-	-	_	-	-

#### Allocation Method

- 1. Set the station addresses for Other Station Monitor 1 to Other Station Monitor 5 as follows:
  - Other Station Monitor 1: Station Address (Pn9B1) = 04 hex
  - Other Station Monitor 2: Station Address (Pn9B4) = 05 hex
  - Other Station Monitor 3: Station Address (Pn9B7) = 06 hex
  - Other Station Monitor 4: Station Address (Pn9BA) = 07 hex
  - Other Station Monitor 5: Station Address (Pn9BD) = 08 hex

	Other Station Monit	Torque			
Pn9B1	Setting Range	Setting Unit	Default Setting	When Enabled	Classification
	0002 to FEEF	_	0002	After restart	Setup
	Other Station Monit	Torque			
Pn9B4	Setting Range	Setting Unit	Default Setting	When Enabled	Classification
	0002 to FEEF	_	0002	After restart	Setup

Continued from previous page.

	Other Station Monit	Torque			
Pn9B7	Setting Range	Setting Unit	Default Setting	When Enabled	Classification
	0002 to FEEF	-	0002	After restart	Setup
	Other Station Monit	tor 4: Station Addr	ess		Torque
Pn9BA	Setting Range	Setting Unit	Default Setting	When Enabled	Classification
	0002 to FEEF	-	0002	After restart	Setup
	Other Station Monit	tor 5: Station Addr	ess		Torque
Pn9BD	Setting Range	Setting Unit	Default Setting	When Enabled	Classification
	0002 to FEEF	—	0002	After restart	Setup

# **2.** Set the number of transmission bytes for Other Station Monitor 1 to Other Station Monitor 5 as follows:

• Other Station Monitor 1: Number of Transmission Bytes (Pn9B2) = 3

• Other Station Monitor 2: Number of Transmission Bytes (Pn9B5) = 3

• Other Station Monitor 3: Number of Transmission Bytes (Pn9B8) = 3

- Other Station Monitor 4: Number of Transmission Bytes (Pn9BB) = 3
- Other Station Monitor 5: Number of Transmission Bytes (Pn9BE) = 3

Parameter		Meaning	When Enabled	Classification
	n.🗆 🗆 🗆 0	Reserved setting (Do not use.)		
	n.🗆 🗆 🗆 1	Reserved setting (Do not use.)		
	n.🗆 🗆 🗠 2	32 bytes		
Pn9B2	n.🗆 🗆 🗠 3		After restart	Setup
	(default	48 bytes		
	setting)		-	
	n.🗆 🗆 🛛 4	Reserved setting (Do not use.)		
	n.□□□0	Reserved setting (Do not use.)	-	
	n.0001	Reserved setting (Do not use.)	-	
	n.🗆 🗆 🗠 2	32 bytes		
Pn9B5	n.□□□3		After restart	Setup
	(default	48 bytes		
	setting)		-	
	n.0004	Reserved setting (Do not use.)		
	n.□□□0	Reserved setting (Do not use.)	-	
	n.□□□1	Reserved setting (Do not use.)	-	
Pn9B8	n.□□□2	32 bytes	After restart	Setup
FIIBDO	n.□□□3 (default	48 bytes	Aller Testart	Setup
	setting)	40 Dytes		
	n.0004	Reserved setting (Do not use.)	-	
	n.□□□0	Reserved setting (Do not use.)		
	n.0001	Reserved setting (Do not use.)	-	
	n.0002	32 bytes	-	
Pn9BB	n.0003		After restart	Setup
	(default	48 bytes		
	setting)			
	n.0004	Reserved setting (Do not use.)	-	
	n.🗆 🗆 🗆 0	Reserved setting (Do not use.)		
	n.0001	Reserved setting (Do not use.)		
	n.🗆 🗆 🗠 2	32 bytes		
Pn9BE	n.🗆 🗆 🖂 3		After restart	Setup
	(default	48 bytes		
	setting)			
	n.0004	Reserved setting (Do not use.)		

#### Checking the Settings

Perform the following operations to check whether other station monitoring is set correctly.

- Set other station monitoring. Refer to the following section for details.
   Allocation Method on page 4-10
- 2. Send a CONNECT command to the drive axis SERVOPACK.
- 3. Send an SMON command to the drive axis SERVOPACK.
- **4.** With the SMON command, set bit 28 in the SVCMD\_IO area to 1 (Enable other station monitor) for the drive axis SERVOPACK.
- 5. Send the SMON command to the drive axis SERVOPACK and check that bit 20 (MON-START) in the SVCMD\_IO area (input) is 1 (Execute other station monitoring).

### Setting Parameters in the Auxiliary Axis SERVOPACKs

To use torque/force assistance, you must set parameters in all the auxiliary axis SERVOPACKs that you use.

The parameters that are set in the auxiliary axis SERVOPACKs are described in this section.

#### Torque/Force Assistance Mode Setting

Set Pn0D4 to n. DDD5 for the auxiliary axis SERVOPACKs for torque/force assistance.

Parameter		Meaning	When Enabled	Classification
	n.□□□0 (default setting)	Disable torque/force assistance.		Setup
	n.□□□1 n.□□□2 n.□□□3 n.□□□4	Reserved setting (Do not use.)		
Pn0D4		Reserved setting (Do not use.)	After restart	
111001		Reserved setting (Do not use.)		
		Use the SERVOPACK to control a drive axis.		
	n.🗆 🗆 🗆 5	Use the SERVOPACK to control an auxiliary axis.		

#### Setting Up Other Station Monitoring

By assigning an auxiliary axis SERVOPACK to other station monitoring, you can monitor torque references sent from the host controller to the drive axis SERVOPACK with the auxiliary axis SERVOPACKs.

	Drive Axis SERVOPACK	Auxiliary Axis SERVOPACK 1	Auxiliary Axis SERVOPACK 2	Auxiliary Axis SERVOPACK 3	Auxiliary Axis SERVOPACK 4	Auxiliary Axis SERVOPACK 5
MECHATROLINK-III communications sta- tion address: Set using the rotary switches (S1 and S2).	03 hex	04 hex	05 hex	06 hex	07 hex	08 hex
Number of transmis- sion bytes for MECHA- TROLINK-III communications: Set using the DIP switch (S3).	48 bytes	48 bytes	48 bytes	48 bytes	48 bytes	48 bytes

Continued from previous page.					previous page.	
	Drive Axis SERVOPACK	Auxiliary Axis SERVOPACK 1	Auxiliary Axis SERVOPACK 2	Auxiliary Axis SERVOPACK 3	Auxiliary Axis SERVOPACK 4	Auxiliary Axis SERVOPACK 5
Other Station Monitor 1	Monitor the data for auxil- iary axis SER- VOPACK 1 (04 hex).	Monitor the data for the drive axis SERVOPACK (03 hex).				
Other Station Monitor 2	Monitor the data for auxil- iary axis SER- VOPACK 2 (05 hex).	_	-	-	_	-
Other Station Monitor 3	Monitor the data for auxil- iary axis SER- VOPACK 3 (06 hex).	_	-	_	_	-
Other Station Monitor 4	Monitor the data for auxil- iary axis SER- VOPACK 4 (07 hex).	-	-	-	-	-
Other Station Monitor 5	Monitor the data for auxil- iary axis SER- VOPACK 5 (08 hex).	_	_	_	_	-

Continued from previous page.

#### Allocation Method

#### 1. Set Pn9B1 (Other Station Monitor 1: Station Address) to 03 hex.

	Other Station Moni	Torque			
Pn9B1	Setting Range	Setting Unit	Default Setting	When Enabled	Classification
	0002 to FEEF	_	0002	After restart	Setup

#### 2. Set Pn9B2 (Other Station Monitor 1: Number of Transmission Bytes) to 3.

Pa	arameter	Meaning	When Enabled	Classification
	n.🗆 🗆 🗆 0	Reserved setting (Do not use.)		
	n.🗆 🗆 🗆 1	Reserved setting (Do not use.)		
	n.🗆 🗆 🗠 2	32 bytes		
Pn9B2	n.□□□3 (default	48 bytes	After restart	Setup
	setting)			
	n.🗆 🗆 🛛 4	Reserved setting (Do not use.)		

# **3.** Set Pn9B3 (Other Station Monitor 1: Monitor Information Setting) to the data contents for torque references from the host controller to the drive axis SERVOPACK.

Parameter		Meaning	When Enabled	Classification
	n.🗆🗆XX	Address Offset		
Pn9B3	n.🗆X🗆 🗆	Data Size (Unit: bytes)	After restart	Setup
	n.XDDD	Reserved parameter (Do not change.)		

When using MONITOR 1 in MECHATROLINK-III communications (address offset: 20 bytes (14 hex), number of data bytes: 4 bytes), set Pn9B3 to n.1414.

When using MONITOR 2 in MECHATROLINK-III communications (address offset: 24 bytes (18 hex), number of data bytes: 4 bytes), set Pn9B3 to n.1416.

When using MONITOR 3 in MECHATROLINK-III communications (address offset: 28 bytes (1C hex), number of data bytes: 4 bytes), set Pn9B3 to n.141C.

• Servo ON Command (SV\_ON: 31 hex) Data Format

Dutes	SV_ON				
Bytes	Command	Response			
0	31 hex	31 hex			
1	WDT	RWDT			
2	CMD_CTRL	CMD_STAT			
3	OMD_OTTL	OND_STAT			
4					
5	SVCMD_CTRL	SVCMD_STAT			
6	SVOIVID_CTAL	SVOIVID_STAT			
7					
8					
9	SVCMD_IO	SVCMD_IO			
10		300000_10			
11					
12					
13		CPRM_SEL_			
14		MON1			
15					
16					
17		CPRM_SEL_			
18		MON2			
19					
20					
21	Reserved	MONITOR1			
22	neserveu	WONTONT			
23					
24					
25		MONITOR2			
26					
27					
28					
29		MONITOR3			
30					
31					

#### Checking the Settings

Perform the following operations to check whether other station monitoring is set correctly.

- Set other station monitoring. Refer to the following section for details.
   Allocation Method on page 4-10
- 2. Send a CONNECT command to the auxiliary axis SERVOPACK.
- 3. Send an SMON command to the auxiliary axis SERVOPACK.
- 4. With the SMON command, set bit 28 in the SVCMD\_IO area to 1 (Enable other station monitor) for the auxiliary axis SERVOPACK.
- 5. Send the SMON command to the auxiliary axis SERVOPACK and check that bit 20 (MONSTART) in the SVCMD\_IO area (input) is 1 (Execute other station monitoring).

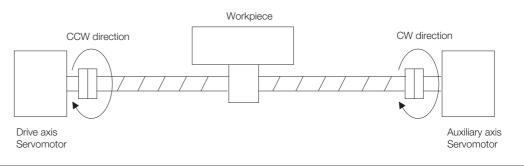
#### ◆ Torque/Force Assistance Output Polarity Selection

Depending on how the Servomotors are used, it may be necessary to reverse the torque/force assistance output polarity.

Use  $Pn0D4 = n.\Box X \Box \Box$  (Torque/Force Assistance Output Polarity Selection) to set the torque/force assistance output polarity.

Parameter		Meaning	When Enabled	Classification
Pn0D4	n.□0□□ (default setting)	Do not reverse the polarity.	After restart	Setup
	n.🗆 1 🗆 🗆	Reverse the polarity.		

**Example** If you use Servomotors for a drive axis and auxiliary axes to rotate a ball screw and move a workpiece, the rotation direction will be different for the drive axis and auxiliary axes. This can be easily achieved by reversing the polarity of the torque/force assistance output (Pn0D4 =  $n.\Box 1\Box \Box$ ) received by the auxiliary axis SERVOPACKs.



Important

The setting of Pn0D4 =  $n.\Box X \Box \Box$  (Torque/Force Assistance Output Polarity Selection) is valid only in the auxiliary axis SERVOPACKs. The setting in the drive axis SERVOPACK is ignored. Set Pn0D4 =  $n.\Box X \Box \Box$  (Torque/Force Assistance Output Polarity Selection) for each auxiliary axis SERVOPACK appropriate for the machine configuration.

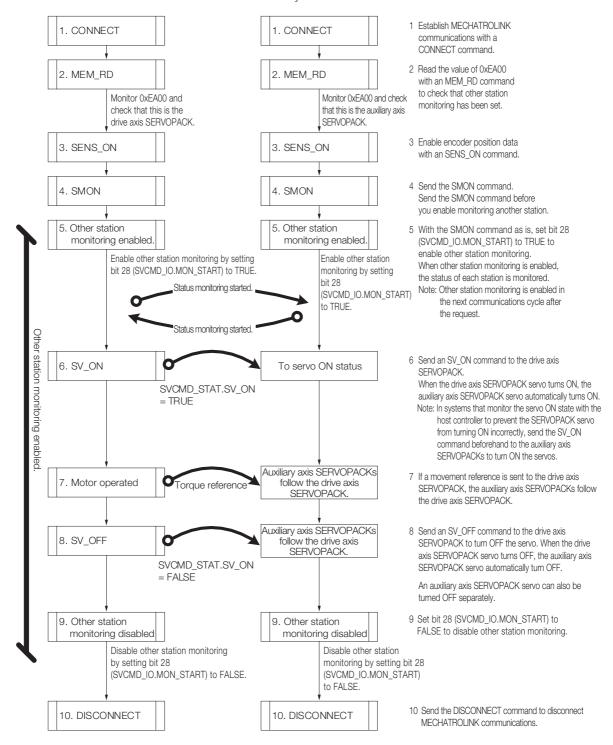
#### ◆ Torque/Force Assistance Rate Setting

The torque output from the auxiliary axis SERVOPACK can be changed based on the torque output by the drive axis SERVOPACK. Set Pn428 (Torque/force Assistance Rate) to the torque/force assistance rate for the torque output from the auxiliary axis SERVOPACK.

	Torque/Force Assis	Position			
Pn428	Setting Range	Setting Unit	Default Setting	When Enabled	Classification
	0 to 65,535	×0.01	100	Immediately	Setup

### **Starting Other Station Monitoring**

Refer to the following startup sequence example to start other station monitoring. Drive Axis SERVOPACK Auxiliary Axis SERVOPACK



### **Trial Operation**

Perform trial operation for torque/force assistance on the drive axis SERVOPACK.

Refer to the following manual for information on trial operation.

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

4.2.3 Monitoring

### Adjustments

Input a reference from the host controller to the drive axis SERVOPACK and make adjustments.

Refer to the following manual for information on adjustments.

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

## 4.2.3 Monitoring

You can monitor the communications status and operating status of torque/force assistance.

# Monitoring the Communications Status of Torque/Force Assistance

The communications status of torque/force assistance is displayed on the indicators on the SERVOPACK's panel display.

### ◆ Drive Axis SERVOPACK

The panel display will be as follows when the drive axis SERVOPACK is performing serial communications for torque/force assistance:



#### Auxiliary Axis SERVOPACK

The panel display will be as follows when the auxiliary axis SERVOPACK is performing serial communications for torque/force assistance.



# Monitoring the Operating Status of Torque/Force Assistance

You can use the SigmaWin+ to monitor the operating status of torque/force assistance.

peration - D				
Control	1/5		Unit	0001-SGD7S-R70A00A000F77
Control	I/F 🖌	Item 🗸		Axis A
POS SPD TRQ	Common	Motor rotating speed	min-1	0
SPD	Common	Speed reference	min-1	0
POS SPD TRQ	Common	Internal torque reference	%	0
POS SPD TRQ	Common	Current Alarm State	-	A.C90 : Encoder Communications Error
POS SPD TRQ	Common	Torque/Force Assistance Operating Status	-	0 : Disabled
POS SPD TRQ	Common	Reference Pulse Multiplier Selection	-	3 : Reference pulse multiplier 3

Refer to the following manual for the operating procedures for the SigmaWin+.  $\square$  AC Servo Drive Engineering Tool SigmaWin+ Operation Manual (Manual No.: SIET S800001 34)

# Reference Pulse Multiplier Selection

5

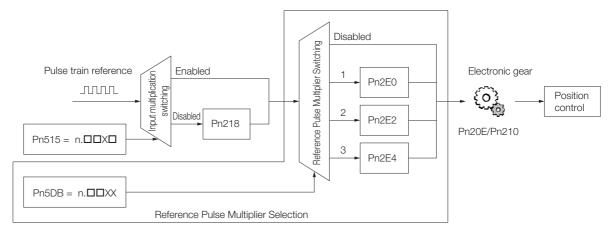
This chapter describes reference pulse multiplier selection. However, this function is supported only for an Analog Voltage/Pulse Train Reference SERVOPACK with the FT77 specification.

5.1	Introd	uction
5.2	Setup	Procedure
	5.2.1 5.2.2 5.2.3 5.2.4 5.2.5	Flowchart5-3Input Signal Allocation5-4Input Signal Connection5-6Control Method Setting5-6Reference Pulse Multiplier Settings5-6
5.3	Opera	ting Procedure
	5.3.1 5.3.2	Reference Pulse Multiplier Selection5-7Reference Pulse Multiplier Selection Timing5-7
5.4	Monito	oring

# 5.1 Introduction

The reference pulse multiplier selection applies the electronic gear in the SERVOPACK.

You can use reference pulse multiplier selection with a host controller that can output pulse references with only a specified number of pulses to change the speed of the Servomotor to any of four speeds.



The Servomotor speed is changed with the /GEAR1 (Reference Pulse Multiplier Selection 1) and /GEAR2 (Reference Pulse Multiplier Selection 2) signals. Refer to the following section for information on changing the reference pulse multiplier.

[ ₹ 5.3.1 Reference Pulse Multiplier Selection on page 5-7

Refer to the following manual for information on the electronic gear.

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

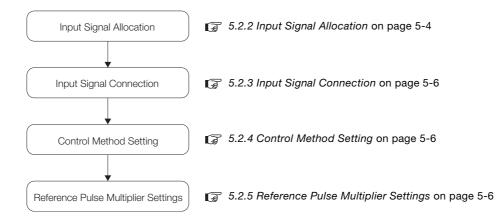


5.2.1 Flowchart

# 5.2 Setup Procedure

## 5.2.1 Flowchart

The following flowchart gives the setup procedure for reference pulse multiplier selection.



5.2.2 Input Signal Allocation

#### Input Signal Allocation 5.2.2

To use reference pulse multiplier selection, you must allocate the /GEAR1 (Reference Pulse Multiplier Selection 1) and /GEAR2 (Reference Pulse Multiplier Selection 2) signals.

Refer to the following manual for details on input signal allocation.

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

The method to allocate the /GEAR1 (Reference Pulse Multiplier Selection 1) and /GEAR2 (Reference Pulse Multiplier Selection 2) signals is described below.

### Input Signal Allocation Mode Setting

The /GEAR1 (Reference Pulse Multiplier Selection 1) and /GEAR2 (Reference Pulse Multiplier Selection 2) signals must be allocated to the I/O signal connector (CN1).

Parameter		Meaning	When Enabled	Classification
Pn50A	n.□□□0 (default set- ting)	Use the sequence input signal terminals with the default allocations.	After restart	Setup
1 1100/1	n.0001	Change the sequence input signal alloca- tions.		

Set Pn50A to n. DDD1 (Change the sequence input signal allocations).

### Input Signal Allocation

 $\bigcirc$ 

If you change the default polarity settings for the /S-ON (Servo ON), P-OT (Forward Drive Prohibit), or N-OT (Reverse Drive Prohibit) signal, the main circuit power supply will not be turned OFF and the overtravel function will not operate if there are signal line disconnections or other Important problems. If you must change the polarity of this signal, verify operation and make sure that no safety problems will exist.

If you allocate two or more signals to the same input circuit, a logical OR of the inputs will be used and all of the allocated signals will operate accordingly. This may result in unexpected operation.

The input signals that you can allocate to the pins on the I/O signal connector (CN1) and the related parameters are given in the following table.

Refer to the following table and allocate the /GEAR1 and /GEAR2 signals to the I/O signal connector (CN1).

Input Signal	Input Signal Name	Parameter
/S-ON	Servo ON	Pn50A = n.□□X□
/P-CON	Proportional Control	Pn50A = n.□X□□
P-OT	Forward Drive Prohibit	Pn50A = n.X□□□
N-OT	Reverse Drive Prohibit	Pn50B = n.□□□X
/ARM-RST	Alarm Reset	Pn50B = n.□□X□
/P-CL	Forward External Torque Limit	Pn50B = n.□X□□
/N-CL	Reverse External Torque Limit	Pn50B = n.X□□□
/SPD-D	Motor Direction	Pn50C = n.□□□X
/SPD-A	Internal Set Speed Selection	Pn50C = n.□□X□
/SPD-B	Internal Set Speed Selection	Pn50C = n.□X□□
/C-SEL	Control Selection	Pn50C = n.X□□□
/ZCLAMP	Zero Camping	Pn50D = n.□□□X
/INHIBIT	Reference Pulse Inhibit	Pn50D = n.□□X□
/G-SEL	Gain Selection	Pn50D = n.□X□□

5.2.2 Input Signal Allocation

		oonandoa nom providad pago.
Input Signal	Input Signal Name	Parameter
/P-DET	Polarity Detection	Pn50D = n.X□□□
SEN	Absolute Data Request	Pn515 = n.□□□X
/PSEL	Reference Pulse Input Multiplication Switch	Pn515 = n.□□X□
FSTP	Forced Stop	Pn516 = n.□□□X
/GEAR1	Reference Pulse Multiplier Selection 1	Pn5DB = n.□□□X
/GEAR2	Reference Pulse Multiplier Selection 2	Pn5DB = n.□□X□

Continued from previous page.

#### Relationship between Parameter Settings, Allocated Pins, and Polarities

The following table shows the relationship between the input signal parameter settings, the pins on the I/O signal connector (CN1), and polarities.

Parameter Setting	Pin	Description
0	40	
1	41	
2	42	
3	43	A reverse signal (a signal with "/" before the signal abbreviation, such as the /
4	44	S-ON signal) is active when the contacts are ON (closed). A signal that does not have "/" before the signal abbreviation (such as the P-
5	45	OT signal) is active when the contacts are OFF (open).
6	46	
7	_	The input signal is not allocated to a connector pin and it is always active. If the signal is processed on a signal edge, then it is always inactive.
8	_	The input signal is not allocated to a connector pin and it is always inactive. Set the parameter to 8 if the signal is not used.
9	40	
A	41	
В	42	
С	43	A reverse signal (a signal with "/" before the signal abbreviation, such as the /
D	44	S-ON signal) is active when the contacts are OFF (open). A signal that does not have "/" before the signal abbreviation (such as the P-
E	45	OT signal) is active when the contacts are ON (closed).
F	46	

Note: Refer to the following section for details on input signal parameter settings.

#### Example of Changing Input Signal Allocations

The following example shows disabling the /P-CL (Forward External Torque Limit) signal allocated to CN1-45 and allocating the /GEAR1 (Reference Pulse Multiplier Selection 1) signal.

Pn50B = n. <b>□</b> 5 <b>□□</b>	Pn5DB = n. <b>□□□</b> 8	Before change
$\downarrow$	$\downarrow$	
Pn50B = n. <b>□</b> 8 <b>□</b> □	Pn5DB = n. <b>DDD</b> E	After change

Refer to the following manual for the parameter setting procedure.

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

#### Confirming Input Signals

You can confirm the status of input signals on the I/O signal monitor. Refer to the following manual for information on the I/O signal monitor.

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

5.2.3 Input Signal Connection

### 5.2.3 Input Signal Connection

Connect the /GEAR1 (Reference Pulse Multiplier Selection 1) and /GEAR2 (Reference Pulse Multiplier Selection 2) signals to the pins that were allocated on the I/O signal connector (CN1).

### 5.2.4 Control Method Setting

Reference pulse multiplier selection can be used only in Position Control Mode. Set the control method to Position Control Mode (Pn000 =  $n.\Box\Box1\Box$ ).

### 5.2.5 Reference Pulse Multiplier Settings

You can use the /GEAR1 (Reference Pulse Multiplier Selection 1) and /GEAR2 (Reference Pulse Multiplier Selection 2) signals to select a reference pulse multiplier and thereby change the speed of the Servomotor to any of four speeds.

The relationship between the /GEAR1 signal, /GEAR2 signal, and reference pulse multipliers is shown by the following table.

/GEAR1 Signal /GEAR2 Signal I		Enabled Reference Pulse Multiplier Parameter		
Low level Low level		Reference pulse multiplier selection is disabled.		
High level	Low level	Reference Pulse Multiplier 1 (Pn2E0)		
Low level	High level	Reference Pulse Multiplier 2 (Pn2E2)		
High level	High level	Reference Pulse Multiplier 3 (Pn2E4)		

Set Pn2E0 (Reference Pulse Multiplier 1), Pn2E2 (Reference Pulse Multiplier 2), and Pn2E4 (Reference Pulse Multiplier 3) to within the following ranges.

 $0.001 \le$  Electronic gear ratio (B/A)  $\le$  64,000

 $0.001 \leq$  Electronic gear ratio (B/A)  $\times$  Reference Pulse Input Multiplier (Pn218)  $\times$  Reference Pulse Multiplier 1 (Pn2E0)  $\leq$  64,000

 $0.001 \leq$  Electronic gear ratio (B/A)  $\times$  Reference Pulse Input Multiplier (Pn218)  $\times$  Reference Pulse Multiplier 2 (Pn2E2)  $\leq$  64,000

 $0.001 \le$  Electronic gear ratio (B/A) × Reference Pulse Input Multiplier (Pn218) × Reference Pulse Multiplier 3 (Pn2E4)  $\le$  64,000

Ĩ
Important

If any of these ranges is exceeded, an A.040 alarm (Parameter Setting Error) will occur.

5.3.1 Reference Pulse Multiplier Selection

# 5.3 Operating Procedure

### 5.3.1 Reference Pulse Multiplier Selection

You can control the /GEAR1 (Reference Pulse Multiplier Selection 1) and /GEAR2 (Reference Pulse Multiplier Selection 2) signals to select a reference pulse multiplier and thereby change the speed of the Servomotor.

The relationship between the /GEAR1 signal, /GEAR2 signal, and reference pulse multipliers is shown by the following table.

/GEAR1 Signal /GEAR2 Signal E		Enabled Reference Pulse Multiplier Parameter		
Low level	Low level	Reference pulse multiplier selection is disabled.		
High level	Low level	Reference Pulse Multiplier 1 (Pn2E0)		
Low level	High level	Reference Pulse Multiplier 2 (Pn2E2)		
High level	High level	Reference Pulse Multiplier 3 (Pn2E4)		

### 5.3.2 Reference Pulse Multiplier Selection Timing

The timing of changing the reference pulse multiplier with the /GEAR1 (Reference Pulse Multiplier Selection 1) and /GEAR2 (Reference Pulse Multiplier Selection 2) signals is shown below.

/GEAR1 signal	OFF	C	DN
/GEAR2 signal	ON		1 ms max.
Reference pulse multiplier	Reference Pulse N	1ultiplier 2	Reference Pulse Multiplier 3

# 5.4 Monitoring

You can use the SigmaWin+ to monitor the operating status of reference pulse multiplier selection.

Operation						
Control	I/F 🖌	Thom	11-26	0001-SGD7S-R70A00A000F77		
Control	1/F			V Item V Unit		Axis A
POS SPD TRQ	Common	Motor rotating speed	min-1	0		
SPD	Common	Speed reference	min-1	0		
POS SPD TRQ	Common	Internal torque reference	%	0		
POS SPD TRQ	Common	Current Alarm State	-	A.C90 : Encoder Communications Error		
POS SPD TRQ	Common	Torque/Force Assistance Operating Status	-	0 : Disabled		
POS SPD TRQ	Common	Reference Pulse Multiplier Selection	-	3 : Reference pulse multiplier 3		

Refer to the following manual for the SigmaWin+ operating procedure.

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

# Maintenance

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

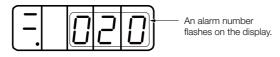
6.1	Analog Vo	oltage/Pulse Train Reference SERVOPACK with FT77 Specification 6-2
	$\begin{array}{c} 6.1.1 \\ 6.1.2 \\ 6.1.3 \\ 6.1.4 \\ 6.1.5 \\ 6.1.6 \\ 6.1.7 \end{array}$	Alarm Displays
6.2	MECHATRO	DLINK-III Communications Reference SERVOPACK with FT77 Specification 6-58
	6.2.1 6.2.2 6.2.3 6.2.4 6.2.5 6.2.6 6.2.7	Alarm Displays6-58List of Alarms6-58Troubleshooting Alarms6-64Warning Displays6-96List of Warnings6-97Troubleshooting Warnings6-99Troubleshooting Based on the Operationand Conditions of the Servomotor6-106

6.1.1 Alarm Displays

#### Analog Voltage/Pulse Train Reference SERVOPACK with FT77 Specification 0

#### Alarm Displays 6.1.1

If an error occurs in the SERVOPACK, an alarm number will be displayed on the panel display.



This section provides a list of the alarms that may occur and the cause of and corrections for those alarms.

#### List of Alarms 6.1.2

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.

Ω 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 Number			Servo- motor Stop- ping Method	Alarm Reset Possi- ble?	Alarm Code Output		
	Alarm Name	Alarm Meaning			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 detec- tion data for the main circuit.	Gr.1	Yes	Н	Н	Н
A.040	Parameter Setting Error	A parameter setting is out- side of the setting range.	Gr.1	No	Н	Н	Н

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Alarm	Alarm Name		Servo- motor	Alarm Reset Possi- ble?	Alarm Code Output		
Number	Alarm Name	Alarm Meaning	Stop- ping Method		ALO1	ALO2	ALO3
A.041	Encoder Output Pulse Setting Error	The setting of Pn212 (Num- ber of Encoder Output Pulses) or Pn281 (Encoder Output Resolution) is outside of the setting range or does not satisfy the setting condi- tions.	Gr.1	No	Н	Н	Н
A.042	Parameter Combination Error	The combination of some parameters exceeds the set- ting 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 dif- ferent type of motor from the previously connected motor.	Gr.1	No	н	Н	Н
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	н	Н	Н
A.0b0	Invalid Servo ON Com- mand Alarm	The /S-ON (Servo ON) signal was input from the host con- troller after a utility function that turns ON the Servomo- tor was executed.	Gr.1	Yes	н	Н	Н
A.100	Overcurrent Detected	An overcurrent flowed through the power trans- former or the heat sink over- heated.	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	<ul> <li>The AC power supply input setting or DC power supply input setting is not correct.</li> <li>The power supply wiring is not correct.</li> </ul>	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

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Continued from previous page							
Alarm Name	Alarm Meaning	Servo- motor Stop-	Alarm Reset				
		ping Method	ble?	ALO1	ALO2	ALO3	
Encoder Output Pulse Overspeed	<ul> <li>Rotary Servomotor: The pulse output speed for the setting of Pn212 (Number of Encoder Output Pulses) was exceeded.</li> <li>Linear Servomotor: The motor speed upper limit for the setting of Pn281 (Encoder Output Resolution) was exceeded.</li> </ul>	Gr.1	Yes	L	Н	L	
Vibration Alarm	Abnormal oscillation was detected in the motor speed.	Gr.1	Yes	L	Н	L	
Autotuning Alarm	Vibration was detected during autotuning for the tun- ing-less function.	Gr.1	Yes	L	н	L	
Maximum Speed Setting Error	The setting of Pn385 (Maxi- mum Motor Speed) is greater than the maximum motor speed.	Gr.1	Yes	L	Н	L	
Instantaneous Overload	The Servomotor was operat- ing for several seconds to several tens of seconds under a torque that largely exceeded the rating.	Gr.2	Yes	L	L	L	
Continuous Overload	The Servomotor was operat- ing continuously under a torque that exceeded the rat- ing.	Gr.1	Yes	L	L	L	
Dynamic Brake Overload	When the dynamic brake was applied, the rotational or lin- ear kinetic energy exceeded the capacity of the dynamic brake resistor.	Gr.1	Yes	L	L	L	
Inrush Current Limiting Resistor Overload	The main circuit power sup- ply was frequently turned ON and OFF.	Gr.1	Yes	L	L	L	
Internal Temperature Error 1 (Control Board Tempera- ture Error)	The surrounding tempera- ture of the control PCB is abnormal.	Gr.2	Yes	L	L	L	
Internal Temperature Error 2 (Power Board Tempera- ture Error)	The surrounding tempera- ture of the power PCB is abnormal.	Gr.2	Yes	L	L	L	
Internal Temperature Sen- sor Error	An error occurred in the temperature sensor circuit.	Gr.2	No	L	L	L	
SERVOPACK Built-in Fan Stopped	The fan inside the SERVO- PACK stopped.	Gr.1	Yes	L	L	L	
Encoder Backup Alarm	The power supplies to the encoder all failed and the position data was lost.	Gr.1	No	н	н	Н	
Encoder Checksum Alarm	There is an error in the checksum results for encoder memory.	Gr.1	No	Н	н	н	
Encoder Battery Alarm	The battery voltage was lower than the specified level after the control power sup- ply was turned ON.	Gr.1	Yes	Н	Н	Н	
	Encoder Output Pulse Overspeed Vibration Alarm Autotuning Alarm Maximum Speed Setting Error Instantaneous Overload Continuous Overload Continuous Overload Dynamic Brake Overload Dynamic Brake Overload Inrush Current Limiting Resistor Overload Internal Temperature Error 1 (Control Board Tempera- ture Error) Internal Temperature Error 2 (Power Board Tempera- ture Error) Internal Temperature Sen- sor Error SERVOPACK Built-in Fan Stopped Encoder Backup Alarm	Encoder Output Pulse• 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 Resolu- tion) was exceeded.Vibration AlarmAbnormal oscillation was detected in the motor speed.Autotuning AlarmVibration was detected during autotuning for the tun- ing-less function.Maximum Speed Setting ErrorThe setting of Pn385 (Maxi- mum Motor Speed) is greater than the maximum motor speed.Instantaneous OverloadThe Servomotor was operat- ing continuously under a torque that largely exceeded the rating.Dynamic Brake OverloadThe Servomotor was operat- ing continuously under a torque that largely exceeded the rating.Dynamic Brake OverloadThe Servomotor was operat- ing continuously under a torque that exceeded the rat- torque that exceeded the rat- torque that exceeded the rat- torque that exceeded the rat- torque that exceeded the capacity of the dynamic brake resistor.Inrush Current Limiting Resistor OverloadThe surrounding tempera- ture of the control PCB is abnormal.Internal Temperature Error 2 (Power Board Tempera- ture Error)The surrounding tempera- ture of the power PCB is abnormal.Internal Temperature Sen- sor ErrorAn error occurred in the tem- perature sensor circuit.SERVOPACK Built-in Fan StoppedThe fan inside the SERVO- PACK stopped.Encoder Backup AlarmThe battery voltage was lower than the specified level after the control power sup-Encoder Battery AlarmThe battery volt	Alarm NameAlarm MeaningServo- motor Stop- ping MethodEncoder Output Pulse Overspeed• Rotary Servomotor: The pulse output speed for the setting of Pn212 (Number of Encoder Output Pulses) Unear Servomotor: The motor speed upper limit for the setting of Pn281 (Encoder Output Resolu- tion) was exceeded.Gr. 1Vibration AlarmAbnormal oscillation was detected in the motor speed.Gr. 1Autotuning AlarmVibration was detected during autotuning for the tun- ing-less function.Gr. 1Maximum Speed Setting ErrorThe setting of Pn385 (Maxi- mum Motor Speed) is greater than the maximum motor speed.Gr. 1Instantaneous OverloadThe Servomotor was operat- ing for several seconds to several tens of seconds under a torque that largely exceeded the rating.Gr. 1Dynamic Brake OverloadThe Servomotor was operat- ing.Gr. 1Inrush Current Limiting Resistor OverloadThe main circuit power sup- ply was frequently turned ON and OFF.Gr. 2Internal Temperature Error 1 (Control Board Tempera- ture of the control PCB is abnormal.Gr. 2Internal Temperature Error 2 (Power Board Tempera- ture of the power PCB is abnormal.Gr. 2Internal Temperature Error 2 (ServOPACK Built-in Fan perature sensor circuit.Gr. 2SERVOPACK Built-in Fan totopedThe power supplies to the encoder all failed and the position data was lost.Encoder Backup AlarmThe battery voltage was lower than the specified level after the control power sup-Internal Temperature Sen- tor (PCK Stopped)Th	Alarm NameAlarm MeaningServo- motor motor ping MethodAlarm Reset Possi- ble?Encoder Output Pulse Overspeed- Rotary Servomotor: The setting of Pn212 (Number of Encoder Output Pulses, was exceeded. - Linear Servomotor: The motor speed upper limit for the setting of Pn231 (Encoder Output Pulses, was exceeded.Gr.1YesVibration AlarmAbnormal oscillation was detected in the motor speed. Unig autotuning for the tun- ing-less function.Gr.1YesAutotuning AlarmVibration was detected during autotuning for the tun- ing-less function.Gr.1YesMaximum Speed Setting ErrorThe Servomotor was operat- ing for several seconds under a torque that largely exceeded the rating.Gr.1YesContinuous OverloadThe Servomotor was operat- ing continuously under a torque that exceeded the rati- ing.Gr.1YesDynamic Brake OverloadThe Servomotor was operat- ing continuously under a torque that exceeded the rati- ing.Gr.1YesIntrush Current Limiting Resistor OverloadThe surrounding tempera- ture of the control PCB is abormal.Gr.1YesInternal Temperature Error (Power Board Tempera- ture of the control PCB is abormal.Gr.2YesInternal Temperature Error SERVOPACK Built-in Fan StoppedThe fan inside the SERVO- RACK stopped.Gr.1YesEncoder Backup AlarmThe fan inside the SERVO- RACK stopped.Gr.1YesEncoder Checksum AlarmThe parter sup- conder memory.Gr.1NoSERVOPACK	Alarm NameAlarm MeaningServomotor Stop- ping MethodAlarm Possi- ble?Alarm AlarEncoder Output Pulse Overspeed- Rotary Servomotor: The pulse output speed for the setting of Pn212 (Number of Encoder Output Pulses) was exceeded.Gr.1YesLVibration AlarmAnormal oscillation was detected in the motor speed. Utination was detected during autotuning for the tun- ing-less function.Gr.1YesLAutotuning AlarmAnormal oscillation was detected in the motor speed. Gr.1Gr.1YesLAutotuning AlarmMormal oscillation was detected in the motor speed. ing for several seconds to several tens of seconds under a torque that largely was exceeded the rating.Gr.1YesLContinuous OverloadThe Servomotor was operat- ing for several seconds to under a torque that largely was exceeded the rating.Gr.1YesLDynamic Brake OverloadThe Servomotor was operat- ing continuously under a torque that exceeded the rating.Gr.1YesLIntrush Current Limiting Resistor OverloadThe surrounding tempera- ture errorGr.1YesLInternal Temperature Error 1 (Control Board Tempera- ture of the control PCB is anomal.Gr.2YesLInternal Temperature Error 2 (Power Board Tempera- ture of the opwer PCB is anomal.Gr.2YesLInternal Temperature Error 2 (Power Board Tempera- ture of the power PCB is anomal.Gr.2YesLInternal Temperature Error 2 (Power Board Tempera- tur	Alarm Name     Alarm Meaning     Servo- indor Stop- ping Method     Alarm Co- Output Possi- be?       Encoder Output Pulse Overspeed        • Rotary Servomotor: The pulse output speed for the soting of Pn212 (Number of Encoder Output Pulses) was exceeded.     Gr.1     Yes     L     H       Vibration Alarm     Abnormal oscillation was detected in the motor speed. (Encoder Output Resolu- tion) was exceeded.     Gr.1     Yes     L     H       Autotuning Alarm     Abnormal oscillation was detected in the motor speed.     Gr.1     Yes     L     H       Maximum Speed Setting Error     The setting of Pn358 (Maxi- mum Motor Speed) is greater than the maximum motor speed.     Gr.2     Yes     L     L       Dynamic Brake Overload     The Servomotor was operat- ing:     Gr.1     Yes     L     L       Dynamic Brake Overload     The Servomotor was operat- ing:     Gr.1     Yes     L     L       Dynamic Brake Overload     The servomotor was operat- ing:     Gr.1     Yes     L     L       Dynamic Brake Overload     The surrounding tempera- ture of the control POE is abnormal.     Gr.1     Yes     L     L       Internal Temperature Error 1 (Control Board Tempera- ture of the control POE is abnormal.     Gr.1     Yes     L     L       Encoder Overload     The surrounding tempera- ture of the control POE is abnormal.     Gr.1     Yes     L	

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Alarm			Servo- motor	Alarm Reset	Alarm Code Output		
Number	r Alarm Name	Alarm Meaning	Stop- ping Method	Possi- ble?	ALO1	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 (tempera- ture) for the overheat protec- tion 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 lin- ear encoder.	Gr.1	No	Н	Н	Н
A.891	Encoder Module Error	An error occurred in the lin- ear 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 posi- tion 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

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Maintenance

Continued from previous page							page.
Alarm	Alarm Name	Alarm Name Alarm Meaning	Servo- motor Stop-	Alarm Reset	Alarm Cod Output		
Number	Alam Name	Alam Meaning	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 Dis- agreement	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 calculat- ing the position data of the encoder.	Gr.1	No	L	Н	L
A.C92	Encoder Communications Timer Error	An error occurred in the com- munications 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	ing Possi-	ALO1	ALO2	ALO3
A.Cb0	Encoder Echoback Error	The contents of communica- tions 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 (Posi- tion 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 set- ting of Pn520 (Position Devi- ation Overflow Alarm Level) is exceeded before the limit is cleared.	Gr.2	Yes	L	L	Н
A.d10	Motor-Load Position Devi- ation 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.E90	Torque/Force Assistance Communications Error	An error occurred in the com- munications data.	Gr.2	No	Н	L	L
A.E91	Torque/Force Assistance Drive Axis Alarm	An alarm occurred in the SERVOPACK for the drive axis.	Gr.2	Yes	Н	L	L
A.E92	Torque/Force Assistance Auxiliary Axis Alarm	An alarm occurred in the SERVOPACK for the auxiliary axis.	Gr.2	Yes	Н	L	L

Maintenance

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Alarm			Servo- motor	Alarm Reset	Ala	rm Co Output	de
Number	Alarm Name	Alarm Meaning	Stop- ping Method	Possi- ble?	ALO1	ALO2	ALO3
A.E93	Torque/Force Assistance Communications Stop	Torque/force assistance communications stopped due to a hardware error.	Gr.2	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
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
A.F50	Servomotor Main Circuit Cable Disconnection	The Servomotor did not operate or power was not supplied to the Servomotor even though the /S-ON (Servo ON) signal was input when the Servomotor was ready to receive it.	Gr.1	Yes	Н	L	н
FL-1* FL-2*							
FL-2* FL-3* FL-4* FL-5* FL-6*	System Alarm	An internal program error occurred in the SERVO- PACK.	_	No	Undefined.		ed.
CPF00	Digital Operator Commu- nications Error 1	Communications were not possible between the Digi-					
CPF01	Digital Operator Commu- nications Error 2	<ul> <li>tal Operator (model: JUSP-OP05A-1-E) and the SER-VOPACK (e.g., a CPU error occurred).</li> <li>The setting of Pn0D4 = n.□□□X was changed.</li> </ul>	_	No	Undefined.		ed.

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\* 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.  $\bigcap_{No:: SIEP C720829 06)}$ AC Servo Drive  $\Sigma$ -V-Series for Large-Capacity Models/ $\Sigma$ -7-Series User's Manual Safety Module (Manual No.: SIEP C720829 06)

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 volt- age within the specified range, and initialize the parameter settings.	*1
	The power supply was shut OFF while writing parameter set- tings.	Check the timing of shutting OFF the power supply.	Initialize the parameter settings and then set the parameters again.	*1
<b>A.020:</b> Parameter	The number of times that parameters were written exceeded the limit.	Check to see if the parameters were fre- quently changed from the host controller.	The SERVOPACK may be faulty. Replace the SER- VOPACK. Reconsider the method for writing the parame- ters.	_
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 elec- tricity, 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 countermea- sures 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 For- mat 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 soft- ware version of the parameters specified to write.	Read the product infor- mation to see if the soft- ware versions are the same. If they are differ- ent, 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
data format in the 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 in the parameter data in the SER- VOPACK.)	The power supply was shut OFF while setting a utility func- tion.	Check the timing of shutting OFF the power supply.	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.	-

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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 capaci- ties do not match each other.	Check the combination of the SERVOPACK and Servomotor capacities.	Select a proper combina- tion of SERVOPACK and Servomotor capacities.	*1
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SER- VOPACK.	-
	A parameter setting is outside of the setting range.	Check the setting ranges of the parame- ters that have been changed.	Set the parameters to values within the setting ranges.	-
A.040: Parameter Set- ting Error	The electronic gear ratio is outside of the setting range.	Check the electronic gear ratio. The ratio must be within the fol- lowing range: 0.001 < (Pn20E/Pn210) < 64,000.	Set the electronic gear ratio in the following range: 0.001 < (Pn20E/ Pn210) < 64,000.	*1
(A parameter set- ting is outside of the setting range.)	The setting of refer- ence pulse multiplier 1 is out of range.	Check reference pulse multiplier 1. It must be in the following range: $0.001 \le (Pn20E/Pn210)$ $\times Pn218 \times Pn2E0 \le$ 6,400,000.	Set reference pulse multiplier 1 to within the following range: $0.001 \le$ (Pn20E/Pn210) × Pn218 × Pn2E0 ≤ 6,400,000	page 5-6
	The setting of refer- ence pulse multiplier 2 is out of range.	Check reference pulse multiplier 2. It must be in the following range: $0.001 \le (Pn20E/Pn210)$ $\times Pn218 \times Pn2E2 \le$ 6,400,000.	Set reference pulse multi- plier 2 to within the follow- ing range: $0.001 \le$ (Pn20E/Pn210) × Pn218 × Pn2E2 ≤ 6,400,000	page 5-6
	The setting of refer- ence pulse multiplier 3 is out of range.	Check reference pulse multiplier 3. It must be in the following range: $0.001 \le (Pn20E/Pn210)$ $\times Pn218 \times Pn2E4 \le$ 6,400,000.	Set reference pulse multiplier 3 to within the following range: $0.001 \le$ (Pn20E/Pn210) × Pn218 × Pn2E4 ≤ 6,400,000	page 5-6
A.041: Encoder Output Pulse Setting Error	The setting of Pn212 (Number of Encoder Output Pulses) or Pn281 (Encoder Out- put Resolution) is out- side of the setting range or does not sat- isfy the setting condi- tions.	Check the setting of Pn212 or Pn281.	Set Pn212 or Pn281 to an appropriate value.	*1

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Alarm Number: 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 Servo- motor was changed.	Check to see if the detection conditions <sup>*2</sup> are satisfied.	Decrease the setting of the electronic gear ratio (Pn20E/Pn210).	*1		
<b>A.042:</b> Parameter Com-	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 <sup>*2</sup> are satisfied.	Increase the setting of Pn533 or Pn585.	*1		
bination Error	The movement speed of advanced autotun- ing went below the setting range when the electronic gear ratio (Pn20E/ Pn210) or the Servomotor was changed.	Check to see if the detection conditions <sup>*3</sup> are satisfied.	Decrease the setting of the electronic gear ratio (Pn20E/Pn210).	+1		
	Pn0D4 was set to $n.\square\square\square3$ or $n.\square\square\square2$ when Torque Control Mode (Pn000 = $n.\square\square2\square$ ) was not set.	Check the setting of Pn000 = $n.\Box\BoxX\Box$ .	Set Pn000 to n.□□2□.	page 4-5		
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 = $n.X\square\square\square$ .	Make sure that the setting of the Fully-closed Mod- ule agrees with the setting of Pn002 = n.XDDD.	*1		
<b>A.050:</b> Combination Error	The SERVOPACK and Servomotor capaci- ties do not match each other.	Confirm that the follow- ing condition is met: $1/4 \le$ (Servomotor capacity/SERVOPACK capacity) $\le 4$	Select a proper combina- tion of the SERVOPACK and Servomotor capaci- ties.	*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.	-		
<b>A.051:</b> 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 lin- ear encoder.	Write the motor parame- ter 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 specifica-tions.	Change to a correct com- bination 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
<b>A.0b0:</b> 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 Ser- vomotor was exe- cuted.		Turn the power supply to the SERVOPACK OFF and ON again. Or, execute a software reset.	*1

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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 Servo- motor.	*1		
<b>A.100:</b> 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 termi- nals U, V, or W.	The SERVOPACK may be faulty. Replace the SER- VOPACK.	*1		
Detected (An overcurrent flowed through the power trans-	The regenerative resistor is not wired correctly or there is faulty contact.	Check the wiring.	Correct the wiring.	*]		
former 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 con- sumed by the DB resis- tor 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 meth- ods, or the mechanisms so that the dynamic brake does not need to be used so frequently.	-		
	The regenerative pro- cessing capacity was exceeded.	Check the regenerative load ratio in the Sig- maWin+ Motion Monitor Tab Page to see how frequently the regenera- tive resistor is being used.	Recheck the operating conditions and load.	*4		
	The SERVOPACK regenerative resis- tance is too small.	Check the regenerative load ratio in the Sig- maWin+ Motion Monitor Tab Page to see how frequently the regenera- tive 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: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	A heavy load was applied while the Ser- vomotor 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 trans- former 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.	*]
	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 Servo- motor.	*1
A.101: Motor Overcur- rent 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 termi- nals U, V, or W.	The SERVOPACK may be faulty. Replace the SER- VOPACK.	*1
allowable cur- rent.)	A heavy load was applied while the Ser- vomotor 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 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.	-
	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
	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 it see if an Exter- nal Regenerative Resis- tor 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 Regener- ative 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 Regenera- tive Resistor Unit is con- nected 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.300: Regeneration Error	The jumper between the regenerative resis- tor terminals (B2 and B3) was removed from one of the fol- lowing 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.	Correctly connect a jumper.	*1
	The External Regener- ative Resistor is not wired correctly, or was removed or discon- nected.	Check the wiring of the External Regenerative Resistor.	Correct the wiring of the External Regenerative Resistor.	*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 an alarm still occurs, the SERVO- PACK may be faulty. Replace the SERVO- PACK.	-

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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 volt- age within the specified range.	-
	The external regener- ative resistance value or regenerative resis- tor capacity is too small, or there has been a continuous regeneration state.	Check the operating conditions or the capacity using the Sig- maJunmaSize+ Capac- ity Selection Software or other means.	Change the regenerative resistance value or capac- ity. Reconsider the operating conditions using the Sig- maJunmaSize+ Capacity Selection Software or other means.	*4
	There was a continu- ous regeneration state because a negative load was continu- ously 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 Resis- tor Capacity) is smaller than the capacity of the Exter- nal 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 Resis- tance) 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 regener- ative 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 discon- nected when the SERVOPACK power supply voltage was high.	Measure the resistance of the regenerative resistor using a measur- ing instrument.	If you are using the regen- erative resistor built into the SERVOPACK, replace the SERVOPACK. If you are using an Exter- nal Regenerative Resis- tor, replace the External Regenerative Resistor.	-
4 220.	DC power was sup- plied when an AC power supply input was specified in the settings.	Check the power sup- ply 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 sup- plied when a DC power supply input was specified in the settings.	Check the power sup- ply 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 SERVO- PACKs: SGD7S -R70A, -R90A, -1R6A, -2R8A, -R70F, -R90F, -2R1F, or -2R8F.	Check it see if an Exter- nal Regenerative Resis- tor 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 light- ning surge.	Measure the power supply voltage.	Improve the power sup- ply 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 SER- VOPACK.	_
A.400: Overvoltage (Detected in the	The voltage for AC power supply was too high during accelera- tion or deceleration.	Check the power sup- ply voltage and the speed and torque during operation.	Set the AC power supply voltage within the speci- fied range.	-
main circuit power supply section of the SERVOPACK.)	The external regener- ative 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 oper- ating conditions and load.	*4
	The moment of inertia ratio or mass ratio exceeded the allow- able 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 SERVO- PACK may be faulty. Replace the SERVO- PACK.	_
	The power supply voltage went below the specified range.	Measure the power supply voltage.	Set the power supply volt- age 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 (Momen- tary 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 ( $\ominus$ 1 and $\ominus$ 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	A reference value that exceeded the over- speed detection level was input.	Check the input refer- ence.	Reduce the reference value. Or, adjust the gain.	*1
(The motor exceeded the maximum speed.)	The motor exceeded the maximum speed.	Check the waveform of the motor speed.	Reduce the speed refer- ence 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 out- put 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 out- put 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 oper- ation.	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 appro- priate value.	*1
	The vibration detec- tion level (Pn312 or Pn384) is not suitable.	Check that the vibra- tion 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 cus- tom tuning or Easy FFT.	Check the waveform of the motor speed.	Check the operating pro- cedure 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 max- imum motor speed.	*1

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	The wiring is not cor- rect or there is a faulty contact 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 (Lin- ear 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 = $n.\Box\BoxX\Box$ .	Set Pn080 = n.□□X□ to an appropriate value.	*1
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SER- VOPACK.	-
	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 consump- tion by the dynamic brake was detected.)	When the Servomo- tor was stopped with the dynamic brake, the rotational or linear kinetic energy exceeded the capac- ity of the dynamic brake resistor.	Check the power con- sumed by the DB resis- tor to see how frequently the DB is being used.	<ul> <li>Reconsider the following:</li> <li>Reduce the Servomotor command speed.</li> <li>Decrease the moment of inertia ratio or mass ratio.</li> <li>Reduce the frequency of stopping with the dynamic brake.</li> </ul>	-
	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	The allowable fre- quency of the inrush current limiting resis- tor 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.	-
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: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	The surrounding tem- perature is too high.	Check the surrounding temperature using a thermostat. Or, check the operating status with the SERVOPACK installation environment monitor.	Decrease the surround- ing temperature by improving the SERVO- PACK installation condi- tions.	*1
A.7A1:	An overload alarm was reset by turning OFF the power sup- ply 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 exces- sive load or operation was performed that exceeded the regen- erative processing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenera- tive load ratio to check the regenerative pro- cessing capacity.	Reconsider the load and operating conditions.	-
	The SERVOPACK installation orientation is not correct or there is insufficient space around the SERVO- PACK.	Check the SERVOPACK installation conditions.	Install the SERVOPACK according to specifica- tions.	*1
	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SER- VOPACK.	-
	The surrounding tem- perature is too high.	Check the surrounding temperature using a thermostat. Or, check the operating status with the SERVOPACK installation environment monitor.	Decrease the surround- ing temperature by improving the SERVO- PACK installation condi- tions.	*1
A 740.	An overload alarm was reset by turning OFF the power sup- ply 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 Tempera- ture Error 2 (Power Board Temperature Error)	There was an exces- sive load or operation was performed that exceeded the regen- erative processing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenera- tive load ratio to check the regenerative pro- cessing capacity.	Reconsider the load and operating conditions.	-
	The SERVOPACK installation orientation is not correct or there is insufficient space around the SERVO- PACK.	Check the SERVOPACK installation conditions.	Install the SERVOPACK according to specifica- tions.	*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: 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 con- nection 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 mea- sures 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.	_	<ul> <li>When Using an Absolute Encoder</li> <li>Set up the encoder again.</li> <li>If the alarm still occurs, the Servomotor may be faulty. Replace the Servomotor.</li> <li>When Using a Singleturn Absolute Encoder or Incremental Encoder or Incremental Encoder</li> <li>The Servomotor may be faulty. Replace the Servomotor.</li> <li>The linear encoder may be faulty. Replace the linear encoder.</li> </ul>	*1
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SER- VOPACK.	-
A.830: Encoder Battery Alarm (The absolute encoder battery voltage was lower than the speci- fied level.)	The battery connec- tion is faulty or a bat- tery is not connected.	Check the battery con- nection.	Correct the battery con- nection.	*]
	The battery voltage is lower than the specified value (2.7 V).	Measure the battery voltage.	Replace the battery.	*]
	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SER- VOPACK.	-

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	The encoder malfunc- tioned.	-	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 appro- priate 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 malfunc- tioned due to noise.	-	Correct the wiring around the encoder by separating the Encoder Cable from the Servomotor Main Cir- cuit Cable or by ground- ing 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 sen- sor.	_
	Rotary Servomotor: The Servomotor speed was 200 min <sup>-1</sup> 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 <sup>-1</sup> , and turn ON the control power supply.	_
A.850: Encoder Over- speed (Detected at the	Linear Servomotor: The Servomotor exceeded the speci- fied 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 surround- ing 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 speci- fied 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 tem- perature around the Servomotor is too high.	Measure the surround- ing 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 Sig-maWin+.	Operate the Servo Drive so that the motor load remains within the speci- fied range.	*1
A.861: Motor Over- heated	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 tem- perature is too high.	Check the surrounding temperature using a thermostat.	Lower the surrounding temperature by improving the installation conditions of the Linear Servomotor or the machine.	-
	The overheat protec- tion input signal line is disconnected or short-circuited.	Check the input voltage with the overheat pro- tection input information on the Motion Monitor Tab Page on the Sig- maWin+.	Repair the line for the overheat protection input signal.	-
A.862:	An overload alarm was reset by turning OFF the power sup- ply 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 per- formed 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 detec- tion 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.	-
<b>A.891:</b> 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.	-
<b>A.8A0:</b> External Encoder Error	Setting the origin of the absolute linear encoder failed because the motor moved.	Before you set the ori- gin, 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 Con- verter Unit.	_
A.8A2: External Incre- mental Encoder Sensor Error	A failure occurred in the external encoder.	-	Replace the external encoder.	-
<b>A.8A3:</b> External Abso- lute Encoder Position Error	A failure occurred in the external absolute encoder.	-	The external absolute encoder may be faulty. Refer to the encoder manufacturer's instruc- tion manual for correc- tions.	-

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Alarm Number:	Possible Cause	Confirmation	Continued from pro	Reference
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 maxi- mum 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 sec- tion.	-	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 611.	A malfunction occurred in the speed reference input sec- tion.	_	Reset the alarm and restart operation.	*1
A.b11: 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- ence A/D Error	A malfunction occurred in the read- ing section for the torque reference input.	-	Reset the alarm and restart operation.	*1
(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 Detec- tion 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.	-
<b>A.bF0:</b> 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
<b>A.bF3:</b> 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.	-
<b>A.bF4:</b> 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.	-
<b>A.bF5:</b> 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.	-
<b>A.bF6:</b> 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.	-
<b>A.bF7:</b> 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.	-
<b>A.bF8:</b> 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 = $n.\Box\BoxX\Box$ .	Set Pn080 = $n.\Box\Box X\Box$ to an appropriate value.	*1
Servomotor Out of Control (Detected when the servo is turned ON.)	A failure occurred in the encoder.	-	If the motor wiring is cor- rect and an alarm still occurs after turning the power supply OFF and ON again, 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 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.	-
A.C20: Phase Detection Error	The count-up direc- tion of the linear encoder does not match the forward direction of the Mov- ing Coil in the motor.	Check the setting of Pn080 = $n.\square\squareX\square$ (Motor Phase Sequence Selection). Check the installation orientation for the linear encoder and Moving Coil.	Change the setting of Pn080 = $n.\Box\Box X\Box$ . Correctly reinstall the lin- ear 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:	The polarity sensor is protruding from the Magnetic Way of the motor.	Check the polarity sen- sor.	Correctly reinstall the Moving Coil or Magnetic Way of the motor.	-
Polarity Sensor Error	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 sen- sor.	-
A.C22: Phase Informa- tion Disagree- ment	The SERVOPACK phase information is different from the lin- ear encoder phase information.	-	Perform polarity detec- tion.	*1

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	The parameter set- tings 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 installa- tion. 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 pro- cessed 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 Detec- tion 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. Imple- ment 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 rec- ommend 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.	_

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### 6.1 Analog Voltage/Pulse Train Reference SERVOPACK with FT77 Specification

# 6.1.3 Troubleshooting Alarms

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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 sig- nals. Execute polarity detection at a position where an overtravel sig- nal would not be detected.	*1
A.C52: Polarity Detec- tion Not Com- pleted	<ul> <li>The servo was turned ON under the follow- ing circumstances.</li> <li>Before polarity detection was com- pleted</li> <li>Before /P-DET was input</li> </ul>	_	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 detec- tion.	_	Increase the setting of Pn48E (Polarity Detection Range). Or, increase the setting of Pn481 (Polarity Detection Speed Loop Gain).	-
A.C54: Polarity Detec- tion Failure 2	An external force was applied to the Servo- motor.	_	Increase the setting of Pn495 (Polarity Detection Confirmation Force Refer- ence). Increase the setting of Pn498 (Polarity Detec- tion Allowable Error Range). Increasing the allowable error will also increase the motor tem- perature.	_
A.C80: Encoder Clear	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.	-
Error or Multiturn 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.	-

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	There is a faulty con- tact 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 dis- connection or short- circuit in the encoder. Or, the cable imped- ance is outside the specified values.	Check the condition of the Encoder Cable.	Use the Encoder Cable within the specified specifications.	-
A.C90: Encoder Commu- nications Error	One of the following has occurred: corro- sion caused by improper tempera- ture, humidity, or gas, a short-circuit caused by entry of water drops or cutting oil, or faulty contact in con- nector caused by vibration.	Check the operating environment.	Improve the operating environmental, and replace the cable. If the alarm still occurs, replace the SERVOPACK.	*1
	A malfunction was caused by noise.	_	Correct the wiring around the encoder by separating the Encoder Cable from the Servomotor Main Cir- cuit Cable or by ground- ing 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 Commu- nications Posi- tion 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 countermea- sures against noise for the encoder wiring.	*1
	Excessive vibration or shock was applied to the encoder.	Check the operating conditions.	Reduce machine vibra- tion. Correctly install the Ser- vomotor or linear encoder.	-
A.C92: Encoder Commu- nications 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 <sup>2</sup> .	-	
	The Encoder Cable is too long and noise entered on it.	_	<ul> <li>Rotary Servomotors: The Encoder Cable wir- ing distance must be 50 m max.</li> <li>Linear Servomotors: The Encoder Cable wir- ing distance must be 20 m max.</li> </ul>	-	
A.Cb0: Encoder Echo- back 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 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 vibra- tion. Correctly install the Ser- vomotor 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 differ- ent 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.	-	

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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 Con- verter Unit and SERVO- PACK.	*1
A.CF1: Reception Failed Error in Feed-	A specified cable is not being used between Serial Con- verter Unit and SER- VOPACK.	Check the wiring speci- fications of the external encoder.	Use a specified cable.	-
back Option Module Commu- nications	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 Con- verter Unit and SERVO- PACK must be 20 m or less.	-
	The sheath on cable between the Serial Converter Unit and SERVOPACK is bro- ken.	Check the cable that connects the Serial Converter Unit.	Replace the cable between the Serial Con- verter 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 Con- verter 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 Cir- cuit Cables.	Make sure that there are no faulty contacts in the wiring for the Servomotor and encoder.	-
<b>A.d00:</b> Position Devia-	The frequency of the position reference pulse is too high.	Reduce the reference pulse frequency and try operating the SERVO- PACK.	Reduce the position refer- ence pulse frequency or the reference accelera- tion rate, or reconsider the electronic gear ratio.	*1
Position Devia- tion Overflow (The setting of Pn520 (Position Deviation Over- flow Alarm Level) was exceeded by the position devi- ation while the servo was ON.)	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 Con- stant).	*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.	-

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.d01: Position Devia- tion 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 Devia- tion Overflow Alarm for Speed Limit at Servo ON	If position deviation remains in the devia- tion counter, the set- ting 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 Posi- tion Deviation	The motor direction and external encoder installation orientation are backward.	Check the motor direc- tion and the external encoder installation ori- entation.	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 refer- ence pulse counter.	Reconsider the operating specifications.	-
	There is a faulty con- nection 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.	-
<b>A.E71:</b> Safety Option Module Detec- tion Failure	The Safety Option Module was discon- nected.	_	Execute Fn014 (Reset Option Module Configura- tion 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.	-

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Alarm Number:	Possible Cause	Confirmation	Correction	Reference
Alarm Name	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.	_
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	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.E90: Torque/Force Assistance Com- munications Error	Torque/force assis- tance communica- tions is being affected by noise.	_	Implement noise counter- measures for torque/force assistance communica- tions lines. If an alarm still occurs, review the setting of Pn0D4 = n.□□X□ (Torque/Force Assistance Transmission Speed Selection).	page 4-3
	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.E91: Torque/Force Assistance Drive Axis Alarm	An alarm occurred in the SERVOPACK for the drive axis.	Check the alarm status in the SERVOPACK for the drive axis.	Eliminate the cause of the alarm in the SERVOPACK for the drive axis.	-
A.E92: Torque/Force Assistance Auxil- iary Axis Alarm	An alarm occurred in the SERVOPACK for the auxiliary axis.	Check the alarm status in the SERVOPACK for the auxiliary axis.	Eliminate the cause of the alarm in the SERVOPACK for the auxiliary axis.	_
A.E93: Torque/Force Assistance Com- munications Stop	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
<b>A.Eb1:</b> Safety Function Signal Input Tim- ing Error	The delay between activation of the /HWBB1 and /HWBB2 input sig- nals 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 cir- cuits may be faulty. Alternatively, the input sig- nal cables may be discon- nected. Check to see if any of these items are faulty or have been dis- connected.	-
	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.	-
	The three-phase power supply wiring is not correct.	Check the power sup- ply 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 sup- ply.	Balance the power sup- ply 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 with- out specifying a sig- nal-phase AC power supply input (Pn00B = $n.\Box 1\Box \Box$ ).	Check the power sup- ply and the parameter setting.	Match the parameter set- ting 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.	_
A.F50: Servomotor Main Circuit Cable Dis- connection (The Servomotor did not operate or power was not supplied to the Servomotor even though the /S-ON (Servo ON) signal was input when the Servomotor was ready to receive it.)	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SER- VOPACK.	-
	The wiring is not cor- rect or there is a faulty contact in the motor wiring.	Check the wiring.	Make sure that the Servo- motor is correctly wired.	*1

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
FL-1*5:System AlarmFL-2*5:System AlarmFL-3*5:System AlarmFL-4*5:System AlarmFL-5*5:System AlarmFL-6*5: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 con- tact between the Digi- tal Operator and the SERVOPACK.	Check the connector contact.	Disconnect the connec- tor 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.	-
<b>CPF01:</b> 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.	-

\*1. Refer to the following manual for details.
 Ω 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<sup>-1</sup>] ×  $\frac{\text{Encoder resolution}}{6 \times 10^5} \leq \frac{\text{Pn20E}}{\text{Pn210}}$ 

 Maximum motor speed [min<sup>-1</sup>] × Encoder resolution Pn20E - ≥ Approx. 3.66 × 10<sup>12</sup> Pn210

Linear Servomotor

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

	Pn585 [mm/s]		Resolution of Serial Converter Unit	/	Pn20E
	Linear encoder pitch [µm]	~	10	2	Pn210
-	Pn385 [100 mm/s]		Resolution of Serial Converter Unit		Pn20E
	Linear encoder pitch [µm]	~	Approx. 6.10 ×10 <sup>5</sup>	2	Pn210

6.1.4 Warning Displays

<ul> <li>*3. Detection Conditions</li> <li>• Rotary Servomotor If either of the following conditions</li> </ul>	s is detected, an alarm will occur.
• Rated motor speed [min <sup>-1</sup> ] $\times$ 1/3 $\times$ $\frac{E}{-}$	$\frac{1}{6 \times 10^5} \leq \frac{\text{Pn20E}}{\text{Pn210}}$
• Maximum motor speed [min <sup>-1</sup> ] $\times \frac{Enc}{App}$	$\frac{\text{coder resolution}}{\text{prox. } 3.66 \times 10^{12}} \ge \frac{\text{Pn20E}}{\text{Pn210}}$
Linear Servomotor     If either of the following conditions	s is detected, an alarm will occur.
Rated motor speed [mm/s] × 1/3 Linear encoder pitch [μm]	$\times \ \frac{\text{Resolution of Serial Converter Unit}}{10} \le \frac{\text{Pn20E}}{\text{Pn210}}$
- Pn385 [100 mm/s] Linear encoder pitch [μm]	$\times \frac{\text{Resolution of Serial Converter Unit}}{\text{Approx. } 6.10 \times 10^5} \ge \frac{\text{Pn20E}}{\text{Pn210}}$

- \*4. Refer to the following manual for details.
   Ω Σ-7-Series Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)
- \*5. These alarms are not stored in the alarm history. They are only displayed on the panel display.

# 6.1.4 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.

This section provides a list of warnings and the causes of and corrections for warnings.

6.1.5 List of Warnings

# 6.1.5 List of Warnings

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

Warning	Warning Name	Meaning		Warning Code Output		
Number				ALO2		
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 $\times$ Pn528/100)		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 warn- ing by setting Pn310 (Vibration Detection Selec- tions).	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 Bat- tery 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 Com- pensation Information Disagreement	The speed ripple compensation information stored in the encoder does not agree with the speed rip- ple 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	

- Note: 1. A warning code is not output unless you set Pn001 to n.1 (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	$Pn310 = n.\square\square\squareX$ (Vibration Detection Selection)		
A.923	- (Not affected by the setting of Pn008 = $n.\Box X \Box \Box$ .)		
A.930	Pn008 = n. DDX (Low Battery Voltage Alarm/Warning Selection)		
A.942	Pn423 = n.□□X□ (Speed Ripple Compensation Information Disagreement Warning Detection Selection)		
A.971	$Pn008 = n.\square\square\squareX$ (Low Battery Voltage Alarm/Warning Selection) (Not affected by the setting of $Pn008 = n.\squareX\square\square$ .)		
A.9A0	Pn00D = $n.X\square\square\square$ (Overtravel Warning Detection Selection) (Not affected by the setting of Pn008 = $n.\squareX\square\square$ .)		
A.9b0	Pn00F = n.		

# 6.1.6 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 Cir- cuit 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 refer- ence pulse frequency or the reference acceleration rate, or reconsider the electronic gear ratio.	*
<b>A.900:</b> Position Deviation Overflow	The acceleration of the position ref- erence is too high.	Reduce the reference acceleration and try operating the SERVO- PACK.	Apply smoothing, i.e., by using Pn216 (Position Ref- erence Acceleration/ Decel- eration Time Constant).	*
	The excessive position deviation alarm level (Pn520 × Pn51E/100) is too low for the operating condi- tions.	Check excessive posi- tion 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.	-
<b>A.901:</b> Position Deviation Overflow Alarm at Servo ON	The position devi- ation 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).	*

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Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Reference
	The wiring is not correct or there is a faulty contact 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 protec- tion characteris- tics.	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 Ser- vomotor was not driven because of mechanical prob- lems.	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.	-
	Abnormal vibra- tion was detected during motor operation.	Check for abnormal motor noise, and check the speed and torque waveforms during oper- ation.	Reduce the motor speed. Or, reduce the servo gain with custom tuning.	*
<b>A.911:</b> Vibration	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 Iner- tia Ratio) to an appropriate value.	*
	The vibration detection level (Pn312 or Pn384) is not suitable.	Check that the vibration detection level (Pn312 or Pn384) is suitable.	Set a suitable vibration detection level (Pn312 or Pn384).	*

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Warning Number:		0	Continued from pre	
Warning Name	Possible Cause	Confirmation	Correction	Reference
	The surrounding temperature is too high.	Check the surrounding temperature using a thermostat. Or, check the operating status with the SERVOPACK installation environ- ment monitor.	Decrease the surrounding temperature by improving the SERVOPACK installa- tion conditions.	*
	An overload alarm was reset by turn- ing 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 pro- cessing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenera- tive load ratio to check the regenerative pro- cessing capacity.	Reconsider the load and operating conditions.	-
	The SERVOPACK installation orien- tation is not cor- rect or there is insufficient space around the SER- VOPACK.	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 thermostat. Or, check the operating status with the SERVOPACK installation environ- ment monitor.	Decrease the surrounding temperature by improving the SERVOPACK installa- tion conditions.	*
	An overload alarm was reset by turn- ing 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 pro- cessing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenera- tive load ratio to check the regenerative pro- cessing capacity.	Reconsider the load and operating conditions.	-
	The SERVOPACK installation orien- tation is not cor- rect or there is insufficient space around the SER- VOPACK.	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:	Possible Cause	Confirmation	Correction	Reference
Warning Name	The power supply voltage exceeded the specified range.	Measure the power supply voltage.	Set the power supply volt- age within the specified range.	-
<b>A.920:</b> Regenerative Over- load (warning before an A.320 alarm occurs)	There is insuffi- cient external regenerative resis- tance, regenera- tive resistor capacity, or SER- VOPACK capac- ity, or there has been a continuous regeneration state.	Check the operating conditions or the capacity using the Sig- maJunmaSize+ Capac- ity Selection Software or another means.	Change the regenerative resistance value, regenera- tive resistance capacity, or SERVOPACK capacity. Reconsider the operating conditions using the Sigma- JunmaSize+ Capacity Selection Software or other means.	_
	There was a con- tinuous regenera- tion 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 exter- nal 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 con- sumed by the DB resis- tor to see how frequently the DB is being used.	<ul> <li>Reconsider the following:</li> <li>Reduce the Servomotor command speed.</li> <li>Decrease the moment of inertia or mass.</li> <li>Reduce the frequency of stopping with the dynamic brake.</li> </ul>	-
	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	The battery con- nection is faulty or a battery is not connected.	Check the battery con- nection.	Correct the battery connec- tion.	*
	The battery volt- age is lower than the specified value (2.7 V).	Measure the battery voltage.	Replace the battery.	*
only when an abso- lute encoder is con- nected.)	A failure occurred in the SERVO- PACK.	-	The SERVOPACK may be faulty. Replace the SERVO- PACK.	-

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Warning Number: Describle Cause Confirmation Confirmation				
Warning Name	Possible Cause	Confirmation	Correction	Reference
	The surrounding temperature is too high.	Check the surrounding temperature using a thermostat.	Lower the surrounding tem- perature 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 Servo- motor is faulty or the sensor attached to the machine is faulty.	-	The temperature detection circuit in the Linear Servo- motor may be faulty or the sensor attached to the machine may be faulty. Replace the Linear Servo- motor or repair the sensor attached to the machine.	-
A.941: Change of Parame- ters 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 compensation information stored in the encoder does not agree with the speed ripple compensa-	_	Reset the speed ripple compensation value on the SigmaWin+.	*
A.942: Speed Ripple Com- pensation Informa- tion Disagreement		_	Set Pn423 to n. <b>D</b> 1 <b>D</b> (Do not detect A.942 alarms). However, changing the setting may increase the speed ripple.	*
	tion information stored in the SER- VOPACK.	_	Set Pn423 to n. DDD (Disable speed ripple com- pensation). 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 volt- age within the specified range.	-
	For a 100-V SER- VOPACK, the AC power supply volt- age dropped below 60 V.	Measure the power supply voltage.	Set the power supply volt- age 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 interrup- tion occurred.	Measure the power supply voltage.	If you have changed the setting of Pn509 (Momen- tary 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.	-

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Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Reference
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.	<ul> <li>Even if an overtravel signal is not shown by the input signal monitor, momentary overtravel may have been detected. Take the following precautions.</li> <li>Do not specify move- ments that would cause overtravel from the host controller.</li> <li>Check the wiring of the overtravel signals.</li> <li>Implement countermea- sures against noise.</li> </ul>	*
A.9b0: Preventative Mainte- nance Warning	One of the con- sumable parts has reached the end of its service life.	_	Replace the part. Contact your Yaskawa representa- tive 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)

6.1.7 Troubleshooting Based on the Operation and Conditions of the Servomotor

# 6.1.7 Troubleshooting Based on the Operation and Conditions of the Servomotor

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

Turn OFF the Servo System before troubleshooting the items shown in bold lines in the table.

Problem	Possible Cause	Confirmation	Correction	Reference
	The control power supply is not turned ON.	Measure the voltage between control power supply terminals.	Correct the wiring so that the control power supply is turned ON.	-
	The main circuit power sup- ply is not turned ON.	Measure the voltage between the main circuit power input terminals.	Correct the wiring so that the main circuit power supply is turned ON.	-
	The I/O signal connector (CN1) pins are not wired cor- rectly or are disconnected.	Check the wiring condi- tion of the I/O signal con- nector (CN1) pins.	Correct the wiring of the I/O signal connec- tor (CN1) pins.	*
	The wiring for the Servomo- tor Main Circuit Cables or Encoder Cable is discon- nected.	Check the wiring condi- tions.	Wire the cable cor- rectly.	-
	There is an overload on the Servomotor.	Operate the Servomotor with no load and check the load status.	Reduce the load or replace the Servomo- tor with a Servomotor with a larger capacity.	-
	The type of encoder that is being used does not agree with the setting of $Pn002 = n.\Box X \Box \Box$ (Encoder Usage).	Check the type of the encoder that is being used and the setting of $Pn002 = n.\Box X \Box \Box$ .	Set Pn002 = $n.\Box X \Box \Box$ according to the type of the encoder that is being used.	*
Servomotor Does Not	No speed or position refer- ence is input.	Check the allocation sta- tus of the input signals.	Allocate an input signal so that the speed and position references are input correctly.	*
Start	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. $\Box$ X (Input Signal Allocation Mode) and Pn50A = n. $\Box$ X I (/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 Con- trol) signal is not correct.	Check the setting of Pn000 = $n.\Box\Box X\Box$ (Con- trol 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.	*
	The reference pulse mode selection is not correct.	Check the setting of Pn200 =n. DDX (Refer- ence Pulse Form) and the reference pulse form.	Set Pn200 =n.	*
	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 con- trol method and input method.	*

Continued on next page.

6.1.7 Troubleshooting Based on the Operation and Conditions of the Servomotor

Problem	Possible Cause	Confirmation	Correction	Reference
	Torque control: The torque reference input is not appro- priate.	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 con- trol method and input method.	*
	Position control: The refer- ence pulse input is not appropriate.	Check the setting of Pn200 =n.□□□X (Refer- ence Pulse Form) and the sign and pulse signals.	Correctly set the con- trol 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 sig- nal.	*
	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	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 sig- nals. If you are not using the safety function, con- nect the Safety Jumper Connector (provided as an accessory) to CN8.	*
ooes Not Start	The FSTP (Forced Stop Input) signal is still OFF.	Check the FSTP signal.	<ul> <li>Turn ON the FSTP signal.</li> <li>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.</li> </ul>	*
	A failure occurred in the SER- VOPACK.	-	Replace the SERVO- PACK.	-
		Check the setting of Pn080 =n.□□□X (Polar- ity 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.	<ul> <li>If you are using an incremental linear encoder, turn ON the /S-ON or /P-DET signal.</li> <li>If you are using an absolute linear encoder, turn OFF the external /S-ON signal and execute polarity detection.</li> </ul>	*

6.1.7 Troubleshooting Based on the Operation and Conditions of the Servomotor

Problem	Possible Cause	Confirmation	Continued from pre	Reference
Servomotor Moves Instanta- neously, and Then Stops	There is a mistake in the Servomotor wiring.	Check the wiring.	Wire the Servomotor correctly.	-
	There is a mistake in the wir- ing of the encoder or Serial Converter Unit.	Check the wiring.	Wire the Serial Con- verter Unit correctly.	-
	There is a mistake in the lin- ear encoder wiring.	Check the wiring.	Wire the cable cor- rectly.	_
	The setting of Pn282 (Linear Encoder Scale Pitch) is not correct.	Check the setting of Pn282.	Correct the setting of Pn282.	*
	The count-up direction of the linear encoder does not match the forward direction of the Moving Coil in the motor.	Check the directions.	Change the setting of Pn080 = $n.\Box\Box X\Box$ (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 connec- tions for the power line (U, V, and W phases) and the encoder or Serial Converter Unit may be unstable. Check the wir- ing.	Tighten any loose ter- minals or connectors and correct the wiring.	-
Servomotor Moves with- out a Refer- ence Input	Speed control: The speed reference input is not appro- priate.	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 con- trol method and input method.	*
	Torque control: The torque reference input is not appro- priate.	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 con- trol method and input method.	*
	The speed reference offset is not correct.	The SERVOPACK offset is adjusted incorrectly.	Adjust the SERVO- PACK offset.	*
	Position control: The refer- ence pulse input is not appropriate.	Check the setting of Pn200 =n.□□□X (Refer- ence Pulse Form) and the sign and pulse signals.	Correctly set the con- trol method and input method.	-
	A failure occurred in the SER- VOPACK.	_	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. $\Box$ 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.	-

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### 6.1 Analog Voltage/Pulse Train Reference SERVOPACK with FT77 Specification

# 6.1.7 Troubleshooting Based on the Operation and Conditions of the Servomotor

	Continued from previous page.				
Problem	Possible Cause	Confirmation	Correction	Reference	
Dynamic Brake Does Not Operate	The setting of Pn001 = $n.\square\square\squareX$ (Motor Stopping Method for Servo OFF and Group 1 Alarms) is not suitable.	Check the setting of Pn001 = $n.\Box\Box\BoxX$ .	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 resis- tance may be discon- nected.	Replace the SERVO- PACK. To prevent dis- connection, reduce the load.	-	
	There was a failure in the dynamic brake drive circuit.	-	There is a defective component in the dynamic brake circuit. Replace the SERVO- PACK.	-	

Continued from previous page.

Problem	Possible Cause	Confirmation	Correction	Reference
	The Servomotor vibrated considerably while perform- ing 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 allow- able value, or increase the load level or reduce the rigidity level in the tuning-less level set- tings.	*
	The machine mounting is not secure.	Check to see if there are any loose mounting screws.	Tighten the mounting screws.	-
	The machine mounting is not secure.	Check to see if there is misalignment in the coupling.	Align the coupling.	-
		Check to see if the coupling is balanced.	Balance the coupling.	
	The bearings are defective.	Check for noise and vibration around the bear- ings.	Replace the Servomo- tor.	-
	There is a vibration source at the driven machine.	Check for any foreign matter, damage, or defor- mation in the machine's moving parts.	Consult with the machine manufacturer.	-
Abnormal Noise from Servomotor	Noise interference occurred because of incorrect I/O sig- nal cable specifications.	Check the I/O signal cables to see if they sat- isfy specifications. Use shielded twisted-pair wire cables or screened twisted-pair cables with conductors of at least 0.12 mm <sup>2</sup> .	Use cables that satisfy the specifications.	-
	Noise interference occurred because an I/O signal cable is too long.	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.	Make sure that the rotary or Linear Encoder Cable satisfies the specifica- tions. Use a shielded twisted-pair wire cable or a screened twisted-pair cable with a conductors of at least 0.12 mm <sup>2</sup> .	Use cables that satisfy the specifications.	-
	Noise interference occurred because the Encoder Cable is too long.	Check the length of the Encoder Cable.	<ul> <li>Rotary Servomotors: The Encoder Cable length must be 50 m max.</li> <li>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.</li> </ul>	-
	Noise interference occurred because the Encoder Cable is damaged.	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.	-

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Problem	Possible Cause	Confirmation	Correction	Reference
	The Encoder Cable was sub- jected to excessive noise interference.	Check to see if the Encoder Cable is bundled with a high-current line or installed near a high-cur- rent 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.	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.	Implement counter- measures against noise for the encoder wiring.	-
Abnormal Noise from Servomotor	The encoder was subjected to excessive vibration or shock.	Check to see if vibration from the machine occurred. Check the Ser- vomotor installation (mounting surface preci- sion, securing state, and alignment). Check the linear encoder installation (mounting sur- face precision and secur- ing method).	Reduce machine vibra- tion. Improve the mounting state of the Servomotor or linear encoder.	-
	A failure occurred in the encoder.	_	Replace the Servomo- tor.	-
	A failure occurred in the Serial Converter Unit.	-	Replace the Serial Con- verter Unit.	-
	A failure occurred in the linear encoder.	_	Replace the linear encoder.	-
	The servo gains are not bal- anced.	Check to see if the servo gains have been cor- rectly tuned.	Perform autotuning without a host refer- ence.	*
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 appro- priate value.	-
Vibrates at Frequency of Approx. 200 Hz to 400 Hz.	The setting of Pn102 (Posi- tion Loop Gain) is too high.	Check the setting of Pn102. The default setting is Kp = 40.0/s.	Set Pn102 to an appro- priate value.	-
	The setting of Pn101 (Speed Loop Integral Time Con- stant) is not appropriate.	Check the setting of Pn101. The default setting is Ti = 20.0 ms.	Set Pn101 to an appro- priate 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 appro- priate value.	_

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Problem	Possible Cause	Confirmation	Continued from pre Correction	Reference
	The servo gains are not bal- anced.	Check to see if the servo gains have been cor- rectly tuned.	Perform autotuning without a host refer- ence.	*
Large Motor Speed	The setting of Pn100 (Speed Loop Gain) is too high.	Check the setting of Pn100. The default setting is Kv = 40.0 Hz.	Set Pn100 to an appropriate value.	_
	The setting of Pn102 (Posi- tion Loop Gain) is too high.	Check the setting of Pn102. The default setting is Kp = 40.0/s.	Set Pn102 to an appro- priate value.	-
Overshoot on Starting and Stop- ping	The setting of Pn101 (Speed Loop Integral Time Con- stant) is not appropriate.	Check the setting of Pn101. The default setting is Ti = 20.0 ms.	Set Pn101 to an appro- priate 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 appro- priate value.	-
	The torque reference is satu- rated.	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.	*
Abaoluto	Noise interference occurred because of incorrect Encoder Cable specifications.	Check the Encoder Cable to see if it satisfies speci- fications. Use a shielded twisted- pair wire cable or a screened twisted-pair cable with conductors of at least 0.12 mm <sup>2</sup> .	Use cables that satisfy the specifications.	-
Absolute Encoder Position Deviation Error (The position that was saved in the host con- troller when the power was turned OFF is dif-	Noise interference occurred because the Encoder Cable is too long.	Check the length of the Encoder Cable.	<ul> <li>Rotary Servomotors: The Encoder Cable length must be 50 m max.</li> <li>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.</li> </ul>	-
ferent from the posi- tion when the power	Noise interference occurred because the Encoder Cable is damaged.	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.	-
was next turned ON.)	The Encoder Cable was sub- jected to excessive noise interference.	Check to see if the Encoder Cable is bundled with a high-current line or installed near a high-cur- rent 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.	Check to see if the machines are correctly grounded.	Properly ground the machines to separate them from the FG of the encoder.	-

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Problem	Possible Cause	Confirmation	Correction	Reference	
	There is a SERVOPACK pulse counting error due to noise.	Check to see if there is noise interference on the I/O signal line from the encoder or Serial Con- verter Unit.	Implement counter- measures against noise for the encoder or Serial Converter Unit wiring.	-	
Absolute Encoder Position Deviation Error (The position that was saved in the	The encoder was subjected to excessive vibration or shock.	Check to see if vibration from the machine occurred. Check the Servomotor installation (mounting sur- face precision, securing state, and alignment). Check the linear encoder installation (mounting sur- face precision and secur- ing method).	Reduce machine vibra- tion. Improve the mounting state of the Servomotor or linear encoder.	-	
host con- troller when	A failure occurred in the encoder.	-	Replace the Servomo- tor or linear encoder.	-	
the power was turned	A failure occurred in the SER- VOPACK.	-	Replace the SERVO- PACK.	-	
OFF is dif- ferent from the posi-		Check the error detec- tion section of the host controller.	Correct the error detec- tion section of the host controller.	-	
tion when the power was next turned ON.)	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.	-	
	Position Data Reading Error	Check for noise interfer- ence in the cable between the SERVO- PACK and the host con- troller.	Implement counter- measures against noise and then perform parity checks again for the multiturn data or abso- lute encoder position data.	-	

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Problem	Possible Cause	Confirmation	Correction	Reference
		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	Check the operating con- dition of the overtravel limit switches.	Make sure that the overtravel limit switches operate correctly.	-
	input.	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.	*
		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.	_
Overtravel	The P-OT/N-OT (Forward Drive Prohibit or Reverse Drive Prohibit) signal mal- functioned.	Check to see if the opera- tion of the overtravel limit switches is unstable.	Stabilize the operating condition of the over- travel limit switches.	-
Occurred		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 allo- cation of the P-OT or N-OT (Forward Drive Prohibit or	Check to see if the P-OT signal is allocated in Pn50A = $n.X\square\square\square$ .	If another signal is allo- cated in Pn50A =n.XDDD, allocate the P-OT signal instead.	*
	Reverse Drive Prohibit) sig- nal 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 = $n.\square\square\squareX$ .	If another signal is allo- cated in Pn50B =n.□□□X, allocate the N-OT signal instead.	*
	The selection of the Servo- motor stopping method is not correct.	Check the servo OFF stopping method set in Pn001 = $n.\Box\BoxX$ or Pn001 = $n.\Box\BoxX\Box$ .	Select a Servomotor stopping method other than coasting to a stop.	*
		Check the torque control stopping method set in Pn001 = $n.\Box\BoxX$ or Pn001 = $n.\Box\BoxX\Box$ .	Select a Servomotor stopping method other than coasting to a stop.	*
Improper Stop Posi-	The limit switch position and dog length are not appropriate.	-	Install the limit switch at the appropriate position.	-
tion for Overtravel (OT) Signal	The overtravel limit switch position is too close for the coasting distance.	-	Install the overtravel limit switch at the appropriate position.	_

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Problem	Possible Cause	Confirmation	Continued from pre	Reference
	Noise interference occurred because of incorrect Encoder Cable specifications.	Check the Encoder Cable to see if it satisfies speci- fications. Use a shielded twisted-pair wire cable or a screened twisted-pair cable with conductors of at least 0.12 mm <sup>2</sup> .	Use cables that satisfy the specifications.	-
Position Deviation	Noise interference occurred because the Encoder Cable is too long.	Check the length of the Encoder Cable.	<ul> <li>Rotary Servomotors: The Encoder Cable length must be 50 m max.</li> <li>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.</li> </ul>	-
(without Alarm)	Noise interference occurred because the Encoder Cable is damaged.	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 sub- jected to excessive noise interference.	Check to see if the Encoder Cable is bundled with a high-current line or installed near a high-cur- rent 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.	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 I/O signal line from the encoder or Serial Con- verter Unit.	Implement counter- measures against noise for the encoder wiring or Serial Converter Unit wiring.	-

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Problem	Possible Cause	Confirmation	Continued from pre	Reference
	The encoder was subjected to excessive vibration or shock.	Check to see if vibration from the machine occurred. Check the Servomotor installation (mounting sur- face precision, securing state, and alignment). Check the linear encoder installation (mounting sur- face precision and secur- ing method).	Reduce machine vibra- tion. Improve the mounting state of the Servomotor or linear encoder.	-
	The coupling between the machine and Servomotor is not suitable.	Check to see if position offset occurs at the cou- pling 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 sig- nal cable specifications.	Check the I/O signal cables to see if they sat- isfy specifications. Use a shielded twisted-pair wire cable or a screened twisted-pair cable with conductors of at least 0.12 mm <sup>2</sup> .	Use cables that satisfy the specifications.	-
	If reference pulse input multi- plication switching is being used, noise may be causing the I/O signals used for this function (/PSEL and /PSELA) to be falsely detected.	Check the I/O signal cables to see if they sat- isfy specifications. Use a shielded twisted-pair wire cable or a screened twisted-pair cable with conductors of at least 0.12 mm <sup>2</sup> .	Use cables that satisfy the specifications.	-
	Noise interference occurred because an I/O signal cable is too long.	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.)	-	Replace the Servomo- tor or linear encoder.	-
	A failure occurred in the SER- VOPACK.	-	Replace the SERVO- PACK.	-
	The surrounding air tempera- ture is too high.	Measure the surrounding air temperature around the Servomotor.	Reduce the surround- ing air temperature to 40°C or less.	-
	The surface of the Servomo- tor is dirty.	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 Ser- vomotor 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)

Maintenance

6-57

6.2.1 Alarm Displays

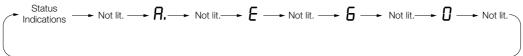
# 6.2 MECHATROLINK-III Communications Reference SERVOPACK with FT77 Specification

# 6.2.1 Alarm Displays

If an error occurs in the SERVOPACK, an alarm number will be displayed on the panel display.

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

Example: Alarm A.E60



This section provides a list of the alarms that may occur and the causes of and corrections for those alarms.

## 6.2.2 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.  $\square$   $\Sigma$ -7 Series  $\Sigma$ -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 SERVOPACK.	Gr.1	No
A.025	System Alarm	An internal program error occurred in the SERVOPACK.	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.

		Continued t	'	ous 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 Servomo- tor 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 transis- tor 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	<ul> <li>The AC power supply input setting or DC power supply input setting is not correct.</li> <li>The power supply wiring is not correct.</li> </ul>	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	<ul> <li>Rotary Servomotor: The pulse output speed for the setting of Pn212 (Number of Encoder Out- put Pulses) was exceeded.</li> <li>Linear Servomotor: The motor speed upper limit for the setting of Pn281 (Encoder Output Resolution) was exceeded.</li> </ul>	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 sec- onds to several tens of seconds under a torque that largely exceeded the rating.	Gr.2	Yes
A.720	Continuous Overload	The Servomotor was operating continuously under a torque that exceeded the rating.	Gr.1	Yes
		When the dynamic brake was applied, the rota-		

Continued on next page.

Servo-Alarm motor Alarm Reset Alarm Name Alarm Meaning Stop-Possi-Number ping ble? Method Inrush Current Limiting The main circuit power supply was frequently A.740 Gr.1 Yes turned ON and OFF. **Resistor Overload** Internal Temperature Error The surrounding temperature of the control PCB A.7A1 1 (Control Board Tempera-Gr 2 Yes is abnormal. ture Error) Internal Temperature Error The surrounding temperature of the power PCB A.7A2 2 (Power Board Tempera-Gr.2 Yes is abnormal. ture Error) Internal Temperature Sen-An error occurred in the temperature sensor cir-A.7A3 Gr.2 No sor Error cuit. SERVOPACK Built-in Fan A.7Ab The fan inside the SERVOPACK stopped. Gr.1 Yes Stopped The power supplies to the encoder all failed and A.810 Encoder Backup Alarm Gr.1 No the position data was lost. There is an error in the checksum results for A.820 Encoder Checksum Alarm Gr. 1 No encoder memory. The battery voltage was lower than the specified A.830 Encoder Battery Alarm level after the control power supply was turned Gr.1 Yes ON. A.840 Encoder Data Alarm There is an internal data error in the encoder. Gr.1 No The encoder was operating at high speed when A.850 **Encoder Overspeed** Gr.1 No the power was turned ON. 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 The input voltage (temperature) for the overheat protection input (TH) signal exceeded the setting A.862 **Overheat Alarm** Gr.1 Yes of Pn61B (Overheat Alarm Level). A.890 Encoder Scale Error Gr.1 A failure occurred in the linear encoder. No A.891 Encoder Module Error An error occurred in the linear encoder. No Gr.1 A.8A0 External Encoder Error An error occurred in the external encoder. Gr.1 Yes External Encoder Module A.8A1 An error occurred in the Serial Converter Unit. Gr.1 Yes Frror External Incremental A.8A2 Gr.1 An error occurred in the external encoder. Yes Encoder Sensor Error External Absolute Encoder An error occurred in the position data of the A.8A3 Gr 1 Yes external encoder. Position Error External Encoder Over-An overspeed error occurred in the external A.8A5 Gr.1 Yes speed encoder. External Encoder Over-An overheating error occurred in the external A.8A6 Gr.1 Yes heated encoder. A.b33 **Current Detection Error 3** An error occurred in the current detection circuit. Gr.1 No **MECHATROLINK Commu-**ASIC error 1 occurred in MECHATROLINK com-A.b6A Gr. 1 No munications nications ASIC Error 1 MECHATROLINK Commu-ASIC error 2 occurred in MECHATROLINK com-A.b6b Gr.2 No nications ASIC Error 2 munications. Internal program error 0 occurred in the SERVO-A.bF0 System Alarm 0 Gr.1 No PACK. Internal program error 1 occurred in the SERVO-A.bF1 Gr.1 System Alarm 1 No PACK. Internal program error 2 occurred in the SERVO-A.bF2 System Alarm 2 Gr.1 No PACK.

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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 Dis- agreement	The phase information does not match.	Gr.1	No
A.C50	Polarity Detection Failure	The polarity detection failed.	Gr.1	No
A.C51	Overtravel Detected during Polarity Detection	The overtravel signal was detected during polarity detection.	Gr.1	Yes
A.C52	Polarity Detection Not Completed	The servo was turned ON before the polarity was detected.	Gr.1	Yes
A.C53	Out of Range of Motion for Polarity Detection	The travel distance exceeded the setting of Pn48E (Polarity Detection Range).	Gr.1	No
A.C54	Polarity Detection Failure 2	The polarity detection failed.	Gr.1	No
A.C80	Encoder Clear Error or Multiturn Limit Setting Error	The multiturn data for the absolute encoder was not correctly cleared or set.	Gr.1	No
A.C90	Encoder Communications Error	Communications between the encoder and SERVOPACK is not possible.	Gr.1	No
A.C91	Encoder Communications Position Data Acceleration Rate Error	An error occurred in calculating the position data of the encoder.	Gr.1	No
A.C92	Encoder Communications Timer Error	An error occurred in the communications timer between the encoder and SERVOPACK.	Gr.1	No
A.CA0	Encoder Parameter Error	The parameters in the encoder are corrupted.	Gr.1	No
A.Cb0	Encoder Echoback Error	The contents of communications with the encoder are incorrect.	Gr.1	No
A.CC0	Multiturn Limit 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 Mod- ule failed.	Gr.1	No
A.CF2	Timer Stopped Error in Feedback Option Module Communications	An error occurred in the timer for communica- tions 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

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Alarm Number         Alarm Name         Alarm Meaning         motor pring pring mice of the serve was turned ON after the position devi- bie?         motor principal principal bie?           A.d01         Position Deviation Over- flow Alarm at Serve ON atom covered the serve was offer.         The serve was turned ON after the position devi- tion exceeded the serve was offer.         Gr.1         Yes           A.d02         Position Deviation Over- flow Alarm for Speed Limit at Serve ON         If position deviation remains in the deviation counter, the serve was offer.         Gr.2         Yes           A.d10         Moor-Load Position Devi- ation Overflow         The position feedback data exceeded the serve on Uning fully closed loop con- trol.         Gr.2         Yes           A.d10         Moor-Load Position Deviation feedback data exceeded ation Overflow         The position feedback data exceeded to monotor reception.         Gr.1         No           A.ed20         MECHATROLINK Internal station Monitor Recep- tion Error         An error occurred in MECHATROLINK other station Monitor Recep- tion monitor reception.         Gr.2         Yes           A.Ed21         MECHATROLINK Other Station Monitor Setting Error         An error occurred in MECHATROLINK other station monitor setting.         Gr.2         Yes           A.Ed40         MECHATROLINK Other station monitor setting of the MECHATROLINK communica- from recorred in the MECHATROLINK other station monitor.         Gr.2         Yes           A.Ed41 </th <th></th> <th></th> <th>Continueu</th> <th></th> <th>Jus page.</th>			Continueu		Jus page.
A.d01         Position Deviation Over- flow Alarm at Servo ON         ation exceeded the setting of Ph526 (Position 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 position reference is input and the setting of Ph529 or Ph584 (Speed Limit Level at Servo ON) This alare noccurs if a position reference is input and the setting of Ph529 (Position Deviation Overlation Deviation Overlation between the motor and load during fully-closed loop con- trol.         Gr.2         Yes           A.d10         Motor-Load Position Devi ation Overflow         The position feedback data exceeded ±1,879,048,192.         Gr.1         No           A.d30         Position Data Overflow         The position feedback data exceeded ±1,879,048,192.         Gr.1         No           A.e02         MECHATROLINK Internal Synchronization Error         An error occurred in MECHATROLINK other sta- tion monitor reception.         Gr.2         Yes           A.E30         MECHATROLINK Other Station Monitor Error         An error occurred in MECHATROLINK other sta- tion monitor reception.         Gr.2         Yes           A.E40         MECHATROLINK Comp Error         An error occurred in MECHATROLINK other sta- tion stransmission cycle setting Error         Gr.2         Yes           A.E41         micron bat Size Set- ting Error         An error occurred in MECHATROLINK communica- tions data size is not correct.         Gr.2		Alarm Name	Alarm Meaning	motor Stop- ping	Alarm Reset Possi- ble?
A.d02         Position Deviation Over- flow Alarm for Speed Limit at Servo ON         counter, the setting of Pn529 or Pn534 (Speed Imit Level at Servo ON) imits the speed when ph520 (Position Deviation Overflow Alarm Level) is exceeded before the limit is cleared.         Gr.2         Yes           A.d10         Motor-Load Position Devi ation Overflow         There was too much position deviation between the motor and load during fully-closed loop con- tool.         Gr.2         Yes           A.d30         Position Date Overflow         The position feedback data exceeded ±1,879,048,192.         Gr.1         No           A.d30         Position Date Overflow         The position feedback data exceeded ±1,879,048,192.         Gr.1         No           A.e02         Synchronization Error         Synchronization error occurred in MECHATROLINK other Station Monitor Recep- tion monitor reception.         Gr.2         Yes           A.E31         MECHATROLINK Other Station Monitor Event         An error occurred in MECHATROLINK other sta- tion monitor.         Gr.2         Yes           A.E42         MECHATROLINK Trans- mission Cycle Setting Error         The setting of the MECHATROLINK communica- tions transmission cycle is not correct.         Gr.2         Yes           A.E44         MECHATROLINK Syn- chronization Faled- corror in MECHATROLINK Syn- mications Data Size Set- tions data size is not correct.         Gr.2         Yes           A.E44         MECHATROLINK Syn- chronization Faled- corror in MECHATR	A.d01		ation exceeded the setting of Pn526 (Position Deviation Overflow Alarm Level at Servo ON)	Gr.1	Yes
A.d10       Middi-Load Fosition Deering       the motor and load during fully-closed loop control.       Gr.2       Yes         A.d30       Position Data Overflow       The position feedback data exceeded       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.E30       MECHATROLINK Other Station Monitor Reception       An error occurred in MECHATROLINK other station monitor reception.       Gr.2       Yes         A.E31       MECHATROLINK Other Station Monitor Setting Error       An error occurred in the MECHATROLINK other station monitor reception.       Gr.2       Yes         A.E32       MECHATROLINK Trans- mission Cycle Setting Error       An error occurred in MECHATROLINK other station monitor.       Gr.2       Yes         A.E40       MECHATROLINK Communications string for the MECHATROLINK communica- mission Cycle Setting Error       Gr.2       Yes         A.E41       MECHATROLINK Syn- chronization Error in ALE42       MECHATROLINK Syn- chronization Error in ALE44       The setting of the MECHATROLINK communica- ing Error in ALE450*       Gr.2       Yes         A.E50*       MECHATROLINK Syn- chronization Error in ALE40       A synchronization failed during MECHATROLINK communications.       Gr.2       Yes         A.E60*       MECHATROLINK Syn- chronization Failed </td <td>A.d02</td> <td>flow Alarm for Speed Limit</td> <td>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)</td> <td>Gr.2</td> <td>Yes</td>	A.d02	flow Alarm for Speed Limit	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)	Gr.2	Yes
A.630Position Data Overnow±1,879,048,192.Gir.1NoA.E02MECHATROLINK Internal Synchronization Error 1A synchronization error occurred during MECHA- TROLINK communications with the SERVO- PACK.Gr.1YesA.E30MECHATROLINK Other Station Monitor Recep- tion ErrorAn error occurred in MECHATROLINK other station Monitor Setting ErrorAn error occurred in the MECHATROLINK other station Monitor Setting ErrorGr.2YesA.E31MECHATROLINK Other Station Monitor Setting ErrorAn error occurred in MECHATROLINK other station monitor reception.Gr.2YesA.E32MECHATROLINK Other Station Monitor ErrorAn error occurred in MECHATROLINK other station monitor.Gr.2YesA.E40MECHATROLINK Trans- mission Cycle Setting ErrorThe setting of the MECHATROLINK communica- tions transmission cycle is not correct.Gr.2YesA.E41MECHATROLINK Station Address Setting ErrorThe setting of the MECHATROLINK station address is not correct.Gr.2YesA.E42MECHATROLINK Syn- chronization ErrorA synchronization error occurred during MECHA- TROLINK communications.Gr.2YesA.E50*MECHATROLINK Syn- chronization FarionA synchronization error occurred ontinuously during MECHATROLINK Communications.Gr.2YesA.E61*MECHATROLINK CommunicationsSynchronization error occurred in the transmission cycle during MECHATROLINK communications.Gr.2YesA.E51*MECHATROLINK Syn- chronization Frame Not ReceivedAn error occurred in the tran	A.d10		the motor and load during fully-closed loop con-	Gr.2	Yes
A.E02       MECHATROLINK Terror 1       TROLINK communications with the SERVO- PACK.       Gr.1       Yes         A.E30       MECHATROLINK Other Station Monitor Recep- tion Error       An error occurred in MECHATROLINK other sta- for monitor reception.       Gr.2       Yes         A.E31       MECHATROLINK Other Station Monitor Setting Error       An error occurred in the MECHATROLINK other station monitor reception.       Gr.2       Yes         A.E32       MECHATROLINK Other Station Monitor Error       An error occurred in MECHATROLINK other sta- fition monitor.       Gr.2       Yes         A.E40       MECHATROLINK Trans- mission Cycle Setting Error       The setting of the MECHATROLINK communica- tions transmission cycle is not correct.       Gr.2       Yes         A.E41       MECHATROLINK Commu- nications Data Size Set- ting Error       The setting of the MECHATROLINK communica- doress is not correct.       Gr.2       Yes         A.E42       MECHATROLINK Straion Address Setting Error       The setting of the MECHATROLINK station address is not correct.       Gr.2       Yes         A.E50*       MECHATROLINK Syn- chronization Failed       A synchronization arise during MECHATROLINK communications.       Gr.2       Yes         A.E61       Synchronization failed       Synchronization failed       Gr.2       Yes         A.E61*       Reception Error in MECHATROLINK Syn- chronization Failed       An error occurred in the	A.d30	Position Data Overflow		Gr.1	No
A.E30Station Monitor ReceptionAn error occurred in MECHATROLINK other station monitor reception.Gr.2YesA.E31MECHATROLINK Other Station Monitor Setting ErrorAn error occurred in the MECHATROLINK other station monitor setting.Gr.2YesA.E32MECHATROLINK Other Station Monitor ErrorAn error occurred in MECHATROLINK other station monitor.Gr.2YesA.E40MECHATROLINK Transmission Cycle Setting ErrorThe setting of the MECHATROLINK communications transmission cycle is not correct.Gr.2YesA.E41MECHATROLINK Communications transmission cycle is not correct.The setting of the MECHATROLINK communications data size is not correct.Gr.2YesA.E42MECHATROLINK Station Address Setting ErrorThe setting of the MECHATROLINK station address is not correct.Gr.2YesA.E50*MECHATROLINK Syn- chronization ErrorA synchronization error occurred during MECHA- TROLINK communications.Gr.2YesA.E60*Reception Error chronization FailedA synchronization failed during MECHATROLINK communications.Gr.2YesA.E61Synchronization failedAn error occurred in the transmission cycle during MECHATROLINK communications.Gr.2YesA.E63MECHATROLINK Syn- chronization Interval ransmission CycleAn error occurred in the transmission cycle during MECHATROLINK communications.Gr.2YesA.E63MECHATROLINK Syn- chronization Interval ReceivedAn error occurred in the transmission cycle during MECHATROLINK communications.Gr.2Yes<	A.E02		TROLINK communications with the SERVO-	Gr.1	Yes
A.E31Station Monitor Setting ErrorAn error occurred in the MECHATHOLINK other station monitor setting.Gr.2YesA.E32MECHATROLINK Other Station Monitor ErrorAn error occurred in MECHATROLINK other sta- tion monitor.Gr.2YesA.E40MECHATROLINK Trans- mission Cycle Setting ErrorMECHATROLINK Communica- tions transmission cycle is not correct.Gr.2YesA.E41MECHATROLINK Communica- ting ErrorThe setting of the MECHATROLINK communica- tions data size sis not correct.Gr.2YesA.E42MECHATROLINK Station Address Setting ErrorThe setting of the MECHATROLINK station address is not correct.Gr.2YesA.E50*MECHATROLINK Syn- chronization Error in MECHATROLINK Syn- chronization FailedSynchronization failed during MECHATROLINK communications.Gr.2YesA.E60*Reception Error in MECHATROLINK Communi- nicationsCommunications error soccurred continuously during MECHATROLINK communications.Gr.2YesA.E61Error in MECHATROLINK Syn- chronization Interval Fransmission CycleAn error occurred in the transmission cycle during MECHATROLINK communications.Gr.2YesA.E63MECHATROLINK Syn- chronization Interval ReceivedAn error occurred in the transmission cycle during MECHATROLINK communica- ins.Gr.2YesA.E63MECHATROLINK Syn- chronization Frame Not ReceivedAn error occurred in the transmission cycle during MECHATROLINK communica- ins.Gr.2YesA.E63Ferdatron Module Detection FailureDetect	A.E30	Station Monitor Recep-		Gr.2	Yes
A.E32Station Monitor Errortion monitor.Gr.2YesA.E40MECHATROLINK Transmission Cycle Setting ErrorThe setting of the MECHATROLINK communications Data Size Setting ErrorThe setting of the MECHATROLINK communications Data Size Setting ErrorThe setting of the MECHATROLINK communications Data Size Setting ErrorThe setting of the MECHATROLINK communications data size is not correct.Gr.2YesA.E41MECHATROLINK Station Address Setting ErrorThe setting of the MECHATROLINK station address is not correct.Gr.2YesA.E50*MECHATROLINK Syn- chronization ErrorA synchronization error occurred during MECHA- TROLINK communications.Gr.2YesA.E51MECHATROLINK Syn- chronization FailedCommunications errors occurred continuously during MECHATROLINK communications.Gr.2YesA.E60*Reception Error in MECHATROLINK CommunicationsCommunications errors occurred continuously during MECHATROLINK communications.Gr.2YesA.E61Error in MECHATROLINK Syn- chronization Interval transmission CycleAn error occurred in the transmission cycle during MECHATROLINK communications.Gr.2YesA.E61MECHATROLINK Syn- chronization Interval transmission CycleAn error occurred in the transmission cycle during MECHATROLINK communica- tors.Gr.2YesA.E63MECHATROLINK Syn- chronization Frame Not ReceivedDetection frames were continuously not received during MECHATROLINK communica- tors.Gr.2YesA.E71Safety Option Module Detection FailureDetection of the Safety Option M	A.E31	Station Monitor Setting		Gr.2	Yes
A.E40mission Cycle Setting ErrorThe setting of the MECHATROLINK communica- tions transmission cycle is not correct.Gr.2YesA.E41MECHATROLINK Communications Data Size Set- ting ErrorThe setting of the MECHATROLINK communica- tions data size is not correct.Gr.2YesA.E42MECHATROLINK Station Address Setting ErrorThe setting of the MECHATROLINK station address is not correct.Gr.2NoA.E50*MECHATROLINK Syn- chronization ErrorA synchronization error occurred during MECHA- TROLINK communications.Gr.2YesA.E51MECHATROLINK Syn- chronization FailedSynchronization failed during MECHATROLINK communications.Gr.2YesA.E60*Reception Error in MECHATROLINK CommunicationsCommunications error occurred continuously during MECHATROLINK communications.Gr.2YesA.E61Synchronization Interval Error in MECHATROLINK Transmission CycleAn error occurred in the transmission cycle during MECHATROLINK communications.Gr.2YesA.E61MECHATROLINK Syn- chronization Frame Not ReceivedSynchronization frames were continuously not received during MECHATROLINK communica- tions.Gr.2YesA.E71Safety Option Module Detection FailureDetection of the Safety Option Module failed.Gr.1NoA.E72Feedback Option Module Detection FailureDetection of the Feedback Option Module failed.Gr.1NoA.E74Unsupported SafetyAn unsupported Safety Option Module was con-Gr.1No	A.E32			Gr.2	Yes
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A.E42Address Setting Erroraddress is not correct.Gr.2NoA.E50*MECHATROLINK Syn- chronization ErrorA synchronization error occurred during MECHA- TROLINK communications.Gr.2YesA.E51MECHATROLINK Syn- chronization FailedSynchronization failed during MECHATROLINK communications.Gr.2YesA.E60*Reception Error in MECHATROLINK Commu- nicationsCommunications errors occurred continuously during MECHATROLINK communications.Gr.2YesA.E61Synchronization Interval Error in MECHATROLINK Transmission CycleAn error occurred in the transmission cycle during MECHATROLINK communications.Gr.2YesA.E63MECHATROLINK Syn- chronization Frame Not ReceivedSynchronization frames were continuously not received during MECHATROLINK communica- tions.Gr.2YesA.E71Safety Option Module Detection FailureDetection of the Safety Option Module failed.Gr.1NoA.E72Feedback Option Module Detection FailureDetection of the Feedback Option Module failed.Gr.1No	A.E41	nications Data Size Set-		Gr.2	Yes
A.E50*chronization ErrorTRÓLINK communications.Gr.2YesA.E51MECHATROLINK Syn- chronization FailedSynchronization failed during MECHATROLINK communications.Gr.2YesA.E60*Reception Error in MECHATROLINK Commu- nicationsCommunications errors occurred continuously during MECHATROLINK communications.Gr.2YesA.E61*Synchronization Interval Error in MECHATROLINK Transmission CycleCommunications errors occurred continuously during MECHATROLINK communications.Gr.2YesA.E61MECHATROLINK Commu- nicationsAn error occurred in the transmission cycle during MECHATROLINK communications.Gr.2YesA.E63MECHATROLINK Syn- chronization Frame Not ReceivedSynchronization frames were continuously not received during MECHATROLINK communica- tions.Gr.2YesA.E71Safety Option Module Detection FailureDetection of the Safety Option Module failed.Gr.1NoA.E72Feedback Option Module Detection FailureDetection of the Feedback Option Module failed.Gr.1NoA.E74Unsupported SafetyAn unsupported Safety Option Module was con- An unsupported Safety Option Module was con-Gr.1No	A.E42			Gr.2	No
A.E51chronization Failedcommunications.Gr.2YesA.E60*Reception Error in MECHATROLINK CommunicationsCommunications errors occurred continuously during MECHATROLINK communications.Gr.2YesA.E61Synchronization Interval Error in MECHATROLINK Transmission CycleAn error occurred in the transmission cycle during MECHATROLINK communications.Gr.2YesA.E63MECHATROLINK Syn- chronization Frame Not ReceivedSynchronization frames were continuously not received during MECHATROLINK communica- tions.Gr.2YesA.E71Safety Option Module Detection FailureDetection of the Safety Option Module failed.Gr.1NoA.E72Feedback Option Module Detection FailureDetection of the Feedback Option Module failed.Gr.1NoA.E74Unsupported SafetyAn unsupported Safety Option Module was con- Option Module was con-Gr.1No	A.E50*			Gr.2	Yes
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A.E61Error in MECHATROLINK Transmission CycleAn error occurred in the transmission cycle during MECHATROLINK communications.Gr.2YesA.E63MECHATROLINK Syn- chronization Frame Not ReceivedSynchronization frames were continuously not received during MECHATROLINK communica- tions.Gr.2YesA.E71Safety Option Module Detection FailureDetection of the Safety Option Module failed.Gr.1NoA.E72Feedback Option Module Detection FailureDetection of the Feedback Option Module failed.Gr.1NoA.E74Unsupported SafetyAn unsupported Safety Option Module was con- Option Module was con-Gr.1No	A.E60*	MECHATROLINK Commu-		Gr.2	Yes
A.E63chronization Frame Not Receivedreceived during MECHATROLINK communica- tions.Gr.2YesA.E71Safety Option Module Detection FailureDetection of the Safety Option Module failed.Gr.1NoA.E72Feedback Option Module Detection FailureDetection of the Feedback Option Module failed.Gr.1NoA.E72Feedback Option FailureDetection of the Feedback Option Module failed.Gr.1NoA.E74Unsupported SafetyAn unsupported Safety Option Module was con- Option Module was con-Gr.1No	A.E61	Error in MECHATROLINK		Gr.2	Yes
A.E71       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.E72       Feedback Option Module Detection Failure       Detection of the Feedback Option Module failed.       Gr. 1       No         A.E74       Unsupported Safety       An unsupported Safety Option Module was con-       Gr. 1       No	A.E63	chronization Frame Not	received during MECHATROLINK communica-	Gr.2	Yes
A.E/2     Detection Failure     Detection of the Feedback Option Module failed.     Gr. 1     No       A E74     Unsupported Safety     An unsupported Safety Option Module was con-     Gr. 1     No	A.E71		Detection of the Safety Option Module failed.	Gr.1	No
	A.E72		Detection of the Feedback Option Module failed.	Gr.1	No
Option Module nected.	A.E74	Unsupported Safety Option Module	An unsupported Safety Option Module was connected.	Gr.1	No

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Alarm Number	Alarm Name	Alarm Meaning	Servo- motor Stop- ping Method	Alarm Reset Possi- ble?
A.E91	Torque/Force Assistance Drive Axis Alarm	An alarm occurred in the SERVOPACK for the drive axis.	Gr.2	Yes
A.E92	Torque/Force Assistance Auxiliary Axis Alarm	An alarm occurred in the SERVOPACK for an auxiliary axis.	Gr.2	Yes
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 Tim- eout	A timeout error occurred for a MECHATROLINK command.	Gr.2	Yes
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
A.F50	Servomotor Main Circuit Cable Disconnection	The Servomotor did not operate or power was not supplied to the Servomotor even though the SV_ON (Servo ON) command was input when the Servomotor was ready to receive it.	Gr.1	Yes
FL-1*				
FL-2*				
FL-3*	System Alarm	An internal program error occurred in the	_	No
FL-4*	Gystern / Marin	SERVOPACK.		NO
FL-5*				
FL-6*				
CPF00	Digital Operator Commu- nications Error 1	Communications were not possible between the Digital Operator (model: JUSP-OP05A-1-E) and	_	No
CPF01	Digital Operator Commu- nications Error 2	the SERVOPACK (e.g., a CPU error occurred).		INU

\* 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)

# 6.2.3 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 volt- age within the specified range, and initialize the parameter settings.	*1
	The power supply was shut OFF while writing parameter set- tings.	Check the timing of shutting OFF the power supply.	Initialize the parameter settings and then set the parameters again.	
A.020: Parameter	The number of times that parameters were written exceeded the limit.	Check to see if the parameters were fre- quently changed from the host controller.	The SERVOPACK may be faulty. Replace the SERVOPACK. Reconsider the method for writing the parameters.	-
Checksum Error (There is an error in the parameter data in the SERVOPACK.)	A malfunction was caused by noise from the AC power supply, ground, static elec- tricity, 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 countermea- sures against noise.	*1
	Gas, water drops, or cutting oil entered the SERVOPACK and caused failure of the internal components.	Check the installation conditions.	The SERVOPACK may be faulty. Replace the SERVOPACK.	-
	A failure occurred in the SERVOPACK.	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may have failed.	The SERVOPACK may be faulty. Replace the SERVOPACK.	-
A.021: Parameter For- mat 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 soft- ware version of the parameters specified to write.	Read the product infor- mation to see if the soft- ware versions are the same. If they are differ- ent, 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 SERVOPACK.	-
	The power supply voltage suddenly dropped.	Measure the power supply voltage.	The SERVOPACK may be faulty. Replace the SERVOPACK.	-
A.022: System Check- sum Error (There is an error in the parameter data in the SERVOPACK.)	The power supply was shut OFF while setting a utility func- tion.	Check the timing of shutting OFF the power supply.	The SERVOPACK may be faulty. Replace the SERVOPACK.	-
	A failure occurred in the SERVOPACK.	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may have failed.	The SERVOPACK may be faulty. Replace the SERVOPACK.	-

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.024: System Alarm (An internal pro- gram error occurred in the SERVOPACK.)	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	-
A.025: System Alarm (An internal pro- gram error occurred in the SERVOPACK.)	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	-
A.030: Main Circuit Detector Error	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	-
	The SERVOPACK and Servomotor capaci- ties do not match each other.	Check the combination of the SERVOPACK and Servomotor capacities.	Select a proper combina- tion of SERVOPACK and Servomotor capacities.	*1
<b>A.040:</b> Parameter Set-	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	-
ting Error (A parameter set- ting is outside of the setting	A parameter setting is outside of the setting range.	Check the setting ranges of the parame- ters that have been changed.	Set the parameters to values within the setting ranges.	-
range.)	The electronic gear ratio is outside of the setting range.	Check the electronic gear ratio. The ratio must be within the fol- lowing 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 Out- put Resolution) is out- side of the setting range or does not sat- isfy the setting condi- tions.	Check the setting of Pn212 or Pn281.	Set Pn212 or Pn281 to an appropriate value.	*1

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Alarm Number:	Possible Cause	Confirmation	Correction	Reference
Alarm Name		Committation	Conscion	TELETENCE
	The speed of program jogging went below the setting range when the electronic gear ratio (Pn20E/ Pn210) or the Servo- motor was changed.	Check to see if the detection conditions <sup>*2</sup> 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 <sup>*2</sup> are satisfied.	Increase the setting of Pn533 or Pn585.	*1
	The movement speed of advanced autotun- ing went below the setting range when the electronic gear ratio (Pn20E/ Pn210) or the Servomotor was changed.	Check to see if the detection conditions <sup>*3</sup> 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 = $n.X\square\square\square$ .	Make sure that the setting of the Fully-closed Module agrees with the setting of Pn002 = $n.X\square\square\square$ .	*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 capaci- ties do not match each other.	Confirm that the follow- ing condition is met: $1/4 \le$ (Servomotor capacity/SERVOPACK capacity) $\le 4$	Select a proper combina- tion of the SERVOPACK and Servomotor capaci- ties.	*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 SERVOPACK.	-
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 lin- ear encoder.	Write the motor parame- ter 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 specifica-tions.	Change to a correct com- bination 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-	A Rotary Servomotor was removed and a Linear Servomotor was connected.	_	Set the parameters for a Linear Servomotor and reset the motor type alarm. Then, turn the power supply to the SERVOPACK OFF and ON again.	*1
front type of motor from the previ- ously connected motor.)	A Linear Servomotor was removed and a Rotary Servomotor was connected.	_	Set the parameters for a Rotary Servomotor and reset the motor type alarm. Then, turn the power supply to the SERVOPACK OFF and ON again.	*1
A.080: Linear Encoder Pitch Setting Error	The setting of Pn282 (Linear Encoder Scale Pitch) has not been changed from the default setting.	Check the setting of Pn282.	Correct the setting of Pn282.	*1
<b>A.0b0:</b> Invalid Servo ON Command Alarm	The SV_ON (Servo ON) command was sent from the host controller after a util- ity 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
	The Main Circuit Cable is not wired correctly or there is faulty contact.	Check the wiring.	Correct the wiring.	
	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.	
A.100:	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 Servo- motor.	*1
Overcurrent Detected (An overcurrent flowed through the power tran- sistor or the heat sink overheated.)	There is a short-circuit or ground fault inside the SERVOPACK.	Check for short-circuits across the Servomotor connection terminals U, V, and W on the SERVOPACK, or between the ground and terminals U, V, or W.	The SERVOPACK may be faulty. Replace the SERVOPACK.	-
	The regenerative resistor is not wired correctly or there is faulty contact.	Check the wiring.	Correct the wiring.	*]
	The dynamic brake (DB, emergency stop executed from the SERVOPACK) was frequently activated, or a DB overload alarm occurred.	Check the power con- sumed by the DB resis- tor 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 meth- ods, or the mechanisms so that the dynamic brake does not need to be used so frequently.	-

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	The regenerative pro- cessing capacity was exceeded.	Check the regenerative load ratio in the Sig- maWin+ Motion Monitor Tab Page to see how frequently the regenera- tive resistor is being used.	Recheck the operating conditions and load.	*4
A.100: Overcurrent	The SERVOPACK regenerative resis- tance is too small.	Check the regenerative load ratio in the Sig- maWin+ Motion Monitor Tab Page to see how frequently the regenera- tive resistor is being used.	Change the regenerative resistance to a value larger than the SERVO- PACK minimum allowable resistance.	
Detected (An overcurrent flowed through the power tran- sistor or the heat	A heavy load was applied while the Ser- vomotor 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.	-
sink overheated.)	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.	-
	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:	Dessible Course	Confirmation	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.	
	There is a short-circuit or ground fault in a Main Circuit Cable.	Check for short-circuits across cable phases U, V, and W, or between the ground and cable phases U, V, and W.	The cable may be short- circuited. Replace the cable.	
	There is a short-circuit or ground fault inside the Servomotor.	Check for short-circuits across Servomotor phases U, V, and W, or between the ground and Servomotor phases U, V, or W.	The Servomotor may be faulty. Replace the Servo- motor.	*1
A.101: Motor Overcur- rent Detected (The current to the motor exceeded the allowable cur-	There is a short-circuit or ground fault inside the SERVOPACK.	Check for short-circuits across the Servomotor connection terminals U, V, and W on the SERVOPACK, or between the ground and terminals U, V, or W.	The SERVOPACK may be faulty. Replace the SERVOPACK.	
rent.)	A heavy load was applied while the Ser- vomotor 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 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.	-
	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
	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 Regener- ative 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 Regenera- tive Resistor Unit is con- nected 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.	
<b>A.300:</b> Regeneration Error	The jumper between the regenerative resis- tor terminals (B2 and B3) was removed from one of the fol- lowing SERVOPACKs: SGD7S-3R8A, -5R5A, -7R6A, -120A, -180A, -200A, or -330A.	Check to see if the jumper is connected between power supply terminals B2 and B3.	Correctly connect a jumper.	*1
	The External Regener- ative Resistor is not wired correctly, or was removed or discon- nected.	Check the wiring of the External Regenerative Resistor.	Correct the wiring of the External Regenerative Resistor.	
	A failure occurred in the SERVOPACK.	_	While the main circuit power supply is OFF, turn the control power supply to the SERVOPACK OFF and ON again. If an alarm still occurs, the SERVO- PACK may be faulty. Replace the SERVO- PACK.	-

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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 volt- age within the specified range.	_
	The external regener- ative resistance value or regenerative resis- tor capacity is too small, or there has been a continuous regeneration state.	Check the operating conditions or the capacity using the Sig- maJunmaSize+ Capac- ity Selection Software or other means.	Change the regenerative resistance value or capac- ity. Reconsider the operating conditions using the Sig- maJunmaSize+ Capacity Selection Software or other means.	*4
	There was a continu- ous regeneration state because a negative load was continu- ously applied.	Check the load applied to the Servomotor during operation.	Reconsider the system including the servo, machine, and operating conditions.	_
<b>A.320:</b> Regenerative Overload	The setting of Pn600 (Regenerative Resis- tor Capacity) is smaller than the capacity of the Exter- nal 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 Resis- tance) 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 regener- ative resistance is too high.	Check the regenerative resistance.	Change the regenerative resistance to a correct value or use an External Regenerative Resistor of an appropriate capacity.	*4
	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	_

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	The regenerative resistor was discon- nected when the SERVOPACK power supply voltage was high.	Measure the resistance of the regenerative resistor using a measur- ing instrument.	If you are using the regen- erative resistor built into the SERVOPACK, replace the SERVOPACK. If you are using an Exter- nal Regenerative Resis- tor, replace the External Regenerative Resistor.	-
4 000	DC power was sup- plied when an AC power supply input was specified in the settings.	Check the power sup- ply 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 sup- plied when a DC power supply input was specified in the settings.	Check the power sup- ply to see if it is an AC power supply.	Correct the power supply setting to match the actual power supply.	
	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 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 AC/DC power supply voltage within the specified range.	_
	The power supply is not stable or was influenced by a light- ning surge.	Measure the power supply voltage.	Improve the power sup- ply 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 SER- VOPACK.	-
A.400: Overvoltage (Detected in the	The voltage for AC power supply was too high during accelera- tion or deceleration.	Check the power sup- ply voltage and the speed and torque during operation.	Set the AC power supply voltage within the speci- fied range.	-
main circuit power supply section of the SERVOPACK.)	The external regener- ative 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 oper- ating conditions and load.	*4
	The moment of inertia ratio or mass ratio exceeded the allow- able 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 SERVO- PACK may be faulty. Replace the SERVO- PACK.	-
	The power supply voltage went below the specified range.	Measure the power supply voltage.	Set the power supply volt- age 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 (Momen- tary 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 ( $\ominus$ 1 and $\ominus$ 2) on the SERVOPACK.	-
	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	_

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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 refer- ence.	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 refer- ence input gain and adjust the servo gain. Or, reconsider the operating conditions.	_
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	-
A.511: Encoder Output	The encoder output pulse frequency exceeded the limit.	Check the encoder out- put 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 out- put 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 oper- ation.	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 appro- priate value.	*1
	The vibration detec- tion level (Pn312 or Pn384) is not suitable.	Check that the vibra- tion 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 cus- tom tuning or Easy FFT.	Check the waveform of the motor speed.	Check the operating pro- cedure 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 max- imum motor speed.	*1

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	The wiring is not cor- rect or there is a faulty contact 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 (Lin- ear Encoder Scale Pitch).	Check the setting of Pn282.	Correct the setting of Pn282.	*1
	There is an error in the setting of $Pn080 =$ n. $\Box\BoxX\Box$ (Motor Phase Sequence Selection).	Check the setting of Pn080 = $n.\Box\Box X\Box$ .	Set Pn080 = n.□□X□ to an appropriate value.	*1
	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	_
	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 consump- tion by the dynamic brake was detected.)	When the Servomo- tor was stopped with the dynamic brake, the rotational or linear kinetic energy exceeded the capac- ity of the dynamic brake resistor.	Check the power con- sumed by the DB resis- tor to see how frequently the DB is being used.	<ul> <li>Reconsider the following:</li> <li>Reduce the Servomotor command speed.</li> <li>Decrease the moment of inertia ratio or mass ratio.</li> <li>Reduce the frequency of stopping with the dynamic brake.</li> </ul>	-
	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	-
A.740: Inrush Current Limiting Resistor Overload (The main circuit power supply was frequently turned ON and OFF.)	The allowable fre- quency of the inrush current limiting resis- tor was exceeded when the main circuit power supply was turned ON and OFF.	-	Reduce the frequency of turning the main circuit power supply ON and OFF.	-
	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	-

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	The surrounding tem- perature is too high.	Check the surrounding temperature using a thermostat. Or, check the operating status with the SERVOPACK installation environment monitor.	Decrease the surround- ing temperature by improving the SERVO- PACK installation condi- tions.	*1
	An overload alarm was reset by turning OFF the power sup- ply too many times.	Check the alarm display to see if there is an overload alarm.	Change the method for resetting the alarm.	-
A.7A1: Internal Tempera- ture Error 1 (Control Board Temperature Error)	There was an exces- sive load or operation was performed that exceeded the regen- erative processing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenera- tive load ratio to check the regenerative pro- cessing capacity.	Reconsider the load and operating conditions.	_
	The SERVOPACK installation orientation is not correct or there is insufficient space around the SERVO- PACK.	Check the SERVOPACK installation conditions.	Install the SERVOPACK according to specifica- tions.	*1
	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	-
	The surrounding tem- perature is too high.	Check the surrounding temperature using a thermostat. Or, check the operating status with the SERVOPACK installation environment monitor.	Decrease the surround- ing temperature by improving the SERVO- PACK installation condi- tions.	*1
4.740	An overload alarm was reset by turning OFF the power sup- ply 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 Tempera- ture Error 2 (Power Board Temperature Error)	There was an exces- sive load or operation was performed that exceeded the regen- erative processing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenera- tive load ratio to check the regenerative pro- cessing capacity.	Reconsider the load and operating conditions.	_
	The SERVOPACK installation orientation is not correct or there is insufficient space around the SERVO- PACK.	Check the SERVOPACK installation conditions.	Install the SERVOPACK according to specifica- tions.	*1
	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	_
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 SERVOPACK.	-

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.7Ab: SERVOPACK Built-in Fan Stopped	The fan inside the SERVOPACK stopped.	Check for foreign matter inside the SERVOPACK.	Remove foreign matter from the SERVOPACK. If 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.	
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 con- nection 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 mea- sures to supply power to the encoder, and set up the encoder.	
	A failure occurred in the absolute encoder.	_	If the alarm still occurs after setting up the encoder again, replace the Servomotor.	-
	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	-
A.820: Encoder Check- sum Alarm (Detected at the encoder.)	A failure occurred in the encoder.	_	<ul> <li>When Using an Absolute Encoder</li> <li>Set up the encoder again.</li> <li>If the alarm still occurs, the Servomotor may be faulty. Replace the Servomotor.</li> <li>When Using a Singleturn Absolute Encoder or Incremental Encoder</li> <li>The Servomotor may be faulty. Replace the Servomotor.</li> <li>The linear encoder may be faulty. Replace the linear encoder.</li> </ul>	*1
	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	-
A.830: Encoder Battery	The battery connec- tion is faulty or a bat- tery is not connected.	Check the battery con- nection.	Correct the battery con- nection.	*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.	*]
	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	-

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	The encoder malfunc- tioned.	_	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 appro- priate 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 malfunc- tioned due to noise.	_	Correct the wiring around the encoder by separating the Encoder Cable from the Servomotor Main Cir- cuit Cable or by ground- ing 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 sen- sor.	-
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 <sup>-1</sup> 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 <sup>-1</sup> , and turn ON the control power supply.	-
	Linear Servomotor: The Servomotor exceeded the speci- fied 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. Continued o	-

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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 surround- ing 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 speci- fied range.	*]
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 tem- perature around the Servomotor is too high.	Measure the surround- ing temperature around the Servomotor.	Reduce the surrounding air temperature of the Servomotor to 40°C or less.	-
	The motor load is greater than the rated load.	Check the load with the accumulated load ratio on the Motion Monitor Tab Page on the Sig-maWin+.	Operate the Servo Drive so that the motor load remains within the speci- fied range.	*1
A.861: Motor Over- heated	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. Continued o	

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Alarm Number:	Possible Cause	Confirmation	Correction	Reference
Alarm Name		Committation		nelelelice
	The surrounding tem- perature is too high.	Check the surrounding temperature using a thermostat.	Lower the surrounding temperature by improving the installation conditions of the Linear Servomotor or the machine.	-
	The overheat protec- tion input signal line is disconnected or short-circuited.	Check the input voltage with the overheat pro- tection input information on the Motion Monitor Tab Page on the Sig- maWin+.	Repair the line for the overheat protection input signal.	-
A.862:	An overload alarm was reset by turning OFF the power sup- ply 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 per- formed 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 detec- tion 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.	-
<b>A.8A0:</b> External Encoder Error	Setting the origin of the absolute linear encoder failed because the motor moved.	Before you set the ori- gin, 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 Con- verter Unit.	-
A.8A2: External Incre- mental Encoder Sensor Error	A failure occurred in the external encoder.	_	Replace the external encoder.	_
A.8A3: External Abso- lute Encoder Position Error	A failure occurred in the external absolute encoder.	-	The external absolute encoder may be faulty. Refer to the encoder manufacturer's instruc- tion manual for correc- tions.	-

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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 maxi- mum speed.	-
A.8A6: External Encoder Overheated	An overheating error was detected in the external encoder.	-	Replace the external encoder.	-
A.b33: Current Detec- tion 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 sec- tion.	-	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 sec- tion due to noise.	-	<ul> <li>Implement the following countermeasures against noise.</li> <li>Check the MECHA-TROLINK Communications Cable and FG wiring.</li> <li>Attach a ferrite core to the MECHATROLINK Communications Cable.</li> </ul>	-
	There is a fault in the SERVOPACK MECHATROLINK communications sec- tion.	-	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.	-
<b>A.bF7:</b> 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.	-
<b>A.bF8:</b> 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. $\Box$ $\Box$ $\Box$ (Motor Phase Sequence Selection).	Check the setting of Pn080 = $n.\Box\BoxX\Box$ .	Set Pn080 = $n.\Box\Box X\Box$ to an appropriate value.	*1
Servomotor Out of Control (Detected when the servo is turned ON.)	A failure occurred in the encoder.	-	If the motor wiring is cor- rect and an alarm still occurs after turning the power supply OFF and ON again, 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.	- n next page.

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	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.	-
<b>A.C20:</b> Phase Detection Error	The count-up direc- tion of the linear encoder does not match the forward direction of the Mov- ing Coil in the motor.	Check the setting of Pn080 = n. $\Box$ X (Motor Phase Sequence Selection). Check the installation orientation for the linear encoder and Moving Coil.	Change the setting of Pn080 = n. Correctly reinstall the lin- ear 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:	The polarity sensor is protruding from the Magnetic Way of the motor.	Check the polarity sen- sor.	Correctly reinstall the Moving Coil or Magnetic Way of the motor.	-
Polarity Sensor Error	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 sen- sor.	-
A.C22: Phase Informa- tion Disagree- ment	The SERVOPACK phase information is different from the lin- ear encoder phase information.	-	Perform polarity detec- tion.	*1

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.C50: Polarity Detec- tion Failure	The parameter set- tings are not correct.	Check the linear encoder specifications and feedback signal status.	The settings of Pn282 (Linear Encoder Scale Pitch) and Pn080 = $n.\Box X \Box$ (Motor Phase Sequence Selection) may not match the installa- tion. 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 pro- cessed 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.	_
	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. Imple- ment 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 rec- ommend 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 sig- nals. Execute polarity detection at a position where an overtravel sig- nal would not be detected.	*1
A.C52: Polarity Detec- tion Not Com- pleted	The servo was turned ON when using an absolute linear encoder, Pn587 was set to n. DD (Do not detect polarity), and the polarity had not been detected.	_	When using an absolute linear encoder, set Pn587 to n.	-
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 detec- tion.	_	Increase the setting of Pn48E (Polarity Detection Range). Or, increase the setting of Pn481 (Polarity Detection Speed Loop Gain).	-
A.C54: Polarity Detec- tion Failure 2	An external force was applied to the Servo- motor.	_	Increase the setting of Pn495 (Polarity Detection Confirmation Force Refer- ence). Increase the setting of Pn498 (Polarity Detec- tion Allowable Error Range). Increasing the allowable error will also increase the motor tem- perature.	-
A.C80: Encoder Clear	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.	-
Error or Multiturn 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.	-

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	There is a faulty con- tact 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 dis- connection or short- circuit in the encoder. Or, the cable imped- ance is outside the specified values.	Check the condition of the Encoder Cable.	Use the Encoder Cable within the specified specifications.	-
A.C90: Encoder Commu- nications Error	One of the following has occurred: corro- sion caused by improper tempera- ture, humidity, or gas, a short-circuit caused by entry of water drops or cutting oil, or faulty contact in con- nector caused by vibration.	Check the operating environment.	Improve the operating environmental, and replace the cable. If the alarm still occurs, replace the SERVOPACK.	*1
	A malfunction was caused by noise.	_	Correct the wiring around the encoder by separating the Encoder Cable from the Servomotor Main Cir- cuit Cable or by ground- ing 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 Commu- nications Posi- tion Data Acceleration Rate Error	Noise entered on the signal lines because the Encoder Cable is bent or the sheath is damaged.	Check the condition of the Encoder Cable and connectors.	Check the Encoder Cable to see if it is installed correctly.	*1
	The Encoder Cable is bundled with a high- current line or installed near a high- current line.	Check the installation condition of the Encoder Cable.	Confirm that there is no surge voltage on the Encoder Cable.	-
	There is variation in the FG potential because of the 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 countermea- sures against noise for the encoder wiring.	*1
	Excessive vibration or shock was applied to the encoder.	Check the operating conditions.	Reduce machine vibra- tion. Correctly install the Ser- vomotor or linear encoder.	-
A.C92: Encoder Commu- nications 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.	*]
	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 <sup>2</sup> .	-
	The Encoder Cable is too long and noise entered on it.	-	<ul> <li>Rotary Servomotors: The Encoder Cable wir- ing distance must be 50 m max.</li> <li>Linear Servomotors: The Encoder Cable wir- ing distance must be 20 m max.</li> </ul>	-
A.Cb0: Encoder Echo- back 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 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 vibra- tion. Correctly install the Ser- vomotor 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.	-
<b>A.CC0:</b> Multiturn Limit Disagreement	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
	The multiturn limit of the encoder is differ- ent 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.	-

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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 Con- verter 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 speci- fications of the external encoder.	Use a specified cable.	-
Module Commu- nications	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 Con- verter Unit and SERVO- PACK must be 20 m or less.	-
	The sheath on cable between the Serial Converter Unit and SERVOPACK is bro- ken.	Check the cable that connects the Serial Converter Unit.	Replace the cable between the Serial Con- verter 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 Con- verter 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 Cir- cuit Cables.	Make sure that there are no faulty contacts in the wiring for the Servomotor and encoder.	-
	The position com- mand speed is too fast.	Reduce the position command speed and try operating the SERVOPACK.	Reduce the position refer- ence speed or the refer- ence acceleration rate, or reconsider the electronic gear ratio.	*1
A.d00: Position Devia- tion Overflow (The setting of Pn520 (Position Deviation Over- flow Alarm Level) was exceeded by the position devi- ation 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 accel- eration by selecting the position reference filter (ACCFIL) using a MECHA- TROLINK 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: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.d01: Position Devia- tion 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).	
A.d02: Position Devia- tion Overflow Alarm for Speed Limit at Servo ON	If position deviation remains in the devia- tion counter, the set- ting 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 set- ting of Pn520 (Posi- tion 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 Posi- tion Deviation	The motor direction and external encoder installation orientation are backward.	Check the motor direc- tion and the external encoder installation ori- entation.	Install the external encoder in the opposite direction, or change the setting of Pn002 = n.XDDD (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 refer- ence pulse counter.	Reconsider the operating specifications.	-
A.E02:	The MECHATROLINK transmission cycle fluctuated.	_	Remove the cause of transmission cycle fluctu- ation at the host control- ler.	-
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.	-

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
	The MECHATROLINK Communications Cable is not wired correctly.	Check the wiring condi- tions.	Correct the MECHA- TROLINK Communica- tions Cable wiring.	-
A.E30: MECHATROLINK Other Station Monitor Recep- tion Error	A MECHATROLINK data reception error occurred due to noise.	Check the installation conditions.	<ul> <li>Implement the following countermeasures against noise.</li> <li>Check the MECHA-TROLINK Communications Cable and FG wiring and implement countermeasures to prevent noise from entering.</li> <li>Attach a ferrite core to the MECHATROLINK Communications Cable.</li> </ul>	_
	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SER- VOPACK.	-
A.E31: MECHATROLINK Other Station Monitor Setting Error	There is a mistake in the settings for other station monitoring.	Check the parameters related to other station monitoring.	Correct the settings of Pn9B1 to Pn9C0.	-
A.E32: MECHATROLINK Other Station Monitor Error	An error occurred in a monitored station.	Check the status of the monitored station.	Eliminate the cause of the error at the monitored station.	-
A.E40: MECHATROLINK Transmission Cycle Setting Error	The setting of MECHATROLINK transmission cycle is outside of the speci- fied range.	Check the setting of the MECHATROLINK trans- mission cycle.	Set the MECHATROLINK transmission cycle to an appropriate value.	_
A.E41: MECHATROLINK Communications Data Size Setting Error	The number of trans- mission 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
<b>A.E42:</b> 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 communica- tions network have the same address.	Check to see if two or more stations on the communications net- work 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.	
*5	The WDT data in the host controller was not updated normally.	Check to see if the WDT data is being updated at the host controller.	Correctly update the WDT data at the host controller.	_
A.E50 <sup>*5</sup> : 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.	-

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.E51: MECHATROLINK Synchronization	The WDT data at the host controller was not updated correctly at the start of syn- chronous communi- cations, so synchronous commu- nications 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.	_
Failed	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 wir- ing is not correct.	Check the MECHA- TROLINK wiring.	Correct the MECHA- TROLINK Communica- tions Cable wiring. Correctly connect the ter- minator.	-
A.E60 <sup>*5</sup> : Reception Error in MECHATROLINK Communications	A MECHATROLINK data reception error occurred due to noise.	_	Implement countermea- sures against noise. (Check the MECHA- TROLINK Communica- tions Cable and FG wiring, and implement measures such as attach- ing a ferrite core to the MECHATROLINK Com- munications 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.	-
A.E61: Synchronization Interval Error in MECHATROLINK Transmission Cycle	The MECHATROLINK transmission cycle fluctuated.	Check the setting of the MECHATROLINK trans- mission cycle.	Remove the cause of transmission cycle fluctu- ation at the host control- ler.	-
	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.E63: MECHATROLINK Synchronization Frame Not Received	MECHATROLINK wir- ing is not correct.	Check the Servomotor wiring.	Correct the MECHA- TROLINK Communica- tions Cable wiring.	-
	A MECHATROLINK data reception error occurred due to noise.	_	Implement countermea- sures against noise. (Check the MECHA- TROLINK Communica- tions Cable and FG wiring, and implement measures such as attach- ing a ferrite core to the MECHATROLINK Com- munications 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 con- nection 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 Configura- tion 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.	-
	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.	_
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.E91: Torque/Force Assistance Drive Axis Alarm	An alarm occurred in the SERVOPACK for the drive axis.	Check the alarm status in the SERVOPACK for the drive axis.	Eliminate the cause of the alarm in the SERVOPACK for the drive axis.	_

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
A.E92: Torque/Force Assistance Auxil- iary Axis Alarm	An alarm occurred in the SERVOPACK for an auxiliary axis.	Check the alarm status in the SERVOPACK for the auxiliary axis.	Eliminate the cause of the alarm in the SERVOPACK for the auxiliary axis.	-
A.Eb1: Safety Function Signal Input Tim- ing Error	The delay between activation of the /HWBB1 and /HWBB2 input sig- nals 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 cir- cuits may be faulty. Alternatively, the input sig- nal cables may be discon- nected. Check to see if any of these items are faulty or have been dis- connected.	_
	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.	<ul> <li>For fully-closed loop control, check the status of the external encoder when the command is exe- cuted.</li> <li>For other types of control, check the status of the linear encoder when the command is exe- cuted.</li> </ul>	Execute the SENS_ON command only when an external encoder (e.g., a linear encoder) is con- nected.	_

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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 sup- ply wiring.	Make sure that the power supply is correctly wired.	*1
<b>A.F10:</b> Power Supply Line Open Phase	The three-phase power supply is unbalanced.	Measure the voltage for each phase of the three-phase power sup- ply.	Balance the power sup- ply by changing phases.	-
(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 with- out specifying a sig- nal-phase AC power supply input (Pn00B = $n.\Box 1\Box \Box$ ).	Check the power sup- ply and the parameter setting.	Match the parameter set- ting 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.	-
A.F50: Servomotor Main Circuit Cable Dis-	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	-
connection (The Servomotor did not operate or power was not supplied to the Servomotor even though the SV_ON (Servo ON) command was input when the Servomotor was ready to receive it.)	The wiring is not cor- rect or there is a faulty contact in the motor wiring.	Check the wiring.	Make sure that the Servo- motor is correctly wired.	*1
FL-1 <sup>*5</sup> : System Alarm FL-2 <sup>*5</sup> : System Alarm FL-3 <sup>*5</sup> : System Alarm FL-4 <sup>*5</sup> : System Alarm FL-5 <sup>*5</sup> : System Alarm FL-6 <sup>*5</sup> : 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.	_
<b>CPF00:</b> Digital Operator Communications	There is a faulty con- tact between the Digi- tal Operator and the SERVOPACK.	Check the connector contact.	Disconnect the connec- tor and insert it again. Or, replace the cable.	-
Error 1	A malfunction was caused by noise.	_	Keep the Digital Operator or the cable away from sources of noise.	-

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# 6.2.4 Warning Displays

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference
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.	_
$\sum \Sigma$ -7 Series $\Sigma$ -	ring manual for details. -7S SERVOPACK with ME( SIEP S800001 28)	CHATROLINK-III Communio	cations References Product Mar	nual
	otor ollowing conditions is detect Encoder resolution <			
<ul> <li>Maximum motor s</li> <li>Linear Servomot</li> </ul>	Approx. 3.66 ×			
	blowing conditions is detect	ted, an alarm will occur.		
	$\frac{5 \text{ [mm/s]}}{\text{der pitch [}\mu\text{m]}} \times \frac{\text{Resoluti}}{100000000000000000000000000000000000$	< _	Pn20E Pn210	
Pn385 [ Linear enco	$\frac{100 \text{ mm/s}]}{\text{der pitch } [\mu m]} \times \frac{\text{Resolut}}{100 \text{ mm/s}}$	$\frac{\text{ion of Serial Converter Unit}}{\text{Approx. 6.10} \times 10^5} \ge \frac{1}{10000000000000000000000000000000000$	Pn20E Pn210	
<ul> <li>*3. Detection Condition</li> <li>• Rotary Servomon</li> <li>If either of the formation</li> </ul>		ied, an alarm will occur.		
<ul> <li>Rated motor spe</li> </ul>	eed [min <sup>-1</sup> ] $\times$ 1/3 $\times$ $\frac{\text{Encoder resonance}}{6 \times 10^5}$	$\frac{\text{Pn20E}}{\text{Pn210}} \leq \frac{\text{Pn20E}}{\text{Pn210}}$		
Maximum motor	r speed [min <sup>-1</sup> ] $\times \frac{\text{Encoder resolu}}{\text{Approx. 3.66} \times}$	>		
Linear Servomot If either of the for	tor Iowing conditions is detect	ted, an alarm will occur.		
Rated motor (	speed [mm/s] × 1/3 Resolut	tion of Serial Converter Unit	Pn20E Pn210	
	oder pitch [µm] ×	10 =	11/210	

\*4. Refer to the following manual for details.

Ω Σ-7-Series Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

\*5. These alarms are not stored in the alarm history. They are only displayed on the panel display.

#### Warning Displays 6.2.4

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.

This section provides a list of warnings and the causes of and corrections for warnings.

#### 6.2.5 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: $(Pn520 \times Pn51E/100)$	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: $(Pn526 \times Pn528/100)$	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 opera- tion. The detection level is the same as A.520. Set whether to output an alarm or a warning by setting Pn310 (Vibration Detection Selection).	Required.
A.912	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 (Regenera- tive 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 protec- tion 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 com- pensation 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 on next page.

Maintenance

#### 6.2.5 List of Warnings

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 Interfer- ence)	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 (Undervolt- age) 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.

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\* 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: 1. A warning code is not output unless you set Pn001 to n.1 (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 = $n.\Box\Box\BoxX$ (Vibration Detection Selection)
A.923	− (Not affected by the setting of Pn008 = $n.\Box X\Box\Box$ .)
A.930	Pn008 = n.
A.942	Pn423 = n. DDXD (Speed Ripple Compensation Information Dis- agreement Warning Detection Selection)
A.94A to A.960 and A.97A to A.97b	Pn800=n.□□X□ (Warning Check Masks)
A.971	Pn008 = $n.\Box \Box X \Box$ (Function Selection for Undervoltage) (Not affected by the setting of Pn008 = $n.\Box X \Box \Box$ .)
A.9A0	$Pn00D = n.X \square \square \square$ (Overtravel Warning Detection Selection) (Not affected by the setting of $Pn008 = n.\square X \square \square$ .)
A.9b0	Pn00F = n.

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 Cir- cuit 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 ref- erence 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 condi- tions.	Check excessive posi- tion 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 devi- ation 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).	-

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Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Reference
	The wiring is not correct or there is a faulty contact 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 protec- tion characteris- tics.	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 Ser- vomotor was not driven because of mechanical prob- lems.	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.	-
	Abnormal vibra- tion was detected during motor operation.	Check for abnormal motor noise, and check the speed and torque waveforms during oper- ation.	Reduce the motor speed. Or, reduce the servo gain with custom tuning.	*
A.911: Vibration	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 Iner- tia Ratio) to an appropriate value.	*
	The vibration detection level (Pn312 or Pn384) is not suitable.	Check that the vibration detection level (Pn312 or Pn384) is suitable.	Set a suitable vibration detection level (Pn312 or Pn384).	*

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Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Reference
	The surrounding temperature is too high.	Check the surrounding temperature using a thermostat. Or, check the operating status with the SERVOPACK installation environ- ment monitor.	Decrease the surrounding temperature by improving the SERVOPACK installa- tion conditions.	*
	An overload alarm was reset by turn- ing 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 pro- cessing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenera- tive load ratio to check the regenerative pro- cessing capacity.	Reconsider the load and operating conditions.	-
	The SERVOPACK installation orien- tation is not cor- rect or there is insufficient space around the SER- VOPACK.	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 thermostat. Or, check the operating status with the SERVOPACK installation environ- ment monitor.	Decrease the surrounding temperature by improving the SERVOPACK installa- tion conditions.	*
	An overload alarm was reset by turn- ing 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 pro- cessing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenera- tive load ratio to check the regenerative pro- cessing capacity.	Reconsider the load and operating conditions.	-
	The SERVOPACK installation orien- tation is not cor- rect 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 volt- age within the specified range.	-
A.920: Regenerative Over- load (warning before an A.320 alarm occurs)	There is insuffi- cient external regenerative resis- tance, regenera- tive resistor capacity, or SERVOPACK capacity, or there has been a con- tinuous regenera- tion state.	Check the operating conditions or the capacity using the Sig- maJunmaSize+ Capac- ity Selection Software or another means.	Change the regenerative resistance value, regenera- tive resistance capacity, or SERVOPACK capacity. Reconsider the operating conditions using the Sigma- JunmaSize+ Capacity Selection Software or other means.	-
	There was a con- tinuous regenera- tion 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 exter- nal 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 con- sumed by the DB resis- tor to see how frequently the DB is being used.	<ul> <li>Reconsider the following:</li> <li>Reduce the Servomotor command speed.</li> <li>Decrease the moment of inertia or mass.</li> <li>Reduce the frequency of stopping with the dynamic brake.</li> </ul>	_
	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 SERVOPACK 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	The battery con- nection is faulty or a battery is not connected.	Check the battery con- nection.	Correct the battery connec- tion.	*
	The battery volt- age is lower than the specified value (2.7 V).	Measure the battery voltage.	Replace the battery.	*
only when an abso- lute encoder is con- nected.)	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 surrounding temperature is too high.	Check the surrounding temperature using a thermostat.	Lower the surrounding tem- perature 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 Servo- motor is faulty or the sensor attached to the machine is faulty.	_	The temperature detection circuit in the Linear Servo- motor may be faulty or the sensor attached to the machine may be faulty. Replace the Linear Servo- motor or repair the sensor attached to the machine.	-
	The speed ripple	_	Reset the speed ripple compensation value on the SigmaWin+.	*
A.942: Speed Ripple Com- pensation Informa- tion Disagreement	compensation information stored in the encoder does not agree with the speed ripple compensa- tion information stored in the SERVOPACK.	_	Set Pn423 to n. DD D (Do not detect A.942 alarms). However, changing the set- ting may increase the speed ripple.	*
		_	Set Pn423 to n. DDD (Disable speed ripple com- pensation). However, changing the setting may increase the speed ripple.	*
A.94A: Data Setting Warn- ing 1 (Parameter Number Error)	An invalid param- eter number was used.	Check the command that caused the warn-ing.	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 warn-ing.	Set the parameter within the setting range.	*
A.94C: Data Setting Warn- ing 3 (Calculation Error)	The calculation result of the set- ting is not correct.	Check the command that caused the warn-ing.	Set the parameter within the setting range.	*
A.94d: Data Setting Warn- ing 4 (Parameter Size)	The parameter size set in the command is not correct.	Check the command that caused the warn-ing.	Set the correct parameter size.	*
<b>A.94E:</b> Data Setting Warn- ing 5 (Latch Mode Error)	A latch mode error was detected.	Check the command that caused the warn-ing.	Change the setting of Pn850 or the LT_MOD data for the LTMOD_ON com- mand sent by the host con- troller to an appropriate value. (The applies when using the MECHATROLINK-II-com- patible profile.)	*

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Warning Number: Warning Name	Possible Cause	Confirmation	Continued from pre	Reference
A.95A: Command Warning 1 (Unsatisfied Com- mand Conditions)	The command conditions are not satisfied.	Check the command that caused the warn-ing.	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 warn-ing.	Do not send unsupported commands.	*
A.95d: Command Warning 4 (Command Inter- ference)	The command sending condi- tions for latch- related com- mands was not satisfied.	Check the command that caused the warn-ing.	Send the command after the command conditions are satisfied.	*
A.95E: Command Warning 5 (Subcommand Not Possible)	The command sending condi- tions for subcom- mands was not satisfied.	Check the command that caused the warn- ing.	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 warn-ing.	Do not send undefined commands.	*
	The MECHA- TROLINK Com- munications Cable is not wired cor- rectly.	Check the wiring condi- tions.	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.	<ul> <li>Implement the following countermeasures against noise.</li> <li>Check the MECHA-TROLINK Communications Cable and FG wiring and implement countermeasures to prevent noise from entering.</li> <li>Attach a ferrite core to the MECHATROLINK Communications Cable.</li> </ul>	-
	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
	For a 200-V SERVOPACK, the AC power supply voltage dropped below 140 V.	Measure the power supply voltage.	Set the power supply volt- age 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 volt- age 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 interrup- tion occurred.	Measure the power supply voltage.	If you have changed the setting of Pn509 (Momen- tary 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.	-
<b>A.97A:</b> Command Warning 7 (Phase Error)	A command that cannot be exe- cuted in the cur- rent phase was sent.	_	Send the command after the command conditions are satisfied.	-
<b>A.97b:</b> Data Clamp Out of Range	The set com- mand data was clamped to the minimum or maxi- mum 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.	<ul> <li>Even if an overtravel signal is not shown by the input signal monitor, momentary overtravel may have been detected. Take the following precautions.</li> <li>Do not specify move- ments that would cause overtravel from the host controller.</li> <li>Check the wiring of the overtravel signals.</li> <li>Implement countermea- sures against noise.</li> </ul>	*
A.9b0: Preventative Mainte- nance Warning	One of the con- sumable parts has reached the end of its service life.	-	Replace the part. Contact your Yaskawa representa- tive for replacement.	*

\* 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)

# 6.2.7 Troubleshooting Based on the Operation and Conditions of the Servomotor

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

Turn OFF the Servo System before troubleshooting the items shown in bold lines in the table.

Problem	Possible Cause	Confirmation	Correction	Reference
	The control power supply is not turned ON.	Measure the voltage between control power supply terminals.	Correct the wiring so that the control power supply is turned ON.	-
	The main circuit power sup- ply is not turned ON.	Measure the voltage across the main circuit power input terminals.	Correct the wiring so that the main circuit power supply is turned ON.	-
	The I/O signal connector (CN1) pins are not wired cor- rectly or are disconnected.	Check the wiring condi- tion of the I/O signal con- nector (CN1) pins.	Correct the wiring of the I/O signal connector (CN1) pins.	*
	The wiring for the Servomo- tor Main Circuit Cables or Encoder Cable is discon- nected.	Check the wiring condi- tions.	Wire the cable cor- rectly.	-
	There is an overload on the Servomotor.	Operate the Servomotor with no load and check the load status.	Reduce the load or replace the Servomo- tor with a Servomotor with a larger capacity.	-
	The type of encoder that is being used does not agree with the setting of $Pn002 = n.\Box X \Box \Box$ (Encoder Usage).	Check the type of the encoder that is being used and the setting of $Pn002 = n.\Box X \Box \Box$ .	Set Pn002 = $n.\Box X \Box \Box$ according to the type of the encoder that is being used.	*
Servomotor	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).	*
Does Not Start	The SV_ON command was not sent.	Check the commands sent from the host con- troller.	Send the SV_ON com- mand from the host controller.	-
	The SENS_ON (Turn ON Sensor) command was not sent.	Check the commands sent from the host con- troller.	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 sig- nals. If you are not using the safety func- tion, connect the Safety Jumper Connector (provided as an acces- sory) to CN8.	*
	The FSTP (Forced Stop Input) signal is still OFF.	Check the FSTP signal.	<ul> <li>Turn ON the FSTP signal.</li> <li>If you will not use the function to force the motor to stop, set Pn516 = n.□□□X (FSTP (Forced Stop Input) Signal Alloca- tion) to disable the signal.</li> </ul>	*

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Problem	Possible Cause	Confirmation	Correction	Reference
	A failure occurred in the SERVOPACK.	-	Replace the SERVO- PACK.	-
		Check the setting of Pn080 =n.□□□X (Polar- ity Sensor Selection).	Correct the parameter setting.	*
Servomotor Does Not Start	The polarity detection was not executed.	Check the inputs to the SV_ON (Servo ON) com- mand.	<ul> <li>If you are using an incremental linear encoder, send the SV_ON command from the host controller.</li> <li>If you are using an absolute linear encoder, execute polarity detection.</li> </ul>	*
	There is a mistake in the Servomotor wiring.	Check the wiring.	Wire the Servomotor correctly.	-
	There is a mistake in the wir- ing of the encoder or Serial Converter Unit.	Check the wiring.	Wire the Serial Con- verter Unit correctly.	-
	There is a mistake in the lin- ear encoder wiring.	Check the wiring.	Wire the cable cor- rectly.	-
Servomotor Moves Instanta-	The setting of Pn282 (Linear Encoder Scale Pitch) is not correct.	Check the setting of Pn282.	Correct the setting of Pn282.	*
neously, 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 = $n.\Box\Box X\Box$ (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 connec- tions for the power line (U, V, and W phases) and the encoder or Serial Converter Unit may be unstable. Check the wir- ing.	Tighten any loose ter- minals or connectors and correct the wiring.	-
	A failure occurred in the SERVOPACK.	_	Replace the SERVO- PACK.	-
Servomotor Moves with- out a Refer- ence Input	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. $\Box$ 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.	-

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Problem	Possible Cause	Confirmation	Continued from pre	
Problem		Confirmation	Correction	Reference
	The setting of Pn001 = $n.\Box\Box\BoxX$ (Motor Stopping Method for Servo OFF and Group 1 Alarms) is not suitable.	Check the setting of Pn001 = $n.\Box\Box\BoxX$ .	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 resis- tance may be discon- nected.	Replace the SERVO- PACK. To prevent dis- connection, reduce the load.	-
	There was a failure in the dynamic brake drive circuit.	-	There is a defective component in the dynamic brake circuit. Replace the SERVO- PACK.	-
	The Servomotor vibrated considerably while perform- ing 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 allow- able value, or increase the load level or reduce the rigidity level in the tuning-less level set- tings.	*
	The machine mounting is not secure.	Check to see if there are any loose mounting screws.	Tighten the mounting screws.	_
	The machine mounting is not secure.	Check to see if there is misalignment in the coupling.	Align the coupling.	-
		Check to see if the cou- pling is balanced.	Balance the coupling.	-
	The bearings are defective.	Check for noise and vibration around the bear- ings.	Replace the Servomo- tor.	-
Abnormal Noise from Servomotor	There is a vibration source at the driven machine.	Check for any foreign matter, damage, or defor- mation in the machine's moving parts.	Consult with the machine manufacturer.	-
	Noise interference occurred because of incorrect I/O signal cable specifications.	Check the I/O signal cables to see if they sat- isfy specifications. Use shielded twisted-pair cables or screened twisted-pair cables with conductors of at least 0.12 mm <sup>2</sup> (stranded wire).	Use cables that satisfy the specifications.	-
	Noise interference occurred because an I/O signal cable is too long.	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.	Check the Encoder Cable to see if it satisfies speci- fications. Use shielded twisted-pair cables or screened twisted-pair cables with conductors of at least 0.12 mm <sup>2</sup> (stranded wire).	Use cables that satisfy the specifications.	-

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Problem	Possible Cause	Confirmation	Correction	Reference
	Noise interference occurred because the Encoder Cable is too long.	Check the length of the Encoder Cable.	<ul> <li>Rotary Servomotors: The Encoder Cable length must be 50 m max.</li> <li>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.</li> </ul>	-
	Noise interference occurred because the Encoder Cable is damaged.	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 sub- jected to excessive noise interference.	Check to see if the Encoder Cable is bundled with a high-current line or installed near a high-cur- rent line.	Correct the cable lay- out so that no surge is applied by high-current lines.	-
Abnormal Noise from Servomotor	There is variation in the FG potential because of the influence of machines on the Servomotor side, such as a welder.	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.	Implement counter- measures against noise for the encoder wiring.	-
	The encoder was subjected to excessive vibration or shock.	Check to see if vibration from the machine occurred. Check the Ser- vomotor installation (mounting surface preci- sion, securing state, and alignment). Check the linear encoder installation (mounting sur- face precision and secur- ing method).	Reduce machine vibra- tion. Improve the mounting state of the Servomotor or linear encoder.	-
	A failure occurred in the encoder.	-	Replace the Servomo- tor.	-
	A failure occurred in the Serial Converter Unit.	-	Replace the Serial Con- verter Unit.	-
	A failure occurred in the linear encoder.	-	Replace the linear encoder.	-

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Droblem	Dessible Cause	Confirmation	Continued from pre	
Problem	Possible Cause			Reference
	The servo gains are not bal- anced.	Check to see if the servo gains have been cor- rectly tuned.	Perform autotuning without a host refer- ence.	*
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 appro- priate value.	-
Vibrates at Frequency of Approx. 200 to 400	The setting of Pn102 (Posi- tion Loop Gain) is too high.	Check the setting of Pn102. The default setting is Kp = 40.0/s.	Set Pn102 to an appro- priate value.	-
Hz.	The setting of Pn101 (Speed Loop Integral Time Con- stant) is not appropriate.	Check the setting of Pn101. The default setting is Ti = 20.0 ms.	Set Pn101 to an appro- priate 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 appro- priate value.	-
	The servo gains are not bal- anced.	Check to see if the servo gains have been cor- rectly tuned.	Perform autotuning without a host refer- ence.	*
	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 appro- priate value.	-
Large Motor Speed	The setting of Pn102 (Posi- tion Loop Gain) is too high.	Check the setting of Pn102. The default setting is Kp = 40.0/s.	Set Pn102 to an appro- priate value.	-
Overshoot on Starting and Stop- ping	The setting of Pn101 (Speed Loop Integral Time Con- stant) is not appropriate.	Check the setting of Pn101. The default setting is Ti = 20.0 ms.	Set Pn101 to an appro- priate 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 appro- priate value.	-
	The torque reference is saturated.	Check the waveform of the torque reference.	Use the mode switch.	-
	The force limits (Pn483 and Pn484) are set to the default values.	The default values of the force limits are $Pn483 = 30\%$ and $Pn484 = 30\%$ .	Set Pn483 and Pn484 to appropriate values.	*

6.2.7	Troubleshooting	Based on the	Operation a	and Conditions	of the Servomotor
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Duektowe	Descible Original	Configuration	Continued from pre	
Problem	Possible Cause	Confirmation	Correction	Reference
	Noise interference occurred because of incorrect Encoder Cable specifications.	Check the Encoder Cable to see if it satisfies speci- fications. Use shielded twisted-pair cables or screened twisted-pair cables with conductors of at least 0.12 mm <sup>2</sup> (stranded wire).	Use cables that satisfy the specifications.	-
Absolute Encoder Position	Noise interference occurred because the Encoder Cable is too long.	Check the length of the Encoder Cable.	<ul> <li>Rotary Servomotors: The Encoder Cable length must be 50 m max.</li> <li>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.</li> </ul>	-
Deviation Error (The position that was	Noise interference occurred because the Encoder Cable is damaged.	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.	-
saved in the host con- troller when the power was turned	The Encoder Cable was sub- ject to excessive noise inter- ference.	Check to see if the Encoder Cable is bundled with a high-current line or installed near a high-cur- rent line.	Correct the cable lay- out so that no surge is applied by high-current lines.	-
OFF is dif- ferent from the posi- tion when the power	There is variation in the FG potential because of the influence of machines on the Servomotor side, such as a welder.	Check to see if the machines are correctly grounded.	Properly ground the machines to separate them from the FG of the encoder.	-
was next turned ON.)	There is a SERVOPACK pulse counting error due to noise.	Check to see if there is noise interference on the I/O signal line from the encoder or Serial Con- verter Unit.	Implement counter- measures against noise for the encoder or Serial Converter Unit wiring.	-
	The encoder was subjected to excessive vibration or shock.	Check to see if vibration from the machine occurred. Check the Servomotor installation (mounting sur- face precision, securing state, and alignment). Check the linear encoder installation (mounting sur- face precision and secur- ing method).	Reduce machine vibra- tion. Improve the mounting state of the Servomotor or linear encoder.	-
	A failure occurred in the encoder.	-	Replace the Servomo- tor or linear encoder.	-
	A failure occurred in the SERVOPACK.	_	Replace the SERVO- PACK.	-

Continued on next page.

			Continued from pre	vious page.	
Problem	Possible Cause	Confirmation	Correction	Reference	
Absolute Encoder Position		Check the error detec- tion section of the host controller.	Correct the error detec- tion section of the host controller.	-	
Deviation Error (The position that was		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.	-	
saved in the host con- troller when the power was turned OFF is dif- ferent from the posi- tion when the power was next turned ON.)	Host Controller Multiturn Data or Absolute Encoder Position Data Reading Error	Check for noise interfer- ence in the cable between the SERVO- PACK and the host con- troller.	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			Make sure that the overtravel limit switches operate correctly.	-
	Drive Prohibit) signal was input.	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.	*	
		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.	-	
Overtravel	The P-OT/N-OT (Forward Drive Prohibit or Reverse Drive Prohibit) signal mal-	Check to see if the opera- tion of the overtravel limit switches is unstable.	Stabilize the operating condition of the over- travel limit switches.	-	
Occurred	functioned.	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 allo- cation of the P-OT or N-OT (Forward Drive Prohibit or	Check to see if the P-OT signal is allocated in Pn50A = $n.X\square\square\square$ .	If another signal is allo- cated in Pn50A =n.X□□□, allocate the P-OT signal instead.	*	
	Reverse Drive Prohibit) sig- nal in Pn50A = n.XDDD or Pn50B = n.DDDX.	Check to see if the N-OT signal is allocated in Pn50B = $n.\Box\Box\BoxX$ .	If another signal is allo- cated in Pn50B =n.□□□X, allocate the N-OT signal instead.		
	The selection of the Servo- motor stopping method is	Check the servo OFF stopping method set in $Pn001 = n.\Box\BoxX$ or $Pn001 = n.\Box\BoxX\Box$ .	Select a Servomotor stopping method other than coasting to a stop.	*	
	not correct.	Check the torque control stopping method set in Pn001 = $n.\Box\BoxX$ or Pn001 = $n.\Box\BoxX\Box$ .	Select a Servomotor stopping method other than coasting to a stop.		

Continued from previous page.

Droblem	Describle Course	Confirmation	Continued from pre	
Problem	Possible Cause	Confirmation	Correction Install the limit switch at	Reference
Improper Stop Posi- tion for	The limit switch position and dog length are not appropriate.	-	the appropriate posi- tion.	-
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.	Check the Encoder Cable to see if it satisfies speci- fications. Use shielded twisted-pair cables or screened twisted-pair cables with conductors of at least 0.12 mm <sup>2</sup> (stranded wire).	Use cables that satisfy the specifications.	-
	Noise interference occurred because the Encoder Cable is too long.	Check the length of the Encoder Cable.	<ul> <li>Rotary Servomotors: The Encoder Cable length must be 50 m max.</li> <li>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.</li> </ul>	_
	Noise interference occurred because the Encoder Cable is damaged.	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 Deviation (without Alarm)	The Encoder Cable was sub- jected to excessive noise interference.	Check to see if the Encoder Cable is bundled with a high-current line or installed near a high-cur- rent 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.	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 I/O signal line from the encoder or Serial Con- verter Unit.	Implement counter- measures against noise for the encoder wiring or Serial Converter Unit wiring.	-
	The encoder was subjected to excessive vibration or shock.	Check to see if vibration from the machine occurred. Check the Servomotor installation (mounting sur- face precision, securing state, and alignment). Check the linear encoder installation (mounting sur- face precision and secur- ing method).	Reduce machine vibra- tion. Improve the mounting state of the Servomotor or linear encoder.	-
	The coupling between the machine and Servomotor is not suitable.	Check to see if position offset occurs at the cou- pling between machine and Servomotor.	Correctly secure the coupling between the machine and Servomotor.	-

Continued on next page.

			Continued from pre	vious page.
Problem	Possible Cause	Confirmation	Correction	Reference
Position Deviation			Use cables that satisfy the specifications.	-
(without Alarm)	Noise interference occurred because an I/O signal cable is too long.	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.)	-	Replace the Servomo- tor or linear encoder.	-
	A failure occurred in the SERVOPACK.	-	Replace the SERVO- PACK.	_
	The surrounding air tempera- ture is too high.	Measure the surrounding air temperature around the Servomotor.	Reduce the surround- ing air temperature to 40°C or less.	-
	The surface of the Servomo- tor is dirty.	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 Ser- vomotor 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 MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)

# **Parameter Lists**

This chapter provides information on the parameters.

7.1	Analog Vo	oltage/Pulse Train Reference SERVOPACK with FT77 Specification7-2
	7.1.1 7.1.2	Parameter Lists7-2Parameter Recording Table7-37
7.2	MECHATR	OLINK-III Communications Reference SERVOPACK with FT77 Specification 7-45
	7.2.1 7.2.2	List of Servo Parameters
	7.2.3	Parameters

# .1 Analog Voltage/Pulse Train Reference SERVOPACK with FT77 Specification

Indicates when a change to the

7,

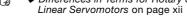
parameter will be effective.

# 7.1.1 Parameter Lists

# 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.



		-					1/				
Parameter No.	Size		Name		Setting Range	Setting Unit	Default Setting	Àpplicable Motors	When Enabled	Classifi- cation	Refer- ence
	2	Basic Fund	ction Select	ions 0	0000 hex to 10B1 hex	-	0000 hex	All	After restart	Setup	-
	If there are differences in the parameters for Rotary Servomotor and Linear Servomotor, information is provided for both.       • Tuning Refer to the following manual for detail         • Top row: For Rotary Servomotors       • Setup         • Bottom row: For Linear Servomotors       • References Product Manual (Manual No									g Voltage/Puls	se Train 11 26)
			Rotation I	Direction	Selection	1/				Deference	
			Movemen	t Directio	on Selection	V				Referenc	9
	n.□□□X			Use CCW as the forward direction.							
				Use the directio	e direction in wh n.	ich the linea	ar encoder co	ounts up as the	e forward	_	
				Use CV	V as the forward	direction. (	Reverse Rota	ation Mode)			
			1		e direction in wh n. (Reverse Mov			unts down as	the forward		
				lethod S	election					Referenc	е
			0	Speed	control with ana	alog referenc	ces				
			1	Position	n control with pu						
			2	Torque	control with and	alog referen	ces				
Pn000			3	Internal	set speed cont	rol with con	tact commar	nds			
			4		ng between inte control with ana			ith contact ref	erences and		
			5		ng between inte n control with pu			ith contact ref	erences and		
	n.		6		ng between inte control with ana			ith contact ref	erences and	_	
			7		ng between pos with analog refe		I with pulse t	rain references	and speed		
			8		ng between pos with analog refe		I with pulse t	rain references	and torque		
			9	Switchi with an	Switching between torque control with analog references and speed control with analog references						
			A		ng between spe ro clamping	ed control v	with analog re	ferences and	speed control		
			В		ng between pos with reference p			rain references	and position		
	n.		Reserved	paramet	ter (Do not char	nge.)					
			Rotary/Lin	ear Serve	omotor Startup S	Selection Wł	nen Encoder I	s Not Connect	ed	Referenc	e
	n.:	xooo	0	When an encoder is not connected, start as SERVOPACK for Rotary Servinotor.							
			1	When a motor.	an encoder is no	ot connected	d, start as SE	RVOPACK for	Linear Servo-	_	
								-	-		-

# List of Parameters

The following table lists the parameters.

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

Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
	2	Basic Fund tions 0	tion Selec-	ec- 0000 hex to - 0000 A				After restart	Setup	*1
Pn000		n.□□□X	Movement         I           0         I           1         I           0         S           1         I           0         S           1         I           0         S           1         I           0         S           1         I           0         S           1         I           2         T           3         I           4         S           5         F           6         t           7         S           8         S           9         S           A         S           A         S	irection Selection Direction Selection Jse CCW as the for Jse CCW as the for Jse CW as the for Jse CW as the for Jse the direction lirection. (Reverse ethod Selection Selection control with Position control with Thernal set speed Switching betwee pred control with Switching betwee control with analo Switching betwee control with analog refere Switching betwee control with refere	tion forward dire in which the rward dire- in which the e Moveme h analog re h analog re n internal sin h analog re n internal sin h analog re n internal sin h analog re n internal sin h analog re n position g reference n position g reference n torque conces n speed co g n position	tion. (Rev ne linear er nt Mode) eferences rain referer eferences ith contact set speed eferences control wite es control with control with	erse Rotation acoder counts acces commands control with c control with c control with c control with c ch pulse train a th pulse train a analog refere analog refere	Mode) down as the down as the ontact references a references a ences and sp nces and sp	e forward ences and ences and ences and nd speed nd torque peed contr	
		n.¤X¤¤		parameter (Do no		,				
				ear Servomotor	•					
		n.XDDD	r v	Vhen an encoder notor. Vhen an encoder					,	
				notor.						

Continued on next page.

							COI	tinued from	i previou	s page.	
Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence	
	2	Application Selections	n Function 1	0000 hex to 1142 hex	-	0000 hex	All	After restart	Setup	*1	
			Motor Stopp	oing Method for	r Servo Ol	FF and Gro	oup 1 Alarms				
			0 Sto	op the motor by	applying	the dynam	ic brake.				
		n.000X		op the motor by ake.	the apply	ing dynam	ic brake and t	then release	the dynan	nic	
			2 Cc	east the motor to	o a stop w	ithout the	dynamic brak	e.			
			Overtravel S	topping Metho	d						
				Apply the dynamic brake or coast the motor to a stop (use the stopping method set in Pn001 = $n.\Box\Box\BoxX$ ).							
				Decelerate the motor to a stop using the torque set in Pn406 as the maximum torque and then servo-lock the motor. Decelerate the motor to a stop using the torque set in Pn406 as the maximum							
		n.□□X□	2 De tor	celerate the mo que and then le	tor to a st t the moto	op using th or coast.	ne torque set i	n Pn406 as i	the maxim	um	
Pn001				Decelerate the motor to a stop using the deceleration time set in Pn30A and then servo-lock the motor.						nd	
				celerate the mo		op using t	he deceleratio	on time set ir	ı Pn30A aı	nd	
			Main Circuit Power Supply AC/DC Input Selection								
		n.OXOO		out AC power as nals (do not use			wer supply us	ing the L1, L	2, and L3	ter-	
		1.0.00	1 ter	out DC power as minals or the B ared converter).	1 and $\ominus$ 2			0		2	
			Warning Co	de Output Sele	ction						
			0 OL	itput only alarm	codes on	the ALO1	ALO2, and A	LO3 termina	als.		
		n.X000	1 ter	Output both warning codes and alarm codes on the ALO1, ALO2, and AL terminals. However, while an warning code is being output, the ALM (Serv Alarm) output signal will remain ON (normal state).						O3 0	

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Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer ence		
	2	Application Selections	n Function 2	0000 hex to 4213 hex	-	0000 hex	_	After restart	Setup	*1		
			Speed/Po	sition Control Op	tion (T-RE	F Input Al	location)		Applicat Motors			
			0	Do not use T-REF.						•		
		n.🗆🗆 🗆 X	1 1	Jse T-REF as an e								
				Jse T-REF as a to		All						
	_			Jse T-REF as an e 'P-CL or /N-CL is		rque limit i	nput when					
			Torque Co	ntrol Option (V-R		Applicable Motors						
		n.🗆🗆 X 🗆	0	Do not use V-REF					All			
	_		1 l	Jse V-REF as an	external sp	peed limit i	nput.					
Pn002			Encoder Usage						Applicat Motors			
		n.¤X¤¤	0 1	Use the encoder according to encoder specifications.								
			1 (	Use the encoder as an incremental encoder.						All		
			2 1	Jse the encoder a	Rotary	, 						
			External E	ncoder Usage					Applicat Motors			
			0	Do not use an ext	ernal enco	der.						
		n.X000		The external enco motor rotation.	der moves	s in the for	ward directior	n for CCW				
			2 1	Reserved setting (	Do not us	e.)			Rotary	,		
				The external enco motor rotation.	der moves	s in the rev	erse direction	for CCW				
			4 I	Reserved setting (	Do not us	e.)			-			

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Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer ence
	2	Application Selections		0000 hex to 105F hex	_	0002 hex	All	Immedi- ately	Setup	*1
n.□□XX	Selections	6	105F hex nitor 1 Signal Se Motor speed (1 Motor speed (1 Speed reference Speed reference Force reference Position deviatio Position amplifie Position reference Position reference	Position reference speed (1 V/1,000 min <sup>-1</sup> ) Position reference speed (1 V/1,000 mm/s) Reserved setting (Do not use.)						
Pn006		n.⊔⊔XX	07 08	Load-motor pos Positioning com pleted: 0 V)		`		,	g not com	-
			09	Speed feedforw Speed feedforw						
			0A	Torque feedforw Force feedforwa			. /			
			0B	Active gain (1st	gain: 1 V,	2nd gain: 2	2 V)			
			0C	Completion of p pleted: 0 V)	osition ref	erence dis	tribution (com	pleted: 5 V,	not com-	
			0D	External encode	r speed (1	V/1,000 r	nin <sup>-1</sup> : value at	the motor s	shaft)	
			0E	Reserved setting	g (Do not i	use.)				
			OF	Reserved setting	g (Do not i	use.)				
			10	Main circuit DC	voltage					
			11 to 5F	Reserved setting	gs (Do not	use.)				
		n.🗆X🗆 🗆	Reserved p	parameter (Do no	ot change	.)				
		n.X000	Reserved p	parameter (Do no	ot change	.)				

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Parameter No.	Size	Name		Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refe enco	
	2	Application Function Selections 7		0000 hex to 105F hex	-	0000 hex	All	Immedi- ately	Setup	*1	
		n.□□XX	Analog Monitor 2 Signal Selection								
			00	Motor speed (1 V/1,000 min <sup>-1</sup> )							
				Motor speed (1 V/1,000 mm/s)							
			01	Speed reference (1 V/1,000 min <sup>-1</sup> )							
				Speed reference (1 V/1,000 mm/s)							
			02	Torque reference (1 V/100% rated torque)							
				Force reference (1 V/100% rated force)							
			03	Position deviation (0.05 V/reference unit)							
				Position amplifier deviation (after electronic gear) (0.05 V/encoder pulse unit)							
Pn007			04	Position amplifier deviation (after electronic gear) (0.05 V/linear encode pulse unit)							
			05	Position reference speed (1 V/1,000 min <sup>-1</sup> )							
			00	Position reference speed (1 V/1,000 mm/s)							
			06	Reserved setting (Do not use.)							
			07	Load-motor position deviation (0.01 V/reference unit)							
			08	Positioning completion (positioning completed: 5 V, positioning not com- pleted: 0 V)							
			09	Speed feedforward (1 V/1,000 min <sup>-1</sup> )							
				Speed feedforward (1 V/1,000 mm/s)							
			0A	Torque feedforward (1 V/100% rated torque)							
				Force feedforward (1 V/100% rated force)							
			0B	Active gain (1st gain: 1 V, 2nd gain: 2 V)							
			OC	Completion of position reference distribution (completed: 5 V, not completed: 0 V)							
			0D	External encoder speed (1 V/1,000 min <sup>-1</sup> : value at the motor shaft)							
			0E	Reserved setting (Do not use.)							
			0F	Reserved setting (Do not use.)							
			10	Main circuit DC voltage							
			11 to 5F	Reserved setting	gs (Do not	use.)					
		n.□X□□ Reserved parameter (Do not change.)									
		n.XDDD Reserved parameter (Do not change.)									

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Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence	
Pn008	2	Application Selections	n Function 8	0000 hex to 7121 hex	_	0000 hex	Rotary	After restart	Setup	*1	
										_	
		n.DDDX	Low Battery Voltage Alarm/Warning Selection								
			0         Output alarm (A.830) for low battery voltage.           1         Output warning (A.930) for low battery voltage.								
			1 01	itput warning (A	(.930) for I	ow battery	voltage.				
		n.OOXO	Function Selection for Undervoltage								
			0 Do	not detect und	lervoltage.						
			1 Detect undervoltage warning and limit torque at host controller.								
				etect undervolta SERVOPACK).	ge warning	g and limit	torque with Pr	1424 and Pn	425 (i.e., o	nly	
		n.¤X¤¤	Warning De	ection Selection	on						
			0 Detect warnings.								
			1 Do	not detect war	nings exc	ept for A.9	71.				
		n.XDDD	Reserved pa	arameter (Do no	ot change	)					
					or onlange						
		Application	n Function	0000 hex to		0010	1	After			
	2	Selections		0121 hex	-	hex	All	restart	Tuning	*1	
			-								
		n.🗆 🗆 🛛 X	Reserved parameter (Do not change.)								
Pn009		n.00X0	Current Control Mode Selection								
			0 Us	e current contro	ol mode 1.						
			• SERVOPACK Models SGD7S-R70A, -R90A, -1R6A, -2R8A, -3R8A, -5R5A,								
			<ul> <li>and -7R6A: Use current control mode 1.</li> <li>SERVOPACK Models SGD7S-120A, -180A, -200A, -330A, -470A, -550A, - 590A, and -780A: Use current control mode 2.</li> </ul>								
		n.¤X¤¤	Speed Detection Method Selection								
				e speed detecti							
			1 Us	e speed detecti	on 2.						
	n.XDDD Reserved parameter (Do not change.)										

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								tinued fron					
Parameter No.	Size	Na	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence			
	2	Application Selections	Function A	0000 hex to 0044 hex	-	0001 hex	All	After restart	Setup	*1			
			Motor Sto	pping Method fo	r Group 2	Alarms							
				Apply the dynamic method set in Pn			motor to a st	op (use the	stopping				
			1	Decelerate the mo torque. Use the se	otor to a st etting of P	op using t n001 = n. <b>l</b>	he torque set ⊐□□X for the	in Pn406 as e status afte	the maxin r stopping	num			
		n.000X		Decelerate the mo torque and then le			he torque set	in Pn406 as	the maxin	num			
			3	Decelerate the mo the setting of Pn0	otor to a s 01 = n. <b>□I</b>	top using t ⊐□X for th	he decelerations the deceleration the deceleration the status after	on time set i stopping.	n Pn30A.	Use			
				Decelerate the motor then let the motor		top using t	he deceleration	on time set i	n Pn30A a	and			
Pn00A			Stopping	Method for Force	d Stops								
				Apply the dynamic		coast the	motor to a st	op (use the	stopping				
			0	Decelerate the mo	001 = n. <b>□</b>	□□X).				num			
		n.DDXD		torque. Use the se	etting of P	n001 = n. <b>l</b>	⊐□□X for the	e status afte	r stopping				
				<ul> <li>2 Decelerate the motor to a stop using the torque set in Pn406 as the maximum torque and then let the motor coast.</li> <li>Decelerate the motor to a stop using the deceleration time set in Pn30A. Use</li> </ul>									
				Decelerate the mo the setting of Pn0					n Pn30A.	Use			
				4 Decelerate the motor to a stop using the deceleration time set in Pn30A and then let the motor coast.									
		n.🗆X🗆	Reserved	parameter (Do no	ot change	.)							
		n.XDDD	Reserved	parameter (Do no	ot change	.)							
	2	Application Selections		0000 hex to 1121 hex	_	0000 hex	All	After restart	Setup	*1			
			Operator P	arameter Display	Selection	1							
		n.000X		isplay only setup									
			-	Display all paramet									
			Motor Stop	ping Method for	Group 2 A	Alarms							
D 000		-	0 5	Stop the motor by	setting th	e speed re	ference to 0.						
Pn00B	1	n.□□X□		Apply the dynamic nethod set in Pn0			notor to a sto	p (use the s	topping				
		-	2 5	Set the stopping m	nethod wit	h Pn00A =	: n.□□□X.						
			Power Inpu	ut Selection for Th	nree-phas	e SERVOF	PACK						
		n.¤X¤¤		lse a three-phase	•								
				lse a three-phase			as a single-ph	ase power	supply inp	ut.			
	I -			. (5									
		n.XDDD	Reserved p	parameter (Do not	t change.)								

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	_						Con	tinued fron	n previou:	s page.		
Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
	2	Application Selections	r Function C	0000 hex to 0131 hex	-	0000 hex	-	After restart	Setup	*1		
							<u> </u>					
			Function Sel	ection for Test	without a	Motor			Applical Motor			
		n.□□□X		able tests with					All			
				able tests witho	out a moto	ſ.						
			Encoder Res	olution for Tes	ts without	a Motor			Applical Motor			
Pn00C		n.□□X□		e 13 bits. e 20 bits.								
				e 22 bits.					Rotary	/		
			3 Us	e 24 bits.								
			Encoder Typ	e Selection for	Tests wit	nout a Mo	tor		Applical Motor	ble		
		n.¤X¤¤	0 Us	e an incrementa	al encoder				All	5		
			1 Use an absolute encoder.									
		n.XOOO	.XDDD Reserved parameter (Do not change.)									
	2	Application Selections	n Function D	0000 hex to 1001 hex	-	0000 hex	All	After restart	Setup	*1		
D 00D		n.DDXD	Reserved pa	rameter (Do no	ot change	)						
Pn00D		n.🗆X🗆 🗆	Reserved pa	rameter (Do no	ot change	)						
			Overtravel W	travel Warning Detection Selection								
		n.XDDD		not detect ove		rnings.						
			1 De	tect overtravel	warnings.							
	2	Application Selections	Function	0000 hex to 2011 hex	-	0000 hex	All	After restart	Setup	*1		
			Preventative	Maintenance	Warning S	election						
		n.🗆🗆 🛛 X		ot detect preve			0					
Pn00F			1	ct preventative			igs.					
		n.□□X□		rameter (Do no	-							
		n.¤X¤¤		rameter (Do no		•						
		n.XDDD	Reserved pa	rameter (Do no	ot change	)						
Pn010	2		ss Selection JSB Commu-	0000 hex to 007F hex	_	0001 hex	All	After restart	Setup	_		
Pn021	2	Reserved p	arameter (Do	_	_	0000	All	_	_	_		
	-	not change	,			hex	/ \ll					
D=000	~	neserveu L	barameter (Do			0000	A !!					
Pn022	2	not change	•	-	-	0000 hex 0000	All	-	-	-		

Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence			
	2	Application Selections	n Function 80	0000 hex to 1111 hex	-	0000 hex	Linear	After restart	Setup	*1			
		n.□□□X		nsor Selection Jse polarity sense	or.								
	_		1 [	o not use polarit	y sensor.								
Pn080				or Phase Sequence Selection									
P11060		n.DDXD		Set a phase-A lea									
			1 8	Set a phase-B lea	d as a pha	se sequen	ce of U, V, an	d W.					
	ļ	n.¤X¤¤	Reserved	served parameter (Do not change.)									
			Calculation Method for Maximum Speed or Encoder Output Pulses           0         Calculate the encoder output pulse setting for a fixed maximum speed.										
	n.XDDD		0     Calculate the encoder output pulse setting for a fixed maximum speed.       1     Calculate the maximum speed for a fixed encoder output pulse setting.										
									otting.				
	2	Application Selections	n Function 81	0000 hex to 1111 hex	-	0000 hex	All	After restart	Setup	*1			
			Phase-C.	Pulse Output Sel	ection								
		n.🗆🗆 🗆 X		Output phase-C		in the for	ward direction						
Pn081				Output phase-C	-				ıs.				
		n.🗆🗆 X 🗆	Reserved	parameter (Do n	ot change	.)							
		n.¤X¤¤	Reserved	parameter (Do n	ot change	.)							
		n.XDDD	Reserved parameter (Do not 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	Torque/For tance Sele			0000 hex to 3155 hex	_	1050 hex	All	After restart	Setup	page 4-3			
			Torque/Fo	orce	Assistance Mo	de Selecti	on							
			0		able torque/for									
			1		e the SERVOPA			e axis.						
		n.000X	2	low • /S • S	e the SERVOPA ring input signa S-ON (Servo Of EN (Absolute D ALM-RST (Alarr	ls with the N) signal lata Reque	SERVOPA	xiliary axis. Do ACK for the d	o not synchr rive axis.	onize the f	ol-			
			3	Use the SERVOPACK to control an auxiliary axis. Synchronize the following input signals with the SERVOPACK for the drive axis. <ul> <li>/S-ON (Servo ON) signal</li> <li>SEN (Absolute Data Request) signal</li> <li>/ALM-RST (Alarm Reset) signal</li> </ul>										
Pn0D4			4	Res	served setting (	Do not us	e.)							
THODA			5	Res	served setting (	Do not us	e.)							
	1		Torque/Fo	orce	Assistance Tra	nsmission	Speed Se	lection						
			0 Transmission Speed 1 (reference communications cycle: 12,000 μs or less)											
			1	Tra	nsmission Spe	ed 2 (refer	ence comi	munications c	ycle: 6,000 j	us or less)				
		n.🗆🗆 X 🗆	2	Tra	nsmission Spee	ed 3 (refer	ence comi	nunications c	ycle: 5,000 j	us or less)				
			3	Tra	Transmission Speed 4 (reference communications cycle: 3,000 $\mu$ s or less)									
			4	Tra	Transmission Speed 5 (reference communications cycle: 1,000 $\mu$ s or les									
			5	5 Transmission Speed 6 (reference communications cycle: 500 μs or less)										
			Torque/Fo	orce	Assistance Out	tput Polari	ty Selectio	n						
		n.¤X¤¤	0	0 Do not reverse the polarity.										
			1	1 Reverse the polarity.										
		n.XDDD	XDDD Reserved setting (Do not change.)											
Pn0D5	2	Reserved s not use.)	setting (Do		_	-	0000 hex	All	_	-	_			
Pn100	2	Speed Loc	op Gain		10 to 20,000	0.1 Hz	400	All	Immedi- ately	Tuning	*1			
Pn101	2	Speed Loc Time Cons	op Integral stant		15 to 51,200	0.01 ms	2000	All	Immedi- ately	Tuning	*1			
Pn102	2	Position Lo	oop Gain		10 to 20,000	0.1/s	400	All	Immedi- ately	Tuning	*1			
Pn103	2	Moment of		tio	0 to 20,000	1%	100	All	Immedi- ately	Tuning	*1			
Pn104	2	Second Sp Gain	beed Loop		10 to 20,000	0.1 Hz	400	All	Immedi- ately	Tuning	*1			
Pn105	2	Second Sp Integral Tir	ne Constar		15 to 51,200	0.01 ms	2000	All	Immedi- ately	Tuning	*1			
Pn106	2	Second Po Gain	osition Loop	С	10 to 20,000	0.1/s	400	All	Immedi- ately	Tuning	*1			
Pn109	2	Feedforwa			0 to 100	1%	0	All	Immedi- ately	Tuning	*1			
Pn10A	2	Feedforwa Constant	rd Filter Tir	ne	0 to 6,400	0.01 ms	0	All	Immedi- ately	Tuning	*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	Gain Applic tions	cation Selec-	0000 hex to 5334 hex	-	0000 hex	All	-	Setup	*1	
			Mode Switch	ing Selection					Whe Enabl		
				e the internal to 10C).	orque refer	ence as th	e condition (le	evel setting:			
			1	e the speed ref e the speed ref				<b>o</b> ,			
		n.🗆🗆 🗆 X	Use	e the accelerati 10E).				•	Imme atel		
			2 Use	e the accelerati 182).	on referen	ce as the	condition (leve	el setting:		y	
Pn10B			3 Use	e the position c	leviation a	s the conc	lition (level set	tting: Pn10F)			
			4 Do	not use mode	switching.						
		n.□□X□ 0 PI control Method								en led	
		1 I-P control								er	
				served settings	(Do not u	se.)			resta	art	
		n.¤X¤¤	Reserved pa	rameter (Do no	ot change.	.)					
		n.X000	Becorved pa	rameter (Do no	at change	<u> </u>					
	-		neserved pa		or change.	)					
Pn10C	2	Mode Swit for Torque	ching Level Reference	0 to 800	1%	200	All	Immedi- ately	Tuning	*1	
Pn10D	2		ching Level	0 to 10,000	1 min <sup>-1</sup>	0	Rotary	Immedi- ately	Tuning	*1	
Pn10E	2	Mode Swit for Acceler	ching Level ation	0 to 30,000	1 min <sup>-1</sup> /s	0	Rotary	Immedi- ately	Tuning	*1	
Pn10F	2	Mode Swit for Positior	ching Level Deviation	0 to 10,000	1 refer- ence unit	0	All	Immedi- ately	Tuning	*1	
Pn11F	2	Position Int Constant	tegral Time	0 to 50,000	0.1 ms	0	All	Immedi- ately	Tuning	*1	
Pn121	2	Friction Co Gain	mpensation	10 to 1,000	1%	100	All	Immedi- ately	Tuning	*1	
Pn122	2	Second Fri	ction Com- Gain	10 to 1,000	1%	100	All	Immedi- ately	Tuning	*1	
Pn123	2	Friction Co Coefficient	mpensation	0 to 100	1%	0	All	Immedi- ately	Tuning	*1	
Pn124	2		mpensation Correction	-10,000 to 10,000	0.1 Hz	0	All	Immedi- ately	Tuning	*1	
Pn125	2	Friction Co Gain Corre	mpensation ection	1 to 1,000	1%	100	All	Immedi- ately	Tuning	*1	
Pn131	2	Gain Switc	hing Time 1	0 to 65,535	1 ms	0	All	Immedi- ately	Tuning	*1	
Pn132	2	Gain Switc	hing Time 2	0 to 65,535	1 ms	0	All	Immedi- ately	Tuning	*1	
Pn135	2	Gain Switc Time 1	hing Waiting	0 to 65,535	1 ms	0	All	Immedi- ately	Tuning	*1	
Pn136	2	Gain Switc Time 2	hing Waiting	0 to 65,535	1 ms	0	All	Immedi- ately	Tuning	*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	Automatic ing Selection	Gain Switcl ons 1	n- 0000 hex to 0052 hex	-	0000 hex	All	Immedi- ately	Tuning	*1				
	Ī		Gain Swite	ching Selection										
			0	Use manual gain s The gain is switch		lly with the		Solaction	pignal					
		n.000X		Reserved setting (		,	/G-SEL (Gall	I Selection)	signai.					
				Use automatic gai		,	1.							
	_		2	The gain is switch switching conditio second gain to the	ed automa n A is sati	atically fron sfied. The	n the first gair gain is switch	ed automati	cally from					
Pn139			Gain Swite	ching Condition A	۱									
			0,	/COIN (Positioning	oning Completion Output) signal turns ON. oning Completion Output) signal turns OFF.									
					, ,		) signal turns	OFF.						
		n.🗆 🗆 X 🗆		NEAR (Near Outp	, 0									
			-	<ul> <li>3 /NEAR (Near Output) signal turns OFF.</li> <li>4 Position reference filter output is 0 and reference pulse input is OFF.</li> </ul>										
				Position reference			relefence pu	ise iriput is (	JII.					
					· ·									
		n.¤X¤¤	Reserved	parameter (Do no	ot change.	.)								
		n.XDDD	Reserved	parameter (Do no	ot change.	.)								
					1.07			Immedi-						
Pn13D	2	Current Ga	ain Level	100 to 2,000	1%	2000	All	ately	Tuning	*1				
	2	Model Folle	owing Con- d Selections	0000 hex to 1121 hex	-	0100 hex	All	Immedi- ately	Tuning	*1				
					ļ	ПОХ		atory						
	_													
				lowing Control Se										
		n.🗆 🗆 🛛 X		o not use model fo		ontrol.								
	_		1 U	se model following	g control.									
			Vibration	Suppression Sele	ction									
		n.DDXD		•										
			1 Perform vibration suppression for a specific frequency.											
Dm140			-											
Pn140			-	erform vibration su erform vibration su										
	Ī		2 Po	erform vibration su Suppression Adju	uppressior stment Se	n for two sp election	pecific freque	ncies.						
			2 Point 2 Poin	erform vibration su Suppression Adju Do not adjust vibra tuning without a h	stment Se ation supp	n for two sp election	becific frequer	ncies. uring executi	on of auto	- om				
		n.0X00	2   Performance     Vibration   9     0   1	erform vibration su Suppression Adju Do not adjust vibra tuning without a ha tuning.	stment Se ation supp ost referer	election pression au	tomatically du	uring executi	, and cust	 om				
		n.0X00	2   Privation     Vibration   1	erform vibration su Suppression Adju Do not adjust vibra tuning without a ho tuning. Adjust vibration su without a host refe	stment Se ation supp ost referer	election pression au nce, autotu	tomatically during example	uring execution of a	, and cust	m				
		n.0X00	2   Pi     Vibration \$     0     1	erform vibration su Suppression Adju Do not adjust vibra tuning without a ho tuning. Adjust vibration su without a host refer ing.	stment Se ation supp ost referen uppression erence, au	a for two sp election pression au ince, autotu a automatic totuning w	tomatically during with a host reference	uring executionst reference	, and cust	m				
			2     Pi       Vibration \$       0       1       Speed Fer	erform vibration su Suppression Adju Do not adjust vibra tuning without a ho tuning. Adjust vibration su without a host refe ing. edforward (VFF)/1	stment Se ation supp ost referer uppression erence, au	a for two sp election pression au oression autoru a automatic totuning w edforward	tomatically during with a host reference (TFF) Selection	uring executionst reference eccution of a prence, and o on	, and cust utotuning custom tur	om ו				
		n.0X00	2     Pi       Vibration \$       0       1       Speed Fee       0	erform vibration su Suppression Adju Do not adjust vibration tuning without a ho tuning. Adjust vibration su without a host refer ing. edforward (VFF)/1 Do not use model	stment Se ation supp ost referer uppression erence, au forque Fee following	a for two sp election pression au ace, autotu a automatic totuning w edforward control and	tomatically during with a host reference (TFF) Selection of the speed/torque of the sp	uring executionst reference eccution of a erence, and on us feedforwa	, and cust utotuning custom tur rd togethe	om ו				
			2     Pi       Vibration \$       0       1       Speed Fee       0	erform vibration su Suppression Adju Do not adjust vibra tuning without a ho tuning. Adjust vibration su without a host refe ing. edforward (VFF)/1	stment Se ation supp ost referer uppression erence, au forque Fee following	a for two sp election pression au ace, autotu a automatic totuning w edforward control and	tomatically during with a host reference (TFF) Selection of the speed/torque of the sp	uring executionst reference eccution of a erence, and on us feedforwa	, and cust utotuning custom tur rd togethe	om ו				
			2     Pi       Vibration \$       0       1       Speed Fee       0	erform vibration su Suppression Adju Do not adjust vibration tuning without a ho tuning. Adjust vibration su without a host refer ing. edforward (VFF)/1 Do not use model	stment Se ation supp ost referer uppression erence, au forque Fee following	a for two sp election pression au ace, autotu a automatic totuning w edforward control and	tomatically during with a host reference (TFF) Selection of the speed/torque of the sp	uring executionst reference eccution of a erence, and on us feedforwa	, and cust utotuning custom tur rd togethe	om ו				
Pn141	2	n.XDDD	2     Pi       Vibration \$       0       1       Speed Fee       0	erform vibration su Suppression Adju Do not adjust vibra tuning without a ho tuning. Adjust vibration su without a host refe ing. edforward (VFF)/T Do not use model Use model followin	stment Se ation supp ost referer uppression erence, au forque Fee following	a for two sp election pression au ace, autotu a automatic totuning w edforward control and	tomatically during with a host reference (TFF) Selection of the speed/torque of the sp	ncies. uring executionst reference eccution of a erence, and o on ue feedforwa forward toge	, and cust utotuning custom tur rd togethe	om ו				
Pn141 Pn142		n.XDDD Model Folle trol Gain Model Folle	2     Privation S       0     1       1     1       Speed Fee       0       1       owing Con-       owing Con-	erform vibration su Suppression Adju Do not adjust vibra tuning without a ho tuning. Adjust vibration su without a host refe ing. edforward (VFF)/I Do not use model Use model followin	stment Se ation supp ost referen uppression erence, au forque Fee following ng control	a for two sp election pression au pression autoru a automatic totuning w edforward control and and speed	tomatically during with a host reference of the speed/torque feedf	ncies. uring execution ost reference eccution of a erence, and o on ie feedforwa forward toge Immedi- ately Immedi-	, and cust	om n- .r.				
	2	n.XDDD Model Folle trol Gain Model Folle trol Gain C Model Folle	2     Privation S       0     1       1     1       Speed Fee       0       1       owing Con-       owing Con-	Suppression Adju Do not adjust vibration su tuning without a host values vibration su without a host refer ing. Sedforward (VFF)/I Do not use model Use model following 10 to 20,000 500 to 2,000	stment Se ation supp ost referen uppression erence, au forque Fee following ng control	a for two sp election pression au pression au oression au automatic totuning w edforward control and and speed	tomatically during with a host reference of the second sec	ncies. uring execution ost reference accution of a arence, and o on ue feedforwa forward toge Immedi- ately	, and cust utotuning custom tur rd togethe ther.	om 				

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
Pn144	2	Model Following Con- trol Bias in the Reverse Direction	0 to 10,000	0.1%	1000	All	Immedi- ately	Tuning	*1		
Pn145	2	Vibration Suppression 1 Frequency A	10 to 2,500	0.1 Hz	500	All	Immedi- ately	Tuning	*1		
Pn146	2	Vibration Suppression 1 Frequency B	10 to 2,500	0.1 Hz	700	All	Immedi- ately	Tuning	*1		
Pn147	2	Model Following Con- trol Speed Feedforward Compensation	0 to 10,000	0.1%	1000	All	Immedi- ately	Tuning	*1		
Pn148	2	Second Model Follow- ing Control Gain	10 to 20,000	0.1/s	500	All	Immedi- ately	Tuning	*1		
Pn149	2	Second Model Follow- ing Control Gain Correc- tion	500 to 2,000	0.1%	1000	All	Immedi- ately	Tuning	*1		
Pn14A	2	Vibration Suppression 2 Frequency	10 to 2,000	0.1 Hz	800	All	Immedi- ately	Tuning	*1		
Pn14B	2	Vibration Suppression 2 Correction	10 to 1,000	1%	100	All	Immedi- ately	Tuning	*1		
	2	Control-Related Selec- tions	0000 hex to 0021 hex	-	0021 hex	All	After restart	Tuning	*1		
	-	Model Follow	ving Control Tv	ne Select	ion						

			Model Following Control Type Selection											
		n.🗆🗆 🗆 X	0	Use	e model followi	ng control	type 1.							
			1	Use	e model followi	ng control	type 2.							
Pn14F	l 1		Tuning-le	ss T	ype Selection									
PIII4F			0		e tuning-less ty	pe 1.								
		n.DDXD	1		e tuning-less ty									
			2		e tuning-less ty									
	1 1					1	<b>\</b>							
	-	n.¤X¤¤	Reserved	pai	rameter (Do no	ot change.	)							
		n.X000	Reserved	pa	rameter (Do no	ot change.	)							
	2		nance Con- d Selection		0000 hex to 0011 hex	-	0010 hex	All	Immedi- ately	Tuning	*1			
									1					
			Anti-Reso	Anti-Resonance Control Selection										
		n.DDDX	0											
			1	Use	e anti-resonanc	e control.								
	1		Anti-Resonance Control Adjustment Selection											
Pn160		n.00X0	0	Do not adjust anti-resonance control automatically during execution of auto- tuning without a host reference, autotuning with a host reference, and custom tuning.										
			1		ust anti-resona nout a host refe									
		n.¤X¤¤	Reserved	pa	rameter (Do no	ot change.	)							
		n.XDDD	Reserved	pai	rameter (Do no	ot change.	)							
Pn161	2	Anti-Resor quency	nance Fre-		10 to 20,000	0.1 Hz	1000	All	Immedi- ately	Tuning	*1			
Pn162	2	Anti-Resor Correction	nance Gain		1 to 1,000	1%	100	All	Immedi- ately	Tuning	*1			
Pn163	2	Anti-Resor	nance Dam	p-	0 to 300	1%	0	All	Immedi- ately	Tuning	*1			
									Continuc	d on nov	t nado			

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Parameter No.	Size	N	ame		Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
Pn164	2	Anti-Resor Time Cons rection			-1,000 to 1,000	0.01 ms	0	All	Immedi- ately	Tuning	*1		
Pn165	2	Anti-Resor Time Cons rection			-1,000 to 1,000	0.01 ms	0	All	Immedi- ately	Tuning	*1		
Pn166	2	Anti-Resor ing Gain 2	nance Dan	np-	0 to 1,000	1%	0	All	Immedi- ately	Tuning	*1		
	2	Tuning-less Related Se	s Function lections	-	0000 hex to 2711 hex	-	1401 hex	All	-	Setup	*1		
			Tuning-le	uning-less Selection									
	n.DDDX				0 Disable tuning-less function.								
			1	1 Enable tuning-less function.									
			Speed C	ontr	ol Method					Whe Enab			
Pn170		n.🗆 🗆 X 🗆	0		e for speed cor					After			
1 11 10			1	Use	e for speed cor	ntrol and u	se host co	ntroller for po	sition contro	l. resta	art		
		n.0X00	Rigidity	_eve	1					Whe Enab			
			0 to 7	Set	the rigidity lev	el.				Imme atel			
		n.X000	Tuning-le	ess L	oad Level					Whe Enab			
		11	0 to 2 Set the load level for the tuning-less function.								edi- y		
Pn181	2		vitching Level 0 to 10,000 1 mm/s 0 Linear Immedi- ately						Tuning	*1			
Pn182	2	Mode Swit for Acceler	ching Level 0 to 20 000 t mm (-2 0 Lippor Immedi-					Tuning	*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	Position C ence For S	ontrol Refer- Selections	0000 hex to 2236 hex	-	0000 hex	All	After restart	Setup	*1				
				Pulse Form gn and pulse tra W and CCW pul		0	aic							
			2 Tv	vo-phase pulse				hase A and	phase B) :	×1,				
		n.🗆 🗆 🛛 X	3 ро	vo-phase pulse psitive logic					· ·					
			4 pc	vo-phase pulse ositive logic		-	e differential (p	hase A and	phase B) :	×4,				
				gn and pulse tra W and CCW pul	. 0	Ŭ	gic							
			Clear Signa	gnal Form										
Pn200			_		riation whe	n the sign	al is at high le	vel.						
		n.🗆🗆 X 🗆												
				ear position dev		-								
				ear position dev										
	Clear Operation													
			· · · ·		viation at a	base bloc	k (at servo OF	F or when a	alarm occu	rs).				
		n.¤X¤¤	1 Do not clear position error (cleared only with CLR (Clear Position Deviation)											
			SI	<ol> <li>2 Clear position deviation when an alarm occurs.</li> </ol>										
			2 0				1000013.							
			Filter Select											
		n.XDDD		0 Use the reference input filter for a line-driver signal. (1 Mpps max.)										
				1Use the reference input filter for an open-collector signal. (200 kpps max.)2Use reference input filter 2 for a line-driver signal. (1 to 4 Mpps)										
			2 0	se reterence inpi	ut filter 2 f	or a line-dr	iver signal. (1	to 4 Mpps)						
Pn205	2	Multiturn L	imit	0 to 65,535	1 rev	65535	Rotary	After restart	Setup	*1				
	2	Position Control tion Select	ontrol Func- ions	0000 hex to 2210 hex	-	0010 hex	All	After restart	Setup	*1				
		n.🗆 🗆 🗆 X	Reserved pa	arameter (Do no	ot change.	)								
		n.🗆 🗆 X 🗆	Reserved pa	arameter (Do no	ot change.	)								
		n.¤X¤¤	Reserved pa	arameter (Do no	ot change.	)								
Pn207			/COIN (Posi	tioning Comple	tion Outp	ut) Signal	Output Timin	g						
				utput when the a an the setting of					same or les	3S				
		n.XDDD	1 th	utput when the a e setting of Pn52 osition reference	22 (Positio									
				utput when the a setting of Pn5										
					1 scale									
Pn20A	4	Number of Encoder S	External cale Pitches	4 to 1,048,576	pitch/ revolu- tion	32768	Rotary	After restart	Setup	*1				
Pn20E	4	Electronic (Numerato	Gear Ratio r)	1 to 1,073,741,824	1	64	All	After restart	Setup	*1				
				1				<b>A</b> 11	· .					

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								tinued from		
Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
Pn210	4	Electronic (Denomina		1 to 1,073,741,824	1	1	All	After restart	Setup	*1
Pn212	4	Number of Output Pul		16 to 1,073,741,824	1 P/Rev	2048	Rotary	After restart	Setup	*1
Pn216	2	Position Re Acceleratio tion Time C	n/Decelera-	0 to 65,535	0.1 ms	0	All	Immedi- ately after the motor stops	Setup	*1
Pn217	2		osition Refer- ment Time	0 to 10,000	0.1 ms	0	All	Immedi- ately after the motor stops	Setup	*1
Pn218	2	Reference Multiplier	Pulse Input	1 to 100	× 1	1	All	Immedi- ately	Setup	*1
	2	Fully-close Selections	d Control	0000 hex to 1003 hex	-	0000 hex	Rotary	After restart	Setup	*1
		n.000X	•	rameter (Do no rameter (Do no	<b>.</b>	,				
Pn22A		n.OXOO	Reserved pa	rameter (Do no	ot change	.)				
			Fully-closed	Control Speed	I Feedbac	k Selectio	n			
		n.XDDD		e motor encode e external enco	•	1				
			1 036	e external enco	idel speed					
Pn281	2	Encoder O tion	utput Resolu-	1 to 4,096	1 edge/ pitch	20	All	After restart	Setup	*1
Pn282	4	Linear Enco Pitch	oder Scale	0 to 6,553,600	0.01 μm	0	Linear	After restart	Setup	*1
Pn2E0	4	Reference plier 1	Pulse Multi-	1 to 1,073,741,824	-	1	All	Immedi- ately	Setup	page 5-6
Pn2E2	4	Reference plier 2	Pulse Multi-	1 to 1,073,741,824	-	1	All	Immedi- ately	Setup	page 5-6
Pn2E4	4	Reference plier 3	Pulse Multi-	1 to 1,073,741,824	-	1	All	Immedi- ately	Setup	page 5-6
Pn300	2	Speed Refe Gain	erence Input	150 to 3,000	0.01 V/ Rated motor speed	600	All	Immedi- ately	Setup	*1
Pn301	2	Internal Se	t Speed 1	0 to 10,000	Rotary: 1 min <sup>-1</sup> Direct Drive: 0.1 min <sup>-1</sup>	100	Rotary	Immedi- ately	Setup	*1
Pn302	2	Internal Se	t Speed 2	0 to 10,000	Rotary: 1 min <sup>-1</sup> Direct Drive: 0.1 min <sup>-1</sup>	200	Rotary	Immedi- ately	Setup	*1
Pn303	2	Internal Se	Internal Set Speed 3		Rotary: 1 min <sup>-1</sup> Direct Drive: 0.1 min <sup>-1</sup>	300	Rotary	Immedi- ately	Setup	*1
Pn304	2	Jogging Sp	beed	0 to 10,000	Rotary: 1 min <sup>-1</sup> Direct Drive: 0.1 min <sup>-1</sup>	500	Rotary	Immedi- ately	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		
Pn305	2	Soft Start A Time	Acceleratio	on	0 to 10,000	1 ms	0	All	Immedi- ately	Setup	*1		
Pn306	2	Soft Start [ Time	Deceleratio	on	0 to 10,000	1 ms	0	All	Immedi- ately	Setup	*1		
Pn307	2	Speed Refe Time Cons		er	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			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			0000 hex to 0002 hex	-	0000 hex	All	Immedi- ately	Setup	*1		
	_												
			Vibration	Detection Selection									
		n.000X	0	Do	not detect vibr	ation.							
Pn310			1	Out	tput a warning	(A.911) if v	vibration is	detected.					
FIISTU			2	Out	tput an alarm (/	4.520) if vi	bration is o	detected.					
		n.DDXD	Reserved	d pa	rameter (Do no	ot change.	)						
		n.□X□□ Reserved parameter (Do not change.)											
		n.XDDD	Reserved	d pa	rameter (Do no	ot change.	)						
							[						
Pn311	2	Vibration D sitivity		Sen-	50 to 500	1%	100	All	Immedi- ately	Tuning	*1		
Pn312	2	Vibration D Level	etection		0 to 5,000	1 min <sup>-1</sup>	50	Rotary	Immedi- ately	Tuning	*1		
Pn316	2	Maximum I	Notor Spe	ed	0 to 65,535	1 min <sup>-1</sup>	10000	Rotary	After restart	Setup	*1		
Pn324	2	Moment of culation Sta			0 to 20,000	1%	300	All	Immedi- ately	Setup	*1		
Pn380	2	Internal Se	t Speed 1		0 to 10,000	1 mm/s	10	Linear	Immedi- ately	Setup	*1		
Pn381	2	Internal Se	t Speed 2		0 to 10,000	1 mm/s	20	Linear	Immedi- ately	Setup	*1		
Pn382	2	Internal Se	t Speed 3		0 to 10,000	1 mm/s	30	Linear	Immedi- ately	Setup	*1		
Pn383	2	Jogging Sp	beed		0 to 10,000	1 mm/s	50	Linear	Immedi- ately	Setup	*1		

Vibration Detection

Maximum Motor Speed

Torque Reference Input Gain

First Stage First Torque Reference Filter Time

Forward Torque Limit

Reverse Torque Limit

Forward External Torque

Reverse External Torque

0 to 5,000

1 to 100

10 to 100

0 to 65,535

0 to 800

0 to 800

0 to 800

0 to 800

1 mm/s

100

mm/s 0.1 V/

rated

torque

0.01 ms

1%<sup>\*2</sup>

 $1\%^{*2}$ 

 $1\%^{*2}$ 

 $1\%^{*2}$ 

10

50

30

100

800

800

100

100

Linear

Linear

All

All

Rotary

Rotary

All

All

2

2

2

2

2

2

2

2

Level

Constant

Limit

Limit

Pn384

Pn385

Pn400

Pn401

Pn402

Pn403

Pn404

Pn405

Setup Continued on next page.

Immedi-ately

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restart

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Tuning

Setup

Setup

Tuning

Setup

Setup

Setup

			itinued from	n previou	s page.					
Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
Pn406	2	Emergency	/ Stop Torque	0 to 800	1% <sup>*2</sup>	800	All	Immedi- ately	Setup	*1
Pn407	2	Speed Lim Torque Co	it during ntrol	0 to 10,000	1 min <sup>-1</sup>	10000	Rotary	Immedi- ately	Setup	*1
	2	Torque-Rel tion Select	lated Func- ions	0000 hex to 1111 hex	-	0000 hex	All	_	Setup	*1
		n.000X		Selection 1 sable first stage able first stage					Whe Enabl	l <b>ed</b> di-
	Speed Limit Selection									en led
		n.00X0	0 Pn Us	e the smaller of 407 as the spe e the smaller of	ed limit. f the maxir		•	0	:	
Pn408			Us 1	480 as the spe e the smaller of tting of Pn407 a e the smaller of	f the overs as the spe	ed limit.				
			se	Whe						
		n.¤X¤¤	Notch Filter						Enabl	
				able second st able second sta					Imme atel	
			Friction Con	pensation Fun	ction Sele	ection			Whe Enabl	
		n.X000		able friction co able friction co					Imme atel	
Pn409	2	First Stage Frequency	Notch Filter	50 to 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1
Pn40A	2	First Stage 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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Pn416 <ul> <li>n.□□□X</li> <li>Notch Filter Sel</li></ul>	le third stage e third stage	-	0000 hex	All	Immedi-					
Pn416 $n.\Box\Box\Box$ $0$ Disable 1 $n.\Box\Box$ $0$ Disable 1 $n.\Box$ $0$ Disable 	le third stage e third stage			1	ately	Setup	*1			
Pn416 $1$ Enable 1 $n.\Box\BoxX\Box$ $0$ Disable 1 $n.\BoxX\Box\Box$ $0$ Disable 1 $n.\BoxX\Box\Box$ $0$ Disable 	e third stage	Filter Selection 3								
Pn416       n.□□X□       0       Disabil         n.□X□□       0       Disabil         n.□X□□       0       Disabil         n.□X□□       0       Disabil         n.□X□□       Reserved paran         n.X□□□       Reserved paran         n.N10       Reserved paran         n.N100       Reserved paran         n.N100       Reserved paran         n.N100       Reserved paran         n.N100       Reserved paran         Pn418       2         Pn419       2         Pn410       2         Pn411       2         Pn412       Fourth Stage Notch Filter Frequency         Pn411       2         Pn412       Fifth Stage Notch Filter Frequency         Pn415       2         Pn416       2         Pn417       2         Speed Ripple Compen- Statio	lection 4									
Pn417       2       Third Stage Notch Filter Sel n.□X□□       0       Disability 0         Pn417       2       Third Stage Notch Filter Frequency       5         Pn418       2       Third Stage Notch Filter Q Value       5         Pn418       2       Third Stage Notch Filter Q Value       5         Pn419       2       Third Stage Notch Filter Q Value       5         Pn418       2       Fourth Stage Notch Filter Depth       5         Pn418       2       Fourth Stage Notch Filter Depth       5         Pn418       2       Fourth Stage Notch Filter Depth       5         Pn41B       2       Fourth Stage Notch Filter Depth       5         Pn41B       2       Fourth Stage Notch Filter Depth       5         Pn41C       2       Fourth Stage Notch Filter Ter Depth       5         Pn41E       2       Fifth Stage Notch Filter Depth       5         Pn41E       2       Fifth Stage Notch Filter Depth       5         Pn41F       2       Speed Ripple Compen- sation Selections       0         1       Enable       0       Disabili         1       Enable       1       Enable	Notch Filter Selection 4									
Notch Filter Sel 0       Notch Filter Sel 0         n.UXDD       Reserved paran         n.XDDD       Reserved paran         Pn417       2         Third Stage Notch Filter O Value       5         Pn418       2         Pn419       2         Pn418       2         Pn419       2         Pn418       2         Fourth Stage Notch Filter Depth       5         Pn418       2         Pn418       2         Fourth Stage Notch Filter O Value       5         Pn41B       2       Fourth Stage Notch Filter C Q Value       5         Pn41D       2       Fifth Stage Notch Filter O Value       5         Pn41E       2       Fifth Stage Notch Filter Q Value       5         Pn41F       2       Speed Ripple Compen- Sation Selections       0         1       Enable       1       Enable         Pn423       n.DDDX       0       Disable         1       0										
n.□X□□       0       Disability         n.□X□□       Reserved parameters         n.X□□□       Reserved parameters         n.X□□□       Reserved parameters         n.X□□□       Reserved parameters         Pn417       2         Pn418       2         Pn418       2         Pn419       2         Pn419       2         Pn419       2         Pn419       2         Pn419       2         Pn419       2         Pn418       2         Pn419       2         Fourth Stage Notch Filter       0         Pn41B       2         Fourth Stage Notch Filter       5         Pn41B       2       Fourth Stage Notch Filter         Pn41D       2       Fifth Stage Notch Filter       5         Pn41E       2       Fifth Stage Notch Filter       5         Pn41E       2       Fifth Stage Notch Filter       5         Pn41F       2       Speed Ripple Compen-       0         Q       Value       0       Disabili         1       Enable       1       Enable         Pn423       N       0 <td>e fourth stag</td> <td>je notch fil</td> <td>ter.</td> <td></td> <td></td> <td></td> <td></td>	e fourth stag	je notch fil	ter.							
Image: Note of the served parameter of the ser	lection 5									
n.X□□□       Reserved parameter         n.X□□□       Reserved parameter         n.X□□□       Reserved parameter         Pn417       2       Third Stage Notch Filter Q Value       5         Pn418       2       Third Stage Notch Filter Q Value       5         Pn419       2       Third Stage Notch Filter Depth       6         Pn419       2       Fourth Stage Notch Filter Ter Frequency       5         Pn41B       2       Fourth Stage Notch Filter Ter Q Value       5         Pn41B       2       Fourth Stage Notch Filter Ter Q Value       5         Pn41D       2       Fourth Stage Notch Filter Ter Q Value       5         Pn41D       2       Fifth Stage Notch Filter Ter Q Value       5         Pn41E       2       Fifth Stage Notch Filter Q Value       5         Pn41F       2       Fifth Stage Notch Filter Q Value       5         Pn41F       2       Speed Ripple Compen- Sation Selections       0         1       Enable       1       Enable         1       Enable       1       0       Detection         1       D       0       Detection       1       0	5									
Pn417       2       Third Stage Notch Filter Frequency       5         Pn418       2       Third Stage Notch Filter Depth       5         Pn419       2       Third Stage Notch Filter Depth       5         Pn419       2       Third Stage Notch Filter Depth       6         Pn419       2       Fourth Stage Notch Filter Ter Prequency       5         Pn41A       2       Fourth Stage Notch Filter Ter Q Value       5         Pn41B       2       Fourth Stage Notch Filter Ter Q Value       5         Pn41D       2       Fourth Stage Notch Filter Terequency       5         Pn41D       2       Fifth Stage Notch Filter Frequency       5         Pn41E       2       Fifth Stage Notch Filter Q Value       5         Pn41E       2       Fifth Stage Notch Filter Depth       6         Pn41F       2       Speed Ripple Compen- 0       0         2       Speed Ripple Compen- ation Selections       0         1       Enable       1       Enable         Pn423       N       0       Detection	e fifth stage	notch filte	r.							
Pn417       2       Frequency       3         Pn418       2       Third Stage Notch Filter Q Value       5         Pn419       2       Third Stage Notch Filter Depth       5         Pn419       2       Fourth Stage Notch Filter Depth       6         Pn419       2       Fourth Stage Notch Filter Ter Frequency       5         Pn418       2       Fourth Stage Notch Fil- ter Depth       5         Pn41B       2       Fourth Stage Notch Fil- ter Depth       6         Pn41D       2       Fourth Stage Notch Filter Trequency       5         Pn41D       2       Fifth Stage Notch Filter Trequency       5         Pn41E       2       Fifth Stage Notch Filter Q Value       5         Pn41F       2       Fifth Stage Notch Filter Depth       6         2       Speed Ripple Compen- Sation Selections       0       0         2       Speed Ripple Compen- Sation Selection       0       Disable         1       Enable       1       Enable       0         1       Do no       0       Detector       1	meter (Do no	ot change.	)							
Pn418       2       Q Value       S         Pn419       2       Third Stage Notch Filter Depth       ()         Pn419       2       Fourth Stage Notch Filter Terequency       ()         Pn41A       2       Fourth Stage Notch Filter Terequency       ()         Pn41B       2       Fourth Stage Notch Filter Q Value       ()         Pn41B       2       Fourth Stage Notch Filter Q Value       ()         Pn41C       2       Fourth Stage Notch Filter Terequency       ()         Pn41D       2       Fifth Stage Notch Filter Terequency       ()         Pn41E       2       Fifth Stage Notch Filter Q Value       ()         Pn41E       2       Fifth Stage Notch Filter Q Value       ()         Pn41F       2       Fifth Stage Notch Filter Depth       ()       ()         2       Speed Ripple Compension Selections       ()       ()         2       Speed Ripple Compension Selection       ()       ()         1       Enable       ()       ()       ()         Pn423       I       C       ()       ()       ()	50 to 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1			
Pn41A       2       Depth       Second Sec	50 to 1,000	0.01	70	All	Immedi- ately	Tuning	*1			
Pn41A       2       ter Frequency       3         Pn41B       2       Fourth Stage Notch Fil- ter Q Value       5         Pn41C       2       Fourth Stage Notch Fil- ter Depth       6         Pn41D       2       Fifth Stage Notch Filter Frequency       5         Pn41D       2       Fifth Stage Notch Filter G Value       5         Pn41E       2       Fifth Stage Notch Filter Q Value       5         Pn41F       2       Fifth Stage Notch Filter Depth       6         2       Speed Ripple Compen- sation Selections       0         1       Enable       1       Enable         Pn423       Image: Speed Ripple Compen- tion Selection       0       Detection	0 to 1,000	0.001	0	All	Immedi- ately	Tuning	*1			
Pn41D       2       ter Q Value       0         Pn41C       2       Fourth Stage Notch Fil- ter Depth       0         Pn41D       2       Fifth Stage Notch Filter Frequency       5         Pn41E       2       Fifth Stage Notch Filter Q Value       5         Pn41F       2       Fifth Stage Notch Filter Depth       5         2       Speed Ripple Compen- Sation Selections       0         1       Enable       1         Pn423       n.□□X□       Speed Ripple C tion Selection	50 to 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1			
Pn410       2       ter Depth       0         Pn41D       2       Fifth Stage Notch Filter Frequency       5         Pn41E       2       Fifth Stage Notch Filter Q Value       5         Pn41F       2       Fifth Stage Notch Filter Depth       5         2       Speed Ripple Compen- sation Selections       0         1       Enable       1         Pn423       n.□□X□       Speed Ripple C tion Selection	50 to 1,000	0.01	70	All	Immedi- ately	Tuning	*1			
Pn41D     2     Frequency     3       Pn41E     2     Fifth Stage Notch Filter Q Value     5       Pn41F     2     Fifth Stage Notch Filter Depth     6       2     Speed Ripple Compen- sation Selections     0       1     Enable       1     Enable       1     Enable       0     Detection       0     Detection       1     Do no	0 to 1,000	0.001	0	All	Immedi- ately	Tuning	*1			
Pn41E     2     Q Value     3       Pn41F     2     Fifth Stage Notch Filter Depth     0       2     Speed Ripple Compen- sation Selections     0       n.□□□X     Speed Ripple C 0     0       Pn423     n.□□X□     Speed Ripple C 1       Pn423     N.□□X□	50 to 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1			
Pn41P     2     Depth     C       2     Speed Ripple Compensation Selections     0       n.□□□X     Speed Ripple C       0     Disable       1     Enable       n.□□X□     Speed Ripple C       0     Disable       1     Enable       0     Detection       0     Detection       1     Do no	50 to 1,000	0.01	70	All	Immedi- ately	Tuning	*1			
Pn423	0 to 1,000	0.001	0	All	Immedi- ately	Tuning	*1			
n.□□□X 0 Disabl 1 Enable n.□□X 0 Disabl 1 Enable 0 Disable 0 Dis	000 hex to 1111 hex	-	0000 hex	Rotary	_	Setup	*1			
n.□□□X 0 Disabl 1 Enable n.□□X 0 Disabl 1 Enable 0 Disable 0 Dis						Whe				
Pn423 n.□□X□ Speed Ripple C tion Selection 0 Detec 1 Do no	Compensatio	on Functio	n Selectio	n		Enab				
Pn423 n.□□X□ Speed Ripple C tion Selection 0 Detec 1 Do no	le speed ripp					Imme atel				
n.□□X□ 0 Detec 1 Do no	e speed ripp Compensatic			greement Wa	rning Detec-	Whe	en			
	t A.942 aları	ms.				Enab				
Speed Ripple C	ot detect A.9	42 alarms	•			resta				
	Compensatio	on Enable	Condition	Selection		Whe Enabl				
	d reference <sup>r</sup> speed					Afte				
Pn424 2 Torque Limit at Main Cir- cuit Voltage Drop		1%*2	50	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				
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		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 <sup>-1</sup>	0	Rotary Ser- vomotor	Immedi- ately	Tuning	*1				
Pn428	2	Torque/For tance Rate		0 to 65,535	× 0.01	100	All	Immedi- ately	Setup	page 4-6				
Pn456	2	Sweep Tor ence Amp	que Refer- litude	1 to 800	1%	15	All	Immedi- ately	Tuning	*1				
	2	Notch Filte Selections	er Adjustment 1	0000 hex to 0101 hex	-	0101 hex	All	Immedi- ately	Tuning	*1				
			Notch Filter	Adjustment Se	lection 1									
		n.000X	0 tun	not adjust the ing without a h ing.										
				just the first sta hout a host refe										
Pn460		n.DDXD	Reserved pa	rameter (Do no	ot change.	)								
			Notch Filter	Adjustment Se	lection 2									
		n.¤X¤¤		stom tuning. just the second	stage not	ch filter au	tomatically di	irina executi	on of auto	tun-				
			1 ing	without a host ing.										
		n.XDDD	Reserved pa	rameter (Do no	ot change.	)								
	2	Gravity Co Related Se	mpensation- elections	0000 hex to 0001 hex	-	0000 hex	All	After restart	Setup	*1				
	_													
				avity Compensation Selection										
		n.□□□X		able gravity co able gravity cor										
Pn475		n.00X0		ameter (Do not	•									
		n.OXOO		ameter (Do not										
				,	0,									
		n.X000	Reserved par	ameter (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		0 to 10,000	1 mm/s	10000	Linear	Immedi- ately	Setup	*1				
Pn481	2	Polarity De Speed Loc		10 to 20,000	0.1 Hz	400	Linear	Immedi- ately	Tuning	-				
Pn482	2	Polarity De Speed Loc Time Cons	op Integral	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 De ence Spee	etection Refer-	0 to 100	1 mm/s	20	Linear	Immedi- ately	Tuning	_				
				1	1	1	1	· · · · J	1	1				

								· · · · · · · · · · · · · · · · · · ·	
Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
Pn486	2	Polarity Detection Refer- ence Acceleration/ Deceleration Time	0 to 100	1 ms	25	Linear	Immedi- ately	Tuning	_
Pn487	2	Polarity Detection Con- stant Speed Time	0 to 300	1 ms	0	Linear	Immedi- ately	Tuning	-
Pn488	2	Polarity Detection Refer- ence 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 Con- firmation Force Refer- ence	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 Compen- sation 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 <sup>-1</sup>	10	Rotary	Immedi- ately	Setup	*1
Pn502	2	Rotation Detection Level	1 to 10,000	1 min <sup>-1</sup>	20	Rotary	Immedi- ately	Setup	*1
Pn503	2	Speed Coincidence Detection Signal Output Width	0 to 100	1 min <sup>-1</sup>	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 <sup>-1</sup>	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

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Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refe enc				
	2	Input Sign	al Selections	0000 hex to FFF2 hex	-	2100 hex	All	After restart	Setup	*1				
				Allocation Mod										
		n.🗆 🗆 🗆 X		se the sequence				fault allocati	ons.					
				hange the seque		0	cations.							
			2 R	eserved setting (	Do not us	e.)								
			/S-ON (Ser	/o ON) Signal A	llocation									
			0 A											
			1 A	ctive when CN1-	41 input s	signal is ON	l (closed).							
				ctive when CN1-		0	. ,							
				ctive when CN1-		-								
				Active when CN1-44 input signal is ON (closed).										
				5 Active when CN1-45 input signal is ON (closed).										
				<ul> <li>Active when CN1-46 input signal is ON (closed).</li> <li>The signal is always active.</li> </ul>										
		n.🗆 🗆 X 🗆		<ul><li>7 The signal is always active.</li><li>8 The signal is always inactive.</li></ul>										
				-										
				ctive when CN1-		-								
				ctive when CN1-		-								
				ctive when CN1-		0	(1)							
				ctive when CN1-										
Pn50A				ctive when CN1-		-								
				ctive when CN1-		-								
			/P-CON (Proportional Control) Signal Allocation											
		n.□X□□ 0 to F The allocations are the same as the /S-ON (Servo ON) signal allocat												
			P-OT (Forw	ard Drive Prohit	oit) Signal	Allocation								
			0 E	nable forward dr	ive when (	CN1-40 inp	out signal is O	N (closed).						
			1 E	nable forward dr	ive when (	CN1-41 inp	out signal is O	N (closed).						
				nable forward dr		•	0	,						
			3 Enable forward drive when CN1-43 input signal is ON (closed).											
			4 Enable forward drive when CN1-44 input signal is ON (closed).											
			5 Enable forward drive when CN1-45 input signal is ON (closed).											
			6 Enable forward drive when CN1-46 input signal is ON (closed).											
		n.XDDD		et the signal to a	, ,									
				et the signal to a										
				hable forward dr			÷							
				hable forward dr			0							
			B Enable forward drive when CN1-42 input signal is OFF (open).											
				able forward dr	ivo whon (	NI1_12 inr	ut cianal in O	EF (opon)						
				hable forward dr			÷							
			D E	nable forward dr nable forward dr nable forward dr	ive when (	CN1-44 inp	out signal is O	FF (open).						

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Parameter No.	Size	N	ame		Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer ence		
	2	Input Signa 2	al Selections	S	0000 hex to FFFF hex	_	6543 hex	All	After restart	Setup	*1		
		n.□□□X	0     1     2     3     4     5     6     7   5 8   5 9     A	Enak Enak Enak Enak Enak Enak Set t Enak Enak	e Drive Prohit ble reverse dri ble reverse dri ble reverse dri ble reverse dri ble reverse dri ble reverse dri ble reverse dri the signal to a ble reverse dri ble reverse dri ble reverse dri ble reverse dri	ve when C ve when C ve when C ve when C ve when C ve when C lways pro lways ena ve when C ve when C	CN1-40 inp CN1-41 inp CN1-42 inp CN1-43 inp CN1-44 inp CN1-45 inp CN1-45 inp hibit revers ble reverse CN1-40 inp CN1-41 inp	ut signal is O ut signal is O e drive. e drive. ut signal is O ut signal is O	N (closed). N (closed). N (closed). N (closed). N (closed). N (closed). FF (open).				
Pn50B			C I D I E I	Enable reverse drive when CN1-42 input signal is OFF (open).Enable reverse drive when CN1-43 input signal is OFF (open).Enable reverse drive when CN1-44 input signal is OFF (open).Enable reverse drive when CN1-45 input signal is OFF (open).Enable reverse drive when CN1-46 input signal is OFF (open).									
		nX	0 ( 1 ( 2 ( 3 ( 4 ( 5 ( 6 ( 7 ( 8 ( 7 ( 9 ( 0 ( 0 ( 0 ( 0 ( 0 ( 0 ( 0 ( 0	Activ ON ( Activ ON ( Activ ON ( Activ ON ( Activ ON ( Activ ON ( Activ ON ( Activ ON ( Activ ON ( Activ OFF Activ OFF Activ OFF Activ OFF Activ OFF Activ OFF Activ OFF Activ	arm Reset) Si ve on signal ec (closed). ve on signal ec (open). ve on signal ec (open).	dge when dge when	CN1-40 in CN1-41 in CN1-42 in CN1-43 in CN1-43 in CN1-45 in CN1-46 in e.) CN1-46 in CN1-40 in CN1-41 in CN1-41 in CN1-42 in CN1-43 in CN1-44 in	put signal chi put signal chi	anges from ( anges from (	DFF (open) DFF (open) DFF (open) DFF (open) DFF (open) DFF (open) DFF (open) DFF (open) DFF (open) DFF (open) DN (closed) DN (closed) DN (closed) DN (closed)	) to ) to ) to ) to ) to ) to ) to ) to		
		n.OXOO	0 to F	The a	d External To allocations are t	he same a	s the /S-ON	l (Servo ON) si	gnal allocatior	IS.			
		n.XDDD			e External To allocations are t	-		-		IS.			

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Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence			
	2	Input Signa 3	al Selection	s 0000 hex to FFFF hex	_	8888 hex	All	After restart	Setup	*1			
	-		-										
			/SPD-D (Motor Direction) Signal Allocation 0 Active when CN1-40 input signal is ON (closed).										
						0	( )						
				Active when CN1-		-							
			-	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	Active when CN1-	45 input s	signal is ON	V (closed).						
			6	Active when CN1-46 input signal is ON (closed).									
		n.🗆🗆 🛛 X	7	The signal is always active.									
			8	The signal is alway	ys inactive								
			9	Active when CN1-	40 input s	ignal is OF	F (open).						
			A	Active when CN1-	41 input s	ignal is OF	F (open).						
Pn50C			В	Active when CN1-42 input signal is OFF (open).									
			С	Active when CN1-43 input signal is OFF (open).									
			D	Active when CN1-44 input signal is OFF (open).									
			E	Active when CN1-45 input signal is OFF (open).									
			F	Active when CN1-	46 input s	ignal is OF	F (open).						
			/SPD-A (I	nternal Set Speed	Selection	n Input) Sig	gnal Allocatic	n					
		n.DDXD		The allocations are tions.	e the same	e as the /S	PD-D (Motor	Direction) sig	gnal alloca	l-			
			/SPD-B (I	nternal Set Speed	Selection	n Input) Si	gnal Allocatic	on					
		n.¤X¤¤		The allocations are tions.	e the same	e as the /S	PD-D (Motor	Direction) sig	gnal alloca	l-			
			/C-SEL (C	Control Selection I	nput) Sigr	nal Allocat	ion						
		n.XDDD		The allocations are tions.	e the same	e as the /S	PD-D (Motor	Direction) sig	gnal alloca				

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Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refe ence		
	2	Input Signa 4	al Selections	0000 hex to FFFF hex	-	8888 hex	-	After restart	Setup	*1		
Pn50D		n.□□□X	0         Add           1         Add           2         Add           3         Add           4         Add           5         Add           6         Add           7         Th           8         Th           9         Add           A         Add           B         Add	Zero Clamping I etive when CN1- etive 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 42 input s	nal Allocat ignal is ON ignal is OF ignal is OF	V (closed). V (closed). V (closed). V (closed). V (closed). V (closed). V (closed). V (closed). F (open). F (open). F (open).		Applicat Motors			
			E Ad	tive when CN1- tive when CN1- tive when CN1-	45 input s	ignal is OF	F (open).					
		n.DDXD	/INHIBIT (Reference Pulse Inhibit Input) Signal Allocation							ble s		
				0 to F The allocations are the same as the /ZCLAMP (Zero Clamping Input) signal allocations.								
		n.OXOO	/G-SEL (Ga	n Selection Inp	ut) Signal	Allocation	1		Applical Motor			
				0 to F The allocations are the same as the /ZCLAMP (Zero Clamping Input) signal allocations.								
			/P-DET (Pol	arity Detection	Input) Sig	nal Alloca	tion		Applicat Motors			
		n.XDDD		The allocations are the same as the /ZCLAMP (Zero Clamping Input) signal allocations.								

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Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence			
	2	Output Sig	nal Selec-	0000 hex to 6666 hex	_	3211 hex	All	After restart	Setup	*1			
				0000 Hex		TIEX		Testart					
			/COIN (Posit	ioning Comple	tion Outp	ut) Signal J	Allocation						
			0 Dis	abled (the abov	ve signal c	output is no	ot used).						
			1 Ou	tput the signal	from the C	N1-25 or	CN1-26 outpi	ut terminal.					
		n.🗆🗆 🗆 X		tput the signal									
				tput the signal				ut terminal.					
				tput the signal									
				Output the signal from the CN1-38 output terminal. Output the signal from the CN1-39 output terminal.									
Pn50E			6 Ou	tput the signal	from the C	IN 1-39 OUT	iput terminai.						
		N-CMP (Speed Coincidence Detection Output) Signal Allocation           n.□□X□         The allocations are the same as the (COIN (Positioning Completion) size											
		n.□□X□     0 to 6     The allocations are the same as the /COIN (Positioning Completion) signal allocations.											
			/TGON (Rota	tion Detection	Output) S	Signal Allo	cation						
	n.□X□□       /TGON (Rotation Detection Output) Signal Allocation         0 to 6       The allocations are the same as the /COIN (Positioning Completion) signal allocations.												
			/S-RDY (Servo Ready) Signal Allocation										
		n.X000		OIN (Position	ing Complet	ion) signal							
	2	Output Sig tions 2	nal Selec-	0000 hex to 6666 hex	_	0000 hex	All	After restart	Setup	*1			
	/CLT (Torque Limit Detection Output) Signal Allocation												
			· ·	abled (the abov	• •	•							
				tput the signal	0	•	,	ut terminal					
				tput the signal									
		n.🗆🗆 🗆 X		tput the signal									
			4 Ou	tput the signal	from the C	N1-37 out	tput terminal.						
			5 Ou	tput the signal	from the C	N1-38 out	tput terminal.						
Dococ			6 Ou	tput the signal	from the C	N1-39 out	tput terminal.						
Pn50F			/VLT (Speed	Limit Detection	n) Signal <i>i</i>	Allocation				_			
		n.🗆 🗆 🛛		e allocations are allocations.	e the same	e as the /C	ELT (Torque Lii	mit Detectio	n Output) s	sig-			
			/BK (Brake C	output) Signal /	Allocation								
		n.¤X¤¤	O to 6 The	allocations are allocations.		e as the /C	CLT (Torque Lii	mit Detection	n Output) s	sig-			
			/WARN (War	ning Output) S	ignal Allo	cation							
		n.X000	O to 6 The	allocations are allocations.	-		LT (Torque Li	mit Detection	n Output) s	sig-			

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Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refe enc			
	2	Output Sig	gnal Selec-	0000 hex to 0666 hex	-	0000 hex	All	After restart	Setup	*1			
							<u> </u>	I					
			/NEAR (Nea	ır Output) Signa	t) Signal Allocation								
				sabled (the abov	•		,						
				utput the signal			-						
		n.🗆🗆 🗆 X		utput the signal									
				utput the signal utput the signal				ut terminai.					
n510				utput the signal									
11010				utput the signal									
		n.DDXD		· · ·									
			•	Reserved parameter (Do not change.)									
		n.□X□□ /PSELA (Reference Pulse Input Multiplication Switching Output) Signal Allocation 0 to 6 The allocations are the same as the /NEAR (Near) signal allocations.											
		n.XDDD	Reserved p	arameter (Do no	ot change	.)							
					<u> </u>	-)							
		Output Sid	gnal Inverse	0000 hex to		0000	A 11	After	Oature	*1			
	2	Settings		1111 hex	-	hex	All	restart	Setup	*1			
			Output Sigr	al Inversion for	CN1-25 a	and CN1-2	6 Terminals						
		n.🗆🗆 🗆 X		ne signal is not ir									
			1 Th	ne signal is inver	ted.								
			Output Sigr	al Inversion for	CN1-27 a	and CN1-2	8 Terminals						
		n.🗆🗆 X 🗆		ne signal is not ir									
n512			1 Th	ne signal is inver	ted.								
			Output Siar	al Inversion for	CN1-29 a	and CN1-3	0 Terminals						
		n.¤X¤¤		ne signal is not ir									
			1 Tr	ne signal is inver	ted.								
			Output Sigr	al Inversion for	CN1-37	Ferminal							
		n.X000		ne signal is not ir									
			1 Th	ne signal is inver	ted.								
		Output Sic	gnal Inverse	0000 hex to		0000		After					
	2	Settings 2		0011 hex	-	hex	All	restart	Setup	*1			
			Output Sigr	al Inversion for	CN1-38	Terminal							
		n.🗆 🗆 🗆 X		ne signal is not ir									
				ne signal is inver									
n513			Output Sign	al Inversion for	CN1-39	Terminal							
		n.🗆 🗆 X 🗆		ne signal is not ir									
				ne signal is inver									
		n.🗆X🗆 🗆	Reserved p	arameter (Do no	ot change	.)							
		n.XDDD	-	arameter (Do no	-								

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							Con	itinued from	n previou	s page.		
Parameter No.	Size	N	Name		Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
	2	Output Sig tions 4	nal Selec-	0000 hex to 0666 hex	-	0000 hex	All	After restart	Setup	*1		
		n.000X	Beconved pr	remotor (Do po	t obongo	<u>\</u>				_		
	ſ		Reserved pa	Reserved parameter (Do not change.)								
	r	n.DDXD	Reserved pa	arameter (Do no	ot change.	)						
Pn514	r	n.DXDD	0 Dis 1 Ou 2 Ou 3 Ou 4 Ou 5 Ou	tative Maintena sabled (the above toput the signal toput the signal toput the signal toput the signal toput the signal toput the signal	ve signal c from the C from the C from the C from the C from the C	utput is no N1-25 or N1-27 or N1-29 or N1-37 out	ot used). CN1-26 outpi CN1-28 outpi CN1-30 outpi CN1-30 outpi tput terminal. tput terminal.	ut terminal.				
	r	n.XDDD	Reserved pa	arameter (Do no	ot change.	)						

arameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refe enc		
	2	Input Signa	al Selections	0000 hex to FFFF hex	-	8888 hex	All	After restart	Setup	*1		
		0		TTTT HOX		ПОХ		rootart				
	_											
				te Data Reque		-						
				tive when CN1-		U U	( )					
				tive when CN1-	•	•	,					
				tive when CN1-		-						
				tive when CN1-		U U	,					
				tive when CN1-	•	•	,					
				<ul> <li>Active when CN1-45 input signal is ON (closed).</li> <li>Active when CN1-46 input signal is ON (closed).</li> </ul>								
						ignal is ON	I (closed).					
		n.🗆🗆 🗆 X		e signal is alway								
				able when 5 V i								
				tive when CN1-		0	,					
				tive when CN1-		0	(1)					
				tive when CN1-		0	,					
				tive when CN1-		U U	,					
				tive when CN1-		U U	,					
				tive when CN1-		0	,					
		F Ac	tive when CN1-	46 input s	ignal is OF	F (open).						
515			/PSEL (Refe	rence Pulse Inp	out Multip	lication Sv	vitching Input	) Signal Allo	ocation			
			0 Ac	tive when CN1-	40 input s	ignal is ON	l (closed).					
			1 Ac	tive when CN1-	41 input s	ignal is ON	l (closed).					
			2 Ac	tive when CN1-	42 input s	ignal is ON	l (closed).					
			3 Ac	tive when CN1-	43 input s	ignal is ON	l (closed).					
			4 Ac	tive when CN1-	44 input s	ignal is ON	l (closed).					
			5 Ac	tive when CN1-	45 input s	ignal is ON	l (closed).					
			6 Ac	tive when CN1-	46 input s	ignal is ON	l (closed).					
		n.🗆🗆 X 🗆	7 Th	e signal is alway	ys active.							
			8 Th	e signal is alway	s inactive							
			9 Ac	tive when CN1-	40 input s	ignal is OF	F (open).					
			A Ac	tive when CN1-	41 input s	ignal is OF	F (open).					
			B Ac	tive when CN1-	42 input s	ignal is OF	F (open).					
			C Ac	tive when CN1-	43 input s	ignal is OF	F (open).					
			D Ac	tive when CN1-	44 input s	ignal is OF	F (open).					
			E Ac	tive when CN1-	45 input s	ignal is OF	F (open).					
			F Ac	tive when CN1-	46 input s	ignal is OF	F (open).					
		n.¤X¤¤	Reserved pa	rameter (Do no	ot change.	)						
		n.X000	Reserved pa	rameter (Do no	ot change	)						
	-				en ango.	/						

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Parameter No.	Size	1	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence			
	2	Input Sigr 7	al Selections	0000 hex to FFFF hex	-	8888 hex	All	After restart	Setup	*1			
			FSTP (Force	d Stop Input) Si	gnal Alloc	ation							
			0 E	nable drive wher	n CN1-40	input signa	al is ON (close	ed).					
			1 E	nable drive wher	n CN1-41	input signa	al is ON (close	ed).					
				nable drive wher									
				nable drive wher									
				nable drive wher		1 0	,	,					
				nable drive wher nable drive wher									
				et the signal to a				,	a stop)				
		n.DDDX	9	et the signal to a					17				
Pn516				top).			aiways uisabi	c loroling the					
			9 E	nable drive wher	n CN1-40	input signa	al is OFF (ope	n).					
			A E	nable drive wher	n CN1-41	input signa	al is OFF (ope	n).					
				nable drive wher									
				nable drive wher		. 0		,					
				nable drive wher									
				Enable drive when CN1-45 input signal is OFF (open).									
	F Enable drive when CN1-46 input signal is OFF (open).												
		n.DDXD	Reserved pa	rameter (Do not	t change.)								
	n.□X□□ Reserved parameter (Do not change.)												
		n.XDDD Reserved parameter (Do not change.)											
		1			1			1					
	2	Output Si tions 5	gnal Selec-	0000 hex to 0666 hex	-	0654 hex	All	After restart	Setup	*1			
				n Code Output)	-								
			+	isabled (the abov	-			ut torminal					
				utput the signal utput the signal									
		n.🗆 🗆 🗆 X		utput the signal									
				utput the signal			-						
				utput the signal			•						
Pn517			6 O	utput the signal	from the C	N1-39 ou	tput terminal.						
					0								
		n.🗆 🗆 X 🗆		n Code Output) ne allocations are	0								
			U 10 h	ons.	e the same	e as the AL		Sue Output)	Signal alloc	Ja-			
			ALO3 (Alarr	n Code Output)	Signal All	ocation							
		n.¤X¤¤		ne allocations are	e the same	e as the Al	_O1 (Alarm Co	ode Output)	signal allo	ca-			
		tions.											
				aramotor (1)o no	ot change.	.)							
		n.XDDD	Reserved p										
Pn518 <sup>*3</sup>	_		odule-Related	-	_	_	All	_	_				
Pn518 <sup>*3</sup>	_	Safety Mo Paramete	odule-Related rs	-	_	_	All	_	_				
Pn518 <sup>*3</sup>	- 4	Safety Mo Paramete	odule-Related rs ad Position Overflow	0 to 1,073,741,824	- 1 refer- ence unit	-	All	- Immedi- ately	- Setup	- *1			

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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	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 <sup>-1</sup>	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	2	Base Current Derating at Motor Overload Detection	10 to 100	1%	100	All	After restart	Setup	*1
Pn52F	2	Monitor Display at Startup	0000 hex to 0FFF hex	_	0FFF hex	All	Immedi- ately	Setup	*1
	2	Program Jogging- Related Selections	0000 hex to 0005 hex	_	0000 hex	All	Immedi- ately	Setup	*1

Continued from previous page

		Program .	ogging Operatio	n Pattern						
					prward by t	ravel distance	e in Pn531) >	Number	of	
					everse by t	ravel distance	e in Pn531) ×	Number	of	
	/	2	movements in Pn Waiting time in Pr	536 1535 → Re	,		,			
	n.□□□X	3	movements in Pn Waiting time in Pr	vements in Pn536 aiting time in Pn535 $\rightarrow$ Forward by travel distance in Pn531) × Number of						
		4	Vaiting time in Pn535 $\rightarrow$ Forward by travel distance in Pn531 $\rightarrow$ Waiting time Pn535 $\rightarrow$ Reverse by travel distance in Pn531) $\times$ Number of movements in n536							
		5	(Waiting time in Pn535 $\rightarrow$ Reverse by travel distance in Pn531 $\rightarrow$ Waiting time in Pn535 $\rightarrow$ Forward by travel distance in Pn531) × Number of movements in Pn536							
	n.🗆🗆 X 🗆	Reserved	ed parameter (Do not change.)							
	n.¤X¤¤	Reserved parameter (Do not change.)								
	n ХППП	Reserved parameter (Do not change )								
		10001100		st onlange.	1					
4	Program Jo Distance	ogging Trav	el 1 to 1,073,741,824	1 refer- ence unit	32768	All	Immedi- ately	Setup	*1	
2			<sup>e-</sup> 1 to 10,000	Rotary: 1 min <sup>-1</sup> Direct Drive: 0.1 min <sup>-1</sup>	500	Rotary	Immedi- ately	Setup	*1	
		n.□X□□ n.X□□□ 4 Program J Distance	n.□□□X     0     (       n.□□□X     1     (       2     (       3     (       4     (       5     (       n.□X□     Reserved       n.X□□     Reserved       n.X□□     Reserved       1.X□□     Reserved       1.X□□     Reserved	0       (Waiting time in Primovements	0       movements in Pn536         1       (Waiting time in Pn535 → Removements in Pn536         2       (Waiting time in Pn535 → Removements in Pn536         2       (Waiting time in Pn535 → Removements in Pn536         3       (Waiting time in Pn535 → Removements in Pn536         3       (Waiting time in Pn535 → Removements in Pn536         4       (Waiting time in Pn535 → Removements in Pn536         4       (Waiting time in Pn535 → Removements in Pn536         4       (Waiting time in Pn535 → Removements in Pn536         5       (Waiting time in Pn535 → Removements in Pn536         6       (Waiting time in Pn535 → Removements in Pn536         6       (Waiting time in Pn535 → Removements 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movements in Pn536         4       (Waiting time in Pn535 → Forward by t in Pn535 → Forward by t in Pn535 → Reverse by travel distance Pn536         1       Reserved parameter (Do not change.)         1       1 to 1,073,741,824       1 refer- ence unit       32768         2       Program Jogging Move- ment Speed       1 to 10,000       500</td> <td>0       Waiting time in Pn535 → Forward by travel distance movements in Pn536         1       (Waiting time in Pn535 → Reverse by travel distance movements in Pn536         2       (Waiting time in Pn535 → Forward by travel distance movements in Pn536         2       (Waiting time in Pn535 → Reverse by travel distance movements in Pn536 → Forward by travel distance movements in Pn536 → Forward by travel distance in Pn535 → Forward by travel distance in Pn535 → Forward by travel distance in Pn536 → Forward by travel distance in Pn535 → Forward by travel distance in Pn536 → Forward by travel distance in Pn535 → Forward by travel distance in Pn536 → Forward by travel distance in Pn535 → Forward by travel distance in Pn536 →</td> <td>0       Waiting time in Pn535 → Forward by travel distance in Pn531) &gt; movements in Pn536         1       Waiting time in Pn535 → Reverse by travel distance in Pn531) &gt; movements in Pn536         2       Waiting time in Pn535 → Forward by travel distance in Pn531) &gt; movements in Pn536         2       Waiting time in Pn535 → Forward by travel distance in Pn531) &gt; movements in Pn536         3       Waiting time in Pn535 → Reverse by travel distance in Pn531) &gt; movements in Pn536         4       Waiting time in Pn535 → Forward by travel distance in Pn531) &gt; movements in Pn536         4       Waiting time in Pn535 → Forward by travel distance in Pn531) &gt; movements in Pn536         4       Waiting time in Pn535 → Forward by travel distance in Pn531 → movements in Pn536         5       (Waiting time in Pn535 → Forward by travel distance in Pn531 → movements in Pn536         4       Waiting time in Pn535 → Forward by travel distance in Pn531 → movements in Pn536         5       (Waiting time in Pn535 → Forward by travel distance in Pn531 → in Pn535 → Forward by travel distance in Pn531 → in Pn535 → Forward by travel distance in Pn531 → in Pn535 → Forward by travel distance in Pn531 → in Pn535 → Forward by travel distance in Pn531 → in Pn536         1       <b>Reserved parameter (Do not change.)</b>         1       <b>n.DXD</b>       Reserved parameter (Do not change.)         1       1 to 1,073,741,824       ately         2       Program Jogging Move- ment Speed       1 to 10,000<!--</td--><td>0       Waiting time in Pn535 → Forward by travel distance in Pn531) × Number movements in Pn536         1       (Waiting time in Pn535 → Reverse by travel distance in Pn531) × Number movements in Pn536         2       (Waiting time in Pn535 → Forward by travel distance in Pn531) × Number movements in Pn536         2       (Waiting time in Pn535 → Reverse by travel 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   (Waiting time in Pn535 → Reverse by travel distance movements in Pn536         2       (Waiting time in Pn535 → Forward by travel distance movements in Pn536         2       (Waiting time in Pn535 → Reverse by travel distance movements in Pn536 → Forward by travel distance movements in Pn536 → Forward by travel distance in Pn535 → Forward by travel distance in Pn535 → Forward by travel distance in Pn536 → Forward by travel distance in Pn535 → Forward by travel distance in Pn536 → Forward by travel distance in Pn535 → Forward by travel distance in Pn536 → Forward by travel distance in Pn535 → Forward by travel distance in Pn536 →	0       Waiting time in Pn535 → Forward by travel distance in Pn531) > movements in Pn536         1       Waiting time in Pn535 → Reverse by travel distance in Pn531) > movements in Pn536         2       Waiting time in Pn535 → Forward by travel distance in Pn531) > movements in Pn536         2       Waiting time in Pn535 → Forward by travel distance in Pn531) > movements in Pn536         3       Waiting time in Pn535 → Reverse by travel distance in Pn531) > movements in Pn536         4       Waiting time in Pn535 → Forward by travel distance in Pn531) > movements in Pn536         4       Waiting time in Pn535 → Forward by travel distance in Pn531) > movements in Pn536         4       Waiting time in Pn535 → Forward by travel distance in Pn531 → movements in Pn536         5       (Waiting time in Pn535 → Forward by travel distance in Pn531 → movements in Pn536         4       Waiting time in Pn535 → Forward by travel distance in Pn531 → movements in Pn536         5       (Waiting time in Pn535 → Forward by travel distance in Pn531 → in Pn535 → Forward by travel distance in Pn531 → in Pn535 → Forward by travel distance in Pn531 → in Pn535 → Forward by travel distance in Pn531 → in Pn535 → Forward by travel distance in Pn531 → in Pn536         1 <b>Reserved parameter (Do not change.)</b> 1 <b>n.DXD</b> Reserved parameter (Do not change.)         1       1 to 1,073,741,824       ately         2       Program Jogging Move- ment Speed       1 to 10,000 </td <td>0       Waiting time in Pn535 → Forward by travel distance in Pn531) × Number movements in Pn536         1       (Waiting time in Pn535 → Reverse by travel distance in Pn531) × Number movements in Pn536         2       (Waiting time in Pn535 → Forward by travel distance in Pn531) × Number movements in Pn536         2       (Waiting time in Pn535 → Reverse by travel distance in Pn531) × Number movements in Pn536         3       (Waiting time in Pn535 → Reverse by travel distance in Pn531) × Number movements in Pn536         3       (Waiting time in Pn535 → Reverse by travel distance in Pn531) × Number movements in Pn536         3       (Waiting time in Pn535 → Forward by travel distance in Pn531) × Number movements in Pn536         4       (Waiting time in Pn535 → Forward by travel distance in Pn531) × Number of movements in Pn536         4       (Waiting time in Pn535 → Forward by travel distance in Pn531) × Number of movement Pn536         5       (Waiting time in Pn535 → Forward by travel distance in Pn531) × Number of movement Pn536         6       (Waiting time in Pn535 → Forward by travel distance in Pn531) × Number of movement Pn536         7       (Maiting time in Pn535 → Reverse by travel distance in Pn531) × Number of movement Pn536         8       (Waiting time in Pn535 → Forward by travel distance in Pn531) × Number of movement Pn536         9       (Maiting time in Pn535 → Forward by travel distance in Pn531) × Number of movement Pn536         1       Number of travel distance i</td>	0       Waiting time in Pn535 → Forward by travel distance in Pn531) × Number movements in Pn536         1       (Waiting time in Pn535 → Reverse by travel distance in Pn531) × Number movements in Pn536         2       (Waiting time in Pn535 → Forward by travel distance in Pn531) × Number movements in Pn536         2       (Waiting time in Pn535 → Reverse by travel distance in Pn531) × Number movements in Pn536         3       (Waiting time in Pn535 → Reverse by travel distance in Pn531) × Number movements in Pn536         3       (Waiting time in Pn535 → Reverse by travel distance in Pn531) × Number movements in Pn536         3       (Waiting time in Pn535 → Forward by travel distance in Pn531) × Number movements in Pn536         4       (Waiting time in Pn535 → Forward by travel distance in Pn531) × Number of movements in Pn536         4       (Waiting time in Pn535 → Forward by travel distance in Pn531) × Number of movement Pn536         5       (Waiting time in Pn535 → Forward by travel distance in Pn531) × Number of movement Pn536         6       (Waiting time in Pn535 → Forward by travel distance in Pn531) × Number of movement Pn536         7       (Maiting time in Pn535 → Reverse by travel distance in Pn531) × Number of movement Pn536         8       (Waiting time in Pn535 → Forward by travel distance in Pn531) × Number of movement Pn536         9       (Maiting time in Pn535 → Forward by travel distance in Pn531) × Number of movement Pn536         1       Number of travel distance i	

						Con	tinued from	n previou	s page.
Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
Pn534	2	Program Jogging Accel- eration/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 Num- ber 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	-
Pn560	2	Residual Vibration Detection Width	1 to 3,000	0.1%	400	All	Immedi- ately	Setup	*1
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 Out- put 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	_

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Parameter No.	Size	N	ame		Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refe ence			
	2	Reference plier Selec Allocations	tion Signal		0000 hex to 00FF hex	-	0088 hex	All	After restart	Setup	page 5-4			
	1		/GEAR1 (	Refe	Reference Pulse Multiplier Selection 1) Signal Allocation									
			0		ive when CN1-	•	,	•						
			1	Act	ive when CN1-	41 input s	signal is ON	V (closed).						
			2	Act	ive when CN1-	42 input s	signal is ON	l (closed).						
			3	Act	ive when CN1-	43 input s	signal is ON	l (closed).						
			4	Act	ive when CN1-	44 input s	signal is ON	l (closed).						
			5		ive when CN1-		-							
			6	Active when CN1-46 input signal is ON (closed).										
		n.🗆🗆 X	7	The signal is always active.										
			8	The signal is always inactive. Active when CN1-40 input signal is OFF (open).										
n5DB			9 A		ive when CN1-		0	(1)						
			B		ive when CN1-	•	0	,						
			C		ive when CN1-		0							
			D				0	(1)						
			D       Active when CN1-44 input signal is OFF (open).         E       Active when CN1-45 input signal is OFF (open).											
			F Active when CN1-46 input signal is OFF (open).											
		/GEAR2 (Reference Pulse Multiplier Selection 2) Signal Allocation												
		n.DDXD	0 to F	Sar	ne as settings ocation.	•	,	•		ion 1) Sign	al			
		n.¤X¤¤	Reserved	l par	ameter (Do not	change.)								
		n.XDDD	Reserved	Inar	ameter (Do not	change )								
			1100011000	- pur		onungoly								
Pn600	2	Regenerati Capacity <sup>*4</sup>			Depends on model. <sup>*5</sup>	10 W	0	All	Immedi- ately	Setup	*1			
Pn601	2	Dynamic B tor Allowat Consumpt	ole Energy		0 to 65,535	10 J	0	All	After restart	Setup	*6			
Pn603	2	Regenerati tance	ive Resis-		0 to 65,535	10 m $\Omega$	0	All	Immedi- ately	Setup	*1			
Pn604	2	Dynamic B tance	rake Resis	3-	0 to 65,535	10 m $\Omega$	0	All	After restart	Setup	*6			
	2	Overheat F Selections	Protection		0000 hex to 0003 hex	-	0000 hex	Linear	After restart	Setup	*1			
	.		0	<b>D</b>							_			
			Overheat 0		tection Selection									
			1		able overheat p				omotor *7					
		n.🗆 🗆 🗆 X			e overheat prot nitor a negative					machino o	nd			
n61A			2	use	overheat prote	ection.	•							
			3		nitor a positive overheat prote		put from a	sensor attac	ned to the m	hachine an	d			
	[	n.🗆🗆 X 🗆	Reserved	l par	ameter (Do not	change.)								
		n.🗆X🗆 🗆	Reserved	l par	ameter (Do not	change.)								
		n.XDDD	Reserved	l par	ameter (Do not	change.)								
n61B*8	2	Overheat A	Alarm Leve	el	0 to 500	0.01 V	250	All	Immedi- ately	Setup	*1			
									Continue					

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						Con	itinued from	n previou:	s page.
Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
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 <sup>*3</sup>	-	Safety Module-Related Parameters	_	_	_	All	_	_	_

\*1. Refer to the following manual for details.

Ω 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.

Ω 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 AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Dynamic Brake Hardware Option Specifications Product Manual (Manual No.: SIEP S800001 73)

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

\*8. Enabled only when Pn61A is set to n. DDD2 or n. DDD3.

# 7.1.2 Parameter Recording Table

Parameter No.	Default Setting	Name	When Enabled
Pn000	0000 hex	Basic Function Selections 0	After restart
Pn001	0000 hex	Application Function Selec- tions 1	After restart
Pn002	0000 hex	Application Function Selec- tions 2	After restart
Pn006	0002 hex	Application Function Selec- tions 6	Immediately
Pn007	0000 hex	Application Function Selec- tions 7	Immediately
Pn008	0000 hex	Application Function Selec- tions 8	After restart
Pn009	0010 hex	Application Function Selec- tions 9	After restart
Pn00A	0001 hex	Application Function Selec- tions A	After restart
Pn00B	0000 hex	Application Function Selec- tions B	After restart
Pn00C	0000 hex	Application Function Selec- tions C	After restart
Pn00D	0000 hex	Application Function Selec- tions D	After restart
Pn00F	0000 hex	Application Function Selec- tions F	After restart
Pn010	0001 hex	Axis Address Selection for UART/USB Communica- tions	After restart
Pn021	0000 hex	Reserved parameter	_
Pn022	0000 hex	Reserved parameter	_
Pn040	0000 hex	Reserved parameter	_
Pn080	0000 hex	Application Function Selec- tions 80	After restart
Pn081	0000 hex	Application Function Selec- tions 81	After restart
Pn0D4	1050 hex	Torque/Force Assistance Selections	After restart
Pn0D5	0000 hex	Reserved parameter	-
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 Inte- gral Time Constant	Immediately
Pn106	400	Second Position Loop Gain	Immediately
Pn109	0	Feedforward	Immediately
Pn10A	0	Feedforward Filter Time Constant	Immediately
Pn10B	0000 hex	Gain Application Selections	*
Pn10C	200	Mode Switching Level for Torque Reference	Immediately

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

Continued on next page.

		Continued from p	nued from previous page.	
Parameter No.	Default Setting	Name	When Enabled	
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	
Pn11F	0	Position Integral Time Con- stant	Immediately	
Pn121	100	Friction Compensation Gain	Immediately	
Pn122	100	Second Friction Compen- sation Gain	Immediately	
Pn123	0	Friction Compensation Coefficient	Immediately	
Pn124	0	Friction Compensation Fre- quency 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	0000 hex	Automatic Gain Switching Selections 1	Immediately	
Pn13D	2000	Current Gain Level	Immediately	
Pn140	0100 hex	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 Direc- tion	Immediately	
Pn144	1000	Model Following Control Bias in the Reverse Direc- tion	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	0021 hex	Control-Related Selections	After restart	
Pn160	0010 hex	Anti-Resonance Control- Related Selections	Immediately	

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Parameter No.	Default Setting	Name	When Enabled
Pn161	1000	Anti-Resonance Frequency	Immediately
Pn162	100	Anti-Resonance Gain Cor- rection	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	1401 hex	Tuning-less Function- Related Selections	*
Pn181	0	Mode Switching Level for Speed Reference	Immediately
Pn182	0	Mode Switching Level for Acceleration	Immediately
Pn200	0000 hex	Position Control Reference For Selections	After restart
Pn205	65535	Multiturn Limit	After restart
Pn207	0010 hex	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 Acceler- ation/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 Mul- tiplier	Immediately
Pn22A	0000 hex	Fully-closed Control Selec- tions	After restart
Pn281	20	Encoder Output Resolution	After restart
Pn282	0	Linear Encoder Scale Pitch	After restart
Pn2E0	1	Reference Pulse Multiplier 1	Immediately
Pn2E2	1	Reference Pulse Multiplier 2	Immediately
Pn2E4	1	Reference Pulse Multiplier 3	Immediately
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

Parameter Lists

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_	Continued from previ		
Parameter No.	Default Setting	Name	When Enabled
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 Aver- age Movement Time	Immediately
Pn310	0000 hex	Vibration Detection Selec- tions	Immediately
Pn311	100	Vibration Detection Sensi- tivity	Immediately
Pn312	50	Vibration Detection Level	Immediately
Pn316	10000	Maximum Motor Speed	After restart
Pn324	300	Moment of Inertia Calcula- tion 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	0000 hex	Torque-Related Function Selections	*
Pn409	5000	First Stage Notch Filter Fre- quency	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 Fre- quency	Immediately

Continued from previous page.

Continued from previous page.

_	Continued from previous page.			
Parameter No.	Default Setting	Name When Enabled		
Pn410	50	Second Stage Second Torque Reference Filter Q Immediately Value		
Pn412	100	First Stage Second Torque Reference Filter Time Con- Immediately stant		
Pn415	0	T-REF Filter Time Constant Immediately		
Pn416	0000 hex	Torque-Related Function Selections 2         Immediately		
Pn417	5000	Third Stage Notch Filter Immediately Frequency		
Pn418	70	Third Stage Notch Filter Q Value		
Pn419	0	Third Stage Notch Filter Immediately Depth		
Pn41A	5000	Fourth Stage Notch Filter Immediately Frequency		
Pn41B	70	Fourth Stage Notch Filter Q Value		
Pn41C	0	Fourth Stage Notch Filter Immediately		
Pn41D	5000	Fifth Stage Notch Filter Fre- quency		
Pn41E	70	Fifth Stage Notch Filter Q Value Immediately		
Pn41F	0	Fifth Stage Notch Filter Immediately		
Pn423	0000 hex	* Speed Ripple Compensa- tion Selections		
Pn424	50	Torque Limit at Main Circuit Voltage Drop		
Pn425	100	Release Time for Torque Limit at Main Circuit Voltage Immediately Drop		
Pn426	0	Torque Feedforward Aver- age Movement TimeImmediately		
Pn427	0	Speed Ripple Compensa- tion Enable Speed Immediately		
Pn428	100	Torque/Force Assistance Immediately Rate		
Pn456	15	Sweep Torque Reference Amplitude Immediately		
Pn460	0101 hex	Notch Filter Adjustment         Immediately           Selections 1         Immediately		
Pn475	0000 hex	Gravity Compensation- Related Selections After restart		
Pn476	0	Gravity Compensation Torque Immediately		
Pn480	10000	Speed Limit during Force Immediately		
Pn481	400	Polarity Detection Speed Immediately		
Pn482	3000	Polarity Detection Speed Loop Integral Time Con- Immediately stant		
Pn483	30	Forward Force Limit Immediately		

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	Continued from previous p		
Parameter No.	Default Setting	Name	When Enabled
Pn484	30	Reverse Force Limit	Immediately
Pn485	20	Polarity Detection Refer- ence Speed	Immediately
Pn486	25	Polarity Detection Refer- ence Acceleration/Deceler- ation Time	Immediately
Pn487	0	Polarity Detection Con- stant 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 Confir- mation Force Reference	Immediately
Pn498	10	Polarity Detection Allowable Error Range	Immediately
Pn49F	0	Speed Ripple Compensa- tion Enable Speed	Immediately
Pn501	10	Zero Clamping Level	Immediately
Pn502	20	Rotation Detection Level	Immediately
Pn503	10	Speed Coincidence Detec- tion 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 Interrup- tion Hold Time	Immediately
Pn50A	2100 hex	Input Signal Selections 1	After restart
Pn50B	6543 hex	Input Signal Selections 2	After restart
Pn50C	8888 hex	Input Signal Selections 3	After restart
Pn50D	8888 hex	Input Signal Selections 4	After restart
Pn50E	3211 hex	Output Signal Selections 1	After restart
Pn50F	0000 hex	Output Signal Selections 2	After restart
Pn510	0000 hex	Output Signal Selections 3	After restart
Pn512	0000 hex	Output Signal Inverse Set- tings	After restart
Pn513	0000 hex	Output Signal Inverse Set- tings 2	After restart
Pn514	0000 hex	Output Signal Selections 4	After restart
Pn515	8888 hex	Input Signal Selections 6	After restart
Pn516	8888 hex	Input Signal Selections 7	After restart
Pn517	0654 hex	Output Signal Selections 5	After restart
Pn51B	1000	Motor-Load Position Devia- tion Overflow Detection Level	Immediately
Pn51E	100	Position Deviation Over- flow Warning Level	Immediately
Pn520	5242880	Position Deviation Over- flow Alarm Level	Immediately

Continued from previous page.

Continued from previous page.

Parameter		Continued from p	When
No.	Default Setting	Name	Enabled
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
Pn52F	0FFF hex	Monitor Display at Startup	Immediately
Pn530	0000 hex	Program Jogging-Related Selections	Immediately
Pn531	32768	Program Jogging Travel Distance	Immediately
Pn533	500	Program Jogging Move- ment Speed	Immediately
Pn534	100	Program Jogging Accelera- tion/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 Moni- tor Unit Time	Immediately
Pn560	400	Residual Vibration Detec- tion Width	Immediately
Pn561	100	Overshoot Detection Level	Immediately
Pn580	10	Zero Clamping Level	Immediately
Pn581	20	Zero Speed Level	Immediately
Pn582	10	Speed Coincidence Detec- tion 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 Move- ment Speed	Immediately
Pn586	0	Motor Running Cooling Ratio	Immediately
Pn5DB	0088	Reference Pulse Multiplier Selection Signal Allocations	After restart

Parameter Lists

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#### Continued from previous page. Parameter When **Default Setting** Name No. Enabled **Regenerative Resistor** Pn600 0 Immediately Capacity Dynamic Brake Resistor Pn601 0 Allowable Energy Con-After restart sumption Pn603 0 Regenerative Resistance Immediately Pn604 0 Dynamic Brake Resistance After restart Overheat Protection Selec-Pn61A 0000 hex After restart tions Pn61B 250 Overheat Alarm Level Immediately Pn61C 100 Overheat Warning Level Immediately Pn61D 0 Overheat Alarm Filter Time Immediately

\* The enable timing depends on the digit that is changed. Refer to the following section for details.

### 7-44

Indicates when a change to the

"After restart" indicates parameters

that will be effective after one of the

 The power supply is turned OFF and ON again.

• The CONFIG command is sent.

A software reset is executed.

parameter will be effective.

following is executed.

# 7.2 MECHATROLINK-III Communications Reference SERVOPACK with FT77 Specification

# 7.2.1 List of Servo Parameters

# 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.

Parameter No.	Size	Ν	lame	Setting Range	Setting Unit	Default Setting	Applica- ble Motors	Whr n Enabled	Classi- fication	Refer- ence				
	2	Basic Funct	ion Selections (	0000 hex to 10B1 hex	-	0000 hex	All	After restart	Setup	_				
		Rotar inform • To	y Servomotor an nation is provide p row: For Rota ottom row: For L		notor,	• S • T	etup uning εr to the follov Σ-7 Series Σ MECHATRO	wing two class ving manual for -7S SERVOPA LINK-III Comn duct Manual (N	details. CK with runication					
			Movement D	rection Selecti	on									
			Use	Use CCW as the forward direction.										
Pn000 M3		n.🗆 🗆 🗆 X	0 Use tion	the direction in	n which the	e linear enc	oder counts	up as the for	ward dire	C-				
				CW as the for	ward direc	tion. (Rever	se Rotation	Mode)						
	_		1 Use	the direction in	n which the	e linear enc \Mode)	oder counts	down as the	forward					
Symbols	s are	provided wher	n a parameter is	valid only for a sp	ecific profile									
• <u>M2</u> • <u>M3</u>			,	ATROLINK-II-compa ATROLINK-III standa		e./								
	_				· · · · ·									
			Rotary/Linear	Servomotor Sta	artup Selec	tion When E	Encoder Is N	ot Connected						
		n.XOOO	0 Wh	en an encoder or.	is not conr	nected, star	t as SERVO	PACK for Rot	ary Servo	-				
			1 Wh tor.	en an encoder i	s not conr	ected, star	t as SERVO	PACK for Line	ar Servor	no-				

## **List of Servo Parameters**

The following table lists the parameters.

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

Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence					
	2	Basic Functions 0	tion Selec-	0000 hex to 10B1 hex	-	0000 hex	All	After restart	Setup	*1					
			Rotation D	irection Selectio	n										
			Movement	Direction Select	ion										
				Jse CCW as the f	orward dir	ection.									
		n.🗆 🗆 🗆 X		Ise the direction i on.	n which th	ne linear er	ncoder counts	s up as the fo	orward dire	€C-					
				Jse CW as the for		(		,							
Pn000			<sup>1</sup> Use the direction in which the linear encoder counts down as the forw direction. (Reverse Movement Mode)												
		n. DDXD Reserved parameter (Do not change.)													
		n.🗆X🗆 🗆	Reserved p	parameter (Do no	ot change.	.)									
	n.XDDD 0 When an encoder is not connected, start as SERVOPACK for Rotary Service of the start as Service of the start as SERVOPACK for Rotary Service of the start as Service of the start														
				Vhen an encoder or.	is not con	nected, sta	art as SERVO	PACK for Lir	iear Servo	mo-					
	2	Application Selections		0000 hex to 1142 hex	-	0000 hex	All	After restart	Setup	*1					
	Ī	Motor Stopping Method for Servo OFF and Group 1 Alarms													
			INDIOLOL 210h	oping Method for	Servo OF	FF and Gro	oup 1 Alarms								
				Stop the motor k			•								
		n.□□□X	0		by applying	g the dyna	mic brake.	then release	e the dyna	mic					
		n.000X	0	Stop the motor k Stop the motor k	by applying by the appl	g the dynai lying dynar	mic brake. mic brake and		e the dyna	mic					
	-	n.000X	0	Stop the motor k Stop the motor k brake.	by applying by the appl to a stop	g the dynai lying dynar	mic brake. mic brake and		e the dyna	mic					
	-	n.□□□X	0 1 2 Overtravel	Stop the motor k Stop the motor k brake. Coast the motor	by applying by the appl to a stop d b brake or	g the dyna lying dynar without the coast the	mic brake. nic brake and e dynamic bra	ike.	-	mic					
	-	n.□□□X	0 1 2 Overtravel 0 A m 1 D	Stop the motor k Stop the motor k brake. Coast the motor Stopping Metho	by applying by the appl to a stop d brake or 01 = n.□I tor to a st	g the dynai lying dynar without the coast the DDX). op using th	mic brake. nic brake and e dynamic bra motor to a sto	ake. op (use the s	topping						
Pn001		n.□□□X	0 1 2 Overtravel 0 A m 1 C to 2 C	Stop the motor k Stop the motor k brake. Coast the motor Stopping Metho pply the dynamic bethod set in PnC Decelerate the mo	by applying by the appl to a stop d brake or 01 = n.□I tor to a st ervo-lock t tor to a st	g the dynam lying dynam without the coast the DIX). op using the the motor. op using the	mic brake. mic brake and e dynamic bra motor to a sto ne torque set i	ake. op (use the s in Pn406 as	topping the maxim	num					
Pn001			0       1       2       Overtravel       0       1       2       1       2       2       1       2       1       2       1       2       1       2       3	Stop the motor to Stop the motor to brake. Coast the motor Stopping Metho poly the dynamic bethod set in PhO Decelerate the mo porque and then so Decelerate the mo	by applying by the applying to a stop d brake or 101 = n. tor to a st ervo-lock to tor to a st tor to a st tor to a st	g the dynam lying dynam without the coast th	mic brake. mic brake and e dynamic bra motor to a sto ne torque set i ne torque set i	ake. op (use the s in Pn406 as in Pn406 as	topping the maxim the maxim	num					
Pn001			0 1 2 Overtravel 0 A m 1 C to 2 C to 3 C to 4 C	Stop the motor to Stop the motor to brake. Coast the motor Stopping Metho poly the dynamic nethod set in PhO Decelerate the mo proque and then is Decelerate the mo proque and then is Decelerate the mo	by applying by the applying by the applying to a stop brake or 101 = n. tor to a st tor to a st tor to a st tor to a st t the moto tor to a st e motor.	g the dynam lying dynam without the coast the r Coast	mic brake. mic brake and e dynamic bra motor to a sto ne torque set i ne torque set i he deceleratio	ake. op (use the s in Pn406 as in Pn406 as on time set ir	topping the maxim the maxim n Pn30A an	num					
Pn001			0       1       2       Overtravel       0       1       2       1       2       1       2       3       4	Stop the motor to Stop the motor to brake. Coast the motor Stopping Metho poly the dynamic bethod set in PhO Decelerate the mo- porque and then se Decelerate the mo- porque and then le Decelerate the mo- porque and then le Decelerate the mo- porque and the mo-	by applying by the applying by the applying to a stop brake or $01 = n. \Box I$ tor to a st tor to a st tor to a st tor to a st tor to a st e motor.	g the dynam lying dynar without the coast the DIX). op using the motor. op using the op using the op using the	mic brake. mic brake and e dynamic bra motor to a sto me torque set i ne torque set i he deceleratio	ake. op (use the s in Pn406 as in Pn406 as on time set ir	topping the maxim the maxim n Pn30A an	num					
Pn001		n.□□X□	0       1       2       Overtravel       0       1       2       1       2       3       4       0       1       1       1       2       1   <	Stop the motor to Stop the motor to brake. Coast the motor Stopping Metho poly the dynamic nethod set in PnC Decelerate the mo- proque and then so Decelerate the mo- proque and then le Decelerate the mo- proque and then le Decelerate the mo- proque and then le Decelerate the mo- programma the mo- pr	to a stop to a stop d brake or 101 = n. tor to a st ervo-lock to tor to a st tor to a st tor to a st tor to a st e motor. tor to a st coast. AC/DC In s the main	g the dynam lying dynam without the coast the motor. op using the motor. op using the op using t	mic brake. mic brake and e dynamic bra motor to a sto ne torque set i ne torque set i he deceleratio he deceleratio	ake. op (use the s in Pn406 as in Pn406 as on time set in on time set in	topping the maxim the maxim n Pn30A an	num num nd					
Pn001			012Overtravel0122234401111	Stop the motor to Stop the motor to brake. Coast the motor Stopping Metho poly the dynamic nethod set in PhO Decelerate the mo- progue and then is Decelerate the mo- progue and then le Decelerate the mo- progue and the mo-	by applying by the applying by the applying by the applying to a stop c brake or 101 = n. tor to a st tor to a st e motor. tor to a st coast. AC/DC In s the main e shared co s the main	g the dynamic of the	mic brake. mic brake and e dynamic bra motor to a sto me torque set i ne torque set i ne deceleration he deceleration wer supply us wer supply us	ake. op (use the s in Pn406 as in Pn406 as on time set ir on time set ir ing the L1, L	topping the maxim the maxim n Pn30A an n Pn30A an 2, and L3 ⊕ and ⊖	num num nd ter-					
Pn001		n.□□X□	0       1       2       0     A       0     A       1     C       2     C       3     C       4     C       Main Circu     0       0     Ir       1     Ir       1     Ir       1     Ir       1     Ir       1     Ir       1     Ir	Stop the motor to Stop the motor to Stop the motor to brake. Coast the motor Stopping Metho poly the dynamic nethod set in PnC becelerate the mo- proque and then so becelerate the mo- proque and then le becelerate the mo- progue and the mo-	by applying by the applying to a stop tor to a st e motor. tor to a st e motor. tor to a st coast. <b>AC/DC In</b> is the main by shared co is the main and $\bigcirc$ 2	g the dynam lying dynam without the coast the m mathematic op using the op using th	mic brake. mic brake and e dynamic bra motor to a sto me torque set i ne torque set i ne deceleration he deceleration wer supply us wer supply us	ake. op (use the s in Pn406 as in Pn406 as on time set ir on time set ir ing the L1, L	topping the maxim the maxim n Pn30A an n Pn30A an 2, and L3 ⊕ and ⊖	num num nd ter-					

Parameter No.	Size	N	NameSetting RangeSetting UnitDefault SettingApplicableWhen 								Refer ence		
	2	2Application Function Selections 20000 hex to 4213 hex-0011 hex-After 								Setup	*1		
		n.000X	0 1 2 3 Torque C 0	ROLINK Cor Reserved se Use TLIM as Reserved se Use P_TLIM in the OPTIC control Optio Reserved se	Applicat Motors All Applicat Motors	ble							
Pn002			1         Use the speed limit for torque control (VLIM) as the speed limit.           Encoder Usage										
		n.¤X¤¤	0 1 2	Use the end Use the end Use the end	oder a	mental en	S.	- All Rotary					
			External	Encoder Usa	age					Applicat Motors			
			0	Do not use	an ext	ernal encc	der.				_		
		n.XDDD	1	The externa motor rotati		der moves	s in the for	ward directior	n for CCW				
			2	Reserved se	etting (	Do not us	e.)			Rotary			
			3	The externa motor rotati		der moves	s in the rev	erse direction	for CCW				
			4	Reserved se	ttina (	'Do not us	e)						

Continued on next page.

Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer ence				
	2	Application Selections		0000 hex to 105F hex	-	0002 hex	All	Immedi- ately	Setup	*1				
			Analog Mo	nitor 1 Signal Se	election									
			00	Motor speed (1	V/1,000 m	nin <sup>-1</sup> )								
				Motor speed (1 V/1,000 mm/s)										
			01	Speed reference	e (1 V/1,00	00 min⁻¹)								
				Speed reference (1 V/1,000 mm/s)										
			02	Torque reference	e (1 V/100	% rated to	rque)							
				Force reference			,							
			03	Position deviation			,							
			0.1	Position amplifie			0,1			unit)				
			04	Position amplifie pulse unit)	er deviation	n (after ele	ctronic gear) (	0.05 V/linea	r encoder					
			05	Position reference	ce speed (	d (1 V/1,000 min <sup>-1</sup> )								
				Position reference	ce speed (	1 V/1,000	mm/s)							
			06	Reserved setting (Do not use.)										
n006		n.🗆🗆 XX	07	Load-motor position deviation (0.01 V/reference unit)										
			08	Positioning completion (positioning completed: 5 V, positioning not completed: 0 V)										
			09	Speed feedforw	ard (1 V/1	,000 min <sup>-1</sup> )								
				Speed feedforw	ard (1 V/1	,000 mm/s	:)							
			0A	Torque feedforw	ard (1 V/1	00% rated	torque)							
				Force feedforwa	rd (1 V/10	0% rated	orce)							
			0B	Active gain (1st	-									
			0C	Completion of p pleted: 0 V)	osition ref	erence dis	tribution (com	pleted: 5 V,	not com-					
			0D	External encode	r speed (1	V/1,000 r	nin <sup>-1</sup> : value at	the motor s	shaft)					
			0E	Reserved setting	g (Do not i	use.)								
			OF	Reserved setting	g (Do not i	use.)								
			10	Main circuit DC	voltage									
			11 to 5F	Reserved setting	gs (Do not	use.)								
		n.🗆X🗆	Reserved	parameter (Do no	ot change	)								
		n.XDDD	Reserved	parameter (Do no	t change	)								
	-													

Continued from previous page.

Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	tinued fror When Enabled	Classi- fication	Refe									
	2	Application Selections	Function 7	0000 hex to 105F hex	-	0000 hex	All	Immedi- ately	Setup	*1									
			Analog Mo	onitor 2 Signal Se	election														
			00	Motor speed (1 Motor speed (1		,													
			01	Speed reference															
			00	Speed reference Torque reference		,	rque)												
			02	Force reference Position deviation			,												
			04	Position amplifie Position amplifie			0,1		•	unit)									
				pulse unit) Position reference															
			05	Position reference Reserved setting			mm/s)												
		n.□□XX	06		5 (	,	\//roforor	nit)											
Pn007		/	07	Load-motor pos Positioning com pleted: 0 V)					g not com										
			09	Speed feedforw		, ,													
				Speed feedforward (1 V/1,000 mm/s) Torque feedforward (1 V/100% rated torque)															
				Force feedforwa	rd (1 V/10	0% rated	force)												
			0B	Active gain (1st	gain: 1 V,	2nd gain: 2	2 V)												
			0C	Completion of position reference distribution (completed: 5 V, not completed: 0 V) External encoder speed (1 V/1,000 min <sup>-1</sup> : value at the motor shaft)															
			0D																
			0E	Reserved setting	g (Do not ι	use.)													
			OF	Reserved setting (Do not use.)         Main circuit DC voltage															
			10																
			11 to 5F																
		n.¤X¤¤	Reserved	parameter (Do no	ot change.	.)													
		n.XDDD	Reserved	parameter (Do no	ot change.	.)													
	2	Application Selections	n Function 8	0000 hex to 7121 hex	-	4000 hex	Rotary	After restart	Setup	*1									
				N/ 1/ A1		<u> </u>				_									
				ry Voltage Alarm															
			0Output alarm (A.830) for low battery voltage.1Output warning (A.930) for low battery voltage.																
		n.000X		1 (	.930) for l	ow battery	voltage.			Function Selection for Undervoltage									
		n.DDDX	1 (	Dutput warning (A	·	ow battery	voltage.												
		n.□□□X	1 ( Function S	Dutput warning (A	ervoltage	-	voltage.												
Pn008		n.000X	1 ( Function S 0 [	Dutput warning (A	ervoltage lervoltage.	-	-	st controller.											
Pn008			1 ( Function S 0 [ 1 [ 0 [	Dutput warning (A Selection for Und Do not detect unc	ervoltage lervoltage. ge warning	g and limit	torque at hos		1425 (i.e., d	only									
Pn008			1         0           0         0           1         0           2         1	Dutput warning (A Selection for Und Do not detect unc Detect undervolta Detect undervolta	ervoltage lervoltage. ge warning ge warning	g and limit	torque at hos		1425 (i.e., c	only									
Pn008			1         0           0         0           1         0           2         1	Dutput warning (A Selection for Und Do not detect unc Detect undervolta Detect undervolta n SERVOPACK).	ervoltage lervoltage. ge warning ge warning	g and limit	torque at hos		1425 (i.e., d	only									
Pn008		n.□□X□	1CFunction S01212Warning D	Dutput warning (A Selection for Und Do not detect unc Detect undervolta Detect undervolta n SERVOPACK).	ervoltage lervoltage. ge warning ge warning n	g and limit g and limit	torque at hos torque with P		1425 (i.e., c	only									

							Con	itinued fron	n previou	s page	
Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence	
	2	Application Selections		0000 hex to 0121 hex	-	0010	All	After	Tuning	*1	
		Selections	9	UTZTHEX		hex		restart			
			Deservedues	enter (De re		N					
		n.🗆 🗆 🗆 X	Reserved par	rameter (Do no	t change.	)					
			Current Cont	rol Mode Sele	ction						
				e current contro							
		n.DDXD	ar	ERVOPACK Mo nd -7R6A: Use				a, -2R8A, -3	R8A, -5R5	ōA,	
Pn009			• SI	ERVOPACK Mo 90A, and -780A	dels SGD	7S-120A,	-180A, -200A	, -330A, -47	0A, -550A	<b>\</b> , -	
			2 Use	e current contro	l mode 2.						
			Speed Detec	tion Method S	election						
		n.¤X¤¤	· ·	e speed detecti							
				e speed detecti							
	i i	n.X000	Deserved new	remeter (De ne	tabanaa	N					
			neserveu par	rameter (Do no	n change.	)					
	-	Application	n Function	0000 hex to		0001		After			
	2	Selections		1044 hex	-	hex	All	restart	Setup	*1	
			Motor Stopp	ing Method fo	r Group 2	Alarms					
				ply the dynami ethod set in Pn			motor to a st	op (use the s	stopping		
			tor	celerate the mo que. Use the s	etting of P	n001 = n. <b>I</b>	□□□X for the	e status after	stopping		
		n.□□□X	<sup>2</sup> tor	2 Decelerate the motor to a stop using the torque set in Pn406 as the maximum torque and then let the motor coast.							
			3 the	celerate the me setting of PnC	01 = n. <b>□</b> I	⊐⊡X for th	ne status after	stopping.			
				celerate the me on let the motor		top using t	the deceleration	on time set i	n Pn30A a	and	
Pn00A			Stopping Me	ethod for Force	ed Stops						
			0 Ap	ply the dynami thod set in Pn	c brake or 001 = n. <b>□</b>	coast the □□X).	motor to a st	op (use the s	stopping		
				celerate the mo que. Use the s							
		n.□□X□		celerate the mo que and then le			he torque set	in Pn406 as	the maxir	num	
				celerate the me setting of PnC					n Pn30A.	Use	
				celerate the me on let the motor		top using t	the deceleration	on time set i	n Pn30A a	and	
		n.¤X¤¤	Reserved pa	rameter (Do n	ot change	.)					
		n.XDDD	Reserved pa	rameter (Do n	ot change	.)					
					U	,					

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							Cor	ntinued fron	n previous	s page		
Parameter No.	Size	Ν	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer ence		
	2	Application Selections	n Function B	0000 hex to 1121 hex	-	0000 hex	All	After restart	Setup	*1		
	1		Operator Par	ameter Display	Selectior	ı						
		n.🗆 🗆 🗆 X	-	play only setup								
			1 Dis	play all paramet	ters.							
			Motor Stopp	ing Method for	Group 2	Alarms						
			0 Sto	op the motor by	setting th	e speed re	ference to 0.					
Pn00B		n.🗆 🗆 X 🗆	1 Ap	ply the dynamic thod set in Pn0	brake or	coast the r	notor to a sto	op (use the s	topping			
				t the stopping n			n. <b>DDD</b> X.					
	-									_		
		n.OXOO		Selection for T			PACK					
				e a three-phase e a three-phase			as a single-pl	nase power :	supply inpu	ut.		
		n.XDDD					0 1		11,7,1			
	-		Reserved pa	rameter (Do no	t cnange.)							
		Applicatio	n Eurotion	0000 hex to		0000		After				
	2	Selections		0131 hex	-	hex	-	restart	Setup	*1		
			Function Se	lection for Test	without a	Motor			Applicat			
		n.🗆 🗆 🗆 X	0 Dis	sable tests with	out a moto	or			Motors	5		
			1 En	All								
					Applicat							
			Encoder Res		Motors							
Pn00C		n.□□X□	0 Us	e 13 bits.								
FILLOC				Rotar								
				e 22 bits.								
			3 Us	se 24 bits.								
			Encoder Typ	e Selection for	Tests wit	hout a Mo	tor		Applicat Motors			
		n.¤X¤¤	0 Us	e an incrementa	al encoder					3		
			1 Us	e an absolute e	ncoder.				All			
		n.XDDD	Reserved na	arameter (Do no	ot change	)						
		11.7000	neserved pe		or change	·)						
		Applicatio	n Function	0000 hex to		0000		After				
	2	Selections		1001 hex	-	hex	All	restart	Setup	*1		
		n.🗆 🗆 🗆 X	Reserved pa	arameter (Do no	ot change	.)						
		n.🗆 🗆 X 🗆	Reserved pa	arameter (Do no	ot change	.)						
Pn00D			December of the	, ,		, ,						
		n.¤X¤¤	Reserved pa	arameter (Do no	or change.							
				Varning Detecti								
		n.XDDD	0 Do	not detect ove		rnings.						
			1 De	etect overtravel								

Parameter Lists

							Con	tinued fron	n previou	s page				
Parameter No.	Size		Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence				
	2	Application Selection	on Function Is F	0000 hex to 2011 hex	-	0000 hex	All	After restart	Setup	*1				
Pn00F		n.000X	0 D	ve Maintenance	entative m	aintenance								
111001		n.00X0	Reserved	parameter (Do no	ot change	.)								
	I	n.🗆X🗆	Reserved	Reserved parameter (Do not change.)										
		n.XDDD	Reserved	parameter (Do no	ot change	)								
Pn021	2	Reserved not chan	l parameter (E ge.)	00 _	-	0000 hex	All	_	_	_				
Pn022	2	Reserved not chan	l parameter (E ge.)	All	-	-	-							
	2	Σ-V Com tion Swite	patible Func- ch	0000 hex to 2111 hex	-	0000 hex	-	After restart	Setup	-				
	n.	000X	0 Pe	tions Interface C erform Σ-7 commu erform Σ-V commu	unications.		on		Applica Moto					
Pn040					olution Compatibility Selection									
	n.		-1 Us	Use the encoder resolution of the connected motor. Use a resolution of 20 bits when connected to an SGM7J, SGM7A, SGM7P, or SGM7G Servomotor.										
	n.		Reserved pa	arameter (Do not	change.)									
	n.	XOOO	Reserved pa	arameter (Do not	change.)									
	2	Application Selection	on Function Is 80	0000 hex to 1111 hex	-	0000 hex	Linear	After restart	Setup	*1				
	1	n.000X	0 1	nsor Selection Jse polarity senso Do not use polarity										
Pn080	-	n.00X0	0 5	se Sequence Sel Set a phase-A lead	d as a pha									
	1 Set a phase-B lead as a phase sequence of							d W.						
		n.0X00		parameter (Do no	0,									
	1	n.X000	0 0	Method for Max Calculate the enco Calculate the maxi	der outpu	t pulse set	ting for a fixed	d maximum :						
								Continue						

Continued from previous page.

									tinued fron	n previou	s page.			
Parameter No.	Size		ame		Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence			
	2	Application Selections	Function 81		0000 hex to 1111 hex	_	0000 hex	All	After restart	Setup	*1			
			Phase-C I	Puls	e Output Sele	ection								
		n.🗆🗆 🛛 X			out phase-C p	,								
Pn081			1	Outp	out phase-C p	ulses in bo	oth the for	ward and reve	erse directio	ns.				
		n.🗆 🗆 X 🗆	Reserved	para	ameter (Do no	ot change.	)							
		n.¤X¤¤	Reserved	para	ameter (Do no	ot change.	)							
		n.XDDD	Reserved	para	ameter (Do no	ot change.	)							
		Torque/For	ce Assis-		0000 hex to		1050	A.II.	After	Catur	page			
	2	tance Selec			3155 hex	-	hex	All	restart	Setup	page 4-9			
			Torque/Fc	orce	Assistance M	lode Selec	ction							
			- · · ·		ble torque/for									
			1	Rese	erved setting (	Do not us	e.)							
		n.🗆 🗆 🗆 X	2	Rese	erved setting (	Do not us	e.)							
Pn0D4				<ul> <li>Use the SERVOPACK to control a drive axis.</li> <li>Use the SERVOPACK to control an auxiliary axis.</li> </ul>										
			5											
		n.🗆🗆 X 🗆	Reserved	d parameter (Do not change.)										
			Torque/Fo	orce	Assistance O	utput Pola	arity Selec	tion						
		n.¤X¤¤			not reverse the	. ,								
			1	Reve	erse the polari	ty.								
		n.XDDD	Reserved	para	ameter (Do no	ot change.	)							
		Deserved					00000							
Pn0D5	2	Reserved p (Do not cha	ange.)		_	-	00000 hex	All	_	-	-			
Pn100	2	Speed Loo	p Gain		10 to 20,000	0.1 Hz	400	All	Immedi- ately	Tuning	*1			
Pn101	2	Speed Loo Time Cons			15 to 51,200	0.01 ms	2000	All	Immedi- ately	Tuning	*1			
Pn102	2	Position Lo	op Gain		10 to 20,000	0.1/s	400	All	Immedi- ately	Tuning	*1			
Pn103	2	Moment of	Inertia Rati	io	0 to 20,000	1%	100	All	Immedi- ately	Tuning	*1			
Pn104	2	Second Sp Gain	eed Loop		10 to 20,000	0.1 Hz	400	All	Immedi- ately	Tuning	*1			
		Gain Second Speed Loop Integral Time Constant			15 += 51 000	0.01 ms	2000	All	Immedi- ately	Tuning	*1			
Pn105	2			ıt	15 to 51,200				atory					
Pn105 Pn106	2		ne Constan	ιι \	10 to 20,000	0.1/s	400	All	Immedi- ately	Tuning	*1			
		Integral Tin Second Po	ne Constan sition Loop	ιι \		0.1/s 1%	400 0	All	Immedi-	Tuning Tuning	*1			

Continued on next page.

Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
	2	Gain Applie tions	cation Selec	- 0000 hex to 5334 hex	-	0000 hex	All	-	Setup	*1		
			Mode Swi	tching Selection					Whe Enab			
				Jse the internal to Pn10C).	orque refer	ence as th	e condition (le	evel setting:				
			1 ⊢	Jse the speed ref								
		n.DDDX			e the speed reference as the condition (level setting: Pn181). e the acceleration reference as the condition (level setting:							
			2	Pn10E). Use the acceleration	10E). the acceleration reference as the condition (level setting: 182).							
Pn10B				Jse the position o	tting: Pn10F)							
			4 [	Do not use mode	switching.							
			Speed Loo	Speed Loop Control Method								
		n.🗆 🗆 X 🗆	0	PI control					Afte	r		
			2 and 3									
		n.🗆X🗆 🗆	Reserved	parameter (Do no	ot change	.)						
	n.XDDD Reserved parameter (Do not change.)											
				· · · · · · · · · · · · · · · · · · ·		,						
Pn10C	2	Mode Swit for Torque	ching Level Reference	0 to 800	1%	200	All	Immedi- ately	Tuning	*1		
Pn10D	2	Mode Swit for Speed	ching Level Reference	0 to 10,000	1 min <sup>-1</sup>	0	Rotary	Immedi- ately	Tuning	*1		
Pn10E	2	Mode Swit for Acceler	ching Level ation	0 to 30,000	1 min <sup>-1</sup> /s	0	Rotary	Immedi- ately	Tuning	*1		
Pn10F	2	Mode Swit for Positior	ching Level Deviation	0 to 10,000	1 refer- ence unit	0	All	Immedi- ately	Tuning	*1		
Pn11F	2	Position Int Constant	tegral Time	0 to 50,000	0.1 ms	0	All	Immedi- ately	Tuning	*1		
Pn121	2	Friction Co Gain	mpensation	10 to 1,000	1%	100	All	Immedi- ately	Tuning	*1		
Pn122	2	Second Fri	ction Com- Gain	10 to 1,000	1%	100	All	Immedi- ately	Tuning	*1		
Pn123	2	Friction Co Coefficient	mpensation	0 to 100	1%	0	All	Immedi- ately	Tuning	*1		
Pn124	2	Friction Co Frequency	mpensation Correction	-10,000 to 10,000	0.1 Hz	0	All	Immedi- ately	Tuning	*1		
Pn125	2	Friction Co Gain Corre	mpensation ction	1 to 1,000	1%	100	All	Immedi- ately	Tuning	*1		
Pn131	2	Gain Switc	hing Time 1	0 to 65,535	1 ms	0	All	Immedi- ately	Tuning	*1		
Pn132	2	Gain Switc	hing Time 2	0 to 65,535	1 ms	0	All	Immedi- ately	Tuning	*1		
Pn135	2	Gain Switc Time 1	hing Waiting	0 to 65,535	1 ms	0	All	Immedi- ately	Tuning	*1		
Pn136	2	Gain Switc Time 2	hing Waiting	0 to 65,535	1 ms	0	All	Immedi- ately	Tuning	*1		

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No.         Range         Unit         Setting         Motors         Enabled         fication         encode           2         Automatic Gains Nutch- ing Salections 1         0000 here to 0052 hox         -         0000 hox         All         Immedia         Turking         1           0         User manual gain switching 1         -         0000         All         Immedia         1         -         -         0         0         -         -         0         -         -         -         0         -         -         -         0         -         -         -         0         -         -         0         -         -         -         0         -         -         -         0         -									Cor	ntinued from	n previou:	s page.
2         Instant         0052 hex         -         hex         All         ately         Inning         1           Image: Selections 1         0052 hex         -         hex         All         ately         Inning         1           Image: Selections 1         0         Use manual gain swritching output sign         1         Hey environmental gain swritching output selection 1         1         Hey environmental gain swritching output signal turns ON.         1         Hey environmental gain swritching output signal turns ON.         1         1         Hey environmental gain output signal turns ON.         1         COIN (Positioning Completion Output) signal turns ON.         1         Counce there are filter output is 0 and position reference linput is ON.         1         <	Parameter No.	Size	N	ame			•			-		Refer- ence
Pn139         Q         User manual gain switching mailing with G-SEL in the serve command output signals (SVCMD_[0, N).           1         Reserved setting (D) not use.)           1         Reserved setting (D) not use.)           2         Use automatic gain switching pattern 1.           2         The gain is switched automatically from the gain is switched automatically from the second gain to		2			ch-		-		All		Tuning	*1
Pn139         Q         User manual gain switching mailing with G-SEL in the serve command output signals (SVCMD_[0, N).           1         Reserved setting (D) not use.)           1         Reserved setting (D) not use.)           2         Use automatic gain switching pattern 1.           2         The gain is switched automatically from the gain is switched automatically from the second gain to				Gain Sw	itchi	ng Selection						
Image: Second setting (Do not use.)         Image: Second setting (Do not use.)           Image: Second setting (Do not use.)         Image: Second setting (Do not use.)         Image: Second setting (Do not use.)           Image: Second setting condition A is satisfied. The gain is switched automatically from the second gain when switching condition a is not satisfied.         Image: Second				0	The	e gain is switch	witching. ed manua	lly with G-	SEL in the se	rvo comman	d output s	ig-
Pn139         Use automatic jain 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.           Pn139         Qain Switching Condition A 0         COUN (Positioning Completion Output) signal turns ON. 1         Count (Positioning Completion Output) signal turns OFF. 1         Count (Positioning Control Solution (Position (P			n.🗆 🗆 🗆 X	1		. = ,	Do not us	e.)				
Model Following Control Selection           Image: space of the second s				2	The swi	e gain is switch tching conditio	ed automa n A is sati	atically fron sfied. The	n the first gair gain is switch	ed automati	cally from	
n.□DXD       1       /COIN (Positioning Completion Output) signal turns OFF.         2       /NEAR (Near Output) signal turns ON.         3       /NEAR (Near Output) signal turns ON.         n.DXDD       Reserved parameter (Do not change.)         n.XDD       Reserved parameter (Do not change.)         n.XDDD       Model Following Con-         1121 hex       -       0100         n.DEXD       Do not use model following control.         1       Vibration Suppression Selection         n.DDXD       0       Do not adjust vibration suppression for two specific frequency.         2       Perform vibration suppression automatically du	Pn139			Gain Sw	itchi	ng Condition A	<b>۱</b>					
N.DXD       2       NEAR (Near Output) signal turns ON.         3       /NEAR (Near Output) signal turns OFF.         4       Position reference filter output is 0 and position reference input is OFF.         5       Position reference input is ON.         n.DXDD       Reserved parameter (Do not change.)         n.XDDD       Model Following Con- 1121 hex       -       0100         1       Use model following control.       Immediately       Tuning         1       Use model following control.       -       1         1       Use model following control.       -       -         1       Use model following control.       -       -         1       Use model following control.       -       -         1       Do not use model following control.       -       -         1       Use model following control.       -       -         1       Do no				0	/CC	DIN (Positioning	g Complet	ion Output	) signal turns	ON.		
Image: Second				1			· ·	•	) signal turns	OFF.		
Image: second			n.🗆🗆 X 🗆	-			, 0					
S       Position reference input is ON.         n.DXD       Reserved parameter (Do not change.)         n.XDD       Reserved parameter (Do not change.)         2       Current Gain Level       100 to 2,000       1%       2000       All       Immedi- ately       Tuning       1         2       Model Following Con- trol-Related Selections       0000 hex to 1121 hex       0100 hex       All       Immedi- ately       Tuning       1         n.DDDX       0       Do not use model following control.       1       Use model following control.       1         1       Use model following control.       1       Use model following control.       1       Perform vibration suppression.         1       Perform vibration suppression for two specific frequency: 2       Perform vibration suppression automatically during execution of autotun- ing without a host reference, autotuning with a host reference, and custom tun- ing:         1       Adjust vibration suppression automatically during execution of autotun- ing without a host reference, autotuning with a host reference, and custom tun- ing:         1       Adjust vibration suppression automatically during execution of autotun- ing:       1       Do							, 0					
N.I.I.C.         Reserved parameter (Do not change.)           n.XIIII         Reserved parameter (Do not change.)           n.XIIII         Reserved parameter (Do not change.)           Pn13D         2         Current Gain Level         100 to 2,000         1%         2000         All         Immedi- ately         Tuning         *1           2         Model Following Con- trol-Related Selections         0000 hex to 1121 hex         -         0100         All         Immedi- ately         Tuning         *1           1         Use model following control Selection         0         Do not use model following control.         -									I position refe	rence input i	s OFF.	
NICLO         Reserved parameter (Do not change.)           Pn13D         2         Current Gain Level         100 to 2,000         1%         2000         All         Immedi- ately         Tuning         *1           2         Model Following Con- trol-Related Selections         0000 hex to 1121 hex         -         0100         All         Immedi- ately         Tuning         *1           1         Wodel Following Control Selection         -         0         Do not use model following control.         -         1         Use model following control.           1         Use model following control.         1         Use model following control.         -				5	Pos	sition reference	input is C	۷N.				
Pn13D         2         Current Gain Level         100 to 2,000         1%         2000         All         Immediately         Tuning         *1           2         Model Following Control Releated Selections         0100 hex to 1121 hex         -         0100         All         Immediately         Tuning         *1           n.□□□X         0         Do not use model following control.         1         Use model following control.         1         Use model following control.           n.□□DX         0         Do not use model following control.         1         Use model following control.           n.□DXD         0         Do not perform vibration suppression.         1         Perform vibration suppression for a specific frequency.         2           2         Perform vibration suppression for two specific frequencies.         1         Adjust vibration suppression automatically during execution of autotunining without a host reference, autotuning with a host reference, and custom tuning.           n.□DXD         0         Do not use model following control and speed/torque feedforward together.           1         Adjust vibration suppression automatically during execution of autotuning with- out a host reference, autotuning with a host reference, and custom tuning.           n.□DXD         0         Do not use model following control and speed/torque feedforward together.           Pn141			n.¤X¤¤	Reserve	d pai	rameter (Do no	ot change	.)				
Pn13D       2       Current Gain Level       100 to 2,000       1%       2000       All       ately       100 ing       *1         2       Model Following Con- trol-Related Selections       0000 hex to 1121 hex       -       0100       All       Immedi- ately       Tuning       *1         n.□□DXD       Model Following Control Selection       0       Do not use model following control.       - </td <td></td> <td></td> <td>n.X000</td> <td>Reserve</td> <td>d pai</td> <td>rameter (Do no</td> <td>ot change</td> <td>.)</td> <td></td> <td></td> <td></td> <td></td>			n.X000	Reserve	d pai	rameter (Do no	ot change	.)				
2       trol-Related Selections       1121 hex       -       hex       All       ately       fulning       1         n.□□□X       Model Following Control Selection       0       Do not use model following control.       1       Use model following control.         Image: Note that the second selection       0       Do not perform vibration suppression.       1       Use model following control.         Image: Note that the second selection       0       Do not perform vibration suppression.       1       Perform vibration suppression for a specific frequency.         2       Perform vibration suppression for two specific frequencies.       0       Do not adjust vibration suppression automatically during execution of autotuning with a host reference, autotuning with a host reference, and custom tuning.         Image: Number of the second s	Pn13D	2	Current Ga	in Level		100 to 2,000	1%	2000	All		Tuning	*1
Pn140       0       Do not use model following control.         1       Use model following control.         1       Use model following control.         1       Perform vibration suppression for a specific frequency.         2       Perform vibration suppression for a specific frequencies.         1       Perform vibration suppression for two specific frequencies.         1       Perform vibration suppression for two specific frequencies.         1       Perform vibration suppression automatically during execution of autotuning without a host reference, and custom tuning.         1       Adjust vibration suppression automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.         1       Adjust vibration suppression automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.         1       Adjust vibration suppression automatically during execution of autotuning.         1       Adjust vibration suppression automatically during execution of autotuning.         1       Use model following control and speed/torque feedforward together.         1       Use model following control and speed/torque feedforward together.         1       Use model following control and speed/torque feedforward together.         1       Use model following control and speed/torque feedforward together.         1		2					-		All		Tuning	*1
Pn140       0       Do not use model following control.         1       Use model following control.         1       Use model following control.         1       Perform vibration suppression for a specific frequency.         2       Perform vibration suppression for a specific frequencies.         1       Perform vibration suppression for two specific frequencies.         1       Perform vibration suppression for two specific frequencies.         1       Perform vibration suppression automatically during execution of autotuning without a host reference, and custom tuning.         1       Adjust vibration suppression automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.         1       Adjust vibration suppression automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.         1       Adjust vibration suppression automatically during execution of autotuning.         1       Adjust vibration suppression automatically during execution of autotuning.         1       Use model following control and speed/torque feedforward together.         1       Use model following control and speed/torque feedforward together.         1       Use model following control and speed/torque feedforward together.         1       Use model following control and speed/torque feedforward together.         1									1			
Pn140       Vibration       Suppression       Selection         0       Do not perform vibration suppression.       1       Perform vibration suppression.         1       Perform vibration suppression for a specific frequency.       2         2       Perform vibration suppression for two specific frequencies.         N_DDD       Do not adjust vibration suppression automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.         1       Adjust vibration suppression automatically during execution of autotuning with-out a host reference, autotuning with a host reference, and custom tuning.         1       Adjust vibration suppression automatically during execution of autotuning with-out a host reference, autotuning with a host reference, and custom tuning.         1       Adjust vibration suppression automatically during execution of autotuning with-out a host reference, autotuning with a host reference, and custom tuning.         1       Adjust vibration suppression automatically during execution of autotuning.         1       Do not use model following control and speed/torque feedforward together.         1       Use model following control and speed/torque feedforward together.         1       Use model following control and speed/torque feedforward together.         1       Use model following control and speed/torque feedforward together.         1       Use model following control and speed/torque feedforward to				Model F	ollow	ing Control Se	election					
Pn140       Vibration Suppression Selection         0       Do not perform vibration suppression.         1       Perform vibration suppression for a specific frequency.         2       Perform vibration suppression for two specific frequencies. <b>Vibration Suppression Adjustment Selection</b> 0       Do not adjust vibration suppression automatically during execution of autotuning with a host reference, autotuning with a host reference, and custom tuning.         1       Adjust vibration suppression automatically during execution of autotuning with-out a host reference, autotuning with a host reference, and custom tuning.         1       Adjust vibration suppression automatically during execution of autotuning.         1       Adjust vibration suppression automatically during execution of autotuning with-out a host reference, autotuning with a host reference, and custom tuning.         1       Adjust vibration suppression automatically during execution of autotuning.         1       Nodel Following Con-trol and speed/torque feedforward together.         1       Use model following control and speed/torque feedforward together.         1       Use model following con-trol Gain         1       Use model following con-trol and speed/torque feedforward together.         1       Use model following con-trol and speed/torque feedforward together.         1       Use model following con-trol Gain Correction         10       to			n.🗆🗆 🗆 X	-			0	ontrol.				
Pn140       0       Do not perform vibration suppression.         1       Perform vibration suppression for a specific frequency.         2       Perform vibration suppression for two specific frequencies.         N.DXDD       0       Do not adjust vibration suppression automatically during execution of autotuning.         0       1       Adjust vibration suppression automatically during execution of autotuning.         1       Adjust vibration suppression automatically during execution of autotuning.         1       Adjust vibration suppression automatically during execution of autotuning with-out a host reference, autotuning with a host reference, and custom tuning.         1       Adjust vibration suppression automatically during execution of autotuning.         1       Adjust vibration suppression automatically during execution of autotuning with-out a host reference, autotuning with a host reference, and custom tuning.         1       Adjust vibration suppression automatically during execution of autotuning.         1       Do not use model following control and speed/torque feedforward together.         1       Use model following control and speed/torque feedforward together.         1       Use model following control and speed/torque feedforward together.         1       Use model following control and speed/torque feedforward together.         1       Use model following control and speed/torque feedforward together.         1 <td></td> <td></td> <td></td> <td>1</td> <td>Use r</td> <td>model following</td> <td>g control.</td> <td></td> <td></td> <td></td> <td></td> <td></td>				1	Use r	model following	g control.					
Pn140       Image: Perform vibration suppression for a specific frequency.         Pn140       Vibration Suppression Adjustment Selection         Image: Perform vibration suppression automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.         Image: Principal distribution       Vibration suppression automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.         Image: Principal distribution       Speed Feedforward (VFF)/Torque Feedforward (TFF) Selection         Image: Principal distribution       Image: Principal distribution       Image: Principal distribution         Principal distribution       Model Following Control and speed/torque feedforward together.       Image: Principal distribution         Principal distribution       Model Following Control and speed/torque feedforward together.       Image: Principal distribution       Image: Principal distribut				Vibration	n Sup	pression Sele	ction					
Pn140       1       Perform vibration suppression for a specific frequency.         2       Perform vibration suppression for two specific frequencies.         n.DXDD       0       Do not adjust vibration suppression automatically during execution of autotuning with a host reference, and custom tuning.         1       Adjust vibration suppression automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.         1       Adjust vibration suppression automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.         n.XDDD       Speed Feedforward (VFF)/Torque Feedforward (TFF) Selection         0       Do not use model following control and speed/torque feedforward together.         1       Use model following control and speed/torque feedforward together.         Pn141       2       Model Following Control       10 to 20,000       0.1%       500       All       Immediately       Tuning       *1         Pn142       2       Model Following Control       500 to 2,000       0.1%       1000       All       Immediately       Tuning       *1         Pn143       2       Model Following Control       0 to 10,000       0.1%       1000       All       Immediately       Tuning       *1         Pn144       2       Model Following Contorection			n.ППХП	0	Do n	ot perform vibr	ation supp	pression.				
Pn140       Vibration Suppression Adjustment Selection         n.□X□□       0       Do not adjust vibration suppression automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.         1       Adjust vibration suppression automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.         N.□□□       Speed Feedforward (VFF)/Torque Feedforward (TFF) Selection         n.X□□□       0       Do not use model following control and speed/torque feedforward together.         Pn141       2       Model Following Con- trol Gain       10 to 20,000       0.1/s       500       All       Immedi- ately       Tuning       *1         Pn142       2       Model Following Con- trol Gain Correction       500 to 2,000       0.1%       1000       All       Immedi- ately       Tuning       *1         Pn143       2       Model Following Con- trol Bias in the Forward       0 to 10,000       0.1%       1000       All       Immedi- ately       Tuning       *1         Pn144       2       Model Following Con- trol Bias in the Reverse       0 to 10,000       0.1%       1000       All       Immedi- ately       Tuning       *1										,		
N.IXIII       Do not adjust vibration suppression automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.         N.IXIIII       Adjust vibration suppression automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.         N.IXIIIII       Speed Feedforward (VFF)/Torque Feedforward (TFF) Selection         N.XIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Pn140			2	Perfo	orm vibration su	ppressior	n for two sp	pecific freque	ncies.		
n.□X□□       0       ing without a host reference, autotuning with a host reference, and custom tuning.         1       Adjust vibration suppression automatically during execution of autotuning with-out a host reference, autotuning with a host reference, and custom tuning.         n.X□□□       1       Adjust vibration suppression automatically during execution of autotuning with-out a host reference, autotuning with a host reference, and custom tuning.         N.X□□□       0       Do not use model following control and speed/torque feedforward together.         1       Use model following control and speed/torque feedforward together.         1       Use model following control and speed/torque feedforward together.         Pn141       2       Model Following Con- trol Gain       10 to 20,000       0.1/s       500       All       Immedi- ately       Tuning       *1         Pn142       2       Model Following Con- trol Bias in the Forward       0 to 10,000       0.1%       1000       All       Immedi- ately       Tuning       *1         Pn143       2       Model Following Con- trol Bias in the Reverse       0 to 10,000       0.1%       1000       All       Immedi- ately       Tuning       *1				Vibratior	n Sup	pression Adju	stment Se	election				
Image: Note of the problem in the provide the providet the provide the provide the provide the provide the provide the			n.¤X¤¤	0	ing	without a host						
n.X□□□       0       Do not use model following control and speed/torque feedforward together.         1       Use model following control and speed/torque feedforward together.         1       Use model following control and speed/torque feedforward together.         Pn141       2       Model Following Con- trol Gain       10 to 20,000       0.1/s       500       All       Immedi- ately       Tuning       *1         Pn142       2       Model Following Con- trol Gain Correction       500 to 2,000       0.1%       1000       All       Immedi- ately       Tuning       *1         Pn143       2       Model Following Con- trol Bias in the Forward       0 to 10,000       0.1%       1000       All       Immedi- ately       Tuning       *1         Pn144       2       Model Following Con- trol Bias in the Reverse       0 to 10,000       0.1%       1000       All       Immedi- ately       Tuning       *1				1								
Image: Note of the problem in the p				Speed F	eedf	orward (VFF)/T	orque Fe	edforward	(TFF) Selecti	on		
Pn141       2       Model Following Con- trol Gain       10 to 20,000       0.1/s       500       All       Immedi- ately       Tuning       *1         Pn142       2       Model Following Con- trol Gain Correction       500 to 2,000       0.1/s       1000       All       Immedi- ately       Tuning       *1         Pn142       2       Model Following Con- trol Gain Correction       500 to 2,000       0.1%       1000       All       Immedi- ately       Tuning       *1         Pn143       2       Model Following Con- trol Bias in the Forward Direction       0 to 10,000       0.1%       1000       All       Immedi- ately       Tuning       *1         Pn144       2       Model Following Con- trol Bias in the Reverse       0 to 10,000       0.1%       1000       All       Immedi- ately       Tuning       *1			n.XDDD	-			0				0	er.
Pn1412trol Gain10 to 20,0000.1/s300AllatelyIding41Pn1422Model Following Con- trol Gain Correction500 to 2,0000.1%1000AllImmedi- atelyTuning*1Pn1432Model Following Con- trol Bias in the Forward Direction0 to 10,0000.1%1000AllImmedi- atelyTuning*1Pn1442Model Following Con- trol Bias in the Reverse0 to 10,0000.1%1000AllImmedi- atelyTuning*1					USE	e itiodel tollowi	ig control	and speed	a/torque feed	iorward toge	uner.	
Pn142       2       trol Gain Correction       S00 to 2,000       0.1%       1000       All       ately       Tuning       *1         Pn143       2       Model Following Control Bias in the Forward Direction       0 to 10,000       0.1%       1000       All       Immediately       Tuning       *1         Pn143       2       Model Following Control Bias in the Forward       0 to 10,000       0.1%       1000       All       Immediately       Tuning       *1         Pn144       2       Model Following Control Bias in the Reverse       0 to 10,000       0.1%       1000       All       Immediately       Tuning       *1	Pn141	2	trol Gain	0		10 to 20,000	0.1/s	500	All		Tuning	*1
Pn143       2       trol Bias in the Forward Direction       0 to 10,000       0.1%       1000       All       Immedi- ately       Tuning       *1         Pn144       2       Model Following Con- trol Bias in the Reverse       0 to 10,000       0.1%       1000       All       Immedi- ately       Tuning       *1	Pn142	2			ן-	500 to 2,000	0.1%	1000	All		Tuning	*1
Pn144 2 trol Bias in the Reverse 0 to 10,000 0.1% 1000 All transmission Tuning *1	Pn143	2	trol Bias in Direction	the Forwa	ard	0 to 10,000	0.1%	1000	All		Tuning	*1
	Pn144	2	trol Bias in			0 to 10,000	0.1%	1000	All		Tuning	*1

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								tinued from	n previou:	s page.				
Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence				
Pn145	2	Vibration S Frequency	uppression 1 A	10 to 2,500	0.1 Hz	500	All	Immedi- ately	Tuning	*1				
Pn146	2	Vibration S Frequency	uppression 1 B	10 to 2,500	0.1 Hz	700	All	Immedi- ately	Tuning	*1				
Pn147	2	Model Follo trol Speed Compensa	Feedforward	0 to 10,000	0.1%	1000	All	Immedi- ately	Tuning	*1				
Pn148	2	Second Mo Control Ga	odel Following in	10 to 20,000	0.1/s	500	All	Immedi- ately	Tuning	*1				
Pn149	2		del Following in Correction	500 to 2,000	0.1%	1000	All	Immedi- ately	Tuning	*1				
Pn14A	2	Vibration S Frequency	uppression 2	10 to 2,000	0.1 Hz	800	All	Immedi- ately	Tuning	*1				
Pn14B	2	Vibration S Correction	uppression 2	10 to 1,000	1%	100	All	Immedi- ately	Tuning	*1				
	2	Control-Re tions	lated Selec-	0000 hex to 0021 hex	_	0021 hex	All	After restart	Tuning	*1				
				ving Control Ty	•									
		n.□□□X		e model followii e model followii	0	51								
	Tuning-less Type Selection													
Pn14F				e tuning-less ty	ng 1									
		n.🗆 🗆 X 🗆		1     Use tuning-less type 2.										
				e tuning-less ty										
			Reserved na											
	n.□X□□ Reserved parameter (Do not change.)									_				
		n.XOOO	Reserved pa	rameter (Do no	ot change.	)								
	2	Anti-Reson trol-Related	ance Con- d Selections	0000 hex to 0011 hex	_	0010 hex	All	Immedi- ately	Tuning	*1				
				nce Control Se										
		n.□□□X		not use anti-re e anti-resonanc		ontrol.								
Pn160				nce Control Ad	•		utomaticall	luring at the	tion of the					
FIIIO		n.00X0	0 tun	not adjust anti- ing without a he ing.										
				ust anti-resona hout a host refe										
		n.¤X¤¤	<ul> <li>without a host reference, autotuning with a host reference, and custom tuning.</li> <li>Reserved parameter (Do not change.)</li> </ul>											
	-		Reserved pa	rameter (Do no	ot change.	)								
		n.X000		rameter (Do no rameter (Do no		,								
Pn161		n.XDDD Anti-Reson	Reserved pa	•		,	All	Immedi- ately	Tuning	*1				
Pn161 Pn162		n.X000	Reserved pa	rameter (Do no	ot change.	)	All	ately Immedi-	Tuning	*1				
-	2	n.X□□□ Anti-Reson quency Anti-Reson Correction	Reserved pa	rameter (Do no	0.1 Hz	) 1000		ately	0					
Pn162	2	n.XDDD Anti-Reson quency Anti-Reson Correction Anti-Reson	Reserved pa ance Fre- ance Gain ance Damp- ance Filter	rameter (Do no 10 to 20,000 1 to 1,000	0.1 Hz	) 1000 100	All	ately Immedi- ately Immedi-	Tuning	*1				
Pn162 Pn163	2 2 2	n.XDDD Anti-Reson quency Anti-Reson Correction Anti-Reson ing Gain Anti-Reson Time Cons	Reserved pa ance Fre- ance Gain ance Damp- ance Filter tant 1 Cor- ance Filter	rameter (Do no 10 to 20,000 1 to 1,000 0 to 300 -1,000 to	0.1 Hz 1%	) 1000 100 0	All	ately Immedi- ately Immedi- ately Immedi-	Tuning Tuning	*1				

		1	Continued from pr								
Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence	
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	0000 hex to 2711 hex	-	1401 hex	All	-	Setup	*1	
		n.000X		Selection sable tuning-les able tuning-less					Whe Enab	led er	
			Speed Cont						Whe	en	
Pn170		n.□□X□	0 Us	e for speed cor		se host co	ntroller for pc	sition contro	Enab Afte ol. resta	er	
		n.¤X¤¤		Rigidity Level							
				t the rigidity lev	el.				Imme atel Whe Enab	y en	
		n.X000		O to 2     Set the load level for the tuning-less function.							
Pn181	2	Mode Swith for Speed I	ching Level Reference								
Pn182	2	Mode Swite for Acceler	ching Level ation	0 to 30,000	1 mm/s <sup>2</sup>	0	Linear	Immedi- ately	Tuning	*1	
Pn205	2	Multiturn L	imit	0 to 65,535	1 rev	65535	Rotary	After restart	Setup	*1	
	2	Position Co tion Selection	ontrol Func- ions	0000 hex to 2210 hex	-	0010 hex	All	After restart	Setup	*1	
		n.DDDX	Reserved pa	arameter (Do no	ot change.	)					
		n.□□X□	Reserved pa	arameter (Do no	ot change.	)					
		n.¤X¤¤	Reserved pa	arameter (Do no	ot change.	)					
Pn207				tioning Comple	•	, 0	•	0	amo or lo		
		n.XDDD	0 tha	an the setting of Itput when the a	f Pn522 (P absolute v	ositioning alue of the	Completed W position erro	/idth). r is the same	e or less th	ian	
		11.XUUU	pc Ou	e setting of Pn52 sition reference utput when the a	filter is 0. absolute v	alue of the	position erro	r is the same	e or less th	ian	
			2 the 0.	e setting of Pn5	22 (Positic	ning Com	oleted Width)	and the refe	rence inpu	ut is	
Pn20A	4	Number of Encoder So	External cale Pitches	4 to 1,048,576	1 scale pitch/ revolu- tion	32768	Rotary	After restart	Setup	*1	
Pn20E	4	Electronic ( (Numerator		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		16 to 1,073,741,824	1 P/Rev	2048	Rotary	After restart	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	Fully-close Selections	d Control	0000 hex to 1003 hex	-	0000 hex	Rotary	After restart	Setup	*1			
	-	~ 000V	Decented not	remeter (De no	tohongo	<u>\</u>							
		n.□□□X		rameter (Do no									
Pn22A	-	n.□□X□	•	rameter (Do no		,							
		n.¤X¤¤	Reserved par	rameter (Do no	ot change.	)							
		n.X000		Control Speed motor encode		k Selectio	n						
				e external enco		l.							
	-		9										
	2		ontrol Expan- ion Selections	0000 hex to 0001 hex	-	0000 hex	All	After restart	Setup	*1			
	Ī		Paaklash Co	mpensation Di	reation								
		n.000X		mpensate forw		nces.							
Pn230			1 Cor	mpensate reve	rse referer	ices.							
		n.DDXD	Reserved par	rameter (Do no	ot change.	)							
		n.□X□□ Reserved parameter (Do not change.)											
	n.XDDD Reserved parameter (Do not change.)												
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			
Pn281	2	Encoder O tion	utput Resolu-	1 to 4,096	1 edge/ pitch	20	All	After restart	Setup	*1			
Pn282	4	Linear Enc Pitch	oder Scale	0 to 6,553,600	0.01 μm	0	Linear	After restart	Setup	*1			
Pn2E0	4	Reserved p (Do not ch		-	-	1	All	-	-	_			
Pn2E2	4	Reserved p (Do not ch		-	-	1	All	-	-	-			
Pn2E4	4	Reserved p (Do not ch		-	-	1	All	-	-	-			
Pn304	2	Jogging Sp	beed	0 to 10,000	Rotary: 1 min <sup>-1</sup> Direct Drive: 0.1 min <sup>-1</sup>	500	Rotary	Immedi- ately	Setup	*1			
Pn305	2	Soft Start / Time	Acceleration	0 to 10,000	1 ms	0	All	Immedi- ately	Setup	*2			
Pn306	2	Soft Start I Time	Deceleration	0 to 10,000	1 ms	0	All	Immedi- ately	Setup	*2			
Pn308	2	Speed Fee Time Cons	dback Filter tant	0 to 65,535	0.01 ms	0	All	Immedi- ately	Setup	*1			
Pn30A	2	Servo OFF Stops	on Time for and Forced	0 to 10,000	1 ms	0	All	Immedi- ately	Setup	*1			
Pn30C	2	Speed Fee Average M Time	dforward ovement	0 to 5,100	0.1 ms	0	All	Immedi- ately	Setup	*1			

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Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer ence
	2	Vibration E Selections		0000 hex to 0002 hex	_	0000 hex	All	Immedi- ately	Setup	*1
			Vibration Det	ection Selecti	on					
			0 Do	not detect vibr	ation.					
		n.🗆 🗆 🗆 X		tput a warning		/ibration is	detected.			
Pn310				tput an alarm (A	, ,					
		n.DDXD	Reserved pa	rameter (Do no	ot change.	)				
		n.¤X¤¤	Reserved pa	rameter (Do no	ot change.	)				
		n.XDDD	Reserved pa	rameter (Do no	ot change.	)				
			<u> </u>							
Pn311	2	Vibration E sitivity	Detection Sen-	50 to 500	1%	100	All	Immedi- ately	Tuning	*1
Pn312	2	Vibration E Level	Detection	0 to 5,000	1 min <sup>-1</sup>	50	Rotary	Immedi- ately	Tuning	*1
Pn316	2	Maximum	Motor Speed	0 to 65,535	1 min <sup>-1</sup>	10000	Rotary	After restart	Setup	*1
Pn324	2	Moment of culation St	f Inertia Cal- tarting Level	0 to 20,000	1%	300	All	Immedi- ately	Setup	*1
Pn383	2	Jogging S	peed	0 to 10,000	1 mm/s	50	Linear	Immedi- ately	Setup	*1
Pn384	2	Vibration E Level	Detection	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		e First Torque Filter Time	0 to 65,535	0.01 ms	100	All	Immedi- ately	Tuning	*1
Pn402	2	Forward To	orque Limit	0 to 800	1%*3	800	Rotary	Immedi- ately	Setup	*1
Pn403	2	Reverse To	orque Limit	0 to 800	1%*3	800	Rotary	Immedi- ately	Setup	*1
Pn404	2	Forward Ex Limit	xternal Torque	0 to 800	1%*3	100	All	Immedi- ately	Setup	*1
Pn405	2	Reverse Ex Limit	xternal Torque	0 to 800	1%*3	100	All	Immedi- ately	Setup	*1
Pn406	2	Emergenc	y Stop Torque	0 to 800	1%*3	800	All	Immedi- ately	Setup	*1
Pn407	2	Speed Lim Torque Co		0 to 10,000	1 min <sup>-1</sup>	10000	Rotary	Immedi- ately	Setup	*1

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Parameter	۵.				Setting	Setting	Default	Applicable	When	Classi-	
No.	Size	Na	ame		Range	Unit	Setting	Motors	Enabled	fication	
	2	Torque-Rel tion Selecti			0000 hex to 1111 hex	-	0000 hex	All	_	Setup	*1
			Notch Filt	ər S	Selection 1					Wh Ena	
		n.🗆 🗆 🗆 X	0	Dis	able first stage	notch filte	er.			Imm	
			1	Ena	able first stage	notch filter	r.			ate	ely
			Speed Lin	nit \$	Selection					Wh Enal	
			0	⊃n∠	e the smaller of 107 as the spe	ed limit.		•	0		
		n.□□X□		⊃n∠	e the smaller of 480 as the spe	Af					
Pn408			1	sett	e the smaller of ting of Pn407 a		art				
				Jse sett	e the smaller of ting of Pn480 a	the overs the spee	peed alarr ed limit.	n detection sp	beed and the	;	
			Notch Filt	Notch Filter Selection 2							en oled
		n.¤X¤¤		Disa	Imm						
			1	=na	able second sta	age notch	filter.			ate	
			Friction C	om	pensation Fun	ction Sele	ection			Wh Ena	
		n.XDDD		Disa	Imm ate						
			1	=na	able friction cor	npensatioi	n.			all	iy
		Einst Otana	Netela Cilta						luce on a sti		
Pn409	2	First Stage Frequency	Notch Filte	r	50 to 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1
Pn40A	2	First Stage Q Value	Notch Filte	r	50 to 1,000	0.01	70	All	Immedi- ately	Tuning	*1
Pn40B	2	First Stage Depth	Notch Filte	r	0 to 1,000	0.001	0	All	Immedi- ately	Tuning	*1
Pn40C	2	Second Sta ter Frequer	nčy		50 to 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1
Pn40D	2	Second State ter Q Value		-il-	50 to 1,000	0.01	70	All	Immedi- ately	Tuning	*1
Pn40E	2	Second Sta ter Depth	0		0 to 1,000	0.001	0	All	Immedi- ately	Tuning	*1
Pn40F	2	Second Sta Torque Ref Frequency	erence Filte	r	100 to 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1
Pn410	2	Second Sta Torque Ref Q Value			50 to 100	0.01	50	All	Immedi- ately	Tuning	*1
Pn412	2	First Stage Torque Ref Time Cons	erence Filte	r	0 to 65,535	0.01 ms	100	All	Immedi- ately	Tuning	*1

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Parameter	0			Sotting	Sotting	Default		tinued fron When	Classi-	Refe
No.	Size		ame	Setting Range	Setting Unit	Setting	Applicable Motors	Enabled	fication	ence
	2	Torque-Relation Selection	ated Func- ions 2	0000 hex to 1111 hex	-	0000 hex	All	Immedi- ately	Setup	*1
				er Selection 3						
		n.□□□X	-	Disable third stage Enable third stage						
						э.				
				er Selection 4						
Pn416		n.□□X□	-	Disable fourth stag	0					
			1 E	Enable fourth stag	ge notch fi	iter.				
			-	er Selection 5						
		n.¤X¤¤		Disable fifth stage						
			1 E	Enable fifth stage	notch filte	r.				
		n.XDDD	Reserved	parameter (Do no	ot change	.)				
Pn417	2	Frequency	e Notch Filte	50 10 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1
Pn418	2	Third Stage Q Value	e Notch Filte	50 to 1,000	0.01	70	All	Immedi- ately	Tuning	*1
Pn419	2	Depth	e Notch Filte	0 10 1,000	0.001	0	All	Immedi- ately	Tuning	*1
Pn41A	2	ter Frequer	, ,	50 10 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1
Pn41B	2	Fourth Stag ter Q Value	ge Notch Fil	- 50 to 1,000	0.01	70	All	Immedi- ately	Tuning	*1
Pn41C	2	Fourth Stag ter Depth	ge Notch Fil	- 0 to 1,000	0.001	0	All	Immedi- ately	Tuning	*1
Pn41D	2	Frequency	Notch Filter	50 10 5,000	1 Hz	5000	All	Immedi- ately	Tuning	*1
Pn41E	2	Q Value	Notch Filte	50 10 1,000	0.01	70	All	Immedi- ately	Tuning	*1
Pn41F	2	Depth	Notch Filte	0 10 1,000	0.001	0	All	Immedi- ately	Tuning	*1
	2	Speed Ripp sation Sele	ole Compen octions	- 0000 hex to 1111 hex	-	0000 hex	Rotary	-	Setup	*1
			o 15:						Whe	en
		n.□□□X		ple Compensatio			n		Enab	
			0 [	Disable speed ripp					Imme atel	
			ater	у						
			1 E	Enable speed ripp		nsation.				
Pn/23				ple Compensatio	•		greement War	ning Detec-	Whe Enab	
Pn423		n.00X0	Speed Rip tion Select	ple Compensatio tion Detect A.942 alar	on Informa	ation Disaç	greement War	ming Detec-	Enab Afte	led er
Pn423		n.00X0	Speed Rip tion Select	ple Compensatio	on Informa	ation Disaç	greement War	rning Detec-	Enab	led er
Pn423			Speed Rip tion Select 0 [ 1 [	ple Compensatio tion Detect A.942 alar	on Informa ms. 42 alarms	ation Disaç		rning Detec-	Enab Afte	led er art n
Pn423		n.===X==	Speed Rip tion Select 0 [ 1 ] Speed Rip	ple Compensation tion Detect A.942 alarn Do not detect A.9	on Informa ms. 42 alarms	ation Disaç		rning Detec-	Enab After resta Whe Enabl Afte	led er art n ed
Pn423			Speed Rip tion Select 0 [ 1 ] Speed Rip 0 S	ple Compensation Detect A.942 alarn Do not detect A.9 ple Compensation	on Informa ms. 42 alarms	ation Disaç		rning Detec-	Enab Afte resta Whe Enabl	led er art n ed r
Pn423			Speed Rip tion Select 0 [ 1 ] Speed Rip 0 S 1 ]	ple Compensation Detect A.942 alari Do not detect A.9 ple Compensation Speed reference	on Informa ms. 42 alarms on Enable	ation Disag		rning Detec-	Enab After resta Whe Enabl Afte	led er art n ed
Pn423		n.=X===	Speed Rip 1 I Speed Rip 0 S 1 N Reserved	ple Compensation Detect A.942 alam Do not detect A.9 ple Compensation Speed reference Motor speed parameter (Do not	on Informa ms. 42 alarms on Enable	ation Disag			Enab After resta Whe Enabl Afte	led er art n ed
Pn423 Pn424	2	n. 🗆 X 🗆 🗆 n. X 🗆 🗆 Torque Lim cuit Voltage	Speed Rip tion Select 0 [ 1 ] Speed Rip 0 S 1 N Reserved	ple Compensation Detect A.942 alam Do not detect A.9 ple Compensation Speed reference Motor speed parameter (Do not ir-0 to 100	on Informa ms. 42 alarms on Enable	ation Disag		Immedi- ately	Enab After resta Whe Enabl Afte	led er art n ed

Parameter Lists

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					-			tinued fron		1 0			
Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence			
Pn426	2	Torque Fee Average M Time		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 <sup>-1</sup>	0	Rotary	Immedi- ately	Tuning	*1			
Pn428	2	Torque/For tance Rate		0 to 65,535	×0.01	100	All	Immedi- ately	Setup	page 4-9			
Pn456	2	Sweep Tor ence Ampl		1 to 800	1%	15	All	Immedi- ately	Tuning	*1			
	2	Notch Filte Selections	r Adjustment 1	0000 hex to 0101 hex	-	0101 hex	All	Immedi- ately	Tuning	*1			
			Notch Filter	Adjustment Se	lection 1								
		n.000X	0 tur	not adjust the ning without a h ning.									
			Adjust the first stage notch filter automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning										
Pn460		n.🗆🗆 X 🗆	Reserved pa	rameter (Do no	ot change.	)							
			t	Adjustment Se									
		n.¤X¤¤	0 au cu	not adjust the totuning withou stom tuning.	t a host re	ference, a	utotuning with	n a host refe	rence, and				
			1 ing	just the second without a host hing.									
		n.XDDD Reserved parameter (Do not change.)											
				1			1						
	2	Gravity Co Related Se	mpensation- lections	0000 hex to 0001 hex	-	0000 hex	All	After restart	Setup	*1			
	.									_			
		n.DDDX		censation Selec		n.							
Pn475				able gravity cor	•								
		n.🗆🗆 X 🗆	Reserved pa	rameter (Do not	change.)								
		n.¤X¤¤	Reserved par	rameter (Do not	change.)								
		n.X000	Reserved par	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 Cont	it during trol	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 Loc Time Cons	tection p Integral	15 to 51,200	0.01 ms	3000	Linear	Immedi- ately	Tuning	_			
		Forward Fo		0 to 800	1%*3	30	Linear	Immedi- ately	Setup	*1			
Pn483	2						Lincor	Immedi-		*1			
Pn483 Pn484	2	Reverse Fo		0 to 800	1% <sup>*3</sup>	30	Linear	ately	Setup	1			
		Reverse Fo	orce Limit tection Refer-	0 to 800 0 to 100	1% <sup>*3</sup> 1 mm/s	30 20	Linear	ately Immedi- ately	Setup Tuning	_			
Pn484	2	Reverse Fo Polarity De ence Spee	orce Limit tection Refer- d tection Refer- leration/					Immedi-		-			

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
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 Con- firmation Force Refer- ence	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 Compen- sation 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 <sup>-1</sup>	20	Rotary	Immedi- ately	Setup	*1
Pn503	2	Speed Coincidence Detection Signal Output Width	0 to 100	1 min <sup>-1</sup>	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 <sup>-1</sup>	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 1	0000 hex to FFF2 hex	-	1881 hex	All	After restart	Setup	*1

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n.🗆 🗆 🛛 X	Rese	rved parameter (Do not change.)
n.□□X□	Rese	rved parameter (Do not change.)
n.¤X¤¤	Rese	rved 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).
	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.XDDD	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).
	Α	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).

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Parameter	Size	N	ame	Setting	Setting	Default	Applicable	When	Classi-	Refer			
No.		Input Signa	al Selection	Range s 0000 hex to	Unit	Setting 8882	Motors	Enabled After	fication	ence			
	2	2		FFFF hex	-	hex	All	restart	Setup	*1			
				i.									
			N-OT (Re	verse Drive Proh	ibit) Sianal	Allocation	1						
				Enable reverse d				N (closed).					
				Enable reverse d			-						
				Enable reverse d									
			3	Enable reverse d	rive when (	N1-9 inpu	t signal is ON	I (closed).					
			4	Enable reverse d	rive when (	N1-10 inp	ut signal is O	N (closed).					
			5	Enable reverse d	rive when (	CN1-11 inp	ut signal is O	N (closed).					
			6	Enable reverse d	rive when (	CN1-12 inp	ut signal is O	N (closed).					
		n.🗆 🗆 🗆 X	7	Set the signal to always prohibit reverse drive.									
			8	Set the signal to always enable reverse drive.									
			9	Enable reverse d	rive when (	CN1-13 inp	ut signal is O	FF (open).					
			Α	Enable reverse d	rive when (	CN1-7 inpu	t signal is OF	F (open).					
			В	Enable reverse d	rive when (	CN1-8 inpu	t signal is OF	F (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).									
			E										
			F	Enable reverse d	rive when (	CN1-12 inp	ut signal is O	FF (open).					
		n.🗆 🗆 X 🗆											
Pn50B			T COCI VCG	Reserved parameter (Do not change.)									
			/P-CL (Fo	rward External T	orque Limi	t Input) Sig	gnal Allocatio	n					
			0	Active when CN1	-13 input s	signal is ON	l (closed).						
				Active when CN1		,	, ,						
				Active when CN1		-							
				Active when CN1		-							
				Active when CN1		-							
				Active when CN1		-							
				Active when CN1		signal is ON	l (closed).						
		n.¤X¤¤		The signal is alwa	,								
				The signal is alwa									
			9	Active when CN1	-13 input s	signal is OF	F (open).						
			A	Active when CN1									
				Active when CN1		,	· · · /						
				Active when CN1	-	-							
				Active when CN1	•	9							
				Active when CN1		•	( ,						
			F	Active when CN1	-12 input s	signal is OF	r⊢ (open).						
			/N-CL (Re	verse External T	orque Limi	t Input) Sig	gnal Allocatic	on					
		n.XDDD		The allocations a Input) signal alloc		e as the /P	-CL (Forward	External To	rque Limit				

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Devenuela							Con	itinued fron	n previou:	s pag				
Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refe ence				
	2	Output Sig tions 1	nal Selec-	0000 hex to 6666 hex	-	0000 hex	All	After restart	Setup	*1				
					I	I	I							
			/COIN (Po	sitioning Comple	tion Outp	ut) Signal .	Allocation							
			0 [	Disabled (the abov	/e signal c	output is no	ot used).							
		n.🗆🗆🗆 X	1 (	Output the signal	from the C	N1-1 or C	N1-2 output	terminal.						
				Output the signal										
			-	Dutput the signal			CN1-26 outpi	ut terminal.						
			4 to 6 F	Reserved settings	(Do not u	se.)								
Pn50E			/V-CMP (S	peed Coincidend	e Detecti	on Output	) Signal Alloc	ation						
		n.□□X□	0 to 6 The allocations are the same as the /COIN (Positioning Completion) signal allo- cations.											
			/TGON (Rotation Detection Output) Signal Allocation											
		n. $\Box$ X $\Box$ D 0 to 6 The allocations are the same as the /COIN (Positioning Completion) signal allo- cations.												
			/S-RDY (Servo Ready) Signal Allocation											
		n.XDDD		The allocations are cations.	e the same	e as the /C	OIN (Positioni	ng Completi	on) signal :	allo-				
									i					
	2	Output Sig tions 2	nal Selec-	0000 hex to 6666 hex	_	0100 hex	All	After restart	Setup	*1				
			/CLT (Torg	ue Limit Detectio		Signal All	acation							
			· · ·	Disabled (the abov	. ,	•								
				Output the signal	-			terminal						
		n.🗆🗆🗆 X		Output the signal										
				Output the signal										
				Reserved settings										
Pn50F				ed Limit Detection										
FIIOUF		n.□□X□		The allocations are			LT (Torque Lir	mit Detection	n Output) «	sia-				
				nal allocations.					i output) t					
			/BK (Brake	e Output) Signal A	Allocation									
			/BK (Brake Output) Signal Allocation           0 to 6         The allocations are the same as the /CLT (Torque Limit Detection Output) signal allocations.											
		n.¤X¤¤		nal allocations.			× 1							
		n.□X□□	0100 r		ignal Alloo	cation								

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Parameter No.	Size	Name		Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence			
	2	Output Sig tions 3	nal Selec-	Il Selec- 0000 hex to - 0000 hex All After restart Setup									
			/NEAR (N	ear Output) Signa	al Allocatio	on							
			0	Disabled (the above signal output is not used).									
		n.000X	1	Output the signal from the CN1-1 or CN1-2 output terminal.									
			2	Output the signal from the CN1-23 or CN1-24 output terminal.									
Pn510			3	Output the signal	from the C	CN1-25 or	CN1-26 outp	ut terminal.					
			4 to 6	Reserved settings	s (Do not u	se.)							
		n.DDXD	Reserved	parameter (Do n	ot change	.)							
		n.¤X¤¤	Reserved	parameter (Do n	ot change	.)							
		n.XDDD	Reserved	parameter (Do n	ot change	.)							

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Parameter No.	Size	N	lame		Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refe enc			
110.	2	Input Sign	al Selectior	IS	0000 hex to		6543	All	After	Setup	*1			
	⊢	5			FFFF hex		hex	7.00	restart	oorap				
								<b>.</b>						
			· · · ·	0	Return Decele		• •	0	ation					
			0		ive when CN1-		0	, ,						
			1		ive when CN1- ive when CN1-		,	,						
			3		ive when CN1-		<b>,</b>	,						
			4		ive when CN1-	1 .	<i>.</i>	<b>\</b>						
			5		ive when CN1-		-							
			6		ive when CN1-		-							
		n.🗆 🗆 🗆 X	7		signal is alway			(						
			8		signal is alway									
			9		ive when CN1-			F (open).						
			А	Act	ive when CN1-	7 input sig	gnal is OFF	(open).						
			В	Act	ive when CN1-	8 input się	gnal is OFF	(open).						
			С	Act	ive when CN1-	9 input się	gnal is OFF	(open).						
			D	Act	ive when CN1-	10 input s	signal is OF	F (open).						
n511			E	Act	ive when CN1-	11 input s	signal is OF	F (open).						
			F	Act	ive when CN1-	12 input s	signal is OF	F (open).						
			/EXT1 (E)	kterr	nal Latch Input	1) Signal	Allocation	ı						
			0 to 3		signal is alway									
			4											
		n.□□X□	5											
			6											
			D											
		-	E											
			F	Active when CN1-12 input signal is OFF (open).										
			7 to C The signal is always inactive.											
			/EXT2 (External Latch Input 2) Signal Allocation											
		n.¤X¤¤			allocations are				Latch Input	1) signal a	allo-			
			0 to F		ons.				Laton input	r) olgridi e				
			/EXT3 (E)	torr	nal Latch Input	3) Signal	Allocation	1						
		n.XDDD			allocations are	, 0			Latch Input	1) signal a	allo-			
			0 to F		ons.				Laton input	r) oignaí c				
		Output Sic	gnal Inverse		0000 hex to		0000	A 11	After					
	2	Settings	,		1111 hex	-	hex	All	restart	Setup	*1			
			Output S	igna	I Inversion for	CN1-1 ar	nd CN1-2	Terminals						
		n.🗆🗆🗙	0	The	signal is not ir	nverted.								
			1	The	signal is invert	ted.								
			Output S	igna	I Inversion for	CN1-23 a	and CN1-2	4 Terminals						
n512		n.🗆 🗆 X 🗆	0	-	signal is not ir									
			1		signal is invert									
					-		10111	o <del>T</del> · · ·			_			
			Output Signal Inversion for CN1-25 and CN1-26 Terminals       IXDD     0       The signal is not inverted.											
		n.¤X¤¤	0		-									
			1	Ine	signal is invert	ea								
						.00.								

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Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer ence			
	2	Output Sig tions 4	nal Selec-	0000 hex to 0666 hex	-	0000 hex	All	After restart	Setup	*1			
		n.🗆 🗆 🗆 X	Reserved	parameter (Do no	ot change	)							
		n.DDXD	Reserved	parameter (Do no	ot change	)							
			/PM (Prev	entative Maintena	ance Outp	ut) Signal	Allocation						
Pn514				Disabled (the abov	0		,						
		n.¤X¤¤		Output the signal									
				Output the signal									
				Output the signal			CIN1-26 outpi	ut terminal.					
	-		4 to 6	Reserved settings	(Do not u	se.)							
		n.XDDD	Reserved	parameter (Do no	ot change	)							
	_												
	2	Input Sign 7	al Selections	s 0000 hex to FFFF hex	-	8888 hex	All	After restart	Setup	*1			
	FSTP (Forced Stop Input) Signal Allocation       0     Enable drive when CN1-13 input signal is ON (closed).												
			0	Enable drive when	n CN1-13	input signa	al is ON (close	ed).					
			1	Enable drive when	n CN1-7 ir	nput signal	is ON (closed	d).					
			2 Enable drive when CN1-8 input signal is ON (closed).										
				<ul> <li>3 Enable drive when CN1-9 input signal is ON (closed).</li> <li>4 Enable drive when CN1-10 input signal is ON (closed).</li> </ul>									
		n.000X	5 Enable drive when CN1-11 input signal is ON (closed). 6 Enable drive when CN1-12 input signal is ON (closed).										
			<ul> <li>Enable drive when CN1-12 input signal is ON (closed).</li> <li>Set the signal to always prohibit drive (always force the motor to stop).</li> </ul>										
	n		<ul> <li>Set the signal to always prohibit drive (always force the motor to stop).</li> <li>8 Set the signal to always enable drive (always disable forcing the motor to stop).</li> </ul>										
				Enable drive when CN1-13 input signal is OFF (open).									
Pn516		-		Enable drive when									
		-		Enable drive when									
		-		Enable drive when									
		-		Enable drive wher									
		-		Enable drive wher									
			F	Enable drive wher	n CN1-12	input signa	al is OFF (ope	n).					
	n	.DDXD	Reserved p	parameter (Do not	t change.)								
	n	.0X00	Reserved p	arameter (Do not	t change.)								
	n	.X000	Reserved p	arameter (Do not	t change.)								
					1				1				
Pn518 <sup>*4</sup>	_	Safety Mo Parameter	dule-Related	_ t	_	_	All	_	_	_			
			-										
Pn51B	4	Motor-Loa Deviation ( Detection	Overflow	0 to 1,073,741,824	1 refer- ence unit	1000	Rotary	Immedi- ately	Setup	*1			
Pn51E	2		eviation Ove		1%	100	All	Immedi- ately	Setup	*1			
			5		1 refer-			- 5	1				

<b>D</b>					<b>0</b> ····	<b>0</b>	D (		tinued from	· ·	
Parameter No.	Size	N	lame		Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
Pn522	4	Positioning Width	g Complete		0 to 1,073,741,824	1 refer- ence unit	7	All	Immedi- ately	Setup	*1
Pn524	4	Near Signa	al Width		1 to 1,073,741,824	1 refer- ence unit	107374 1824	All	Immedi- ately	Setup	*1
Pn526	4	Position D flow Alarm Servo ON	eviation Ov Level at	-	1 to 1,073,741,823	1 refer- ence unit	524288 0	All	Immedi- ately	Setup	*1
Pn528	2		eviation Ov ng Level at		10 to 100	1%	100	All	Immedi- ately	Setup	*1
Pn529	2	Speed Lim Servo ON	nit Level at		0 to 10,000	1 min <sup>-1</sup>	10000	Rotary	Immedi- ately	Setup	*1
Pn52A	2	Multiplier p closed Rot	per Fully- tation		0 to 100	1%	20	Rotary	Immedi- ately	Tuning	*1
Pn52B	2	Overload V	Varning Le	vel	1 to 100	1%	20	All	Immedi- ately	Setup	*1
Pn52C	2	Base Curre at Motor C Detection	ent Derating Verload	g	10 to 100	1%	100	All	After restart	Setup	*1
	2	Program J Related Se	ogging- elections		0000 hex to 0005 hex	-	0000 hex	All	Immedi- ately	Setup	*1
	-	Program Jogging Operation Pattern									
				(Waiting time in Pn535 $\rightarrow$ Forward by travel distance in Pn531) × Number of							
			0		ements in Pn		of ward by		5 IIT 1100 1 <i>j 7</i>	( Number	
			1		ting time in Pr ements in Pn		everse by t	ravel distance	e in Pn531) >	< Number	of
			2	mov (Wai	ting time in Pr ements in Pn ting time in Pr ements in Pn	536 1535 → Re	-				
Pn530		n.000X	3	mov (Wai	ting time in Pr ements in Pn ting time in Pr ements in Pn	536 1535 → Fo	-		,		
			4		ting time in Pr n535 → Rever 36						
			5	(Wai in Pr Pn5	ting time in Pr n535 → Forwa 36	$1535 \rightarrow Re$	everse by t vel distance	ravel distance e in Pn531) ×	e in Pn531 → Number of n	<ul> <li>Waiting t novements</li> </ul>	ime s in
		n.DDXD	Reserved	d para	ameter (Do no	ot change	.)				
		n.¤X¤¤	Reserved	d para	ameter (Do no	ot change	.)				
		n.XDDD	Reserved	l para	ameter (Do no	ot change	.)				
Pn531	4	Program J Distance	ogging Trav		1 to 1,073,741,824	1 refer- ence unit	32768	All	Immedi- ately	Setup	*1
Pn533	2	Program J ment Spee	n Jogging Move- beed 1 to 10,000 Drive: 500 Rotary Immedi- 0.1 min <sup>-1</sup>							Setup	*1
Pn534	2	Program J eration/De Time	ogging Acc celeration	cel-	2 to 10,000	1 ms	100	All	Immedi- ately	Setup	*1
		Dragram		;+					luna una a all'	1	

Program Jogging Wait-ing Time

Program Jogging Num-ber of Movements

0 to 10,000

0 to 1,000

100

1

All

All

1 ms

1 time

2

2

Pn535

Pn536

Parameter Lists

7

Setup Continued on next page.

Setup

\*1

\*1

Immedi-ately

Immedi-ately

Parameter No.	Size	Na	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
Pn550	2	Analog Mor Voltage	nitor 1 Offset	-10,000 to 10,000	0.1 V	0	All	Immedi- ately	Setup	*1
Pn551	2	Analog Mor Voltage	nitor 2 Offset	-10,000 to 10,000	0.1 V	0	All	Immedi- ately	Setup	*1
Pn552	2	Analog Mor nification	nitor 1 Mag-	-10,000 to 10,000	× 0.01	100	All	Immedi- ately	Setup	*1
Pn553	2	Analog Mor nification	nitor 2 Mag-	-10,000 to 10,000	× 0.01	100	All	Immedi- ately	Setup	*1
Pn55A	2	Power Con Monitor Un		1 to 1,440	1 min	1	All	Immedi- ately	Setup	-
Pn560	2	Residual Vi Detection V		1 to 3,000	0.1%	400	All	Immedi- ately	Setup	*1
Pn561	2	Overshoot Level	Detection	0 to 100	1%	100	All	Immedi- ately	Setup	*1
Pn581	2	Zero Speed	d Level	1 to 10,000	1 mm/s	20	Linear	Immedi- ately	Setup	*1
Pn582	2	Speed Coir Detection S Width	ncidence Signal Output	0 to 100	1 mm/s	10	Linear	Immedi- ately	Setup	*1
Pn583	2	Brake Refe put Speed		0 to 10,000	1 mm/s	10	Linear	Immedi- ately	Setup	*1
Pn584	2	Speed Limi Servo ON	t Level at	0 to 10,000	1 mm/s	10000	Linear	Immedi- ately	Setup	*1
Pn585	2	Program Jo ment Spee	ogging Move- d	1 to 10,000	1 mm/s	50	Linear	Immedi- ately	Setup	*1
Pn586	2	Motor Runr Ratio	ning Cooling	0 to 100	1%/ Max. speed	0	Linear	Immedi- ately	Setup	-
	2		tection Selection for near Encoder	0000 hex to 0001 hex	-	0000 hex	Linear	Immedi- ately	Setup	_
Pn587		n.DDDX	0 Do n	ction Selection ot detect polar ct polarity.		lute Linea	r Encoder			
		n.DDXD	Reserved par	rameter (Do no	ot change.	.)				
	-	n.¤X¤¤	•	rameter (Do no						
		n.X000	Reserved par	rameter (Do no	ot change.	.)				
Pn600	2	Regenerativ Capacity*5	ve Resistor	Depends on model.*6	10 W	0	All	Immedi- ately	Setup	*1
Pn601	2	Dynamic Bi Allowable E sumption	rake Resistor Energy Con-	0 to 65,535	10 J	0	All	After restart	Setup	*7
Pn603	2	Regenerativ tance	ve Resis-	0 to 65,535	10 m $\Omega$	0	All	Immedi- ately	Setup	*1
Pn604	2	Dynamic Br tance	rake Resis-	0 to 65,535	10 mΩ	0	All	After restart	Setup	*7

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Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence			
2	Overheat F Selections	Protection	0000 hex to 0003 hex	-	0000 hex	Linear	After restart	Setup	*1			
		Overheat F	rotection Selection	on								
		0 [	Disable overheat p	protection.								
		1 (	Jse overheat prot	ection in t	ne Yaskaw	a Linear Serv	omotor.*8					
	n.DDDX											
					put from a	sensor attacl	hed to the m	achine an	d			
	n.00X0	Reserved p	parameter (Do not	change.)								
	n.¤X¤¤	Reserved p	parameter (Do not	change.)								
	n.XDDD	Reserved p	arameter (Do not	change.)								
_												
2	Overheat A	larm Level	0 to 500	0.01 V	250	All	Immedi- ately	Setup	*1			
2	Overheat V	Varning Leve	el 0 to 100	1%	100	All	Immedi- ately	Setup	*1			
2	Overheat A Time	larm Filter	0 to 65,535	1 s	0	All	Immedi- ately	Setup	*1			
_			_	_	_	All	_	_	_			
	2	2     Overheat F       Selections       n.□□□X       n.□□X□       n.□□X□       n.□X□□       1.□X□□       2     Overheat A       2     Overheat A       2     Overheat A       2     Overheat A       3     Overheat A       3     Safety Mode	2       Overheat Protection Selections         0       0         1       0	2     Overheat Protection Selections     0000 hex to 0003 hex       1     0     Disable overheat protection       1     Use overheat protection       2     Monitor a negative use overheat protection       3     Monitor a positive use overheat protection       1     Use overheat protection       3     Monitor a positive use overheat protection       1     Reserved parameter (Do not       1     0 to 500       2     Overheat Alarm Level     0 to 100       2     Overheat Alarm Filter     0 to 65,535       3     Safety Module-Related     0	Name     Range     Unit       2     Overheat Protection Selections     0000 hex to 0003 hex     -       0     Disable overheat protection 1     Use overheat protection in th 2       1     Use overheat protection in th 2       1     Use overheat protection.       3     Monitor a negative voltage in use overheat protection.       1     Use overheat protection.       3     Monitor a positive voltage in use overheat protection.       n.□□X□     Reserved parameter (Do not change.)       n.□X□□     Reserved parameter (Do not change.)       n.X□□□     Reserved parameter (Do not change.)       n.X□□□     Reserved parameter (Do not change.)       1     0 to 500     0.01 V       2     Overheat Alarm Level     0 to 500     1%       2     Overheat Alarm Filter Time     0 to 65,535     1 s	Name       Range       Unit       Setting         2       Overheat Protection Selections       0000 hex to 0003 hex       -       0000 hex         1       Use overheat protection in the Yaskaw         1       Use overheat protection in the Yaskaw         2       Monitor a negative voltage input from a use overheat protection.         3       Monitor a positive voltage input from a use overheat protection.         n.□□X□       Reserved parameter (Do not change.)         n.□□X□       Reserved parameter (Do not change.)         n.□X□□       Reserved parameter (Do not change.)         n.X□□□       Reserved parameter (Do not change.)         1       0 to 500       0.01 V       250         2       Overheat Alarm Level       0 to 100       1%       100         2       Overheat Alarm Filter       0 to 65,535       1 s       0	Name       Range       Unit       Setting       Motors         2       Overheat Protection Selections       0000 hex to 0003 hex       -       0000 hex       Linear         0       Disable overheat protection.       -       0       Linear         1       Use overheat protection in the Yaskawa Linear Serveration.       1       Use overheat protection.         2       Monitor a negative voltage input from a sensor attacture use overheat protection.       3       Monitor a positive voltage input from a sensor attacture use overheat protection.         1.       Reserved parameter (Do not change.)       -       -       -         n.       Reserved parameter (Do not change.)       -       -         1.       Reserved parameter (Do not change.)       -       -         2       Overheat Alarm Level       0 to 500       0.01 V       250       All         2       Overheat Alarm Filter       0 to 65,535       1 s       0       All	Name       Range       Unit       Setting       Motors       Enabled         2       Overheat Protection Selections       0000 hex to 0003 hex       -       0000 hex       Linear       After restart         n       Overheat Protection Selection       -       0000 hex       Linear       After restart         1       Use overheat protection in the Yaskawa Linear Servomotor.*8       1       Use overheat protection.       -         2       Monitor a negative voltage input from a sensor attached to the nuse overheat protection.       -       -       -         3       Monitor a positive voltage input from a sensor attached to the muse overheat protection.       -       -       -         n.       Reserved parameter (Do not change.)       -       -       -       -       -         1       Reserved parameter (Do not change.)       -       -       -       -       -       -         1       Use overheat Protection.       - <td>Name         Range         Unit         Setting         Motors         Enabled         fication           2         Overheat Protection Selections         0000 hex to 0003 hex         -         0000 hex         Linear         After restart         Setup           n.         O         Disable overheat protection         -         0000 hex         Linear         After restart         Setup           1         Use overheat protection in the Yaskawa Linear Servomotor.**         -         Monitor a sensor attached to the machine ar use overheat protection.         -         Monitor a sensor attached to the machine ar use overheat protection.           1         Use overheat protection.         3         Monitor a negative voltage input from a sensor attached to the machine ar use overheat protection.         -           1         Use overheat protection.         3         Monitor a positive voltage input from a sensor attached to the machine ar use overheat protection.         -           1         Reserved parameter (Do not change.)         -         -         -         -           1         Reserved parameter (Do not change.)         -         -         -         -         -           1         Reserved parameter (Do not change.)         -         -         -         -         -         -         -         -</td>	Name         Range         Unit         Setting         Motors         Enabled         fication           2         Overheat Protection Selections         0000 hex to 0003 hex         -         0000 hex         Linear         After restart         Setup           n.         O         Disable overheat protection         -         0000 hex         Linear         After restart         Setup           1         Use overheat protection in the Yaskawa Linear Servomotor.**         -         Monitor a sensor attached to the machine ar use overheat protection.         -         Monitor a sensor attached to the machine ar use overheat protection.           1         Use overheat protection.         3         Monitor a negative voltage input from a sensor attached to the machine ar use overheat protection.         -           1         Use overheat protection.         3         Monitor a positive voltage input from a sensor attached to the machine ar use overheat protection.         -           1         Reserved parameter (Do not change.)         -         -         -         -           1         Reserved parameter (Do not change.)         -         -         -         -         -           1         Reserved parameter (Do not 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	Communic trols	ations Con-	0000 hex to 1FF3 hex	-	1040 hex	All	Immedi- ately	Setup	_				
										_				
				LINK Commun	ications C	heck Mas	k for Debugg	ling						
				ot mask.						-				
		n.🗆 🗆 🗆 X				nunication	s errors (A.E6	60).		-				
			3 Igno	re WDT errors ( re both MECHA s (A.E50).	,	communic	ations errors	(A.E60) and	WDT	-				
			Warning Ch	· · ·						i				
				ot mask.						-				
			1 Igno	re data setting	warnings (	A.94 <b>□</b> ).				-				
			2 Igno	re command w	arnings (A	.95 <b>□</b> ).				-				
			3 Igno	re both A.94□	and A.95 <b>D</b>	J warnings	8.			-				
			4 Igno	re communicati	ons warni	ngs (A.96 <b>E</b>	⊐).			_				
Pn800			5 Igno	re both A.94□	and A.96	J warnings	6.			_				
111000			6 Igno	re both A.95□	and A.96 <b>E</b>	] warnings	3.			_				
		n.🗆🗆 X 🗆	7 Igno	re A.94 <b>□</b> , A.95	□, and A.	96 <b>□</b> warni	ings.			_				
				re data setting	0		,			_				
				re A.94 <b>□</b> , A.97			0			-				
				Ignore A.95□, A.97A, and A.97b warnings.										
				Ignore A.94 , A.95 , A.97A, and A.97b warnings.										
				Ignore A.96□, A.97A, and A.97b warnings.										
				Ignore A.94, A.96, A.97A, and A.97b warnings.										
			E         Ignore A.95□, A.96□, A.97A, and A.97b warnings.           F         Ignore A.94□, A.95□, A.96□, A.97A, and A.97b warnings.											
			Reserved parameter (Do not change.)											
		n.¤X¤¤			-		*10			-				
		n.XDDD	Automatic Warning Clear Selection for Debugging <sup>*10</sup>											
		M3 <sup>*10</sup>		0 Retain warnings for debugging.										
			1 Auto	matically clear	warnings (	MECHAIH	IOLINK-III spe	ecification).		-				
	2	Application Selections Limits)	Function 6 (Software	0000 hex to 0103 hex	-	0003 hex	All	Immedi- ately	Setup	*1				
			Software Lir											
				ble both forward			re limits.			-				
		n.🗆 🗆 🗆 X		ble forward soft						-				
D=001				ble both forwar		ree softwa	are limite			-				
Pn801		n.□□X□		rameter (Do no						-				
		11.00/0			•	,				1				
				nit Check for R			roforonaca			1				
		n.¤X¤¤		ot perform soft						-				
										-				
		n.XDDD	Reserved pa	rameter (Do no	ot change	)				1				
Pn803	2	Origin Don	99	0 to 250	1 refer-	10	All	Immedi-	Satura	*2				
111003		Origin Ran	96	010200	ence unit	10	All	ately	Setup	-				
Pn804	4	Forward S	oftware Limit	-1,073,741,823 to 1,073,741,823	1 refer- ence unit	107374 1823	All	Immedi- ately	Setup	*1				
	I	1		,,,,			1	1	1	۰				

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Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
Pn806	4	Reverse So	oftware Limit	-1,073,741,823 to 1,073,741,823	1 refer- ence unit	-10737 41823	All	Immedi- ately	Setup	*1
Pn808	4	Absolute E Offset	ncoder Origin	-1,073,741,823 to 1,073,741,823	1 refer- ence unit	0	All	Immedi- ately <sup>*11</sup>	Setup	*1
Pn80A	2	First Stage eration Co	Linear Accel- nstant	1 to 65,535	10,000 refer- ence units/s <sup>2</sup>	100	All	Immedi- ately <sup>*12</sup>	Setup	*2
Pn80B	2	Second St Acceleratic	age Linear on Constant	1 to 65,535	10,000 refer- ence units/s <sup>2</sup>	100	All	Immedi- ately *12	Setup	*2
Pn80C	2	Acceleration Switching	on Constant Speed	0 to 65,535	100 ref- erence units/s	0	All	Immedi- ately <sup>*12</sup>	Setup	*2
Pn80D	2	First Stage Deceleratio	Linear on Constant	1 to 65,535	10,000 refer- ence units/s <sup>2</sup>	100	All	Immedi- ately <sup>*12</sup>	Setup	*2
Pn80E	2	Second St Deceleratio	age Linear on Constant	1 to 65,535	10,000 refer- ence units/s <sup>2</sup>	100	All	Immedi- ately <sup>*12</sup>	Setup	*2
Pn80F	2	Deceleration Switching	on Constant Speed	0 to 65,535	100 ref- erence units/s	0	All	Immedi- ately <sup>*12</sup>	Setup	*2
Pn810	2		al Accelera- eration Bias	0 to 65,535	100 ref- erence units/s	0	All	Immedi- ately <sup>*13</sup>	Setup	*2
Pn811	2		al Accelera- eration Time	0 to 5,100	0.1 ms	0	All	Immedi- ately *13	Setup	*2
Pn812	2	Movement Time	Average	0 to 5,100	0.1 ms	0	All	Immedi- ately *13	Setup	*2
Pn814	4	External Po Final Trave		-1,073,741,823 to 1,073,741,823	1 refer- ence unit	100	All	Immedi- ately	Setup	*2
	2	Origin Retu tings	urn Mode Set-	0000 hex to 0001 hex	-	0000 hex	All	Immedi- ately	Setup	*14
Pn816 M2 <sup>*15</sup>		n.000X n.00X0 n.0X00	1 Retu Reserved pa Reserved pa	n Direction rn in forward di rn in reverse dii rameter (Do no rameter (Do no rameter (Do no	ection. ot change. ot change.	)				
Pn817 *16	2	Origin App 1	roach Speed	0 to 65,535	100 ref- erence units/s	50	All	Immedi- ately <sup>*12</sup>	Setup	*2
Pn818 *17	2	Origin App 2	roach Speed	0 to 65,535	100 ref- erence units/s	5	All	Immedi- ately <sup>*12</sup>	Setup	*2
Pn819	4	Final Trave Origin Retu	l Distance for Jrn	-1,073,741,823 to 1,073,741,823	1 refer- ence unit	100	All	Immedi- ately	Setup	*2

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Parameter Lists

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Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
	2	Input Signa Selections	al Monitor	0000 hex to 7777 hex	-	0000 hex	All	Immedi- ately	Setup	*14		
										_		
			IO12 Signal									
				ot map.						_		
				itor CN1-13 inp		1.				-		
		n.🗆 🗆 🗆 X		itor CN1-7 inpu itor CN1-8 inpu						_		
				itor CN1-8 inpu						_		
				itor CN1-9 lipu						_		
Pn81E										-		
M2 *15												
			IO13 Signal	Mapping								
		n.□□X□										
			IO14 Signal	Mapping								
		n.¤X¤¤	0 to 7 The	mappings are ti	ne same a	s the IO12	signal mappi	ngs.		_		
		n.XDDD	IO15 Signal	Mapping								
			0 to 7 The	0 to 7 The mappings are the same as the IO12 signal mappings.								
	2	Command tions	Data Alloca-	0000 hex to 1111 hex	-	0010 hex	All	After restart	Setup	*14		
			Option Field	Allocation								
		n.🗆 🗆 🗆 X	0 Disal	ole option field	allocation.					-		
DIALE			1 Enab	le option field a	allocation.					_		
Pn81F M2 <sup>*15</sup>			Position Cor	trol Command	TFF/TLIM	1 Allocatio	n					
1112		n.🗆🗆 X 🗆	0 Disal	ole allocation.						_		
			1 Enab	le allocation.						_		
		n.¤X¤¤	Reserved pa	rameter (Do no	ot change.	)						
		n.XDDD	Reserved pa	rameter (Do no	ot change.	)						
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	0	All	Immedi- ately	Setup	*2		
				2,147,403,047	unit				d on nov			

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Parameter No.	Size		Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refe enc			
	2	Option M tion	onitor 1 Selec-	0000 hex to FFFF hex	_	0000 hex	_	Immedi- ately	Setup	*2			
		tion		IIII IIEX		TIEX		atery					
	_	Catting			Monitor			٥	nliachla M	ata			
	_	Setting	Monitor Regio	<u> </u>	Monitor			AL	plicable Mo	Stors			
		000 hex	Motor speed [1		verspeed (	detection s	needl		All				
		001 hex	Speed reference						All				
		002 hex	Torque [100000	•					All				
		003 hex	Position deviati			nce units]			All				
	0	004 hex	Position deviati						All				
	0	00A hex	Encoder count	(lower 32 bits)	[reference	units]			All				
	0	00B hex	Encoder count	(upper 32 bits)	[reference	e units]			All				
	0	00C hex	FPG count (low	er 32 bits) [refe	erence uni	ts]			All				
	0	00D hex	FPG count (up)	per 32 bits) [ref	erence un	its]			All				
	Lo	ow-Speed	Monitor Regior	l				1					
	0	010 hex	Un000: Motor s	speed [min <sup>-1</sup> ]					All				
	0	011 hex	Un001: Speed	Reference [mir	1 <sup>-1</sup> ]				All				
	0	012 hex	Un002: Torque						All				
			Un003: Rotatio Number of enc displayed in de	oder pulses fro	ion								
	0	013 hex	Un003: Electric Linear encoder	al Angle 1 [line	layed in decir	nal	All						
		014 have	Un004: Rotatio Electrical angle		All								
n824 M3 <sup>*10</sup>	0	014 hex	Un004: Electric Electrical angle										
1013	0	015 hex	Un005: Input S		All								
	0	016 hex	Un006: Output	Signal Monitor	•				All				
	0	017 hex	Un007: Input R	eference Spee	d [min <sup>-1</sup> ]				All				
	0	018 hex	Un008: Position	n Deviation [ref	erence un	its]			All				
	0	019 hex	Un009: Accum	ulated Load Ra	atio [%]				All				
	0	01A hex	Un00A: Regene	erative Load Ra	atio [%]				All				
		01B hex	Un00B: Dynam						All				
	0	01C hex	Un00C: Input F				-		All				
	0	01D hex	Un00D: Feedba						All				
		01E hex	Un00E: Fully-cl resolution]	•	edback Pu	lse Counte	er [external en	coder	Rotary				
		023 hex	Initial multiturn		-				Rotary				
		024 hex	Initial incremen						Rotary				
		025 hex	Initial absolute			,			Linear				
		026 hex	Initial absolute				-		Linear				
		040 hex	Un025: SERVC						All				
		041 hex	Un026: Servon				tor		All				
		042 hex	Un027: Built-in		-	J			All				
		043 hex	Un028: Capaci				atio		All				
		044 hex	Un029: Surge I			-			All				
		045 hex	Un02A: Dynam		All								
		046 hex	Un032: Instant						All				
	0	047 hex 048 hex							All				

								linue		n previous	s page
Parameter No.	Size	Ν	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors		nen bled	Classi- fication	Refer- ence
		0.111			• • •				<b>A</b> 1 <sup>1</sup>		_
		Setting		0.1	Monitor				Applic	able Moto	ors
		Communica	ations Module	,	dhaalana	aitian /LDC	O1) [reference				
		0080 hex	units]	e of latched fee						All	
Pn824 M3 *10		0081 hex	units]	e of latched fee		sition (LPC	S2) [referenc	е		All	
		0084 hex	Continuous L	atch Status (EX	(STATUS)					All	
		All Areas									
		Other values	Reserved set	tings (Do not us	se.)					All	
	2	Option Mo tion	onitor 2 Selec-	0000 hex to FFFF hex	_	0000 hex	All		nedi- ely	Setup	*2
Pn825		0000 to 0084 hex	The setting	s are the same	as those f	or the Opt	on Monitor 1	Selec	tion.		_
Pn827	2	Linear Dec Constant	celeration 1 for Stopping	1 to 65,535	10,000 refer- ence units/s <sup>2</sup>	100	All		nedi- y <sup>*12</sup>	Setup	*2
Pn829	2		aiting Time (for Deceleration	0 to 65,535	10 ms	0	All		nedi- y <sup>*12</sup>	Setup	*2
	2		ld Allocations	0000 hex to 1E1E hex	-	1813 hex	All		ter tart	Setup	*14
Pn82A M2 <sup>*15</sup>		nX	0         Alloc           1         Alloc           2         Alloc           3         Alloc           4         Alloc           5         Alloc           6         Alloc           7         Alloc           8         Alloc           9         Alloc           8         Alloc           9         Alloc           0         Alloc           0         Alloc           0         Disa           1         Enalloc           0         Disa           1         Enalloc	cation (Option) cate bits 0 and cate bits 1 and 2 cate bits 2 and 3 cate bits 2 and 3 cate bits 3 and 4 cate bits 3 and 4 cate bits 5 and 6 cate bits 5 and 6 cate bits 6 and 7 cate bits 7 and 8 cate bits 7 and 8 cate bits 9 and 9 cate bits 10 and cate bits 11 and cate bits 12 and cate bits 13 and cate bits 14 and cation Enable/D settings are the cation Enable/D	2 to ACCF 3 to ACCF 4 to ACCF 5 to ACCF 5 to ACCF 6 to ACCF 7 to ACCF 10 to ACCF 10 to ACCF 10 to ACCF 10 to ACCF 11 to ACC 11 to ACC 12 to ACCF 13 to ACCF 14 to ACC Disable Sec cation. cation.	IL. IL. IL. IL. IL. IL. FIL. CFIL. CFIL. CFIL. CFIL. of the AC	CFIL allocatic	ons.			
		n. X000		ble G_SEL alloc							-
			0 0.00		, action in						

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Parameter No.	Size	Ν	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
	2	Option Fie	ld Allocations	0000 hex to 1F1F hex	-	1D1C hex	All	After restart	Setup	*14
		2				TIEX		Testart		
			V_PPI Alloca	ate bit 0 to V_F	וחנ					
				ate bit 0 to V_F						
				ate bit 1 to V_F						_
				ate bit 2 to V_I						
				ate bit 4 to V_F						
				ate bit 5 to V_F						
				ate bit 6 to V_F						
		n.🗆 🗆 🗆 X		ate bit 7 to V_F						_
				ate bit 8 to V_F						
			9 Alloc	ate bit 9 to V_F	PPI.					
			A Alloc	ate bit 10 to V	PPI.					
Pn82B			B Alloc	ate bit 11 to V	PPI.					_
M2 *15			C Alloc	ate bit 12 to V_	_PPI.					
			D Alloc	ate bit 13 to V_	_PPI.					
			E Alloc	ate bit 14 to V_	_PPI.					
			F Alloc	ate bit 15 to V_	_PPI.					
			V PPI Alloca	tion Enable/Di	sable Sele	ection				
		n.🗆 🗆 X 🗆	_	ole V_PPI alloca						-
				le V_PPI alloca						_
		n.¤X¤¤	P_PI_CLR A	location (Optic	on)					
		11.0700	0 to F The	settings are the	same as	for the V_F	PPI allocations	3.		_
										-
			1	location Enabl		Selection				
		n.XDDD		ole P_PI_CLR a						_
			1 Enab	ole P_PI_CLR a	liocation.					_
	2	Option Fie	Id Allocations	0000 hex to	_	1F1E	All	After	Setup	*14
		3		1F1F hex		hex	711	restart	Octup	
			-							_
		n.DDDX	P_CL Allocat	tion (Option)						
			0 to F The	settings are the	same as	for the V_F	PPI allocations	3.		_
										-
				tion Enable/Dis		ction				_
Pn82C		n.□□X□		ole P_CL alloca						_
M2 *15			1 Enat	ole P_CL allocation	lion.					
			N_CL Alloca	tion (Option)						
		n.¤X¤¤		settings are the	same as	for the V.F	PPL allocations	3		_
					54110 43		. i anoodtiork			-
			N_CL Alloca	tion Enable/Dis	sable Sele	ction				
		n.XDDD		ole N_CL alloca						-
				le N_CL alloca						
										-
								O a a tila	od on nov	

								Con	itinued from	n previou	s page.	
Parameter No.	Size	Name			Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence	
	2	Option Fiel 4	d Allocati	ions	0000 hex to 1F1C hex	-	0000 hex	All	After restart	Setup	*14	
			BANK_S	SEL1	Allocation (Op	tion)						
		n.DDDX	0	Alloca	ate bits 0 to 3	to BANK_	SEL1.				-	
			1	Alloca	ate bits 1 to 4	to BANK_	SEL1.				_	
			2	Alloca	ate bits 2 to 5	to BANK_	SEL1.				_	
			3	Alloca	ate bits 3 to 6	to BANK_	SEL1.					
			4	Alloca	ate bits 4 to 7	to BANK_	SEL1.					
			5	Alloca	ate bits 5 to 8 <sup>-</sup>	to BANK_	SEL1.					
Pn82D			6	Alloca	ate bits 6 to 9	to BANK_	SEL1.					
			7	Allocate bits 7 to 10 to BANK_SEL1.								
			8	Allocate bits 8 to 11 to BANK_SEL1.								
			9	Alloca	ate bits 9 to 12	to BANK	_SEL1.				_	
M2 <sup>*15</sup>					ate bits 10 to 1		-				_	
1012					ate bits 11 to 1		-				_	
			С	Alloca	ate bits 12 to 1	5 to BAN	K_SEL1.				_	
			BANK_S	SEL1	Allocation Ena	able/Disab	le Selectio	on				
		n.DDXD	0	Disab	le BANK_SEL	1 allocatio	n.				-	
			1	Enab	le BANK_SEL1	allocation	۱.				_	
		n.¤X¤¤		DISABLE Allocation (Option)								
			0 to F	The s	ettings are the	same as	for the V_F	PPI allocations	6.		_	
			LT_DISABLE Allocation Enable/Disable Selection									
		n.XDDD	0	Disable LT_DISABLE allocation.							_	
			1	Enab	le LT_DISABLE	allocatior	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 5	Id Allocations	0000 hex to 1D1F hex	-	0000 hex	All	After restart	Setup	*14					
		n.□□□X	Reserved parameter (Do not change.)												
		n.🗆🗆 X 🗆	Reserved parameter (Do not change.)												
		OUT_SIGNAL Allocation (Option)													
			0 Alloo	ate bits 0 to 2	to OUT_SI	GNAL.				-					
			1 Alloo	ate bits 1 to 3	to OUT_SI	GNAL.									
			2 Alloo	Allocate bits 2 to 4 to OUT_SIGNAL.											
				ate bits 3 to 5											
				Allocate bits 5 to 7 to OUT_SIGNAL.											
Pn82E															
M2 *15		n.¤X¤¤		ate bits 6 to 8											
		n.UXUU		cate bits 7 to 9						_					
				cate bits 8 to 10	-					-					
				ate bits 9 to 11						_					
				cate bits 10 to 1						_					
				ate bits 10 to 1											
				ate bits 12 to 1		-				-					
						-				-					
		D Allocate bits 13 to 15 to OUT_SIGNAL.													
			OUT_SIGNAL Allocation Enable/Disable Selection												
		n.XDDD	0 Disable OUT_SIGNAL allocation.												
			1 Enable OUT_SIGNAL allocation.												
				0000 how to		0000		After							
	2	Motion Se	ttings	0000 hex to 0001 hex	-	0000 hex	All	After restart	Setup	*2					
	2	Motion Se	ttings		_		All		Setup	*2					
	2	Motion Se	-	0001 hex	_	hex			Setup	*2					
	2	Motion Se	Linear Acce	0001 hex eration/Decele		hex	ection	restart		*2					
	2		Linear Acce	eration/Decele		hex	ection	restart		*2					
	2	Motion Se	Linear Acce 0 Use igno	eration/Decele Pn80A to Pn80 red.)	F and Pn8	hex nstant Sele 327. (The s	ection ettings of Pn8	restart 334 to Pn84	0 are	*2					
Pn833	2		Linear Acce 0 Use igno	eration/Decele Pn80A to Pn80 red.) Pn834 to Pn84	F and Pn8	hex nstant Sele 327. (The s	ection ettings of Pn8	restart 334 to Pn84	0 are	*2					
Pn833	2		Linear Acce 0 Use igno 1 Use igno	eration/Decele Pn80A to Pn80 red.)	IF and Pn8 0. (The se	hex hex hex hex hex hex hex hex hex hex	ection ettings of Pn8	restart 334 to Pn84	0 are	*2					
Pn833	2	n.000X	Linear Acce 0 Use igno 1 Use igno Reserved pa	eration/Decele Pn80A to Pn80 red.) Pn834 to Pn84 red.)	F and Pn8 0. (The se ot change	hex hex 327. (The s ttings of P	ection ettings of Pn8	restart 334 to Pn84	0 are	*2					
Pn833	2	n.000X	Linear Acce 0 Use igno 1 Use igno Reserved parts Reserved parts	eration/Decele Pn80A to Pn80 red.) Pn834 to Pn84 red.) arameter (Do no	F and Pn8 0. (The se ot change.	hex hexant Sele 327. (The s tttings of P )	ection ettings of Pn8	restart 334 to Pn84	0 are	*2					
Pn833	2	n.□□□X n.□□X□ n.□X□□	Linear Acce 0 Use igno 1 Use igno Reserved parts Reserved parts	eration/Decele Pn80A to Pn80 red.) Pn834 to Pn84 red.) arameter (Do no	F and Pn8 0. (The se ot change.	hex hexant Sele 327. (The s tttings of P )	ection ettings of Pn8	restart 334 to Pn84	0 are	*2					
Pn833	2	n.□□□X n.□□X□ n.□X□ n.X□□□	Linear Acce         0       Use         1       Use         1       Reserved pa         Reserved pa       Reserved pa	eration/Decele Pn80A to Pn80 red.) Pn834 to Pn84 red.) arameter (Do no arameter (Do no	F and Pn8 0. (The se ot change. ot change. ot change.	hex hexant Sele 327. (The s tttings of P )	ection ettings of Pn8	restart 334 to Pn84 IF and Pn82	0 are	*2					
	2	n.□□□X n.□□X□ n.□X□ n.X□□ First Stage	Linear Acce 0 Use igno 1 Use igno Reserved pa Reserved pa Reserved pa e Linear Accel-	eration/Decele Pn80A to Pn80 red.) Pn834 to Pn84 red.) trameter (Do no trameter (Do no trameter (Do no trameter (Do no trameter (Do no	F and Pn8 0. (The se ot change. ot change. ot change. 10,000 refer-	hex hex 327. (The s ttings of P )	ection ettings of Pn8 n80A to Pn8C	restart 334 to Pn84 F and Pn82	0 are 7 are	*2					
		n.□□□X n.□□X□ n.□X□ n.X□□□	Linear Acce 0 Use igno 1 Use igno Reserved pa Reserved pa Reserved pa e Linear Accel-	eration/Decele Pn80A to Pn80 red.) Pn834 to Pn84 red.) arameter (Do no arameter (Do no	F and Pn8 0. (The se ot change. ot change. t change. 10,000 refer- ence	hex hexant Sele 327. (The s tttings of P )	ection ettings of Pn8	restart 334 to Pn84 IF and Pn82	0 are	-					
		n.□□□X n.□□X□ n.□X□ n.X□□ First Stage	Linear Acce 0 Use igno 1 Use igno Reserved pa Reserved pa Reserved pa e Linear Accel-	eration/Decele Pn80A to Pn80 red.) Pn834 to Pn84 red.) trameter (Do no trameter (Do no trameter (Do no trameter (Do no trameter (Do no	F and Pn8 0. (The se ot change. ot change. 10,000 refer- ence units/s <sup>2</sup>	hex hex 327. (The s ttings of P )	ection ettings of Pn8 n80A to Pn8C	restart 334 to Pn84 F and Pn82	0 are 7 are	-					
Pn834	4	n.□□X n.□X□ n.□X□ n.X□□ First Stage eration Co	Linear Acce 0 Use igno 1 Use igno Reserved pa Reserved pa Reserved pa e Linear Accel- nstant 2 age Linear	0001 hex eration/Decele Pn80A to Pn80 red.) Pn834 to Pn84 red.) urameter (Do no urameter (Do n	F and Pn8 0. (The se ot change. ot change. 10,000 refer- ence units/s <sup>2</sup> 10,000 refer-	hex hex 327. (The s 327. (The s ) ) ) )	All	restart 334 to Pn84 F and Pn82 Immedi- ately *12	0 are 7 are Setup	*2					
Pn834		n.□□X n.□X□ n.□X□ n.X□□ First Stage eration Co	Linear Acce 0 Use igno 1 Use igno Reserved pa Reserved pa Reserved pa e Linear Accel- nstant 2	0001 hex eration/Decele Pn80A to Pn80 red.) Pn834 to Pn84 red.) trameter (Do no trameter (Do no trameter (Do no trameter (Do no trameter (Do no	F and Pn8 0. (The se ot change. ot change. 10,000 refer- ence units/s <sup>2</sup> 10,000 refer- ence	hex hex 327. (The s ttings of P )	ection ettings of Pn8 n80A to Pn8C	Immedi- ately *12	0 are 7 are	-					
Pn834	4	n.□□X n.□X□ n.□X□ n.X□□ First Stage eration Co	Linear Acce 0 Use igno 1 Use igno Reserved pa Reserved pa Reserved pa e Linear Accel- nstant 2 age Linear	0001 hex eration/Decele Pn80A to Pn80 red.) Pn834 to Pn84 red.) urameter (Do no urameter (Do n	F and Pn8 0. (The se ot change ot change t change t change 10,000 refer- ence units/s <sup>2</sup>	hex hex 327. (The s 327. (The s ) ) ) )	All	restart 334 to Pn84 F and Pn82 Immedi- ately *12	0 are 7 are Setup	*2					
Pn834 Pn836	4	n.□□X n.□□X□ n.□X□ n.X□□ First Stage eration Co Second St Acceleration	Linear Acce 0 Use igno 1 Use igno Reserved pa Reserved pa Reserved pa Accel- nstant 2 age Linear on Constant 2	0001 hex eration/Decele Pn80A to Pn80 red.) Pn834 to Pn84 red.) urameter (Do no urameter (Do no urameter (Do no 1 to 20,971,520 1 to 20,971,520 0 to	F and Pn8 0. (The se ot change. ot change. ot change. 10,000 refer- ence units/s <sup>2</sup> 10,000 refer- ence units/s <sup>2</sup> 1 refer-	hex hex 327. (The s 327. (The s ttings of P ) ) ) ) 100	All	restart 334 to Pn84 F and Pn82 Immedi- ately *12 Immedi- ately *12 Immedi-	0 are 7 are Setup Setup	*2					
Pn834 Pn836	4	n.□□X n.□X□ n.□X□ n.X□□ First Stage eration Co Second St Acceleration	Linear Acce 0 Use igno 1 Use igno Reserved pa Reserved pa Reserved pa Accel- nstant 2 age Linear on Constant 2	eration/Decele Pn80A to Pn80 red.) Pn834 to Pn84 red.) arameter (Do no arameter (Do no aramete	F and Pn8 0. (The se ot change ot change t change t change 10,000 refer- ence units/s <sup>2</sup>	hex hex 327. (The s 327. (The s ) ) ) )	All	restart 334 to Pn84 F and Pn82 Immedi- ately *12 Immedi- ately *12	0 are 7 are Setup	*2					
Pn833 Pn834 Pn836 Pn838	4	n.□□□X n.□□X□ n.□X□ n.□X□ n.X□□ First Stage eration Co Second St Acceleration Switching	Linear Acce 0 Use igno 1 Use igno Reserved pa Reserved pa Reserved pa e Linear Accel- nstant 2 age Linear on Constant 2 on Constant Speed 2	0001 hex eration/Decele Pn80A to Pn80 red.) Pn834 to Pn84 red.) urameter (Do no urameter (Do no urameter (Do no 1 to 20,971,520 1 to 20,971,520 0 to 2,097,152,000	F and Pn8 0. (The se ot change. ot change. 10,000 refer- ence units/s <sup>2</sup> 1 refer- ence units/s <sup>2</sup> 1 refer- ence units/s <sup>2</sup>	hex hex 327. (The s 327. (The s ttings of P ) ) ) ) 100	All	restart 334 to Pn84 F and Pn82 Immediately *12 Immediately *12 Immediately *12 Immediately *12	0 are 7 are Setup Setup	*2					
Pn834 Pn836	4	n.□□□X n.□□X□ n.□X□ n.□X□ n.X□□ First Stage eration Co Second St Acceleration Switching First Stage	Linear Acce 0 Use igno 1 Use igno Reserved pa Reserved pa Reserved pa e Linear Accel- nstant 2 age Linear on Constant 2 on Constant Speed 2	0001 hex eration/Decele Pn80A to Pn80 red.) Pn834 to Pn84 red.) urameter (Do no urameter (Do no urameter (Do no 1 to 20,971,520 1 to 20,971,520 0 to	F and Pn8 0. (The se ot change. ot change. ot change. 10,000 refer- ence units/s <sup>2</sup> 10,000 refer- ence units/s <sup>2</sup>	hex hex 327. (The s 327. (The s ttings of P ) ) ) ) 100	All	restart 334 to Pn84 F and Pn82 Immedi- ately *12 Immedi- ately *12 Immedi-	0 are 7 are Setup Setup	*2					

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Parameter No.	Size	N	lame		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 <sup>2</sup>	100	All	Immedi- ately <sup>*12</sup>	Setup	*2	
Pn83E	4	Deceleration Constant Switching Speed 2			0 to 2,097,152,000	1 refer- ence unit/s	0	All	Immedi- ately <sup>*12</sup>	Setup	*2	
Pn840	4	Linear Deceleration Constant 2 for Stopping			1 to 20,971,520	10,000 refer- ence units/s <sup>2</sup>	100	All	Immedi- ately <sup>*12</sup>	Setup	*2	
Pn842 *16	4	Second Origin Approach Speed 1			0 to 20,971,520	100 ref- erence units/s	0	All	Immedi- ately <sup>*12</sup>	Setup	*2	
Pn844 *17	4	Second Origin Approach Speed 2			0 to 20,971,520	100 ref- erence units/s	0	All	Immedi- ately <sup>*12</sup>	Setup	*2	
Pn846	2	POSING Command Scurve Acceleration/ Deceleration Rate			0 to 50	1%	0	All	Immedi- ately <sup>*12</sup>	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 Seq Settings	Latch Sequence 1 to 4 Settings			-	0000 hex	All	Immedi- ately	Setup	*2	
	-		Latch Sequence 1 Signal Selection									
			0		Phase C						_	
	n.DDDX		1		signal						_	
			2		r2 signal						_	
			3	3 EXT3 signal								
			Lateh Sequence 2 Signal Selection									
Pn852	n.OOXO		Latch Sequence 2 Signal Selection									
			0 to 3 The settings are the same as those for the Latch Sequence 1 Signal Selec-									
			Latch	Seque	nce 3 Signal Selection							
		n.¤X¤¤	0 to 3	The stion.	settings are the same as those for the Latch Sequence 1 Signal Selec-							
	Latch Sequence 4 Signal Selection											
		n.XDDD	0 to 3 The settings are the same as those for the Latch Sequence 1 Signal Selection.									

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Parameter No.	Size	Ν	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refe ence			
	2	Latch Seq Settings	juence 5 to	0 8 0000 hex 3333 he		0000 hex	All	Immedi- ately	Setup	*2			
		- Cottinigo						atory					
			Latch Se	equence 5 Signa	al Selection					Ī			
			0	Phase C						_			
		n.🗆🗆 X		EXT1 signal						_			
				EXT2 signal						_			
			3	EXT3 signal						_			
Pn853			Latch Se	equence 6 Signa	al Selection								
11000		<b>n. D X D D</b> to 3 The settings are the same as those for the Latch Sequence 5 Signal Selection.											
			Latch Se	tch Sequence 7 Signal Selection									
		n.¤X¤¤	0 to 3 The settings are the same as those for the Latch Sequence 5 Signal Selec- tion.										
			Latch Se	Latch Sequence 8 Signal Selection									
		n.XDDD	1010.3	0 to 3 The settings are the same as those for the Latch Sequence 5 Signal Selec- tion.									
	2	SVCMD_I Monitor Al	llocations	1 1717 he	x _	0000 hex	All	Immedi- ately	Setup	*2			
			Input Signal Monitor Allocation for CN1-13 (SVCMD_IO)           0         Allocate bit 24 (IO_STS1) to CN1-13 input signal monitor.										
				Allocate bit 24 (I Allocate bit 25 (I			-			_			
				Allocate bit 26 (I			-			-			
		n.🗆 🗆 🗆 X		Allocate bit 27 (I			-			_			
		n.DDDX			0_5154) (0 C		are original inter						
			4	Allocate bit 28 (I			-	iitor.					
					O_STS5) to C	N1-13 inp	ut signal mon			_			
Pn860			5 6	Allocate bit 28 (I Allocate bit 29 (I Allocate bit 30 (I	O_STS5) to C O_STS6) to C O_STS7) to C	N1-13 inp N1-13 inp N1-13 inp	ut signal mon ut signal mon ut signal mon	iitor. iitor.		_			
Pn860 M3 *10			5 6	Allocate bit 28 (I Allocate bit 29 (I	O_STS5) to C O_STS6) to C O_STS7) to C	N1-13 inp N1-13 inp N1-13 inp	ut signal mon ut signal mon ut signal mon	iitor. iitor.		-			
			5 6 7	Allocate bit 28 (I Allocate bit 29 (I Allocate bit 30 (I	O_STS5) to C O_STS6) to C O_STS7) to C O_STS8) to C	N1-13 inp N1-13 inp N1-13 inp N1-13 inp	ut signal mon ut signal mon ut signal mon ut signal mon	iitor. iitor.		-			
		n.00X0	5 6 7 CN1-13 0	Allocate bit 28 (I Allocate bit 29 (I Allocate bit 30 (I Allocate bit 31 (I Input Signal Mo Disable allocatio	O_STS5) to C O_STS6) to C O_STS7) to C O_STS8) to C O_STS8) to C Onitor Enable/ n for CN1-13	N1-13 inp N1-13 inp N1-13 inp N1-13 inp <b>Disable S</b> input sign	ut signal mon ut signal mon ut signal mon ut signal mon election al monitor.	iitor. iitor.		- - -			
		n.00X0	5 6 7 CN1-13 0	Allocate bit 28 (I Allocate bit 29 (I Allocate bit 30 (I Allocate bit 31 (I Input Signal Mo	O_STS5) to C O_STS6) to C O_STS7) to C O_STS8) to C O_STS8) to C Onitor Enable/ n for CN1-13	N1-13 inp N1-13 inp N1-13 inp N1-13 inp <b>Disable S</b> input sign	ut signal mon ut signal mon ut signal mon ut signal mon election al monitor.	iitor. iitor.		   			
			5 6 7 CN1-13 0 1	Allocate bit 28 (I Allocate bit 29 (I Allocate bit 30 (I Allocate bit 31 (I Input Signal Mo Disable allocatio	O_STS5) to C O_STS6) to C O_STS7) to C O_STS8) to C onitor Enable/ n for CN1-13 n for CN1-13	N1-13 inp N1-13 inp N1-13 inp N1-13 inp <b>Disable S</b> input sign	ut signal mon ut signal mon ut signal mon ut signal mon election al monitor. al monitor.	iitor. iitor.		-			
		n.==X==	5 , 6 , 7 , 0 , 1 , Input Sig	Allocate bit 28 (I Allocate bit 29 (I Allocate bit 30 (I Allocate bit 31 (I <b>Input Signal Mo</b> Disable allocation	O_STS5) to C O_STS6) to C O_STS7) to C O_STS8) to C Onitor Enable/ n for CN1-13 n for CN1-13 ocation for C	N1-13 inp N1-13 inp N1-13 inp N1-13 inp <b>Disable S</b> input sign input sign N1-7 (SVC	ut signal mon ut signal mon ut signal mon ut signal mon election al monitor. al monitor.	itor. itor. itor.		- - - - -			
			5 6 7 2 CN1-13 0 1 Input Sig 0 to 7	Allocate bit 28 (I Allocate bit 29 (I Allocate bit 30 (I Allocate bit 31 (I Input Signal Mo Disable allocatio Enable allocatio	O_STS5) to C O_STS6) to C O_STS7) to C O_STS8) to C Onitor Enable/ n for CN1-13 n for CN1-13 ocation for C the same as	N1-13 inp N1-13 inp N1-13 inp N1-13 inp <b>Disable S</b> input sign input sign N1-7 (SVC the CN1-1	ut signal mon ut signal mon ut signal mon ut signal mon election al monitor. al monitor. SMD_IO) 3 allocations.	itor. itor. itor.		-			
			5         .           6         .           7         .           0         .           1         .           0         .           0         .           0         .           0         .           0         .           0         .           0         .           0         .           0         .           0         .           0         .           0         .	Allocate bit 28 (I Allocate bit 29 (I Allocate bit 30 (I Allocate bit 31 (I Input Signal Mo Disable allocatio Enable allocatio gnal Monitor All The settings are	O_STS5) to C O_STS6) to C O_STS7) to C O_STS8) to C O_STS8) to C Onitor Enable/ In for CN1-13 n for CN1-13 ocation for C the same as nitor Enable/E n for CN1-7 ir	N1-13 inp N1-13 inp N1-13 inp N1-13 inp Disable S input sign input signa N1-7 (SVC the CN1-1 Disable Se nput signa	ut signal mon ut signal mon ut signal mon ut signal mon election al monitor. al monitor. 3 allocations. lection I monitor.	itor. itor. itor.		-			

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Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence			
	2	SVCMD_IC Monitor Al	) Input Signal locations 2	0000 hex to 1717 hex	-	0000 hex	All	Immedi- ately	Setup	*2			
				-		-		,					
		n.DDDX	Input Signal N	Monitor Alloca	tion for C	N1-8 (SVC	MD_IO)						
			0 to 7 The s	ettings are the	same as	the CN1-1	3 allocations.			_			
				Signal Monitor									
Pn861		n.□□X□		le allocation fo						-			
M3 *10				Monitor Alloca									
		n.¤X¤¤		ettings are the						_			
			CN1-9 Input Signal Monitor Enable/Disable Selection										
		n.XDDD		le allocation fo						-			
			1 Enabl	e allocation fo	r CN1-9 in	put signal	monitor.			-			
		SVCMD IC	) Input Signal	0000 hex to		0000		Immedi-					
	2	Monitor Al	locations 3	1717 hex	-	hex	All	ately	Setup	*2			
			In mut Cinnal N		tion for O								
		n.DDDX		Monitor Alloca ettings are the									
			CN1-10 Input Signal Monitor Enable/Disable Selection										
Pn862		n.🗆 🗆 X 🗆		0 Disable allocation for CN1-10 input signal monitor.									
M3 *10		1 Enable allocation for CN1-10 input signal monitor.											
		n.🗆X🗆 🗆	n.DXDD Input Signal Monitor Allocation for CN1-11 (SVCMD_IO)										
				ettings are the						-			
		n.XDDD		t Signal Monite									
				e allocation fo		1 0				_			
					1				1				
	2	SVCMD_IC Monitor Al	D Input Signal locations 4	0000 hex to 1717 hex	-	0000 hex	All	Immedi- ately	Setup	*2			
					I								
		n.DDDX		Monitor Alloca									
				ettings are the						-			
Pn863 M3 *10		n.DDXD	CN1-12 Input Signal Monitor Enable/Disable Selection         0       Disable allocation for CN1-12 input signal monitor.										
			0         Disable allocation for CN1-12 input signal monitor.           1         Enable allocation for CN1-12 input signal monitor.										
		n.🗆X🗆 🗆	Reserved par	ameter (Do no	ot change.	)							
		n.XDDD	•	ameter (Do no	0	,							
								0	d on nov				

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Parameter No.	Size		ame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
	2	SVCMD_IC nal Monitor	) Output Sig- r Allocations 1	0000 hex to 1717 hex	-	0000 hex	All	Immedi- ately	Setup	*2		
		1		L	I.	L	L			L		
			Output Signa	I Monitor Alloo	cation for	CN1-1 and	d CN1-2 (SV0	CMD_IO)		T		
			0 Alloca	ate bit 24 (IO_S	STS1) to C	N1-1/CN1	-2 output sig	nal monitor.		_		
				ate bit 25 (IO_S			· •			_		
				ate bit 26 (IO_S	,		1 0			_		
		n.🗆 🗆 🗆 X		ate bit 27 (IO_S						_		
				ate bit 28 (IO_S ate bit 29 (IO_S						_		
				ate bit 29 (IO_3 ate bit 30 (IO_3	,		. 0			_		
Pn868										_		
M3 *10												
				2 Output Signa								
		n.□□X□		ble allocation fo			0			_		
	1 Enable allocation for CN1-1/CN1-2 output signal monitor.											
		n.¤X¤¤	Output Signa	I Monitor Alloo	cation for	CN1-23 aı	nd CN1-24 (S	SVCMD_IO)				
			0 to 7 The s	ettings are the	same as	the CN1-1	/CN1-2 alloca	ations.		_		
	1		CN1-23/CN1	-24 Output Sig	gnal Moni <sup>.</sup>	tor Enable	/Disable Sele	ction		T .		
		n.XDDD	0 Disable allocation for CN1-23/CN1-24 output signal monitor.									
			1 Enab	le allocation for	r CN1-23/	CN1-24 ot	utput signal m	ionitor.		-		
	2	SVCMD_IC	) Output Sig-	0000 hex to		0000	All	Immedi-	Setup	*2		
		nal Monitor	r Allocations 2	1717 hex	_	hex	All	ately	Setup	2		
	n.□□□X Output Signal Monitor Allocation for CN1-25 and CN1-26 (SVCMD_IO)											
	0 to 7 The settings are the same as the CN1-1/CN1-2 allocations.									_		
Pn869	1		CN1-25/CN1	-26 Output Sig	gnal Moni <sup>.</sup>	tor Enable	/Disable Sele	ction				
M3 *10		n.🗆🗆 X 🗆	0 Disab	le allocation fo	or CN1-25,	/CN1-26 o	utput signal n	nonitor.		_		
			1 Enab	le allocation for	r CN1-25/	CN1-26 ot	utput signal m	ionitor.		_		
	i	n.🗆X🗆 🗆	Reserved par	rameter (Do no	ot change.	)						
	l i	~ VOOO	Decembed not	remeter (De ne	t obongo	<u>۱</u>				_		
		n.XDDD	Reserved par	rameter (Do no	ot change.	.)				_		
		1			I							
Pn880	2	Station Ad tor (for mai	dress Moni-	03 hex to	_	_	All	_	Setup	*1		
1 11000	2	read only)	internarioe,	EF hex			7 41		Ootop			
			nission Byte nitor [bytes]									
Pn881	2	(for mainte	nance, read	17, 32, 48	-	-	All	-	Setup	*1		
		only)	on Cuola Cat									
Pn882	2	Transmission Cycle Set- ting Monitor [× 0.25 µs] 0 hex to 2 (fig mointor [× 0.25 µs] 0 hex to FEFE her – All – Setup								*1		
1 11002		(for mainte only)	nance, read	FFFF hex	_		7311	-				
		Communications Cycle								<u> </u>		
Pn883	2 Setting Monitor [trans- mission cycles] (for 0 to 32 – – All – Setup *1									*1		
			ce, read only)									
								Continue	ed on nex	t page.		

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Parameter No.	Size	1	Name	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence		
	2	Communi trols 2	cations Con-	0000 hex to 0001 hex	-	0000 hex	All	Immedi- ately	Setup	*2		
				INK Communic			s	•				
Pn884 M3 <sup>*10</sup>	n	.000X	U TROI	tain the status s INK communication the holding brains	ations erro	r occurs.	_					
	n	.00X0	Reserved pa	rameter (Do not	change.)							
	n	.0X00	Reserved parameter (Do not change.)									
	n	.X000	Reserved na	rameter (Do not	change)							
			neserved pa		change.)							
Pn88A	2	Monitor	ROLINK Fror Counter enance, read	0 to 65,535	_	0	All	_	Setup	_		
Pn890 to Pn8A6	4	tor during	d Data Moni- Alarm/Warn- enance, read	0 hex to FFFFFFF hex	_	0 hex	All	_	Setup	*1		
Pn8A8 to Pn8BE	4	during Ala	e Data Monitor arm/Warning enance, read	0 hex to FFFFFFFF hex	-	0 hex	All	_	Setup	*1		
Pn900	2	Number o Banks	of Parameter	0 to 16	-	0	All	After restart	Setup	*2		
Pn901	2	Number o Bank Mer	of Parameter mbers	0 to 15	-	0	All	After restart	Setup	*2		
Pn902 to Pn910	2	Paramete ber Defini	r Bank Mem- tion	0000 hex to 08FF hex	-	0000 hex	All	After restart	Setup	*2		
Pn920 to Pn95F	2		r Bank Data d in nonvolatile	0000 hex to FFFF hex	-	0000 hex	All	Immedi- ately	Setup	*2		
Pn9B1	2	Other Sta Station A	tion Monitor 1: ddress	0002 hex to FEEF hex	-	0002 hex	All	After restart	Setup	page 4-9		
	2		tion Monitor 1: of Station Bytes		-	3	All	After restart	Setup	page 4-9		
										_		
				Transmission B								
				erved setting (D						_		
		n.DDDX		erved setting (D	o not use.	)				_		
Pn9B2				oytes						_		
FII3D2				erved setting (D	o not use.	)				_		
	n.□□X□ Reserved parameter (Do not change.)											
	n.□X□□ Reserved parameter (Do not change.)											
		n.XDDD	Reserved p	arameter (Do no	ot change	.)						
	I								nd on nov			

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Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence			
	2		ion Monitor 1: formation Set		-	1000 hex	All	After restart	Setup	page 4-9			
Pn9B3		n.🗆🗆XX	Address Off	set									
		n.¤X¤¤	Data Size (L	Jnit: bytes)						[			
		n.DDDX	Reserved pa	arameter (Do no	ot change.	)				Ī			
			•							_			
Pn9B4	2	Other Stat Station Ad	ion Monitor 2: Idress	0002 hex to FEEF hex	-	0002 hex	All	After restart	Setup	page 4-9			
	2	Other Stat	ion Monitor 2:	0 to 4	_	3	All	After	Setup	page 4-9			
		Number of	f Station Bytes	3				restart		4-9			
			Number of	Transmission B	/tes					1			
			0 Res	erved setting (D	o not use.	)				-			
		n.□□□X	1 Res	erved setting (D	o not use.	)				_			
				oytes						_			
Pn9B5				oytes		\				_			
			4 Reserved setting (Do not use.)										
		n.🗆🗆 X 🗆	Reserved pa	arameter (Do no	ot change.	.)							
		n.											
		n.XDDD	Reserved pa	arameter (Do no	ot change.	)				[			
	2		ion Monitor 2: formation Set		-	1000 hex	All	After restart	Setup	page 4-9			
										-			
Pn9B6		n.🗆 🗆 X 🗆	Address Off	set									
		n.¤X¤¤	Data Size (U	Jnit: bytes)									
		n.XDDD	Reserved pa	arameter (Do no	ot change.	)							
Pn9B7	2	Station Ad		FEEF hex	-	0002 hex	All	After restart	Setup	page 4-9			
	2		ion Monitor 3: f Station Bytes		-	3	All	After restart	Setup	page 4-9			
			Number of <sup>-</sup>	Transmission B	/tes								
				erved setting (D		,				_			
		n.🗆 🗆 🗆 X		erved setting (D	o not use.	)				_			
D.000				oytes						_			
Pn9B8				oytes erved setting (D	o not use	)				-			
			1										
		n.□□X□		arameter (Do no		<b>,</b>				-			
		n.¤X¤¤	Reserved pa	arameter (Do no	ot change								
		n.XDDD	Reserved pa	arameter (Do no	ot change.	)				I			

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Size	N	ame	Setting							
2			Range	Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence	
		on Monitor 3: ormation Set-	0000 hex to 14FF hex	_	1000 hex	All	After restart	Setup	page 4-9	
I	n.🗆🗆XX	Address Offs	et							
	n.0X00	Data Size (Ur	iit: bytes)							
I	n.XDDD	Reserved par	ameter (Do no	ot change.	)				I	
0	Other Stati	on Monitor 4:	0002 hex to		0002	A 11	After	Catura	page	
	Station Ad	dress	FEEF hex	-	hex		restart After		4-9	
2			0 to 4	-	3	All	restart	Setup	page 4-9	
Ī					)					
	n.🗆 🗆 🗆 X		0 (	o not use.	)				_	
		,							_	
4 Reserved setting (Do not use.)										
	n.🗆🗆 X🗆	Reserved par	ameter (Do no	ot change.	)					
n.□X□□ Reserved parameter (Do not change.)										
	n.XDDD	Reserved par	ameter (Do no	ot change.	)					
2			0000 hex to 14FF hex	_	1000 hex	All	After restart	Setup	page 4-9	
1	n.□□XX Address Offset									
- î	n.¤X¤¤	Data Size (Ur	iit: bytes)							
- î	n.XOOO			ot change.	)				-	
				it on angoi	/					
2	Other Stati Station Ad	on Monitor 5: dress	0002 hex to FEEF hex	-	0002 hex	All	After restart	Setup	page 4-9	
2			0 to 4	_	3	All	After restart	Setup	page 4-9	
		Number of Tr	ansmission By	rtes						
									_	
	n.🗆🗆 🗆 X		÷.	o not use.	)				_	
		,							_	
		4 Rese	rved setting (D	o not use.	)				_	
	n.DDXD	Reserved par	ameter (Do no	ot change.	)					
I	n.¤X¤¤	Reserved par	ameter (Do no	ot change.	)					
	n.XDDD	Reserved par	ameter (Do no	ot change.	)					
		2         Station Ada           2         Other Stati Number of           1         Other Stati Number of           1         n.□□□X           1         n.□□X□           1         n.□□X□           1         Nonitor Inf ting           1         N□□XX           1         n.□□XX           1         Nonitor Inf ting           1         N□□XX           1         N□□XX           1         N□□10           2         Other Stati Station Ad           2         Other Stati Number of	2       Other Station Monitor 4: Station Address         2       Other Station Monitor 4: Number of Station Bytes         2       Other Station Monitor 4: Number of Station Bytes         1       Reserved part         1       Reserved part <td>2       Other Station Monitor 4: Station Address       0002 hex to FEEF hex         2       Other Station Monitor 4: Number of Station Bytes       0 to 4         2       Other Station Monitor 4: Number of Station Bytes       0 to 4         1       Reserved setting (D) 2       1         2       3       48 bytes         3       48 bytes         4       Reserved setting (D)         1       Reserved setting (D)         2       32 bytes         3       48 bytes         4       Reserved setting (D)         n.□□X□       Reserved parameter (Do no         n.□X□□       Reserved parameter (Do no         n.□X□□       Reserved parameter (Do no         n.□□XX       Address Offset         n.□X□□       Data Size (Unit: bytes)         n.X□□□       Reserved parameter (Do no         n.X□□□       Reserved parameter (Do no         n.X□□□       Reserved parameter (Do no         n.X□□□       Reserved setting (D)         n.X□□□       Reserved parameter (Do no         n.X□□□       Reserved setting (D)         n.X□□□       Reserved setting (D)         1       Reserved setting (D)         2       Other Station Monitor 5: Number o</td> <td>2       Other Station Monitor 4: Station Address       0002 hex to FEEF hex       -         2       Other Station Monitor 4: Number of Station Bytes       0 to 4       -         1       Reserved setting (Do not use.)       1         2       32 bytes       3       48 bytes         3       48 bytes       4       Reserved setting (Do not use.)         1       Reserved setting (Do not use.)       1       Reserved setting (Do not use.)         1       Reserved setting (Do not use.)       2       32 bytes         3       48 bytes       4       Reserved setting (Do not use.)         n.□□X□       Reserved parameter (Do not change.       n.□X□□         n.□X□□       Reserved parameter (Do not change.       -         n.□□XX       Address Offset       -         n.□□XX       Address Offset       -         n.□□XX       Address       002 hex to 14FF hex       -         2       Other Station Monitor 5: Number of Station Bytes       0 to 4       -         2       Other Station Monitor 5: Number of Station Bytes       0 to 4       -         2       Other Station Monitor 5: Number of Station Bytes       0 to 4       -         2       Other Station Monitor 5: Number of Station Bytes       0 to 4</td> <td>2       Other Station Monitor 4: Station Address       0002 hex to FEEF hex       -       0002 hex         2       Other Station Monitor 4: Number of Station Bytes       0 to 4       -       3         1       Reserved setting (Do not use.)       1       Reserved setting (Do not use.)       2         2       3       48 bytes       -       3         1       Reserved setting (Do not use.)       -       2         1       Reserved setting (Do not use.)       -       -         1       Reserved parameter (Do not change.)       -       -         n.□DXD       Reserved parameter (Do not change.)       -       1000 hex         n.□XDD       Data Size (Unit: bytes)       -       1000 hex         n.XDDD       Data Size (Unit: bytes)       -       -       3         1       Reserved parameter (Do not change.)       -       1002 hex         2       Other Station Monitor 5: Number of Station Bytes       0 to 4       -       3         2       Other Station Monitor 5: Numbe</td> <td>2       Other Station Monitor 4: Station Address       0002 hex to FEEF hex       -       0002 hex       All         2       Other Station Monitor 4: Number of Station Bytes       0 to 4       -       3       All         2       Other Station Monitor 4: Number of Station Bytes       0 to 4       -       3       All         1       Reserved setting (Do not use.)       1       Reserved setting (Do not use.)       -         2       32 bytes       3       48 bytes       -       -         4       Reserved setting (Do not use.)       -       -       -         n.□DXD       Reserved parameter (Do not change.)       -       -       -         n.□XDD       Reserved parameter (Do not change.)       -       All         n.□XDD       Reserved parameter (Do not change.)       -       All         n.□XDD       Reserved parameter (Do not change.)       -       All         n.□XDD       Data Size (Unit: bytes)       -       1000 hex       All         n.□XDD       Reserved parameter (Do not change.)       -       3       All         1       Reserved parameter (Do not change.)       -       1000 hex       All         2       Other Station Monitor 5: Number of Station Bytes       0</td> <td>2       Other Station Monitor 4: Station Address       0002 hex to FEEF hex       -       0002 hex       All       After restart         2       Other Station Monitor 4: Number of Station Bytes       0 to 4       -       3       All       After restart         2       Other Station Bytes       0       Reserved setting (Do not use.)       1       Reserved setting (Do not use.)       1         1       Reserved setting (Do not use.)       1       Reserved setting (Do not use.)       1         2       32 bytes       3       48 bytes       -       -         4       Reserved parameter (Do not change.)       -       -       -         n.□UX□       Reserved parameter (Do not change.)       -       -       -         n.TX□□       Reserved parameter (Do not change.)       -       -       1000 hex       All       After restart         2       Other Station Monitor 4: Ing       0000 hex to 14FF hex       -       1000 hex       All       After restart         1.0□UX       Address Offset       -       -       1000 hex       All       After restart         2       Other Station Monitor 5: Station Address       0 to 4       -       3       All       After restart         2       Other Sta</td> <td>2       Other Station Monitor 4: EEF hax       0002 hex to FEEF hax       -       0002 hex       All       After restart       Setup         2       Other Station Monitor 4: Number of Station Bytes       0 to 4       -       3       All       After restart       Setup         1       Reserved setting (Do not use.)       1       Reserved setting (Do not use.)       -       3       All       After restart       Setup         1       Reserved setting (Do not use.)       1       Reserved setting (Do not use.)       -</td>	2       Other Station Monitor 4: Station Address       0002 hex to FEEF hex         2       Other Station Monitor 4: Number of Station Bytes       0 to 4         2       Other Station Monitor 4: Number of Station Bytes       0 to 4         1       Reserved setting (D) 2       1         2       3       48 bytes         3       48 bytes         4       Reserved setting (D)         1       Reserved setting (D)         2       32 bytes         3       48 bytes         4       Reserved setting (D)         n.□□X□       Reserved parameter (Do no         n.□X□□       Reserved parameter (Do no         n.□X□□       Reserved parameter (Do no         n.□□XX       Address Offset         n.□X□□       Data Size (Unit: bytes)         n.X□□□       Reserved parameter (Do no         n.X□□□       Reserved parameter (Do no         n.X□□□       Reserved parameter (Do no         n.X□□□       Reserved setting (D)         n.X□□□       Reserved parameter (Do no         n.X□□□       Reserved setting (D)         n.X□□□       Reserved setting (D)         1       Reserved setting (D)         2       Other Station Monitor 5: Number o	2       Other Station Monitor 4: Station Address       0002 hex to FEEF hex       -         2       Other Station Monitor 4: Number of Station Bytes       0 to 4       -         1       Reserved setting (Do not use.)       1         2       32 bytes       3       48 bytes         3       48 bytes       4       Reserved setting (Do not use.)         1       Reserved setting (Do not use.)       1       Reserved setting (Do not use.)         1       Reserved setting (Do not use.)       2       32 bytes         3       48 bytes       4       Reserved setting (Do not use.)         n.□□X□       Reserved parameter (Do not change.       n.□X□□         n.□X□□       Reserved parameter (Do not change.       -         n.□□XX       Address Offset       -         n.□□XX       Address Offset       -         n.□□XX       Address       002 hex to 14FF hex       -         2       Other Station Monitor 5: Number of Station Bytes       0 to 4       -         2       Other Station Monitor 5: Number of Station Bytes       0 to 4       -         2       Other Station Monitor 5: Number of Station Bytes       0 to 4       -         2       Other Station Monitor 5: Number of Station Bytes       0 to 4	2       Other Station Monitor 4: Station Address       0002 hex to FEEF hex       -       0002 hex         2       Other Station Monitor 4: Number of Station Bytes       0 to 4       -       3         1       Reserved setting (Do not use.)       1       Reserved setting (Do not use.)       2         2       3       48 bytes       -       3         1       Reserved setting (Do not use.)       -       2         1       Reserved setting (Do not use.)       -       -         1       Reserved parameter (Do not change.)       -       -         n.□DXD       Reserved parameter (Do not change.)       -       1000 hex         n.□XDD       Data Size (Unit: bytes)       -       1000 hex         n.XDDD       Data Size (Unit: bytes)       -       -       3         1       Reserved parameter (Do not change.)       -       1002 hex         2       Other Station Monitor 5: Number of Station Bytes       0 to 4       -       3         2       Other Station Monitor 5: Numbe	2       Other Station Monitor 4: Station Address       0002 hex to FEEF hex       -       0002 hex       All         2       Other Station Monitor 4: Number of Station Bytes       0 to 4       -       3       All         2       Other Station Monitor 4: Number of Station Bytes       0 to 4       -       3       All         1       Reserved setting (Do not use.)       1       Reserved setting (Do not use.)       -         2       32 bytes       3       48 bytes       -       -         4       Reserved setting (Do not use.)       -       -       -         n.□DXD       Reserved parameter (Do not change.)       -       -       -         n.□XDD       Reserved parameter (Do not change.)       -       All         n.□XDD       Reserved parameter (Do not change.)       -       All         n.□XDD       Reserved parameter (Do not change.)       -       All         n.□XDD       Data Size (Unit: bytes)       -       1000 hex       All         n.□XDD       Reserved parameter (Do not change.)       -       3       All         1       Reserved parameter (Do not change.)       -       1000 hex       All         2       Other Station Monitor 5: Number of Station Bytes       0	2       Other Station Monitor 4: Station Address       0002 hex to FEEF hex       -       0002 hex       All       After restart         2       Other Station Monitor 4: Number of Station Bytes       0 to 4       -       3       All       After restart         2       Other Station Bytes       0       Reserved setting (Do not use.)       1       Reserved setting (Do not use.)       1         1       Reserved setting (Do not use.)       1       Reserved setting (Do not use.)       1         2       32 bytes       3       48 bytes       -       -         4       Reserved parameter (Do not change.)       -       -       -         n.□UX□       Reserved parameter (Do not change.)       -       -       -         n.TX□□       Reserved parameter (Do not change.)       -       -       1000 hex       All       After restart         2       Other Station Monitor 4: Ing       0000 hex to 14FF hex       -       1000 hex       All       After restart         1.0□UX       Address Offset       -       -       1000 hex       All       After restart         2       Other Station Monitor 5: Station Address       0 to 4       -       3       All       After restart         2       Other Sta	2       Other Station Monitor 4: EEF hax       0002 hex to FEEF hax       -       0002 hex       All       After restart       Setup         2       Other Station Monitor 4: Number of Station Bytes       0 to 4       -       3       All       After restart       Setup         1       Reserved setting (Do not use.)       1       Reserved setting (Do not use.)       -       3       All       After restart       Setup         1       Reserved setting (Do not use.)       1       Reserved setting (Do not use.)       -	

Continued from previous page.

							001	tinued from	i previou	s paye.
Parameter No.	Size	N	Name		Setting Unit	Default Setting	Applicable Motors	When Enabled	Classi- fication	Refer- ence
	2		on Monitor 5: ormation Set-	0000 hex to 14FF hex	-	1000 hex	All	After restart	Setup	page 4-9
Pn9BF		n.00XX n.0X00 n.X000	Address Offs Data Size (Ur Reserved par		ot change.	.)				I I I

\*1. Refer to the following manual for details.

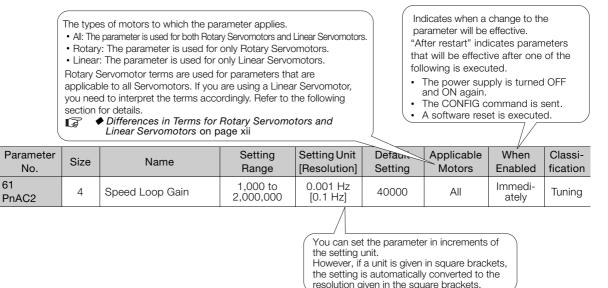
- Ω Σ-7 Series Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)
- \*2. Refer to the following manual for details.
- Ω Σ-7-Series MECHATROLINK-III Communications Standard Servo Profile Command Manual (Manual No.: SIEP S800001 31)
- \*3. Set a 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.

Ω Σ-7-Series Σ-7S/Σ-7W SERVOPACK with Dynamic Brake Hardware Option Specifications 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. DD2 or n. DD3.
- \*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.
- Ω Σ-7-Series 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.

# 7.2.2 List of MECHATROLINK-III Common Parameters

# Interpreting the Parameter Lists



# List of MECHATROLINK-III Common Parameters

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

Parameter No.	Size	Nan	ne	Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classi- fication
	4	Encoder Ty only)	pe (read	0 hex or 1 hex	-	-	All	-	
01									
PnA02		0000 hex	Absolute	encoder					
		0001 hex	Incremen	tal encoder					
	4	Motor Type only)	(read	0 hex or 1 hex	-	-	All	_	
02									_
PnA04		0000 hex	Rotary Se	ervomotor					ation
		0001 hex	Linear Se	ervomotor					ormé
									info
	4	Semi-close closed Type only)	d/Fully- e (read	0 hex or 1 hex	-	-	All	_	Device information
03									
PnA06		0000 hex	Semi-clo	sed					
		0001 hex	Fully-clos	sed					
04 PnA08	4	Rated Spee only)	ed (read	0 hex to FFFFFFF hex	1 min <sup>-1</sup>	-	All	_	]
05 PnA0A	4	Maximum ( Speed (read	Dutput d only)	0 hex to FFFFFFF hex	1 min <sup>-1</sup>	-	All	-	]

							Continued fr		1 0		
Parameter No.	Size	Nan	пе	Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classi- fication		
06 PnA0C	4	Speed Mult (read only)	iplier	-1,073,741,823 to 1,073,741,823	_	-	All	_			
07 PnA0E	4	Rated Torqu (read only)	he	0 hex to FFFFFFF hex	1 N∙m	_	All	_			
08 PnA10	4	Maximum C Torque (rea		0 hex to FFFFFFF hex	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)		0 hex to FFFFFFF hex	1 pulse/rev	_	Rotary	_	Devic		
0B PnA16	4	Linear Scal	e Pitch	0 to 65,536,000	1 nm [0.01 μm]	0	Linear	After restart			
0C PnA18	4	Pulses per Scale Pitch (read only) Electronic Gear Ratio		0 hex to FFFFFFF hex	1 pulse/ pitch	-	Linear	_			
21 PnA42	4	(Numerator	)	1 to 1,073,741,824	-	16	All	After restart	_		
22 PnA44	4	Electronic G (Denominat		1 to 1,073,741,824	_	1	All	After restart	_		
23 PnA46	4	Absolute Er Origin Offse		-1,073,741,823 to 1,073,741,823	1 reference unit	0	All	Immedi- ately <sup>*1</sup>			
24 PnA48	4	Multiturn Li	mit	0 to 65,535	1 Rev	65535	Rotary	After restart			
	4	Limit Settin	g	0 hex to 33 hex	_	0000 hex	All	After restart	_		
		Bit 0	P-OT	0: Enabled, 1: Di	isabled)				suc		
		Bit 1 N-OT (0: Enabled, 1: Disabled)									
25		Bit 2	Rese	erved.							
PnA4A		Bit 3	Rese	erved.							
		Bit 4	P-SC	T (0: Disabled, 1:	Enabled)				ine		
		Bit 5	N-SC	DT (0: Disabled, 1:	Enabled)				Machine specifications		
		Bits 6 to 31	Rese	rved.					≥		
26 PnA4C	4	Forward Sc Limit	ftware	-1,073,741,823 to 1,073,741,823	1 reference unit	10737418 23	All	Immedi- ately	-		
27 PnA4E	4	Reserved p (Do not cha	arameter inge.)	-	-	0	All	Immedi- ately			
28 PnA50	4	Reverse So Limit	ftware	-1,073,741,823 to 1,073,741,823	1 reference unit	-1073741 823	All	Immedi- ately			
29 PnA52	4	Reserved p (Do not cha		-	-	0	All	Immedi- ately	1		
	4	Speed Unit	*2	0 hex to 4 hex	-	0 hex	All	After restart			
41 PnA82		0000 hex 0001 hex 0002 hex 0003 hex	Percenta min <sup>-1*3</sup>	e units/min ge (%) of rated spe					Unit settings		
		0004 hex	Maximum	n motor speed/400	)00000 hex <sup>*4</sup>						

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							Continued fr	om previo	us page.
Parameter No.	Size	Name	ę	Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classi- fication
42 PnA84	4	Speed Base Un *3, *4 (Set the value or from the followir formula: Speed (41 PnA82) × 10	f n ng unit	-3 to 3	_	0	All	After restart	
	4	Position Unit		0 hex	-	0 hex	All	After restart	
43 PnA86		0000 hex Ref	erence u	units					
44 PnA88	4	Position Base U (Set the value o from the followir formula: Positior (43 PnA86) × 10	f n ng n unit	0	_	0	All	After restart	-
	4	Acceleration Un	it	0 hex	-	0 hex	All	After restart	
45 PnA8A		0000 hex Refe	erence ur	nits/s <sup>2</sup>					Unit settings
46 PnA8C	4	Acceleration Ba Unit (Set the value of from the followin formula: Acceler unit (45 PnA8A) 10 <sup>n</sup> )	f n ng ration	4 to 6	_	4	All	After restart	
	4	Torque Unit	-	1 hex or 2 hex	-	1 hex	All	After restart	
47 PnA8E				(%) of rated toro		· 	· 		
48 PnA90	4	Torque Base Un (Set the value o from the followir formula: Torque (47 PnA8E) × 10	f n ng unit	-5 to 0	_	0	All	After restart	

		Continued from previous							us page.
Parameter No.	Size	Name		Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classi- fication
	4	Supported Unit (re only)	ad	_	-	0601011F hex	All	_	
49 PnA92		Speed Units Bit 0 Bit 1 Bit 2 Bit 3 Bit 4 Bits 5 to 7 Position Units Bit 8 Bits 9 to 15 Acceleration Units	Rei Per Ma Rei Rei	ference units/s (1: ference units/min ( rcentage (%) of rat n <sup>-1</sup> (rpm) (1: Enable ximum motor spec served (0: Disable ference units (1: En served (0: Disable	(1: Enabled) ed speed (1: E ed) ed/4000000 he d).	nabled)	ed)		Unit settings
		Bit 16         Bit 17         Bits 18 to 23         Torque Units         Bit 24         Bit 25         Bit 26         Bits 27 to 31	Ret ms Ret N•r Per Ma	ference units/s <sup>2</sup> (1 (acceleration time served (0: Disabled) n (0: Disabled) rcentage (%) of rat ximum torque/400 served (0: Disabled	e required to re d). ed torque (1: E 000000 hex		beed) (0: Disa	bled)	
61 PnAC2 62	4	Speed Loop Gain Speed Loop Integ	ral	1,000 to 2,000,000	0.001 Hz [0.1 Hz] 1 μs	40000	All	Immedi- ately Immedi-	-
PnAC4	4	Time Constant	Iai	150 to 512,000	[0.01 ms]	20000	All	ately	
63 PnAC6	4	Position Loop Gai	n	1,000 to 2,000,000	0.001/s [0.1/s]	40000	All	Immedi- ately	
64 PnAC8	4	Feed Forward Cor pensation	n-	0 to 100	1%	0	All	Immedi- ately	
65 PnACA	4	Position Loop Inte gral Time Constan		0 to 5,000,000	1 μs [0.1 ms]	0	All	Immedi- ately	_
66 PnACC	4	In-position Range		0 to 1,073,741,824	1 reference unit	7	All	Immedi- ately	_
67 PnACE	4	Near-position Ran	ge	1 to 1,073,741,824	1 reference unit	10737418 24	All	Immedi- ately	1
81 PnB02	4	Exponential Func- tion Acceleration/ Deceleration Time Constant		0 to 510,000	1 μs [0.1 ms]	0	All	Immedi- ately <sup>*6</sup>	Tuning
82 PnB04	4	Movement Averag Time	е	0 to 510,000	1 μs [0.1 ms]	0	All	Immedi- ately <sup>*6</sup>	
83 PnB06	4	Final Travel for Ext nal Input Positionii		-1,073,741,823 to 1,073,741,823	1 reference unit	100	All	Immedi- ately	
84 PnB08	4	Zero Point Return Approach Speed		0 hex to 3FFFFFFF hex	10 <sup>-3</sup> min <sup>-1</sup>	× 5,000 hex refer- ence units/s con- verted to 10 <sup>-3</sup> min <sup>-1</sup>	All	Immedi- ately	
85 PnB0A	4	Zero Point Return Creep Speed		0 hex to 3FFFFFFF hex	10 <sup>-3</sup> min <sup>-1</sup>	× 500 hex reference units/s con- verted to 10 <sup>-3</sup> min <sup>-1</sup>	All	Immedi- ately	

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Parameter No.	Size	Nar	ne	Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classi- fication
86 PnB0C	4	Final Travel Point Retur		-1,073,741,823 to 1,073,741,823	1 reference unit	100	All	Immedi- ately	
	4	Monitor Se	lect 1	0 hex to F hex	-	1 hex	All	Immedi- ately	
		0000 hex	APOS						
		0000 hex	CPOS						
07		0001 hex	PERR						
		0002 hex	LPOS1						
		0004 hex	LPOS2						
		0005 hex	FSPD						p
		0006 hex	CSPD						Tuning
87 PnB0E		0007 hex	TRQ						-
		0008 hex	ALARM						
		0009 hex	MPOS						
		000A hex	Reserved	(undefined value).					
		000B hex	Reserved	(undefined value).					
		000C hex	CMN1 (co	ommon monitor 1)					
		000D hex		ommon monitor 2)					
		000E hex		ptional monitor 1)					
		000F hex	OMN2 (o	ptional monitor 2)					
								Immedi-	
	4	Monitor Se	lect 2	0 hex to F hex	-	0 hex	All	ately	ated
88									d-rel: leter:
PnB10		0000 to 000F hex	The settin	gs are the same a	s those for Fixe	ed Monitor S	Selection 1.		Command-related parameters
									Cor
	I						Contin	aund on no	

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Parameter No.	Size	Nar	ne	Setting Range	e Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled			
	4	Monitor Se SEL_MON <sup>2</sup>		0 hex to 9 he	× –	0 hex	All	Immedi- ately			
		SLL_IVION						atery			
		0000 have				t					
		0000 hex 0001 hex	TPOS (target position in reference coordinate system)								
		0001 hex	-		sition in reference coordinate system) et set in POS_SET (Set Coordinate System) command)						
		0002 hex	_	get speed)	IIIFO3_3L1 (Set (	COOLUINALE	System) con	imanu)			
		0003 hex 0004 hex		(speed limit)							
		0004 hex 0005 hex	_	(torque limit)							
			Monitor I Byte 1: C 00 hex: 01 hex: 02 hex: 03 hex: Byte 2: C 00 hex: 01 hex: 02 hex: 02 hex: Byte 3: R	Description urrent commun Phase 0 Phase 1 Phase 2 Phase 3 urrent control n Position control Speed control 1 Torque control	node I mode mode mode						
			Bit	Name	Description	Value	Settin	a			
		0006 hex	-			Processing status	s for 0	Latch dete not yet pro cessed.	ction		
9			Bit 0	LT_RDY1	LT_REQ1 in SVCM- D_CTRL region	VI- 1	Processing detection in progress.				
nB12			0006 hex Bit 1		Bit 1	LT_RDY1	Processing status	r	Latch dete not yet pro cessed.	-	
					_	LT_REQ2 in SVCI D_CTRL region	1	Processing detection in progress.			
						0	Phase C				
			Bits 2			1	External inp signal 1				
			and 3	LT_SEL1R	Latch signal	2	External in signal 2	out			
						3	External inp signal 3	out			
						0	Phase C				
			Bits 4			1	External in signal 1	out			
			and 5	LT_SEL2R	Latch signal	2	External inp signal 2				
						3	External inp signal 3	out			
			Bit 6	Reserved (0	).						
		0007 hex	Reserved								
		0008 hex	INIT_PGF	POS (Low)		it position r	eference dat	a			
			INIT_PGPOS (Low)     verted to 64-bit position reference data       INIT_PGPOS (High)     Upper 32 bits of initial encoder position converted to 64-bit position reference data								

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Parameter No.	Size	Na	me	Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classi- ficatior
	4	Monitor Se SEL_MON		0 hex to 9 hex	-	0 hex	All	Immedi- ately	
8A PnB14		0000 to 0009 hex	The setting	s are the same as	those for SEL	_MON Monit	or Selection	1.	
8B PnB16	4	Zero Point Range	Detection	0 to 250	1 reference unit	10	All	Immedi- ately	
8C PnB18	4	Forward To	orque Limit	0 to 800	1%	100	All	Immedi- ately	
8D PnB1A	4	Reverse Torque Limit		0 to 800	1%	100	All	Immedi- ately	
8E PnB1C	4	Zero Speed Detec- tion Range		1,000 to 10,000,000	10 <sup>-3</sup> min <sup>-1</sup>	20000	All	Immedi- ately	ers
8F PnB1E	4	Speed Match Signal Detection Range		0 to 100,000	10 <sup>-3</sup> min <sup>-1</sup>	10000	All	Immedi- ately	ramete
	4	SVCMD_0 Enabled/D (read only)	isabled	_	_	0FFF3F3F hex	All	_	Command-related parameters
		Bit 0	CN	ID_PAUSE (1: Ena	abled)				nand-re
		Bit 1	CN	/ID_CANCEL (1: E	nabled)				Jun
		Bits 2 and	3 ST	OP_MODE (1: Ena	abled)				Ŏ
		Bits 4 and		CFIL (1: Enabled)					
		Bits 6 and	7 Re	eserved (0: Disable	ed).				
90		Bit 8	LT.	_REQ1 (1: Enable	d)				
PnB20		Bit 9		LT_REQ2 (1: Enabled)					
		Bits 10 and		_SEL1 (1: Enabled	-				
		Bits 12 and		_SEL2 (1: Enabled					
		Bits 14 and		served (0: Disable					
		Bits 16 to		L_MON1 (1: Enab					
		Bits 20 to		L_MON2 (1: Enab					
		Bits 24 to		L_MON3 (1: Enab					
		Bits 28 to	31 Re	served (0: Disable	ed).				

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Parameter No.	Size	Name	Setting Range	Setting Unit [Resolution]	Default Setting	Continued fr Applicable Motors	When Enabled	Class
	4	SVCMD_STAT bit Enabled/Disabled (read only)	-	0 hex	0FFF3F33 hex	All	-	_
				(4				
			CMD_PAUSE_CMP	. ,				
			CMD_CANCEL_CM	, ,				
			Reserved (0: Disable	,				
			ACCFIL (1: Enabled)					
			Reserved (0: Disable	,				
			L_CMP1 (1: Enabled					
91			L_CMP2 (1: Enabled					
PnB22			POS_RDY (1: Enable	ed)				
			PON (1: Enabled)					
		Bit 12	M_RDY (1: Enabled)					
		Bit 13	SV_ON (1: Enabled)					
		Bits 14 and 15	Reserved (0: Disable	ed).				ပ
		Bits 16 to 19	SEL_MON1 (1: Enat	oled)				etei
		Bits 20 to 23	SEL_MON2 (1: Enat	oled)				ram
		Bits 24 to 27	SEL_MON3 (1: Enat	oled)				pa
		Bits 28 to 31	Reserved (0: Disable	ed).				ted
	4	I/O Bit Enabled/Dis- abled (Output) (read		_	007F01F0 hex	All	_	Command-related parameters
		only)			ПСХ			ő
				1)				
			Reserved (0: Disable	ea).				
		-	V_PPI (1: Enabled)					
			P_PPI (1: Enabled)					
			P_CL (1: Enabled)					
92		-	N_CL (1: Enabled)					
PnB24			G_SEL (1: Enabled)					
			G_SEL (0: Disabled)					
			Reserved (0: Disable	,				
			BANK_SEL (1: Enab					
		Bits 20 to 22	SO1 to SO3 (1: Ena	,				
				ad)				1
		Bit 23	Reserved (0: Disable	eu).				

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Parameter No.	Size	Name	Setting Range	Setting Unit [Resolution]	Default Setting	Applicable Motors	When Enabled	Classi- fication		
	4	I/O Bit Enabled/Dis abled (Input) (read only)		-	FF0FFEFE hex	All	_			
		Bit 0	Reserved (0: Disable	ed).						
		Bit 1	DEC (1: Enabled)							
		Bit 2	P-OT (1: Enabled)							
		Bit 3	N-OT (1: Enabled)							
		Bit 4	EXT1 (1: Enabled)							
		Bit 5	EXT2 (1: Enabled)							
		Bit 6 EXT3 (1: Enabled)						ters		
		Bit 7	ESTP (1: Enabled)					ESTP (1: Enabled)		ame
		Bit 8	Reserved (0: Disabled).					Command-related parameters		
93		Bit 9	BRK_ON (1: Enabled)					ed b		
PnB26		Bit 10	P-SOT (1: Enabled)					elati		
		Bit 11	N-SOT (1: Enabled)					n-bi		
		Bit 12	DEN (1: Enabled)					nar		
		Bit 13	NEAR (1: Enabled)					omr		
		Bit 14	PSET (1: Enabled)					Ŭ		
		Bit 15 ZPOINT (1: Enabled)								
		Bit 16	T_LIM (1: Enabled)							
		Bit 17	V_LIM (1: Enabled)							
		Bit 18	V_CMP (1: Enabled)							
		Bit 19	ZSPD (1: Enabled)							
		Bits 20 to 23	Reserved (0: Disable	,						
		Bits 24 to 31	I0_STS1 to I0_STS8	(1: Enabled)						

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\*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 0002 hex or 0003 hex, 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 0004 hex, set the Speed Base Unit Selection (parameter 42) to 0.

\*5. If you set the Torque Unit Selection (parameter 47) to 0002 hex, 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.

# 7.2.3 Parameter Recording Table

Parameter No.	Default Setting	Name	When Enabled
Pn000	0000 hex	Basic Function Selections 0	After restart
Pn001	0000 hex	Application Function Selec- tions 1	After restart
Pn002	0011 hex	Application Function Selec- tions 2	After restart
Pn006	0002 hex	Application Function Selec- tions 6	Immediately
Pn007	0000 hex	Application Function Selec- tions 7	Immediately
Pn008	4000 hex	Application Function Selec- tions 8	After restart
Pn009	0010 hex	Application Function Selec- tions 9	After restart
Pn00A	0001 hex	Application Function Selec- tions A	After restart
Pn00B	0000 hex	Application Function Selec- tions B	After restart
Pn00C	0000 hex	Application Function Selec- tions C	After restart
Pn00D	0000 hex	Application Function Selec- tions D	After restart
Pn00F	0000 hex	Application Function Selec- tions F	After restart
Pn021	0000 hex	Reserved parameter	—
Pn022	0000 hex	Reserved parameter	_
Pn040	0000 hex	Σ-V Compatible Function Switch	After restart
Pn080	0000 hex	Application Function Selec- tions 80	After restart
Pn081	0000 hex	Application Function Selec- tions 81	After restart
Pn0D4	1050 hex	Torque/Force Assistance Selections	After restart
Pn0D5	0000 hex	Reserved parameter	_
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 Inte- gral Time Constant	Immediately
Pn106	400	Second Position Loop Gain	Immediately
Pn109	0	Feedforward	Immediately
Pn10A	0	Feedforward Filter Time Constant	Immediately
Pn10B	0000 hex	Gain Application Selections	*1
Pn10C	200	Mode Switching Level for Torque Reference	Immediately
Pn10D	0	Mode Switching Level for Speed Reference	Immediately

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

Continued on next page.

	Continued from previous pag				
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 Con- stant	Immediately		
Pn121	100	Friction Compensation Gain	Immediately		
Pn122	100	Second Friction Compen- sation Gain	Immediately		
Pn123	0	Friction Compensation Coefficient	Immediately		
Pn124	0	Friction Compensation Fre- quency 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	0000 hex	Automatic Gain Switching Selections 1	Immediately		
Pn13D	2000	Current Gain Level	Immediately		
Pn140	0100 hex	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 Direc- tion	Immediately		
Pn144	1000	Model Following Control Bias in the Reverse Direc- tion	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	0021 hex	Control-Related Selections	After restart		
Pn160	0010 hex	Anti-Resonance Control- Related Selections	Immediately		
Pn161	1000	Anti-Resonance Frequency	Immediately		

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Parameter No.	Default Setting	Name	When Enabled
Pn162	100	Anti-Resonance Gain Cor- rection	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	1401 hex	Tuning-less Function- Related Selections	*1
Pn181	0	Mode Switching Level for Speed Reference	Immediately
Pn182	0	Mode Switching Level for Acceleration	Immediately
Pn205	65535	Multiturn Limit	After restart
Pn207	0010 hex	Position Control Function Selections	After restart
Pn20A	32768	Number of External Encoder Scale Pitches	After restart
Pn20E	16	Electronic Gear Ratio (Numerator)	After restart
Pn210	1	Electronic Gear Ratio (Denominator)	After restart
Pn212	2048	Number of Encoder Output           Pulses	After restart
Pn22A	0000 hex	Fully-closed Control Selec- tions	After restart
Pn230	0000 hex	Position Control Expansion Function Selections	After restart
Pn231	0	Backlash Compensation	Immediately
Pn233	0	Backlash Compensation Time Constant	Immediately
Pn281	20	Encoder Output Resolution	After restart
Pn282	0	Linear Encoder Scale Pitch	After restart
Pn2E0	1	Reserved parameter	-
Pn2E2	1	Reserved parameter	_
Pn2E4	1	Reserved parameter	-
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 Aver- age Movement Time	Immediately
Pn310	0000 hex	Vibration Detection Selec- tions	Immediately
Pn311	100	Vibration Detection Sensi- tivity	Immediately
Pn312	50	Vibration Detection Level	Immediately

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		Continued from p	1 0
Parameter No.	Default Setting	Name	When Enabled
Pn316	10000	Maximum Motor Speed	After restart
Pn324	300	Moment of Inertia Calcula- tion 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 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	0000 hex	Torque-Related Function Selections	*1
Pn409	5000	First Stage Notch Filter Fre- quency	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 Fre- quency	Immediately
Pn410	50	Second Stage Second Torque Reference Filter Q Value	Immediately
Pn412	100	First Stage Second Torque Reference Filter Time Con- stant	Immediately
Pn416	0000 hex	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

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		Continued from p	previous page.
Parameter No.	Default Setting	Name	When Enabled
Pn41D	5000	Fifth Stage Notch Filter Fre- quency	Immediately
Pn41E	70	Fifth Stage Notch Filter Q Value	Immediately
Pn41F	0	Fifth Stage Notch Filter Depth	Immediately
Pn423	0000 hex	Speed Ripple Compensa- tion 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 Aver- age Movement Time	Immediately
Pn427	0	Speed Ripple Compensa- tion Enable Speed	Immediately
Pn456	15	Sweep Torque Reference Amplitude	Immediately
Pn460	0101 hex	Notch Filter Adjustment Selections 1	Immediately
Pn475	0000 hex	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	Immediately
Pn485	20	Polarity Detection Refer- ence Speed	Immediately
Pn486	25	Polarity Detection Refer- ence Acceleration/Deceler- ation Time	Immediately
Pn487	0	Polarity Detection Con- stant Speed Time	Immediately
Pn488	100	Polarity Detection Refer- ence Waiting Time	Immediately
Pn48E	10	Polarity Detection Range	Immediately
Pn490	100	Polarity Detection Load Level	Immediately
Pn495	100	Polarity Detection Confir- mation 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 Detec- tion Signal Output Width	Immediately

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		Continued from p	
Parameter No.	Default Setting	Name	When Enabled
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 Interrup- tion Hold Time	Immediately
Pn50A	1881 hex	Input Signal Selections 1	After restart
Pn50B	8882 hex	Input Signal Selections 2	After restart
Pn50E	0000 hex	Output Signal Selections 1	After restart
Pn50F	0100 hex	Output Signal Selections 2	After restart
Pn510	0000 hex	Output Signal Selections 3	After restart
Pn511	6543 hex	Input Signal Selections 5	After restart
Pn512	0000 hex	Output Signal Inverse Set- tings	After restart
Pn514	0000 hex	Output Signal Selections 4	After restart
Pn516	8888 hex	Input Signal Selections 7	After restart
Pn51B	1000	Motor-Load Position Devia- tion 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	0000 hex	Program Jogging-Related Selections	Immediately
Pn531	32768	Program Jogging Travel Distance	Immediately
Pn533	500	Program Jogging Move- ment Speed	Immediately
Pn534	100	Program Jogging Accelera- tion/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

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Parameter		Continued from p	When
No.	Default Setting	Name	Enabled
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 Moni- tor Unit Time	Immediately
Pn560	400	Residual Vibration Detec- tion Width	Immediately
Pn561	100	Overshoot Detection Level	Immediately
Pn581	20	Zero Speed Level	Immediately
Pn582	10	Speed Coincidence Detec- tion 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 Move- ment Speed	Immediately
Pn586	0	Motor Running Cooling Ratio	Immediately
Pn587	0000 hex	Polarity Detection Execu- tion Selection for Absolute Linear Encoder	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	0000 hex	Overheat Protection Selec- tions	After restart
Pn61B	250	Overheat Alarm Level	Immediately
Pn61C	100	Overheat Warning Level	Immediately
Pn61D	0	Overheat Alarm Filter Time	Immediately
Pn800	1040 hex	Communications Controls	Immediately
Pn801	0003 hex	Application Function Selec- tions 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 <sup>*2</sup>
Pn80A	100	First Stage Linear Accelera- tion Constant	Immedi- ately <sup>*3</sup>
Pn80B	100	Second Stage Linear Acceleration Constant	Immedi- ately <sup>*3</sup>
Pn80C	0	Acceleration Constant Switching Speed	Immedi- ately <sup>*3</sup>
Pn80D	100	First Stage Linear Decelera- tion Constant	Immedi- ately <sup>*3</sup>

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	Continued from previous page.			
Parameter No.	Default Setting	Name	When Enabled	
Pn80E	100	Second Stage Linear Deceleration Constant	Immedi- ately <sup>*3</sup>	
Pn80F	0	Deceleration Constant Switching Speed	Immedi- ately <sup>*3</sup>	
Pn810	0	Exponential Acceleration/ Deceleration Bias	Immedi- ately <sup>*3</sup>	
Pn811	0	Exponential Acceleration/ Deceleration Time Constant	Immedi- ately <sup>*3</sup>	
Pn812	0	Movement Average Time	Immedi- ately <sup>*3</sup>	
Pn814	100	External Positioning Final Travel Distance	Immedi- ately <sup>*3</sup>	
Pn816	0000 hex	Origin Return Mode Set- tings	Immedi- ately <sup>*3</sup>	
Pn817	50	Origin Approach Speed 1	Immedi- ately <sup>*3</sup>	
Pn818	5	Origin Approach Speed 2	Immedi- ately <sup>*3</sup>	
Pn819	100	Final Travel Distance for Origin Return	Immedi- ately <sup>*3</sup>	
Pn81E	0000 hex	Input Signal Monitor Selec- tions	Immediately	
Pn81F	0010 hex	Command Data Allocations	After restart	
Pn820	0	Forward Latching Area	Immediately	
Pn822	0	Reverse Latching Area	Immediately	
Pn824	0000 hex	Option Monitor 1 Selection	Immediately	
Pn825	0000 hex	Option Monitor 2 Selection	Immediately	
Pn827	100	Linear Deceleration Con- stant 1 for Stopping	Immedi- ately <sup>*3</sup>	
Pn829	0	SVOFF Waiting Time (for SVOFF at Deceleration to Stop)	Immediately	
Pn82A	1813 hex	Option Field Allocations 1	After restart	
Pn82B	1D1C hex	Option Field Allocations 2	After restart	
Pn82C	1F1E hex	Option Field Allocations 3	After restart	
Pn82D	0000 hex	Option Field Allocations 4	After restart	
Pn82E	0000 hex	Option Field Allocations 5	After restart	
Pn833	0000 hex	Motion Settings	After restart	
Pn834	100	First Stage Linear Accelera- tion Constant 2	Immedi- ately <sup>*3</sup>	
Pn836	100	Second Stage Linear Acceleration Constant 2	Immedi- ately <sup>*3</sup>	
Pn838	0	Acceleration Constant Switching Speed 2	Immedi- ately <sup>*3</sup>	
Pn83A	100	First Stage Linear Decelera- tion Constant 2	Immedi- ately <sup>*3</sup>	
Pn83C	100	Second Stage Linear Deceleration Constant 2	Immedi- ately <sup>*3</sup>	
Pn83E	0	Deceleration Constant Switching Speed 2	Immedi- ately <sup>*3</sup>	
Pn840	100	Linear Deceleration Con- stant 2 for Stopping	Immedi- ately <sup>*3</sup>	

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Parameter No.	Default Setting	Name	When Enabled
Pn842	0	Second Origin Approach Speed 1	Immedi- ately <sup>*3</sup>
Pn844	0	Second Origin Approach Speed 2	Immedi- ately <sup>*3</sup>
Pn846	0	POSING Command Scurve Acceleration/Deceleration Rate	Immedi- ately <sup>*3</sup>
Pn850	0	Number of Latch Sequences	Immediately
Pn851	0	Continuous Latch Sequence Count	Immediately
Pn852	0000 hex	Latch Sequence 1 to 4 Set- tings	Immediately
Pn853	0000 hex	Latch Sequence 5 to 8 Set- tings	Immediately
Pn860	0000 hex	SVCMD_IO Input Signal Monitor Allocations 1	Immediately
Pn861	0000 hex	SVCMD_IO Input Signal Monitor Allocations 2	Immediately
Pn862	0000 hex	SVCMD_IO Input Signal Monitor Allocations 3	Immediately
Pn863	0000 hex	SVCMD_IO Input Signal Monitor Allocations 4	Immediately
Pn868	0000 hex	SVCMD_IO Output Signal Monitor Allocations 1	Immediately
Pn869	0000 hex	SVCMD_IO Output Signal Monitor Allocations 2	Immediately
Pn880	-	Station Address Monitor (for maintenance, read only)	-
Pn881	-	Set Transmission Byte Count Monitor [bytes] (for maintenance, read only)	_
Pn882	_	Transmission Cycle Setting Monitor [× 0.25 μs] (for maintenance, read only)	_
Pn883	-	Communications Cycle Setting Monitor [transmis- sion cycles] (for mainte- nance, read only)	_
Pn884	0000 hex	Communications Controls 2	Immediately
Pn88A	0	MECHATROLINK Receive Error Counter Monitor (for maintenance, read only)	_
Pn890 to Pn8A6	0 hex	Command Data Monitor during Alarm/Warning (for maintenance, read only)	_
Pn8A8 to Pn8BE	0 hex	Response Data Monitor during Alarm/Warning (for maintenance, read only)	-
Pn900	0	Number of Parameter Banks	After restart
Pn901	0	Number of Parameter Bank Members	After restart
Pn902 to Pn910	0000 hex	Parameter Bank Member Definition	After restart

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Parameter No.	Default Setting	Name	When Enabled	
Pn920 to Pn95F	0000 hex	Parameter Bank Data (Not saved in nonvolatile mem- ory.)	Immediately	
Pn9B1	0002 hex	Other Station Monitor 1: Station Address	After restart	
Pn9B2	3	Other Station Monitor 1: Number of Station Bytes	After restart	
Pn9B3	1000 hex	Other Station Monitor 1: Monitor Information Setting	After restart	
Pn9B4	0002 hex	Other Station Monitor 2: Station Address	After restart	
Pn9B5	3	Other Station Monitor 2: Number of Station Bytes	After restart	
Pn9B6	1000 hex	Other Station Monitor 2: Monitor Information Setting	After restart	
Pn9B7	0002 hex	Other Station Monitor 3: Station Address	After restart	
Pn9B8	3	Other Station Monitor 3: Number of Station Bytes	After restart	
Pn9B9	1000 hex	Other Station Monitor 3: Monitor Information Setting	After restart	
Pn9BA	0002 hex	Other Station Monitor 4: Station Address	After restart	
Pn9BB	3	Other Station Monitor 4: Number of Station Bytes	After restart	
Pn9BC	1000 hex	Other Station Monitor 4: Monitor Information Setting	After restart	
Pn9BD	0002 hex	Other Station Monitor 5: Station Address	After restart	
Pn9BE	3	Other Station Monitor 5: Number of Station Bytes	After restart	
Pn9BF	1000 hex	Other Station Monitor 5: Monitor Information Setting	After restart	
01 PnA02	_	Encoder Type (read only)	-	
02 PnA04	-	Motor Type (read only)	-	
03 PnA06	-	Semi-closed/Fully-closed Type (read only)	-	
04 PnA08	_	Rated Speed (read only)	_	
05 PnA0A	_	Maximum Output Speed (read only)	_	
06 PnA0C	_	Speed Multiplier (read only)	-	
07 PnA0E	_	Rated Torque (read only)	-	
08 PnA10	_	Maximum Output Torque (read only)	-	
09 PnA12	_	Torque Multiplier (read only)	-	
0A PnA14	_	Resolution (read only)	_	
0B PnA16	0	Linear Scale Pitch	After restart	

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Devenenter			
Parameter No.	Default Setting	Name	When Enabled
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 <sup>*2</sup>
24 PnA48	65535	Multiturn Limit	After restart
25 PnA4A	0000 hex	Limit Setting	After restart
26 PnA4C	1073741823	Forward Software Limit	Immediately
27 PnA4E	0	Reserved (Do not change.)	Immediately
28 PnA50	-1073741823	Reverse Software Limit	Immediately
29 PnA52	0	Reserved (Do not change.)	Immediately
41 PnA82	0 hex	Speed Unit	After restart
42 PnA84	0	Speed Base Unit	After restart
43 PnA86	0 hex	Position Unit	After restart
44 PnA88	0	Position Base Unit	After restart
45 PnA8A	0 hex	Acceleration Unit	After restart
46 PnA8C	4	Acceleration Base Unit	After restart
47 PnA8E	1 hex	Torque Unit	After restart
48 PnA90	0	Torque Base Unit	After restart
49 PnA92	0601011F hex	Supported Unit (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	Feed Forward Compensa- tion	Immediately
65 PnACA	0	Position Loop Integral Time Constant	Immediately
66 PnACC	7	In-position Range	Immediately
67 PnACE	1073741824	Near-position Range	Immediately

Parameter Lists

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Parameter	Default Catting	Name	When
No.	Default Setting	Name	Enabled
81 PnB02	0	Exponential Function Acceleration/Deceleration Time Constant	Immedi- ately <sup>*3</sup>
82 PnB04	0	Movement Average Time	Immedi- ately <sup>*3</sup>
83 PnB06	100	Final Travel for External Input Positioning	Immediately
84 PnB08	× 5,000 hex refer- ence units/s con- verted to 10 <sup>-3</sup> min <sup>-1</sup>	Zero Point Return Approach Speed	Immediately
85 PnB0A	× 500 hex reference units/s converted to 10 <sup>-3</sup> min <sup>-1</sup>	Zero Point Return Creep Speed	Immediately
86 PnB0C	100	Final Travel for Zero Point Return	Immediately
87 PnB0E	1 hex	Monitor Select 1	Immediately
88 PnB10	0 hex	Monitor Select 2	Immediately
89 PnB12	0 hex	Monitor Select for SEL_MON1	Immediately
8A PnB14	0 hex	Monitor Select for SEL_MON2	Immediately
8B PnB16	10	Zero Point Detection Range	Immediately
8C PnB18	100	Forward Torque Limit	Immediately
8D PnB1A	100	Reverse Torque Limit	Immediately
8E PnB1C	20000	Zero Speed Detection Range	Immediately
8F PnB1E	10000	Speed Match Signal Detection Range	Immediately
90 PnB20	0FFF3F3F hex	SVCMD_ CTRL bit Enabled/Disabled (read only)	_
91 PnB22	0FFF3F33 hex	SVCMD_ STAT bit Enabled, Disabled (read only)	-
92 PnB24	007F01F0 hex	I/O Bit Enabled/Disabled (Output) (read only)	_
93 PnB26	FF0FFEFE hex	I/O Bit Enabled/Disabled (Input) (read only)	_

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\*1. The enable timing depends on the digit that is changed. Refer to the following section for details.
 7.2.1 List of Servo Parameters on page 7-45

\*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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# **Revision History**

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

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# $\Sigma$ -7-Series AC Servo Drive $\Sigma$ -7S SERVOPACK with FT/EX Specification for Torque/Force Assistance for Conveyance Application **Product Manual**

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In the event that the end user of this product is to be the military and said product is to be employed in any weapons systems or the manufacture thereof, the export will fall under the relevant regulations as stipulated in the Foreign Exchange and Foreign Trade Regulations. Therefore, be sure to follow all procedures and submit all relevant documentation according to any and all rules, regulations and laws that may apply. Specifications are subject to change without notice for ongoing product modifications and improvements

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